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U.S. DEPARTMENT OF COMMERCE / National Bureau of Standards

Annotated Bibliography of the Literature on Resource Sharing Computer Networks

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[1] Headquarters and Laboratories at Gaithersburg, Maryland, unless otherwise noted; mailing address Washington, D.C. 20234.

[2] Located at Boulder, Colorado 80302.

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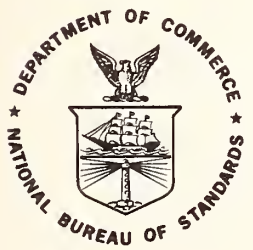

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Annotated Bibliography of the Literature on Resource Sharing Computer Networks*

Helen M. Wood
Shirley Ward Watkins
Ira W. Cotton

ABSTRACT

This bibliography consists of over 1,000 references with critical annotations to the literature on computer networks. A classification scheme has been developed to make each citation more accessible by general topic. Five indexes to the bibliography are included: author index, corporate author index, network index, title word index, and report number index.

Key Words: Bibliography; computer network; data communications; resource sharing.

INTRODUCTION

A fully annotated bibliography on resource sharing computer networks has been prepared by the Computer Networking Section of the NBS Institute for Computer Sciences and Technology. This work is an extension of the annotated bibliography published in 1973 by Blanc, Cotton, Pyke and Watkins.** The current bibliography contains nearly two times the number of references contained in the previous work. Its purpose is to serve as a working tool for those involved in computer networking research as well as those who are concerned with the design, evaluation, selection, and use of computer networks. The volume of requests for the first bibliography indicated the widespread and

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**R.P. Blanc, I.W. Cotton, T.N. Pyke, Jr., and S.W. Watkins, Annotated Bibliography of the Literature on Resource Sharing Computer Networks, NBS Special Publication 384, September 1973.

continuing need for such a work and, consequently, the indexes have been brought up to date through December 1975 and produced once again in this readily available form as an NBS Special Publication. Several documents published in 1976 are also included.

The bibliography covers computer networks consisting of independent computer systems which communicate with one another and share resources such as hardware, programs, or data and excludes, for example, articles on time-sharing and multi-processing which deal specifically and exclusively with those topics. Ancillary topics are covered if they are sufficiently relevant. Errors of exclusion have been considered by the authors to be more serious than errors of inclusion. All articles which are clearly topical are included without regard to quality; one purpose of the annotations is to identify particularly worthwhile articles.

A systematic search of relevant literature was undertaken in order to identify candidate documents for inclusion in the bibliography. All available related bibliographies, including those in Computing Reviews and those available through the ARPA Network Information Center were utilized in this search. Complete coverage of the personal collections of individuals at NBS who have been working in the computer networking area for some time is also included. As papers and reports were made a part of this collection, citations made within them were checked for potential additional documents for the collection. In addition, recent literature that may contain appropriate papers has been searched. No documents of a classified nature are included; however, some reports that may be rather difficult to obtain but are formal reports of recognized organizations are included.

No document is referenced in this bibliography unless it has actually been obtained for the collection at NBS. These documents are not, however, available from NBS except for internal use.

As each document was cataloged, the bibliographic data and annotations were placed in machine-readable form through the use of a key-to-tape terminal. The magnetic tapes resulting from this operation were then converted to industry compatible tapes and used as input to a special set of COBOL programs on the NBS Univac 1108 service computer. These programs were developed by the Computer Information Section of the NBS Institute for Computer Sciences and Technology.

The method of developing the bibliography has been to obtain potential documents through all possible sources and to evaluate their appropriateness for the collection according to the criteria stated above. All documents are annotated in a reasonably critical manner relative to this general subject area and placing particular attention on the currency of the information contained. All documents are categorized according to a classification scheme that has been developed for this specialized collection. This scheme permits each document to be placed in one primary category and one or more secondary categories as appropriate.

HOW TO USE THE INDEXES

The computer-produced output for this collection includes an annotated master bibliographic listing, an author index, a corporate author index, a network index, a title word index and a report number index.

Bibliographic Index

The Bibliography Section contains complete bibliographic citations ordered by subject category and, within category, by author. If there was no personal author for the paper, then the citation is ordered by title, within subject category. The annotation for each document is included only in the primary category and is cross-referenced when an entry appears in secondary categories.

Author Index

All authors of each article are listed in the Author Index with their names followed by as much of the title as will fit on one line. No indication is given here as to whether an individual is the sole author or one of several coauthors. Reference should be made to the Bibliographic Index for this information.

Authors will be found under the prefix when their last name is preceded by prefixes such as: DE, DI, LA, VAN, VER and VON. Authors may be listed with their given names in full or with one or more of their given names shortened to initials. This, plus the fact that authors whose names are followed by suffixes such as JR, SR, II and III sometimes publish with the suffix dropped, means that occasionally references by the same author may become slightly separated. Each entry identifies the document's subject category number and first author for cross-referencing.

Corporate Author Index

For each article listed in this index, the organization at which each author was employed at the time of publication of the article is given, followed by as much of the title as will fit on one line. As with the Author Index, organizations employing all authors of each article are listed.

Each entry identifies the document's subject category number and first author for cross-referencing.

Title Word Index

The Title Word Index is a keyword out of context (KWOC) index. Each title can be found under all of the significant words that it contains.

Over 70 words which are of limited use as search tools such as ALMOST, AND, BIG, FOR, HAVING, NO, OF, THE and WITHIN have been excluded from the keyword index in order to reduce the length of this list. In addition words such as COMPUTER, COMPUTERS, NETWORK, and NETWORKING have been excluded as keywords since they appear so often in titles in the specific area covered by this report that they lose their value as keywords.

Each title cross-references the main citation entry in the Bibliography Section by category number and the first ten characters from the primary author's last name.

Network Index

The network Index contains entries concerned with specific networks, such as ARPA or WWMCCS. As with the Title Word Index, each entry cross-references the bibliography by category number and author's last name.

Report Number Index

Each document's associated report numbers, when known, are listed in the Report Number Index, followed by as much of the title as will fit on one line. Report numbers include grant numbers, contract number, Defense Documentation Center "AD" numbers, Library of Congress "LC" numbers, and so forth. Each entry is cross-referenced to the main citation by category number and author's last name.

CLASSIFICATION SCHEME

The classification scheme developed for the previously published bibliography of resource-sharing computer networks was designed to satisfy both a reflection of the field as it seems to be structured as well as pragmatic considerations of covering the "collection" evenly. This was accomplished by a hierarchical classification scheme, which first permitted the field to be structured, and then permitted discrimination between groups of articles to as great a detail as seemed warranted. Since articles may be multiply classified, there was minimal concern that all classes be mutually exclusive.

An article is assigned to as many classes as seem useful for researchers interested in that particular class. A distinction is made between primary classification and secondary classification only for reasons of efficiency in the production of the bibliography; a full reference appears in all cases, but the annotation appears only at the primary reference. Secondary references point to the primary reference so that the annotation may be located.

This taxonomy is not considered to be definitive, but has been adapted to the content of the bibliography and the needs of researchers. New categories are added as required and/or existing categories further subdivided.

The following notes describe the authors' intent for each entry in the classification scheme:

1. INTRODUCTORY - all articles of a general, introductory survey or tutorial nature. Note, however, that general descriptions of specific networks are assigned to section 3. All articles in this section are assigned to one of the following classes:

    1.0 General - self-explanatory

    1.1 Objectives - articles dealing with goals, purposes, objectives of resource-sharing computer networks. Why are such networks being built; what are the expected benefits?

    1.2 Survey - comparison articles describing two or more networks

    1.3 Tutorial - tutorial articles dealing with computer

networks and tutorial articles dealing with ancillary subjects (e.g., data communications)

1.4 Bibliographies

1.5 Social Issues - such issues as are raised by computer networks

1.6 Forecasts - prognostications regarding the growth or future development of computer networks

1.9 Other - anything else which properly falls in the introductory section

2. THEORY - all analyses, simulations, algorithms, theoretical formulations and results of any sort dealing with computer networks. The main distinction to be made is from the next section on architecture.

This section is broken down into the following classes:

2.0 General - self-explanatory

2.1 Analysis - divided further as follows:

2.1.0 General

2.1.1 Simulation - descriptions of actual simulations c networking systems

2.1.2 Analysis - all analytic work which is not based on simulations

2.1.3 Routing - all articles dealing with routing algorithms, computations or simulation. (This class was pragmatically established).

2.1.4 Modelling - descriptions of models of networking systems, especially those which have not led to analytic results and which have not been implemented by simulations. (Naturally, there will be some overlap with the sections on simulation and analysis)

2.1.9 Other

2.2 Measurement - any results of observing the operation of existing networks, or techniques of measurement which could be applied

2.3 User Considerations - human factors, response time considerations, system friendliness discussions

2.9 Other - anything else

3. ARCHITECTURE - all articles dealing with the actual design of networks, components, implementation issues

3.0 General

3.1 Specific networks - descriptions of specific networks, further categorized as follows:

3.1.0 General descriptions - distinguished from the next class by judgment only

3.1.1 Technical descriptions - including interim reports

3.1.2 Evaluation - performance analyses, reported results of operating, introspective articles

3.2 Telecommunications - all articles dealing with data communications

3.2.0 General

3.2.1 Transmission Facilities - lines, circuits, common carrier and specialized facilities (but not modems, multiplexers, etc.)

3.2.2 System design - of data communications systems

3.2.3 Hardware components - components of a data communication system: modems, multiplexers, etc.

3.2.9 Other - anything else dealing with telecommunications (telecommunications software, however, is assigned to 3.4)

3.3 Hardware - components for computer networks, excluding specific communications hardware covered in the previous class

3.3.0 General

3.3.1 Interfaces - between processors or between a processor and the data communications

system

3.3.2 Processors - including front-ends and switching computers

3.3.9 Other

3.4 Software - of any type. Application programs will be classed under applications.

3.4.0 General

3.4.1 Communications - communications control (but line disciplines are reserved for 3.5)

3.4.2 Operating Systems - including network control programs

3.4.3 Data Management

3.4.4 User-oriented

3.4.5 Software Testing

3.4.9 Other

3.5 Protocols - including line discipline and communications control procedures

3.5.0 General

3.5.1 Low Level

3.5.2 High Level

3.5.9 Other

3.9 Other

4. APPLICATIONS - all articles dealing with uses of computer networks

4.0 General

4.1 Functional - packages, services or capabilities likely to have widespread use (e.g., text editing or teleconferencing systems)

4.1.0 General

4.1.1 Teleconferencing Systems

4.1.2 File Management (including file transfer and data sharing)

4.1.9 Other

4.2 Discipline-oriented - applications common to a specific field (e.g., an engineering package, a chemical analysis service)

4.2.0 General

4.2.1 Health and Medical Sciences

4.2.2 Library Science

4.2.3 Education

4.2.9 Other

4.3 Computer Utility - this category is usually claimed by the article itself

4.9 Other

5. MANAGEMENT - all articles dealing in any way with the operation or business of computer networks

5.0 General

5.1 Operations - day to day management

5.2 Market Analysis - who are the users?

5.3 Financial - capitalization, billing, finance

5.4 Regulatory - public policy, tariffs, etc.

5.5 Standards

5.6 Security - systems, requirements

5.7 User Services

5.8 Procurement

5.9 Other

ANNOTATED BIBLIOGRAPHY
Complete through 1975

Index of Categories

1. INTRODUCTORY

1.0 GENERAL

BARAN, PAUL, ON DISTRIBUTED COMMUNICATIONS: I. INTRODUCTION TO DISTRIBUTED COMMUNICATIONS NETWORKS, RAND CORP., SANTA MONICA, CA, AUG 64, RC RM-3420-PR, AF 49(638)-700, (AD-444 830), 37P, 3 REFS

THIS IS THE INTRODUCTORY REPORT TO THE SERIES OF DOCUMENTS THAT FOR THE FIRST TIME PRESENT THE MESSAGE-SWITCHED DISTRIBUTED NETWORK AS CLEARLY SUPERIOR TO CENTRALIZED AND HIERARCHICAL NETWORKS FOR SURVIVABILITY. A STANDARD MESSAGE BLOCK IS PROPOSED TO SIMPLIFY NETWORK DESIGN AND ARGUMENTS ARE MADE FOR DYNAMIC ROUTING AND LOW COST COMMUNICATION LINKS THAT IN A DISTRIBUTED CONFIGURATION CAN PROVIDE RELIABLE COMMUNICATIONS.
(ALSO UNDER 3.0)

BARAN, PAUL, ON DISTRIBUTED COMMUNICATIONS: XI. SUMMARY OVERVIEW, RAND CORP., SANTA MONICA, CA, AUG 64, RC RM-3767-PR, AF 49(638)-700, (AD-444 837), 23P
(ANNOTATION UNDER 3.0)

BAUER, WALTER F., COMPUTER/COMMUNICATIONS SYSTEMS: PATTERNS AND PROSPECTS, (INFORMATICS INC., SHERMAN OAKS, CA), GRUENBERGER, F., COMPUTERS AND COMMUNICATIONS--TOWARD A COMPUTER UTILITY, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1968, (TK 5101.C67, LC 68-16776), P 13-37, 11 REFS

AN OVERVIEW OF THE IMPACT OF THE MARRIAGE OF COMPUTERS AND COMMUNICATIONS IS PROVIDED. THE HISTORY OF COMPUTER COMMUNICATIONS AND THE ECONOMIC AND SOCIAL IMPLICATIONS OF THE MARRIAGE ARE TOUCHED UPON. SOME PARTICULARLY INTERESTING PREDICTIONS CONCERNING THE ROLE OF MESSAGE SWITCHING ARE MADE.
(ALSO UNDER 4.3)

BENDICK, MARC, FINAL REPORT OF THE COMMITTEE ON NETTING COMPUTER SYSTEMS, SYSTEM DEVELOPMENT CORP., SANTA MONICA, CA, ELECTRONIC INDUSTRIES ASSOCIATION, WASHINGTON, DC, DEFENSE COMMUNICATIONS COUNCIL, JUL 70, 52P

A SELECTION OF PROBLEMS AND A VARIETY OF GENERALIZATIONS ARE PROVIDED THAT RELATE TO THE NETWORKING OF STAND-ALONE COMPUTER SYSTEMS FOR MILITARY APPLICATIONS.

BORKO, H., NATIONAL AND INTERNATIONAL INFORMATION NETWORKS IN SCIENCE AND TECHNOLOGY, (CALIFORNIA, UNIV. OF, LOS ANGELES),
AFIPS PROCEEDINGS, 1968 FALL JOINT COMPUTER CONFERENCE, VOLUME 33, PART 2, (SAN FRANCISCO, CA, DECEMBER 9-11, 1968), THOMPSON BOOK CO., WASHINGTON, DC, 1968, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 1469-1472, 3 REFS

THE NEED FOR AND PROBLEMS OF A NATIONAL AND INTERNATIONAL SCIENCE NETWORK ARE INTRODUCED. THE DIFFICULTIES ASSOCIATED WITH THE MASSIVENESS OF TECHNOLOGICAL INFORMATION AS WELL AS THE MAGNITUDE OF THE GOVERNMENTAL AND PRIVATE EFFORTS AIMED AT SOLVING THESE DIFFICULTIES ARE PRESENTED. IT IS STATED THAT ALTHOUGH THE EFFORTS ARE COORDINATED, THEY ARE NOT TRULY INTEGRATED, AND THEREFORE THE INDIVIDUAL ENTITIES SHOULD BECOME INTERCONNECTED AND COOPERATIVE IN SHARING PROBLEM SOLVING RESOURCES. THE TECHNICAL PROBLEMS OF A NATIONAL AND INTERNATIONAL NETWORK ARE CATEGORIZED AS NOT INSURMOUNTABLE, BUT MANAGEMENT PROBLEMS ARE CONSIDERED MORE DIFFICULT AND SOME ARE EXPLICITLY STATED. THE CONCLUDING STATEMENTS CONCERNING THE IMPLICATIONS OF COMPUTER NETWORKS MAY BE A BIT OVERLY OPTIMISTIC.

CASTLE, JAMES C., SYSTEM CONTROL IN MULTIPLE ACCESS COMPUTER NETWORKS, (GENERAL ELECTRIC CO., BETHESDA, MD, DEPT. OF INFORMATION NETWORKS),
INTERDISCIPLINARY CONFERENCE ON MULTIPLE ACCESS COMPUTER NETWORKS, (AUSTIN, TX, APRIL 20-22, 1970), APR 70, P S-3-I--S-3-II, 30 REFS

A TERMINOLOGY FOR COMPUTER NETWORKS IS PRESENTED AND NETWORK STRUCTURES AND ALTERNATIVE NETWORK CONTROL SCHEMES ARE BRIEFLY DISCUSSED. THE GENERAL ELECTRIC CENTRALIZED NETWORK SERVES AS AN EXAMPLE FOR THE DISCUSSION.
(ALSO UNDER 3.0)

FLOOD, MERRILL M., COMMERCIAL INFORMATION PROCESSING NETWORKS--PROSPECTS AND PROBLEMS IN PERSPECTIVE, HUXLEY, JUDITH, THE OUTLOOK FOR TECHNOLOGICAL CHANGE AND EMPLOYMENT, APPENDIX VOLUME I, TECHNOLOGY AND THE AMERICAN ECONOMY, AND ECONOMIC PROGRESS, THE REPORT OF THE COMMISSION, FEB 66, (HC 106.5.A5682), P I-233--I-252

THIS ANALYSIS REVIEWS COMMERCIAL NETWORK ACTIVITIES AND RELATED IMPLICATIONS. SPECIAL PROJECTS IN THE AREAS OF LIBRARIES, EDUCATION, BIOMEDICINE, ENGINEERING, LAW, PRODUCT DISTRIBUTION, FINANCE, TRANSPORTATION, AND RELATED IMPLICATIONS AND IMPACTS ARE DISCUSSED. THEN A NUMBER OF PROBLEMS ASSOCIATED WITH NETWORKING ARE PUT FORTH, PARTICULARLY THOSE DEALING WITH LEGAL ISSUES. THE PAPER CONCLUDES WITH A LIST OF RECOMMENDATIONS FOR FEDERAL GOVERNMENT ACTION.
(ALSO UNDER 5.0)

HARTUNG, ALBERT F., COMPUTER NETWORKS AND COMMUNICATIONS, (SYSTEM DEVELOPMENT CORP., SANTA MONICA, CA, DEPT. OF COMMUNICATIONS PROJECTS),
COMPUTER, VOL 7, ISSUE 2, FEB 74, P 11

IN THIS VERY BRIEF, INTRODUCTORY ARTICLE HARTUNG ASSERTS THAT NETWORKS SHOULD BE ACCESSIBLE BY PERSONS AT DIFFERENT LEVELS OF USER SOPHISTICATION AND SHOULD BE ADAPTIVE TO CHANGING REQUIREMENTS.

KURTZ, THOMAS, REGIONAL NETWORKS,(PRESENTED AT, NETWORKS IN HIGHER EDUCATION: PROCEEDINGS OF THE EDUCOM COUNCIL MEETING SEMINAR, ATLANTA, GA, OCTOBER 15,1970), (DARTMOUTH COLLEGE, HANOVER, NH),
BEHAVIORAL SCIENCE, VOL 16, ISSUE 5, SEP 71, P 494-497

AFTER REVIEWING DIMENSIONS FOR CLASSIFICATION OF NETWORKS, E.G., COMMUNICATIONS, TYPE OF SERVICE EXCHANGED, AND ORGANIZATIONAL STRUCTURE, THE AUTHOR DISCUSSES THE KIND OF NETWORK REPRESENTED BY A RECENT BURST OF ACTIVITY THAT HAS GROWN OUT OF THE PIERCE REPORT, 'COMPUTERS IN HIGHER EDUCATION.' TWO PROJECTS AT DARTMOUTH AIMED AT ADDRESSING THE CURRICULUM DEVELOPMENT PROBLEM ARE MENTIONED: PROJECT COEXIST, AND PROJECT COMPUTE.

NEUMANN, A. J., A GUIDE TO NETWORKING TERMINOLOGY, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, SYSTEMS AND SOFTWARE DIV., MAR 74, N8S TN-803, NSF AG-350, 29P
(ANNOTATION UNDER 1.3)

O'SULLIVAN, THOMAS C., TERMINAL NETWORKS FOR TIME-SHARING, (RAYTHEON CO., SUDBURY, MA, DATA SYSTEMS SECTION),
DATAMATION, VOL 13, ISSUE 7, JUL 67, P 34-43, 1 REFS

THIS IS ANOTHER ARTICLE ON THE RAYTHEON TERMINAL NETWORK. SEE O'SULLIVAN'S ARTICLE 'EXPLOITING THE TIME-SHARING ENVIRONMENT' IN CATEGORY 3.1.2.

PROBST, LESTER A., COMMUNICATIONS DATA PROCESSING SYSTEMS: DESIGN CONSIDERATIONS, (FAIM, NEW YORK),
COMPUTERS AND AUTOMATION, VOL 17, ISSUE 5, MAY 68, P 18-21

A CHECKLIST OF CONSIDERATIONS IS PROVIDED RELATIVE TO THE SUCCESSFUL IMPLEMENTATION AND EVENTUAL OPERATION OF A 'COMMUNICATION DATA PROCESSING SYSTEM'. A COMMUNICATION DATA PROCESSING SYSTEM IS DEFINED AS AN ON-LINE SYSTEM CONSISTING OF: INQUIRY RESPONSE, DATA COLLECTION, DATA DISSEMINATION, AND MESSAGE SWITCHING.

ROBERTS, LAWRENCE G., D. R. PADEN, NETWORK OF COMPUTERS, SESSION II, DEFINITION, MODELING AND EVALUATION--SESSION SUMMARY, (ADVANCED RESEARCH PROJECTS AGENCY, WASHINGTON, DC, NATIONAL SECURITY AGENCY, FORT MEADE, MD),
PROCEEDINGS OF INVITATIONAL WORKSHOP ON COMPUTERS, OCT 68, P S7-65

A DISCUSSION SESSION AIMED AT DEFINING NETWORKS OF COMPUTERS (NOC) IS SUMMARIZED, IDENTIFYING THE MAIN PROBLEMS, AND REVIEWING THE CURRENT APPROACHES TO SOLUTIONS. THE SUMMARY REPORTS AGREEMENT THAT A RESOURCE SHARING NETWORK OF COMPUTERS SHOULD HAVE THE FOLLOWING FEATURES:
(1) EACH COMPUTER SHOULD BE CAPABLE OF EXTENDING LOCALLY AVAILABLE SERVICE TO THE ENTIRE NETWORK,
(2) USER-DESIGNED PROCEDURES SHOULD BE ABLE TO REQUEST ANY SERVICES AVAILABLE IN THE NETWORK, AND
(3) EACH COMPUTER MUST BE CAPABLE OF ACCEPTING AND EXECUTING AN ARBITRARY PROCEDURE.
THE DISCUSSION THEN CONSIDERS SOME DESIGN QUESTIONS, MODELING ALTERNATIVES, AND PERFORMANCE MEASURES. THE FINALE IS A LIST OF INTERESTING UNANSWERED QUESTIONS CONCERNING NETWORKS.
(ALSO UNDER 2.0)

1.1 OBJECTIVES

ARONOFSKY, JULIUS, COMPUTER USAGE IN THE NATURAL SCIENCES, REPORT OF WORKSHOP 1, (SOUTHERN METHODIST UNIV., DALLAS, TX)

I.1 OBJECTIVES

GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 99-104

THE USE OF COMPUTERS IN THE NATURAL SCIENCES COVERS A BROAD SPECTRUM OF USERS. PARTICIPANTS OF THE WORKSHOP EMPHASIZE THAT THE GOAL OF A NETWORK SHOULD BE TO ACCOMMODATE INDIVIDUALS WHO REQUIRE LARGE BLOCKS OF COMPUTER TIME AS WELL AS SMALL USERS WHICH IN THE AGGREGATE REQUIRE EXTENSIVE COMPUTER POWER. IT IS NOTED THAT THERE IS A NEED FOR A CATALOG OF THE COMPUTING RESOURCES OF NATIONAL SCIENCE LABORATORIES AND UNDER WHAT CIRCUMSTANCES THEY ARE AVAILABLE TO HIGHER EDUCATION.
(ALSO UNDER 4.2.9)

AUFENKAMP, D. DON, NSF ACTIVITIES IN NETWORKING FOR SCIENCE, (NATIONAL SCIENCE FOUNDATION, WASHINGTON, DC).
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 38-43, 2 REFS

THE AUTHOR REVIEWS SOME NSF SUPPORTED ACTIVITIES ASSOCIATED WITH THE CONCEPT OF A NATIONAL SCIENCE COMPUTER NETWORK. THESE INCLUDE PROGRAMS SPONSORING RESEARCH, DEVELOPMENT AND SPECIAL STUDIES IN THE AREAS OF RESOURCE SHARING, USER CHARACTERISTICS, USER NEEDS, AND NETWORK TECHNOLOGY.
(ALSO UNDER 1.6, 4.2.0)

AUFENKAMP, D. D., NATIONAL SCIENCE (COMPUTER) NETWORK, (NATIONAL SCIENCE FOUNDATION, WASHINGTON, DC, OFFICE OF COMPUTING ACTIVITIES).
NETWORKS FOR HIGHER EDUCATION. PROCEEDINGS OF THE EDUCOM SPRING CONFERENCE, (WASHINGTON, DC, APRIL 13, 1972), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1972, P 29-35

THIS IS AN INTRODUCTION TO THE CONCEPT OF THE NATIONAL SCIENCE COMPUTER NETWORK LINKING USERS AT ACADEMIC AND OTHER INSTITUTIONS TO SPECIALIZED RESOURCES FOR COMPUTING AND SCIENCE INFORMATION SERVICES. THE EMPHASIS IN THIS PRESENTATION IS ON THE STRUCTURED SHARING OF COMPUTER RESOURCES AND THE RELATED BENEFITS RATHER THAN ACCENTUATING THE COMPUTER NETWORK TECHNOLOGY.
(ALSO UNDER 4.2.0)

AUFENKAMP, D. D., NSF NETWORK INITIATIVE. (NATIONAL SCIENCE FOUNDATION, WASHINGTON, DC, OFFICE OF COMPUTING ACTIVITIES)
NETWORKS AND DISCIPLINES. PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (ANN ARBOR, MI, OCTOBER 11-13, 1973), 1973, P 88-90, 3 REFS

A SHORT, GENERAL DISCUSSION IS PRESENTED ON THE WORK OF THE NATIONAL SCIENCE FOUNDATION TOWARDS A NATIONAL SCIENCE COMPUTER NETWORK. THE SCOPE AND OBJECTIVES OF THE NETWORK INITIATIVE AND CURRENT RESEARCH PROJECTS IN THIS AREA ARE INCLUDED.
(ALSO UNDER 4.2.0)

BARBER, D. L. A., PROGRESS WITH THE EUROPEAN INFORMATICS NETWORK, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), EUROPEAN INFORMATICS NETWORK).
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION. COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 215-220, 9 REFS
(ANNOTATION UNDER 3.1.0)

BARBER, D. L. A., THE EUROPEAN COMPUTER NETWORK PROJECT, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND)),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 192-200, 16 REFS
(ANNOTATION UNDER 3.1.0)

BELL, C. G., A. N. HABERMANN, J. MCCREDIE, RONALD M. RUTLEDGE, W. WULF, COMPUTER NETWORKS, (CARNEGIE-MELLON UNIV., PITTSBURGH, PA, DEPT. OF COMPUTER SCIENCE),
COMPUTER, VOL 3, ISSUE 5, SEP-OCT 70, P 13-23
(ANNOTATION UNDER 3.1.0)

BENOIT, JOHN W., S. B. MAHLE, P. H. MESSING, D. C. WOOD, EVALUATION OF THE NETWORK FEATURES REQUIRED TO ATTAIN THE APPROVED NMCS OBJECTIVES, MITRE CORP., WASHINGTON, DC, 25 JUN 71, MC WP-9742, SSP

MITRE IS A CONSULTANT TO THE DEFENSE COMMUNICATIONS AGENCY ASSISTING IN PREPARING FOR THE DEVELOPMENT OF A COMPUTER NETWORK IN THE NATIONAL MILITARY COMMAND SYSTEM (NMCS). THIS PAPER DISCUSSES THE OBJECTIVES TO BE MET BY AN NMCS NETWORK AND EVALUATES THE CAPABILITIES WHICH CHARACTERIZE NETWORKS TO IDENTIFY THOSE FEATURES WHICH WILL BE REQUIRED TO ATTAIN THE NMCS OBJECTIVES.

BENVENUTO, A. A., J. R. GOODROE, R. P. MORTON, SYSTEM LOAD SHARING STUDY, MITRE CORP., WASHINGTON, DC, 25 MAR 69, MTR 5062, AF F19628-68-C-0365, 9SP
(ANNOTATION UNDER 1.2)

BROWN, GEORGE W., AN INTERUNIVERSITY INFORMATION NETWORK. II. EVALUATION, (CALIFORNIA, UNIV. OF, IRVINE),
KENT, ALLEN, ORRIN E. TAULBEE, ELECTRONIC INFORMATION HANDLING, (PITTSBURGH, PA, OCTOBER 7-9, 1964), SPARTAN BOOKS INC., WASHINGTON, DC, 1965, KNOWLEDGE AVAILABILITY SYSTEMS SERIES, (LC 65-17306), P 269-278

IN A RATHER GENERAL WAY SOME OF THE IMPORTANT PROBLEMS INVOLVED IN THE EVALUATION OF AN INTER-UNIVERSITY NETWORK ARE PRESENTED.
(ALSO UNDER 3.1.2)

BROWN, GEORGE W., JAMES G. MILLER, THOMAS A. KEENAN, EDUNET REPORT OF THE SUMMER STUDY ON INFORMATION NETWORKS, INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, WILEY (JOHN) AND SONS INC., NEW YORK, 1967, (LC 67-21328), 440P

THIS BOOK IS A REPORT OF A STUDY ON INFORMATION NETWORKS CONDUCTED BY EDUCOM WHICH WAS UNDERTAKEN TO CONSIDER WHETHER AN ADVANCED EDUCATIONAL NETWORK WOULD MAKE AMERICAN HIGHER EDUCATION MORE EFFICIENT AND ECONOMICAL AND IMPROVE THE QUALITY OF INSTRUCTION AND RESEARCH. TWO NETWORK DESIGNS ARE PRESENTED AND ANALYZED.

COLE, G. D., COMPUTER NETWORKS, (SYSTEM DEVELOPMENT CORP., SANTA MONICA, CA),
1972 WESCON TECHNICAL PAPERS, SESSION 7: COMPUTER NETWORKS, (PRESENTED AT, WESTERN ELECTRONIC SHOW AND CONVENTION, SEPTEMBER 19-22, 1972), 1972, P 7-1--7-2, 2 REFS

THIS ARTICLE IS PRIMARILY AN INTRODUCTION TO THE REMAINING ARTICLES PRESENTED AT THE COMPUTER NETWORKS SESSION OF THE WESCON CONFERENCE, ALTHOUGH IT DOES BRIEFLY DISCUSS SOME OF THE BENEFITS OF COMPUTER NETWORKING.

DAVIS, RUTH M., DR., COMPUTING NETWORKS: A POWERFUL NATIONAL FORCE,(PRESENTED AT, COMPCON 73 COMMITTEE, FEBRUARY 28, 1973), (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY),
COMPUTER, VOL 6, ISSUE 4, APR 73, P 14-18

IN THIS PAPER, A COPY OF HER COMPCON 73 KEYNOTE SPEECH, DR. DAVIS ASSERTS THAT "COMPUTER NETWORKS COULD WELL BE THE STRONGEST FORCE AT OUR COMMAND TODAY." SHE SUPPORTS THIS ASSERTION WITH EXAMPLES OF THE ALREADY PRESENT DEPENDENCE UPON THE COUPLING OF MINI- AND MAXICOMPUTERS IN OUR NATION, AND URGES THE ADOPTION OF A PLAN THAT SHE CONSIDERS MINIMAL IN MEETING NETWORK USERS' AND TECHNOLOGISTS' OBLIGATION TO SOCIETY AND TO THE BENEFICIAL APPLICATION OF COMPUTER TECHNOLOGY.

DAVIS, RUTH M., PRACTICALITIES OF NETWORK USE, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY),
NETWORKS FOR HIGHER EDUCATION. PROCEEDINGS OF THE EDUCOM SPRING CONFERENCE, (WASHINGTON, DC, APRIL 13, 1972), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1972, P 13-28
(ANNOTATION UNDER 4.0)

DEGRASSE, RICHARD V., REMOTE COMPUTING IN HIGHER EDUCATION: PROSPECTS FOR THE FUTURE, VERMONT, UNIV. OF, BURLINGTON, ACADEMIC COMPUTING CENTER, DEC 71, NSF GJ-947, 103P, 53 REFS

DIRECTIONS FOR EDUCATIONAL COMPUTING NETWORKS ARE IDENTIFIED, SOME BASED ON CITED SURVEYS AND OTHER PAPERS, SOME WITHOUT APPARENT JUSTIFICATION. ALSO CONTAINED ARE SUMMARIES OF TECHNOLOGICAL AND REGULATORY TRENDS IN COMPUTERS AND COMMUNICATIONS. GREAT CONCERN IS NOTED FOR THE 1250 EDUCATIONAL INSTITUTIONS WITHOUT ACCESS TO COMPUTING FACILITIES, AND IT IS TO SERVE THEM THAT A PRIMARY JUSTIFICATION FOR NETWORKING IS MADE. THE REPORT VIEWS SUCH NETWORKS AS TEMPORARY, HOWEVER, UNTIL USER SITES HAVE OBTAINED THEIR OWN COMPUTER FACILITIES, AT WHICH POINT THE NETWORK MAY NOT BE NEEDED.

1.1 OBJECTIVES

ECONOMY OF SCALE IS MENTIONED BUT NOT EXPLORED OTHER THAN TO INTRODUCE THE CONCEPT OF REGIONAL NETWORKS AS MORE LIKELY TO SUCCEED THAN LARGER, PERHAPS NATIONAL NETS. ALTHOUGH THE CONCLUSIONS STATED AT THE BEGINNING OF THE REPORT CALL FOR A NATIONAL EDUCATIONAL NETWORK, LITTLE SUPPORTING MATERIAL IS PRESENTED TOWARD THIS CONCLUSION. THE USE OF PPBS MANAGEMENT FOR A NETWORK, OR NETWORK COMMUNITY, IS PROPOSED.
(ALSO UNDER 4.2.3)

DIXON, WILFRID J., DATA AND COMPUTING FACILITIES. (CALIFORNIA, UNIV. OF, LOS ANGELES).
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 105-114
(ANNOTATION UNDER 4.2.D)

FIFE, DENNIS W., PRIMARY ISSUES IN USER NEEDS. (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY).
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 89-95, 3 REFS
(ANNOTATION UNDER 2.3)

GOLDSTEIN, BERNARD, THE CASE FOR NETWORKS. (UNITED DATA CENTERS INC., NEW YORK).
DATAMATION, VOL 16, ISSUE 3, MAR 70, P 62-64

NETWORKING OFFERS A SOLUTION TO INDEPENDENT DATA PROCESSING INSTALLATIONS WHICH SUFFER FROM THE PROBLEMS OF UNDERCAPITALIZATION AND LACK OF TECHNICAL TALENT. OTHER BENEFITS CLAIMED FOR NETWORKS ARE PROTECTION FOR INVESTMENTS THROUGH MARKET DOMINANCE AND AMORTIZATION OF PACKAGE DEVELOPMENT OVER A LARGER MARKETPLACE. THE ARGUMENT IS SOMEWHAT GENERAL AND SPECIFIC EXAMPLES ARE LACKING.
(ALSO UNDER 5.3)

GREENBERGER, MARTIN, APPLICATIONS DEVELOPMENT AND USER SERVICES, REPORT OF WORKSHOP II. (JOHNS HOPKINS UNIV.).
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 373-384, 1 REFS

THE WORKSHOP INITIALLY DEALT WITH THE MEANING OF THE TERM *NETWORK* AND FOLLOWED WITH DISCUSSIONS OF THE FOLLOWING TOPICS: INCENTIVES; IDENTIFYING RESOURCES TO BE SHARED; STANDARDS AND QUALITY CONTROL; EFFECT OF DIFFERENT USER TYPES; GOVERNANCE AND ALLOCATION; AND OTHER POLICY ISSUES.
(ALSO UNDER 1.3)

HAMILTON, WALTER C.JR., LARGE-SCALE NUMERICAL ANALYSIS AS APPLIED TO THE BASIC SCIENCES. (BROOKHAVEN NATIONAL LAB., UPTON, NY).
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 96-98

NETWORKING CAN PROVIDE IMPORTANT RESOURCES FOR USERS WITH LARGE-SCALE COMPUTE-BOUND PROBLEMS. THE AUTHOR DISCUSSES THE POTENTIAL EXPANSION OF SCIENTIFIC HORIZONS TO NEW CLASSES OF PROBLEMS THROUGH THE POWER OF NEW TYPES OF COMPUTERS THAT NETWORKING WILL MAKE AVAILABLE TO MANY USERS.
(ALSO UNDER 1.6)

HERNDON, EDWIN S., E. PEREZ, NOREEN O. WELCH, CONCEPTS FOR A WWMCCS INTERCOMPUTER NETWORK, MC MTR-5122, AF F19628-71-C-0002, 122P, 40 REFS

THE PROBLEMS THAT ARISE WHEN IMPLEMENTING A DISTRIBUTED DATA BASE SYSTEM IN AN INTERCOMPUTER NETWORK ARE ADDRESSED IN THIS PAPER. THREE PROBLEM AREAS ARE DISCUSSED: THE DETERMINATION OF THE NODE AT WHICH DESIRED INFORMATION RESIDES, THE USER AND SYSTEM CAPABILITIES NECESSARY TO ACCESS AND MAINTAIN THESE (DISTRIBUTED) DATA BASES, AND THE IMPACT OF SUCH SCHEMES ON THE HARDWARE AND SOFTWARE CONFIGURATIONS OF THE HOST SITES. THE DISCUSSION DEALS SPECIFICALLY WITH THE WWMCCS (WORLD WIDE MILITARY COMMAND AND CONTROL SYSTEM) NETWORK OF HONEYWELL 6000 COMPUTERS, BUT THE CONCEPTS ARE DEVELOPED IN A REASONABLY GENERAL MANNER.

JASPER, DAVID P., A DEFINITION OF NETWORKS, (CONTROL DATA CORP., MINNEAPOLIS, MI).
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, *COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?*, (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-162B), P 67-69, 3 REFS

THE PURPOSE OF COMPUTER NETWORKS FROM THE VIEWPOINT OF SERVICES PROVIDED TO USERS IS EXPLAINED, BASED ON EXPERIENCES WITH CYBERNET. ALSO, AN ATTEMPT IS MADE TO CLASSIFY NETWORKS ACCORDING TO A SET OF BROAD FUNCTIONAL CLASSES, RATHER THAN THE TRADITIONAL USE OF TOPOLOGY.

KAPRIELIAN, ZOHRAB A., DR., A FEASIBILITY STUDY OF COMPUTER SHARING: UCLA-CALTECH-USC. (SOUTHERN CALIFORNIA, UNIV. OF, LOS ANGELES).
EDUCOM BULLETIN, VOL 8, ISSUE 1, SPRING 73, P 8-10

A COOPERATIVE EFFORT IN ASSESSING MUTUAL ADVANTAGES AVAILABLE THRU RESOURCE SHARING IS PRESENTED. THE PROGRAM, INVOLVING THREE DIVERSE UNIVERSITIES IN SOUTHERN CALIFORNIA, IS DESCRIBED. IN ADDITION TO THE GENERAL CONCLUSION OF FEASIBILITY, THE AUTHOR ENUMERATES FACTORS OF POSSIBLE INTEREST TO OTHERS CONTEMPLATING SIMILAR RESOURCE SHARING PROGRAMS.
(ALSO UNDER 3.1.2)

KEMENY, JOHN G., DR., THE QUESTION OF NETWORKS: WHAT KIND AND WHY?, (DARTMOUTH COLLEGE, HANOVER, NH),
EDUCOM BULLETIN, VOL 8, ISSUE 2, SUMMER 73, P 18-21

THE AUTHOR ADDRESSES A VARIETY OF QUESTIONS RELATIVE TO TIME-SHARING SYSTEMS AND NETWORKS. HIS VIEWS REFLECT HIS INVOLVEMENT WITH THE DARTMOUTH TIME-SHARING SYSTEM (DTSS). AMONG QUESTIONS CONSIDERED ARE: WHAT IS A NETWORK? WHAT KIND OF SUPPLIERS SHOULD ONE CONSIDER IN A NETWORK? WHAT IS REMOTE? CAN DTSS BE CONSIDERED TO BE A NETWORK? HE BUILDS A CASE FOR A *FACILITATING NETWORK*, A NETWORK WHICH WOULD INTERFACE THOUSANDS OF USERS WITH SEVERAL EXISTING TIME-SHARING SYSTEMS.

KIMBEL, DIETER, PLANNING OF DATA COMMUNICATIONS NETWORKS--ECONOMIC, TECHNOLOGICAL AND INSTITUTIONAL ISSUES. (ORGANISATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, PARIS, (FRANCE)).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CH0-690-8C, NSF GJ-33239, P 251-259, 19 REFS
(ANNOTATION UNDER 5.4)

LENNON, WILLIAM J., A USER ORIENTED MINI-COMPUTER NETWORK. (NORTHWESTERN UNIV., EVANSTON, IL, DEPT. OF COMPUTER SCIENCES).
COMPCON FALL '75, ELEVENTH IEEE COMPUTER SOCIETY CONFERENCE, HOW TO MAKE COMPUTERS EASIER TO USE, DIGEST OF PAPERS, (WASHINGTON, DC, SEPTEMBER 9-11, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75CH0988-6C, P 133-136, 4 REFS
(ANNOTATION UNDER 3.1.D)

LICKLIDER, J. C. R., POTENTIAL OF NETWORKING FOR RESEARCH AND EDUCATION. (MASSACHUSETTS INST. OF TECH., CAMBRIDGE).
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 44-50, 1 REFS

PROBABLE CHANGES THAT WILL RESULT FROM COMPUTER COMMUNICATION NETWORKS OF THE FUTURE ARE DISCUSSED FROM BOTH THE TECHNICAL AND SOCIAL POINTS OF VIEW. THE AUTHOR ENVISIONS A CONTINUALLY CHANGING CONFIGURATION OF *NETWORK OF NETWORKS* CONNECTING PEOPLE WITH CONSOLES TO OTHER PEOPLE WITH CONSOLES AND TO INFORMATION SYSTEMS AND SERVICES. SUCH A NETWORK WOULD BE INDEPENDENT OF THE GEOGRAPHICAL DISTRIBUTION OF ITS COMPONENT PARTS.
(ALSO UNDER 1.5, 1.6)

MAUTZ, ROBERT E., STATEWIDE PLANNING AND REGIONAL CENTERS, (STATE UNIVERSITY SYSTEM OF FLORIDA),
THE FINANCING AND ORGANIZATION OF COMPUTING IN HIGHER EDUCATION: 1971, PROCEEDINGS OF THE EDUCOM SPRING CONFERENCE, (PHILADELPHIA, PA, APRIL 29, 1971), 1971, P 10-17
(ANNOTATION UNDER 4.3)

MERIT PROPOSAL SUMMARY, MERIT COMPUTER NETWORK, ANN ARBOR, MI, FEB 70, 9P
(ANNOTATION UNDER 3.1.0)

MILLER, JAMES G., EDUCOM: INTERUNIVERSITY COMMUNICATIONS COUNCIL, INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ., MAY 66, 22P

A BRIEF DESCRIPTION OF EDUCOM, THE INTERUNIVERSITY COMMUNICATIONS COUNCIL, IS FOLLOWED BY A PRESENTATION OF PLANS AND HOPES FOR INVOLVEMENT IN THE DEVELOPMENT OF NATIONAL INFORMATION NETWORKS.
(ALSO UNDER 4.2.3)

NIELSEN, NORMAN R., THE MERIT OF REGIONAL COMPUTING NETWORKS, (STANFORD UNIV., CA), COMMUNICATIONS OF THE ACM, VOL 14, ISSUE 5, MAY 71, P 319-326, 3 REFS

THIS PAPER DESCRIBES SOME OF THE EXPERIENCES RELATED TO THE STANFORD REGIONAL COMPUTING NETWORK, A NATIONAL SCIENCE FOUNDATION FUNDED NETWORK PROVIDING TERMINALS TO HIGH SCHOOLS AND COLLEGES IN THE AREA FOR ACCESS TO THE IBM 360/67 AT STANFORD. THE DISTINCTION BETWEEN SUPPLYING SERVICE TO THE NETWORK USERS AND JUST RAW COMPUTING POWER IS WELL DISPLAYED. PROBLEMS RELATED TO FACULTY INVOLVEMENT, COST JUSTIFICATION, ADEQUATE CAPACITY, AND CONSULTATION ARE POINTED OUT. ONE OF THE ADVANTAGEOUS OUTCOMES OF THE NETWORK HAS BEEN THE STIMULATION OF INTEREST IN COMPUTING BY LARGE COMMUNITIES OF PREVIOUSLY UNEXPOSED INDIVIDUALS.
(ALSO UNDER 3.1.2)

PACIFIC EDUCATIONAL COMPUTER NETWORK STUDY, HAWAII, UNIV. OF, HONOLULU, ALOHA SYSTEM, 31 MAR 7S, HU TR-CN7S-1, NSF GJ-33220, 12P

THE PACIFIC EDUCATIONAL COMPUTER NETWORK FEASIBILITY STUDY EXAMINED TECHNICAL AND NON-TECHNICAL ASPECTS OF THE FORMATION OF AN INTERNATIONAL PACIFIC AREA COMPUTER NETWORK FOR HIGHER EDUCATION. THIS IS A FINAL REPORT OF THAT STUDY. A BIBLIOGRAPHY OF MATERIALS PRODUCED BY OR CONTRIBUTED TO THE STUDY IS INCLUDED.
(ALSO UNDER 3.0)

PECK, PAUL L., EFFECTIVE CORPORATE NETWORKING, ORGANIZATION, AND STANDARDIZATION, (MITRE CORP., WASHINGTON, DC), AFIPS PROCEEDINGS, 1971 FALL JOINT COMPUTER CONFERENCE, VOLUME 39, (LAS VEGAS, NV, NOVEMBER 16-18, 1971), AFIPS PRESS, MONTVALE, NJ, 1971, AFIPS CONFERENCE PROCEEDINGS, (LC SS-44701), P S61-S69, 24 REFS

WITH AN EMPHASIS ON CORPORATE COMPUTING NETWORKS, THE NEGATIVE EFFECTS OF INCOMPATIBILITIES INTRODUCED WHEN NETWORKING DISSIMILAR SYSTEMS ARE DESCRIBED. HARDWARE, OPERATING SYSTEM, AND PROGRAMMING LANGUAGE INCOMPATIBILITIES ARE PRIMARY, WHILE DATA INCOMPATIBILITY IS CONSIDERED SECOND ORDER. THE ADVANTAGES OF NETWORKING ARE LISTED, CONCLUDING WITH AN ECONOMY OF SCALE ARGUMENT USING THE SUCCESSFUL TRIANGLE UNIVERSITY COMPUTER CENTER AS AN EXAMPLE. HOMOGENEOUS NETWORKS ARE INTRODUCED AS MOST DESIRABLE FOR CORPORATIONS, WITH CAREFUL ATTENTION GIVEN TO IMPLEMENTATION AND OPERATING PROCEDURES, ESPECIALLY STANDARDS.

PECK, PAUL L., THE IMPLICATIONS OF ADP NETWORKING STANDARDS FOR OPERATIONS RESEARCH, MITRE CORP., BEDFORD, MA, JUN 69, MC MTP-333, AF F19628-68-C-0365, (AD-696 675), 15P, 5 REFS

THIS DOCUMENT PRESENTS AN ELEMENTARY DISCUSSION OF SOME OF THE PROBLEMS PRESENTLY BEING EXPERIENCED BY OPERATIONS RESEARCHERS IN LARGE DECENTRALIZED ORGANIZATIONS (PRIMARILY IN A MILITARY ENVIRONMENT). NETWORKING IS SEEN AS A SOLUTION TO MANY OF THEIR PROBLEMS, BUT ONLY IF ADEQUATE ADP STANDARDS CAN BE ESTABLISHED AND ENFORCED FIRST. THE NEED FOR THE USER COMMUNITY TO PARTICIPATE IN THIS STANDARDIZATION IS EMPHASIZED.
(ALSO UNDER 5.5)

POWELL, J. J., D. C. WOOD, ANALYSIS OF NMCS PROBLEM AREAS RELATED TO COMPUTER NETWORKS AND PROPOSED NMCS NETWORK OBJECTIVES, MITRE CORP., WASHINGTON, DC, 1 APR 71, MC WP-9707, AF F19628-71-C-0002, 34P, 7 REFS

OPERATIONAL PROBLEM AREAS OF THE NATIONAL MILITARY COMMAND SYSTEM (NMCS) ARE ANALYZED AND CAPABILITIES OF COMPUTER NETWORKS WHICH COULD ALLEVIATE THESE PROBLEMS ARE IDENTIFIED. POTENTIAL PROBLEMS RAISED BY THE AVAILABILITY OF SUCH CAPABILITIES ARE ADDRESSED. OBJECTIVES OF AN NMCS COMPUTER NETWORK ARE PROPOSED AND THEIR IMPLICATIONS DISCUSSED. THE DISCUSSION IS WELL THOUGHT OUT AND NOT LIMITED IN APPLICABILITY TO THE NMCS.

ROBERTS, LAWRENCE G., MULTIPLE COMPUTER NETWORKS AND INTERCOMPUTER COMMUNICATION, ADVANCED RESEARCH PROJECTS AGENCY, WASHINGTON, DC, JUN 67, 12P, 3 REFS

ONE OF THE EARLIER WORKS DESCRIBING SOME OF THE CHARACTERISTICS OF THE THEN-PROPOSED ARPA NETWORK, THE PAPER INCLUDES SOME OF THE REASONS FOR A NETWORK: LOAD SHARING, INTERPERSONAL MESSAGE SERVICE, DATA SHARING, PROGRAM SHARING, AND REMOTE SERVICE. BENEFITS WERE EXPECTED THROUGH THE USE OF SPECIALIZED HARDWARE AND SYSTEM SOFTWARE AND THE DISTRIBUTED COOPERATION OF LARGE NUMBERS OF PEOPLE ON SPECIFIC PROBLEMS. IT IS INTERESTING TO NOTE THAT THE NETWORK WAS ORIGINALLY INTENDED TO BE BASED ON DIAL-UP SERVICE.

RUTLEDGE, RONALD M., ALBIN L. VAREHA, LEE C. VARIAN, ALLAN H. WEIS, SALOMON F. SEROUSSI, JAMES W. MEYER, JOAN F. JAFFE, MARY ANNE K. ANGELL, AN INTERACTIVE NETWORK OF TIME-SHARING COMPUTERS, (CARNEGIE-MELLON UNIV., PITTSBURGH, PA. PRINCETON UNIV., NJ, INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY, THOMAS J. WATSON RESEARCH CENTER), PROCEEDINGS OF 24TH NATIONAL CONFERENCE, ASSOCIATION FOR COMPUTING MACHINERY, (AUGUST 26-28, 1969), ASSOCIATION FOR COMPUTING MACHINERY, NEW YORK, 1969, ACM P-69, P 431-441, 13 REFS
(ANNOTATION UNDER 3.1.0)

SAMUELSON, KJELL, COMMUNICATING WITHIN A WORLD SYSTEM, (STOCKHOLM, UNIV. OF, (SWEDEN), ROYAL INST. OF TECH., STOCKHOLM, (SWEDEN)),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 361-366, 5 REFS
(ANNOTATION UNDER 1.6)

SEDELOW, SALLY YEATES, WALTER A. SEDELOW, JR., LANGUAGE RESEARCH AND THE COMPUTER: A STUDY OF THE CONCEPT OF A NATIONAL CENTER OR NETWORK FOR COMPUTATIONAL RESEARCH ON LANGUAGE (CE-NCOREL), KANSAS, UNIV. OF, LAWRENCE, 1972, NSF GJ-28599, 467P, 41 REFS
(ANNOTATION UNDER 4.2.9)

SILVERSTEIN, MARTIN E., COMPUTERS, COMMUNICATIONS, AND DISTRIBUTED HEALTH CARE SYSTEMS, (HEALTH ANALYSIS INC., BETHESDA, MD),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 463-464

THIS IS A GENERAL INTRODUCTION TO THE POTENTIAL USE OF COMPUTER COMMUNICATIONS IN THE HEALTH FIELD. IT CONCLUDES WITH A SPECIFIC EXAMPLE IN THE AREA OF EMERGENCY CARE WHERE A COMPUTER MAINTAINS CONSTANT INVENTORY OF TRAFFIC ROUTES AND EMERGENCY DEPARTMENT STATUS, ANALYSES INCOMING PHYSIOLOGICAL SIGNALS FROM PORTABLE DIAGNOSTIC EQUIPMENT, AND DIRECTS EMERGENCY VEHICLE TRAFFIC.
(ALSO UNDER 4.2.1)

SUNG, R., J. B. WOODFORD, STUDY OF COMMUNICATION LINKS FOR THE BIOMEDICAL COMMUNICATIONS NETWORK, AEROSPACE CORP., EL SEGUNDO, CA, DIV. OF SATELLITE SYSTEMS, 29 MAY 69, AC ATR-69(7130-06)-1, NIH PH-43-68-991, 278P, 56 REFS
(ANNOTATION UNDER 3.2.1)

WEEG, GERARD P., THE ROLE OF REGIONAL COMPUTER NETWORKS, (IOWA, UNIV. OF, IOWA CITY, COMPUTER CENTER),
LEVIEN, ROGER E., COMPUTERS IN INSTRUCTION: THEIR FUTURE FOR HIGHER EDUCATION, (OCTOBER 1-3, 1970), RAND CORP., SANTA MONICA, CA, JUL 71, RC R-718-NSF-CCOM-RC, P 55-66, 6 REFS

THOSE FACTORS THAT INFLUENCE THE DIRECTION OF REGIONAL COMPUTER NETWORKS IN HIGHER EDUCATION ARE ENUMERATED. A DESCRIPTIVE SECTION IS INCLUDED ON THE ADMINISTRATIVE PROBLEMS OF REGIONAL NETWORKS. THE DARTMOUTH, OREGON STATE, AND UNIVERSITY OF IOWA NETWORKS ARE DESCRIBED, INCLUDING A GOOD SUMMARY OF USAGE STATISTICS.
(ALSO UNDER 5.0)

WEISS, EDWARD C., SCIENCE INFORMATION IN A CHANGING WORLD, (NATIONAL SCIENCE FOUNDATION, WASHINGTON, DC, OFFICE OF SCIENCE INFORMATION SERVICE),
NETWORKS AND DISCIPLINES, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (ANN ARBOR, MI, OCTOBER 11-13, 1973), 1973, P 93-100

THE OFFICE OF SCIENCE INFORMATION SERVICE (OSIS) HAS MANY PROGRAMS OF RESEARCH ON NETWORKING AND RESOURCE SHARING. AFTER A BRIEF HISTORY OF OSIS, THREE PROJECTS ARE DESCRIBED: 1) THE UNIVERSITY-CENTERED INFORMATION SYSTEM, 2) THE RESEARCH PROGRAM, A PROGRAM WITH TWO BASIC GOALS--TO DEVELOP TECHNICAL KNOWLEDGE NECESSARY FOR BETTER INFORMATION AND DATA RETRIEVAL SYSTEMS AND TO EXTEND UNDERSTANDING OF THE INFORMATION-TRANSFER PROCESS, AND 3) THE DATA SYSTEMS PROGRAM, A PROGRAM TO STUDY THE HANDLING OF FACTUAL AND QUANTITATIVE DATA.

WHALEY, RANDALL M., PROMOTION AND ECONOMICS OF RESOURCE SHARING, (UNIVERSITY CITY SCIENCE CENTER, PHILADELPHIA, PA),

1.1 OBJECTIVES

GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 345-355
(ANNOTATION UNDER S.1)

1.2 SURVEY

AUFENKAMP, D. D., E. C. WEISS, NSF ACTIVITIES RELATED TO A NATIONAL SCIENCE COMPUTER NETWORK, NATIONAL SCIENCE FOUNDATION, WASHINGTON, DC).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 226-232, 1 REFS

THE NATIONAL SCIENCE FOUNDATION IS MOUNTING AN EXPANDED RESEARCH PROGRAM WHICH COULD LEAD TO THE DEVELOPMENT OF A NATIONAL SCIENCE COMPUTER NETWORK LINKING UNIVERSITIES, COLLEGES AND OTHER INSTITUTIONS IN SUPPORT OF RESEARCH AND EDUCATION. THIS ARTICLE IS A BRIEF COMPENDIUM OF PRESENTLY SUPPORTED PROJECTS AND ACTIVITIES WHICH RELATE TO SUCH A NATIONAL NETWORK.
(ALSO UNDER 4.0)

BECKER, J., W. C. OLSEN, INFORMATION NETWORKS, (INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ), CUADRA, C. A., ANNUAL REVIEW OF INFORMATION SCIENCE AND TECHNOLOGY, VOLUME 3, ENCYCLOPEDIA BRITANNICA INC., CHICAGO, IL, 1968, (Z699.A1A6S, LC 66-25096), P 289-327, 190 REFS

THIS REVIEW PRESENTS AN EXHAUSTIVE SURVEY OF DEVELOPMENTS IN THE AREA OF NETWORKING FOR THE YEAR 1967-68. DEVELOPMENTS ARE GROUPED INTO THREE MAIN AREAS FOR DISCUSSION: (1) EDUCATION, (2) LIBRARIES, AND (3) GOVERNMENT, INDUSTRY AND PROFESSIONAL SOCIETIES. THE COVERAGE, THOUGH BY NOW SOMEWHAT DATED, IS IMPRESSIVE. THE BIBLIOGRAPHY CONTAINS 190 ENTRIES. IT IS PERHAPS MOST INTERESTING TO NOTE THE DIVERSITY OF PLANS FOR NETWORKS PUT FORTH FOUR YEARS AGO, AND SEE WHICH HAVE COME TO FRUITION TODAY.
(ALSO UNDER 4.2.0)

BENVENUTO, A. A., J. R. GOODROE, R. P. MORTON, SYSTEM LOAD SHARING STUDY, MITRE CORP., WASHINGTON, DC, 25 MAR 69, MTR 5062, AF F19628-68-C-0365, 9SP

WHILE ONLY SUPERFICIALLY DESCRIBING THE BENEFITS, CONSTRAINTS, AND GENERAL CONSIDERATIONS IMPORTANT IN DECIDING WHETHER TO UTILIZE COMPUTER NETWORKING (IN THIS CASE FOR THE NATIONAL MILITARY COMMAND CENTER AND ASSOCIATED FACILITIES), THIS DOCUMENT CONTAINS SEVERAL SUMMARIES OF OPERATING NETWORKS, CIRCA 1968. THESE SUMMARIES ARE NON-CRITICAL IN NATURE AND THE FAST-PACED DEVELOPMENTS IN NETWORKING RENDER THE BASIC CONFIGURATIONS SHOWN OBSOLETE IN AT LEAST A FEW CASES.
(ALSO UNDER 1.1)

CANADA MEETS COMPUTER COMMUNICATION NEEDS, (TELECOMMUNICATIONS, DEDHAM, MA), TELECOMMUNICATIONS, VOL 6, ISSUE 9, SEP 72, P S2, S4

RECENT AND ANTICIPATED FUTURE DEVELOPMENTS IN DATA COMMUNICATIONS IN CANADA CAN BE FOUND IN THIS INTERESTING SURVEY. A DESCRIPTION OF A COMMUNICATION SERVICE IS INCLUDED WHICH USES MINICOMPUTERS AS COMMUNICATIONS CONTROLLERS, FRONT-ENDS FOR LARGER HOST COMPUTERS, REMOTE CONCENTRATORS FOR TERMINALS, STORE-AND-FORWARD MESSAGE-SWITCHING NODES, OR FOR COMBINATIONS OF THESE FUNCTIONS.
(ALSO UNDER 3.1.0)

CHAMBLEE, J. A., OPERATIONAL CONSIDERATIONS FOR THE IMPLEMENTATION OF COMPUTER NETWORKS IN THE NMCSSC, MITRE CORP., WASHINGTON, DC, 1 JUL 70, MC WP-9598, AF F19628-68-C-0365, 59P, 5 REFS

THREE OPERATIONAL COMPUTER FACILITIES OF THE NATIONAL MILITARY COMMAND SYSTEM (NMCS) ARE DESCRIBED IN TERMS OF EXISTING CONNECTIVITY, WORK FLOW, WORKLOAD CHARACTERISTICS, HARDWARE, SOFTWARE, DATA BASES, OPERATING RULES, AND OPERATIONAL PROBLEMS. THE FACILITIES ARE THE NATIONAL MILITARY COMMAND SYSTEM SUPPORT CENTER (NMCSSC), THE NATIONAL MILITARY COMMAND CENTER (NMCC), AND THE ALTERNATE NATIONAL MILITARY COMMAND CENTER (ANMCC). DESIRABLE FEATURES OF ANY NETWORKING SCHEME TO BE INSTALLED IN THE NMCS ARE IDENTIFIED. THREE EXISTING PROPOSED NETWORKING APPROACHES, ATTACHED SUPPORT PROCESSOR (ASP), DATA LINK SUPPORT (DLS), AND THE ARPA NETWORK, ARE DISCUSSED RELATIVE TO THE DESIRABLE FEATURES.

DAVIES, DONALD W., NEW DATA NETWORKS IN EUROPE, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND)), TELECOMMUNICATIONS, VOL 9, ISSUE 6, JUN 75, P 22-25, 47, 12 REFS

THIS ARTICLE INTRODUCES AND BRIEFLY DESCRIBES SIX EUROPEAN COMPUTER NETWORKS AS WELL AS MENTIONING THE ARPANET LINKS TO EUROPE. PROBLEMS OF INTERCONNECTION AND STANDARDS ARE ALSO BRIEFLY ADDRESSED.

DAVIS, RUTH M., MAN-MACHINE COMMUNICATION, (ADVANCED RESEARCH PROJECTS AGENCY, WASHINGTON, DC), CUADRA, CARLOS A., ANNUAL REVIEW OF INFORMATION SCIENCE AND TECHNOLOGY, VOLUME 1, WILEY (JOHN) AND SONS, NEW YORK, 1966, ADI ANNUAL REVIEW SERIES, (LC 66-25096), P 221-254, 99 REFS

THIS "FIRST ANNUAL REVIEW OF THE FIELD OF MAN-MACHINE COMMUNICATION" IS A STRAIGHTFORWARD DISCUSSION OF CONCEPTS IN MAN-MACHINE COMMUNICATION AND THE LITERATURE RELEVANT TO THOSE CONCEPTS. TIME-SHARING, INTERACTIVE LANGUAGES, ON-LINE APPLICATIONS, INTERACTIVE DISPLAYS, PROBLEM SOLVING, AND APPLICATIONS TO SPECIFIC USER GROUPS ARE COVERED. LITERATURE IS CONSIDERED PERTINENT TO ONE OF THE CONCERTS IF IT CONTAINS DESCRIPTIONS OF PARTICULAR APPLICATIONS, EQUIPMENT OR PROBLEM AREAS; PROVIDES COMPREHENSIVE COVERAGE OF A TOPIC; ADVANCES A WORTHY APPROACH OR CONCEPT; OR HIGHLIGHTS AN IMPORTANT POINT MADE BY THE REVIEWER.
(ALSO UNDER 2.3)

DE GENNARO, RICHARD, MAJOR TRENDS IN LIBRARY COMPUTERIZATION, (PENNSYLVANIA, UNIV. OF, PHILADELPHIA), FACTS AND FUTURES, WHAT'S HAPPENING NOW IN COMPUTING FOR HIGHER EDUCATION, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (PRINCETON, NJ, OCTOBER 9-11, 1973), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1974, (LC 74-79222), P 282-286

CO-OPERATIVE COMPUTER-BASED NETWORKS, VENDOR-SUPPLIED SYSTEMS AND SERVICES, AND PACKAGE SYSTEMS ARE IDENTIFIED AS THE THREE MAJOR CATEGORIES OF ACTIVITIES AND TRENDS IN LIBRARY AUTOMATION. THE CATEGORIES ARE DEFINED INCLUDING EXAMPLES OF EXISTING IMPLEMENTATIONS.
(ALSO UNDER 4.1.9)

EDUCATIONAL COMPUTER NETWORKS, WHERE IS THE BOOM HEADING?, GOVERNMENT DATA SYSTEMS, VOL 3, ISSUE 3, MAY-JUN 73, P 14-15, 18, 31, 35

REGIONAL COMPUTER NETWORKS SERVING COLLEGES, UNIVERSITIES, SECONDARY SCHOOLS AND RESEARCH HOSPITALS HAVE BEEN DEVELOPED AND FUNCTIONING SINCE THE LATE 1960S. THIS ARTICLE DESCRIBES SOME OF THE PROBLEMS AND DECISIONS WHICH MUST BE FACED BY THESE NETWORKS. DETAILS GIVEN ON MANY NETWORKS AND LISTS OF NSF FUNDED REGIONAL COMPUTATIONAL NETWORKS AND OF LIBRARY NETWORKS ARE PROVIDED.
(ALSO UNDER 4.2.3)

ELIE, MICHEL, GENERAL PURPOSE NETWORKS OF COMPUTERS, CALIFORNIA, UNIV. OF, LOS ANGELES, 1970, 125P, 46 REFS

THIS THESIS IS A SURVEY OF THE FIELD OF GENERAL PURPOSE COMPUTER NETWORKS AND A DISCUSSION OF SOME OF THE RELEVANT CONCEPTS. A VARIETY OF NETWORKS ARE DISCUSSED AND AN ATTEMPT IS MADE TO CATEGORIZE THEM. MODELING TECHNIQUES IN COMPUTER NETWORKS ARE SURVEYED AND APPLIED TO DATA SHARING AND LOAD SHARING. SOME OF THE PRESENT DAY IDEAS ON INTERPROCESS COMMUNICATION ARE REVIEWED. FINALLY THE HOST-HOST PROTOCOL OF THE ARPANET IS DESCRIBED AND A SPECIFIC SITE IMPLEMENTATION IS ANALYZED.
(ALSO UNDER 2.1.2)

ELOVITZ, HONEY S., CONSTANCE L. HEITMEYER, WHAT IS A COMPUTER NETWORK?, (NAVAL RESEARCH LAB., WASHINGTON, DC), IEEE 1974 NATIONAL TELECOMMUNICATIONS CONFERENCE, (SAN DIEGO, CA, DECEMBER 2-4, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE P-74CH0902-7-CSCB, (LC 57-20724), P 1007-1014, 16 REFS

COMPUTER NETWORKS ARE CLASSIFIED ACCORDING TO THE DEGREE OF TRANSPARENCY PRESENTED BY THE NETWORK TO THE USER. THE PRIMARY DISTINCTION BETWEEN THE TWO CLASSES SUGGESTED IS IN RESPONSIBILITY FOR MANAGING COMPUTER RESOURCES. IN THE FIRST CLASS, THE RESPONSIBILITY FOR RESOURCE MANAGEMENT FALLS ON THE USER; IN THE SECOND CLASS THE USER IS AIDED IN THE ACQUISITION AND HANDLING OF NEEDED RESOURCES BY A NETWORK OPERATING SYSTEM.
THESE CONCEPTS ARE DISCUSSED WITH REFERENCE TO EXAMPLES FROM TYMNET, ARPANET, OCS (UNIVERSITY OF CALIFORNIA - IRVINE)

I.2 SURVEY

AND OCN (UNIVERSITY OF MARYLAND).

FARBER, DAVID J., NETWORKS: AN INTRODUCTION. (CALIFORNIA, UNIV. OF, IRVINE).
DATAMATION, VOL 18, ISSUE 4, APR 72, P 36-39

A BRIEF COMPARISON OF SEVERAL COMPUTER NETWORKS IS PRESENTED. THE DIAGRAM OF THE ARPA NETWORK IS NOW OUT OF DATE AND CYBERNET HAS ALSO SINCE BEEN RESTRUCTURED. SOME INTERESTING SUMMARIZING COMMENTS ARE MADE AND THE ARTICLE IS USEFUL AS A 'SNAP SHOT' INTRODUCTION TO SOME OF THE EXISTING COMPUTER NETWORKS.

GAINES, EUGENE C., JR., JANET M. TAPLIN, THE EMERGENCE OF NATIONAL NETWORKS REMOTE COMPUTING--YEAR VI.
(TIME-SHARING ENTERPRISES INC., PHILADELPHIA, PA).
TELECOMMUNICATIONS, VOL 5, ISSUE 12, DEC 71, P 27-29, 44-46

DEVELOPMENTS FOR THE YEAR 1971 IN THE AREA OF PUBLIC NATIONAL COMPUTER-COMMUNICATIONS NETWORKS ARE SUMMARIZED. A NUMBER OF SUCH NETWORKS ARE BRIEFLY SURVEYED INCLUDING CYBERNET, UCC, DATRAN, GE, ON-LINE SYSTEMS, SBC, COM-SHARE, TYMSHARE, AND INFONET.

HEAFNER, JOHN F., ERIC F. HARSLEM, LARGE-SCALE SHARING OF COMPUTER RESOURCES. (USC INFORMATION SCIENCES INST., MARINA DEL REY, CA, RAND CORP., SANTA MONICA, CA).
1972 WESCON TECHNICAL PAPERS, SESSION 7: COMPUTER NETWORKS, (PRESENTED AT, WESTERN ELECTRONIC SHOW AND CONVENTION, SEPTEMBER 19-22, 1972), 1972, P 7-1-1--7-1-8, 17 REFS

SOME OF THE PAST AND CURRENT EFFORTS IN NETWORKING ARE REVIEWED. THE PAPER PRESENTS A GENERAL OVERVIEW OF THE ECONOMIC AND TECHNICAL ISSUES OF NETWORKS AND BRIEFLY MENTIONS SOME OF THE LEGAL AND SOCIAL ASPECTS. THE FUNDAMENTAL PURPOSE OF ALL OF THE NETWORKS DESCRIBED WAS RESOURCE SHARING BUT EACH INVOLVES A DIFFERENT CONFIGURATION OF COMPUTER AND COMMUNICATION FACILITIES.

HIRSCH, PHIL, MULTI-ACCESS COMPUTER NETWORKS.
DATAMATION, VOL 16, ISSUE 6, JUN 70, P 153-154
(ANNOTATION UNDER 4.3)

KIRSTEIN, PETER T., ON THE DEVELOPMENT OF COMPUTER AND DATA NETWORKS IN EUROPE, (LONDON, UNIV. OF, (ENGLAND)).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 240-244, 10 REFS

AS AN INTRODUCTION TO ATTEMPTS TO START GENERAL PURPOSE DISTRIBUTED COMPUTER NETWORKS IN EUROPE, THE MORE SUCCESSFUL CENTRALIZED NETWORKS AND SPECIAL PURPOSE NETWORKS ARE DISCUSSED. PROPOSALS FOR SPECIAL DATA NETWORKS TO HANDLE LOW AND MEDIUM SPEED TRAFFIC ARE DESCRIBED AND PREDICTIONS ARE MADE ON THE WAY THAT COMPUTER NETWORKS WILL DEVELOP IN EUROPE.
(ALSO UNDER 4.3)

LISSANDRELLO, GEORGE J., WORLD DATA COMMUNICATIONS AS SEEN BY THE DATA PROCESSING SYSTEMS DESIGNER, (IBM WORLD TRADE CORP., NEW YORK).
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 130-136
(ANNOTATION UNDER 3.2.1)

MAKINO, YASUO, DATA COMMUNICATION IN JAPAN, (MINISTRY OF POSTS AND TELECOMMUNICATIONS, TOKYO, (JAPAN)),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 8-16

THE GROWTH OF TELECOMMUNICATIONS SERVICES IN JAPAN IS SUMMARIZED, WITH SPECIAL ATTENTION TO HOW THAT GROWTH HAS BEEN LIMITED BY REGULATION. THE REVIEW PROVIDED IN THIS ARTICLE SEEMS TO BE COMPREHENSIVE.
(ALSO UNDER 5.4)

MARRON, BEATRICE, ELIZABETH FONG, DENNIS W. FIFE, KIRK RANKIN, A STUDY OF SIX UNIVERSITY-BASED INFORMATION SYSTEMS, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY, JUN 73, NBS TN-781, NSF CA68, 98P

A METHODOLOGY FOR CATEGORICALLY DESCRIBING COMPUTER-BASED INFORMATION SYSTEMS WAS DEVELOPED AND APPLIED TO SIX UNIVERSITY-BASED, NSF-SUPPORTED SYSTEMS. THE SYSTEMS UNDER STUDY ALL OPERATE AS RETAIL INFORMATION CENTERS PRIMARILY SERVING CAMPUS COMMUNITIES BY ACCESSING LARGE COMMERCIALLY-AVAILABLE DATA BASES USING THIRD GENERATION COMPUTER CONFIGURATIONS. THE SYSTEMS VARY IN DESIGN PHILOSOPHY, MODE OF USER SERVICE, TRANSFERABILITY CHARACTERISTICS, AND OPERATIONAL STATUS. A SUMMARY MATRIX IS INCLUDED.
(ALSO UNDER 4.2.9)

MCKENNEY, JAMES L., REGIONAL COMPUTING SYSTEMS, REPORT OF WORKSHOP 8, (HARVARD UNIV., CAMBRIDGE, MA, GRADUATE SCHOOL OF BUSINESS ADMINISTRATION),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 288-295

THE WORKSHOP DISCUSSES SOME SUCCESSFUL REGIONAL NETWORKS, I.E., TUCC, NERCOMP, AND MERIT, AND THE FACTORS IMPORTANT IN THEIR DEVELOPMENT. THE CONCLUSION ENUMERATES FUNCTIONS THAT NEED FURTHER SUPPORT.

MUENCH, P. E., COMMON CARRIER APPROACH TO DIGITAL DATA TRANSMISSION: TERMINALS, TRANSMISSION EQUIPMENT AND FUTURE PLANS FOR THE COMPUTER UTILITY, (BELL TELEPHONE LABS, INC., HOLMDEL, NJ),
GRUENBERGER, F., COMPUTERS AND COMMUNICATIONS--TOWARD A COMPUTER UTILITY, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1968, (TK 5101.G67, LC 68-16776), P 79-94, 1 REFS

A HISTORY OF DATA COMMUNICATIONS IS GIVEN DURING THE SECOND GENERATION COMPUTER ERA, IN ADDITION TO SOME INSIGHT INTO 'RECENT' (1968) INNOVATIONS, AND A PREDICTION FOR THE FUTURE.
(ALSO UNDER 4.3)

NIELSEN, NORMAN R., NETWORK COMPUTING, (STANFORD UNIV., CA, WELLSCO DATA CORP.),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 64-73, 1 REFS

THIS PAPER PRESENTS A SUMMARY OF PROBLEMS AND ISSUES UNCOVERED DURING A STUDY OF SOME REGIONAL COMPUTING NETWORKS FUNDED BY THE NATIONAL SCIENCE FOUNDATION. THESE ARE NETWORKS DEVELOPED PRIMARILY FOR STUDENT EDUCATION OR CURRICULUM DEVELOPMENT. ALTHOUGH THE FINDINGS OF THE STUDY MAY NOT ALL APPLY DIRECTLY TO NATIONAL NETWORKS, MANY OF THE ISSUES ARE RELEVANT.
(ALSO UNDER 2.3, 5.7)

NORWOOD, FRANK W., TELECOMMUNICATIONS PROGRAMS AFFECTING NETWORK DEVELOPMENT,
BECKER, JOSEPH, PROCEEDINGS OF THE CONFERENCE ON INTERLIBRARY COMMUNICATIONS AND INFORMATION NETWORKS, (WARRENTON, VA, SEPTEMBER 28-OCTOBER 2, 1970), AMERICAN LIBRARY ASSOCIATION, CHICAGO, IL, 1971, DEC 0-9-230268-4235(095), (LC 70-18596), P 59-68, 24 REFS

AN IN-DEPTH SURVEY OF EVENTS AND ISSUES IN THE TELECOMMUNICATIONS FIELD FOR THE PERIOD 1968-1970 IS PRESENTED. THE TREATMENT IS PRIMARILY FROM AN ENTREPRENEURAL POINT OF VIEW AND EMPHASIZES PUBLIC POLICY AS REPRESENTED BY DECISIONS AND CONCERNS OF THE FEDERAL COMMUNICATIONS COMMISSION.
(ALSO UNDER 5.4)

OVERHAGE, CARL F. J., INFORMATION NETWORKS, (MASSACHUSETTS INST. OF TECH., CAMBRIDGE),
CUADRA, C. A., ANNUAL REVIEW OF INFORMATION SCIENCE AND TECHNOLOGY, VOLUME 4, ENCYCLOPEDIA BRITANNICA INC., CHICAGO, IL, 1969, (Z699.A1A65.V.4, LC 66-25096), P 339-377, 145 REFS

THIS IS A GOOD OVERVIEW OF ACTIVITIES RELATED TO INFORMATION NETWORKS. THE PAPER FIRST FUNCTIONALLY DESCRIBES THE VARIOUS CONTEXTS OF THE WORD 'NETWORKS'. THEN, SPECIFIC NETWORKS ARE REVIEWED AS TO UTILITY, INCLUDING LIBRARY NETWORKS, MEDICAL NETWORKS, HOSPITAL NETWORKS, GOVERNMENT AND BUSINESS NETWORKS, AND REAL-TIME INFORMATION NETWORKS. PROBLEMS OF COMPATIBILITY AND REGULATION ARE ALSO DISCUSSED.
(ALSO UNDER 4.2.0)

PETERSON, JACK J., SANDRA A. VEIT, SURVEY OF COMPUTER NETWORKS, MITRE CORP., WASHINGTON, DC, SEP 71, MC MTP-357, AF F19628-71-C-0002, 87P, 37 REFS

A GOOD, OBJECTIVE SURVEY OF EXISTING NETWORKS IS PRESENTED. THE NETWORKS COVERED ARE: ARPA, COINS, CYBERNET, OCS (IRVINE), OLS (MILITARY), MERIT, NETWORK/440, OCTOPUS, TSS, AND TUCC. EACH NETWORK IS DESCRIBED IN TERMS OF CONFIGURATION, COMMUNICATIONS, USAGE, AND MANAGEMENT.

ROSE, GORDON A., COMPUTER GRAPHICS COMMUNICATION SYSTEMS, (NEW SOUTH WALES, UNIV. OF, KENSINGTON, (AUSTRALIA), DEPT. OF ELECTRONIC COMPUTATION),
INFORMATION PROCESSING 68; PROCEEDINGS OF IFIP CONGRESS 1968, VOLUME 2--HARDWARE, APPLICATIONS, (EDINBURGH, (SCOTLAND), AUGUST 5-10, 1968), NORTH-HOLLAND PUBLISHING CO., AMSTERDAM, (NETHERLANDS), 1969, IFIP CONGRESS PROCEEDINGS, (LC 65-24118), P 692-703, 20 REFS

AN EARLY DISPLAY COUPLED DIRECTLY TO A COMPUTER AND A BUFFERED DISPLAY WITH A LOCAL PROCESSOR ARE REVIEWED. THREE RECENT SCHEMES WHICH HAVE EVOLVED FROM THESE ARE THEN COMPARED. EACH AIMS FOR LOW-COST GRAPHICAL COMMUNICATION WITHIN A MULTI-TERMINAL SYSTEM. THE THREE DISPLAY SYSTEMS DISCUSSED ARE THE ADVANCED REMOTE DISPLAY STATION II PROJECT, THE INTERGRAPHIC PROJECT, AND THE IBM 1500 INSTRUCTIONAL DISPLAY SYSTEM. THE PAPER ASSERTS THAT THE TECHNIQUES OF THESE RECENT SCHEMES, SUPPLEMENTED WITH WIRED VIDEO BROADCASTING TECHNIQUES, COULD BE USED TO LINK THOUSANDS OF TERMINALS TO A CENTRAL COMPUTER(S) AT LOW COST. A POSSIBLE CONFIGURATION IS PROPOSED.
(ALSO UNDER 4.3)

SCHWARTZ, MISCHA, ROBERT R. BOORSTYN, RAYMOND L. PECKHOLTZ, TERMINAL-ORIENTED COMPUTER-COMMUNICATION NETWORKS, (POLYTECHNIC INST. OF BROOKLYN, NY, GEORGE WASHINGTON UNIV., WASHINGTON, DC),
PROCEEDINGS OF THE IEEE, VOL 60, ISSUE 11, NOV 72, P 1408-1423, 16 REFS

FOUR OPERATING COMPUTER-COMMUNICATION NETWORKS, TYMNET, GE INFORMATION SERVICES, NASDAQ AND INFONET ARE DESCRIBED IN THIS PAPER. FEATURES CONSIDERED FOR EACH NETWORK INCLUDE; NETWORK STRUCTURE, MESSAGE HANDLING, COMMUNICATIONS REQUIREMENTS, ROUTING, RELIABILITY AND DESIGN FEATURES.

SIMMS, ROBERT L., JR., TRENDS IN COMPUTER/COMMUNICATION SYSTEMS, (BELL TELEPHONE LABS, INC., HOLMDEL, NJ, DEPT. OF COMPUTER COMMUNICATIONS ENGINEERING),
COMPUTERS AND AUTOMATION, VOL 17, ISSUE 5, MAY 68, P 22-25

A NUMBER OF TRENDS IN COMMUNICATIONS AND THE IMPLICATIONS OF THOSE TRENDS ARE VERY BRIEFLY DISCUSSED INCLUDING THE INCREASE IN REMOTE ON-LINE ACCESS TO COMPUTERS, HIGHER DATA TRANSMISSION RATES, CLUSTERING OF COMPUTING POWER, USE OF INTEGRATED CIRCUITS AND MODEM PACKAGING TECHNIQUES, PUSH-BUTTON TELEPHONES AS DATA TERMINALS, AND DIGITAL TRANSMISSION SYSTEMS.

SWANSON, ROWENA W., INFORMATION SYSTEM NETWORKS--LET'S PROFIT FROM WHAT WE KNOW, (PRESENTED AT, THIRD ANNUAL COLLOQUIUM ON INFORMATION RETRIEVAL, PHILADELPHIA, PA, MAY 12-13, 1966), AIR FORCE OFFICE OF SCIENTIFIC RESEARCH, ARLINGTON, VA, DIRECTORATE OF INFORMATION SCIENCES, JUN 66, AFOSR 66-0873, (AD-637 488), 48P, 217 REFS

A USEFUL SURVEY OF LARGE SCALE INFORMATION SYSTEMS CIRCA 1966 IMPLEMENTED IN MANY SECTORS OF GOVERNMENT AND INDUSTRY IS PRESENTED.

THE COMMUNICATIONS MINICOMPUTER, (TELECOMMUNICATIONS, DEDHAM, MA),
TELECOMMUNICATIONS, VOL 6, ISSUE 10, OCT 72, P 15-16, 18, 20, 22
(ANNOTATION UNDER 3.2.3)

WEEG, GERARD P., REGIONAL STAR NETWORKS AS SEEN BY THE USER AND SERVER, (IOWA, UNIV. OF, IOWA CITY),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 320-337

THE IOWA, TEXAS, AND DARTMOUTH NETWORKS ARE DISCUSSED. ABUNDANT STATISTICS ARE INCLUDED CONCERNING OPERATIONAL COSTS (PERSONNEL AND EQUIPMENT), SERVICE SCHEDULES, HARDWARE CONFIGURATIONS, SPACE REQUIREMENTS, VOLUME OF INPUT AND OUTPUT, USER STATISTICS, USAGE STATISTICS, AND COST TO MEMBER COLLEGES.

WOOD, DAVID C., A SURVEY OF THE CAPABILITIES OF 8 PACKET SWITCHING NETWORKS, (MITRE CORP., MCLEAN, VA),
PROCEEDINGS OF THE 1975 SYMPOSIUM-COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, JUNE 18, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, 75CH0973-8C, P 1-7, 22 REFS

THIS INFORMATIVE PAPER SURVEYS EIGHT PACKET SWITCHING COMPUTER NETWORKS WITH EMPHASIS ON THEIR CAPABILITIES AND THE ECONOMIC ANALYSES WHICH JUSTIFY THEIR USE. THE PAPER IS DEFINITELY GEARED TOWARDS A POTENTIAL NETWORK USER AND IS NOT CONCERNED WITH INTERNAL CHARACTERISTICS OF THE NETWORKS, SUCH AS ROUTING STRATEGIES AND PACKET FORMATS.
(ALSO UNDER 3.1.0)

1.3 TUTORIAL

BALL, CHRISTOPHER J., COMMUNICATIONS AND THE MINICOMPUTER,
COMPUTER, VOL 4, ISSUE 5, SEP-OCT 71, P 13-21, 5 REFS

THE VARIETY OF FUNCTIONS THAT A MINICOMPUTER CAN PERFORM IN A DATA COMMUNICATIONS NETWORK ARE DISCUSSED. GOOD DESCRIPTIONS OF MESSAGE CONCENTRATION, ADAPTIVE LINE SPEED CONTROL, LINE POLLING, ERROR DETECTION AND CORRECTION, FRONT-END PROCESSING, AND MESSAGE-SWITCHING ARE INCLUDED.
(ALSO UNDER 3.3.2)

BECKER, HAL B., INFORMATION NETWORK DESIGN CAN BE SIMPLIFIED STEP-BY-STEP, (HONEYWELL INFORMATION SYSTEMS INC., PHOENIX, AZ),
COMPUTER DECISIONS, VOL 4, ISSUE 10, OCT 72, P 14-17

THIS ARTICLE SUGGESTS THAT PUTTING TOGETHER AN INFORMATION PROCESSING NETWORK CAN BE VIEWED AS THE GROWTH OF A TREE. THE FIRST CONSIDERATION IS THE TYPE OF NETWORK THAT IS DESIRED (THE ROOTS) AND THE NETWORK PROCESSING THAT WILL BE NECESSARY (THE TRUNK). THE NEXT STAGE IS TO EXAMINE THE NETWORK AND CONTROL FUNCTIONS (PRIMARY BRANCHES) AT THE OVERALL AND SPECIFIC FUNCTION LEVELS (SECONDARY BRANCHES). FINALLY THE DESIGNER SHOULD EXAMINE THE AVAILABLE HARDWARE AND SOFTWARE (LEAVES). THE ANALOGY IS SOMEWHAT ARTIFICIAL, AS IS THE ACCOMPANYING ILLUSTRATION, BUT THE LAYERED APPROACH TO SPECIFICATION IS VALID. AS A TUTORIAL EXPOSITION OF THAT APPROACH THE ARTICLE IS FAIRLY GOOD.

BERNARD, DAN, INTERCOMPUTER NETWORKS: AN OVERVIEW AND A BIBLIOGRAPHY, PENNSYLVANIA, UNIV. OF, PHILADELPHIA, WHARTON SCHOOL, MAY 73, ONR N00014-67-A-0216-0007, (AD-769 232), 250P

THIS EFFORT REPRESENTS A GOOD INTRODUCTION TO NETWORKS OF COMPUTERS, HEREIN REFERRED TO AS INTERCOMPUTER NETWORKS. APPLICATION AREAS, LOGICAL AND PHYSICAL CONNECTIONS, AND MANAGEMENT ASPECTS ARE AMONG THE TOPICS DISCUSSED.
(ALSO UNDER 5.0)

BLANC, ROBERT P., REVIEW OF COMPUTER NETWORKING TECHNOLOGY, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY, JAN 74, NBS TN-804, NSF AG-350, 135P, 41 REFS

THIS REPORT GIVES A DESCRIPTIVE SUMMARY OF THE TECHNICAL CHARACTERISTICS OF EXISTING COMPUTER NETWORKS, INCLUDING DATA COMMUNICATION TECHNOLOGY AND CONFIGURATION RELATED TO SUPPORT OF RESOURCE SHARING SERVICES FOR A COMPUTER NETWORK. INCLUDED ARE DISCUSSIONS OF TERMINAL SUPPORT CAPABILITIES FOR THE COMMUNICATIONS NETWORK AND A DEVELOPMENT OF RELEVANT NETWORK TERMINOLOGY. THE REPORT CONCLUDES WITH A COMPARATIVE EVALUATION OF EXISTING TECHNOLOGICAL APPROACHES TO NETWORKING.
(ALSO UNDER 3.4.0)

BOLT, RICHARD H., THE CHALLENGE OF MANAGING COMPUTER NETWORKS, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 299-310
(ANNOTATION UNDER 5.0)

COTTON, IRA W., COMPUTER NETWORKS: CAPABILITIES AND LIMITATIONS, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY),
PILKEY, W., K. SACZOLSKI, H. SCHAEFFER, STRUCTURAL MECHANICS COMPUTER PROGRAMS: SURVEYS, ASSESSMENTS, AND AVAILABILITY, VIRGINIA, UNIV. OF PRESS, CHARLOTTESVILLE, 1974, P 1043-1055, 25 REFS

THIS PAPER PROVIDES AN INTRODUCTION TO THE CAPABILITIES AND LIMITATIONS INVOLVED WITH THE USE OF TODAY'S COMPUTER NETWORKS. EMPHASIS IS ON THE APPLICABILITY OF NETWORKS FOR A WIDE RANGE OF APPLICATIONS -- AND THE EQUALLY WIDE RANGE OF PROBLEMS.

1.3 TUTORIAL

DIAMOND, F., R. JOHNSON, O. MCAULIFFE. SOME RECENT APPLICATIONS OF AUTOMATIC DATA PROCESSING TO TELECOMMUNICATIONS. (ROME AIR DEVELOPMENT CENTER, GRIFFISS AFB, NY).
IEEE 1974 NATIONAL TELECOMMUNICATIONS CONFERENCE, (SAN DIEGO, CA, DECEMBER 2-4, 1974). INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE P-74CH0902-7-CSCB, (LC 57-20724), P 482-490, 13 REFS
(ANNOTATION UNDER 3.2.0)

DOLL, DIXON R., DR., TELECOMMUNICATIONS TURBULENCE AND THE COMPUTER NETWORK EVOLUTION, (DMW TELECOMMUNICATIONS CORP., ANN ARBOR, MI).
COMPUTER, VOL 7, ISSUE 2, FEB 74, P 13-22, 53 REFS

THIS ARTICLE IS EXCELLENT READING BECAUSE IT NOT ONLY PRESENTS AN OVERVIEW OF COMPUTER NETWORKS, BUT ALSO INDICATES POTENTIAL PROBLEM AREAS. DOLL BEGINS BY DEFINING WHAT ELEMENTS COMPRISE A NETWORK POINTING TO ALREADY EXISTENT NETWORKS, NETWORK ORGANIZATION, MODES OF USAGE, AND PACKET SWITCHING ARE AMONG THE TOPICS DISCUSSED.
THE AUTHOR POINTS TO PROBLEM AREAS BOTH IN THE TECHNOLOGICAL AND ECONOMIC SPHERES. HE CONCLUDES THAT THE TECHNOLOGICAL PROBLEMS ARE BEING SOLVED, BUT THE QUESTION OF THE ECONOMICS OF NETWORKING IS STILL UNANSWERED.
(ALSO UNDER 3.0, 3.2.0)

DORFF, ERVIN K., COMPUTERS AND COMMUNICATIONS: COMPLEMENTING TECHNOLOGIES, (COMPUTER COMMUNICATIONS INC., INGLEWOOD, CA).
COMPUTERS AND AUTOMATICN, VOL 18, ISSUE 5, MAY 69, P 22-23

THIS ARTICLE PROVIDES ONLY THE BRIEFEST SKETCH OF THE DEVELOPMENTS LEADING TO INTEGRATED COMPUTER/COMMUNICATIONS SYSTEMS. MESSAGE SWITCHING SYSTEMS AND TIME-SHARING ARE VIEWED AS THE MOST SIGNIFICANT MILESTONES. THE MOST INTERESTING PREDICTION DESCRIBES 'DISTRIBUTED' COMPUTER SYSTEMS AS PROVIDING LOCAL STORAGE AT EACH TERMINAL SITE WHICH IS ADDRESSABLE BY THE CENTRAL COMPUTER IN A MANNER SIMILAR TO ADDRESSING ITS OWN INTERNAL STORAGE.

ELMENDORF, C. H., P. E. MUENCH, K. W. SUSSMAN, DATA COMMUNICATIONS NETWORK ARCHITECTURE, (AMERICAN TELEPHONE AND TELEGRAPH CO., NEW YORK).
INTERDISCIPLINARY CONFERENCE ON MULTIPLE ACCESS COMPUTER NETWORKS, (AUSTIN, TX, APRIL 20-22, 1970), APR 70, P 3-4-1--3-4-6, 3 REFS
(ANNOTATION UNDER 3.0)

FARBER, DAVID J., DISTRIBUTED DATA BASES -- AN EXPLORATION, (CALIFORNIA, UNIV. OF, IRVINE, DEPT. OF INFORMATION AND COMPUTER SCIENCE).
PROCEEDINGS OF THE 1975 SYMPOSIUM-COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, JUNE 16, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, 75CH0973-8C, P 25-27, 2 REFS

THIS PAPER IS CONCERNED WITH THE ISSUES WHICH MOTIVATE, ALLOW, AND SUPPORT THE IDEA OF A DISTRIBUTED DATA BASE. AFTER DEFINITIONS ARE GIVEN, RELATED ISSUES IN THE FOLLOWING SET OF AREAS ARE BRIEFLY EXPLORED: MANAGEMENT, COST, RELIABILITY, SECURITY, TRANSFERABILITY, AND FEASIBILITY.
(ALSO UNDER 5.9)

FORGIE, JAMES W., SPEECH TRANSMISSION IN PACKET-SWITCHED STORE-AND-FORWARD NETWORKS, (MASSACHUSETTS INST. OF TECH., LEXINGTON, LINCOLN LAB.).
AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 137-142, 17 REFS

AFTER THE AUTHOR CHARACTERIZES A SPEECH DATA STREAM AND PACKET-SWITCHED NETWORKS, HE DISCUSSES THE PROBLEMS ASSOCIATED WITH SPEECH TRANSMISSION IN SUCH NETWORKS. HIS OVERALL OBSERVATIONS CONCERNING SPEECH DATA AND PACKET-SWITCHED NETWORKS ARE OPTIMISTIC.

FRANK, HOWARD, COMPUTER NETWORKS: ART TO SCIENCE TO ART,(PRESENTED AT THE, PROCEEDINGS OF THE SYMPOSIUM ON LARGE-SCALE NETWORKS, EVANSTON, IL, APRIL 18-19, 1974), (NETWORK ANALYSIS CORP., GLEN COVE, NY).
NETWORKS, VOL 5, ISSUE 1, JAN 75, P 7-32, 16 REFS

THERE ARE TOO FEW PLACES TO BEGIN TO LEARN ABOUT COMPUTER NETWORK DESIGN WITHOUT RAPIDLY GETTING IN OVER YOUR HEAD. THIS ARTICLE SIGNIFICANTLY ADDS TO THAT SMALL NUMBER. IT IMPARTS A REAL FEELING FOR THE DESIGN PROCESS AND ANALYTIC TECHNIQUES, WITHOUT SNOWING THE READER, AND WITHOUT OVERSIMPLIFYING THE PROBLEM. THE FLAVOR OF THE VARIOUS APPROACHES IS WELL EXPRESSED, BE THEY HIGHLY ANALYTIC (SCIENCE) OR RATHER ITERATIONS OF EDUCATED GUESSES (ART). THE ARTICLE ITSELF IS HIGHLY READABLE, AND SHOULD BE READ BY ALL WHO WANT TO KNOW WHAT DESIGNING NETWORKS IS ALL ABOUT.
(ALSO UNDER 2.1.0, 3.2.2)

FRANK, H., I. T. FRISCH, PLANNING COMPUTER-COMMUNICATION NETWORKS, (NETWORK ANALYSIS CORP., GLEN COVE, NY).
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TKSI02.5.A283), P 1-28, 20 REFS

SOME OF THE FUNDAMENTAL TECHNIQUES OF NETWORK ANALYSIS AND THEIR APPLICATION TO COMPUTER-COMMUNICATIONS NETWORKS ARE PRESENTED. THE TECHNIQUES ARE USED TO OPTIMIZE NETWORKS WITH RESPECT TO COST, LAYOUT, ROUTING, THROUGHPUT, DELAYS, AND RELIABILITY.
(ALSO UNDER 3.1.0, 3.2.2)

FRISCH, IVAN T., HOWARD FRANK, COMPUTER COMMUNICATIONS--HOW WE GOT WHERE WE ARE, (NETWORK ANALYSIS CORP., GLEN COVE, NY).
AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 109-117, 30 REFS

THIS IS AN EXCELLENT ARTICLE WHICH TRACES THE EVOLUTION OF NETWORKING. FOR THE NOVICE TO COMPUTER NETWORKING THIS ARTICLE PRESENTS AN OVERVIEW FOR UNDERSTANDING THE 'WHY' AND 'HOW' OF NETWORKS DEVELOPMENT. HOWEVER, EVEN THE COMPUTER NETWORK EXPERT SHOULD FIND THIS ARTICLE ENJOYABLE AND INTERESTING.

GOURLEY, DAVID E., DATA COMMUNICATIONS: INITIAL PLANNING, (DATA TRANSMISSION CO., VIENNA, VA).
DATAMATION, VOL 18, ISSUE 10, OCT 72, P 59-64

AN INTRODUCTION TO DATA COMMUNICATIONS PLANNING IS PRESENTED. ITEMS COVERED INCLUDE DEFINING WORKLOAD REQUIREMENTS, EVALUATING CONFIGURATIONS IN TERMS OF PROJECTED COST EFFECTIVENESS, CHANNEL BANDWIDTH CONSIDERATIONS, MODEMS, MULTIPLEXERS AND CONCENTRATORS, AND TERMINALS. EACH ITEM IS INTRODUCED IN ONE OR TWO PARAGRAPHS.

GREENBERGER, MARTIN, APPLICATIONS DEVELOPMENT AND USER SERVICES. REPORT OF WORKSHOP 11, (JOHNS HOPKINS UNIV.).
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 373-384, 1 REFS
(ANNOTATION UNDER 1.1)

HAMAKER, R. F., DISTRIBUTED COMPUTER SYSTEMS, (INTERNATIONAL BUSINESS MACHINES CORP., RESEARCH TRIANGLE PARK, NC, SYSTEMS DEVELOPMENT DIV.).
TELECOMMUNICATIONS, VOL 4, ISSUE 3, MAR 70, P 25-30

A SHORT DISSERTATION ON THE PHILOSOPHY OF A DISTRIBUTED NETWORK AND SOME ASSOCIATED TECHNICAL CONSIDERATIONS ARE PRESENTED.

HITTEL, L. A., SOME PROBLEMS IN DATA COMMUNICATIONS BETWEEN THE USER AND THE COMPUTER, (GENERAL ELECTRIC CO., PHOENIX, AZ).
AFIPS PROCEEDINGS, 1966 FALL JOINT COMPUTER CONFERENCE, VOLUME 29, (SAN FRANCISCO, CA, NOVEMBER 7-10, 1966), SPARTAN BOOKS INC., WASHINGTON, DC, 1966, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 395-402

THIS SOMEWHAT DATED TUTORIAL ON DATA COMMUNICATIONS SYSTEMS DESIGN AND IMPLEMENTATION NEVERTHELESS CONTAINS SOME INTERESTING INFORMATION. A SECTION ON 'PROGRAMMING FOR DATA SET CONTROL' IS INFORMATIVE AND STILL CURRENT. AS ARE THE SECTIONS ON 'INSTALLATION' AND 'MAINTAINABILITY AND OPERATION CONSIDERATIONS.' IT IS PERHAPS MOST INTERESTING TO NOTE THAT THE MAJORITY OF THE PROBLEMS IN DATA COMMUNICATIONS WHICH WERE RECOGNIZED SIX YEARS AGO ARE STILL WITH US TODAY.
(ALSO UNDER 3.2.2)

JASPER, O. P., PRINCIPLES OF NETWORK DESIGN, (CONTROL DATA CORP., MINNEAPOLIS, MN).
PROCEEDINGS OF THE 1974 SYMPOSIUM, COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, MAY 23, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, 74CH0835-9C, P 1-5

1.3 TUTORIAL

IN THIS ARTICLE JASPER PRESENTS AN ANALYSIS OF BASIC CONCEPTS AND PRINCIPLES OF COMPUTER NETWORKS. GENERAL DEFINITIONS ALONG WITH NETWORK OBJECTIVES AND FUNCTIONAL CAPABILITIES ARE DISCUSSED. COMPARISONS ARE MADE BETWEEN COMPUTER NETWORKS AND MINICOMPUTERS, AS WELL AS BETWEEN VARIOUS NETWORK CONFIGURATIONS. TUTORIAL IN NATURE, THIS PAPER PRESENTS AN INTERESTING AND HIGHLY READABLE OVERVIEW OF COMPUTER NETWORKS.

KAHN, ROBERT E., RESOURCE-SHARING COMPUTER COMMUNICATIONS NETWORKS, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA), PROCEEDINGS OF THE IEEE, VOL 60, ISSUE 11, NOV 72, P 1397-1407, 34 REFS

THIS PAPER PROVIDES A GOOD INTRODUCTION TO RESOURCE-SHARING COMPUTER COMMUNICATION NETWORKS COVERING SUCH AREAS AS: DISTRIBUTED VS. CONCENTRATED RESOURCES, COMPUTER-TO-COMPUTER COMMUNICATION, MESSAGE-SWITCHED COMMUNICATIONS, AND NETWORK ACCESS.

KLEINROCK, LEONARD, COMPUTER NETWORKS, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE), CARDENAS, A. F., DR., L. PRESSLER, M. A. MARTIN, COMPUTER SCIENCE, WILEY-INTERSCIENCE, NEW YORK, 1972, (LC 71-169162), P 241-284, 40 REFS

THIS IS A VERY INTERESTING EXPOSITION EMPHASIZING MODELING OF COMPUTER NETWORKS. FOLLOWING A SKETCHY HISTORY OF NETWORKING AND OF THE ARPA NETWORK AN INTRODUCTION TO THE MODELING OF INDIVIDUAL TIME-SHARING SYSTEMS AS NETWORK NODES IS GIVEN. NETWORK DELAY AS A FUNCTION OF THE MIX OF SHORT AND LONG MESSAGES IS DISCUSSED. AN INTERESTING PROPOSAL IS MADE THAT SIMULATION MODELS OF NETWORKS BE COMBINED WITH MODELS OF THEIR TIME-SHARING NODES TO REALISTICALLY SIMULATE OVERALL NETWORK BEHAVIOR. SOME INTRIGUING SUMMARY COMMENTS ABOUT THE NATURE OF THE MAN-NETWORK INTERFACE ARE INCLUDED.
(ALSO UNDER 2.1.0)

KLEINROCK, LEONARD, MODELS FOR COMPUTER NETWORKS, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF ENGINEERING), IEEE INTERNATIONAL CONFERENCE ON COMMUNICATIONS, VOLUME 2, JUN 69, P 21-9--21-16, 13 REFS

THIS INTRODUCTION TO DIFFERENT APPROACHES TO THE STUDY OF COMPUTER NETWORKS INCLUDES BOTH ANALYTIC AND SIMULATION METHODS. THE EXAMPLES GIVEN ARE ALL BASED ON THE ARPA NETWORK. THIS ARTICLE IS SLIGHTLY OUT OF DATE NOW, BUT IS STILL VERY USEFUL AND INFORMATIVE AS A TUTORIAL INTRODUCTION.
(ALSO UNDER 2.1.0)

KLEINROCK, LEONARD, SURVEY OF ANALYTICAL METHODS IN QUEUEING NETWORKS, (CALIFORNIA, UNIV. OF, LOS ANGELES), RUSTIN, RANDALL, COURANT COMPUTER SCIENCE SYMPOSIUM 3, COMPUTER NETWORKS, (NOVEMBER 30-DECEMBER 1, 1970), PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1972, PRENTICE-HALL SERIES IN AUTOMATIC COMPUTATION, (LC 79-39373), P 185-205, 11 REFS

A SET OF ANALYTICAL METHODS FOR ESTIMATING THE PERFORMANCE OF A NETWORK IS DESCRIBED, WITH A GIVEN TOPOLOGY, ROUTING PROCEDURE, AND TRAFFIC MATRIX, THE LENGTH OF TIME IT TAKES A MESSAGE TO TRANSIT THE NETWORK IS ANALYZED. OPTIMIZATION TECHNIQUES RELATING CHANNEL CAPACITIES, MESSAGE DELAYS, AND COSTS TO A GIVEN TOPOLOGY AND ROUTING PROCEDURE ARE ALSO DISCUSSED.
(ALSO UNDER 2.1.2)

KUO, FRANKLIN F., USER STANDARDS FOR COMPUTER NETWORKS, (HAWAII, UNIV. OF, HONOLULU), FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000I-7-DATA, P 2-16--2-17

THIS PAPER BRIEFLY ADDRESSES THE ISSUE OF STANDARDS FROM A NETWORK USER'S POINT OF VIEW - IN PARTICULAR, AN ARPANET USER'S POINT OF VIEW.

LARSSON, T., DATA COMMUNICATION IN SWEDEN--AND SOME ASPECTS OF THE SITUATION IN EUROPE, (SWEDISH TELECOMMUNICATIONS ADMINISTRATION, FARSTA), WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 17-25

THIS ARTICLE SURVEYS THE DEVELOPMENT OF DATA COMMUNICATIONS FACILITIES IN SWEDEN. THE AUTHOR IDENTIFIES A NEED FOR AND A TREND TOWARDS REPLACING PRIVATE DATA COMMUNICATIONS NETWORKS WITH A PUBLIC NETWORK. SOME EFFORTS AT INTERNATIONAL COOPERATION (WITHIN EUROPE) IN THE DATA COMMUNICATION FIELD ARE DESCRIBED, ALONG WITH RESULTS OF A LARGE MARKET SURVEY. THE AUTHOR RECOGNIZES THAT EUROPE IS BEHIND AMERICA IN THE DEVELOPMENT OF DATA COMMUNICATIONS FACILITIES, BUT SINCE THEY HAVE THE ADVANTAGE OF BEING ABLE TO STUDY THE DEVELOPMENT IN THE U.S. THEY SHOULD BE ABLE TO MOVE RAPIDLY IN THIS AREA.

LUCKY, ROBERT W., COMMON-CARRIER DATA COMMUNICATION, (BELL TELEPHONE LABS, INC., HOLMDEL, NJ), ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 142-196, 18 REFS

THIS CHAPTER PROVIDES COMPREHENSIVE DISCUSSION OF COMMON DATA TRANSMISSION FACILITIES, AND HOW TO USE THESE FACILITIES IN SETTING UP A COMPUTER NETWORK. THE SERVICES OF THE COMMON CARRIERS FOR DATA TRANSMISSION, THE BASIC TECHNIQUES AND EQUIPMENT FOR TRANSMISSION, AND THE IDIOSYNCRASIES AND BEHAVIOR OF THE NETWORK ARE DESCRIBED.
(ALSO UNDER 3.2.1)

MARTIN, JAMES T., SYSTEMS ANALYSIS FOR DATA TRANSMISSION, INTERNATIONAL BUSINESS MACHINES CORP., SYSTEMS RESEARCH INST., PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1972, PRENTICE HALL SERIES IN AUTOMATIC COMPUTATION, (LC 75-37761), 909P

IN THIS COMPREHENSIVE GUIDE TO THE DESIGN OF DATA COMMUNICATIONS NETWORKS, MARTIN IS CONCERNED WITH THE CALCULATIONS AND SYSTEM DECISIONS NECESSARY WHEN DESIGNING DATA TRANSMISSION SYSTEMS. INCLUDED ARE DISCUSSIONS OF SYSTEM, USER, TERMINAL, NETWORK, AND SOFTWARE CONSIDERATIONS, AS WELL AS NUMEROUS FORMULAS, DESIGN TABLES, AND EXAMPLES OF THEIR APPLICATION TO PRACTICAL PROBLEMS.
(ALSO UNDER 3.2.2)

MARTIN, J., TELECOMMUNICATIONS AND THE COMPUTER, INTERNATIONAL BUSINESS MACHINES CORP., NEW YORK, SYSTEMS RESEARCH H INST., PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1969, PRENTICE-HALL SERIES IN AUTOMATIC COMPUTATION, (LC 78-76038), 470P, 47 REFS

COMPUTER-COMMUNICATIONS CONCEPTS ARE PRESENTED IN AN EASY-TO-READ MANNER IN THIS POPULAR INTRODUCTION TO TELECOMMUNICATIONS. SOME OF THE MORE IMPORTANT CONCEPTS INTRODUCED INCLUDE: TYPES OF LINES AND TARIFFS, TRANSMISSION MEDIA, MODULATION AND DEMODULATION, PULSE CODE MODULATION, MULTIPLEXING, WIDEBAND COMMUNICATIONS, AND DATA ERROR TREATMENT.
(ALSO UNDER 3.2.0)

MERTEN, HANNES, COMMUNICATION WITH DATA BASES, (SIEMENS AG, MUNICH, (WEST GERMANY)), THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 61-66

THIS PAPER IS INTENDED TO BE AN OVERVIEW OF THE REQUIREMENTS FOR TELEPROCESSING TOOLS SUCH AS TERMINALS, TRANSMISSION LINES AND DATA QUANTITIES TO BE TRANSMITTED. THE AUTHOR LISTS THESE REQUIREMENTS FOR TWO CLASSES OF DATA BASE USERS, PEOPLE AND COMPUTERS, WITH RESPECT TO THREE TYPES OF SYSTEMS - OPERATIONAL, MANAGEMENT AND INFORMATION RETRIEVAL.

NEUMANN, A. J., A GUIDE TO NETWORKING TERMINOLOGY, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, SYSTEMS AND SOFTWARE DIV., MAR 74, NBS TN-803, NSF AG-350, 29P

THERE SEEMS TO BE CONSIDERABLE CONFUSION WHENEVER COMMUNICATIONS SPECIALISTS AND COMPUTER ANALYSTS GET TOGETHER TO DISCUSS A COMMON TOPIC SUCH AS COMPUTER NETWORKS. THEY OFTEN USE THE SAME WORDS, BUT DON'T MEAN THE SAME THING. THIS GUIDE TO NETWORKING TERMINOLOGY, REALLY A GLOSSARY ACCUMULATED FROM A NUMBER OF SOURCES WITH SOME ORIGINAL CONTRIBUTIONS, IS AN ATTEMPT TO COLLECT IN ONE PLACE THE COMMON TECHNICAL VOCABULARY NEEDED FOR COMPUTER NETWORKING. THE GLOSSARY IS NOT TOTALLY COMPLETE NOR ARE ALL THE DEFINITIONS PERFECT, BUT IT IS AN ADMIRABLE FIRST EFFORT AND A USEFUL COLLECTION.
(ALSO UNDER 1.0)

NEUMANN, PETER G., SYSTEM DESIGN FOR COMPUTER NETWORKS, (STANFORD RESEARCH INST., MENLO PARK, CA), ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 29-81, 83 REFS

THIS PAPER PRESENTS A CONCEPTUAL FRAMEWORK FOR AN UNDERSTANDING OF COMPUTER SYSTEMS AND COMPUTER NETWORKS, INDEPENDENT OF HARDWARE AND SOFTWARE IMPLEMENTATION DETAILS. EMPHASIS IS PLACED ON MULTIPROCESSOR COMPUTER SYSTEMS AND MULTISYSTEM COMPUTER NETWORKS. THE BENEFITS OF CAREFUL STRUCTURING OF BOTH SYSTEMS AND NETWORKS ARE PRESENTED.
(ALSO UNDER 3.0)

1.3 TUTORIAL

PEHRSON, DAVID L., INTERFACING AND DATA CONCENTRATION, (CALIFORNIA, UNIV. OF, LIVERMORE), ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 197-236, 7 REFS

A GENERAL DISCUSSION OF COMMUNICATIONS INTERFACING AND DATA CONCENTRATION IS PRESENTED IN THIS PAPER. AREAS DISCUSSED INCLUDE: THE SERIAL COMMUNICATIONS PROBLEM, INTERFACE REQUIREMENTS, APPROACHES TO INTERFACE IMPLEMENTATION, CONCENTRATOR TYPES, CONCENTRATOR APPLICATIONS, CONCENTRATOR TRADEOFFS, PARALLEL COMMUNICATION INTERFACE, AND AS AN EXAMPLE, THE OCTOPUS SYSTEM.
(ALSO UNDER 3.3.1, 3.2.3)

PETERSON, JACK J., SANDRA A. VEIT, CATALOG OF NETWORK FEATURES, MITRE CORP., WASHINGTON, DC, 15 MAR 71, MC WP-969S, AF F19628-71-C-0002, 47P, 10 REFS

DEFINITIONS OF A NUMBER OF TERMS RELATED TO COMPUTER NETWORKING ARE GIVEN. THE ORDERING OF TERMS IS LOGICAL RATHER THAN ALPHABETICAL, AND EXAMPLES AND OPINIONS ARE GIVEN WITH EACH ITEM. THE CATALOG IS CERTAINLY USEFUL, BUT THE SET OF TERMS IS INCOMPLETE AND THE SUBSET CHOSEN CANNOT EASILY BE CHARACTERIZED. IT IS WORTHWHILE READING, HOWEVER, AS AN INTRODUCTION TO NETWORKING CONCEPTS.

PYKE, THOMAS N., JR., ROBERT P. BLANC, COMPUTER NETWORKING TECHNOLOGY -- A STATE OF THE ART REVIEW, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY), COMPUTER, VOL 6, ISSUE 8, AUG 73, P 12-19, 44 REFS

HIGHLIGHTS OF COMPUTER NETWORKING TECHNOLOGY, AS REPRESENTED IN EXISTING AND PLANNED NETWORKS, ARE REVIEWED. THIS ARTICLE DISCUSSES THE TECHNOLOGY THAT UNDERLIES THE FIELD OF COMPUTER NETWORKS BY DEFINING AND EXPLORING A SET OF TECHNOLOGICAL DIMENSIONS AND THEN ATTEMPTING TO PLACE INDIVIDUAL NETWORKS IN THIS MULTIDIMENSIONAL SPACE. AREAS COVERED ARE NETWORK COMPONENTS AND ARCHITECTURE INCLUDING CIRCUITS, CHANNELS, NODES, NETWORK TOPOLOGY, COMPOSITION, NETWORK CONTROL, INTERFACES AND NETWORK UTILIZATION.
(ALSO UNDER 3.0)

SHAFRITZ, ARNOLD B., THE USE OF COMPUTERS IN MESSAGE SWITCHING NETWORKS, (AUERBACH CORP., PHILADELPHIA, PA, INFORMATION SCIENCES DIV.), PROCEEDINGS OF THE 19TH NATIONAL CONFERENCE, ASSOCIATION FOR COMPUTING MACHINERY, (PHILADELPHIA, PA, AUGUST 25-27, 1964), ASSOCIATION FOR COMPUTING MACHINERY, NEW YORK, 1964, ACM P-64, (LC 64-25615), P N2.3-1--N2.3-6

THIS PAPER PROVIDES A USEFUL DESCRIPTION OF CONCEPTS IN MESSAGE SWITCHING COMPARING THEM TO AND DISTINGUISHING THEM FROM CIRCUIT SWITCHING. THE ADVANTAGES OF ONE APPROACH OVER THE OTHER ARE ALSO CLARIFIED.

STIMLER, SAUL, PLANNING A DATA COMMUNICATION SYSTEM, PART I: A BROAD OVERVIEW AND BASIC CONCEPTS, (STIMLER ASSOCIATES, MOORESTOWN, NY), MODERN DATA, VOL 3, ISSUE 4, APR 70, P 134-135, 138-140, 2 REFS

THIS ARTICLE IS AN INTRODUCTION TO SOME OF THE MORE BASIC CONCEPTS OF DATA COMMUNICATIONS. COVERAGE IS BRIEF AND SUPERFICIAL.

TEICHHOLTZ, NATHAN A., DISTRIBUTED COMPUTING: A MODULAR APPROACH TO COMPLEX SYSTEMS, (DIGITAL EQUIPMENT CORP., MAYNARD, MA), COMPCON FALL '75, ELEVENTH IEEE COMPUTER SOCIETY CONFERENCE, HOW TO MAKE COMPUTERS EASIER TO USE, DIGEST OF PAPERS, (WASHINGTON, DC, SEPTEMBER 9-11, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75CH0988-6C, P 137-138

THIS EXTREMELY SHORT ARTICLE DOES LITTLE MORE THAN OBSERVE THAT DISTRIBUTED COMPUTING NETWORKS ARE BEGINNING TO PROVIDE ATTRACTIVE ALTERNATIVES FOR THE IMPLEMENTATION OF COMPLEX SYSTEMS.

TOWNSEND, MICHAEL J., COMMUNICATION CONTROL BY COMPUTER--AN INTRODUCTION, (GTE INFORMATION SYSTEMS INC., HUNTINGTON BEACH, CA, TEMPO COMPUTERS DIV.), TELECOMMUNICATIONS, VOL 6, ISSUE 5, MAY 72, P 33-34, 36-38, 60, 62

THE COMMUNICATION CONTROL FUNCTIONS WHICH ARE REQUIRED IN A TELEPROCESSING SYSTEM ARE IDENTIFIED AND EXPLAINED. AFTER SOME BACKGROUND MATERIAL, THE SURVEY OF FUNCTIONS IS WELL-PRESENTED AT THE TUTORIAL LEVEL.

WINKLER, STANLEY, DR., LEE DANNER, DATA SECURITY IN THE COMPUTER COMMUNICATION ENVIRONMENT, (INTERNATIONAL BUSINESS MACHINES CORP., GAITHERSBURG, MD, SYSTEM DEVELOPMENT DIV.), COMPUTER, VOL 7, ISSUE 2, FEB 74, P 23-31, 7 REFS
(ANNOTATION UNDER 5.6)

1.4 BIBLIOGRAPHIES

ALSBERG, PETER A., GENEVA G. BELFORD, DEBORAH S. BROWN, STEVE R. BUNCH, JOHN D. DAY, ENRIQUE GRAPA, DAVID C. HEALY, JOHN R. MULLEN, PAUL L. PETRONELLI, AN ANNOTATED BIBLIOGRAPHY TO NETWORK DATA MANAGEMENT AND RELATED LITERATURE, ILLINOIS, UNIV. OF, URBANA, CENTER FOR ADVANCED COMPUTATION, 1 APR 75, IU-CAC 149, OCA 100-75-C-0021, (AD-A014 232), 287P

OVER 400 DOCUMENTS RELATED TO NETWORK DATA MANAGEMENT AND RESOURCE SHARING ARE ANNOTATED. THE DOCUMENTS COVER TOPICS IN DATA MANAGEMENT, COMPUTER NETWORKS, COMMUNICATIONS, RESOURCE ALLOCATION, MEASUREMENT AND ANALYSIS, FRONT ENDS, SECURITY AND APPLICATION SUPPORT.

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THIS IS THE FIRST EDITION OF THE PRESENT BIBLIOGRAPHY. ALL REFERENCES FROM THIS BIBLIOGRAPHY HAVE BEEN INCLUDED IN THE VERSION YOU ARE NOW USING.

COMPUTER NETWORKING, A DDC BIBLIOGRAPHY, DEFENSE DOCUMENTATION CENTER, ALEXANDRIA, VA, MAY 75, FEB 65-DEC 74, DDC TAS-75-9, (AD-A010 200), 332P

THIS BIBLIOGRAPHY CONTAINS ABOUT 250 UNCLASSIFIED-UNLIMITED CITATIONS ON COMPUTER NETWORKING: DESIGN, PROGRAMMING, DATA PROCESSING, INTERFACING, AND APPLICATION OF NETWORKS IN THEIR PERFORMANCE AND USE. ALSO INCLUDED ARE REFERENCES TO DOCUMENTS CONTAINING INFORMATION ON THE CAPABILITY AND RELIABILITY OF THE ALOHA SYSTEM AND THE ARPA COMPUTER NETWORK. THE CITATIONS WERE TAKEN FROM ENTRIES PROCESSED INTO THE DEFENSE DOCUMENTATION CENTER'S DATA BANK BETWEEN JANUARY 1965 AND MARCH 1975.

DUGGAN, MICHAEL A., BIBLIOGRAPHY 17, COMPUTER UTILITIES--SOCIAL AND POLICY IMPLICATIONS: A REFERENCE BIBLIOGRAPHY, (NEW HAMPSHIRE, UNIV. OF, DURHAM, WHITTEMORE SCHOOL OF BUSINESS AND ECONOMICS), COMPUTING REVIEWS, VOL 9, ISSUE 10, OCT 68, P 631-644

REPRESENTED IN THIS BIBLIOGRAPHY ARE REFERENCES THAT PERTAIN TO THE SOCIAL AND POLICY IMPLICATIONS OF THE COMPUTER AND/OR INFORMATION UTILITIES. EMPHASIS IS PLACED UPON HOW THESE UTILITIES WILL BE USED.

GROOMS, DAVID W., COMPUTER NETWORKS, A BIBLIOGRAPHY WITH ABSTRACTS, NATIONAL TECHNICAL INFORMATION SERVICE, SPRINGFIELD, VA, JUN 75, 1969-JUN 75, NTIS PS-75-524, 297P

THE CITATIONS (245) PRESENT RESEARCH ON ALL ASPECTS OF COMPUTER NETWORKS INCLUDING HARDWARE, SOFTWARE, DATA TRANSMISSION, AND APPLICABLE THEORY ON NETWORK DESIGN. SPECIFIC STUDIES ON THE ARPANET, THE ALOHA SYSTEM, AND GLOBNET ARE INCLUDED.

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1.5 SOCIAL ISSUES

BARAN, PAUL, COMMUNICATIONS, COMPUTERS AND PEOPLE, (PREPARED FOR, AFIPS FALL JOINT COMPUTER CONFERENCE, LAS VEGAS, NV, DECEMBER 2, 1965), RAND CORP., SANTA MONICA, CA, NOV 65, RC P-3235, (AD-624-431), 20P

ALTHOUGH THE PRIMARY INTEREST IN THIS EXPOSITION IS ON PROBABLE NEGATIVE SOCIETAL EFFECTS OF COMPUTERS AND COMMUNICATIONS, SOME ATTENTION IS GIVEN TO THE USE OF COMPUTERS AND COMPUTER-LIKE EQUIPMENT IN COMMUNICATIONS NETWORKS AND ON THE IMPACT OF LESS EXPENSIVE DIGITAL COMMUNICATIONS CIRCUITS ON THE USE OF COMPUTERS. MOST OF BARAN'S COMMENTS CONCERNING SOCIETAL IMPACT ARE INVOLVED WITH AGGREGATION EFFECTS BROUGHT ABOUT THROUGH THE USE OF COMPUTERS AND COMMUNICATIONS TOGETHER. HE PROPOSES A NUMBER OF PROTECTIVE MEASURES AND STATES THE NEED FOR STILL MORE.

BUTLER, R. E., INTERNATIONAL COOPERATION AND REGULATION FOUNDATIONS FOR DEVELOPMENT, (INTERNATIONAL TELECOMMUNICATIONS UNION, GENEVA, (SWITZERLAND)),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 11-17

THIS PAPER PRESENTS A GENERAL OVERVIEW OF THE PRESENT SITUATION OF COMPUTER DEVELOPMENT, THE INTERDEPENDENCE OF TELECOMMUNICATION AND SOME PERSPECTIVES OF DATA COMMUNICATION DEVELOPMENT AND USER REQUIREMENTS. IT OUTLINES BASIC FUTURE CONSIDERATIONS WHICH NECESSITATE THE CONSIDERATION OF ECONOMIC AND SOCIAL IMPLICATIONS AND THE ATTITUDE OF GOVERNMENTS AND TELECOMMUNICATION AUTHORITIES.
RELATIONSHIPS BETWEEN THE COMPUTER INDUSTRY AND THE TELECOMMUNICATIONS INTERESTS ARE DISCUSSED.
(ALSO UNDER 5.4, 3.2.0)

ENSLOW, PHILIP H., JR., LT. COL., NETWORK VIABILITY: ECONOMIC, LEGAL, AND SOCIAL CONSIDERATIONS, (EXECUTIVE OFFICE OF THE PRESIDENT, WASHINGTON, DC, OFFICE OF TELECOMMUNICATIONS POLICY),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, "COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?", (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 7-10, 2 REFS
(ANNOTATION UNDER 5.4)

FANO, ROBERT M., ON THE SOCIAL ROLE OF COMPUTER COMMUNICATIONS, (MASSACHUSETTS INST. OF TECH., CAMBRIDGE), PROCEEDINGS OF THE IEEE, VOL 60, ISSUE 11, NOV 72, P 1249-1253, 4 REFS

PRESSURES THAT LEAD TO MORE WIDESPREAD USE OF COMPUTERS IN THE OPERATION OF SOCIETY ARE ILLUSTRATED. IT IS POINTED OUT THAT COMPUTER NETWORKS ARE NECESSARY TO HANDLE THE MASSIVE BOOKKEEPING PROBLEMS OF SOCIETY AND THE STORAGE OF KNOWLEDGE. A GOOD ANALOGY IS RAISED COMPARING THE IMPORTANCE OF ECONOMIC COMPUTER NETWORKS TO THE MASS PRODUCTION OF SERVICES WITH THE IMPORTANCE OF ECONOMIC TRANSPORTATION NETWORKS TO THE MASS PRODUCTION OF GOODS. THE DANGER IS ALSO DISCUSSED OF PROVIDING COMPUTER ACCESS AND THE ASSOCIATED INFORMATION TO A RESTRICTED SEGMENT OF SOCIETY WHICH CAN BE TRANSFORMED INTO POWER OVER THE REST OF SOCIETY. THE CONCLUSION IS THAT COMPUTERS MUST BE MADE TRULY ACCESSIBLE TO THE PUBLIC AT LARGE.

GILLESPIE, ROBERT, UNIVERSITY RELATIONS WITH NETWORKS: FORCING FUNCTIONS AND FORCES, (WASHINGTON, UNIV. OF, SEATTLE), GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 240-244
(ANNOTATION UNDER 3.1.0)

HABERSTROH, CHADWICK J., BEHAVIORAL IMPLICATIONS OF ORGANIZATION CHANGE, (WISCONSIN, UNIV. OF, MILWAUKEE), GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 212-221, 5 REFS

THE AUTHOR DISCUSSES THE ENVIRONMENTAL ASPECTS OF A LARGE-SCALE NATIONAL COMPUTER NETWORK THAT WILL POSE ORGANIZATIONAL PROBLEMS FOR MEMBER UNIVERSITIES AND OTHER RESEARCH ORGANIZATIONS.
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JEFFERY, LAWRENCE R., SOFTWARE: THE DASH IN COMPUTER--COMMUNICATIONS, (MITRE CORP., BEDFORD, MA),
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THIS ESSAY CONTAINS LITTLE TECHNICAL INFORMATION CONCERNING SOFTWARE: IN FACT, IT CONTAINS LITTLE TECHNICAL INFORMATION AND LITTLE INFORMATION CONCERNING SOFTWARE. IT IS, HOWEVER, FAR RANGING IN ITS DISCUSSION OF SOME DESIRED CAPABILITIES FOR COMPUTER COMMUNICATIONS SYSTEMS, COMPLETE WITH SAMPLE MAN-MACHINE DIALOGUES.
(ALSO UNDER 3.5.0)

JOHNSON, LELAND L., SOME IMPLICATIONS OF NEW COMMUNICATIONS TECHNOLOGIES FOR NATIONAL SECURITY IN THE 1970S, RAND CORP., SANTA MONICA, CA, SEP 67, RC P-3639, (AD-658 424), 24P, 14 REFS
(ANNOTATION UNDER 5.4)

KIMBEL, DIETER, PLANNING OF DATA COMMUNICATIONS NETWORKS--ECONOMIC, TECHNOLOGICAL AND INSTITUTIONAL ISSUES, (ORGANISATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, PARIS, (FRANCE)),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-696-8C, NSF GJ-33239, P 251-259, 19 REFS
(ANNOTATION UNDER 5.4)

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(ANNOTATION UNDER 1.1)

MAISEL, HERBERT, RESPONSIBILITY FOR THE HUMANISTIC USE OF THE INFORMATION REVOLUTION: WHERE WILL THE BATTLE BE FOUGHT?, (GEORGETOWN UNIV., WASHINGTON, DC),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-696-8C, NSF GJ-33239, P 47-48, 8 REFS

THIS ESSAY IDENTIFIES SOME NON-OBVIOUS PLACES WHERE THE REAL 'BATTLES' WILL BE FOUGHT REGARDING THE WAY IN WHICH INFORMATION SYSTEMS (PARTICULARLY COMPUTER-COMMUNICATIONS BASED SYSTEMS) WILL BE USED AND THEIR IMPACT ON SOCIETY. SOME OF THESE ARE THE CONGRESS, THE EXECUTIVE OFFICE OF THE PRESIDENT, EDUCATIONAL INSTITUTIONS, AND WITHIN THE STRUCTURES OF MANY PRIVATE ORGANIZATIONS.

PARKER, EDWIN B., OR., DEMOCRACY AND INFORMATION PROCESSING, (STANFORD UNIV., CA, CENTER FOR ADVANCED STUDY IN THE BEHAVIORAL SCIENCES),
EDUCOM BULLETIN, VOL 5, ISSUE 4, FALL 70, P 2-6

THE AUTHOR ADDRESSES THE MAJOR COMPONENTS OF A PUBLIC INFORMATION UTILITY SYSTEM AND DISCUSSES A PLAUSIBLE PATH BY WHICH OUR PRESENT MEDIA SYSTEM COULD EVOLVE TO SUCH A SYSTEM. HE ENUMERATES THE POSITIVE SOCIAL CONSEQUENCES OF THE NEW MEDIUM AND CONCLUDES BY BRIEFLY CONSIDERING SOME OF THE RELEVANT ECONOMIC FACTORS.

ROCKOFF, MAXINE L., HEALTH CARE COMMUNICATION SYSTEMS, (HEALTH SERVICES AND MENTAL HEALTH ADMINISTRATION, ROCKVILLE, MD),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-696-8C, NSF GJ-33239, P 465-467
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THOMPSON, GORDON B., THREE CHARACTERIZATIONS OF COMMUNICATIONS REVOLUTIONS, (BELL-NORTHERN RESEARCH, OTTAWA, (CANADA)),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-696-8C, NSF GJ-33239, P 36-37

THIS ESSAY DEALS WITH THE PROBLEM OF DEVELOPING TOOLS FOR THE ASSESSMENT OF THE IMPACT OF COMMUNICATIONS SYSTEMS ON SOCIETY AS A WHOLE. THE THREE CHARACTERIZATIONS DISCUSSED ARE (1) THE INCREASE IN THE EASE WITH WHICH STORED HUMAN EXPERIENCE CAN BE ACCESSED; (2) THE INCREASE IN THE SIZE OF THE COMMON INFORMATION SPACE SHARED BY THE COMMUNICANTS; AND (3) THE INCREASE IN THE EASE OF DISCOVERY AND DEVELOPMENT OF NASCENT CONSENSUS. TESTS OF SIGNIFICANCE CORRESPONDING TO

1.5 SOCIAL ISSUES

THE THREE CHARACTERIZATIONS ARE GIVEN.

1.6 FORECASTS

A TRANS-CANADA COMPUTER COMMUNICATIONS NETWORK. PHASE I OF A MAJOR PROGRAM ON COMPUTERS. SCIENCE COUNCIL OF CANADA, AUG 71, SCC R-13, SCC SS22-1971-13, 41P
(ANNOTATION UNDER 3.1.0)

ALDEN, R. M., THE WIRED CITY: THE ROLE OF AN INDEPENDENT TELEPHONE COMPANY, (UNITED TELECOMMUNICATIONS INC., KANSAS CITY, MO),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 417-419
(ANNOTATION UNDER 4.3)

AUFENKAMP, D. DON, NSF ACTIVITIES IN NETWORKING FOR SCIENCE, (NATIONAL SCIENCE FOUNDATION, WASHINGTON, DC),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 38-43, 2 REFS
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BAALMAN, RIEKO, THE FUTURE OF COMPUTER COMMUNICATION--A FACILITY FOR FEW OR A UTILITY FOR MANY?, (SHELL INTERNATIONALE PETROLEUM, MAGUE, (NETHERLANDS)),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 383-388

AFTER DISCUSSING VARIOUS CURRENT AND PROJECTED APPLICATIONS FOR COMPUTER COMMUNICATIONS, THE AUTHOR MOVES INTO A DISCUSSION OF NETWORKING IN BOTH THE PUBLIC AND PRIVATE SECTORS IN EUROPE. SEVERAL PROBLEM AREAS ARE IDENTIFIED, AND IN CONCLUSION IT IS STATED THAT EUROPEAN PTT ADMINISTRATIONS COULD ONLY GAIN FROM A REMOVAL OF BARRIERS AND AN ENERGETIC STIMULATION OF THE UTILITY CONCEPT FOR COMPUTER COMMUNICATIONS.
(ALSO UNDER 5.4)

BRYANT, SUSAN, PAN G. YATRAKIS, AN ECONOMIC MODEL OF TWO-WAY BROADBAND NETWORKS, (GTE LABS, INC., WALTHAM, MA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 89-92
(ANNOTATION UNDER 2.1.4)

COVIELLO, GINO J., ROY O. ROSNER, COST CONSIDERATIONS FOR A LARGE DATA NETWORK, (DEFENSE COMMUNICATIONS AGENCY, RESTON, VA),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 289-294, 6 REFS

THE 10-YEAR COST SENSITIVITY, AS A FUNCTION OF CHANNEL BIT RATE, FOR A WIDE GEOGRAPHICALLY DISPERSED MIX OF VARIABLE SIZE DATA CUSTOMERS IS DEVELOPED BASED ON CURRENT AND PROJECTED COSTS FOR LEASED TRANSMISSION SERVICE AND PURCHASED PACKET SWITCHING PROCESSORS. TO ACHIEVE THIS OBJECTIVE, A MODEL FOR THE PROJECTION OF LEASED TRANSMISSION COSTS INTO THE FUTURE IS PROPOSED. RESULTS OF THE STUDY INDICATE THAT IN AN EFFICIENTLY DESIGNED DATA NETWORK, THE SENSITIVITY OF COST WITH CHANNEL BIT RATE IS VERY MINIMAL OVER A SIGNIFICANTLY BROAD RANGE OF INTEREST, AND FURTHER INDICATES THAT THIS RESULT IS NOT EXPECTED TO CHANGE WITH TIME. HENCE, ONCE CAN PROCEED WITH CONFIDENCE TOWARDS A SYSTEM DESIGN THAT IS EXPECTED TO REMAIN COST-EFFECTIVE FOR A LONG TIME SPAN.
THIS IS AN INTERESTING APPLICATION OF TECHNOLOGICAL FORECASTING TO DATA COMMUNICATIONS. THE RESULTS CAN BE NO BETTER THAN THE BASIC ASSUMPTIONS, BUT SUCH AN APPROACH IS CLEARLY PREFERABLE TO PURE GUESSWORK.
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CUADRA, CARLOS A., COMPUTER TECHNOLOGY AND LIBRARIES OF THE FUTURE, (SYSTEM DEVELOPMENT CORP., SANTA MONICA, CA),
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(ANNOTATION UNDER 4.2.2)

DAVIES, D. W., TELEPROCESSING AND DATA COMMUNICATION OF THE FUTURE, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), DIV. OF COMPUTER SCIENCE),
ELECTRONICS AND POWER, VOL 17, DEC 71, P 464-467

THE NEED FOR SPECIAL NETWORKS FOR DATA COMMUNICATION IS DEVELOPED, AND PACKET-SWITCHING IS SUGGESTED AS A PARTICULARLY VIABLE TECHNOLOGY.

DAY, LAWRENCE H., THE FUTURE OF COMPUTER AND COMMUNICATIONS SERVICES, (BELL CANADA, MONTREAL),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 42, 1973, NATIONAL COMPUTER CONFERENCE AND EXPOSITION, (NEW YORK, NY, JUNE 4-8, 1973), AFIPS PRESS, MONTVALE, NJ, 1973, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 723-734, 19 REFS

THIS PAPER EXAMINES A NUMBER OF STUDIES ON THE FUTURE OF THE COMPUTER AND COMMUNICATIONS INDUSTRIES. AFTER A GENERAL INTRODUCTION TO FORECASTING AND DELPHI TECHNIQUES THE FOLLOWING APPLICATIONS OF COMPUTER AND COMMUNICATIONS SERVICES ARE DISCUSSED: COMPUTER-ASSISTED INSTRUCTION, USE OF COMPUTER COMMUNICATIONS CAPABILITIES AS A SUBSTITUTE SOME FOR INTER-URBAN TRAVEL, AND USE OF COMPUTER BASED SERVICES IN THE HOME.
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DUNN, D. A., A. J. LIPINSKI, ECONOMIC CONSIDERATIONS IN COMPUTER-COMMUNICATION SYSTEMS, (STANFORD UNIV., CA, DEPT. OF ENGINEERING-ECONOMIC SYSTEMS, INSTITUTE FOR THE FUTURE, MENLO PARK, CA),
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 371-422, 30 REFS
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FISCHER, L. RICHARD, LEGAL IMPLICATIONS OF A CASHLESS SOCIETY, (MORRISON, FOERSTER, HOLLOWAY, CLINTON AND CLARK, SAN FRANCISCO, CA),
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(ANNOTATION UNDER 1.5)

HAMILTON, WALTER C.OR., LARGE-SCALE NUMERICAL ANALYSIS AS APPLIED TO THE BASIC SCIENCES, (BROOKHAVEN NATIONAL LAB., UPTON, NY),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 96-98
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HAMMER, CARL, COMPUTER COMMUNICATIONS: THE FUTURE, (SPERRY RAND CORP., WASHINGTON, DC, UNIVAC DIV.),
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A FORECAST OF THE DIRECTION WHICH DEVELOPMENTS IN THE COMPUTER COMMUNICATIONS AREA WILL BE TAKING IS PRESENTED, BASED ON THE REALIZATION 'THAT TOMORROW'S TECHNOLOGY IS FOUNDED UPON THAT OF TODAY'. BRIEF FORECASTS ARE MADE IN EACH OF THREE AREAS: HARDWARE, SOFTWARE, AND THE SUPPORTING DISCIPLINES.

HARVEY, SAMUEL B., THE CONCEPT OF THE SINGER WORLDWIDE COMPUTER NETWORK, (SINGER CO., NEW YORK),
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1.6 FORECASTS

IN AN EFFORT TO DESCRIBE THE BASIC FACTORS WHICH INFLUENCE SINGER'S SYSTEMS PLANS, SEVERAL TRENDS WHICH SINGER FEELS ARE EVOLVING RAPIDLY IN THE COMPUTER INDUSTRY ARE IDENTIFIED: THE END OF SERIAL BATCH PROCESSING, BETTER EDUCATION OF END USERS, AND EXISTENCE OF NON-CENTRALIZED INFORMATION NETWORKS, DEVELOPMENT OF INTELLIGENT TERMINALS, IMPROVED COMMUNICATION SYSTEMS AND EXPANSION OF APPLICATION AREAS. THESE TRENDS ARE DISCUSSED ONLY AS THEY APPLY TO SINGER'S OPERATIONS.
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KAPRIELIAN, ZOHRAB A., THE POLITICS OF COOPERATION, (SOUTHERN CALIFORNIA, UNIV. OF, LOS ANGELES), GREENBERGER, MARTIN, JULIUS APONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 207-211
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MASON, W. F., R. K. LAY, THE WIRED CITY: SERVICES FOR HOME DELIVERY VIA INTERACTIVE CABLE TV, (MITRE CORP., WASHINGTON, DC),
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(ANNOTATION UNDER 4.3)

CHLMER, AUGUST, SUMMARY OF THE EXISTING DATA COMMUNICATIONS SERVICES IN WESTERN EUROPE AND TENTATIVE FORECAST OF NEW SERVICES FOR THE NEXT DECADE, (BUNDESMINISTERIUM FUER DAS POST UND FERNMELDEWESEN, (WEST GERMANY)),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 260-266

DATA SETS, TELEX STATIONS, AND SIMILAR FACILITIES ARE COUNTED FOR SOME EUROPEAN COUNTRIES AND SOME PROJECTIONS ARE MADE FOR GROWTH OVER THE NEXT TEN YEARS. A FEW PROJECTED NEW SERVICES ARE ALSO DISCUSSED.
(ALSO UNDER 3.2.1)

PARTICIPATING DEMONSTRATIONS OF A MULTI-PURPOSE NETWORK LINKING DISSIMILAR COMPUTERS AND TERMINALS,
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 41-42

SOME OF THE DEMONSTRATIONS PROVIDED DURING THE ARPA NETWORK SPECIAL PROJECT AT THE INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATIONS HELD IN WASHINGTON, D.C., ARE BRIEFLY DESCRIBED. A NETWORK MAP COMPLETE AS OF AUGUST 1972 IS INCLUDED.

ROBERTS, LAWRENCE, DR., ARPA NETWORK IMPLICATIONS, (ADVANCED RESEARCH PROJECTS AGENCY, ARLINGTON, VA), EDUCOM BULLETIN, VOL 6, ISSUE 3, FALL 71, P 4-8

THE CHARACTERISTICS OF COMPUTER-TO-COMPUTER COMMUNICATIONS ARE ENUMERATED. THE AUTHOR LOOKS AHEAD AT THE CHANGES IN COMPUTER SYSTEM ORGANIZATION ASSUMING BROAD AVAILABILITY OF A DATA COMMUNICATIONS SERVICE SIMILAR TO THE ARPANET SYSTEM. HE DISCUSSES THREE SIGNIFICANT APPLICATIONS OF NETWORKS WITH DATA COMMUNICATIONS SERVICE: HARDWARE SHARING; SOFTWARE SHARING; AND DATA BASE SHARING.
(ALSO UNDER 4.0)

ROCKOFF, MAXINE L., HEALTH CARE COMMUNICATION SYSTEMS, (HEALTH SERVICES AND MENTAL HEALTH ADMINISTRATION, ROCKVILLE, MD),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 465-467
(ANNOTATION UNDER 4.2.1)

SAMUELSON, KJELL, COMMUNICATING WITHIN A WORLD SYSTEM, (STOCKHOLM, UNIV. OF, (SWEDEN), ROYAL INST. OF TECH., STOCKHOLM, (SWEDEN)),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 361-366, 5 REFS

ASSERTING THAT INTERNATIONAL COMPUTER COMMUNICATION IS FEASIBLE TODAY ON A WORLDWIDE BASIS, THE AUTHOR GOES ON TO STATE THAT CONSTRAINTS AGAINST PROGRESS ARE SOCIOECONOMICAL IN NATURE, RATHER THAN PURELY TECHNICAL. THE IMPLICATIONS AND OPPORTUNITIES FOR SEVERAL GLOBAL IMPROVEMENTS BY MEANS OF COMPUTER COMMUNICATIONS ARE ANALYZED FOR A NUMBER OF ACTUALLY EXISTING SITUATIONS. ONE REAL-LIFE EXAMPLE IS REPORTED WHICH INVOLVES A NETWORK FOR A DOZEN COUNTRIES IN SOUTH-EAST ASIA AND THE PACIFIC.
(ALSO UNDER 1.5, 1.1)

THOMPSON, JOHN P., THE WIRED CITY: COMMERCIAL SERVICES TO BE PROVIDED BY BROADBAND TELECOMMUNICATIONS SYSTEMS, (LITTLE (ARTHUR D.) INC., CAMBRIDGE, MA),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 425-428
(ANNOTATION UNDER 5.2)

WALKER, PHILIP M., STUART L. MATHISON, REGULATORY POLICY AND FUTURE DATA TRANSMISSION SERVICES, (TELENET COMMUNICATIONS CORP., WALTHAM, MA),
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 295-370, 13 REFS
(ANNOTATION UNDER 5.4)

WALKER, PHILIP M., STUART L. MATHISON, SPECIALIZED COMMON CARRIERS, (GEORGETOWN, UNIV. OF, WASHINGTON, DC, LAW CENTER, LITTLE (ARTHUR D.) INC., CAMBRIDGE, MA),
TELEPHONE ENGINEER AND MANAGEMENT, 15 OCT 71, P 41-60, 8 REFS

ISSUES ASSOCIATED WITH THE INTRODUCTION OF SPECIALIZED COMMON CARRIERS FOR DATA COMMUNICATION ARE ADDRESSED. THE FEATURES OF THE MICROWAVE COMMUNICATION, INC. (MCI) AND THE DATA TRANSMISSION COMPANY (DATRAN) PROPOSALS ARE DISCUSSED AND THEN THE POTENTIAL IMPACT IS CONSIDERED. POLICY ISSUES AND THE BENEFITS OF COMPETITION ARE COVERED, INCLUDING SOME REASONABLE PREDICTIONS ON THE FUTURE OF DATA COMMUNICATION PROVIDED BY SPECIALIZED AND COMMON CARRIERS.
(ALSO UNDER 3.1.0, 3.2.1)

WARDEN, CHARLES, AN ECONOMIC POLICY FOR UNIVERSITY COMPUTER SERVICES, (DATA RESOURCES INC.),
GREENBERGER, MARTIN, JULIUS APONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 199-206

AN ECONOMIST DISCUSSES THE ECONOMICS OF RESOURCE SHARING, ADDRESSING SPECIFICALLY THE IMPLICATIONS THAT MIGHT RESULT IF THE COMPUTER SERVICE INDUSTRY WERE TO BE MADE A PUBLIC UTILITY.

WIRSCHING, JOSEPH E., COMPUTER OF THE 1980'S--IS IT A NETWORK OF MICROCOMPUTERS?,
COMPCON FALL '75, ELEVENTH IEEE COMPUTER SOCIETY CONFERENCE, HOW TO MAKE COMPUTERS EASIER TO USE, DIGEST OF PAPERS, (WASHINGTON, DC, SEPTEMBER 9-11, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75CH0968-6C, P 23-26

THE QUESTION OF WHETHER A NETWORK OF MICROCOMPUTERS CAN BE UTILIZED IN THE SOLUTION OF LARGE SCALE COMPUTER PROBLEMS IS ADDRESSED. A HISTORICAL VIEW OF TRENDS IN COMPUTER ARCHITECTURE IS PRESENTED, DELINEATING THE METHODS BY WHICH INCREASES IN COMPUTING POWER HAVE BEEN ATTAINED. CURRENT EFFORTS IN APPLYING PARALLELISM ARE ANALYZED AND A NETWORK OF MICROCOMPUTERS IS PROPOSED, OUTLINING ITS LIMITATIONS. GENERAL COST COMPARISONS ARE INCLUDED.

YIUM, THOMAS, GARY G. MOSS, JOHN J. RITENOUR, JR., TECHNICAL TELECOMMUNICATION FORCES, (DEPARTMENT OF THE AIR FORCE, AIR FORCE COMMUNICATIONS SERVICE),
IEEE 1974 NATIONAL TELECOMMUNICATIONS CONFERENCE, (SAN DIEGO, CA, DECEMBER 2-4, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE P-74CH0902-7-CSCB, (LC 57-20724), P 461-467, 29 REFS

I.6 FORECASTS

BACKGROUND IS PRESENTED ON THE GROWING INTERACTION OF TELECOMMUNICATIONS AND ADP, ALONG WITH A GENERAL DISCUSSION OF PRESENT AND FUTURE TRENDS IN TELECOMMUNICATIONS. A COMPREHENSIVE OVERVIEW IS GIVEN OF THE PROBLEMS FACING SYSTEMS MANAGERS AND PLANNERS, AS WELL AS COMMENTS ON THE IMPACT OF THE CONTINUING REDUCTIONS IN COST OF COMPUTING HARDWARE, EVER INCREASING SOFTWARE COMPLEXITY, IMPROVEMENTS IN TRANSMISSION MEDIA, NETWORKING AND LOCAL LEVEL CONSIDERATIONS, AND SECURITY, PLUS REMARKS ON INADEQUACIES IN EXISTING PROCEDURES AND STANDARDS.
(ALSO UNDER 3.2.0)

I.9 OTHER

FRANK, HOWARD, SUMMARIES OF DISCUSSION SESSIONS: COMPUTER NETWORKS,(PRESENTED AT THE, PROCEEDINGS OF THE SYMPOSIUM ON LARGE-SCALE NETWORKS, EVANSTON, IL, APRIL 18-19, 1974), (NETWORK ANALYSIS CORP., GLEN COVE, NY).
NETWORKS, VOL 5, ISSUE 1, JAN 75, P 69-73
(ANNOTATION UNDER 2.0)

MITCHELL, H. F., JR., DR., THE FUTURE OF THE SWITCHING COMPUTER, (BUNKER-RAMO CORP., CANOGA PARK, CA, BUSINESS AND INDUSTRY DIV.).
DATAMATION, VOL 11, ISSUE 2, FEB 65, P 24-25

INTENDED FOR A GENERAL AUDIENCE, THIS SHORT ARTICLE PREDICTS SOME OF THE CAPABILITIES TO BE PROVIDED BY COMPUTER/COMMUNICATIONS SYSTEMS. IT'S WORTH A GLANCE JUST TO SEE WHERE WE ARE TODAY VIS A VIS THE PREDICTIONS.

ZAKARIAN, Z. V., THE MAD MAD WORLD OF DATA COMMUNICATIONS, (WESTERN UNION DATA SERVICES CO.).
INFOSYSTEMS, VOL 19, ISSUE 8, AUG 72, P 18-21

A DISCUSSION OF THE FRUSTRATIONS IN USING A VARIETY OF DATA COMMUNICATIONS FACILITIES IS PRESENTED, FOLLOWED BY THE CONCLUSION THAT DATA COMMUNICATIONS USERS NEED A SINGLE VENDOR WITH TOTAL COMMUNICATIONS SYSTEM RESPONSIBILITY.

2. THEORY

2.0 GENERAL

BARAN, PAUL. ON DISTRIBUTED COMMUNICATIONS: XI. SUMMARY OVERVIEW, RAND CORP., SANTA MONICA, CA, AUG 64, RC RM-3767-PR, AF 49(638)-700, (AD-444 837), 23P
(ANNOTATION UNDER 3.0)

COFFMAN, E. G., JR., M. J. ELPHICK, A. SHOSHANI, SYSTEM DEADLOCKS, (PENNSYLVANIA, STATE UNIV. OF, UNIVERSITY PARK, NEWCASTLE UPON TYNE, UNIV. OF, (ENGLAND)), SYSTEM DEVELOPMENT CORP., SANTA MONICA, CA),
COMPUTING SURVEYS, VOL 3, ISSUE 2, JUN 71, P 67-78, 18 REFS

THIS PAPER ON DEADLOCK SITUATIONS WITHIN INDIVIDUAL COMPUTER SYSTEMS CONTAINS A SURVEY OF TECHNIQUES ALSO APPLICABLE TO A COMPUTER NETWORKING ENVIRONMENT.

FRANK, HOWARD, LEONARD KLEINROCK, ROBERT E. KAHN, COMPUTER COMMUNICATION NETWORK DESIGN--EXPERIENCE WITH THEORY AND PRACTICE, (NETWORK ANALYSIS CORP., GLEN COVE, NY, CALIFORNIA, UNIV. OF, LOS ANGELES, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA),
AFIPS CONFERENCE, 1972 SPRING JOINT COMPUTER CONFERENCE, VOLUME 40, (ATLANTIC CITY, NJ, MAY 16-18, 1972), AFIPS PRESS, MONTVALE, NJ, 1972, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 255-270, 52 REFS
(ANNOTATION UNDER 3.0)

FRANK, HOWARD, SUMMARIES OF DISCUSSION SESSIONS: COMPUTER NETWORKS,(PRESENTED AT THE, PROCEEDINGS OF THE SYMPOSIUM ON LARGE-SCALE NETWORKS, EVANSTON, IL, APRIL 18-19, 1974), (NETWORK ANALYSIS CORP., GLEN COVE, NY),
NETWORKS, VOL 5, ISSUE 1, JAN 75, P 69-73

ANYONE GIVING A BRIEFING OR WRITING A PAPER ON COMPUTER NETWORKS USUALLY WANTS TO MENTION THE SIGNIFICANT PROBLEMS IN THE AREA REQUIRING FURTHER RESEARCH. HERE THEY ARE, ALL LISTED AND SUMMARIZED. THE AUTHOR DISTINGUISHES BETWEEN 'DIFFICULT BUT TRACTABLE' PROBLEMS AND 'AREAS REQUIRING MAJOR BREAKTHROUGHS.' THESE ARE LISTED BELOW FOR READER CONVENIENCE; THE SUMMARIES ARE WORTH READING.
DIFFICULT BUT TRACTABLE PROBLEMS: 1. CIRCUIT VS PACKET SWITCHING 2. PACKET SWITCHING WITH PRIORITIES 3. DESIGN OF INSENSITIVE NETWORKS 4. CENTRALIZED VS DISTRIBUTED CONTROL 5. CENTRALIZED VS DISTRIBUTED DATA BASES 6. MIXED VOICE AND DATA NETWORKS 7. NETWORK SURVIVABILITY AND RELIABILITY 8. COST MODEL IMPROVEMENTS 9. USER AND CHARGING MODELS.
AREAS REQUIRING MAJOR BREAKTHROUGHS: 1. A GOOD DYNAMIC NETWORK THEORY 2. A NETWORK PROTOCOL THEORY 3. A THEORY OF NETWORK MEASUREMENT 4. MACROSCOPIC NETWORK ANALYSIS 5. SOFTWARE OPTIMIZATION, RELIABILITY, ROBUSTNESS 6. NETWORK SECURITY.
(ALSO UNDER 1.9)

KLEINROCK, LEONARD, COMPUTER NETWORK RESEARCH, CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE, 15 AUG 70, DAHC 15-69-C-0285, (ARPA 1380, AD-711 342), 122P, 26 REFS

INCLUDED IN THIS REPORT ARE BOTH GENERAL REFERENCE TO NETWORKING RESEARCH IN PROGRESS AND, IN APPENDIX F, SPECIFIC APPETITIZING COMMENTS ABOUT NETWORK PERFORMANCE MEASURES, MODELING (ESPECIALLY FOR LONG MESSAGES), NODE STORAGE ESTIMATES, ROUTING ALGORITHMS, AND FLOW CONTROL. UNFORTUNATELY, MOST OF THIS MATERIAL IS ONLY A PRELUDE TO A MORE DETAILED DESCRIPTION AND FUTURE WORK.

ROBERTS, LAWRENCE G., D. R. PADEN, NETWORK OF COMPUTERS, SESSION II, DEFINITION, MODELING AND EVALUATION--SESSION SUMMARY, (ADVANCED RESEARCH PROJECTS AGENCY, WASHINGTON, DC, NATIONAL SECURITY AGENCY, FORT MEADE, MD),
PROCEEDINGS OF INVITATIONAL WORKSHOP ON COMPUTERS, OCT 68, P 57-65
(ANNOTATION UNDER 1.0)

2.1 ANALYSIS

BENES, V. E., MATHEMATICAL THEORY OF CONNECTING NETWORKS AND TELEPHONE TRAFFIC, BELL TELEPHONE LABS, INC., MURRAY HILL, NJ, ACADEMIC PRESS INC., NEW YORK, 1965, MATHEMATICS IN SCIENCE AND ENGINEERING, VOLUME 17, (TK5101.B38, LC 65-21156), 325P, 90 REFS

RIGOROUS MATHEMATICAL THEORIES AND MODELS FOR TELEPHONE TYPE NETWORKS ARE DEVELOPED IN THIS TEXT. THE EMPHASIS IS ON COMBINATIONAL PROBLEMS OF NETWORK DESIGN AND PROBABILISTIC PROBLEMS OF TRAFFIC ANALYSIS INCLUDING STATISTICAL ANALYSIS OF TRAFFIC MEASUREMENT DATA AND ANALYTICAL APPROACHES TO DETERMINING THE GRADE OF SERVICE. PROBLEMS OF NETWORK DELAY ARE NOT ADDRESSED.

CERF, V. G., D. D. COWAN, R. C. MULLIN, R. G. STANTON, TOPOLOGICAL DESIGN CONSIDERATIONS IN COMPUTER COMMUNICATION NETWORKS,
COMPUTER COMMUNICATION NETWORKS, SELECTED PAPERS, (PRESENTED AT, UNIV. OF SUSSEX, BRIGHTON, (ENGLAND),), 1973, P 01-018,
(ANNOTATION UNDER 2.1.1)

FRANK, HOWARD, RESEARCH IN STORE AND FORWARD COMPUTER NETWORKS, NETWORK ANALYSIS CORP., GLEN COVE, NY, 15 DEC 71, 15 JUN-15 DEC 71, ARPA DAHC-15-70-C-0120, (AD-737 403), 123P, 10 REFS

DESIGN ALTERNATIVES ARE INVESTIGATED FOR NETWORKS OF THE ARPANET TYPE IN TERMS OF NETWORK SIZE, TOPOLOGY, AND DATA RATE CONSIDERATIONS FOR THE HIGH SPEED LINKS. IN ADDITION, QUESTIONS OF ROUTING AND RELIABILITY IN STORE-AND-FORWARD NETWORKS ARE ADDRESSED. A DISCUSSION ON THE USE OF THE 50 KILOBIT ARPANET LINKS TO SERVE USERS REQUIRING A THROUGHPUT OF 6 KB IS PARTICULARLY INTERESTING. AN ANALYSIS IS PRESENTED JUSTIFYING THE USE OF 50 KB LINKS RATHER THAN 9.6 KB LINKS.

FRISCH, IVAN T., DR., TECHINCAL PROBLEMS IN NATIONWIDE NETWORKING AND INTERCONNECTION, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
IEEE TRANSACTIONS ON COMMUNICATIONS, VOL COM-23, ISSUE 1, JAN 75, P 78-88, 43 REFS
(ANNOTATION UNDER 3.0)

KLEINROCK, LEONARD, SIMON S. LAM, PACKET-SWITCHING IN A SLOTTED SATELLITE CHANNEL, (CALIFORNIA, UNIV. OF, LOS ANGELES)
AFIPS CONFERENCE PROCEEDINGS, VOLUME 42, 1973, NATIONAL COMPUTER CONFERENCE AND EXPOSITION, (NEW YORK, NY, JUNE 4-8, 1973), AFIPS PRESS, MONTVALE, NJ, 1973, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 703-710, 13 REFS

THE PERFORMANCE OF A SLOTTED SATELLITE SYSTEM FOR PACKET-SWITCHING IS ANALYZED IN THIS PAPER. MODELS WERE DEVELOPED WHOSE RESULTS SHOW THE RELATIONSHIP BETWEEN DELAY AND THROUGHPUT. THE FIRST MODEL IS THAT OF A LARGE POPULATION OF USERS EACH WITH A SMALL DEMAND ON THE CHANNEL. THE SECOND IS MANY SMALL USERS WITH THE ADDITION OF ONE LARGE USER.
(ALSO UNDER 2.1.4, 3.2.9)

MUNTZ, RICHARD R., J. W. WONG, ASYMPTOTIC PROPERTIES OF CLOSED QUEUEING NETWORK MODELS,(PRESENTED AT THE, EIGHTH ANNUAL PRINCETON CONFERENCE ON INFORMATION SCIENCES AND SYSTEMS, PRINCETON, NJ, MARCH 28-29, 1974), (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE),
KLEINROCK, LEONARD, COMPUTER NETWORK RESEARCH, 30 JUN 74, 1 JAN-30 JUN 74, ARPA DAHC-15-73-C-0368, (AD-A008 422), P 47-52, 9 REFS

THIS PAPER IS AN APPLICATION OF GENERAL PRINCIPLES PRESENTED IN 'ANALYTIC MODELS FOR COMPUTER SYSTEMS PERFORMANCE ANALYSIS' BY R. R. MUNTZ. THE ASYMPTOTIC PROPERTIES OF RESOURCE UTILIZATIONS AND MEAN RESPONSE TIME FOR A GENERAL NETWORK MODEL OF A TIME-SHARING SYSTEM ARE DERIVED. THE CONCEPTS OF LIMITING RESOURCES, SYSTEM BALANCE AND SYSTEM SATURATION ARE DISCUSSED, AND SOME INTERESTING INTERPRETATIONS OF THE RESULTS ARE GIVEN.

MUNTZ, RICHARD R., ANALYTIC MODELS FOR COMPUTER SYSTEM PERFORMANCE ANALYSIS, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE),
KLEINROCK, LEONARD, COMPUTER NETWORK RESEARCH, 30 JUN 74, 1 JAN-30 JUN 74, ARPA DAHC-15-73-C-0368, (AD-A008 422), P 26-46, 42 REFS

THIS PAPER IS A SURVEY OF RECENT ADVANCES IN THE APPLICATION OF ANALYTIC MODELING TO COMPUTER SYSTEM PERFORMANCE ANALYSIS. EMPHASIS IS PLACED ON MULTIPLE RESOURCE MODELS AND QUEUEING NETWORK MODELS IN PARTICULAR. A COMPARATIVE SURVEY OF APPROACHES TO THE ANALYSIS OF QUEUEING NETWORKS IS PRESENTED. THE APPLICATION OF THESE MODELS TO THE STUDY OF FUNDAMENTAL CONCEPTS SUCH AS SATURATION AND SYSTEM BALANCE IS DISCUSSED. PUBLISHED EMPIRICAL STUDIES EVALUATING THE APPLICABILITY OF THESE MODELS FOR QUANTITATIVELY PREDICTING SYSTEM PERFORMANCE ARE DESCRIBED.

SLYKE, R. VAN, W. CHOU, H. FRANK, AVOIDING SIMULATION IN SIMULATING COMPUTER COMMUNICATION NETWORKS, (NETWORK ANALYSIS CORP., GLEN COVE, NY),

2.1 ANALYSIS

AFIPS CONFERENCE PROCEEDINGS. VOLUME 42, 1973. NATIONAL COMPUTER CONFERENCE AND EXPOSITION, (NEW YORK, NY, JUNE 4-8, 1973), AFIPS PRESS, MONTVALE, NJ, 1973, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 165-169, 11 REFS
(ANNOTATION UNDER 2.1.1)

2.1.0 GENERAL

BARAN, PAUL, ON DISTRIBUTED COMMUNICATIONS NETWORKS,(PRESENTED AT, FIRST CONGRESS OF THE INFORMATION SYSTEMS SCIENCES, HOT SPRINGS, VA, NOVEMBER 1962), (RAND CORP., SANTA MONICA, CA).
IEEE TRANSACTIONS ON COMMUNICATION SYSTEMS, VOL CS-12, ISSUE 1, MAR 64, P 1-9, 1 REFS

THIS IS AN INTERESTING EXPOSITION BECAUSE IT INTRODUCES MANY OF THE BASIC CONCEPTS WHICH WERE LATER IMPLEMENTED IN THE ARPANET. THE DISCUSSION IS CHIEFLY CONCERNED WITH DISTRIBUTED NETWORK ANALYSIS AND THE SURVIVABILITY OF NODES AND LINKS IN THE EVENT OF AN ENEMY THERMO-NUCLEAR ATTACK. A RUDIMENTARY COST ANALYSIS IS PERFORMED ON A VARIETY OF COMMUNICATION TECHNIQUES INCLUDING PULSE REGENERATIVE REPEATERS AND 'MINI-COST' MICROWAVE. A DISCUSSION ON STORE AND FORWARD TECHNIQUES FOLLOWS AND A HEURISTIC ROUTING SCHEME IS DESCRIBED.

FRANK, HOWARD, ANALYSIS AND OPTIMIZATION OF STORE-AND-FORWARD COMPUTER NETWORKS, NETWORK ANALYSIS CORP., GLEN COVE, NY, IS JUN 70, DAHC 15-70-C-0120, (AD-707 438), 62P, 7 REFS

THIS IS A GENERAL DESCRIPTION OF A COMPUTER PROGRAM WHICH SIMULATES AN ARPA-LIKE NETWORK. THE EMPHASIS IS ON FINDING LOW COST TOPOLOGIES WHICH SATISFY CONSTRAINTS ON NETWORK TIME DELAY, RELIABILITY, CONGESTION, AND OTHER PERFORMANCE PARAMETERS. SOME OF THE ASSUMPTIONS EMBODIED IN THE MODEL ARE BASED ON THE INTERNAL OPERATION OF THE IMP, INCLUDING STRATEGIES FOR BUFFER ALLOCATION. IN ADDITION TO PRESENTING THE RESULTS OF A NUMBER OF RUNS THAT DERIVE ALTERNATIVE ARPA NETWORK CONFIGURATIONS UNDER VARIOUS LOADING ASSUMPTIONS THE REPORT ALSO INTRODUCES TECHNIQUES FOR DESIGN OF CENTRALIZED COMPUTER NETWORKS.

FRANK, HOWARD, COMPUTER NETWORKS: ART TO SCIENCE TO ART,(PRESENTED AT THE, PROCEEDINGS OF THE SYMPOSIUM ON LARGE-SCALE NETWORKS, EVANSTON, IL, APRIL 18-19, 1974), (NETWORK ANALYSIS CORP., GLEN COVE, NY).
NETWORKS, VOL 5, ISSUE 1, JAN 75, P 7-32, 16 REFS
(ANNOTATION UNDER 1.3)

FRANK, HOWARD, SPIN YOUR DATA LINKS INTO AN OPTIMUM NETWORK, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
COMPUTER DECISIONS, VOL 3, ISSUE 12, DEC 71, P 6-11

THIS HIGHLY READABLE ARTICLE PROVIDES A GOOD AND STILL APPLICABLE DISCUSSION OF MANY OF THE NETWORK DESIGN TRAPS THAT MAY BE AND HAVE BEEN ENCOUNTERED BY THE UNWARY. A DESCRIPTION IS GIVEN OF A NETWORK OPTIMIZATION PROGRAM USED BY NETWORK ANALYSIS CORP. IN THE DESIGN OF THE ARPA NETWORK.

FRATTA, L., U. MONTANARI, ANALYTICAL TECHNIQUES FOR COMPUTER NETWORKS ANALYSIS AND DESIGN, (POLITECNICO DI MILANO, (ITALY), ISTITUTO PER L'ELABORAZIONE DELL'INFORMAZIONE, PISA, (ITALY)),
GELENBE, EROL, ROBERT MAHL, COMPUTER ARCHITECTURES AND NETWORKS, MODELLING AND EVALUATION, (AUGUST 12-14, 1974),
AMERICAN ELSEVIER PUBLISHING CO. INC., NEW YORK, 1974, (LC 74-83728), P 155-185, 35 REFS

THE GOAL OF NETWORK ANALYSIS IS TO IDENTIFY A MEASURE WHICH CAN BE USED IN THE EVALUATION OF THE BEHAVIOR OF A MESSAGE SWITCHING COMMUNICATIONS NETWORK. THIS PAPER IDENTIFIES THE MOST IMPORTANT PARAMETERS TO BE EVALUATED AND THEN GOES ON TO DEVELOP AN ANALYTICAL EXPRESSION FOR ONE OF THEM: AVERAGE DELAY.
ALSO DISCUSSED ARE THE PROBLEMS OF NETWORK RELIABILITY. ALONG THIS LINE A SECTION IS INCLUDED WHICH DESCRIBES SOME OF THE AUTHORS' IDEAS ABOUT NETWORK SYNTHESIS WITH THE GOAL OF ACHIEVING GOOD RELIABILITY.

HANSLER, EBERHARD, GERALD K. MCAULIFFE, ROBERT S. WILKOV, OPTIMIZING THE RELIABILITY IN CENTRALIZED COMPUTER NETWORKS, (INTERNATIONAL BUSINESS MACHINES CORP., ZURICH, (SWITZERLAND), RESEARCH LAB., INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY, THOMAS J. WATSON RESEARCH CENTER),
IEEE TRANSACTIONS ON COMMUNICATIONS, VOL COM-20, ISSUE 3, JUN 72, P 640-644, 9 REFS

THE RELIABILITY OF COMPUTER NETWORKS CONSISTING OF CLUSTERS OF TERMINALS CONNECTED TO REMOTE CONCENTRATORS WHICH ARE CONNECTED TO A CENTRAL HOST IS DISCUSSED. IT IS SHOWN THAT CONFIGURATIONS OTHER THAN THE FREQUENTLY USED STAR MAY BE MORE RELIABLE AND LESS EXPENSIVE.

KLEINROCK, LEONARD, ANALYTIC AND SIMULATION METHODS IN COMPUTER NETWORK DESIGN, (CALIFORNIA, UNIV. OF, LOS ANGELES), AFIPS PROCEEDINGS, 1970 SPRING JOINT COMPUTER CONFERENCE, VOLUME 36, (ATLANTIC CITY, NJ, MAY 5-7, 1970), AFIPS PRESS, MONTVALE, NJ, 1970, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 569-579, 12 REFS

AN ANALYTICAL MODEL FOR A COMPUTER NETWORK IS DERIVED FROM KLEINROCK'S EARLIER MODEL OF A COMMUNICATIONS NETWORK FOR THE PURPOSE OF OPTIMIZING THE SELECTION OF CHANNEL CAPACITIES UNDER PRESENT DAY COST FUNCTIONS. A NEW, ASYNCHRONOUS UPDATING PROCEDURE FOR ROUTING TABLES IN THE IMP'S OF THE ARPANET IS ALSO DESCRIBED IN WHICH UPDATES TAKE PLACE ONLY WHEN SIGNIFICANT CHANGES OCCUR.

KLEINROCK, LEONARD, COMPUTER NETWORK RESEARCH, CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE, 15 FEB 70, DAHC 15-69-C-0285, (AD-705 149), 75P, 41 REFS

INCLUDED IN THIS REPORT ARE BOTH GENERAL REFERENCE TO NETWORKING RESEARCH IN PROGRESS AND, IN APPENDIX F, SPECIFIC COMMENTS ABOUT NETWORK PERFORMANCE MEASURES, MODELING (ESPECIALLY FOR LONG MESSAGES), NODE STORAGE ESTIMATES, ROUTING ALGORITHMS, AND FLOW CONTROL. UNFORTUNATELY, MOST OF THIS MATERIAL IS ONLY A PRELUDE TO A MORE DETAILED DESCRIPTION AND FUTURE WORK.

KLEINROCK, LEONARD, COMPUTER NETWORKS, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE), CARDENAS, A. F., DR., L. PRESSLER, M. A. MARTIN, COMPUTER SCIENCE, WILEY-INTERSCIENCE, NEW YORK, 1972, (LC 71-169162), P 241-284, 40 REFS
(ANNOTATION UNDER 1.3)

KLEINROCK, LEONARD, MODELS FOR COMPUTER NETWORKS, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF ENGINEERING),
IEEE INTERNATIONAL CONFERENCE ON COMMUNICATIONS, VOLUME 2, JUN 69, P 21-9--21-16, 13 REFS
(ANNOTATION UNDER 1.3)

MAMRAK, SANDRA ANN, COMPARATIVE RESPONSE TIMES OF TIME-SHARING SYSTEMS ON THE ARPA NETWORK, ILLINOIS, UNIV. OF, URBANA, DEPT. OF COMPUTER SCIENCE, MAY 75, IU R-75-722, ARPA DAHC-04-72-C-0001, 141P, 30 REFS

ANALYTICAL, SIMULATION AND STATISTICAL PERFORMANCE EVALUATION TOOLS ARE EMPLOYED TO INVESTIGATE THE FEASIBILITY OF A DYNAMIC RESPONSE TIME MONITOR THAT IS CAPABLE OF PROVIDING COMPARATIVE RESPONSE TIME INFORMATION FOR COMPUTER NETWORK USERS WISHING TO PROCESS VARIOUS COMPUTING APPLICATIONS AT SOME NETWORK COMPUTING NODE. THE RESEARCH DEMONSTRATES THAT SUFFICIENT SYSTEM DATA ARE CURRENTLY OBTAINABLE, AT LEAST FOR THE FIVE DIVERSE ARPA NETWORK SYSTEMS STUDIED IN DETAIL, TO DESCRIBE AND PREDICT RESPONSE TIME FOR NETWORK TIME-SHARING SYSTEMS AS IT DEPENDS ON SOME MEASURE OF SYSTEM BUSYNESS OR LOAD LEVEL.
(ALSO UNDER 2.2)

WHITNEY, V. KEVIN MOORE, COMPARISON OF NETWORK TOPOLOGY OPTIMIZATION ALGORITHMS, (GENERAL MOTORS CORP., WARREN, MI), WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 332-337, 10 REFS

ANALYTICAL COMPARISONS OF PROCEDURES THAT OPTIMIZE CENTRALIZED COMMUNICATIONS NETWORKS OF MULTI-DROP LINES ARE IMPOSSIBLE EXCEPT IN A FEW VERY SPECIAL CASES. TO FACILITATE COMPARISON, SEVERAL TOPOLOGY OPTIMIZATION PROCEDURES WERE UNIFORMLY CODED AND APPLIED TO A VARIETY OF TEST CONFIGURATIONS. THE TEST CASES WERE CHOSEN TO REPRESENT REAL COMMUNICATIONS NETWORKS HAVING BETWEEN FIFTY AND FIVE HUNDRED TERMINAL LOCATIONS. THE PROCEDURES SELECTED ARE COMPARED WITH RESPECT TO FINAL NETWORK COST, PROCEDURE EXECUTION TIME, AND PROCEDURE FLEXIBILITY.

2.1.1 SIMULATION

BALACHANDRAN, V., J. W. MCCREDIE, D. I. MIKHAIL, MODELS OF THE JOB ALLOCATION PROBLEM IN COMPUTER NETWORKS, (CARNEGIE-MELLON UNIV., PITTSBURGH, PA, DEPT. OF COMPUTER SCIENCE AND GRADUATE SCHOOL OF INDUSTRIAL ADMINISTRATION), COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 211-214, 6 REFS

2.1.1 SIMULATION

THIS PAPER ADDRESSES THE JOB ASSIGNMENT PROBLEM IN A NETWORK OF NON-IDENTICAL BUT FUNCTIONALLY SIMILAR COMPUTERS. PERIODIC REVIEW MODELS ARE FORMULATED USING INTEGER PROGRAMMING, NETWORK FLOW ALGORITHMS, TRANSPORTATION PROBLEMS, AND HEURISTIC BALANCING PROCEDURES. A VARIETY OF FORMULATIONS ARE STUDIED AND COMPARED USING A SIMULATION MODEL AS A TOOL FOR COMPARING THE DIFFERENT FORMULATIONS.
(ALSO UNDER 2.1.4)

BOEHM, B. W., R. MOBLEY, A COMPUTER SIMULATION OF ADAPTIVE ROUTING TECHNIQUES FOR DISTRIBUTED COMMUNICATIONS SYSTEMS, RAND CORP., SANTA MONICA, CA, FEB 66, RC MEMO RM-4782-PR, AF 49(638)-1700, 44P, 2 REFS

A SIMULATION PROGRAM TO TEST VARIOUS ADAPTIVE TECHNIQUES FOR A MODEL OF A DISTRIBUTED COMMUNICATIONS SYSTEM IS DESCRIBED. THE PROGRAM SIMULATES THE PROGRESS OF MESSAGES THROUGH THE SYSTEM AND MEASURES THE EFFECTS OF ADAPTATION OF THE ROUTING TECHNIQUES TO VARIOUS DEGREES OF LINK AND NODE DESTRUCTION.

BOEHM, SHARLA P., PAUL BARAN, ON DISTRIBUTED COMMUNICATIONS: II. DIGITAL SIMULATION OF HOT-POTATO ROUTING IN A BROADBAND DISTRIBUTED COMMUNICATIONS NETWORK, RAND CORP., SANTA MONICA, CA, AUG 64, RC RM-3103-PR, AF 49(638)-700, (AD-444 834), 49P

THIS IS A DESCRIPTION OF A SIMULATION OF A DISTRIBUTED MESSAGE-SWITCHED NETWORK EXAMINING THE EFFECTIVENESS OF 'HOT-POTATO' ROUTING ON NETWORK MESSAGE DELAY AND OVERALL NETWORK RELIABILITY.

BORTELS, W. H., SIMULATION OF INTERFERENCE OF PACKETS IN THE ALOHA TIME-SHARING SYSTEM, HAWAII, UNIV. OF, HONOLULU, MAR 70, HU TR-B70-2, AF F44620-69-C-0030, 26P, 4 REFS

A SIMULATION OF THE RANDOM ACCESS COMMUNICATION METHOD PROPOSED IN THE UNIVERSITY OF HAWAII ALOHA TIME-SHARING SYSTEM IS REPORTED. INSIGHT IS PROVIDED INTO THE UPPER LIMIT OF ACTIVE USERS THE ACCESS TECHNIQUE CAN SUPPORT ON A GIVEN CHANNEL, THE AVERAGE NUMBER OF RETRANSMISSIONS REQUIRED AS A FUNCTION OF ACTIVE USERS, AND THE NUMBER OF TIMES A GIVEN PACKET NEEDS TO BE RETRANSMITTED DUE TO INTERFERENCE WITH OTHER PACKETS.

BOWDON, EDWARD K., SR., SANDRA A. MAMRAK, FRED R. SALZ, SIMULATION--A TOOL FOR PERFORMANCE EVALUATION IN NETWORK COMPUTERS, (ILLINOIS, UNIV. OF, URBANA),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 42, 1973, NATIONAL COMPUTER CONFERENCE AND EXPOSITION, (NEW YORK, NY, JUNE 4-8, 1973), AFIPS PRESS, MONTVALE, NJ, 1973, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 121-131, 6 REFS

A SIMULATION MODEL FOR A NETWORK CENTER IS PRESENTED. THIS MODEL WAS TESTED FOR ACCURACY BY BEING USED TO REPRESENT THE INTERACTION AMONG SIMULATED ENTITIES OF AN EXISTING NETWORK, ILLINET, AT THE UNIVERSITY OF ILLINOIS.
THE ARTICLE GOES ON TO PROPOSE A PRIORITY ASSIGNMENT TECHNIQUE DESIGNED TO REPRESENT THE WORTH OF TASKS IN THE SYSTEM AS AN AID TO MORE MEANINGFUL COMPUTER SYSTEM PERFORMANCE MEASUREMENT.

CADY, GEORGE M., GUNTHER LUTHER, TRADE-OFF STUDIES IN COMPUTER NETWORKS, (SYSTEM DEVELOPMENT CORP., SANTA MONICA, CA), COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 147-150, 5 REFS
(ANNOTATION UNDER 2.1.4)

CERF, V. G., D. D. COWAN, R. C. MULLIN, R. G. STANTON, TOPOLOGICAL DESIGN CONSIDERATIONS IN COMPUTER COMMUNICATION NETWORKS,
COMPUTER COMMUNICATION NETWORKS, SELECTED PAPERS, (PRESENTED AT, UNIV. OF SUSSEX, BRIGHTON, (ENGLAND),), 1973, P 01-018.

A LINEAR GRAPH MODEL OF COMPUTER-COMMUNICATION NETWORKS IS PRESENTED WHICH ESTABLISHES A LOWER BOUND ON DELAY AND VULNERABILITY FOR THESE NETWORKS. THE AUTHORS FEEL THAT THESE TWO CRITERIA WOULD BE USEFUL TO NETWORK DESIGNERS FOR MEASURING A PROPOSED NETWORK AGAINST AN 'IDEAL' NETWORK.
(ALSO UNDER 2.1.4, 2.1)

CHOU, WUSHOW, PATRICK V. MCGREGOR, A UNIFIED SIMULATION MODEL FOR COMMUNICATION PROCESSORS, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
PROCEEDINGS OF THE 1975 SYMPOSIUM-COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, JUNE 18, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, 75CH0973-8C, P 40-46, 18 REFS

IN THIS PAPER THE AUTHORS HAVE PRESENTED A UNIFIED SIMULATION MODEL OF COMMUNICATION PROCESSORS. THE MODEL COMBINES THE POSITIVE ATTRIBUTES OF BRUTE-FORCE SIMULATION AND ANALYTIC MODELS THROUGH EVENT SIMULATION OF INTERCONNECTED QUEUEING STRUCTURES. BECAUSE THE MODEL IS VERY GENERAL, THE AUTHORS ASSERT THAT IT CAN BE IMPLEMENTED TO GIVE A VERY EFFICIENT AND ACCURATE SIMULATION TOOL FOR THE EVALUATION OF COMMUNICATION PROCESSOR DESIGN VARIATIONS. POSSIBLE EXTENTIONS TO THE MODEL ARE NOTED AND CONSIDERATIONS LEADING TO THE EFFECTIVE IMPLEMENTATION OF THE MODEL ARE DISCUSSED.
(ALSO UNDER 2.1.4)

CHOU, W., H. FRANK, R. VAN SLYKE, SIMULATION OF CENTRALIZED COMPUTER COMMUNICATIONS SYSTEMS, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 121-130, 3 REFS
(ANNOTATION UNDER 3.2.2)

DANTHINE, A., E. ESCHENAUER, INFLUENCE ON THE NODE BEHAVIOUR OF THE NODE-TO-NODE PROTOCOL, (LIEGE, UNIV. OF, (BELGIUM), CTN-EIA, (BELGIUM)),
FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000I-7-DATA, P 7-I--7-8, 11 REFS

DESCRIBED IS THE BASIC NODE-TO-NODE PROTOCOL OF A PACKET-SWITCHED NETWORK. A SIMULATION PROGRAM DEVELOPED TO COMPARE SEVERAL PROTOCOLS IS DESCRIBED, AND SOME QUESTIONS ARE RAISED IN CONNECTION WITH ADAPTIVE ROUTING ALGORITHMS.
(ALSO UNDER 3.5.1)

DEMERCADO, JOHN, RENE GUINDON, JOHN DASILVA, MICHEL KADOCH, THE CANADIAN UNIVERSITIES COMPUTER NETWORK TOPOLOGICAL CONSIDERATIONS, (MINISTRY OF COMMUNICATIONS, OTTAWA, (CANADA)),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 220-225, 10 REFS

IN CANADA PLANS ARE BEING DEVELOPED FOR A CANADIAN UNIVERSITIES COMPUTER NETWORK (CANUNET). THIS PAPER REVIEWS THE RESULTS OF THE STUDY PREPARED WITHIN THE MINISTRY OF COMMUNICATIONS ON THE TOPOLOGICAL ANALYSIS OF VARIOUS POSSIBLE NETWORK CONFIGURATIONS FOR CANUNET. IN PARTICULAR, SIMULATION RESULTS FOR TWO POSSIBLE 18 NODE CANUNET TOPOLOGIES ARE PRESENTED. ONE OF THESE TOPOLOGIES IS BASED ON THE USE OF PURELY TERRESTRIAL COMMUNICATION FACILITIES, AND THE OTHER IS BASED ON A COMBINATION OF TERRESTRIAL AND SATELLITE FACILITIES.

DUDICK, A. L., C. D. PACK, ROUND ROBIN SCHEDULING IN A COMPUTER COMMUNICATIONS SYSTEM WITH FINITE SWAP TIME AND STATISTICALLY MULTIPLEXED ARRIVALS, (BELL TELEPHONE LABS, INC., HOLMDEL, NJ),
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 58-64, 15 REFS
(ANNOTATION UNDER 2.1.2)

IRLAND, MAREK, SIMULATION OF CIGALE 1974, (WATERLOO, UNIV. OF, ONTARIO, (CANADA), COMPUTER COMMUNICATIONS NETWORK GROUP),
FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000I-7-DATA, P 5-13--5-19, 7 REFS

AFTER A BRIEF DESCRIPTION OF CIGALE, A SIMULATION STUDY DESIGNED TO OBSERVE THE BEHAVIOR OF CIGALE UNDER 'REALISTIC' TRAFFIC CONDITIONS IS DESCRIBED. IT IS SUGGESTED THAT THESE RESULTS BE APPLIED TO THE PROBLEM OF CONGESTION CONTROL.

KELLER, T. W., D. F. TOWSLEY, K. M. CHANDY, J. C. BROWNE, A TOOL FOR NETWORK DESIGN: THE AUTOMATIC ANALYSIS OF STOCHASTIC MODELS OF COMPUTER NETWORKS, (TEXAS, UNIV. OF, AUSTIN, DEPT. OF COMPUTER SCIENCES),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 151-154, 11 REFS

2.1.1 SIMULATION

AN INTERACTIVE SYSTEM WAS DEVELOPED FOR THE ANALYSIS OF CERTAIN QUEUING NETWORK MODELS. THE GOAL OF THE SYSTEM WAS TO PROVIDE A FAST AND INEXPENSIVE TOOL TO AID SYSTEM ANALYSTS IN THE DESIGN AND DEVELOPMENT OF NETWORKS. THE ASQ SYSTEM (ALGEBRAIC SOLUTIONS TO QUEUES) AND APPLICATIONS OF THE SYSTEM ARE DESCRIBED.

KERSHENBAUM, AARON, TOOLS FOR PLANNING AND DESIGNING DATA COMMUNICATIONS NETWORKS, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 43, 1974, NATIONAL COMPUTER CONFERENCE, (CHICAGO, IL, MAY 6-10, 1974), AFIPS PRESS, MONTVALE, NJ, 1974, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 583-591, 8 REFS

CAREFULLY DESIGNED AND PROPERLY USED COMPUTER PROGRAMS CAN BE POWERFUL TOOLS FOR ANALYSTS TO EMPLOY IN THE PLANNING AND MANAGEMENT PROCESS. THE AUTHOR DESCRIBES PROGRAMS WHICH CAN BE USED AS DESIGN AND ANALYSIS TOOLS. THE HIGHLIGHT OF THE PAPER IS THE DESCRIPTION OF TWO EXAMPLES OF THE USE OF SIMULATION PACKAGES: ONE FOR NETWORK ANALYSIS AND THE OTHER FOR DESIGN.

KLEINROCK, LEONARD, FOUAD TOBAGI, RANDOM ACCESS TECHNIQUES FOR DATA TRANSMISSION OVER PACKET-SWITCHED RADIO CHANNELS, (CALIFORNIA, UNIV. OF, LOS ANGELES),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 187-201, 17 REFS

ANALYTIC MODELING AND SIMULATION ARE USED IN THIS STUDY OF DATA TRANSMISSION OVER PACKET-SWITCHED RADIO CHANNELS. TWO ALTERNATIVES FOR MULTIPLEXING TERMINALS IN THE RADIO CHANNEL ARE PRESENTED: CARRIER SENSE MULTIPLE ACCESS (CSMA) AND SPLIT-CHANNEL RESERVATION MULTIPLE ACCESS (SRMA).
(ALSO UNDER 2.1.4)

KORN, GRANINO A., A MINI-MULTIPROCESSOR SYSTEM FOR ON-LINE SIMULATION OF DYNAMICAL SYSTEMS, (ARIZONA, UNIV. OF, TUCSON)
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 169-172, 4 REFS

A MULTIPROCESSOR SYSTEM OF 17 MINICOMPUTERS FOR ON-LINE SIMULATION OF A DYNAMICAL SYSTEM IS PROPOSED. AFTER A THEORETICAL DISCUSSION OF SIMULATION OF DYNAMICAL SYSTEMS THE SIMULATION SYSTEM IS DESCRIBED. COST, PERFORMANCE AND FUTURE DEVELOPMENTS OF THE SYSTEM ARE INCLUDED.

MCDONALD, MILO, HARRY RUDIN, NOTE ON INHERENT AND IMPOSED PRIORITIES IN PACKET SWITCHING, (INTERNATIONAL BUSINESS MACHINES CORP., BOEBLINGEN, (GERMANY), INTERNATIONAL BUSINESS MACHINES CORP., RUSCHLIKON, (SWITZERLAND), ZURICH RESEARCH LAB.),
IEEE TRANSACTIONS ON COMMUNICATIONS, VOL COM-22, ISSUE 10, OCT 74, P 1678-1681, 6 REFS
(ANNOTATION UNDER 3.2.2)

NIELSEN, NORMAN R., NEW DIRECTIONS FOR NETWORK SIMULATORS, (STANFORD RESEARCH INST., MENLO PARK, CA),
GELENBE, EROL, ROBERT MAHL, COMPUTER ARCHITECTURES AND NETWORKS, MODELLING AND EVALUATION, (AUGUST 12-14, 1974),
AMERICAN ELSEVIER PUBLISHING CO, INC., NEW YORK, 1974, (LC 74-83728), P 501-514, 2 REFS

AMONG THE ISSUES ADDRESSED BY A SERIES OF NSF-SPONSORED GENERAL WORKING SEMINARS WERE THE CONDITIONS UNDER WHICH COMPUTER NETWORKING COULD EFFECTIVELY BE APPLIED TO RESEARCH AND EDUCATION.
THIS PAPER DISCUSSES THE RESEARCH PLAN PREPARED FOR DEVELOPING A MODEL OF A COMPUTER NETWORK WHICH WOULD REPRESENT THESE CONDITIONS.

PRICE, WYN L., SIMULATION STUDIES OF AN ISARITHMICALLY CONTROLLED STORE AND FORWARD DATA COMMUNICATION NETWORK, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND)),
ROSENFELD, JACK L., INFORMATION PROCESSING 74, PROCEEDINGS OF IFIP CONGRESS 74, 1, COMPUTER HARDWARE AND ARCHITECTURE, (STOCKHOLM, (SWEDEN), AUGUST 5-10, 1974), AMERICAN ELSEVIER PUBLISHING CO, INC., NEW YORK, 1974, P 1S1-1S4, 6 REFS
(ANNOTATION UNDER 2.1.3)

PRICE, W. L., DR., G. W. COWIN, SIMULATION STUDIES OF THE EFFECT OF LINK BREAKDOWN ON DATA COMMUNICATION NETWORK PERFORMANCE, NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), DIV. OF COMPUTER SCIENCE, FEB 75, NPL R-COM-SCI-77, 20P

THIS PAPER DESCRIBES WORK DONE AT NPL ON NETWORK SIMULATION. IN PARTICULAR IT CONCERNS A STUDY OF THE EFFECT OF LINK FAILURE. A PROTOCOL IS DESCRIBED WHICH ENABLES THE NETWORK TO RECOVER AFTER A FAILURE WITH NO LOSS OF DATA PACKETS. IN AN APPENDIX A BRIEF ACCOUNT IN INCLUDED OF A PROGRAM OF WORK ON THE ENHANCEMENT OF THE NETWORK BY THE ADDITION OF EXTRA LINKS./
(ALSO UNDER 2.2)

PRICE, W. L., SIMULATION OF DATA TRANSIT NETWORKS, NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), DIV. OF COMPUTER SCIENCE, APR 72, NPL-DCS COM-SCI-56, 10P, 5 REFS

THE USE OF AN EVENT-BASED NETWORK SIMULATION PACKAGE IS DESCRIBED IN THIS BRIEF REPORT. THE NETWORK BEING STUDIED IS A STORE-AND-FORWARD PACKET-SWITCHING NETWORK WITH EIGHTEEN NODES JOINED BY THIRTY-ONE 1.5 MBIT/SEC LINKS.

PRICE, W. L., SIMULATION OF PACKET-SWITCHING NETWORKS CONTROLLED ON ISARITHMIC PRINCIPLES, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), DIV. OF COMPUTER SCIENCE),
DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 44-49, 9 REFS

THE AUTHOR DESCRIBES SIMULATION EXPERIMENTS ON AN ISARITHMICALLY CONTROLLED PACKET-SWITCHING NETWORK. THE ISARITHMIC PRINCIPLE, A METHOD OF CONGESTION CONTROL, PLACES AN UPPER LIMIT ON THE NUMBER OF PACKETS IN TRANSIT AT ONE TIME. ASSUMING THAT ONE OF THE IMPORTANT MEASURING CRITERIA IS THE AVERAGE TIME SPENT BY TRAFFIC IN AWAITING ADMISSION TO THE NETWORK, HE SHOWS HOW THIS TIME CAN BE MINIMIZED.

RAVINDRAN, V. K., THAMPY THOMAS, CHARACTERIZATION OF MULTIPLE MICROPROCESSOR NETWORKS, (STANFORD UNIV., CA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 133-137, 7 REFS
(ANNOTATION UNDER 3.1.1)

REDDING, J. L., COMPUTER NETWORK SIMULATOR, NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER, BETHESDA, MD, SEP 71, NSRDC R-3650, (AD-730 053), 35P, 14 REFS

A COMPUTER NETWORK MODEL TO ANALYZE DISTRIBUTED DATA BASES IS DESCRIBED. A COMPUTER NODE IS PARAMETERIZED IN TERMS OF MULTIPROGRAMMING CAPABILITY, NUMBER OF I/O CHANNELS, AND THE JOB STREAM CHARACTERISTICS. THE NETWORK IS DESCRIBED TO THE COMPUTER MODEL BY INTER-NODE CONNECTIONS. THE SIMULATOR ALLOWS FOR TRADEOFF ANALYSIS BETWEEN CENTRALIZED AND DISTRIBUTED DATA BASES IN TERMS OF COMMUNICATION LINE AND DATA BASE UTILIZATION.

SLYKE, R. VAN, W. CHOU, H. FRANK, AVOIDING SIMULATION IN SIMULATING COMPUTER COMMUNICATION NETWORKS, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 42, 1973, NATIONAL COMPUTER CONFERENCE AND EXPOSITION, (NEW YORK, NY, JUNE 4-8, 1973), AFIPS PRESS, MONTVALE, NJ, 1973, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 165-169, 11 REFS

THREE APPROACHES FOR DETERMINING KEY FEATURES OF A SYSTEM BEFORE SIMULATION, AND THUS HELPING TO AVOID UNNECESSARY SIMULATIONS, ARE PRESENTED. THE FIRST TAKES ADVANTAGE OF SITUATIONS IN WHICH EVENTS OCCUR INFREQUENTLY. THE SECOND ARISES FROM SIMULATIONS IN WHICH THE SIGNIFICANT EVENTS OCCUR MOST OF THE TIME AND THE RARE EVENTS ARE OF LESS IMPORTANCE. THE LAST IDEA INVOLVES UTILIZING ANALYTICAL TECHNIQUES BY HYBRID SIMULATIONS. NUMEROUS ILLUSTRATIONS ARE GIVEN.
(ALSO UNDER 2.1)

TRIPATHI, PRABODH C., SIMULATION OF A RANDOM ACCESS DISCRETE ADDRESS COMMUNICATION SYSTEM, HAWAII, UNIV. OF, HONOLULU, APR 70, UH TN-70-1, AF F44620-69-C-0030, 16P, 9 REFS

THIS PAPER DISCUSSES RESULTS OBTAINED FROM THE SIMULATION OF A RANDOM ACCESS COMMUNICATION SYSTEM FOR THE ALOHA SYSTEM. SINCE DEVICES CAN ACCESS THE CHANNEL AT RANDOM THERE IS A CERTAIN PROBABILITY OF COLLISION OF MESSAGE PACKETS. THE PROBABILITY OF NO COLLISIONS IS PLOTTED AGAINST THE NUMBER OF ACTIVE USER TERMINALS, AND THE PROBABILITY OF SUCCESSFUL PACKET TRANSMISSION WITH THE NUMBER OF RETRANSMISSIONS FOR INCREASING NUMBERS OF ACTIVE USER TERMINALS IS PLOTTED. THE ADVANTAGES OF THIS RANDOM ACCESS TECHNIQUE OVER TIME-DIVISION AND FREQUENCY-DIVISION MULTIPLEXING AND POLLING ARE INDICATED.

WARE, GLENN O., JOHN H. SCHUENEMEYER, AN INFORMATION DISSEMINATION NETWORK MODEL, (GEORGIA, UNIV. OF, ATHENS),
FACTS AND FUTURES, WHAT'S HAPPENING NOW IN COMPUTING FOR HIGHER EDUCATION, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE,

2.1.1 SIMULATION

(PRINCETON, NJ, OCTOBER 9-11, 1973), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1974, (LC 74-79222), P 62-68, 6 REFS
(ANNOTATION UNDER 4.1.9)

WEBER, J. H., L. A. GIMPELSON, UNISIM--A SIMULATION PROGRAM FOR COMMUNICATIONS NETWORKS, (BELL TELEPHONE LABS. INC., HOLMDEL, NJ),
AFIPS PROCEEDINGS, 1964 FALL JOINT COMPUTER CONFERENCE, VOLUME 26, (SAN FRANCISCO, CA, OCTOBER 1964), SPARTAN BOOKS INC., BALTIMORE, MD, 1964, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 233-249, 2 REFS

A SIMULATION PROGRAM IS DESCRIBED WHICH PERMITS THE INVESTIGATION OF POSSIBLE ROUTING CONFIGURATIONS AND CONTROL SCHEMES FOR COMMUNICATION NETWORKS. THE PROGRAM ACCOMMODATES NETWORKS WITH MAXIMUM DIMENSIONS OF 63 NODES AND 1953 TRUNK GROUPS AND HANDLES BOTH DIRECT AND STORE AND FORWARD TRAFFIC.

WEBER, J. H., A SIMULATION STUDY OF ROUTING AND CONTROL IN COMMUNICATIONS NETWORKS,(PRESENTED AT, FOURTH INTERNATIONAL TELETRAFFIC CONFERENCE, LONDON, (ENGLAND), JULY 1968),
BELL SYSTEM TECHNICAL JOURNAL, VOL 43, ISSUE 6, NOV 64, P 2639-2676, 6 REFS

THIS REPORT DESCRIBES A STUDY PERFORMED WITH THE AID OF A SIMULATION PROGRAM IN WHICH LARGE NETWORKS ARE EXAMINED TO PROVIDE A GUIDE TO NETWORK DESIGN UNDER VARIOUS CIRCUMSTANCES OF GEOGRAPHY AND LOAD LEVELING. COMPARISONS ARE MADE CONCERNING ENGINEERED COSTS AND OVERLOAD CAPABILITY OF NETWORKS USING SEVERAL ALTERNATE ROUTING CONFIGURATIONS AND EMPLOYING A NUMBER OF DIFFERENT OPERATING AND CONTROL PROCEDURES.

YAGEO, BERNARD, JR., ECONOMIES OF SCALE, NETWORKS, AND NETWORK COST ELASTICITY, (BELL TELEPHONE LABS. INC., HOLMDEL, NJ),
HALL, ARTHUR O., III, DIGEST OF THE CONFERENCE ON THE ECONOMIES OF SCALE IN TODAY'S TELECOMMUNICATIONS SYSTEMS, (WASHINGTON, DC, SEPTEMBER 13, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE 73-CHC-830-0-SCALE, P 26
(ANNOTATION UNDER 2.1.4)

2.1.2 ANALYSIS

BARBER, D. L. A., THE CHOICE OF PACKET PARAMETERS FOR PACKET SWITCHED NETWORKS, NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), DIV. OF COMPUTER SCIENCE, NOV 70, NPL-DCS TM-S1, 7P

TRADEOFFS IN THE DETERMINATION OF PACKET LENGTH AND CONTROL PROCEDURES FOR PACKET SWITCHED NETWORKS ARE DISCUSSED, WITH AN EMPHASIS ON MINIMIZING NETWORK DELAY.

BARR, WILLIAM J., COST EFFECTIVE ANALYSIS OF NETWORK COMPUTERS, ILLINOIS, UNIV. OF, URBANA, DEPT. OF COMPUTER SCIENCE, AUG 72, IU-DCS R-72-538, NSF GJ-28289, (PB-211 784), 73P, 44 REFS

SEVERAL EXISTING NETWORKS ARE EXAMINED TO SHOW EXAMPLES OF PROBLEMS AND SOLUTIONS IN NETWORKING. THE AUTHOR SHOWS THE POTENTIAL ADVANTAGES OF NETWORKS FROM A BUSINESSPERSON'S POINT OF VIEW. HE THEN DEVELOPS A PRIORITY ASSIGNMENT TECHNIQUE WHICH REPRESENTS THE WORTH OF TASKS IN THE SYSTEM AND CAN BE USED TO DETERMINE LOAD LEVELING RULES FOR THE WHOLE NETWORK.
(ALSO UNDER 5.3)

BOWDON, EDWARD K., SR., NETWORK COMPUTER ANALYSIS, (PRESENTED AT, FIFTH HAWAII INTERNATIONAL CONFERENCE ON SYSTEM SCIENCES,), ILLINOIS, UNIV. OF, URBANA, DEPT. OF COMPUTER SCIENCE, JAN 72, IU-DCS R72-505, NSF GJ-28289, (PB-207 417), 28P, 64 REFS

LOAD SHAPING ON A GEOGRAPHICALLY DISTRIBUTED NETWORK OF COMPUTERS IS DISCUSSED. AVERAGE INTERARRIVAL RATES AND PROCESSING TIMES FOR PRIORITY CLASSES ARE USED TO DETERMINE WHAT FRACTION OF THE JOBS IN EACH CLASS SHOULD BE TRANSMITTED BETWEEN CENTERS IN ORDER TO BALANCE THE AVERAGE WAITING TIMES FOR EACH PRIORITY CLASS THROUGHOUT THE NETWORK.

BOWDON, EDWARD K., SR., PRIORITY ASSIGNMENT IN A NETWORK OF COMPUTERS,
IEEE COMPUTER GROUP CONFERENCE, (MINNEAPOLIS, MN, JUNE 17-19, 1969), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, JUN 69, IEEE 69C-30-C, P 60-66, 11 REFS

A PRIORITY JOB SCHEDULING ALGORITHM IS DEVELOPED FOR A MULTIPROCESSOR, SINGLE QUEUE SYSTEM. THE ANALYSIS IS EXTENDED TO THE CASE OF A GEOGRAPHICALLY DISTRIBUTED PROCESSOR SYSTEM TO SELECT THE PRIORITY CLASS MOST SUITABLE FOR TRANSMISSION TO A REMOTE PROCESSOR FOR THE BEST NETWORK PERFORMANCE. THE ALGORITHM DEVELOPED IS DEPENDENT UPON STATISTICS GENERATED LOCALLY AT EACH PROCESSOR WITHOUT ANALYZING THE NETWORK OF DISTRIBUTED PROCESSORS AS A WHOLE. THE ARTICLE IS SHORT ON NON-MATHEMATICAL SUPPORT MATERIAL WHICH WOULD HELP THE READER TO BETTER APPRECIATE THE EFFORT.

BOWDON, EDWARD K., SR., PRIORITY ASSIGNMENT IN A NETWORK OF COMPUTERS,(PRESENTED AT, 1969 IEEE COMPUTER GROUP CONFERENCE, MINNEAPOLIS, MN, JUNE 17-19, 1969), (ILLINOIS, UNIV. OF, URBANA, DEPT. OF COMPUTER SCIENCE),
IEEE TRANSACTIONS ON COMPUTERS, VOL C-18, ISSUE 11, NOV 69, P 1021-1026, 12 REFS

BOWDEN PRESENTS A MATHEMATICAL DEVELOPMENT OF AN ANALYTIC TOOL FOR ALLOCATING TASKS ACCORDING TO PRIORITIES AMONG SERVING COMPUTER CENTERS IN A LOAD-SHARING COMPUTER NETWORK. THE RESULTS ARE INTENDED TO BE DIRECTLY APPLICABLE TO THE COLLINS C SYSTEM, A DISTRIBUTED NETWORK OF FOUR COMPUTER CENTERS.

CASEY, R. G., ALLOCATION OF COPIES OF A FILE IN AN INFORMATION NETWORK, (INTERNATIONAL BUSINESS MACHINES CORP., SAN JOSE, CA),
AFIPS CONFERENCE, 1972 SPRING JOINT COMPUTER CONFERENCE, VOLUME 40, (ATLANTIC CITY, NJ, MAY 16-18, 1972), AFIPS PRESS, MONTVALE, NJ, 1972, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 617-625, 7 REFS

A LINEAR COST MODEL IS DERIVED FOR AN INFORMATION NETWORK RELATIVE TO THE ALLOCATION OF THE COPIES OF A FILE. BOUNDS ARE DERIVED FOR THE NUMBER OF COPIES OF THE FILE THAT SHOULD EXIST IN THE NETWORK AS A FUNCTION OF THE RELATIVE VOLUME OF QUERY AND UPDATE TRAFFIC DIRECTED TO THAT FILE.
(ALSO UNDER 2.1.4)

CERF, VINTON G., WILLIAM E. NAYLOR, STORAGE CONSIDERATIONS IN STORE-AND-FORWARD MESSAGE SWITCHING, (CALIFORNIA, UNIV. OF, LOS ANGELES),
1972 WESCON TECHNICAL PAPERS, SESSION 7: COMPUTER NETWORKS, (PRESENTED AT, WESTERN ELECTRONIC SHOW AND CONVENTION, SEPTEMBER 19-22, 1972), 1972, P 7-3-1--7-3-8, 5 REFS

THIS ARTICLE DESCRIBES A MEASUREMENT FACILITY IN THE ARPA NETWORK. IT STUDIES THE AMOUNT OF STORAGE AND THE AMOUNT OF TIME NEEDED TO REASSEMBLE MULTI-PACKET MESSAGES, ONE ASPECT OF STORE AND FORWARD MESSAGE SWITCHING. FORMULAE ARE DEVELOPED WHICH PREDICT BOTH THE SPACE-TIME PRODUCT REQUIRED FOR MESSAGE REASSEMBLY AND THE EXPECTED THROUGHPUT WHICH CAN BE ACHIEVED AS A FUNCTION OF MESSAGE LENGTH.
(ALSO UNDER 2.2)

CHANG, S. K., O. T. TANG, PROCESSOR ALLOCATION IN A DISTRIBUTED COMPUTER SYSTEM, (INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY, THOMAS J. WATSON RESEARCH CENTER),
PROCEEDINGS OF THE 1975 SYMPOSIUM-COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, JUNE 18, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, 75CH0973-8C, P 47-54, 10 REFS

IN THE DESIGN OF A DISTRIBUTED COMPUTER SYSTEM, PROCESSORS ARE TO BE ALLOCATED SO THAT PROCESSING REQUIREMENTS FROM TERMINAL STATIONS CAN BE SATISFIED. THIS REPORT ANALYZES SEVERAL ALGORITHMS FOR PROCESSOR ALLOCATION.

CHOU, W., A. KERSHENBAUM, A UNIFIED ALGORITHM FOR DESIGNING MULTIDROP TELEPROCESSING NETWORKS, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 148-156, 18 REFS

THE AUTHORS DESCRIBE A MODIFIED FORM OF KRUSKAL'S ALGORITHM FOR DESIGNING MINIMUM COST MULTIDROP LINES WHICH CONNECT REMOTE TERMINALS TO A CONCENTRATOR OR A CENTRAL DATA PROCESSING COMPUTER. THE ALGORITHM HAS BEEN APPLIED TO LARGE NETWORKS WITH OVER 1,000 TERMINALS, YIELDING EXCELLENT RESULTS AND USING ONLY 15 SECONDS OF COMPUTER TIME ON A CDC 6600 COMPUTER.

CHU, WESLEY W., ASYNCHRONOUS TIME-DIVISION MULTIPLEXING SYSTEMS, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER

2.1.2 ANALYSIS

SCIENCE).
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 237-268, 30 REFS

AN ASYNCHRONOUS TIME-DIVISION MULTIPLEXING (I.E. STATISTICAL MULTIPLEXING) TECHNIQUE FOR DATA TRANSMISSION IS PROPOSED. THIS TECHNIQUE GREATLY IMPROVES CHANNEL EFFICIENCY, SYSTEM ORGANIZATION FOR ERROR CONTROL, AND MESSAGE SCHEDULING AS COMPARED WITH COMMONLY USED MULTIPLEXING TECHNIQUES IN DATA COMMUNICATIONS SYSTEMS, I.E., FREQUENCY-DIVISION MULTIPLEXING AND SYNCHRONOUS TIME-DIVISION MULTIPLEXING.
(ALSO UNDER 3.2.3)

CHU, WESLEY W., OEMULTIPLEXING CONSIDERATIONS FOR STATISTICAL MULTIPLEXORS, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE).
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71C59-C, P 32-38, 7 REFS
(ANNOTATION UNDER 3.2.9)

CHU, WESLEY W., OPTIMAL FILE ALLOCATION IN A COMPUTER NETWORK, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE).
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 82-94, 8 REFS
(ANNOTATION UNDER 2.1.4)

CHU, WESLEY W., OPTIMAL FILE ALLOCATION IN A MULTIPLE COMPUTER SYSTEM,(PRESENTED AT, IFIP CONGRESS 68, EDINBURGH, (SCOTLAND), AUGUST 5-10, 1968), (BELL TELEPHONE LABS, INC., HOLMDEL, NJ), IEEE TRANSACTIONS ON COMPUTERS, VOL C-18, ISSUE 10, OCT 69, P 885-889, 5 REFS

THIS CHALLENGING PAPER INTRODUCES A NON-LINEAR INTEGER PROGRAM AS A MODEL FOR FILE ALLOCATION IN A DISTRIBUTED COMPUTER NETWORK. THE SINGLE MEASURE OF OPTIMALITY IS COST, TAKING INTO ACCOUNT STORAGE, UPDATING, TRANSMISSION, REQUEST RATES AND ALLOWABLE FILE ACCESS TIMES.

CRAIG, L. J., I. S. REED, OVERLAPPING TESSELLATED COMMUNICATIONS NETWORKS, RAND CORP., SANTA MONICA, CA, DEPT. OF COMPUTER SCIENCES, RAND CORP., SANTA MONICA, CA, DEPT. OF ELECTRONICS, 13 JUN 61, RC P-2359, (AD-676 259), 18P
(ANNOTATION UNDER 2.1.4)

DASILVA, JOHN S., ON THE DESIRABILITY OF INTEGRATING A COMMUNICATION SYSTEM FOR TWO USER CLASSES, (MINISTRY OF COMMUNICATIONS, OTTAWA, (CANADA)),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 113-117, 4 REFS

A THEORETICAL DISCUSSION OF THE PERFORMANCE OF A COMMUNICATION SYSTEM WHICH MUST SERVE TWO CLASSES OF USERS WITH DISTINCT MESSAGE ARRIVAL RATES IS PRESENTED. AN INTEGRATED COMMUNICATION SYSTEM IS COMPARED WITH A SEGREGATED COMMUNICATION SYSTEM UNDER A CHANNEL-CAPACITY CONSTRAINT.
(ALSO UNDER 3.2.2)

DEMERCADO, JOHN, MINIMUM COST-RELIABLE COMPUTER COMMUNICATION NETWORKS, (MINISTRY OF COMMUNICATIONS, OTTAWA, (CANADA)), AFIPS CONFERENCE PROCEEDINGS, VOLUME 41, PART I, 1972, FALL JOINT COMPUTER CONFERENCE, (ANAHEIM, CA, DECEMBER 5-7, 1972), AFIPS PRESS, MONTVALE, NJ, 1972, (LC 55-44701), P 553-559

THIS HIGHLY TECHNICAL PAPER PRESENTS A THEORY OF RELIABILITY PREDICTION FOR GENERAL NETWORKS WHOSE NODES AND LINKS HAVE CONSTANT FAILURE AND REPAIR RATES. THE AUTHOR ASSERTS THAT THE METHODS PRESENTED ARE APPLICABLE TO A LARGE CLASS OF NETWORKS INCLUDING COMPUTER-COMMUNICATION NETWORKS.

DOLL, DIXON R., EFFICIENT ALLOCATION OF RESOURCES IN CENTRALIZED COMPUTER-COMMUNICATION NETWORK DESIGN, MICHIGAN, UNIV. OF, ANN ARBOR, SYSTEMS ENGINEERING LAB., NOV 69, MI-SEL TR-36, MI-RADC TR-69-305, AF 30(602)-3953, AF F30602-69-C-0214, 330P, 82 REFS

A THOROUGH TREATMENT OF ANALYTIC DESIGN PROCEDURES FOR CENTRALIZED COMPUTER COMMUNICATION NETWORKS IS PRESENTED. FOLLOWING A NUMBER OF CLEAR AND COMPLETE DEFINITIONS OF RELEVANT TERMS, THE FACTORS INFLUENCING SELECTION OF A CENTRALIZED OR DISTRIBUTED NETWORK ARE DISCUSSED, LEADING TO A CONCLUSION THAT A COMPREHENSIVE STUDY OF THE DESIGN OF CENTRALIZED NETWORKS IS STILL NEEDED. SEVERAL ASSUMPTIONS ARE MADE AND JUSTIFIED IN THE REPORT, INCLUDING POISSON INTER-ARRIVAL DISTRIBUTIONS FOR DATA FLOW INTO SUCH NETWORKS. FUTURE WORK IS SUGGESTED IN WHICH SOME OF THESE ASSUMPTIONS ARE MODIFIED TO REPRESENT DIFFERENT AND, PERHAPS, STILL MORE REALISTIC CONFIGURATIONS, INCLUDING SUPERIMPOSED CENTRALIZED NETWORKS.

DUDICK, A. L., C. D. PACK, ROUND ROBIN SCHEDULING IN A COMPUTER COMMUNICATIONS SYSTEM WITH FINITE SWAP TIME AND STATISTICALLY MULTIPLEXED ARRIVALS, (BELL TELEPHONE LABS, INC., HOLMDEL, NJ),
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71C59-C, P 58-64, 15 REFS

ANALYTIC AND SIMULATION TECHNIQUES ARE EMPLOYED TO INVESTIGATE THE EFFECT OF ASYNCHRONOUS TIME DIVISION MULTIPLEXING (ATDM) ON THE PERFORMANCE OF A COMPUTER-COMMUNICATIONS SYSTEM. SOME INTERESTING RESULTS CONCERNING ATDM ARE PRESENTED INCLUDING SOME POSSIBLE DETRIMENTAL EFFECTS ON NETWORK DELAYS.
(ALSO UNDER 2.1.1)

ELIE, MICHEL, GENERAL PURPOSE NETWORKS OF COMPUTERS, CALIFORNIA, UNIV. OF, LOS ANGELES, 1970, 125P, 46 REFS
(ANNOTATION UNDER 1.2)

ESAU, L. R., K. C. WILLIAMS, ON TELEPROCESSING SYSTEM DESIGN, PART II, A METHOD FOR APPROXIMATING THE OPTIMAL NETWORK, IBM SYSTEMS JOURNAL, VOL 5, ISSUE 3, 1966, P 142-147, 2 REFS

AN ALGORITHM IS DEVELOPED FOR OPTIMIZING A MULTIPOINT NETWORK WHERE A SINGLE CONTROL CENTER IS CONNECTED TO A NUMBER OF TERMINALS IN A MULTI-DROP CONFIGURATION, FIXED LINE CAPACITY, TRAFFIC, AND THE DISTANCE BETWEEN THE PROCESSOR AND THE TERMINALS ARE CONSIDERED.

FERGUSON, MICHAEL J., A STUDY OF UNSLOTTED ALOHA WITH ARBITRARY MESSAGE LENGTHS, (HAWAII, UNIV. OF, HONOLULU, MCGILL UNIV., MONTREAL, (CANADA)),
FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000-7-DATA, P 5-20--5-25, 5 REFS

THIS PAPER PRESENTS AN EXTENSION OF THE ANALYSIS REPORTED IN FERGUSON'S EARLIER WORK ENTITLED 'AN ANALYSIS OF VARIABLE LENGTH PACKETS IN UNSLOTTED ALOHA' (FEB. 1975). THE AUTHOR DESCRIBES THE EARLIER MODEL AS BEING SIMPLE AND SLIGHTLY UNREALISTIC. IN THIS MORE RECENT PAPER HE DESCRIBES THE SAME MODEL BUT THIS TIME WITH AN EXTENDED OFFERED PACKET LENGTH THAT MAY BE ANY DENSITY.
(ALSO UNDER 2.1.4)

FISHER, C. R., R. L. SLIGH, THE DATRAN NETWORK, (DATA TRANSMISSION CO., VIENNA, VA),
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71C59-C, P 65-72
(ANNOTATION UNDER 3.1.0)

FRANK, HOWARD, WUSHOW CHOU, TOPOLOGICAL OPTIMIZATION OF COMPUTER NETWORKS, (NETWORK ANALYSIS CORP., GLEN COVE, NY), PROCEEDINGS OF THE IEEE, VOL 60, ISSUE 11, NOV 72, P 1385-1397, 59 REFS
(ANNOTATION UNDER 2.1.4)

FRANK, HOWARD, OPTIMAL DESIGN OF COMPUTER NETWORKS, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
RUSTIN, RANDALL, COURANT COMPUTER SCIENCE SYMPOSIUM 3, COMPUTER NETWORKS, (NOVEMBER 30-DECEMBER 1, 1970), PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1972, PRENTICE-HALL SERIES IN AUTOMATIC COMPUTATION, (LC 79-39373), P 167-183
(ANNOTATION UNDER 2.1.4)

FRANK, HOWARD, THE PRACTICAL IMPACT OF RECENT COMPUTER ADVANCES ON THE ANALYSIS AND DESIGN OF LARGE SCALE NETWORKS, THIRD SEMIANNUAL TECHNICAL REPORT, NETWORK ANALYSIS CORP., GLEN COVE, NY, JUN 74, ARPA DAHC-15-73-C-0135, 370P, 122 REFS

WHILE THE ARTICLE IS HEAVILY DIRECTED TO THE ARPANET, THE INFORMATION IS PERTINENT FOR ALL INTERESTED IN LARGE-SCALE

2.1.2 ANALYSIS

NETWORKS. SOME TOPICS INCLUDE PACKET-SWITCHED COMMUNICATIONS, PACKET RADIO SYSTEMS AND COST/THROUGHPUT/RELIABILITY CHARACTERISTICS OF LARGE PACKET SWITCHED NETWORKS.

FRIEDMAN, T. D., A SYSTEM OF APL FUNCTIONS TO STUDY COMPUTER NETWORKS. (INTERNATIONAL BUSINESS MACHINES CORP., SAN JOSE, CA. RESEARCH LAB.).
AFIPS CONFERENCE PROCEEDINGS. VOLUME 42, 1973. NATIONAL COMPUTER CONFERENCE AND EXPOSITION. (NEW YORK, NY, JUNE 4-8, 1973), AFIPS PRESS, MONTVALE, NJ, 1973. AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 141-148, 3 REFS

A COLLECTION OF PROGRAMS WRITTEN ON THE APL TERMINAL SYSTEM ARE DESCRIBED. THESE PROGRAMS, DEVELOPED AS PART OF A LARGER STUDY OF MODELING AND DESIGN OF COMPUTER NETWORKS, MAKE IT POSSIBLE TO CREATE, MODIFY AND EVALUATE GRAPH THEORETIC REPRESENTATIONS OF COMPUTER NETWORKS WHILE WORKING AT THE TERMINAL.
(ALSO UNDER 2.1.4)

FRISCH, I. T., M. MALEK-ZAVAREI, AN EFFICIENT PROGRAM FOR REAL-TIME ASSIGNMENT OF JOBS IN A HYBRID COMPUTER NETWORK, (NETWORK ANALYSIS CORP., GLEN COVE, NY, BELL TELEPHONE LABS, INC., HOLMDEL, NJ).
TOU, JULIUS T., SOFTWARE ENGINEERING, COINS ***!MO4XME 2--PROCEEDINGS OF THE THIRD SYMPOSIUM ON COMPUTER AND INFORMATION SCIENCES, (MIAMI BEACH, FL, DECEMBER 1969), ACADEMIC PRESS, NY, 1971, (LC 76-127707), P 253-264, 12 REFS

THE PURPOSE OF'D*S PAPER IS TO APPLY SOME RESULTS OF CURRENT RESEARCH IN NETWORK FLOWS TO A DIFFICULT PROBLEM ARISING IN THE STUDY OF HYBRID COMPUTER NETWORKS. THEOREMS ARE PRESENTED WHICH PROVIDE A HEURISTIC METHOD FOR SOLVING A NETWORK FLOW PROBLEM AND WHICH MAY BE SPECIALIZED FOR SOLVING JOB ASSIGNMENTS IN A HYBRID COMPUTER NETWORK.

FRISCH, I. T., D. K. SEN, ALGORITHMS TO REALIZE DIRECTED COMMUNICATION NETS, CALIFORNIA, UNIV. OF, BERKELEY, DEPT. OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE, LENKURT ELECTRIC CO., SAN CARLOS, CA, DEC 67, CU-DEECS S177-29, DA-ARO D-31-124-G776, (AD-674 086), 1DP, 7 REFS
REPRINT FROM/IEEE TRANSACTIONS ON CIRCUIT THEORY, CT-14:4 (DEC 67) 37D-379/

MATHEMATICAL THEORIES ARE FORMULATED FOR A REAL SQUARE UNSYMMETRICAL MATRIX REPRESENTING THE TERMINAL CAPACITY MATRIX OF A DIRECTED COMMUNICATION NET.

GERLA, MARIO, APPROXIMATIONS AND BOUNDS FOR THE TOPOLOGICAL DESIGN OF DISTRIBUTED COMPUTER NETWORKS, (NETWORK ANALYSIS CORP., GLEN COVE, NY).
FOURTH DATA COMMUNICATIONS SYMPOSIUM. NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT. (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000-7-DATA, P 4-9--4-15, 15 REFS

SINCE A RAPID GROWTH OF DISTRIBUTED NETWORKS IS ANTICIPATED FOR THE FUTURE YEARS, IT IS MOST IMPORTANT TO PROVIDE NETWORK PLANNERS WITH RELIABLE DESIGN TOOLS OF WELL-TESTED EFFICIENCY. THIS PAPER EVALUATES THE EFFICIENCY OF THE TOPOLOGICAL TOOLS PRESENTLY AVAILABLE, REVIEWS THE EXISTING SUBOPTIMAL TECHNIQUES FOR DISTRIBUTED NETWORK DESIGN, DERIVES BOUNDS ON MINIMUM NETWORK COST, AND DISCUSSES EXACT SOLUTION METHODS.

HANSLER, EBERHARD, GERALD K. MCAULIFFE, ROBERT S. WILKOV, RELIABILITY CONSIDERATIONS IN CENTRALIZED COMPUTER NETWORKS, (INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY, THOMAS J. WATSON RESEARCH CENTER).
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 96-101, 9 REFS

AN ANALYSIS OF THE RELIABILITY OF COMPUTER NETWORKS IN WHICH CLUSTERS OF TERMINALS ARE CONNECTED THROUGH REMOTE CONCENTRATORS TO DATA PROCESSING CENTERS IS PRESENTED. IT IS SHOWN THAT NETWORK TOPOLOGIES DIFFERENT FROM A STAR MAY HAVE SIGNIFICANTLY HIGHER RELIABILITY AT NO INCREASE IN COST.

HANSLER, EBERHARD, G. K. MCAULIFFE, ROBERT S. WILKOV, EXACT CALCULATION OF COMPUTER NETWORK RELIABILITY, (INTERNATIONAL BUSINESS MACHINES CORP., RUSCHLIKON, (SWITZERLAND), RESEARCH LAB., INTERNATIONAL BUSINESS MACHINES CORP., DUBLIN, (IRELAND), INTERNATIONAL BUSINESS MACHINES CORP., ARMONK, NY).
AFIPS CONFERENCE PROCEEDINGS, VOLUME 41, PART I, 1972, FALL JOINT COMPUTER CONFERENCE, (ANAHEIM, CA, DECEMBER 5-7, 1972), AFIPS PRESS, MONTVALE, NJ, 1972, (LC 55-44701), P 49-54, 9 REFS

A PROCEDURE IS PRESENTED FOR EXACTLY CALCULATING THE NODE PAIR FAILURE PROBABILITY IN COMPUTER NETWORKS. IT IS STATED THAT THIS PROCEDURE MAY BE USED TO CALCULATE THE RELIABILITY OF THE COMMUNICATION PATHS BETWEEN ANY PAIR OF NODES IN A DISTRIBUTED COMPUTER NETWORK AS LARGE AS THE ARPA NETWORK.

HAYES, J. F., D. N. SHERMAN, TRAFFIC AND DELAY IN A CIRCULAR DATA NETWORK, (BELL TELEPHONE LABS, INC., HOLMDEL, NJ).
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 102-107, 8 REFS

THE OPERATION AND TRAFFIC BEHAVIOR FOR A DATA TRANSMISSION SYSTEM USING A RING TOPOLOGY ARE STUDIED. DATA IS BLOCKED INTO FIXED LENGTH PACKETS AND MUST BE BUFFERED UNTIL AN EMPTY SLOT ARRIVES ON THE RING. FORMULAS ARE DERIVED FROM WHICH APPROXIMATIONS TO AVERAGE MESSAGE DELAY THROUGH THE RING CAN BE CALCULATED.
(ALSO UNDER 3.2.1)

HOPEWELL, LYNN, W. S. CHOU, HOWARD FRANK, ANALYSIS OF ARCHITECTURAL STRATEGIES FOR A LARGE MESSAGE-SWITCHING NETWORK: A CASE STUDY, (NETWORK ANALYSIS CORP., GLEN COVE, NY).
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE. DIGEST OF PAPERS. 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 118-123, 2 REFS

THIS PAPER REPORTS ON A STUDY MADE TO DETERMINE THE BEST SYSTEM MODERNIZATION PROCEDURE FOR THE FEDERAL AVIATION AGENCY'S MESSAGE SWITCHING NETWORK. SEVERAL APPROACHES WERE DEVELOPED USING SPEED LINES, CONCENTRATORS, BUFFERED TERMINALS AND NETWORK TOPOLOGIES, AND THEN COMPARED ON A COST VERSUS CAPACITY BASIS. THESE STRATEGIES AND THE RESULTS OF THE STUDY ARE DESCRIBED.
(ALSO UNDER 3.1.2)

HOSFORD, JOHN E., OPTIMAL ALLOCATION OF LEASED COMMUNICATION LINES, (LOCKHEED MISSILES AND SPACE CO., SUNNYVALE, CA), MANAGEMENT SCIENCE, VOL 9, ISSUE 4, JUL 63, P 613-622, 4 REFS

SOME PRACTICAL COMMENTS, ANALYTICAL TECHNIQUES, AND TABLES FOR MULTI-SERVER QUEUING APPLIED TO MULTIPLE COMMUNICATION LINES BETWEEN TWO POINTS IN SUPPORT OF A NETWORK ARE INCLUDED IN THIS ARTICLE. THE DISCUSSION IS ALSO APPLICABLE TO DETERMINING THE NUMBER OF PORTS NEEDED ON A TIME-SHARING SYSTEM OR CONCENTRATOR TO SUPPORT ESTIMATED TERMINAL LOADING.

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK, QUARTERLY TECHNICAL REPORT NO. 13, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, APR 72, 1 JAN-30 APR 72, BBN R-2353, BBN QTR-13, OAHC 15-69-C-0179, 31P
(ANNOTATION UNDER 3.1.1)

IRANI, K. B., I. S. UPPAL, J. W. BOYSE, O. M. COLEMAN, O. L. HINSHAW, G. A. MCCLAIN, L. S. RANDALL, A. M. WOOLF, A STUDY OF INFORMATION IN MULTIPLE-COMPUTER AND MULTIPLE-CONSOLE DATA PROCESSING SYSTEMS, MICHIGAN, UNIV. OF, ANN ARBOR, SYSTEMS ENGINEERING LAB., AUG 71, MI-SEL AR-4, AF F30602-69-C-0210, (AD-729 194), 176P, 57 REFS

THIS AMBITIOUS REPORT DEVELOPS MATHEMATICAL TECHNIQUES FOR ANALYZING MULTIPLE COMPUTER, MULTIPLE TERMINAL ON-LINE SYSTEMS FOR THE PURPOSE OF DETERMINING OPTIMAL CONFIGURATION AND EFFICIENT SCHEDULING OF RESOURCES IN THIS TYPE OF SYSTEM.

KLEINROCK, LEONARD, RESOURCE ALLOCATION IN COMPUTER SYSTEMS AND COMPUTER-COMMUNICATION NETWORKS, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE).
ROSENFELD, JACK L., INFORMATION PROCESSING 74, PROCEEDINGS OF IFIP CONGRESS 74, I, COMPUTER HARDWARE AND ARCHITECTURE, (STOCKHOLM, (SWEDEN), AUGUST 5-10, 1974), AMERICAN ELSEVIER PUBLISHING CO, INC., NEW YORK, 1974, P 11-18, 25 REFS

RESOURCE SHARING TRADEOFFS AMONG PERFORMANCE, THROUGHPUT, EFFICIENCY, RESOURCE CAPACITY, AND THE NUMBER OF RESOURCES ARE DISCUSSED. QUEUING THEORY IS USED TO PROVIDE CONVINCING ARGUMENTS THAT 'BIGGER IS BETTER,' WHEN ALLOCATING RESOURCES IN COMPUTER SYSTEMS AND COMMUNICATIONS NETWORKS. WHILE CONTAINING SOME 37 FORMAL EQUATIONS, THERE ARE MORE THEN AMPLE FIGURES TO HELP THE SERIOUS READER UNDERSTAND THE AUTHOR'S ARGUMENTS.

KLEINROCK, LEONARD, SCHEDULING, QUEUEING, AND DELAYS IN TIME-SHARED SYSTEMS AND COMPUTER NETWORKS, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE).
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 95-141, 64 REFS

2.1.2 ANALYSIS

THIS PAPER PRESENTS STUDIES ON THE TYPES OF DELAYS THAT ARE INTRODUCED IN THE PROCESS OF TRANSMITTING MESSAGES WITHIN A COMPUTER NETWORK. IT ADDRESSES TWO BASIC SOURCES OF DELAYS IN TWO SEPARATE ROUTINES: DELAY EXPERIENCED BY A MESSAGE AT THE INTERNAL NODES OF A NETWORK WHEN IT REQUESTS SERVICE OF A REMOTE TIME-SHARED SYSTEM, AND DELAY INTRODUCED BY THE NETWORK TRANSMITTING A REQUEST FOR SERVICE OR RETURNING RESULTS OF COMPUTATIONS.

KLEINROCK, LEONARD, SURVEY OF ANALYTICAL METHODS IN QUEUEING NETWORKS, (CALIFORNIA, UNIV. OF, LOS ANGELES), RUSTIN, RANDALL, COURANT COMPUTER SCIENCE SYMPOSIUM 3. COMPUTER NETWORKS, (NOVEMBER 30-DECEMBER 1, 1970), PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1972, PRENTICE-HALL SERIES IN AUTOMATIC COMPUTATION, (LC 79-39373), P 185-205, 11 REFS
(ANNOTATION UNDER 1.3)

KONHEIM, ALAN G., BERNO MEISTER, POLLING IN A MULTIDROP COMMUNICATION SYSTEM: WAITING LINE ANALYSIS, (INTERNATIONAL BUSINESS MACHINES, ZURICH, (SWITZERLAND), RESEARCH LAB.), JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71C59-C, P 124-129

A COMMUNICATIONS SYSTEM CONTAINING DATA INPUT TERMINALS, BUFFERED AND MULTIDROPPED, CONNECTED TO A CENTRAL STATION WHICH PERFORMS SEQUENTIAL POLLING OF THE TERMINALS IS ANALYZED. THE DISTRIBUTION OF QUEUE LENGTHS THROUGHOUT THE SYSTEM IS CALCULATED.

KUMMERLE, KARL, MULTIPLEXOR PERFORMANCE FOR INTEGRATED LINES-AND PACKET-SWITCHED TRAFFIC, (INTERNATIONAL BUSINESS MACHINES CORP., RUSCHLIKON, (SWITZERLAND)), THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 507-515, 11 REFS

THE PROBLEM OF MAKING A PACKET-SWITCHED NETWORK APPEAR TO BE LINE-SWITCHED IS POSED. SEVERAL SOLUTIONS ARE OUTLINED AND THEN TWO, FIXED BOUNDARY AND MOVEABLE BOUNDARY SOLUTIONS, ARE ANALYZED.

LAVIA, ANTHONY, ERIC G. MANNING, PERTURBATION TECHNIQUES FOR TOPOLOGICAL OPTIMIZATION OF COMPUTER NETWORKS, (WATERLOO, UNIV. OF, ONTARIO, (CANADA), COMPUTER COMMUNICATIONS NETWORKS GROUP), FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000I-7-DATA, P 4-16--4-23, 18 REFS

A PERTURBATION SOLUTION METHOD IS PRESENTED FOR THE DESIGN OF COMPUTER COMMUNICATION NETWORKS WITH MINIMAL TOPOLOGICAL COSTS, UNDER RELIABILITY AND PERFORMANCE REQUIREMENT CONSTRAINTS. THE TECHNIQUES DESCRIBED HAVE BEEN APPLIED TO A CANADIAN NETWORK RESULTING IN A REPORTED COST IMPROVEMENT OF AROUND $30,000 PER YEAR, WITH AN EXPENDITURE OF LESS THAN $10 OF COMPUTER RESOURCES.
(ALSO UNDER 3.2.2)

LIPNER, S. B., P. MELANSON, COMPUTATION OF MESSAGE DELAYS IN A COMMUNICATIONS NETWORK, MITRE CORP., BEDFORD, MA, 10 DEC 71, MC WP-4083, AF F19(628)-71-C-0002, 17P, 2 REFS

A COMPUTER PROGRAM IS DESCRIBED THAT MAY BE USED TO EVALUATE THE DELAYS EXPERIENCED BY TRAFFIC FLOWING IN A COMPUTER COMMUNICATIONS NETWORK. THE PROGRAM IS BASED ON KLEINROCK'S MODEL (SEE 'ANALYTIC AND SIMULATION METHODS IN COMPUTER NETWORK DESIGN,' IN CATEGORY 2.I.0) FOR DELAYS IN THE ARPA NETWORK. LISTINGS, FLOWCHARTS AND OPERATING INSTRUCTIONS ARE PROVIDED, AS WELL AS AN EXAMPLE OF THE USE OF THE PROGRAM.
(ALSO UNDER 2.1.4)

LIVINGS, HAROLD E., UDO W. POOCH, SELF ADAPTIVE TELEPROCESSING NETWORK DESIGN, (TEXAS A AND M UNIV., COLLEGE STATION, DEPT. OF INDUSTRIAL ENGINEERING), PROCEEDINGS OF THE 1975 SYMPOSIUM-COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, JUNE 18, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, 75CH0973-8C, P 55-60, 4 REFS

THIS PAPER DESCRIBES A SELF ADAPTIVE, HEURISTIC TECHNIQUE FOR DESIGNING TELEPROCESSING OR DATA COMMUNICATIONS NETWORKS. A COMPLETE NETWORK DESIGN PACKAGE HAS BEEN DEVELOPED USING THIS TECHNIQUE. THE RESULTING SYSTEM PRODUCES NEAR OPTIMAL NETWORK DESIGNS WITH MINIMAL COMPUTATION. OPTIMALITY IN THIS SENSE IS ANALYZED IN TERMS OF OVERALL NETWORK COST./

MANNING, ERIC, A HOMOGENEOUS NETWORK FOR DATA SHARING, (WATERLOO, UNIV. OF, ONTARIO, (CANADA), DEPT. OF APPLIED ANALYSIS AND COMPUTER SCIENCE), GELENBE, EROL, ROBERT MAHL, COMPUTER ARCHITECTURES AND NETWORKS, MODELLING AND EVALUATION, (AUGUST 12-14, 1974), AMERICAN ELSEVIER PUBLISHING CO. INC., NEW YORK, 1974, (LC 74-83728), P 345-353, 9 REFS
(ANNOTATION UNDER 3.2.2)

MARCHESE, J. F., W. GERHARD, SOME EFFECTS OF SWITCHED NETWORK TIME DELAYS AND TRANSMISSION SPEED ON DATA BASED/DATA COMMUNICATION SYSTEMS, (INTERNATIONAL BUSINESS MACHINES CORP., ZURICH, (SWITZERLAND), RESEARCH LAB.), WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 352-357, 3 REFS

THE EFFECTS ON THE USER OF COMMUNICATION NETWORK SWITCHING SPEED AND DATA RATES ARE EXAMINED AND THE SENSITIVITY OF SWITCHING COST TO SWITCHING SPEED IS ANALYZED. THE CONCLUSIONS ARE INTUITIVE, BUT ANALYTICAL MATERIAL IS DEVELOPED IN SUPPORT OF THEM.

MCCREGOR, P., O. SHEN, LOCATING CONCENTRATION POINTS IN DATA COMMUNICATION NETWORKING, (NETWORK ANALYSIS CORP., GLEN COVE, NY), FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000I-7-DATA, P 4-1--4-8, 30 REFS

THIS PAPER CONSIDERS A TOPOLOGICAL DESIGN ASPECT OF THE PROBLEM OF ACCESS OF NETWORK RESOURCES. IN PARTICULAR, THE PROBLEM OF LOCATING 'ACCESS FACILITIES', OR CONCENTRATION POINTS, TO OBTAIN AN ECONOMIC CONNECTION OF 'USERS' TO 'RESOURCES' IS CONSIDERED. AN ALGORITHM IS PRESENTED FOR THE DESIGN OF MULTIDROP NETWORKS THAT MAY INCORPORATE GENERIC ACCESS FACILITIES TO ECONOMICALLY CONNECT NODES (USERS) TO RESOURCE CONNECTION POINTS. EXTENSION OF THE BASIC ALGORITHM TO HANDLE MORE GENERAL PROBLEMS IS DISCUSSED.

MEISTER, B., H. R. MULLER, H. R. RUDIN, JR., OPTIMIZATION OF A NEW MODEL FOR MESSAGE-SWITCHING NETWORKS, (INTERNATIONAL BUSINESS MACHINES CORP., ZURICH, (SWITZERLAND), ZURICH RESEARCH LAB.), BLACKER, HARRY L., IEEE INTERNATIONAL CONFERENCE ON COMMUNICATIONS, VOLUME 7, (MONTREAL, (CANADA), JUNE 14-16, 1971), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1971, IEEE CAT-71C28-COM, (LC 64-23226), P 39-16 - 39-21, 6 REFS

THE AUTHORS DESCRIBE CRITERIA DEVELOPED FOR OPTIMUM CAPACITY ASSIGNMENT OF STORE-AND-FORWARD OR MESSAGE-SWITCHING NETWORKS USING A NETWORK MODEL WHICH CONTAINS NODAL PROCESSORS AND INTERCONNECTING LINKS. IT INCLUDES THE EFFECT OF NODAL PROCESSORS ON COST AND PERFORMANCE OF THE NETWORK. LINEAR AND STEPPED COST FUNCTIONS ARE CONSIDERED.

OPDERBECK, HOLGER, LEONARD KLEINROCK, THE INFLUENCE OF CONTROL PROCEDURES ON THE PERFORMANCE OF PACKET-SWITCHED NETWORKS, (CALIFORNIA, UNIV. OF, LOS ANGELES), IEEE 1974 NATIONAL TELECOMMUNICATIONS CONFERENCE, (SAN DIEGO, CA, DECEMBER 2-4, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE P-74CHO902-7-CSCB, (LC 57-20724), P 810-817, 13 REFS

HERE IS AN EXCELLENT INTRODUCTION TO THE PROBLEM OF DESIGNING AND VALIDATING FLOW CONTROL MECHANISMS FOR COMPUTER NETWORKS. SEVERAL DIFFICULTIES WITH SCHEMES ORIGINALLY TRIED IN THE ARPANET ARE ILLUSTRATED WITH THE SOLUTIONS TO CORRECT THEM. UNFORTUNATELY, NO SATISFACTORY SOLUTION TO THE GENERAL PROBLEM OF DISCOVERING HIDDEN PROBLEMS IS AVAILABLE YET.
(ALSO UNDER 2.1.3)

ROBERTS, LAWRENCE G., DYNAMIC ALLOCATION OF SATELLITE CAPACITY THROUGH PACKET RESERVATION, (DEPARTMENT OF DEFENSE, ARLINGTON, VA, ADVANCED RESEARCH PROJECTS AGENCY), COMPUTER COMMUNICATION NETWORKS, SELECTED PAPERS, (PRESENTED AT, UNIV. OF SUSSEX, BRIGHTON, (ENGLAND),), 1973, P AI-AIS, 10 REFS

A PACKET RESERVATION SYSTEM WHICH TAKES ADVANTAGE OF THE MULTI-ACCESS PROPERTY OF SATELLITES IS DESCRIBED AND ANALYTICALLY COMPARED TO FOUR OTHER TECHNIQUES: A FULLY CONNECTED CHANNELIZED NETWORK, A STORE-AND-FORWARD STAR, A TIME DIVISION MULTI-ACCESS TECHNIQUE AND THE ALOHA RANDOM ACCESS PACKET BROADCAST TECHNIQUE.
(ALSO UNDER 3.2.9)

SENCER, M. A., EVALUATION OF PACKET SWITCHING NETWORK CONTROLLED ON ISARITHMIC PRINCIPLES. (BELL CANADA, COMPUTER COMMUNICATIONS GROUP).
IEEE 197A NATIONAL TELECOMMUNICATIONS CONFERENCE, (SAN DIEGO, CA, DECEMBER 2-4, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 197A, IEEE P-74CH09D2-7-CSCB, (LC 57-2D724), P B3B-B42, 1D REFS

THE BEHAVIOR OF A PACKET SWITCHED NETWORK WITH ISARITHMIC FLOW CONTROL (FIXED LIMIT ON THE NUMBER OF PACKETS IN THE SYSTEM AT ANY ONE TIME) IS MATHEMATICALLY ANALYZED, WITH A NUMBER OF SIMPLIFYING ASSUMPTIONS. THE RESULTS ARE RATHER TERSELY PRESENTED; THIS ARTICLE IS NOT FOR THE CASUAL READER.

STAMBLER, LEON, ELEMENTARY TELEPHONE SWITCHING THEORY APPLIED TO THE DESIGN OF MESSAGE SWITCHING SYSTEMS. (RADIO CORP. OF AMERICA, NEW YORK, DIV. OF COMMUNICATION SYSTEMS).
AFIPS PROCEEDINGS, 1966 FALL JOINT COMPUTER CONFERENCE, VOLUME 29, (SAN FRANCISCO, CA, NOVEMBER 7-10, 1966), SPARTAN BOOKS INC., WASHINGTON, DC, 1966, AFIPS CONFERENCE PROCEEDINGS, (LC 55-AA701), P A13-423, 5 REFS
(ANNOTATION UNDER 3.2.1)

TREHAN, RANVIR K., PROJECTED RESPONSE CHARACTERISTICS OF THE WWMCCS INTERCOMPUTER NETWORK, MITRE CORP., WASHINGTON, DC, 8 MAY 72, MC MP-9845, AF F19628-71-C-0002, 5AP, 5 REFS
(ANNOTATION UNDER 2.1.4)

URANO, YOSHIYORI, KINJI ONO, SEIICHI INOUE, OPTIMAL DESIGN OF DISTRIBUTED NETWORKS, (KOKUSAI DENSHIN DENWA CO. LTD., TOKYO, (JAPAN)).
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 197A, P 413-420, 9 REFS

THE PAPER PRESENTS TWO NETWORK DESIGN PROBLEMS INVOLVED WITH FILE SHARING: ONE ON A PUBLIC DATA NETWORK AND THE OTHER A PRIVATELY OWNED NETWORK COMPOSED OF LEASED LINES. DESIGN MODELS ARE MATHEMATICALLY DERIVED. THE AUTHORS SUPPORT FURTHER EXAMINATION OF ALGORITHMIC DESIGN FOR SIGNIFICANT PROGRESS IN THE DEVELOPMENT OF COMPUTER NETWORKS.

VERMA, P. K., A. M. RYBEZYNSKI, THE ECONOMICS OF SEGREGATED AND INTEGRATED SYSTEMS IN DATA COMMUNICATION WITH GEOMETRICALLY DISTRIBUTED MESSAGE LENGTHS, (BELL CANADA COMPUTER COMMUNICATIONS, OTTAWA),
DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-AC, P 3B-43, 7 REFS

INTEGRATING TWO DIFFERENT MESSAGE SWITCHING SYSTEMS INTO ONE WITH THE RESULTANT INTEGRATED SYSTEM HAVING THE COMBINED CHANNEL CAPACITY NEED NOT NECESSARILY RESULT IN IMPROVED PERFORMANCE.
THIS PAPER PRESENTS AN ALGORITHM WHICH IT CLAIMS CAN BE USED TO ESTABLISH THE RELATIVE SUPERIORITY OF A SEGREGATED OR INTEGRATED SYSTEM FOR GEOMETRICALLY DISTRIBUTED MESSAGE LENGTHS.

WHITE, LEE J., OPTIMUM CONCENTRATOR LOCATION IN TELECOMMUNICATIONS DESIGN, (OHIO, STATE UNIV. OF, COLUMBUS),
1972 PROCEEDINGS OF THE ACM, VOLUME I, (BOSTON, MA, AUGUST 1972), ASSOCIATION FOR COMPUTING MACHINERY, NEW YORK, 1972, P 53A-5A2, 15 REFS

A MATHEMATICAL ANALYSIS OF THE ALLOCATION OF CONCENTRATORS IN A NETWORK IS PRESENTED. A GENERAL MODEL FOR ANALYSIS BASED ON A STAR SUBGRAPH IS PROPOSED.

WILKOV, ROBERT S., ANALYSIS AND DESIGN OF RELIABLE COMPUTER NETWORKS, (INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY, THOMAS J. WATSON RESEARCH CENTER),
IEEE TRANSACTIONS ON COMMUNICATIONS, VOL COM-20, ISSUE 3, JUN 72, P 660-678, 86 REFS

THIS IS A SURVEY OF CURRENT RESEARCH IN GRAPH THEORY APPLIED TO CHARACTERIZE COMPUTER NETWORK RELIABILITY. SIGNIFICANT RELIABILITY CRITERIA AND THEIR RELEVANCE TO DIFFERENT APPLICATIONS ARE DISCUSSED AND THE DIFFICULTIES AND LIMITATIONS ASSOCIATED WITH EACH RELIABILITY MEASURE ARE INDICATED.

ZEIGLER, JACK F., LEONARD KLEINROCK, NODAL BLOCKING IN LARGE NETWORKS, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE),
BLACKER, HARRY L., IEEE INTERNATIONAL CONFERENCE ON COMMUNICATIONS, VOLUME 7, (MONTREAL, (CANADA), JUNE 14-16, 1971), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1971, IEEE CAT-71C2B-COM, (LC 6A-23226), P 39-9--39-15, 1D REFS
(ANNOTATION UNDER 2.1.A)

ZEIGLER, JACK F., NOCAL BLOCKING IN LARGE NETWORKS, CALIFORNIA, UNIV. OF, LOS ANGELES, COMPUTER SYSTEMS MODELING AND ANALYSIS GROUP, OCT 71, CU-CSMAG ENG-7167, DAHC 15-69-C-0285, 152P, 27 REFS

NODAL BLOCKING (THE SATURATION OF REASSEMBLY OR STORE-AND-FORWARD BUFFERS IN INTERMEDIATE OR DESTINATION PROCESSORS) IN LARGE NETWORKS IS DISCUSSED RELATIVE TO THE ARPANET. A MARKOVIAN NETWORK MODEL IS DEVELOPED TO PREDICT THE FRACTION OF BLOCKED NODES IN A LARGE-SCALE STORE-AND-FORWARD NETWORK.

2.1.3 ROUTING

AGNEW, CARSON E., ON THE OPTIMALITY OF ADAPTIVE ROUTING ALGORITHMS, (STANFORD, UNIV. OF, CA),
IEEE 197A NATIONAL TELECOMMUNICATIONS CONFERENCE, (SAN DIEGO, CA, DECEMBER 2-4, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 197A, IEEE P-74CH09D2-7-CSCB, (LC 57-2D724), P 1021-1025, 12 REFS

TWO ANALYTIC MODELS OF A STORE-AND-FORWARD COMMUNICATIONS NETWORK ARE CONSTRUCTED, ONE TO FIND THE OPTIMAL MESSAGE ROUTING AND THE OTHER TO ILLUSTRATE THE EQUILIBRIUM MAINTAINED BY AN ADAPTIVE ROUTING ALGORITHM.
MATHEMATICAL MANIPULATION OF THE MODELS DEMONSTRATES THAT ADAPTIVE ROUTING DOES NOT SATISFY THE NECESSARY CONDITIONS FOR AN OPTIMAL ROUTING. ADAPTIVE ROUTING TENDS TO OVERUSE THE MOST DIRECT PATH AND UNDERUSE ALTERNATE ROUTES BECAUSE IT DOES NOT CONSIDER THE IMPACT OF ITS CURRENT ROUTING DECISION ON THE FUTURE OF THE NETWORK.

BARAN, PAUL, ON DISTRIBUTED COMMUNICATIONS: IV. PRIORITY, PRECEDENCE, AND OVERLOAD, RAND CORP., SANTA MONICA, CA, AUG 64, RC RM-363B-PR, AF 49(638)-700, (AD-4AA B40), 63P, 6 REFS

THIS REPORT PRESENTS A DETAILED DISCUSSION OF THE DESIGN OF A DISTRIBUTED MESSAGE-SWITCHED NETWORK UNDER OVERLOAD CONDITIONS. THE GOAL IS TO DETERMINE THE EFFECTS OF PRIORITY SCHEMES TO REDUCE LOAD, YET ALLOW IMPORTANT TRAFFIC TO PASS IN AN OVERLOADED NETWORK.

BARAN, PAUL, ON DISTRIBUTED COMMUNICATIONS: V. HISTORY, ALTERNATIVE APPROACHES, AND COMPARISONS, RAND CORP., SANTA MONICA, CA, AUG 64, RC RM-3097-PR, AF A9(638)-700, (AD-44A B3B), 51P, 6 REFS

BARAN DESCRIBES AND COMPARES SEVERAL ROUTING STRATEGIES FOR DISTRIBUTED MESSAGE SWITCHED NETWORKS. HE DISCUSSES THE DIFFICULTY OF DIFFERENTIATING BETWEEN MESSAGE AND CIRCUIT SWITCHED NETWORKS.

CANTOR, DAVID G., MARIO GERLA, OPTIMAL ROUTING IN A PACKET-SWITCHED COMPUTER NETWORK, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF MATHEMATICS, NETWORK ANALYSIS CORP., GLEN COVE, NY),
IEEE TRANSACTIONS ON COMPUTERS, VOL C-23, ISSUE 10, OCT 74, P 1062-1069, 22 REFS

THE PROBLEM OF FINDING OPTIMAL ROUTES IN A PACKET-SWITCHED COMPUTER NETWORK CAN BE FORMULATED AS A NONLINEAR MULTICOMMODITY FLOW PROBLEM.
PRESENTED HERE IS A METHOD WHICH IS BASED ON DECOMPOSITION TECHNIQUES. THIS METHOD WAS ORIGINALLY DEVELOPED FOR A COMPUTER NETWORK APPLICATION AND CAN BE EXTENDED TO A VARIETY OF CONVEX MULTICOMMODITY FLOW PROBLEMS.

CEGRELL, TORSTEN, A ROUTING PROCEDURE FOR THE TIDAS MESSAGE-SWITCHING NETWORK, (ASEA LME AUTOMATION AB, VASTERAS, (SWEDEN)),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 197A, P 253-262, 10 REFS

THIS PAPER DEALS WITH A TOTALLY INTEGRATED DATA ACQUISITION AND TRANSMISSION SYSTEM WHICH COVERS ALL OF SWEDEN. THE SYSTEM, UNDER CONSTRUCTION AT THE TIME THIS PAPER WAS SUBMITTED, CONTAINS A DISTRIBUTED COMPUTER-COMMUNICATION NETWORK AT ITS CENTER. AN INVESTIGATION OF SOME ROUTING METHODS SUITABLE FOR THIS NETWORK IS PRESENTED. THE NETWORK IS OF THE STORE AND FORWARD MESSAGE-SWITCHING VARIETY.

DAVIES, D. W., THE CONTROL OF CONGESTION IN PACKET SWITCHING NETWORKS, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND)), JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 46-49, 2 REFS

THE CONCEPT OF CONGESTION PREVENTION IN A PACKET-SWITCHING NETWORK THROUGH 'ISARITHMIC' OPERATION IS INTRODUCED AND ANALYZED. THIS TERM IS USED TO REFER TO THE TECHNIQUE OF HOLDING CONSTANT THE NUMBER OF PACKETS IN THE NETWORK.

2.1.3 ROUTING

WHEN DATA CARRYING PACKETS ARRIVE AT A DESTINATION, THEY ARE REPLACED BY EMPTY PACKETS WHICH ARE PUT BACK (NTO THE NETWORK. WHEN DATA IS TO BE ENTERED INTO THE NETWORK, AN EMPTY PACKET IS FOUND AND REPLACED BY A DATA PACKET.

FULTZ, GARY LEE, ADAPTIVE ROUTING TECHNIQUES FOR MESSAGE SWITCHING COMPUTER-COMMUNICATION NETWORKS, CALIFORNIA, UNIV. OF, LOS ANGELES, SCHOOL OF ENGINEERING AND APPLIED SCIENCE, JUL 72, COMPUTER SYSTEMS MODELING AND ANALYSIS GROUP REPORT SERIES, CU-SEAS ENG-7252, OAHC 15-69-C-0285, 418P., 131 REFS

ADAPTIVE ROUTING TECHNIQUES APPLICABLE TO MESSAGE SWITCHING COMPUTER-COMMUNICATION NETWORKS, SUCH AS THE ARPA NETWORK, ARE CONSIDERED IN THIS REPORT. EMPHASIS IS ON THE PREDICTION OF AVERAGE MESSAGE DELAY AND THE SPECIFICATION, IMPLEMENTATION AND EVALUATION OF VARIOUS CLASSES OF MESSAGE ROUTING PROCEDURES. A MODEL OF A MESSAGE SWITCHING NETWORK IS UTILIZED AS THE BASIS FOR A SIMULATION PROGRAM TO OBTAIN THE PERFORMANCE OF SPECIFIC ROUTING ALGORITHMS. A METHODOLOGY FOR INVESTIGATING MESSAGE ROUTING STRATEGIES (S DEVELOPED AND ROUT(NG TECHNIQUES ARE CLASSIFIED.

FULTZ, GARY L., LEONARD KLEINROCK, ADAPTIVE ROUTING TECHNIQUES FOR STORE-AND-FORWARD COMPUTER-COMMUNICATION NETWORKS, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE), BLACKER, HARRY L., IEEE INTERNATIONAL CONFERENCE ON COMMUNICATIONS, VOLUME 7, (MONTREAL, (CANADA), JUNE 14-16, 1971), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1971, IEEE CAT-71C28-COM, (LC 64-23226), P 39-1 - 39-8, 17 REFS

THIS PAPER DESCRIBES A STUDY MADE OF ROUTING TECHNIQUES APPLICABLE TO STORE-AND-FORWARD COMPUTER NETWORKS. IT SHOWS THE IMPORTANCE OF THE ROUTING TECHNIQUES IN RELATION TO THE DESIGN AND PERFORMANCE OF NETWORKS. A NUMBER OF ROUTING TECHNIQUES ARE COMPARED USING THE AVERAGE MESSAGE DELAY AS THE MEASURE OF NETWORK PERFORMANCE.
(ALSO UNDER 2.2)

GERLA, MARIO, DETERMINISTIC AND ADAPTIVE ROUTING POLICIES IN PACKET-SWITCHED COMPUTER NETWORKS, (NETWORK ANALYSIS CORP., GLEN COVE, NY), DATA NETWORKS: ANALYSIS AND DES(GN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CHOB28-4C, P 23-28, 13 REFS

EFFICIENT ROUTING POLICIES ARE REQUIRED FOR BOTH THE DESIGN AND OPERATION OF DISTRIBUTED, PACKET-SWITCHED COMPUTER NETWORKS. THE AUTHOR DESCRIBES TWO MAIN CLASSES OF ROUTING POLICIES. IN THE DESIGN PROCESS, DETERMINISTIC POLICIES ARE GENERALLY USED; FOR THE ROUTING OF PACKETS IN A REAL NETWORK ADAPTIVE POLICIES ARE IMPLEMENTED. THE TWO POLICIES ARE COMPARED USING ANALYTICAL AND SIMULATION METHODS. A NEW CENTRALIZED ADAPTIVE POLICY IS PROPOSED WHICH COMBINES THE POSITIVE FEATURES OF BOTH DETERM(NISTIC AND ADAPTIVE ROUTING.

GERLA, M., W. CHOU, FLOW CONTROL STRATEGIES IN PACKET SWITCHED COMPUTER NETWORKS, (NETWORK ANALYSIS CORP., GLEN COVE, NY), (EEE 1974 NATIONAL TELECOMMUNICATIONS CONFERENCE, (SAN DIEGO, CA, DECEMBER 2-4, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE P-74CH0902-7-CSCB, (LC 57-20724), P 1032-1038, 8 REFS

FLOW CONTROL STRATEGIES ARE THE ENSEMBLE OF CONTROL PROCEDURES IN A NETWORK THAT REGULATE INPUT RATES AND THUS PREVENT NETWORK CONGESTION. THIS PAPER REPRESENTS A PRELIMINARY EFFORT IN THE DEVELOPMENT OF GENERAL MODELS FOR THE CLASSIFICATION AND EVALUATION OF DIFFERENT FLOW CONTROL STRATEGIES. IN PARTICULAR, EXISTING AND PROPOSED FLOW CONTROL TECHNIQUES ARE REVIEWED, AND DIRECTIONS FOR FUTURE RESEARCH ARE (NDICATED.
TWO DIFFERENT TYPES OF FLOW CONTROL ARE DISTINGUISHED: REASSEMBLY CONTROL AND STORE AND FORWARD (S/F) CONTROL. CLEAR EXPLANATIONS SHOW THE DIFFERENT PROBLEMS EACH TECHNIQUE ADDRESSES AND ESTABLISH THE NEED FOR EACH TYPE OF CONTROL IN MODERN NETWORKS. THE RELATIONSHIP BETWEEN CONTROL TECHNIQUE AND PERFORMANCE IN A NETWORK IS ALSO CLEARLY ILLUSTRATED WITH AN ARPANET EXAMPLE. THIS PAPER SHOULD BE REQUIRED READING FOR ANYONE SEEKING AN INTRODUCTION TO FLOW CONTROL PRINCIPLES.

JILEK, PETER, FLOW CONTROL IN COMPUTER NETWORKS, (SIEMENS AG, MUNICH, (WEST GERMANY)), THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 239-247, 2 REFS

DISCUSSED IS A METHOD TO CONTROL THE FLOW OF MESSAGES IN A COMPUTER NETWORK. AN ALGORITHM IS PROPOSED WHICH MODULO CONTROLS THE FLOW OF DATA IN SUCH A WAY THAT THE RESOURCES OF THE COMMUNICATION SUBNET ARE USED ECONOMICALLY AND A GOOD COMPROMISE IS ACHIEVED BETWEEN THE REQUIREMENTS OF SHORT TRANSPORT DELAYS FOR INTERACTIVE MESSAGES AND HIGH THROUGHPUT EFFICIENCY FOR BATCH MESSAGES.

KLEINROCK, LEONARD, HOLGER OPDERBECK, THROUGHPUT IN THE ARPANET - PROTOCOLS AND MEASUREMENT, (CALIFORNIA, UN(V. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE, TELENET CORP., WASHINGTON, DC), FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000I-7-DATA, P 6-I--6-11, 13 REFS

ASSERTING THAT THE SPEED WITH WHICH LARGE FILES CAN BE TRANSMITTED THROUGH A COMPUTER NETWORK IS AN IMPORTANT PERFORMANCE MEASUREMENT OF THAT NETWORK, THIS PAPER EXAMINES THE ACHIEVABLE SUSTAINED THROUGHPUT IN THE ARPANET, MESSAGE-HANDLING PROTOCOLS ARE ALSO DESCRIBED.
(ALSO UNDER 3.5.1, 2.2)

NAYLOR, WILLIAM E., A LOOP-FREE ADAPTIVE ROUTING ALGORITHM FOR PACKET SWITCHED NETWORKS, (CALIFORNIA, UN(V. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE), FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLV(NG OPERATIONAL ENVIRONMENT, (QUEBEC C(TY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000I-7-DATA, P 7-9--7-14, 11 REFS

THE MAIN EMPHASIS OF THIS PAPER IS TO PRESENT A ROUTING ALGORITHM AND PROVE THAT IT IS LOOP-FREE. THE ALGORITHM PRESENTED IS PARTICULARLY DESIGNED FOR THE ARPANET, BUT THE AUTHOR STATES THAT ITS ESSENTIAL PROPERTIES ARE TRANSFERABLE TO OTHER PACKET-SWITCHED NETWORKS.

OPDERBECK, HOLGER, LEONARD KLEINROCK, THE INFLUENCE OF CONTROL PROCEDURES ON THE PERFORMANCE OF PACKET-SWITCHED NETWORKS, (CALIFORNIA, UNIV. OF, LOS ANGELES), IEEE 1974 NATIONAL TELECOMMUNICATIONS CONFERENCE, (SAN DIEGO, CA, DECEMBER 2-4, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE P-74CH0902-7-CSCB, (LC 57-20724), P B10-B17, 13 REFS
(ANNOTATION UNDER 2.1.2)

PICKHOLTZ, RAYMOND L., CALDWELL MCCOY, JR., IMPROVEMENTS IN ROUTING IN A PACKET-SWITCHED NETWORK, (GEORGE WASHINGTON UNIV., WASHINGTON, DC, NAVAL RESEARCH LAB., WASHINGTON, DC), THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 249-252, 8 REFS

THIS PAPER ADDRESSES SOME COMPARISONS OF ADAPTIVE ROUTING ALGORITHMS IN STORE-AND-FORWARD COMMUNICAT(ON NETWORKS. THE CONCERN HERE IS TO DEMONSTRATE HOW SOME RELATIVELY SIMPLE ADD-ONS TO EXISTING ADAPTIVE ALGOR(THMS CAN DECREASE AVERAGE MESSAGE DELAY AND INCREASE MESSAGE THROUGHPUT IN THE NETWORK.

POLLACK, M., MESSAGE ROUTE CONTROL IN A LARGE TELETYPE NETWORK,(PRESENTED AT, SYMPOSIUM ON 'OPTIMUM ROUTING (N LARGE NETWORKS' (IFIP CONGRESS 62), MUNICH, (GERMANY), AUGUST 27-SEPTEMBER 1,1962), (PLANN(NG RESEARCH CORP., LOS ANGELES, CA), JOURNAL OF THE ASSOCIATION FOR COMPUTING MACHINERY, VOL 11, ISSUE 1, JAN 64, P 104-116, 5 REFS

REAL-TIME METHODS FOR OBTAINING OPTIMAL TRAFFIC ROUTES FOR DIRECTED NETWORKS ARE DETAILED. THE THREE METHODS PRESENTED, ALL UTILIZING DIGITAL COMPUTERS, ARE THE LINK-FLOW METHOD, THE ROUTE-FLOW METHOD, AND THE NEAREST-NEIGHBOR METHOD. THE ADVANTAGES OF THE THIRD METHOD FOR LARGER NETWORKS ARE DISCUSSED.

PRICE, WYN L., SIMULATION STUDIES OF AN ISARITHMICALLY CONTROLLED STORE AND FORWARD DATA COMMUNICATION NETWORK, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND)), ROSENFELD, JACK L., INFORMATION PROCESSING 74, PROCEEDINGS OF IFIP CONGRESS 74, I, COMPUTER HARDWARE AND ARCHITECTURE, (STOCKHOLM, (SWEDEN), AUGUST 5-10, 1974), AMERICAN ELSEVIER PUBLISHING CO. INC., NEW YORK, 1974, P 151-154, 6 REFS

THE PRINCIPLE OF ISARITHMIC FLOW CONTROL OF DATA TRAFFIC IN STORE AND FORWARD NETWORKS IS DESCRIBED AND THE RESULTS OF A SERIES OF SIMULATION EXPERIMENTS ARE DISCUSSED.
(ALSO UNDER 2.1.1)

PRICE, W. L., DESIGN OF DATA COMMUNICATION NETWORKS USING SIMULATION TECHNIQUES,(PRESENTED AT, NETWORK DESIGN SYMPOSIUM, EDINBURGH, (SCOTLAND), MARCH 18, 1974), (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND)),

2.1.3 ROUTING

COMPUTER AIDED DESIGN, VOL 6, ISSUE 3, JUL 74, P 171-175, 21 REFS
(ANNOTATION UNDER 3.2.2)

PROSSER, REESE T., ROUTING PROCEDURES IN COMMUNICATIONS NETWORKS--PART II: DIRECTORY PROCEDURES, (MASSACHUSETTS INST. OF TECH., LEXINGTON, LINCOLN LAB.),
IRE TRANSACTIONS ON COMMUNICATIONS SYSTEMS, VOL CS-10, ISSUE 4, DEC 62, P 329-335, 8 REFS

SEE ANNOTATION FOR PART I OF THIS 2-PART ARTICLE.

PROSSER, REESE T., ROUTING PROCEDURES IN COMMUNICATIONS NETWORKS--PART I: RANDOM PROCEDURES, (MASSACHUSETTS INST. OF TECH., LEXINGTON, LINCOLN LAB.),
IRE TRANSACTIONS ON COMMUNICATIONS SYSTEMS, VOL CS-10, ISSUE 4, DEC 62, P 322-329, 6 REFS

THIS REPORT REPRESENTS A STUDY OF POSSIBLE ROUTING PROCEDURES IN A MILITARY COMMUNICATION NETWORK IN ORDER TO EVALUATE THE PROCEDURES IN TERMS OF FUTURE TACTICAL REQUIREMENTS. ESTIMATES OF THE AVERAGE TRAVERSE TIME OF EACH MESSAGE AND AVERAGE TRAFFIC FLOW THROUGH EACH NODE ARE DERIVED BY STATISTICAL METHODS. PART ONE IS DEVOTED TO ROUTING PROCEDURES INVOLVING RANDOM SELECTION AND PART TWO TO PROCEDURES DETERMINED BY DIRECTORY INFORMATION. THE ADVANTAGES OF THE DIRECTORY PROCEDURES ARE EXPRESSED QUANTITATIVELY BY RESULTS OBTAINED IN A LARGE-SCALE SIMULATION EXPERIMENT. THE PROCEDURES ARE STATED TO BE APPLICABLE TO A MILITARY COMMUNICATIONS SYSTEM SUITABLE FOR COMBAT UNITS OPERATING IN A HOSTILE ENVIRONMENT./

SCHWARTZ, MISCHA, CASTERET K. CHEUNG, THE GRADIENT PROJECTION ALGORITHM FOR MULTIPLE ROUTING IN MESSAGE-SWITCHED NETWORKS, (COLUMBIA UNIV., NEW YORK, DEPT. OF ELECTRICAL ENGINEERING, POLYTECHNIC INST. OF NEW YORK, BROOKLYN, DEPT. OF ELECTRICAL ENGINEERING AND ELECTROPHYSICS),
FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000I-7-DATA, P 6-19--6-25, 5 REFS

VARIOUS ALGORITHMS HAVE BEEN PROPOSED FOR DETERMINING THE ROUTING PATHS DESIGNED TO MINIMIZE THE AVERAGE OVERALL MESSAGE TIME DELAY IN MESSAGE-SWITCHED NETWORKS. THIS PAPER DESCRIBES THE APPLICATION OF THE GRADIENT PROJECTION ALGORITHM TO THIS PROBLEM.
EXECUTION TIMES FOR EXAMPLE NETWORKS ARE GIVEN. INCLUDED ARE 10-NODE ARPA-TYPE DISTRIBUTED NETWORKS WITH VARYING COMMODITIES.

SEGALL, ADRIAN, NEW ANALYTICAL MODELS FOR DYNAMIC ROUTING IN COMPUTER NETWORKS, (MASSACHUSETTS INST. OF TECH., CAMBRIDGE, DEPT. OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE),
NATIONAL TELECOMMUNICATIONS CONFERENCE, CONFERENCE RECORD, VOLUME 2, (NEW ORLEANS, LA, DECEMBER 1-3, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH-1015-7-CSCB, (LC 57-20724), P 27-1--27-5, 6 REFS

NEW MODELS FOR OPTIMAL DYNAMIC ROUTING IN A STORE-AND-FORWARD DATA COMMUNICATION NETWORK ARE DESCRIBED. THESE MODELS ELIMINATE THE NECESSITY FOR EXPLICITLY CALCULATING DELAYS AND OTHER QUALITIES. IN ADDITION THESE MODELS NATURALLY ACCOMODATE CLOSED-LOOP CONTROL THAT CHANGES THE ROUTING STRATEGY ACCORDING TO THE NETWORK CONGESTION.

2.1.4 MODELLING

BALACHANDRAN, V., J. W. MCCREDIE, O. I. MIKHAIL, MODELS OF THE JOB ALLOCATION PROBLEM IN COMPUTER NETWORKS, (CARNEGIE-MELLON UNIV., PITTSBURGH, PA, DEPT. OF COMPUTER SCIENCE AND GRADUATE SCHOOL OF INDUSTRIAL ADMINISTRATION),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 211-214, 6 REFS
(ANNOTATION UNDER 2.1.1)

BROWN, RICHARD D., MODEL FOR EXAMINING ROUTING DOCTRINE IN STORE-AND-FORWARD COMMUNICATION NETWORKS, AIR FORCE INST. OF TECH., WRIGHT-PATTERSON AFB, OH, SCHOOL OF SYSTEMS AND LOGISTICS, JUL 69, AFIT-SSL SLSR-11-69, (AD-863 838), 79P, 63 REFS

A LINEAR PROGRAMMING MODEL IS FORMULATED FOR EXAMINING ROUTING DOCTRINE IN STORE-AND-FORWARD COMMUNICATIONS NETWORKS. GENERAL CONCEPTS OF STORE-AND-FORWARD COMMUNICATIONS ARE DISCUSSED. VARIOUS OPTIONS OF CONSTRAINT, VARIABLES, OBJECTIVE FUNCTIONS AND LIMITATIONS OF THE MODEL ARE PRESENTED.

BRYANT, SUSAN, PAN G. YATRAKIS, AN ECONOMIC MODEL OF TWO-WAY BROADBAND NETWORKS, (GTE LABS, INC., WALTHAM, MA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 89-92

AN ECONOMIC SIMULATION MODEL OF TWO-WAY BROADBAND AND INTEGRATED (BROADBAND/TELEPHONE) LOCAL COMMUNICATION NETWORKS IS DESCRIBED IN THIS PAPER. THE MODEL CONSIDERS SOCIO-ECONOMIC AND DEMOGRAPHIC PROJECTIONS OF THE COMMUNITY, DESIGN PARAMETERS, COST, TECHNOLOGICAL ADVANCES AND DEMAND PROJECTIONS.
(ALSO UNDER 1.6)

BURDET, CLAUDE-ALAIN, OSAMA MIKHAIL, MINIMAL COST NETWORK OF COMPUTER SYSTEMS UNDER ECONOMIES-OF-SCALE, (CARNEGIE-MELLON UNIV., PITTSBURGH, PA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 155-157, 6 REFS

THE EFFECTS OF ECONOMIES-OF-SCALE ON THE LOCATION AND ALLOCATION OF COMPUTING CAPACITY IN A COMPUTER NETWORK FOR A GEOGRAPHICALLY DISPERSED ORGANIZATION ARE STUDIED IN THIS PAPER. A STATIC MODEL AND A DYNAMIC MODEL ARE FORMULATED.

CADY, GEORGE M., GUNTHER LUTHER, TRADE-OFF STUDIES IN COMPUTER NETWORKS, (SYSTEM DEVELOPMENT CORP., SANTA MONICA, CA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 147-150, 5 REFS

THE CACTOS (COMPUTATION AND COMMUNICATION TRADE-OFF STUDY) PROGRAM WAS ESTABLISHED TO DETERMINE HOW AN AGENCY COULD MEET FUTURE COMPUTATIONAL REQUIREMENTS. THE CACTOS MODEL WAS DEVELOPED TO ANALYTICALLY MODEL THE BEHAVIOR OF COMPUTER NETWORKS AND HELP ESTABLISH GUIDELINES FOR THE DESIGN OF COST EFFECTIVE COMPUTER NETWORKS. THE CACTOS MODEL AND SOME RESULTS WITH THE MODEL ARE DESCRIBED IN THIS PAPER.
(ALSO UNDER 2.1.1)

CADY, GEORGE M., COMPUTATION AND COMMUNICATION TRADE-OFF STUDIES: AN ANALYTICAL MODEL OF COMPUTER NETWORKS, (SYSTEM DEVELOPMENT CORP., SANTA MONICA, CA),
1972 WESCON TECHNICAL PAPERS, SESSION 7: COMPUTER NETWORKS, (PRESENTED AT, WESTERN ELECTRONIC SHOW AND CONVENTION, SEPTEMBER 19-22, 1972), 1972, P 7-2-1--7-2-12, 7 REFS

THIS PAPER DISCUSSES THE NEED FOR QUANTITATIVE MODELING OF COMPUTER NETWORKS AND PRESENTS AN APPROACH TO THE CONSTRUCTION OF AN ANALYTICAL MODEL OF COMPUTER NETWORK PERFORMANCE. THE AUTHOR SUGGESTS THAT THE MODEL WILL BE A USEFUL TOOL IN THE EVALUATION OF PROPOSED CHANGES TO EXISTING NETWORKS, AS AN AID IN THE DESIGN OF NEW NETWORKS, AND IN UNDERSTANDING THE BEHAVIOR OF COMPUTER NETWORKS IN MORE GENERAL WAYS.

CASEY, R. G., ALLOCATION OF COPIES OF A FILE IN AN INFORMATION NETWORK, (INTERNATIONAL BUSINESS MACHINES CORP., SAN JOSE, CA),
AFIPS CONFERENCE, 1972 SPRING JOINT COMPUTER CONFERENCE, VOLUME 40, (ATLANTIC CITY, NJ, MAY 16-18, 1972), AFIPS PRESS, MONTVALE, NJ, 1972, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 617-625, 7 REFS
(ANNOTATION UNDER 2.1.2)

CASEY, R. G., DESIGN OF TREE NETWORKS FOR DISTRIBUTED DATA, (INTERNATIONAL BUSINESS MACHINES CORP., SAN JOSE, CA),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 42, 1973, NATIONAL COMPUTER CONFERENCE AND EXPOSITION, (NEW YORK, NY, JUNE 4-8, 1973), AFIPS PRESS, MONTVALE, NJ, 1973, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 251-257, 15 REFS

A SIMPLIFIED MODEL WITH FEATURES SUCH AS DISCRETE CAPACITY ASSIGNMENT, ECONOMY OF SCALE, AND DISTINCTION BETWEEN QUERY AND UPDATE TRANSACTIONS HAS BEEN DEVELOPED FOR THE PROBLEM OF LOCATING INFORMATION RESOURCES AND CHOOSING A TOPOLOGY FOR A NETWORK OF DISTRIBUTED DATA FILES. A SAMPLE ALGORITHM HAS BEEN FORMULATED FOR THE CASE OF TREE DESIGN. A DESCRIPTION IS GIVEN OF THE MODEL, TREE DESIGN, NETWORK DESIGN PROCEDURE AND EXPERIMENTS WITH THE ALGORITHM.

2.1.4 MODELLING

CERF, V. G., D. D. COWAN, R. C. MULLIN, R. G. STANTON, TOPOLOGICAL DESIGN CONSIDERATIONS IN COMPUTER COMMUNICATION NETWORKS,
COMPUTER COMMUNICATION NETWORKS, SELECTED PAPERS, (PRESENTED AT, UNIV, OF SUSSEX, BRIGHTON, (ENGLAND),), 1973, P 01-018,
(ANNOTATION UNDER 2.1.1)

CHOU, WUSHOW, PATRICK V. MCGREGOR, A UNIFIED SIMULATION MODEL FOR COMMUNICATION PROCESSORS, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
PROCEEDINGS OF THE 1975 SYMPOSIUM-COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, JUNE 18, 1975),
INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, 75CH0973-8C, P 40-46, 18 REFS
(ANNOTATION UNDER 2.1.1)

CHU, WESLEY W., OPTIMAL FILE ALLOCATION IN A COMPUTER NETWORK, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE),
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973,
COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 82-94, 8 REFS

THE PROBLEM OF SHARED USAGE OF LARGE INFORMATION FILES VIA INTERCONNECTED COMPUTERS IS ADDRESSED. THE AUTHOR INTRODUCES A MODEL WHICH PROVIDES A COMMON DENOMINATOR FOR ANALYSIS AND COMPARISON OF VARIOUS PROPOSED INFORMATION SYSTEM CONFIGURATIONS, A TOOL TO STUDY THE SENSITIVITY OF VARIOUS PARAMETERS AND CONSTRAINTS TO THE OPERATING COST, AND A METHOD FOR EVALUATING THE GROWTH POTENTIAL OF INFORMATION SYSTEMS.
(ALSO UNDER 2.1.2)

CRAIG, L. J., I. S. REED, OVERLAPPING TESSELLATED COMMUNICATIONS NETWORKS, RAND CORP., SANTA MONICA, CA, DEPT. OF COMPUTER SCIENCES, RAND CORP., SANTA MONICA, CA, DEPT. OF ELECTRONICS, 13 JUN 61, RC P-2359, (AD-676 259), 18P

THIS PAPER INVESTIGATES BANDWIDTH REQUIREMENTS FOR 'MOSAIC' NETWORKS. FOR THE MATHEMATICAL MODEL USED IT IS ASSUMED THAT THE NODES PERFORM A SWITCHING FUNCTION AND THAT NO STORE-AND-FORWARD FACILITIES EXIST.
(ALSO UNDER 2.1.2)

ELSPAS, B., J. GOLDBERG, R. A. SHORT, H. S. STONE, INVESTIGATION OF PROPAGATION-LIMITED COMPUTER NETWORKS, STANFORD RESEARCH INST., MENLO PARK, CA, JUL 65, SRI 4523, AF 19(628)-2902, (AD-621 039), 203P, 30 REFS

THIS REPORT DETAILS THE MODELING TECHNIQUES USED FOR THE ANALYSIS, ORGANIZATION, AND DESIGN OF LOGICAL NETWORKS IN WHICH PROPAGATION DELAYS ON THE LINES CONNECTING THE NODES OF THE NETWORK ARE APPRECIABLE COMPARED TO DELAYS WITHIN THE NODES. TECHNIQUES FOR EMBEDDING NONPROPAGATION-LIMITED NETWORKS WITHIN PROPAGATION-LIMITED NETWORKS ARE DEVELOPED AND GRAPHICAL MODELS OF PROPAGATION-LIMITED NETWORKS ARE DESIGNED.

FERGUSON, MICHAEL J., A STUDY OF UNSLOTTED ALOHA WITH ARBITRARY MESSAGE LENGTHS, (HAWAII, UNIV. OF, HONOLULU, MCGILL UNIV., MONTREAL, (CANADA)),
FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000-7-DATA, P S-2D--S-2S, 5 REFS
(ANNOTATION UNDER 2.1.2)

FRANK, HOWARD, I. T. FRISCH, W. CHOU, TOPOLOGICAL CONSIDERATIONS IN THE DESIGN OF THE ARPA COMPUTER NETWORK,
(NETWORK ANALYSIS CORP., GLEN COVE, NY),
AFIPS PROCEEDINGS, 1970 SPRING JOINT COMPUTER CONFERENCE, VOLUME 36, (ATLANTIC CITY, NJ, MAY 5-7, 1970), AFIPS PRESS, MONTVALE, NJ, 1970, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P SB1-SB7, 7 REFS

A BASIC DISCUSSION OF THE MODELING THAT IS PERFORMED IN THE TOPOLOGICAL DESIGN OF THE ARPA NETWORK IS PRESENTED. THE GOAL OF THE MODELING IS TO MINIMIZE THE COST/BIT TRANSMITTED WHILE SATISFYING NETWORK END-TO-END RESPONSE CRITERIA OF LESS THAN 0.2 SECOND FOR A SHORT MESSAGE UNDER PROJECTED NETWORK LOAD. DIFFICULTY IS ACKNOWLEDGED IN ESTIMATING TRAFFIC IN THE NETWORK AND REASONABLE ASSUMPTIONS ARE MADE. EMPHASIS IS PLACED ON THE EFFECT OF DIFFERENT CAPACITY COMMUNICATION CIRCUITS, AS PRESENTLY TARIFFED, ON OVERALL COST/BIT OF THE NETWORK APPROPRIATELY LOADED.

FRANK, HOWARD, WUSHOW CHOU, TOPOLOGICAL OPTIMIZATION OF COMPUTER NETWORKS, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
PROCEEDINGS OF THE IEEE, VOL 60, ISSUE 11, NOV 72, P 1385-1397, 59 REFS

MODELING, ANALYSIS, DESIGN PROBLEMS AND METHODOLOGIES ARE DISCUSSED FOR CENTRALIZED AND DISTRIBUTED COMPUTER-COMMUNICATION NETWORKS. OBJECTIVES WERE TO SPECIFY THE LOCATION AND CAPACITY OF EACH COMMUNICATION LINK AND TO PROVIDE A LOW-COST NETWORK, SATISFYING CONSTRAINTS ON RESPONSE TIME, THROUGHPUT AND RELIABILITY. NETWORK MODELS, STRUCTURES AND APPROACHES TO TOPOLOGICAL DESIGN ARE PRESENTED.
(ALSO UNDER 2.1.2)

FRANK, HOWARD, OPTIMAL DESIGN OF COMPUTER NETWORKS, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
RUSTIN, RANDALL, COURANT COMPUTER SCIENCE SYMPOSIUM 3, COMPUTER NETWORKS, (NOVEMBER 30-DECEMBER 1, 1970), PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1972, PRENTICE-HALL SERIES IN AUTOMATIC COMPUTATION, (LC 79-39373), P 167-183

THIS PAPER DISCUSSES PROCEDURES TO DEVELOP MINIMAL COST NETWORKS CAPABLE OF FULFILLING TRAFFIC AND MAXIMUM ALLOWABLE TIME DELAY REQUIREMENTS FOR BOTH CENTRALIZED AND DISTRIBUTED NETWORKS. THESE TECHNIQUES WERE APPLIED IN THE ARPANET DESIGN.
(ALSO UNDER 2.1.2)

FRIEDMAN, T. D., A SYSTEM OF APL FUNCTIONS TO STUDY COMPUTER NETWORKS, (INTERNATIONAL BUSINESS MACHINES CORP., SAN JOSE, CA, RESEARCH LAB.),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 42, 1973, NATIONAL COMPUTER CONFERENCE AND EXPOSITION, (NEW YORK, NY, JUNE 4-8, 1973), AFIPS PRESS, MONTVALE, NJ, 1973, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 141-148, 3 REFS
(ANNOTATION UNDER 2.1.2)

JACKSON, P. E., CHARLES D. STUBBS, A STUDY OF MULTIACCESS COMPUTER COMMUNICATIONS, (BELL TELEPHONE LABS, INC., HOLMDEL, NJ),
AFIPS PROCEEDINGS, 1969 SPRING JOINT COMPUTER CONFERENCE, VOLUME 34, (BOSTON, MA, MAY 14-16, 1969), AFIPS PRESS, MONTVALE, NJ, 1969, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 491-504, 13 REFS

A USEFUL MODEL OF MAN-COMPUTER DIALOGUE AND THE RESULTS OF DATA COLLECTED AND INTERPRETED RELATIVE TO THIS MODEL IS PRESENTED. A 'DATA STREAM MODEL' IS DEVELOPED TO INVESTIGATE HOLDING TIMES ACROSS DIFFERENT TYPES OF SYSTEMS IN RELATION TO USER/COMPUTER SEND TIMES, USER/COMPUTER IDLE TIMES, USER/COMPUTER DELAY TIMES AND COMMUNICATION BURST CHARACTERISTICS. INTERESTING CONCLUSIONS ARE DRAWN FOR THE SYSTEMS STUDIED AND THE MODEL IS APPLICABLE IN GENERAL TO USER-COMPUTER INTERACTIONS. THE MODEL IS SOMEWHAT LIMITED. THERE IS NO TREATMENT OF FULL DUPLEX, FOR EXAMPLE, BUT THE MODEL STILL DESERVES CAREFUL ATTENTION. ALL DESIGNERS OF INTERACTIVE REMOTE ACCESS SYSTEMS AND OF COMMUNICATIONS FACILITIES TO SUPPORT THEM SHOULD BE FAMILIAR WITH THIS MATERIAL.

KLEINROCK, LEONARD, FOUAD TOBAGI, RANDOM ACCESS TECHNIQUES FOR DATA TRANSMISSION OVER PACKET-SWITCHED RADIO CHANNELS,
(CALIFORNIA, UNIV. OF, LOS ANGELES),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 187-201, 17 REFS
(ANNOTATION UNDER 2.1.1)

KLEINROCK, LEONARD, SIMON S. LAM, PACKET-SWITCHING IN A SLOTTED SATELLITE CHANNEL, (CALIFORNIA, UNIV. OF, LOS ANGELES)
AFIPS CONFERENCE PROCEEDINGS, VOLUME 42, 1973, NATIONAL COMPUTER CONFERENCE AND EXPOSITION, (NEW YORK, NY, JUNE 4-8, 1973), AFIPS PRESS, MONTVALE, NJ, 1973, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 703-710, 13 REFS
(ANNOTATION UNDER 2.1)

LIPNER, S. B., P. MELANSON, COMPUTATION OF MESSAGE DELAYS IN A COMMUNICATIONS NETWORK, MITRE CORP., BEDFORD, MA, ID DEC 71, MC WP-4083, AF F19(628)-71-C-0002, 17P, 2 REFS
(ANNOTATION UNDER 2.1.2)

MITRANI, I., NETWORKS OF UNRELIABLE COMPUTERS, (NEWCASTLE-UPON-TYNE, UNIV. OF, (ENGLAND)),
GELENBE, EROL, ROBERT MAHL, COMPUTER ARCHITECTURES AND NETWORKS, MODELLING AND EVALUATION, (AUGUST 12-14, 1974),
AMERICAN ELSEVIER PUBLISHING CO. INC., NEW YORK, 1974, (LC 74-83728), P 359-374, 4 REFS

THIS PAPER IS CONCERNED WITH THE CONSTRUCTION AND ANALYSIS OF MODELS OF COMPUTER NETWORKS, TAKING INTO ACCOUNT THE FACT THAT AT SOME TIME IN THE LIFE OF EVERY COMPUTER SYSTEM THERE WILL BE PERIODS OF NON-OPERATION. HEAVILY LOADED AND NON-HEAVILY LOADED NETWORKS ARE CONSIDERED FROM DIFFERENT POINTS OF VIEW.

2.1.4 MODELLING

ROBERTS, LAWRENCE G., DYNAMIC ALLOCATION OF SATELLITE CAPACITY THROUGH PACKET RESERVATION, (DEPARTMENT OF DEFENSE, ARLINGTON, VA).
AFIPS CONFERENCE PROCEEDINGS, VOLUME 42, 1973, NATIONAL COMPUTER CONFERENCE AND EXPOSITION, (NEW YORK, NY, JUNE 4-8, 1973), AFIPS PRESS, MONTVALE, NJ, 1973, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 711-716, 10 REFS

A RESERVATION TECHNIQUE IS PRESENTED WHICH TAKES FULL ADVANTAGE OF THE MULTI-ACCESS CAPABILITIES OF SATELLITES FOR DATA TRAFFIC. A MODEL OF DATA TRAFFIC IS DEVELOPED AND THE RESERVATION TECHNIQUE IS COMPARED WITH THE ALOHA SYSTEM TECHNIQUE, TIME DIVISION MULTIPLE-ACCESS, AND FREQUENCY DIVISION MULTIPLEXING.
(ALSO UNDER 3.2.9)

SEGAL, M., A PREEMPTIVE PRIORITY MODEL WITH TWO CLASSES OF CUSTOMERS. (BELL TELEPHONE LABS. INC., HOLMDEL, NJ), JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71C59-C, P 168-174, 3 REFS

A MODEL OF A TRUNK GROUP SERVING VOICE AND DATA COMMUNICATIONS IS ANALYZED. THE MODEL SERVICES TWO KINDS OF CUSTOMERS: PRIMARY CUSTOMERS WHO RECEIVE PREEMPTIVE PRIORITY AND SECONDARY CUSTOMERS WHO ARE SERVED ONLY WHEN THE FACILITY IS NOT FULLY OCCUPIED BY PRIMARY CUSTOMERS. EXAMPLES ARE GIVEN OF THE EFFECT OF QUEUING OF SECONDARY CUSTOMERS.

SMITH, J. W., ON DISTRIBUTED COMMUNICATIONS: III. DETERMINATION OF PATH-LENGTHS IN A DISTRIBUTED NETWORK, RAND CORP., SANTA MONICA, CA, AUG 64, RC RM-3578-PR, AF 49(638)-700, (AD-444 833), 91P, 1 REFS

THIS IS A DETAILED DESCRIPTION OF MODELING A DISTRIBUTED MESSAGE-SWITCHED NETWORK UNDER HEAVY LOADING TO DETERMINE MESSAGE PATHS.

SPRAGINS, JOHN D., ANALYSIS OF LOOP TRANSMISSION SYSTEMS, (INTERNATIONAL BUSINESS MACHINES CORP., RALEIGH, NC), JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71C59-C, P 175-182, 7 REFS

AN ANALYTICAL MODEL OF A RING TRANSMISSION SYSTEM WITH RANDOM SLOT ASSIGNMENT AND FIXED SLOT SIZE IS DEVELOPED. IT IS ASSUMED THAT ALL TRANSMISSION ORIGINATES FROM OR TERMINATES AT A SINGLE CENTRAL PROCESSOR. THUS ESTABLISHING A PRIORITY RELATIVE TO POSITION. THAT IS, UPSTREAM TERMINALS HAVE PRIORITY OVER DOWNSTREAM. ANALYSIS FOR MULTIPLE PROCESSORS IS NOT COVERED.

TREHAN, RANVIR K., PROJECTED RESPONSE CHARACTERISTICS OF THE WWMCCS INTERCOMPUTER NETWORK, MITRE CORP., WASHINGTON, DC, 8 MAY 72, MC WP-9845, AF F19628-71-C-0002, 54P, 5 REFS

THIS PAPER PRESENTS AN ANALYTIC COMPUTER MODEL FOR ANALYZING AND ESTIMATING RESPONSE CHARACTERISTICS OF AN INTERCOMPUTER NETWORK UTILIZING STORE-AND-FORWARD COMMUNICATIONS. THE MODEL ANALYZES THE NETWORK ON A LINK-BY-LINK BASIS, COMPUTING EXPECTED DELAY FROM SUCH FACTORS AS BANDWIDTH, AVERAGE MESSAGE LENGTH AND MESSAGE DEMAND DISTRIBUTION (LINE LOADING). SUCH VARIABLES AS THOSE INTRODUCED BY ADAPTIVE ROUTING ALGORITHMS ARE NOT CONSIDERED. THE MODEL IS APPLIED TO ONE POSSIBLE DESIGN OF AN INTERCOMPUTER NETWORK TO DERIVE APPROXIMATE ANTICIPATED MESSAGE RESPONSE CHARACTERISTICS. PARAMETRIC SENSITIVITY ANALYSIS IS PERFORMED, AND A GENERALIZED COMPUTER MODEL (INCLUDING A FORTRAN PROGRAM LISTING) FOR STOCHASTIC NETWORK ANALYSIS IS DESCRIBED.
(ALSO UNDER 2.1.2)

YAGED, BERNARD, JR., ECONOMIES OF SCALE, NETWORKS, AND NETWORK COST ELASTICITY, (BELL TELEPHONE LABS. INC., HOLMDEL, NJ), HALL, ARTHUR D., III, DIGEST OF THE CONFERENCE ON THE ECONOMIES OF SCALE IN TODAY'S TELECOMMUNICATIONS SYSTEMS, (WASHINGTON, DC, SEPTEMBER 13, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE 73-CHO-830-0-SCALE, P 26

THIS PAPER ATTEMPTS TO LAY A FOUNDATION FOR EXAMINING NETWORK ECONOMY OF SCALE EFFECTS. MODELS ARE PRESENTED TO ILLUSTRATE HOW TO MEASURE NETWORK SCALE EFFECTS, FOR BOTH STATIC AND DYNAMIC STUDIES.
(ALSO UNDER 2.1.1, 5.3)

ZEIGLER, JACK F., LEONARD KLEINROCK, NODAL BLOCKING IN LARGE NETWORKS, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE), BLACKER, HARRY L., IEEE INTERNATIONAL CONFERENCE ON COMMUNICATIONS, VOLUME 7, (MONTREAL, (CANADA), JUNE 14-16, 1971), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1971, IEEE CAT-71C28-COM, (LC 64-23226), P 39-9--39-15, 10 REFS

A MODEL IS PRESENTED TO ANALYZE STORE-AND-FORWARD COMMUNICATION NETWORKS IN WHICH THE NODES HAVE A FINITE STORAGE CAPACITY FOR MESSAGES. A NODE IS BLOCKED WHEN ITS STORAGE IS FILLED; OTHERWISE IT IS FREE. ARPANET TERMINOLOGY IS USED IN THIS VERY PRACTICAL AND USEFUL ANALYSIS. THE THEORETICAL CONCLUSIONS ARE SUBSTANTIATED BY COMPUTER-BASED SIMULATION./
(ALSO UNDER 2.1.2)

2.2 MEASUREMENT

ABRAMS, MARSHALL D., GEORGE E. LINDAMOOD, THOMAS N. PYKE, JR., MEASURING AND MODELLING MAN-MACHINE INTERACTION, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY), FIRST ANNUAL SIGME SYMPOSIUM ON MEASURING AND EVALUATION, 1973, P 136-142, 11 REFS

THE OPERATION OF A NETWORK MEASUREMENT MACHINE (NMM) DEVELOPED AS A TOOL FOR THE MEASUREMENT OF COMPUTER SERVICE AS SEEN BY THE USER, AND THE ANALYSIS OF THE DATA OBTAINED ARE BRIEFLY DISCUSSED. THE OBJECTIVES OF THE MEASUREMENT OF COMPUTER SERVICE ARE DEFINED AND A SET OF MODELS AND IMPORTANT MEASUREMENTS ARE DEVELOPED.
(ALSO UNDER 2.3)

ABRAMS, MARSHALL D., A NEW APPROACH TO PERFORMANCE EVALUATION OF COMPUTER NETWORKS, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY), PROCEEDINGS OF THE 1974 SYMPOSIUM, COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, MAY 23, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, 74CH0835-9C, P 1S-2D, 9 REFS

THIS PAPER DESCRIBES A 'STIMULUS-ACKNOWLEDGEMENT-RESPONSE' MODEL CONCEPTUALIZED TO DESCRIBE THE MAN-COMPUTER INTERACTION WHICH TAKES PLACE IN AN INTERACTIVE CONVERSATIONAL COMPUTING ENVIRONMENT. ALSO PRESENTED IS A DESCRIPTION OF A MINICOMPUTER-BASED DATA ACQUISITION SYSTEM CALLED THE NETWORK MEASUREMENT MACHINE (NMM) WHICH HAS BEEN DEVELOPED TO MEASURE THE DELIVERY OF COMPUTER SERVICES TO ANY USER. OUTPUTS FROM THE NMM ARE PROCESSED BY DATA ANALYSIS ROUTINES WHICH PROVIDE STATISTICAL SUMMARIES OF WORKLOAD, RESPONSE, AND COMMUNICATIONS UTILIZATION ANALYSIS OVER SUBSETS OF A CONVERSATION, SUCH AS USE OF SPECIFIC SOFTWARE SERVICES. A SAMPLE APPLICATION OF THE NMM IS DISCUSSED.

ABRAMS, MARSHALL D., CONSUMER-ORIENTED MEASUREMENT OF COMPUTER NETWORK PERFORMANCE, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY), IEEE 1974 NATIONAL TELECOMMUNICATIONS CONFERENCE, (SAN DIEGO, CA, DECEMBER 2-4, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE P-74CH0902-7-CSCB, (LC 57-20724), P 843-844, 7 REFS

THIS SHORT PAPER IDENTIFIES SOME MEASURES OF INTERACTIVE SYSTEM PERFORMANCE AND INDICATES HOW THEY ARE BEING INVESTIGATED IN A PROJECT AT THE NATIONAL BUREAU OF STANDARDS. FOR A MORE COMPLETE ACCOUNT OF THIS WORK SEE 'THE SERVICE CONCEPT APPLIED TO COMPUTER NETWORKS' BY M. D. ABRAMS AND IRA W. COTTON AND ABRAMS' 'A NEW APPROACH TO PERFORMANCE EVALUATION OF COMPUTER NETWORKS.'

ABRAMS, MARSHALL D., IRA W. COTTON, THE SERVICE CONCEPT APPLIED TO COMPUTER NETWORKS, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY, AUG 75, NBS TN-880, (LC 75-600056), 38P, 19 REFS

THE NETWORK MEASUREMENT SYSTEM (NMS) REPRESENTS THE IMPLEMENTATION OF A NEW APPROACH TO THE PERFORMANCE MEASUREMENT AND EVALUATION OF COMPUTER NETWORK SYSTEMS AND SERVICES. THIS TECHNICAL NOTE INTRODUCES THE SERVICE CONCEPT AND OTHER BACKGROUND INFORMATION NECESSARY TO UNDERSTAND THE NEED FOR AND USE OF THE NMS. THE NOTE ALSO INCLUDES A DISCUSSION OF APPLICATIONS FOR THE NMS.

BARBER, D. L. A., SOME OBSERVATIONS ON STORE-AND-FORWARD AND CIRCUIT-SWITCHED DATA NETWORKS, NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), DIV. OF COMPUTER SCIENCE, JAN 70, NPL-DCS COM-SCI-T.M.-36, 26P

HERE IS A VERY INTERESTING COMPARISON OF MESSAGE AND CIRCUIT SWITCHING CONCERNED PRIMARILY WITH TECHNICAL MEASURES OF PERFORMANCE. BASED ON A SET OF REASONABLE ASSUMPTIONS, THE REPORT SHOWS MESSAGE-SWITCHING PREFERABLE

2.2 MEASUREMENT

FOR SHORT MESSAGES AND CIRCUIT-SWITCHING WHEN LONG MESSAGES ARE PREDOMINANT. UNFORTUNATELY, IT IS NOT UNTIL THE END OF THE REPORT THAT THE SEMANTIC DIFFICULTIES IN DIFFERENTIATING BETWEEN MESSAGE AND CIRCUIT SWITCHING ARE INTRODUCED.

BELL, THOMAS E., COMPUTER PERFORMANCE VARIABILITY, (RAND CORP., SANTA MONICA, CA).
AFIPS CONFERENCE PROCEEDINGS, VOLUME 43, 1974, NATIONAL COMPUTER CONFERENCE, (CHICAGO, IL, MAY 6-10, 1974), AFIPS PRESS, MONTVALE, NJ, 1974, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 761-766, 12 REFS

THE AUTHOR'S MAJOR POINT, VARIABILITY OF COMPUTER PERFORMANCE, IS A REALITY. ELAPSED TIME (BOTH IN BATCH AND ON-LINE ENVIRONMENTS), I/O ACTIVITY AND PROCESSOR ACTIVITY ARE ALL TESTED IN DESCRIBED EXPERIMENTS AND FOUND TO BE SUBJECT TO DEGREES OF VARIABILITY. THE MORALE: MAKE SURE PERFORMANCE EVALUATION IS DONE IN AN ENVIRONMENT REFLECTIVE OF WHAT THE OPERATION ENVIRONMENT WILL BE.

BELL, THOMAS E., HUMAN PERCEPTION OF TELECOMMUNICATIONS RESPONSIVENESS, (TRW SYSTEMS GROUP, REDONDO BEACH, CA).
NATIONAL TELECOMMUNICATIONS CONFERENCE, CONFERENCE RECORD, VOLUME 2, (NEW ORLEANS, LA, DECEMBER 1-3, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH-1015-7-CSCB, (LC 57-20724), P 44-18--44-20, 6 REFS
(ANNOTATION UNDER 2.3)

CERF, VINTON G., WILLIAM E. NAYLOR, STORAGE CONSIDERATIONS IN STORE-AND-FORWARD MESSAGE SWITCHING, (CALIFORNIA, UNIV. OF, LOS ANGELES),
1972 WESCON TECHNICAL PAPERS, SESSION 7: COMPUTER NETWORKS, (PRESENTED AT, WESTERN ELECTRONIC SHOW AND CONVENTION, SEPTEMBER 19-22, 1972), 1972, P 7-3-1--7-3-8, 5 REFS
(ANNOTATION UNDER 2.1.2)

COLE, GERALD D., COMPUTER NETWORK MEASUREMENTS: TECHNIQUES AND EXPERIMENTS, CALIFORNIA, UNIV. OF, LOS ANGELES, COMPUTER SYSTEMS MODELING AND ANALYSIS GROUP, OCT 71, CU-CSMAG ENG-7165, DAHC 15-69-C-0285, (AD-739 344), 350P, 89 REFS

THIS THESIS PROVIDES A COMPREHENSIVE DESCRIPTION OF THE MEASUREMENT PROGRAM BEING CONDUCTED AT UCLA FOR THE ARPA NETWORK. THE INTERNAL NETWORK MECHANISMS FOR 'INSTRUMENTATION' ARE DESCRIBED, EMPIRICAL MEASUREMENT DATA ARE PRESENTED, AND THE RELATIONSHIP OF THE MEASUREMENT EFFORT TO MODEL BUILDING AND THE ANALYTIC APPROACH IS EXPLAINED. FOR AN OVERVIEW OF THE MATERIAL IN THIS REPORT SEE COLE'S ARTICLE 'PERFORMANCE MEASUREMENTS ON THE ARPA COMPUTER NETWORK' IN CATEGORY 2.2.

COLE, GERALD D., PERFORMANCE MEASUREMENTS ON THE ARPA COMPUTER NETWORK, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE),
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71C59-C, P 39-45, 3 REFS

THE ACTIVITIES OF THE ARPA NETWORK MEASUREMENT CENTER AT UCLA ARE DISCUSSED. THE AVAILABLE TOOLS ARE DESCRIBED WITH SAMPLE COMPUTER PRINTOUTS TO ILLUSTRATE THEIR APPLICATION. THE RESULTS OF SOME EXPERIMENTS WHICH ARE ALSO PRESENTED GIVE A GOOD FEEL FOR THE VALUE OF THE MEASUREMENT PROGRAM IN PROVIDING INSIGHT INTO NETWORK PERFORMANCE. THIS ARTICLE IS A GOOD OVERVIEW; FOR AN EXHAUSTIVE TREATMENT SEE COLE'S THESIS, 'COMPUTER NETWORK MEASUREMENTS: TECHNIQUES AND EXPERIMENTS' IN CATEGORY 2.2.

COTTON, IRA W., COST-BENEFIT ANALYSIS OF INTERACTIVE SYSTEMS, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC. INST. FOR COMPUTER SCIENCES AND TECHNOLOGY),
THE SECOND JERUSALEM CONFERENCE ON INFORMATION TECHNOLOGY, (JERUSALEM, (ISRAEL), JULY 29-AUGUST 1, 1974), 1974, P 729-746, 29 REFS
(ANNOTATION UNDER 5.8)

DATA TRAFFIC MEASUREMENTS GUIDE IMPROVEMENTS TO RESOURCE-SHARING NETWORK,
COMMUNICATIONS EQUIPMENT AND SYSTEMS DESIGN, JUN 72, P 2-4

THIS DESCRIPTION OF THE UCLA NETWORK MEASUREMENT CENTER IN THE ARPA NETWORK WAS APPARENTLY BASED ON AN INTERVIEW WITH GERALD COLE. THE ARTICLE CONSISTS OF A BRIEF DESCRIPTION OF THE CAPABILITIES OF THE CENTER, FOLLOWED BY A FAIRLY DETAILED EXAMPLE WHICH ILLUSTRATES THE SCOPE OF THE MEASUREMENT FACILITIES. FOR MORE DETAILED INFORMATION, REFER TO OTHER ARTICLES BY COLE HIMSELF, IN PARTICULAR, 'COMPUTER NETWORK MEASUREMENTS: TECHNIQUES AND EXPERIMENTS' IN CATEGORY 2.2.

FULLER, S. H., R. J. SWAN, W. A. WULF, THE INSTRUMENTATION OF C.MMP, A MULTI-(MINI) PROCESSOR, (CARNEGIE-MELLON UNIV., PITTSBURGH, PA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 173-176, 9 REFS

A HARDWARE MONITOR TO IMPLEMENT A MEASUREMENT FACILITY FOR CARNEGIE-MELLON UNIVERSITY'S MULTI-MINIPROCESSOR, C.MMP IS DESCRIBED. SOFTWARE CONTROL OF THE HARDWARE MONITOR MAKES POSSIBLE AN INTEGRATED HARDWARE/SOFTWARE PERFORMANCE EVALUATION. A GENERAL DISCUSSION OF HARDWARE MONITORS IS PRESENTED BEFORE GIVING SPECIFIC DETAILS OF THE C.MMP HARDWARE MONITOR AND ITS APPLICATIONS.

FULTZ, GARY L., LEONARD KLEINROCK, ADAPTIVE ROUTING TECHNIQUES FOR STORE-AND-FORWARD COMPUTER-COMMUNICATION NETWORKS, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE),
BLACKER, HARRY L., IEEE INTERNATIONAL CONFERENCE ON COMMUNICATIONS, VOLUME 7, (MONTREAL, (CANADA), JUNE 14-16, 1971), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1971, IEEE CAT-71C28-COM, (LC 64-23226), P 39-1 - 39-8, 17 REFS
(ANNOTATION UNDER 2.1.3)

GRUBB, DANA S., DATA COMMUNICATIONS SYSTEM THROUGHPUT PERFORMANCE USING HIGH SPEED TERMINALS ON THE DIAL TELEPHONE NETWORK, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY, MAY 73, NBS TN-779, 33P, 7 REFS

DATA THROUGHPUT OF HIGH SPEED DATA TERMINALS USING THE DIAL TELEPHONE NETWORK IS CALCULATED FOR SIGNALING RATES OF 1200 TO 4800 BITS PER SECOND USING THE ANSI X3.28-1971 CONTROL PROCEDURES. THE THROUGHPUT IS MEASURED IN TERMS OF THE PROPOSED ANSI CRITERIA TRANSFER RATE FOR INFORMATION BITS (TRIB) DESCRIBED IN X3S3S/80. THE THROUGHPUT CALCULATIONS ARE SHOWN GRAPHICALLY WITH TRIB AS A FUNCTION OF BLOCK LENGTH, ERROR RATES OF THE TELEPHONE CONNECTION, SIGNALING RATE AND TELEPHONE LINE DELAYS. ERROR RATES ARE BASED ON A PUBLISHED SURVEY INVOLVING SEVERAL HUNDRED TELEPHONE CONNECTIONS TO GEOGRAPHICALLY DISTRIBUTED PARTS OF THE UNITED STATES.
(ALSO UNDER 3.2.1)

GRUBB, DANA S., IRA W. COTTON, CRITERIA FOR THE PERFORMANCE EVALUATION OF DATA COMMUNICATIONS SERVICES FOR COMPUTER NETWORKS, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, COMPUTER SYSTEMS ENGINEERING DIV., SEP 75, NBS TN-882, 36P, 37 REFS

IN GENERAL, WHEN TELECOMMUNICATIONS SERVICES ARE USED AS A MEANS OF INTERCHANGING INFORMATION BETWEEN INFORMATION PROCESSING SYSTEMS, OR BETWEEN TERMINALS AND SYSTEMS, A NUMBER OF PARAMETERS DETERMINE HOW WELL THAT INTERCHANGE IS PERFORMED. THIS REPORT EXAMINES THE FOLLOWING CHARACTERISTICS OF TELECOMMUNICATIONS SERVICES: TRANSFER RATE, AVAILABILITY, CHANNEL ESTABLISHMENT TIME, NETWORK DELAY, LINE TURNAROUND DELAY, TRANSPARENCY, AND SECURITY. THESE TERMS ARE ALL DEFINED AND THEIR SIGNIFICANCE DISCUSSED. THE EFFECTS OF THESE FACTORS ON DATA COMMUNICATION NETWORKS ARE ILLUSTRATED.
(ALSO UNDER 3.2.0)

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK, QUARTERLY TECHNICAL REPORT NO. 16, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, JAN 73, 1 OCT-31 DEC 72, BBN R-2499, DAHC 15-69-C-0179, 41P, 7 REFS

THIS QUARTERLY TECHNICAL REPORT DESCRIBES THE WORK DONE ON THE ARPA NETWORK DURING THE LAST QUARTER OF 1972. IMPS AND TIPS INSTALLED, SOFTWARE DEVELOPMENT CHANGES TO THE NETWORK CONTROL CENTER, WORK ON THE HIGH SPEED MODULAR IMP AND PUBLICATIONS AND CONFERENCE PARTICIPATION ARE ALL DISCUSSED. THE RESULTS OF A STUDY OF THE THEORETICAL AND MEASURED THROUGHPUT OF THE ARPA NETWORK ARE PRESENTED.
(ALSO UNDER 3.1.2, 3.1.1)

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK, QUARTERLY TECHNICAL REPORT NO. 2, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, JUL 69, 1 APR-30 JUN 69, BBN R-1837, BBN QTR-2, DAHC 15-69-0179, ISP
(ANNOTATION UNDER 3.1.1)

KIMBLETON, STEPHEN R., MODELING CONSIDERATIONS IN COMPUTER COMMUNICATION RESOURCE CONTROL, (PRESENTED AT THE, EIGHTH HAWAII INTERNATIONAL CONFERENCE ON SYSTEM SCIENCES, HONOLULU, JANUARY 7-9, 1975), SOUTHERN CALIFORNIA, UNIV. OF, MARINA

2.2 MEASUREMENT

DEL REY, INFORMATION SCIENCES INST., JAN 75, ARPA DAHC-15-72-C-0308, ONR N00014-67-A-0181-0036, (AD-A008 238), 13P, 16 REFS

THE BASIC THESIS OF THIS PAPER IS THAT EFFECTIVE UTILIZATION OF MISSION ORIENTED NETWORKS REQUIRES COORDINATION AND CONTROL OF BOTH COMMUNICATION AND COMPUTER FACILITIES, THAT NETWORK DYNAMICS REQUIRE THESE CAPABILITIES TO BE EFFECTIVELY "ON-LINE," AND THAT THEIR ACHIEVEMENT REQUIRES A MODEL-BASED APPROACH. SOME OF THE IMPLICATIONS OF THIS THESIS ARE OUTLINED AND ITS FEASIBILITY IS DISCUSSED.

KING, R. G., SYSTEM TESTING TECHNIQUES FOR COMPUTER NETWORKS, (JOHNS HOPKINS UNIV., SILVER SPRING, MD, APPLIED PHYSICS LAB.),
PROCEEDINGS OF THE 1974 SYMPOSIUM, COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, MAY 23, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, 74CH0835-9C, P 25-29, 2 REFS

THE AUTHOR OBSERVES THAT THE TREND IN THE FIELD OF DIGITAL COMPUTERS IS TOWARDS THE DEVELOPMENT OVER THE NEXT 5-10 YEARS OF COMPLEX SYSTEMS CONSISTING OF NETWORKS OF BOTH LARGE AND SMALL PROCESSORS, OPERATING ASYNCHRONOUSLY IN PARALLEL. THIS PAPER ADDRESSES THE PROBLEM OF HOW TO TEST SUCH SYSTEMS AND WHAT TECHNIQUES MAY BE USED TO ENHANCE THE TESTING EFFECTIVENESS. INITIAL SYSTEM DEBUGGING OF BOTH HARDWARE AND SOFTWARE IS DISCUSSED IN SOME DETAIL. SOME OF THE TECHNIQUES PRESENTED ARE APPLICABLE TO THE DETECTION AND ISOLATION OF HARDWARE FAILURES DURING OPERATION AND TO THE HANDLING OF ERRORS IN OPERATIONAL DATA TRANSMISSION. THE GENERAL CONCLUSION IS THAT GOOD SYSTEM DESIGN WILL ALLOW THE USE OF SYSTEM TEST MECHANISMS TO PRODUCE IMPROVED SYSTEM PERFORMANCE AND RELIABILITY.

KLEINROCK, LEONARD, HOLGER OPDERBECK, THROUGHPUT IN THE ARPANET - PROTOCOLS AND MEASUREMENT, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE, TELENET CORP., WASHINGTON, DC),
FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1001-7-DATA, P 6-1--6-11, 13 REFS
(ANNOTATION UNDER 2.1.3)

KLEINROCK, LEONARD, WILLIAM E. NAYLOR, ON MEASURED BEHAVIOR OF THE ARPA NETWORK, (CALIFORNIA, UNIV. OF, LOS ANGELES), AFIPS CONFERENCE PROCEEDINGS, VOLUME 43, 1974, NATIONAL COMPUTER CONFERENCE, (CHICAGO, IL, MAY 6-10, 1974), AFIPS PRESS, MONTVALE, NJ, 1974, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 767-780, 18 REFS

THE VARIOUS TOOLS USED BY THE NETWORK MEASUREMENT CENTER (NMC) OF THE ARPANET ARE BRIEFLY DISCUSSED, FOLLOWED BY A DESCRIPTION OF AN EXPERIMENT CONDUCTED EVERY TWO MONTHS ON THE NETWORK AND THE RESULTS OF THAT EXPERIMENT. THE CONCLUSIONS ARE MOST INTERESTING AND IMPACT CERTAIN DESIGN PARAMETERS FOR THE NETWORK.

KLEINROCK, LEONARD, COMPUTER NETWORK RESEARCH, CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE, 31 DEC 71, 1 JUL-31 DEC 71, ARPA DAHC-15-69-C-0285, (AD-739 705), IISP, 79 REFS

ACTIVITIES AT UCLA IN NETWORK MODELING AND MEASUREMENT ARE SUMMARIZED. THE RESULTS IN GRAPHICAL FORM FOR ARPA NETWORK LOADING EXPERIMENTS ARE GIVEN. THE CAPABILITIES OF PRESENT AND PLANNED MEASUREMENT TOOLS FOR THE ARPA NETWORK ARE DESCRIBED. THE APPENDIXES CONTAIN FIVE GOOD RELATED PAPERS INCLUDING "PERFORMANCE MEASUREMENTS ON THE ARPA COMPUTER NETWORK".

KLEINROCK, LEONARD, PERFORMANCE MODELS AND MEASUREMENTS OF THE ARPA COMPUTER NETWORK, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE),
COMPUTER COMMUNICATION NETWORKS, SELECTED PAPERS, (PRESENTED AT, UNIV. OF SUSSEX, BRIGHTON, (ENGLAND),), 1973, P C1-C25, 29 REFS

THE AUTHOR SUMMARIZES SOME OF THE PERFORMANCE EVALUATION METHODS WHICH HAVE BEEN USEFUL IN THE DESIGN OF THE ARPA NETWORK. ANALYTICAL, SIMULATION AND MEASUREMENT RESULTS WHICH HAVE ENABLED PREDICTION AND EVALUATION OF SYSTEM PERFORMANCE ARE DESCRIBED.

MAMRAK, SANDRA ANN, COMPARATIVE RESPONSE TIMES OF TIME-SHARING SYSTEMS ON THE ARPA NETWORK, ILLINOIS, UNIV. OF, URBANA, DEPT. OF COMPUTER SCIENCE, MAY 75, IU R-75-722, ARPA DAHC-04-72-C-0001, 141P, 30 REFS
(ANNOTATION UNDER 2.1.0)

MENDICINO, SAMUEL F., GEORGE G. SUTHERLAND, PERFORMANCE MEASUREMENTS IN LLL OCTOPUS COMPUTER NETWORK, (CALIFORNIA, UNIV. OF, LIVERMORE, LAWRENCE LIVERMORE LAB.),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, "COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?", (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 109-112, 2 REFS

AS AN AID TO NETWORK PERFORMANCE MEASUREMENT, DATA WERE COLLECTED ON SIGNIFICANT NETWORK PARAMETERS ON THE OCTOPUS COMPUTER NETWORK. THE STATISTICS DESCRIBED IN THIS PAPER INCLUDE THE FOLLOWING: TOTAL NUMBER OF USER LOGONS, SAMPLE USER LOAD, SYSTEM MESSAGES (TO AND FROM THE SYSTEM), MESSAGES BETWEEN THE USER AND THE EXECUTING PROGRAMS, FILE TRANSPORT TRAFFIC, CPU UTILIZATION, CPU I/C BOUND TIME, AND DISK HEAD MOVES. VERY LITTLE EVALUATION IS GIVEN BASED ON THESE STATISTICS.

MORGAN, DAVID E., OR., WALTER BANKS, DALE P. GOODSPEED, RICHARD KOLANKO, A COMPUTER NETWORK MONITORING SYSTEM, (WATERLOO, UNIV. OF, ONTARIO, (CANADA), COMPUTER COMMUNICATIONS NETWORKS GROUP),
IEEE TRANSACTIONS ON SOFTWARE ENGINEERING, VOL SE-1, ISSUE 3, SEP 75, P 299-311, 36 REFS

THE IMPLEMENTORS OF THE CNMS RECOGNIZED FROM THE START THAT THE USERS OF SYSTEM MONITORS ARE MANAGERS OF SYSTEMS, NOT HARDWARE SOFTWARE OR STATISTICS EXPERTS. THUS THEIR CONCEPT WAS TO DEVELOP AN EASY TO USE TOOL; NOT A SET OF DISPARATE TOOLS, BUT ONE TOOL RESPONSIBLE FOR MONITORING AN ENTIRE SYSTEM.
THIS IS A WELL WRITTEN ARTICLE, AND THE CONTENT IS MOST INTERESTING.

MORGAN, D. E., R. C. KOLANKO, MODELS TO AID USER MEASUREMENT OF A COMPUTER NETWORK, (WATERLOO, UNIV. OF, ONTARIO, (CANADA), COMPUTER COMMUNICATIONS NETWORKS GROUP),
NATIONAL TELECOMMUNICATIONS CONFERENCE, CONFERENCE RECORD, VOLUME 2, (NEW ORLEANS, LA, DECEMBER 1-3, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH-1015-7-CSCB, (LC 57-20724), P 44-1--44-5, 10 REFS

DESCRIBED IS THE APPROACH TAKEN BY THE UNIVERSITY OF WATERLOO TO THE PROBLEM OF DETERMINING THE TOOLS AND TECHNIQUES NEEDED TO ALLOW A USER TO OBSERVE AND EVALUATE A COMPUTER NETWORK OR SYSTEM. THE GENERAL APPROACH TAKEN WAS TO DEFINE THE REAL SYSTEM IN TERMS OF LAYERS OF ABSTRACT MACHINES, TO DETERMINE THE MEASURES NEEDED IN TERMS OF THESE MACHINES, TO MAKE THE MEASUREMENTS ON THE REAL SYSTEM, AND THEN TO INTERPRET THEM IN TERMS OF THE ABSTRACT MACHINES.

MORGAN, D. E., W. BANKS, W. COLVIN, D. SUTTON, A PERFORMANCE MEASUREMENT SYSTEM FOR COMPUTER NETWORKS, (WATERLOO, UNIV. OF, ONTARIO, (CANADA)),
ROSENFELD, JACK L., INFORMATION PROCESSING 74, PROCEEDINGS OF IFIP CONGRESS 74, 1, COMPUTER HARDWARE AND ARCHITECTURE, (STOCKHOLM, (SWEDEN), AUGUST 5-10, 1974), AMERICAN ELSEVIER PUBLISHING CO. INC., NEW YORK, 1974, P 29-33, 33 REFS

THE AUTHORS PROVIDE GOOD BACKGROUND INFORMATION CONCERNING THE PERFORMANCE MEASUREMENT OF NETWORKS OF COMPUTERS, BEFORE DESCRIBING THE UNIVERSITY OF WATERLOO'S MONITORING SYSTEM. AMONG THE GENERAL INFORMATION GIVEN ARE DEFINITIONS OF NETWORKING AND MEASUREMENT TERMINOLOGIES, AND DESCRIPTIONS OF CURRENTLY AVAILABLE TOOLS TO MEASURE COMPUTER SYSTEMS AND THE EFFORT NEEDED TO EXPAND THESE TO NETWORK MEASUREMENT.
THE REMOTE-COMPUTER-CONTROLLED HARDWARE MONITOR (RCHM) IS A MODULAR SYSTEM. THIS MONITORING SYSTEM INCORPORATES HARDWARE MONITORS, A MEASUREMENT LANGUAGE FOR MONITOR CONTROL, DATA ANALYSIS SOFTWARE, A NETWORK TRAFFIC GENERATOR, AND MEASUREMENT SOFTWARE RESIDENT IN THE SYSTEM UNDER TEST.

O'NEIL, D. R., ERROR CONTROL FOR DIGITAL DATA TRANSMISSION OVER TELEPHONE NETWORKS, MITRE CORP., BEDFORD, MA, MAY 65, MC TM-04113, AF 19(628)-2390, (AF-ESD TR-65-67, AD-616 678), 48P, 27 REFS
(ANNOTATION UNDER 3.2.1)

PRICE, W. L., OR., G. W. COWIN, SIMULATION STUDIES OF THE EFFECT OF LINK BREAKDOWN ON DATA COMMUNICATION NETWORK PERFORMANCE, NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), DIV. OF COMPUTER SCIENCE, FEB 75, NPL R-COM-SCI-77, 20P
(ANNOTATION UNDER 2.1.1)

RUBIN, MARTIN L., BEVERLY HUNTER, MARILYN KNETSCH, EVALUATION OF THE EXPERIMENTAL CAI NETWORK (1973-1975) OF THE LISTER HILL NATIONAL CENTER FOR BIOMEDICAL COMMUNICATIONS, NATIONAL LIBRARY OF MEDICINE, HUMAN RESOURCES RESEARCH ORGANIZATION (HUMRRO), ALEXANDRIA, VA, EASTERN DIV., JAN 75, HUMRRO FR-ED-75-1, N01-LM-4-4725, (LMNCBC 75-03, PB-239 358), 77P

THE NATIONAL LIBRARY OF MEDICINE ESTABLISHED AN EXPERIMENTAL BIOMEDICAL CAI NETWORK IN 1973 TO TEST THE FEASIBILITY OF SHARING CAI LEARNING MATERIALS THROUGH A NATIONAL COMPUTER NETWORK. THIS REPORT DESCRIBES THE EVALUATION OF THAT

2.2 MEASUREMENT

EXPERIMENT. THE EVALUATION IS DESIGNED TO ASSIST DECISION MAKERS IN PLANNING FUTURE MECHANISM FOR DISTRIBUTING BIOMEDICAL CAI, ALTHOUGH THE RESULTS MAY BE OF INTEREST TO DECISION MAKERS IN OTHER FIELDS AS WELL.
(ALSO UNDER 4.2.3)

STILLMAN, RONA E., CR., BELKIS LEONG-HONG, SOFTWARE TESTING FOR NETWORK SERVICES, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY, JUL 75, NBS TN-874, NSF AG-350, (LC 75-600046), 40P, 9 REFS
(ANNOTATION UNDER 3.4.5)

WATKINS, SHIRLEY W., MARSHALL D. ABRAMS, INTERPRETATION OF DATA IN THE NETWORK MEASUREMENT SYSTEM, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY, MAR 76, NBS TN-897, 42P, 15 REFS

THE DATA ANALYSIS PACKAGE (DAP) FOR THE NETWORK MEASUREMENT SYSTEM IS DISCUSSED. THE RATIONALE FOR AND DESCRIPTION OF THE MODEL USED BY THE DAP TO INTERPRET THE DATA COLLECTED BY THE NETWORK MEASUREMENT MACHINE, STATISTICAL MEASURES, AND THE PRESENTATION FORM OF ANALYZED DATA ARE AMONG THE TOPICS DISCUSSED. FOR A COMPLETE DESCRIPTION OF THE NETWORK MEASUREMENT SYSTEM, OF WHICH DAP IS A PART, SEE ABRAMS AND COTTON, 'THE SERVICE CONCEPT APPLIED TO COMPUTER NETWORKS.'

WOOD, DAVID C., MEASUREMENT OF USER TRAFFIC CHARACTERISTICS ON ARPANET, (MITRE CORP., MCLEAN, VA), FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH10001-7-DATA, P 9-2, 1 REFS

THIS VERY SHORT PAPER REPORTS SOME DETAILED MEASUREMENTS OF THE PACKETS GENERATED ON THE ARPANET BY AN INDIVIDUAL USER ENGAGED IN COMMON APPLICATIONS WITH VARIOUS HOSTS. BOTH THE TRAFFIC CHARACTERISTICS AND TRANSFER RATES ARE REPORTED FOR FILE TRANSFERS BETWEEN HOSTS.

2.3 USER CONSIDERATIONS

ABRAMS, MARSHALL D., GEORGE E. LINDAMOOD, THOMAS N. PYKE, JR., MEASURING AND MODELLING MAN-MACHINE INTERACTION, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY), FIRST ANNUAL SIGME SYMPOSIUM ON MEASURING AND EVALUATION, 1973, P 136-142, 11 REFS
(ANNOTATION UNDER 2.2)

ANDERSON, ROBERT H., ADVANCED INTELLIGENT TERMINALS AS A USER'S NETWORK INTERFACE, (RAND CORP., SANTA MONICA, CA), COMPCON FALL '75, ELEVENTH IEEE COMPUTER SOCIETY CONFERENCE, HOW TO MAKE COMPUTERS EASIER TO USE, DIGEST OF PAPERS, (WASHINGTON, DC, SEPTEMBER 9-11, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75CH0988-6C, P 180-182, 9 REFS

ONE POSSIBLE SOLUTION TO THE PROBLEM OF ASSISTING THE USER IN ACCESSING NETWORK RESOURCES IS DISCUSSED. AN OVERVIEW OF THE TYPES OF SERVICES WHICH MIGHT BE PROVIDED BY AN INTELLIGENT TERMINAL IN THE NEAR FUTURE IS PRESENTED. ALSO, A RESEARCH PROGRAM CURRENTLY UNDERWAY AT RAND AIMED AT DEVELOPING A PROTOTYPE SYSTEM IS DESCRIBED.

BELL, THOMAS E., HUMAN PERCEPTION OF TELECOMMUNICATIONS RESPONSIVENESS, (TRW SYSTEMS GROUP, REDONDO BEACH, CA), NATIONAL TELECOMMUNICATIONS CONFERENCE, CONFERENCE RECORD, VOLUME 2, (NEW ORLEANS, LA, DECEMBER 1-3, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH-1015-7-CSCB, (LC 57-20724), P 44-18--44-20, 6 REFS

THIS PAPER CONTAINS A HIGHLY INTERESTING DESCRIPTION OF INFORMAL STUDIES THAT ATTEMPTED TO FIND METRICS TO CORRELATE WITH USER'S PERCEPTIONS OF HOW WELL A COMPUTER SYSTEM OR NETWORK WAS RESPONDING. WHILE ALLOWING THAT BLIND ACCEPTANCE OF AVERAGE RESPONSE TIME AS AN APPROPRIATE METRIC IS PROBABLY BETTER THAN IMPLICIT ASSUMPTIONS ABOUT CONSTANT RESPONSE TIME, THE POINT IS WELL MADE THAT WITH THE MAGNITUDE OF RESOURCES INVESTED IN THE DEVELOPMENT AND OPERATION OF TELECOMMUNICATIONS SYSTEMS, WE SHOULD NOT PROCEED ON THE ASSUMPTION THAT SIMPLE METRICS ARE ADEQUATE FOR ANALYSIS, DESIGN, PURCHASE, OR OPERATION OF THESE COMPLEX SYSTEMS.
(ALSO UNDER 2.2)

BENOIT, JOHN W., ERIKA GRAF-WEBSTER, EVOLUTION OF NETWORK USER SERVICES--THE NETWORK RESOURCE MANAGER, (MITRE CORP., MCLEAN, VA), PROCEEDINGS OF THE 1974 SYMPOSIUM, COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, MAY 23, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, 74CH0883-9C, P 21-24, 6 REFS

THIS PAPER DESCRIBES A NETWORK RESOURCE MANAGER CALLED THE REX SYSTEM WHICH WAS DEVELOPED TO ENABLE A TERMINAL USER ON THE ARPA NETWORK TO OBTAIN INFORMATION ABOUT NETWORK RESOURCES USING AN INTERACTIVE QUERY LANGUAGE. ALTHOUGH COMPLETE SUCCESS WAS NOT ACHIEVED WITH THE REX SYSTEM DUE TO DIFFICULTIES ARISING FROM THE DIFFERENCES IN OPERATING SYSTEMS AND HARDWARE ARCHITECTURE WITHIN THE NETWORK, THE PAPER DOES PROVIDE A VALID EXAMPLE OF ONE METHOD OF SATISFYING THE USER'S NEED FOR A CONVENIENT MEANS OF LEARNING ABOUT, COMPARING, SELECTING AND USING RESOURCES AT A REMOTE HOST ON A NETWORK.
(ALSO UNDER 3.4.4)

CHUPIN, JEAN CLAUDE, CONTROL CONCEPTS OF A LOGICAL NETWORK MACHINE FOR DATA BANKS, (I.M.A.G., GRENOBLE, (FRANCE), CII SCIENTIFIC CENTER), ROSENFELD, JACK L., INFORMATION PROCESSING 74, PROCEEDINGS OF IFIP CONGRESS 74, 2, SOFTWARE, (STOCKHOLM, (SWEDEN), AUGUST 5-10, 1974), AMERICAN ELSEVIER PUBLISHING CO. INC., NEW YORK, 1974, P 291-295, 7 REFS
(ANNOTATION UNDER 3.4.3)

DAVIES, DONALD W., CHRISTOPHER R. EVANS, DAVID M. YATES, HUMAN FACTORS IN INTERACTIVE TELEPROCESSING SYSTEMS, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND)), THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 491-496, 5 REFS

SYSTEMS SHOULD BE DESIGNED SO THAT THE NEW AND EXPERIENCED USERS CAN FEEL AT EASE. SEVERAL BALANCES ARE GIVEN WHICH MUST BE STRUCK IN ORDER TO ACHIEVE THIS GOAL. THE AUTHORS PROPOSE THAT SECURITY SHOULD BE UNOBTRUSIVE IN THAT A USER SHOULD BE UNAWARE OF ITS EXISTENCE UNLESS HE ATTEMPTS A FORBIDDEN ACTION.

DAVIS, RUTH M., MAN-MACHINE COMMUNICATION, (ADVANCED RESEARCH PROJECTS AGENCY, WASHINGTON, DC), CAUDRA, CARLOS A., ANNUAL REVIEW OF INFORMATION SCIENCE AND TECHNOLOGY, VOLUME 1, WILEY (JOHN) AND SONS, NEW YORK, 1966, ADI ANNUAL REVIEW SERIES, (LC 66-25096), P 221-254, 99 REFS
(ANNOTATION UNDER 1.2)

DICKEY, SHANE, COMPUTER NETWORKS CAN BE FRIENDLY, (HEWLETT-PACKARD CO., PALO ALTO, CA), COMPCON FALL '75, ELEVENTH IEEE COMPUTER SOCIETY CONFERENCE, HOW TO MAKE COMPUTERS EASIER TO USE, DIGEST OF PAPERS, (WASHINGTON, DC, SEPTEMBER 9-11, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75CH0988-6C, P 129-132, 2 REFS

THE AUTHOR DEFINES SYSTEM 'FRIENDLINESS' IN TERMS OF EASE OF SYSTEM USE AND SYSTEM ADAPTABILITY TO TECHNOLOGICAL ADVANCES. AS AN EXAMPLE OF A 'FRIENDLY' SYSTEM HE REFERENCES PROGRAM-TO-PROGRAM COMMUNICATION IN THE HEWLETT-PACKARD 9700 DISTRIBUTED SYSTEM.

FIFE, DENNIS W., PRIMARY ISSUES IN USER NEEDS, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY), GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 89-95, 3 REFS

THE INSTITUTE FOR COMPUTER SCIENCES AND TECHNOLOGY OF THE NATIONAL BUREAU OF STANDARDS (NBS) IS ASSISTING THE NATIONAL SCIENCE FOUNDATION (NSF) IN TECHNICAL PLANNING TO DELINEATE MAJOR APPROACHES TOWARD THE EVENTUAL DEVELOPMENT OF A NATIONAL SCIENCE COMPUTER NETWORK. NBS'S PRIMARY EFFORTS FOCUS ON NETWORK MANAGEMENT REQUIREMENTS, APPLICATION CRITERIA FOR COMMUNICATIONS TECHNOLOGY, AND USER CHARACTERISTICS.
(ALSO UNDER 5.7, 1.1)

GREENBERGER, MARTIN, NUMERICAL DATA BASES, STATISTICAL ANALYSIS, AND MODELING, REPORT OF WORKSHOP 2, (JOHNS HOPKINS UNIV.), GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 115-130, 3 REFS
(ANNOTATION UNDER 4.2.9)

GREENBERGER, MARTIN, USER ORGANIZATIONS, REPORT OF WORKSHOP 7, (JOHNS HOPKINS UNIV.), GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING

2.3 USER CONSIDERATIONS

COMPUTER AND INFORMATION RESOURCES NATIONWIDE. MIT PRESS, CAMBRIDGE, MA. 1973, P 273-281

THE WORKSHOP WAS CONCEPNED WITH USERS OF COMPUTER NETWORKS. AMONG THE ISSUES ADDRESSED WERE: ADVANTAGES AND DISADVANTAGES OF USER GROUPS; IMPACT OF COMPUTER NETWORKS ON USER GROUPS; POLICIES NEEDED TO PROTECT THE INTERESTS OF THE USER; AND STEPS TO INITIATE USER PARTICIPATION.
(ALSO UNDER 5.7)

KIMBLETON, STEPHEN R., NETWORK PERFORMANCE, USER SATISFACTION, AND DATA BASE ACCESS. (USC-INFORMATION SCIENCES INST., MARINA DEL REY, CA),
NATIONAL TELECOMMUNICATIONS CONFERENCE. CONFERENCE RECORD. VOLUME 2. (NEW ORLEANS, LA. DECEMBER 1-3, 1975). INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975. IEEE 75-CH-1015-7-CSCB. (LC 57-20724), P 44-12-44-17, 15 REFS

TO PROVIDE A QUANTITATIVE FOUNDATION FOR RESOLVING USER CONCERNS ABOUT THE QUALITY OF PERFORMANCE BEING DELIVERED BY A COMPUTER NETWORK, IT IS NECESSARY TO DEVELOP POLICIES FOR DETERMINING THE OPTIMAL LOCATION OF INFORMATION FROM THE USER'S VIEWPOINT. THE STATED OBJECTIVE OF THIS HIGHLY RELEVANT PAPER IS TO DEVELOP LOCALLY OPTIMAL BLOCK ASSIGNMENT POLICIES FOR A COMPUTER COMMUNICATION NETWORK.
(ALSO UNDER 3.2.2)

MARCUS, RICHARD S., NETWORK ACCESS FOR THE INFORMATION RETRIEVAL APPLICATION, (MASSACHUSETTS INST. OF TECH., CAMBRIDGE, ELECTRONIC SYSTEMS LAB.),
1975 IEEE INTERCON CONFERENCE RECORD, (NEW YORK, APRIL 8-10, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, P 25-4-1--25-4-7, 12 REFS
(ANNOTATION UNDER 3.4.4)

MASSY, WILLIAM F., INSTITUTIONAL RELATIONS, REPORT OF WORKSHOP 6, (STANFORD UNIV., CA),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 245-262, 1 REFS
(ANNOTATION UNDER 4.1.2)

MASSY, WILLIAM F., TEXT PROCESSING AND INFORMATION RETRIEVAL, REPORT OF WORKSHOP 4, (STANFORD UNIV., CA),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 165-177
(ANNOTATION UNDER 4.1)

MCKENNEY, JAMES L., INTERACTIVE ON-LINE RESPONSIVE SYSTEMS, REPORT OF WORKSHOP 3, (HARVARD UNIV., CAMBRIDGE, MA, GRADUATE SCHOOL OF BUSINESS ADMINISTRATION),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 143-160

THE WORKSHOP CONSIDERED ISSUES RELATED TO COMPUTER DESIGN AND USER CHARACTERISTICS FROM THE POINT OF VIEW OF THE RESEARCH WORKER REQUIRING ACCESS TO COMPUTER SYSTEMS WITH A HIGH DEGREE OF RELIABILITY AND A RICH VARIETY OF SOFTWARE. THE WORKSHOP IDENTIFIED FIVE CLASSES OF USERS AND SPECIFIED THE NEEDS AND SYSTEM REQUIREMENTS FOR EACH CLASS. THESE CLASSIFICATIONS ARE: (1) PROBLEM SOLVING, (2) DESIGN ACTIVITIES, (3) SIMULATION AND MODELING, (4) DATA ACQUISITION AND PROCESS CONTROL, AND (5) INSTRUCTIONAL SYSTEMS.

MILLER, ROBERT B., RESPONSE TIME IN MAN-COMPUTER CONVERSATIONAL TRANSACTIONS, (INTERNATIONAL BUSINESS MACHINES CORP., POUGHKEEPSIE, NY),
AFIPS PROCEEDINGS, 1968 FALL JOINT COMPUTER CONFERENCE, VOLUME 33, PART I, (SAN FRANCISCO, CA, DECEMBER 9-11, 1968), THOMPSON BOOK CO., WASHINGTON, DC, 1968, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 267-277, 5 REFS

INTERACTIVE MAN/COMPUTER SYSTEMS HAVE GENERALLY BEEN DESIGNED WITH ONLY INTUITIVELY DERIVED SPECIFICATIONS FOR RESPONSE CRITERIA. IN THIS PAPER, THE AUTHOR, A BEHAVIORAL SCIENTIST, ATTEMPTS TO LIST AND DEFINE THE DIFFERENT CLASSES OF OPERATOR ACTION AND PURPOSE AT INTERACTIVE TERMINALS. THE IMPLICATION IS THAT DIFFERENT ACTIONS AND PURPOSES HAVE DIFFERENT ACCEPTABLE RESPONSE TIMES. FOR EACH CATEGORY IDENTIFIED THE AUTHOR PRESENTS, WITH A RATHER THOROUGH DISCUSSION, ACCEPTABLE RESPONSE CRITERIA.
THE 16 CATEGORIES OF ACTIVITIES WHICH THE AUTHOR IDENTIFIES CAN ACTUALLY BE CHARACTERIZED BY MORE GENERAL CLASSES OF ACTIVITY. ONE SUCH CLASS IS THE INPUT OF DATA TO THE SYSTEM, AS BY KEYBOARD OR LIGHT-PEN. AN IMMEDIATE RESPONSE OF NO LONGER THAN 0.1 TO 0.2 SECONDS IS DEMANDED FOR THIS CLASS. A SECOND CLASS IS CHARACTERIZED BY A USER ENGAGED IN INTENSE INTERACTION REQUIRING THE READY ACCESS OF DATA FROM HIS OWN 'SHORTTERM MEMORY'. SUCH ACTIVITY REQUIRES NO LONGER THAN A TWO-SECOND RESPONSE IN ORDER THAT THE CHAIN OF THOUGHT NOT BE BROKEN. A FINAL CLASS INCLUDES THOSE ACTIVITIES WHICH COMPLETE A SUBJECTIVE (SUB)TASK OR (SUB)PURPOSE. MORE EXTENDED DELAYS (UP TO 15 SECONDS OR MORE) MAY BE PERMITTED FOLLOWING SUCH AN ACTIVITY COMPLETION, OR 'CLOSURE', THAN IN THE PROCESS OF OBTAINING A CLOSURE.
THIS PAPER IS RECOMMENDED TO ALL INVOLVED IN INTERACTIVE MAN/COMPUTER SYSTEM DESIGN.

NEUMANN, A. J., A BASIS FOR STANDARDIZATION OF USER-TERMINAL PROTOCOLS FOR COMPUTER NETWORK ACCESS, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, SYSTEMS AND SOFTWARE DIV., JUL 75, NBS TN-877, (LC 75-600052), 29P, 5 REFS
(ANNOTATION UNDER 5.5)

NEUMANN, A. J., NETWORK USER INFORMATION SUPPORT, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, SYSTEMS AND SOFTWARE DIV., DEC 73, NBS TN-802, NSF AG-350, 27P, 14 REFS
(ANNOTATION UNDER 5.7)

NEUMANN, A. J., USER PROCEDURES STANDARDIZATION FOR NETWORK ACCESS, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, SYSTEMS DEVELOPMENT DIV., OCT 73, NBS TN-799, NSF AG-350, 43P, 10 REFS
(ANNOTATION UNDER 5.5)

NIELSEN, NORMAN R., NETWORK COMPUTING, (STANFORD UNIV., CA, WELLSCO DATA CORP.),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 64-73, 1 REFS
(ANNOTATION UNDER 1.2)

OWENS, JERRY L., A USER'S VIEW OF THE LAWRENCE LIVERMORE LABORATORY'S COMPUTER NETWORKS, (LAWRENCE LIVERMORE LAB., LIVERMORE, CA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 75-78, 4 REFS
(ANNOTATION UNDER 3.1.2)

PICKENS, JOHN R., COMPUTER NETWORKS FROM THE USER'S POINT OF VIEW, (CALIFORNIA, UNIV. OF, SANTA BARBARA, DEPT. OF ELECTRICAL ENGINEERING),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 71-74, 7 REFS

IN AN EFFORT TO STUDY USER REACTION TO COMPUTER NETWORKS AN EXPERIMENT WAS PERFORMED WITH A GROUP OF GRADUATE STUDENTS ACCESSING THE ARPANET. THE ENCOUNTERS OF THE STUDENTS WERE USED TO EVALUATE USER SATISFACTION. BASED ON THESE EXPERIENCES A NUMBER OF CRITERIA WERE FORMULATED FOR EVALUATION OF NETWORK RESOURSES. THESE ARE PRESENTED ALONG WITH SUGGESTED REFINEMENTS TO IMPROVE USER SATISFACTION.
(ALSO UNDER 5.7)

PYKE, THOMAS N., JR., ROBERT P. BLANC, NETWORKING CHALLENGES: THE USER'S VIEWPOINT, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCE AND TECHNOLOGY),
FACTS AND FUTURES, WHAT'S HAPPENING NOW IN COMPUTING FOR HIGHER EDUCATION, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (PRINCETON, NJ, OCTOBER 9-11, 1973), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1974, (LC 74-79222), P 211-217

ALTHOUGH COMPUTER NETWORKS OFFER MANY BENEFITS TO THEIR USERS, MANY PROBLEM AREAS ARE INVOLVED IN THE EFFECTIVE UTILIZATION OF THESE NETWORKS. THREE SUCH PROBLEM CLASSES ARE IDENTIFIED: NETWORK SERVICE SELECTION, DOCUMENTATION, AND FRAGMENTED NETWORK SERVICE. SUGGESTIONS FOR RESOLVING THESE PROBLEMS ARE GIVEN.
(ALSO UNDER 5.7)

PYKE, THOMAS N., JR., NETWORK ACCESS TECHNIQUES: SOME RECENT DEVELOPMENTS, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY),
PROCEEDINGS OF THE THIRD TEXAS CONFERENCE ON COMPUTING SYSTEMS, (AUSTIN, TX, NOVEMBER 7-8, 1974), IEEE COMPUTER SOCIETY, LONG BEACH, CA, 1974, 74-CH0895-3C, P 2-2-1--2-2-4, 12 REFS

2.3 USER CONSIDERATIONS

ACCESS PROBLEMS FOR THE USER OF COMPUTER NETWORKS ARE DETAILED. THEN A FRAMEWORK FOR PROBABLE NETWORK ACCESS ASSISTANCE FUNCTIONS IS PROVIDED BY A BRIEF DISCUSSION ON SEVERAL IMPLEMENTED AND PLANNED ACCESS SUPPORT CONFIGURATIONS./

TAULBEE, ORRIN E., SIEGFRIED TREU, JIRI NEHNEVAJSA, USER ORIENTATION IN NETWORKING, (PITTSBURGH, UNIV. OF, PA), AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 637-644, 18 REFS

AFTER ESTABLISHING THE NEED FOR CONSIDERING THE PLIGHT OF THE USER IN NETWORKING, THE AUTHORS OUTLINE A STRUCTURED APPROACH TO SOLVING THE PROBLEM. EMPHASIS IS PLACED ON AN INTERDISCIPLINARY APPROACH WITH ATTENTION ON PSYCHOLOGICAL AND SOCIOLOGICAL CONSIDERATIONS.

TREU, SIEGFRIED, A COMPUTER TERMINAL NETWORK FOR TRANSPARENT STIMULATION OF THE USER OF AN ON-LINE RETRIEVAL SYSTEM, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INFORMATION PROCESSING TECHNOLOGY DIV., JUL 72, NBS TN-732, 33P, 22 REFS

A COMPUTER TERMINAL NETWORK TO ENABLE 'TRANSPARENT STIMULATION' OF THE USER OF AN ON-LINE RETRIEVAL SYSTEM HAS BEEN DESIGNED, IMPLEMENTED, AND PILOT TESTED. ITS BASIC PURPOSE IS TO PROVIDE A SUITABLE AND EFFECTIVE FRAMEWORK AND METHODOLOGY FOR EXPERIMENTAL IDENTIFICATION/VALIDATION OF THOSE HUMAN CHARACTERISTICS WHICH SHOULD BE RECOGNIZED/REINFORCED IN MAN-COMPUTER INTERFACE DESIGN. THE RATIONALE BEHIND THE TRANSPARENT STIMULATION APPROACH IS PRESENTED AND THE METHODOLOGY EMPLOYED FOR SUCH REAL-TIME, UNOBTRUSIVE SCANNING AND MANIPULATION OF THE MAN-COMPUTER DIALOGUE IS DESCRIBED. A GENERAL OVERVIEW OF THE HARDWARE AND SOFTWARE FEATURES OF THE IMPLEMENTED STIMULATION NETWORK IS INCLUDED.

2.9 OTHER

BECKER, HAL B., A STRUCTURED APPROACH TO INFORMATION NETWORKS, (HONEYWELL INFORMATION SYSTEMS INC., PHOENIX, AZ), COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 35-38

THE AUTHOR PRESENTS A STRUCTURED, APPLICATION INDEPENDENT APPROACH TO INFORMATION NETWORK DESIGN AS AN AID TO DESIGNERS AND IMPLEMENTORS OF INFORMATION NETWORKS. NETWORKING FUNCTIONS ARE IDENTIFIED, INDEPENDENT OF THE SPECIFIC APPLICATIONS THAT THE NETWORK ITSELF WILL ACCOMMODATE. THUS, THE AUTHOR CONTENDS, THIS APPROACH PROVIDES A GREAT DEGREE OF FLEXIBILITY IN THAT THE SAME BASIC SET OF FUNCTIONS CAN BE APPLIED TO ANY NETWORK REGARDLESS OF ITS SIZE OR THE APPLICATIONS INVOLVED.

CHANORA, A. N., SOME CONSIDERATIONS IN THE DESIGN OF HOMOGENEOUS DISTRIBUTED DATA BASES, (INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY, THOMAS J. WATSON RESEARCH CENTER), COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 185-186, 6 REFS

DATA BASES WHICH ARE LOGICALLY SIMILAR BUT DISTRIBUTED AMONG SEVERAL COMPUTING FACILITIES CAN BE INTEGRATED TO PROVIDE ACCESS OF THE INFORMATION TO ALL USERS. THE DESIGN OF HOMOGENEOUS, DISTRIBUTED DATA BASES TO PROVIDE FLEXIBILITY OF ACCESS, AND THE RELATED SECURITY AND DEADLOCK PROBLEMS ARE DISCUSSED.

FREEMAN, DAVID N., ROBERT R. PEARSON, EFFICIENCY VS. RESPONSIVENESS IN A MULTIPLE-SERVICES COMPUTER FACILITY, (TRIANGLE UNIVERSITIES COMPUTATION CENTER, RESEARCH TRIANGLE PARK, NC, WEST GEORGIA COLLEGE, CARROLLTON), PROCEEDINGS OF 23RD NATIONAL CONFERENCE, ASSOCIATION FOR COMPUTING MACHINERY, (AUGUST 27-29, 1968), BRANDON-SYSTEMS PRESS INC., PRINCETON, NJ, 1968, ACM P-68, P 25-34, 9 REFS

JOB SCHEDULING ALGORITHMS IN A MULTIPROGRAMMING ENVIRONMENT--OS ON AN IBM 360/75--ARE DISCUSSED. THE TRIANGLE UNIVERSITIES COMPUTER CENTER (TUCC) NETWORK IS USED AS A CASE IN POINT TO DEVELOP THE ANALYSIS. THIS NETWORK IS NOT THE MAIN TOPIC, BUT SOME INSIGHT TO THE STRUCTURE OF THIS APPARENTLY SUCCESSFUL SERVICE CENTER CAN BE GAINED.

FREEMAN, DAVID N., OR., JOE R. RAGLAND, THE RESPONSE-EFFICIENCY TRADE-OFF IN A MULTIPLE-UNIVERSITY SYSTEM, (PENNSYLVANIA, UNIV. OF, PHILADELPHIA, TRIANGLE UNIVERSITIES COMPUTATION CENTER, RESEARCH TRIANGLE PARK, NC), DATAMATION, VOL 16, ISSUE 3, MAR 70, P 112-113, 116

THE PRINCIPAL FEATURES OF THE CENTRAL SERVICE FACILITY FOR THE TRIANGLE UNIVERSITIES COMPUTATION CENTER (TUCC) REGIONAL COMPUTER NETWORK ARE SUMMARIZED. A WIDE MIX OF JOBS IS HANDLED EFFICIENTLY BY PLACING HEAVY EMPHASIS ON FAST-BATCH AND BY UTILIZING LARGE CORE STORAGE TO PROVIDE COST-EFFECTIVE OPERATION. OVER 90% OF THE SYSTEM LOAD IS FROM REMOTE TERMINALS.

LEFKOVITS, H. C., CHARACTERISTICS OF DATABASE SYSTEMS IN A COMPUTER NETWORK ENVIRONMENT, (GENERAL ELECTRIC CO., BRIDGEPORT, CT, ADVANCED SYSTEMS AND TECHNOLOGY OPERATION), INTERDISCIPLINARY CONFERENCE ON MULTIPLE ACCESS COMPUTER NETWORKS, (AUSTIN, TX, APRIL 20-22, 1970), APR 70, P 3-1-1--3-1-8

THIS SHORT ARTICLE ILLUSTRATES THE DIFFERENCES BETWEEN A TREE-STRUCTURED DATA BASE AND MORE GENERAL GRAPH-STRUCTURED DATA BASES. DESPITE ADDITIONAL DIFFICULTIES, GRAPH-STRUCTURED DATA BASES ARE FELT TO BE NECESSARY IN A NETWORK ENVIRONMENT.
(ALSO UNDER 4.1.2)

RAYMOND, RICHARD C., A MODEL WHICH AIDS IN THE DESIGN OF CENTRAL STATIONS FOR LARGE COMPUTER NETWORKS, (GENERAL ELECTRIC CO., NEW YORK, RESEARCH AND DEVELOPMENT CENTER), INTERDISCIPLINARY CONFERENCE ON MULTIPLE ACCESS COMPUTER NETWORKS, (AUSTIN, TX, APRIL 20-22, 1970), APR 70, P 3-S-1--3-S-8, 3 REFS

A CONVERSATIONAL MODEL TO AID IN THE DESIGN OF THE COMPUTER SYSTEMS WHICH SERVE LARGE, MULTI-USER COMPUTER NETWORKS IS DESCRIBED. SAMPLE RESULTS INCLUDE A NUMBER OF OPTIONAL SYSTEMS BALANCED IN RELATION TO PROCESSOR, MEMORY, I/O CONTROL, FILE STORAGE, PAGING, AND OTHER PARAMETERS FOR VARIOUS TYPES OF JOB REQUIREMENTS. RESULTS ARE OBTAINED BY SETTING PARAMETERS DESCRIBING A JOB MIX ENVIRONMENT IN SOME DETAIL TO A SIMULATOR IMPLEMENTED IN FORTRAN ON THE GE MARK II TIME-SHARING SYSTEM. OUTPUT IS VERY DETAILED AND INCLUDES COST INFORMATION FOR THE SYSTEMS DESCRIBED.

WHITNEY, V. KEVIN MOORE, A STUDY OF OPTIMAL FILE ASSIGNMENT AND COMMUNICATION NETWORK CONFIGURATION IN REMOTE-ACCESS COMPUTER MESSAGE PROCESSING AND COMMUNICATION SYSTEMS, MICHIGAN, UNIV. OF, ANN ARBOR, DEPT. OF ELECTRICAL ENGINEERING, SEP 70, MI-DEE SEL-48, AF F30602-69-C-0214, 408P, 187 REFS

A RESEARCH PROJECT IS DESCRIBED FOR FILE DISTRIBUTION IN NETWORKS HAVING THE FOLLOWING CHARACTERISTICS: LARGE DATA BASES ORGANIZED INTO RECORD FILES, WIDELY DISTRIBUTED USERS, AN ON-LINE COMMUNICATION NETWORK JOINING USERS TO DATA BASE SITES, AND SPECIFIED PERFORMANCE CONSTRAINTS (E.G., RESERVATION SYSTEMS, TIME-SHARING SYSTEMS). THE PROBLEMS ADDRESSED INCLUDE: (1) OPTIMAL NUMBERS AND LOCATION OF SITES FOR SYSTEM FILES; (2) OPTIMAL DESIGN OF COMMUNICATIONS CHANNELS AND NETWORKS OF THESE CHANNELS; (3) OPTIMAL DESIGN OF COMMUNICATIONS NETWORK TOPOLOGIES. THE SOLUTION PROCEDURES ARE INTEGRATED INTO A TOTAL DESIGN PROCEDURE AND AN EXAMPLE OF ITS APPLICATION TO A LARGE SYSTEM IS GIVEN.
(ALSO UNDER 4.1.2)

3. ARCHITECTURE

3.0 GENERAL

ARONOFSKY, JULIUS, COMPUTERS AND COMMUNICATIONS. REPORT OF WORKSHOP 9, (SOUTHERN METHODIST UNIV., DALLAS, TX), GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 356-364, 1 REFS

THE WORKSHOP WAS CONCERNED WITH ALTERNATIVE NETWORK DESIGNS, COMPUTER EQUIPMENT CONFIGURATIONS, TELECOMMUNICATIONS APPROACHES, SWITCHING SYSTEMS, AND BASIC NETWORK CONFIGURATIONS. IT ALSO DEALT WITH THE QUESTIONS OF TELECOMMUNICATIONS POLICY.

ASHENHURST, ROBERT L., HIERARCHICAL COMPUTING, (CHICAGO, UNIV. OF, IL, INST. FOR COMPUTER RESEARCH), GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 74-88, 6 REFS

HIERARCHICAL COMPUTING TOGETHER WITH NETWORKING MAY MAKE COMPUTING MORE COST-EFFECTIVE FOR EDUCATIONAL AND RESEARCH ORGANIZATIONS. THE AUTHOR DISCUSSES THE ATTRIBUTES OF COMPUTERS AND INFORMATION SYSTEMS THAT MAKE HIERARCHICAL COMPUTING ATTRACTIVE, PARTICULARLY IN THE CONTEXT OF COMPUTER NETWORKS. A SPECIFIC EXAMPLE OF THIS CONCEPT, THE MINICOMPUTER INTERFACING SUPPORT SYSTEM (MISS) PROJECT AT THE UNIVERSITY OF CHICAGO, IS DESCRIBED. (ALSO UNDER 3.1.1)

BALZER, R., W. CUVAL, R. BRESSLER, INTERENTITY COMMUNICATION, RAND CORP., SANTA MONICA, CA, 13 OCT 71, 5P

A DISCUSSION OF INTER-PROCESS, INTER-USER COMMUNICATION IN A NETWORK ENVIRONMENT IS CONTAINED IN THIS REPORT. IT PRESENTS SOME INTRIGUING IDEAS, BOTH IN GENERAL AND FOR A PROPOSED EXPERIMENT IN WHICH TWO GEOGRAPHICALLY SEPARATED USERS CAN COMMUNICATE WITH THE SAME PROGRAM IN EXECUTION AND POSSIBLY WITH A RECORD OF PRIOR INTERACTION WITH THE PROGRAM.

BARAN, PAUL, ON DISTRIBUTED COMMUNICATIONS: I. INTRODUCTION TO DISTRIBUTED COMMUNICATIONS NETWORKS, RAND CORP., SANTA MONICA, CA, AUG 64, RC RM-3420-PR, AF 49(638)-700, (AD-444 830), 37P, 3 REFS
(ANNOTATION UNDER 1.0)

BARAN, PAUL, ON DISTRIBUTED COMMUNICATIONS: XI. SUMMARY OVERVIEW, RAND CORP., SANTA MONICA, CA, AUG 64, RC RM-3767-PR, AF 49(638)-700, (AD-444 837), 23P

THIS VOLUME OF 'ON DISTRIBUTED COMMUNICATIONS' SUMMARIZES WORK PERFORMED ON THIS PROJECT AS OF AUGUST 1964. IT IS CLAIMED THAT A HIGHLY RELIABLE ERROR-FREE DIGITAL COMMUNICATIONS SYSTEM USING NOISY LINKS AND UNRELIABLE COMPONENTS CAN BE BUILT USING THEN STATE-OF-THE-ART ELECTRONIC COMPONENTS. BARAN CLAIMS TO HAVE BEGUN TO UNDERSTAND SOME OF THE PHENOMENA ASSOCIATED WITH TIME DELAYS, ROUTING ALGORITHMS, AND THE LIKE, FOR SUCH NETWORKS. ALTHOUGH SOME OF THE MATERIAL IN THIS REPORT IS VALID ONLY FOR BARAN'S ORIGINAL INTENT FOR A SPECIFIC TYPE OF SYSTEM FOR A MILITARY ENVIRONMENT, SOME OF THE CONCLUSIONS AND HIS GENERAL APPROACH IN SUMMARIZING THE ADVANTAGES AND DISADVANTAGES OF THIS TYPE OF NETWORK ARE USEFUL IN EVALUATING ALTERNATIVE APPROACHES TO RESOURCE-SHARING COMPUTER NETWORKS OF THE 1970'S.
(ALSO UNDER 2.0, 1.0)

BARTLETT, K. A., TRANSMISSION CONTROL IN A LOCAL DATA NETWORK, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND)), INFORMATION PROCESSING 68; PROCEEDINGS OF IFIP CONGRESS 1968, VOLUME 2--HARDWARE, APPLICATIONS, (EDINBURGH, (SCOTLAND), AUGUST 5-10, 1968), NORTH-HOLLAND PUBLISHING CO., AMSTERDAM, (NETHERLANDS), 1969, IFIP CONGRESS PROCEEDINGS, (LC 65-24118), P 704-708, 3 REFS

A NETWORK IS DESCRIBED CONNECTING A VARIETY OF COMPUTERS, PERIPHERALS, AND TERMINALS TO A CENTRAL ROUTING COMPUTER. THIS CENTRAL ROUTING COMPUTER IS A MESSAGE-SWITCHING COMPUTER ACTING AS A NODE IN A NATIONAL DISTRIBUTED COMPUTER NETWORK. OTHER THAN NOTING ITS EXISTENCE, THE CONCERN IS NOT WITH THE NATIONAL NET, BUT ONLY WITH LOCAL NETS THAT CONNECT TO IT. THE MESSAGE-SWITCHING COMPUTER IS DESIGNED TO HANDLE HIGH SPEED SUBSCRIBERS. LOWER SPEED DEVICES ARE FIELDED THROUGH A HIERARCHY OF MULTIPLEXORS, EACH PERFORMING TRANSMISSION CONTROL AND ERROR CORRECTION, LARGELY THROUGH HARDWARE. THE HARDWARE DEVICES DESCRIBED APPEAR SUITABLE FOR HALF DUPLEX TRANSMISSION.

BELYAKOV-BODIN, V. I., YU. I. TORGOV, ON THE STRUCTURE OF A HETEROGENEOUS COMPUTING SYSTEM, CONTROLLED BY A LARGE DIGITAL COMPUTER, AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AFB, OH, FOREIGN TECHNOLOGY DIV., ACADEMY OF SCIENCES OF THE USSR, COMPUTER CENTER, 1 OCT 69, AFSC-FTD MT-23-1450-68, AF F33657-68-D-1287, (AD-699 640), 8P, 4 REFS
REPRINT FROM WORKS ON TECHNICAL CYBERNETICS (1967) 60-66?

SOME INTERESTING CONCEPTS IN HIERARCHICAL COMPUTING ARE PRESENTED RELATIVE TO A CONFIGURATION WITH A NUMBER OF MEDIUM SCALE COMPUTERS INTEGRATED INTO A SYSTEM CONTROLLED BY A LARGER COMPUTER.

BENNETT, J. M., C. S. WALLACE, J. W. WININGS, A GRAFTED MULTI-ACCESS NETWORK, (SYDNEY, UNIV. OF, (AUSTRALIA), DEPT. OF BASSER COMPUTING),
INFORMATION PROCESSING 68; PROCEEDINGS OF IFIP CONGRESS 1968, VOLUME 2--HARDWARE, APPLICATIONS, (EDINBURGH, (SCOTLAND), AUGUST 5-10, 1968), NORTH-HOLLAND PUBLISHING CO., AMSTERDAM, (NETHERLANDS), 1969, IFIP CONGRESS PROCEEDINGS, (LC 65-24118), P 917-922, 2 REFS

A NETWORK IS DESCRIBED WHERE A SMALL COMPUTER IS GRAFTED ONTO A LARGE ONE (I.E. LITTLE INTERFERENCE IS INTRODUCED INTO THE NORMAL OPERATING SYSTEM OF THE LARGE MACHINE) TO PROVIDE NECESSARY FUNCTIONS NOT ORIGINALLY INCLUDED IN THE LARGE SYSTEM INCLUDING ON-LINE FILE STORAGE, INTERACTIVE CONSOLE COMMUNICATION, JOB SCHEDULING, FILE EDITING, AND COMMAND LANGUAGE INTERPRETATION.

BIRNBAUM, J., A TIME SHARED SYSTEM FOR MULTIPLE INDEPENDENT LABORATORIES, (INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY, THOMAS J. WATSON RESEARCH CENTER),
IEEE TRANSACTIONS ON NUCLEAR SCIENCE, VOL NS-18, ISSUE 1, FEB 71, P 287-291, 6 REFS

A COMPUTER BASED DATA ACQUISITION NETWORK IS DESCRIBED FOR THE TRANSMISSION OF INFORMATION BETWEEN REMOTE INDEPENDENT LABORATORIES AND A TIME-SHARED IBM 360. SATELLITE COMPUTERS, WHICH WOULD NORMALLY BE USED FOR PERFORMING THE REAL-TIME TASKS, ARE REPLACED BY LESS EXPENSIVE CONTROLLERS WITH A MORE LIMITED INSTRUCTION SET, BUT WITH ENHANCED FACILITIES FOR INFORMATION TRANSFER.

BLANC, ROBERT P., AVAILABILITY AND USEABILITY OF COMPUTER COMMUNICATION NETWORKS, (PRESENTED AT, SEVENTH HAWAII INTERNATIONAL CONFERENCE ON SYSTEM SCIENCES, HONOLULU, HI, JANUARY 8-10, 1974), NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, COMPUTER NETWORKING SECTION, JAN 74, NSF EC-04984, NSF GJ-33220, NSF AG-350, (HU CN74-7), 4P, 9 REFS

THE TECHNICAL CHARACTERISTICS OF EXISTING APPROACHES TO COMPUTER NETWORKING TECHNOLOGY ARE REVIEWED FOR THE PURPOSE OF IDENTIFYING THOSE FEATURES WHICH LEND THEMSELVES PARTICULARLY WELL TO THE INTERCONNECTION OF COMPUTERS, AS WELL AS COMPUTER TERMINALS.

CASTLE, JAMES C., SYSTEM CONTROL IN MULTIPLE ACCESS COMPUTER NETWORKS, (GENERAL ELECTRIC CO., BETHESDA, MD, DEPT. OF INFORMATION NETWORKS),
INTERDISCIPLINARY CONFERENCE ON MULTIPLE ACCESS COMPUTER NETWORKS, (AUSTIN, TX, APRIL 20-22, 1970), APR 70, R S-3-1--S-3-11, 30 REFS
(ANNOTATION UNDER 1.0)

CHOU, WUSHOW, COMPUTER COMMUNICATION NETWORKS--THE PARTS MAKE UP THE WHOLE, (NETWORK ANALYSIS CORP., GLEN COVE, NY), AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 119-128, 27 REFS

THIS ARTICLE IS A INTRODUCTORY, YET THOROUGH, DISCUSSION OF THE COMPONENTS OF COMPUTER COMMUNICATIONS NETWORKS. TERMINOLOGY RELATED TO NETWORK ARCHITECTURE AND COMMUNICATIONS IS DEFINED. THE COMMUNICATION DEVICES, TRANSMISSION FACILITIES AND TRAFFIC MANAGEMENT OF CENTRALIZED, RING-SWITCHED AND STORE-AND-FORWARD SWITCHED NETWORKS ARE DISCUSSED.

CROWTHER, W. R., F. E. HEART, A. A. MCKENZIE, J. M. MCQUILLAN, D. C. WALDEN, ISSUES IN PACKET SWITCHING NETWORK DESIGN, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 161-175, 33 REFS

AFTER DEFINING KEY TERMINOLOGY, THE AUTHORS DELVE INTO A THOROUGH DISCUSSION OF NETWORK DESIGN. AMONG THE TOPICS COVERED ARE PERFORMANCE GOALS, HARDWARE DESIGN, STORE-AND-FORWARD SUBNETWORK SOFTWARE DESIGN, AND SOURCE-TO-DESTINATION SOFTWARE DESIGN. THE AUTHORS EMPHASIZE THAT ALTHOUGH CONSIDERABLE EXPERIENCE HAS BEEN GAINED WITH PACKET-SWITCHING, THE FUTURE HOLDS GREAT CHALLENGES. AMONG THESE CHALLENGES ARE SPEECH TRANSMISSION, NETWORK INTERCONNECTION, RADIO TRANSMISSION

3.0 GENERAL

AND TRANSFERRING THIS TECHNOLOGY FROM AN R&D ENVIRONMENT TO WIDESPREAD PRODUCTION IMPLEMENTATIONS. THIS IS AN INFORMATIVE, WELL-WRITTEN ARTICLE.

DAVIS, RUTH M., THE NATIONAL BIOMEDICAL COMMUNICATIONS NETWORK AS A DEVELOPING STRUCTURE. (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC. CENTER FOR COMPUTER SCIENCES AND TECHNOLOGY),
BECKER, JOSEPH, PROCEEDINGS OF THE CONFERENCE ON INTERLIBRARY COMMUNICATIONS AND INFORMATION NETWORKS, (WARRENTON, VA, SEPTEMBER 28-OCTOBER 2, 1970), AMERICAN LIBRARY ASSOCIATION, CHICAGO, IL, 1971, DEC 0-9-230288-423S(09S), (LC 70-185896), P 294-309, 4 REFS

ALTHOUGH THE PRIMARY TOPIC OF THIS PAPER IS THE PLANNING FOR A BIOMEDICAL COMMUNICATIONS NETWORK, CONSIDERABLE MATERIAL OF MUCH MORE GENERAL INTEREST IS PRESENTED. A GENERAL DESCRIPTION OF NETWORK STRUCTURES AND PERFORMANCE OBJECTIVES INCLUDES COVERAGE OF CENTRALIZED, COMPOSITE-CENTRALIZED, AND HIERARCHICAL NETWORKS.
(ALSO UNDER 4.2.9)

DOLL, DIXON R., DR., TELECOMMUNICATIONS TURBULENCE AND THE COMPUTER NETWORK EVOLUTION. (DMW TELECOMMUNICATIONS CORP., ANN ARBOR, MI),
COMPUTER, VOL 7, ISSUE 2, FEB 74, P 13-22, 53 REFS
(ANNOTATION UNDER 1.3)

ELMENDORF, C. H., P. E. MUENCH, K. W. SUSSMAN, DATA COMMUNICATIONS NETWORK ARCHITECTURE. (AMERICAN TELEPHONE AND TELEGRAPH CO., NEW YORK),
INTERDISCIPLINARY CONFERENCE ON MULTIPLE ACCESS COMPUTER NETWORKS, (AUSTIN, TX, APRIL 20-22, 1970), APR 70, P 3-4-1--3-4-6, 3 REFS

THE OPTIMAL BALANCE IN TTHE SELECTION OF COMMUNICATIONS COMPONENTS OF A NETWORK IS DISCUSSED. VARIOUS BELL SYSTEM OFFERINGS ARE DESCRIBED AND THEIR POTENTIAL APPLICATION IN COMPUTER NETWORKS ARE DISCUSSED.
(ALSO UNDER 1.3)

FARBER, DAVID J., DATA RING ORIENTED COMPUTER NETWORKS, (CALIFORNIA, UNIV. OF, IRVINE),
RUSTIN, RANDALL, COURANT COMPUTER SCIENCE SYMPOSIUM 3. COMPUTER NETWORKS, (NOVEMBER 30-DECEMBER 1, 1970), PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1972, PRENTICE-HALL SERIES IN AUTOMATIC COMPUTATION, (LC 79-39373), P 79-93

THIS IS A VERY INTERESTING AND TECHNICALLY ORIENTED PAPER ON THE DISTRIBUTED COMPUTING SYSTEM (DCS) AT THE UNIVERSITY OF CALIFORNIA, IRVINE. SOME GOOD INSIGHT INTO RING CONFIGURED SYSTEMS IS GIVEN.

FRANK, HOWARD, LEONARD KLEINROCK, ROBERT E. KAHN, COMPUTER COMMUNICATION NETWORK DESIGN--EXPERIENCE WITH THEORY AND PRACTICE. (NETWORK ANALYSIS CORP., GLEN COVE, NY, CALIFORNIA, UNIV. OF, LOS ANGELES, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA),
AFIPS CONFERENCE, 1972 SPRING JOINT COMPUTER CONFERENCE, VOLUME 40, (ATLANTIC CITY, NJ, MAY 16-18, 1972), AFIPS PRESS, MONTVALE, NJ, 1972, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 255-270, 52 REFS

THIS IS AN EXCELLENT REVIEW OF THE STATE-OF-THE-ART OF THE DESIGN OF MESSAGE SWITCHED NETWORKS. WITH AN EMPHASIS ON THE INITIAL AND CONTINUING DESIGN OF THE ARPANET, THE CAPABILITIES AND LIMITATIONS OF PRESENT DESIGN TECHNIQUES ARE CLEARLY SUMMARIZED. LITTLE ATTENTION IS GIVEN TO IMPLEMENTATION DETAILS OR TO COMPARISON WITH CIRCUIT-SWITCHED NETWORKS, BUT THE CONCEPTUAL PROBLEMS IN DESIGNING AND IMPLEMENTING ARPA-TYPE NETWORKS ARE IDENTIFIED AND DISCUSSED FORTHRIGHTLY AND IN AN ACADEMICALLY SATISFYING MANNER.
(ALSO UNDER 2.0)

FRISCH, IVAN T., DR., TECHINCAL PROBLEMS IN NATIONWIDE NETWORKING AND INTERCONNECTION, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
IEEE TRANSACTIONS ON COMMUNICATIONS, VOL COM-23, ISSUE 1, JAN 75, P 78-88, 43 REFS

THE COMPUTER-COMMUNICATIONS REVOLUTION IS NOW AT THE POINT WHERE LOCAL INTERACTIVE SUBSCRIBERS WILL BE PRESENTED WITH THE OPPORTUNITIES FOR NATIONWIDE INTERCONNECTION. THIS ARTICLE DESCRIBES A RANGE OF TECHNICAL PROBLEMS THAT MUST BE FACED IN THE IMPLEMENTATION OF NATIONAL AND LOCAL NETWORKS. SOME TECHNIQUES ARE PROPOSED AND EVALUATED.
(ALSO UNDER 2.1)

GERLA, M., H. FRANK, W. CHOU, J. ECKL, DESIGN ALTERNATIVES FOR LARGE DISTRIBUTED NETWORKS, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
NATIONAL TELECOMMUNICATIONS CONFERENCE, CONFERENCE RECORD, VOLUME 2, (NEW ORLEANS, LA, DECEMBER 1-3, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH-101S-7-CSCB, (LC 57-20724), P 27-1S--27-21, 25 REFS

THIS PAPER REVIEWS THE ALTERNATIVE NETWORK CONFIGURATIONS AVAILABLE FOR BACKBONE AND LOCAL ACCESS DESIGN AND DISCUSSES THE IMPACT OF NETWORK STRATEGY, PARAMETERS AND REQUIREMENTS ON OPTIMAL BACKBONE NODE NUMBER AND LOCATION. GENERAL TRENDS OF COST AND PERFORMANCE VERSUS NUMBER OF NODES ARE DERIVED, AND ARE ILLUSTRATED WITH A LARGE NETWORK DESIGN APPLICATION.

HOWE, W. GERRY, TOM R. KIBLER, CONTROL CONCEPTS OF A LOGICAL NETWORK MACHINE, INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY, THOMAS J. WATSON RESEARCH CENTER, 22 APR 71, IBM-TJWRC RC-3331, 13P

THE CONTROL CONCEPTS AND THE COMMAND LANGUAGE CONSIDERATIONS THAT FORM THE BASIS FOR THE NETWORK OPERATING SYSTEM ARCHITECTURE FOR THE IBM NETWORK/440 ARE DESCRIBED.

LAY, W. M., D. L. MILLS, M. V. ZELKOWITZ, OPERATING SYSTEMS ARCHITECTURE FOR A DISTRIBUTED COMPUTER NETWORK, (MARYLAND, UNIV. OF, COLLEGE PARK, DEPT. OF COMPUTER SCIENCE),
PROCEEDINGS OF THE 1974 SYMPOSIUM, COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, MAY 23, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, 74CH0835-9C, P 39-43, 8 REFS

THIS PAPER DESCRIBES THE STRUCTURE OF THE SUPERVISORY SYSTEM FOR A DISTRIBUTED COMPUTER NETWORK WHICH IS UNDER DEVELOPMENT AT THE UNIVERSITY OF MARYLAND. THE NETWORK CONSISTS OF A DEC PDP11/45, A UNIVAC 1106 AND A UNIVAC 1108. TWO DIFFERENT HOSTEL ORGANIZATIONS, ONE FOR THE PDP11/45 AND THE OTHER FOR EITHER OF THE UNIVAC 1100-SERIES COMPUTERS, HAVE BEEN DEVELOPED, AND ARE DESCRIBED. THESE HOSTEL ORGANIZATIONS PROVIDE A COMMON INTERFACE FOR USER PROCESSES AND ESTABLISH A COMMON SYSTEM FOR COMMUNICATION WHICH IS INDEPENDENT OF PROCESS LOCATION.

LEGATES, JOHN, NETWORKS IN HIGHER EDUCATION: PROCEEDINGS OF THE EDUCOM COUNCIL MEETING SEMINAR. INTRODUCTION.(PRESENTED AT, NETWORKS IN HIGHER EDUCATION: PROCEEDINGS OF THE EDUCOM COUNCIL MEETING SEMINAR, ATLANTA, GA, OCTOBER 15, 1970, (INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ),
BEHAVIORAL SCIENCE, VOL 16, ISSUE 5, SEP 71, P 490-492

THIS IS AN INTRODUCTORY PAPER PRESENTED AT A SEMINAR DEVOTED TO THE THEORETICAL AND PRACTICAL ASPECTS OF NATIONAL, REGIONAL, AND LOCAL COMPUTER NETWORKS. THE AUTHOR DISCUSSES THE MAJOR VARIABLES IN NETWORKING; SIZE; SHAPE; NATURE OF ELEMENTS LINKED; NATURE OF THE CONNECTION; AND NATURE OF THE ITEMS DISTRIBUTED.

MARILL, THOMAS, LAWRENCE G. ROBERTS, TOWARD A COOPERATIVE NETWORK OF TIME-SHARED COMPUTERS, (COMPUTER CORP. OF AMERICA, CAMBRIDGE, MA, MASSACHUSETTS INST. OF TECH., LEXINGTON, LINCOLN LAB.),
AFIPS PROCEEDINGS, 1966 FALL JOINT COMPUTER CONFERENCE, VOLUME 29, (SAN FRANCISCO, CA, NOVEMBER 7-10, 1966), SPARTAN BOOKS INC., WASHINGTON, DC, 1966, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 425-431, 3 REFS

THE CONTENT OF THIS PAPER IS ALMOST IDENTICAL TO MARILL'S ARTICLE, 'A COOPERATIVE NETWORK OF TIME-SHARING COMPUTERS' IN CATEGORY 3.0. AN APPENDIX IS ADDED WHICH DESCRIBES THE MESSAGE PROTOCOL EMPLOYED IN THE NETWORK.

MARILL, THOMAS, A COOPERATIVE NETWORK OF TIME-SHARING COMPUTERS: PRELIMINARY STUDY, COMPUTER CORP. OF AMERICA, CAMBRIDGE, MA, 1 JUN 66, CCA TR-11, 52P, 6 REFS

FACILITIES FOR THE INTERCONNECTION OF TIME-SHARING SYSTEMS ARE DISCUSSED. THE FACILITIES ARE OFF-THE-SHELF, VINTAGE 1966. A 'DICTIONARY' OF MODEMS, COMMON CARRIERS, AND COMMUNICATIONS TECHNIQUES IS PROVIDED. THE RECOMMENDED CONFIGURATION CALLS FOR THE CONNECTION OF COMPUTERS VIA 1200 BAUD DIALUP LINES. DISTANT SYSTEMS WOULD LOOK LIKE TERMINALS TO A HOST SYSTEM AND NO MONITOR CHANGES WOULD BE REQUIRED.
(ALSO UNDER 3.2.0)

MCKAY, DOUGLAS B., DONALD P. KARP, JAMES W. MEYER, ROBERT S. NACHBAR, EXPLORATORY RESEARCH ON NETTING IN IBM, INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY, THOMAS J. WATSON RESEARCH CENTER, 14 JUN 71, IBM-TJWRC RC-3486, 43P

3.0 GENERAL

TWO TYPES OF NETWORKS ARE DESCRIBED. THE FIRST IS A DISTRIBUTED NETWORK OF HOMOGENEOUS COMPUTERS--IBM 360/67'S. A TERMINAL FROM ONE HOST IS ABLE TO INTERACT WITH ANOTHER HOST THROUGH A SWITCHED CONNECTION ESTABLISHED ON DEMAND BETWEEN THE HOSTS. THE SECOND NETWORK IS NETWORK/440, WHICH IS CLASSIFIED BY THE AUTHOR AS ONE OF NON-HOMOGENEOUS HARDWARE AND OPERATING SYSTEMS. THE OBJECT BEING TO VIEW THE NETWORK AS ONE MULTIPROCESSOR. THE NETWORK IS CENTRAL SWITCHED, CONNECTING FOUR DIFFERENT MODEL 360'S AT THE IBM RESEARCH CENTER. EACH OPERATING UNDER OS/360 AND ACCESSING EACH OTHER THROUGH THE BASIC TELECOMMUNICATIONS ACCESS METHOD. A NETWORK CONTROL LANGUAGE CALLED 'ACL' IS DEFINED AND APPEARS CONVENIENT TO USE. EACH PROCESSOR MUST BE ABLE TO COMPILE AND INTERPRET ACL. THE NETWORK IS DESIGNED FOR CONVENIENT REMOTE PROGRAMMING AND FOR LARGE OR SMALL FILE TRANSMISSION. PROGRAM EXECUTION CAN OCCUR EITHER LOCALLY OR REMOTELY WITH APPARENT EASE. THE STORE AND FORWARD TECHNIQUES USED BY THE NETWORK CONTROL ARE TOLERANT OF HOST CRASHES AND CAN SAVE TRANSMISSIONS ON DISK UNTIL A HOST HAS RECOVERED, INTERACTIVE USERS, IF THEY DESIRE, CAN OBTAIN A DIRECT LOGICAL CONNECTION TO A REMOTE HOST. A DRAWBACK TO THE NETWORK IS THAT ALL COMMUNICATIONS PROCESSING AND ERROR RECOVERY INVOLVES THE HOST COMPUTERS. FRONT END PROCESSORS ARE UNDER CONSIDERATION TO IMPROVE EFFICIENCY.

MCKENNEY, JAMES L., SOFTWARE SYSTEMS AND OPERATING PROCEDURES. REPORT OF WORKSHOP 10, (HARVARD UNIV., CAMBRIDGE, MA. GRADUATE SCHOOL OF BUSINESS ADMINISTRATION),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 365-372, 1 REFS

THE WORKSHOP CONSIDERED SOFTWARE SYSTEMS AND OPERATING PROCEDURES AS A KEY MEANS TO PROVIDING SERVICE TO THE USER. THE DISCUSSION WAS PARTLY INFLUENCED BY EXPERIENCES IN EXISTING NETWORK SYSTEMS, PARTICULARLY THE DIFFERENT REQUIREMENTS FOR DIFFERENT MACHINES ON THE ARPA NETWORK, THE WIDE VARIATION AMONG JOB CONTROL LANGUAGES, AND THE FUTILITY OF CREATING ONE MORE PLANNING COMMITTEE ON STANDARDS.
(ALSO UNDER 5.5)

NEUMANN, PETER G., SYSTEM DESIGN FOR COMPUTER NETWORKS, (STANFORD RESEARCH INST., MENLO PARK, CA),
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 29-81, 83 REFS
(ANNOTATION UNDER 1.3)

PACIFIC EDUCATIONAL COMPUTER NETWORK STUDY, HAWAII, UNIV. OF, HONOLULU, ALOHA SYSTEM, 31 MAR 75, HU TR-CN75-1, NSF GJ-33220, 12P
(ANNOTATION UNDER 1.1)

PERRY, JOHN, SOME SOLUTIONS TO NETWORK IMPLEMENTATION PROBLEMS, (INTERNATIONAL COMPUTERS LTD., LONDON, (ENGLAND), SYSTEMS AND TECHNICAL SUPPORT),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 549-554

DESIGN AND IMPLEMENTATION PRINCIPLES FOR A COMPUTER NETWORK ARE DISCUSSED. IN THE AREA OF DESIGN, SPECIFICATION OF CLEAR OBJECTIVES, SIMPLICITY, AND RESTRAINT IN ERROR HANDLING ARE SUGGESTED. AT THE IMPLEMENTATION STAGE, CONTROL, MODULARITY AND TESTING ARE PROPOSED. ABOVE ALL THE INCLUSION OF OPERATIONS PERSONNEL IN THE PROCEDURE IS STRESSED.

PHISTER, MONTGOMERY, JR., SYSTEM DESIGN OF ON-LINE SERVICE SYSTEMS, (SCIENTIFIC DATA SYSTEMS, SANTA MONICA, CA),
GRUENBERGER, F., COMPUTERS AND COMMUNICATIONS--TOWARD A COMPUTER UTILITY, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1968, (TK 5101.C67, LC 68-16776), P 135-149
(ANNOTATION UNDER 4.3)

PYKE, THOMAS N., JR., ROBERT P. BLANC, COMPUTER NETWORKING TECHNOLOGY -- A STATE OF THE ART REVIEW, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY),
COMPUTER, VOL 6, ISSUE 8, AUG 73, P 12-19, 44 REFS
(ANNOTATION UNDER 1.3)

RETZ, DAVID L., OPERATING SYSTEM DESIGN CONSIDERATIONS FOR THE PACKET-SWITCHING ENVIRONMENT, (SPEECH COMMUNICATIONS RESEARCH LAB. INC., SANTA BARBARA, CA),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 197S, (LC 55-44701), P 155-160, 22 REFS

THIS ARTICLE IS A DISCUSSION OF PACKET-SWITCHING NETWORK ENVIRONMENTS. THE LAYERED STRUCTURE OF PROTOCOLS AND THE RELATED IMPLICATIONS ON THE HOST SYSTEMS ARE PRESENTED. FRONT END SYSTEMS AND AUTOMATED RESOURCE SHARING, WHICH ARE TWO AREAS OF AIDING USER ACCESS TO NETWORKS, ARE INCLUDED IN THE TOPICS. ALTHOUGH THE ARTICLE REPRESENTS A GENERAL DISCUSSION OF PACKET-SWITCHING, THE EXAMPLES POINT TO THE ARPANET.
(ALSO UNDER 3.3.2, 3.4.1)

ROOME, W. D., H. C. TORNG, MODELING AND DESIGN OF COMPUTER NETWORKS WITH DISTRIBUTED COMPUTATION FACILITIES, (CORNELL UNIV., ITHACA, NY, SCHOOL OF ELECTRICAL ENGINEERING),
PROCEEDINGS OF THE 1974 SYMPOSIUM, COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, MAY 23, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, 74CH0835-9C, P 30-38, 23 REFS

THIS PAPER ADDRESSES THE FOLLOWING PROBLEMS RELATING TO THE COMPUTATIONAL ASPECTS OF A COMPUTER NETWORK: (1) PRESENT A NETWORK MODEL FOR PERFORMANCE ANALYSIS AND OPTIMAL SELECTION OF BOTH PROCESSOR POWERS AND COMMUNICATIONS SUBSYSTEM SPEEDS; (2) DEVELOP A NETWORK SCHEDULING METHOD FOR AUTOMATICALLY AND DYNAMICALLY DISTRIBUTING THE RECEIVED WORKLOAD AMONG THE NETWORK'S RESOURCES; (3) DEMONSTRATE THAT A DYNAMIC SCHEDULING METHOD CAN BE EFFECTIVE WITHOUT PRIOR KNOWLEDGE OF JOB EXECUTION TIMES, AS LONG AS STATISTICALLY RELATED ESTIMATES ARE PROVIDED; AND (4) ASSESS THE RELATIVE MERITS OF DISTRIBUTED AND CENTRALIZED NETWORKS. THE AUTHORS' CONTENTION IS THAT DISTRIBUTED AUTOMATIC SELECTION NETWORKS ARE FEASIBLE IN ALMOST ALL SITUATIONS, AND IN MANY CASES ARE DEFINITELY SUPERIOR.

SCANTLEBURY, R. A., P. T. WILKINSON, THE DESIGN OF A SWITCHING SYSTEM TO ALLOW REMOTE ACCESS TO COMPUTER SERVICES BY OTHER COMPUTERS AND TERMINAL DEVICES, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND)),
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 160-167, 8 REFS

A PROPOSAL FOR A NATIONAL DATA NETWORK FOR THE UNITED KINGDOM IS DESCRIBED. THE PROPOSED NETWORK IS ORGANIZED HIERARCHICALLY AND IS INTENDED TO MEET THE REQUIREMENTS OF GENERALIZED COMPUTER TO COMPUTER COMMUNICATIONS. CONCEPTUALLY, THE PROPOSED NETWORK HAS MANY SIMILARITIES TO THE EXISTING ARPANET.

SMITH, B. T., MIXED COMPUTER NETWORKS: BENEFITS, PROBLEMS AND GUIDELINES, (CIVIL SERVICE DEPT., LONDON, (ENGLAND)),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 201-209, 4 REFS

THE ADVANTAGES OF HAVING HETEROGENEOUS COMPUTER NETWORKS RATHER THAN NETWORKS OF IDENTICAL COMPUTERS ARE DISCUSSED. SOME NINE SEPARATE BENEFITS ARE IDENTIFIED, FOLLOWED BY EIGHT PROBLEM AREAS. NO SUBSTANTIVE SOLUTIONS TO THESE PROBLEMS ARE PRESENTED OTHER THAN A BRIEF EXPOSITION OF THE LAYERED APPROACH TO INTERFACES AND PROTOCOLS ALREADY IN USE IN A NUMBER OF NETWORKS. A 'FEASIBILITY' CHART FOR VARIOUS FUNCTIONS ON VARIOUS TYPES OF NETWORKS (HETEROGENEOUS OR HOMOGENEOUS) IS PRESENTED.

STEADMAN, HOWARD L., GEORGE R. SUGAR, SOME WAYS OF PROVIDING COMMUNICATION FACILITIES FOR TIME-SHARED COMPUTING, (ESSA RESEARCH LABS., BOULDER, CO),
AFIPS PROCEEDINGS, 1968 SPRING JOINT COMPUTER CONFERENCE, VOLUME 32, (ATLANTIC CITY, NJ, APRIL 30-MAY 2, 1968), THOMPSON BOOK CO., WASHINGTON, DC, 1968, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 23-29

ALTERNATIVE APPROACHES TO MEETING THE COMMUNICATIONS REQUIREMENTS FOR THE TIME-SHARED COMPUTING NETWORK OF THE ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION ARE SUMMARIZED. WITH ATTENTION GIVEN TO TERMINALS, COMMUNICATIONS LINES, SWITCHING FACILITIES, AND DATA SETS.

3.1.0 GENERAL DESCRIPTION

A TRANS-CANADA COMPUTER COMMUNICATIONS NETWORK, PHASE I OF A MAJOR PROGRAM ON COMPUTERS, SCIENCE COUNCIL OF CANADA, AUG 71, SCC R-13, SCC SS22-1971-13, 41P

THIS IS AN INTERESTING PROPOSAL DOCUMENTING THE NEED FOR THE TRANS-CANADA COMPUTER COMMUNICATION NETWORK (TCCN). ECONOMIC FORCES AND TECHNICAL PROSPECTS ARE OUTLINED AND SOME SOCIAL ISSUES ARE ADDRESSED. A SECTION ON POLICY OPTIONS FOR OWNERSHIP AND ORGANIZATION OF THE ENTIRE NETWORK OPERATION IS INCLUDED. THE PROJECT APPEARS TO BE MOTIVATED

3.1.0 GENERAL DESCRIPTION

IN PART FROM A CONCERN THAT WITHOUT A NATIONAL POLICY TO CONTROL AND DIRECT NETWORKING, COMPUTER AND INFORMATION SERVICES IN CANADA WILL EVENTUALLY BE AVAILABLE ONLY VIA SPUR LINES TO U.S. COMPUTER COMMUNICATIONS NETWORKS.
(ALSO UNDER 1.6, 5.0)

ABRAMSON, NORMAN, THE ALOHA SYSTEM--ANOTHER ALTERNATIVE FOR COMPUTER COMMUNICATIONS, (HAWAII, UNIV. OF., HONOLULU), AFIPS PROCEEDINGS, 1970 FALL JOINT COMPUTER CONFERENCE, VOLUME 37, (HOUSTON, TX, NOVEMBER 17-19, 1970), AFIPS PRESS, MONTVALE, NJ, 1970, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 281-285, 13 REFS

ABRAMSON DESCRIBES A MULTIPLE ACCESS METHOD FOR SHARING A RADIO CHANNEL AMONG A NUMBER OF USERS. HIS TECHNIQUE DEPENDS ON THE BURST TYPE COMMUNICATION CHARACTERISTIC OF MAN-COMPUTER INTERACTION. A TYPE OF RANDOM ACCESS CHANNEL WITH ACKNOWLEDGEMENTS IS DESCRIBED, FOLLOWED BY APPROPRIATE ANALYSIS, AND THE CONCEPTS MAY BE ESPECIALLY APPLICABLE FOR SATELLITE COMMUNICATION.
(ALSO UNDER 3.2.1)

ABRAMSON, NORMAN, THE ALOHA SYSTEM, (HAWAII, UNIV. OF., HONOLULU),
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 501-517, 16 REFS

THE ALOHA SYSTEM IS AN EXPERIMENTAL UHF-RADIO COMPUTER-COMMUNICATION NETWORK. VARIOUS ASPECTS OF THE SYSTEM ARE DESCRIBED IN THIS PAPER INCLUDING: THE INTERFACE, CAPACITY AND OPERATION OF THE RANDOM-ACCESS ALOHA CHANNEL, GENERAL DESIGN OF THE SYSTEM, AND GENERAL USE OF THE SYSTEM.

ALARCIA, GABRIEL, SANTIAGO HERRERA, C.T.N.E'S PACKET SWITCHING NETWORK, ITS APPLICATIONS,
(C.T.N.E., MADRID, (SPAIN)),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 163-170

IN 1974, C.T.N.E.'S PACKET SWITCHING NETWORK CONSISTED OF TWO SWITCHING AND RETRANSMISSION COMPUTERS (CCR'S), JOINED TO EACH OTHER AND TO THE DATA PROCESSING CENTERS OF THE SUBSCRIBER (CCA), AND THREE CONCENTRATORS WHICH CONNECT THE 500 SUBSCRIBER'S TERMINALS TO THE CCR'S. BY 1978 THE NUMBER OF CONCENTRATORS SHOULD REACH 10 WHILE THE NUMBER OF TERMINALS MAY REACH 5000. THE AUTHORS, ENCOURAGED BY THE FAVORABLE ACCEPTANCE OF THE NETWORK IN SPAIN, ARE IN FAVOR OF AN INTERNATIONAL CONNECTION OF NETWORKS OF THIS TYPE.

AN EXPERIMENTAL COMPUTER NETWORK, COMPUTER CORP. OF AMERICA, CAMBRIDGE, MA, 30 MAR 69, 1 JAN 67-31 MAR 69, AF 19(628)-5167, (MIT ESD-TR-69-74, AD-694 055), 50P, 12 REFS

AN EXPERIMENT IN COMPUTER NETWORKING IS DESCRIBED IN WHICH THE TX-2 COMPUTER AT LINCOLN LABS WAS CONNECTED AS A USER TO THE Q-32 COMPUTER AT THE SYSTEM DEVELOPMENT CORPORATION UTILIZING A SPECIALLY DEVELOPED TRANSMISSION PROTOCOL. BESIDES DESCRIBING RELATIVELY STRAIGHTFORWARD EXPERIMENTS CONDUCTED WITH THIS LINK, THE REPORT MENTIONS OTHERS PLANNED IN WHICH THE Q-32 WOULD USE THE TX-2 AND IN WHICH A DEC 338 DISPLAY SYSTEM AT THE ARPA OFFICE IN WASHINGTON WOULD ALSO BE INVOLVED. THERE IS ALSO A BRIEF DISCUSSION OF THE PROBLEMS INVOLVED IN COMPUTER-TO-COMPUTER NETWORKING. SPECIFICALLY MENTIONED IS THE INCREASED NEED FOR DOCUMENTATION WHEN USERS OF REMOTE ACCESS SYSTEMS ARE VERY REMOTE FROM THAT SYSTEM. AN ARGUMENT IS MADE THAT THE ASCII CODE AND ASSOCIATED PROTOCOL ARE INEFFICIENT AND INAPPROPRIATE FOR COMPUTER-TO-COMPUTER COMMUNICATIONS.

EARBER, D. L. A., D. W. DAVIES, THE NPL DATA NETWORK, NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), DIV. OF COMPUTER SCIENCE, OCT 70, NPL-DCS COM-SCI-T.M.-47, 14P, 12 REFS

A GENERAL PURPOSE LABORATORY DATA NETWORK IS DESCRIBED THAT IS DESIGNED AS A PROTOTYPE OF A PROPOSED LOWER LEVEL PORTION OF A BRITISH DATA NETWORK. IT IS PACKET-SWITCHED, CENTRALIZED, AND INCORPORATES A SPECIALIZED HARDWARE INTERFACE TO TERMINALS.

BARBER, D. L. A., PROGRESS WITH THE EUROPEAN INFORMATICS NETWORK, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), EUROPEAN INFORMATICS NETWORK),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 215-220, 9 REFS

RECENT DEVELOPMENTS WITH THE EUROPEAN INFORMATICS NETWORK PROJECT ARE DESCRIBED. A PAPER GIVEN BY BARBER AT THE FIRST ICCC INTRODUCED THIS PROJECT. THE PRESENT PAPER BRIEFLY REVIEWS THE BACKGROUND, DESCRIBES THE NATURE OF THE NETWORK THAT WILL BE CONSTRUCTED, OUTLINES THE WAY THE SPECIFICATION WAS PREPARED, AND DESCRIBES THE PROCEDURES ADOPTED FOR THE SELECTION OF TENDERS AND THE ANALYSIS OF TENDERS. THE PAPER CONCLUDES WITH A DISCUSSION OF SOME OF THE MORE IMPORTANT FEATURES OF THE SPECIFICATION.
(ALSO UNDER 1.1)

BARBER, D. L. A., THE EUROPEAN COMPUTER NETWORK PROJECT, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND)),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 192-200, 16 REFS

IN NOVEMBER 1971 THE MINISTERS OF EIGHT EUROPEAN COUNTRIES SIGNED AN AGREEMENT TO START A PROJECT AIMED AT BUILDING A EUROPEAN COMPUTER NETWORK. THE NETWORK, WHICH WILL USE STORE-AND-FORWARD PACKET-SWITCHING TECHNIQUES, WILL INITIALLY JOIN FIVE DATA PROCESSING RESEARCH CENTERS IN FOUR COUNTRIES, BUT LATER IS EXPECTED TO BE EXTENDED TO INCLUDE CENTERS IN OTHER NATIONS. THIS PAPER OUTLINES THE REASONS THAT LED TO THE DECISION TO GO AHEAD WITH A EUROPEAN COMPUTER NETWORK, AND DISCUSSES THE FORM IT WILL TAKE, THE FUNCTIONS IT WILL PERFORM, AND THE WAY THE PROJECT WILL BE CONDUCTED.
(ALSO UNDER 1.1)

BELL, C. G., A. N. HABERMANN, J. MCCREDIE, RONALD M. RUTLEDGE, W. WULF, COMPUTER NETWORKS, (CARNEGIE-MELLON UNIV., PITTSBURGH, PA, DEPT. OF COMPUTER SCIENCE),
COMPUTER, VOL 3, ISSUE 5, SEP-OCT 70, P 13-23

COMPUTER NETWORK RESEARCH IS RATIONALIZED IN TERMS OF THE POTENTIAL LONG-TERM CAPABILITIES THAT WILL RESULT. LONG TERM ADVANTAGES OF NETWORKS ARE DISCUSSED ALONG WITH THOSE HAVING MORE IMMEDIATE COST AND PERFORMANCE PAYOFF. CONCEPTS ARE WELL SUPPORTED ANALYTICALLY.
(ALSO UNDER 1.1)

BERNITT, DANIEL, INTRA-UNIVERSITY NETWORKS,(PRESENTED AT, NETWORKS IN HIGHER EDUCATION: PROCEEDINGS OF THE EDUCOM COUNCIL MEETING SEMINAR, ATLANTA, GA, OCTOBER 15, 1970, (PENNSYLVANIA, STATE UNIV. OF, UNIVERSITY PARK), BEHAVIORAL SCIENCE, VOL 16, ISSUE 5, SEP 71, P 492-494

THE HISTORY AND CURRENT STATUS OF THE COMPUTING NETWORK AT PENNSYLVANIA STATE UNIVERSITY IS DESCRIBED. TWO DISTINCTIVE ASPECTS OF THE TYPE OF NETWORK IMPLEMENTED ARE (1) RETAINING THE BATCH MODE OF OPERATION AS THE PRIMARY ORIENTATION OF THE SYSTEM AND (2) ESTABLISHING COMPUTATIONAL LABORATORIES FOR THE EXCLUSIVE USE OF STUDENTS AND MAKING THESE LABS OPERATE ON A SELF-SERVICE BASIS. THE SUCCESS OF THE BATCH NETWORK APPROACH IS EVIDENT FROM THE FACT THAT SYSTEM THROUGHPUT INCREASED FROM 300,000 JOBS DURING 1967-68 ACADEMIC YEAR TO OVER A MILLION IN 1969 WITH PEAKS OF NEARLY 10,000 JOBS PER DAY.

BLACK, G., D. R. JUDD, COMPUTER NETWORKS, (NATIONAL COMPUTING CENTRE, MANCHESTER, (ENGLAND)),
SCIENCE JOURNAL, VOL 3, ISSUE 9, SEP 67, P 35-40

IN THIS PAPER A BRITISH NATIONAL COMPUTER NETWORK IS PROPOSED AND SUPERFICIALLY DESCRIBED. IT IS BASED ON THE INTERCONNECTION OF AREA COMPUTER SYSTEMS THAT EACH MAY HAVE DIFFERENT FUNCTIONS. TWO POINTS BROUGHT OUT ARE THE POTENTIAL USE OF SUCH A NETWORK TO PROVIDE BEFORE-THE-FACT CONVERSION TO A NEW MACHINE AT ONE SITE THROUGH THE USE OF A REMOTE COMPUTER AND THE CONTINUAL ESTIMATION AND PROPAGATION OF 'SURPLUS CAPACITY' REPORTS BY PARTICIPATING COMPUTER SYSTEMS.

BREITHAUPT, A. R., PROJECT VIPERIDAE, A BELL LABS COMPUTING NETWORK, (BELL TELEPHONE LABS, INC., NAPERVILLE, IL), COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-162B), P 235-238, 3 REFS

A DESCRIPTION IS GIVEN OF A NETWORK DEVELOPED BY PROJECT VIPERIDAE TO MAKE GENERAL PURPOSE BATCH AND TIME SHARING COMPUTING FACILITIES OF THREE CENTERS AVAILABLE TO EIGHT BELL LABS LOCATIONS. THIS PROJECT'S GOAL IS TO ESTABLISH EXTENSIVE GENERAL PURPOSE COMPUTER NETWORKING WITHIN BELL LABS.

CAMPBELL, G. H., K. FUCHEL, S. L. PADWA, N. F. SCHUMBURG, BROOKNET - A HIGH SPEED COMPUTER NETWORK, (BROOKHAVEN

3.1.0 GENERAL DESCRIPTION

NATIONAL LAB., UPTON, NY. DEPT. OF APPLIED MATHEMATICS).
PROCEEDINGS OF THE THIRD TEXAS CONFERENCE ON COMPUTING SYSTEMS, (AUSTIN, TX, NOVEMBER 7-8, 1974), IEEE COMPUTER SOCIETY, LONG BEACH, CA, 1974, 74-CH0895-3C, P 2-4-1--2-4-6, 8 REFS

BROOKNET IS A DIGITAL COMMUNICATION NETWORK WHICH JOINS SEVENTEEN COMPUTERS OF DIFFERENT MANUFACTURERS TO A CENTRAL FACILITY CONSISTING OF TWO CDC 6600'S. BROOKNET IS NOT AN OPERATING SYSTEM, RATHER IT IS ONE OF THE EXECUTING JOBS; THIS MEANS THAT WHILE BROOKNET MAY ABORT ON AN ERROR, IT DOES NOT CRASH THE SYSTEM.

CANADA MEETS COMPUTER COMMUNICATION NEEDS, (TELECOMMUNICATIONS, DEDHAM, MA),
TELECOMMUNICATIONS, VOL 6, ISSUE 9, SEP 72, P S2, S4
(ANNOTATION UNDER 1.2)

CHRISTY, P. P., R. R. HENLEY, M. S. BLOIS, A NETWORK STRUCTURED HOSPITAL INFORMATION SYSTEM, (CALIFORNIA, UNIV. OF, SAN FRANCISCO, MEDICAL CENTER),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 223-226

A HOSPITAL INFORMATION SYSTEM STRUCTURED AS A NETWORK OF DISPLAY-ORIENTED MINICOMPUTERS IS DESCRIBED. THE ADVANTAGES OF THE SYSTEM--ECONOMIC, TECHNICAL, AND ADMINISTRATIVE--ARE MENTIONED. AN INPUT DEVICE, CALLED A 'PHRASE TYPEWRITER,' IS INTRODUCED AS A MAN-MACHINE INTERFACE WHICH UTILIZES MINICOMPUTERS AND ALLOWS EACH KEYSTROKE TO DENOTE A PHRASE. THIS SYSTEM PERFORMS AS AN ECONOMIC, MODULAR, HIGH-PERFORMANCE DATA ENTRY AND RETRIEVAL SYSTEM.
(ALSO UNDER 4.2.1)

CLARK, DAVID D., ROBERT M. GRAHAM, JEROME H. SALTZER, MICHAEL D. SCHROEDER, THE CLASSROOM INFORMATION AND COMPUTING SERVICE, MASSACHUSETTS INST. OF TECH., CAMBRIDGE, PROJECT MAC, 11 JAN 71, MIT-MAC TR-80, NONR 4102(01), 278P
(ANNOTATION UNDER 4.3)

COLEMAN, MICHAEL L., ACCNET--A CORPORATE COMPUTER NETWORK, (ALUMINUM CO. OF AMERICA, PITTSBURGH, PA),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 42, 1973, NATIONAL COMPUTER CONFERENCE AND EXPOSITION, (NEW YORK, NY, JUNE 4-8, 1973), AFIPS PRESS, MONTVALE, NJ, 1973, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 133-140, 56 REFS

THIS PAPER DISCUSSES THE JUSTIFICATIONS FOR A CORPORATE COMPUTER NETWORK, OUTLINES A PROPOSED STAGE BY STAGE DEVELOPMENT, AND ANALYZES AND PROPOSES SOLUTIONS FOR SEVERAL OF THE PROBLEMS INHERENT IN SUCH A NETWORK.

COMRS, BILL, TYMNET: A DISTRIBUTED NETWORK, (TYMSHARE INC.),
DATAMATION, VOL 19, ISSUE 7, JUL 73, P 40-43

A GENERAL DISCUSSION OF TYMSHARE INC.'S NETWORK, IDENTIFIED AS TYMNET IS GIVEN IN THIS PAPER. TYMNET IS A DISTRIBUTED NETWORK CONNECTING 54 CITIES WITH 37 LARGE-SCALE COMPUTERS. THE BASIC CONFIGURATION OF THE NETWORK, ERROR DETECTION CAPABILITY, USER PROCEDURES, SUPERVISORY LOG OF NETWORK STATUS AND OCCURRENCES, AND CURRENT ENHANCEMENTS TO THE SYSTEM ARE DESCRIBED.

CORNELIUS, JOHN, HIERARCHICAL COMPUTING FOR CHEMISTRY, (CALIFORNIA, UNIV. OF, SAN DIEGO),
FACTS AND FUTURES, WHAT'S HAPPENING NOW IN COMPUTING FOR HIGHER EDUCATION, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (PRINCETON, NJ, OCTOBER 9-11, 1973), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1974, (LC 74-79222), P 289-292, 1 REFS

THE CHEMISTRY DEPARTMENT AT THE UNIVERSITY OF CALIFORNIA, SAN DIEGO, IS INTERESTED IN INTERCONNECTING THE HETEROGENEOUS MINICOMPUTERS IN ITS LABORATORIES. TO FACILITATE THIS INTERCONNECTION NO ATTEMPT TO EXPLORE BEYOND THE STATE-OF-THE-ART HAS BEEN MADE. THE CAMAC DATA PROCESSING STANDARD FOR COMPUTER INTERFACES HAS BEEN ADOPTED DUE TO ITS SIMPLE PROTOCOLS AND FLEXIBILITY.

CORNEW, RONALD W., DR., PHILIP M. MORSE, DISTRIBUTED COMPUTER NETWORKING: MAKING IT WORK ON A REGIONAL BASIS, (NEW ENGLAND BOARD OF HIGHER EDUCATION, WELLESLEY, MA, MASSACHUSETTS INST. OF TECH., CAMBRIDGE, OPERATIONS RESEARCH CENTER),
SCIENCE, VOL 189, 15 AUG 75, P 523-531, 21 REFS

THIS IS AN EXCELLENT ARTICLE ON THE SELF-SUPPORTING NEW ENGLAND REGIONAL COMPUTING PROGRAM (NERCOMP) NETWORK. HISTORICAL EVOLUTION OF NERCOMP, ORGANIZATIONAL AND MANAGERIAL DESCRIPTIONS OF THE NETWORK, AND NETWORKING PROBLEMS ARE AMONG THE TOPICS DISCUSSED. THE CONCEPT OF RESOURCE-CHAINING WAS DEVELOPED IN A NERCOMP COMMITTEE. RESOURCE-CHAINING REFERS TO THE CHAIN OF INSTITUTIONS THROUGH WHICH COMPUTING RESOURCES PASS FROM SUPPLIER TO DISTRIBUTOR TO END USER; ASSIGNING MANAGERIAL RESPONSIBILITIES TO APPROPRIATE UNITS. NERCOMP IS PRESENTLY MODIFYING ITS LINE-SWITCHED NETWORK TO A MESSAGE-SWITCHED NETWORK. RATIONALE FOR THIS CHANGE AND THEIR USE OF NIMPHS (NETWORK INTERFACE MESSAGE PROCESSING HOSTS) ARE EXPLAINED.
CERTAINLY NERCOMP'S DEDICATION TO THE ISSUES OF NETWORK MANAGEMENT AND ORGANIZATION HAS CONTRIBUTED TO THE SUCCESS OF THIS REGIONAL NETWORK.
(ALSO UNDER 5.1)

DAVIES, D. W., K. A. BARTLETT, R. A. SCANTLEBURY, P. T. WILKINSON, A DIGITAL COMMUNICATION NETWORK FOR COMPUTERS GIVING RAPID RESPONSE AT REMOTE TERMINALS, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND)),
PROCEEDINGS OF THE ACM SYMPOSIUM ON OPERATING SYSTEM PRINCIPLES, (GATLINBURG, TN, OCTOBER 1967), 1967, 7 REFS

SOME OF THE EARLY THOUGHTS CONCERNING THE DESIGN AND DEVELOPMENT OF COMMON-CARRIER DATA NETWORKS ARE PRESENTED IN THIS PAPER. A DESIGN FOR SUCH A NETWORK IS PROPOSED. THE TECHNICAL ASPECTS OF THE NETWORK AND THE RANGE OF COMMUNICATIONS REQUIREMENTS IT IS DESIGNED TO MEET ARE DEALT WITH PRIMARILY.
(ALSO UNDER 3.2.2)

DAVIES, D. W., THE PRINCIPLES OF A DATA COMMUNICATION NETWORK FOR COMPUTERS AND REMOTE PERIPHERALS, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND)),
INFORMATION PROCESSING 68; PROCEEDINGS OF IFIP CONGRESS 1968, VOLUME 2--HARDWARE, APPLICATIONS, (EDINBURGH, (SCOTLAND), AUGUST 5-10, 1968), NORTH-HOLLAND PUBLISHING CO., AMSTERDAM, (NETHERLANDS), 1969, IFIP CONGRESS PROCEEDINGS, (LC 65-24118), P 709-714, 4 REFS

THIS PROPOSAL FOR A NATIONAL PHYSICS LABORATORY COMPUTER NETWORK IN THE UNITED KINGDOM PRESENTS A DESIGN SIMILAR IN MANY RESPECTS TO THE ARPA NETWORK.

DELL, F. R. E., FEATURES OF A PROPOSED SYNCHRONOUS DATA NETWORK, (UNITED KINGDOM POST OFFICE, LONDON, DEPT. OF TELECOMMUNICATIONS DEVELOPMENT),
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 50-57

THIS PROPOSAL DESCRIBES A DATA COMMUNICATIONS NETWORK CAPABLE OF EITHER CIRCUIT-SWITCHING OR PACKET-SWITCHING. DATA RATES AND FORMATS ARE DESCRIBED, THE USE OF PULSE CODE MODULATION IN THE LOCAL AND MAIN NETWORKS IS CONSIDERED. THE PACKET FORMAT IS SPECIFIED, AND ECONOMIC CONSIDERATIONS ARE LISTED.
(ALSO UNDER 3.2.2)

DENES, JOHN E., BROOKNET--AN EXTENDED CORE STORAGE CRIENTED NETWORK OF COMPUTERS AT BROOKHAVEN NATIONAL LABORATORY, (BROOKHAVEN NATIONAL LAB., UPTON, NY, DEPT. OF APPLIED MATHEMATICS),
INFORMATION PROCESSING 68; PROCEEDINGS OF IFIP CONGRESS 1968, VOLUME 2--HARDWARE, APPLICATIONS, (EDINBURGH, (SCOTLAND), AUGUST 5-10, 1968), NORTH-HOLLAND PUBLISHING CO., AMSTERDAM, (NETHERLANDS), 1969, IFIP CONGRESS PROCEEDINGS, (LC 65-24118), P 928-932, 4 REFS

BROOKNET IS A CENTRALIZED NETWORK IN WHICH A CDC6600 IS USED TO COMMUNICATE WITH AND SUPPORT A NUMBER OF MINI COMPUTERS IN A LABORATORY ENVIRONMENT. AT THE TIME OF THIS PAPER, BROOKNET HAD ONLY TWO PDP-8'S CONNECTED TO THE 6600. ONE OF THESE WAS BEING USED TO SUPPORT HARDWARE AND SOFTWARE CHECKOUT FOR THE NETWORK'S SUPPORT MECHANISM IN THE 6600. TWO SIGMA 7'S THAT SUPERVISE AND COLLECT DATA FROM ON-LINE EXPERIMENTS AND DRIVE CRT DISPLAYS WERE BEING PREPARED FOR CONNECTION TO THE 6600.

DIFFLEY, MICHAEL W., DESIGN CONSIDERATIONS OF A PROPOSED LOCAL AREA COMPUTER NETWORK EMPHASIZING THE NEEDS OF THE HEALTH SCIENCES, (MINNESOTA, UNIV. OF, MINNEAPOLIS),
DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 97-103, 5 REFS
(ANNOTATION UNDER 4.2.1)

DIXON, WILFRID J., DATA AND COMPUTING FACILITIES. (CALIFORNIA, UNIV. OF, LOS ANGELES).
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 105-114
(ANNOTATION UNDER 4.2.0)

ELLIS, T. O., E. F. HARSLEM, JOHN F. HEAFNER, K. U. UNCAPHER, ARPA NETWORK SERIES: I. INTRODUCTION TO THE ARPA NETWORK AT RAND AND TO THE RAND VIDED GRAPHICS SYSTEM, RAND CORP., SANTA MONICA, CA, SEP 71, RC R-664-ARPA, ARPA DAHC-15-67-C-0141, IAD-733 049), 48P, 32 REFS

THE FIRST SECTION OF THIS REPORT PROVIDES A GENERAL OVERVIEW OF THE ARPANET. A SECOND SECTION DESCRIBES THE RAND VIDEO GRAPHICS SYSTEM AND ITS INTERFACE TO THE ARPANET THROUGH AN IBM 1800 CONNECTED TO AN IMP I INTERFACE MESSAGE PROCESSOR).
(ALSO UNDER 3.3.2)

FARBER, DAVID J., JULIAN FELDMAN, FRANK R. HEINRICH, MARSHA D. HOPWOOD, KENNETH C. LARSON, DONALD C. LOOMIS, LAWRENCE A. ROWE, THE DISTRIBUTED COMPUTING SYSTEM, (CALIFORNIA, UNIV. OF, IRVINE, DEPT. OF INFORMATION AND COMPUTER SCIENCE).
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, "COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?", (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, ILC 68-1628), P 31-34, 8 REFS

A SHORT DESCRIPTION OF THE DISTRIBUTED COMPUTING SYSTEM AND ITS IMPLEMENTATION IS PRESENTED IN THIS PAPER. ASPECTS OF THIS "RELIABLE, FAIL-SOFT INFORMATION UTILITY" DESCRIBED INCLUDE BASIC ORGANIZATION, COMMUNICATION LINKS, RESIDENT SYSTEM SERVICES, PROTECTION OF THE SYSTEM AND RESOURCE ALLOCATION.

FEENEY, GEORGE J., CONCENTRATION IN NETWORK OPERATIONS, (GENERAL ELECTRIC CO.).
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 182-188, 1 REFS

THE AUTHOR DESCRIBES THE GENERAL ELECTRIC NETWORK INCLUDING GEOGRAPHIC COVERAGE, MAJOR FEATURES AND PLANS FOR EXPANSION. HE ALSO DISCUSSES SOME CENTRAL ISSUES IN THE EVOLUTION OF COMPUTING IN HIGHER EDUCATION.

FISHER, C. R., R. L. SLIGH, THE DATRAN NETWORK, (DATA TRANSMISSION CO., VIENNA, VA),
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 65-72

THE PLANNED DATRAN NATIONWIDE ALL DIGITAL SWITCHED NETWORK DESIGNED TO LINK SUBSCRIBER TERMINALS IN 35 METROPOLITAN AREAS IS DISCUSSED. THE SYSTEM DESIGN AND SERVICES AND A NETWORK SIMULATOR ARE BRIEFLY DESCRIBED. THE SIMULATOR IS USED TO EVALUATE THE PROJECTED PERFORMANCE OF THE NETWORK RELATIVE TO DESIGN SPECIFICATIONS.
(ALSO UNDER 2.1.2)

FLETCHER, J. G., LAWRENCE RADIATION LABORATORY OCTOPUS SYSTEM, (CALIFORNIA, UNIV. OF, LIVERMORE, LAWRENCE RADIATION LAB.),
PROCEEDINGS OF INVITATIONAL WORKSHOP ON COMPUTERS, OCT 68, P 225-231

THIS IS AN INTRODUCTION TO SOME FEATURES OF THE LAWRENCE RADIATION LABORATORY (LRL) OCTOPUS NETWORK, WHICH INCLUDES CDC 6600'S AND A CDC 7600. CONTROL IS INITIALLY CENTRALIZED IN A DEC PDP-6, BUT PLANS CALL FOR THE DISTRIBUTION OF CONTROL TO A NETWORK OF PDP-8'S (A FACT NOW) EACH CAPABLE OF SERVING 128 TELETYPES AND ALLOWING EACH TELETYPE ACCESS TO ANY CDC MACHINE. FILE CONTROL IS CENTRAL AND IS PERFORMED BY THE PDP-6. THE NETWORK CONTAINS A NUMBER OF STORAGE DEVICES, BUT THE MOST INTERESTING IS THE IBM PHOTOSTORE, ONE TRILLION BIT, 5 SEC ACCESS PER 4100 WORDS, NON ERASABLE. THE FILE STRUCTURE IS SIMILAR TO THAT OF MULTICS, WITH ROOTS AND DIRECTORIES WITHIN DIRECTORIES. LRL HAS CRITICAL SECURITY PROBLEMS AND HAS DEVELOPED SOME INTERESTING MEASURES TO PROTECT FILES. THE AUTHOR SUGGESTS APPLICATION OF THE CONCEPTS EMBODIED IN OCTOPUS TO ANY DISTRIBUTED NETWORK OF HETEROGENEOUS COMPUTERS.

FRANK, H., I. T. FRISCH, PLANNING COMPUTER-COMMUNICATION NETWORKS, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 1-28, 20 REFS
(ANNOTATION UNDER 1.3)

FUCHEL, KURT, SIDNEY HELLER, TWO DISSIMILAR NETWORKS - IS MARRIAGE POSSIBLE?, (BROOKHAVEN NATIONAL LAB., UPTON, NY, DEPT. OF APPLIED MATHEMATICS),
PROCEEDINGS OF THE 1975 SYMPOSIUM-COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, JUNE 18, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, 75CH0973-8C, P 19-24, 10 REFS
(ANNOTATION UNDER 3.3.2)

GABLER, HERMANN G., THE GERMAN EDS NETWORK, (DEUTSCHE BUNDESPOST, DARMSTADT, (WEST GERMANY), FERNMELDETECHNISCHES ZENTRALAMT),
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 80-85, 8 REFS

A PLANNED ELECTRONIC DATA SWITCHING SYSTEM FOR DATA COMMUNICATIONS IN GERMANY IS DESCRIBED. A STORED PROGRAM SWITCHING SYSTEM IS DESCRIBED AND JUSTIFIED. FREQUENCY DIVISION MULTIPLEXING, RATHER THAN DIGITAL TECHNIQUES, ARE USED FOR CHANNELS BETWEEN SWITCHING CENTERS.
(ALSO UNDER 3.2.0)

GILLERMAN, LIONEL, A MULTI-FACETED COMMERCIAL COMPUTER NETWORK, (MCDONNELL DOUGLAS AUTOMATION CO., LONG BEACH, CA, COMPUTER COMMUNICATIONS),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, "COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?", (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 231-233

A GENERAL DESCRIPTION OF THE MCDONNELL DOUGLAS COMMERCIAL COMPUTER NETWORK AND HARDWARE AND SOFTWARE CAPABILITIES OF THE VARIOUS LINKS ARE GIVEN. SERVICES PROVIDED BY THIS NETWORK INCLUDE CONVERSATIONAL BATCH SERVICE, TEXT EDITING, HOSPITAL INFORMATION, ON-LINE DATA COLLECTION AND INFORMATION MANAGEMENT.

GILLESPIE, ROBERT, UNIVERSITY RELATIONS WITH NETWORKS: FORCING FUNCTIONS AND FORCES, (WASHINGTON, UNIV. OF, SEATTLE),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 240-244

THE AUTHOR DISCUSSES, IN THE CONTEXT OF THE COMPUTER CENTER AT THE UNIVERSITY OF WASHINGTON, MAJOR ISSUES AND FORCES (POSITIVE AND NEGATIVE) AFFECTING UNIVERSITY COMPUTING CENTERS. HE CONCLUDES WITH A RECOMMENDED LIST OF QUESTIONS TO BE STUDIED BY THOSE FACED WITH PROBLEMS OF NETWORKS AND UNIVERSITY RELATIONSHIPS.
(ALSO UNDER 1.5, 5.0)

HANNA, WAYNE L., THE UCS TELEPROCESSING NETWORK, (UNITED COMPUTING SYSTEMS INC., KANSAS CITY, MO),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, "COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?", (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 97-100

UNITED COMPUTING SYSTEMS, INC. HAS DEVELOPED A NATIONAL COMPUTER-COMMUNICATIONS NETWORK (UNINET) TO SUPPORT THE TIME-SHARING AND REMOTE BATCH REQUIREMENTS OF THEIR COMPUTER SERVICE COMPANY. THIS PAPER DESCRIBES THE NETWORK'S OBJECTIVES, DEVELOPMENT, HARDWARE AND SOFTWARE CONFIGURATION AND PLANS FOR FUTURE DEVELOPMENTS.

HARGRAVES, ROBERT F., JR., THOMAS E. KURTZ, THE DARTMOUTH TIME SHARING NETWORK, (DARTMOUTH COLLEGE, HANOVER, NH),
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 423-456

A GENERAL DESCRIPTION OF THE DARTMOUTH TIME SHARING NETWORK IS PRESENTED. THE HISTORY OF THE NETWORK, DEVELOPMENT TO THE PRESENT, APPLICATIONS AND SERVICES OF THE NETWORK, TECHNICAL DESCRIPTION OF THE SYSTEM, DESCRIPTION OF THE COMMUNICATIONS SYSTEM AND A SHORT SECTION ON THE BENEFITS OF STANDARDS IN NETWORK OPERATION ARE ALSO GIVEN.
(ALSO UNDER 5.5)

HARGRAVES, ROBERT F., JR., DEVELOPMENT OF COMMUNICATION REQUIREMENTS FOR THE DARTMOUTH TIME SHARING SYSTEM, (DARTMOUTH COLLEGE, HANOVER, NH).
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, "COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?", (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 15-18

3.1.0 GENERAL DESCRIPTION

THE DARTMOUTH TIME SHARING SYSTEM HAS GROWN TO REACH 40 LOCATIONS AND ACCOMMODATES 158 PORTS. THIS PAPER DESCRIBES THE GROWTH OF THE COMMUNICATIONS REQUIREMENTS FOR THE DARTMOUTH CENTER. SOME BACKGROUND INFORMATION ON THE SYSTEM, ITS DEVELOPMENT SINCE 1967, USE OF THE BELL TELEPHONE NETWORK, AND THE COMMUNICATIONS REQUIREMENTS ARE DESCRIBED. INCLUDED ARE THE USE OF FREQUENCY-DIVISION MULTIPLEXING, MULTIPLE-DROP MULTIPLEXING, SUBCHANNEL SHARING, MAINTENANCE PROCEDURES, AND THE DATREX NETWORK. FUTURE PLANS FOR THE NETWORK ARE ALSO INCLUDED.

HARVEY, SAMUEL B., THE CONCEPT OF THE SINGER WORLDWIDE COMPUTER NETWORK, (SINGER CO., NEW YORK),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 187-188
(ANNOTATION UNDER 1.6)

HEHN, EARL L., JR., MAC INTEGRATED MANAGEMENT SYSTEM (MACIMS), (DEPARTMENT OF THE AIR FORCE, SCOTT AFB, IL, MILITARY AIRLIFT COMMAND),
INTERDISCIPLINARY CONFERENCE ON MULTIPLE ACCESS COMPUTER NETWORKS, (AUSTIN, TX, APRIL 20-22, 1970), APR 70, P 2-1-1--2-1-6

THIS IS A NON-TECHNICAL DESCRIPTION OF THE SYSTEM DEVELOPMENT PLAN AND THE DEVELOPMENT STATUS OF THE MILITARY AIRLIFT COMMAND'S INTEGRATED MANAGEMENT SYSTEM (MACIMS).

HENCH, R. R., D. F. FOSTER, TOWARD AN INCLUSIVE INFORMATION NETWORK, (GENERAL ELECTRIC CO., BETHESDA, MD),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 41, PART II, 1972, FALL JOINT COMPUTER CONFERENCE, (ANAHEIM, CA, DECEMBER 5-7, 1972), AFIPS PRESS, MONTVALE, NJ, 1972, (LC 55-44701), P 1235-1241, 8 REFS

AN OVERALL FUNCTIONAL DESCRIPTION IS GIVEN FOR THE GENERAL ELECTRIC NETWORK. THE NETWORK IS CURRENTLY (1975) THE WORLD'S LARGEST COMPUTER NETWORK, SERVING AN INTERNATIONAL CLIENTELE.

HERZOG, BERTRAM, COMPUTER NETWORKS, MERIT COMPUTER NETWORK, ANN ARBOR, MI, MAY 72, MCN 05721-TP-8, 21P, 10 REFS

THIS DOCUMENT CONTAINS A GENERAL DESCRIPTION OF THE MERIT COMPUTER NETWORK WHICH INTERCONNECTS THE COMPUTER CENTERS OF THREE MICHIGAN UNIVERSITIES.

HERZOG, BERTRAM, MERIT COMPUTER NETWORK, (MICHIGAN, UNIV. OF, ANN ARBOR),
RUSTIN, RANDALL, COURANT COMPUTER SCIENCE SYMPOSIUM 3, COMPUTER NETWORKS, (NOVEMBER 30-DECEMBER 1, 1970), PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1972, PRENTICE-HALL SERIES IN AUTOMATIC COMPUTATION, (LC 79-39373), P 45-48

A BRIEF INTRODUCTION TO THE MERIT NETWORK IS PROVIDED AND THE OBJECTIVES OF THE PROJECT ARE STATED. ONE INTERESTING OBJECTIVE IS TO PROVIDE A MODEL TO STUDY THE ADMINISTRATIVE PROBLEMS ASSOCIATED WITH THE EXCHANGE OF COMPUTING DOLLARS IN A NETWORK COMMUNITY.

HIROTA, KENICHIRO, MASAO KATO, YUTAKA YOSHIDA, A DESIGN OF PACKET SWITCHING SYSTEM, (NTT PUBLIC CORP., TOKYO, (JAPAN)),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 151-162, 6 REFS

THE AUTHORS DISCUSS DESIGN OBJECTIVES FOR A DIGITAL DATA NETWORK IN JAPAN. FEATURES OF PACKET-SWITCHING, INTEGRATION OF PACKET SWITCHING AND CIRCUIT SWITCHING, PACKET FORMATS AND DATA LINKS ARE ALL DESCRIBED WITH DIRECTION TOWARDS THIS SPECIFIC NETWORK. AS A RESULT OF THIS WORK, STUDIES CONCERNING VARIOUS GRADES OF INTEGRATION OF PACKET AND CIRCUIT SWITCHING CONTINUE IN JAPAN.

HOWELL, R. H., THE INTEGRATED COMPUTER NETWORK SYSTEM, (BRISTOL, UNIV. OF, (ENGLAND)),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 214-219

A COMPUTER NETWORK LINKING THE UNIVERSITIES OF SOUTH WEST ENGLAND AND SOUTH WALES IS BRIEFLY DESCRIBED.

INNES, D. R., J. L. ALTY, AN INTRA UNIVERSITY NETWORK, (LIVERPOOL, UNIV. OF, (ENGLAND), COMPUTER LAB.),
FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000I-7-DATA, P 1-8--1-13, 6 REFS

LIVERPOOL UNIVERSITY HAS DEVELOPED A SYSTEM LINKING VARIOUS OF ITS DEPARTMENT COMPUTERS TO THE CENTRAL FACILITIES OF THE COMPUTER LABORATORY, MOTIVATIONS FOR ESTABLISHING THE NETWORK ARE DESCRIBED AND A FULL DISCUSSION OF THE STEPS TAKEN TO ATTAIN A HIGH LEVEL OF RELIABILITY EARLY IN THE OPERATION OF THE NETWORK IS INCLUDED.

JENNINGS, MICHAEL A., COMPUTER SERVICES IN THE OREGON DEPARTMENT OF HIGHER EDUCATION, (OREGON DEPT. OF HIGHER EDUCATION),
FACTS AND FUTURES, WHAT'S HAPPENING NOW IN COMPUTING FOR HIGHER EDUCATION, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (PRINCETON, NJ, OCTOBER 9-11, 1973), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC, (EDUCOM), PRINCETON, NJ, 1974, (LC 74-79222), P 83-99

IN ORDER TO MEET THE ADMINISTRATIVE AND ACADEMIC COMPUTING NEEDS OF THE OREGON DEPARTMENT OF HIGHER EDUCATION, A COMPUTER NETWORK LINKING NINE PUBLIC INSTITUTIONS IS PLANNED. THIS ARTICLE DISCUSSES AT A MANAGERIAL LEVEL COMPUTING NEEDS, POLICIES, AND THE IMPLEMENTATION AND FINANCIAL PLANS FOR THIS NETWORK.
(ALSO UNDER 5.0)

KAPRIELIAN, ZOHRAB A., THE POLITICS OF COOPERATION, (SOUTHERN CALIFORNIA, UNIV. OF, LOS ANGELES),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 207-211

A DESCRIPTION OF THE RESOURCE-SHARING PROJECT AT THE UNIVERSITY OF SOUTHERN CALIFORNIA IS FOLLOWED BY COMMENTS ON THE ORGANIZATIONAL AND POLITICAL CONSIDERATIONS OF COMPUTER SHARING. THE AUTHOR CONCLUDES THAT THE POTENTIAL MUTUAL BENEFITS OF RESOURCE SHARING OUTWEIGH THE POSSIBLE DISADVANTAGES.
(ALSO UNDER 1.6)

KARP, P. M., ORIGIN, DEVELOPMENT AND CURRENT STATUS OF THE ARPA NETWORK, (STANFORD UNIV., CA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 49-52, 19 REFS

THIS ARTICLE PROVIDES A WELL-WRITTEN, ALTHOUGH SOMEWHAT DATED, OVERVIEW AND STATUS REPORT FOR THE ARPA NETWORK AS OF THE BEGINNING OF 1973. SEVERAL EXAMPLES OF NETWORK USAGE ARE BRIEFLY MENTIONED.

KARP, P. M., PROPOSAL FOR THE DEVELOPMENT OF A SECURE PILOT NETWORK FOR THE WORLD-WIDE MILITARY COMMAND AND CONTROL SYSTEM (WWMCCS) BASED ON THE ARPA COMPUTER NETWORK TECHNOLOGY, MITRE CORP., WASHINGTON, DC, 7 JUL 71, MC MTR-6019, 41P, 13 REFS

THIS DOCUMENT CONTAINS A PROPOSAL FOR THE DESIGN AND DEVELOPMENT OF A SECURE PILOT INTER-COMPUTER NETWORK FOR THE WORLD WIDE MILITARY COMMAND AND CONTROL SYSTEM (WWMCCS) BASED ON THE TECHNOLOGY OF THE ARPA NETWORK. IT IS SUGGESTED THAT THE APPLICABILITY OF ARPA-DEVELOPED PRINCIPLES BE VERIFIED FOR THE WWMCCS VIA AN EXPERIMENTATION PROGRAM ON THE ARPA NETWORK ITSELF PRIOR TO THE IMPLEMENTATION OF THE SECURE PILOT NETWORK. THIS PROGRAM CENTERS ON THE EVALUATION OF USER-ORIENTED FEATURES AND EXPERIMENTS WITH DISTRIBUTED DATA HANDLING.

LAGASSE, J. P., G. ARTAUD, J. P. CABANEL, ARAMIS--A PROCESSING NETWORK WITH USER DATA BASES INTERACTIVE SYSTEMS, (UNIVERSITE PAUL SABATIER, TOULOUSE, (FRANCE), CENTRE D'INFORMATIQUE),
COMPCON FALL '75, ELEVENTH IEEE COMPUTER SOCIETY CONFERENCE, HOW TO MAKE COMPUTERS EASIER TO USE, DIGEST OF PAPERS, (WASHINGTON, DC, SEPTEMBER 9-11, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75CH09BB-6C, P 213-216, 7 REFS

IN THIS PAPER, SEVERAL ASPECTS OF HANDLING DISTRIBUTED DATA BASES ON A MINICOMPUTER NETWORK ARE DISCUSSED. A PROPOSED DISTRIBUTED RESOURCE MANAGEMENT SYSTEM IS DESCRIBED. ALTHOUGH THE PAPER IS SOMEWHAT DIFFICULT TO UNDERSTAND, USEFUL IDEAS ARE PRESENTED.

LANCE, G. N., AUSTRALIAN COMPUTING NETWORK. (COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION, (AUSTRALIA), COMPUTING RESEARCH SECTION).
DATAMATION, VOL 11, ISSUE 3, MAR 65, P 31-33

IN 1965 AUSTRALIA WAS SETTING UP A NATIONAL COMPUTING NETWORK. THIS IS A GENERAL DISCUSSION LACKING MUCH DETAIL.

LAWRENCE, D. E., A PROPOSED COMPUTER NETWORK FOR THE AUSTRALIAN NATIONAL UNIVERSITY. AUSTRALIAN NATIONAL UNIV., CANBERRA, COMPUTER CENTRE, AUG 71, ANU-CC TR-38, 44P, 2 REFS

A PROPOSAL FOR A CENTRALIZED REGIONAL NETWORK IS PRESENTED. IT MOST CLOSELY RESEMBLES THE TRIANGLE UNIVERSITIES COMPUTER CENTER (TUCC) NETWORK WITH THE ADDITION OF A FEW ATTRACTIVE FEATURES FOR DEVICE SUPPORT AND AUTOMATIC LOAD-SHARING. IMPRESSIVE FIGURES FOR PROJECTED PERFORMANCE ARE GIVEN AND A DETAILED DESIGN OF NETWORK COMPONENTS IS PROVIDED.

LEGATES, JOHN C., THE ARPA COMPUTER NETWORK--TECHNICAL ASPECTS IN NONTECHNICAL LANGUAGE. INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 10 JAN 72, 26P

THE AUTHOR EXPLAINS THE TECHNICAL FEATURES OF THE ARPA NETWORK IN NONTECHNICAL LANGUAGE AND DISCUSSES SOME OF THE POSSIBLE BENEFITS THAT IT CAN BRING TO A POTENTIAL USER. HE ADDRESSES PERFORMANCE REQUIREMENTS, DESIGN, RELIABILITY, THE HOST, SERVICES, AND COSTS AND TYPES OF CONNECTIONS.

LEGATES, JOHN, THE LESSONS OF EIN. (EDUCATIONAL INFORMATION NETWORK).
EDUCOM BULLETIN, VOL 7, ISSUE 2, SUMMER 72, P 18-20, 1 REFS

THE CONCEPTION AND IMPLEMENTATION OF THE EDUCATIONAL INFORMATION NETWORK (EIN) ARE DESCRIBED PROVIDING BACKGROUND FOR THE AUTHOR'S DISCUSSION OF EIN'S PROBLEMS AND PERFORMANCE. THE CONCLUSION ENUMERATES THE LESSONS OF THE EIN EXPERIENCE.
(ALSO UNDER 4.0)

LENNON, WILLIAM J., RONALD C. BARRETT, JOHN T. SPIES, A MINI-COMPUTER RESEARCH NETWORK. (NORTHWESTERN UNIV., EVANSTON, IL. DEPT. OF COMPUTER SCIENCES, HUGHES AIRCRAFT CO., CULVER CITY, CA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE. DIGEST OF PAPERS. "COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?". (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973. (LC 68-1628). P 191-194. 2 REFS

A DESCRIPTION IS GIVEN OF A STAR SHAPED NETWORK OF MINICOMPUTERS AT NORTHWESTERN UNIVERSITY. CHARACTERISTICS OF THE NETWORK ARE GIVEN, INCLUDING PROGRAMMING CONSIDERATIONS, INTERFACE REQUIREMENTS, HARDWARE FACILITIES, GENERAL PERFORMANCE OF THE SYSTEM, AND FUTURE GOALS OF THE PROJECT.

LENNON, WILLIAM J., A USER ORIENTED MINI-COMPUTER NETWORK. (NORTHWESTERN UNIV., EVANSTON, IL. DEPT. OF COMPUTER SCIENCES),
COMPCON FALL '75. ELEVENTH IEEE COMPUTER SOCIETY CONFERENCE. HOW TO MAKE COMPUTERS EASIER TO USE. DIGEST OF PAPERS, (WASHINGTON, DC, SEPTEMBER 9-11, 1975). INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75CH0988-6C, P 133-136, 4 REFS

DESCRIBED IS THE COMPUTER SCIENCE LABORATORY AT THE TECHNOLOGICAL INSTITUTE OF NORTHWESTERN UNIVERSITY WHICH IS A STAR-SHAPED NETWORK OF REAL-TIME MINICOMPUTERS, PREDOMINATELY DEC PDP-8'S.
(ALSO UNDER 1.1)

LESSER, RICHARD C., ANTHONY RALSTON, THE DEVELOPMENT OF A MULTI-CAMPUS REGIONAL COMPUTING CENTER. (NEW YORK, STATE UNIV. OF, ALBANY),
INFORMATION PROCESSING 68; PROCEEDINGS OF IFIP CONGRESS 1968. VOLUME 2--HARDWARE, APPLICATIONS, (EDINBURGH, (SCOTLAND), AUGUST 5-10, 1968), NORTH-HOLLAND PUBLISHING CO., AMSTERDAM, (NETHERLANDS), 1969. IFIP CONGRESS PROCEEDINGS, (LC 65-24118), P 939-944

A MULTI-CAMPUS REGIONAL COMPUTING CENTER WHICH IS DEVELOPED AROUND A CENTRALIZED NETWORK WITH ONE VERY LARGE COMPUTER AND A NUMBER OF REMOTE BATCH AND INTERACTIVE TERMINALS DISTRIBUTED AMONG THE PARTICIPATING CAMPUSES IS DESCRIBED. A RATIONALE FOR REGIONAL COMPUTING IS PRESENTED, BUT FEW PROBLEMS RELATING TO QUESTIONS OF ECONOMICS, MANAGERIAL ORGANIZATION OR OPERATION OF SUCH NETWORKS ARE DISCUSSED.

LUTHER, W. J., CONCEPTUAL BASES OF CYBERNET. (CONTROL DATA CORP.),
RUSTIN, RANDALL, COURANT COMPUTER SCIENCE SYMPOSIUM 3, COMPUTER NETWORKS, (NOVEMBER 30-DECEMBER 1, 1970), PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1972, PRENTICE-HALL SERIES IN AUTOMATIC COMPUTATION, (LC 79-39373), P 111-146

CDC'S CYBERNET IS THE CENTRAL TOPIC OF THIS PAPER, BUT MUCH OF THE MATERIAL IS APPLICABLE TO OTHER NETWORKING EFFORTS. A SCHEME FOR CLASSIFYING NETWORK USERS IN RELATION TO THEIR NETWORK DEMANDS IS DESCRIBED, ALONG WITH SOME INTERESTING COMMENTS ON NETWORK ACCOUNTING, ACCESSIBILITY, AND RELIABILITY. CYBERNET ITSELF IS A DISTRIBUTED NETWORK OF CDC 6600'S AND SERVICES INTERACTIVE AND REMOTE JOB ENTRY USERS. THE COMMUNICATIONS, NODES, AND CDC 6600 "CENTRODS" ARE DISCUSSED IN DETAIL.

MARZOLI, SERGIO, PERFORMANCES OF THE IRICON 2 SYSTEM OFFERED BY ITALCABLE, (ITALCABLE S.P.A., ROME, (ITALY)),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION. COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P S79-S88, 3 REFS

THE AUTHOR DISCUSSES ITALY'S INTERNATIONAL INFORMATION EXCHANGE NETWORK, IRICON 2. THE HARDWARE AND CAPABILITIES ARE GIVEN. THE AUTHOR IS IN FAVOR OF THE DEVELOPMENT OF A WORLD-WIDE PUBLIC DATA NETWORK AND FEELS THAT ITALY WILL BE A MAJOR CONTRIBUTOR TO SUCH DEVELOPMENT.

MCKAY, DOUGLAS B., DONALD P. KARP, IBM COMPUTER NETWORK/440, (INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY, THOMAS J. WATSON RESEARCH CENTER),
RUSTIN, RANDALL, COURANT COMPUTER SCIENCE SYMPOSIUM 3, COMPUTER NETWORKS, (NOVEMBER 30-DECEMBER 1, 1970), PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1972, PRENTICE-HALL SERIES IN AUTOMATIC COMPUTATION, (LC 79-39373), P 27-43, 1 REFS

NETWORK/440, AN IBM RESEARCH PROJECT, IS DESCRIBED. THIS NETWORK IS CLASSIFIED AS HETEROGENOUS BECAUSE AT EACH OF THE NODES A DIFFERENT MODEL OF THE IBM 360 IS USED. AN INTERESTING AND SEEMINGLY POWERFUL CONTROL LANGUAGE (ACL) FOR PROGRAMMING ANY COMPUTER ON THE NETWORK IS DESCRIBED. NETWORK CONTROL IS CENTRALIZED, ACHIEVING SOME IMPLEMENTATION AND MAINTENANCE SIMPLICITIES. THE COMMUNICATION METHOD IS STORE-AND-FORWARD, MESSAGE-SWITCHED WITH ALL MESSAGES DESTINED FOR PROCESSES REMOTE FROM THE ORIGINATING COMPUTER PASSING THROUGH THE CENTRAL CONTROLLER.

MCKAY, DOUGLAS B., DONALD P. KARP, NETWORK/440--IBM RESEARCH COMPUTER SCIENCES DEPARTMENT COMPUTER NETWORK, INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY, THOMAS J. WATSON RESEARCH CENTER, 2 JUL 71, IBM-TJWRC RC-3431, 15P

THIS PAPER DESCRIBES THE DESIGN, IMPLEMENTATION, AND PROBLEMS ENCOUNTERED IN IBM'S NETWORK RESEARCH PROJECT, NETWORK/440. NETWORK/440 IS A NETWORK WITH CENTRALIZED CONTROL AND DISTRIBUTED COMPUTING POWER WHICH PROVIDES A USER, VIA A NETWORK CONTROL LANGUAGE, WITH THE ABILITY TO CONTROL GEOGRAPHICALLY SEPARATED PROCESSES. PROBLEMS WHICH REMAIN TO BE SOLVED ARE CONCERNED WITH EFFICIENT UTILIZATION OF THE COMMUNICATIONS FACILITY BY FRONT END PROCESSING AND FULL-DUPLEX OPERATION, AS WELL AS MORE CONVENIENT REMOTE DATA ACCESS WITH MINIMUM USER EFFORT.

MENDICINO, SAMUEL F., OCTOPUS: THE LAWRENCE RADIATION LABORATORY NETWORK. (CALIFORNIA, UNIV. OF, LIVERMORE, LAWRENCE RADIATION LAB.),
RUSTIN, RANDALL, COURANT COMPUTER SCIENCE SYMPOSIUM 3, COMPUTER NETWORKS, (NOVEMBER 30-DECEMBER 1, 1970), PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1972, PRENTICE-HALL SERIES IN AUTOMATIC COMPUTATION, (LC 79-39373), P 95-110

THIS PAPER DESCRIBES THE OCTOPUS NETWORK AT THE LAWRENCE RADIATION LABORATORY (LRL) WHICH INCLUDES THE LARGE CDC MACHINES (2-CDC 6600'S, 2-CDC 7600'S) LOCATED AT LRL. THE NETWORK IS DISTRIBUTED AND HAS THREE FUNCTIONAL ENTITIES: A REMOTE TERMINAL SYSTEM, A SHARED DATA STORAGE SYSTEM, AND A REMOTE JOB ENTRY SYSTEM. THE TERMINAL SYSTEM CONSISTS OF PDP-8 CONCENTRATORS EACH CAPABLE OF HANDLING 128 TERMINALS. THERE ARE PRESENTLY 350 TELETYPES ON THE SYSTEM. THE DATA STORAGE SYSTEM INCORPORATES A PDP-6 CONTROLLER WITH DISK AND AN IBM PHOTOSTORE. THE PROPOSED REMOTE JOB ENTRY SYSTEM WILL HAVE UP TO 16 STATIONS CONSISTING OF A 600 LPM PRINTER AND 300 CPM READER CONTROLLED BY A PDP-8.

MENDICINO, SAMUEL F., THE LAWRENCE RADIATION LABORATORY OCTOPUS, CALIFORNIA, UNIV. OF, LIVERMORE, LAWRENCE RADIATION LAB., APR 71, CU-LRL 73149, 17P

A NETWORK CONTAINING FOUR LARGE CDC COMPUTERS, ALL IN CLOSE PROXIMITY AND UNDER SINGLE ADMINISTRATIVE CONTROL, IS DESCRIBED. THE FIRST ITERATION OF THE NETWORK CONTAINED A SINGLE COMMUNICATIONS CONTROLLER TO SERVE ALL TERMINALS AND INTERFACE TO THE FOUR COMPUTERS. DUE TO RELIABILITY CONSIDERATIONS, THE TERMINAL CONTROL FUNCTION IS REVISED TO BE DISTRIBUTED AMONG A NUMBER OF SMALL PROCESSORS. THE RESULT IS A SYSTEM OF 350 TERMINALS WITH REDUNDANT PATHS OF

3.1.0 GENERAL DESCRIPTION

CONNECTION TO THE FOUR COMPUTERS. A PROPOSED ADDITION FOR REMOTE BATCH ENTRY IS ALSO DESCRIBED.

MERIT PROPOSAL SUMMARY, MERIT COMPUTER NETWORK, ANN ARBOR, MI, FEB 70, 9P

SOME OF THE POTENTIAL BENEFITS FROM NETWORKS ARE OUTLINED AS A PRELUDE TO A PROPOSAL FOR INTERCONNECTING THREE UNIVERSITIES IN THE STATE OF MICHIGAN. THE GENERAL APPROACH IS TO USE OFF-THE-SHELF TECHNOLOGY IN AN EFFORT TO MINIMIZE THE DEVELOPMENT EFFORT AND TO FOCUS ON THE MANAGEMENT AND UTILIZATION PROBLEMS INSTEAD. THE NETWORK HAS BEEN IMPLEMENTED AND IS DESCRIBED IN SUBSEQUENT PAPERS.
(ALSO UNDER 1.1)

NOWAKOSKI, DONALD B., STATE INTEGRATED INFORMATION NET (SIINET). A CONCEPT. (WESTERN UNION TELEGRAPH CO., ARLINGTON, VA).
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 137-147

A NETWORK IS DESCRIBED TO MEET THE REQUIREMENTS FOR TIMELY INFORMATION ABOUT THE INTERNAL OPERATIONS OF STATE GOVERNMENTS. A GENERAL DISCUSSION OF THE STATE INTEGRATED INFORMATION NET (SIINET) IS FOLLOWED BY DESCRIPTIONS OF THE THREE POTENTIAL MAJOR COMPONENTS OF SIINET: THE STATE RECORD INFORMATION SYSTEM, THE ECOLOGICAL MONITOR AND CONTROL SYSTEM, AND THE STATE CRIME INFORMATION SYSTEM.
(ALSO UNDER 4.2.0)

ORTHNER, F., HELMUTH, DAVID M., MCKEOWN, JR., A PACKET SWITCHING NETWORK FOR MINICOMPUTERS, (GEORGE WASHINGTON UNIV., WASHINGTON, DC, DEPT. OF CLINICAL ENGINEERING),
COMPCON FALL '75, ELEVENTH IEEE COMPUTER SOCIETY CONFERENCE, HOW TO MAKE COMPUTERS EASIER TO USE, DIGEST PAPERS, (WASHINGTON, DC, SEPTEMBER 9-11, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75CH0968-6C, P 217-220, 9 REFS

A NETWORK OF MINICOMPUTERS OF DIFFERENT SIZE ARCHITECTURE OR MANUFACTURER IS OUTLINED. BOTH THE HARDWARE ARCHITECTURE AND SOFTWARE ADDITIONS TO THE HOST REAL-TIME OPERATING SYSTEM ARE DISCUSSED. IT MIGHT BE NOTED THAT IN THIS NETWORK, THE IMPS ARE CONSTRUCTED FROM MICROPROCESSORS.

FEARSON, DAVID J., DONALD WILKIN, SOME DESIGN ASPECTS OF A PUBLIC PACKET SWITCHED NETWORK, (FERRANTI LTD., MANCHESTER, (ENGLAND)),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 199-213

THIS ARTICLE DISCUSSES THE FERRANTI IMPLEMENTATION OF THE BRITISH POST OFFICE SPECIFICATION OF THE EXPERIMENTAL PACKET SWITCHED SERVICE (EPSS). A BRIEF BACKGROUND OF THE REASONS FOR THE EXPERIMENT IS GIVEN FOLLOWED BY A DISCUSSION OF THE MAIN AREAS OF THE SPECIFICATION THAT SIGNIFICANTLY INFLUENCED THE ULTIMATE SYSTEM DESIGN. DISCARDED SOLUTIONS ARE BRIEFLY MENTIONED AND SOME OF THE MAIN ASPECTS OF THE CHOSEN SOLUTION ARE DISCUSSED.

PINTER, LASZLO, DEVELOPMENT OF A HUNGARIAN COMPUTER DATA CENTER NETWORK, (COMPANY FOR COMPUTING SERVICES AND MANAGEMENT ORGANIZATION, BUDAPEST, (HUNGARY)),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 113-117

THIS ARTICLE PROVIDES A GENERAL DESCRIPTION OF THE COUNTRY-WIDE COMPUTER NETWORK IN HUNGARY. THE MOTIVATION FOR AND DESIGN OF THIS NETWORK ARE DESCRIBED. THIS NETWORK CONSISTED OF 8 REGIONAL BRANCHES IN THE SUMMER OF 1974, AND IT IS HOPED THAT WITHIN A FEW YEARS EACH COUNTY OF HUNGARY (19 IN NUMBER) WILL HAVE A REGIONAL BRANCH.

POUZIN, LOUIS, CIGALE, THE PACKET SWITCHING MACHINE ON THE CYCLADES COMPUTER NETWORK, (INSTITUT DE RECHERCHE D'INFORMATIQUE ET D'AUTOMATIQUE, ROCQUENCOURT, (FRANCE)),
POSENFELD, JACK L., INFORMATION PROCESSING 74, PROCEEDINGS OF IFIP CONGRESS 74, I. COMPUTER HARDWARE AND ARCHITECTURE, (STOCKHOLM, (SWEDEN), AUGUST 5-10, 1974), AMERICAN ELSEVIER PUBLISHING CO, INC., NEW YORK, 1974, P 155-159, 28 REFS

THIS PAPER PRESENTS A BRIEF SUMMARY OF CIGALE THE COMMUNICATIONS NETWORK WITHIN FRANCE'S GENERAL PURPOSE COMPUTER NETWORK CYCLADES. EXTENSIVE REFERENCES ARE INCLUDED.

POUZIN, LOUIS, PRESENTATION AND MAJOR DESIGN ASPECTS OF THE CYCLADES COMPUTER NETWORK, (INSTITUT DE RECHERCHE D'INFORMATIQUE ET D'AUTOMATIQUE, ROCQUENCOURT, (FRANCE)),
DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 80-87, 13 REFS

THIS PAPER DESCRIBES THE GENERAL DESIGN AND PHILOSOPHY OF A COMPUTER NETWORK UNDER DEVELOPMENT IN FRANCE. THE NETWORK WILL LINK ABOUT 20 HETEROGENEOUS COMPUTERS LOCATED IN UNIVERSITIES, RESEARCH AND DATA PROCESSING CENTERS. GOALS ARE TO SET UP A PROTOTYPE NETWORK IN ORDER TO FOSTER EXPERIMENTS IN VARIOUS AREAS, SUCH AS: DATA COMMUNICATIONS; COMPUTER INTERACTION; COOPERATIVE RESEARCH; DISTRIBUTED DATA BASES. THE NETWORK IS INTENDED TO BE BOTH AN OBJECT OF RESEARCH AND AN OPERATIONAL TOOL. WHILE IN MANY WAYS SIMILAR TO THE ARPANET, IT PRESENTS SOME DISTINCTIVE DIFFERENCES IN ADDRESS AND MESSAGE HANDLING INTENDED TO FACILITATE INTERCONNECTION WITH OTHER NETWORKS.

PRESTIA, CLARK A., SINGER POINT-OF-SALE SYSTEMS, (SINGER BUSINESS MACHINES, SAN LEANDRO, CA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 189-190
(ANNOTATION UNDER 4.1.9)

RICHARDSON, D. J., THE A.A.E.C. COMPUTER NETWORK DESIGN, (AUSTRALIAN ATOMIC ENERGY COMMISSION, LUCAS HEIGHTS, RESEARCH ESTABLISHMENT),
AUSTRALIAN COMPUTER JOURNAL, VOL 3, ISSUE 2, MAY 71, P 55-59, 4 REFS

AUSTRALIAN PLANS FOR A LOCAL DATA COMMUNICATION NETWORK ARE DESCRIBED. THE NETWORK IS BASED ON A PARALLEL BUS SCHEME UTILIZING SYNCHRONOUS TRANSMISSION WITH A CENTRALIZED CONTROLLER. THIS BUS, REFERRED TO AS A 'DATA WAY', IS PLANNED TO OPERATE AT A HIGH ENOUGH DATA RATE TO PERMIT 50,000 BITS/SECOND TO BE TRANSFERRED FROM PORT TO PORT ON THE NETWORK. NETWORK TERMINALS INCLUDE AN IBM 360 AND OTHER SMALLER COMPUTERS, AS WELL AS TERMINAL CONTROL COMPUTERS. A LIMITED RATIONALE FOR THE NETWORK IS GIVEN AND A MECHANISM FOR RESOLVING PRIORITIES ON THE BUS IS PRESENTED.

ROBERTS, LAWRENCE G., BARRY D. WESSLER, COMPUTER NETWORK DEVELOPMENT TO ACHIEVE RESOURCE SHARING, (ADVANCED RESEARCH PROJECTS AGENCY, WASHINGTON, DC),
AFIPS PROCEEDINGS, 1970 SPRING JOINT COMPUTER CONFERENCE, VOLUME 36, (ATLANTIC CITY, NJ, MAY 5-7, 1970), AFIPS PRESS, MONTVALE, NJ, 1970, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 543-549, 7 REFS

AN EXCELLENT OVERVIEW OF THE ARPA NETWORK IS PROVIDED IN THIS KEY PAPER. THE DESIGN PHILOSOPHY IS JUSTIFIED IN TERMS OF COST, CAPACITY, RESPONSIVENESS, AND RELIABILITY. THE READER GETS A GOOD GENERAL PICTURE OF THE ARPANET AND AN INDICATION OF THE DESIGN OBJECTIVES.

ROBERTS, LAWRENCE G., NATIONAL NETWORKS,(PRESENTED AT, NETWORKS IN HIGHER EDUCATION: PROCEEDINGS OF THE EDUCOM COUNCIL MEETING SEMINAR, ATLANTA, GA, OCTOBER 15, 1970, (ADVANCED RESEARCH PROJECTS AGENCY, ARLINGTON, VA),
BEHAVIORAL SCIENCE, VOL 16, ISSUE 5, SEP 71, P 500-508

THE AUTHOR DISCUSSES COMPUTER-TO-COMPUTER NETWORKS, SPECIFICALLY, COMPUTER-TO-COMPUTER INTERACTION. SOME OF THE ISSUES ADDRESSED ARE: FUNCTIONS OF THE INTERFACE MESSAGE PROCESSOR (IMP); TOPOLOGY OF THE ARPANET (PRESENT AND EXPANDED); COMPARATIVE COSTS IN TRANSMITTING INFORMATION; A NEW CONCEPT FOR PROGRAM SHARING THROUGH NETWORKING.

ROSEN, SAUL, JOHN M. STEELE, A LOCAL COMPUTER NETWORK, (PURDUE UNIV., LAFAYETTE, IN, COMPUTING CENTER),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 129-132, 2 REFS

THE PURDUE COMPUTER NETWORK WAS STARTED ON A MODEST SCALE IN 1968, AND HAS SINCE EVOLVED INTO A SYSTEM CONSISTING OF MORE THAN 40 COMPUTERS AND IN EXCESS OF 100 KEYBOARD TERMINALS, ALL OF WHICH MAY BE IN SIMULTANEOUS OPERATION. HARDWARE AND SOFTWARE DESIGN EFFORTS THAT WERE NECESSARY IN THE DEVELOPMENT OF THE NETWORK ARE DESCRIBED.

RUSSELL, J. J., D. C. KNIGHT, COMMUNICATION AND SYSTEMS DEVELOPMENT IN THE C.S.I.R.O. NETWORK, (COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION, MELBOURNE, (AUSTRALIA), COMPUTING RESEARCH SECTION, COMMONWEALTH

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SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION, ADELAIDE, (AUSTRALIA). COMPUTING RESEARCH SECTION).
PROCEEDINGS OF THE THIRD AUSTRALIAN COMPUTER CONFERENCE, (CANBERRA, (AUSTRALIA), MAY 16-20, 1966). AUSTRALIAN TRADE PUBLICATIONS, 1966, P 384-388. CSIRO REFS

A DISCUSSION OF THE CSIRO COMPUTER NETWORK OF AUSTRALIA IS PRESENTED HERE. THE NETWORK CONSISTS OF A LARGE CENTRAL COMPUTER CONNECTED TO THREE SATELLITE COMPUTERS. BESIDES THE TECHNICAL DESCRIPTION, THE HISTORY OF THE DECISION TO DEVELOP THE NET, THE STAFF RESPONSIBILITIES, AND COMPATIBILITY PROBLEMS ARE DESCRIBED.

RUTLEDGE, RONALD M., ALBIN L. VAREHA, LEE C. VARIAN, ALLAN H. WEIS, SALOMON F. SEROUSSI, JAMES W. MEYER, JOAN F. JAFFE, MARY ANNE K. ANGELL, AN INTERACTIVE NETWORK OF TIME-SHARING COMPUTERS, (CARNEGIE-MELLON UNIV., PITTSBURGH, PA. PRINCETON UNIV., NJ, INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY, THOMAS J. WATSON RESEARCH CENTER). PROCEEDINGS OF 24TH NATIONAL CONFERENCE, ASSOCIATION FOR COMPUTING MACHINERY, (AUGUST 26-28, 1969), ASSOCIATION FOR COMPUTING MACHINERY, NEW YORK, 1969, ACM P-69, P 431-441, 13 REFS

THE TSS NETWORK, A NETWORK OF IBM 360/67'S LOCATED AT CARNEGIE-MELLON AND PRINCETON UNIVERSITIES AND AT IBM IS DESCRIBED. THE COMPUTERS ARE CONNECTED THROUGH IBM 2702 SYNCHRONOUS INTERFACES OVER LEASED OR DIAL-UP LINES AT 2000 BAUD OR HIGHER DATA RATES. TRANSMISSION IS HALF DUPLEX AND NO LINE MULTIPLEXING IS PERFORMED. A NETWORK COMMAND LANGUAGE ALLOWS A USER AT ONE SITE TO RUN PROCESSES AT OTHER SITES ASYNCHRONOUSLY, RECEIVING NOTIFICATION OF TASK COMPLETION. THE STATED GOALS OF THE NETWORK ARE PROGRAM SHARING, DATA SHARING, SPECIAL FACILITIES ACCESS, AND LOAD SHARING.
(ALSO UNDER 1.1)

SHARMA, R. L., J. C. SHAH, M. T. EL-BARDAI, K. K. SHARMA, C-SYSTEM: MULTIPROCESSOR NETWORK ARCHITECTURE, (COLLINS RADIO CO., DALLAS, TX, COMMUNICATION SWITCHING SYSTEMS DIV.),
ROSENFELD, JACK L., INFORMATION PROCESSING 74, PROCEEDINGS OF IFIP CONGRESS 74, 1, COMPUTER HARDWARE AND ARCHITECTURE, (STOCKHOLM, (SWEDEN), AUGUST 5-10, 1974), AMERICAN ELSEVIER PUBLISHING CO. INC., NEW YORK, 1974, P 19-23

THIS IS A BRIEF DESCRIPTION OF THE COLLINS RADIO COMPANY C-SYSTEM. A COAXIAL LOOP AND A LOOP SYNCHRONIZER MAINTAIN A BASE RATE OF 32 MBPS PROVIDING 16 - 2 MBPS CHANNELS. PROCESSORS ATTACHED TO THE LOOP SUPPORT A VARIETY OF PERIPHERALS. THE SYSTEM FINDS USE IN AIRLINE COMMUNICATION SYSTEMS, BANKING SYSTEMS AND OTHERS.

TEAGER, HERBERT M., THE EXOTIC MEDICAL USER AND THE ONGOING COMPUTER REVOLUTION, (BOSTON UNIV., MA, MEDICAL CENTER),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 131-142
(ANNOTATION UNDER 4.2.1)

THE MERIT COMPUTER NETWORK, PROGRESS REPORT FOR THE PERIOD JULY 1969-MARCH 1971, MERIT COMPUTER NETWORK, ANN ARBOR, MI, MAY 71, JUL 69-MAR 71, MCN 0571-PR-4, (PB-200 674), 61P

THE OBJECTIVES AND GENERAL IMPLEMENTATION PLANS FOR THE MERIT NETWORK ARE INTRODUCED. PLANS CALL FOR A MINICOMPUTER BASED THREE NODE NETWORK IN WHICH THE INTERCONNECTED THREE 'HOST' COMPUTERS ARE NETWORKED WITH NO HARDWARE OR SOFTWARE MODIFICATIONS TO THE HOST SYSTEMS. ACCESS BY USERS OF EACH SYSTEM IS PROVIDED TO THE RESOURCES OF THE OTHER TWO SYSTEMS. THE EFFORT IS COORDINATED BY A BOARD OF DIRECTORS REPRESENTING THE THREE PARTICIPATING UNIVERSITIES.

THIES, ARTHUR W., IGOR T. HAWRYSZKIEWYCZ, DAVID J. GANNON, DESIGN OF THE AUSTRALIAN POST OFFICE COMPUTER NETWORK, (AUSTRALIAN POST OFFICE, MELBOURNE, (AUSTRALIA)),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 99-105

THE AUTHORS DESCRIBE THE DESIGN OF THE NETWORK TO MEET AUSTRALIA'S PUBLIC POSTAL AND TELECOMMUNICATIONS NEEDS. DUE TO THE GEOGRAPHICAL DISTRIBUTION OF POPULATION CENTERS, A SYSTEM INCORPORATING LIMITED DECENTRALIZATION OF MAIN PROCESSING POWER AND HEAVY RELIANCE ON LINE COMMUNICATIONS WAS CHOSEN. ISSUES OF CENTRALIZATION VS. DECENTRALIZATION, NETWORK CONFIGURATIONS, RELIABILITY AND STANDARDS IN RELATION TO THIS SPECIFIC IMPLEMENTATION ARE ALL BRIEFLY DISCUSSED.

TYMES, LA ROY, TYMNET--A TERMINAL ORIENTED COMMUNICATION NETWORK, (TYMSHARE INC., CUPERTINO, CA),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 38, 1971, SPRING JOINT COMPUTER CONFERENCE, (ATLANTIC CITY, NJ, MAY 18-20, 1971), AFIPS PRESS, MONTVALE, NJ, 1971, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 211-216, 5 REFS

THE TYMNET COMMERCIAL COMPUTER NETWORK IS INTRODUCED. THE NETWORK IS SPECIFICALLY DESIGNED FOR TERMINAL TO COMPUTER COMMUNICATIONS. IT INCORPORATES SPEED RECOGNITION, FULL-DUPLEX SUPPORT, HALF-DUPLEX SUPPORT AND SOME SPECIAL DEVICE FEATURES INCLUDING A 'CHARACTER GOBBLER' TO FLUSH THE PIPE-LINE OF OUTPUT ON A USER GENERATED BREAK. THE SAME MACHINE (VARIAN 620 MINICOMPUTER) IS USED AS A FRONT END TO THE HOSTS (XDS 940'S) IN THIS DISTRIBUTED NETWORK AND AS A REMOTE TERMINAL CONCENTRATOR TO ACCOMMODATE DIAL-UP USERS. THE NETWORK CONTROLLER RESIDES IN ONE OF THE HOSTS BUT IS AUTOMATICALLY TRANSFERRABLE TO AN ALTERNATE HOST IN THE EVENT OF FAILURE. THIS NETWORK IS NOT DESIGNED TO ACCOMMODATE ALL FORMS OF COMPUTER INPUT--NO BATCH OR GRAPHICS SUPPORT FOR EXAMPLE--BUT IS GEARED TOWARD THE INTERACTIVE TERMINAL USER.

WALKER, PHILIP M., STUART L. MATHISON, SPECIALIZED COMMON CARRIERS, (GEORGETOWN, UNIV. OF, WASHINGTON, DC, LAW CENTER, LITTLE (ARTHUR D.) INC., CAMBRIDGE, MA),
TELEPHONE ENGINEER AND MANAGEMENT, 15 OCT 71, P 41-60, 8 REFS
(ANNOTATION UNDER 1.6)

WEIS, ALLAN H., DISTRIBUTED NETWORK ACTIVITY AT IBM, (INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY, DEPT. OF COMPUTING SYSTEMS),
RUSTIN, RANDALL, COURANT COMPUTER SCIENCE SYMPOSIUM 3, COMPUTER NETWORKS, (NOVEMBER 30-DECEMBER 1, 1970), PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1972, PRENTICE-HALL SERIES IN AUTOMATIC COMPUTATION, (LC 79-39373), P 1-25, 4 REFS

IN THIS PAPER WEIS DESCRIBES THE TSS NETWORK OF IBM COMPUTERS AND DISCUSSES SOME PROBLEMS OF NETWORKING IN GENERAL. OF INTEREST, BUT LACKING IN DETAIL, IS THE MENTION OF TDCAM (TABLE DRIVEN COMPUTER ACCESS METHOD) WHICH PERMITS SIMULTANEOUS COMMUNICATION WITH DIFFERENT SYSTEMS AND MACHINES. THE NETWORKING PROBLEMS WHICH RECEIVE TREATMENT ARE ARCHITECTURE, RESOURCE CONTROL, DATA INTERCHANGE, TELECOMMUNICATIONS, AND TECHNICAL MANAGEMENT.

WILLIAMS, LELAND H., A FUNCTIONING COMPUTER NETWORK FOR HIGHER EDUCATION IN NORTH CAROLINA, (TRIANGLE UNIVERSITIES COMPUTATION CENTER, RESEARCH TRIANGLE PARK, NC),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 222-232, 6 REFS

THE AUTHOR DESCRIBES THE COMPUTER NETWORK AT THE TRIANGLE UNIVERSITIES COMPUTATION CENTER (TUCC) AND ALSO DISCUSSES ITS ACHIEVEMENTS AND PLANS FOR THE FUTURE.

WOOD, DAVID C., A SURVEY OF THE CAPABILITIES OF 8 PACKET SWITCHING NETWORKS, (MITRE CORP., MCLEAN, VA),
PROCEEDINGS OF THE 1975 SYMPOSIUM-COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, JUNE 18, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, 75CH0973-8C, P 1-7, 22 REFS
(ANNOTATION UNDER 1.2)

ZAKS, RODNAY, A PROCESSOR NETWORK FOR URBAN TRAFFIC CONTROL, (COPPE-FEDERAL UNIV., RIO DE JANEIRO, (BRAZIL), SINGER CO., SUNNYVALE, CA, TRAFFIC INFORMATION SYSTEMS),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 215-218, 2 REFS

A COMPUTERIZED URBAN TRAFFIC CONTROL SYSTEM UTILIZING MICROPROCESSOR-BASED LOCAL TRAFFIC PROCESSORS WITH A CENTRAL PROCESSOR MONITORING AND COORDINATING THE ACTIVITY OF LOCAL TRAFFIC PROCESSORS IS DESCRIBED IN THIS ARTICLE. THE DESCRIPTION INCLUDES THE ORGANIZATION OF THE NETWORK, CONTROL CENTER OF THE NETWORK, THE LOCAL TRAFFIC PROCESSORS, AND THE DESIGN OF THE COMMUNICATIONS NETWORK.
(ALSO UNDER 4.9)

3.1.1 TECHNICAL DESCRIPTIONS

ABRAMSON, NORMAN, FINAL TECHNICAL REPORT FOR CONTRACT NUMBER NAS2-6700, HAWAII, UNIV. OF, HONOLULU, ALOHA SYSTEM, JAN 75, HU TR-875-1, 49P

RESEARCH IN THE ALOHA SYSTEM UNDER THIS CONTRACT WAS DIVIDED INTO TWO MAJOR TASKS: (1) TO STUDY AND DEVELOP ADVANCED FORMS OF COMPUTER-COMMUNICATIONS NETWORKS USING RANDOM-ACCESS PACKET SWITCHING METHODS, AND (2) TO CONDUCT GENERAL STUDIES

3.1.1 TECHNICAL DESCRIPTIONS

OF MULTIPROCESSOR SYSTEM ORGANIZATION CENTERED ON THE DEVELOPMENT OF THE BCC 500 COMPUTER, DESIGNED AT BERKELEY COMPUTER CORPORATION. THE RESULTS OF THIS RESEARCH ARE EXPLAINED IN DETAIL IN THIS REPORT. ALSO INCLUDED IS A LIST OF OTHER DOCUMENTS PUBLISHED IN SUPPORT OF EACH TASK.
(ALSO UNDER 3.2.2)

ABRAMSON, NORMAN. THE ALOHA SYSTEM, HAWAII, UNIV. OF, HONOLULU, JAN 72, UH TR-B72-1, NASA NAS2-6700, AF F44620-69-C-0030, 30P, 16 REFS
(ANNOTATION UNDER 3.2.1)

AISO, HIDEO, ASAO ISHIZUKA, NORIYUKI KAMIGAYASHI, HIDEYUKI TOKUDA, AKIRA TAKEYAMA, YOUICHI SHIMIZU, YUTAKA MATSUSHITA, HIDEKI NISHIGAKI, RYOJI HIRATSUKA, A MINICOMPUTER COMPLEX--KOCOS (KEIO-OKI'S COMPLEX SYSTEM), (KEIO UNIV., YOKOHAMA, (JAPAN); OKI ELECTRIC INDUSTRY CO. LTD., TOKYO, (JAPAN)).
FOURTH DATA COMMUNICATIONS SYMPOSIUM. NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000I-7-DATA, P S-7--S-5I2, 14 REFS

THIS IS A STUDY OF THE KOCOS MINICOMPUTER COMPLEX WHICH WAS CREATED TO FACILITATE RESOURCE AND LOAD SHARING IN A HETEROGENEOUS MINICOMPUTER COMPLEX. ANOTHER DESIGN GOAL WAS TO REALIZE PARALLEL PROCESSING THROUGH ORGANIC INTEGRATION OF RESOURCES. THE SYSTEM CONFIGURATION AND INTERPROCESS COMMUNICATIONS FACILITY ARE DESCRIBED.

ANDERSON, O. R., THE EPIC-OPS--A DISTRIBUTED NETWORK EXPERIMENT, (SPERRY RAND CORP., ST. PAUL, MN, SPERRY UNIVAC DEFENSE SYSTEMS DIV.).
EASCON '75 RECORD, IEEE ELECTRONICS AND AEROSPACE SYSTEMS CONFERENCE, (WASHINGTON, DC, SEPTEMBER 29-OCTOBER 1, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CHO-998-5-EASCON, (LC 73-2277), P 12I-A--121-G

THE AUTHOR DESCRIBES THE EPIC COMPUTER, THE VIRTUAL ADDERS TRANSLATOR, THE MEMORY MULTIPLEX DATA LINK, THE FUTURE NETWORK MASS STORE, AND THE NETWORK PROCESS CONTROL. LOCALIZED DISTRIBUTED PROCESSING FOR RESOURCE-SHARING IS THE OPERATIONAL GOAL. AN EXCELLENT ARTICLE FOR THOSE INTERESTED IN LOCAL NETWORKS.

ARPANET: DESIGN, OPERATION, MANAGEMENT AND PERFORMANCE, NETWORK ANALYSIS CORP., GLEN COVE, NY, APR 73, 148P, 25 REFS

THIS REPORT COULD BE APPROPRIATELY TITLED 'EVERYTHING YOU EVER WANTED TO KNOW ABOUT THE ARPANET (CIRCA 1973)'. TECHNICAL IN NATURE, THIS REPORT COVERS SUCH AREAS AS: INTRODUCTORY BACKGROUND, DEVELOPMENT AND MANAGEMENT OF THE NETWORK, TRAFFIC MANAGEMENT AND PROBLEMS, ROUTING, PROTOCALS, SECURITY, RELIABILITY, MEASUREMENT AND STATISTICS. ALTHOUGH IT REPRESENTS A COMPREHENSIVE SUMMARY OF THE ARPANET, THE REPORT WAS PUBLISHED IN 1973 AT A TIME WHEN THERE WERE FEWER HOSTS AND PREVIOUS TO THE SATELLITE LINKS TO HAWAII, ENGLAND, AND NORWAY. WHILE RECOMMENDED AS WORTHWHILE READING, BE ADVISED OF THE TIME DIFFERENTIAL.

ASHENHURST, ROBERT L., HIERARCHICAL COMPUTING, (CHICAGO, UNIV. OF, IL, INST. FOR COMPUTER RESEARCH).
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 74-88, 6 REFS
(ANNOTATION UNDER 3.0)

ATKINSON, D. M., U. C. STAHLENDORF, THE PROBABLE FUTURE OF CANADIAN LONG HAUL DIGITAL DATA NETWORK CONNECTIONS WITH THE U.S.A., (BELL CANADA),
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 10-15

THE SOCIO-ECONOMIC CONDITION IN CANADA WHICH WILL RESULT IN NETWORK CONFIGURATIONS DIFFERENT FROM THOSE EVOLVING IN THE U.S. IS OUTLINED. THE FUTURE OF TELECOMMUNICATIONS AND THE OBJECTIVES OF A DIGITAL NETWORK IN CANADA ARE COVERED IN SOME DETAIL.
(ALSO UNDER 3.2.0)

AUPPERLE, ERIC M., MERIT COMPUTER NETWORK: HARDWARE CONSIDERATIONS, (MICHIGAN, UNIV. OF, ANN ARBOR),
RUSTIN, RANDALL, COURANT COMPUTER SCIENCE SYMPOSIUM 3, COMPUTER NETWORKS, (NOVEMBER 30-DECEMBER 1, 1970), PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1972, PRENTICE-HALL SERIES IN AUTOMATIC COMPUTATION, (LC 79-39373), P 49-63

THE HARDWARE USED IN THE COMMUNICATIONS SUBNET OF THE MERIT NETWORK IS DESCRIBED AND THE CHOSEN CONFIGURATION IS COMPARED TO ALTERNATIVES. A RATHER INTERESTING ARRANGEMENT IS MENTIONED THAT ALLOWS A SINGLE AUTOMATIC CALLING UNIT TO BE MULTIPLEXED AMONG EIGHT LINES.
(ALSO UNDER 3.3.2)

BARKAUSKAS, B. J., R. R. BEZAC, C. A. TRLICA, A COMPUTER NETWORK FOR PERIPHERAL TIME SHARING, (BELL TELEPHONE LABS. INC., NAPERVILLE, IL),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 227-229

THE ARCHITECTURE OF A SYSTEM UTILIZING A MEDIUM-SCALE COMPUTER WITH A STANDARD COMPLEMENT OF PERIPHERALS AS THE CENTRAL PERIPHERAL CONTROLLER AND DATA MANAGER TO SUPPORT A NETWORK OF MINI-COMPUTERS IS DESCRIBED. THIS SYSTEM PROVIDES AN ECONOMICAL LOCAL PROCESSING CAPABILITY EVEN WHEN EXPENSIVE PERIPHERALS ARE REQUIRED.

BEERE, MAX P., NEIL C. SULLIVAN, TYMNET--A SERENDIPITOUS EVOLUTION, (TYMSHARE INC., CUPERTINO, CA),
IEEE TRANSACTIONS ON COMMUNICATIONS, VOL COM-20, ISSUE 3, JUN 72, P 511-515, 2 REFS

THE TYMNET COMMERCIAL COMPUTER NETWORK AND SOME OF THE EARLY PROBLEMS WITH ITS USAGE AND RESULTANT CHANGES IN THE NETWORK ARE DESCRIBED. THE TRANSITION TO MINICOMPUTERS AS HOST COMPUTER INTERFACES, INTERACTIVE TERMINAL USER INTERFACES, AND STORE-AND-FORWARD NODES IN THE NETWORK IS DISCUSSED. ALSO DESCRIBED ARE THE TYMNET CONCEPTS OF A VIRTUAL CIRCUIT AND A CENTRALIZED NETWORK CONTROLLER.

BENOIT, JOHN W., IRA W. COTTON, O. C. WOOD, PROPOSED IMPLEMENTATION PLAN FOR A WWMCCS INTERCOMPUTER NETWORK, MITRE CORP., WASHINGTON, DC, 2 DEC 71, MC WP-5807, AF F19628-71-C-0002, 41P

THIS DOCUMENT PRESENTS A DEVELOPMENT PLAN FOR A PROTOTYPE WWMCCS (WORLD WIDE MILITARY COMMAND AND CONTROL SYSTEM) COMPUTER NETWORK LINKING THREE NEW WWMCCS STANDARD SYSTEMS (HONEYWELL 6000 COMPUTERS). THE NETWORK DESIGN IS BASED ON THE TECHNOLOGY OF THE ARPA NETWORK. TASK AREAS ARE IDENTIFIED, SCHEDULES DEVELOPED, AND BUDGETARY INFORMATION PRESENTED.
(ALSO UNDER 5.9)

CHRISTMAN, RONALD D., DEVELOPMENT OF THE LASL COMPUTER NETWORK, (LOS ALAMOS SCIENTIFIC LAB., NM),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 239-242, 4 REFS

TECHNICAL ASPECTS OF NETWORK HARDWARE AND SOFTWARE, SYSTEM DESIGN, IMPLEMENTATION EXPERIENCE, AND PROJECTED COSTS ARE PRESENTED FOR A NETWORK (HYDRA), UNDER DEVELOPMENT AT THE LOS ALAMOS SCIENTIFIC LABORATORY. MAJOR GOALS OF THE NETWORK ARE TO PROVIDE A COMMON DATA BASE FOR ALL USERS AND COMPUTERS AND TO PROVIDE REMOTE TERMINAL CAPABILITIES.

COCANOWER, ALFRED B., MERIT COMPUTER NETWORK: SOFTWARE CONSIDERATIONS, (MICHIGAN, UNIV. OF, ANN ARBOR),
RUSTIN, RANDALL, COURANT COMPUTER SCIENCE SYMPOSIUM 3, COMPUTER NETWORKS, (NOVEMBER 30-DECEMBER 1, 1970), PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1972, PRENTICE-HALL SERIES IN AUTOMATIC COMPUTATION, (LC 79-39373), P 65-77, 1 REFS

A DESCRIPTION OF THE COMMUNICATIONS SOFTWARE FOR THE MERIT NETWORK IS PROVIDED. THE FUNCTIONAL RELATIONSHIPS OF THE MODULES IN BOTH THE HOST AND COMMUNICATIONS COMPUTERS ARE DETAILED.
(ALSO UNDER 3.4.0)

COCANOWER, ALFRED B., WAYNE FISCHER, W. S. GERSTENBERGER, BRIAN S. READ, THE COMMUNICATIONS COMPUTER OPERATING SYSTEM--THE INITIAL DESIGN, MERIT COMPUTER NETWORK, ANN ARBOR, MI, OCT 70, MCN M-1070-TN-3, (PB-203 552), 94P

THE OPERATING SYSTEM OF THE MERIT NETWORK COMMUNICATIONS COMPUTER (CC) IS DESCRIBED IN DETAIL. THE CC IS THE INTERFACE BETWEEN A COMPUTER NODE AND THE NETWORK AND ITS PRIMARY FUNCTION IS TO MULTIPLEX CONNECTIONS BETWEEN PAIRS OF PROCESSES AT SEPARATE NODES. SEMAPHORES ARE USED TO SYNCHRONIZE TASKS AND REGULATE RECORD TRAFFIC, AND THEY ARE AUGMENTED SO THAT BLOCKED TASKS CAN BE ASYNCHRONOUSLY RESTARTED.

OESPRES, REMI, RCP, THE EXPERIMENTAL PACKET-SWITCHED DATA TRANSMISSION SERVICE OF THE FRENCH PTT, (CENTRE COMMUN O*ETUDES DE TELEVISION ET TELECOMMUNICATIONS, RENNES CEDEX, (FRANCE)), THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 171-185

RCP IS AN EXPERIMENTAL PACKET SWITCHED NETWORK IN FRANCE DESIGNED IN PREPARATION FOR A PUBLIC PACKET SWITCHED SERVICE. THE INITIAL CONFIGURATION OF RCP INCLUDES THREE SWITCHING COMPUTERS AND THREE TIME-DIVISION MULTIPLEXORS WITH CUSTOMER COMPUTERS ACCESS TO THE NETWORK THROUGH 4800 BIT/SEC TRANSMISSION LINES. BASIC SERVICE IS OFFERED BY THE SETTING UP OF FULL DUPLEX *VIRTUAL CIRCUITS*, AND THE CONTROL OF TRANSMISSION ON THESE CIRCUITS. THE ARTICLE CONTAINS A GOOD TECHNICAL DISCUSSION OF THE NETWORK INCLUDING ARCHITECTURE AND PROTOCOLS.

FARBER, DAVID J., FRANK HEINRICH, THE STRUCTURE OF A DISTRIBUTED COMPUTER SYSTEM--THE DISTRIBUTED FILE SYSTEM, (CALIFORNIA, UNIV. OF, IRVINE), WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 364-370, 8 REFS

THE DISTRIBUTED COMPUTING SYSTEM (DCS) IS DESCRIBED AND ITS USE OF RING TECHNOLOGY WITH CONTROL DISTRIBUTED AMONG ITS MULTIPLE PROCESSORS IS DISCUSSED. THE DCS DISTRIBUTED FILE SYSTEM, IS DESCRIBED IN DETAIL. THE FILE SYSTEM IS A HIERARCHICAL STRUCTURE WITH ONE IMPORTANT ADDITION: EACH LEVEL OF THE STRUCTURE BECOMES A SINGLE LEVEL DESCRIPTION OF THE ENTIRE STRUCTURE ABOVE IT. THE INTERESTING ASSOCIATED FAIL-SOFT CAPABILITIES ARE ALSO DISCUSSED. (ALSO UNDER 4.1.2)

FLETCHER, JOHN G., OCTOPUS COMMUNICATIONS STRUCTURE, (LAWRENCE LIVERMORE LAB., LIVERMORE, CA), COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, *COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?*, (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 21-23, 3 REFS

A DESCRIPTION OF THE LAWRENCE LIVERMORE LABORATORY*S OCTOPUS NETWORK IS PRESENTED IN THIS PAPER. OCTOPUS IS STRUCTURED WITH FOUR LARGE COMPUTERS AND MANY SUBNETWORKS WHICH EACH PROVIDE A SERVICE TO THE LARGE COMPUTERS SUCH AS REMOTE INPUT/OUTPUT, TERMINAL INTERACTION AND FILE STORAGE. IT IS PROPOSED THAT THIS STRUCTURE IS QUITE FLEXIBLE AND ADAPTABLE.

GOODLETT, JIM, JOE MARINO, UNITED AIR LINES' PLACE ON ON-LINE DATA PROCESSING, (UNITED AIR LINES, DENVER, CO), COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, *COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?*, (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 219-221, 2 REFS

THREE SYSTEMS ARE DESCRIBED RELATED TO THE DATA PROCESSING AND RESERVATION INFORMATION NEEDS OF UNITED AIR LINES. THE INSTAMATIC SYSTEM WAS UTILIZED FOR ELEVEN YEARS BEFORE APOLLO (UNITED*S VERSION OF IBM PARS) BECAME THE SOURCE OF ALL RESERVATIONS INFORMATION. NOW A NEW NETWORK MANAGEMENT SYSTEM IS BEING PLANNED WHICH WILL HANDLE RESERVATIONS AND OTHER DATA PROCESSING COMMUNICATION NEEDS. CHARACTERISTICS OF THESE SYSTEMS ARE GIVEN. (ALSO UNDER 4.1.2)

HADDON, B. K., M. W. WHITELAW, AN OPERATING SYSTEM FOR A COMPUTER NETWORK, (SYDNEY, UNIV. OF, (AUSTRALIA)), PROCEEDINGS OF FOURTH AUSTRALIAN COMPUTER CONFERENCE, VOLUME I, (ADELAIDE, (AUSTRALIA), AUGUST 11-15, 1969), GRIFFIN PRESS, NETLEY, (SOUTH AUSTRALIA), 1969, P 255-260, 12 REFS

THIS ARTICLE, ALTHOUGH SOMEWHAT DATED, PRESENTS AN IN DEPTH CONSIDERATION OF TYPICAL PROBLEMS ENCOUNTERED WHEN FORMING A COMPUTER NETWORK. THE PARTICULAR NETWORK DESCRIBED WAS DESIGNED AND DEVELOPED BY THE BASSER COMPUTING DEPARTMENT AT THE UNIVERSITY OF SYDNEY AND CONSISTED OF FIVE COMPUTERS, FROM FOUR MANUFACTURERS, AS WELL AS A LARGE RANGE OF INPUT/OUTPUT EQUIPMENT. (ALSO UNDER 3.4.2)

HARCHARIK, J. ROBERT, TYMNET, PRESENT AND FUTURE, (TYMSHARE INC., CUPERTINO, CA), EASCON *75 RECORD, IEEE ELECTRONICS AND AEROSPACE SYSTEMS CONFERENCE, (WASHINGTON, DC, SEPTEMBER 29-OCTOBER 1, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CHO-998-5-EASCON, (LC 73-2277), P 124-A--124-G

TYMNET WAS DESIGNED TO HANDLE LOW SPEED COMMUNICATIONS BETWEEN INTERACTIVE TERMINALS AND HOST COMPUTERS. THERE ARE BASICALLY TWO TYPES OF HOSTS SERVICED BY THE COMMUNICATION NETWORK; TYMSHARE OWNED HOSTS WHICH OFFER TIME-SHARING SERVICES VIA TYMNET, AND NON-TYMSHARE OWNED HOSTS WHICH USE THE NETWORK TO SERVE THEIR COMPUTER USERS. THE THREE TYPES OF NODES ARE REMOTE TYMSAT (TERMINAL SUPPORT), BASE TYMSAT (INTERFACE TO TYMSHARE HOSTS) AND TYMCOM III (INTERFACE TO NON-TYMSHARE HOSTS). INCLUDED IN THE DISCUSSION ARE DESCRIPTIONS OF TYMNET I,S AND 2,D.

HASSING, THOMAS E., RAYMOND M. HAMPTON, GERALD W. BAILEY, ROBERT S. GARDELLA, A LOOP NETWORK FOR GENERAL PURPOSE DATA COMMUNICATIONS IN A HETEROGENEOUS WORLD, (NATIONAL SECURITY AGENCY, FORT MEADE, MD), DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CHDB2B-4C, P 88-96, 21 REFS

THIS PAPER DESCRIBES A PACKET SWITCHING DATA COMMUNICATIONS NETWORK UNDER DEVELOPMENT AT THE NATIONAL SECURITY AGENCY. SUCCESSFUL IMPLEMENTATION OF THIS EXPERIMENTAL NETWORK WILL PROVIDE THE BASIS FOR A FUTURE GENERAL-PURPOSE, HIGH BANDWIDTH DATA COMMUNICATIONS NETWORK. THIS FUTURE NETWORK WILL SERVICE A LARGE, HETEROGENEOUS GROUP OF COMPUTERS, BATCH TERMINALS, AND CONVERSATIONAL TERMINALS TO FORM A GENERAL PURPOSE NETWORK OF COMPUTING RESOURCES.

HEART, FRANK E., ROBERT E. KAHN, S. M. ORNSTEIN, WILLIAM R. CROWTHER, DAVID C. WALDEN, THE INTERFACE MESSAGE PROCESSOR FOR THE ARPA COMPUTER NETWORK, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA), AFIPS PROCEEDINGS, 1970 SPRING JOINT COMPUTER CONFERENCE, VOLUME 36, (ATLANTIC CITY, NJ, MAY 5-7, 1970), AFIPS PRESS, MONTVALE, NJ, 1970, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 551-567, 35 REFS

THIS IS THE PRIMARY PUBLISHED DETAILED DESCRIPTION OF THE ARPA NETWORK COMMUNICATIONS SUBNET. CONSIDERABLE ATTENTION WAS GIVEN IN THE DESIGN TO ELIMINATING CONGESTION THROUGH THE USE OF 'LINKS', BUT THE PRECAUTIONS STILL WERE INADEQUATE TO ELIMINATE MASSIVE CONGESTION UNDER CERTAIN CONDITIONS, NECESSITATING REDESIGN AND MODIFICATIONS IN 1972 BEFORE SIGNIFICANT NET LOADING COULD BE SUPPORTED. THERE IS EMPHASIS ON THE SELECTION OF THE RUGGEDIZED HONEYWELL DDP 516 TO REDUCE MEAN TIME BETWEEN FAILURE, A PRACTICE THAT HAS SINCE BEEN FOUND UNNECESSARY. AN APPARENT WEAKNESS OF THE PAPER IS THE SHOWING OF CHARTS OF NETWORK TRANSIT TIMES FOR AN UNLOADED (LIGHTLY LOADED) NET, WITH AN IMPLICATION THAT THE DESIGN GOAL OF LESS THAN A HALF SECOND AVERAGE ONE WAY TRANSIT TIME FOR THE LOADED NET HAS BEEN OR WILL BE MET.

HERNDON, EDWIN S., HERBERT J. STERNICK, JOHN W. BENOIT, ROY O. BEVERIDGE, PAUL BRUCE, IRA W. COTTON, JEAN ISELI, RANVIR K. TREHAN, NOREEN O. WELCH, O. C. WOOD, PROTOTYPE WWMCCS INTERCOMPUTER NETWORK (PWIN) DEVELOPMENT PLAN, MITRE CORP., WASHINGTON, DC, 1 MAY 71, MC MTR-6181, AF F19628-71-C-0002, 149P, 13 REFS

A DETAILED PLAN FOR DEVELOPMENT OF A PROTOTYPE WWMCCS (WORLD WIDE MILITARY COMMAND AND CONTROL SYSTEM) INTERCOMPUTER NETWORK IS CONTAINED IN THIS REPORT. IT INCLUDES A DESCRIPTION OF THE PROCUREMENT AND DEVELOPMENT ACTIVITIES TO BE UNDERTAKEN BY THE DEFENSE COMMUNICATIONS SYSTEM (DCS) AND THE JOINT TECHNICAL SUPPORT ACTIVITY (JTSA) AS WELL AS AN EXTENSIVE EXPERIMENTATION PROGRAM. THIS DEVELOPMENT PLAN IS BASED UPON AN EARLIER VERSION *PROPOSED IMPLEMENTATION PLAN FOR A WWMCCS INTERCOMPUTER NETWORK* IN CATEGORY 3.1.1, WHICH HAS BEEN EXTENSIVELY REVISED TO PLACE THE NETWORK PLANS IN THE CONTEXT OF TOTAL DEFENSE COMMUNICATIONS AGENCY OBJECTIVES. (ALSO UNDER 5.9)

INITIAL DESIGN FOR INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, JAN 69, BBN R-1763, OAHC 15-69-DI79, 76P

THIS GENERAL DESCRIPTION OF BOTH THE HARDWARE AND SOFTWARE DESIGN OF THE ARPA NETWORK INTERFACE MESSAGE PROCESSOR (IMP) IS A RATHER EARLY DOCUMENT REFERRING TO A NON-RUGGEDIZED IMP AND MAKING MINIMAL REFERENCE TO RECOGNIZED BUT UNRECONCILED PROBLEMS SUCH AS REASSEMBLY MESSAGE QUEUING. THE MECHANISM FOR RESOLVING HOST COMPUTER WORD LENGTH DIFFERENCES AND THE GENERAL IMP-TO-IMP PROTOCOL ARE DESCRIBED. OVERALL MESSAGE FLOW AND THE CONCEPT OF MESSAGES DIVIDED INTO PACKETS ARE SUMMARIZED.

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK, QUARTERLY TECHNICAL REPORT NO. 1, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, APR 69, 2 JAN-31 MAR 69, BBN R-1783, BBN QTR-1, OAHC 15-69-DI79, 14P

THE CONTENTS OF THIS QUARTERLY TECHNICAL REPORT ARE AS FOLLOWS: HARDWARE DESIGN, SOFTWARE DEBUGGING, MULTIPLE HOSTS ON AN IMP, AND ROUTING ALGORITHMS. THE HARDWARE DESIGN SECTION CONTAINS A LISTING OF FEATURES WHICH HAVE BEEN MODIFIED ON THE HONEYWELL 516 FOR USE IN THE ARPA NETWORK. THIS INFORMATION DOES NOT APPEAR IN ANY OTHER DOCUMENT AND MAY BE OF INTEREST. THE OTHER SECTIONS OF THE REPORT HAVE BEEN OBSOLETED BY LATER DEVELOPMENTS.

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK. QUARTERLY TECHNICAL REPORT NO. 10, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, JUL 71, 1 APR-30 JUN 71, BBN R-2175, BBN QTR-10, ARPA QAHC-1S-69-C-0179, 17P

THE CONTENTS OF THIS QUARTERLY TECHNICAL REPORT ARE AS FOLLOWS: NETWORK WORKING GROUP PARTICIPATION, TERMINAL IMP. THE CONTENTS OF THIS QUARTERLY TECHNICAL REPORT ARE OBSOLETE.

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK. QUARTERLY TECHNICAL REPORT NO. 11, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, OCT 71, 1 JUL-30 SEP 71, BBN R-2270, BBN QTR-11, ARPA QAHC-1S-69-C-0179, 7P

THIS QUARTERLY TECHNICAL REPORT PRIMARILY COVERS THE TERMINAL IMP (TIP). ALL OF THE INFORMATION IN THIS QUARTERLY TECHNICAL REPORT HAS BEEN SUPERSEDED BY SUBSEQUENT DOCUMENTS.

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK. QUARTERLY TECHNICAL REPORT NO. 12, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, JAN 72, 1 OCT-31 DEC 71, BBN R-2309, BBN QTR-12, QAHC 1S-69-C-0179, (AD-736 213), 14P

A SUMMARY OF IMP/TIP PROBLEMS AND DEVELOPMENTS IS PRESENTED. THE DIFFICULTY IN SERVICING REMOTE BATCH TERMINALS THROUGH THE TIP IS DISCUSSED AND A SOLUTION RELATED TO HAVING AN ATTACHED MODEM PERFORM ERROR DETECTION/CORRECTION IS PROPOSED. A DISCUSSION OF A NEW TYPE OF IMP CALLED A HIGH SPEED MODULAR IMP IS GIVEN BUT DETAILS ARE LACKING. USER REACTIONS TO THE TIP ARE SUMMARIZED AS FAVORABLE TO THE TIP, BUT DISSATISFIED WITH THE LACK OF AVAILABILITY OF NETWORK RESOURCES. A DETAILED DESCRIPTION OF THE IMP-TO-DISTANT-HOST INTERFACE IS GIVEN.

INTERFACE MESSAGE PROCESSORS FOR THE ARRA COMPUTER NETWORK. QUARTERLY TECHNICAL REPORT NO. 13, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, APR 72, 1 JAN-30 APR 72, BBN R-2353, BBN QTR-13, CAHC 1S-69-C-0179, 31P

THE CONTENTS OF THIS QUARTERLY TECHNICAL REPORT ARE AS FOLLOWS: TIP MAGNETIC TAPE OPTION, BUFFERING REQUIREMENTS FOR SPECIAL CIRCUITS, TRANSMISSION AND FLOW CONTROL. THE SECTION ON TIP MAGNETIC TAPE OPTION DESCRIBES THE OPTION'S CAPABILITIES AND COMMANDS FOR USING THIS FEATURE. THE SECTION ON BUFFERING REQUIREMENTS CONTAINS A DETAILED ANALYTIC DISCUSSION OF THE EFFECT OF USING LINE SPEEDS OTHER THAN THE STANDARD 50 KILOBIT/SECOND FOR IMR TO IMP COMMUNICATIONS. EXTENSIVE TABLES AND GRAPHS ARE PRESENTED FOR THE DATA WHICH IS DEVELOPED. THE ALGORITHM EMPLOYED PROVIDES FOR THE PRIOR ALLOCATION OF SPACE FOR MESSAGES FROM IMP TO IMP AND FOR CONTROL OVER THE TOTAL NUMBER OF MESSAGES WHICH MAY BE IN TRANSIT BETWEEN ANY TWO PARTICULAR IMP'S.
(ALSO UNDER 2.1.2)

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK. QUARTERLY TECHNICAL REPORT NO. 14, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, JUL 72, 1 APR-30 JUN 72, BBN QTR-14, BBN R-2396, ARPA QAHC-1S-69-C-0179, 18P

THE FIRST PART OF THIS REPORT IS DEVOTED TO PROBLEMS ENCOUNTERED IN LOADING AND PROPAGATING A NEW VERSION OF THE ARPANET IMP OPERATING SYSTEM. SOLUTIONS ARE PROPOSED TO MAKE TRANSITIONS TO NEW VERSIONS OF THE SOFTWARE SMOOTHER. THE SECOND PART OF THE REPORT DESCRIBES THE HIGH SPEED MODULAR IMP (HSMIMP) AND JUSTIFIES ITS DESIGN. THE HSMIMP HAS A THROUGHPUT OF 10 TIMES THAT OF A NORMAL IMP. A MULTIPROCESSOR CONFIGURATION WITH SHARED MEMORIES WAS CHOSEN. THE PROCESSOR SELECTED IS A LOCKHEED SUE MINICOMPUTER.

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK. QUARTERLY TECHNICAL REPORT NO. 15, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, OCT 72, 1 JUL-30 SEP 72, BBN QTR-15, BBN R-2468, ARRA QAHC-1S-69-C-0179, 15P

THIS QUARTERLY PROGRESS REPORT COVERS THE FOLLOWING TOPICS: TIP MAGNETIC TAPE OPTION, SATELLITE TRANSMISSION FLOW CONTROL TECHNIQUES, AND PROGRAM ORGANIZATION FOR THE HIGH SPEED MODULAR IMP (HSMIMP). REVISIONS TO THE PROTOCOLS FOR THE MAGNETIC TAPE OPTION ARE DESCRIBED. VARIOUS CONTROL TECHNIQUES FOR A SATELLITE CHANNEL ARE DESCRIBED AND ONE IS RECOMMENDED. A NEW PROGRAMMING TECHNIQUE THAT REDUCES THE OVERHEAD IN INTERRUPT-DRIVEN SYSTEMS IS DESCRIBED FOR THE HSMIMP.

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK. QUARTERLY TECHNICAL REPORT NO. 16, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, JAN 73, 1 OCT-31 DEC 72, BBN R-2499, QAHC 1S-69-C-0179, 41P, 7 REFS
(ANNOTATION UNDER 2.2)

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK. QUARTERLY TECHNICAL REPORT NO. 2, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, JUL 69, 1 APR-30 JUN 69, BBN R-1837, BBN QTR-2, QAHC 1S-69-0179, 1SP

PROGRAM DESIGN FOR THE OPERATIONAL INTERFACE MESSAGE PROCESSOR (IMP) AND NETWORK MEASUREMENTS ARE COVERED IN THIS QUARTERLY TECHNICAL REPORT. MUCH OF THE INFORMATION PRESENTED IS NOW OBSOLETE.
(ALSO UNDER 2.2)

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK. QUARTERLY TECHNICAL REPORT NO. 3, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, OCT 69, 1 JUL-30 SEP 69, BBN R-1890, BBN QTR-3, QAHC 1S-69-C-0179, 10P

THIS QUARTERLY TECHNICAL REPORT COVERS IMR HARDWARE CHECKOUT AND INSTALLATION, SOFTWARE DEVELOPMENT, AND PROJECTED IMP PERFORMANCE. THE FIRST TWO SECTIONS OF THIS REPORT ARE NOW OBSOLETE. THE SECTION ON PROJECTED IMP PERFORMANCE MAY BE OF INTEREST; HOWEVER, NOTE THAT FIGURE 2 WHICH SHOULD SHOW A CURVE OF MAXIMUM THROUGHPUT AS A FUNCTION OF MESSAGE LENGTH HAS BEEN OMITTED.

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK. QUARTERLY TECHNICAL REPORT NO. 3, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, OCT 73, 1 JUL-30 SEP 73, AF F08606-73-C-0027, (BBNI R-2667), 20P

ACTIVITIES DESCRIBED IN THIS REPORT ARE: STUDY OF ROUTING ALGORITHMS; THE SATELLITE IMP; AND THE TERMINAL IMP (TIP). A COMPLETE STATUS REPORT ON THE TIP EFFORT ADDRESSES THE FOLLOWING: FABRICATION, INSTALLATION AND MAINTENANCE; DOCUMENTATION AND THE TIP USERS GROUP; TERMINAL AND MODEM HANDLING CAPABILITIES; MAGNETIC TAPE OPTION; USE OF RESOURCE SHARING EXECUTIVE (RSEXEC); SOFTWARE IMPROVEMENTS; AND BANDWIDTH CAPABILITIES.
(ALSO UNDER 3.3.2)

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK. QUARTERLY TECHNICAL REPORT NO. 4, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, JAN 70, 1 OCT-31 DEC 69, BBN R-1928, BBN QTR-4, QAHC 1S-69-C-0179, 10P

THE CONTENTS OF THIS QUARTERLY TECHNICAL REPORT ARE AS FOLLOWS: SOFTWARE DEVELOPMENT, HARDWARE DEVELOPMENT, PHONE LINE TEST PROGRAM, HOST PROTOCOL. FEATURES IN THE IMP SOFTWARE ALLOWING FOR FOUR SETS OF MEASUREMENT FACILITIES ARE DESCRIBED. THE BRIEF DESCRIPTION OF A PHONE LINE TEST PROGRAM FOR THE 50 KILOBIT COMMUNICATION CIRCUITS MAY ALSO BE OF INTEREST. THE OTHER SECTIONS HAVE BEEN SUPERCEDED BY SUBSEQUENT REPORTS.

INTERFACE MESSAGE PROCESSORS FOR THE ARRA COMPUTER NETWORK. QUARTERLY TECHNICAL REPORT NO. 5, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, APR 70, 1 JAN-31 MAR 70, BBN R-1966, BBN QTR-5, ARPA QAHC-1S-69-C-0179, 14P

THE CONTENTS OF THIS QUARTERLY TECHNICAL REPORT ARE AS FOLLOWS: SOFTWARE DEVELOPMENT, HARDWARE DEVELOPMENT, NETWORK TESTING, PHONE LINE TEST PROGRAM. ITEMS OF INTEREST IN THIS REPORT INCLUDE A MODEM SIMULATOR BEING BUILT TO SIMULATE SIX FULL-DUPLEX COMMUNICATION CIRCUITS TOGETHER WITH ATTACHED MODEMS AND EXTENSIONS TO THE PHONE LINE TEST PROGRAM DESCRIBED IN QUARTERLY TECHNICAL REPORT NO. 4.

INTERFACE MESSAGE PROCESSORS FOR THE ARRA COMPUTER NETWORK. QUARTERLY TECHNICAL REPORT NO. 6, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, JUL 70, 1 ARR-30 JUN 70, BBN R-2003, BBN QTR-6, ARPA QAHC-1S-69-C-0179, 13P

THE CONTENTS OF THIS QUARTERLY TECHNICAL REPORT ARE AS FOLLOWS: SOFTWARE DEVELORMENT, HARDWARE, NETWORK TESTING, NETWORK CONTROL CENTER. ITEMS OF INTEREST IN THIS QUARTERLY TECHNICAL REPORT INCLUDE DESCRIPTION OF A NETWORK LOAD SIMULATOR AND SOME EMPIRICAL DATA REGARDING THROUGHPUT.

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK. QUARTERLY TECHNICAL REPORT NO. 7, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, OCT 70, 1 JUL-30 SEP 70, BBN R-2059, BBN QTR-7, QAHC 1S-69-C-0179, 12P

THE CONTENTS OF THIS QUARTERLY TECHNICAL REPORT ARE AS FOLLOWS: IMP PROGRAM DEVELOPMENT, TERMINAL IMP, NETWORK CONTROL CENTER, HOST PROTOCOL. THE PRELIMINARY DESIGN OF THE TERMINAL IMP IS DESCRIBED. HOWEVER, ALL OF THE CONTENTS OF THIS QUARTERLY TECHNICAL REPORT HAVE BEEN SUPERCEDED BY SUBSEQUENT REPORTS.
(ALSO UNDER S.1)

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK. QUARTERLY TECHNICAL REPORT NO. 8, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, JAN 71, 1 OCT-31 DEC 70, BBN R-2103, BBN QTR-8, QAHC 1S-69-C-0179, 13P

THE CONTENTS OF THIS QUARTERLY TECHNICAL REPORT ARE AS FOLLOWS: TERMINAL IMP, NETWORK CONTROL CENTER, THROUGHPUT AND PROTOCOL STUDY. THIS QUARTERLY TECHNICAL REPORT IS MOST NOTABLE FOR ITS SAMPLE OF HOURLY SUMMARY INFORMATION PRODUCED BY THE NETWORK CONTROL CENTER.
(ALSO UNDER S.1)

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK. QUARTERLY TECHNICAL REPORT NO. 9, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, APR 71, 1 JAN-31 MAR 71, BBN R-2123, BBN QTR-9, ARPA QAHC-IS-69-C-0179, 11P

THIS QUARTERLY TECHNICAL REPORT CONTAINS A DESCRIPTION OF THE TERMINAL IMP (TIP) MULTI-LINE CONTROLLER. THE OTHER SECTIONS ON NETWORK THROUGHPUT AND PROTOCOLS ARE OBSOLETE.

JORDAN, BERNARD W., JR., ERIC L. BAOTZ, C.MUP--NORTHWESTERN UNIVERSITY'S MULTIMICROCOMPUTER NETWORK, (NORTHWESTERN UNIV., EVANSTON, IL),
PROCEEDINGS OF THE 1974 SYMPOSIUM, COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, MAY 23, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, 74CH0835-9C, P SI-SS, 6 REFS

NORTHWESTERN UNIVERSITY IS BUILDING A MULTIMICROCOMPUTER NETWORK AS A TOOL FOR RESEARCH IN NETWORKING AND HIGH LEVEL COMPUTER CONSTRUCTION. ALTHOUGH THE INTEL 8008 MICROPROCESSOR CHIP WAS CHOSEN, MANY OF THE CONCLUSIONS DRAWN FROM THIS PROJECT COULD BE APPLICABLE TO OTHER PROCESSORS WITH SIMILAR PIN-OUT AND SPEED LIMITATIONS.
THIS PAPER DISCUSSES THE SYSTEM HARDWARE AND SOFTWARE CONFIGURATION, TIMING CONSIDERATIONS, BUS PROTOCOLS, AND HARDWARE DEBUGGING TECHNIQUES UTILIZED.

KIRSTEIN, PETER T., UNIVERSITY COLLEGE, LONDON, ARPANET PROJECT, ANNUAL REPORT, UNIVERSITY COLLEGE, LONDON, (ENGLAND), DEPT. OF STATISTICS AND COMPUTER SCIENCE, DEC 74, 1 JUL 73-30 SEP 74, UC TR-17, ONR N00014-74-C-2080, 59P, 24 REFS

THIS REPORT DESCRIBES THE ACTIVITIES OF THE UNIVERSITY COLLEGE LONDON (UCL) GROUP IN CONNECTION WITH ARPANET DURING THE REPORTING PERIOD. THE CONNECTION OF A HOST TO ARPANET BY A FRONT-END PROCESSOR, WITH NO SPECIAL RESIDENT SOFTWARE IN THE MAIN HOST, WAS EFFECTED AND THIS WORK IS DESCRIBED IN DETAIL. THE SUBJECT OF INTERCONNECTION OF NETWORKS IS ALSO ADDRESSED.
(ALSO UNDER 3.3.2)

KUO, FRANKLIN F., NORMAN ABRAMSON, SOME ADVANCES IN RADIO COMMUNICATIONS FOR COMPUTERS, (HAWAII, UNIV. OF, HONOLULU, DEPT. OF ELECTRICAL ENGINEERING),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 57-60, 7 REFS

THE ALOHA SYSTEM, AN EXPERIMENTAL UHF RADIO COMPUTER COMMUNICATION NETWORK, IS DESCRIBED IN THIS PAPER INCLUDING THE PRESENT CONFIGURATION, THE HOST INTERFACE (MENEHUNE), SOFTWARE PROGRAMS DEVELOPED, AND USE OF SATELLITE COMMUNICATIONS. THE PRESENT ONGOING WORK AND A SHORT LOOK INTO FUTURE DEVELOPMENTS OF THE PROJECT ARE ALSO GIVEN.
(ALSO UNDER 3.2.1)

MCKAY, DOUGLAS B., DONALD P. KARP, JAMES W. MEYER, ROBERT S. NACHBAR, EXPLORATORY RESEARCH ON NETTING AT IBM, (INTERNATIONAL BUSINESS MACHINES CORP., RESEARCH CENTER),
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 457-484

THIS CHAPTER DISCUSSES TWO OF IBM'S EXPERIMENTAL COMPUTER NETWORKS PROJECTS. THE FIRST, THE TSS NETWORK, IS A HOMOGENOUS NET WHOSE NODES CONSIST EXCLUSIVELY OF IBM 360/67 COMPUTERS. THE SECOND PROJECT, NETWORK 440, IS AN INHOMOGENEOUS NET WITH DISPARATE MACHINES RUNNING UNDER DIFFERENT OPERATING SYSTEMS AT EVERY NODE. IN THIS SYSTEM, THE VARIOUS NETWORK PROCESSORS ARE VIEWED AS COMPRISING ONE LARGE MULTIPROCESSOR. THUS DIFFERENT STEPS OF A SINGLE JOB CAN BE EXECUTED ON DIFFERENT PARTICIPATING SYSTEMS.

MILLER, EDWARD F., JR., EDWARD L. PRICHARD, PROCESS CONTROL AND FILE MANAGEMENT PROBLEMS IN LARGE MINICOMPUTER NETWORKS, (GENERAL RESEARCH CORP., SANTA BARBARA, CA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 199-201, 3 REFS
(ANNOTATION UNDER 3.4.3)

PEHRSON, DAVID L., AN ENGINEERING VIEW OF THE LRL OCTOPUS COMPUTER NETWORK, CALIFORNIA, UNIV. OF, LIVERMORE, LAWRENCE RADIATION LAB., 17 NOV 70, CU-LRL UCID-15754, 32P

A COMPLETE DESCRIPTION OF THE LAWRENCE RADIATION LABORATORY (LRL) OCTOPUS NETWORK IS GIVEN. THE FILE SYSTEM, WHICH IS COMMON TO ALL OF THE PROCESSORS (CDC 6600'S AND 7600'S), AND THE TELETYPE NETWORK, ALSO COMMON AND CONTROLLED BY MINICOMPUTERS, ARE DESCRIBED IN DETAIL. PROBLEMS ARE WELL DOCUMENTED AND FUTURE PLANS ARE OUTLINED, INCLUDING A REMOTE JOB ENTRY SYSTEM, A CPT BASED SYSTEM TO SUPPLEMENT THE TELETYPES, AND AN OPTICAL MASS MEMORY.

ROMERANTZ, MORRIS, LAWRENCE A. SAMES, DATA DISTRIBUTION NETWORK FOR THE TABLON MASS STORAGE SYSTEM, (DEPARTMENT OF DEFENSE, WASHINGTON, DC),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 243-246, 2 REFS

THE TABLON HARDWARE DESIGN AND IMPLEMENTATION ASPECTS OF CONNECTING DIFFERENT, REMOTE, LARGE SCALE COMPUTERS INTO A LARGE MASS STORAGE SYSTEM ARE DISCUSSED. THE SYSTEM DESIGN INVOLVED A SIMPLE, RELIABLE, CONTROLLED, SWITCHING AND BUFFERING NETWORK. CHARACTERISTICS OF THE FOLLOWING ARE GIVEN: INTERFACE UNIT, CPU TO BUFFER SWITCH, MASS STORAGE SYSTEM TO BUFFER SWITCH, BUFFER MEMORIES, SWITCH CONTROLLER, STORAGE CONTROL PROCESSOR AND THE COMMUNICATIONS TERMINAL AND COMMUNICATIONS DATA MULTIPLEXER.

RAVINDRAN, V. K., THAMPY THOMAS, CHARACTERIZATION OF MULTIPLE MICROPROCESSOR NETWORKS, (STANFORD UNIV., CA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 133-137, 7 REFS

LSI HAS MADE POSSIBLE NEW DESIGNS, USES AND ECONOMIES OF COMPUTING SYSTEMS. THIS PAPER STUDIES LSI MICROPROCESSOR ARCHITECTURE AND PERFORMANCE AND GIVES AN EXAMPLE OF A MICROPROCESSOR NETWORK. THE STUDY CONCLUDES THAT MICROPROCESSOR NETWORKS CAN BE CONFIGURED ECONOMICALLY TO BOOST THE SERVICE CAPABILITIES AND REDUCE RESOURCE OVERHEADS OF A SYSTEM. IT ALSO POINTS OUT THAT THERE IS A LIMIT TO THE NUMBER OF MICROPROCESSORS THAT CAN EFFECTIVELY BE CONNECTED TO SHARE A RESOURCE, WITHOUT RESULTING IN A DEGENERATION OF THROUGHPUT AND RESPONSE.
(ALSO UNDER 2.1.1)

ROBERTS, LAWRENCE G., BARRY D. WESSLER, THE ARPA NETWORK, (ADVANCED RESEARCH PROJECTS AGENCY, ARLINGTON, VA, UTAH, UNIV. OF, SALT LAKE CITY),
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 485-500, 8 REFS

THE ARPA NETWORK WAS DESIGNED WITH TWO GOALS: TO DEVELOP AND TEST COMPUTER-COMMUNICATIONS TECHNIQUES, AND TO OBTAIN BENEFITS OF RESOURCE SHARING FOR MEMBERS OF THE ARPA COMMUNITY. AFTER A SECTION DESCRIBING THE PROPERTIES OF A COMMUNICATIONS SYSTEM FOR INTERCONNECTING LARGE COMPUTERS, THE AUTHORS DESCRIBE THE ARPA NETWORK. INCLUDED ARE DISCUSSIONS OF CONFIGURATION, RELIABILITY, COMMUNICATION SYSTEM DESIGNS, NETWORK USES, AND FUTURE PLANS OF THIS NETWORK AND OF NETWORKS IN GENERAL.

RUSCHITZKA, M. G., P. S. FABRY, THE PRIME MESSAGE SYSTEM, (CALIFORNIA, UNIV. OF, BERKELEY, COMPUTER SYSTEMS RESEARCH PROJECT),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 125-128, 9 REFS

THE PRIME SYSTEM IS A MEDIUM-SIZED, GENERAL PURPOSE, MULTI-PROCESSOR, TIME-SHARING SYSTEM UNDER DEVELOPMENT AT THE UNIVERSITY OF CALIFORNIA AT BERKELEY. THE MESSAGE SYSTEM, DESCRIBED IN THIS PAPER, COMBINES THE ADDRESSING GENERALITY OF A NETWORK MESSAGE SYSTEM WITH A COST CONSCIOUS IMPLEMENTATION. DESIGN FACTORS AND IMPLEMENTATION DETAILS ARE GIVEN AND ARE CONTRASTED WITH ARPA TECHNIQUES.
(ALSO UNDER 3.3.2)

SCANTLEBURY, P. A., P. T. WILKINSON, K. A. BARTLETT, THE DESIGN OF A MESSAGE SWITCHING CENTRE FOR A DIGITAL COMMUNICATION NETWORK, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND)),
INFORMATION PROCESSING 68; PROCEEDINGS OF IFIP CONGRESS 1968, VOLUME 2--HARDWARE, APPLICATIONS, (EDINBURGH, (SCOTLAND), AUGUST 5-10, 1968), NORTH-HOLLAND PUBLISHING CO., AMSTERDAM, (NETHERLANDS), 1969, IFIP CONGRESS PROCEEDINGS, (LC 65-24118), P 723-727, 3 REFS

THIS IS AN EARLY DESCRIPTION OF THE PROPOSED NATIONAL PHYSICS LABORATORY NETWORK IN ENGLAND. THE PORTION OF THE NETWORK DISCUSSED HERE IS THE STORE-AND-FORWARD TRUNK NETWORK AND THE SWITCHING CENTERS WHICH PERFORM THAT FUNCTION.

3.1.1 TECHNICAL DESCRIPTIONS

THE SWITCHING CENTERS ARE SMALL GENERAL PURPOSE COMPUTERS WITH SPECIAL HARDWARE JOINED BY HIGH SPEED LINKS INTO A DISTRIBUTED NETWORK. AN ADAPTIVE ROUTING SCHEME TO ACCOMMODATE OVERLOADS AND FAILURES IS ALSO DESCRIBED.

SCANTLEBURY, R. A., A MODEL FOR THE LOCAL AREA OF A DATA COMMUNICATION NETWORK--OBJECTIVES AND HARDWARE ORGANIZATION, NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), DIV. OF COMPUTER SCIENCE, OCT 69, NPL-DCS COM-SCI-T.M.29, 17P, 10 REFS

A FUNCTIONAL DESCRIPTION OF THE COMPONENTS OF A MESSAGE SWITCHED NETWORK PRESENTLY BEING IMPLEMENTED BY THE NATIONAL PHYSICAL LABORATORY IS PROVIDED. THE DISCUSSION CONCENTRATES ON THE LOCAL NETWORK WHERE ALL USERS CONNECT TO A SINGLE SWITCHING CENTER. THE INTERCONNECTION OF THESE LOCAL NETWORKS RECEIVES LITTLE ATTENTION.
(ALSO UNDER 3.2.2, 3.2.3)

TENKHOFF, PHILIP A., THE INFONET REMOTE TELEPROCESSING COMMUNICATION NETWORK--DESIGN, PERFORMANCE, AND OPERATION, (COMPUTER SCIENCES CORP., EL SEGUNDO, CA),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 401-412, 3 REFS

FOUR UNIVAC 1108'S CURRENTLY ARE THE BASE OF THE COMPUTER SCIENCES CORPORATION INFORMATION NETWORK (INFONET). THE PRINCIPAL ELEMENT OF THE COMMUNICATIONS NETWORK IS THE REMOTE COMMUNICATIONS CONCENTRATOR (RCC) WHICH INTERFACES THE INFONET SYSTEM TO A VARIETY OF COMMUNICATIONS MEDIA. A NETWORK OVERVIEW, DESCRIPTION OF THE RCC, NETWORK RELIABILITY AND A LOOK AT THE FUTURE ARE SOME OF THE TOPICS DISCUSSED.

TYGIELSKI, RALPH E., GROWTH OF A NETWORK, (SBC DEVELOPMENT LAB., CAMPBELL, CA),
PROCEEDINGS OF THE 1975 SYMPOSIUM-COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, JUNE 18, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, 75CH0973-8C, P 14-18

THE COC/SBC DATA SERVICES NETWORK INTERCONNECTS THE PROCESSING ELEMENTS OF CALL/370, KRONOS TIME-SHARING, FOCUS AND CALL/PLUS DATA SERVICES INTO A NETWORK COMPLEX CONSISTING OF A CNP AND OVER 46 REMOTE MINICOMPUTERS.
THIS PAPER TRACES THE GROWTH OF THE COC/SBC DATA SERVICES NETWORK TO ITS PRESENT FORM AND EXPLORES SOME OF THE PROBLEMS ENCOUNTERED IN ITS DESIGN AND IMPLEMENTATION.

WILKINSON, P. T., A MODEL FOR THE LOCAL AREA OF A DATA COMMUNICATION NETWORK--SOFTWARE ORGANIZATION, NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), DIV. OF COMPUTER SCIENCE, OCT 69, NPL-DCS COM-SCI-T.M.29, 20P, 6 REFS

THE NATIONAL PHYSICAL LABORATORY NETWORK IS DESCRIBED IN TERMS OF THE INTERACTION OF TERMINALS WITH THE NETWORK. THE NETWORK IS STAR CONNECTED AND ALLOWS ANY TERMINAL TO EXCHANGE INFORMATION WITH ANY OTHER TERMINAL VIA THE MESSAGE SWITCHING COMPUTER (MSC). THE CHARACTERISTICS OF THE OPERATING SYSTEM FOR THE MSC ARE SUMMARIZED.
(ALSO UNDER 3.4.0, 3.2.2)

ZARA, PHILIP E., AN AOP MANAGER'S VIEW OF THE CONFLUENCE OF DATA PROCESSING AND TELECOMMUNICATIONS, (ELECTRONIC SYSTEMS DIV., L. G. HANSCOM FIELD, MA),
IEEE 1974 NATIONAL TELECOMMUNICATIONS CONFERENCE, (SAN DIEGO, CA, DECEMBER 2-4, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE P-74CH0902-7-CSCB, (LC 57-20724), P 46B-47S, 9 REFS

ONLY THE FIRST PAGE OF THIS ARTICLE DISCUSSES THE 'CONFLUENCE OF DATA PROCESSING AND TELECOMMUNICATIONS' IN ANY GENERAL OR HISTORICAL TERMS. THE BULK OF THE ARTICLE IS A DESCRIPTION OF AN AIR FORCE AOP REQUIREMENTS STUDY AND THE NETWORK CONFIGURATION THAT WAS RECOMMENDED: AN ARPA-LIKE PACKET NETWORK BETWEEN BASES, WITH LOCAL CABLE FACILITIES FOR TERMINALS AND ON-BASE MINICOMPUTERS.

3.1.2 EVALUATION

AUPPERLE, ERIC M., MERIT NETWORK RE-EXAMINED, (MICHIGAN, UNIV. OF, ANN ARBOR, MERIT COMPUTER NETWORK PROJECT),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 25-30, 2 REFS

THIS PAPER REVIEWS SOME OF THE DESIGN DECISIONS MADE FOR THE MERIT NETWORK IN THE LIGHT OF OPERATING EXPERIENCE. THE ORIGINAL GOALS AND OBJECTIVES OF THE MERIT PROJECT ARE GIVEN, AND A SHORT PROGRESS AND CURRENT STATUS REPORT IS INCLUDED.

BINDER, R., N. ABRAMSON, F. KUO, A. OKINAKA, D. WAX, ALOHA PACKET BROADCASTING--A RETROSPECT, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, HAWAII, UNIV. OF, HONOLULU, ALOHA SYSTEM),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 203-215, 15 REFS

WHILE PACKET BROADCASTING SYSTEMS CAN ACHIEVE THE SAME EFFICIENCIES AS PACKET SWITCHED NETWORKS, FOR LOCAL DISTRIBUTION DATA NETWORKS AND DATA NETWORKS USING SATELLITE CHANNELS, THEY HAVE SPECIAL ADVANTAGES. THOSE CHARACTERISTICS RELATED TO LOCAL DATA NETWORKS ARE DISCUSSED. THE PACKET BROADCASTING DISCUSSION IS BASED ON THE LESSONS LEARNED IN THE DESIGN AND IMPLEMENTATION OF THE ALOHA NET.
(ALSO UNDER 3.5.1, 3.2.2)

BROWN, GEORGE W., AN INTERUNIVERSITY INFORMATION NETWORK, II. EVALUATION, (CALIFORNIA, UNIV. OF, IRVINE),
KENT, ALLEN, ORRIN E. TAULBEE, ELECTRONIC INFORMATION HANDLING, (PITTSBURGH, PA, OCTOBER 7-9, 1964), SPARTAN BOOKS INC., WASHINGTON, DC, 1965, KNOWLEDGE AVAILABILITY SYSTEMS SERIES, (LC 65-17306), P 269-278
(ANNOTATION UNDER 1.1)

CANTOR, D. G., M. GERLA, CAPACITY ALLOCATION IN DISTRIBUTED COMPUTER NETWORKS, (PRESENTED AT THE, SEVENTH INTERNATIONAL CONFERENCE ON SYSTEM SCIENCES, HONOLULU, HAWAII, JANUARY 1974), (CALIFORNIA, UNIV. OF, LOS ANGELES, NETWORK ANALYSIS CORP., GLEN COVE, NY),
KLEINROCK, LEONARD, COMPUTER NETWORK RESEARCH, 30 JUN 74, 1 JAN-30 JUN 74, ARPA DAHC-15-73-C-0368, (AD-A008 422), P 22-25, 10 REFS

IN A COMPUTER COMMUNICATION NETWORK AVERAGE MESSAGE DELAY IS A FUNCTION OF LINK CAPACITY AS WELL AS LINK DATA FLOW. GENERALLY ONLY DISCRETE CAPACITY VALUES ARE AVAILABLE; THEREFORE THE CAPACITY ALLOCATION PROBLEM MAY BE SOLVED USING INTEGER PROGRAMMING TECHNIQUES.
THE SIGNIFICANCE OF THE WORK REPORTED HERE IS THAT IT PRESENTS AN ALGORITHM FOR FINDING THE OPTIMAL ALLOCATION OF CAPACITY IN DISTRIBUTED COMPUTER NETWORKS WHERE THE CHANNEL CAPACITIES MUST BE DRAWN FROM A DISCRETE SET. THIS IS AN IMPORTANT AND REALISTIC PROBLEM IN COMPUTER NETWORK DESIGN.

CERF, VINTON G., AN ASSESSMENT OF ARPANET PROTOCOLS, (STANFORD, UNIV. OF, CA),
THE SECOND JERUSALEM CONFERENCE ON INFORMATION TECHNOLOGY, (JERUSALEM, (ISRAEL), JULY 29-AUGUST 1, 1974), 1974, P 653-664, 14 REFS

SOME THEORETICAL AND PRACTICAL MOTIVATIONS FOR THE REDESIGN OF THE ARPANET COMMUNICATIONS PROTOCOLS ARE PRESENTED. ISSUES CONCERNING MULTIPACKET MESSAGES, HOST RETRANSMISSION, DUPLICATE DETECTION, SEQUENCING, AND ACKNOWLEDGMENT ARE DISCUSSED. SIMPLIFICATIONS FOR THE IMP/IMP PROTOCOL ARE PROPOSED ON THE ASSUMPTION THAT NEW HOST LEVEL PROTOCOLS ARE ADOPTED. FAMILIARITY WITH THE CURRENT PROTOCOL DESIGNS IS PROBABLY NECESSARY SINCE MANY OF THE ARGUMENTS REFER TO DETAILS IN THE PRESENT PROTOCOL DESIGN.
(ALSO UNDER 3.5)

DIAMOND, F., R. JOHNSON, D. MCAULIFFE, SOME RECENT APPLICATIONS OF AUTOMATIC DATA PROCESSING TO TELECOMMUNICATIONS, (ROME AIR DEVELOPMENT CENTER, GRIFFISS AFB, NY),
IEEE 1974 NATIONAL TELECOMMUNICATIONS CONFERENCE, (SAN DIEGO, CA, DECEMBER 2-4, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE P-74CH0902-7-CSCB, (LC 57-20724), P 48Z-49D, 13 REFS
(ANNOTATION UNDER 3.2.D)

EMERY, JAMES C., PROBLEMS AND PROMISES OF REGIONAL COMPUTER SHARING, (PENNSYLVANIA, UNIV. OF, PHILADELPHIA),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 189-198

THE AUTHOR DISCUSSES SOME OF THE PROBLEMS ENCOUNTERED IN THE OPERATION OF UNI-COLL, A REGIONAL COMPUTER FACILITY FORMED BY A NUMBER OF COLLEGES AND UNIVERSITIES IN THE DELAWARE VALLEY. HE ALSO DESCRIBES APPROACHES THAT MIGHT BE TAKEN TO ELIMINATE MANY OF THE PROBLEMS.
(ALSO UNDER 5.0)

HAYES, J. F., MODELING AN EXPERIMENTAL COMPUTER COMMUNICATION NETWORK, (BELL TELEPHONE LABS, INC., HOLMDEL, NJ), DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 4-11, 7 REFS

THE AUTHOR REPORTS THE RESULTS OF A PERFORMANCE STUDY OF AN EXPERIMENTAL COMPUTER COMMUNICATION NETWORK CURRENTLY BEING DESIGNED AND BUILT. THE FUNCTION OF THE NETWORK IS TO PROVIDE A FLEXIBLE COMMUNICATIONS MEDIUM BETWEEN COMPUTERS, USERS, AND PERIPHERALS. MATHEMATICAL MODELS WERE DEVELOPED IN ORDER TO GAIN INSIGHT INTO THE OPERATION OF VARIOUS SYSTEM COMPONENTS.

HOBGOOD, W. SANDS, EVALUATION OF AN INTERACTIVE-BATCH SYSTEM NETWORK, (INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY, THOMAS J. WATSON RESEARCH CENTER), IBM SYSTEMS JOURNAL, VOL 11, ISSUE 1, 1972, P 2-15, 7 REFS

THE COMBINATION OF TWO COMPUTER NETWORKS AS DESCRIBED IN THIS PAPER ILLUSTRATES THE POTENTIAL FOR SIMILAR COMPLEMENTARY INTERCONNECTIONS IN A LARGER AND MORE GENERAL NETWORK. AN INTERACTIVE IBM 360/67 WITH A GOOD DATA MANAGEMENT SYSTEM IS CONNECTED TO AN IBM 360/91, A HIGH THROUGHPUT BATCH SYSTEM. THE CONNECTION IS HIERARCHICAL IN THAT TERMINAL USERS OF THE 67 CAN SUBMIT BATCH JOBS THROUGH TO THE 91. IN ADDITION, SMALLER COMPUTERS HAVE BEEN CONNECTED HIERARCHICALLY TO THE 67 AS AN INTERMEDIARY IN TRANSMITTING DATA TO THE 91, USING THE 67 TO PROVIDE A FRIENDLIER INTERFACE TO THE SMALLER COMPUTERS. OF PARTICULAR INTEREST ARE THE DISCUSSIONS OF MEASUREMENT OF DATA SET SIZE FOR TRANSFERS TO AND FROM THE 91 IN THIS CONFIGURATION AND OF THE STAGES OF SYSTEM (NETWORK) TIMING THAT WERE NECESSARY TO ACHIEVE SUCCESSFUL OPERATION.

HOPEWELL, LYNN, W. S. CHOU, HOWARD FRANK, ANALYSIS OF ARCHITECTURAL STRATEGIES FOR A LARGE MESSAGE-SWITCHING NETWORK: A CASE STUDY, (NETWORK ANALYSIS CORP., GLEN COVE, NY), COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, "COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?", (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, ILC 68-1628), P 118-123, 2 REFS
(ANNOTATION UNDER 2.1.2)

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK, QUARTERLY TECHNICAL REPORT NO. 16, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, JAN 73, I DCT-31 DEC 72, BBN R-2499, DAHC 15-69-C-0179, 41P, 7 REFS
(ANNOTATION UNDER 2.2)

KAHN, ROBERT E., STATUS AND PLANS FOR THE ARPANET, (ADVANCED RESEARCH PROJECTS AGENCY, ARLINGTON, VA), GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 51-54, 1 REFS

THE EVOLVING STRUCTURE OF THE ARPANET, BOTH IN CAPACITY AND CONNECTIVITY, MAKES IT POSSIBLE TO INCREASE THE NETWORK'S CAPACITY. THE AUTHOR DESCRIBES BRIEFLY THE DEVELOPMENT OF THE ARPANET AND PLANS FOR EXTENDING THE NETWORK CONCEPT.

KAHN, ROBERT E., WILLIAM R. CROWTHER, A STUDY OF THE ARPA NETWORK DESIGN AND PERFORMANCE, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, AUG 71, BBN 2161, DAHC 15-69-C-0179, 32P

THIS IS A VERY GOOD STUDY OF KNOWN PROBLEMS IN THE ARPANET COMMUNICATIONS NETWORK AFTER ONE AND ONE-HALF YEAR'S EXPERIENCE. PROBLEMS ADDRESSED INCLUDE REASSEMBLY LOCKUP, STORE AND FORWARD LOCKING, CONGESTION, AND ROUTING FOR HIGH DATA RATES. SOLUTIONS TO EACH PROBLEM ARE POSED, IT IS ACKNOWLEDGED THAT FURTHER INVESTIGATION WHICH MAY TAKE SOME TIME WILL BE NECESSARY TO SUCCESSFULLY SOLVE ALL OF THE PROBLEMS. THE DEPENDENCE OF THE COMMUNICATIONS NETWORK ON THE ATTACHED HOST COMPUTERS TO ACCEPT DATA IS EMPHASIZED. THUS, NETWORK THROUGHPUT DEPENDS IN PART ON EXTERNAL PROCEDURAL FLOW RESTRICTIONS.

KAPRIELIAN, ZOHRAB A., DR., A FEASIBILITY STUDY OF COMPUTER SHARING: UCLA-CALTECH-USC, (SOUTHERN CALIFORNIA, UNIV. OF, LOS ANGELES), EDUCOM BULLETIN, VOL 8, ISSUE 1, SPRING 73, P 8-10
(ANNOTATION UNDER 1.1)

KORFHAGE, R. R., THE INDIANA REGIONAL COMPUTING NETWORK, (PURDUE UNIV., LAFAYETTE, IN), A FIRST REPORT OF AN EXPLORATORY PROGRAM OF REGIONAL COOPERATIVE COMPUTING ACTIVITIES, JAN 70, NSF CCR-70-12, P 101-108,

THE EXPERIENCES OF THE INDIANA REGIONAL COMPUTING NETWORK IN ITS FIRST YEAR OF OPERATION ARE REPORTED. THIS NETWORK HAS A CENTRAL COMPUTER AT PURDUE UNIVERSITY SERVING TERMINALS THROUGHOUT INDIANA.

KURTZ, THOMAS E., THE NERCOMP NETWORK, (DARTMOUTH COLLEGE, HANOVER, NH), GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 282-287

THE AUTHOR DESCRIBES THE NEW ENGLAND REGIONAL COMPUTER PROJECT NETWORK, NERCOMP, ADDRESSING BOTH ITS DEVELOPMENT AND ITS CURRENT STATUS. HE STATES THAT THE PROBLEMS ENCOUNTERED IN A REGIONAL NETWORK ARE A SUBSET OF THOSE TO BE EXPECTED AT THE NATIONAL LEVEL. ALSO, THAT EXPANDED REGIONAL NETWORKS LIKE NERCOMP MAY BE THE PRACTICAL WAY OF PROVIDING AN EVENTUAL NATIONAL, INTERCOMPUTER, INTERINSTITUTIONAL NETWORK.

LARSEN, A., E. MCWILLIAMS, S. SALTZMAN, THE FINGER LAKES REGIONAL COMPUTING ORGANIZATION: CREATING A REGIONAL, ACADEMIC COMPUTING NETWORK, (CORNELL UNIV., ITHACA, NY, MASSACHUSETTS INST. OF TECH., CAMBRIDGE), A FIRST REPORT OF AN EXPLORATORY PROGRAM OF REGIONAL COOPERATIVE COMPUTING ACTIVITIES, JAN 70, NSF CCR-70-12, P 29-42, 5 REFS

THIS REPORT ON THE OPERATION OF THE FINGER LAKES REGIONAL COMPUTING ORGANIZATION (BASED ON A CENTRAL COMPUTER AT CORNELL UNIVERSITY) STRESSES THE NEED TO ALLOW AMPLE TIME FOR THE SYSTEM AND ITS USERS TO ACHIEVE A RELATIVELY STEADY-STATE CONDITION. A NUMBER OF CONCLUSIONS AND OBSERVATIONS REGARDING THE SETUP AND OPERATION OF SUCH A REGIONAL NETWORK ARE PRESENTED.

MCCARN, DAVIS B., A MEDICAL INFORMATION NETWORK AND CONSTRAINTS ON NETWORKING, (NATIONAL LIBRARY OF MEDICINE, WASHINGTON, DC), GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 338-344, 2 REFS

THE DEVELOPMENT AND OPERATION OF THE MEDICAL LITERATURE ANALYSIS AND RETRIEVAL SYSTEM, MEDLARS, THE ON-LINE MEDICAL INFORMATION NETWORK OF THE NATIONAL LIBRARY OF MEDICINE, ARE DESCRIBED. BASED ON HIS EXPERIENCE IN THE DEVELOPMENT OF MEDLARS, THE AUTHOR DISCUSSES CHARACTERISTICS OF COMPUTING IN HIGHER EDUCATION THAT MIGHT MAKE THE PROBLEMS OF NETWORKING DIFFICULT.
(ALSO UNDER 4.2.1)

MCQUILLAN, JOHN M., WILLIAM R. CROWTHER, BERNARD P. COSELL, DAVID C. WALDEN, FRANK E. HEART, IMPROVEMENTS IN THE DESIGN AND PERFORMANCE OF THE ARPA NETWORK, (PREPARED FOR, AFIPS FALL JOINT COMPUTER CONFERENCE, 1972), BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, 1972, ARPA DAHC-15-69-C-0172, 36P, 13 REFS

SOME ARPANET IMPLEMENTATION PROBLEMS AND ACCOMPANYING SOLUTIONS ARE DESCRIBED. DISCUSSIONS ON THE REASSEMBLY LOCKOUT PROBLEM, THE ELIMINATION OF THE LINK MECHANISM, SOME REFINEMENT IN THE ACKNOWLEDGEMENT SYSTEM TO INCREASE THE EFFECTIVE TRANSMISSION RATE, THE DEVELOPMENT OF A VERY DISTANT HOST INTERFACE, IMPROVED BUFFER MANAGEMENT FOR LINES WITH A WIDE RANGE OF SPEEDS, AND BETTER NETWORK DIAGNOSTICS ARE INCLUDED. THE HYPOTHETICAL PERFORMANCE OF THE NETWORK IS THEN RE-EVALUATED TO SHOW THE POTENTIAL IMPROVEMENTS BROUGHT ABOUT BY THE CHANGES.

MIMNO, N. W., BERNARD P. COSELL, DAVID C. WALDEN, S. C. BUTTERFIELD, J. B. LEVIN, TERMINAL ACCESS TO THE ARPA NETWORK: EXPERIENCE AND IMPROVEMENTS, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA), COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, "COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?", (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, ILC 68-1628), P 39-43, 11 REFS

THIS ARTICLE PRESENTS AN ACCOUNT OF THE DEVELOPMENT OF A DIRECT TERMINAL ACCESS CAPABILITY ON THE ARPA NETWORK. THIS DEVELOPMENT IS VIEWED AS A CONTINUAL TRADEOFF BETWEEN USER DEMANDS AND SYSTEM CAPABILITY AND MANAGEABILITY. THE SYSTEM WAS ORIGINALLY DESIGNED ACCORDING TO A BASIC PHILOSOPHY OF SUPPORTING MANY DIFFERENT TYPES OF SIMPLE TERMINALS. THIS PHILOSOPHY HAS BEEN MODIFIED BY THE NEEDS OF MORE SOPHISTICATED USERS AND TERMINALS, BUT IS BELIEVED TO STILL BE ESSENTIALLY VALID.

NIELSEN, NORMAN R., THE MERIT OF REGIONAL COMPUTING NETWORKS, (STANFORD UNIV., CA), COMMUNICATIONS OF THE ACM, VOL 14, ISSUE 5, MAY 71, P 319-326, 3 REFS
(ANNOTATION UNDER 1.1)

NIELSEN, NORMAN R., THE STANFORD REGIONAL COMPUTING NETWORK, (STANFORD UNIV., CA),

3.1.2 EVALUATION

A FIRST REPORT OF AN EXPLORATORY PROGRAM OF REGIONAL COOPERATIVE COMPUTING ACTIVITIES, JAN 70, NSF CCR-70-12, P 137-148.

THE STANFORD UNIVERSITY PILOT REGIONAL EDUCATIONAL COMPUTING NETWORK CONSISTS OF A CENTRAL TIME-SHARING SYSTEM AT STANFORD SERVING TERMINALS AT FIVE INSTITUTIONS IN THE SAN FRANCISCO AREA. THIS ARTICLE OWELLS ON THE LESSONS LEARNED IN THE DEVELOPMENT OF THIS REGIONAL ACADEMIC NETWORK. THE NEED FOR FACULTY INVOLVEMENT, THE NEED FOR GOOD DOCUMENTATION, THE PROBLEMS OF PRICING, AND OTHER TOPICS ARE BRIEFLY COVERED.
(ALSO UNDER 5.1)

OWENS, JERRY L., A USER'S VIEW OF THE LAWRENCE LIVERMORE LABORATORY'S COMPUTER NETWORKS, (LAWRENCE LIVERMORE LAB., LIVERMORE, CA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 75-78, 4 REFS

A DESCRIPTION OF THE OCTOPUS NETWORK IS PRESENTED FROM A USER'S STANDPOINT. THE SUB-NETWORKS THAT MAKE UP THE OCTOPUS NETWORK ARE BRIEFLY DESCRIBED. PROBLEMS AND COMPLAINTS OF THE USERS ARE GIVEN INCLUDING COMPLAINTS OF LOW RELIABILITY, LACK OF CAPACITY POOR DESIGN AND CHANGING HARDWARE AND SOFTWARE. THE AUTHOR DISCUSSES THESE PROBLEM AREAS CANDIDLY AND ADDRESSES ALSO THE INTERACTION OF THESE PROBLEMS ON ONE ANOTHER. HOWEVER HIS BIAS IS QUITE EVIDENT WHEN HE CONTENTS THAT THESE CRITICISMS ARE 'REALLY VERY MINOR WHEN THE MAGNITUDE AND COMPLEXITY OF THE LLL NETWORK IS TAKEN INTO CONSIDERATION.' AND THAT THE LLL NETWORK IS THE 'BEST AND MOST USEFUL COMPUTER NETWORK IN THE WORLD.'
(ALSO UNDER 2.3, 5.7)

O'SULLIVAN, THOMAS C., EXPLOITING THE TIME-SHARING ENVIRONMENT, (RAYTHEON CO., SUDBURY, MA),
PROCEEDINGS OF 22ND NATIONAL CONFERENCE, ASSOCIATION FOR COMPUTING MACHINERY, THOMPSON BOOK CO., WASHINGTON, DC, 1967, ACM CONFERENCE PROCEEDINGS, A.C.M. P-67, (LC 64-25615), P 169-175, 3 REFS

THE EXPERIENCES OF THE RAYTHEON SPACE AND INFORMATION DIVISION IN USING A NUMBER OF COMMERCIAL TIME-SHARING SYSTEMS ARE DISCUSSED. THE SYSTEMS ARE BRIEFLY COMPARATIVELY ANALYZED. AN UNSOPHISTICATED PBX TERMINAL NETWORK IS DESCRIBED WHICH ALLOWS ANY OF THE TERMINALS TO CONNECT TO ANY OF THE AVAILABLE SYSTEMS. ALSO INCLUDED IS THE DESCRIPTION OF A DESIGN OF A REMOTE TERMINAL INTERFACE COMPUTER WHICH CAN ALLOW A 'STANDARD' TERMINAL TO CONNECT TO ANY ACCESSIBLE COMPUTER SYSTEM.

POUZIN, LOUIS, THE CYCLADES NETWORK - PRESENT STATE AND DEVELOPMENT TRENDS, (INSTITUT DE RECHERCHE D'INFORMATIQUE ET D'AUTOMATIQUE, (FRANCE)),
PROCEEDINGS OF THE 1975 SYMPOSIUM-COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, JUNE 18, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, 75CH0973-8C, P 8-13, 17 REFS

THIS PAPER BRIEFLY REVIEWS THE MAJOR DEVELOPMENTAL STAGES OF THE CYCLADES NETWORK. IN ADDITION IT INDICATES CHANGES IN THE INITIAL PLANS WHICH HAVE BEEN AND ARE TAKING PLACE, CURRENT DEVELOPMENTS AND A LOOK TO THE FUTURE.

ROBERTS, LAWRENCE G., NETWORK RATIONALE: A FIVE-YEAR REEVALUATION, (DEPARTMENT OF DEFENSE, ARLINGTON, VA, ADVANCED RESEARCH PROJECTS AGENCY),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 3-5
(ANNOTATION UNDER 5.3)

SCHELONKA, EDWARD P., RESOURCE SHARING WITH ARPANET, (LOS ALAMOS SCIENTIFIC LAB., NM),
IEEE 1974 NATIONAL TELECOMMUNICATIONS CONFERENCE, (SAN DIEGO, CA, DECEMBER 2-4, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE P-74CH0902-7-CSCB, (LC 57-20724), P 1045-1048, 2 REFS
(ANNOTATION UNDER 5.1)

WYATT, JOE B., THE HARVARD PLAN, (HARVARD UNIV., CAMBRIDGE, MA),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 311-319, 2 REFS
(ANNOTATION UNDER 5.1)

3.2.0 GENERAL

AN INTRODUCTION TO THE USE OF DATA COMMUNICATIONS IN THE UNITED KINGDOM, PLIENER ASSOCIATES LTD., LEEDS, (ENGLAND), 1972, 39P

THIS DOCUMENT ADDRESSES TELECOMMUNICATIONS AT THE INTRODUCTORY LEVEL. PRACTICAL INFORMATION IS PRESENTED AND TERMINOLOGY DISCUSSED AT THE NOVICE LEVEL IN COMMUNICATIONS. TARIFF SUMMARIES AND TECHNIQUES DESCRIBED ARE RELATED TO ACTIVITIES IN THE UNITED KINGDOM.

ATKINSON, D. M., U. C. STRAHLENDORF, THE PROBABLE FUTURE OF CANADIAN LONG HAUL DIGITAL DATA NETWORK CONNECTIONS WITH THE U.S.A., (BELL CANADA),
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71C59-C, P 10-15
(ANNOTATION UNDER 3.1.1)

BEERE, MAX F., COMMERCIAL DATA NETWORKS USING AVAILABLE COMMON CARRIER FACILITIES, (TYMSHARE INC.),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 55-63, 1 REFS

ALTERNATIVES FOR DEVELOPING NETWORKS THAT LINK TERMINALS TO COMPUTERS RATHER THAN COMPUTERS TO COMPUTERS ARE DISCUSSED. THE AUTHOR POINTS OUT THE ADVANTAGES AND DISADVANTAGES OF USING EXISTING COMMON CARRIER FACILITIES. HE ALSO ENUMERATES SEVERAL DIFFERENT TYPES OF COMPUTER ORIENTED NETWORKS IN ORDER OF INCREASING POTENTIAL IMPORTANCE. THE CONCEPT OF 'VALUE-ADDED NETWORK SERVICE' (VANS) IS DISCUSSED.

BUTLER, R. E., INTERNATIONAL COOPERATION AND REGULATION FOUNDATIONS FOR DEVELOPMENT, (INTERNATIONAL TELECOMMUNICATIONS UNION, GENEVA, (SWITZERLAND)),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 11-17
(ANNOTATION UNDER 1.5)

DAVIES, DONALD W., DEREK L. A. BARBER, COMMUNICATION NETWORKS FOR COMPUTERS, NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), WILEY (JOHN) AND SONS, NEW YORK, 1973, WILEY SERIES IN COMPUTING, (LC 73-2775), 575P, 99 REFS

THIS HIGHLY READABLE BOOK PROVIDES AN EXCELLENT INTRODUCTION TO THE SUBJECT OF COMPUTER-COMMUNICATION NETWORKS. NOT ONLY ARE SUCH NETWORKS DESCRIBED AS THEY EXIST TODAY, BUT, IN ADDITION, THERE ARE CHAPTERS DEALING WITH PRINCIPLES OF COMPUTER NETWORKS, BASICS OF DATA TRANSMISSION, STORAGE, MULTIPLEXING, AND MESSAGE AND DATA SWITCHING. THE FINAL PART OF THE BOOK IS CONCERNED WITH THE NEW POSSIBILITIES FOR COMMUNICATION NETWORKS WHICH HAVE ARISEN BECAUSE STORAGE AND PROCESSORS ARE CHEAPER AND DATA TRANSMISSION IS FASTER.

DIAMOND, F., R. JOHNSON, D. MCAULIFFE, SOME RECENT APPLICATIONS OF AUTOMATIC DATA PROCESSING TO TELECOMMUNICATIONS, (ROME AIR DEVELOPMENT CENTER, GRIFFISS AFB, NY),
IEEE 1974 NATIONAL TELECOMMUNICATIONS CONFERENCE, (SAN DIEGO, CA, DECEMBER 2-4, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE P-74CH0902-7-CSCB, (LC 57-20724), P 482-490, 13 REFS

FEW ARTICLES THESE DAYS ACTUALLY EXPLAIN WHAT COMPUTERS DO IN BOTH CIRCUIT SWITCHING AND MESSAGE SWITCHING APPLICATIONS. THIS ARTICLE IS AN EXCEPTION, FOR IT DOES EXPLAIN IN A TUTORIAL FASHION THE VARIOUS FUNCTIONS PERFORMED IN EACH CASE. AFTER COMPARING CIRCUIT SWITCHING WITH A TYPICAL MESSAGE SWITCHING SYSTEM (AUTODIN), PACKET SWITCHING IS INTRODUCED (IN THE FORM OF ARPANET) AND COMPARED TO MESSAGE SWITCHING.
THE ARTICLE ENDS WITH A DESCRIPTION OF AN 'ASSOCIATIVE COMMUNICATIONS MULTIPLEXER' ON WHICH THE AUTHORS HAVE APPARENTLY BEEN WORKING AND WHICH IS CLAIMED TO BE APPLICABLE FOR A VARIETY OF SWITCHING FUNCTIONS. UNFORTUNATELY, THE USE OF ASSOCIATIVE PROCESSING TECHNIQUES IN COMMUNICATIONS IS NOT WELL EXPLAINED.
(ALSO UNDER 1.3, 3.1.2)

DOLL, DIXON R., DR., TELECOMMUNICATIONS TURBULENCE AND THE COMPUTER NETWORK EVOLUTION, (DMW TELECOMMUNICATIONS CORP., ANN ARBOR, MI),
COMPUTER, VOL 7, ISSUE 2, FEB 74, P 13-22, 53 REFS
(ANNOTATION UNDER 1.3)

3.2.0 GENERAL

FARBER, DAVID J., KENNETH C. LARSON, THE SYSTEM ARCHITECTURE OF THE DISTRIBUTED COMPUTER SYSTEM--THE COMMUNICATIONS SYSTEM, (PRESENTED AT, SYMPOSIUM ON COMPUTER NETWORKS, APRIL 1972), CALIFORNIA, UNIV. OF, IRVINE, 1972, NSF GJ-1045, 16SP, 9 REFS

THIS IS A GENERAL DESCRIPTION OF THE COMMUNICATIONS SYSTEM FOR A RING STRUCTURE EXPERIMENTAL COMPUTER NETWORK. IT INTRODUCES A MECHANISM FOR AN ASSOCIATIVE STORE AT THE NETWORK INTERFACE FOR EACH PROCESSOR THAT CONTAINS THE 'NAMES' OF ALL PROCESSES PRESENTLY RESIDING WITHIN THE ATTACHED PROCESSOR TO FACILITATE INTER-PROCESS MESSAGE ADDRESSING.

GABLER, HERMANN G., THE GERMAN EDS NETWORK, (DEUTSCHE BUNDESPOST, DARMSTADT, (WEST GERMANY), FERNMELDETECHNISCHES ZENTRALAMT),
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 80-85, 8 REFS
(ANNOTATION UNDER 3.1.0)

GRUBB, DANA S., IRA W. COTTON, CRITERIA FOR THE PERFORMANCE EVALUATION OF DATA COMMUNICATIONS SERVICES FOR COMPUTER NETWORKS, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, COMPUTER SYSTEMS ENGINEERING DIV., SEP 75, NBS TN-882, 36P, 37 REFS
(ANNOTATION UNDER 2.2)

HINKELMAN, ROBERT M., PLANNING A DATA COMMUNICATIONS SYSTEM, PART 2: COMMON CARRIER FACILITIES (CONTINUED), (AMERICAN TELEPHONE AND TELEGRAPH CO., CAMDEN, NJ),
MODERN DATA, VOL 3, ISSUE 6, JUN 70, P 62-64, 66

THIS IS A CONTINUATION OF THE ARTICLE BY HINKELMAN, 'PLANNING A DATA COMMUNICATIONS SYSTEM, PART 2-COMMON CARRIER FACILITIES.'

HINKELMAN, ROBERT M., PLANNING A DATA COMMUNICATIONS SYSTEM, PART 2: COMMON CARRIER FACILITIES, (AMERICAN TELEPHONE AND TELEGRAPH CO., CAMDEN, NJ),
MODERN DATA, VOL 3, ISSUE 5, MAY 70, P 76-80

THE USE OF THE PUBLIC SWITCHED NETWORK TO CONNECT TELETYPEWRITER TERMINALS TO REMOTELY ACCESSIBLE COMPUTERS IS OUTLINED.

MARILL, THOMAS, A COOPERATIVE NETWORK OF TIME-SHARING COMPUTERS: PRELIMINARY STUDY, COMPUTER CORP. OF AMERICA, CAMBRIDGE, MA, 1 JUN 66, CCA TR-11, 52P, 6 REFS
(ANNOTATION UNDER 3.0)

MARTIN, J., TELECOMMUNICATIONS AND THE COMPUTER, INTERNATIONAL BUSINESS MACHINES CORP., NEW YORK, SYSTEMS RESEARCH H INST., PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1969, PRENTICE-HALL SERIES IN AUTOMATIC COMPUTATION, (LC 78-76038), 470P, 47 REFS
(ANNOTATION UNDER 1.3)

YIUM, THOMAS, GARY G. MOSS, JOHN J. RITENOUR, JR., TECHNICAL TELECOMMUNICATION FORCES, (DEPARTMENT OF THE AIR FORCE, AIR FORCE COMMUNICATIONS SERVICE),
IEEE 1974 NATIONAL TELECOMMUNICATIONS CONFERENCE, (SAN DIEGO, CA, DECEMBER 2-4, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE P-74CHD902-7-CSCB, (LC 57-20724), P 461-467, 29 REFS
(ANNOTATION UNDER 1.6)

3.2.1 TRANSMISSION FACILITIES

ABRAMSON, NORMAN, PACKET SWITCHING WITH SATELLITES, HAWAII, UNIV. OF, HONOLULU, ALOHA SYSTEM, MAR 73, HU B73-2, NASA NAS2-6700, AF F44620-69-C-0030, ONR N00014-70-C-0414, 24P, 20 REFS

THIS PAPER PROVIDES A THEORETICAL FRAMEWORK FROM WHICH THE CAPACITY, DELAY AND AVERAGE POWER OF THE NEW FORMS OF COMPUTER-COMMUNICATION NETWORKS CAN BE DERIVED. ALSO DESCRIBED ARE WAYS IN WHICH THESE FORMS OF COMMUNICATION MIGHT BE EMPLOYED IN SOME OF THE PLANNED U.S. DOMESTIC SATELLITE SYSTEMS TO PROVIDE A PUBLIC, PACKET SWITCHED SERVICE. A SHORT HISTORY OF COMPUTER-COMMUNICATIONS NETWORKS UP TO 1973 IS INCLUDED, AS WELL AS A DESCRIPTION OF THE CHARACTERISTICS OF THE ALOHA BURST RANDOM ACCESS COMMUNICATION METHOD.
THIS PAPER WAS ONE OF THREE PRESENTED IN A SESSION OF THE 1973 NATIONAL COMPUTER CONFERENCE AND EXPOSITION DEVOTED TO EXAMINING TECHNIQUES FOR USING A SATELLITE IN A MULTI-ACCESS BROADCAST MODE BY TRANSMITTING ADDRESSED DATA PACKETS FROM MANY GROUND STATIONS, DYNAMICALLY SHARING THE CAPACITY OF A SINGLE WIDEBAND SATELLITE CHANNEL.
(ALSO UNDER 3.2.2, 3.2.3)

ABRAMSON, NORMAN, THE ALOHA SYSTEM--ANOTHER ALTERNATIVE FOR COMPUTER COMMUNICATIONS, (HAWAII, UNIV. OF, HONOLULU), AFIPS PROCEEDINGS, 1970 FALL JOINT COMPUTER CONFERENCE, VOLUME 37, (HOUSTON, TX, NOVEMBER 17-19, 1970), AFIPS PRESS, MONTVALE, NJ, 1970, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 281-285, 13 REFS
(ANNOTATION UNDER 3.1.0)

ABRAMSON, NORMAN, THE ALOHA SYSTEM, HAWAII, UNIV. OF, HONOLULU, JAN 72, UH TR-B72-1, NASA NAS2-6700, AF F44620-69-C-0030, 30P, 16 REFS

A RADIO FREQUENCY COMMUNICATIONS SYSTEM IS DESCRIBED USING AN UNCONVENTIONAL MULTIPLEXING TECHNIQUE. RANDOM ACCESS MULTIPLEXING IS ALLOWED AND RETRANSMISSION WITH TIME DELAYS IS USED TO RESOLVE PROBLEMS OF INTERFERENCE. A MATHEMATICAL ARGUMENT IS PRESENTED ATTEMPTING TO DEFINE PRACTICAL CHANNEL UTILIZATION (LOW PROBABILITY OF INTERFERENCE) USING THE RANDOM MULTIPLEXING TECHNIQUE, BUT THE ARGUMENT IS DEVELOPED FOR A VERY SPECIFIC TYPE OF DATA TRANSFER -- 80 OR 40 CHARACTERS AT A TIME. THE SYSTEM DESERVES ATTENTION BECAUSE IT IS A DEFINITE ATTEMPT TO GEAR THE COMMUNICATIONS SYSTEM TO THE CHARACTERISTICS OF THE USER (BURST USAGE IS THE ASSUMPTION) AND MORE FULLY UTILIZE CHANNEL CAPACITY.
(ALSO UNDER 3.1.1)

ANDREAE, SYPKO W., ROBERT W. LAFORE, JR., AN ERROR-CORRECTING DATA LINK BETWEEN SMALL AND LARGE COMPUTERS, (CALIFORNIA, UNIV. OF, BERKELEY, LAWRENCE RADIATION LAB.),
AFIPS PROCEEDINGS, 1968 SPRING JOINT COMPUTER CONFERENCE, VOLUME 32, (ATLANTIC CITY, NJ, APRIL 30-MAY 2, 1968), THOMPSON BOOK CO., WASHINGTON, DC, 1968, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 105-110

A UNIQUE SOLUTION TO A CRUCIAL DESIGN PROBLEM IN CREATING HIERARCHICAL COMPUTER NETWORKS UTILIZING SMALL COMPUTERS IN LABORATORY OR OTHER SETTINGS IS PRESENTED. THIS SCHEME USES MULTIPLE PARALLEL TWISTED PAIRS AND FULL ECHOING FOR ERROR DETECTION. SPECIAL ATTENTION IS GIVEN TO MINIMIZING THE HARDWARE AND SOFTWARE REQUIRED FOR ERROR CHECKING. IN DIVERTING FROM MORE CONVENTIONAL COMMUNICATIONS FACILITIES THE PAPER SHOWS LITTLE APPRECIATION FOR THE 'UNDETECTED ERROR' CONCEPT IN EVALUATING COMMUNICATION LINK PERFORMANCE.

ANSLOW, N. G., J. HANSCOTT, IMPLEMENTATION OF INTERNATIONAL DATA EXCHANGE NETWORKS, (BOAC, LONDON AIRPORT, (ENGLAND)), WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 181-184

SOME OF THE PROBLEMS INVOLVED WITH CONSTRUCTING A DATA TRANSMISSION NETWORK FOR USE ON AN INTERNATIONAL AND INTERCONTINENTAL BASIS ARE REVIEWED. THE PAPER DISCUSSES THE TECHNICAL DIFFICULTIES OF GETTING STANDARD VOICE GRADE TELEPHONE CHANNELS SUITABLY CONDITIONED FOR THE TRANSMISSION OF DATA AT MEDIUM/HIGH SPEEDS, PARTICULARLY IN THE ABSENCE OF AGREED UPON INTERNATIONAL STANDARDS FOR SOME PARAMETERS WHICH ARE ESSENTIAL TO ACHIEVING A SATISFACTORY BIT ERROR RATE. THE PAPER ALSO DISCUSSES THE ADMINISTRATIVE AND CONTROL PROBLEMS OF OPERATING A DATA NETWORK TOGETHER WITH THE PRACTICAL DIFFICULTIES OF ACHIEVING AND MAINTAINING ITS PERFORMANCE TO A CONSISTENTLY HIGH STANDARD. THE INTER-RELATIONSHIP BETWEEN MEDIUM/HIGH SPEED DATA TRANSMISSION FACILITIES AND THE CONVENTIONAL LOW SPEED TELEGRAPH NETWORK IS NOTED AND SOME THOUGHTS ARE OFFERED FOR FUTURE DEVELOPMENTS.
(ALSO UNDER 5.1)

BROD, ERNEST, INTERNATIONAL DIGITAL DATA SERVICE, (WESTERN UNION INTERNATIONAL INC., NEW YORK),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 589-596, 6 REFS

WESTERN UNION'S INTERNATIONAL DIGITAL DATA SERVICE (IDDS) IS DESCRIBED: DESIGN, PERFORMANCE AND MARKETING CONSIDERATIONS. IDDS FEATURES INCLUDE UP TO 9600 BPS TRANSMISSION RATE AND HIGH RELIABILITY BY PROVIDING DUAL TRANSMISSION PATHS ROUTED VIA BOTH CABLE AND SATELLITE LINKS WITH AUTOMATIC SWITCHING IN THE EVENT OF A FAILURE.

3.2.1 TRANSMISSION FACILITIES

CHOU, W., M. GERLA, H. FRANK, COMMUNICATION NETWORK COST REDUCTION USING DOMESTIC SATELLITES, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
PROCEEDINGS OF THE 1974 SYMPOSIUM, COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, MAY 23, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, 74CH0835-9C, P 9-14, 17 REFS

THIS PAPER DISCUSSES THE OPTIMIZATION OF NETWORKS CONTAINING BOTH TERRESTRIAL AND SATELLITE LINKS. SEVERAL LINE COST MODELS ARE DESCRIBED. THESE INCLUDE: DISTANCE DEPENDENT STRUCTURES; LOCATION DEPENDENT STRUCTURES; VOLUME DISCOUNT STRUCTURES; AND HIERARCHICAL STRUCTURES. IN ADDITION A PROCEDURE FOR OPTIMIZING DOMESTIC SATELLITE COMMUNICATIONS NETWORKS FOR COMPUTER COMMUNICATIONS IS PRESENTED IN SOME DETAIL. A NUMBER OF REFERENCES DEALING WITH TERMINAL PARTITIONING AND CLUSTERING PROBLEMS ARE INCLUDED.
(ALSO UNDER 5.3)

CHU, WESLEY W., A STUDY OF ASYNCHRONOUS TIME DIVISION MULTIPLEXING FOR TIME-SHARING COMPUTER SYSTEMS, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE),
AFIPS PROCEEDINGS, 1969 FALL JOINT COMPUTER CONFERENCE, VOLUME 35, (LAS VEGAS, NV, NOVEMBER 18-20, 1969), AFIPS PRESS, MONTVALE, NJ, 1969, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 669-678, 17 REFS

THIS IMPORTANT CONTRIBUTION TO THE LITERATURE ON COMPUTER-TO-TERMINAL COMMUNICATIONS IS CONCERNED WITH ASYNCHRONOUS TIME DIVISION MULTIPLEXING TO EFFICIENTLY USE A TRANSMISSION CIRCUIT ON A TIME-SHARED BASIS. EACH TRANSMITTED MESSAGE REQUIRES AN ADDRESS, AND BUFFERING IS REQUIRED TO HANDLE RANDOM MESSAGE ARRIVALS, BOTH AT THE COMPUTER AND USER ENDS OF THE CIRCUIT. SINCE THE FEASIBILITY OF ASYNCHRONOUS MULTIPLEXING DEPENDS ON AN ACCEPTABLY LOW BUFFER OVERFLOW PROBABILITY AND EXPECTED MESSAGE QUEUING DELAY DUE TO BUFFERING, AN ANALYSIS OF THE STATISTICAL BEHAVIOR OF THE BUFFER IS PRESENTED. THIS IS DONE BOTH FOR THE USER-TO-COMPUTER BUFFER AND FOR THE COMPUTER-TO-USER BUFFER.

COX, KENNETH A., THE PROMISE AND PERIL OF COMPETITION IN INTERCITY COMMUNICATIONS, (MCI COMMUNICATIONS CORP., WASHINGTON, DC),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 434-440, 8 REFS
(ANNOTATION UNDER 5.4)

CROWTHER, W. R., F. E. HEART, A. A. MCKENZIE, J. M. MCQUILLAN, D. C. WALDEN, ISSUES IN PACKET-SWITCHING NETWORK DESIGN, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, DEC 74, ARPA DAHC-15-69-C-0179, AF F08606-73-C-0027, 73R, 33 REFS

THIS IS AN EXCELLENT ARTICLE WHICH DESCRIBES A TECHNOLOGY WHICH REVOLUTIONIZED COMPUTER-COMMUNICATIONS TECHNOLOGY -- PACKET-SWITCHING. WHILE THE AUTHORS HAVE THEIR ROOTS IN THE ARPANET, THEY ALSO REPRESENT THE VIEWPOINTS OF OTHER IMPLEMENTED OR PLANNED PACKET-SWITCHING NETWORK DESIGNERS.
THE TWO FUNDAMENTAL GOALS OF DATA PROCESSING IN PACKET-SWITCHING SYSTEMS ARE DEFINED TO BE LOW DELAY AND HIGH THROUGHPUT. TO ACHIEVE THESE GOALS THERE ARE A VARIETY OF DESIGN CHOICES TO BE MADE, RANGING FROM NETWORK HARDWARE (HOSTS, CIRCUITS, HOST-TO-NODE CONNECTIONS, OVERALL CONNECTIVITY) TO STORE-AND-FORWARD SUBNETWORK SOFTWARE (ROUTING, NODE-TO-NODE TRANSMISSION PROCEDURES). THE SOURCE-TO-DESTINATION SOFTWARE DESIGN IS ALSO DISCUSSED.
THIS ARTICLE IS RECOMMENDED READING FOR THOSE INTERESTED IN GETTING ACQUAINTED WITH PACKET-SWITCHING AT MORE THAN A CURSORY LEVEL.

DATA TRANSMISSION NETWORK COMPUTER-TO-COMPUTER STUDY, COMPUTER SCIENCES CORP., FALLS CHURCH, VA, 1971, (AD-729 695), 153P, 24 REFS

DATA TRANSMISSION METHODS FOR 50 KILOBIT PER SECOND COMPUTER-TO-COMPUTER COMMUNICATIONS USING PRIMARILY SATELLITE LINKS ARE DISCUSSED. THERE IS NO EXPLANATION OF THE NEED FOR THIS HIGH DATA RATE. THE EMPHASIS IS ON VARIOUS APPROACHES TO MINIMIZING THE END-TO-END ERROR RATE FOR SUCH HIGH BANDWIDTH DATA COMMUNICATIONS.

FICK, HERBERT, STRUCTURES AND OPERATING PRINCIPLES OF NETWORKS FOR DATA TRAFFIC, (SIEMENS AG, MUNICH, (WEST GERMANY)),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 525-533, 23 REFS

VARIOUS ASPECTS OF CIRCUIT-SWITCHED NETWORKS, BOTH WITH AND WITHOUT CLOCK CONTROL, ARE DISCUSSED: THEIR CHARACTERISTICS, STRUCTURES AND USE OF TIME-DIVISION MULTIPLEXING. THEN STORE-AND-FORWARD NETWORKS FOR MESSAGE AND PACKET SWITCHING ARE EXAMINED. OPERATING PRINCIPLES, FEATURES AND IMPLIED DELAYS ARE DISCUSSED.

FRANK, HOWARD, ISRAEL GITMAN, RICHARD VAN SLYKE, PACKET RADIO SYSTEM--NETWORK CONSIDERATIONS, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 217-231, 20 REFS

ANALYTIC MODELING AND SIMULATION WERE THE TECHNIQUES USED TO INVESTIGATE THE DESIGN PROBLEMS OF THE PACKET RADIO NETWORK. COMPONENTS OF THE PACKET RADIO NETWORK, TOPOLOGY, ROUTING, AND DATA CAPACITY ARE DISCUSSED.

GAN, GIWAKAR G., OPTICAL LINKS FOR COMMUNICATIONS IN LOCAL DISTRIBUTION, (DATA TRANSMISSION CO., VIENNA, VA), JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 86-95, 12 REFS

THE ADVANTAGES OF OPTICAL DATA COMMUNICATION LINKS ARE DESCRIBED, ATMOSPHERIC EFFECTS ARE ANALYZED, AND OPTICAL DETECTION TECHNIQUES ARE EVALUATED.

GERLA, MARIO, JOHN ECKL, MOVING BITS BY AIR, LAND AND SEA--CARRIERS, VANS AND PACKETS, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 129-135, 4 REFS

CONVENTIONAL AND SPECIALIZED CARRIERS AND VALUE-ADDED NETWORKS, TYPICALLY PACKET-SWITCHED, ARE DISCUSSED AND REPRESENTATIVE COSTS GIVEN. THE AUTHORS DO NOT ATTEMPT TO PERSUADE THE READER TO ADOPT ONE PARTICULAR APPROACH TO DATA COMMUNICATIONS, RATHER THEY EMPHASIZE THE EVALUATION OF ALL ALTERNATIVES AVAILABLE BEFORE MAKING A SELECTION.

GRUBB, DANA S., DATA COMMUNICATIONS SYSTEM THROUGHPUT PERFORMANCE USING HIGH SPEED TERMINALS ON THE DIAL TELEPHONE NETWORK, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY, MAY 73, NBS TN-779, 33P, 7 REFS
(ANNOTATION UNDER 2.2)

HAYES, J. F., D. N. SHERMAN, TRAFFIC AND DELAY IN A CIRCULAR DATA NETWORK, (BELL TELEPHONE LABS, INC., HOLMDEL, NJ), JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 102-107, 8 REFS
(ANNOTATION UNDER 2.1.2)

HUSTED, JOHN M., CURRENT AND NEAR FUTURE DATA TRANSMISSION VIA SATELLITES OF THE INTELSAT NETWORK, (COMSAT LABS., CLARKSBURG, MD),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 358-363, 6 REFS

DATA TRANSMISSION PERFORMANCE CHARACTERISTICS FOR THE INTELSAT SATELLITE NETWORK, WHICH PRESENTLY USES CONVENTIONAL FREQUENCY-DIVISION MULTIPLEXING, ARE DETAILED. IN ADDITION, PROJECTIONS ARE MADE FOR THE VERY NEAR FUTURE FOR OPERATIONAL SERVICE WHICH WILL PROVIDE DATA CHANNELS WHOSE QUALITY CAN BE VARIED TO SATISFY A RANGE OF BIT ERROR RATE PERFORMANCE SPECIFICATIONS.

KAHN, ROBERT E., THE ORGANIZATION OF COMPUTER RESOURCES INTO A PACKET RADIO NETWORK, (ADVANCED RESEARCH PROJECTS AGENCY, ARLINGTON, VA),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 177-186, 37 REFS
(ANNOTATION UNDER 3.2.2)

KAPLAN, SIDNEY J., THE ADVANCING COMMUNICATION TECHNOLOGY AND COMPUTER COMMUNICATION SYSTEMS, (WESTERN UNION TELEGRAPH CO., MAHWAH, NJ),
AFIPS PROCEEDINGS, 1968 SPRING JOINT COMPUTER CONFERENCE, VOLUME 32, (ATLANTIC CITY, NJ, APRIL 30-MAY 2, 1968), THOMPSON BOOK CO., WASHINGTON, DC, 1968, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 119-133, 3 REFS

3.2.1 TRANSMISSION FACILITIES

RECENT ADVANCES IN COMMUNICATIONS TECHNOLOGY ALONG WITH NEW AND IMPROVED COMMUNICATIONS SERVICES PERMITTED BY THESE ADVANCES ARE OUTLINED. THE CHANGING COMPUTER COMMUNICATIONS REQUIREMENTS ARE ALSO PRESENTED. TI CARRIER, MICROWAVE TRANSMISSION, MULTIPLEXING, SWITCHING AND STORE-AND-FORWARD TECHNIQUES ARE ALL BRIEFLY DESCRIBED.

KRETZMER, E. R., MODERN TECHNIQUES FOR DATA COMMUNICATION OVER TELEPHONE CHANNELS, IBELL TELEPHONE LABS. INC., HOLMDEL, NJ).
INFORMATION PROCESSING 68: PROCEEDINGS OF IFIP CONGRESS 1968. VOLUME 2--HARDWARE, APPLICATIONS. (EDINBURGH, (SCOTLAND), AUGUST 5-10, 1968). NORTH-HOLLAND PUBLISHING CO., AMSTERDAM, (NETHERLANDS). 1969. IFIP CONGRESS PROCEEDINGS, (LC 65-24118). P 716-722, 10 REFS

METHODS FOR INCREASING COMMUNICATION CHANNEL UTILIZATION ARE DESCRIBED. PHASE-SHIFT KEYING AND OTHER TECHNIQUES AND THEIR UTILITY IN MULTIPLYING EFFECTIVE BANDWIDTH ARE DISCUSSED. ALSO DISCUSSED ARE EQUALIZATION AND ERROR CONTROL TC COPE WITH THE INCREASED SENSITIVITY OF THOSE TECHNIQUES TO NOISE AND OTHER CIRCUIT PARAMETERS.

KUO, FRANKLIN F., NORMAN ABRAMSON, SOME ADVANCES IN RADIO COMMUNICATIONS FOR COMPUTERS, (HAWAII, UNIV. OF, HONOLULU, DEPT. OF ELECTRICAL ENGINEERING).
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE. DIGEST OF PAPERS. 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?'. (SAN FRANCISCO, CA. FEBRUARY 27-28, MARCH 1, 1973). INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973. (LC 68-1628), P 57-60, 7 REFS
(ANNOTATION UNDER 3.1.1)

LABONTE, ROBERT C., DEVELOPING A WIRED NATION--A GENERAL PURPOSE DIGITAL COMMUNICATIONS SYSTEM FOR OPERATION ON A CONVENTIONAL CATV SYSTEM, (MITRE CORP., BEDFORD, MA).
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE. DIGEST OF PAPERS. 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?'. (SAN FRANCISCO, CA. FEBRUARY 27-28, MARCH 1, 1973). INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973. (LC 68-1628). P 85-88
(ANNOTATION UNDER 4.9)

LAM, SIMON S., LEONARD KLEINROCK, DYNAMIC CONTROL SCHEMES FOR A PACKET SWITCHED MULTI-ACCESS BROADCAST CHANNEL, (INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY; THOMAS J. WATSON RESEARCH CENTER; CALIFORNIA, UNIV. OF, LOS ANGELES).
AFIPS CONFERENCE PROCEEDINGS. VOLUME 44, 1975. NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975). AFIPS PRESS, MONTVALE, NJ. 1975. (LC 55-44701). P 143-153. 15 REFS

DYNAMIC CHANNEL CONTROL IS PRESENTED AS A NECESSITY FOR GUARANTEEING AN ACCEPTABLE LEVEL OF CHANNEL PERFORMANCE IN RANDOM ACCESS COMMUNICATIONS SYSTEMS. SOME CONTROL ALGORITHMS ARE DISCUSSED, AND SIMULATION RESULTS INDICATE THAT THEY ARE CAPABLE OF ACHIEVING PERFORMANCE CLOSE TO THE OPTIMUM.

LEMING, THOMAS L., THE ECONOMIES OF SPECIAL PURPOSE VS. GENERAL PURPOSE NETWORKS, IMCI TELECOMMUNICATIONS CORP., WASHINGTON, DC).
HALL, ARTHUR O., III, DIGEST OF THE CONFERENCE ON THE ECONOMIES OF SCALE IN TODAY'S TELECOMMUNICATIONS SYSTEMS, (WASHINGTON, DC, SEPTEMBER 13, 1973). INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973. IEEE 73-CHC-830-0-SCALE, P 30-35

THE AUTHOR'S INTENT IS TO ESTABLISH A CASE FOR SPECIALIZED CARRIERS. HE APPROACHES THIS ISSUE IN TWO WAYS: WHY THE GENERAL PURPOSE TELEPHONE COMPANY CAN'T PROVIDE SPECIALIZED TELECOMMUNICATION SERVICES ECONOMICALLY AND WHY THE SPECIALIZED SERVICES CARRIERS CAN.

LISSANORELLO, GEORGE J., WORLD DATA COMMUNICATIONS AS SEEN BY THE DATA PROCESSING SYSTEMS DESIGNER, (IBM WORLD TRADE CORP., NEW YORK).
JACKSON, PETER E., PROCEEDINGS. ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA. OCTOBER 20-22, 1971). 1971. IEEE CAT-71C59-C, P 130-136

THE COMPARATIVE ECONOMICS OF DATA COMMUNICATIONS IN SEVERAL COUNTRIES IS DISCUSSED. DIFFERENCES IN THE TARIFF STRUCTURES IN THESE COUNTRIES ARE PRESENTED ALONG WITH A COMPARISON OF BREAK-EVEN COST JUSTIFICATION OF LEASED VERSUS SWITCHED FACILITIES. ALSO INCLUDED ARE AVAILABILITY STATISTICS BY COUNTRY OF LEASED POINT-TO-POINT, LEASED MULTIPOINT, SWITCHED TELEPHONE, AND SWITCHED TELETYPEWRITER FACILITIES.
(ALSO UNDER 1.2)

LUCKY, ROBERT W., COMMON-CARRIER DATA COMMUNICATION, (BELL TELEPHONE LABS. INC., HOLMDEL, NJ).
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 142-196, 18 REFS
(ANNOTATION UNDER 1.3)

MAKINO, YASUO, COMPETITION IN THE FIELDS OF COMPUTERS AND COMMUNICATIONS IN JAPAN, (MINISTRY OF POSTS AND TELECOMMUNICATIONS, TOKYO, (JAPAN)),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972). INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 441-444
(ANNOTATION UNDER 5.4)

NISHIZAWA, YASUNORI, HIDENAO MUNAKATA, HIROSHI SUNAGAWA, HIROMASA IKEDA, THREE LEVEL SUBSCRIBER SIGNALING FOR DATA NETWORK, (OKI ELECTRIC INDUSTRY CO. LTD., TOKYO, (JAPAN), ENGINEERING DEVELOPMENT DIV., NIPPON TELEGRAPH AND TELEPHONE PUBLIC CORP., MUSASHINO, (JAPAN), MUSASHINO ELECTRICAL COMMUNICATION LAB.),
DATA NETWORKS: ANALYSIS AND DESIGN. THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 50-58, 4 REFS

THIS PAPER REPORTS RESULTS OF A STUDY ON THE SUBSCRIBER SIGNALING SYSTEM IN A DATA SWITCHING NETWORK. THE AUTHORS DISCUSS REQUIREMENTS FOR THE SUBSCRIBER LINE SIGNALING AND THE ADVANTAGES IN REALIZING THE REQUIREMENTS WITH A THREE LEVEL SIGNALING SYSTEM. THE SYSTEM IS APPLICABLE TO BOTH START-STOP AND SYNCHRONOUS TERMINALS.

OHLMER, AUGUST, SUMMARY OF THE EXISTING DATA COMMUNICATIONS SERVICES IN WESTERN EUROPE AND TENTATIVE FORECAST OF NEW SERVICES FOR THE NEXT DECADE, (BUNDESMINISTERIUM FUER DAS POST UND FERNMELDEWESEN, (WEST GERMANY)),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 260-266
(ANNOTATION UNDER 1.6)

O'NEIL, O. R., ERROR CONTROL FOR DIGITAL DATA TRANSMISSION OVER TELEPHONE NETWORKS, MITRE CORP., BEDFORD, MA, MAY 65, MC TM-04113, AF 19(628)-2390, IAF-ESD TR-65-87, AD-616 678), 48P, 27 REFS

THE PRESENTATION OF ERROR CONTROL TECHNIQUES FOR BINARY DIGITAL DATA TRANSMISSION OVER COMMERCIAL TELEPHONE NETWORKS CONTAINED IN THIS REPORT COVERS ERROR CONTROL ALGORITHMS, ERROR STATISTICS FOR DIGITAL DATA ON TELEPHONE LINES, AND PERFORMANCE EVALUATION OF THE RELEVANT STATISTICAL TECHNIQUES. HARDWARE ERROR CONTROL DEVICES ARE ALSO SURVEYED.
(ALSO UNDER 2.2)

SCHWARTZ, JAY W., MICHAEL MUNTNER, MULTIPLE-ACCESS COMMUNICATIONS FOR COMPUTER NETS, (INSTITUTE FOR DEFENSE ANALYSES, ARLINGTON, VA; DEFENSE COMMUNICATIONS AGENCY, WASHINGTON, DC; SYSTEM ENGINEERING FACILITY),
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 269-294, 23 REFS

THIS CHAPTER DEALS WITH MULTIPLE ACCESS TECHNIQUES INCLUDING SATELLITE AND LINE-OF-SIGHT CHANNELS FOR COMPUTER NETWORKS. IT DEMONSTRATES THAT A LARGE NUMBER OF USERS CAN BE ACCOMMODATED WITH NETTED OPERATION IN TERRESTRIAL RADIO AND COMMUNICATION SATELLITE CHANNELS.

STAMBLER, LEON, ELEMENTARY TELEPHONE SWITCHING THEORY APPLIED TO THE DESIGN OF MESSAGE SWITCHING SYSTEMS, (RADIO CORP. OF AMERICA, NEW YORK, DIV. OF COMMUNICATION SYSTEMS),
AFIPS PROCEEDINGS, 1966 FALL JOINT COMPUTER CONFERENCE, VOLUME 29, (SAN FRANCISCO, CA, NOVEMBER 7-10, 1966), SPARTAN BOOKS INC., WASHINGTON, DC, 1966, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 413-423, 5 REFS

THE AUTHOR SYSTEMATICALLY DEVELOPS A MODEL OF A MESSAGE SWITCHED SYSTEM BASED ON TELEPHONE SWITCHING THEORY. EFFECTIVENESS OF THE MESSAGE SWITCH IS MEASURED IN TERMS OF TRUNK UTILIZATION. THE TECHNIQUES PROVIDE A MEANS FOR STUDYING CHANNEL COORDINATION AND HARDWARE/SOFTWARE TRADEOFFS.

3.2.1 TRANSMISSION FACILITIES

(ALSO UNDER 2.1.2)

STUEHRK, CARL F., BELL SYSTEM SERVICES FOR DIGITAL DATA TRANSMISSION. (AMERICAN TELEPHONE AND TELEGRAPH CO., NEW YORK). FACTS AND FUTURES: WHAT'S HAPPENING NOW IN COMPUTING FOR HIGHER EDUCATION. PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (PRINCETON, NJ., OCTOBER 9-11, 1973). INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1974. (LC 74-79222). P 322-327

THIS ARTICLE EXPLAINS THE ALTERNATIVES AT & T OFFERS FOR USE IN THE CONSTRUCTION OF DATA NETWORKS. THE DATAPHONE DIGITAL SERVICE (DDS) AND DATA UNDER VOICE (DUV) FACILITY ARE DESCRIBED.

SUNG, R., J. B. WOODFORD, STUDY OF COMMUNICATION LINKS FOR THE BIOMEDICAL COMMUNICATIONS NETWORK, AEROSPACE CORP., EL SEGUNDO, CA., DIV. OF SATELLITE SYSTEMS, 29 MAY 69, AC ATR-69(7130-06)-1, NIH PH-43-68-991, 278P, 56 REFS

THE TECHNICAL AND ECONOMIC ASPECTS OF PROVIDING THE COMMUNICATIONS LINKS FOR A BIOMEDICAL COMMUNICATIONS NETWORK ARE OUTLINED. A VARIETY OF POTENTIAL COMMUNICATION LINKS ARE CONSIDERED, BUT SATELLITE LINKS RECEIVE SPECIAL ATTENTION, AND IT IS SHOWN UNDER WHAT CONDITIONS THEY BECOME ECONOMICALLY FAVORABLE. THE TECHNOLOGICAL DISCUSSION IS PRECEDED BY A DESCRIPTION OF BIOMEDICAL COMMUNICATIONS APPLICATIONS.
(ALSO UNDER 1.1)

TALBERT, LEE B., PCI'S VANLINE SERVICE, (PACKET COMMUNICATIONS INC.).
FACTS AND FUTURES: WHAT'S HAPPENING NOW IN COMPUTING FOR HIGHER EDUCATION, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (PRINCETON, NJ., OCTOBER 9-11, 1973), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1974. (LC 74-79222), P 327-332

THIS ARTICLE DISCUSSES THE CONCEPT OF VALUE-ADDED NETWORKS IN ADDITION TO PCI'S ATTEMPTED IMPLEMENTATION, VANLINE. PACKET-SWITCHING WAS TO BE THE TECHNOLOGICAL BASE FOR THIS NETWORK WHICH LOOKED LIKE AN ARPANET. PACKET-SWITCHING IS PROPOSED AS THE PRACTICAL SOLUTION TO A NATIONWIDE NEED FOR A NATIONAL, PUBLIC, HIGH-PERFORMANCE DATA COMMUNICATIONS SYSTEM. ALTHOUGH PCI'S VAN DID NOT FLY, DUE TO FINANCIAL DIFFICULTIES, THE CONCEPTS PROPOSED ARE STILL QUITE VALID.

TRAFTON, P. J., H. A. BLANK, N. F. MCALLISTER, DATA TRANSMISSION NETWORK COMPUTER-TO-COMPUTER STUDY, (COMPUTER SCIENCES CORP., FALLS CHURCH, VA).
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71C59-C, P 183-191, 16 REFS

ERROR CONTROL IS STUDIED FOR COMPUTER-TO-COMPUTER COMMUNICATIONS USING A SATELLITE LINK WITH INTERCONNECTING LAND LINES. THE OBJECTIVE IS TO ACHIEVE AN EFFECTIVE ERROR RATE OF ONE IN ONE HUNDRED MILLION BITS. THE TECHNIQUES ANALYZED ARE FORWARD ERROR CORRECTING (FEC) AND AUTO REPEAT REQUEST (ARQ). THE CONCLUSIONS ARE THAT ARQ IS A CLEAR CHOICE FOR SEPARATE ERROR CONTROL ON INDIVIDUAL INTERCONNECTING LINKS. FEC WINS IN THE END ERROR CONTROL CASE.

VOLK, JOHN L., INTERACTIVE TELEVISION EXPERIMENT IN RESTON, VIRGINIA, (MITRE CORP., MCLEAN, VA).
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, "COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?", (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973. (LC 68-1628), P 81-84
(ANNOTATION UNDER 4.9)

WALKER, PHILIP M., STUART L. MATHISON, REGULATORY POLICY AND FUTURE DATA TRANSMISSION SERVICES, (TELENET COMMUNICATIONS CORP., WALTHAM, MA).
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973. COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 295-370, 13 REFS
(ANNOTATION UNDER 5.4)

WALKER, PHILIP M., STUART L. MATHISON, SPECIALIZED COMMON CARRIERS, (GEORGETOWN, UNIV. OF, WASHINGTON, DC, LAW CENTER, LITTLE (ARTHUR D.) INC., CAMBRIDGE, MA).
TELEPHONE ENGINEER AND MANAGEMENT, 15 OCT 71, P 41-60, 8 REFS
(ANNOTATION UNDER 1.6)

3.2.2 SYSTEM DESIGN

ABRAMSON, NORMAN, FINAL TECHNICAL REPORT FOR CONTRACT NUMBER NAS2-6700, HAWAII, UNIV. OF, HONOLULU, ALOHA SYSTEM, JAN 75, HU TR-B75-1, 49P
(ANNOTATION UNDER 3.1.1)

ABRAMSON, NORMAN, PACKET SWITCHING WITH SATELLITES, HAWAII, UNIV. OF, HONOLULU, ALOHA SYSTEM, MAR 73, HU B73-2, NASA NAS2-6700, AF F44620-69-C-0030, ONR N00014-70-C-0414, 24P, 20 REFS
(ANNOTATION UNDER 3.2.1)

BINDER, R., N. ABRAMSON, F. KUO, A. OKINAKA, D. WAX, ALOHA PACKET BROADCASTING--A RETROSPECT, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, HAWAII, UNIV. OF, HONOLULU, ALOHA SYSTEM).
AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 203-215, 15 REFS
(ANNOTATION UNDER 3.1.2)

CHOU, WUSHOW, PLANNING AND DESIGN OF DATA COMMUNICATIONS NETWORKS, (NETWORK ANALYSIS CORP., GLEN COVE, NY).
AFIPS CONFERENCE PROCEEDINGS, VOLUME 43, 1974, NATIONAL COMPUTER CONFERENCE, (CHICAGO, IL, MAY 6-10, 1974), AFIPS PRESS, MONTVALE, NJ, 1974, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 553-559, 6 REFS
(ANNOTATION UNDER 5.0)

CHOU, W., H. FRANK, R. VAN SLYKE, SIMULATION OF CENTRALIZED COMPUTER COMMUNICATIONS SYSTEMS, (NETWORK ANALYSIS CORP., GLEN COVE, NY).
DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 121-130, 3 REFS

THE AUTHORS DESCRIBE THE SIMULATION APPROACH FOR A GENERALIZED COMPUTER COMMUNICATION SYSTEM. THE SIMULATION PROGRAM CONSISTS OF THREE MODULES REPRESENTING DIFFERENT LEVELS IN A HIERARCHY. THE LOWEST LEVEL MODELS THE POLLED MULTIDROP LINE CONNECTING REMOTE TERMINALS TO THE CONCENTRATOR. THE SECOND LEVEL MODELS THE TRUNK LINES AND THE CONCENTRATOR. THE HIGHEST LEVEL MODELS THE CENTRAL COMPUTER WHICH COMMUNICATES WITH REMOTE TERMINALS VIA THE TRUNKS. THE TECHNIQUES DEVELOPED ARE ILLUSTRATED BY APPLICATION TO THE NASDAQ SYSTEM.
(ALSO UNDER 2.1.1)

CLOWES, G. J., C. S. JAYASURIYA, TRAFFIC CONSIDERATIONS IN SWITCHED DATA NETWORKS, (BELL-NORTHERN RESEARCH, OTTAWA, (CANADA)).
DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 18-22, 9 REFS

DIFFERENT TYPES OF SWITCHED NETWORKS (CIRCUIT SWITCHED, PACKET SWITCHED, AND COMBINED CIRCUIT/PACKET SWITCHED) ARE COMPARED BASED ON A MODEL FOR THE DATA TRAFFIC BETWEEN MAJOR CANADIAN CITIES. CONSIDERATION IS GIVEN TO THE INTERNODAL GRADE OF SERVICE AND THE SIGNIFICANT NETWORK DESIGN PARAMETERS. DIFFERENT NETWORK TOPOLOGIES, WITH FIXED ROUTING STRATEGIES ARE ANALYZED.

CUCCIO, ALLEN B. J., MICROPROCESSOR UTILIZATION IN TRANSACTION TERMINAL NETS, (HONEYWELL INFORMATION SYSTEMS INC., OKLAHOMA CITY, OK).
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, "COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?", (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973. (LC 68-1628), P 161-164, 1 REFS

THE HONEYWELL INFORMATION SYSTEMS BANK TELLER TERMINALS HAVE A MICROPROCESSOR INCORPORATED IN THE TERMINAL. THE ADVANTAGES OF THESE INTELLIGENT TERMINALS IN A TRANSACTION TERMINAL NETWORK AND BENEFITS OVER EARLIER SYSTEMS DESIGNS ARE DISCUSSED. TWO TYPES OF SYSTEM ARCHITECTURE, THE DECENTRALIZED APPROACH WITH INTELLIGENT TERMINALS AND A CENTRALIZED APPROACH WITH MINIMAL TERMINAL CAPABILITIES, ARE COMPARED. STATISTICS ARE GIVEN TO SHOW THE ADVANTAGES OF THE FIRST SYSTEM ARCHITECTURE.

DASILVA, JOHN S., ON THE DESIRABILITY OF INTEGRATING A COMMUNICATION SYSTEM FOR TWO USER CLASSES, (MINISTRY OF COMMUNICATIONS, OTTAWA, (CANADA)).
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, "COMPUTING NETWORKS FROM

3.2.2 SYSTEM DESIGN

MINIS THROUGH MAXIS -- ARE THEY FOR REAL?", (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973). INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 113-117, 4 REFS
(ANNOTATION UNDER 2.1.2)

DAVIES, DONALD W., PACKET SWITCHING, MESSAGE SWITCHING AND FUTURE DATA COMMUNICATION NETWORKS, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND)),
ROSENFELD, JACK L., INFORMATION PROCESSING 74, PROCEEDINGS OF IFIP CONGRESS 74, 1, COMPUTER HARDWARE AND ARCHITECTURE, (STOCKHOLM, (SWEDEN), AUGUST 5-10, 1974), AMERICAN ELSEVIER PUBLISHING CO, INC., NEW YORK, 1974, P 147-150, 5 REFS

THE FEW PACKET SWITCHED DATA COMMUNICATION NETWORKS NOW IN EXISTENCE WILL SOON BE JOINED BY MANY OTHERS WHICH ARE AT AN ADVANCED STAGE OF PLANNING OR DEVELOPMENT.
THE IMPLICATIONS FOR STANDARDIZATION AND INTERWORKING ARE DESCRIBED.

DAVIES, D. W., K. A. BARTLETT, R. A. SCANTLEBURY, P. T. WILKINSON, A DIGITAL COMMUNICATION NETWORK FOR COMPUTERS GIVING RAPID RESPONSE AT REMOTE TERMINALS, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND)),
PROCEEDINGS OF THE ACM SYMPOSIUM ON OPERATING SYSTEM PRINCIPLES, (GATLINBURG, TN, OCTOBER 1967), 1967, 7 REFS
(ANNOTATION UNDER 3.1.0)

DAVIES, D. W., COMMUNICATION NETWORKS TO SERVE RAPID-RESPONSE COMPUTERS, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND)),
INFORMATION PROCESSING 68; PROCEEDINGS OF IFIP CONGRESS 1968, VOLUME 2--HARDWARE, APPLICATIONS, (EDINBURGH, (SCOTLAND), AUGUST 5-10, 1968), NORTH-HOLLAND PUBLISHING CO., AMSTERDAM, (NETHERLANDS), 1969, IFIP CONGRESS PROCEEDINGS, (LC 65-24118), P 650-658, 4 REFS

STORE-AND-FORWARD TECHNIQUES ARE PROPOSED AS A PROMISING ALTERNATIVE FOR DATA COMMUNICATIONS IN A NETWORKING ENVIRONMENT. EXISTING NETWORK SCHEMES ARE IDENTIFIED AND THE ADVANTAGES OF THE MESSAGE CONCENTRATION NETWORK OVER THE MULTI-DROP NETWORK ARE DETAILED. A DISCUSSION ON AVAILABLE COMMUNICATION TECHNIQUES IS INSERTED AND PULSE CODE MODULATION IS DISCUSSED IN SOME DETAIL.

DELL, F. R. E., FEATURES OF A PROPOSED SYNCHRONOUS DATA NETWORK, (UNITED KINGDOM POST OFFICE, LONDON, DEPT. OF TELECOMMUNICATIONS DEVELOPMENT),
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 50-57
(ANNOTATION UNDER 3.1.0)

DESPRES, REMI F., A PACKET SWITCHING NETWORK WITH GRACEFUL SATURATED OPERATION, (CENTRE, NATIONAL D'ETUDES DES TELECOMMUNICATIONS (CNET), ISSY LES MOULINEAUX, (FRANCE)),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8BC, NSF GJ-33239, P 345-351, 14 REFS

A CONCEPTUAL SPECIFICATION FOR A PACKET SWITCHING NETWORK DESIGNED TO OPERATE UNDER A SATURATED CONDITION IS PRESENTED. IT COMPRISES FIXED ROUTING, I.E., A VIRTUAL CIRCUIT IS ESTABLISHED BETWEEN TWO CORRESPONDENTS, PRIVATE BUFFERING ALLOCATING A BUFFER FOR EACH CIRCUIT, PACKET HANDSHAKING INDICATING THE FREEING OF A BUFFER FOR THE NEXT TRANSMISSION, AND VARIABLE PACKET LENGTH. PRIVATE BUFFERING HAS ADVANTAGES, BUT IT REQUIRES CONSIDERABLE STORAGE SPACE. PACKET HANDSHAKING REQUIRES ADDITIONAL STORAGE SPACE TO GUARANTEE ACCEPTANCE OF THE ACKNOWLEDGMENT AND TO AVOID A LOCKOUT. VARIABLE PACKET LENGTH REQUIRES OVERHEAD IN BUFFER ALLOCATION AND COLLECTION. THESE FACTORS SHOULD BE CONSIDERED IN EVALUATING THIS PROPOSAL.
(ALSO UNDER 3.4.1)

FERGUSON, MICHAEL J., AN ANALYSIS OF VARIABLE LENGTH PACKETS IN UNSLOTTED ALOHA, HAWAII, UNIV. OF, HONOLULU, ALOHA SYSTEM, FEB 75, HU TR-B7S-7, NASA NAS2-8590, 9P, 7 REFS

THIS PAPER ANALYZES A MODEL FOR THE UNSLOTTED ALOHA SYSTEM WITH VARIABLE LENGTH PACKETS. THE STUDY SHOWS THAT EXPONENTIAL MESSAGES IN AN UNSLOTTED CHANNEL HAVE LOWER THROUGHPUT THAN FIXED LENGTH PACKETS. AN EXTENSION TO OTHER PACKET DISTRIBUTIONS IS UNDERWAY.

FOSTER, D. F., L. S. NIOUS, J. M. VENE, MACIMS COMMUNICATION NETWORK CONFIGURATION, MITRE CORP., BEDFORD, MA, 31 JUL 71, MC MTR-2176, AF F19628-71-C-0002, 166P, 20 REFS

THE MILITARY AIRLIFT COMMAND (MAC) INFORMATION MANAGEMENT SYSTEM (MACIMS) IS A FUNCTIONALLY INTEGRATED COMMAND, CONTROL AND MANAGEMENT INFORMATION SYSTEM WHICH WILL AID MAC IN ACHIEVING A MAJOR IMPROVEMENT IN CONTROL AND MANAGEMENT OF THE MAC FLEET. THE MACIMS SYSTEM INCLUDES THREE DATA PROCESSING CENTERS TOGETHER WITH FIFTEEN REMOTE BASES WHICH HAVE ACCESS TO THE PROCESSING CENTERS ON AN INTERACTIVE BASIS. MACIMS RELIES EXTENSIVELY ON A COMMUNICATION NETWORK FOR DATA EXCHANGE BETWEEN PROCESSING CENTERS AND TO PROVIDE REMOTE USERS WITH INTERACTIVE ACCESS TO THE DATA PROCESSING EQUIPMENT. A DATA COMMUNICATIONS SUBSYSTEM FOR MACIMS IS DESCRIBED IN THIS REPORT WHICH WILL MEET CURRENTLY DEFINED REQUIREMENTS. THE TECHNICAL DESCRIPTION IS BASED ON INDIVIDUAL CONSIDERATIONS AT EACH REMOTE SITE. THE PROPOSED TERMINAL CONFIGURATIONS FOR THE REMOTE BASES INCLUDE A MIXTURE OF MULTIPLEXERS, MINICOMPUTERS AND CONTROLLERS FOR MULTI-DROP LINES. A DESCRIPTION OF THE TERMINALS IS ALSO INCLUDED.

FRANK, HOWARD, COMPUTER NETWORKS: ART TO SCIENCE TO ART,(PRESENTED AT THE, PROCEEDINGS OF THE SYMPOSIUM ON LARGE-SCALE NETWORKS, EVANSTON, IL, APRIL 18-19, 1974), (NETWORK ANALYSIS CORP., GLEN COVE, NY),
NETWORKS, VOL 5, ISSUE 1, JAN 75, P 7-32, 16 REFS
(ANNOTATION UNDER 1.3)

FRANK, HOWARD, PROVIDING RELIABLE NETWORKS WITH UNRELIABLE COMPONENTS, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 161-164, 8 REFS

THE AUTHOR POINTS OUT THAT MANY LARGE COMMUNICATIONS NETWORKS ARE BEING DESIGNED WITH LITTLE CONSIDERATION OF NETWORK RELIABILITY AS DISTINGUISHED FROM COMPONENT OR ELEMENT RELIABILITY. HE DISCUSSES (1) POSSIBLE MEASURES OF NETWORK RELIABILITY AND (2) WAYS FOR IMPROVING RELIABILITY OF TERMINAL ORIENTED NETWORKS WITH CONCENTRATORS.

FRANK, H., I. T. FRISCH, PLANNING COMPUTER-COMMUNICATION NETWORKS, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 1-28, 20 REFS
(ANNOTATION UNDER 1.3)

GERLA, MARIO, NEW LINE TARIFFS AND THEIR IMPACT ON NETWORK DESIGN, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 43, 1974, NATIONAL COMPUTER CONFERENCE, (CHICAGO, IL, MAY 6-10, 1974), AFIPS PRESS, MONTVALE, NJ, 1974, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 577-582, 6 REFS

THIS PAPER ADDRESSES THE IMPACT OF VARIOUS LINE TARIFF ALTERNATIVES ON NETWORK DESIGN. EXISTING AND PROPOSED TARIFFS FOR COMMON CARRIERS, SPECIALIZED COMMON CARRIERS, VALUE-ADDED NETWORKS, AND SATELLITE COMMUNICATIONS ARE GIVEN. THEN LINE COST COMPUTATION FOR NETWORK DESIGN IS CONSTRUCTED FOR DISTANCE DEPENDENT (DID), LOCATION DEPENDENT (LOD) AND VOLUME DISCOUNT (VOD) STRUCTURES.
THE AUTHOR STRESSES PRECISE SPECIFICATION OF COMMUNICATIONS REQUIREMENTS AND PREPAREDNESS TO RECONFIGURE CURRENT NETWORKS TO INSURE ECONOMIES THROUGH NETWORK DESIGN.
(ALSO UNDER 5.4)

GRISETTI, ROBERT S., THE SYNTHESIS OF COMMUNICATIONS AND COMPUTERS, (WESTERN UNION TELEGRAPH CO.),
GRUENBERGER, F., COMPUTERS AND COMMUNICATIONS--TOWARD A COMPUTER UTILITY, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1968, (TK 5101.C67, LC 68-16776), P 209-219

WESTERN UNION'S ISCS (INFORMATION SERVICE COMPUTER SYSTEM) WHICH IS A PUBLIC MESSAGE SERVICE IS DESCRIBED. THE ISCS CONSISTS OF PROCESSOR CENTERS (PC'S) AT SAN FRANCISCO, CHICAGO, AND NEW YORK WHICH PERFORM ALL LOGICAL FUNCTIONS ASSOCIATED WITH PROCESSING AND TRANSMITTING MESSAGES. EACH PC IS CONNECTED TO A COMMUNICATION CENTER (CC) AND ALL CC'S ARE INTERCONNECTED. THE CC'S ARE USED FOR TERMINAL SERVICING AND LINE INTERACTIONS. BOTH PC'S AND CC'S ARE UNIVAC 418'S. NO INFORMATION IS GIVEN ON THE HOW PC'S AND CC'S ACTUALLY PROCESS MESSAGES INTERNALLY.
(ALSO UNDER 4.3)

HITTEL, L. A., SOME PROBLEMS IN DATA COMMUNICATIONS BETWEEN THE USER AND THE COMPUTER, (GENERAL ELECTRIC CO., PHOENIX, AZ),
AFIPS PROCEEDINGS, 1966 FALL JOINT COMPUTER CONFERENCE, VOLUME 29, (SAN FRANCISCO, CA, NOVEMBER 7-10, 1966), SPARTAN BOOKS INC., WASHINGTON, DC, 1966, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 395-402

3.2.2 SYSTEM DESIGN

(ANNOTATION UNDER 1.3)

ITOH, KAZUO, TAKAO KATO, ON HASHIOA, YUTAKA YOSHIOA, AN ANALYSIS OF TRAFFIC HANDLING CAPACITY OF PACKET SWITCHED AND CIRCUIT SWITCHED NETWORKS, (HITACHI LTD., YOKOHAMA, (JAPAN), TOTSUKA WORKS, NIPPON TELEGRARH AND TELEPHONE RUBLIC CORR., MUSASHINO, (JAPAN), MUSASHINO ELECTRICAL COMMUNICATION LAB.),
DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 29-37, 5 REFS

THIS PARER REPORTS THE RESULTS OF A STUDY ON TRAFFIC HANDLING CARACITY OF SWITCHING NODES AND TRANSMISSION LINES IN THE CIRCUIT AND PACKET SWITCHED NETWORK. COST EVALUATION METHODS FOR THE TWO TYPES OF NETWORKS ARE RRESENTED. THE RESULTS OF THE COMPARISON INDICATE THAT THERE ARE APPLICATION REGIONS FAVORABLE FOR EACH TYRE OF NETWORK.

JANSKY, CURTIS M., STRATEGIES FOR MAXIMUM COST EFFECTIVENESS OF A SWITCHED NETWORK, (ADVANCED TECHNOLOGY SYSTEMS INC., ARLINGTON, VA),
TELECOMMUNICATIONS, VOL 6, ISSUE 4, APR 72, P 25-28, 30, 32, 21 REFS

THIS ARTICLE CONTAINS A POTROURRI OF INFORMATION OF INTEREST TO THE DESIGNER OF DATA COMMUNICATIONS SYSTEMS. THE SYSTEM CONCERTS EMPHASIZED HERE ARE BASED ON THE STRATEGY OF UTILIZING 'TIME' AS AN OPERATIONAL PARAMETER IN THE FUNCTIONING OF THE SYSTEM. THIS RARAMETER IS APRLIED TO SUCH DIVERSE ANALYSES AS SATISFYING HUMAN REAL-TIME REQUIREMENTS AND DETERMINING THE NUMBER OF GATES IN THE LOGIC CIRCUITRY NEEDED FOR A DATA TERMINAL.

JORRE, RALPH, JOHN HAYTER, GEOFF BOYFIELD, AN AID TO DESIGNING, STORING AND ANALYSING DATA TRANSMISSION SYSTEM CONFIGURATIONS, (BRITISH POST OFFICE, LONDON, (ENGLAND)),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 421-432, 2 REFS

IDENTIFICATION OF MEASURABLE ELEMENTS OF DATA TRANSMISSION SYSTEMS IS PRESCRIBED AS THE FIRST STEP TO CONFIGURING SUCH SYSTEMS. THE DEVELOPMENT OF A FICTITIOUS DATA TRANSMISSION SYSTEM THROUGH FOUR STAGES OF INCREASING COMPLEXITY IS PROVIDED.

KAHN, ROBERT E., THE ORGANIZATION OF COMPUTER RESOURCES INTO A PACKET RADIO NETWORK, (ADVANCED RESEARCH PROJECTS AGENCY, ARLINGTON, VA),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 177-186, 37 REFS

THE ALOHA SYSTEM EMERGED AS A SOLUTION TO ELIMINATING THE UNUSUALLY HIGH ERROR RATE ON THE LOCAL TELEPHONE LINES AT THE UNIVERSITY OF HAWAII. THE ALOHA SYSTEM SERVED AS A MODEL FOR THE DEVELOPMENT OF THE RADIONET DISCUSSED IN THIS ARTICLE. THE SYSTEM REQUIREMENTS AND STRUCTURE FOR PACKET RADIO TECHNOLOGY ARE DISCUSSED. THE AUTHOR DOES NOT EVADE THE PRIVACY ISSUE WHICH RELIES ON ENCRYPTION. BECAUSE EVERY RECEIVER IN A RADIONET IS CAPABLE OF BEING A TRANSMITTER, AUTHENTICATION OF RECEIVER AND TRANSMITTER IS A NECESSITY. PERSONAL RADIO TERMINALS, CABLE TV, FREQUENCY MANAGEMENT AND COMPUTER ARCHITECTURE ARE ENVISIONED APPLICATIONS AREAS FOR PACKET RADIO TECHNOLOGY.
(ALSO UNDER 3.2.1)

KIMBLETON, STEPHEN R., NETWORK PERFORMANCE, USER SATISFACTION, AND DATA BASE ACCESS, (USC-INFORMATION SCIENCES INST., MARINA DEL REY, CA),
NATIONAL TELECOMMUNICATIONS CONFERENCE, CONFERENCE RECORD, VOLUME 2, (NEW ORLEANS, LA, DECEMBER 1-3, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH-1015-7-CSCB, (LC 57-20724), P 44-12-44-17, 15 REFS
(ANNOTATION UNDER 2.3)

KUO, FRANKLIN F., THE ALOHA BROADCAST PACKET COMMUNICATIONS SYSTEM,(PRESENTED AT THE NORTHWEST 74, CIPS-ACM PACIFIC REGIONAL SYMPOSIUM, VANCOUVER, (CANADA), MAY 23-24, 1974), (HAWAII, UNIV. OF, HONOLULU, ALOHA SYSTEM),
GELENBE, EROL, ROBERT MAHL, COMPUTER ARCHITECTURES AND NETWORKS, MODELLING AND EVALUATION, (AUGUST 12-14, 1974), AMERICAN ELSEVIER PUBLISHING CO, INC., NEW YORK, 1974, (LC 74-83728), P 275-283, 12 REFS

HERE IS ANOTHER GENERAL OVERVIEW DESCRIBING IMPORTANCE OF PACKET COMMUNICATIONS TO COMPUTER-COMMUNICATION NETWORKS. IT DISCUSSES WHAT PACKET BROADCASTING IS AND GIVES A DETAILED DESCRIPTION OF THE ALOHA PACKET RADIO NETWORK AS AN ILLUSTRATION. FINALLY IT MENTIONS SOME PRESENT EFFORTS ON PACKET SATELLITE SYSTEMS.

LAVIA, ANTHONY, ERIC G. MANNING, PERTURBATION TECHNIQUES FOR TOPOLOGICAL OPTIMIZATION OF COMPUTER NETWORKS, (WATERLOO, UNIV. OF, ONTARIO, (CANADA), COMPUTER COMMUNICATIONS NETWORKS GROUP),
FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000I-7-DATA, P 4-16--4-22, 18 REFS
(ANNOTATION UNDER 2.1.2)

MANNING, ERIC, A HOMOGENEOUS NETWORK FOR DATA SHARING, (WATERLOO, UNIV. OF, ONTARIO, (CANADA), DEPT. OF APPLIED ANALYSIS AND COMPUTER SCIENCE),
GELENBE, EROL, ROBERT MAHL, COMPUTER ARCHITECTURES AND NETWORKS, MODELLING AND EVALUATION, (AUGUST 12-14, 1974), AMERICAN ELSEVIER PUBLISHING CO, INC., NEW YORK, 1974, (LC 74-83728), P 345-353, 9 REFS

THE MAJOR IDEAS INTRODUCED HERE ARE THOSE OF REAL AND VIRTUAL NETWORK ADDRESS SPACES, AND THE EXCLUSIVE USE OF MESSAGE SWITCHING IN BOTH THE COMMUNICATIONS SUBNETWORK AND THE HOST OPERATING SYSTEM. A CORE-TO-CORE MESSAGE TRANSFER ALGORITHM, USING VIRTUAL ADDRESSES FOR PRELIMINARY PROTOCOL AND REAL ADDRESSES FOR ACTUAL DATA TRANSMISSION, ILLUSTRATES THE UTILITY OF THESE IDEAS. THE AUTHOR STATES THAT THESE IDEAS PROVIDE A SIMPLE UNIFORM PRIMITIVE STRUCTURE TO ALLOW EXCHANGE OF MESSAGE SEGMENTS BETWEEN TASKS IN SINGLE OR MULTIPLE HOSTS.
(ALSO UNDER 2.1.2)

MARTIN, JAMES T., SYSTEMS ANALYSIS FOR DATA TRANSMISSION, INTERNATIONAL BUSINESS MACHINES CORP., SYSTEMS RESEARCH INST., PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1972, PRENTICE HALL SERIES IN AUTOMATIC COMPUTATION, (LC 75-37761), 909P
(ANNOTATION UNDER 1.3)

MCDONALD, MILO, HARRY RUDIN, NOTE ON INHERENT AND IMPOSED PRIORITIES IN PACKET SWITCHING, (INTERNATIONAL BUSINESS MACHINES CORP., BOEBLINGEN, (GERMANY), INTERNATIONAL BUSINESS MACHINES CORP., RUSCHLIKON, (SWITZERLAND), ZURICH RESEARCH LAB.),
IEEE TRANSACTIONS ON COMMUNICATIONS, VOL COM-22, ISSUE 10, OCT 74, P 1678-1681, 6 REFS

IT HAS BEEN OBSERVED THAT THE MECHANISM OF TRANSMITTING A SINGLE MESSAGE AS A SERIES OF (POSSIBLY NONCONTIGUOUS) PACKETS INTRODUCES AN EFFECTIVE PRIORITY WHICH FAVORS SHORT OVER LONG MESSAGES. THIS PAPER ADDRESSES THE QUESTION, HOW STRONG IS THIS EFFECTIVE PRIORITY? THE ANALYSIS PRESENTED IS BASED ON SIMULATION.
(ALSO UNDER 2.1.1)

OSSANNA, JOSEPH F., IDENTIFYING TERMINALS IN TERMINAL-ORIENTED SYSTEMS, (BELL TELEPHONE LABS, INC., MURRAY HILL, NJ), JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71C59-C, P 148-152, 9 REFS

AN AUTOMATIC TERMINAL RECOGNITION ALGORITHM IS PRESENTED. TERMINAL PROPERTIES THAT PERMIT UNIQUE IDENTIFICATION ARE DISCUSSED AND AN ALGORITHM IS DESCRIBED WHICH ALLOWS AUTOMATIC RECOGNITION EITHER WHEN A TERMINAL IS CONNECTED (IF IT SPONTANEOUSLY SENDS A CHARACTER) OR AFTER THE USER SENDS A CHARACTER. THE LOW ORDER BITS OF THIS FIRST CHARACTER ARE USED FOR AUTOMATIC SPEED RECOGNITION AND THE REMAINING BITS CAN BE USED TO IDENTIFY OTHER PROPERTIES OF THE TERMINAL AS REQUIRED BY THE SYSTEM DESIGNER.

PAN, GEORGE S., CONFIGURATION OF AN EFFICIENT DATA COMMUNICATION SYSTEM, (SYSTEMS ARCHITECTS INC., RANDOLPH, MA),
TELECOMMUNICATIONS, VOL 6, ISSUE 6, JUN 72, P 43-44, 48, 50, 52, 70

THE PROBLEMS OF COMMUNICATION SYSTEM PLANNING AND COST MINIMIZATION ARE ADDRESSED. GENERAL CONCEPTS AND A CHECKLIST OF RELEVANT CONSIDERATIONS ARE PRESENTED, BUT SPECIFIC TECHNIQUES ARE NOT DESCRIBED IN DETAIL.

PRICE, W. L., DESIGN OF DATA COMMUNICATION NETWORKS USING SIMULATION TECHNIQUES,(PRESENTED AT, NETWORK DESIGN SYMPOSIUM, EDINBURGH, (SCOTLAND), MARCH 18, 1974), (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND)),
COMPUTER AIDED DESIGN, VOL 6, ISSUE 3, JUL 74, P 171-175, 21 REFS

THE CHARACTERISTICS OF PACKET SWITCHING DATA COMMUNICATION NETWORKS ARE BRIEFLY DISCUSSED AND TECHNIQUES OF THE USE OF SIMULATION AS A DESIGN TOOL ARE OUTLINED. THE DESIGN OF DATA COMMUNICATION NETWORKS IN GENERAL IS NOT DISCUSSED.
(ALSO UNDER 2.1.3)

3.2.2 SYSTEM DESIGN

RAYMOND, R. C., D. J. MCKEE, A DESIGN MODEL FOR TELEPROCESSING SYSTEMS, (GENERAL ELECTRIC CO., BETHESDA, MD), DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 131-140

THE ARTICLE DESCRIBES A MODEL, IN THE FORM OF A COMPUTER PROGRAM AND ASSOCIATED DATA BASES, CAPABLE OF DESIGNING A TELEPROCESSING SYSTEM TO MEET GIVEN LOAD REQUIREMENTS. THE CURRENT VERSION ACCEPTS UP TO 120 CITIES (20 MAY BE OUTSIDE THE UNITED STATES) AND CENTRAL SWITCHING AND DATA PROCESSING MAY BE PROVIDED IN UP TO 20 COMPUTING CENTERS LOCATED AT ARBITRARILY CHOSEN CITIES OF THE SYSTEM. THE MODEL IS SUITABLE FOR EXPLORATION OF SYSTEM COSTS AND DESIGN FEATURES, CENTER LOCATIONS, TYPES AND AMOUNTS OF WORK PROCESSED, COMMON CARRIER TARIFFS, REDUNDANCY REQUIREMENTS, AND OTHER VARIABLES.

ROSNER, ROY DANIEL, LARGE SCALE NETWORK DESIGN CONSIDERATIONS, (DEFENSE COMMUNICATIONS AGENCY, RESTON, VA), THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 189-197, 9 REFS

DESIGN ALTERNATIVES FOR THE DEFENSE COMMUNICATIONS SYSTEM ARE DISCUSSED, TO PROVIDE QUANTIFICATION OF NETWORK STRUCTURES, A COMPARISON ON THE BASIS OF CHANNELS, CHANNEL MILES AND NETWORK DELAY IS PERFORMED, COMPARISONS OF DIFFERENT NETWORK TOPOLOGIES AND STRUCTURES ARE MADE USING AN ANALYTIC NETWORK SYNTHESIS PROGRAM, THE RESULTS ARE PLOTTED TO DETERMINE THE OPTIMAL CONFIGURATION.

SCANTLEBURY, R. A., A MODEL FOR THE LOCAL AREA OF A DATA COMMUNICATION NETWORK--OBJECTIVES AND HARDWARE ORGANIZATION, NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), DIV. OF COMPUTER SCIENCE, OCT 69, NPL-DCS COM-SCI-T.M.29, 17P, 10 REFS (ANNOTATION UNDER 3.1.1)

WAAL, PETER C., DIGITAL TELEMETRY IN NETWORK CONTROL, (APPLIED DATA RESEARCH INC.), EASCON '75 RECORD, IEEE ELECTRONICS AND AEROSPACE SYSTEMS CONFERENCE, (WASHINGTON, DC, SEPTEMBER 29-OCTOBER 1, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH0-998-5-EASCON, (LC 73-2277), P 122-A--122-D

TELEMETRY TECHNIQUES ARE PROPOSED FOR EFFECTIVE CENTRALIZED CONTROL BY NETWORKS. ANALOG, DIGITAL AND HYBRID TECHNIQUES ARE DISCUSSED AND THEN THE HARDWARE AND SOFTWARE CONSIDERATIONS FOR IMPLEMENTING THE CONTROL SYSTEM ARE DESCRIBED. AN EXTENSIVE BACK-UP PROCEDURE IN THE EVENT OF POWER FAILURE IS PROPOSED.

WECKER, STUART, A DESIGN FOR A MULTIPLE PROCESSOR OPERATING ENVIRONMENT, (DIGITAL EQUIPMENT CORP., MAYNARD, MA), COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, "COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?", (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 143-146, 14 REFS (ANNOTATION UNDER 3.4.D)

WHITNEY, V. KEVIN M., DIXON R. DOLL, A DATABASE SYSTEM FOR THE MANAGEMENT AND DESIGN OF TELECOMMUNICATION NETWORKS, DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 141-147, 12 REFS

A COMPUTER SYSTEM BUILT UPON A RELATIONAL DATA BASE COMPRISED OF SETS OF DATA DESCRIBING NETWORK TERMINALS, COMMUNICATIONS CHANNELS, AND TRAFFIC IS DESCRIBED. THE SYSTEM IS INTENDED TO AID IN THE DESIGN AND MANAGEMENT OF TELECOMMUNICATION NETWORKS. ALL SYSTEM FACILITIES MAY BE USED EITHER INTERACTIVELY OR IN A BATCHED MODE FOR A WIDE VARIETY OF NETWORK MANAGEMENT TASKS SUCH AS THE DESIGN OF NEW NETWORKS, THE MODIFICATION OR EXPANSION OF EXISTING NETWORKS, AND THE PREPARATION OF REPORTS ON NETWORK COST AND PERFORMANCE.

WILKINSON, P. T., A MODEL FOR THE LOCAL AREA OF A DATA COMMUNICATION NETWORK--SOFTWARE ORGANIZATION, NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), DIV. OF COMPUTER SCIENCE, OCT 69, NPL-DCS COM-SCI-T.M.29, 20P, 6 REFS (ANNOTATION UNDER 3.1.1)

3.2.3 HARDWARE COMPONENTS

ABRAMSON, NORMAN, PACKET SWITCHING WITH SATELLITES, HAWAII, UNIV. OF, HONOLULU, ALOHA SYSTEM, MAR 73, HU B73-2, NASA NAS2-6700, AF F4462O-69-C-0030, ONR N00014-70-C-0414, 24P, 20 REFS (ANNOTATION UNDER 3.2.1)

BARAN, PAUL, ON DISTRIBUTED COMMUNICATIONS: VIII, THE MULTIPLEXING STATION, RAND CORP., SANTA MONICA, CA, AUG 64, RC RM-3764-PR, AF 49(638)-700, (AD-444 831), 103P, 3 REFS

THIS REPORT PRESENTS THE DESIGN OF A MULTIPLEXER THAT INTERFACES BOTH TELETYPEWRITER AND SYNCHRONOUS CIRCUITS TO A DISTRIBUTED MESSAGE-SWITCHED NETWORK. A CORE PLUS DRUM MACHINE IS PROPOSED WITH A PUSH-BUTTON MANUAL SIGNALING SCHEME FOR MESSAGE ADDRESSING.

CHU, WESLEY W., ASYNCHRONOUS TIME-DIVISION MULTIPLEXING SYSTEMS, (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE), ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 237-268, 30 REFS (ANNOTATION UNDER 2.1.2)

CHU, WESLEY W., DYNAMIC BUFFER MANAGEMENT FOR COMPUTER COMMUNICATIONS, (CALIFORNIA, UNIV. OF, LOS ANGELES), DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 68-72, 7 REFS

A DYNAMIC BUFFER MANAGEMENT SYSTEM FOR COMPUTER COMMUNICATIONS THAT UTILIZES VIRTUAL ADDRESS CONCEPTS IS PRESENTED. THE SYSTEM PROVIDES FLEXIBILITY AS WELL AS EFFICIENCY IN UTILIZATION OF BUFFER SPACE. AN ESTIMATION OF REQUIRED BUFFER SIZE AND STRATEGIES FOR HANDLING BUFFER OVERFLOW ARE DESCRIBED. METHODS FOR ALLOCATING BUFFER RESOURCES AMONG THE SET OF BUFFER OUTPUTS ARE DISCUSSED. THE DYNAMIC BUFFER MANAGEMENT DESCRIBED HAS BEEN SUCESSFULLY IMPLEMENTED IN THE STATISTICAL DEMULTIPLEXOR CONSTRUCTED AT UCLA.

FRALICK, STANLEY C., DAVID H. BRANDIN, FRANKLIN F. KUO, CHRISTOPHER HARRISON, DIGITAL TERMINALS FOR PACKET BROADCASTING, (STANFORD RESEARCH INST., CA, HAWAII, UNIV. OF, HONOLULU), AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 253-261, 11 REFS

RADIO COMMUNICATIONS, NETWORK ACCESS AND CENTRAL LOGIC, AND INPUT/OUTPUT ARE THE THREE FUNCTIONS OF A RADIO TERMINAL. EVEN THOUGH THESE FUNCTIONS ARE MORE COMPLEX THAN THOSE NORMALLY PERFORMED BY A TERMINAL, THERE IS AN ADDITIONAL CONCERN TO MAKE RADIO TERMINALS OF A PERSONAL LIGHTWEIGHT SIZE, I.E., SUITCASE TERMINALS. DESCRIPTION OF THE HARDWARE AND SOFTWARE REQUIRED FOR THESE TERMINALS IS GIVEN.

FRALICK, STANLEY C., JAMES C. GARRETT, TECHNOLOGICAL CONSIDERATIONS FOR PACKET RADIO NETWORKS, (STANFORD RESEARCH INST., MENLO PARK, CA, ROCKWELL INTERNATIONAL, RICHARDSON, TX), AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 233-243, 13 REFS

THE THREE PRIMARY ELEMENTS OF A PACKET RADIO NETWORK ARE THE TERMINAL, STATION, AND REPEATER. THE USER'S INTERFACE TO THE NETWORK IS THE TERMINAL. THE STATION HAS THE RESPONSIBILITY OF THE OVER-ALL MANAGEMENT OF THE NETWORK INCLUDING INITIALIZATION, ROUTING, FLOW CONTROL, DIRECTORY AND ACCOUNTING FUNCTIONS. NETWORKS OVER A SMALL AREA REQUIRE ONLY THESE TWO ELEMENTS; BUT FOR EXTENDED AREAS, REPEATERS ARE NECESSARY. THE REPEATER RECEIVES AND RETRANSMITS PACKETS, DETECTS ERRORS AND PERFORMS ROUTING FUNCTIONS. THE AUTHORS DESCRIBE AN EXPERIMENTAL REPEATER AND DISCUSS RADIO FREQUENCY CHANNEL LIMITATIONS.

MCGREGOR, PATRICK, EFFECTIVE USE OF DATA COMMUNICATIONS HARDWARE, (NETWORK ANALYSIS CORP., GLEN COVE, NY), AFIPS CONFERENCE PROCEEDINGS, VOLUME 43, 1974, NATIONAL COMPUTER CONFERENCE, (CHICAGO, IL, MAY 6-10, 1974), AFIPS PRESS, MONTVALE, NJ, 1974, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 565-575, 31 REFS

THE COST, RELIABILITY, PERFORMANCE, AND FLEXIBILITY OF HARDWARE IN DATA COMMUNICATIONS NETWORKS ARE ADDRESSED IN THIS ARTICLE. IN THE COST SECTION MODEM SHARING UNITS, MULTIPLEXERS, CONCENTRATORS, BIPLEXERS, PORT SHARING UNITS AND FRONT END PROCESSORS ARE ALL BRIEFLY DISCUSSED ALONG WITH TYPICAL COSTS INCURRED AND POTENTIAL ECONOMY. RELIABILITY IS VIEWED FROM TWO ANGLES: THE EXPECTED PER CENT TIME A TERMINAL CANNOT CONNECT WITH THE CPU, AND THE EXPECTED PER CENT TIME AN ENTIRE OFFICE CANNOT. PERFORMANCE IS MEASURED IN TERMS OF TERMINAL RESPONSE TIME. FLEXIBILITY DEALS WITH GROWTH TO HANDLE MORE

3.2.3 HARDWARE COMPONENTS

TERMINALS AND HEAVIER TRAFFIC, AND TO HANDLE A BROADER VARIETY OF TERMINALS.
THE AUTHOR HAS ACCOMPLISHED HIS GOAL OF A FUNCTIONAL APPROACH TO THE EFFECTIVE USE OF DATA COMMUNICATIONS HARDWARE.

PEHRSON, DAVID L., INTERFACING AND DATA CONCENTRATION, (CALIFORNIA, UNIV. OF., LIVERMORE).
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 197-236, 7 REFS
(ANNOTATION UNDER 1.3)

SCANTLEBURY, R. A., A MODEL FOR THE LOCAL AREA OF A DATA COMMUNICATION NETWORK--OBJECTIVES AND HARDWARE ORGANIZATION, NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), DIV. OF COMPUTER SCIENCE, OCT 69, NPL-DCS COM-SCI-T.M.29, 17P, 10 REFS
(ANNOTATION UNDER 3.1.1)

SHIMASAKI, NOBUHIKO, TOHRU KOHASHI, KOHEI HABARA, YASUNOBU SUZUKI, A COMPATIBLE MULTIPLEXING TECHNIQUE FOR ANISOCHRONOUS AND ISOCHRONOUS DIGITAL DATA TRAFFIC, (NIPPON ELECTRIC CO. LTD., TOKYO, (JAPAN), NIPPON TELEGRAPH AND TELEPHONE PUBLIC CORP., MUSASHINO, (JAPAN), RESEARCH AND DEVELOPMENT BUREAU, NIPPON TELEGRAPH AND TELEPHONE PUBLIC CORP., MUSASHINO, (JAPAN), MUSASHINO ELECTRICAL COMMUNICATION LAB.),
DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 59-67, 12 REFS

THIS PAPER REPORTS THE RESULTS OF A STUDY ON A MULTIPLEXING SCHEME FOR DIGITAL DATA TRANSMISSION AND SWITCHING WHICH CAN HANDLE BOTH ANISOCHRONOUS AND ISOCHRONOUS DATA TRAFFIC OF VARIOUS MIXES. THE STUDY WAS DESIGNED TO DETERMINE A UNIFIED SCHEME, BOTH ECONOMICAL AND FLEXIBLE, FOR INTER-CITY HEAVY TRAFFIC DATA LINKS IN THE DOMESTIC DIGITAL DATA NETWORK. VARIOUS MULTIPLEXING SCHEMES ARE DESCRIBED AND THEIR FEATURES ANALYZED.

SOBOLEWSKI, J. S., PROGRAMMABLE COMMUNICATION PROCESSORS, (WASHINGTON, STATE UNIV. OF., PULLMAN),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 380-389, 15 REFS

VARIOUS ASPECTS OF MINICOMPUTERS USED AS COMMUNICATION PROCESSORS ARE DESCRIBED. THE CONCEPTS OF CONCENTRATORS, COMMUNICATIONS CONTROLLERS, AND MESSAGE SWITCHERS ARE SUMMARIZED AND THE USE OF MINICOMPUTERS IN THESE ROLES IS DISCUSSED.

THE COMMUNICATIONS MINICOMPUTER, (TELECOMMUNICATIONS, DEDHAM, MAI,
TELECOMMUNICATIONS, VOL 6, ISSUE 10, OCT 72, P 15-16, 18, 20, 22

THIS SURVEY IS USEFUL AS A GUIDE TO MINICOMPUTER SELECTION FOR USE IN DATA COMMUNICATIONS NETWORKS. AFTER A BRIEF INTRODUCTION TO THE CONCEPTS OF FRONT END PROCESSING, INTELLIGENT TERMINALS, MESSAGE SWITCHERS, AND CONCENTRATORS, A FACTUAL ONE LINE PER ENTRY SUMMARY IS PRESENTED ON MINICOMPUTERS SURVEYED THAT ARE USED IN THESE ROLES.
(ALSO UNDER 1.2)

ZAFIROPULO, PITRO, FLEXIBLE MULTIPLEXING FOR NETWORKS SUPPORTING LINE-SWITCHED AND PACKET-SWITCHED DATA TRAFFIC, (INTERNATIONAL BUSINESS MACHINES CORP., RUSCHLIKON, (SWITZERLAND)),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 517-523, 7 REFS

THE USE OF MULTIPLEXER/DEMULTIPLEXER PAIRS IS PROPOSED FOR THE INTEGRATION OF LINE-SWITCHED AND PACKET-SWITCHED TRAFFIC ON A SINGLE LINE OR TRUNK. SYNCHRONIZATION AND SIGNALLING BETWEEN THESE PAIRS IS DISCUSSED IN ADDITION TO THE IMPACT OF THE NEEDED CONTROL CONFIGURATION ON SIGNALLING PROTOCOLS.

3.2.9 OTHER

BEERE, MAX P., THE ECONOMICS OF NEW INFORMATION NETWORKS, (PACKET COMMUNICATIONS INC., WALTHAM, MAI,
HALL, ARTHUR O., III, DIGEST OF THE CONFERENCE ON THE ECONOMIES OF SCALE IN TODAY'S TELECOMMUNICATIONS SYSTEMS, (WASHINGTON, DC, SEPTEMBER 13, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE 73-CHC-830-0-SCALE, P 36-38, 4 REFS

THE EVOLUTION OF VALUE ADDED NETWORKS (VANS) IS TRACED, AND THE TYPES OF SERVICES AND KINDS OF COST STRUCTURES ASSOCIATED WITH VANS ARE DISCUSSED. THE APPROACHES OF TYMNET, ARPA, AND PACKET COMMUNICATIONS INC. ARE BRIEFLY DESCRIBED.
(ALSO UNDER 5.3)

BHUSHAN, ABHAY K., ROBERT H. STOTZ, PROCEDURES AND STANDARDS FOR INTER-COMPUTER COMMUNICATIONS, (MASSACHUSETTS INST. OF TECH., CAMBRIDGE, ELECTRONICS SYSTEMS LAB.),
AFIPS PROCEEDINGS, 1968 SPRING JOINT COMPUTER CONFERENCE, VOLUME 32, (ATLANTIC CITY, NJ, APRIL 30-MAY 2, 1968), THOMPSON BOOK CO., WASHINGTON, DC, 1968, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 95-104, 24 REFS
(ANNOTATION UNDER 3.5.1)

BIRKE, DENNIS M., STATE-TRANSITION PROGRAMMING TECHNIQUES AND THEIR USE IN PRODUCING TELEPROCESSING DEVICE CONTROL PROGRAMS, (PITTSBURGH, UNIV. OF., PA, COMPUTER CENTER),
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 21-31, 8 REFS

THE USE OF STATE-TRANSITION TECHNIQUES IN WRITING PROGRAMS FOR COMPLEX, TIMING DEPENDENT PROCESSES, E.G., TELEPROCESSING DEVICE CONTROL PROGRAMS, IS DESCRIBED. IT IS SHOWN HOW THESE TECHNIQUES MAY CONTRIBUTE TO SIMPLIFYING THE DEFINITION, IMPLEMENTATION, AND DEBUGGING OF CONTROL PROGRAMS.

CHU, WESLEY W., DEMULTIPLEXING CONSIDERATIONS FOR STATISTICAL MULTIPLEXORS, (CALIFORNIA, UNIV. OF., LOS ANGELES, DEPT. OF COMPUTER SCIENCE),
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 32-38, 7 REFS

SOME VERY USEFUL INFORMATION IS PROVIDED FOR THE DESIGN OF STATISTICAL MULTIPLEXERS ABOUT BEHAVIOR OF THE DEMULTIPLEXER (REASSEMBLY) BUFFERS. THE RELATIONSHIPS AMONG BUFFER OVERFLOW PROBABILITY, BUFFER SIZE, TRAFFIC VOLUME, AVERAGE MESSAGE LENGTH, AND MESSAGE DESTINATION ARE ANALYZED.
(ALSO UNDER 2.1.2)

HALL, ARTHUR O., III, AN OVERVIEW OF ECONOMIES OF SCALE IN EXISTING COMMUNICATIONS SYSTEMS, (HALL (ARTHUR O.) INC., PORT DEPOSIT, MD),
HALL, ARTHUR O., III, DIGEST OF THE CONFERENCE ON THE ECONOMIES OF SCALE IN TODAY'S TELECOMMUNICATIONS SYSTEMS, (WASHINGTON, DC, SEPTEMBER 13, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE 73-CHC-830-0-SCALE, P 5-17, 9 REFS

AS AN INTRODUCTION TO OTHER PAPERS FROM THIS WORKSHOP, THE AUTHOR GIVES A BASIC DEFINITION OF 'ECONOMIES OF SCALE' IN TELECOMMUNICATIONS AND BASIC CONCEPTS RELATING TO THE DEFINITION. HE DESCRIBES SOME OF THE WORK COMPLETED IN THE PAST AND GIVES GENERAL INFORMATION ON COMMUNICATION SERVICES AND NETWORKS, COST CONCEPTS AND MEASURES OF SCALE, THE PHYSICAL BASES OF ECONOMIES AND DISECONOMIES OF SCALE IN COMMUNICATION SYSTEMS AND THE HUMAN BASES FOR COMMUNICATION SYSTEM ECONOMY.

HIROTA, KEN'ICHIRO, PUBLIC TELEPHONE NETWORK AND COMPUTER-COMMUNICATION, (NIPPON TELEGRAPH AND TELEPHONE PUBLIC CORP., TOKYO, (JAPAN)),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 267-271

THE PUBLIC TELEPHONE NETWORK IN JAPAN IS DESCRIBED, EMPHASIZING ITS USE FOR DATA COMMUNICATION. A PUBLIC CALCULATION SERVICE CALLED 'DIALS' AVAILABLE THROUGH THE TELEPHONE NETWORK IS BRIEFLY DESCRIBED.

KLEINROCK, LEONARD, SIMON S. LAM, PACKET-SWITCHING IN A SLOTTED SATELLITE CHANNEL, (CALIFORNIA, UNIV. OF, LOS ANGELES),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 42, 1973, NATIONAL COMPUTER CONFERENCE AND EXPOSITION, (NEW YORK, NY, JUNE 4-8, 1973), AFIPS PRESS, MONTVALE, NJ, 1973, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 703-710, 13 REFS
(ANNOTATION UNDER 2.1)

MANNING, ERIC G., NEWHALL LOOPS AND PROGRAMMABLE TOM TWO FACETS OF CANADIAN RESEARCH IN COMPUTER COMMUNICATIONS,

3.2.9 OTHER

(WATERLOO, UNIV. OF, (CANADA)).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972). INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 338-342, 9 REFS

TWO CANADIAN RESEARCH PROPOSALS ARE PRESENTED. THESE ARE THE DEVELOPMENT OF THE NEWHALL LOOP CONCEPT TO SERVE AS THE COMMUNICATIONS SUBNET INTERCONNECTING THE SWITCHES OF A DISTRIBUTED STORE-AND-FORWARD NETWORK AND THE PROGRAMMABLE TIME DIVISION MULTIPLEXING CONCEPT AS A METHOD OF DYNAMICALLY VARYING THE BANDWIDTH ASSIGNED TO DATA 'CALLS'.

MCCARN, DAVIS B., THE COMMUNICATIONS JUNGLE AS SEEN BY THE USER, (NATIONAL LIBRARY OF MEDICINE, BETHESDA, MD), PROCEEDINGS OF THE 1974 SYMPOSIUM, COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, MAY 23, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, 74CH0835-9C, P 7-8, 1 REFS

MEDLINE (MEDICAL LITERATURE ANALYSIS AND RETRIEVAL SYSTEM ON-LINE) PROVIDES ON-LINE BIBLIOGRAPHIC RETRIEVAL SERVICES TO USERS VIA SEVERAL EXISTING COMPUTER NETWORKS. DUE PRIMARILY TO THE NUMBER OF PATH ELEMENTS BETWEEN THE TYPICAL USER AND THE SYSTEM, AND THE SIGNAL CONVERSION WHICH TAKES PLACE BETWEEN EACH PATH ELEMENT, COMMUNICATIONS SERVICES RELATED PROBLEMS COMPRISE ABOUT THREE QUARTERS OF MEDLINE USER DIFFICULTIES. THIS SHORT ARTICLE HIGHLIGHTS A FEW EXAMPLES OF THE COMMUNICATIONS PROBLEMS WHICH HAVE OCCURRED WITH MEDLINE TO ILLUSTRATE THE RANGE OF PROBLEMS WHICH HAVE CONFRONTED ONE COMMUNICATIONS USER.

O'SULLIVAN, THOMAS C., SHADOW TELEPHONE NETWORKS FOR TIME-SHARING TERMINALS, (RAYTHEON CO., SUDBURY, MA, DEPT. OF ADVANCED SYSTEMS),
COMPUTERS AND AUTOMATION, VOL 15, ISSUE 10, OCT 66, P 38-39

DESCRIBED IN THIS BRIEF ARTICLE IS THE RAYTHEON TERMINAL SWITCHING NETWORK WHICH ALLOWS A NUMBER OF TERMINALS TO ACCESS A VARIETY OF TIME-SHARING SYSTEMS THROUGH A SIMPLE PBX SWITCHBOARD. SEE O'SULLIVAN'S ARTICLE 'EXPLOITING THE TIME-SHARING ENVIRONMENT' IN CATEGORY 3.1.2.

ROBERTS, LAWRENCE G., DYNAMIC ALLOCATION OF SATELLITE CAPACITY THROUGH PACKET RESERVATION, (DEPARTMENT OF DEFENSE, ARLINGTON, VA),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 42, 1973, NATIONAL COMPUTER CONFERENCE AND EXPOSITION, (NEW YORK, NY, JUNE 4-8, 1973), AFIPS PRESS, MONTVALE, NJ, 1973, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 711-716, 10 REFS
(ANNOTATION UNDER 2.1.4)

ROBERTS, LAWRENCE G., DYNAMIC ALLOCATION OF SATELLITE CAPACITY THROUGH PACKET RESERVATION, (DEPARTMENT OF DEFENSE, ARLINGTON, VA, ADVANCED RESEARCH PROJECTS AGENCY),
COMPUTER COMMUNICATION NETWORKS, SELECTED PAPERS, (PRESENTED AT, UNIV. OF SUSSEX, BRIGHTON, (ENGLAND),), 1973, P A1-A15, 10 REFS
(ANNOTATION UNDER 2.1.2)

3.3.1 INTERFACES

BARBER, D. L. A., EASING THE INTRODUCTION OF A PACKET SWITCHING SERVICE, NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), DIV. OF COMPUTER SCIENCE, MAR 71, NPL-CSO COM-SCI-T.M.-52, 20P

IT IS PROPOSED THAT NEW DATA NETWORKS BE DESIGNED WITH SOME COMPATIBILITY WITH EXISTING NETWORKS AND THAT EARLY AGREEMENT BE REACHED ON STANDARDS OF ALL TYPES. THEN THE REPORT GOES INTO DETAIL ON A PARTICULAR HARDWARE APPROACH FOR THE USER-NETWORK INTERFACE. A PHYSICAL BOX WITH BUTTONS AND LIGHTS IS DESCRIBED IN DETAIL AS THE SOLUTION TO BOTH FLOW CONTROL INTO THE NET AND SUCCESSFUL ESTABLISHMENT OF CONNECTIONS THROUGH THE NET. THE DISCUSSION IS QUITE DETAILED./
(ALSO UNDER 5.5)

BARBER, D. L. A., EXPERIENCE WITH THE USE OF THE B.S. INTERFACE IN COMPUTER PERIPHERALS AND COMMUNICATION SYSTEMS, NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), DIV. OF COMPUTER SCIENCE, OCT 69, NPL-DCS COM-SCI-T.M.29, ISP, 9 REFS

EXPERIENCE WITH THE USE OF THE BRITISH STANDARD SPECIFICATION AA22 WHICH IS A 'DIGITAL INPUT/OUTPUT INTERFACE FOR DATA COLLECTION SYSTEMS' IS DESCRIBED. ITS APPLICATION WITH PERIPHERAL DEVICES, COMPUTER I/O BUSES, CONNECTIONS TO DIRECT STORE, AND, OF SPECIAL INTEREST, ITS USE IN THE NATIONAL PHYSICAL LABORATORY NETWORK ARE ALL DISCUSSED.
(ALSO UNDER 5.5)

BOUKNIGHT, W. J., G. R. GROSSMAN, D. M. GROTHE, THE ARPA NETWORK TERMINAL SYSTEM--A NEW APPROACH TO NETWORK ACCESS, (ILLINOIS, UNIV. OF, URBANA, CENTER FOR ADVANCED COMPUTATION),
DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 73-79, 17 REFS

THIS PAPER DISCUSSES THE GENERAL DESIGN AND PHILOSOPHY OF THE ARPA NETWORK TERMINAL SYSTEM (ANTS) AND ITS POTENTIAL USES IN VARIOUS TELECOMMUNICATIONS SITUATIONS. BUILT AROUND THE DEC PDP-11 FAMILY, ANTS PROVIDES ITS USERS WITH ACCESS TO OVER 50 COMPUTER AND RESEARCH INSTALLATIONS AT MORE THAN 40 SITES. THE FOLLOWING LIST OF SECTION TITLES TAKEN FROM THE PAPER GIVES AN OVERVIEW OF THE CONTENTS OF THE ARTICLE: PROTOTYPE DEVELOPMENT; HARDWARE; SOFTWARE CHARACTERISTICS; DEVICE MANAGEMENT; DATA HANDLING; DEVICE CLASSES; INTELLIGENT INTERFACING; USER INTERFACE; SITE SUPPORT; UNIVERSITY OF ILLINOIS INSTALLATIONS; AND FUTURE PLANS.

FRASER, A. G., A 10-WIRE INTERFACE FOR DATA COMMUNICATIONS, (BELL TELEPHONE LABS, INC., MURRAY HILL, NJ),
DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 113-120, 1 REFS

GIVEN THE CONTINUING GROWTH IN COMPUTING TECHNOLOGY, NEW DATA COMMUNICATIONS SYSTEMS MUST BE ABLE TO ACCOMMODATE CHANGES IN TERMINAL BEHAVIOR AND CONTROL REQUIREMENTS WITHOUT REQUIRING CHANGES IN INSTALLED EQUIPMENT. A SYNCHRONOUS SERIAL INTERFACE CONNECTING DATA PROCESSING EQUIPMENT TO A COMMUNICATIONS SYSTEM IS DESCRIBED. THE 10-WIRE INTERFACE IS MORE FLEXIBLE THAN EXISTING STANDARDS AND CAN HANDLE CERTAIN DESIRABLE EXTENSIONS TO COMMUNICATIONS CONTROL FUNCTIONS.

PEHRSON, DAVID L., INTERFACING AND DATA CONCENTRATION, (CALIFORNIA, UNIV. OF, LIVERMORE),
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 197-236, 7 REFS
(ANNOTATION UNDER 1.3)

TRIPATHI, PRABODH C., DESIGN CONSIDERATIONS FOR THE MENEHUNE-KAHUNA INTERFACE FOR THE ALOHA SYSTEM, A PRELIMINARY REPORT DESIGN CONSIDERATIONS FOR THE MENEHUNE-KAHUNA INTERFACE FOR THE ALOHA SYSTEM, A PRELIMINARY REPORT, HAWAII, UNIV. OF, HONOLULU, AUG 69, UH TN-69-7, AF F44620-69-C-0030, 7P

THE ALOHA SYSTEM HARDWARE INTERFACE BETWEEN AN IBM 360/65 COMPUTER AND ITS NETWORK COMMUNICATIONS FRONT END, AN HP 211SA, IS DESCRIBED. THE STANDARD INTERFACE BETWEEN THE IBM 1827 DATA CONTROL UNIT AND THE IBM 360/65 IS BRIEFLY DESCRIBED AND A SPECIAL INTERFACE BETWEEN THE IBM 1827 AND THE HP 211SA IS DETAILED.

ZACHAROV, B., THE USE OF A MODULAR SYSTEM FOR TERMINAL COUPLING, CONCENTRATING AND MULTIPLEXING IN COMPUTER NETWORKS, (SCIENCE RESEARCH COUNCIL, DARESBURY LAB.),
IEEE 1974 NATIONAL TELECOMMUNICATIONS CONFERENCE, (SAN DIEGO, CA, DECEMBER 2-4, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE P-74CH0902-7-CSCB, (LC 57-2072A), P 1039-104A, 12 REFS

THE USE OF CAMAC, A STANDARD INTERFACE SPECIFICATION, IS RECOMMENDED FOR ALL INTERFACES BETWEEN PROCESSORS, TERMINALS, MULTIPLEXERS AND CONCENTRATORS IN COMPUTER NETWORKS. UNFORTUNATELY, WITHOUT SOME KNOWLEDGE OF THE CAMAC SPECIFICATION, THE ARGUMENTS MADE IN THE ARTICLE ARE DIFFICULT TO EVALUATE; NO DESCRIPTION WHATSOEVER OF CAMAC APPEARS IN THE ARTICLE.

3.3.2 PROCESSORS

AMSTUTZ, STANFORD R., DISTRIBUTED INTELLIGENCE IN DATA COMMUNICATIONS NETWORKS, (HONEYWELL INFORMATION SYSTEMS INC., FRAMINGHAM, MA),
COMPUTER, VOL 4, ISSUE 6, NOV-DEC 71, P 26-32

THIS IS AN INFORMATIVE SUMMARY ON THE USE OF MINICOMPUTERS AS COMMUNICATIONS PROCESSORS BOTH AS FRONT ENDS TO CENTRAL COMPUTERS AND AS REMOTE TERMINAL CONCENTRATORS. IT IS SHOWN WHERE THE PROPER EMPLOYMENT OF MINICOMPUTERS CAN REMOVE SOME OF THE LOAD FROM A CENTRAL COMPUTER AND CAN REDUCE COMMUNICATIONS LINE CHARGES WHEN USED AS CONCENTRATORS. THE FUNCTIONS

3.3.2 PROCESSORS

THAT A MINICOMPUTER CAN PERFORM AT THE CENTRAL COMPUTER AND REMOTE TERMINAL SITES ARE SPECIFIED.

ARNSTEIN, S. M., W. R. CROWTHER, M. F. KRALEY, R. D. BRESSLER, A. MICHEL, F. E. HEART, PLURIBUS--A RELIABLE MULTIPROCESSOR. (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA).
AFIPS CONFERENCE PROCEEDINGS. VOLUME 44. 1975. NATIONAL COMPUTER CONFERENCE. (ANAHEIM, CA. MAY 19-22, 1975). AFIPS PRESS. MONTVALE, NJ. 1975. (LC 55-44701). P 551-559. 14 REFS

THE PLURIBUS IS A FAMILY OF SWITCHING NODES (ARPA IMP'S) WHICH HANDLE HIGH BANDWIDTH (1.5 MEGABAND CIRCUITS), AND HIGH FANOUT TO HOSTS IN ADDITION TO BEING MODULAR IN DESIGN. THE ARCHITECTURE AND GOALS ARE DISCUSSED IN ADDITION TO SOME OF THE FAILURES. WHILE DESIGNED FOR THE ARPANET, MOST OF THE CONCEPTS ARE APPLICATION INDEPENDENT.

AUPPERLE, ERIC M., MERIT COMPUTER NETWORK: HARDWARE CONSIDERATIONS, (MICHIGAN, UNIV. OF, ANN ARBOR).
RUSTIN, RANDALL, COURANT COMPUTER SCIENCE SYMPOSIUM 3. COMPUTER NETWORKS, (NOVEMBER 30-DECEMBER 1, 1970), PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1972, PRENTICE-HALL SERIES IN AUTOMATIC COMPUTATION, (LC 79-39373), P 49-63
(ANNOTATION UNDER 3.1.1)

BALL, CHRISTOPHER J., COMMUNICATIONS AND THE MINICOMPUTER.
COMPUTER, VOL 4, ISSUE 5, SEP-OCT 71, P 13-21, 5 REFS
(ANNOTATION UNDER 1.3)

BARAN, PAUL, ON DISTRIBUTED COMMUNICATIONS: VII. TENTATIVE ENGINEERING SPECIFICATIONS AND PRELIMINARY DESIGN FOR A HIGH-DATA-RATE DISTRIBUTED NETWORK SWITCHING NODE, RAND CORP., SANTA MONICA, CA, AUG 64, RC RM-3763-PR, AF 49(638)-700, (AD-444 832), 85P, 5 REFS

THIS ENGINEERING SPECIFICATION FOR A SMALL COMPUTER BASED SWITCHING NODE FOR A MESSAGE SWITCHED DISTRIBUTED NETWORK UNFORTUNATELY WAS DONE SHORTLY BEFORE THE WIDESPREAD USE OF MINICOMPUTERS. CONSIDERABLE SPACE IS DEVOTED TO THE DESIGN OF SUCH A MACHINE AS THE BASE FOR A SWITCHING NODE.

BECHER, WILLIAM D., ERIC M. AUPPERLE, THE COMMUNICATIONS COMPUTER HARDWARE OF THE MERIT COMPUTER NETWORK, (MICHIGAN, UNIV. OF, DEARBORN, ENGINEERING DIV., MICHIGAN, UNIV. OF, ANN ARBOR, DEPT. OF ELECTRICAL ENGINEERING).
IEEE TRANSACTIONS ON COMMUNICATIONS, VOL COM-20, ISSUE 3, JUN 72, P 516-526, 11 REFS

THIS ARTICLE DESCRIBES THE COMMUNICATIONS COMPUTER AND RELATED INTERFACES FOR THE MERIT COMPUTER NETWORK. THE MERIT NETWORK INTERCONNECTS THREE MICHIGAN UNIVERSITIES VIA DIALABLE VOICE-GRADE PHONE LINES. THE UNIVERSITY CENTERS ARE AUTONOMOUS AND INCLUDE TWO IBM 360 SYSTEMS AND A CDC 6600. THE COMMUNICATIONS COMPUTER IS A PDP-11. DETAILS OF THE HOST AND COMMUNICATIONS INTERFACES ARE PRESENTED.

BINDER, RICHARD, MULTIPLEXING IN THE ALOHA SYSTEM: MENEHUNE - KEIKI DESIGN CONSIDERATIONS, HAWAII, UNIV. OF, HONOLULU, NOV 69, HU TR-B69-3, AF F44620-69-C-0030, 41P, 4 REFS

A COMMUNICATIONS FRONT END IS DESCRIBED USING A TECHNOLOGY SIMILAR TO THAT OF THE ARPANET INTERFACE MESSAGE PROCESSOR. THE COMMUNICATIONS PROTOCOL IS SIMPLE WITH FIXED MESSAGE LENGTHS AND A ONE-WAY (FRONT END TO TERMINAL) ACKNOWLEDGEMENT SCHEME. THE OTHER SIGNIFICANT CONCEPTS IN ALOHA, NAMELY THE REPLACEMENT OF WIRE BY A RADIO CHANNEL AND THE RANDOM ACCESS CHANNEL, ARE VERY WELL DESCRIBED IN THE ABRAMSON ARTICLE "THE ALOHA SYSTEM" IN CATEGORY 3.2.1.

BURCHFIEL, J., P. TOMLINSON, M. BEELER, FUNCTIONS AND STRUCTURE OF A PACKET RADIO STATION, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA).
AFIPS CONFERENCE PROCEEDINGS. VOLUME 44. 1975. NATIONAL COMPUTER CONFERENCE. (ANAHEIM, CA. MAY 19-22, 1975). AFIPS PRESS. MONTVALE, NJ. 1975. (LC 55-44701). P 245-251. 10 REFS

A STATION IS THE ELEMENT OF A PACKET RADIO NETWORK RESPONSIBLE FOR OVERALL MANAGEMENT INCLUDING ROUTING, STATISTICAL ANALYSIS, LOGGING, AND DATA ENCRYPTION. CONTROL FUNCTIONS AND PROTOCOLS ARE DISCUSSED.

BURNER, M. B., R. MILLION, O. W. RICHARD, J. S. SOBOLEWSKI, THE USE OF A SMALL COMPUTER AS A TERMINAL CONTROLLER FOR A LARGE COMPUTING SYSTEM. (WASHINGTON, STATE UNIV. OF, PULLMAN).
AFIPS PROCEEDINGS. 1969 SPRING JOINT COMPUTER CONFERENCE. VOLUME 34. (BOSTON, MA. MAY 14-16, 1969). AFIPS PRESS. MONTVALE, NJ, 1969, AFIPS CONFERENCE PROCEEDINGS. (LC 55-44701). P 775-776

THIS ARTICLE BRIEFLY DESCRIBES THE USE OF AN INTERDATA MODEL 3 TO REPLACE AN IBM 2702 TERMINAL CONTROL UNIT.

CARTER, W. C., RELIABILITY TECHNIQUES APPLICABLE TO MESSAGE PROCESSORS. (INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY, THOMAS J. WATSON RESEARCH CENTER).
DATA NETWORKS: ANALYSIS AND DESIGN. THIRD DATA COMMUNICATIONS SYMPOSIUM. (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 157-158, 9 REFS

THE AUTHOR DISCUSSES FAULT TOLERANT COMPUTERS. SOME OF THE TECHNIQUES ADDRESSED ARE: OFF-LINE FAULT DETECTION, ON-LINE FAULT DETECTION, RECOVERY, FAULT-AVOIDANCE TECHNIQUES, AND MODELING.

CLOSS, FELIX, PACKET ARRIVAL AND BUFFER STATISTICS IN A PACKET SWITCHING NODE, (IBM RESEARCH LAB., ZURICH, (SWITZERLAND), DATA COMMUNICATIONS CENTER).
DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 12-17, 10 REFS

THE AUTHOR REPORTS ON THE INVESTIGATION OF A MODEL FOR A PACKET SWITCHING NODE. FIRST, THE STATISTICS OF PACKET ARRIVAL AT A TRUNK ARE ANALYZED. THEN THESE STATISTICS ARE USED FOR AN APPROXIMATE ANALYSIS OF BUFFER REQUIREMENTS AND OVERFLOW PROBABILITIES.

CROWTHER, W., J. MCQUILLAN, D. WALDEN, RELIABILITY ISSUES IN THE ARPA NETWORK, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA).
DATA NETWORKS: ANALYSIS AND DESIGN, THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST, PETERSBURG, FL, NOVEMBER 13-15, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE CN-73-CH0828-4C, P 159-160, 5 REFS

THE COMMUNICATIONS SUBNET OF THE ARPA NETWORK CONSISTS OF INTERFACE MESSAGE PROCESSORS (IMPS) CONNECTED TOGETHER BY WIDE-BAND COMMUNICATIONS CIRCUITS. BOTH THE IMP'S AND THE CIRCUITS OCCASIONALLY FAIL. THE REPORT DISCUSSES SOME OF THE TECHNIQUES EMPLOYED TO MINIMIZE THE EFFECTS OF COMPONENT FAILURES.

ORR, ERVIN K., A MULTIPLE MINICOMPUTER MESSAGE SWITCHING SYSTEM, (COMPUTER COMMUNICATIONS INC., CULVER CITY, CA).
COMPUTER DESIGN, VOL 11, ISSUE 4, APR 72, P 67-73

HAVING FOUND MINICOMPUTERS TO BE IDEALLY SUITED FOR A VARIETY OF MESSAGE-SWITCHING AND FRONT-END COMMUNICATIONS TASKS, THE TREND IS NOW TO ASSIGN THEM ADDITIONAL TASKS. THIS ARTICLE DESCRIBES SUCH AN APPROACH BASED ON A MULTI-PROCESSOR MINICOMPUTER SYSTEM. EACH PROCESSOR IN THE COMPLEX IS DEDICATED TO A PARTICULAR SET OF FUNCTIONS, RATHER THAN BEING DYNAMICALLY ALLOCATED TO TASKS. AN ADDITIONAL SINGLE PROCESSOR IN THE SYSTEM CAN ACT AS BACKUP FOR ANY OF THE OTHERS.

ELLIS, T. O., E. F. HAPSLEM, JOHN F. HEAFNER, K. U. UNCAPHER, ARPA NETWORK SERIES: I. INTRODUCTION TO THE ARPA NETWORK AT RAND AND TO THE RAND VIDEO GRAPHICS SYSTEM, RAND CORP., SANTA MONICA, CA, SEP 71, RC R-664-ARPA, ARPA DAHC-15-67-C-0141, (AD-733 049), 48P, 32 REFS
(ANNOTATION UNDER 3.1.0)

FAYDLLE, G., ERDL GELENBE, J. LABETOULLE, D. BASTIN, THE STABILITY PROBLEM OF BROADCAST PACKET SWITCHING COMPUTER NETWORKS, (IRIA-LABORIA, ROCQUENCOURT, (FRANCE)),
GELENBE, ERDL, ROBERT MAHL, COMPUTER ARCHITECTURES AND NETWORKS, MODELLING AND EVALUATION, (AUGUST 12-14, 1974), AMERICAN ELSEVIER PUBLISHING CO. INC., NEW YORK, 1974, (LC 74-83728), P 135-140, 10 REFS

DUE TO THE INEFFICIENCY OF ALLOCATING A LARGE NUMBER OF LOW CAPACITY CHANNELS TO A LARGE SET OF USER PAIRS TRANSMITTING DATA TO EACH OTHER, COMPARED TO THE SHARING OF A HIGH SPEED CHANNEL BETWEEN THE ENSEMBLE OF USERS, VARIOUS FORMS OF PACKET SWITCHING SCHEMES HAVE BEEN SUGGESTED AND IMPLEMENTED IN THE ARPA, CYCLADES AND ALOHA COMPUTER NETWORKS. THIS PAPER IS CONCERNED WITH NETWORKS USING RADIO CHANNELS FOR PACKET SWITCHING SIMILAR TO THE APPROACH TAKEN IN THE ALOHA NETWORK. THE PAPER PRESENTS A SIMPLE MATHEMATICAL MODEL OF THE BROADCAST CHANNEL FOLLOWED BY A PROOF OF THE INSTABILITY OF THE INFINITE POPULATION SLOTTED BROADCAST CHANNEL. THE RESULT PRESENTED CONFIRMS THE DISCUSSION BASED ON "FLUID APPROXIMATION" AND THE SIMULATIONS OF KLEINROCK AND LAM AS DISCUSSED IN THEIR ARTICLE "PACKET SWITCHING IN A SLOTTED SATELLITE CHANNEL", NATIONAL COMPUTER CONFERENCE, AFIPS CONFERENCE PROCEEDINGS, 1973.

FUCHEL, KURT, SIDNEY HELLER, TWO DISSIMILAR NETWORKS - IS MARRIAGE POSSIBLE?, (BROOKHAVEN NATIONAL LAB., UPTON, NY,

3.3.2 PROCESSORS

DEPT. OF APPLIED MATHEMATICS).
PROCEEDINGS OF THE 1975 SYMPOSIUM-COMPUTER NETWORKS: TRENDS AND APPLICATIONS. (GAITHERSBURG, MD, JUNE 18, 1975). INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975. 75CH0973-8C. P 19-24, 10 REFS

THIS PAPER CONSIDERS THE PROBLEM OF TYING TOGETHER TWO DISSIMILAR NETWORKS. THE TWO UNDER CONSIDERATION ARE BROOKNET AND ARPANET. EACH NETWORK IS BRIEFLY DESCRIBED AND THEN CONTRASTED WITH THE OTHER. THE APPROACH SUGGESTED INVOLVES A LARGE MINICOMPUTER, SUCH AS A PDP-11 OR CDC 3200 WHICH WOULD PLAY THE ROLE OF VDH AND INCLUDE SOFTWARE FOR BOTH ARPANET AND BROCKNET.
ALTHOUGH THE DISCUSSION IS SPECIFICALLY ABOUT BROOKNET, THE AUTHORS FEEL THAT IT APPLIES EQUALLY WELL TO ANY HIGH SPEED CENTRAL NODE NETWORK.
(ALSO UNDER 3.1.0)

HEART, F. E., S. M. ORNSTEIN, W. R. CROWTHER, W. B. BARKER, A NEW MINICOMPUTER/MULTIPROCESSOR FOR THE ARPA NETWORK, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA), AFIPS CONFERENCE PROCEEDINGS, VOLUME 42, 1973, NATIONAL COMPUTER CONFERENCE AND EXPOSITION, (NEW YORK, NY, JUNE 4-8, 1973), AFIPS PRESS, MONTVALE, NJ, 1973, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 529-537, 31 REFS

A NEW MINICOMPUTER/MULTIPROCESSOR IS DESCRIBED. UNIQUE FEATURES OF THE HARDWARE DESIGN AND SOFTWARE ORGANIZATION INCLUDE: AN EXPANDABLE NUMBER OF IDENTICAL PROCESSORS EACH WITH 'PRIVATE' MEMORY; SHARED MEMORY AND I/O EQUIPMENT CONTROLLABLE BY ANY PROCESSOR; A MODULAR SCHEME FOR INTERCONNECTING PROCESSORS; AND THE ABSENCE OF AN EXECUTIVE SYSTEM, WITH EACH PROCESSOR DETERMINING ITS OWN TASK ALLOCATION. THE AUTHORS BELIEVE THAT THIS SYSTEM MAY OFFER SIGNIFICANT ADVANTAGES IN MODULARITY, RELIABILITY AND COST/PERFORMANCE.

HEBDITCH, D. L., SOFTWARE DISPERSION: THE MINICOMPUTER IN DATA COMMUNICATIONS,(PRESENTED AT, SOFTWARE 72, CANTERBURY, (ENGLAND), JULY 24-26, 1972), (PLIENER ASSOCIATES LTD., LEEDS, (ENGLAND)),
VARIOUS ARTICLES AND PAPERS, 1972, 15P, 11 REFS

THIS IS A REASONABLY GOOD TREATMENT OF THE VARIETY OF APPLICATIONS OF MINICOMPUTERS IN DATA COMMUNICATIONS SYSTEMS. THE EMPHASIS IS ON PROGRAMMING CONSIDERATIONS FOR MINICOMPUTERS TO PERFORM COMMUNICATIONS CONTROL TASKS. INCLUDED IS SOME SPECULATION ON THE LIKELY EFFECT OF MINICOMPUTERS AS COMMUNICATIONS CONTROLLERS ON EXISTING CPU COMMUNICATIONS CONTROL SOFTWARE.
(ALSO UNDER 3.4.1)

HOLMES, JAMES F., SPECIFYING A MESSAGE-SWITCHING COMPUTER, (BOOZ, ALLEN AND HAMILTON), CONTROL ENGINEERING, VOL 12, ISSUE 2, FEB 65, P 89-92, 4 REFS

A SET OF SPECIFICATIONS IS PRESENTED FOR A MESSAGE SWITCHING COMPUTER DESIGNED TO TRANSFER DATA VARYING IN CODE, PRIORITY, AND SPEED AMONG DIFFERENT INPUT AND OUTPUT DEVICES. A SHORT JUSTIFICATION FOLLOWS EACH ELEMENT OF THE SPECIFICATION.

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK, QUARTERLY TECHNICAL REPORT NO. 3, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, OCT 73, 1 JUL-30 SEP 73, AF F08606-73-C-0027, (88NI R-2667), 20P
(ANNOTATION UNDER 3.1.1)

KAHN, ROBERT E., TERMINAL ACCESS TO THE ARPA COMPUTER NETWORK, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA), RUSTIN, RANDALL, COURANT COMPUTER SCIENCE SYMPOSIUM 3, COMPUTER NETWORKS, (NOVEMBER 30-DECEMBER 1, 1970), PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1972, PRENTICE-HALL SERIES IN AUTOMATIC COMPUTATION, (LC 79-39373), P 147-166

THIS PAPER DESCRIBES SOME OF THE FEATURES OF THE TERMINAL INTERFACE MESSAGE PROCESSOR (TIP) FOR THE ARPANET. TERMINALS ARE ABLE TO CONNECT TO THE ARPANET DIRECTLY THROUGH THE TIP WITHOUT THE NECESSITY OF A HOST COMPUTER. SOME INTERESTING QUESTIONS AND ANSWERS CONCERNING ERROR HANDLING ON THE ARPANET ARE INCLUDED.

KIRSTEIN, PETER T., UNIVERSITY COLLEGE, LONDON, ARPANET PROJECT, ANNUAL REPORT, UNIVERSITY COLLEGE, LONDON, (ENGLAND), DEPT. OF STATISTICS AND COMPUTER SCIENCE, DEC 74, 1 JUL 73-30 SEP 74, UC TR-17, ONR N00014-74-C-2080, 59P, 24 REFS
(ANNOTATION UNDER 3.1.1)

NEWPORT, C. B., SMALL COMPUTERS IN DATA NETWORKS, (HONEYWELL INC., FRAMINGHAM, MA), AFIPS PROCEEDINGS, 1969 SPRING JOINT COMPUTER CONFERENCE, VOLUME 34, (BOSTON, MA, MAY 14-16, 1969), AFIPS PRESS, MONTVALE, NJ, 1969, AFIPS CONFERENCE PROCEEDINGS, (LC 85-44701), P 773-775

THE USE OF A MINICOMPUTER AS A REMOTE CONCENTRATOR IN THE AMERICAN AIRLINES SABRE SYSTEM AND AS A COMMUNICATIONS CONTROLLER IN A HONEYWELL H-1648 TIME-SHARING SYSTEM IS BRIEFLY DESCRIBED. IT IS AN INTERESTING, BUT DATED, REPORT.

ORNSTEIN, S. M., FRANK E. HEART, WILLIAM R. CROWTHER, H. K. RISING, S. B. RUSSELL, A. MICHEL, THE TERMINAL IMP FOR THE ARPA COMPUTER NETWORK, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA), AFIPS CONFERENCE, 1972 SPRING JOINT COMPUTER CONFERENCE, VOLUME 40, (ATLANTIC CITY, NJ, MAY 16-18, 1972), AFIPS PRESS, MONTVALE, NJ, 1972, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 243-254, 15 REFS

THE TERMINAL INTERFACE MESSAGE PROCESSOR (TIP) FOR THE ARPANET IS DESCRIBED. THE TIP PERMITS DIRECT TERMINAL ACCESS TO THE NETWORK, I.E., THE NETWORK CAN BE ACCESSED BY A TERMINAL USER WITHOUT A HOST COMPUTER. THE TIP IS ACTUALLY AN IMP (INTERFACE MESSAGE PROCESSOR) WITH THE ADDITION OF A MULTI-LINE CONTROLLER (MLC) TOGETHER WITH ADDITIONAL CORE AND SOFTWARE WHICH ALLOWS FOR THE CONNECTION OF TERMINALS TO THE IMP.

RETZ, DAVID L., OPERATING SYSTEM DESIGN CONSIDERATIONS FOR THE PACKET-SWITCHING ENVIRONMENT, (SPEECH COMMUNICATIONS RESEARCH LAB. INC., SANTA BARBARA, CA), AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 155-160, 22 REFS
(ANNOTATION UNDER 3.0)

3.3.9 OTHER

BELL, C. GORDON, ROBERT C. CHEN, SAMUEL H. FULLER, JOHN GRASON, SATISH REGE, DANIEL P. SIEWIOREK, THE ARCHITECTURE AND APPLICATIONS OF COMPUTER MODULES: A SET OF COMPONENTS FOR DIGITAL SYSTEMS DESIGN, (DIGITAL EQUIPMENT CORP., MAYNARD, MA, CARNEGIE-MELLON UNIV., PITTSBURGH, PA, DEPTS. OF COMPUTER SCIENCE AND ELECTRICAL ENGINEERING), COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 177-180, 14 REFS

THIS PAPER DISCUSSES THE DESIGN AND USE OF SYSTEM-BUILDING MODULES, CALLED COMPUTER MODULES (CMS). EACH CM CONSISTS OF A PROCESSOR, MEMORY, AND PARTS WHICH HANDLE SUCH OPERATIONS AS HANDSHAKING AND BUFFERING. THE ARCHITECTURE OF CMS, AND THEIR APPLICATIONS ARE DESCRIBED.

GENTILE, R. B., J. R. LUCAS, JR., THE TABLON MASS STORAGE NETWORK, (DEPARTMENT OF DEFENSE, WASHINGTON, DC), AFIPS CONFERENCE PROCEEDINGS, VOLUME 38, 1971, SPRING JOINT COMPUTER CONFERENCE, (ATLANTIC CITY, NJ, MAY 18-20, 1971), AFIPS PRESS, MONTVALE, NJ, 1971, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 345-356, 6 REFS

THE TABLON MASS STORAGE NETWORK WHICH PROVIDES SEVERAL TRILLION BITS OF ON-LINE STORAGE TO A NUMBER OF DISSIMILAR COMPUTERS CONNECTED TO THE NETWORK IS DESCRIBED. USER COMPUTERS, LOCAL OR REMOTE, SHARE THE COMMON STORAGE SYSTEM, WHICH INCORPORATES A PAIR OF PDP-10'S FOR NETWORK CONTROL, AN AMPEX TERABIT MEMORY, AND TWO IBM 1360 PHOTO STORAGE SYSTEMS. ALL COMPONENTS OF THE MASS STORAGE SYSTEM AND THE CONTROL SOFTWARE ARE DESCRIBED IN DETAIL.
(ALSO UNDER 4.3)

ROBERTS, LAWRENCE G., EXTENSIONS OF PACKET COMMUNICATION TECHNOLOGY TO A HAND HELD PERSONAL TERMINAL, (ADVANCED RESEARCH PROJECTS AGENCY, WASHINGTON, DC), AFIPS CONFERENCE, 1972 SPRING JOINT COMPUTER CONFERENCE, VOLUME 40, (ATLANTIC CITY, NJ, MAY 16-18, 1972), AFIPS PRESS, MONTVALE, NJ, 1972, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 295-298, 11 REFS

THE FEASIBILITY OF A HAND HELD PERSONAL TERMINAL IS DISCUSSED AND ITS METHOD OF TRANSMITTING AND RECEIVING DATA USING RANDOM ACCESS RADIO TRANSMISSION TECHNIQUES IS DESCRIBED. THE TERMINAL AND ITS FUNCTIONAL CHARACTERISTICS ARE DESCRIBED IN DETAIL. THE PACKET COMMUNICATION TECHNOLOGY FOR THE TERMINAL WAS DEVELOPED UNDER THE ARPANET PROJECT.

VAN DAM, ANDRIES, GEORGE M. STABLER, INTELLIGENT SATELLITES FOR INTERACTIVE GRAPHICS, (BROWN UNIV., PROVIDENCE, RI), AFIPS CONFERENCE PROCEEDINGS, VOLUME 42, 1973, NATIONAL COMPUTER CONFERENCE AND EXPOSITION, (NEW YORK, NY, JUNE 4-8, 1973), AFIPS PRESS, MONTVALE, NJ, 1973, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 229-238, 31 REFS

3.3.9 OTHER

AN INTELLIGENT SATELLITE TERMINAL IS DEFINED AS A TERMINAL DEVICE CONTAINING A GENERAL PURPOSE COMPUTER WHICH IS EASILY ACCESSIBLE TO THE ORDINARY USER FOR ANY PURPOSE AND PROGRAM. THE AUTHORS INVESTIGATE INTELLIGENT SATELLITE COMPUTING, DESIGN FEATURES FOR SATELLITE CONFIGURATIONS, SOFTWARE STRATEGIES AND APPLICATIONS. THE BROWN UNIVERSITY GRAPHICS SYSTEM (BUGS) IS DESCRIBED.

3.4.0 GENERAL

BLANC, ROBERT P., REVIEW OF COMPUTER NETWORKING TECHNOLOGY, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY, JAN 74, NBS TN-804, NSF AG-350, 135P, 41 REFS
(ANNOTATION UNDER 1.3)

COCANOWER, ALFRED B., MERIT COMPUTER NETWORK: SOFTWARE CONSIDERATIONS, (MICHIGAN, UNIV. OF., ANN ARBOR), RUSTIN, RANDALL, COURANT COMPUTER SCIENCE SYMPOSIUM 3, COMPUTER NETWORKS, (NOVEMBER 30-DECEMBER 1, 1970), PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1972, PRENTICE-HALL SERIES IN AUTOMATIC COMPUTATION, (LC 79-39373), P 65-77, 1 REFS
(ANNOTATION UNDER 3.1.1)

FARBER, DAVID J., KENNETH C. LARSON, THE STRUCTURE OF A DISTRIBUTED COMPUTING SYSTEM--SOFTWARE, (PRESENTED AT, SYMPOSIUM ON COMPUTER-COMMUNICATIONS NETWORKS AND TELETRAFFIC, 1972), CALIFORNIA, UNIV. OF, IRVINE, 1972, NSF GJ-1045, 17P, 2 REFS

THIS WELL PREPARED DESCRIPTION OF A DISTRIBUTED NETWORK OF SMALL COMPUTERS ORGANIZED IN A RING CONFIGURATION UTILIZING HIGH BANDWIDTH COMMUNICATION CIRCUITS DESCRIBES BOTH HARDWARE AND SOFTWARE, MESSAGE ADDRESSING BETWEEN PROCESSES WITHIN ONE CPU OR BETWEEN CPU'S IS HANDLED IN A GENERAL, WELL-THOUGHT-OUT MANNER. SIMULATION AND PROTOTYPE IMPLEMENTATION OF THE NETWORK HAS ALREADY BEGUN.
(ALSO UNDER 5.6)

SOMIA, MONIQUE M., SUPER SYSTEM OR SUBSYSTEM IN A DISTRIBUTED COMPUTER NETWORK, (INTERNATIONAL BUSINESS MACHINES CORP., PARIS, 1FRANCE)),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 315-323, 16 REFS

THE AIM OF THIS PAPER IS TO STUDY THE LOGICAL STRUCTURES WHICH CAN LINK, IN A DISTRIBUTED COMPUTER NETWORK, THE SET OF SOFTWARE FACILITIES DEDICATED TO THE NETWORK, TO THE NORMAL CONTROL SYSTEMS WHICH MANAGE THE DIFFERENT COMPUTERS OF THE NETWORK. TWO ALTERNATE STRUCTURES ARE STUDIED: A NETWORK SYSTEM WHICH IS A SURER SYSTEM, THE COMPONENTS OF WHICH ARE THE LOCAL CONTROL SYSTEMS, AND A NETWORK SYSTEM WHICH IS ON EACH COMPUTER, A SUBSYSTEM OF THE LOCAL CONTROL SYSTEM.

SOMIA, MONIQUE, THE APPROACH OF SOFTWARE PROBLEMS IN THE SOC EXPERIMENTAL COMPUTER NETWORK, (IBM-FRANCE, PARIS), WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 390-396, 10 REFS

THE SOFTWARE FACILITIES PROVIDED THE USER OF THE SOC SYSTEM (FRENCH ABBREVIATION FOR CONNECTED COMPUTER SYSTEM) ARE DESCRIBED. THE NETWORK CONNECTS, IN A DISTRIBUTED FASHION, SIX IBM 360'S (DIFFERENT MODELS) THROUGH THEIR 2701 INTERFACES. A NETWORK CONTROL LANGUAGE IS DESCRIBED WHICH SUPPORTS FILE COPYING AND TRANSMISSION OF JOBS TO REMOTE COMPUTERS AND IS APPARENTLY LIMITED TO USE ON IBM 360'S RUNNING UNDER THE 'OS' OPERATING SYSTEM.

WECKER, STUART, A DESIGN FOR A MULTIPLE PROCESSOR OPERATING ENVIRONMENT, (DIGITAL EQUIPMENT CORP., MAYNARD, MA), COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 143-146, 14 REFS

AN OPERATING SYSTEM DESIGN FOR MULTIPLE PROCESSOR HARDWARE CONFIGURATIONS WITH A UNIFIED COMMUNICATION STRUCTURE FOR INFORMATION EXCHANGE IS PRESENTED. LINKED HARDWARE CONFIGURATIONS OF PROCESSORS, THE COMMUNICATIONS PROBLEMS OF THESE SYSTEMS, AND A GENERAL DESIGN FOR AN OPERATING SYSTEM FOR MULTIPLE PROCESSOR HARDWARE ARE DISCUSSED. THE GOAL OF THIS PAPER IS TO SHOW THAT THERE IS A TECHNIQUE WHICH CAN BE UTILIZED TO BUILD 'CLEANLY INTERFACED OPERATING SYSTEMS FOR MULTIPLE PROCESSOR ENVIRONMENTS.'
(ALSO UNDER 3.2.2)

WILKINSON, P. T., R. A. SCANTLEBURY, THE CONTROL FUNCTIONS IN A LOCAL DATA NETWORK, (NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND)),
INFORMATION PROCESSING 68: PROCEEDINGS OF IFIP CONGRESS 1968, VOLUME 2--HARDWARE, APPLICATIONS, (EDINBURGH, (SCOTLAND), AUGUST 5-10, 1968), NORTH-HOLLAND PUBLISHING CO., AMSTERDAM, (NETHERLANDS), 1969, IFIP CONGRESS PROCEEDINGS, (LC 65-24118), P 734-738, 3 REFS

THE OPERATING PRINCIPLES OF A PROPOSED INTERFACE COMPUTER AND FACILITIES THAT IT SHOULD OFFER IN RELATION TO A NATIONAL NETWORK ARE DESCRIBED. THE INTERFACE COMPUTER CONTROLS THE LOCAL NETWORK AND ACTS AS THE INTERFACE BETWEEN THE LOCAL AND NATIONAL NETWORKS. THE NETWORK CONCEPT IS A STORE-AND-FORWARD SYSTEM CONNECTING A NUMBER OF LOCAL OR REGIONAL NETWORKS. THE REGIONAL NETS JOIN A NUMBER OF SUBSCRIBER TERMINALS WITHIN A GEOGRAPHICAL REGION.

WILKINSON, P. T., A MODEL FOR THE LOCAL AREA OF A DATA COMMUNICATION NETWORK--SOFTWARE ORGANIZATION, NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), DIV. OF COMPUTER SCIENCE, OCT 69, NPL-DCS COM-SCI-T.M.29, 20P, 6 REFS
(ANNOTATION UNDER 3.1.1)

3.4.1 COMMUNICATIONS

BRANCH, JACK, DEFINE YOUR MESSAGE SWITCHING SOFTWARE NEEDS BEFORE YOU BUY, (INCOTEL LTD., NEW YORK),
COMPUTER DECISIONS, VOL 4, ISSUE 6, JUN 72, P 37-39

THIS BRIEF 'COOKBOOK' ARTICLE GIVES A SUGGESTED PROCEDURE FOR SPECIFYING MESSAGE-SWITCHING SOFTWARE: 1. DEFINE THE SYSTEM'S PURPOSE, 2. DETERMINE THE TYPES AND NUMBERS OF CIRCUITS NEEDED, 3. SPECIFY MESSAGE FORMATS, 4. ESTIMATE MESSAGE STATISTICS, 5. DESIGN A HANDLING METHOD FOR MESSAGES WITH IMPROPER FORMAT, 6. LIST ROUTING REQUIREMENTS, 7. LIST ALTERNATE ROUTING NEEDS, 8. PROVIDE MESSAGE PROTECTION DATA, 9. LIST REQUIREMENTS FOR A JOURNAL OF MESSAGE STATISTICS, 10. STATE MESSAGE RETRIEVAL NEEDS. THE TREATMENT IS SOMEWHAT SUPERFICIAL.

DESPRES, REMI F., A RACKET SWITCHING NETWORK WITH GRACEFUL SATURATED OPERATION, (CENTRE, NATIONAL D'ETUDES DES TELECOMMUNICATIONS (CNET), ISSY LES MOULINEAUX, (FRANCE)),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 345-351, 14 REFS
(ANNOTATION UNDER 3.2.2)

HEBDITCH, D. L., SOFTWARE DISPERSION: THE MINICOMPUTER IN DATA COMMUNICATIONS,(PRESENTED AT, SOFTWARE 72, CANTERBURY, (ENGLAND), JULY 24-26, 1972), (PLIENER ASSOCIATES LTD., LEEDS, (ENGLAND)),
VARIOUS ARTICLES AND PAPERS, 1972, ISP, 11 REFS
(ANNOTATION UNDER 3.3.2)

KAHN, ROBERT E., WILLIAM R. CROWTHER, FLOW CONTROL IN A RESOURCE-SHARING COMPUTER NETWORK, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA),
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71C59-C, P 108-116, 13 REFS

THIS PAPER IS A TECHNICAL DISCUSSION DEVOTED TO NETWORK FLOW CONTROL, SPECIFICALLY IN RELATION TO THE ARPANET, AND IS PARTICULARLY CONCERNED WITH LOCKOUT AND LOCKOUT PREVENTION. SOURCE/DESTINATION FLOW CONTROL IS DISCUSSED FIRST AND THE MANIPULATION OF REASSEMBLY BUFFERS, RFNM'S (REQUEST FOR NEXT MESSAGE), AND PRIORITY HANDLING ARE EXPLAINED AND THEIR USE IN REASSEMBLY LOCKOUT IS DETAILED. STORE AND FORWARD FLOW CONTROL IS THEN CONSIDERED, INCLUDING LOCKOUT PROBLEMS AND SOLUTIONS USING BUFFER ALLOCATION, ACKNOWLEDGEMENT SCHEMES, AND OVERFLOW BUFFER ALLOTMENT.

OLIVER, PAUL, DESIGN SPECIFICATIONS FOR A GENERALIZED TELEPROCESSING SYSTEM, (SPERRY RAND CORP., WASHINGTON, DC, UNIVAC DIV.),
IAG JOURNAL, VOL 4, ISSUE 4, 1971, P 350-359, 3 REFS

A TELEPROCESSING SYSTEM IS SPECIFIED WHICH IS DESIGNED TO ALLOW ANY APPLICATION OR SYSTEMS PROGRAM TO CONNECT TO

3.4.1 COMMUNICATIONS

ANY TERMINAL DEVICE. THE TELEPROCESSING SYSTEM SOFTWARE MODULES ARE FUNCTIONALLY DESCRIBED, INCLUDING A DISCUSSION OF THE *DESCRIPTOR LIBRARY* WHICH CONTAINS INFORMATION NECESSARY FOR THE PROPER HANDLING OF DIFFERENT TERMINAL TYPES.

RETZ, DAVID L., ELF--A SYSTEM FOR NETWORK ACCESS, (SPEECH COMMUNICATIONS RESEARCH LAB., INC., SANTA BARBARA, CA), 1975 IEEE INTERCON CONFERENCE RECORD, (NEW YORK, APRIL 8-10, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, P 2S-2-1--2S-2-5, 8 REFS

THIS PAPER DESCRIBES THE STRUCTURAL ASPECTS OF ELF AS A SYSTEM FOR NETWORK ACCESS, AND PRESENTS A FUNCTIONAL VIEW OF USER SERVICES PROVIDED BY THE SYSTEM. A GENERAL DISCUSSION OF ARPANET PROTOCOL STRUCTURE IS ALSO INCLUDED.

RETZ, DAVID L., OPERATING SYSTEM DESIGN CONSIDERATIONS FOR THE PACKET-SWITCHING ENVIRONMENT, (SPEECH COMMUNICATIONS RESEARCH LAB., INC., SANTA BARBARA, CA), AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 155-160, 22 REFS
(ANNOTATION UNDER 3.0)

3.4.2 OPERATING SYSTEMS

AKKOYUNLU, E., A. BERNSTEIN, R. SCHANTZ, SOFTWARE COMMUNICATION ACROSS MACHINE BOUNDARIES, (NEW YORK, STATE UNIV. OF, STONY BROOK), COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, *COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?*, (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 203-205, 3 REFS

A SOFTWARE COMMUNICATION FACILITY FOR AN OPERATING SYSTEM WHICH IS PART OF A NETWORK IS DESCRIBED. DATA PORTS ARE INTRODUCED AS A WAY OF CONTROLLING INFORMATION FLOW BETWEEN TWO PROCESSES IN AN ORDERLY FASHION. THE PURPOSE OF THIS SYSTEM IS TO ALLOW A USER PROCESS IN THE NETWORK ENVIRONMENT TO CONTROL THE FLOW OF INFORMATION BETWEEN IT AND OTHER OBJECTS IN THE SYSTEM (FILES OR OTHER PROCESSES).

BENOIT, JOHN W., E. PEREZ, DESIGN SPECIFICATIONS FOR PWIN NON-FUNCTIONAL NETWORK CONTROL SOFTWARE, MITRE CORP., WASHINGTON, DC, 30 JUN 72, MC WP-9858, AF F19628-71-C-0002, 245P, 4 REFS

THIS DOCUMENT CONTAINS THE DESIGN SPECIFICATIONS FOR THE NETWORK CONTROL SOFTWARE TO BE IMPLEMENTED ON THE HONEYWELL 6000 SERIES COMPUTERS FOR THE INITIAL PHASE OF THE PROTOTYPE WWMCCS (WORLD WIDE MILITARY COMMAND AND CONTROL SYSTEM) INTERCOMPUTER NETWORK. THIS NETWORK IS MODELED ON THE ARPA NETWORK, AND THIS DOCUMENT DESCRIBES IN DETAIL THE DESIGN OF THE NETWORK CONTROL PROGRAM. OF POSSIBLE INTEREST IS THE DESIGN DECISION TO LOCATE THE IMP INTERFACE SOFTWARE IN A FRONT-END COMPUTER (DATANET 355) WHILE THE SOFTWARE TO IMPLEMENT THE PROTOCOLS AND PROVIDE INTER-PROCESS COMMUNICATIONS IS LOCATED IN THE MAINFRAME.

FREDERICKSEN, O., R. W. RYNIKER, A COMPUTER NETWORK INTERFACE FOR OS/MVT, INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY, THOMAS J. WATSON RESEARCH CENTER, 5 APR 71, IBM-TJWRC RC-3317, 13P

SOFTWARE IMPLEMENTED UNDER OS/MVT (OPERATING SYSTEM FOR THE IBM 360/370) TO PROVIDE NETWORK FUNCTIONS FOR USER PROGRAMS IS DESCRIBED. THE REPORT PRESENTS A GENERAL DISCUSSION OF THE STRUCTURE OF THAT SOFTWARE. ITS RELATIONSHIP TO THE OPERATING SYSTEM AND THE DESIGN DECISIONS WHICH WERE MADE TO PROVIDE FOR CONVERSATIONAL COMMUNICATION AND THE TRANSFER OF JOBS AND DATA SETS BETWEEN SYSTEMS.

HADDON, B. K., M. W. WHITELAW, AN OPERATING SYSTEM FOR A COMPUTER NETWORK, (SYDNEY, UNIV. OF, (AUSTRALIA)), PROCEEDINGS OF FOURTH AUSTRALIAN COMPUTER CONFERENCE, VOLUME I, (ADELAIDE, (AUSTRALIA), AUGUST 11-15, 1969), GRIFFIN PRESS, NETLEY, (SOUTH AUSTRALIA), 1969, P 255-260, 12 REFS
(ANNOTATION UNDER 3.1.1)

METCALFE, ROBERT M., STRATEGIES FOR OPERATING SYSTEMS IN COMPUTER NETWORKS, (MASSACHUSETTS INST. OF TECH., CAMBRIDGE, PROJECT MAC), 1972 PROCEEDINGS OF THE ACM, VOLUME 1, (BOSTON, MA, AUGUST 1972), ASSOCIATION FOR COMPUTING MACHINERY, NEW YORK, 1972, P 278-281, 16 REFS

IN THIS SHORT BUT INFORMATIVE PAPER THREE STRATEGIES FOR CONSIDERATION IN THE FUTURE DEVELOPMENT OF OPERATING SYSTEMS WHICH WILL MAKE THEM MORE AMENABLE TO NETWORKING ARE DEVELOPED. FIRST, SYSTEMS SHOULD BE MORE CAPABLE OF DETECTING AND RECOVERING FROM COMPONENT MALFUNCTIONS. IT IS POINTED OUT THAT IN THE ARPANET AT THE HOST LEVEL REQUESTS FROM THE IMP FOR HOST RETRANSMISSION SOMETIMES RESULT IN CRASHES. SECOND, SINCE CONTROL PROGRAMS IN THE HOSTS RUN AS DAEMONS (BACKGROUND PROCESSES RESPONSIBLE FOR RECURRING EVENTS IN SYSTEMS SERVICES), OPERATING SYSTEMS SHOULD ALLOW DAEMONS TO FUNCTION EFFICIENTLY. THIRD, INTERPROCESS COMMUNICATION IN AN OPERATING SYSTEM SHOULD BE THROUGH *THIN WIRE* COMMUNICATIONS INTERFACES, THAT IS, EXPLICIT DATA EXCHANGES OVER A CONTROLLABLE COMMUNICATIONS PATH USING WELL-DEFINED PROTOCOLS.

SPIER, MICHAEL J., ELLIOTT I. ORGANICK, THE MULTICS INTERPROCESS COMMUNICATION FACILITY, (MASSACHUSETTS INST. OF TECH., CAMBRIDGE, PROJECT MAC, MASSACHUSETTS INST. OF TECH., CAMBRIDGE, DEPT. OF ELECTRICAL ENGINEERING), PROCEEDINGS, ACM 2ND SYMPOSIUM ON OPERATING SYSTEMS PRINCIPLES, (PRINCETON, NJ, OCTOBER 20-22, 1969), 1969, P 83-91, 10. REFS

THE MULTICS CAPABILITY FOR INTERPROCESS COMMUNICATION, WHICH OFFERS A CLEAN FACILITY FOR COMMUNICATING BETWEEN PROCESSES WITH MINIMUM EFFORT, IS DISCUSSED. THE METHODOLOGY DESCRIBED APPEARS APPLICABLE TO INTERPROCESS COMMUNICATIONS ACROSS MULTIPLE HOST COMPUTERS IN A NETWORK.

THOMAS, ROBERT H., A RESOURCE SHARING EXECUTIVE FOR THE ARPANET, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA), AFIPS CONFERENCE PROCEEDINGS, VOLUME 42, 1973, NATIONAL COMPUTER CONFERENCE AND EXPOSITION, (NEW YORK, NY, JUNE 4-8, 1973), AFIPS PRESS, MONTVALE, NJ, 1973, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 155-163, 16 REFS

RSEXEC (RESOURCE SHARING EXECUTIVE) IS A DISTRIBUTED, EXECUTIVE-LIKE SYSTEM THAT RUNS ON TENEX HOST COMPUTERS IN THE ARPA COMPUTER NETWORK. RSEXEC WAS DESIGNED TO FACILITATE RESOURCE SHARING AMONG HOSTS ON THE ARPANET. THIS PAPER DISCUSSES THE DESIGN AND DEVELOPMENT OF RSEXEC AND DESCRIBES MANY OF THE FEATURES IT PROVIDES TO THE USER.

3.4.3 DATA MANAGEMENT

ANDERSON, R. H., E. F. HARSLEM, JOHN F. HEAFNER, VINTON G. CERF, JAMES MADDEN, ROBERT M. METCALFE, A. SHOSHANI, JAMES WHITE, D. C. WOOD, THE DATA RECONFIGURATION SERVICE--AN EXPERIMENT IN ADAPTABLE, PROCESS/PROCESS COMMUNICATION, (RAND CORP., SANTA MONICA, CA, CALIFORNIA, UNIV. OF, LOS ANGELES, ILLINOIS, UNIV. OF, URBANA, MASSACHUSETTS INST. OF TECH., CAMBRIDGE, SYSTEM DEVELOPMENT CORP., SANTA MONICA, CA, CALIFORNIA, UNIV. OF, SANTA BARBARA, MITRE CORP., WASHINGTON, DC),
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 1-9, 9 REFS

AN INTRODUCTION TO THE PROBLEMS OF DATA COMPATIBILITY IN A NETWORK OF DISSIMILAR COMPUTERS LEADS TO A DESCRIPTION OF A DATA RECONFIGURATION SERVICE (DRS) BEING IMPLEMENTED ON THE ARPANET. THE DRS ALLOWS A PROGRAMMER TO DEFINE *FORMS* THAT DESCRIBE DATA TRANSFORMATIONS AND STORES THE FORMS BY NAME. A USER CAN THEN EMPLOY THE SERVICE BY CALLING THE FORM TO ACCOMPLISH A PARTICULAR TRANSFORMATION OF A NETWORK DATA STREAM PASSING BETWEEN A USING PROCESS AND A SERVING PROCESS.

CHUPIN, JEAN CLAUDE, CONTROL CONCEPTS OF A LOGICAL NETWORK MACHINE FOR DATA BANKS, (I.M.A.G., GRENOBLE, (FRANCE), CII SCIENTIFIC CENTER),
ROSENFELD, JACK L., INFORMATION PROCESSING 74, PROCEEDINGS OF IFIP CONGRESS 74, 2, SOFTWARE, (STOCKHOLM, (SWEDEN), AUGUST 5-10, 1974), AMERICAN ELSEVIER PUBLISHING CO, INC., NEW YORK, 1974, P 291-295, 7 REFS

GENERAL NETWORK SERVICES ARE DEFINED WHICH PROVIDE NETWORK USERS WITH INTERFACES TRANSPARENT TO THE NETWORK. THE OBJECTIVE, ULTIMATELY, IS TO ALLOW THE COLLECTION OF COMPUTING FACILITIES TO APPEAR AS A SINGLE NETWORK FACILITY. THE CONTROL PROBLEMS SPECIFIC TO A DATA BANK APPLICATION ARE ADDRESSED.
(ALSO UNDER 2.3)

FREDERICKSEN, DICK H., DESCRIBING DATA IN A GENERAL-PURPOSE COMPUTER NETWORK, INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY, THOMAS J. WATSON RESEARCH CENTER, 16 NOV 72, IBM RC-4122, 33P, 8 REFS

AFTER A GENERAL DISCUSSION OF THE CHARACTERISTICS OF DATA DESCRIPTION IN A SINGLE COMPUTING SYSTEM, THE AUTHOR DISCUSSES ADDITIONAL PROBLEMS OF DATA DESCRIPTION FOR SEVERAL COMPUTING SYSTEMS IN A NETWORK. EXAMPLES OF DIFFERENT

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APPROACHES TO DATA DESCRIPTION IN NETWORKS ARE TAKEN FROM A REMOTE JOB ENTRY NETWORK, THE 'OS/MVT NETWORK SUBSYSTEM' AND A NETWORK OF DISSIMILAR SYSTEMS. FINALLY THE AUTHOR DISCUSSES THE POSSIBILITY OF NETWORK-ORIENTED 'DATA DESCRIPTION LANGUAGES'.
(ALSO UNDER 3.5.2)

MILLER, EDWARD F., JR., EDWARD L. PRICHARD, PROCESS CONTROL AND FILE MANAGEMENT PROBLEMS IN LARGE MINICOMPUTER NETWORKS, (GENERAL RESEARCH CORP., SANTA BARBARA, CA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE. DIGEST OF PAPERS. 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 199-201, 3 REFS

VARIOUS PROBLEMS IN CONTROL OF PROCESSES AND FILE MANAGEMENT FOR MINICOMPUTER NETWORKS WITH 100 TO 10,000 PROCESSORS ARE DISCUSSED IN THIS ARTICLE. THE THREE MAJOR AREAS CONSIDERED ARE THE OVERALL NETWORK STRUCTURE, THE CONTROL STRUCTURE, AND THE FILE STRUCTURE. AREAS FOR FURTHER RESEARCH ARE OUTLINED.
(ALSO UNDER 3.1.1)

SHOSHANI, ARIE, DATA SHARING IN COMPUTER NETWORKS, (SYSTEM DEVELOPMENT CORP., SANTA MONICA, CA),
1972 WESCON TECHNICAL PAPERS, SESSION 7: COMPUTER NETWORKS, (PRESENTED AT, WESTERN ELECTRONIC SHOW AND CONVENTION, SEPTEMBER 19-22, 1972), 1972, P 7-4-1--7-4-8, 19 REFS
(ANNOTATION UNDER 3.5.2)

4.4 USER-ORIENTED

BENOIT, JOHN W., ERIKA GRAF-WEBSTER, EVOLUTION OF NETWORK USER SERVICES--THE NETWORK RESOURCE MANAGER, (MITRE CORP., MCLEAN, VA),
PROCEEDINGS OF THE 1974 SYMPOSIUM, COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, MAY 23, 1974),
INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, 74CH0835-9C, P 21-24, 6 REFS
(ANNOTATION UNDER 2.3)

MARCUS, RICHARD S., NETWORK ACCESS FOR THE INFORMATION RETRIEVAL APPLICATION, (MASSACHUSETTS INST. OF TECH., CAMBRIDGE, ELECTRONIC SYSTEMS LAB.),
1975 IEEE INTERCON CONFERENCE RECORD, (NEW YORK, APRIL 8-10, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, P 25-4-1--25-4-7, 12 REFS

THE AUTHOR DISCUSSES ASPECTS OF ACCESSING HETEROGENEOUS RETRIEVAL SYSTEMS WHICH MAINTAIN MULTIPLE HETEROGENEOUS BIBLIOGRAPHIC DATA BASES. THE PROBLEMS ASSOCIATED WITH USER ACCESS TO A NUMBER OF SYSTEMS ARE CONSIDERED AS ARE SEVERAL POSSIBLE SOLUTIONS TO THESE PROBLEMS. IN ADDITION AN EXPERIMENTAL INTERFACE IS DESCRIBED WHICH CURRENTLY CONNECTS TO FOUR RETRIEVAL SYSTEMS.
(ALSO UNDER 2.3)

PYKE, THOMAS N., JR., SOME TECHNICAL CONSIDERATIONS FOR IMPROVED SERVICE TO COMPUTER NETWORK USERS, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE. DIGEST OF PAPERS. 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 53-55, 9 REFS
(ANNOTATION UNDER 5.7)

ROSENTHAL, ROBERT, SHIRLEY W. WATKINS, AUTOMATED ACCESS TO NETWORK RESOURCES, A NETWORK ACCESS MACHINE, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY),
PROCEEDINGS OF THE 1974 SYMPOSIUM, COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, MAY 23, 1974),
INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, 74CH0835-9C, P 47-50, 3 REFS

A MINICOMPUTER-BASED NETWORK ACCESS MACHINE (NAM) HAS BEEN DEVELOPED AT THE NATIONAL BUREAU OF STANDARDS TO SIMPLIFY ACCESS TO COMPUTER-BASED NETWORK RESOURCES. THE BASIC ELEMENTS OF THE NAM ARE DESCRIBED IN THIS PAPER. THESE ARE (1) THE MACRO EXPANDER, WHOSE FUNCTION IS TO CREATE THE SPECIFIC MESSAGES USED TO ACQUIRE THE RESOURCE REQUESTED, AND (2) THE RESPONSE ANALYZER, WHICH USES THE EXPECTED RESPONSES, GENERATED BY THE MACRO EXPANDER, TO ENSURE SATISFACTORY PROGRESS TOWARD THE ACQUISITION OF THE DESIRED RESOURCE. THE USER INTERFACE TO NAM IS ALSO DESCRIBED, INCLUDING THE COMMUNICATION PATHS THROUGH NAM FROM THE USER TO THE REMOTE ACCESS SYSTEM.

ROSENTHAL, ROBERT, ACCESSING ONLINE NETWORK RESOURCES WITH A NETWORK ACCESS MACHINE, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY),
1975 IEEE INTERCON CONFERENCE RECORD, (NEW YORK, APRIL 8-10, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, P 25-3-1--25-3-4, 7 REFS

THIS PAPER DESCRIBES A NETWORK ACCESS MACHINE (NAM), WHICH ASSISTS USERS OF ONLINE COMPUTER NETWORKS IN ACCESSING REMOTE RESOURCES. THE NAM, CONSISTING OF A DEDICATED MINICOMPUTER WITH SPECIAL SOFTWARE, PROVIDES SUCH FUNCTIONS AS NETWORK COMMUNICATION LINK ESTABLISHMENT, NETWORK LOGIN, HOST SYSTEM SELECTION AND LOGIN, SERVICE OR RESOURCE SELECTION AND INITIALIZATION SERVICE TERMINATION AND LOGOFF.

ROSENTHAL, ROBERT, NETWORK ACCESS TECHNIQUES: A REVIEW, (TO BE PRESENTED AT THE, AFIPS NATIONAL COMPUTER CONFERENCE, NEW YORK, NY, JUNE 1976), NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY, 1976, NSF OCR-72-01206, 14P, 28 REFS

WITH EMPHASIS ON CURRENTLY OPERATING AND PLANNED SYSTEMS THAT ASSIST USERS IN ACCESSING AVAILABLE NETWORK SERVICES, THIS PAPER IDENTIFIES THE TECHNIQUES USED IN NETWORK ACCESS DEVICES. BY EXAMINING THESE DEVICES, THE TREND TOWARD IMPROVING THE INTERFACE BETWEEN THE USER AND THE COMPUTER IS BROUGHT MORE CLEARLY INTO FOCUS AND UP TO DATE.

3.4.5 SOFTWARE TESTING

STILLMAN, RONA B., DR., BELKIS LEONG-HONG, SOFTWARE TESTING FOR NETWORK SERVICES, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY, JUL 75, NBS TN-874, NSF AG-350, (LC 75-600046), 40P, 9 REFS

THIS REPORT IS A FIRST STEP TOWARD IDENTIFYING EFFECTIVE SOFTWARE TEST AND MEASURMENT TOOLS, AND DEVELOPING A GUIDE FOR THEIR USAGE NETWORK WIDE. THE UTILITY OF TWO TOOLS, THE NBS FORTRAN TEST ROUTINES AND THE NBS ANALYZER, IS STUDIED EXPERIMENTALLY, AND INDICATIONS OF THEIR ROLE IN SYSTEMATIC TESTING IN A NETWORKING ENVIRONMENT ARE GIVEN.
(ALSO UNDER 2.2)

WOOD, DAVID C., TEST AND EVALUATION CRITERIA FOR NETWORK SOFTWARE, (MITRE CORP., MCLEAN, VA),
PROCEEDINGS OF THE 1974 SYMPOSIUM, COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, MAY 23, 1974),
INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, 74CH0835-9C, P 44-48, 1 REFS

THIS PAPER BRIEFLY DESCRIBES THE TEST AND EVALUATION APPROACH BEING USED FOR THE NETWORK SOFTWARE IN THE MAIN COMPUTERS OF A PACKET SWITCHED NETWORK, THE PROTOTYPE WWMCCS (WORLDWIDE MILITARY COMMAND AND CONTROL SYSTEM) INTERCOMPUTER NETWORK (PWIN). IT IDENTIFIES THE FUNCTIONAL CAPABILITIES OF THE NETWORK CONTROL SOFTWARE BEING TESTED; DEFINES THE CRITERIA BEING USED TO EVALUATE THE RELIABILITY AND PERFORMANCE OF THE NETWORK SOFTWARE; AND OUTLINES THE TEST PROGRAM TOOLS DEVELOPED TO SUPPORT THE TEST AND EVALUATION EFFORT.

3.4.9 OTHER

FLETCHER, JOHN G., OCTOPUS SOFTWARE SECURITY, (LAWRENCE LIVERMORE LAB., LIVERMORE, CA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE. DIGEST OF PAPERS. 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 61-62, 1 REFS
(ANNOTATION UNDER 5.6)

FREED, ROY N., PROTECTION OF PROPRIETARY SOFTWARE PROGRAMS IN THE UNITED STATES, (WIDETT AND WIDETT, BOSTON, MA), WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 403-408, 6 REFS
(ANNOTATION UNDER 5.6)

FAIBT, L., A. MULLERY, DATA DESCRIPTIVE LANGUAGE FOR SHARED DATA, INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN

3.4.9 OTHER

HEIGHTS, NY., THOMAS J. WATSON RESEARCH CENTER, 28 JUL 71. IBM-TJWRC RC-3476, ISP
(ANNOTATION UNDER 4.2.D)

HARRIS, DAVID O., JAMES A. HOWARD, ROGER C. WOOD, RESEARCH IN ON-LINE COMPUTATION, CALIFORNIA, UNIV. OF, SANTA BARBARA, 30 SEP 71, 1 JUL 70-31 AUG 71. AF F19620-70-C-0314, (AFCRL 71-0530, AD-735 300), 86P, 30 REFS
(ANNOTATION UNDER 4.2.D)

KRILOFF, HARVEY Z., A HIGH-LEVEL LANGUAGE FOR USE WITH MULTI-COMPUTER NETWORKS, (ILLINOIS, UNIV. OF, CHICAGO), AFIPS CONFERENCE PROCEEDINGS, VOLUME 42, 1973, NATIONAL COMPUTER CONFERENCE AND EXPOSITION, (NEW YORK, NY, JUNE 4-8, 1973), AFIPS PRESS, MONTVALE, NJ, 1973, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 149-153, 11 REFS

IN AN EFFORT TO DEVELOP A SOFTWARE SYSTEM THAT ALLOWS THE AVERAGE USER TO MAKE EFFECTIVE USE OF A COMPUTER NETWORK, A NETWORK VERSION OF THE SPEAKEASY SYSTEM WAS DEVELOPED. THIS PAPER DISCUSSES THE NEED FOR SUCH A SYSTEM AND DESCRIBES THE SPEAKEASY SYSTEM DEVELOPED.

PICKERING, G. E., E. G. MUTSCHLER, G. A. ERICKSON, MULTICOMPUTER PROGRAMMING FOR A LARGE SCALE REAL-TIME DATA PROCESSING SYSTEM, (SPERRY RAND CORP., SAN DIEGO, CA, UNIVAC DIV.), AFIPS PROCEEDINGS, 1964 SPRING JOINT COMPUTER CONFERENCE, VOLUME 25, (WASHINGTON, DC, APRIL 1964), SPARTAN BOOKS INC., BALTIMORE, MD, 1964, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 445-461

THIS REPORT DISCUSSES MULTICOMPUTER PROGRAMMING TECHNIQUES CONCEIVED AND IMPLEMENTED IN A LARGE SCALE TACTICAL DATA SYSTEM DEVELOPED FOR THE U. S. NAVY. TWO MAIN AREAS RECEIVE CONSIDERATION: EXECUTIVE CONTROL IN A MULTICOMPUTER COMPLEX AND DATA TRANSFER BETWEEN COMPUTERS. ASSIGNMENT AND DISTRIBUTION OF TASKS IS NOT DISCUSSED. ON THE SUBJECTS OF CONTROL AND TRANSFER, CONSIDERABLE DETAIL IS PROVIDED.

SEDELOW, SALLY YEATES, WALTER A. SEDELOW, JR., LANGUAGE RESEARCH AND THE COMPUTER: A STUDY OF THE CONCEPT OF A NATIONAL CENTER OR NETWORK FOR COMPUTATIONAL RESEARCH ON LANGUAGE (CE-NCOREL), KANSAS, UNIV. OF, LAWRENCE, 1972, NSF GJ-28599, 467P, 41 REFS
(ANNOTATION UNDER 4.2.9)

SINGER, C. R. M., THE USER DEPARTMENT AND THE COMPUTER, (INTERNATIONAL COMPUTERS LTD., MIDDLESEX, (ENGLAND)), WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 397-402

A DATA COLLECTION SYSTEM CALLED 'DATASTREAM' IS DESCRIBED AND ITS ADVANTAGES OVER MANUAL TECHNIQUES ARE CITED. THE PAPER SOUNDS VERY MUCH LIKE A SALES-PITCH AND IS NOT PARTICULARLY EXCITING TECHNOLOGICALLY.

VAN VLECK, THOMAS H., COMPUTER LANGUAGES FOR THE COMPUTER UTILITY, (MASSACHUSETTS INST. OF TECH., CAMBRIDGE), INTERDISCIPLINARY CONFERENCE ON MULTIPLE ACCESS COMPUTER NETWORKS, (AUSTIN, TX, APRIL 20-22, 1970), APR 70, P S-2-I--S-2-S, 8 REFS

A FEW TECHNICAL AND ECONOMIC CONSIDERATIONS ARE INTRODUCED RELATED TO MAKING LANGUAGE COMPILERS AVAILABLE FOR 'THE COMPUTER UTILITY', LOOSELY DEFINED AS AN INTERACTIVE SYSTEM. THESE CONCEPTS ARE THEN APPLIED TO NETWORKS OF COMPUTERS WITH THE STATED BENEFITS OF LOAD SHARING AND MULTI-PROCESS SOLUTIONS TO A PROBLEM. ALL DISCUSSIONS ARE BRIEF AND INCOMPLETE.
(ALSO UNDER 4.3)

3.5 PROTOCOLS

CERF, VINTON G., AN ASSESSMENT OF ARPANET PROTOCOLS, (STANFORD, UNIV. OF, CA), THE SECOND JERUSALEM CONFERENCE ON INFORMATION TECHNOLOGY, (JERUSALEM, (ISRAEL), JULY 29-AUGUST 1, 1974), 1974, P 653-664, 14 REFS
(ANNOTATION UNDER 3.1.2)

3.5.0 GENERAL

FARBER, DAVID J., KENNETH C. LARSON, NETWORK SECURITY VIA DYNAMIC PROCESS RENAMING, (CALIFORNIA, UNIV. OF, IRVINE, DEPT. OF INFORMATION AND COMPUTER SCIENCE), FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000-7-DATA, P 8-13--8-18, 3 REFS
(ANNOTATION UNDER 5.6)

FIFE, DENNIS W., STANDARDS ANALYSIS FOR FUTURE WWMCCS COMPUTER NETWORKING, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, SYSTEMS AND SOFTWARE DIV., 30 AUG 74, NBSIR 74-570, 107P, 30 REFS
(ANNOTATION UNDER 5.5)

JEFFERY, LAWRENCE R., SOFTWARE: THE DASH IN COMPUTER--COMMUNICATIONS, (MITRE CORP., BEDFORD, MA), IEEE 1974 NATIONAL TELECOMMUNICATIONS CONFERENCE, (SAN DIEGO, CA, DECEMBER 2-4, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE P-74CHO90-7-CSCB, (LC 57-20724), P 476-481, 20 REFS
(ANNOTATION UNDER 1.5)

MCKAY, DOUGLAS B., DONALD P. KARP, A NETWORK/440 PROTOCOL CONCEPT, INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY., THOMAS J. WATSON RESEARCH CENTER, JUL 71, IBM RC-3432, ISP

THE PROTOCOLS ARE DESCRIBED FOR DATA TRANSFER BETWEEN INDEPENDENT SYSTEMS ON NETWORK/440, A NETWORK WITH CENTRAL CONTROL, INCLUDING ERROR HANDLING, MESSAGE FORMAT AND FILE TRANSFER PROTOCOL.

3.5.1 LOW LEVEL PROTOCOLS

BHUSHAN, ABHAY K., ROBERT H. STOTZ, PROCEDURES AND STANDARDS FOR INTER-COMPUTER COMMUNICATIONS, (MASSACHUSETTS INST. OF TECH., CAMBRIDGE, ELECTRONICS SYSTEMS LAB.), AFIPS PROCEEDINGS, 1968 SPRING JOINT COMPUTER CONFERENCE, VOLUME 32, (ATLANTIC CITY, NJ, APRIL 30-MAY 2, 1968), THOMPSON BOOK CO., WASHINGTON, DC, 1968, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 95-104, 24 REFS

THIS DISCUSSION OF CHARACTER CODES AND TRANSMISSION PROCEDURES ATTEMPTS TO ISOLATE THE FACTORS INVOLVED IN INTER-COMPUTER COMMUNICATION THAT MAY JUSTIFY ADDITIONS TO AND DEVIATIONS FROM ANSI STANDARDS AND DRAFT STANDARDS. SPECIAL ATTENTION IS GIVEN TO COMMUNICATION CONTROL PROCEDURES, CHARACTER AND BINARY DATA TRANSPARENCY AND ERROR CONTROL MECHANISMS, INCLUDING A COMPARISON OF THE LONGITUDINAL BLOCK PARITY CHECK TO THE MORE CAPABLE CYCLIC REDUNDANCY CHECK.
(ALSO UNDER 3.2.9, 5.5)

BINDER, RICHARD, ALOHANET PROTOCOLS, HAWAII, UNIV. OF, HONOLULU, ALOHA SYSTEM, SEP 74, HU TR-B74-7, NASA NAS2-6700, 36P, 7 REFS

THIS REPORT DESCRIBES THE PROTOCOL FUNCTIONS USED FOR INTERACTIVE USER NODES IN THE ALOHANET. A SPECIAL LOADING PROTOCOL IN ALSO DEFINED FOR AUTOMATICALLY LOADING PROGRAMMABLE REMOTE UNITS IN THE SYSTEM.

BINDER, R., N. ABRAMSON, F. KUO, A. OKINAKA, D. WAX, ALOHA PACKET BROADCASTING--A RETROSPECT, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, HAWAII, UNIV. OF, HONOLULU, ALOHA SYSTEM), AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 203-215, 15 REFS
(ANNOTATION UNDER 3.1.2)

DANTHINE, A., E. ESCHENAUER, INFLUENCE ON THE NODE BEHAVIOUR OF THE NODE-TO-NODE PROTOCOL, (LIEGE, UNIV. OF, (BELGIUM), CTN-EIA, (BELGIUM)), FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000-7-DATA, P 7-1--7-8, 11 REFS
(ANNOTATION UNDER 2.1.1)

DATAPAC STANDARD NETWORK ACCESS PROTOCOL, TRANS-CANADA TELEPHONE SYSTEM, COMPUTER COMMUNICATIONS GROUP, 30 NOV 74, SBP

3.5.1 LOW LEVEL PROTOCOLS

(ANNOTATION UNDER 5.5)

KARP, DONALD P.. SALOMON F. SEROUSSI. A COMMUNICATIONS INTERFACE FOR COMPUTER NETWORKS. (INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY. DEPT. OF COMPUTER SCIENCE).
JACKSON, PETER E., PROCEEDINGS. ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS. (PALO ALTO, CA, OCTOBER 20-22, 1971). 1971. IEEE CAT-71CS9-C. P 117-123. 3 REFS

A COMMUNICATIONS DISCIPLINE OR FIRST LEVEL PROTOCOL FOR NETWORKS OF COMPUTERS IS DESCRIBED. IT IS ESPECIALLY SUITABLE FOR HALF-DUPLEX, ALTHOUGH ADAPTABLE TO FULL-DUPLEX TRANSMISSION. IT IS STATED THAT IMPLEMENTATION IS UNDER WAY FOR IBM NETWORK/440.

KARP, DONALD P.. SALOMON F. SEROUSSI. A COMMUNICATIONS INTERFACE FOR COMPUTER NETWORKS. INTERNATIONAL BUSINESS MACHINES CORP.. YORKTOWN HEIGHTS, NY. THOMAS J. WATSON RESEARCH CENTER. 24 JUN 71. IBM-TJWRC RC-3417. ISP. 1 REFS

THE COMMUNICATIONS LINE PROTOCOL FOR IBM'S RESEARCH NETWORK/440 IS PRESENTED. THE PROTOCOL IS DESIGNED TO FACILITATE INTERPROCESS COMMUNICATIONS AND IS DEFINED WITH FLEXIBILITY AS THE FOREMOST REQUIREMENT.

KLEINROCK, LEONARD, HOLGER OPDERBECK, THROUGHPUT IN THE ARPANET - PROTOCOLS AND MEASUREMENT. (CALIFORNIA, UNIV. OF, LOS ANGELES, DEPT. OF COMPUTER SCIENCE, TELENET CORP., WASHINGTON, DC).
FOURTH DATA COMMUNICATIONS SYMPOSIUM. NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT. (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975). INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975. IEEE 75-CH1001-7-DATA. P 6-1--6-11. 13 REFS
(ANNOTATION UNDER 2.1.3)

MCKENZIE, A. M.. SOME COMPUTER NETWORK INTERCONNECTION ISSUES. (BOLT, BERANEK AND NEWMAN INC.., CAMBRIDGE, MA).
AFIPS CONFERENCE PROCEEDINGS. VOLUME 43, 1974. NATIONAL COMPUTER CONFERENCE. (CHICAGO, IL, MAY 6-10, 1974). AFIPS PRESS, MONTVALE, NJ. 1974. AFIPS CONFERENCE PROCEEDINGS. (LC 55-44701). P 857-859. 9 REFS

THE AUTHOR BRIEFLY ADDRESSES A NUMBER OF ISSUES CONCERNING THE INTERCONNECTION OF DISSIMILAR COMPUTERS THROUGH DISSIMILAR COMMUNICATIONS NETWORKS. BECAUSE STANDARDS DEVELOPMENT TAKES TIME, HE DOES NOT WANT PRIVATE ARRANGEMENTS TO BE CLOSED OFF. AMONG THE ISSUES ADDRESSED ARE THROUGHPUT VS. DELAY, RETRANSMISSION AND ACKNOWLEDGEMENT, NETWORK TIMING, COMMUNICATIONS EFFICIENCY VS. HOST PROCESSING, SIMPLICITY AND TABLE SPACE, AND FRAGMENTATION AT NETWORK BOUNDARIES.

NAKAJO, TOSHIHIKO, TETSUO NAGATA, HIROTARO OHBA, YUTAKA YOSHIDA, ON THE PACKET INTERLEAVED INTERFACE BETWEEN PACKET SWITCHED NETWORK AND COMPUTERS. (FUJITSU LTD., KAWASAKI, (JAPAN). NIPPON TELEGRAPH AND TELEPHONE PUBLIC CORP., MUSASHINO, (JAPAN). MUSASHINO ELECTRICAL COMMUNICATION LAB.).
DATA NETWORKS: ANALYSIS AND DESIGN. THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973). INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC.. NEW YORK, 1973. (EEE CN-73-CH0828-4C. P 104-112. 6 REFS

THIS PAPER DESCRIBES A STUDY OF TRANSMISSION CONTROL PROCEDURES FOR COMPUTER-TO-COMPUTER AND COMPUTER-TO-TERMINAL COMMUNICATION THROUGH A PUBLIC PACKET SWITCHED NETWORK. FOUR TYPES OF BASIC DATA LINKS ARE DEFINED AND THE FUNCTIONS REQUIRED FOR EACH TYPE ARE DISCUSSED.

PRICE, W. L.. SIMULATION OF A PACKET-SWITCHED DATA NETWORK OPERATING WITH A REVISED LINK AND NODE PROTOCOL. NATIONAL PHYSICAL LAB.., TEDDINGTON, (ENGLAND), DIV. OF COMPUTER SCIENCE. APR 73. NPL COM-68. 40P. 6 REFS

A NODE AND LINK PROTOCOL IS GIVEN FOR A PACKET-SWITCHED DATA NETWORK. THE FULL LOGICAL STRUCTURE OF THE SIMULATOR TO TEST SUCH A PROTOCOL IS ALSO GIVEN. RESULTS OF THE SIMULATION SHOW THAT: (1) IF PRIORITY IS GIVEN TO THROUGH TRAFFIC THE NETWORK CAN HANDLE HEAVY TRAFFIC; (2) MULTIPLE-PACKET TRANSMISSION IS PREFERABLE TO PACKET-AT-A-TIME TRANSMISSION; AND (3) USING FIXED ROUTING, A ROUTING MATRIX WHICH SPREADS THE LOAD MORE EVENLY BETWEEN THE NODES WAS MORE SUCCESSFUL.

ROSENBLUM, STANLEY R.. PROGRESS IN CONTROL PROCEDURE STANDARDIZATION. (HONEYWELL INFORMATION SYSTEMS INC.., FRAMINGHAM, MA).
JACKSON, PETER E., PROCEEDINGS. ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS. (PALO ALTO, CA, OCTOBER 20-22, 1971). 1971. IEEE CAT-71CS9-C. P 153-159. 2 REFS
(ANNOTATION UNDER 5.5)

SHAW, R. T.. BASIC CONTROL PROCEDURES FOR DIGITAL DATA TRANSMISSION. (INTERNATIONAL COMPUTERS LTD.. LONDON, (ENGLAND)).
INFORMATION PROCESSING 68; PROCEEDINGS OF IFIP CONGRESS 1968. VOLUME 2--HARDWARE, APPLICATIONS, (EDINBURGH, (SCOTLAND), AUGUST 5-10, 1968). NORTH-HOLLAND PUBLISHING CO.. AMSTERDAM, (NETHERLANDS). 1969. IFIP CONGRESS PROCEEDINGS. (LC 65-24118). P 728-733. 2 REFS

DIGITAL DATA TRANSMISSION OVER PHONE LINES AND RELATED CONTROL PROCEDURES ARE DISCUSSED. A SYSTEM IS DESCRIBED IN WHICH A COMMON PATH INTERCONNECTS A NUMBER OF TERMINAL INSTALLATIONS AND INCLUDES AT LEAST ONE COMPUTER. INDIVIDUAL TERMINALS ARE GIVEN DETAILED RESPONSIBILITIES THROUGH WELL-DEFINED PROCEDURES AND MESSAGE STRUCTURES. POLLING SELECTION AND INFORMATION TRANSFER PROCESSES ARE DETAILED FOR A MULTI-POINT LINK WITH ONE CONTROL TERMINAL.

3.5.2 HIGH LEVEL PROTOCOLS

CARR, STEPHEN, STEPHEN D. CROCKER, VINTON G. CERF, HOST-HOST COMMUNICATION PROTOCOL IN THE ARPA NETWORK. (UTAH, UNIV. OF, SALT LAKE CITY, CALIFORNIA, UNIV. OF, LOS ANGELES).
AFIPS PROCEEDINGS. 1970 SPRING JOINT COMPUTER CONFERENCE. VOLUME 36, (ATLANTIC CITY, NJ, MAY 5-7, 1970). AFIPS PRESS, MONTVALE, NJ. 1970. AFIPS CONFERENCE PROCEEDINGS. (LC 55-44701). P 589-598. 3 REFS

THIS RELATIVELY EARLY DESCRIPTION OF THE ARPA NETWORK HOST-HOST PROTOCOL DOES NOT INCLUDE HOST-HOST FLOW CONTROL, WHICH WAS OVERLOOKED AT THAT TIME. IN THIS PAPER IT WAS ASSUMED THAT ALL HOSTS ARE INTERACTIVE TIME-SHARING SYSTEMS. THIS SHOWS THE LACK OF ATTENTION GIVEN TO REMOTE JOB ENTRY AND DATA TRANSFER AT THAT TIME. ALTHOUGH A PRINCIPAL EARLY NETWORK NODE, THE UCLA IBM 360/91 WAS NOT A TIME-SHARING SYSTEM. THE BASIC ASSUMPTION OF PROLONGED CONVERSATION ON EACH HOST-HOST LINK IS MADE. THE NETWORK INTERFACE LANGUAGE CONCEPT, IN WHICH INTERACTIVE FRONT ENDS ARE PLACED AT USER SITES, HAS SINCE FALLEN BY THE WAYSIDE, ESPECIALLY WITH THE INTRODUCTION OF THE TIP.

CROCKER, STEPHEN D.. JOHN F. HEAFNER, ROBERT M. METCALFE, JONATHAN B. POSTEL, FUNCTION-ORIENTED PROTOCOLS FOR THE ARPA COMPUTER NETWORK. (ADVANCED RESEARCH PROJECTS AGENCY, WASHINGTON, DC, RAND CORP., SANTA MONICA, CA, MASSACHUSETTS INST. OF TECH., CAMBRIDGE, CALIFORNIA, UNIV. OF, LOS ANGELES).
AFIPS CONFERENCE. 1972 SPRING JOINT COMPUTER CONFERENCE. VOLUME 40, (ATLANTIC CITY, NJ, MAY 16-18, 1972). AFIPS PRESS, MONTVALE, NJ. 1972. AFIPS CONFERENCE PROCEEDINGS. (LC 55-44701). P 271-279. 13 REFS

THIS PAPER DESCRIBES SOME OF THE USER LEVEL PROTOCOLS ON THE ARPANET, INCLUDING THE EXISTING TELNET AND THE PROPOSED FILE TRANSFER AND REMOTE JOB ENTRY (RJE) PROTOCOLS. TELNET FEATURES DISCUSSED ARE THE CHARACTER SET, CHARACTER ECHOING, ESTABLISHING CONNECTIONS, AND SOME INTRIGUING THOUGHTS ON ATTENTION HANDLING. THE FILE TRANSFER PROTOCOL WAS UNSPECIFIED WHEN THIS WAS WRITTEN, BUT A METHOD OF TRANSFERRING FILES THROUGH THE USE OF TELNET IS DESCRIBED. IMPLEMENTATION PLANS ARE DESCRIBED THAT WOULD GIVE A USER THE ABILITY TO LIST A REMOTE DIRECTORY, SEND A LOCAL FILE, RETRIEVE A REMOTE FILE, RENAME A REMOTE FILE, AND DELETE A REMOTE FILE. REMOTE JOB ENTRY, WHICH USES THE FILE TRANSFER PROTOCOL, IS ALSO DESCRIBED.

FREDERICKSEN, DICK H.. DESCRIBING DATA IN A GENERAL-PURPOSE COMPUTER NETWORK. INTERNATIONAL BUSINESS MACHINES CORP.. YORKTOWN HEIGHTS, NY, THOMAS J. WATSON RESEARCH CENTER. 16 NOV 72. IBM RC-4122. 33P. 8 REFS
(ANNOTATION UNDER 3.4.3)

NEUMANN, A. J.. A BASIS FOR STANDARDIZATION OF USER-TERMINAL PROTOCOLS FOR COMPUTER NETWORK ACCESS. NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC. SYSTEMS AND SOFTWARE DIV.. JUL 75. NBS TN-877. (LC 75-600052). 29P. 5 REFS
(ANNOTATION UNDER 5.5)

OHBA, HIROTARO, YUTAKA YOSHIDA, TOSHIHIKO NAKAJO, TETSUO NAGATA, ON THE PACKET-INTERLEAVED INTERFACE BETWEEN PACKET-SWITCHED NETWORK AND COMPUTERS.(PRESENTED AT THE, THIRD DATA COMMUNICATIONS SYMPOSIUM ON DATA NETWORKS ANALYSIS AND DESIGN, ST. PETERSBURG, FL, NOVEMBER 197. (NTT, TOKYO, (JAPAN), DATA COMMUNICATIONS BUREAU, NTT, TOKYO, (JAPAN), MUSASHINO ELECTRICAL COMMUNICATION LAB.., FUJITSU LTD.., KAWASAKI, (JAPAN)),
IEEE TRANSACTIONS ON COMMUNICATIONS, VOL COM-22, ISSUE 10, OCT 74, P 1671-1675, 6 REFS

THIS PAPER DESCRIBES A STUDY OF TRANSMISSION CONTROL PROCEDURES FOR COMPUTER-TO-COMPUTER AND COMPUTER-TO-TERMINAL COMMUNICATION THROUGH A PUBLIC PACKET-SWITCHED NETWORK. A TRANSMISSION CONTROL METHOD AND A CALL CONTROL METHOD BETWEEN A PACKET-SWITCHED NETWORK AND COMPUTERS ARE PROPOSED FOR THE PACKET-INTERLEAVED COMMUNICATION ON THE BASIS OF THE HDLC PROCEDURE.

RUSCHITZKA, M. G., R. S. FABRY, THE PRIME MESSAGE SYSTEM, (CALIFORNIA, UNIV. OF, BERKELEY, COMPUTER SYSTEMS RESEARCH PROJECT),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 125-128, 9 REFS
(ANNOTATION UNDER 3.1.1)

SHOSHANI, ARIE, DATA SHARING IN COMPUTER NETWORKS, (SYSTEM DEVELOPMENT CORP., SANTA MONICA, CA),
1972 WESCON TECHNICAL PAPERS, SESSION 7: COMPUTER NETWORKS, (PRESENTED AT, WESTERN ELECTRONIC SHOW AND CONVENTION, SEPTEMBER 19-22, 1972), 1972, P 7-4-1--7-4-8, 19 REFS

THIS PAPER DESCRIBES, DISCUSSES, AND COMPARES APPROACHES AND TECHNIQUES FOR DATA SHARING ON COMPUTER NETWORKS. THE IMPORTANCE OF A COMMON DATA MANAGEMENT LANGUAGE IS DISCUSSED INCLUDING THE POSSIBILITY OF USING A NATURAL LANGUAGE (A SUBSET OF ENGLISH).
(ALSO UNDER 4.1.0, 3.4.3)

WALDEN, DAVID C., A SYSTEM FOR INTERPROCESS COMMUNICATION IN A RESOURCE SHARING COMPUTER NETWORK, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA),
COMMUNICATIONS OF THE ACM, VOL 15, ISSUE 4, APR 72, P 221-230, 10 REFS

IN THIS PAPER WALDEN BEGINS WITH A RATHER CLEAR PRESENTATION OF A MECHANISM FOR PROCESS TO PROCESS COMMUNICATION WITHIN A SINGLE TIME-SHARING SYSTEM AND EXTRAPOLATES THE MECHANISM FOR REMOTE PROCESSES LOCATED AT DIFFERENT SITES IN A RESOURCE-SHARING COMPUTER NETWORK. ALTHOUGH EXTENSIVE USE OF THE 'PORT' CONCEPT FOR INTERCONNECTING PROCESSES IS MADE THERE IS NO REFERENCE TO BALZER'S IMPORTANT WORK IN THIS AREA. THE PAPER REMAINS INTERESTING, BUT BECOMES UNEVEN WHEN DISCUSSING A HYPOTHETICAL APPLICATION--AN ARPA-LIKE NETWORK. A NUMBER OF POINTS ARE MADE, SOME FOLLOWING FROM THE EARLIER PART OF THE PAPER, OTHERS APPARENTLY OPINIONS OFFERED WITH LITTLE RATIONALE TO BACK THEM UP. THE POINTS ARE:
1) PLACE THE BULK OF THE NETWORK CONTROL PROGRAM (NCP) IN THE IMP, RATHER THAN IN THE HOST COMPUTER. THIS 'NETWORK CONTROLLER' WOULD OCCUPY NO MORE THAN 4K ADDITIONAL IMP CORE AND WOULD HANDLE ALL NCP FUNCTIONS EXCEPT FLOW CONTROL, FOR WHICH HOSTS WOULD REMAIN RESPONSIBLE.
2) MAKE THE NETWORK MESSAGE-SWITCHED AT THE HIGHEST LEVEL. WHILE THE ARPA NETWORK IS ACTUALLY 'CIRCUIT SWITCHED' FROM HOST TO HOST BY ESTABLISHING 'CONNECTIONS' FROM NCP TO NCP, WALDEN PROPOSES ESTABLISHING A CONNECTION BETWEEN PROCESSES IN DIFFERENT HOSTS ONLY FOR THE DURATION OF A SINGLE MESSAGE TRANSFER. THIS, OF COURSE, WOULD INTRODUCE ADDITIONAL SET-UP OVERHEAD ESPECIALLY WHERE TWO PROCESSES REQUIRE CONTINUING COMMUNICATION.
3) THE NUMBER OF BITS PER TRANSMISSION FROM THE SENDING HOST BUFFER IS TO BE A MULTIPLE OF THE SENDING AND RECEIVING HOST AND IMP WORDS LENGTHS. THIS MIGHT ELIMINATE SOME OF THE PRESENT HARDWARE/SOFTWARE MECHANISMS FOR SMOOTHING DATA TRANSFER ACROSS HOST/IMP INTERFACES.
4) SPECIFIC IDENTIFICATION OF PORTS OF A BUFFER FOR TRANSMISSION FOR MULTIPLE 'MESSAGE' TRANSMISSION MIGHT LEAD TO THE POSSIBILITY OF PARALLEL TRANSMISSION FOR PORTS THROUGH THE NETWORK. THUS INCREASING THE EFFECTIVE MAXIMUM DATA RATE FOR A SINGLE 'CONNECTION'.
5) THROUGH DIRECT PROCESS TO PROCESS COMMUNICATION, LOGGING PROCESSES AND OTHER INTERMEDIARIES CAN BE BYPASSED. HOW DOES ONE THEN DO ACCOUNTING?
6) COMPUTER NETWORKS SHOULD BE CONSIDERED SINGLE ENTITIES. THE PARTICIPATING HOST COMPUTERS SHOULD HAVE VERY SIMILAR IF NOT IDENTICAL OPERATING SYSTEMS, ALTHOUGH THE MACHINES COULD BE DIFFERENT. NO RATIONALE AT ALL IS GIVEN FOR THIS STRONG CONCLUDING STATEMENT.

WHITE, GEORGE W., MESSAGE FORMAT PRINCIPLES, (NATIONAL COMMUNICATIONS SYSTEM, WASHINGTON, DC),
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 192-198, 3 REFS

THE TRANSMISSION OF DATA OVER TELECOMMUNICATION CIRCUITS REQUIRES AGREED UPON MESSAGE FORMATS. THIS PAPER IS A DEFINITIVE AND TUTORIAL DISCUSSION OF THE PRINCIPLES TO BE USED FOR DEVELOPING MESSAGE FORMATS. ALL OF THE SUBFIELDS OF MESSAGE HEADERS AND TRAILERS ARE IDENTIFIED AND DEFINED. THE DISCUSSION IS BASED ON THE CURRENT EFFORTS OF AMERICAN NATIONAL STANDARDS INSTITUTE TASK GROUP X3S33, MESSAGE HEADER FORMATS.
(ALSO UNDER 5.5)

ZIMMERMANN, HUBERT, THE CYCLADES END TO END PROTOCOL, (INSTITUT DE RECHERCHE D'INFORMATIQUE ET D'AUTOMATIQUE (IRIA), (FRANCE)),
FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000I-7-DATA, P 7-21--7-26, 10 REFS

PRESENTED IS AN END-TO-END PROTOCOL ADOPTED BY THE CYCLADES NETWORK AND THE EUROPEAN INFORMATICS NETWORK. SOME INDICATIONS ARE GIVEN OF A POSSIBLE IMPLEMENTATION OF THIS PROTOCOL.

4. APPLICATIONS

4.0 GENERAL

AUFENKAMP, D. D., E. C. WEISS, NSF ACTIVITIES RELATED TO A NATIONAL SCIENCE COMPUTER NETWORK, (NATIONAL SCIENCE FOUNDATION, WASHINGTON, DC).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 226-232, 1 REFS
(ANNOTATION UNDER 1.2)

CARROLL, TON W., SEYMOUR J. WOLFSON, KARL L. ZINN, PROGRESS ON APPLICATIONS DEVELOPMENT, 1970-71, A REPORT OF THE ASSOCIATE DIRECTORS OF MERIT PROJECT, MICHIGAN, STATE UNIV. OF, EAST LANSING, WAYNE, STATE UNIV. OF, DETROIT, MI, MICHIGAN, UNIV. OF, ANN ARBOR, DEC 71, MCN 1271-RR-7, 33P, 6 REFS

THE SPECIAL COMPUTER RESOURCES THAT HAVE BEEN DEVELOPED AT EACH OF THE THREE UNIVERSITIES IN THE MERIT NETWORK, AND MADE AVAILABLE THROUGH THE NETWORK, ARE DESCRIBED.

DAVIS, RUTH M., PRACTICALITIES OF NETWORK USE, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY).
NETWORKS FOR HIGHER EDUCATION, PROCEEDINGS OF THE EDUCOM SPRING CONFERENCE, (WASHINGTON, DC, APRIL 13, 1972), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC, (EDUCOM), PRINCETON, NJ, 1972, P 13-28

SOME OF THE CHALLENGES INVOLVED IN ACHIEVING A SUCCESSFUL INTERFACE BETWEEN USERS AND PROVIDERS IN THE MARKETPLACE FOR NETWORK SERVICES ARE OUTLINED. THE EMPHASIS HERE IS ON SERVICES THAT NETWORKS OFFER RATHER THAN COMPUTER NETWORKS PER SE. SOME OF THE TOPICS COVERED INCLUDE: STANDARDS APPLICABLE TO THE COMPUTER NETWORK SERVICE AREA, SEMANTIC DIFFICULTIES IN NETWORK TERMINOLOGY, DETERMINING COST AND PERFORMANCE OF NETWORK SERVICES, NETWORK USER DOCUMENTATION AND USER ASSISTANCE, AND LACK OF COMPATIBILITY AMONG DIFFERENT SERVICES OFFERED THROUGH A NETWORK.
(ALSO UNDER 1.1, 5.7)

DUGGER, EDWARD, THE MATERIALS INFORMATION NETWORK, (AIR FORCE SYSTEMS COMMAND, AIR FORCE MATERIALS LAB.), AMERICAN DOCUMENTATION INSTITUTE 26TH ANNUAL MEETING, AUTOMATION AND SCIENTIFIC COMMUNICATION, PART 2, (CHICAGO, IL, OCTOBER 6-11, 1963), AMERICAN DOCUMENTATION INST., WASHINGTON, DC, 1963, P 217-218

A BRIEF DESCRIPTION OF ACTIVITIES RELATED TO THE AIR FORCE MATERIALS INFORMATION CENTER WHICH PROVIDES COMPUTERIZED INFORMATION ON MATERIALS TECHNOLOGY IS PRESENTED. THE REPORT IS SOMEWHAT OUTDATED AND DESCRIBES FEW INTERESTING TECHNOLOGICAL INNOVATIONS.

EICK, HARRY A., SEYMOUR J. WOLFSON, KARL L. ZINN, DEVELOPMENT OF APPLICATIONS FOR THE MERIT COMPUTING NETWORK, MICHIGAN, STATE UNIV. OF, EAST LANSING, WAYNE, STATE UNIV. OF, DETROIT, MI, MICHIGAN, UNIV. OF, ANN ARBOR, 2 JUN 72, 6P, 3 REFS TO APPEAR IN ACM SIGCUE BULLETIN ON COMPUTER USES IN EDUCATION (JUN 72)

SOME APPLICATIONS IN VARIOUS STAGES OF DEVELOPMENT FOR THE MERIT COMPUTER NETWORK, WHICH LINKS THREE MICHIGAN UNIVERSITIES, ARE BRIEFLY SKETCHED. FOUR PROJECTS ARE DESCRIBED, INCLUDING SHARING OF DATA FILES FROM DIFFERENT INFORMATION SERVICES AND PROVIDING COMPILERS FOR VARIOUS LANGUAGES NOT AVAILABLE ON ALL MACHINES. MANY REFERENCES, BOTH EXPLICIT AND IMPLICIT, ARE MADE TO THE METHOD OF ORGANIZATION AND MANAGEMENT OF THE NETWORK, WHICH IS COOPERATIVE WITH EACH OPERATING CENTER RETAINING COMPLETE AUTONOMY.
(ALSO UNDER 5.0)

EICK, HARRY, DR., SEYMOUR J. WOLFSON, KARL L. ZINN, FACILITIES AND RESOURCES AVAILABLE VIA THE MERIT HOST COMPUTING CENTERS, MERIT COMPUTER NETWORK, ANN ARBOR, MI, MAY 73, MCN 0573-GE-14, 34R

THE COMPUTING SYSTEMS OF THREE UNIVERSITIES, MICHIGAN STATE UNIVERSITY, UNIVERSITY OF MICHIGAN AND WAYNE STATE UNIVERSITY ARE NOW CONNECTED BY THE MERIT COMPUTER NETWORK. THIS REPORT DESCRIBES THE COMPUTING RESOURCES WHICH ARE AVAILABLE TO ALL THREE UNIVERSITIES. A LIST OF THE UNIQUE SOFTWARE AND DATA BASES OF EACH CENTER IS INCLUDED.

HAYES, ROBERT M., BIBLIOGRAPHIC PROCESSING AND INFORMATION RETRIEVAL, (BECKER AND HAYES INC.).
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 161-164
(ANNOTATION UNDER 4.2.2)

LEGATES, JOHN, THE LESSONS OF EIN, (EDUCATIONAL INFORMATION NETWORK).
EDUCOM BULLETIN, VOL 7, ISSUE 2, SUMMER 72, P 18-20, 1 REFS
(ANNOTATION UNDER 3.1.0)

ROBERTS, LAWRENCE, DR., ARPA NETWORK IMPLICATIONS, (ADVANCED RESEARCH PROJECTS AGENCY, ARLINGTON, VA).
EDUCOM BULLETIN, VOL 6, ISSUE 3, FALL 71, P 4-8
(ANNOTATION UNDER 1.6)

ROTHMAN, JOHN, DR., THE TIMES INFORMATION BANK ON CAMPUS, (NEW YORK TIMES, NY).
EDUCOM BULLETIN, VOL 8, ISSUE 3, FALL 73, P 14-19

THE AUTHOR DESCRIBES THE NEW YORK TIMES INFORMATION BANK, ITS PRESENT STATUS AND PLANS FOR THE FUTURE. THE INFORMATION BANK IS AN ON-LINE, REAL-TIME, INTERACTIVE SYSTEM ACCESSING A DATA BASE OF ALL NEWS AND EDITORIAL MATTER PUBLISHED IN THE NEW YORK TIMES AND SELECTED ARTICLES FROM SIXTY OTHER PUBLICATIONS. ONLY A FEW TERMINALS ARE NOW IN USE BUT THE USER POPULATION IS EXPECTED TO GROW RAPIDLY. THIS ARTICLE IS A VERY GENERAL ONE DESCRIBING WHAT CAPABILITIES THE INFORMATION BANK HAS THAT WOULD INTEREST UNIVERSITIES, LIBRARIES, GOVERNMENT AND COMMERCIAL INSTITUTIONS.

SHER, MICHAEL S., DR., EXPERIENCE IN NETWORKING--A CASE STUDY, (ILLINOIS, UNIV. OF, URBANA, CENTER FOR ADVANCED COMPUTATION).
ECUCN BULLETIN, VOL 8, ISSUE 3, FALL 73, P 8-13, 14 REFS

SINCE AUGUST 1971, OVER 90 PERCENT OF THE COMPUTER RESOURCES REQUIRED BY THE STAFF OF THE CENTER FOR ADVANCED COMPUTATION IN THE GRADUATE COLLEGE OF THE UNIVERSITY OF ILLINOIS HAVE BEEN OBTAINED VIA THE ARPA NETWORK. THE AUTHOR REPORTS THE FOLLOWING: (1) THE CENTER'S MEANS OF ACCESSING THE ARPANET; (2) REASONS FOR CHOOSING NETWORKING RATHER THAN LOCALLY AVAILABLE COMPUTER SYSTEMS; (3) THE CENTER'S EXPERIENCE USING THE ARPANET; AND (4) OPINIONS ON THE FUTURE OF NETWORKING IN EDUCATIONAL AND RESEARCH ENVIRONMENTS.

4.1 FUNCTIONAL

MASSY, WILLIAM F., TEXT PROCESSING AND INFORMATION RETRIEVAL, REPORT OF WORKSHOP 4, (STANFORD UNIV., CA).
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 165-177

THE WORKSHOP WAS CONCERNED WITH PROBLEMS ASSOCIATED WITH TEXT-PROCESSING AND INFORMATION RETRIEVAL SERVICES. EDITED VERSIONS OF THE REPORTS OF THREE SUBGROUPS ARE PRESENTED. THESE REPORTS ADDRESS USER CHARACTERISTICS, SYSTEM CHARACTERISTICS, AND CRITICAL PROBLEMS.
(ALSO UNDER 2.3)

TREU, SIEGFRIED, ON-LINE STUDENT DEBATE: AN EXPERIMENT IN COMMUNICATION USING COMPUTER NETWORKS, (PITTSBURGH, UNIV. OF, PA, DEPT. OF COMPUTER SCIENCE).
INTERNATIONAL JOURNAL OF COMPUTER AND INFORMATION SCIENCES, VOL 4, ISSUE 1, MAR 75, P 39-51, 10 REFS

THIS PAPER FALLS INTO THEGENERAL CATEGORY OF COMPUTER-MEDIATED INTERPERSONAL COMMUNICATION AND, MORE SPECIFICALLY, INVOLVES WHAT MAY BE CALLED "TELEDEBATING." AKIN TO THE BETTER KNOWN TELECONFERENCING TECHNIQUES, IT REPRESENTS AN INTERESTING APPLICATION OF STRUCTURED DEBATE IN THE CONTEXT OF A COMPUTER COMMUNICATIONS NETWORK. MORE IMPORTANT, HOWEVER, IS THE DESCRIBED EXPERIMENTAL ATTEMPT TO LEARN ABOUT HOW PEOPLE PERCEIVE AND CONCEPTUALIZE THE STRUCTURES OF FILES USED AS INTERMEDIARY STORAGE VEHICLES FOR THE TRANSMISSION OF INFORMATION BETWEEN/AMONG DEBATORS. THE EXPERIMENTAL EFFORT WAS NECESSARILY LIMITED. CONSIDERABLY MORE RESEARCH IS REQUIRED TO CORROBORATE AND EXTEND THE RESULTS.

4.1.0 GENERAL

BOOTH, GRAYCE M., THE USE OF DISTRIBUTED DATA BASES IN INFORMATION NETWORKS, (HONEYWELL INFORMATION SYSTEMS INC.,

4.1.0 GENERAL

PHOENIX, AZ),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION. (WASHINGTON, DC, OCTOBER 24-26, 1972). INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972. ICCC 72-CHO-690-8C. NSF GJ-33239. P 371-376

THE CONCEPT OF DISTRIBUTING DATA BASES THROUGHOUT A NETWORK OF COMPUTERS IS DISCUSSED. A NUMBER OF ALTERNATIVES ARE PRESENTED FOR DISTRIBUTED DATA BASE CREATION, ASSOCIATION OF FILES WITH JOBS, FILE ACCESS METHODS, AND FILE INTEGRITY. ANALYSIS OF ALTERNATIVES IS LEFT OPEN FOR FURTHER WORK.

KARP, P. M., DOUGLAS B. MCKAY, D. C. WOOD, VIEWS ON ISSUES RELEVANT TO DATA SHARING ON COMPUTER NETWORKS. MITRE CORP., WASHINGTON, DC, INTERNATIONAL BUSINESS MACHINES CORP., 12 MAY 71, NIC-6742, 7P

THIS REPORT SUMMARIZES PLANS AND IDEAS FOR DATA SHARING ON COMPUTER NETWORKS, WITH PARTICULAR INTEREST IN THE ARPA NETWORK. ALTERNATIVES SUCH AS DIRECT CONNECTION BY USERS TO EACH HOST, INTERMEDIATE PROCESSES FOR ASSISTING IN DATA BASE ACCESS, AND AN OVERALL UNIFIED DATA MANAGEMENT APPROACH IN THE NETWORK ARE INTRODUCED. CONCERN IS EXPRESSED FOR A DATA DESCRIPTIVE LANGUAGE, A DATA RECONFIGURATION SERVICE, FILE TRANSFER, AND DATA MANAGEMENT PROBLEMS IN A COMPUTER NETWORK ENVIRONMENT.

MARILL, THOMAS, NETWORK DATA HANDLING SYSTEM. SEMI-ANNUAL TECHNICAL REPORT. COMPUTER CORP. OF AMERICA, CAMBRIDGE, MA, 1 SEP 71, DAHC 04-71-C-0011, (AD-730 724), 56P

THE DATACOMPUTER, DESIGNED TO PROVIDE A CENTRALIZED SPECIALIZED DATA HANDLING NODE WITHIN A COMPUTER COMMUNICATIONS NETWORK, IS DESCRIBED. FOLLOWING AN OVERVIEW OF THE DATACOMPUTER, THE PRIMARY SOFTWARE MODULES ARE DETAILED, INCLUDING THE INPUT-OUTPUT MANAGER, THE REQUEST HANDLER, THE SUPERVISOR, AND THE STORAGE MANAGER.

MELTZER, HERBERT S., HUBERT F. ICKES, INFORMATION INTERCHANGE BETWEEN DISSIMILAR SYSTEMS. (INTERNATIONAL BUSINESS MACHINES CORP., SAN JOSE, CA, SYSTEMS DEVELOPMENT LAB., INTERNATIONAL BUSINESS MACHINES CORP., POUGHKEEPSIE, NY, SYSTEMS DEVELOPMENT DIV.),
MODERN DATA, VOL 4, ISSUE 4, APR 71, P 56-57, 59-60, 63, 66-67

THE PROBLEMS OF INFORMATION INTERCHANGE BETWEEN DISSIMILAR SYSTEMS ARE ADDRESSED. VARIOUS CODES AND INTERCHANGE MECHANISMS ARE EXAMINED. THE PROBLEMS OF TRANSFERRING DATA FILES FROM ONE SYSTEM TO ANOTHER AND OF TRANSFERRING A HIGH-LEVEL LANGUAGE APPLICATION PROGRAM BETWEEN SYSTEMS ARE DISCUSSED.

MORENOFF, EDWARD, THE TRANSFERABILITY OF COMPUTER PROGRAMS AND THE DATA ON WHICH THEY OPERATE. (ROME AIR DEVELOPMENT CENTER, GRIFFISS AFB, NY),
AFIPS PROCEEDINGS. 1969 SPRING JOINT COMPUTER CONFERENCE. VOLUME 34, (BOSTON, MA, MAY 14-16, 1969). AFIPS PRESS, MONTVALE, NJ, 1969, AFIPS CONFERENCE PROCEEDINGS. (LC 55-44701). P 609-610. 8 REFS

THIS BRIEF ARTICLE, REPORTING ON THE PRELIMINARY FINDINGS OF AN AIR FORCE STUDY GROUP, PRESENTS AN EXCELLENT SUMMARY OF THE PROBLEMS INVOLVED IN SOFTWARE TRANSFERABILITY AND SOME POSSIBLE SOLUTIONS. THE MAIN OBSTACLES TO SOFTWARE TRANSFERABILITY ARE SUGGESTED TO BE LOOSE SPECIFICATION OF DATA STRUCTURES, LACK OF PROGRAMMING STANDARDIZATION, AND EXCESSIVE PROGRAMMER FREEDOM WHEN HIGHER LEVEL LANGUAGES ARE USED. POSSIBLE SOLUTIONS TO THESE PROBLEMS ARE: (1) ADMINISTRATIVE CONTROL OF PROGRAMMING AND DOCUMENTATION; (2) EXTENSIONS TO CURRENT LANGUAGES; (3) USE OF A NEW PROGRAMMING ENVIRONMENT WHICH WOULD ELIMINATE THE CONSTRAINTS OF THE OLDER SYSTEM.
(ALSO UNDER 5.5)

SATTLEY, KIRK, ROBERT MILLSTEIN, STEPHEN MARSHALL, ON PROGRAM TRANSFERABILITY, MASSACHUSETTS COMPUTER ASSOCIATES, WAKEFIELD, 24 NOV 70, MCA CA-7011-2411, AF F30602-69-C-0286, 47P, 2 REFS

THE PROBLEM OF PROGRAM TRANSFERABILITY IS ADDRESSED, WHERE 'PROGRAMS' INCLUDE SOURCE CODE, FILE DECLARATIONS, LINK-EDIT COMMANDS, JOB CONTROL CARDS, AND RELATED ESSENTIALS. THE APPROACH IS TO DEFINE A PROCESS DESCRIPTION FOR SOME WIDE CLASS OF CONVENTIONAL HARDWARE WHICH IS DELIVERED TO THE MAPPING SOFTWARE OF THE TARGET MACHINE. THE MAPPING SOFTWARE CREATES A REPRESENTATION OF THE PROCESS IN THE TARGET MACHINE.

SHOSHANI, ARIE, DATA SHARING IN COMPUTER NETWORKS, (SYSTEM DEVELOPMENT CORP., SANTA MONICA, CA),
1972 WESCON TECHNICAL PAPERS, SESSION 7: COMPUTER NETWORKS, (PRESENTED AT, WESTERN ELECTRONIC SHOW AND CONVENTION, SEPTEMBER 19-22, 1972), 1972, P 7-4-1--7-4-8, 19 REFS
(ANNOTATION UNDER 3.5.2)

4.1.1 TELECONFERENCING SYSTEMS

AMARA, ROY, JACQUES VALLEE, FORUM: A COMPUTER-BASED SYSTEM TO SUPPORT INTERACTION AMONG PEOPLE, (INSTITUTE FOR THE FUTURE, MENLO PARK, CA),
ROSENFELD, JACK L., INFORMATION PROCESSING 74, PROCEEDINGS OF IFIP CONGRESS 74, 5, SYSTEMS FOR MANAGEMENT AND ADMINISTRATION, (STOCKHOLM, (SWEDEN), AUGUST 5-10, 1974), AMERICAN ELSEVIER PUBLISHING CO., INC., NEW YORK, 1974, P 1052-1056

FORUM IS A TELECONFERENCING SYSTEM IMPLEMENTED ON A DEC PDP-10 UNDER THE TENEX OPERATING SYSTEM. WHAT DISTINGUISHES FORUM FROM OTHER TELECONFERENCING SYSTEMS IS ITS AVAILABLITY ON A NETWORK (ARPA) WHICH HAS AN INTERNATIONAL REACH. SEVERAL CONFERENCES CAN BE CONDUCTED SIMULTANEOUSLY. A TRANSCRIPT OF EVERY DISCUSSION IS AVAILABLE IN A COMPUTER FILE.
THE MAIN INADEQUACY REPORTED IS THAT THE SYSTEM REQUIRES TYPING BY PARTICIPANTS. HOWEVER, THE PROJECT ENVIRONMENT DOES PROVIDE FOR DEVELOPMENT OF OTHER COMMUNICATION MEDIA WHICH WILL PROBABLY INCLUDE TWO-WAY VOICE COMMUNICATION.

ANDERSON, PETER GORDON, A STRUCTURED APPROACH TO COMPUTERIZED CONFERENCING, (NEW JERSEY INST. OF TECH.),
PROCEEDINGS OF THE 1975 SYMPOSIUM-COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, JUNE 18, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, 75CH0973-8C, P 61-68

A COMPUTERIZED CONFERENCE IS A DEVICE FOR HUMAN COMMUNICATION, WHERE THE PARTICIPANTS COMMUNICATE THROUGH INTERACTIVE COMPUTER TERMINALS. A SPECIAL-PURPOSE DATA MANAGEMENT SYSTEM RUNNING IN A TIME-SHARING COMPUTER ACTS AS THE CONFERENCE MODERATOR. THIS PAPER DESCRIBES SOME POSSIBILITIES FOR USING COMPUTERIZED CONFERENCING, AND SUGGESTS A UNIFYING STRUCTURE FOR CONFERENCING SOFTWARE.

BEDFORD, MICHAEL T., TRENDS IN TELECONFERENCING AND COMPUTER-AUGMENTED MANAGEMENT SYSTEMS, (BELL CANADA, MONTREAL, BUSINESS PLANNING GROUP),
NATIONAL TELECOMMUNICATIONS CONFERENCE, CONFERENCE RECORD, VOLUME 2, (NEW ORLEANS, LA, DECEMBER 1-3, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH-1015-7-CSCB, (LC 57-20724), P 32-20--32-22

THIS HIGHLY READABLE PAPER PRESENTS A GENERAL OVERVIEW OF THE DIFFERENT ASPECTS OF TELECONFERENCING (AUDIO, AUDIO-VISUAL, GRAPHIC, AND DATA) AND THEN GOES ON TO SHOW HOW THE LAST OF THESE (DATA, OR COMPUTER CONFERENCING) CAN BE USED TO FACILITATE A NUMBER OF GROUP COMMUNICATION FUNCTIONS WHICH CAN NOT BE ACHIEVED THROUGH THE OTHER MEDIA.

CONRATH, DAVID W., TELECONFERENCING: THE COMPUTER, COMMUNICATION, AND ORGANIZATION, (WATERLOO, UNIV. OF, (CANADA)),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C. NSF GJ-33239, P 145-146

THIS ARTICLE IS A BRIEF INTRODUCTION TO SEVERAL OTHER ARTICLES (LIPINSKI, LIPINSKI AND RANDOLPH, SCHUYLER AND JOHANSEN, TUROFF, CONSTANT AND SELLEY) GIVEN IN A SESSION OF THE SAME NAME AT THE INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATIONS HELD IN WASHINGTON, D.C.

ENGELBART, DOUGLAS C., RICHARD W. WATSON, JAMES C. NORTON, THE AUGMENTED KNOWLEDGE WORKSHOP, (STANFORD RESEARCH INST., MENLO PARK, CA),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 42, 1973, NATIONAL COMPUTER CONFERENCE AND EXPOSITION, (NEW YORK, NY, JUNE 4-8, 1973), AFIPS PRESS, MONTVALE, NJ, 1973, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 9-21, 41 REFS

UTILIZING THE DEFINITION OF KNOWLEDGE WORKER AS ONE WHO CREATES AND APPLIES KNOWLEDGE TO PRODUCTIVE ENDS, THE AUTHORS DEFINE THE CONCEPT AND FRAMEWORK OF A KNOWLEDGE WORKSHOP AND HOW THIS CONCEPT CAN BE AUGMENTED. A DESCRIPTION OF A PROTOTYPE KNOWLEDGE WORKSHOP IS INCLUDED. THE ARTICLE STATES THAT THE COMPUTER-BASED 'TOOLS' OF KNOWLEDGE WORKSHOP WILL BE PROVIDED IN THE ENVIRONMENT OF A COMPUTER NETWORK SUCH AS THE ARPANET.

ENGELBART, DOUGLAS C., NETWORK INFORMATION CENTER AND COMPUTER AUGMENTED TEAM INTERACTION, STANFORD RESEARCH INST.,

4.1.1 TELECONFERENCING SYSTEMS

MENLO PARK, CA. AUGMENTATION RESEARCH CENTER. 30 JUN 71, 8 FEB 70-8 FEB 71. AF F30602-70-C-0219. (RADC TR-71-175, AD-737 131). 105P. 21 REFS

THIS REPORT SUMMARIZES THE ACTIVITIES OF STANFORD RESEARCH INSTITUTE IN RELATION TO THE NETWORK INFORMATION CENTER OF THE ARPA NETWORK THROUGH JUNE 1971. SOME OF THE EVENTS DESCRIBED ARE THE CONVERSION OF THE PROCESSOR FROM AN XDS-940 TO A DEC PDP-10, THE REDESIGN OF THE ON-LINE SYSTEM, DEVELOPMENT OF HIGHER LEVEL PROCESSES SUCH AS EXECUTABLE TEXT, CONTENT ANALYZERS IN AUTOMATED CLERICAL PROCEDURES, AN ON-LINE JOURNAL, AND AN ON-LINE CALCULATOR.

ENGELBART, DOUGLAS C., NLS TELECONFERENCING FEATURES: THE JOURNAL, AND SHARED-SCREEN TELEPHONING. (STANFORD RESEARCH INST., MENLO PARK, CA, AUGMENTATION RESEARCH CENTER).
COMPCON FALL '75, ELEVENTH IEEE COMPUTER SOCIETY CONFERENCE, HOW TO MAKE COMPUTERS EASIER TO USE, DIGEST OF PAPERS, (WASHINGTON, DC, SEPTEMBER 9-11, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75CH0988-6C, P 173-176, 4 REFS

NLS IS AN EXTENSIVE SYSTEM OF COMPUTER AIDS BEING EVOLVED TOWARD SUPPLYING A COHERENT, COMPREHENSIVE ENVIRONMENT IN WHICH A KNOWLEDGE WORKER MIGHT WORK. THE STATED PURPOSE OF THIS PAPER IS TO DISCUSS TWO POWERFUL MODES OF COMPUTER-AIDED COLLABORATION, AND TO HIGHLIGHT THE WAYS IN WHICH COMPUTER NETWORKS WILL FACILITATE HUMAN COLLABORATION.

ENGLE, JAMES, JEAN ISELI, COLLABORATION SUPPORT SYSTEM, (MITRE CORP., MCLEAN, VA).
COMPCON FALL '75, ELEVENTH IEEE COMPUTER SOCIETY CONFERENCE, HOW TO MAKE COMPUTERS EASIER TO USE, DIGEST OF PAPERS, (WASHINGTON, DC, SEPTEMBER 9-11, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75CH0988-6C, P 177-179

A SYSTEM IS DESCRIBED THAT ALLOWS GEOGRAPHICALLY DISPERSED USERS TO COLLABORATE ONLINE IN EXECUTING REMOTE PROCESSES AND EMPLOY SPECIALIZED RESOURCES FOR THEIR MUTUAL BENEFIT.

LIPINSKI, ANDREW J., HUBERT M. LIPINSKI, ROBERT H. RANDOLPH, COMPUTER-ASSISTED EXPERT INTERROGATION: A REPORT ON CURRENT METHODS DEVELOPMENT, (INSTITUTE FOR THE FUTURE, MENLO PARK, CA).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFEPENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 147-154, 11 REFS

A MAJOR PROGRAM CURRENTLY UNDER WAY AT THE INSTITUTE FOR THE FUTURE TO DEVELOP AND TEST A SYSTEM FOR ON-LINE INTERACTION AMONG EXPERTS VIA A NETWORK OF COMPUTER TERMINALS IS SUMMARIZED. THE AUTHORS REVIEW THE INSTITUTE'S EXISTING METHODS FOR ELICITING AND PROCESSING EXPERT JUDGMENTS, THEN DISCUSS THE OPERATIONAL PROCEDURES BY WHICH THESE METHODS HAVE CONVENTIONALLY BEEN IMPLEMENTED. IN LIGHT OF THE SHORTCOMINGS OF THESE EXISTING PROCEDURES, THE AUTHORS ARGUE AN URGENT NEED FOR ON-LINE GROUP MODELING CAPABILITIES AS THE NEXT LEAP FORWARD IN JUDGMENTAL-RESEARCH METHODOLOGY. A DESCRIPTION IS GIVEN OF THE INSTITUTE'S RECENTLY COMPLETED PROTOTYPE COMPUTER CONFERENCING SYSTEM, WHEREBY REMOTELY SITUATED RESPONDENTS CAN PARTICIPATE IN INSTITUTE INQUIRIES VIA THE ARPA NETWORK AND THE RAND CORPORATION'S PDP-10 COMPUTER. PROBLEMS ENCOUNTERED THUS FAR ARE DISCUSSED, AS ARE FUTURE PLANS FOR SYSTEM REFINEMENT AND EXTENSION. THE PAPER CONCLUDES WITH SOME BRIEF PHILOSOPHICAL OBSERVATIONS ON THE STATE OF THE ART, ACKNOWLEDGING THAT MUCH WORK REMAINS TO BE DONE ON THE STILL-PRIMITIVE TOOLS OF DECISION MAKING.

MACON, NATHANIEL, JOHN MCKENDREE, RONALD WYNN, COMPUTER CONFERENCING IN EMERGENCIES: SOME RELIABILITY CONSIDERATIONS, (AMERICAN UNIV., WASHINGTON, DC, GENERAL SERVICES ADMINISTRATION, WASHINGTON, DC, OFFICE OF PREPAREDNESS), PROCEEDINGS OF THE 1975 SYMPOSIUM-COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, JUNE 18, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, 75CH0973-8C, P 69-73, 7 REFS

THE RESOURCE INTERRUPTION MONITORING SYSTEM (RIMS) IS A MANAGEMENT INFORMATION SYSTEM WITH EXTENSIVE CONFERENCING FEATURES. THIS PAPER DESCRIBES THE SYSTEM AND DISCUSSES ITS USE BY THE OFFICE OF PREPAREDNESS, GSA, AND OTHER FEDERAL AGENCIES.

SCHUYLER, JAMES A., ROBERT JOHANSEN, "ORACLE": COMPUTERIZED CONFERENCING IN A COMPUTER-ASSISTED-INSTRUCTION SYSTEM, (NORTHWESTERN UNIV., EVANSTON, IL, UPSALA COLLEGE, EAST ORANGE, NJ).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 155-160, 10 REFS

THE EVOLUTION AND OPERATION OF ORACLE, A COMPUTER PROGRAM FOR COMPUTERIZED CONFERENCING AND RESEARCH, IS DESCRIBED. ORACLE EXISTS AS AN ESSENTIAL PART OF THE COMPUTER-ASSISTED INSTRUCTION SYSTEM AT NORTHWESTERN UNIVERSITY. THE PAPER DESCRIBES THE OPERATION OF ORACLE AS A COMMUNICATIONS FACILITY FOR TEACHERS AND SYSTEMS DESIGNERS, AS A RESEARCH TOOL, AS A RECORD-KEEPER, AND AS AN INSTRUMENT FOR CURRICULAR FEEDBACK. THUS, ORACLE EXTENDS BEYOND THE TRADITIONAL REALM OF COMPUTER-ASSISTED INSTRUCTION SYSTEMS, AND SUGGESTS ALTERNATIVE USES FOR COMPUTERS IN EDUCATION. BOTH THE SYSTEM REQUIREMENTS FOR THE PROGRAM AND ITS SOCIOLOGICAL DIMENSIONS ARE DISCUSSED.

THOMAS, RICHARD B., A COMPUTER ASSISTED CONFERENCE SYSTEM, (MARYLAND, UNIV. OF, COLLEGE PARK, DEPT. OF COMPUTER SCIENCE).
PROCEEDINGS OF THE 1975 SYMPOSIUM-COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, JUNE 18, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, 75CH0973-8C, P 74-77, 9 REFS

THE UNIVERSITY OF MARYLAND IS DEVELOPING A COMPUTER-ASSISTED CONFERENCING SYSTEM TO BE USED WITHIN THE COMPUTER SCIENCE DEPARTMENT. SEVERAL NOVEL DESIGN FEATURES ARE INCORPORATED INCLUDING THE SYSTEM'S ABILITY TO RESIDE EITHER ON A NETWORK OF COMPUTERS OR ON A SINGLE COMPUTER.

TUROFF, MURRAY, DR., "PARTY-LINE" AND "DISCUSSION"--COMPUTERIZED CONFERENCE SYSTEMS, OFFICE OF EMERGENCY PREPAREDNESS, WASHINGTON, DC, 20 JAN 72, 40P, 4 REFS

THIS PAPER DESCRIBES A COMPUTER-BASED MODE OF GROUP COMMUNICATION AND EXAMINES THE COST/EFFECTIVENESS OF VARIOUS OTHER COMMUNICATIONS MODES TO ARRIVE AT THE CIRCUMSTANCES LEADING TO ECONOMIC ADVANTAGES OF THE COMPUTER-BASED MODE. THE SYSTEM ALLOWS TWO OR MORE PARTIES TO CONVERSE ASYNCHRONOUSLY VIA TERMINALS AT THEIR RESPECTIVE LOCATIONS. THE COST/EFFECTIVENESS IS MEASURED IN TERMS OF NUMBER OF CONFERENCES AND THE VALUE OF INDIVIDUALS' TIME. A HARD COPY RECORD OF THE CONFERENCE IS AN ADDITIONAL BENEFIT.
(ALSO UNDER 5.3)

TUROFF, MURRAY, "PARTY-LINE" AND "DISCUSSION" COMPUTERIZED CONFERENCE SYSTEMS, (OFFICE OF EMERGENCY PREPAREDNESS, WASHINGTON, DC),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 161-171, 10 REFS

TWO COMPUTERIZED VERSIONS OF THE BASIC TELEPHONE CONFERENCE CALL ARE OUTLINED. THE PAPER FIRST EXPLAINS THE OPERATION OF THIS COMPUTERIZED MODE OF GROUP COMMUNICATION BY LEADING THE READER THROUGH AN ILLUSTRATIVE EXAMPLE. THEN AN EXAMPLE OF RELATIVE EFFECTIVENESS AND COSTS OF VARIOUS COMMUNICATION MODES IS PRESENTED IN ORDER TO ILLUSTRATE UNDER WHAT CIRCUMSTANCES THE COMPUTER-BASED MODE OFFERS ECONOMIC ADVANTAGES OVER OTHER COMMUNICATION MODES.

4.1.2 FILE MANAGEMENT

FARBER, DAVID J., FRANK HEINRICH, THE STRUCTURE OF A DISTRIBUTED COMPUTER SYSTEM--THE DISTRIBUTED FILE SYSTEM, (CALIFORNIA, UNIV. OF, IRVINE),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 364-370, 8 REFS
(ANNOTATION UNDER 3.1.1)

GOODLETT, JIM, JOE MARINO, UNITED AIR LINES' PLACE ON ON-LINE DATA PROCESSING, (UNITED AIR LINES, DENVER, CO),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, "COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?", (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 219-221, 2 REFS
(ANNOTATION UNDER 3.1.1)

HEINRICH, FRANK, THE STRUCTURE OF A DISTRIBUTED COMPUTING SYSTEM--THE DISTRIBUTED FILE SYSTEM, CALIFORNIA, UNIV. OF, IRVINE, 1972, NSF GJ-1045, 16P, 8 REFS

4.1.2 FILE MANAGEMENT

A DISTRIBUTED FILE SYSTEM DESIGNED TO PROVIDE RELIABLE, FAIL-SOFT FILE MANAGEMENT IN A DISTRIBUTED COMPUTER NETWORK IS DESCRIBED. THE DESIGN IS MODULAR AND USES A 'SATURATION SIGNALING' MECHANISM TO BROADCAST FOR THE 'OWNER' OF A DESIRED FILE. A DETAILED DISCUSSION OF THE SYSTEM FAIL-SOFT CAPABILITY IS PRESENTED.

LEFKOVITS, H. C., CHARACTERISTICS OF DATABASE SYSTEMS IN A COMPUTER NETWORK ENVIRONMENT, (GENERAL ELECTRIC CO., BRIDGEPORT, CT. ADVANCED SYSTEMS AND TECHNOLOGY OPERATION),
INTERDISCIPLINARY CONFERENCE ON MULTIPLE ACCESS COMPUTER NETWORKS, (AUSTIN, TX, APRIL 20-22, 1970), APR 70, P 3-1-1--3-1-8
(ANNOTATION UNDER 2.9)

MASSY, WILLIAM F., INSTITUTIONAL RELATIONS, REPORT OF WORKSHOP 6, (STANFORD UNIV., CA),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 245-262, 1 REFS

THE NSF-SPONSORED WORKSHOP DISCUSSED FOUR GENERAL ISSUES CONCERNING NETWORKING FROM THE POINT OF VIEW OF COLLEGE OR UNIVERSITY ADMINISTRATION: (1) WHY UNIVERSITIES MIGHT BE INTERESTED IN NETWORKING; (2) SPECIFIC QUESTIONS THAT AN ADMINISTRATION WOULD WANT TO ANSWER BEFORE PROCEEDING; (3) IMPLICATIONS OF NETWORKING FOR THE ORGANIZATION OF THE UNIVERSITY'S COMPUTING CENTER; AND (4) QUESTIONS ABOUT NETWORKING OF CONCERN TO TOP UNIVERSITY ADMINISTRATORS.
(ALSO UNDER 2.3)

NETWORKING AND GRAPHICS RESEARCH, HARVARD UNIV., CAMBRIDGE, MA, DEC 71, 1 JUL 68-31 AUG 71, AF F19628-71-C-0174, (AF-ESD TR-72-126, AD-742 252), 72P, 11 REFS

THIS REPORT DESCRIBES THE RESULTS OF A PROGRAM OF RESEARCH CARRIED OUT AT HARVARD UNIVERSITY DURING THE LATE '60'S AND EARLY '70'S. THE WORK UTILIZED A PDP-1-BASED GRAPHICS FACILITY, A PDP-10, AND THE ARPA NETWORK. MOST OF THE REPORT IS DEVOTED TO RESEARCH IN COMPUTER GRAPHICS, HOWEVER THE ECL PROGRAMMING SYSTEM IS BRIEFLY DESCRIBED. THIS SYSTEM IS INTENDED TO BE USABLE FOR COMMON COMPUTATIONAL TASKS CARRIED OUT CONCURRENTLY ON SEVERAL NODES OF THE ARPA NETWORK.
WORK MORE SPECIFICALLY RELATED TO THE ARPA NETWORK INCLUDED CONSTRUCTION OF NETWORK CONTROL PROGRAMS ON BOTH COMPUTERS, AND WORK DIRECTED TOWARD FACILITATING THE TRANSFER OF FILES OVER THE NETWORK. THIS WORK WAS BROUGHT ABOUT PARTLY BY THE DESIRE TO GIVE GRAPHICS USERS ACCESS TO THE PDP-10 AND, CONVERSELY, TO MAKE THE PDP-1 PERIPHERAL EQUIPMENT AVAILABLE TO PDP-10 USERS.

ROBERTS, LAWRENCE G., ACCESS CONTROL AND FILE DIRECTORIES IN COMPUTER NETWORKS, (ADVANCED RESEARCH PROJECTS AGENCY, WASHINGTON, DC),
IEEE INTERNATIONAL CONVENTION, MAR 68, 4P

AN ARGUMENT IS PRESENTED IN THIS BRIEF PAPER FOR THE NEED TO KEEP DUPLICATE FILE DIRECTORIES CONTAINING OWNERSHIP AND ACCESSABILITY INFORMATION IN MULTI-COMPUTER NETWORKS. SOME ADDITIONAL PROBLEMS REGARDING ACCESS CONFLICTS ARE BRIEFLY SUMMARIZED.

SABLE, JEROME D., TRANSFERABILITY OF DATA AND PROGRAMS BETWEEN COMPUTER SYSTEMS, (AUERBACH CORP., PHILADELPHIA, PA), AFIPS PROCEEDINGS, 1969 SPRING JOINT COMPUTER CONFERENCE, VOLUME 34, (BOSTON, MA, MAY 14-16, 1969), AFIPS PRESS, MONTVALE, NJ, 1969, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 611-612

A HIERARCHY OF DATA STRUCTURE TYPES WHICH RANGE FROM MACHINE AND STORAGE-ORIENTED STRUCTURES TO LOGICAL DATA STRUCTURES TRANSMITTABLE AS CHARACTER STRINGS INDEPENDENT OF PHYSICAL REPRESENTATION IS PRESENTED. THE OBJECT IS TO BE ABLE TO WRITE PROGRAMS FOR ONE OF SEVERAL STANDARD ENVIRONMENTS AND TO DESCRIBE IN A STANDARD WAY THE DATA STRUCTURES WHICH ARE TO BE TRANSMITTED AND INTERPRETED.

WHITNEY, V. KEVIN MCORE, A STUDY OF OPTIMAL FILE ASSIGNMENT AND COMMUNICATION NETWORK CONFIGURATION IN REMOTE-ACCESS COMPUTER MESSAGE PROCESSING AND COMMUNICATION SYSTEMS, MICHIGAN, UNIV. OF., ANN ARBOR, DEPT. OF ELECTRICAL ENGINEERING, SEP 70, MI-DEE SEL-48, AF F30602-69-C-0214, 408P, 187 REFS
(ANNOTATION UNDER 2.9)

4.1.9 OTHER

BANIN, RAM A., ROBERT D. BURN, JR., REAL-TIME DATA ACQUISITION AND PROCESS CONTROL IN A DISTRIBUTED COMPUTING NETWORK, (SYSTEMS CONTROL INC., PALO ALTO, CA),
NATIONAL TELECOMMUNICATIONS CONFERENCE, CONFERENCE RECORD, VOLUME 1, (NEW ORLEANS, LA, DECEMBER 1-3, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH-1015-7-CSCB, (LC 57-20724), P 24-14--24-17, 5 REFS

PRESENTED IS A BRIEF DESCRIPTION OF A DISTRIBUTED COMPUTING NETWORK, CURRENTLY UNDER CONSTRUCTION, WHICH WILL FACILITATE USER EXPERIMENTATION WITH A VARIETY OF SCHEMES FOR COLLECTION, PROCESSING, AND DISPLAY OF DATA IN REAL TIME. FUTURE APPLICATIONS FOR DISTRIBUTED COMPUTING IN REAL TIME ARE INDICATED.

DE GENNARO, RICHARD, MAJOR TRENDS IN LIBRARY COMPUTERIZATION, (PENNSYLVANIA, UNIV. OF., PHILADELPHIA),
FACTS AND FUTURES, WHAT'S HAPPENING NOW IN COMPUTING FOR HIGHER EDUCATION, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (PRINCETON, NJ, OCTOBER 9-11, 1973), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1974, (LC 74-79222), P 282-286
(ANNOTATION UNDER 1.2)

HARSLEM, E. F., JOHN F. HEAFNER, THE DATA RECONFIGURATION SERVICE--AN EXPERIMENT IN ADAPTABLE, PROCESS/PROCESS COMMUNICATION, RAND CORP., SANTA MONICA, CA, NOV 71, RC R-860-ARPA, 22P, 9 REFS

A DATA RECONFIGURATION SERVICE (DRS) WHICH HAS BEEN IMPLEMENTED AND IS CURRENTLY RUNNING AT MIT, UCLA, UCSB, AND RAND IS DESCRIBED, AND ITS SYNTAX IS SPECIFIED IN DETAIL. THE SERVICE ALLOWS A USER TO SPECIFY FORMS IN THE DRS LANGUAGE WHICH ARE USED TO RECONFIGURE DATA BETWEEN USER AND SERVER SITES. THE CURRENT RECONFIGURATIONS ALLOW FOR CHARACTER SET CONVERSIONS, MESSAGE LEADER ADDITION OR DELETION, DATA COMPRESSION AND EXPANSION, GENERATION OF MESSAGE COUNTERS AND FLAGS, GRAPHIC DEVICE CODE CONVERSIONS, DATA FIELD-TRANSPOSITION, AND FILE REFORMATTING. EXAMPLES OF EACH APPLICATION ARE GIVEN./

MARILL, THOMAS, DALE STERN, THE DATACOMPUTER--A NETWORK DATA UTILITY, (COMPUTER CORP. OF AMERICA, CAMBRIDGE, MA), AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 389-395, 9 REFS

THE DATACOMPUTER PROVIDES DATA SHARING SERVICES WITHIN A NETWORK ENVIRONMENT. A DATABASE STORED ON THE DATACOMPUTER IS SHARABLE BY ALL COMPUTERS HAVING ACCESS TO THE SYSTEM. THUS USERS OF DIFFERENT INTERESTS AND WITH DIFFERENT HARDWARE SHARE THE SAME BASE. DESIGN CONCEPTS, THE DATALANGUAGE AND APPLICATIONS ARE ALL DISCUSSED.
(ALSO UNDER 4.3)

PRESTIA, CLARK A., SINGER POINT-OF-SALE SYSTEMS, (SINGER BUSINESS MACHINES, SAN LEANDRO, CA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 189-190

SINGER BUSINESS MACHINES DEVELOPED A POINT-OF-SALE SYSTEM CALLED MODULAR DATA TRANSACTION SYSTEM (MDTS) WHICH IS DECENTRALIZED UTILIZING INTELLIGENT TERMINALS. THE TERMINALS IN STAND-ALONE MODE ARE CAPABLE OF HANDLING SIMPLE TRANSACTIONS, AND A LARGE CENTRAL SYSTEM PROVIDES EXTENDED CAPABILITIES, SUCH AS CREDIT AUTHORIZATION.
(ALSO UNDER 3.1.0)

SCHATZ, V. L., COMPUTER NETWORKS FOR RETAIL STORES, (JEWEL COMPANIES INC., CHICAGO, IL),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 165-167

THE DATA PROCESSING AND DATA COMMUNICATION NEEDS OF A LARGE DIVERSIFIED RETAIL COMPANY ARE DISCUSSED. SOME OF THE APPROACHES FOR SOLVING THESE NEEDS ARE DESCRIBED WHICH INCLUDE NETWORK DEVELOPMENT BEGINNING WITH A STORE-LEVEL SYSTEM, THE ELECTRONIC STORE INFORMATION SYSTEM (ESIS).

WARE, GLENN O., JOHN H. SCHUENEMEYER, AN INFORMATION DISSEMINATION NETWORK MODEL, (GEORGIA, UNIV. OF., ATHENS),
FACTS AND FUTURES, WHAT'S HAPPENING NOW IN COMPUTING FOR HIGHER EDUCATION, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (PRINCETON, NJ, OCTOBER 9-11, 1973), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1974, (LC 74-79222), P 62-68, 6 REFS

THE AUTHORS DESCRIBE A SIMULATION MODEL OF A NETWORK OF LIBRARIES AND INFORMATION RETRIEVAL CENTERS. STATISTICAL

4.1.9 OTHER

ANALYSIS OF DATA COLLECTED CONCERNING TWO EXISTING INFORMATION DISSEMINATION CENTERS, ONE AT THE UNIVERSITY OF GEORGIA AND LEADERMART AT LEHIGH UNIVERSITY, PROVIDED QUANTITATIVE MEASURES AND PREDICTION EQUATIONS WHICH WERE INCORPORATED INTO THE MODEL. THREE AREAS OF NEEDED ADDITIONAL INVESTIGATION WERE IDENTIFIED; SCHEDULING PROCEDURES, OPTIMIZING DATA BASE ALLOCATION AND SIMPLIFING THE USER INTERFACE FOR MULTIDISCIPLINARY NETWORKS.
(ALSO UNDER 2.1.1)

WAX, DAVID M., R. D. MORRISON, JR., NASIC: A REGIONAL EXPERIMENT IN THE BROKERAGE OF INFORMATION SERVICES. (NEW ENGLAND BOARD OF HIGHER EDUCATION), FACTS AND FUTURES. WHAT'S HAPPENING NOW IN COMPUTING FOR HIGHER EDUCATION. PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (PRINCETON, NJ. OCTOBER 9-11, 1973), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1974. (LC 74-79222). P 268-273

NASIC IS AN ATTEMPT TO PROVIDE A LARGE RESEARCH COMMUNITY WITH ACCESS TO A WIDE SPECTRUM OF INFORMATION SERVICES. THIS ARTICLE DESCRIBES THE MOTIVATION, FUNCTIONS AND GOALS ASSOCIATED WITH THIS EFFORT.
(ALSO UNDER 5.0)

WINETT, JOEL M., ON-LINE DOCUMENTATION OF THE COMPATIBLE TIME-SHARING SYSTEM, MASSACHUSETTS INST. OF TECH., LEXINGTON, LINCOLN LAB., 12 MAY 65. MIT-LL TR-387, MIT-ESD TOR-65-68, AF 19(628)-500, (AD-624 110), 46P, 7 REFS

AN ON-LINE SYSTEM IS DESCRIBED WHICH WAS USED FOR STORING AND RETRIEVING INFORMATION ABOUT THE PROGRAMS ASSOCIATED WITH THE MIT COMPATIBLE TIME-SHARING SYSTEM. THE SYSTEM HELPS TO DOCUMENT THE SYSTEM COMMANDS, SUPERVISOR ENTRIES, LIBRARY SUBROUTINES, AND PUBLIC PROGRAMS. THIS SYSTEM IS AN ATTEMPT TO SOLVE THE PROBLEMS OF LACK OF UNIFORMITY IN DOCUMENTATION, DELAYS IN DISTRIBUTION, AND THE INABILITY TO SELECTIVELY RETRIEVE INFORMATION ABOUT A PARTICULAR PROGRAM./

4.2.0 GENERAL

AUFENKAMP, D. DON, NSF ACTIVITIES IN NETWORKING FOR SCIENCE. (NATIONAL SCIENCE FOUNDATION, WASHINGTON, DC), GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 38-43, 2 REFS
(ANNOTATION UNDER 1.1)

AUFENKAMP, D. D., NATIONAL SCIENCE (COMPUTER) NETWORK. (NATIONAL SCIENCE FOUNDATION, WASHINGTON, DC. OFFICE OF COMPUTING ACTIVITIES), NETWORKS FOR HIGHER EDUCATION, PROCEEDINGS OF THE EDUCOM SPRING CONFERENCE, (WASHINGTON, DC, APRIL 13, 1972), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1972, P 29-35
(ANNOTATION UNDER 1.1)

AUFENKAMP, D, D., NSF NETWORK INITIATIVE. (NATIONAL SCIENCE FOUNDATION, WASHINGTON, DC. OFFICE OF COMPUTING ACTIVITIES) NETWORKS AND DISCIPLINES, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (ANN ARBOR, MI, OCTOBER 11-13, 1973), 1973, P 88-90, 3 REFS
(ANNOTATION UNDER 1.1)

BECKER, J., W. C. OLSEN, INFORMATION NETWORKS, (INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ), CUADRA, C. A., ANNUAL REVIEW OF INFORMATION SCIENCE AND TECHNOLOGY, VOLUME 3, ENCYCLOPEDIA BRITANNICA INC., CHICAGO, IL, 1968, (Z699.A1A65, LC 66-25096), P 289-327, 190 REFS
(ANNOTATION UNDER 1.2)

DIXON, WILFRID J., DATA AND COMPUTING FACILITIES. (CALIFORNIA, UNIV. OF, LOS ANGELES), GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 105-114

IN APPROACHING THE QUESTION OF HOW TO MOST EFFECTIVELY PROVIDE ACCESS TO SPECIALIZED COMPUTING POWER, IT IS OBSERVED THAT CERTAIN BASIC PROCESSING REQUIREMENTS ARE COMMON TO COMPUTER CENTERS REGARDLESS OF THE FIELD OF APPLICATION OR SUBJECT MATTER OF THE INDIVIDUAL JOBS BEING PROCESSED. THESE BASIC FUNCTIONS INCLUDE: DATA ORIGINATION, FILE ACCESS, EDITING, REORGANIZATION, PREANALYSIS, ANALYSIS, DISPLAY AND REPORTING, AND DATA CORRECTION AND REDUCTION. THE HEALTH SCIENCES COMPUTING FACILITY AT THE UNIVERSITY OF CALIFORNIA, LOS ANGELES, IS DISCUSSED IN TERMS OF THESE REQUIREMENTS.
(ALSO UNDER 1.1, 3.1.0)

HAIBT, L., A. MULLERY, DATA DESCRIPTIVE LANGUAGE FOR SHARED DATA, INTERNATIONAL BUSINESS MACHINES CORP., YORKTOWN HEIGHTS, NY, THOMAS J. WATSON RESEARCH CENTER, 28 JUL 71, IBM-TJWRC RC-3476, 15P

A DATA DESCRIPTION LANGUAGE IS DESCRIBED WHICH PERMITS THE SPECIFICATION OF THOSE ASPECTS OF DATA REPRESENTATION WHICH WOULD BE SUBJECT TO TRANSFORMATION WHEN TRANSFERRING DATA IN A NETWORK. TWO DESCRIPTIONS ARE GIVEN TO A 'DATA MANAGER': ONE INDICATES HOW THE DATA IS NOW REPRESENTED; THE OTHER INDICATES HOW IT SHOULD LOOK AFTER TRANSFORMATION. THIS DIFFERS FROM THE RAND APPROACH OF SPECIFYING THE PARTICULAR TRANSLATION ALGORITHMS FOR TRANSFORMING FROM ONE FORM TO THE OTHER.
(ALSO UNDER 3.4.9)

HARRIS, DAVID D., JAMES A. HOWARD, ROGER C. WOOD, RESEARCH IN ON-LINE COMPUTATION, CALIFORNIA, UNIV. OF, SANTA BARBARA, 30 SEP 71, 1 JUL 70-31 AUG 71, AF F19620-70-C-0314, (AFCRL 71-0530, AD-735 300), 86P, 30 REFS

THE CONNECTION OF THE UCSB IBM 360 COMPUTER SYSTEM TO THE ARPANET IS DOCUMENTED. THE NETWORK CONTROL PROGRAM AND VARIOUS ASPECTS OF THE UCSB OPERATING SYSTEM ARE DESCRIBED, INCLUDING THE UCSB 'ON-LINE SYSTEM'. OF INTEREST IS A DISCUSSION OF THE DIGITIZED SPEECH RESEARCH EFFORT, PARTICULARLY THE DATA COMPRESSION STUDIES PERMITTING COMPRESSION WITHOUT NOTICEABLE SPEECH DEGRADATION.
(ALSO UNDER 3.4.9)

LICKLIDER, J. C. R., THE ON-LINE INTELLECTUAL COMMUNITY, (INTERNATIONAL BUSINESS MACHINES CORP.), PROCEEDINGS--SECOND NATIONAL SYMPOSIUM ON ENGINEERING INFORMATION, (NEW YORK, OCTOBER 27, 1965), ENGINEERS JOINT COUNCIL, NEW YORK, OCT 65, (LC 64-5057), P 29-36

THIS PRESENTATION DISCUSSES AN INFORMATION NETWORK FOR SCIENCE AND TECHNOLOGY SPANNING DISCIPLINE AND APPLICATION AREAS AS WELL AS GEOGRAPHY. THE PAPER PRESENTS SOME THOUGHTS ON THE FACILITIES, FUNCTIONS, SERVICES, PRINCIPLES, TECHNIQUES, AND PROBLEMS OF NETWORKING. DETAILED TECHNICAL CONSIDERATIONS AND QUESTIONS OF NETWORK MANAGEMENT ARE NOT GIVEN ATTENTION.

NOWAKOWSKI, DONALD B., STATE INTEGRATED INFORMATION NET (SIINET). A CONCEPT, (WESTERN UNION TELEGRAPH CO., ARLINGTON, VA), JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71C59-C, P 137-147
(ANNOTATION UNDER 3.1.0)

OVERHAGE, CARL F. J., INFORMATION NETWORKS, (MASSACHUSETTS INST. OF TECH., CAMBRIDGE), CUADRA, C. A., ANNUAL REVIEW OF INFORMATION SCIENCE AND TECHNOLOGY, VOLUME 4, ENCYCLOPEDIA BRITANNICA INC., CHICAGO, IL, 1969, (Z699.A1A65.V.4, LC 66-25096), P 339-377, 145 REFS
(ANNOTATION UNDER 1.2)

4.2.1 HEALTH AND MEDICAL SCIENCES

CHEN, THOMAS T., DR., SPECIALIZED TERMINAL AND NETWORK (PLATO): AN OVERVIEW OF A HEALTH SCIENCE COMPUTER NETWORK, (ILLINOIS, UNIV. OF, URBANA), COMPCON FALL '75, ELEVENTH IEEE COMPUTER SOCIETY CONFERENCE, HOW TO MAKE COMPUTERS EASIER TO USE, DIGEST OF PAPERS, (WASHINGTON, DC, SEPTEMBER 9-11, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75CH0988-6C, P 189-191, 12 REFS

A DESCRIPTION OF THE SCOPE AND IMPLEMENTATION OF A HEALTH SCIENCES NETWORK EMPLOYED BY THE UNIVERSITY OF ILLINOIS COLLEGE OF MEDICINE IS PRESENTED.

CHRISTY, P. R., R. R. HENLEY, M. S. BLOIS, A NETWORK STRUCTURED HOSPITAL INFORMATION SYSTEM, (CALIFORNIA, UNIV. OF, SAN FRANCISCO, MEDICAL CENTER), COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 223-226

4.2.1 HEALTH AND MEDICAL SCIENCES

(ANNOTATION UNDER 3.1.0)

OIFFLEY, MICHAEL W., DESIGN CONSIDERATIONS OF A PROPOSED LOCAL AREA COMPUTER NETWORK EMPHASIZING THE NEEDS OF THE HEALTH SCIENCES. (MINNESOTA, UNIV. OF, MINNEAPOLIS).
DATA NETWORKS: ANALYSIS AND DESIGN. THIRD DATA COMMUNICATIONS SYMPOSIUM, (ST. PETERSBURG, FL, NOVEMBER 13-15, 1973). INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973. IEEE CN-73-CH0828-4C, P 97-103, 5 REFS

THIS PAPER PRESENTS AN OVERVIEW OF THE DESIGN OF A PROPOSED COMPUTER NETWORK INTENDED FOR USE IN HEALTH SCIENCES RELATED ACTIVITIES. THE PROPOSED NETWORK IS AN EXTENSION OF A CURRENTLY OPERATIONAL NETWORK SERVING THE DIVISIONS OF HEALTH COMPUTER SCIENCES (HCS) AT THE UNIVERSITY OF MINNESOTA, THE PRIMARY FUNCTION OF WHICH HAS BEEN TO PROVIDE ACCESS TO THE RESOURCES OF THE HCS CONTROL DATA 3300.
(ALSO UNDER 3.1.0)

GABRIELI, E. R., OR., MEDICAL NETWORK, (E. J. MEYER MEMORIAL HOSPITAL, BUFFALO, NY, CLINICAL INFORMATION CENTER).
DATAMATION, VOL 16, ISSUE 4, 15 OCT 70, P 42-45

THIS PAPER DESCRIBES THE APPLICATION OF COMPUTERS FOR PROCESSING PRIMARY MEDICAL DATA, EMPHASIZING THE NEED FOR COMPUTER NETWORKS TO PROVIDE RELIABLE ACCESS TO LARGE REFERENCE FILES.

MCCARN, DAVIS B., A MEDICAL INFORMATION NETWORK AND CONSTRAINTS ON NETWORKING, (NATIONAL LIBRARY OF MEDICINE, WASHINGTON, DC).
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 338-344, 2 REFS
(ANNOTATION UNDER 3.1.2)

ROCKOFF, MAXINE L., HEALTH CARE COMMUNICATION SYSTEMS, (HEALTH SERVICES AND MENTAL HEALTH ADMINISTRATION, ROCKVILLE, MD).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 465-467

THE POTENTIAL USES OF BROADBAND COMMUNICATIONS IN THE HEALTH CARE FIELD ARE PRESENTED. INCLUDED ARE APPLICATIONS FOR VOICE, VIDEO, AND DATA SIGNALS. A NUMBER OF VERY INTERESTING POSSIBLE SOCIOLOGICAL CONSEQUENCES OF COMMUNICATIONS TECHNOLOGY IN HEALTH CARE ARE ALSO DISCUSSED, CENTERING MOSTLY ON DEPERSONALIZATION.
(ALSO UNDER 1.5, 1.6)

SILVERSTEIN, MARTIN E., COMPUTERS, COMMUNICATIONS, AND DISTRIBUTED HEALTH CARE SYSTEMS, (HEALTH ANALYSIS INC., BETHESDA, MD).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 463-464
(ANNOTATION UNDER 1.1)

TEAGER, HERBERT M., THE EXOTIC MEDICAL USER AND THE ONGOING COMPUTER REVOLUTION, (BOSTON UNIV., MA, MEDICAL CENTER).
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 131-142

THE AUTHOR LOOKS AT THE UNIQUE NEEDS OF THE MEDICAL RESEARCH AND CLINICAL CARE COMMUNITY WITHIN THE FRAMEWORK OF A PROPOSED COMPUTER NETWORK. AMONG THE SPECIFIC APPLICATION AREAS HE ADDRESSES ARE PATIENT RECORDS, PATIENT CARE AND MEDICAL RESEARCH. THE CONCLUSION ENUMERATES KEY CONSIDERATIONS FOR A POTENTIAL NETWORK.
(ALSO UNDER 3.1.0)

4.2.2 LIBRARY SCIENCE

BYSTROM, JOHN, TELECOMMUNICATION NETWORKS FOR LIBRARIES AND INFORMATION SYSTEMS: APPROACHES TO DEVELOPMENT, BECKER, JOSEPH, PROCEEDINGS OF THE CONFERENCE ON INTERLIBRARY COMMUNICATIONS AND INFORMATION NETWORKS, (WARRENTON, VA, SEPTEMBER 28-OCTOBER 2, 1970), AMERICAN LIBRARY ASSOCIATION, CHICAGO, IL, 1971, OEC 0-9-230288-4235(095), (LC 70-185596), P 27-43, 17 REFS

THIS STUDY OF LIBRARY INFORMATION NETWORKING ENCOMPASSES POLITICAL AND ECONOMIC IMPLICATIONS AS WELL AS TECHNOLOGICAL INNOVATIONS IN GENERAL TERMS.

CUADRA, CARLOS A., COMPUTER TECHNOLOGY AND LIBRARIES OF THE FUTURE, (SYSTEM DEVELOPMENT CORP., SANTA MONICA, CA).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 472-476

THE CURRENT USE OF COMPUTERS IN LIBRARIES IS OUTLINED, AND THEN REASONABLE PREDICTIONS ARE MADE FOR AN EXPANDED ROLE. INCLUDED IN THE EXPANDED ROLE ARE THE FOLLOWING: ON-LINE CATALOGS, COMPUTER SUPPLEMENTED REFERENCE AND CIRCULATION FUNCTIONS, AND ADDITIONAL INTERNAL LIBRARY PROCESSING.
(ALSO UNDER 1.6)

HAYES, ROBERT M., BIBLIOGRAPHIC PROCESSING AND INFORMATION RETRIEVAL, (BECKER AND HAYES INC.).
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 161-164

THE APPLICATIONS FOR A NATIONAL SCIENCE COMPUTER NETWORK FOR BIBLIOGRAPHIC PROCESSING AND INFORMATION RETRIEVAL HAVE BEEN PROVEN TECHNICALLY FEASIBLE, AND OPERATIONALLY USEFUL. THE AUTHOR SUMMARIZES THE RELEVANT CHARACTERISTICS OF SUCH APPLICATIONS AND POINTS OUT ADDITIONAL POSSIBILITIES FOR UTILIZING COMPUTER NETWORKS.
(ALSO UNDER 4.0)

KILGOUR, FREDERICK G., LIBRARY NETWORKS, (OHIO COLLEGE LIBRARY CENTER).
NETWORKS AND DISCIPLINES, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (ANN ARBOR, MI, OCTOBER 11-13, 1973), 1973, P 38-41, 10 REFS

A SHORT PAPER IS PRESENTED GIVING AN OVERVIEW OF LIBRARY AND INFORMATION NETWORKS PRESENTLY AVAILABLE AND PLANNED FOR THE FUTURE. THE AUTHOR ALSO INCLUDES A DISCUSSION OF THE IMPORTANCE OF THESE NETWORKS FOR LIBRARY PRODUCTIVITY.

4.2.3 EDUCATION

DEGRASSE, RICHARD V., REMOTE COMPUTING IN HIGHER EDUCATION: PROSPECTS FOR THE FUTURE, VERMONT, UNIV. OF, BURLINGTON, ACADEMIC COMPUTING CENTER, DEC 71, NSF GJ-947, 103P, 53 REFS
(ANNOTATION UNDER 1.1)

EDUCATIONAL COMPUTER NETWORKS, WHERE IS THE BOOM HEADING?,
GOVERNMENT DATA SYSTEMS, VOL 3, ISSUE 3, MAY-JUN 73, P 14-15, 18, 31, 35
(ANNOTATION UNDER 1.2)

MILLER, JAMES G., EDUCOM: INTERUNIVERSITY COMMUNICATIONS COUNCIL, INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, MAY 66, 22P
(ANNOTATION UNDER 1.1)

RUBIN, MARTIN L., BEVERLY HUNTER, MARILYN KNETSCH, EVALUATION OF THE EXPERIMENTAL CAI NETWORK (1973-1975) OF THE LISTER HILL NATIONAL CENTER FOR BIOMEDICAL COMMUNICATIONS, NATIONAL LIBRARY OF MEDICINE, HUMAN RESOURCES RESEARCH ORGANIZATION (HUMRRO), ALEXANDRIA, VA, EASTERN DIV., JAN 75, HUMRRO FR-ED-75-1, NO1-LM-4-4725, (LMNCBC 75-03, PB-239 358), 77P
(ANNOTATION UNDER 2.2)

SEIDER, WARREN D., LAWRENCE B. EVANS, ARTHUR WESTERBERG, COMPUTERS IN EDUCATION: HOW CHEMICAL ENGINEERS ORGANIZED THE CACHE COMMITTEE, (PENNSYLVANIA, UNIV. OF, PHILADELPHIA, DEPT. OF CHEMICAL ENGINEERING, MASSACHUSETTS INST. OF TECH., CAMBRIDGE, DEPT. OF CHEMICAL ENGINEERING, FLORIDA, UNIV. OF, GAINESVILLE, DEPT. OF CHEMICAL ENGINEERING).
EDUCOM BULLETIN, VOL 8, ISSUE 2, SUMMER 73, P 10-17, 7 REFS

THE ORGANIZATION, ACCOMPLISHMENTS AND ON-GOING ACTIVITIES OF THE CACHE COMMITTEE ARE PRESENTED. THE

4.2.3 EDUCATION

AUTHORS DESCRIBE HOW THE COMMITTEE, COMPRISED OF CHEMICAL ENGINEERING EDUCATORS, IS ENCOURAGING THE USE OF COMPUTERS IN CHEMICAL ENGINEERING EDUCATION, THE SHARING OF SOFTWARE RESOURCES, AND STIMULATING RESEARCH.

4.2.9 OTHER

ARONOFSKY, JULIUS, COMPUTER USAGE IN THE NATURAL SCIENCES, REPORT OF WORKSHOP 1, (SOUTHERN METHODIST UNIV., DALLAS, TX)
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 99-104
(ANNOTATION UNDER 1.1)

BERG, SANFORD V., NETWORKS IN ECONOMICS, (FLORIDA, UNIV. OF, GAINESVILLE),
NETWORKS AND DISCIPLINES, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (ANN ARBOR, MI, OCTOBER 11-13, 1973), 1973, P 25-37, 8 REFS

THE USE OF COMPUTER NETWORKS TO COMBINE USERS, SYSTEMS MANAGEMENT, HARDWARE, SOFTWARE AND DATA TO CREATE A MORE EFFICIENT RESEARCH ENVIRONMENT IN ECONOMICS IS EXAMINED. SOME RESULTS FROM INTERNATIONAL TRADE THEORY ARE APPLIED TO NETWORKING EFFORTS IN ECONOMICS.
(ALSO UNDER 5.1)

CHENHALL, ROBERT G., NETWORKS FOR MUSEUMS AND RELATED DISCIPLINES, (ARKANSAS, UNIV. OF, FAYETTEVILLE, MUSEUM DATA BANK COORDINATING COMMITTEE),
NETWORKS AND DISCIPLINES, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (ANN ARBOR, MI, OCTOBER 11-13, 1973), 1973, P 42-48, 3 REFS

THE ADVANTAGES OF COMPUTER AND COMPUTER NETWORK USE FOR CATALOGING INFORMATION ON ANY TYPE OF COLLECTION ARE DISCUSSED. VARIOUS EXISTING SYSTEMS ARE DESCRIBED SUCH AS GRIPHOS, SELGEM, TAXIR, GIPSY AND SARG. FINALLY A DISCUSSION OF A NEW ORGANIZATION, THE MUSEUM DATA BANK COORDINATING COMMITTEE, ITS FUNCTIONS AND GOALS IS PRESENTED.

DAVIS, RUTH M., THE NATIONAL BIOMEDICAL COMMUNICATIONS NETWORK AS A DEVELOPING STRUCTURE, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, CENTER FOR COMPUTER SCIENCES AND TECHNOLOGY),
BECKER, JOSEPH, PROCEEDINGS OF THE CONFERENCE ON INTERLIBRARY COMMUNICATIONS AND INFORMATION NETWORKS, (WARRENTON, VA, SEPTEMBER 28-OCTOBER 2, 1970), AMERICAN LIBRARY ASSOCIATION, CHICAGO, IL, 1971, DEC 0-9-230288-423S(09S), (LC 70-165596), P 294-309, 4 REFS
(ANNOTATION UNDER 3.0)

GREENBERGER, MARTIN, NUMERICAL DATA BASES, STATISTICAL ANALYSIS, AND MODELING, REPORT OF WORKSHOP 2, (JOHNS HOPKINS UNIV.),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 115-130, 3 REFS

THE WORKSHOP EXAMINED THE CHARACTERISTICS AND NEEDS OF BEHAVIORAL SCIENTISTS AND OTHERS WHO USE COMPUTERS IN SIMILAR WAYS IN ORDER TO SPECIFY THE NEEDS AND DESIRES FOR A NATIONAL NETWORK FOR THIS CLASS OF USERS. THE WORKSHOP ALSO CONSIDERED THE CONSTITUENT GROUPS WHOSE PARTICIPATION AND SUPPORT MIGHT BE CRITICAL TO THE CAUSE OF IMPROVED RESOURSE SHARING THROUGH NETWORKS.
(ALSO UNDER 2.3)

KILGOUR, F. G., A REGIONAL NETWORK--OHIO COLLEGE LIBRARY CENTER, (OHIO COLLEGE LIBRARY CENTER),
DATAMATION, VOL 16, ISSUE 2, FEB 70, P 87-89

THE OHIO COLLEGE LIBRARY CENTER NETWORK IS DESCRIBED. THE NETWORK, BEING PLANNED WHEN THIS ARTICLE WAS WRITTEN, WILL OFFER OHIO COLLEGES AND UNIVERSITIES ON-LINE RETRIEVAL FROM A CENTRAL CATALOG, SERIALS CONTROL, AND COMPUTERIZED ACQUISITION AND CATALOGING SUPPORT.

KULLENBERG, HANS, APPLICATION OF COMPUTER COMMUNICATIONS IN THE AIR TRANSPORT INDUSTRY, (SCANDINAVIAN AIRLINES SYSTEM, BROMMA, (SWEDEN)),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 67-70

THE AUTHOR AVOIDS ALL TECHNICAL DETAILS OF COMPUTER NETWORKS AND TECHNOLOGIES USED IN THE AIR TRANSPORT INDUSTRY. RATHER, EMPHASIS IS PLACED ON THE COMPLEX AND INTERRELATED FUNCTIONS BEHIND THE SCENES OF THIS INDUSTRY WHICH ARE ACCOMPLISHED BY NETWORKS TO SERVE THE PUBLIC.

LYKOS, PETER, NETWORKING AND CHEMISTRY, (NATIONAL SCIENCE FOUNDATION, WASHINGTON, DC, OFFICE OF COMPUTING ACTIVITIES),
NETWORKS AND DISCIPLINES, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (ANN ARBOR, MI, OCTOBER 11-13, 1973), 1973, P 12-19, 8 REFS

THERE ARE MANY AREAS IN WHICH THE COMPUTER PLAYS A BASIC AND COMPREHENSIVE SUPPORTING ROLE IN CHEMISTRY. A GENERAL DISCUSSION IS GIVEN ON THE APPLICATIONS OF COMPUTERS AND COMPUTER NETWORKS IN CHEMISTRY. FOUR PROJECTS INVOLVING CHEMISTRY RESEARCH AND COMPUTERS ARE DESCRIBED. FINALLY AREAS FOR THE FUTURE USE OF COMPUTERS IN CHEMISTRY ARE DISCUSSED.

MARRON, BEATRICE, ELIZABETH FONG, DENNIS W. FIFE, KIRK RANKIN, A STUDY OF SIX UNIVERSITY-BASED INFORMATION SYSTEMS, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY, JUN 73, NBS TN-781, NSF GA6B, 98P
(ANNOTATION UNDER 1.2)

SEDELOW, SALLY YEATES, WALTER A. SEDELOW, JR., LANGUAGE RESEARCH AND THE COMPUTER: A STUDY OF THE CONCEPT OF A NATIONAL CENTER OR NETWORK FOR COMPUTATIONAL RESEARCH ON LANGUAGE (CE-NCOREL), KANSAS, UNIV. OF, LAWRENCE, 1972, NSF GJ-28S99, 467P, 41 REFS

THIS REPORT IS THE RESULT OF AN EXTENSIVE STUDY OF THE CONCEPT OF A NATIONAL CENTER OR NETWORK FOR COMPUTATIONAL RESEARCH ON LANGUAGE (CE-NCOREL) THAT INCLUDED DISCUSSIONS WITH SCIENTISTS, SCHOLARS, AND ADMINISTRATORS AT A VARIETY OF INSTITUTIONS AROUND THE COUNTRY. THREE CHAPTERS ARE PARTICULARLY INTERESTING FOR THEIR NETWORKING IMPLICATIONS. ONE DISCUSSES AVAILABILITY AND RELIABILITY (IN ORDER OF IMPORTANCE) OF SOFTWARE SUITABLE FOR LANGUAGE RESEARCH AND OF VALIDATION AND STANDARDIZATION PROBLEMS IN MAKING IT NATIONALLY AVAILABLE. ANOTHER CONSIDERS HARDWARE COMPATIBLE WITH THE NEEDS OF LANGUAGE AND RELATED RESEARCH, INCLUDING TERMINAL DEVICES, INTERMEDIATE STORAGE DEVICES, AND CORE REQUIREMENTS. THE THIRD DISCUSSES ORGANIZATIONAL MATTERS OF A NATIONAL LANGUAGE RESEARCH NETWORK OR CENTER, CONCLUDING THAT A MAJOR CENTER FOR RESEARCH CONNECTED TO SATELLITE CENTERS THROUGH A NETWORK IS THE MOST ADVANTAGEOUS ARRANGEMENT. SINCE SUCH AN EXTENSIVE SURVEY WAS CONDUCTED IT WOULD HAVE BEEN INTERESTING TO INCLUDE A SECTION ON EXISTING CENTERS OF EXCELLENCE IN PARTICULAR AREAS OF LANGUAGE RESEARCH AND TO CONSIDER THE POSSIBILITY OF ORGANIZING THEM INTO A NETWORK.
(ALSO UNDER 1.1, 3.4.9)

SEDELOW, WALTER, THE CE/NCOREL STUDY, (KANSAS, UNIV. OF, LAWRENCE, DEPTS. OF SOCIOLOGY AND COMPUTER SCIENCE),
NETWORKS AND DISCIPLINES, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (ANN ARBOR, MI, OCTOBER 11-13, 1973), 1973, P 20-24, 1 REFS

A STUDY WAS FUNDED FOR INVESTIGATING THE CONCEPT OF A CENTER OR NETWORK FOR COMPUTATIONAL RESEARCH ON LANGUAGE (CE/NCOREL). GOALS OF THE STUDY AND SOME RESULTANT CONCLUSIONS ARE PRESENTED. (SEE SEDELOW'S, 'LANGUAGE RESEARCH AND THE COMPUTER ...' IN CATEGORY 4.2.)

SHULL, HARRISON, RESOURCE SHARING IN THEORETICAL CHEMISTRY, (INDIANA, UNIV. OF, BLOOMINGTON),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 263-272

THE AUTHOR DISCUSSES ASPECTS OF TWO DIFFERENT FORMS OF RESOURCE SHARING IN THE FIELD OF THEORETICAL CHEMISTRY: THE QUANTUM CHEMISTRY PROGRAM, A SMALL ACTIVE OPERATION; AND THE NATIONAL LABORATORY FOR COMPUTATIONAL CHEMISTRY, ONLY IN THE PROPOSAL STAGE AT THE TIME OF THIS REPORT.

THE FBI'S COMPUTER NETWORK, (FEDERAL BUREAU OF INVESTIGATION, WASHINGTON, DC),
DATAMATION, VOL 16, ISSUE 6, JUN 70, P 146-147, 1S1

THE NATIONAL NETWORK THAT PROVIDES ACCESS TO THE FBI NATIONAL CRIME INFORMATION CENTER (NCIC) IS DESCRIBED. AN IBM 360/50 AT NCIC IS CONNECTED TO OVER 90 TERMINALS, BOTH TELETYPES AS WELL AS STATE AND LOCAL COMPUTERS, AND ITS RESPONSE TO INQUIRIES AVERAGES 5-10 SECONDS. OTHER FBI COMPUTER APPLICATIONS ARE BRIEFLY COVERED.

4.2.5 OTHER

THOMAS, ROBERT H., D. AUSTIN HENDERSON, MCROSS--A MULTI-COMPUTER PROGRAMMING SYSTEM, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA).
AFIPS CONFERENCE, 1972 SPRING JOINT COMPUTER CONFERENCE, VOLUME 40, (ATLANTIC CITY, NJ, MAY 16-18, 1972), AFIPS PRESS, MONTVALE, NJ, 1972, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 281-293, 10 REFS

ONE OF THE FEW REPORTED INSTANCES OF A DISTRIBUTED PROCESSING SYSTEM FOR A SINGLE APPLICATION, I.E., AN APPLICATION REQUIRING THE EXECUTION OF PROGRAMS SIMULTANEOUSLY ON SEVERAL PROCESSORS AND GENERATING TRUE PROCESS TO PROCESS COMMUNICATION, IS DESCRIBED. THE APPLICATION IS AN AIR TRAFFIC CONTROL SIMULATION, AND THE HOST PROCESSORS ARE ALL PDP-10 TENEX SYSTEMS ON THE ARPA NETWORK. THE PAPER DOES NOT DWELL ON THE AIR TRAFFIC CONTROL APPLICATION, BUT FOCUSES ON THE SYSTEM DESIGN AND DETAILS OF THE INTERPROCESS COMMUNICATIONS.

TORREY, S. E., IDEEA NETWORK IMPLEMENTATION FISCAL YEAR 1965, FRANKFORD ARSENAL, PHILADELPHIA, PA, FIRE CONTROL ENGINEERING DIRECTORATE, JAN 66, FA-FCEO M66-16-1, DA 2P023201A720, (AD-629 225), 21P, 1 REFS

A CONCEPTUAL PLAN FOR A FIVE STATION EXPERIMENTAL SYSTEM FOR THE STORAGE, RETRIEVAL, AND DISSEMINATION OF CHEMICAL DATA IS DESCRIBED. A NUMBER OF DIFFERENT MILITARY COMPUTERS ARE TO BE CONNECTED VIA THE PUBLIC SWITCHED NETWORK.

4.3 COMPUTER UTILITY

ALDEN, R. M., THE WIRED CITY: THE ROLE OF AN INDEPENDENT TELEPHONE COMPANY, (UNITED TELECOMMUNICATIONS INC., KANSAS CITY, MO).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 417-419

THE CONCEPT OF A WIRED CITY FOR MAKING ACCESSIBLE AN ENORMOUS RESERVOIR OF COMMUNICATIONS RESOURCES TO HOMES AND BUSINESSES SCATTERED OVER AN ENTIRE CITY IS DISCUSSED. THE ASPECTS CONSIDERED RELATE TO GEOGRAPHY, AVAILABILITY OF SPACE, ELECTRICAL INTERFERENCE, MULTIPLEXING TECHNIQUES, AND MARKET DEMAND. AN INTERESTING CONCLUDING STATEMENT DECLARES THAT THOSE WHO PROVIDE THE FACILITIES WILL NECESSARILY BE COMMON CARRIERS.
(ALSO UNDER 1.6)

BACHRACH, MORTON W., COPYRIGHT ASPECTS OF CATV AS UTILIZED IN INFORMATION NETWORKING.
BECKER, JOSEPH, PROCEEDINGS OF THE CONFERENCE ON INTERLIBRARY COMMUNICATIONS AND INFORMATION NETWORKS, (WARRENTON, VA, SEPTEMBER 28-OCTOBER 2, 1970), AMERICAN LIBRARY ASSOCIATION, CHICAGO, IL, 1971, OEC 0-9-230288-4235(095), (LC 70-185896), P 153-159, 46 REFS

THE LEGAL CONSTRAINTS RELATED TO THE USE OF CABLE TV AS PART OF FUTURE NATIONAL INFORMATION NETWORKS ARE SUMMARIZED. THE DISCUSSION IS CONCENTRATED ON COPYRIGHT PROBLEMS OF TV PROGRAM RETRANSMISSION AND DOES NOT EXPLICITLY ADDRESS ASPECTS OF DATA TRANSMISSION.
(ALSO UNDER 5.4)

BARAN, PAUL, THE COMING COMPUTER UTILITY--LAISSEZ-FAIRE, LICENSING OR REGULATION?, RAND CORP., SANTA MONICA, CA, APR 67, 27P
(ANNOTATION UNDER 5.4)

BAUER, WALTER F., COMPUTER/COMMUNICATIONS SYSTEMS: PATTERNS AND PROSPECTS, (INFORMATICS INC., SHERMAN OAKS, CA).
GRUENBERGER, F., COMPUTERS AND COMMUNICATIONS--TOWARD A COMPUTER UTILITY, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1968, (TK 5101.C67, LC 68-16776), P 13-37, 11 REFS
(ANNOTATION UNDER 1.0)

BEERE, MAX P., TELEPROCESSING--THE UTILITY OF THE COMPUTER UTILITY NEW PROBLEMS? NEW CHALLENGE!, (TYMSHARE INC., CUPERTINO, CA).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 235-236

"WE (COMPUTER COMMUNICATION'S ENTREPRENEURS) ARE KNEE DEEP IN WEEDS AND THOUGH HELP IS IN SIGHT, IT IS NOT AVAILABLE AT PRESENT. AND THERE ARE INDIANS IN THE WOODS TOO - THE FCC, PUC, OTP, AND THE BELL SYSTEM - ...., AND THEY HAVE MANY SCALPS HANGING IN THEIR LODGES." READ THIS ONE FOR THE PROSE AND FOR SOME INTRIGUING VIEWPOINTS.

CARLSON, WILLIAM E., STEPHEN D. CROCKER, THE IMPACT OF NETWORKS ON THE SOFTWARE MARKETPLACE, (AIR FORCE DATA AUTOMATION AGENCY, WASHINGTON, DC, AIR FORCE DATA SERVICES CENTER, DEFENSE ADVANCED RESEARCH PROJECTS AGENCY, ARLINGTON, VA),
EASCON '74, IEEE ELECTRONICS AND AEROSPACE SYSTEMS CONVENTION, (WASHINGTON, DC, OCTOBER 7-9, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE 74-CHO-883-1-AES, (LC 73-2277), P 304-308, 11 REFS

THIS PAPER DESCRIBES A NEW TYPE OF PROJECT WHICH WILL USE THE ARPANET AS A BASIS. THE NATIONAL SOFTWARE WORKS WILL OFFER A COLLECTION OF NETWORK-BASED TOOLS TO EXPEDITE THE DESIGN, DEVELOPMENT, TESTING AND DOCUMENTATION OF COMPUTER SOFTWARE. THE NETWORK IS VIEWED AS PROVIDING A NEW TYPE OF MARKETPLACE FOR THE DISTRIBUTION OF THESE TOOLS. IT IS RECOGNIZED THAT THE CREATION OF EFFICIENT FINANCIAL MECHANISMS FOR THIS MARKETPLACE WILL BE A KEY FACTOR IN ACHIEVING MAXIMUM BENEFITS FROM THE NEW TECHNOLOGY. THE TYPES OF TOOLS TO BE INITIALLY PROVIDED AND THE CHARACTERISTICS OF THE MARKETPLACE ARE DESCRIBED. ISSUES SUCH AS THE NEEDED FINANCIAL MECHANISMS ARE IDENTIFIED BUT DETAILED SOLUTIONS ARE NOT PROPOSED.
(ALSO UNDER 5.2, 5.7)

CLARK, DAVID D., ROBERT M. GRAHAM, JEROME H. SALTZER, MICHAEL D. SCHROEDER, THE CLASSROOM INFORMATION AND COMPUTING SERVICE, MASSACHUSETTS INST. OF TECH., CAMBRIDGE, PROJECT MAC, 11 JAN 71, MIT-MAC TR-80, NONR 4102(01), 278P

A HYPOTHETICAL TIME-SHARING SYSTEM THAT SATISFIES THE EDUCATIONAL REQUIREMENTS FOR A COURSE IN COMPUTER SCIENCE IS PRESENTED. ITS STATED GOALS ARE: TO ACT AS A TOOL FOR COMPUTER SCIENCE STUDENTS, LEAN ENOUGH FOR A ONE SEMESTER COMPREHENSION, BUT COMPLETE ENOUGH TO TRACE THE SERVICE OBJECTIVES OF THE SYSTEM ORGANIZATION; TO DOCUMENT MECHANISMS IN MULTICS WHICH ARE GENERAL SOLUTIONS TO SERVICE OBJECTIVES; AND THE SIMPLIFICATION OF MULTICS WITHOUT SACRIFICING BASIC SERVICE OBJECTIVES. DETAILED DESCRIPTIONS OF THE SOFTWARE, CIMPL (THE SYSTEM IMPLEMENTATION LANGUAGE WHICH LOOKS LIKE PL/1), THE HARDWARE, AND THE FILE SYSTEM (LIKE MULTICS) ARE GIVEN. ALL ARE CLOSELY RELATED TO MULTICS.
(ALSO UNDER 3.1.0)

FEENEY, GEORGE J., THE FUTURE OF COMPUTER UTILITIES, (GENERAL ELECTRIC CO., BETHESDA, MD),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 237-239

THIS IS A POLEMIC IN SUPPORT OF CENTRALIZATION OF PROCESSING POWER IN A COMPUTER NETWORK. PROCESSING POWER FOR GENERAL ELECTRIC'S TIMESHARING NETWORK, ORIGINALLY DISTRIBUTED OVER 17 CENTERS, HAS NOW BEEN CENTRALIZED IN ONE "SUPERCENTER". A NUMBER OF ARGUMENTS IN SUPPORT OF THIS APPROACH AND SOME REMARKS ON NETWORK MANAGEMENT ARE PRESENTED. THE PAPER'S MAJOR SHORTCOMING IS A LACK OF NUMBERS TO BACK UP ECONOMIC ARGUMENTS.
(ALSO UNDER 5.0)

GENTILE, R. B., J. R. LUCAS, JR., THE TABLON MASS STORAGE NETWORK, (DEPARTMENT OF DEFENSE, WASHINGTON, DC),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 38, 1971, SPRING JOINT COMPUTER CONFERENCE, (ATLANTIC CITY, NJ, MAY 18-20, 1971), AFIPS PRESS, MONTVALE, NJ, 1971, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 345-356, 6 REFS
(ANNOTATION UNDER 3.3.9)

GRISETTI, ROBERT S., THE SYNTHESIS OF COMMUNICATIONS AND COMPUTERS, (WESTERN UNION TELEGRAPH CO.),
GRUENBERGER, F., COMPUTERS AND COMMUNICATIONS--TOWARD A COMPUTER UTILITY, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1968, (TK 5101.C67, LC 68-16776), P 205-219
(ANNOTATION UNDER 3.2.2)

MASSETT, F. C., H. W. SILVERMAN, NETWORKS FOR COMPUTER UTILITIES, (RADIO CORP. OF AMERICA, BURLINGTON, MA, RADIO CORP. OF AMERICA, VAN NUYS, CA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, "COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?", (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 195-197

4.3 COMPUTER UTILITY

THIS PAPER CONSIDERS COMPUTER NETWORKS WHICH, LIKE THE ELECTRIC OR GAS UTILITY, ARE CAPABLE OF BRINGING PROCESSING CAPABILITY TO A DISTRIBUTED USER POPULATION WITH VARYING USAGE NEEDS. THE NETWORKS DESCRIBED IN THIS PAPER, WHICH INCLUDE ONE INSTALLED AT WALT DISNEY WORLD, ARE GENERAL PURPOSE IN THAT THE SAME PHYSICAL INTERCONNECTIONS CAN BE USED FOR FEDERATED OR CENTRALIZED SYSTEMS AND SOFTWARE CONTROL CAN OPERATE THE NETWORK IN A LOOSELY OR TIGHTLY COUPLED MANNER. THE NETWORK TECHNIQUES DESCRIBED PROVIDE A GENERALIZED MEANS OF DISTRIBUTING THE PROCESSES OF A UTILITY.

HEATH, FRANK R., FACTORS FOR EVALUATION OF INTEGRATED ON-LINE INFORMATION SYSTEMS, (CARRIER CORP., SYRACUSE, NY), GRUENBERGER, F., COMPUTERS AND COMMUNICATIONS--TOWARD A COMPUTER UTILITY, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1968, (TK 5101.C67, LC 68-16776), P 151-172
(ANNOTATION UNDER 5.0)

HIRSCH, PHIL, MULTI-ACCESS COMPUTER NETWORKS,
DATAMATION, VOL 16, ISSUE 6, JUN 70, P 153-154

SOME ISSUES IN COMPUTER NETWORKING ARE DISCUSSED THROUGH EXTENSIVE RELIANCE ON EXAMPLES. THE TOPICS INCLUDE THE LEGAL ISSUES RELATIVE TO COMMON AND SPECIALIZED CARRIERS, PROBLEMS OF NETWORK STANDARDS, AND ALTERNATIVE IMPLEMENTATIONS./
(ALSO UNDER 1.2)

JOHNSON, LELAND L., SOME IMPLICATIONS OF NEW COMMUNICATIONS TECHNOLOGIES FOR NATIONAL SECURITY IN THE 1970S, RAND CORP., SANTA MONICA, CA, SEP 67, RC P-3639, (AD-658 424), 24P, 14 REFS
(ANNOTATION UNDER 5.4)

KIRSTEIN, PETER T., ON THE DEVELOPMENT OF COMPUTER AND DATA NETWORKS IN EUROPE, (LONDON, UNIV. OF, (ENGLAND)), WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 240-244, 10 REFS
(ANNOTATION UNDER 1.2)

MARILL, THOMAS, DALE STERN, THE DATACOMPUTER--A NETWORK DATA UTILITY, (COMPUTER CORP. OF AMERICA, CAMBRIDGE, MA), AFIPS CONFERENCE PROCEEDINGS, VOLUME 44, 1975, NATIONAL COMPUTER CONFERENCE, (ANAHEIM, CA, MAY 19-22, 1975), AFIPS PRESS, MONTVALE, NJ, 1975, (LC 55-44701), P 389-395, 9 REFS
(ANNOTATION UNDER 4.1.9)

MASON, W. F., R. K. LAY, THE WIRED CITY: SERVICES FOR HOME DELIVERY VIA INTERACTIVE CABLE TV, (MITRE CORP., WASHINGTON, DC),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 420-424

THE USES OF TIME SHARED INTERACTIVE COMPUTER CONTROLLED INFORMATION TELEVISION (TICCIT) ARE EXPLORED FROM THE STANDPOINT OF BENEFITS TO USERS AND PROFITS TO SERVERS. AN APPENDIX SUPPLIES SOME COST PROJECTIONS.
(ALSO UNDER 1.6, 5.2)

MAUTZ, ROBERT B., STATEWIDE PLANNING AND REGIONAL CENTERS, (STATE UNIVERSITY SYSTEM OF FLORIDA), THE FINANCING AND ORGANIZATION OF COMPUTING IN HIGHER EDUCATION: 1971, PROCEEDINGS OF THE EDUCOM SPRING CONFERENCE, (PHILADELPHIA, PA, APRIL 29, 1971), 1971, P 10-17

THE AUTHOR EXPRESSES HIS PHILOSOPHY WITH RESPECT TO THE ROLE OF COMPUTERS IN UNIVERSITIES. THIS PHILOSOPHY WAS SHAPED BY 20 YEARS OF ASSOCIATION WITH THE UNIVERSITY OF FLORIDA, ONE OF THE EARLIEST UNIVERSITIES TO UTILIZE ELECTRONIC DATA PROCESSING MACHINES FOR ADMINISTRATIVE PURPOSES. HE DESCRIBES TWO PROGRAMS HE HAS INAUGURATED IN HIS PRESENT POSITION, 'COMPUTER SHARING' AND 'SYSTEM SHARING', AND DISCUSSES PLANS BEING CONSIDERED BY THE UNIVERSITY SYSTEM FOR ADDITIONAL COMPUTER SHARING.
(ALSO UNDER 1.1)

MCCRE, K. ROGER, OR., ECONOMICS OF THE NETWORK MARKETPLACE, (TEXAS TECH UNIV., LUBBOCK, ARMY COMPUTER SYSTEMS COMMAND, FORT BELVOIR, VA),
EASCON '74, IEEE ELECTRONICS AND AEROSPACE SYSTEMS CONVENTION, (WASHINGTON, DC, OCTOBER 7-9, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE 74-CHO-883-1-AES, (LC 73-2277), P 294-302, 90 REFS
(ANNOTATION UNDER 5.2)

MUENCH, P. E., COMMON CARRIER APPROACH TO DIGITAL DATA TRANSMISSION: TERMINALS, TRANSMISSION EQUIPMENT AND FUTURE PLANS FOR THE COMPUTER UTILITY, (BELL TELEPHONE LABS, INC., HOLMDEL, NJ),
GRUENBERGER, F., COMPUTERS AND COMMUNICATIONS--TOWARD A COMPUTER UTILITY, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1968, (TK 5101.C67, LC 68-16776), P 79-94, 1 REFS
(ANNOTATION UNDER 1.2)

PARKHILL, DOUGLAS F., THE CHALLENGE OF THE COMPUTER UTILITY, ADDISON-WESLEY PUBLISHING CO., NEW YORK, 1966, (HF 5548.2.P27, LC 66-24245), 207P, 45 REFS

A VARIETY OF MATERIAL IS PRESENTED IN THIS BOOK, MUCH OF IT OUTDATED DUE TO THE FAST MOVING NATURE OF THE FIELD (EXAGGERATED BY THE TIME SCALE FOR BOOK PRODUCTION). AS AN INTRODUCTION TO EARLY COMPUTING, IT IS INTERESTING BUT NOT TOTALLY RELEVANT. BY 'COMPUTER UTILITY,' PARKHILL APPARENTLY MEANS ANY COMBINATION OF REMOTE BATCH OR INTERACTIVE COMPUTING SERVICE. PERHAPS THE TERM 'UTILITY' SEEMS ESPECIALLY OUT OF VOGUE NOW SINCE IT NEVER DID REALLY CATCH ON AND HAS FREQUENTLY BEEN LOOSELY USED. THE DESCRIPTION OF 'PUBLIC UTILITY' IS INTERESTING. THE SECTION ON APPLICATIONS AND THE GENERAL CONCLUSION ARE NOT PARTICULARLY STRONG.

PHISTER, MONTGOMERY, JR., SYSTEM DESIGN OF ON-LINE SERVICE SYSTEMS, (SCIENTIFIC DATA SYSTEMS, SANTA MONICA, CA),
GRUENBERGER, F., COMPUTERS AND COMMUNICATIONS--TOWARD A COMPUTER UTILITY, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1968, (TK 5101.C67, LC 68-16776), P 135-149

SYSTEM REQUIREMENTS AND DESIGN CONSIDERATIONS OF SINGLE AND MULTI-COMPUTER COMPUTER NETWORKS SERVING MANY REMOTE USERS ARE PRESENTED. THE PROPERTIES OF ON-LINE SERVICES AND THE SYSTEM REQUIREMENTS TO ACCOMMODATE THOSE SERVICES ARE DISCUSSED AT LENGTH.
(ALSO UNDER 3.0)

ROSE, GORDON A., COMPUTER GRAPHICS COMMUNICATION SYSTEMS, (NEW SOUTH WALES, UNIV. OF, KENSINGTON, (AUSTRALIA), DEPT. OF ELECTRONIC COMPUTATION),
INFORMATION PROCESSING 68: PROCEEDINGS OF IFIP CONGRESS 1968, VOLUME 2--HARDWARE, APPLICATIONS, (EDINBURGH, (SCOTLAND), AUGUST 5-10, 1968), NORTH-HOLLAND PUBLISHING CO., AMSTERDAM, (NETHERLANDS), 1969, IFIP CONGRESS PROCEEDINGS, (LC 65-24110), P 692-703, 20 REFS
(ANNOTATION UNDER 1.2)

THOMPSON, JOHN P., THE WIRED CITY: COMMERCIAL SERVICES TO BE PROVIDED BY BROADBAND TELECOMMUNICATIONS SYSTEMS, (LITTLE (ARTHUR D.) INC., CAMBRIDGE, MA),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 425-428
(ANNOTATION UNDER 5.2)

VAN VLECK, THOMAS H., COMPUTER LANGUAGES FOR THE COMPUTER UTILITY, (MASSACHUSETTS INST. OF TECH., CAMBRIDGE), INTERDISCIPLINARY CONFERENCE ON MULTIPLE ACCESS COMPUTER NETWORKS, (AUSTIN, TX, APRIL 20-22, 1970), APR 70, P S-2-1--S-2-5, 8 REFS
(ANNOTATION UNDER 3.4.9)

WITHINGTON, FREDERIC G., THE MARKET FOR A COMPUTER UTILITY INDUSTRY, (LITTLE (ARTHUR D.) INC., CAMBRIDGE, MA),
GRUENBERGER, F., COMPUTERS AND COMMUNICATIONS--TOWARD A COMPUTER UTILITY, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1968, (TK 5101.C67, LC 68-16776), P 67-77
(ANNOTATION UNDER 5.2)

4.9 OTHER

BENJAMIN, RICHARD T., P. M. KARP, ARPA NETWORK EXPERIMENTATION USING EXISTING DATA MANAGEMENT SYSTEMS, MITRE CORP., WASHINGTON, DC, 21 JUN 71, MC WP-7809, 22P

4.9 OTHER

A PROGRAM OF EXPERIMENTATION USING EXISTING DATA MANAGEMENT SYSTEMS ON THE ARPA NETWORK IS SUMMARIZED. THE WORK DESCRIBED IS REPRESENTATIVE OF PLANNED EXPERIMENTATION AND PROTOTYPE DEVELOPMENT EFFORTS PERFORMED IN CONJUNCTION WITH THE MITRE ENTRY TO THE ARPA NETWORK.

BRUCE, PAUL, D. HIGGINS, E. PEREZ, HERBERT J. STERNICK, NOREEN D. WELCH. A RECOMMENDED RESEARCH AND DEVELOPMENT PLAN FOR DATA EXCHANGE IN THE WORLD WIDE MILITARY COMMAND AND CONTROL SYSTEM, MITRE CORP., WASHINGTON, DC, 8 APR 71, MC WP-9710, AF F19628-71-C-0002, 42P

THE STATED OBJECTIVE OF THIS PLAN IS TO DEVELOP ALTERNATIVE SYSTEM CONCEPTS FOR IMPROVING THE WWMCCS (WORLD WIDE MILITARY COMMAND AND CONTROL SYSTEM) DATA EXCHANGE CAPABILITIES THROUGH THE USE OF DIRECT COMPUTER-TO-COMPUTER COMMUNICATIONS. FIVE TASK AREAS ARE DESCRIBED: (1) INTERCOMPUTER NETWORK; (2) DATA DISTRIBUTION; (3) DATA DESCRIPTION LANGUAGE; (4) MULTI-LEVEL SECURITY; AND (5) ON-LINE TECHNOLOGY STUDIES. THE PURPOSE OF EACH OF THE TASK AREAS IS EXPLAINED, AND SUBTASKS ARE IDENTIFIED AND DESCRIBED.

DAVIS, JAMES, MICROSECONDS AND MULTI-MONTHS: TURNAROUND TIME IN SOCIAL RESEARCH, (NATIONAL OPINION RESEARCH CENTER, NEW YORK).
NETWORKS AND DISCIPLINES, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (ANN ARBOR, MI, OCTOBER 11-13, 1973), 1973, P 49-52

THE NATIONAL OPINION RESEARCH CENTER (NORC) IS AN ACADEMIC, NON-PROFIT, NATIONAL SURVEY ORGANIZATION. THERE ARE THREE PROBLEM AREAS FOR THIS GROUP AND OTHERS LIKE IT INCLUDING LOW USAGE OF DATA, DELAYED USAGE OF DATA, AND THE USAGE OF BAD DATA. THIS PAPER DESCRIBES HOW NETWORKING MAY HELP SOLVE THE PROBLEMS OF THESE SURVEY HOUSES.

DAY, LAWRENCE H., THE FUTURE OF COMPUTER AND COMMUNICATIONS SERVICES, (BELL CANADA, MONTREAL),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 42, 1973, NATIONAL COMPUTER CONFERENCE AND EXPOSITION, (NEW YORK, NY, JUNE 4-8, 1973), AFIPS PRESS, MONTVALE, NJ, 1973, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 723-734, 19 REFS
(ANNOTATION UNDER 1.6)

KARP, P. M., EXPERIMENTATION ON THE ARPA COMPUTER NETWORK, MITRE CORP., WASHINGTON, DC, 29 JAN 71, MC WP-7447, AF F19628-71-C-0002, 41P, 11 REFS

A PROGRAM OF EXPERIMENTATION ON THE ARPA NETWORK IS BEING CONDUCTED BY MITRE. THE OBJECTIVE OF THIS PROGRAM IS TO DEMONSTRATE A RESEARCH CAPABILITY SUITABLE TO OBTAIN SPONSORED RESEARCH PROJECTS IN COMPUTER NETWORKING. THIS DOCUMENT PRESENTS PLANS FOR CONDUCTING INITIAL EXPERIMENTS IN TECHNIQUES OF DATA SHARING AND DATA DISTRIBUTION.

KNIGHT, JOHN R., A CASE STUDY: AIRLINES RESERVATIONS SYSTEMS, (INTERNATIONAL BUSINESS MACHINES CORP., WHITE PLAINS, NY)
PROCEEDINGS OF THE IEEE, VOL 60, ISSUE 11, NOV 72, P 1423-1431

THE HISTORY OF AIRLINE RESERVATIONS SYSTEMS FROM THE 1950'S TO THE PRESENT IS TRACED. THE SYSTEM STRUCTURE IS BROKEN INTO THREE SECTIONS, AGENT-TERMINAL AREA, COMMUNICATIONS FACILITIES AND THE CENTRAL COMPLEX. FACTS LEARNED FROM OVER TWENTY SYSTEMS DEVELOPED TO DATE ARE DISCUSSED.

LABONTE, ROBERT C., DEVELOPING A WIRED NATION--A GENERAL PURPOSE DIGITAL COMMUNICATIONS SYSTEM FOR OPERATION ON A CONVENTIONAL CATV SYSTEM, (MITRE CORP., BEDFORD, MA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 85-88

MITRIX, A DIGITAL CABLE COMMUNICATIONS SYTSTEM HAS BEEN OPERATING FOR A YEAR AT MITRE'S BEDFORD SITE. THE SYSTEM DEMONSTRATES THAT CATV CHANNELS CAN PROVIDE OTHER COMMUNICATION CAPABILITIES THAN TELEVISION AND INTERACTIVE TELEVISION. CAPABILITIES OF THIS SYSTEM ARE DESCRIBED AND POSSIBILITIES OF THIS SYSTEM IN THE FUTURE ARE DISCUSSED.
(ALSO UNDER 3.2.1)

MONTGOMERY, K., LEON, CURRENT TRENDS IN MACHINE-READABLE DATA BASES, (PITTSBURGH, UNIV. OF, PA, INTERDISCIPLINARY DOCTORAL PROGRAM IN INFORMATION SCIENCE),
NETWORKS AND DISCIPLINES, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (ANN ARBOR, MI, OCTOBER 11-13, 1973), 1973, P 81-87, 12 REFS

THIS PAPER COVERS FOUR AREAS INCLUDING A REVIEW OF NATIONALLY AVAILABLE DATA BASES, GROWTH TRENDS IN MACHINE-READABLE DATA BASES, PROBLEM AREAS IN MACHINE-READABLE DATA BASES, AND DATA BASE MANAGEMENT. IT REVIEWS THE TRENDS IN DATA BASE MANAGEMENT AND SUMMARIZES THE ROLES OF THE DATA BASES IN INFORMATION NETWORKS IN GENERAL.

PETERSEN, GERALD A., AFOS: A PROGRAM FOR NATIONAL WEATHER SERVICE FIELD AUTOMATION, (NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, SILVER SPRING, MD),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHD-69C-8C, NSF GJ-33239, P 127-131

THE DESIGN OF A NETWORK FOR USE IN AUTOMATING THE FIELD OPERATIONS OF THE NATIONAL WEATHER SERVICE IS DESCRIBED.

PROPOSAL FOR CONTINUATION OF RESEARCH ON NATURAL COMMUNICATION WITH COMPUTERS, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, MAY 72, BBN P72-CSC-12, 60P

A NETWORK OF TENEX SYSTEMS (PDP 10'S WITH PAGING HARDWARE AND SOFTWARE) INTERCONNECTED THROUGH FRONT END PDP-11'S IS DESCRIBED. THE FRONT END HANDLES ALL COMMUNICATIONS TO ITS HOST SYSTEM INCLUDING THE CONTROL OF PERIPHERALS--READERS PRINTERS, DISKS, AND TAPES. IN ADDITION, THE NETWORK CONTROL PROGRAM FOR NETWORK ACCESS IS IN THE FRONT END. IT WILL BE INTERESTING TO SEE HOW THIS WORKS OUT SINCE THE CONCEPTS MAY BE APPLICABLE TO A WIDE VARIETY OF NETWORKS AND COULD CONTRIBUTE TO REDUCING THE LOAD OF NETWORK CONTROL ON THE HOST COMPUTER. THE APPLICATION TO A NETWORK HAVING HETEROGENEOUS HOSTS IS MENTIONED AS A FUTURE POSSIBILITY.

ROWELL, HARRY B., JR., PROGRAM-SHARING NETWORKS,(PRESENTED AT, NETWORKS IN HIGHER EDUCATION: PROCEEDINGS OF THE EDUCOM COUNCIL MEETING SEMINAR, ATLANTA, GA, OCTOBER 15, 1970, (CARNEGIE-MELLON UNIV., PITTSBURGH, PA),
BEHAVIORAL SCIENCE, VOL 16, ISSUE 5, SEP 71, P 497-499

THE AUTHOR DISCUSSES A SIGNIFICANT PROBLEM IN THE TRANSFER OF SOFTWARE, I.E., LACK OF STANDARDS FOR PROGRAM DOCUMENTATION.

VOLK, JOHN L., INTERACTIVE TELEVISION EXPERIMENT IN RESTON, VIRGINIA, (MITRE CORP., MCLEAN, VA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 81-84

AN INTERACTIVE TELEVISION SYSTEM HAS BEEN OPERATING FOR TWO YEARS IN THE INDIVIDUAL HOMES OF RESTON, VIRGINIA. VARIOUS SERVICES ARE PROVIDED: INSTRUCTIONAL (CAI), ENTERTAINING (GAMES) AND PUBLIC INTEREST (EDITORIALS, HEALTH CARE). THE DEVELOPMENT OF THIS SYSTEM AND A DESCRIPTION OF THE CONFIGURATION AND SERVICES PROVIDED ARE GIVEN IN THIS PAPER.
(ALSO UNDER 3.2.1)

ZAKS, RODNAY, A PROCESSOR NETWORK FOR URBAN TRAFFIC CONTROL, (COPPE-FEDERAL UNIV., RIO DE JANEIRO, (BRAZIL), SINGER CO., SUNNYVALE, CA, TRAFFIC INFORMATION SYSTEMS),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 215-218, 2 REFS
(ANNOTATION UNDER 3.1.0)

5. MANAGEMENT

5.0 GENERAL

A TRANS-CANADA COMPUTER COMMUNICATIONS NETWORK. PHASE I OF A MAJOR PROGRAM ON COMPUTERS, SCIENCE COUNCIL OF CANADA, AUG 71, SCC R-13, SCC SS22-1971-13, 41P
(ANNOTATION UNDER 3.1.0)

ARONOFSKY, JULIUS. NETWORK MANAGEMENT. REPORT OF WORKSHOP 5. (SOUTHERN METHODIST UNIV., DALLAS, TX). GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 233-239

THE NSF-SPONSORED WORKSHOP ADDRESSED SPECIAL MANAGEMENT PROBLEMS IN ORGANIZING AND RUNNING A COMPUTER NETWORK INVOLVING DIFFERENT INSTITUTIONS AND DECENTRALIZED USERS WITH SEPARATE AFFILIATIONS AND DISSIMILAR INTERESTS. THESE INCLUDE: EDUCATION AND TRAINING; FINANCING; INITIAL PARTICIPANTS; CATALOGING OR RESOURCES TO BE SHARED ON NETWORKS; AND REGIONAL VS. NATIONAL NETWORKS.

BERNARD, DAN. INTERCOMPUTER NETWORKS: AN OVERVIEW AND A BIBLIOGRAPHY, PENNSYLVANIA, UNIV. OF, PHILADELPHIA, WHARTON SCHOOL, MAY 73, ONR N00014-67-A-0216-0007, (AD-769 232), 250P
(ANNOTATION UNDER 1.3)

BOLT, RICHARD H., THE CHALLENGE OF MANAGING COMPUTER NETWORKS, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA), GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 299-310

THE AUTHOR DIVIDES THE UNIVERSE OF NETWORKS INTO THREE FUNCTIONAL CATEGORIES: TASK CENTERED NETWORKS; SIGNAL TRANSPORT NETWORKS; AND COMMUNICATION FACILITATION NETWORKS. HE DESCRIBES EACH CATEGORY IN DETAIL EMPHASIZING THE ROLE AND OBJECTIVES OF THE MANAGER IN EACH SITUATION.
(ALSO UNDER 1.3)

BROOKS, FREDERICK P., JR., JAMES K. FERRELL, THOMAS M. GALLIE, ORGANIZATIONAL, FINANCIAL, AND POLITICAL ASPECTS OF A THREE-UNIVERSITY COMPUTING CENTER, (NORTH CAROLINA, UNIV. OF, CHAPEL HILL, DEPT. OF COMPUTER AND INFORMATION SCIENCE, NORTH CAROLINA, STATE UNIV. OF, RALEIGH, DEPT. OF CHEMICAL ENGINEERING, NATIONAL SCIENCE FOUNDATION, WASHINGTON, DC, OFFICE OF COMPUTING ACTIVITIES), INFORMATION PROCESSING 68; PROCEEDINGS OF IFIP CONGRESS 1968, VOLUME 2--HARDWARE, APPLICATIONS, (EDINBURGH, (SCOTLAND), AUGUST 5-10, 1968), NORTH-HOLLAND PUBLISHING CO., AMSTERDAM, (NETHERLANDS), 1969, IFIP CONGRESS PROCEEDINGS, (LC 65-24118), P 923-927

SOME OF THE PRACTICAL CONSIDERATIONS THAT HAVE LED TO THE STABLE, SUCCESSFUL OPERATION OF THE TRIANGLE UNIVERSITIES COMPUTATION CENTER ARE DISCUSSED IN THIS ARTICLE. SOME OF THE INTERESTING DECISIONS INCLUDE THE SELECTION OF A NEUTRAL LOCATION, DESPITE THE ADDITIONAL SETUP COSTS INVOLVED, AND THE METHOD OF JOINT MANAGEMENT OF THE CENTER. ALSO, COSTS ARE SPLIT THREE WAYS AMONG THE PRINCIPAL PARTICIPANTS INDEPENDENT OF USE. ECONOMY OF SCALE IS EXHIBITED OVER THE USE OF SMALLER, SEPARATE CAMPUS FACILITIES ALONG WITH OTHER BENEFITS SUCH AS THE ABILITY TO OFFER RESEARCHERS MORE POWERFUL COMPUTING SUPPORT THAN WOULD OTHERWISE BE POSSIBLE.

CHOU, WUSHOW, PLANNING AND DESIGN OF DATA COMMUNICATIONS NETWORKS, (NETWORK ANALYSIS CORP., GLEN COVE, NY), AFIPS CONFERENCE PROCEEDINGS, VOLUME 43, 1974, NATIONAL COMPUTER CONFERENCE, (CHICAGO, IL, MAY 6-10, 1974), AFIPS PRESS, MONTVALE, NJ, 1974, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 553-559, 6 REFS

CHOU CALLS FOR A TWO FOLD APPROACH TO IMPROVE PLANNING AND DESIGN OF COMMUNICATIONS NETWORKS. NETWORK MANAGERS SHOULD HAVE ABILITY BOTH IN THE TECHNICAL AND MANAGERIAL SPHERES. USERS SHOULD BE EDUCATED CONCERNING THE COST/PERFORMANCE RELATIONSHIP IN ORDER TO SET REASONABLE PERFORMANCE REQUIREMENTS.
HE ALSO EXPLORES PERFORMANCE CRITERIA, NETWORK STRUCTURES, DESIGN TOOLS AND STRATEGIES, AND OTHER COMMUNICATIONS RELATED TOPICS. HIS TEXT IS MEANT AS AN OVERVIEW OF STATE-OF-THE-ART TECHNIQUES AND APPROACHES.
(ALSO UNDER 3.2.2)

COTTON, IRA W., NETWORK MANAGEMENT SURVEY SUMMARY, (PRESENTED AT THE, SEVENTH HAWAII INTERNATIONAL CONFERENCE ON SYSTEM SCIENCES, HONOLULU, JANUARY 8-10, 1974), NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY, JAN 74, NSF EC-40984, NSF GJ-33220, NSF AG-350, 4P

TABULAR SUMMARIES OF THE RESULTS OF A MANAGERIAL SURVEY ARE PRESENTED FOR FIVE DIFFERENT NETWORKS. THE NETWORKS COVERED ARE ARPA, TUCC, MERIT, OREGON STATE, AND TYMNET. THERE'S A LOT OF INFORMATION CRAMMED INTO FOUR PAGES HERE.

DENNIS, JACK B., A POSITION PAPER ON COMPUTING AND COMMUNICATIONS,(PRESENTED AT, ACM SYMPOSIUM ON OPERATING SYSTEM PRINCIPLES, GATLINBURG, TN, OCTOBER 1-4, 1967), (MASSACHUSETTS INST. OF TECH., CAMBRIDGE, PROJECT MAC), COMMUNICATIONS OF THE ACM, VOL 11, ISSUE 5, MAY 68, P 370-377, 12 REFS

THE PROBLEMS AND PROPOSED SOLUTIONS ASSOCIATED WITH MANY INFORMATION SERVICE SYSTEMS SHARING A COMMON COMPUTER INSTALLATION ARE EXPLORED. THE DEVELOPMENT OF GENERAL PURPOSE HARDWARE AND OPERATING SYSTEMS SUITABLE FOR INFORMATION SERVICE SYSTEMS DEVELOPMENT IS PREDICTED AND MULTICS IS GIVEN AS PROOF OF THE FEASIBILITY. TO PROTECT COMPETITION AND GUARANTEE THAT NO SERVICE SYSTEM HAS AN UNFAIR ADVANTAGE, IT IS ADVISED THAT RESPONSIBILITY FOR TASKS BE WELL SPECIFIED TO COMPUTER MANUFACTURER, COMMON CARRIER, INFORMATION SYSTEMS DESIGNER, INFORMATION SYSTEMS MANAGER, AND INSTALLATION OPERATOR. DENNIS PREDICTS THAT COMPUTER NETWORKS WILL DEVELOP AS DISTRIBUTED SYSTEMS RATHER THAN THE PRESENT (1968) CENTRALIZED SYSTEMS.

DUNN, D. A., THE ECONOMICS OF UNIVERSITY COMPUTER NETWORKING, (STANFORD, UNIV. OF, CA), FACTS AND FUTURES, WHAT'S HAPPENING NOW IN COMPUTING FOR HIGHER EDUCATION, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (PRINCETON, NJ, OCTOBER 9-11, 1973), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1974, (LC 74-79222), P 68-72, 3 REFS

THE AUTHOR SUGGESTS THAT UNIVERSITY COMPUTING CENTERS AND ADMINISTRATIONS ARE CONFRONTED WITH MEETING COMPETITION AS ARE BUSINESS FIRMS. HE DESCRIBES BRIEFLY THE ECONOMICS INVOLVED WITH JOINING A NETWORK AND THE ALTERNATIVES COMPUTING CENTERS HAVE TO NETWORKING.
(ALSO UNDER 5.3)

EICK, HARRY A., SEYMOUR J. WOLFSON, KARL L. ZINN, DEVELOPMENT OF APPLICATIONS FOR THE MERIT COMPUTING NETWORK, MICHIGAN, STATE UNIV. OF, EAST LANSING, WAYNE, STATE UNIV. OF, DETROIT, MI, MICHIGAN, UNIV. OF, ANN ARBOR, 2 JUN 72, 6P, 3 REFS TO APPEAR IN ACM SIGCUE BULLETIN ON COMPUTER USES IN EDUCATION (JUN 72)/
(ANNOTATION UNDER 4.0)

EMERY, JAMES C., PROBLEMS AND PROMISES OF REGIONAL COMPUTER SHARING, (PENNSYLVANIA, UNIV. OF, PHILADELPHIA), GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 189-198
(ANNOTATION UNDER 3.1.2)

FEENEY, GEORGE J., THE FUTURE OF COMPUTER UTILITIES, (GENERAL ELECTRIC CO., BETHESDA, MD), WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 237-239
(ANNOTATION UNDER 4.3)

FIFE, DENNIS W., NETWORK MANAGEMENT FOR EXPANDED RESOURCE SHARING, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY), FACTS AND FUTURES, WHAT'S HAPPENING NOW IN COMPUTING FOR HIGHER EDUCATION, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (PRINCETON, NJ, OCTOBER 9-11, 1973), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1974, (LC 74-79222), P 55-61, 7 REFS

THE AUTHOR DESCRIBES FIVE SEQUENTIAL STAGES THROUGH WHICH NETWORK MANAGEMENT PASSES AND THEN DESCRIBES THE DEVELOPMENTS EXPECTED AT EACH OF THESE MANAGEMENT STAGES. THE FIVE STAGES ARE: MUTUAL SERVICE ACCESS OR THE ESTABLISHMENT OF POSSIBLE INDIVIDUAL ACCESS TO MULTIPLE REMOTE COMPUTERS; MUTUAL SUPPORT OR THE PROVISION OF FORMAL ASSISTANCE BY THE COOPERATING ORGANIZATION; OPERATIONS COORDINATION OR THE ARRANGEMENT OF OPERATIONS AND MANAGEMENT CRITERIA BY AGREEMENT OF THE ORGANIZATIONS; SERVICE ALIGNMENT OR THE MUTUAL RECOGNITION OF RESOURCES PROVIDED BY EACH AND LEGALLY APPORTION OF OVERALL MARKET; AND THE FINAL STAGE, JOINT RESOURCE OWNERSHIP, WHICH IS THE MUTUAL INVESTMENT OF CAPITAL AND PERSONNEL TO DEVELOP A NEW COMPUTING RESOURCE.

FIFE, DENNIS W., RESEARCH CONSIDERATIONS IN COMPUTER NETWORKING TO EXPAND RESOURCE SHARING, NATIONAL BUREAU OF

5.0 GENERAL

STANDARDS, WASHINGTON, DC, SYSTEMS AND SOFTWARE DIV., JUN 74, NBS TN-801, NSF AG-350, (LC 74-600089), 24P, 21 REFS

COMPUTER NETWORKING TECHNOLOGY IS ADEQUATELY DEVELOPED NOW TO SUPPORT RESEARCH AND EXPERIMENTATION TO EXPAND RESOURCE SHARING. WHETHER PROGRESS WILL BE MADE DEPENDS UPON ORGANIZATIONAL INITIATIVE AMONG MULTIPLE INSTITUTIONS COMBINING PERSONNEL AND CAPITAL SO AS TO EFFECTIVELY ADDRESS THE MAJOR ISSUES IN MANAGEMENT APPROACH, SUPPORT, AND SOFTWARE DESIGN THAT LIMIT THE FEASIBLE INTERDEPENDENCE OF COMPUTING OPERATIONS. THE ORGANIZATIONAL REQUIREMENTS ARE PARTIALLY REVEALED BY EXAMINING PROGRESSIVE STAGES OF RESOURCE SHARING IN ORGANIZATIONAL AND PERATIONAL TERMS RATHER THAN SUCH TECHNICAL ASPECTS AS LOAD SHARING OR PROGRAM SHARING THAT HAVE BEEN INTRODUCED IN THE PAST. FIVE STAGES ARE IDENTIFIED, RANGING FROM SIMPLY ESTABLISHING MULTIPLE SERVICE ACCESS TO THE ADVANCED STAGE WHERE MULTIPLE INSTITUTIONS ORGANIZE FOR JOINT DEVELOPMENT OF NEW RESOURCES. A PRELIMINARY EVALUATION FRAMEWORK FOR NEW MANAGEMENT ARRANGEMENTS RESULTS WHEN THESE STAGES ARE MAPPED AGAINST THE FOUR FUNCTIONAL LEVELS INHERENT IN COMPUTER NETWORK MANAGEMENT. FUTURE NEEDS FOR NETWORK EXPERIMENTATION AND RESEARCH ARE BRIEFLY DESCRIBED, AND OTHER NBS TECHNICAL RESULTS ARE IDENTIFIED IN CONTEXT.

FLOOD, MERRILL M., COMMERCIAL INFORMATION PROCESSING NETWORKS--PROSPECTS AND PROBLEMS IN PERSPECTIVE, HUXLEY, JUDITH, THE OUTLOOK FOR TECHNOLOGICAL CHANGE AND EMPLOYMENT, APPENDIX VOLUME I, TECHNOLOGY AND THE AMERICAN ECONOMY, AND ECONOMIC PROGRESS, THE REPORT OF THE COMMISSION, FEB 66, (HC 106.5.A5682), R I-233--I-252
(ANNOTATION UNDER 1.0)

GILLESPIE, ROBERT, UNIVERSITY RELATIONS WITH NETWORKS: FORCING FUNCTIONS AND FORCES, (WASHINGTON, UNIV. OF, SEATTLE), GREENBERGER, MARTIN, JULIUS KRONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 240-244
(ANNOTATION UNDER 3.1.0)

HEATH, FRANK R., FACTORS FOR EVALUATION OF INTEGRATED ON-LINE INFORMATION SYSTEMS, (CARRIER CORP., SYRACUSE, NY), GRUENBERGER, F., COMPUTERS AND COMMUNICATIONS--TOWARD A COMPUTER UTILITY, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1968, (TK 5101.C67, LC 68-16776), R 151-172

THIS PAPER DISCUSSES THE FACTORS THAT INFLUENCE MANAGEMENT'S WILLINGNESS OR RELUCTANCE TO PLACE TRUST IN A COMPUTER UTILITY. FIRST THE GENERAL CHARACTERISTICS OF A COMPUTER UTILITY ARE DISCUSSED AND THE NETWORK AT CARRIER CORPORATION IS DESCRIBED. THEN SOME INTERESTING PLUS AND MINUS FACTORS PERTAINING TO CORPORATE ACCEPTANCE OF COMPUTER UTILITIES ARE DESCRIBED.
(ALSO UNDER 4.3)

HOPEWELL, LYNN, MANAGEMENT PLANNING IN THE DATA COMMUNICATION ENVIRONMENT, (NETWORK ANALYSIS CORP., GLEN COVE, NY), AFIPS CONFERENCE PROCEEDINGS, VOLUME 43, 1974, NATIONAL COMPUTER CONFERENCE, (CHICAGO, IL, MAY 6-10, 1974), AFIPS PRESS, MONTVALE, NJ, 1974, AFIPS CONFERENCE PROCEEDINGS, (LC 55-447DI), P 561-564, 6 REFS

THE AUTHOR PRESENTS A CONCEPTUAL FRAMEWORK FOR DATA COMMUNICATIONS MANAGEMENT PLANNING. OVERALL PLANNING IS SUBDIVIDED INTO THREE CATEGORIES. THE DATA COMMUNICATIONS PROCESS DEALS WITH THE RELATIONSHIP BETWEEN TOOLS, THE USER AND OTHER SYSTEM PROCESSES. THE PLANNING PROCESS DEALS WITH GOALS, CONSTRAINTS, TECHNOLOGY AND UNCERTAINTY IN TERMS OF SHORT, MEDIUM AND LONG RANGE TIME SPANS. ORGANIZATIONAL CONSIDERATIONS ENCOMPASS THE INTERDEPENDENT RELATIONSHIP OF TECHNOLOGY AND THE ORGANIZATION. IN HIS SUMMARY HOPEWELL ADVISES THAT THE PLANNING PROCESS INCLUDE THE OPERATING MANAGERS RATHER THAN STRICTLY AN AUTONOMOUS SPECIAL STAFF.

JENNINGS, MICHAEL A., COMPUTER SERVICES IN THE OREGON DEPARTMENT OF HIGHER EDUCATION, (OREGON DEPT. OF HIGHER EDUCATION),
FACTS AND FUTURES, WHAT'S HAPPENING NOW IN COMPUTING FOR HIGHER EDUCATION, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (PRINCETON, NJ, OCTOBER 9-11, 1973), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1974, (LC 74-79222), P 83-99
(ANNOTATION UNDER 3.1.0)

KUO, FRANKLIN F., POLITICAL AND ECONOMIC ISSUES FOR INTERNETWORK CONNECTIONS, (HAWAII, UNIV. OF, HONOLULU, ALOHA SYSTEM),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 389-391, 8 REFS

SIX PROBLEM AREAS FOR COMPUTER INTERCONNECTION ARE BRIEFLY ADDRESSED: AGREEMENTS BETWEEN NETWORKS, STANDARDS, COMMON CARRIERS, ACCOUNTING, TARIFFS, AND PRIVACY AND SECURITY. THERE ARE NO SOLUTIONS PROVIDED, AS WAS THE AUTHOR'S STATED INTENT.

MAKINO, YASUO, PERSPECTIVES ON DATA COMMUNICATION IN JAPAN, (NTT PUBLIC CORP., TOKYO, (JAPAN)),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 25-30

IN JAPAN, DATA COMMUNICATION INCLUDES BOTH DATA PROCESSING AND TELECOMMUNICATIONS. THE AUTHOR DETAILS DATA COMMUNICATION MANAGEMENT - PRESENT STATUS, PROGRESS AND PROBLEMS. HE CONCLUDES THAT A WORLDWIDE COMPUTER NETWORK WILL EMERGE WHICH WILL REQUIRE ADHERENCE TO INTERNATIONAL TECHNICAL STANDARDS.
(ALSO UNDER 5.5)

MONTGOMERY, EDISON, AN INTERUNIVERSITY INFORMATION NETWORK, 1, EDUCOM, (INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ),
KENT, ALLEN, ORRIN E. TAULBEE, ELECTRONIC INFORMATION HANDLING, (PITTSBURGH, PA, OCTOBER 7-9, 1964), SPARTAN BOOKS INC., WASHINGTON, DC, 1965, KNOWLEDGE AVAILABILITY SYSTEMS SERIES, (LC 65-17306), R 261-268

THIS ARTICLE DESCRIBES THE HISTORY AND ORGANIZATION OF EDUCOM, THE INTERUNIVERSITY COMMUNICATIONS COUNCIL. THE TASK FORCES, ONE OF WHICH IS ON INFORMATION NETWORKS, ARE ALSO BRIEFLY DESCRIBED.

MOORE, K. ROGER, DR., MANGEMENT STRATEGIES FOR AOP NETWORKING, ARMY COMPUTER SYSTEMS COMMAND, FORT BELVOIR, VA, 1974, ACSC AT-74-02, 170P, 159 REFS

THE ABSTRACT TO THIS REPORT SUGGESTS THAT THE REPORT 'FOCUSES UPON LONG RANGE ISSUES RATHER THAN SHORT RANGE ISSUES IN PLANNING FOR AOP IN THE ARMY.' IT IS TRUE THAT LONG RANGE ISSUES ARE DISCUSSED, BUT THE RESULTS ARE PRESENTED IN GENERAL FORM SO AS TO BE APPLICABLE TO ANY NETWORKING UNDERTAKING. THE REPORT IS AN EXCELLENT AND DETAILED DISCUSSION OF ECONOMIC AND MANAGERIAL ISSUES IN COMPUTER NETWORKING. AS THE AUTHOR SO APTLY RECOGNIZES, THERE ARE NO TECHNICAL SOLUTIONS FOR MANAGERIAL PROBLEMS, BUT THERE MAY BE MANAGERIAL SOLUTIONS TO TECHNICAL PROBLEMS.

NEUMANN, A. J., REVIEW OF NETWORK MANAGEMENT PROBLEMS AND ISSUES, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, SYSTEMS DEVELOPMENT DIV., OCT 73, NBS TN-795, NSF AG-350, 77P, 26 REFS

IN ORDER TO SURVEY THE PROBLEMS FACING DEVELOPMENT OF NETWORK MANAGEMENT, USER REQUIREMENTS AND SYSTEM REQUIREMENTS ARE OUTLINED IN A QUALITATIVE MANNER. EXAMPLES OF POLITICAL, ECONOMIC AND LEGAL CONSTRAINTS ARE SUMMARIZED, SUCH AS THE ECONOMIC IMPACT OF EXTENDED NETWORKS ON REGIONAL AND LOCAL COMPUTING ACTIVITIES. CRITICAL ISSUES FOR NETWORKING MANAGEMENT, AND OTHER AREAS OF SIGNIFICANT MANAGEMENT CONCERN ARE OUTLINED. ORGANIZATIONAL ALTERNATIVES ARE CONCEIVED IN TERMS OF FOUR LAYER ORGANIZATION MODEL. CONCLUSIONS DEAL WITH CONTINUING PROBLEM AREAS, THE NEED FOR A STRUCTURAL MODEL FOR NETWORK MANAGEMENT, CRITICAL EXPERIMENTS AND TASKS TO BE UNDERTAKEN TO FURTHER NETWORKING CAPABILITIES, AND A SUGGESTION TO ESTABLISH PLANNING TEAMS TO INITIATE SOME OF THE INITIAL STEPS REQUIRED FOR FURTHER NETWORKING DEVELOPMENT.

PARKER, LOUIS T., JR., THOMAS M. GALLIE, FREDERICK P. BROOKS, JR., JAMES K. FERRELL, INTRODUCING COMPUTING TO SMALLER COLLEGES AND UNIVERSITIES--A PROGRESS REPORT, (NORTH CAROLINA COMPUTER ORIENTATION PROJECT, RESEARCH TRIANGLE PARK, DUKE UNIV., DURHAM, NC, NORTH CAROLINA, UNIV. OF, CHAPEL HILL, NORTH CAROLINA, STATE UNIV. OF, RALEIGH), COMMUNICATIONS OF THE ACM, VOL 12, ISSUE 6, JUN 69, P 319-323, 6 REFS

ALTHOUGH SEVERAL YEARS OLD, THE ARTICLE PROVIDES A GOOD OVERVIEW OF THE CIRCUMSTANCES SURROUNDING THE CONCEPTION OF TUCC, THE TRIANGLE UNIVERSITIES COMPUTATION CENTER, NORTH CAROLINA. EXPERIENCES GAINED AND LESSONS LEARNED IN THE EARLY YEARS OF TUCC OPERATION ARE DISCUSSED.
(ALSO UNDER 5.7, 5.1)

STEFFERUD, EINAR, MANAGEMENT'S ROLE IN NETWORKING, (EINAR STEFFERUD AND ASSOCIATES, SANTA MONICA, CA), DATAMATION, VOL 18, ISSUE 4, APR 72, P 40-42

THIS VERY GOOD CONTRIBUTION TO THE NETWORKING LITERATURE IDENTIFIES CRUCIAL MANAGERIAL PROBLEMS FACED IN THE DEVELOPMENT AND OPERATION OF NETWORKS. A MAJOR POTENTIAL CONFLICT IS THAT BY USING SERVICES SUPPLIED THROUGH NETWORKS, CONTROL WITHIN THE USING ORGANIZATION MAY BE WEAKENED. THE NECESSARY MARKETPLACE ACTION AMONG PROVIDERS/USERS OF SERVICE, SERVICE BROKERS, AND NETWORK OPERATORS IS OUTLINED.

S.0 GENERAL

MAX, DAVID M., R. D. MORRISON, JR., NASIC: A REGIONAL EXPERIMENT IN THE BROKERAGE OF INFORMATION SERVICES, (NEW ENGLAND BOARD OF HIGHER EDUCATION), FACTS AND FUTURES. WHAT'S HAPPENING NOW IN COMPUTING FOR HIGHER EDUCATION, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (PRINCETON, NJ, OCTOBER 9-11, 1973), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1974, (LC 74-79222), P 268-273
(ANNOTATION UNDER 4.1.5)

WEEG, GERARD P., THE ROLE OF REGIONAL COMPUTER NETWORKS, (IOWA, UNIV. OF, IOWA CITY, COMPUTER CENTER), LEVIEN, ROGER E., COMPUTERS IN INSTRUCTION: THEIR FUTURE FOR HIGHER EDUCATION, (OCTOBER 1-3, 1970), RAND CORP., SANTA MONICA, CA. JUL 71, RC R-718-NSF-CCOM-RC, P 55-66, 6 REFS
(ANNOTATION UNDER 1.1)

WIJERS, H. J., SOME ORGANIZATIONAL PROBLEMS OF THE INTRODUCTION OF DATA COMMUNICATION SYSTEMS, (NETHERLANDS POSTAL AND TELECOMMUNICATIONS SERVICES HEADQUARTERS, HAGUE), THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 441-443, 5 REFS

THE CONCERN EXPRESSED BY THE AUTHOR IS THAT THE SERVICE SECTOR SHOULD BE MORE ENCOURAGED TO APPLY DATA COMMUNICATION TO FULFILL THEIR NEEDS. THE TITLE OF THE PAPER IS DECEPTIVE BECAUSE SOME ORGANIZATIONAL PROBLEMS ARE LISTED BUT NOT DEEPLY DISCUSSED.

WYATT, JOE B., MANAGEMENT IN APPLICATIONS OF NETWORK ACCESS, (HARVARD UNIV., CAMBRIDGE, MA), 1975 IEEE INTERCON CONFERENCE RECORD, (NEW YORK, APRIL 8-10, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, P 25-1-1--25-1-6, 4 REFS

THIS PAPER ADDRESSES MANAGEMENT CONSIDERATIONS TO BE FACED AS NETWORKS EVOLVE. THE TOPIC IS VIEWED FROM THREE PERSPECTIVES: SHOPPING FOR COMPUTER POWER, GAINING ACCESS TO SCARCE RESOURCES, AND DESIGNING NEW ARCHITECTURES FOR INFORMATION SYSTEMS.

S.1 OPERATIONS

ANSLOW, N. G., J. HANSCOTT, IMPLEMENTATION OF INTERNATIONAL DATA EXCHANGE NETWORKS, (BOAC, LONDON AIRPORT, (ENGLAND)), WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHD-69D-BC, NSF GJ-33239, P 181-184
(ANNOTATION UNDER 3.2.1)

BERG, SANFORD V., NETWORKS IN ECONOMICS, (FLORIDA, UNIV. OF, GAINESVILLE), NETWORKS AND OISCIRLINES. PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (ANN ARBOR, MI, OCTOBER 11-13, 1973), 1973, P 25-37, 8 REFS
(ANNOTATION UNDER 4.2.9)

BOWDON, EDWARD K., SR., W. J. BARR, COST EFFECTIVE PRIORITY ASSIGNMENT IN NETWORK COMPUTERS, (ILLINOIS, UNIV. OF, URBANA, BELL TELEPHONE LABS. INC., PISCATAWAY, NJ), AFIPS CONFERENCE PROCEEDINGS. VOLUME 41, PART II, 1972, FALL JOINT COMPUTER CONFERENCE, (ANAHEIM, CA, DECEMBER 5-7, 1972), AFIPS PRESS, MONTVALE, NJ, 1972, (LC 55-44701), P 755-763, 9 REFS

THE PROBLEM ADDRESSED HERE IS THE OPTIMAL ASSIGNMENT OF TASKS TO AVAILABLE PROCESSORS IN A COMPUTER NETWORK WHICH PERMITS LOAD-LEVELING. A MODEL IS DEVELOPED BASED ON USER-SPECIFIED DEADLINES FOR PARTICULAR TASKS; TASKS CLOSER TO THEIR DEADLINE ARE ASSIGNED GREATER 'VALUE' FOR PROCESSING AS COMPARED WITH JOBS WITH TIME TO SPARE. AN ALGORITHM IS DEVELOPED TO MAXIMIZE A DEFINED MEASURE OF COST-EFFECTIVENESS BASED ON THIS MODEL. THE OPERATION OF THE ALGORITHM IS ILLUSTRATED IN GREAT DETAIL.
(ALSO UNDER 5.7)

CORNEW, RONALD W., OR., PHILIP M. MORSE, DISTRIBUTED COMPUTER NETWORKING: MAKING IT WORK ON A REGIONAL BASIS, (NEW ENGLAND BOARD OF HIGHER EDUCATION, WELLESLEY, MA, MASSACHUSETTS INST. OF TECH., CAMBRIDGE, OPERATIONS RESEARCH CENTER), SCIENCE, VOL 189, 15 AUG 75, P 523-531, 21 REFS
(ANNOTATION UNDER 3.1.0)

COTTON, IRA W., NETWORK MANAGEMENT SURVEY, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY, FEB 74, NBS TN-805, NSF AG-35D, 83P

THIS REPORT PRESENTS SOME OF THE RESULTS OF A STUDY OF MANAGEMENT PRACTICES IN DIFFERENT COMPUTER NETWORKS. FIVE NETWORKS WERE CHOSEN AS TYPICAL OF DIFFERENT APPROACHES TO NETWORK IMPLEMENTATION AND MANAGEMENT: DEFENSE ADVANCED RESEARCH PROJECTS AGENCY (ARPA) NETWORK, MERIT NETWORK, TRIANGLE UNIVERSITIES COMPUTATION CENTER (TUCC), OREGON STATE REGIONAL NETWORK AND TYMNET, A COMMERCIAL NETWORK. A COMMON FORMAT IS EMPLOYED TO SURVEY EACH NETWORK. WHILE THE REPORT IS NOT INTENDED TO BE PRESCRIPTIVE, SOME EMPIRICAL OBSERVATIONS ARE PRESENTED FOR EACH TOPIC COVERED.
(ALSO UNDER 5.3, 5.7)

DAVIS, M. S., ECONOMICS--POINT OF VIEW OF DESIGNER AND OPERATOR, (NORTH CAROLINA, UNIV. OF, CHAPEL HILL), INTERDISCIPLINARY CONFERENCE ON MULTIPLE ACCESS COMPUTER NETWORKS, (AUSTIN, TX, APRIL 20-22, 1970), APR 70, P 4-1-1--4-1-7
(ANNOTATION UNDER 5.3)

GLASER, GEORGE, THE CENTRALIZATION VS. DECENTRALIZATION ISSUE: ARGUMENTS, ALTERNATIVES, AND GUIDELINES, (MCKINSEY AND CO. INC., SAN FRANCISCO, CA), IAG JOURNAL, VOL 4, ISSUE 1, 1971, P 15-28, 6 REFS

CENTRALIZATION VERSUS DECENTRALIZATION OF DATA PROCESSING STAFF, EQUIPMENT, AND AUTHORITIES IS DISCUSSED. THE ADVANTAGES AND DISADVANTAGES OF EACH APPROACH ARE PRESENTED AND CRITERIA FOR MAKING DECISIONS RELATIVE TO DEGREE OF CENTRALIZATION ARE DEVELOPED. THIS IS GOOD TREATMENT OF AN IMPORTANT ISSUE.

HERZOG, BERTRAM, ORGANIZATIONAL ISSUES AND THE COMPUTER NETWORK MARKET, (MICHIGAN, UNIV. OF, ANN ARBOR, MERIT COMPUTER NETWORK), COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE. DIGEST OF PAPERS. 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 11-14, 5 REFS
(ANNOTATION UNDER 5.2)

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK. QUARTERLY TECHNICAL REPORT NO. 7, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, OCT 70, 1 JUL-30 SEP 70, BBN R-2059, BBN QTR-7, OAHC IS-69-C-0179, 12P
(ANNOTATION UNDER 3.1.1)

INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK. QUARTERLY TECHNICAL REPORT NO. 8, BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA, JAN 71, 1 OCT-31 DEC 70, BBN R-2103, BBN QTR-8, OAHC IS-69-C-0179, 13P
(ANNOTATION UNDER 3.1.1)

MCKENZIE, ALEXANDER A., BERNARD P. COSELL, JOHN M. MCQUILLAN, MARTIN J. THROPE, THE NETWORK CONTROL CENTER FOR THE ARPA NETWORK, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA), WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHD-69C-BC, NSF GJ-33239, P 185-191, 6 REFS

THE NETWORK CONTROL CENTER (NCC) CONTAINS A HOST COMPUTER ON THE ARPA NETWORK TO WHICH THE IMP'S PERIODICALLY REPORT AND WHICH SERVES AS A DIAGNOSTIC AND MAINTENANCE-COORDINATING CENTER FOR THE NETWORK. THIS PAPER BRIEFLY DESCRIBES THE NCC HARDWARE AND DISCUSSES SUCH SOFTWARE ISSUES AS NCC-RELATED ROUTINES IN THE IMP'S, DATA COLLECTION AND INTERPRETATION MECHANISMS, LINE STATUS DETERMINATION, IMP STATUS AND PROGRAM RELOADING, AND HOST AND LINE THROUGHPUT. DETAILS OF NCC OPERATIONS (STAFFING, PROBLEM-HANDLING PROCEDURES, TRACK RECORD) AND A SUMMARY OF OVERALL NCC EXPERIENCE AND FUTURE PLANS IS INCLUDED. THE PAPER IS AN EXCELLENT GUIDE TO SOME OF THE TYPES OF CONTROL SERVICES WHICH MUST BE PROVIDED FOR AN OPERATIONAL NETWORK OF THIS TYPE.

MCKENZIE, ALEXANDER A., ON CHARACTERIZING NETWORK VULNERABILITY BY K COMPONENT CUTS, (BOLT, BERANEK AND NEWMAN INC.,

S.1 OPERATIONS

CAMBRIDGE, MA).
FOURTH DATA COMMUNICATIONS SYMPOSIUM. NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT. (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975). INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975. IEEE 75-CH1000I-7-DATA. P 4-24--4-28. 9 REFS

THIS PAPER DESCRIBES THE DEVELOPMENT OF THE ARPA NETWORK OPERATIONS CENTER FROM LATE 1969 THROUGH MID-1975. BOTH HARDWARE AND SOFTWARE ASPECTS ARE DISCUSSED WITH EMPHASIS GIVEN TO A REVIEW OF THE PRESSURES LEADING TO EACH GROWTH STEP. THIS PAPER IS AN UPDATE AND EXTENSION OF AN EARLIER PAPER BY MCKENZIE ENTITLED 'THE NETWORK CONTROL CENTER FOR THE ARPA NETWORK', DATED 1972.

NIELSEN, NORMAN R., THE STANFORD REGIONAL COMPUTING NETWORK. (STANFORD UNIV., CA).
A FIRST REPORT OF AN EXPLORATORY PROGRAM OF REGIONAL COOPERATIVE COMPUTING ACTIVITIES, JAN 70, NSF CCR-70-12, P 137-148, (ANNOTATION UNDER 3.I.2)

PARKER, LOUIS T., JR., THOMAS M. GALLIE, FREDERICK P. BROOKS, JR., JAMES K. FERRELL, INTRODUCING COMPUTING TO SMALLER COLLEGES AND UNIVERSITIES--A PROGRESS REPORT. (NORTH CAROLINA COMPUTER ORIENTATION PROJECT, RESEARCH TRIANGLE PARK, DUKE UNIV., DURHAM, NC, NORTH CAROLINA, UNIV. OF, CHAPEL HILL, NORTH CAROLINA, STATE UNIV. OF, RALEIGH), COMMUNICATIONS OF THE ACM, VOL 12, ISSUE 6, JUN 69, P 319-323, 6 REFS
(ANNOTATION UNDER S.0)

SCHELONKA, EDWARD P., RESOURCE SHARING WITH ARPANET. (LOS ALAMOS SCIENTIFIC LAB., NM).
IEEE 1974 NATIONAL TELECOMMUNICATIONS CONFERENCE, (SAN DIEGO, CA, DECEMBER 2-4, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE P-74CH0902-7-CSCB. (LC 57-20724). P 1045-1048, 2 REFS

TECHNICAL AND ADMINISTRATIVE FUNCTIONS FOR THE ARPANET ARE DESCRIBED. THE MOST INTERESTING PORTIONS OF THIS SHORT REPORT ARE THE DETAILED TRAFFIC AND RELIABILITY STATISTICS WHICH ARE PRESENTED FOR 18 MONTHS OF OPERATION, FROM JUNE 1972 THROUGH NOVEMBER, 1973.
(ALSO UNDER 3.I.2)

STEFFERUD, EINAR, DAVID L. GROBSTEIN, RONALD P. UHLIG, WHOLESALE-RETAIL SPECIFICATION IN RESOURCE SHARING NETWORKS. (STEFFERUD (EINAR) AND ASSOCIATES, LOS ANGELES, CA, PICATINNY ARSENAL, DOVER, NJ, MIS, U.S. ARMY MATERIEL COMMAND), COMPUTER, VOL 6, ISSUE 8, AUG 73, P 31-37, 14 REFS

A MODEL FOR THE MANAGEMENT OF COMPUTER NETWORKS AND AN APPROACH (THE WHOLESALE/RETAIL CONCEPT) THAT THE AUTHORS HAVE FOUND PROMISING IN THEIR EFFORTS TO SOLVE THE PROBLEMS OF NETWORK RESOURCE MANAGEMENT ARE PRESENTED.

STEVENS, MARY ELIZABETH, PROBLEMS OF NETWORK ACCOUNTING, MONITORING AND PERFORMANCE MEASUREMENT, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, CENTER FOR COMPUTER SCIENCES AND TECHNOLOGY, SEP 70, NBS REPORT 10-SS9, NBS 6006400, 133P, 162 REFS
(ANNOTATION UNDER S.3)

WHALEY, RANDALL M., PROMOTION AND ECONOMICS OF RESOURCE SHARING. (UNIVERSITY CITY SCIENCE CENTER, PHILADELPHIA, PA), GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 345-355

THE AUTHOR DISCUSSES RESOURCE SHARING. HE BEGINS WITH THREE INITIAL ASSERTIONS AND ELABORATES ON EACH. (1) A SHARED COMPUTER RESOURCE SYSTEM MUST BE PLANNED, OPERATED, AND MANAGED LIKE A BUSINESS. (2) THE PROBLEMS OF DEVELOPING, OPERATING, AND MANAGING COMPUTING NETWORKS ARE THE SAME AS THOSE ENCOUNTERED IN THE DEVELOPMENT, OPERATION AND MANAGEMENT OF SHARED COMPUTING RESOURCE CENTERS. (3) THE SUCCESS OF A NETWORK DEPENDS ON THE SUCCESSFUL OPERATION OF THE NODES OF THE NETWORK.
(ALSO UNDER 1.I)

WYATT, JOE B., THE HARVARD PLAN. (HARVARD UNIV., CAMBRIDGE, MA), GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 311-319, 2 REFS

COMPUTER OPERATIONS AT HARVARD UNIVERSITY ARE DESCRIBED, BEGINNING WITH THE EARLY DIGITAL COMPUTER MARK I, TO THE PRESENT. THIS BACKGROUND SETS THE STAGE FOR THE AUTHOR'S PRIMARY POINT, THE NEED FOR A COMPUTING SERVICE METHODOLOGY. HE CONCLUDES BY ENUMERATING THE OBJECTIVES OF SUCH A METHODOLOGY.
(ALSO UNDER 3.I.2)

S.2 MARKET ANALYSIS

ANDREWS, GLENN E., FITZROY KENNEDY, THE DATA COMMUNICATIONS MARKET IN THE UNITED STATES, LITTLE (ARTHUR D.) INC., CAMBRIDGE, MA, SEP 66, SBP, 39 REFS

THIS MARKET SURVEY, THOUGH SOMEWHAT DATED, STILL CONTAINS MUCH INFORMATION OF INTEREST. THE REPORT COVERS THREE MAIN AREAS: THE PROJECTED DATA COMMUNICATIONS MARKET IN THE U.S. THROUGH 1970, INDUSTRY STRUCTURE, AND SYSTEM CHARACTERISTICS AND COSTS.

CARLSON, WILLIAM E., STEPHEN D. CROCKER, THE IMPACT OF NETWORKS ON THE SOFTWARE MARKETPLACE. (AIR FORCE DATA AUTOMATION AGENCY, WASHINGTON, DC, AIR FORCE DATA SERVICES CENTER, DEFENSE ADVANCED RESEARCH PROJECTS AGENCY, ARLINGTON, VA),
EASCON '74, IEEE ELECTRONICS AND AEROSPACE SYSTEMS CONVENTION, (WASHINGTON, DC, OCTOBER 7-9, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE 74-CHO-883-I-AES, (LC 73-2277), P 304-308, 11 REFS
(ANNOTATION UNDER 4.3)

DUNN, D. A., ALTERNATIVE FUTURE COMPUTER-COMMUNICATION MARKETS, (STANFORD UNIV., CA), WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 63-67, 11 REFS
(ANNOTATION UNDER S.4)

ENSLOW, PHILIP H., JR., LT. COL., NETWORK VIABILITY: ECONOMIC, LEGAL, AND SOCIAL CONSIDERATIONS. (EXECUTIVE OFFICE OF THE PRESIDENT, WASHINGTON, DC, OFFICE OF TELECOMMUNICATIONS POLICY), COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 7-10, 2 REFS
(ANNOTATION UNDER S.4)

HERZOG, BERTRAM, ORGANIZATIONAL ISSUES AND THE COMPUTER NETWORK MARKET, (MICHIGAN, UNIV. OF, ANN ARBOR, MERIT COMPUTER NETWORK),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 11-14, 5 REFS

WITH THE ADDITION OF A COMPUTER NETWORK, EXISTING ORGANIZATIONAL RELATIONSHIPS ARE COMPLICATED. THIS PAPER EXPLORES THESE COMPLICATIONS THROUGH THE INTERACTIONS BETWEEN THE USER, RETAILER, AND WHOLESALER IN THE CONTEXT OF THE COMPUTER NETWORK MARKET. EXPERIENCES WITH THE MERIT NETWORK SERVE AS EXAMPLES.
(ALSO UNDER S.I)

MASON, W. F., R. K. LAY, THE WIRED CITY: SERVICES FOR HOME DELIVERY VIA INTERACTIVE CABLE TV. (MITRE CORP., WASHINGTON, DC),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 420-424
(ANNOTATION UNDER 4.3)

MASSY, WILLIAM F., NETWORK ECONOMICS AND FUNDING. REPORT OF WORKSHOP 12, (STANFORD UNIV., CA), GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 385-402, 1 REFS
(ANNOTATION UNDER S.3)

MOORE, K. ROGER, DR., ECONOMICS OF THE NETWORK MARKETPLACE. (TEXAS TECH UNIV., LUBBOCK, ARMY COMPUTER SYSTEMS COMMAND,

S.2 MARKET ANALYSIS

FORT BELVOIR, VA).
EASCON '74. IEEE ELECTRONICS AND AEROSPACE SYSTEMS CONVENTION, (WASHINGTON, DC, OCTOBER 7-9, 1974). INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE 74-CHO-883-1-AES, (LC 73-2277), P 294-302, 90 REFS

THE TITLE OF THIS ARTICLE IS QUITE DESCRIPTIVE OF ITS CONTENT. A SHORT BUT EXCELLENT DESCRIPTION IS GIVEN OF ECONOMIES OF SCALE AND ECONOMIES OF SPECIALIZATION AND HOW THEY OPERATE IN A NETWORK ENVIRONMENT. THE KINDS OF ECONOMIES ARE RELATED TO NETWORK TOPOLOGY IN THAT STAR NETWORKS ARE LIKELY TO EXHIBIT ONLY ECONOMIES OF SCALE WHILE DISTRIBUTED NETWORKS MAY EXHIBIT BOTH ECONOMIES OF SCALE AND OF SPECIALIZATION.
THE READER WISHING A MORE DETAILED TREATMENT OF THIS AND RELATED SUBJECT MATTER IS REFERRED TO THE AUTHOR'S EARLIER WORK, "MANAGEMENT STRATEGIES FOR ADP NETWORKING."
(ALSO UNDER S.3, 4.3)

NUGENT, WILLIAM R., NEW CHANNELS OF DISTRIBUTION IN THE INFORMATION INDUSTRY, (LIBRARY OF CONGRESS, WASHINGTON, DC), FACTS AND FUTURES, WHAT'S HAPPENING NOW IN COMPUTING FOR HIGHER EDUCATION, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (PRINCETON, NJ, OCTOBER 9-11, 1973), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC, (EDUCOM), PRINCETON, NJ, 1974, (LC 74-79222), P 260-267, 6 REFS

THE AUTHOR DESCRIBES THE EMERGENCE OF THREE ROLES IN THE INFORMATION ECONOMY; MANUFACTURER, RETAILER, AND BROKER. AMONG THE FACTORS HE IDENTIFIES FOR SUCCESS IN THE INFORMATION INDUSTRY ARE THE DEVELOPMENT OF UNIQUE, DISTINCTIVE, NON-COMPETITIVE SERVICES, CAPITALIZING ON LOW MARGINAL COSTS WHILE OPERATING AT NEAR CAPACITY, AND IMPROVEMENTS IN DISTRIBUTION THROUGH INFORMATION NETWORKS.

STEFFERUD, EINAR, JOSEPH T. HOOTMAN, STRUCTURE OF THE NETWORK MARKETPLACE, (NETWORK MANAGEMENT ASSOCIATES, LOS ANGELES, CA),
EASCON '74. IEEE ELECTRONICS AND AEROSPACE SYSTEMS CONVENTION, (WASHINGTON, DC, OCTOBER 7-9, 1974). INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE 74-CHO-883-1-AES, (LC 73-2277), P 289-293, 17 REFS

THE NEW COMPUTER-COMMUNICATION NETWORKS WHICH HAVE BEEN DEVELOPING ARE SEEN AS PROVIDING THE TRANSPORT SYSTEM FOR COMPUTER-BASED PRODUCTS AND SERVICES. THIS TRANSPORT SYSTEM WILL PERMIT THE COMPUTER INDUSTRY TO TRANSFORM ITSELF FROM COTTAGE INDUSTRY TO MASS PRODUCTION AND MASS DISTRIBUTION MODE, WITH ATTENDENT ECONOMIES. PRODUCTION IS SEPARATE FROM DISTRIBUTION, FOR WHICH THERE MAY BE SEVERAL LEVELS, AND VALUE CAN BE ADDED BY A VARIETY OF INTERMEDIATE SUPPLIERS ALONG THE WAY. SOME OF THESE ADDED VALUE SERVICES FOR COMPUTER SERVICES AND COMMUNICATIONS ARE IDENTIFIED, AND THE CHARACTERISTICS OF THE NEW MARKETPLACE ARE DISCUSSED. THE LENGTH OF THE PAPER ONLY PERMITS AN OVERVIEW, BUT IT IS A USEFUL INTRODUCTION.

THOMPSON, JOHN P., THE WIRED CITY: COMMERCIAL SERVICES TO BE PROVIDED BY BROADBAND TELECOMMUNICATIONS SYSTEMS, (LITTLE (ARTHUR D.) INC., CAMBRIDGE, MA),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 425-428

THE RESULTS OF A MARKET STUDY OF THE POTENTIAL USE OF COMPUTERS IN THE HOME (THROUGH USE OF TERMINALS) TO PROVIDE, FOR EXAMPLE, ELECTRONIC MAIL, THE ELECTRONIC NEWSPAPER, EDUCATION IN THE HOME, AND HOME SHOPPING SERVICES ARE PRESENTED. THE PROJECTIONS ARE OPTIMISTIC.
(ALSO UNDER 4.3, 1.6)

WITHINGTON, FREDERIC G., THE MARKET FOR A COMPUTER UTILITY INDUSTRY, (LITTLE (ARTHUR D.) INC., CAMBRIDGE, MA),
GRUENBERGER, F., COMPUTERS AND COMMUNICATIONS--TOWARD A COMPUTER UTILITY, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1968, (TK 5101.C67, LC 68-16776), P 67-77

THIS ARTICLE IDENTIFIES SEVERAL CHARACTERISTICS OF POTENTIAL MARKETS FOR COMPUTER UTILITIES (PARTICULARLY NOTABLE OF SMALLER USERS): RELUCTANCE TO ACQUIRE COMPUTERS, RELUCTANCE TO DEVELOP PROGRAMS, AND DESIRE FOR RESPONSIVE INDIVIDUAL SERVICE. POTENTIAL SERVICES ARE IDENTIFIED AS THE EQUIPMENT UTILITY, SUBSCRIPTION SERVICES, AND TIME-SHARED SERVICES. THE MARKET IS NOT SEEN DEVELOPING ACCORDING TO ANY PLAN, BUT IN RESPONSE TO THE ACTIONS OF A DIVERSE GROUP OF ENTREPRENEURS.
(ALSO UNDER 4.3)

S.3 FINANCIAL

BARR, WILLIAM J., COST EFFECTIVE ANALYSIS OF NETWORK COMPUTERS, ILLINOIS, UNIV. OF, URBANA, DEPT. OF COMPUTER SCIENCE, AUG 72, IU-DCS R-72-538, NSF GJ-28289, (PB-211 784), 73P, 44 REFS
(ANNOTATION UNDER 2.1.2)

BAUER, WALTER F., DR., RICHARD H. HILL, ECONOMICS OF TIME-SHARED COMPUTING SYSTEMS, PART 1, (INFORMATICS INC., MA), DATAMATION, VOL 13, ISSUE 11, NOV 67, P 48-52, 55, 2 REFS

THIS IS AN INTERESTING COLLECTION OF COMMENTS AND GENERALLY SOUNDLY BASED OBSERVATIONS ON BENEFITS AND PROBLEMS OF TIME-SHARING. TOPICS ON ECONOMIES OF SCALE AND ACCOUNTING FOR SYSTEM RESOURCES USED ARE RELEVANT TO MORE GENERAL NETWORK PLANNING.

BAUER, WALTER F., DR., RICHARD H. HILL, ECONOMICS OF TIME-SHARED COMPUTING SYSTEMS, PART 2, (INFORMATICS INC., MA), DATAMATION, VOL 13, ISSUE 12, DEC 67, P 41, 43, 46-49

SEE ANNOTATION FOR PART 1 OF THIS 2-PART ARTICLE.

BEERE, MAX P., THE ECONOMICS OF NEW INFORMATION NETWORKS, (PACKET COMMUNICATIONS INC., WALTHAM, MA),
HALL, ARTHUR D., III, DIGEST OF THE CONFERENCE ON THE ECONOMIES OF SCALE IN TODAY'S TELECOMMUNICATIONS SYSTEMS, (WASHINGTON, DC, SEPTEMBER 13, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE 73-CHO-830-0-SCALE, P 36-38, 4 REFS
(ANNOTATION UNDER 3.2.9)

BERG, SANFORD V., PLANNING FOR COMPUTER NETWORKS: THE TRADE ANALOGY, (FLORIDA, UNIV. OF, GAINESVILLE), MANAGEMENT SCIENCE, VOL 21, ISSUE 12, AUG 75, P 1458-1465, 16 REFS

RESOURCE SHARING IN COMPUTER NETWORKS EXHIBITS MANY OF THE SAME PROPERTIES AS INTERNATIONAL TRADE. THIS ARTICLE DEVELOPES THE ANALOGY BY EXPLORING MANY OF THE INSTITUTIONAL BARRIERS WHICH FREQUENTLY LIMIT THE EXTENT OF RESOURCE SHARING THAT IS PERMITTED ON A COOPERATIVE COMPUTER NETWORK. SOME SOLUTIONS ARE SUGGESTED, BASED ON THE EXPERIENCE WITH INTERNATIONAL TRADE.

CHOU, W., M. GERLA, H. FRANK, COMMUNICATION NETWORK COST REDUCTION USING DOMESTIC SATELLITES, (NETWORK ANALYSIS CORP., GLEN COVE, NY),
PROCEEDINGS OF THE 1974 SYMPOSIUM, COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, MAY 23, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, 74CHOB3S-9C, P 9-14, 17 REFS
(ANNOTATION UNDER 3.2.1)

COTTON, IRA W., NETWORK MANAGEMENT SURVEY, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY, FEB 74, NBS TN-805, NSF AG-350, 83P
(ANNOTATION UNDER S.1)

COVIELLO, GINO J., ROY D. ROSNER, COST CONSIDERATIONS FOR A LARGE DATA NETWORK, (DEFENSE COMMUNICATIONS AGENCY, RESTON, VA),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 289-294, 6 REFS
(ANNOTATION UNDER 1.6)

DAVIS, M. S., ECONOMICS--POINT OF VIEW OF DESIGNER AND OPERATOR, (NORTH CAROLINA, UNIV. OF, CHAPEL HILL), INTERDISCIPLINARY CONFERENCE ON MULTIPLE ACCESS COMPUTER NETWORKS, (AUSTIN, TX, APRIL 20-22, 1970), APR 70, P 4-1-1--4-1-7

THIS PAPER PROVIDES SOME EXCELLENT INSIGHT INTO THE ECONOMIC CONSIDERATIONS OF THE TRIANGE UNIVERSITIES COMPUTER CENTER (TUCC) A NETWORK SERVING THE UNIVERSITY OF NORTH CAROLINA, N. C. STATE, AND DUKE). THE INTRODUCTION GIVES THE REASONS FOR THE EXISTENCE OF TUCC -- ECONOMIES OF SCALE, SHARING OF PERSONNEL, AND COMMUNALITY OF PROGRAMS -- AND THE CONFIGURATION AND SERVICES. THE ANALYSIS OF THE ECONOMIC AND POLITICAL PROBLEMS FACING TUCC COULD BE GENERALIZED TO THE MANAGEMENT OF OTHER NETWORK COMPUTING FACILITIES.

S.3 FINANCIAL

(ALSO UNDER S.1)

DEI ROSSI, J. A., G. F. MILLS, G. C. SUMNER, A TELEPHONE-ACCESS BIOMEDICAL INFORMATION CENTER, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, CENTER FOR COMPUTER SCIENCES AND TECHNOLOGY, RAND CORP., SANTA MONICA, CA), OPERATIONS RESEARCH, VOL 20, ISSUE 3, MAY-JUN 72, P 643-667, 4 REFS

TELEPHONE-ACCESS INFORMATION SYSTEMS ARE ANALYZED, PARTICULARLY WITH REGARD TO RECORDED MESSAGES ON SUBJECTS OF INTEREST TO PHYSICIANS, BUT WITH GENERAL APPLICABILITY. QUEUING THEORY IS USED TO ARRIVE AT THE NUMBER OF LINES REQUIRED FOR ACCOMMODATING PEAK TRAFFIC. RATE STRUCTURES ARE ANALYZED IN RELATION TO VOLUME OF CALLS. ALSO EXAMINED ARE THE SENSITIVITIES OF COMMUNICATIONS COSTS TO ERRORS IN USAGE ESTIMATES, VARIATIONS IN SERVICE TIME, AND CHANGES IN PEAK HOUR CONDITIONS.

DITTBERNER, DONALD L., TELECOMMUNICATIONS COSTS,
BECKER, JOSEPH, PROCEEDINGS OF THE CONFERENCE ON INTERLIBRARY COMMUNICATIONS AND INFORMATION NETWORKS, (WARRENTON, VA, SEPTEMBER 28-OCTOBER 2, 1970), AMERICAN LIBRARY ASSOCIATION, CHICAGO, IL, 1971, DEC 0-9-230288-423(09S), (LC 70-185896), P 160-162

THIS SHORT PAPER PROVIDES A GOOD INTRODUCTION OF FACTORS AFFECTING TELECOMMUNICATIONS COSTS. THE DISCUSSION FOCUSES ON THE ISSUES THEMSELVES, RATHER THAN BECOMING ENMESHED IN A PRESENTATION OF THE DETAILS OF CURRENT RATE STRUCTURES.

DUNN, DONALD A., CARSON E. AGNEW, ECONOMICS OF INTERNATIONAL STANDARDS FOR COMPUTER COMMUNICATION, (STANFORD, UNIV. OF, CA, DEPT. OF ENGINEERING-ECONOMIC SYSTEMS),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 295-298, 6 REFS

THE ECONOMIC CONSEQUENCES OF THE GROWTH OF COMPUTER NETWORKS ACROSS NATIONAL BORDERS ARE EXPLORED IN TERMS OF THE BENEFITS TO BE REALIZED AND FACTORS LIKELY TO LIMIT OR DELAY SUCH GROWTH. TWO TYPES OF BENEFITS ARE IDENTIFIED: ECONOMIES OF SCALE ARISING FROM SERVING LARGER USER GROUPS, AND EXTERNAL BENEFITS WHICH ARISE FROM THE ADDED OPPORTUNITY TO COMMUNICATE WITH MORE SYSTEMS. SIGNIFICANT AREAS OF CONCERN FOR INTERNATIONAL NETWORKING ARE IDENTIFIED AS SECURITY, PRIVACY OF THE INDIVIDUAL, COPYRIGHT, BALANCE OF PAYMENTS AND OF TRADE, AND DIVISION OF BENEFITS. NO SPECIFIC CONCLUSIONS ARE REACHED BY THE DISCUSSION.
(ALSO UNDER S.5)

DUNN, D. A., A. J. LIPINSKI, ECONOMIC CONSIDERATIONS IN COMPUTER-COMMUNICATION SYSTEMS, (STANFORD UNIV., CA, DEPT. OF ENGINEERING-ECONOMIC SYSTEMS, INSTITUTE FOR THE FUTURE, MENLO PARK, CA),
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 371-422, 30 REFS

USERS, SYSTEM SUPPLIERS AND THE FEDERAL GOVERNMENT ARE EACH INTERESTED IN DIFFERENT COST-PERFORMANCE ASPECTS OF COMPUTER-COMMUNICATION SYSTEMS. THIS PAPER LOOKS AT ECONOMIC CONSIDERATIONS THAT ARE OF CONCERN TO USERS AND SYSTEM SUPPLIERS. IT INCLUDES A GENERAL DISCUSSION ON COST-PERFORMANCE ANALYSIS, DECISION FRAMEWORK, AND COST COMPONENTS PERFORMANCE DIMENSIONS. AN EXAMPLE OF A HYPOTHETICAL DECISION PROBLEM IS GIVEN AND THE COSTS OF COMPUTER COMMUNICATIONS, DATA TRANSMISSION, CPU MEMORY, TERMINALS, AND SOFTWARE ARE DISCUSSED. FINALLY, THE FUTURE DEMAND FOR COMPUTER COMMUNICATIONS IS FORECASTED.
(ALSO UNDER I.6)

DUNN, D. A., THE ECONOMICS OF UNIVERSITY COMPUTER NETWORKING, (STANFORD, UNIV. OF, CA),
FACTS AND FUTURES, WHAT'S HAPPENING NOW IN COMPUTING FOR HIGHER EDUCATION, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (PRINCETON, NJ, OCTOBER 9-11, 1973), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1974, (LC 74-79222), P 68-72, 3 REFS
(ANNOTATION UNDER S.0)

ELLIS, LYNN W., THE LAW OF THE ECONOMIES OF SCALE APPLIED TO COMUTER-COMMUNICATION SYSTEM DESIGN, (INTERNATIONAL TELEPHONE AND TELEGRAPH CORP., NEW YORK),
COMPCON FALL '75, ELEVENTH IEEE COMPUTER SOCIETY CONFERENCE, HOW TO MAKE COMPUTERS EASIER TO USE, DIGEST OF PAPERS, (WASHINGTON, DC, SEPTEMBER 9-11, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75CH0988-6C, P 299-306, 14 REFS

AN UNUSUALLY CLEAR EXPLANATION OF THE LAW OF THE ECONOMIES OF SCALE IS PRESENTED, ALONG WITH SOME CAVEATS AS TO WHEN IT APPLIES. STUDIES SEEKING TO EVALUATE THE EFFECTS OF THE LAW IN AREAS RELEVANT TO COMPUTER COMMUNICATIONS ARE THEN REVIEWED, REVEALING A RATHER NARROW RANGE OF RESULTS (THUS SUPPORTING WIDE APPLICABILITY OF THE LAW).

GOLDSTEIN, BERNARD, THE CASE FOR NETWORKS, (UNITED DATA CENTERS INC., NEW YORK),
DATAMATION, VOL 16, ISSUE 3, MAR 70, P 62-64
(ANNOTATION UNDER I.1)

HOOTMAN, JOSEPH T., THE COMPUTER NETWORK AS A MARKETPLACE,
DATAMATION, VOL 18, ISSUE 4, APR 72, P 43-46

IN THIS INTERESTING DISCUSSION ABOUT THE COMPUTER NETWORKING MARKETPLACE THE BASIC QUESTION OF NETWORKS AS 'VIABLE ECONOMIC ENTITIES' IS RAISED. ALTHOUGH CONTAINING AN AWKWARD CATEGORIZATION OF NETWORKS, THE ARTICLE LISTS QUESTIONS AND GENERAL ISSUES THAT SHOULD CONCERN NETWORK SERVICE SELLERS, BUYERS, AND BROKERS. THIS IS GOOD MATERIAL FOR NETWORK PLANNERS AS WELL AS PROSPECTIVE SERVICE BUYERS AND SELLERS.

HRONES, JOHN A., DR., REGIONAL COMPUTER UTILITIES FOR UNIVERSITIES, (CASE WESTERN RESERVE UNIV., CLEVELAND, OH),
THE FINANCING AND ORGANIZATION OF COMPUTING IN HIGHER EDUCATION: 1971, PROCEEDINGS OF THE EDUCOM SPRING CONFERENCE, (PHILADELPHIA, PA, APRIL 29, 1971), 1971, P 18-23

THE AUTHOR ADDRESSES THE PROBLEMS FACING COLLEGES AND UNIVERSITIES IN FINANCING COMPUTER ACTIVITIES STEMMING FROM CURTAILMENT OF NSF FUNDING AND GROWING BUDGET DEFICITS. HE DESCRIBES HOW THESE PROBLEMS ARE BEING MET AT CASE WESTERN RESERVE UNIVERSITY.

LIENTZ, BENNET P., COMPUTER NETWORK USAGE - COST-BENEFIT ANALYSIS, (CALIFORNIA, UNIV. OF, LOS ANGELES, GRADUATE SCHOOL OF MANAGEMENT),
SHERROD, J., INFORMATION SYSTEMS AND NETWORKS, GREENWOOD PRESS, 1975, P 117-132, 18 REFS
(ANNOTATION UNDER S.8)

MASSY, WILLIAM F., NETWORK ECONOMICS AND FUNDING, REPORT OF WORKSHOP 12, (STANFORD UNIV., CA),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 385-402, 1 REFS

THE TOPICS ADDRESSED BY THIS WORKSHOP FORM THE MAJOR HEADINGS OF THE REPORT: (1) MARKET STRUCTURES AND REGULATORY CONSIDERATIONS, (2) PLANNING FOR NETWORK DEVELOPMENT, AND (3) KEY NEEDS IN NETWORK RESEARCH.
(ALSO UNDER S.2, S.4)

MOORE, K. ROGER, DR., ECONOMICS OF THE NETWORK MARKETPLACE, (TEXAS TECH UNIV., LUBBOCK, ARMY COMPUTER SYSTEMS COMMAND, FORT BELVOIR, VA),
EASCON '74, IEEE ELECTRONICS AND AEROSPACE SYSTEMS CONVENTION, (WASHINGTON, DC, OCTOBER 7-9, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE 74-CHO-883-1-AES, (LC 73-2277), P 294-302, 90 REFS
(ANNOTATION UNDER S.2)

NIELSEN, NORMAN R., FLEXIBLE PRICING: AN APPROACH TO THE ALLOCATION OF COMPUTER RESOURCES, (STANFORD UNIV., CA), AFIPS PROCEEDINGS, 1968 FALL JOINT COMPUTER CONFERENCE, VOLUME 33, PART I, (SAN FRANCISCO, CA, DECEMBER 9-11, 1968), THOMPSON BOOK CO., WASHINGTON, DC, 1968, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 521-531, 6 REFS

THIS PAPER DISCUSSES THE MANAGEMENT PROBLEMS OF RESOURCE ALLOCATION IN SINGLE COMPUTING CENTERS, BUT THE CONCEPTS APPEAR READILY APPLICABLE TO MULTI-COMPUTER, DISTRIBUTED NETWORKS. THE DISCUSSION IS WELL ORGANIZED, DEFINING A SET OF POSSIBLE UTILIZATION MEASUREMENTS, THAT IS, THE MEASUREMENTS CONCERNING A JOB'S UTILIZATION OF THE COMPONENTS OF A COMPUTING SYSTEM. RESOURCES ARE RELATED TO THOSE MEASUREMENTS, AND FINALLY PRICES ARE ASSIGNED TO THE CHOSEN MEASURES. THEN, A CASE FOR FLEXIBLE PRICING IS PRESENTED IN WHICH A USER CAN SELECT AMONG PRIORITY QUEUES AND BE BILLED ACCORDINGLY.

RICHARDSON, LYMAN E., SYSTEM ECONOMICS FROM THE POINT OF VIEW OF THE USER, (T-SCAN LTD., ONTARIO, (CANADA)),
INTERDISCIPLINARY CONFERENCE ON MULTIPLE ACCESS COMPUTER NETWORKS, (AUSTIN, TX, APRIL 20-22, 1970), APR 70, P 4-2-1--4-2-9

S.3 FINANCIAL

THE ECONOMICS OF SYSTEMS IS DISCUSSED, INCLUDING CONSIDERATIONS FOR TERMINAL EQUIPMENT, COMMUNICATIONS, AND PROCESSING, WITH AN EMPHASIS ON RESPONSIVE SYSTEMS FOR BUSINESS USE. SOME INTERESTING POINTS ARE MADE CONCERNING TERMINAL UTILIZATION AND COMMUNICATIONS TRADE-OFFS.

ROBERTS, LAWRENCE G., NETWORK RATIONALE: A FIVE-YEAR REEVALUATION. (DEPARTMENT OF DEFENSE, ARLINGTON, VA. ADVANCED RESEARCH PROJECTS AGENCY).
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE. DIGEST OF PAPERS. 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973). INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973. (LC 68-1628). P 3-5

THIS ARTICLE REVIEWS THE GROWTH OF TRAFFIC ON THE ARPA NETWORK AND PRESENTS COST FIGURES TO JUSTIFY A CLAIM THAT THE NETWORK IS COST-EFFECTIVE. THE COST FIGURES ARE MOST INTERESTING AND IMPRESSIVE, BUT THE DATA ARE PRESENTED IN INSUFFICIENT DETAIL TO JUDGE THEIR VALIDITY.
(ALSO UNDER 3.1.2)

SELWYN, LEE L., ECONOMIES OF SCALE IN COMPUTER USE: INITIAL TESTS AND IMPLICATIONS FOR THE COMPUTER UTILITY. MASSACHUSETTS INST. OF TECH., CAMBRIDGE, PROJECT MAC, JUN 70, MIT-MAC TR-68, NONR 4102(01), (AD-710-011), 116P, 10 REFS
(ANNOTATION UNDER S.4)

SIMMONS, DICK B., NETWORK MANAGEMENT AND COST ANALYSIS. (TEXAS A AND M UNIV., COLLEGE STATION).
PROCEEDINGS OF THE THIRD TEXAS CONFERENCE ON COMPUTING SYSTEMS, (AUSTIN, TX, NOVEMBER 7-8, 1974). IEEE COMPUTER SOCIETY, LONG BEACH, CA, 1974. 74-CH0895-3C, P 2-3-1--2-3-7, 20 REFS

DETAILED COST PROJECTIONS ARE MADE FOR A REGIONAL COMPUTER NETWORK FOR THE STATE OF TEXAS. SUFFICIENT DATA IS PRESENTED FOR MANY ALTERNATIVES IN TERMS OF NUMBER, SIZE AND DISTRIBUTION OF COMPUTERS TO BE EVALUATED AND COMPARED. WHILE THE PARTICULAR COST FIGURES MIGHT NOT BE APPLICABLE FOR OTHER CASES, THE METHOD OF ANALYSIS IS SOUND AND COULD SERVE AS A MODEL FOR OTHER NETWORKS.

STEVENS, MARY ELIZABETH, PROBLEMS OF NETWORK ACCOUNTING, MONITORING AND PERFORMANCE MEASUREMENT, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC. CENTER FOR COMPUTER SCIENCES AND TECHNOLOGY, SEP 70, NBS REPORT 10-559, NBS 6006400, 133P, 162 REFS

SOME OF THE IMPORTANT MANAGERIAL CONTROL PROBLEMS FACED BY THE PLANNERS OF A BIOMEDICAL COMMUNICATIONS NETWORK ARE DISCUSSED. NETWORK ACCOUNTING, NETWORK PERFORMANCE MONITORING, AND APPLYING APPROPRIATE MEASURES OF PERFORMANCE EFFECTIVENESS ARE CONSIDERED. ALTHOUGH MORE QUESTIONS ARE RAISED THAN SOLUTIONS PROVIDED, THE ISSUES SHOULD BE OF IMPORTANCE TO ALL NETWORK PLANNERS AND USERS.
(ALSO UNDER S.1)

THOMPSON, GORDON B., POTENTIAL IMPACT OF USER/AUTHOR RELATIONSHIPS ON PUBLIC DATA NETWORK DESIGN. (BELL-NORTHERN RESEARCH, OTTAWA, (CANADA)).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972). INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 248-250, 3 REFS

THE THESIS OF THIS ARTICLE IS THAT LACK OF ATTENTION TO THE BUSINESS RELATIONSHIPS BETWEEN USERS AND SUPPLIERS IN TODAY'S TIME-SHARING SYSTEMS HAVE PRODUCED A MECHANISM WHICH IS FAR FROM OPTIMAL FOR PROMOTING NETWORK USAGE. COMPARISONS ARE MADE TO THE PUBLIC SWITCHED NETWORK, WHERE A SINGLE BILL IS RENDERED FOR SERVICES WHICH MAY BE PROVIDED BY A NUMBER OF SUPPLIERS, AND TO THE OPERATION OF THE COPYRIGHT LAWS IN THE MUSIC BUSINESS, WITH PERFORMANCE RIGHT FEES BEING PAID WHENEVER A SELECTION IS PLAYED. THE AUTHOR ARGUES THAT CURRENT NETWORKS FAIL TO PROVIDE ADEQUATE MECHANISMS NEEDED TO REWARD AUTHORS AND STIMULATE FURTHER OFFERINGS. THE ROLE OF SUCH AUTHORS AND OF TIME-SHARING AS A SERVICE INDUSTRY IS ALSO DISCUSSED.

TUROFF, MURRAY, OR., 'PARTY-LINE' AND 'DISCUSSION'--COMPUTERIZED CONFERENCE SYSTEMS, OFFICE OF EMERGENCY PREPAREDNESS, WASHINGTON, DC, 20 JAN 72, 40P, 4 REFS
(ANNOTATION UNDER 4.1.1)

YAGER, BERNARD, JR., ECONOMIES OF SCALE, NETWORKS, AND NETWORK COST ELASTICITY. (BELL TELEPHONE LABS, INC., HOLMDEL, NJ).
HALL, ARTHUR O., III, DIGEST OF THE CONFERENCE ON THE ECONOMIES OF SCALE IN TODAY'S TELECOMMUNICATIONS SYSTEMS. (WASHINGTON, DC, SEPTEMBER 13, 1973). INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973. IEEE 73-CHC-830-0-SCALE, P 26
(ANNOTATION UNDER 2.1.4)

S.4 REGULATORY

BAALMAN, RIEKO, THE FUTURE OF COMPUTER COMMUNICATION--A FACILITY FOR FEW OR A UTILITY FOR MANY?, (SHELL INTERNATIONALE PETROLEUM, HAGUE, (NETHERLANDS)).
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION. COMPUTER COMMUNICATION TODAY AND UP TO 1985. (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974). INTERNATIONAL COUNCIL OF ICCC, 1974, P 383-388
(ANNOTATION UNDER 1.6)

BACHRACH, MORTON W., COPYRIGHT ASPECTS OF CATV AS UTILIZED IN INFORMATION NETWORKING.
BECKER, JOSEPH, PROCEEDINGS OF THE CONFERENCE ON INTERLIBRARY COMMUNICATIONS AND INFORMATION NETWORKS, (WARRENTON, VA, SEPTEMBER 28-OCTOBER 2, 1970). AMERICAN LIBRARY ASSOCIATION, CHICAGO, IL, 1971, DEC 0-9-230288-4235(095), (LC 70-185896), P 153-159, 46 REFS
(ANNOTATION UNDER 4.3)

BAKER, DONALD I., ACCESS TO LARGE COMPUTER SYSTEMS, (DEPARTMENT OF JUSTICE, WASHINGTON, DC).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 431-433, 19 REFS

COMPETITION IS CONSIDERED IN THE AREA OF REMOTE ACCESS DATA PROCESSING, OF PARTICULAR INTEREST ARE THE MONOPOLISTIC POSSIBILITIES OF LARGE, HIGHLY SPECIALIZED COMPUTER SYSTEMS COMBINED WITH THE ADVANTAGE OF REMOTE ACCESS. FAIR AND EQUAL ACCESS FOR ALL CUSTOMERS, INCLUDING LATECOMERS, IS PROPOSED WHERE COMPETITION IS IMPOSSIBLE.

BARAN, PAUL, THE COMING COMPUTER UTILITY--LAISSEZ-FAIRE, LICENSING OR REGULATION?, RAND CORP., SANTA MONICA, CA, APR 67, 27P

THIS IS A VERY INTERESTING CONTRIBUTION DISCUSSING SOME OF THE PROBLEMS FACING THE DEVELOPMENT OF NEW COMPUTER COMMUNICATION TECHNOLOGIES WITHIN THE CONSTRAINTS OF PRESENT REGULATION (OR LACK THEREOF) AND CONTAINING RECOMMENDATIONS FOR FUTURE REGULATORY POLICIES. THE CONFLICT ADDRESSED IS THE ONE CREATED BY THE MARRIAGE OF THE UNREGULATED AND ESSENTIALLY OPENLY COMPETITIVE COMPUTER COMPANIES WITH THE HIGHLY REGULATED AND MONOPOLISTIC COMMUNICATIONS UTILITIES. THE ARGUMENTS ARE WELL DEVELOPED WITH EXAMPLES AND ANALOGIES (OFTEN AT THE LAYMAN'S LEVEL) AND LEAD TO RECOMMENDATIONS INTENDED TO ENCOURAGE TECHNOLOGICAL INNOVATIONS, PRESERVE COMPETITION, AND PROTECT AGAINST THE ABUSE OF DATA PRIVACY.
(ALSO UNDER 4.3)

BIGELOW, ROBERT P., REGULATION OF COMPUTER COMMUNICATIONS.
FACTS AND FUTURES. WHAT'S HAPPENING NOW IN COMPUTING FOR HIGHER EDUCATION. PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (PRINCETON, NJ, OCTOBER 9-11, 1973). INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1974, (LC 74-79222), P 317-321

THE IMPORTANCE OF COMMUNICATIONS REGULATIONS IS GROWING DUE TO THE INCREASING USE OF COMMUNICATIONS LINES FOR DATA TRANSMISSION. THE AUTHOR DESCRIBES WHAT GROUPS IN AND OUT OF THE GOVERNMENT MOLD COMMUNICATIONS POLICY. HE ENCOURAGES EDUCATORS TO FAMILIARIZE THEMSELVES WITH THE REGULATORY PROBLEMS IN ORDER TO INSURE ECONOMIC COMMUNICATIONS SERVICES FOR COMPUTING IN HIGHER EDUCATION.

BIGELOW, ROBERT P., SOME LEGAL AND REGULATORY PROBLEMS OF MULTIPLE ACCESS COMPUTER NETWORKS, (HENNESSY, MCCLUSKEY, EARLE AND KILBURN, BOSTON, MA).
INTERDISCIPLINARY CONFERENCE ON MULTIPLE ACCESS COMPUTER NETWORKS, (AUSTIN, TX, APRIL 20-22, 1970), APR 70, P 4-S-1--4-S-11, 12 REFS

LEGAL PROBLEMS IN COMPUTING AND COMMUNICATIONS ARE PRESENTED IN AN INTERESTING AND INFORMATIVE MANNER. THE

S.4 REGULATORY

AGENCIES WHICH HAVE A DIRECT AND INDIRECT EFFECT ON POLICIES AFFECTING THE COMPUTER AND COMMUNICATIONS INDUSTRIES ARE IDENTIFIED. THE VARIETY OF LEGAL PROBLEMS EFFECTING COMPUTER MANAGEMENT, COMMUNICATIONS MANAGEMENT, AND NETWORK MANAGEMENT ARE THEN DISCUSSED, COVERING SUCH AREAS AS HARDWARE AND SOFTWARE PROCUREME. FOREIGN ATTACHMENTS, SPECIALIZED DATA CARRIERS, THE PRIVACY ISSUE, AND ANTI-TRUST CONSIDERATIONS.

BUTLER, R. E., INTERNATIONAL COOPERATION AND REGULATION FOUNDATIONS FOR DEVELOPMENT, (INTERNATIONAL TELECOMMUNICATIONS UNION, GENEVA, (SWITZERLAND)).
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION. COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 11-17
(ANNOTATION UNDER 1.5)

COX, KENNETH A., THE PROMISE AND PERIL OF COMPETITION IN INTERCITY COMMUNICATIONS, (MCI COMMUNICATIONS CORP., WASHINGTON, DC).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 434-440, 8 REFS

A STRONG CASE FOR COMPETITION IN DATA COMMUNICATIONS IS PRESENTED. THE PRIMARY BENEFIT IS THAT THE PUBLIC MAY CHOOSE, ON THE BASIS OF COMPARATIVE PERFORMANCE, BETWEEN THE ESTABLISHED CARRIERS AND THE OFFERERS OF NEW SERVICES, COMPETITORS. IT IS STATED, WILL BE STIMULATED TO PROVIDE INNOVATION, RELIABILITY, ECONOMY, AND IMPROVED QUALITY FOR THE CUSTOMER. THE PERILS OF STIFLING COMPETITION ARE ALSO COVERED.
(ALSO UNDER 3.2.1)

CUTLER, CHARLES R., BEYOND THE COMPUTER INQUIRY (WHO SHOULD BE REGULATED IN COMPUTER/COMMUNICATIONS), (DISTRICT OF COLUMBIA BAR, WASHINGTON).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 453-460, 10 REFS

TAKING INTO ACCOUNT PAST PRECEDENCES OF THE FCC AND TRADITIONALLY ACCEPTED CONDITIONS FOR UTILITY REGULATION, GUIDELINES ARE PROPOSED TO BE APPLIED IN REGULATING COMPUTER/COMMUNICATIONS ACTIVITIES. INITIALLY THE FCC POLICIES ON DATA COMMUNICATIONS ARE DISCUSSED, RAISING SOME INTRIGUING CONTROVERSIES ON THE ROLE OF MESSAGE-SWITCHING SYSTEMS AND THE ANTI-RESALE TARIFF. THE RATIONALES OF REGULATION ARE OUTLINED AND APPLIED TO THE CONTROVERSIAL ISSUES TO ARRIVE AT A SET OF RECOMMENDATIONS STRESSING THE USE OF AS LITTLE REGULATION AS POSSIBLE.

DUNN, D. A., ALTERNATIVE FUTURE COMPUTER-COMMUNICATION MARKETS, (STANFORD UNIV., CA).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 63-67, 11 REFS

THE MARKET STRUCTURE UNDER WHICH COMPUTER-COMMUNICATIONS SYSTEMS WILL OPERATE IS SEEN AS STRONGLY DEPENDENT ON THE REGULATORY ENVIRONMENT UNDER WHICH CABLE TELEVISION DEVELOPS AND THE REGULATIONS GOVERNING COMPETITION BETWEEN THE TELEPHONE CARRIERS AND CABLE TELEVISION SYSTEM OPERATORS. THE AUTHOR SHOWS HOW SEVERAL REALISTIC REGULATORY ALTERNATIVES WHICH COULD BE ADOPTED WOULD RESULT IN WIDELY DIFFERING COMPETITIVE ENVIRONMENTS.
(ALSO UNDER S.2)

ENSLOW, PHILIP H., JR., LT. COL., NETWORK VIABILITY: ECONOMIC, LEGAL, AND SOCIAL CONSIDERATIONS, (EXECUTIVE OFFICE OF THE PRESIDENT, WASHINGTON, DC, OFFICE OF TELECOMMUNICATIONS POLICY).
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 7-10, 2 REFS

THERE ARE ECONOMIC, LEGAL, REGULATORY AND SOCIAL FACTORS WHICH NEED TO BE CONSIDERED DURING THE DESIGN STAGES FOR COMPUTING NETWORKS. THIS PAPER PRESENTS A GOOD OVERVIEW OF THESE FACTORS.
(ALSO UNDER S.2, 1.5)

ENSLOW, PHILIP H., JR., MINI-TUTORIAL ON TELECOMMUNICATIONS MANAGEMENT AND POLICY, (EXECUTIVE OFFICE OF THE PRESIDENT, WASHINGTON, DC, OFFICE OF TELECOMMUNICATIONS POLICY).
NETWORKS FOR HIGHER EDUCATION, PROCEEDINGS OF THE EDUCOM SPRING CONFERENCE, (WASHINGTON, DC, APRIL 13, 1972), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1972, P 36-41

THE OFFICE OF TELECOMMUNICATIONS POLICY (OTP) IS INTRODUCED AND ITS ROLE IN POLICY-MAKING ON DATA COMMUNICATIONS IS DISCUSSED. OTP'S FUNCTION WITHIN THE GOVERNMENT, ITS RELATIONSHIP TO THE FEDERAL COMMUNICATIONS COMMISSION (FCC), AND ITS CONCERN FOR BASIC POLICY ISSUES ARE DESCRIBED.

ENSLOW, PHILIP H., JR., NONTECHNICAL ISSUES IN NETWORK DESIGN--ECONOMIC, LEGAL, SOCIAL, AND OTHER CONSIDERATIONS, (EXECUTIVE OFFICE OF THE PRESIDENT, WASHINGTON, DC, OFFICE OF TELECOMMUNICATIONS POLICY).
COMPUTER, VOL 6, ISSUE 8, AUG 73, P 20-24, 29-30, 2 REFS

POLITICAL, SOCIAL, LEGAL AND ECONOMIC FACTORS RELATING TO COMPUTER NETWORKS ARE DISCUSSED. THE AUTHOR PRESENTS AN ALTERNATIVE TO THE LINE OF REASONING THAT COMPUTER NETWORKS SHOULD BE REGULATED.

FISCHER, L. RICHARD, LEGAL IMPLICATIONS OF A CASHLESS SOCIETY, (MORRISON, FOERSTER, HOLLOWAY, CLINTON AND CLARK, SAN FRANCISCO, CA).
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 101-104, 18 REFS

BEFORE OUR SOCIETY CAN TOTALLY MOVE TO A CASHLESS STATE NUMEROUS LEGAL PROBLEMS MUST BE CONSIDERED. THE DEVELOPMENT OF COMPUTER NETWORKS HAS MADE AN ELECTRONIC FUNDS TRANSFER SYSTEM (EFTS) FEASIBLE. THIS PAPER DISCUSSES THE MOVEMENT TOWARD A CASHLESS SOCIETY AND SOME OF THE LEGAL PROBLEMS THAT MAY ARISE IF AN EFTS WERE IMPLEMENTED.
(ALSO UNDER 1.6)

GERLA, MARIO, NEW LINE TARIFFS AND THEIR IMPACT ON NETWORK DESIGN, (NETWORK ANALYSIS CORP., GLEN COVE, NY).
AFIPS CONFERENCE PROCEEDINGS, VOLUME 43, 1974, NATIONAL COMPUTER CONFERENCE, (CHICAGO, IL, MAY 6-10, 1974), AFIPS PRESS, MONTVALE, NJ, 1974, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 577-582, 6 REFS
(ANNOTATION UNDER 3.2.2)

IRWIN, MANLEY R., MULTIPLE ACCESS COMPUTER NETWORKS: THE ROLE OF THE COMMON CARRIER, (NEW HAMPSHIRE, UNIV. OF, DURHAM, WHITTEMORE SCHOOL OF BUSINESS AND ECONOMICS).
INTERDISCIPLINARY CONFERENCE ON MULTIPLE ACCESS COMPUTER NETWORKS, (AUSTIN, TX, APRIL 20-22, 1970), APR 70, P 4-A-1--4-A-8, 24 REFS

THIS IS A WELL ORGANIZED AND IN-DEPTH DISCUSSION OF THE ROLE OF COMMON CARRIERS IN THE DEVELOPMENT OF MULTIPLE ACCESS COMPUTER NETWORKS. THE AUTHOR SUGGESTS THAT THIS ROLE IS CURRENTLY UNDERGOING REASSESSMENT. THE NATURAL MONOPOLY OF THE CARRIERS IS BEING CHALLENGED, AND, AS THEY THEMSELVES ATTEMPT TO DIVERSIFY HORIZONTALLY BY OFFERING DATA PROCESSING SERVICES, THE VERTICAL INTEGRATION APPROACH WHICH THEY HAVE FOSTERED IS BEING CHALLENGED BY OTHERS. NO CONCLUSIONS ARE REACHED, EXCEPT THAT PUBLIC POLICY DECISIONS OF CONSIDERABLE IMPORTANCE WILL HAVE TO BE MADE WITHIN A DECADE.

IRWIN, MANLEY R., TIME-SHARED INFORMATION SYSTEMS: MARKET ENTRY IN SEARCH OF A POLICY, (NEW HAMPSHIRE, UNIV. OF, DURHAM),
AFIPS PROCEEDINGS, 1967 FALL JOINT COMPUTER CONFERENCE, VOLUME 31, (ANAHEIM, CA, NOVEMBER 14-16, 1967), THOMPSON BOOK CO., WASHINGTON, DC, 1967, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 523-520, 27 REFS

THIS PAPER DISCUSSES THE FCC INVESTIGATION INTO THE POLICY IMPLICATIONS OF COMPUTER TIME-SHARING. THE APPROACH IS TO (1) STATE THE REGULATORY ISSUES AS THE FCC SEES THEM; (2) DISCUSS THE BACKGROUND EVENTS THAT PROMPTED THE INQUIRY; AND (3) EVALUATE SOME OF THE COMPETITIVE ISSUES ASSOCIATED WITH TIME-SHARED COMPUTER SERVICES. THE AUTHOR CONCLUDES THAT THE GROUND RULES FOR MARKET ENTRY ARE AT STAKE IN THE FCC INVESTIGATION.

JOHNSON, LELAND L., SOME IMPLICATIONS OF NEW COMMUNICATIONS TECHNOLOGIES FOR NATIONAL SECURITY IN THE 1970S, RAND CORP., SANTA MONICA, CA, SEP 67, RC P-3639, (AD-658 424), 24P, 14 REFS

THIS DISCUSSION FOCUSES ON SATELLITE COMMUNICATIONS AND ITS POSSIBLE IMPACT ON POLICY IN THE PUBLIC AND MILITARY SECTORS.

S.4 REGULATORY

(ALSO UNDER 1.5, 4.3)

KIMBEL, DIETER, PLANNING OF DATA COMMUNICATIONS NETWORKS--ECONOMIC, TECHNOLOGICAL AND INSTITUTIONAL ISSUES, (ORGANISATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, PARIS, (FRANCE)).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 251-259, 19 REFS

TECHNICAL, ECONOMIC AND INSTITUTIONAL ISSUES ARISING FROM THE INTERACTION OF COMPUTERS AND TELECOMMUNICATIONS ARE IDENTIFIED. THE PAPER POINTS OUT THAT SUCH SYSTEMS DEPEND ENTIRELY UPON TELECOMMUNICATIONS FACILITIES, AND EXPRESSES THE FEAR THAT THE TELECOMMUNICATIONS INDUSTRY MIGHT BECOME THE LIMITING FACTOR, BOTH FOR THE EXPLOITATION OF THE PROMISES OF THE MERGED TECHNOLOGIES AND FOR THE INDUSTRIAL GROWTH OF THE SYSTEMS. IN PLACE OF THE PRESENT VERTICAL POLICY CONCERT, AN INTEGRATED HORIZONTAL POLICY APPROACH IS SUGGESTED TO NEGOTIATE THIS POTENTIAL PROBLEM. THE CASE IS MADE FOR LARGE SCALE NATIONAL PROJECTS AND AN EXAMPLE OF SUCH AN EFFORT IN JAPAN IS CITED.
(ALSO UNDER 1.1, 1.5)

KUO, FRANKLIN F., PUBLIC POLICY ISSUES CONCERNING ARPANET, (HAWAII, UNIV. OF, HONOLULU, ALOHA SYSTEM).
FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000I-7-DATA, P 3-13--3-17, 13 REFS

THIS PAPER ADDRESSES SOME OF THE PUBLIC POLICY ISSUES THAT PERTAIN TO THE ARPA NETWORK. DISCUSSED ARE (1) GOVERNMENT OWNERSHIP, (2) INTERNETTING, (3) PRIVACY AND SECURITY, AND (4) ACCOUNTING, EXCISES AND IMPORT TARIFFS. AS KUO POINTS OUT, ONCE THE PROTECTIVE ADJECTIVE 'EXPERIMENTAL' HAS BEEN DROPPED, THESE PUBLIC POLICY ISSUES MUST BE RESOLVED BEFORE THE NETWORK CAN ASSUME PERMANENT OPERATIONAL STATUS.

LEE, ROBERT E., THE ROLE OF THE FEDERAL COMMUNICATIONS COMMISSION, (FEDERAL COMMUNICATIONS COMMISSION, WASHINGTON, DC).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-69C-8C, NSF GJ-33239, P 49-50

THE FCC'S INTERESTS AND AREAS OF RESPONSIBILITY IN REGULATING COMPUTER COMMUNICATION SYSTEMS ARE BRIEFLY OUTLINED.

MAKINO, YASUO, COMPETITION IN THE FIELDS OF COMPUTERS AND COMMUNICATIONS IN JAPAN, (MINISTRY OF POSTS AND TELECOMMUNICATIONS, TOKYO, (JAPAN)).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 441-444

THE EFFECTS OF COMPETITION AND THE FACTORS INFLUENCING COMPETITION IN REMOTE ACCESS DATA PROCESSING AND TELECOMMUNICATIONS IN JAPAN ARE DESCRIBED. IT IS INTERESTING THAT NO COMPETITION IS EXPECTED IN THE FIELD OF TELECOMMUNICATIONS SERVICE, INCLUDING DATA TRANSMISSION.
(ALSO UNDER 3.2.1)

MAKINO, YASUO, DATA COMMUNICATION IN JAPAN, (MINISTRY OF POSTS AND TELECOMMUNICATIONS, TOKYO, (JAPAN)).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 8-16
(ANNOTATION UNDER 1.2)

MASSY, WILLIAM F., NETWORK ECONOMICS AND FUNDING, REPORT OF WORKSHOP 12, (STANFORD UNIV., CA).
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 385-402, 1 REFS
(ANNOTATION UNDER 5.3)

MATHISON, STUART L., PHILIP M. WALKER, REGULATORY AND ECONOMIC ISSUES IN COMPUTER COMMUNICATIONS, (BOLT, BERANEK AND NEWMAN INC., CAMBRIDGE, MA).
PROCEEDINGS OF THE IEEE, VOL 60, ISSUE 11, NOV 72, P 1254-1272, 18 REFS

IN A TUTORIAL FASHION, THE REGULATORY PROCESS OF COMPUTER COMMUNICATIONS IS DISCUSSED AND RELATED ISSUES ARE RAISED. SOME EXCELLENT INSIGHT IS PROVIDED TO THE CONTROVERSIES ASSOCIATED WITH HYBRID SERVICES AND SPECIALIZED COMMON CARRIERS. THE AUTHORS PROPOSE THE ESTABLISHMENT OF A NEW CLASS OF COMMUNICATIONS COMMON CARRIER CALLED A 'CONTRACT CARRIER'. THE CONTRACT CARRIER WOULD PROVIDE SERVICE UNDER INDIVIDUAL AGREEMENTS WITH ORGANIZATIONS. AN OPERATING PERMIT FROM A REGULATORY AGENCY WOULD BE REQUIRED, BUT THE CONTRACT CARRIER WOULD NOT NEED TO PROVE THAT PUBLIC NECESSITY REQUIRES HIS SERVICES. THUS OPERATING IN A MODE FREE OF CUMBERSOME REGULATORY CONTROL.

MATHISON, STUART L., PHILIP M. WALKER, THE REGULATION OF VALUE ADDED CARRIERS, (TELENET COMMUNICATIONS CORP., WASHINGTON, DC).
FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000I-7-DATA, P 3-1--3-5, 7 REFS

TELENET COMMUNICATIONS CORPORATION IS ONE OF A SMALL NUMBER OF COMPANIES RECENTLY LICENSED BY THE FEDERAL COMMUNICATIONS COMMISSION TO OFFER SERVICE AS A VALUE-ADDED CARRIER (VAC). AT ABOUT THE SAME TIME AS THE VAC LICENSES WERE ISSUED THE FCC OPENED INQUIRY INTO THE SHARED USE AND RESALE OF COMMON CARRIER COMMUNICATION CHANNELS. IN THIS ARTICLE, TELENET ARGUES THAT WHILE IT IS NECESSARY AND PROPER FOR VACS TO BE REGULATED, CERTAIN REQUIREMENTS REGARDING RATE OF RETURN CALCULATIONS AND NEW SERVICE OFFERINGS ARE NOT APPROPRIATE FOR THIS TYPE OF CARRIER, AND OUGHT TO BE RELAXED.

MELODY, WILLIAM H., INTERCONNECTION: IMPACT ON COMPETITION-CARRIERS AND REGULATION, (RENNSYLVANIA, UNIV. OF, PHILADELPHIA).
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION. THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHC-690-8C, NSF GJ-33239, P 445-452, 38 REFS

THE ISSUES OF INTERCONNECTION TO COMMON CARRIER FACILITIES ARE ADDRESSED, INCLUDING A HISTORICAL PERSPECTIVE; CURRENT IMPLICATIONS; MARKET, CARRIER, AND REGULATORY RESPONSES; AND TECHNICAL STANDARDS AND ECONOMIC BARRIERS. THE ISSUE OF INTERCONNECTION IS COVERED IN DETAIL UNDER THE PREMISE THAT IT IS AN AREA WHERE MONOPOLY POWER HAS FAR EXCEEDED ANY POSSIBLE RATIONALIZATION ON THE BASIS OF TECHNOLOGICALLY DETERMINED NATURAL MONOPOLY.

MELODY, WILLIAM H., RELATIONS BETWEEN PUBLIC POLICY ISSUES AND ECONOMIES OF SCALE, (RENNSYLVANIA, UNIV. OF, PHILADELPHIA).
HALL, ARTHUR O., III, DIGEST OF THE CONFERENCE ON THE ECONOMIES OF SCALE IN TODAY'S TELECOMMUNICATIONS SYSTEMS, (WASHINGTON, DC, SEPTEMBER 13, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1973, IEEE 73-CHO-830-0-SCALE, P 39-47, 14 REFS

THIS PAPER PRESENTS A THOROUGH EXAMINATION OF THE RELATION BETWEEN THE TECHNICAL ECONOMIC CONCEPT OF ECONOMIES OF SCALE AND CURRENT PUBLIC POLICY ISSUES IN TELECOMMUNICATIONS. IT DISCUSSES ECONOMIES OF SCALE AND TELECOMMUNICATIONS REGULATION, AND DEVELOPS THE THEORETICAL ECONOMIC CONCEPT OF ECONOMIES OF SCALE IN CONTRAST TO CONCEPTS OF SHORT RUN CAPACITY UTILIZATION, ECONOMIES OF SPECIALIZATION AND ECONOMIES OF TECHNOLOGICAL CHANGE.

NORWOOD, FRANK W., TELECOMMUNICATIONS PROGRAMS AFFECTING NETWORK DEVELOPMENT,
BECKER, JOSEPH, PROCEEDINGS OF THE CONFERENCE ON INTERLIBRARY COMMUNICATIONS AND INFORMATION NETWORKS, (WARRENTON, VA, SEPTEMBER 28-OCTOBER 2, 1970), AMERICAN LIBRARY ASSOCIATION, CHICAGO, IL, 1971, OEC 0-9-230288-4235(095), (LC 70-185896), P 59-68, 24 REFS
(ANNOTATION UNDER 1.2)

SELWYN, LEE L., ECONOMIES OF SCALE IN COMPUTER USE: INITIAL TESTS AND IMPLICATIONS FOR THE COMPUTER UTILITY, MASSACHUSETTS INST. OF TECH., CAMBRIDGE, PROJECT MAC, JUN 70, MIT-MAC TR-68, NONR 4102(01), IAD-710-011), 116R, 10 REFS

THE STUDY ADDRESSES, AS A POSSIBLE BASIS FOR REGULATION OF COMPUTER SERVICES, THE EXISTENCE OF SIGNIFICANT ECONOMIES OF SCALE IN THE PRODUCTION OF SUCH SERVICES. AN ANALYSIS MADE OF DATA ON NEARLY 10,000 COMPUTERS INSTALLED AT FIRMS IN MANUFACTURING INDUSTRIES, SUGGESTED THAT USERS DID PREPARE COMPUTERS AS IF THERE WERE SIGNIFICANT ECONOMIES OF SCALE IN THEIR USE. THE AUTHOR CONCLUDES BY SUGGESTING THAT PUBLIC POLICY BE DIRECTED TOWARD REDUCTION OF BARRIERS THAT TEND TO PREVENT USE OF LARGE SYSTEMS BY GROUPS OF SMALL USERS. HOWEVER THE COSTS ASSOCIATED WITH

S.4 REGULATORY

MULTI-USER SHARING OF LARGE SYSTEMS MUST BE LESS THAN THE ADVANTAGES ASSOCIATED WITH USING THEM.
(ALSO UNDER S.3)

SIMONSON, W. E., COMMUNICATION NEEDS OF REMOTELY ACCESSED COMPUTER, (SOUTHERN CALIFORNIA, UNIV. OF, LOS ANGELES), AFIPS CONFERENCE PROCEEDINGS. 1967 FALL JOINT COMPUTER CONFERENCE, VOLUME 31, (ANAHEIM, CA, NOVEMBER 14-16, 1967), THOMPSON BOOK CO., WASHINGTON, DC, 1967, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P S22-S23

THIS SHORT PAPER DEVELOPS THE THESIS THAT REGULATION SHOULD BE AIMED AT CREATING AND MAINTAINING A COMPETITIVE ENVIRONMENT IN THE AREA OF DATA COMMUNICATIONS.

VON BAEYER, HANS, THE QUEST FOR PUBLIC POLICIES IN COMPUTER/COMMUNICATIONS--CANADIAN APPROACHES, (FEDERAL GOVERNMENT CANADA, OTTAWA),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 19-24

COMPUTER COMMUNICATIONS IMPACTS THE SOCIETAL INSTITUTIONS OF EVERY COUNTRY. IT IS THE RESPONSIBILITY OF PARTICULAR COUNTRIES TO DEAL WITH THIS TECHNOLOGY, UTILIZE IT IN THE BEST MANNER TO MEET SOCIETY NEEDS AND INTEGRATE IT INTO THE STRUCTURE OF SOCIETY. VON BAEYER INVESTIGATES TYPES OF POLICIES AND EXPLAINS THE CANADIAN APPROACH TO THE QUEST FOR PUBLIC POLICIES.

WALKER, PHILIP M., STUART L. MATHISON, REGULATORY POLICY AND FUTURE DATA TRANSMISSION SERVICES. (TELENET COMMUNICATIONS CORP., WALTHAM, MA),
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 295-370, 13 REFS

AS COMMUNICATION SERVICES AVAILABLE FOR TRANSMISSION OF DATA EXPAND, ADDITIONAL SERVICES WILL BE MADE AVAILABLE BY COMMON CARRIERS, SUCH AS THE TELEPHONE COMPANIES AND WESTERN UNION; BUT ALSO NEW COMMON CARRIERS WILL EVOLVE. THIS PAPER DESCRIBES PRESENT AND PLANNED DATA TRANSMISSION SERVICES PROVIDED BY COMMON CARRIERS, THE EMERGENCE OF NEW DATA ORIENTED CARRIERS AND THE VARIOUS POLICY CONSIDERATIONS AFFECTING COMMON CARRIERS.
(ALSO UNDER I.6, 3.2.1)

S.5 STANDARDS

EARBER, D. L. A., EASING THE INTRODUCTION OF A PACKET SWITCHING SERVICE, NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), DIV. OF COMPUTER SCIENCE, MAR 71, NPL-CSD COM-SCI-T.M.-52, 20P
(ANNOTATION UNDER 3.3.1)

EARBER, D. L. A., EXPERIENCE WITH THE USE OF THE B.S. INTERFACE IN COMPUTER PERIPHERALS AND COMMUNICATION SYSTEMS, NATIONAL PHYSICAL LAB., TEDDINGTON, (ENGLAND), DIV. OF COMPUTER SCIENCE, OCT 69, NPL-DCS COM-SCI-T.M.29, ISP, 9 REFS
(ANNOTATION UNDER 3.3.1)

BHUSHAN, ABHAY K., ROBERT M. STOTZ, PROCEDURES AND STANDARDS FOR INTER-COMPUTER COMMUNICATIONS, (MASSACHUSETTS INST. OF TECH., CAMBRIDGE, ELECTRONICS SYSTEMS LAB.),
AFIPS PROCEEDINGS, 1968 SPRING JOINT COMPUTER CONFERENCE, VOLUME 32, (ATLANTIC CITY, NJ, APRIL 30-MAY 2, 1968), THOMPSON BOOK CO., WASHINGTON, DC, 1968, AFIPS CONFERENCE PROCEEDINGS, (LC 55-44701), P 95-104, 24 REFS
(ANNOTATION UNDER 3.5.1)

ECNN, THEODORE M., A STANDARD FOR COMPUTER NETWORKS, (SPERRY RAND RESEARCH CENTER, SUDBURY, MA, DIGITAL TECHNIQUES LAB.),
COMPUTER, VOL 4, MAY-JUN 71, P 10-14, 3 REFS

THIS BRIEF DESCRIPTION OF STANDARDS EFFORTS RELATING TO COMPUTER NETWORK DEVELOPMENT AND USE INCLUDES A STATEMENT OF OBJECTIVES OF SUCH EFFORTS IN ADDITION TO CALLING FOR GOVERNMENT SUPPORT OF STANDARDS DEVELOPMENT ACTIVITIES AND A 'REGISTER' OF DE FACTO STANDARDS.

EGNN, THEODORE M., STANDARDS AND INTERCONNECTION, (HONEYWELL INC., WALTHAM, MA),
INTERDISCIPLINARY CONFERENCE ON MULTIPLE ACCESS COMPUTER NETWORKS, (AUSTIN, TX, APRIL 20-22, 1970), APR 70, P 4-3-1--4-3-8

THE OBJECTIVES AND IMPLICATIONS OF STANDARDIZATION IN DATA TRANSFER, SYSTEM CONTROL, AND DATA BASE DEFINITION FOR COMPUTER NETWORKS ARE OUTLINED. SOME OF THE ORGANIZATIONAL AND POLITICAL PROBLEMS OF STANDARDIZATION ARE WELL DESCRIBED.

CCTTON, IRA W., JOHN W. BENOIT, PROSPECTS FOR THE STANDARDIZATION OF PACKET-SWITCHED NETWORKS, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY; MITRE CORP., MCLEAN, VA),
FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000I-7-DATA, P 2-1--2-7, 5 REFS

PACKET SWITCHED NETWORKS (PSNS) HAVE EXISTED IN AN EXPERIMENTAL FORM FOR SOME TIME, AND THERE ARE A NUMBER OF COMMERCIAL SYSTEMS IN VARIOUS STAGES OF DEVELOPMENT. HOWEVER, THERE IS A NEAR TOTAL LACK OF COMMONALITY IN THE DESIGN OF THESE NETWORKS. AS THE EVENTUAL INTERCONNECTION OF NETWORKS IS INEVITABLE, THERE MAY BE MANY AREAS IN WHICH VOLUNTARY STANDARDIZATION MIGHT BE USEFUL TO BOTH THE OPERATORS AND THE USERS OF SUCH NETWORKS. IN THIS REPORT THE AUTHORS PRESENT THEIR OPINIONS ON THE PROSPECTS FOR THE STANDARDIZATION OF PACKET-SWITCHED NETWORKS.

DATAPAC STANDARD NETWORK ACCESS PROTOCOL, TRANS-CANADA TELEPHONE SYSTEM, COMPUTER COMMUNICATIONS GROUP, 30 NOV 74, 58P

THIS IS THE PRELIMINARY SPECIFICATION FOR A STANDARD NETWORK ACCESS PROTOCOL (SNAP) TO BE IMPLEMENTED ON A CANADIAN PACKET SWITCHED NETWORK CALLED DATAPAC BY JULY 1976. THE PURPOSE OF THIS PROTOCOL IS TO PROVIDE USERS WITH A STANDARD METHOD OF ACCESS TO ALL OF THE FEATURES OF THE DATAPAC NETWORK.
(ALSO UNDER 3.5.1)

DUNN, DONALD A., CARSON E. AGNEW, ECONOMICS OF INTERNATIONAL STANDARDS FOR COMPUTER COMMUNICATION, (STANFORD, UNIV. OF, CA, DEPT. OF ENGINEERING-ECONOMIC SYSTEMS),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 295-298, 6 REFS
(ANNOTATION UNDER S.3)

FIFE, DENNIS W., STANDARDS ANALYSIS FOR FUTURE WWMCCS COMPUTER NETWORKING, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, SYSTEMS AND SOFTWARE DIV., 30 AUG 74, NBSIR 74-570, 107P, 30 REFS

THE WORLD WIDE MILITARY COMMAND AND CONTROL SYSTEM (WWMCCS) IS PLANNED TO INCLUDE AN INTERCOMPUTER NETWORK BASED ON ARPANET TECHNOLOGY. THIS REPORT WAS PREPARED TO SUPPORT PLANNING FOR SUCH A NETWORK. TOPICS COVERED INCLUDE A MODEL AND FUNCTIONAL ANALYSIS OF A WWMCCS COMPUTER NETWORK, ANALYSIS OF COMMUNICATIONS DISCIPLINES, AND DISCUSSIONS OF THE FEASIBILITY OF COMMON SOFTWARE AND USER-ORIENTED NETWORK PROTOCOLS.
SOME OF THE DISCUSSION IS QUITE SPECIFIC TO THE WWMCCS SYSTEMS; HOWEVER, MUCH OF THE DISCUSSION IS READILY GENERALIZED TO OTHER NETWORKS.
(ALSO UNDER 3.5.0)

FITZSIMONS, THOMAS F., ASCII EXTENSION AND EXPANSION AND THEIR IMPACT ON DATA COMMUNICATIONS, (BELL TELEPHONE LABS. INC., PISCATAWAY, NJ),
JACKSON, PETER E., PROCEEDINGS, ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71C59-C, P 73-79

PROPOSED ASCII-RELATED STANDARDS FOR COMPUTER-COMMUNICATIONS ARE DISCUSSED. THE HISTORY OF THE EFFORT, THE CURRENT PROPOSALS, AND THE POTENTIAL IMPACT ON DATA COMMUNICATION ARE INTRODUCED. PARTICULAR ATTENTION IS GIVEN TO VARIOUS PROPOSALS FOR EXTENSIONS OF THE ASCII CODE.

HARGRAVES, ROBERT F., JR., THOMAS E. KURTZ, THE DARTMOUTH TIME SHARING NETWORK, (DARTMOUTH COLLEGE, HANOVER, NH),
ABRAMSON, NORMAN, FRANKLIN F. KUO, COMPUTER-COMMUNICATION NETWORKS, PRENTICE-HALL INC., ENGLEWOOD CLIFFS, NJ, 1973, COMPUTER APPLICATIONS IN ELECTRICAL ENGINEERING SERIES, (TK5102.5.A283), P 423-456
(ANNOTATION UNDER 3.1.0)

LITTLE, JOHN L., CALVIN N. MOOERS, STANDARDS FOR USER PROCEDURES AND DATA FORMATS IN AUTOMATED INFORMATION SYSTEMS AND

S.S STANDARDS

NETWORKS. (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, ROCKFORD RESEARCH INST., CAMBRIDGE, MA),
AFIPS PROCEEDINGS. 1968 SPRING JOINT COMPUTER CONFERENCE. VOLUME 32. (ATLANTIC CITY, NJ. APRIL 30-MAY 2, 1968). THOMPSON BOOK CO., WASHINGTON, DC, 1968. AFIPS CONFERENCE PROCEEDINGS. (LC 55-44701). P 89-94, 4 REFS

'ONCE A TELEPHONE CONNECTION TO A REMOTE AUTOMATED STORAGE UNIT AND PROCESSOR UNIT HAS BEEN ESTABLISHED, THE USER IS ABSOLUTELY HELPLESS UNLESS HE IS THOROUGHLY FAMILIAR WITH THE PARTICULAR KEYBOARD RITUALS AND INCANTATIONS REQUIRED TO ELICIT PERFORMANCE FROM THE SPECIFIC REMOTE MACHINE.' THE PURPOSE OF THE PAPER, THEN, IS TO ATTEMPT TO AMELIORATE THE SITUATION BY THE DEVELOPMENT OF STANDARDS FOR USER CONTROL PROCEDURES AND FOR DATA FORMATS TO BE USED IN AUTOMATED INFORMATION NETWORKS. ELEMENTAL LOGICAL CONTROL ACTIONS FOR A USER ENTERING AN AUTOMATED INFORMATION SYSTEM ARE IDENTIFIED AND IT IS SUGGESTED THAT THEY CAN BE STANDARDIZED AS TO FUNCTION AND CAN BE GIVEN STANDARD KEYBOARD ASSIGNMENTS.

MAKINO, YASUO, PERSPECTIVES ON DATA COMMUNICATION IN JAPAN. (NTT PUBLIC CORP., TOKYO, (JAPAN)),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION. COMPUTER COMMUNICATION TODAY AND UP TO 1985. (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974). INTERNATIONAL COUNCIL OF ICCC, 1974, P 25-30
(ANNOTATION UNDER 5.0)

MCKENNEY, JAMES L., SOFTWARE SYSTEMS AND OPERATING PROCEDURES. REPORT OF WORKSHOP 10, (HARVARD UNIV., CAMBRIDGE, MA, GRADUATE SCHOOL OF BUSINESS ADMINISTRATION),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 365-372, 1 REFS
(ANNOTATION UNDER 3.0)

MCRENOFF, EDWARD, THE TRANSFERABILITY OF COMPUTER PROGRAMS AND THE DATA ON WHICH THEY OPERATE. (ROME AIR DEVELOPMENT CENTER, GRIFFISS AFB, NY),
AFIPS PROCEEDINGS. 1969 SPRING JOINT COMPUTER CONFERENCE. VOLUME 34. (BOSTON, MA, MAY 14-16, 1969). AFIPS PRESS, MONTVALE, NJ, 1969, AFIPS CONFERENCE PROCEEDINGS. (LC 55-44701), P 609-610, 8 REFS
(ANNOTATION UNDER 4.1.0)

NEUMANN, A. J., A BASIS FOR STANDARDIZATION OF USER-TERMINAL PROTOCOLS FOR COMPUTER NETWORK ACCESS, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, SYSTEMS AND SOFTWARE DIV., JUL 75, NBS TN-877, (LC 75-600052), 29P, 5 REFS

SOME OF THE USER PROTOCOLS, ESPECIALLY THOSE USED IN CONNECTION WITH COMPUTER NETWORKS, CAN BE QUITE COMPLEX AND DIFFICULT TO USE FOR THE CASUAL USER. THUS, USER PROTOCOLS NEED TO BE DESIGNED AND STANDARDIZED FOR A WIDE VARIETY OF PEOPLE.
THE PURPOSE OF THIS PAPER IS TO ESTABLISH A BASIS FOR STANDARDIZATION AND DEVELOPMENT OF A UNIFIED USER PROTOCOL.
(ALSO UNDER 3.5.2, 2.3)

NEUMANN, A. J., USER PROCEDURES STANDARDIZATION FOR NETWORK ACCESS, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, SYSTEMS DEVELOPMENT DIV., OCT 73, NBS TN-799, NSF AG-350, 43P, 10 REFS

USER ACCESS PROCEDURES TO INFORMATION SYSTEMS HAVE BECOME OF CRUCIAL IMPORTANCE WITH THE ADVENT OF COMPUTER NETWORKS, WHICH HAVE OPENED NEW TYPES OF RESOURCES TO A BROAD SPECTRUM OF USERS. THIS REPORT SURVEYS USER ACCESS PROTOCOLS OF SIX REPRESENTATIVE SYSTEMS. FUNCTIONAL ACCESS REQUIREMENTS ARE OUTLINED, AND IMPLEMENTATION OF ACCESS PROCEDURES IS ANALYZED BY MEANS OF A COMMON METHODOLOGY.
QUALITATIVE ASSESSMENT OF STANDARDIZATION POSSIBILITIES IDENTIFIES STANDARDIZATION CANDIDATES SUCH AS: SYSTEM AND USER SIGNALS, ON-LINE USER ENTRIES, SYSTEM REQUESTS, AND NETWORK WIDE CATEGORIES OF MESSAGE CONTENT.
(ALSO UNDER 2.3)

PECK, PAUL L., THE IMPLICATIONS OF ADP NETWORKING STANDARDS FOR OPERATIONS RESEARCH, MITRE CORP., BEDFORD, MA, JUN 69, MC MTP-333, AF F19628-68-C-0365, (AD-696 675), 15P, 5 REFS
(ANNOTATION UNDER 1.1)

POUZIN, LOUIS, STANDARDS IN DATA COMMUNICATIONS AND COMPUTER NETWORKS, (INSTITUT DE RECHERCHE D'INFORMATIQUE ET D'AUTOMATIQUE (IRIA), (FRANCE)),
FOURTH DATA COMMUNICATIONS SYMPOSIUM. NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000I-7-DATA, P 2-8--2-12, 10 REFS

IN THIS PAPER THE AUTHOR FIRST DISCUSSES SYSTEM STANDARDS NEEDED TO OFFER USERS UNOBSTRUCTIVE ACCESS TO RESOURCES DISTRIBUTED OVER INTERCONNECTED, HETEROGENEOUS NETWORKS. THEN HE CONSIDERS A NUMBER OF LESS TECHNICAL ASPECTS RELATED TO STANDARDIZATION ISSUES.

ROSENBLUM, STANLEY R., PROGRESS IN CONTROL PROCEDURE STANDARDIZATION, (HONEYWELL INFORMATION SYSTEMS INC., FRAMINGHAM, MA),
JACKSON, PETER E., PROCEEDINGS. ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 153-159, 2 REFS

STANDARDIZATION OF DATA COMMUNICATIONS CONTROL PROCEDURES IS DISCUSSED. A BRIEF HISTORY AND DESCRIPTION OF THE PHILOSOPHY OF CHARACTER-ORIENTED CONTROL PROCEDURES IS GIVEN. A PROPOSAL IS THEN PRESENTED FOR A BIT-ORIENTED CONTROL PROCEDURE. THIS PROCEDURE ALLOWS FOR LINK TRANSMISSION WITH A FORMAT INVARIANT EXCEPT FOR THE PRESENCE OR ABSENCE OF AN EXTENSION FIELD. THE EXTENSION MECHANISM HAS NOT BEEN DEFINED.
(ALSO UNDER 3.5.1)

SCHUTZ, GERALD C., GEORGE E. CLARK, JR., DATA COMMUNICATION STANDARDS, (OFFICE OF THE SECRETARY OF TRANSPORTATION, WASHINGTON, DC, OFFICE OF SYSTEMS ENGINEERING, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, DATA ACQUISITION AND STORAGE SECTION),
COMPUTER, VOL 7, ISSUE 2, FEB 74, P 32-37, 5 REFS

IF YOU HAVE A QUESTION CONCERNING STANDARDS RELATED TO COMMUNICATIONS AND/OR COMPUTERS, THIS ARTICLE WILL POINT YOU TO THE APPROPRIATE COMMITTEE. THE AUTHORS ALSO INDICATE CURRENT CONCERNS IN THE WORLD OF STANDARDS, AND LIST APPROVED AND RECOMMENDED STANDARDS.

STAFFORD, SAMUEL, SERIOUS COMPATIBILITY PROBLEMS IN COMPUTER NETWORKING CHALLENGE NBS, INDUSTRY,
GOVERNMENT EXECUTIVE, VOL 3, ISSUE 7, JUL 71, P 64-66

BASED ON COMMENTS BY DR. RUTH DAVIS OF THE NATIONAL BUREAU OF STANDARDS, THIS ARTICLE HIGHLIGHTS THE PROBLEMS OF IMPROVING NETWORKS IN TERMS OF COST-EFFECTIVENESS AND COMFORTABLE USE BY CUSTOMERS. COMPATIBILITY PROBLEMS AND STANDARDIZATION EFFORTS ARE DISCUSSED AND CLARIFIED. INADEQUATE REPRESENTATION ON STANDARDS COMMITTEES AND TIME LAGS BETWEEN DECISIONS ON STANDARDIZATION AND IMPLEMENTATION ARE TWO SERIOUS PROBLEMS. FURTHER IT IS STATED THAT A FEDERAL COMMUNICATIONS COMMISSION RULING ALLOWING COMPETITION IN DIGITAL DATA TRANSMISSION WILL BE IMPORTANT FROM THE STANDPOINT OF INTRODUCING LOWER-COST COMMUNICATIONS.

STEVENS, MARY ELIZABETH, COMPATIBILITY PROBLEMS OF NETWORK INTERFACING, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, CENTER FOR COMPUTER SCIENCES AND TECHNOLOGY),
BECKER, JOSEPH, PROCEEDINGS OF THE CONFERENCE ON INTERLIBRARY COMMUNICATIONS AND INFORMATION NETWORKS, (WARRENTON, VA, SEPTEMBER 28-OCTOBER 2, 1970), AMERICAN LIBRARY ASSOCIATION, CHICAGO, IL, 1971, DEC 0-9-230288-4235(095), (LC 70-185896), P 202-212, 49 REFS

THIS REPORT IDENTIFIES A POTPOURRI OF PROBLEMS AND QUESTIONS CONCERNING COMPATIBILITY AT THE VARIOUS INTERFACES ASSOCIATED WITH A NETWORK BROADLY CLASSIFIED AS MACHINE-MACHINE AND MAN-MACHINE PROBLEMS. THIS REPORT SCRATCHES THE SURFACE OF A LARGE NUMBER OF PROBLEMS, BUT IS WEAK WHEN IT COMES TO USEFUL SOLUTIONS.

STEVENS, MARY ELIZABETH, STANDARDIZATION, COMPATIBILITY AND/OR CONVERTIBILITY REQUIREMENTS IN NETWORK PLANNING, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, CENTER FOR COMPUTER SCIENCES AND TECHNOLOGY, MAY 70, NBS REPORT 10-252, NBS 6006400, (PB-194 179), 249P, 469 REFS

STANDARDIZATION REQUIREMENTS RELATIVE TO A PROPOSED BIOMEDICAL COMMUNICATIONS NETWORK ARE CONSIDERED. THIS VERY COMPLETE DOCUMENT COVERS THE AREAS OF APPLICABILITY OF STANDARDS, INFORMATION CONTROL REQUIREMENTS, AND MANAGEMENT CONTROL REQUIREMENTS. THIS INFORMATION SHOULD BE USEFUL TO ALL NETWORK DESIGNERS AND PARTICIPANTS.

WHITE, GEORGE W., MESSAGE FORMAT PRINCIPLES, (NATIONAL COMMUNICATIONS SYSTEM, WASHINGTON, DC),
JACKSON, PETER E., PROCEEDINGS. ACM/IEEE SECOND SYMPOSIUM ON PROBLEMS IN THE OPTIMIZATION OF DATA COMMUNICATION SYSTEMS, (PALO ALTO, CA, OCTOBER 20-22, 1971), 1971, IEEE CAT-71CS9-C, P 192-198, 3 REFS
(ANNOTATION UNDER 3.5.2)

S.6 SECURITY

BARAN, PAUL. ON DISTRIBUTED COMMUNICATIONS: IX. SECURITY, SECRECY, AND TAMPER-FREE CONSIDERATIONS. RAND CORP., SANTA MONICA, CA, AUG 64, RC RM-3765-PR, AF 49(638)-700, (AD-444 839), 39P, 3 REFS

THIS REPORT DESCRIBES A NUMBER OF TECHNIQUES THAT CAN ASSURE SECURITY OF DATA TRANSMISSION IN A DISTRIBUTED MESSAGE SWITCHED NETWORK. ALTHOUGH INTENDED AS AN OPEN DISCUSSION OF MATERIAL PARTICULARLY RELEVANT FOR MILITARY SECURITY APPLICATIONS, THE METHODS FOR ASSURING ADEQUACY AND EFFECTIVENESS OF CONTROLS ON DATA ACCESSIBILITY ARE ALSO OF POTENTIAL INTEREST IN MANY APPLICATIONS OF NON-MILITARY RESOURCE SHARING COMPUTER NETWORKS.
TECHNIQUES PROPOSED IN THIS REPORT INCLUDE CONVENTIONAL CRYPTOGRAPHIC TECHNIQUES THAT CAN BE IMPLEMENTED IN THE MESSAGE SWITCHED NETWORK ITSELF. IN ADDITION TO PROPOSING THE INTRODUCTION OF FRAUDULENT TRAFFIC, THE REPORT ALSO MENTIONS A FEW TECHNIQUES SUCH AS TRANSMISSION OF SUCCESSIVE MESSAGE BLOCKS BY EVER CHANGING OR CONTINUOUSLY CHANGING PATHS AS AN EXAMPLE OF THOSE TECHNIQUES PARTICULARLY APPLICABLE TO THIS TYPE OF NETWORK.

BRANSTAD, DENNIS K., ENCRYPTION PROTECTION IN COMPUTER DATA COMMUNICATIONS, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, SYSTEMS AND SOFTWARE DIV.),
FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000I-7-DATA, P 8-1--8-7, 2 REFS

ENCRYPTION CAN BE AN EFFECTIVE PROCESS FOR PROTECTING DATA DURING TRANSMISSION WITHIN DISTRIBUTED COMPUTER SYSTEMS AND NETWORKS. ADDITIONAL SECURITY REQUIREMENS MAY BE SATISFIED BY COMBINING ENCRYPTION TECHNOLOGY WITH A NETWORK ACCESS CONTROL MACHINE IN A NETWORK SECURITY CENTER. THIS PAPER PRESENTS AN ENCRYPTION ALGORITHM FOR USE IN COMPUTER DATA COMMUNICATIONS AND THE SECURITY REQUIREMENTS THAT ARE SATISFIED BY PROPER USE OF THE ALGORITHM. ALSO DISCUSSED IS THE USE OF A NETWORK ACCESS CONTROL MACHINE TO ENFORCE ACCESS RESTRICTIONS TO THE NETWORK.

BROADMAN, IRA S., PROTECTION TECHNIQUES IN DATA PROCESSING SYSTEMS TO MEET USER DATA SECURITY NEEDS, (INTERNATIONAL BUSINESS MACHINES CORP., GAITHERSBURG, MD),
THE SECOND INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, COMPUTER COMMUNICATION TODAY AND UP TO 1985, (STOCKHOLM, (SWEDEN), AUGUST 12-14, 1974), INTERNATIONAL COUNCIL OF ICCC, 1974, P 485-489, 2 REFS

THE AUTHOR CONCENTRATES ON TECHNOLOGY BASED METHODS TO PROTECT INFORMATION STORED AND REFERENCED IN DATA PROCESSING EQUIPMENT. TRUE SECURITY METHODS ARE PRESENTED AND IMPLEMENTATION OF THESE IS REVIEWED AS A SERIES OF PARALLEL FENCES OF INFINITE LENGTH AND HEIGHT SURROUNDING THE DATA. SUCCESSFUL ACCESS IS ACHIEVED ONLY BY PASSING THROUGH THE FIVE GATES.

BROWNE, PETER S., SECURITY IN COMPUTER NETWORKS, (GENERAL ELECTRIC CO., BETHESDA, MD, INFORMATION SERVICES BUSINESS DIV.),
RENNINGER, CLARK R., APPROACHES TO PRIVACY AND SECURITY IN COMPUTER SYSTEMS, (GAITHERSBURG, MD, MARCH 4-5, 1974), SEP 74, NBS SP-404, P 32-37

AS NETWORKS PROLIFERATE AND NETWORK UTILIZATION INCREASES, SECURITY IS BECOMING AN EVER GREATER CONCERN AMONG BOTH USERS AND PROVIDERS OF SERVICE. THIS ARTICLE IS A GOOD OVERVIEW OF THE ISSUES FACED IN PROVIDING SECURITY IN NETWORK SYSTEMS. THE SPECIAL PROBLEMS WHICH NETWORKS POSE TO SECURITY PLANNERS ARE RAISED, BUT SOME SPECIAL ADVANTAGES WHICH NETWORKS OFFER IN IMPLEMENTING SECURITY SYSTEMS ARE ALSO IDENTIFIED. SPECIFIC SECURITY SYSTEMS ARE NOT DESCRIBED IN DETAIL, BUT THE PROBLEMS AND APPROACHES TO THEIR SOLUTIONS ARE WELL OUTLINED.

COTTON, IRA W., PAUL MEISSNER, APPROACHES TO CONTROLLING PERSONAL ACCESS TO COMPUTER TERMINALS, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY),
PROCEEDINGS OF THE 1975 SYMPOSIUM-COMPUTER NETWORKS: TRENDS AND APPLICATIONS, (GAITHERSBURG, MD, JUNE 16, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, 75CHO973-8C, P 32-39, 14 REFS

THIS PAPER DISCUSSES APPROACHES TO CONTROLLING PERSONAL ACCESS TO COMPUTER TERMINALS. THE EMPHASIS IS ON APPROACHES RATHER THAN SPECIFIC DEVICES. IT EXPLAINS HOW DEVICES CAN BE COMPARED, AND INTRODUCES A SYSTEMATIC SET OF CRITERIA THAT CAN BE USED IN PERSONAL IDENTIFICATION SYSTEM EVALUATION AND/OR COMPARISON.

FARBER, DAVID J., KENNETH C. LARSON, NETWORK SECURITY VIA DYNAMIC PROCESS RENAMING, (CALIFORNIA, UNIV. OF, IRVINE, DEPT. OF INFORMATION AND COMPUTER SCIENCE),
FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000I-7-DATA, P 8-13--8-18, 3 REFS

THIS PAPER PRESENTS A PROTOCOL DESIGNED TO OPERATE WITHIN A NETWORK CONSISTING OF REASONABLY SECURE HOSTS, SECURE COMMUNICATIONS PROCESSORS WHICH INTERFACE THE HOSTS TO THE NETWORK, AND HIGHLY VULNERABLE COMMUNICATIONS LINKS.
THIS PROTOCOL IS CURRENTLY BEING IMPLEMENTED ON THE DISTRIBUTED COMPUTER SYSTEM AT THE UNIV. OF CALIFORNIA AT IRVINE. MODIFICATIONS NECESSARY TO ADAPT THE PROTOCOL TO THE ARPA NETWORK WILL BE STUDIED.
(ALSO UNDER 3.5.D)

FARBER, DAVID J., KENNETH C. LARSON, THE STRUCTURE OF A DISTRIBUTED COMPUTING SYSTEM--SOFTWARE, (PRESENTED AT, SYMPOSIUM ON COMPUTER-COMMUNICATIONS NETWORKS AND TELETRAFFIC, 1972), CALIFORNIA, UNIV. OF, IRVINE, 1972, NSF GJ-104S, 17P, 2 REFS
(ANNOTATION UNDER 3.4.0)

FLETCHER, JOHN G., OCTOPUS SOFTWARE SECURITY, (LAWRENCE LIVERMORE LAB., LIVERMORE, CA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, "COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?", (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 61-62, 1 REFS

FOR NETWORK SOFTWARE TO BE SECURE THREE OBJECTIVES MUST BE FULFILLED: NO UNWARRANTED ALTERATIONS OF THE SYSTEM, NO ACCESS TO FILES OTHER THAN THOSE ASSIGNED TO THE SPECIFIC USER, AND NO VIOLATION OF THE RULES REGARDING A HIERARCHIAL INFORMATION CLASSIFICATION SCHEME. THE AUTHOR PRESENTS THE DESIGN FEATURES OF THE OCTOPUS SOFTWARE THAT ALLOW IT TO FULFILL THE THREE OBJECTIVES. BASICALLY, LIMITATION OF MEMORY ACCESS, USE OF PASSWORDS, AND A FILE STRUCTURE FOR CLASSIFYING USE OF FILES.
(ALSO UNDER 3.4.9)

FREED, ROY N., PROTECTION OF PROPRIETARY SOFTWARE PROGRAMS IN THE UNITED STATES, (WIDETT AND WIDETT, BOSTON, MA),
WINKLER, STANLEY, COMPUTER COMMUNICATIONS: IMPACTS AND IMPLEMENTATION, THE FIRST INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, (WASHINGTON, DC, OCTOBER 24-26, 1972), INTERNATIONAL CONFERENCES ON COMPUTER COMMUNICATION, 1972, ICCC 72-CHO-690-8C, NSF GJ-33239, P 403-408, 6 REFS

THIS IS A VERY INTERESTING DISCUSSION OF LEGAL TECHNIQUES FOR PROTECTING PROPRIETARY SOFTWARE FROM UNAUTHORIZED USE. PATENTING, COPYRIGHTING, TRADE SECRETS, LICENSING, LEASING, NON-DISCLOSURE COMMITMENTS, AND PROGRAM REGISTRATION ALL RECEIVE TREATMENT, GIVING A GOOD PERSPECTIVE OF THE PRESENT STATE OF LEGAL DEVELOPMENTS AND ISSUES.
(ALSO UNDER 3.4.9)

LIPNER, STEVEN B., SECURE COMPUTER SYSTEMS FOR NETWORK APPLICATIONS, (MITRE CORP., BEDFORD, MA),
FOURTH DATA COMMUNICATIONS SYMPOSIUM, NETWORK STRUCTURES IN AN EVOLVING OPERATIONAL ENVIRONMENT, (QUEBEC CITY, (CANADA), OCTOBER 7-9, 1975), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1975, IEEE 75-CH1000I-7-DATA, P 8-8--8-12, 16 REFS

THIS PAPER SUMMARIZES A TECHNOLOGY THAT CAN BE USED TO DEVELOP SECURE COMPUTER SYSTEMS AND OUTLINES SOME OF ITS APPLICATIONS TO COMPUTER NETWORKS.

TURN, REIN, PRIVACY SYSTEMS FOR TELECOMMUNICATION NETWORKS, (RAND CORP., SANTA MONICA, CA),
IEEE 1974 NATIONAL TELECOMMUNICATIONS CONFERENCE, (SAN DIEGO, CA, DECEMBER 2-4, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE P-74CHO902-7-CSCB, (LC 57-20724), P 1S1-1S6, 26 REFS

THIS EXCELLENT TUTORIAL ON TECHNIQUES THAT CAN BE USED TO PROVIDE COMMUNICATIONS SECURITY IN COMMERCIAL SYSTEMS SYSTEMATICALLY REVIEWS IN QUALITATIVE TERMS THE PROTECTIVE CHARACTERISTICS OF SEVERAL CLASSES OF ENCRYPTION TECHNIQUES. IT IS NOTED THAT THE LARGE VOLUME OF MESSAGE TRAFFIC IN COMMUNICATIONS NETWORKS MAY SIGNIFICANTLY REDUCE THE EFFECTIVENESS OF THE PRIVACY SYSTEM EMPLOYED. IMPLEMENTATION OF AN ENCRYPTION SYSTEM ON A LINK-BY-LINK BASIS USING LSI COMPONENTS IS RECOMMENDED FOR MODERN TELECOMMUNICATIONS NETWORKS SUCH AS THOSE BASED ON PACKET SWITCHING.

WINKLER, STANLEY, DR., LEE DANNER, DATA SECURITY IN THE COMPUTER COMMUNICATION ENVIRONMENT, (INTERNATIONAL BUSINESS MACHINES CORP., GAITHERSBURG, MD, SYSTEM DEVELOPMENT DIV.),
COMPUTER, VOL 7, ISSUE 2, FEB 74, P 23-31, 7 REFS

THE INCREASING APPLICATION OF COMPUTERS, NUMBER OF PERSONNEL TRAINED IN COMPUTER SCIENCE, AND THE AMOUNTS OF DATA STORED, HAVE LED TO THE INCREASED VULNERABILITY OF COMPUTER SYSTEMS TO SECURITY INVASION. THE AUTHORS CATEGORIZE ATTACKS

S.6 SECURITY

ON DATA SECURITY. THEY THEN DEFINE FUNCTIONAL ASPECTS OF DATA SECURITY AND GO ON TO DISCUSS SECURITY PROBLEMS IN THE COMPUTER COMMUNICATIONS ENVIRONMENT. PROBLEMS DEALING WITH SECURITY IN MULTI-TERMINAL COMPUTER SYSTEMS, INTELLIGENT TERMINAL/COMPUTER INTERACTIONS AND COMPUTER NETWORKS ARE EXPLORED.
(ALSO UNDER 1.3)

S.7 USER SERVICES

ABRAMS, MARSHALL D., REMOTE COMPUTING: THE ADMINISTRATIVE SIDE, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC. INST. FOR COMPUTER SCIENCES AND TECHNOLOGY),
COMPUTER DECISIONS, VOL 5, ISSUE 10, OCT 73, P 42-46, 8 REFS

PROBLEMS FACED BY REMOTE COMPUTER USERS ARE IDENTIFIED, AND PROCEDURES TO CORRECT THESE PROBLEMS SUGGESTED. SUGGESTIONS FOR BETTER ADMINISTRATIVE MANAGEMENT INCLUDE ORGANIZING ACCOUNTING, KEEPING USERS INFORMED OF DEVELOPMENTS, PROVIDING PERSONAL SUPPORT, PROVIDING TECHNICAL SUPPORT, AND SIMPLIFYING THE SYSTEM.

BOWDON, EDWARD K., SR., W. J. BARR, COST EFFECTIVE PRIORITY ASSIGNMENT IN NETWORK COMPUTERS, (ILLINOIS, UNIV. OF, URBANA, BELL TELEPHONE LABS, INC., PISCATAWAY, NJ),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 41, PART II, 1972, FALL JOINT COMPUTER CONFERENCE, (ANAHEIM, CA, DECEMBER 5-7, 1972), AFIPS PRESS, MONTVALE, NJ, 1972, (LC 55-44701), P 755-763, 9 REFS
(ANNOTATION UNDER 5.1)

CARLSON, WILLIAM E., STEPHEN D. CROCKER, THE IMPACT OF NETWORKS ON THE SOFTWARE MARKETPLACE, (AIR FORCE DATA AUTOMATION AGENCY, WASHINGTON, DC, AIR FORCE DATA SERVICES CENTER, DEFENSE ADVANCED RESEARCH PROJECTS AGENCY, ARLINGTON, VA),
EASCON '74, IEEE ELECTRONICS AND AEROSPACE SYSTEMS CONVENTION, (WASHINGTON, DC, OCTOBER 7-9, 1974), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., NEW YORK, 1974, IEEE 74-CHO-883-1-AES, (LC 73-2277), P 304-308, 11 REFS
(ANNOTATION UNDER 4.3)

COTTON, IRA W., NETWORK MANAGEMENT SURVEY, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY, FEB 74, NBS TN-805, NSF AG-350, 83P
(ANNOTATION UNDER 5.1)

DAVIS, RUTH M., PRACTICALITIES OF NETWORK USE, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY),
NETWORKS FOR HIGHER EDUCATION, PROCEEDINGS OF THE EDUCOM SPRING CONFERENCE, (WASHINGTON, DC, APRIL 13, 1972), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1972, P 13-28
(ANNOTATION UNDER 4.0)

DOLKAS, JAMES B., MODERN EDUCATION MEDIA CUT COSTS AT THE COMPUTER CENTER, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, MOFFETT FIELD, CA, AMES RESEARCH CENTER, 1972, ISP, 7 REFS

THE FUNCTIONAL ROLE OF THE USER SERVICES ORGANIZATION THAT SUPPORTS A NETWORK IS DISCUSSED. SPECIAL ATTENTION IS GIVEN TO THE NASA AMES VIDEOTAPE EXPERIMENT AS USED FOR USER EDUCATIONAL PURPOSES RELATED TO THE ILLIAC IV AND CDC 6600/7600. COMPUTER ASSISTED INSTRUCTION IS ALSO MENTIONED. THE PROBLEMS OF INFORMATION COLLECTION AND DISSEMINATION FOR USERS OF A NATIONAL NETWORK ARE NOT ADDRESSED.

FIFE, DENNIS W., PRIMARY ISSUES IN USER NEEDS, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 89-95, 3 REFS
(ANNOTATION UNDER 2.3)

GREENBERGER, MARTIN, USER ORGANIZATIONS, REPORT OF WORKSHOP 7, (JOHNS HOPKINS UNIV.),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 273-281
(ANNOTATION UNDER 2.3)

GROBSTEIN, DAVID L., RONALD P. UHLIG, A WHOLESALE RETAIL CONCEPT FOR COMPUTER NETWORK MANAGEMENT, (PICATINNY ARSENAL, DOVER, NJ, U.S. ARMY MATERIEL COMMAND, WASHINGTON, DC),
AFIPS CONFERENCE PROCEEDINGS, VOLUME 41, PART II, 1972, FALL JOINT COMPUTER CONFERENCE, (ANAHEIM, CA, DECEMBER 5-7, 1972), AFIPS PRESS, MONTVALE, NJ, 1972, (LC 55-44701), P 889-898, 14 REFS

THIS CLASSIC PAPER INTRODUCES THE "WHOLESALE/RETAIL" APPROACH TO THE MANAGEMENT OF COMPUTER NETWORKS. UNDER THIS CONCEPT, A DISTINCTION IS MADE BETWEEN THE PRODUCTION OF NETWORK SERVICES, A WHOLESALE FUNCTION, AND THEIR DELIVERY TO CUSTOMERS, A RETAIL FUNCTION. WHOLESALE PRODUCERS, SUCH AS LARGE TIMESHARING COMPUTER CENTERS, CAN TAKE ADVANTAGE OF CENTRALIZATION AND ECONOMIES OF SCALE IN ORDER TO REDUCE UNIT COSTS. RETAIL SUPPLIERS, ON THE OTHER HAND, NEED TO BE DECENTRALIZED TO CONCENTRATE ON THEIR MAIN FUNCTION -- PROVIDING ASSISTANCE TO USERS.
THIS PAPER DESCRIBES THE CONCEPT IN TUTORIAL FASHION, AND THEN ILLUSTRATES HOW IT MIGHT BE APPLIED TO THE AUTHORS' ORGANIZATION, THE U. S. ARMY MATERIAL COMMAND. THE POINT IS THAT AMC IS QUITE SIMILAR IN ORGANIZATION TO LARGE CORPORATIONS WITH SEMI-AUTONOMOUS DIVISIONS. IF AMC CAN BENEFIT FROM THIS MANAGEMENT APPROACH, THEN SO SHOULD THE CORPORATIONS.

NEUMANN, A. J., NETWORK USER INFORMATION SUPPORT, NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC. SYSTEMS AND SOFTWARE DIV., DEC 73, NBS TN-802, NSF AG-350, 27P, 14 REFS

WITH INCREASING INTEREST IN THE DEVELOPMENT OF COMPUTER NETWORKS AND THE PROLIFERATION OF REMOTE ENTRY CAPABILITY FROM USER TERMINALS, USER SUPPORT TAKES ON NEW DIMENSIONS. SOME USER CHARACTERISTICS ARE OUTLINED AS THEY AFFECT USER SUPPORT. USER SUPPORT REQUIREMENTS ARE IDENTIFIED FOR TRAINING, TERMINAL OPERATION, AND GENERAL INFORMATION TO AID IN NETWORK OPERATIONS. SUPPORT CAPABILITIES INCLUDE ON-LINE AIDS, INFORMATION AVAILABLE ON REQUEST, AND TUTORIAL INFORMATION AVAILABLE AT THE TERMINAL. USER SUPPORT ALSO INCLUDES PERTINENT DOCUMENTATION AND HUMAN CONSULTATION. AREAS OF FUTURE RESEARCH IDENTIFIED ARE: INTERACTIVE LANGUAGE DESIGN, TUTORIAL DESIGN, INTEGRATION OF HARD COPY AND ON-LINE CAPABILITIES, AND FURTHER DEVELOPMENT OF USER FEEDBACK CAPABILITY.
(ALSO UNDER 2.3)

NIELSEN, NORMAN R., NETWORK COMPUTING, (STANFORD UNIV., CA. WELLSCO DATA CORP.),
GREENBERGER, MARTIN, JULIUS ARONOFSKY, JAMES L. MCKENNEY, WILLIAM F. MASSY, NETWORKS FOR RESEARCH AND EDUCATION: SHARING COMPUTER AND INFORMATION RESOURCES NATIONWIDE, MIT PRESS, CAMBRIDGE, MA, 1973, P 64-73, 1 REFS
(ANNOTATION UNDER 1.2)

OWENS, JERRY L., A USER'S VIEW OF THE LAWRENCE LIVERMORE LABORATORY'S COMPUTER NETWORKS, (LAWRENCE LIVERMORE LAB., LIVERMORE, CA),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, "COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?", (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 75-78, 4 REFS
(ANNOTATION UNDER 3.1, 2)

PARKER, LOUIS T., JR., THOMAS M. GALLIE, FREDERICK P. BROOKS, JR., JAMES K. FERRELL, INTRODUCING COMPUTING TO SMALLER COLLEGES AND UNIVERSITIES--A PROGRESS REPORT, (NORTH CAROLINA COMPUTER ORIENTATION PROJECT, RESEARCH TRIANGLE PARK, DUKE UNIV., DURHAM, NC, NORTH CAROLINA, UNIV. OF, CHAPEL HILL, NORTH CAROLINA, STATE UNIV. OF, RALEIGH),
COMMUNICATIONS OF THE ACM, VOL 12, ISSUE 6, JUN 69, P 319-323, 6 REFS
(ANNOTATION UNDER 5.0)

PICKENS, JOHN R., COMPUTER NETWORKS FROM THE USER'S POINT OF VIEW, (CALIFORNIA, UNIV. OF, SANTA BARBARA, DEPT. OF ELECTRICAL ENGINEERING),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, "COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?", (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 71-74, 7 REFS
(ANNOTATION UNDER 2.3)

PYKE, THOMAS N., JR., ROBERT P. BLANC, NETWORKING CHALLENGES: THE USER'S VIEWPOINT, (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCE AND TECHNOLOGY),
FACTS AND FUTURES, WHAT'S HAPPENING NOW IN COMPUTING FOR HIGHER EDUCATION, PROCEEDINGS OF THE EDUCOM FALL CONFERENCE, (PRINCETON, NJ, OCTOBER 9-11, 1973), INTERUNIVERSITY COMMUNICATIONS COUNCIL INC. (EDUCOM), PRINCETON, NJ, 1974, (LC 74-79222), P 211-217

S.7 USER SERVICES

(ANNOTATION UNDER 2.3)

PYKE, THOMAS N., JR., SOME TECHNICAL CONSIDERATIONS FOR IMPROVED SERVICE TO COMPUTER NETWORK USERS. (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY),
COMPCON 73 - SEVENTH ANNUAL IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE, DIGEST OF PAPERS, 'COMPUTING NETWORKS FROM MINIS THROUGH MAXIS -- ARE THEY FOR REAL?', (SAN FRANCISCO, CA, FEBRUARY 27-28, MARCH 1, 1973), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC., NEW YORK, 1973, (LC 68-1628), P 53-55, 9 REFS

THERE ARE MANY TYPES OF SERVICES REQUIRED AND DESIRED BY USERS OF A COMPUTER NETWORK. IN THIS PAPER THE AUTHOR DISCUSSES A 'GENERIC SET OF USER COMMUNICATIONS SUPPORT SERVICE THAT ARE COMMON ACROSS CLASSES OF USERS AND CLASSES OF HOST COMPUTER SERVICES.' VARIOUS TYPES OF USER DEMANDS ARE CONSIDERED AND SOME ALTERNATIVES ARE GIVEN FOR PROVIDING THE CAPABILITY TO SUPPORT THESE USER SERVICES.
(ALSO UNDER 3.4.4)

S.8 PROCUREMENT

COTTON, IRA W., COST-BENEFIT ANALYSIS OF INTERACTIVE SYSTEMS. (NATIONAL BUREAU OF STANDARDS, WASHINGTON, DC, INST. FOR COMPUTER SCIENCES AND TECHNOLOGY),
THE SECOND JERUSALEM CONFERENCE ON INFORMATION TECHNOLOGY, (JERUSALEM, (ISRAEL), JULY 29-AUGUST 1, 1974), 1974, P 729-746, 29 REFS

COST-BENEFIT ANALYSIS IS DISTINGUISHED FROM ANALYSES OF SYSTEM PERFORMANCE IN THAT THE LATTER ARE DIRECTED AT OPTIMIZING SYSTEM PERFORMANCE AT A GIVEN LEVEL OF INVESTMENT, WHILE THE FORMER IS DIRECTED AT JUSTIFYING THE INVESTMENT ITSELF. THIS PAPER ASSESSES THE STATE-OF-THE-ART IN COST-BENEFIT ANALYSIS OF INTERACTIVE SYSTEMS AND SUGGESTS AN APPROACH FOR DEVELOPING IMPROVED METHODOLOGY.
METHODS OF ANALYZING THE PERFORMANCE AND COSTS OF COMPUTER SYSTEMS IN GENERAL AND INTERACTIVE SYSTEMS IN PARTICULAR ARE DISCUSSED. WITH THIS INFORMATION IT IS SHOWN HOW COST-EFFECTIVENESS ANALYSIS MAY BE PERFORMED. THE NEXT CRUCIAL STEP IS TO CONDUCT BENEFIT ANALYSIS, AN ILL-DEFINED ART. THE RESULTS OF BENEFIT ANALYSIS MUST BE COMBINED WITH COST-EFFECTIVENESS ANALYSIS IN ORDER TO PERFORM THE DESIRED COST-BENEFIT ANALYSIS.
AN EXPERIMENTAL METHODOLOGY IS SUGGESTED FOR BETTER PERFORMING BENEFIT ANALYSES OF INTERACTIVE SYSTEMS. A MORE RIGOROUS FORMULATION OF THE COST-BENEFIT PROCEDURE IS THEN OUTLINED. NO ATTEMPT IS MADE IN THE PAPER TO ACTUALLY PERFORM SUCH AN ANALYSIS.
(ALSO UNDER 2.2)

LIENTZ, BENNET P., COMPUTER NETWORK USAGE - COST-BENEFIT ANALYSIS. (CALIFORNIA, UNIV. OF, LOS ANGELES, GRADUATE SCHOOL OF MANAGEMENT),
SHERROD, J., INFORMATION SYSTEMS AND NETWORKS, GREENWOOD PRESS, 1975, P 117-132, 18 REFS

AN EXTREMELY FORMAL MATHEMATICAL MODEL AND ANALYSIS PROCEDURE IS PRESENTED FOR SELECTING THE MOST COST-BENEFICIAL ALTERNATIVE FROM AMONG A NUMBER OF POSSIBILITIES IN A NETWORKING ENVIRONMENT WHERE DECISIONS HAVE TO BE MADE ON WHERE TO PERFORM WORK OF VARYING TYPES. THE MODEL CONSIDERS THE NUMBER OF SYSTEMS AVAILABLE AND THEIR USAGE COSTS (BOTH VARIABLE AND FIXED), RESOURCE LIMITATIONS, TRANSITION COSTS IN CHANGING THE MODE OF USAGE, WEIGHTING FACTORS FOR ARBITRARY PREFERENCES, AND THE COST OF CAPITAL. NETWORKING BENEFITS ARE REFLECTED IN THE MODEL AS A REDUCTION IN EXTERNAL COSTS OF USAGE. IF ALL THE VARIOUS COSTS AND FACTORS CAN BE DETERMINED, AN OPTIMAL SOLUTION CAN BE OBTAINED FOR THE USER.
(ALSO UNDER S.3)

S.9 OTHER

BENOIT, JOHN W., IRA W. COTTON, O. C. WOOD, PROPOSED IMPLEMENTATION PLAN FOR A WWMCCS INTERCOMPUTER NETWORK, MITRE CORP., WASHINGTON, DC, 2 DEC 71, MC WP-9807, AF F19628-71-C-0002, 41P
(ANNOTATION UNDER 3.1.1)

FARBER, DAVID J., DISTRIBUTED DATA BASES -- AN EXPLORATION, (CALIFORNIA, UNIV. OF, IRVINE, DEPT. OF INFORMATION AND COMPUTER SCIENCE),
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