







National Bureau of Standards Library, E-01 Admin. Bldg. OCT 6 1981

101142

QL



QC 100

U5753 0.1104

100 45753 NBS TECHNICAL NOTE 1104

Volume 1

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

The FCC Public Message Services Policy Change: An ETIP Evaluability Assessment Report

NATIONAL BUREAU OF STANDARDS

The National Bureau of Standards' was established by an act of Congress on March 3, 1901. The Bureau's overall goal is to strengthen and advance the Nation's science and technology and facilitate their effective application for public benefit. To this end, the Bureau conducts research and provides: (1) a basis for the Nation's physical measurement system, (2) scientific and technological services for industry and government, (3) a technical basis for equity in trade, and (4) technical services to promote public safety. The Bureau's technical work is performed by the National Measurement Laboratory, the National Engineering Laboratory, and the Institute for Computer Sciences and Technology.

THE NATIONAL MEASUREMENT LABORATORY provides the national system of physical and chemical and materials measurement; coordinates the system with measurement systems of other nations and furnishes essential services leading to accurate and uniform physical and chemical measurement throughout the Nation's scientific community, industry, and commerce; conducts materials research leading to improved methods of measurement, standards, and data on the properties of materials needed by industry, commerce, educational institutions, and Government; provides advisory and research services to other Government agencies; develops, produces, and distributes Standard Reference Materials; and provides calibration services. The Laboratory consists of the following centers:

Absolute Physical Quantities² — Radiation Research — Thermodynamics and Molecular Science — Analytical Chemistry — Materials Science.

THE NATIONAL ENGINEERING LABORATORY provides technology and technical services to the public and private sectors to address national needs and to solve national problems; conducts research in engineering and applied science in support of these efforts; builds and maintains competence in the necessary disciplines required to carry out this research and technical service; develops engineering data and measurement capabilities; provides engineering measurement traceability services; develops test methods and proposes engineering standards and code changes; develops and proposes new engineering practices; and develops and improves mechanisms to transfer results of its research to the ultimate user. The Laboratory consists of the following centers:

Applied Mathematics — Electronics and Electrical Engineering² — Mechanical Engineering and Process Technology² — Building Technology — Fire Research — Consumer Product Technology — Field Methods.

THE INSTITUTE FOR COMPUTER SCIENCES AND TECHNOLOGY conducts research and provides scientific and technical services to aid Federal agencies in the selection, acquisition, application, and use of computer technology to improve effectiveness and economy in Government operations in accordance with Public Law 89-306 (40 U.S.C. 759), relevant Executive Orders, and other directives; carries out this mission by managing the Federal Information Processing Standards Program, developing Federal ADP standards guidelines, and managing Federal participation in ADP voluntary standardization activities; provides scientific and technological advisory services and assistance to Federal agencies; and provides the technical foundation for computer-related policies of the Federal Government. The Institute consists of the following centers:

Programming Science and Technology - Computer Systems Engineering.

Headquarters and Laboratories at Gaithersburg, MD, unless otherwise noted; mailing address Washington, DC 20234.

²Some divisions within the center are located at Boulder, CO 80303.



The FCC Public Message Services Policy Change: An ETIP Evaluability Assessment Report -- Volume 1

James Bell¹ Sharon Kirby¹ Roland G. Weiss² Steve Watson¹

¹The Urban Institute 2100 M Street, NW Washington, DC 20037

²Center for Field Methods Experimental Technology Incentives Program National Bureau of Standards Washington, DC 20234



U.S. DEPARTMENT OF COMMERCE, Juanita M. Kreps, Secretary Luther H. Hodges, Jr., Under Secretary Jordan J. Baruch, Assistant Secretary for Science and Technology WS NATIONAL BUREAU OF STANDARDS, Ernest Ambler, Director

Issued September 1979

National Bureau of Standards Technical Note 1104/1 Nat. Bur. Stand. (U.S.), Tech. Note 1104/1, 232 pages (Sept. 1979) CODEN: NBTNAE

> U.S. GOVERNMENT PRINTING OFFICE WASHINGTON: 1979

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 Stock No. 003–003–02117–2 Price \$11. Sold in sets only. (Add 25 percent additional for other than U.S. mailing)

AB STRACT

This document is a report of work in progress toward evaluating effects of the recent decision of the Federal Communications Commission to open public message services to competition. It is one product of the Regulatory Processes and Effects Project of the Center for Field Methods (ETIP). The broader project, described elsewhere, is attempting to analyze the effects of changes in regulatory processes on industrial innovation. The joint ETIP/FCC project will involve measuring whether the FCC policy change leads to increases in competition, technological innovation, and public benefit.

The first two chapters provide an introduction and snyopsis. Chapter III examines the setting in which the decision occurs in terms of historical developments, industry trends, and views held by various observers. Chapter IV describes the: Commission's mandate for regulation, process for implementing this mandate in terms of regulations and operations, and current industry status. The fifth chapter describes the evaluation logic. The last chapter is an assessment which shows that there are many choices to be made to target the evaluation. A glossary of terms and bibliography are included. Seven appendices are bound separately.

Key words: Administrative experimentation; economic deregulation; evaluability assessment; evaluation; Experimental Technology Incentives Program; Federal Communications Commission; regulatory experimentation; regulatory policy; technological innovation; telecommunications.

ACKNOWLEDGEMENTS

This report could not have been completed without the assistance and cooperation of many people. First and foremost we would like to thank the Federal Communications Commission staff who provided invaluable information both about Commission operations and about issues that are currently being debated within the telecommunications industry. In particular, we wish to acknowledge:

- David Irwin, Chief of Policy and Rules;
- James Smith, Policy and Rules;
- Charles Oliver of Program Evaluation;
- Frank Patella, Judy Nitsche, Ken Levy, and Daniel Harrold of Tariff Review and Tariff Proceedings;
- Jim Ferris, Complaints and Service Standards; and
- Robert James (Domestic Division) and Helene Bauman (International Division) of the Facilities Branch.

We would especially like to thank Leonard Sawicki, Program Evaluation Branch, who provided assistance throughout the effort including reviews and comments on the preliminary drafts of this report.

Staff of both The Urban Institute and The Experimental Technology Incentives Program of the Department of Commerce participated on committees reviewing this report and offered advice during the course of research. We would like to thank Victor Berlin, Bud Libman, and Dan Fulmer of ETIP and Robert Sadacca, John Waller, Joe Nay, Lucile Graham, Michael Mulkey, Bill Foskett, Paul Nalley, John Heinberg, and Richard Schmidt of The Urban Institute.

Our initial contact with the industry produced a gratifying response. We would like to thank the common carriers which expressed interest in our experimental evaluation of the effects of changes in interstate telecommunications regulation. In some cases, carriers submitted information about their operations.

The telecommunications industry is indeed fast moving and complex. We found that the publication <u>Telecommunications Reports</u> provided valuable information about developments in the industry. Mr. Fred Henck, publisher of <u>Reports</u>, very kindly gave us permission to quote his journal. We also appreciate the fine job done by Erica Sweeney who edited this report. Finally, we would like to thank the many people who helped to prepare the report. Staff who assisted us include: Kraig Jones, (Ms.) Mike Malone, Mary Sarley, John Fortunato-Schwandt, Ilona Bush, and Barbara Shunney. We are especially grateful to Copper Wilson who, in spite of coming to the project during the final report writing, took responsibility for primary secretarial support, worked long hours to meet deadlines, and also made valuable contributions to the content of the report.

> James Bell Sharon Kirby Roland Weiss Steven Watson

PREFACE

Regulatory agencies and regulatory reform are subjects of great interest today, and the effects of regulation on technological innovation and productivity in American industry are of special concern. Many reforms and changes in the regulatory process are being proposed, and some are being made. Each change represents an "experiment" in the operation of our society, even if no one carefully determines the result of that "experiment."

Since 1974, the Experimental Technology Incentives Program (ETIP)-located in the Center for Field Methods of the National Bureau of Standards-has pursued an understanding of the relationships between government policies and technology-based economic growth. This goal is based on three premises:

- o Technological change is a significant contributor to social and economic development in the United States.
- o Federal, State, and local government policies can influence the rate and direction of technological change.
- Current understanding of this influence and its impact on social and economic factors is incomplete.

ETIP seeks to improve public policy and the policy research process in order to facilitate technological change in the private sector. The program does not pursue technological change <u>per se</u>. Rather, its mission is to examine and experiment with government policies and practices in order to identify and assist in the removal of government-related barriers and to correct inherent market imperfections that impede the innovation process.

ETIP assists other government agencies in the design and conduct of joint projects. Key agency decision makers are intimately involved in these experiments to ensure that the results are incorporated in the policymaking process. ETIP provides its agency partners with both analytical assistance and funding for the experiments while it oversees the evaluation function.

In 1977, The Urban Institute's Program Evaluation Group was awarded a significant contract (\$856,000 over 15 months) as a result of competitive bidding on a U.S. Department of Commerce Request For Proposal. Under this contract the Program Evaluation Group provided analytic support and data collection services to ETIP. This work was the foundation for the Regulatory Processes and Effects Project (RPE). The Regulatory Processes and Effects Project, through this analytic support work, will analyze the process and attempt to document the results of ETIP's regulatory projects, which investigate whether private sector innovation is generated by changes in regulatory agencies. In December 1978, the Regulatory Processes and Effects Project moved from The Urban Institute to the Performance Development Institute (PDI) as the result of a competitive award process.

Regulatory Processes and Effects Project teams are conducting short, exploratory efforts, significant explorations of expectations and reality, and assessments of fully developed regulatory process changes under various regulatory situations.¹ The following regulatory agencies are (or have been) involved:

> Environmental Protection Agency (Air, Pesticides, and Water), Federal Communications Commision, Food and Drug Administration, Federal Energy Regulatory Commission, Federal Trade Commission, Interstate Commerce Commission, Nuclear Regulatory Commission, Occupational Safety and Health Administration, and State Public Utility Commissions (Electric Power).

The Regulatory Processes and Effects Project not only helps to develop actual regulatory administrative experiments, but also helps formulate a generalizable body of methods for implementing and assessing the effects of regulatory changes on commerce, industry, and technological innovation.

^{1.} ETIP prefers to use the strategy of "administrative experimentation" when applicable. An administrative experimentation stragegy (1) helps to bring about a change in the performance or operation of an agency, and (2) improves the understanding of the relationship between the change introduced and the results observed. Thus, an administrative experiment is conducted more in the sense of carefully evaluated change, and not in the social sciences sense of change controlled by the researcher, according to certain prescribed rules, solely for research purposes. A "quasi-experimental" re-search design may be the best that one can do. <u>See</u>, for example, Campbell, Donald T., "Administrative Experimentation, Institutional Records and Nonreactive Measures," Improving Experimental Design and Statistical Analysis, Stanley, J.C., ed., Chicago: Rand McNalley, 1967. Thompson, Charles W. N., and Rath, Gustave J. "The Administrative Experiment: A Special Case of Field Testing Or Evaluation," Human Factors, Vol. 16, No. 3, June 1974, pp. 238-252. Thompson, Charles W. N. "Administrative Experiments; The Experience of Fifty-Eight Engineers and Engineering Managers," IEEE Transaction on Engineering Management, Vol. EM-21, No. 2, May 1974, pp. 42-50.

In each situation, team members from ETIP, the ETIP contractor (PDI), and the regulatory agency jointly analyze an initiative in regulation, or its implementation as an experiment, and/or perform an assessment of its effects. Other interested parties are also involved, and the work is conducted under the management and review structure of the Regulatory Processes and Effects Project. Consequently, knowledge gained from similar projects can be shared.

This document concerns the development of an effort with the Federal Communications Commission (FCC). In fall 1976, ETIP regulatory staff began to investigate the possibility of developing a joint project with the FCC. With the assistance of a small contract (Transcom, Inc.), it conducted preliminary background research on the Commission and developed three ideas in the area of international telecommunications.

Preliminary discussions continued between ETIP and FCC for several months. During this time, the discussions revealed the need for a considerable amount of definitional and economic research on the telecommunications industry. The Common Carrier Bureau (CCB) Program Evaluation staff proposed alternatives that included public message telegraph services deregulation,²,³ and a Commission attorney began to investigate the legal issues involved.

In June 1977, ETIP and FCC staff agreed that there was sufficient mutual interest in the development of a joint project to justify requesting formal Commission approval for continued work. The Commission granted formal approval in July 1977. ETIP and Commission staff then developed a joint project plan and interagency agreement. The plan, used by ETIP to obtain National Bureau of Standards' approval, describes:

> a project to be carried out with the Federal Communications Commission (FCC) to identify, design, implement, and assess

^{1.} The initial proposals were entitled: "Eliminating Time Delay in the Section 214 International Facilities Construction Authorization Process"; "Elimination of The Requirement That International Record Carrier Rates Be `Cost Justified' with Section 61.38 Support Data (Rate Deregulation For Existing Carriers)"; and "Expanded Communications Carrier Ownership of Satellite Earth Stations for International Telecommunications." Transcom, Inc. International Telecommunications Experimental Ideas For The Experimental Technology Incentives Program, December 7, 1976, 34 pages.

^{2.} Sawicki, Leonard S. Program Evaluation, Common Carrier Bureau of the Federal Communications Commission, Draft of Internal Working Memorandum (undated).

^{3.} The term deregulation is used here to denote a change in policy, practice, and/or rules which reduces (but does not necessarily eliminate) the burden on the regulatee.

one or more administrative experiments . . . intended to obtain knowledge of the agency and commercial impacts of changes in the FCC regulatory $process.^1$

ETIP and Commission staff agreed that the public message telegraph services deregulation, if implemented, might be a change to investigate. Common Carrier Bureau staff expressed an interest in also using the proposed project as a prototype or test of ETIP's evaluation process, and suggested that, if successful, the process might be used in other areas within the Commission.

In October 1977, the staffs of the CCB, ETIP, and The Urban Institute began conducting research. The following activities were included:

- o A review of legal authority was completed in December 1977.²
- o The Urban Institute interviewed CCB staff about Commission procedures and specific plans for public message services deregulation.
- o The Urban Institute drafted, verified, and revised an initial report of findings based on these interviews.³
- o CCB staff drafted a briefing memorandum outlining the characteristics of the change.⁴
- In July 1978, the Western Union Monopoly Inquiry proceeding became part of the focus of the ETIP/Urban Institute research effort to evaluate the impact of a decision, if implemented, to open competition.

An official Memorandum, Opinion, and Order opening public message services commerce to competition was prepared by CCB staff and approved by the Commission on January 25, 1979. The Commission does not view this decision to change its policy as an experiment. The decision was made for reasons of policy and not for purposes of research. What is regarded as experimental is the evaluation process being developed, and the ways in which it can be applied. The Commission has expressed a strong interest in evaluation results as noted by Commissioner Ferris.

1. U.S. Department of Commerce, Bureau of Standards, Experimental Technology Incentives Program. <u>Experiments in Communications Regulation</u>, Project Plan for ETIP Project 161, August 1, 1977.

^{2.} U.S. Federal Communications Commission. "Memorandum of Law," from Richard Severy to David Irwin, dated December 7, 1977.

^{3.} Bell, James: <u>The FCC/ETIP Regulatory Experiment</u>, Working Paper Number 1198-70-01 (Draft), The Urban Institute, Washington, D.C., May 3, 1978.

^{4.} U.S. Federal Communications Commission. "Points Memorandum," by David Irwin, <u>et al</u>., Summer 1978.

••••• I intend to ensure that the Commission monitors the effects of this policy change. This evaluation will be undertaken by staff of the Common Carrier Bureau in cooperation with the Experimental Technology Incentives Program (ETIP) of the National Bureau of Standards. This will enable the Commission to check its expectations of public benefits, based on today's reasoned judgment, against subsequent events in the marketplace.¹

A proposed rulechange will be presented before the Commission, probably in April or May, 1979, and will be finalized after a public notice period. The process that the Commission and ETIP will use to manage the evaluation of the impact of the PMS deregulation over time is currently being developed.

This report contains our findings to date about the operations of the Commission and a logic for the proposed project, and assesses important situations and issues in telecommunications. Using these findings and ETIP/ FCC criteria for success, the report also discusses the possibility of developing a useful evaluation. It represents the result of approximately 27 person months of ETIP and Urban Institute staff time.

This project will also facilitate communications between the Commission, industry, and others, such as Congress, that might be interested. We hope that the report will encourage their interest and suggestions. We also hope that this report and subsequent products of the evaluation will contribute to our understanding of evaluation process and methodology, theories about innovation, effects of regulation, and other subjects of interest to members of government, the research community, and industry.

The Regulatory Processes and Effects Project has been screening regulatory situations which might be appropriate for evaluation as administrative experiments. During the coming year, the methods we are developing will be made more widely available to users. We welcome inquiries from regulatory agencies that wish to draw upon our experience to date. For further background the reader may wish to consult the <u>Management Plan for</u> the Regulatory Processes and Effects Project and the latest proposal to ETIP, Proposal in Response to ETIP Solicitation No. E0-78-3603.

This document was prepared and submitted under Department of Commerce Contract #7-35822 by the Regulatory Processes and Effects Project. The report represents work in progress at this time, and will be revised and updated

^{1.} U.S. Federal Communications Commission News Release. "FCC Ends Western Union Telegram Monopoly; Conditionally Approves Graphnet's Application for Domestic Service (CC Docket Nos. 78-95-96)," Report No. 14735, Action in Docket Case, January 25, 1979--CC, Separate Statement of Chairman Charles D. Ferris.

periodically, as we advance and receive additional information. These reports are used for information exchange on the development of methodology and on substantive results.

It should be noted that the usefulness of the findings about this deregulation can be increased or decreased by the competency of the evaluation. The evaluation must be perceived as thorough and impartial, and it must produce useful findings.

CONTENTS

		Pa	age
ABSTI	RACT		iii
ACKN	OWLEI	DGEMENTS	v
PREFA	ACE		vii
CHAP	TERS	:	
I	INT	RODUCTION AND ORGANIZATION	1
II	SYN	OPSIS OF THE REPORT	7
	A.	The Setting for the Deregulation	11
	Β.	Present Situation	17
		1. Commission Mandate and Code of Federal	
		Regulations Volume 47	17
		2. The Commissioners	19
		3. The Common Carrier Bureau	20
		5. PMS Commerce After Deregulation	21
	C.	Logic of the Evaluation	26
		1. Event ICCB Drafts MO&O and Rulemaking to End PMS Monopoly	30
		2. Event IICommissioners Authorize Revised Rulemaking To Go	30
		3. Event IIICommon Carrier Bureau Streamlines Process	31
		4. Event IVCarriers and Others Apply To Offer PMS Services	32
		5. Event VMarket Structure Is Observed To Change	32
		6. Event VIFindings of Systematic Evaluation	33
	-	7. Event VIIKnowledge Transfer	33
	D.	Potential Users and Uses of Evaluation Information	34
	E∙	Summary of Assessment for Useful Evaluation	35
ттт	FIN	DINCS ABOUT THE SETTING FOR THE EVALUATION	30
*	A.	Organization	39
	Β.	Historical Perspective: The Road to Regulation	41
		1. Patent Protection and Independent Agreement	
		Between Potential Competitors Assure Each A	
		Market Share	41
		2. Competition in Provision of Telephone Service	
		Experiences Market Failure	42
		3. lelephone independents Seek Lessening of	1. 1.
		4. Competitive Telegraph Market Fails	44
	C.	Regulated Telecommunications: Propensity For Change	46
		1. Influence of the Regulator on the Industry	50
		2. Regulatory Decisions Favoring Competition	51
		a. FCC Decision Opens Terminal Equipment Market	52

Ρ	а	g	е
-		~	_

	b. FCC Approves Licensing of Private Point-to-Point			
	Microwave Communications Systems	52		
	c. The Emergence of the Specialized Common			
	Carriers (SCCs)	53		
	d. The <u>Value-added Carrier Decision</u>	54		
	e. The <u>Resale and Shared Use Decision</u>	54		
_	3. Regulatory Decisions Bolstering Monopoly	55		
D•	Telecommunications in Transition: Dynamics of Change	58		
	1. American Telephone and Telegraph	58		
	a. Possible Advantage Over Large and Small	5.9		
	b ATET and Fiber Optics	50		
	AT&T and Teletext-Viewdata Systems	61		
	d. AT&T. Xerox and IBM	62		
	(1) AT&T and the Domsat Moratorium	63		
	(2) AT&T and Satellite Business Systems	63		
	(3) Summary	64		
	2. Western Union Telegraph Company	65		
	a. Response to a Competitive Environment	65		
	b. The Infomaster System	68		
	c. Western Union and the United States Postal			
	Service (USPS)	70		
	(1) Implications of ECOM	71		
	(2) ECOM and Facsimile	72		
	(3) ECOM and Congress	73		
	3. The Specialized Common Carriers	73		
	a. Diversity	74		
	b. A Web Of Competitors	75		
E.∙	Investment, R&D Funding, and Corporate Strategy	//		
	Potterne of the SCCs and An Example of Transfor			
	of Technological Inpovation	70		
	2. Some Examples of Types of Influences on Innova-	15		
	tion in Telecommunications	82		
F.	The Commission's Inquiry Process: Forum For Dialogue	02		
	With The Industry			
	1. Fair Charges and Interconnection	87		
	2. Redefinition of Obsolete Services	89		
G.	Summary	93		
PRE	ESENT SITUATION	95		
A•	Overview	95		
B.	Logic of the Evaluation	97		
C.	The Federal Communications Commission: Regulator of PMS	101		
	1. The Communications Act of 1934	101		
	2. Ine commissioners 3. Code of Federal Regulations Volume 47	102		
	4. The Common Carrier Bureau	103		
	a. Domestic Facilities and International	105		
	and Satellite Branches	110		
	b. Tariff Review Branch	111		
	c. Tariff Proceedings Branch	115		
	0			

IV

	d.	Complaints and Service Standards Accounting and Audits Branches	115
	f.	Economic Studies	117
	1.	The FCC Inquiry Process and Line Support Activities	117
	5. Summ	ary	110
D	The West	ary Union Tolograph Company and DMS Commerce	120
D.	1 The I	Westore Union Telegraph Company and FMS commerce	120
	1. The	Western union relegraph company	120
	Z. PMS I	Revenue and Service Characteristics	122
	a.	PMS Revenue and volume in Perspective	127
	D• .	PMS and Infomaster	129
E.	Potentia.	I Competitors in Deregulated Public Message	101
	Services	Lommerce	131
	I. The	United States Postal Service Mail	134
	2. The	Specialized Common Carriers	135
	a. (Graphnet Systems, Inc.	138
	b • 1	Telenet Communications Corporation	142
A LO	GIC FOR	THE EVALUATION	147
A.	Overview		14/
B•	Event I:	Common Carrier Bureau Drafts An MO&O and	
	Rulemakin	ng Intended to End Western Union's Monopoly,	
	Open Publ	lic Message Services Commerce to Competition,	
	and Reduc	ce Future PMS Regulation	149
	1. Expe	ctations	149
	2. Activ	vities	149
	3. Time	frame	154
C.	Event II	: After Public Notification, Commissioners Authorize	
	CCB Revis	sed PMS Rulemaking To Go Into Effect	154
	1. Expe	ctations	154
	2. Activ	vities	154
	3. Time:	frame	159
D.	Event II	I: Common Carrier Bureau Streamlines The Process	
	For Admin	nistering Ongoing Public Message Services Regulation	160
	1. Expe	ctations	160
	2. Activ	vities	160
	3. Time:	frame	161
E.	Event IV:	: Carriers and Other Interested Businesses Submit	
	Applicat	ions To Offer Public Message Services	163
	1. Expe	ctations	163
	2. Activ	vities	163
	3. Time:	frame	165
F.	Event V:	Public Message Services Market Structure Is	
	Observed	To Change	165
	l. Exper	ctations	165
	2. Activ	vities	167
	3. Time	frame	167
G	Event VT	Systematic Evaluation and Research Demonstrates	107
	Improvem	ent in PMS Commerce	160
	1. Evpe	ctations	160
	2. Action		160
	2 Time		170
	J. IIme		1/2

V

213

H. Event VII: CCB and ETIP Transfer Knowledge Gained From	
Evaluation As Evidenced By Products and Useful Application	ns
of Findings	172
1. Expectations	172
2. Activities	173
3. Timeframe	174
VI AN ASSESSMENT OF THE POTENTIAL FOR USEFUL EVALUATION	177
A. Overview	177
B. Need for Measurement Information	177
1. ETIP and FCC	177
2. Others Who Might Use Evaluation Information	180
C. Evaluation Measurement	184
1. Model for Measurement	184
2. Evaluation Measure Construction and Application	190
a. Measure Construction	190
b. Measure ApplicationA Hypothetical Example	192
D. Findings Concerning The Potential for Useful Evaluation	198
BIBLIOGRAPHY	203

GL	os	SARY	

APPENDICES (BOUND SEPARATELY AS VOLUME II)

- A. PUBLIC MESSAGE SERVICES CHRONOLOGY (1844 Through January 1979) Developed by Steven Watson and Sharon Kirby.
- B• EXECUNET CHRONOLOGY WITH BRIEF INTRODUCTION (July 1975 Through June 1978), Developed by Sharon Kirby.
- C. SPACE INDUSTRIALIZATION CONCEPT AND IMPLICATIONS FOR TELECOMMUNICATIONS, by Copper Wilson and Roland Weiss.
- FINDINGS ABOUT INFORMATION SOURCES AVAILABLE AT THE FEDERAL D. COMMUNICATIONS COMMISSION AND ELSEWHERE, By Sharon Kirby and James Bell.
- E• POTENTIAL USES OF INFORMATION AND POTENTIAL MEASURABLE ISSUES, Developed by Steven Watson, James Bell, Sharon Kirby, Paul Nalley and Roland Weiss.
- F• POTENTIAL USERS OF INFORMATION, Developed by Sharon Kirby.
- G. FCC NEWS RELEASE ANNOUNCING END OF WESTERN UNION MONOPOLY AND CONDITIONAL APPROVAL OF GRAPHNET'S APPLICATION FOR DOMESTIC SERVICE (CC Docket Nos. 78-95-96).

xvi

FIGURES:

II-1 Technologies Which Have Affected, or Might Affect, The Public Message Services Market, and Some Possible Innovative Services/ Applications that Might Occur in the Future 10 II-2 FCC Organization and CCB 47 CFR Responsibility 19 II-3 Basic Representation of Written Message Telecommunications 22 in Terms Of Senders, Receivers, Carriers, and Regulator Components of PMS Regulation and Commerce, Current Status II-4 24 II-5 Logic of the Deregulation Evaluation In Terms Of Main Events Expected To Occur 27 III-1 Western Union Telegraph--All Offices and Agencies (1944-1977) 68 III-2 Patterns of Ownership and Investment--Examples From SCCs 80 III-3 Generic Telecommunications Issues and Links to Current Debates 86 IV-1 Expected Events of the Deregulation--The Logic 100 IV-2 Basic Organization of FCC 105 IV-3 CCB Organization and 47 CFR Responsibility 107 IV-4 Tariff Filings Per Carrier, 9/76 to 4/78 109 IV-5 Tariff Filings Per Month 109 IV-6 Scale Showing Time Constraints and Steps of Tariff Analysis in Preparation for Regularly Scheduled Commission Agenda Meeting (90-day Notice Period) 116 IV-7 Steps in the FCC/CCB Inquiry Process 118 IV-8 The Western Union Telegraph Company, Percentage of Employees By Function 122 IV-9 Distribution of Public Message Services Volume By Percent Per Class of Message 123 IV-10 Western Union Operating Revenue by Type of Service, 1976 127 IV-11 Western Union Operating Revenue, Selected Years 1945-1976 128 IV-12 Distribution of Revenue in Regulated Telecommunications Commerce, 1976 129 IV-13 Western Union's PMS Network 130 IV-14 The Western Union Infomaster Computerized Message Switching System 132 IV-15 Graphnet Computerized Store-and-Forward Facsimile 141 Communications System IV-16 Cost Comparison of Fax GramTM and Telegram 142 IV-17 The Telenet Network, 1977 144 V-1 Event I Participants, Activities, and Potential Products, 153 Measures, and Information Uses V-2 Event II Participants, Activities, and Potential Products, Measures, and Information Uses 158 V-3 Event III Participants, Activities, and Potential Products, 162 Measures, and Information Uses V-4 Event IV Participants, Activities, and Potential Products, Measures, and Information Uses 166 V-5 Event V Participants, Activities, and Potential Products, 168 Measures, and Information Uses

xvii

Page

xviii

V-6	Event VI Participants, Activities, and Potential Products, Measures, and Information Uses	171
V-7	Event VII Participants, Activities, and Potential Products,	
	Measures, and Information Uses	175
VI-1	Special Interest Measurement Needs of Sponsors	179
VI-2	Potential Users of Measurement InformationParticipants	
	and Onlookers	182
VI-3	Components of PMS Regulation and Commerce, Current Status	185
VI-4	Expectations for Measurement Associated with the PMS	
	Deregulation	189
VI-5	Extended Impact of Deregulation	191
VI-6	Basic Configuration of the "Process Rate" Measure	193
VI-7	Hypothetical Evaluation Measure Application: Innovation in	
	Terminal Equipment in Relation to the PMS Deregulation	195

TABLES:

IV-1	Notice/Petition Period Guidelines	116
IV-2	Western Union PMS Messages and Revenues, 1977	126
10-3	and AT&T Compared to Eight Specialized Common Carriers)	136
V-1	Hypothetical Stipulations for PMS Carriers Compared to	
	Current Content Requirements in Sections of Part 63	
	of 47 CFR	151
V-2	Sample Set of Measures	156
V-3	Percentage Change in 47 CFR Rules and Requirements	
	(Hypothetical)	157
VI-1	A Page From Appendix E's Section on Graphnet/Telenet	
	Application to Enter International Market Showing Sample	
	Use of Measurement Information	183
VI-2	Description of Components of PMS Regulation and Commerce	186
VI-3	Links Between Components of PMS Regulation and Commerce	187

I. INTRODUCTION AND ORGANIZATION

Telegraph service preceded telephone service by 40 years. For much of the 1800s, it was the primary telecommunications method in the United States. (See Appendix A, chronology of major events in the history of public message services [PMS].) The Communications Act of 1934 gave the Federal Communications Commission jurisdiction over the telecommunications industry and made the Commission specifically accountable for several trusts including safeguarding, for the public interest, "a rapid, efficient, Nation-wide and worldwide telegraph . . . service at reasonable charges."¹

In 1943, The Western Union Telegraph Company was granted a <u>de jure</u> monopoly in this market, to insure the availability of public message telegraph services, including the telegram.² Since then alternate public message-type services (both unregulated and regulated) have come into common use, often displacing the traditional telegram. Low cost, easily accessible telephone service may be partly responsible for the telegram's decline.

Data processing and electronics technologies developed during the last 20 years have also influenced the telecommunications field. As a result, Western Union's regulated public message services have lost customers, especially commercial customers, to parallel data transmission technology

Communications Act of 1934: Title I, Section I.
According to Part 21, Chapter 1, Subchapter B, "Common Carrier Service," of the Code of Federal Regulations, Volume 47, public message service is defined as "a service whereby facilities are offered to the public for communications between all points served by the carrier or by interconnected carriers on a non-exclusive, message-by-message basis, contemplating a separate connection for each occasion of use."

and message transfer services. Many believe that lowering of regulatory barriers and ending the Western Union PMS monopoly could make these innovations available to the general public and revive the public message services market.

On January 25, 1979, the Commission voted to change its policy and allow competition in this market. The Commission made its decision during a period when political, economic and technological developments facilitate a decrease in telecommunications regulation. Therefore, the methods used by the Commission to deregulate and successfully convert a monopolistic public message services market to a competitive one will probably interest many people in government, industry, and the research community.¹

This report presents a preliminary assessment of the potential of the Commission's initiative to be evaluated usefully. Until the final Commission rulechange and reactions of industry are known, the boundaries of the evaluation cannot be confidently defined, and the initial set of evaluation measures cannot be finalized. We expect to distribute this document to interested parties in government, industry, and the research community, to both inform them of our efforts so far and elicit comments. Their comments should be helpful in directing the future course of the research.

Chapter II is a synopsis of this report. For detailed discussions of major points raised in this chapter (and specific references to source materials), refer to the main body of the report, which is organized as explained below.

^{1.} Throughout this report, the term deregulation is used to denote a change in policy, practice, and/or rules which reduces (but does not necessarily eliminate) the burden on the regulatee. The term reregulation has also been used to denote such a change.

Chapter III examines the telecommunications industry environment in which the deregulation will take place. Historical developments, industry trends, and current issues in telecommunications regulation are presented. The chapter discusses the need to investigate how to use economic, technical, and other information on telecommunications issues to better understand novel regulatory situations. We attempt to demonstrate that an ETIP administrative experiment, could help supply necessary information for other areas of Commission inquiry as well. Additional work must be done at both the theoretical and operational levels. For example, issues, hypotheses, and measures for this change must be specifically linked to existing theories in the literature, and information must be exchanged more directly with industry.

Chapter III should be of interest to all three groups--government, industry, and the research community--mentioned earlier. We are interested in receiving (1) comments on our accuracy in representing the views of various observers, (2) additional views on the issues presented, and (3) data to support or refute the various views presented.

Chapter IV introduces a logic, or the main events which must occur for the evaluation to be successful. The chapter also examines the present regulatory situation by discussing the dominant factors involved in this logic: the Commission's mandate for telecommunications regulation; the Federal Communications Commission's processes for implementing this mandate through regulations and Common Carrier Bureau operations; and The Western Union Telegraph Company and the current public message services market. We also describe the operations of two common carriers that will probably become competitors of Western Union in the PMS market. The descriptions

illustrate how new providers of public message services might differ from Western Union in services and operations. More research in industry is planned.

Readers from the government should find Chapter IV useful not only for its description of the regulatory process, but also for information on industry. Similarly, readers from industry might be interested in the information on regulation as well as that on industry. We are particularly interested in comments from any of these groups that verify or improve the accuracy, validity, and specificity of the descriptions presented.

Chapter V contains a proposed plan for developing an evaluation, organized in terms of the sequence of main events identified in Chapter IV. Specifically, this chapter outlines the participants, activities, expected products, measures and comparisons, information uses, and timeframe associated with each event. While this chapter is presented mainly for ETIP and FCC use, researchers may also wish to examine our proposed approach. We are interested in any suggestions that will help improve the plan for tracking the effects of the deregulation. Data which would help us assess the plausibility of the expected effects would also be appreciated.

Chapter VI assesses the potential to usefully evaluate the effects of the deregulation. It demonstrates that many choices must be made concerning how to target the evaluation and how to allocate efforts in each area marked for close scrutiny. We outline a preliminary set of measures, which will be refined as the FCC policy shift goes into effect and as the research progresses. Readers in government, industry, and the research community will probably be interested in different sections of Chapter VI.

We would particularly like to receive reactions to our preliminary set of evaluation measures and information on their feasibility and validity.¹

A glossary of terms and a bibliography of books, articles, etc., reviewed during this preliminary phase of work are included at the end of the report.

Bound separately as one volume are seven appendices which are referred to in the main body of the report. These are:

- Appendix A: Public Message Services Chronology (1844 Through January 1979)
- Appendix B: Execunet Chronology With Brief Introduction (July 1975 Through June 1978)
- Appendix C: Space Industrialization Concept and Implications For Telecommunications
- Appendix D: Findings About Information Sources Available At The Federal Communications Commission and Elsewhere
- Appendix E: Potential Uses of Information and Potential Measurable Issues
- Appendix F: Potential Users of Information
- Appendix G: FCC News Release Announcing End of Western Union Monopoly and Conditional Approval of Graphnet's Application for Domestic Service (CC Docket Nos. 78-95-96)

^{1.} Please send comments to the ETIP/FCC Evaluation Design Group, Performance Development Institute, 1800 M Street, N.W., Suite 1025, Washington, D.C. 20036.

II. SYNOPSIS OF THE REPORT

On January 25, 1979, the Federal Communications Commission decided to deregulate public message services, and open this market to competition. Deregulation of public message services was chosen as the subject of a project, jointly sponsored by the Commission and the Experimental Technology Incentives Program (ETIP).¹ The Commission does not view this decision to change its policy regarding PMS as an experiment. The decision was made for reasons of policy and not for purposes of research. However, the evaluation process being developed, and its use, are viewed as experimental. The primary purpose of this project is to obtain knowledge about the agency, the industry, and the commercial impacts of changes in the regulatory process, and to evaluate specifically the impact of the public message services deregulation.

The changes in rules and regulations governing PMS commerce must conform with the policy intent of the Commission, which is to reduce PMS regulation and encourage competition. Although the Commission does have a great deal of flexibility in changing its rules and procedures, both Congress and the courts strongly influence Commission actions. It should also be noted that the Commission's authority to deregulate any telecommunications service is limited by the Communications Act of 1934; for example, the Act requires the agency to regulate rates.

^{1.} Throughout this report, deregulation denotes a change in policy, practice, and/or rules which reduces (but does not necessarily eliminate) the burden on the regulatee.

The effects of deregulation are currently being debated, in both the research and policy communities. Many debaters believe that opening regulated markets will lead to increased competition and that this, in turn, will result in increased technological innovation. Consequently, a major hypothesis which this project is testing is whether a competitive PMS market will create an environment for carriers to offer a greater variety of better quality and less expensive public message services to the public. The project can also be related to a broader issue: the role of competition in the telecommunications industry as a whole.

The deregulation of public message services seems consistent with recent events in telecommunications and the current policy of actively encouraging a competitive environment. In the 1960s, innovations in the data processing and electronics technologies began to influence telecommunications. The scope of regulation has consequently become vague in certain market segments (data communications, for example), and traditional service definitions are no longer adequate. Technologically, traditional telegraph services (and perhaps traditional telephone services) have become obsolete for many commercial and private purposes. The Commission is now confronted by unusual regulatory situations, which require a reexamination of its rules, regulations, and procedures, and which seem to call for a more effective data-gathering approach than the agency has used in the past. (See Chapter III for examples of decisions currently facing the Commission.)

Systematic evaluation of a major Commission policy change is rare. Traditionally, the Commission makes decisions on a case-by-case, or problemby-problem basis. Chapter IV describes Commission procedures and shows that CCB staff authority and expertise, the inquiry process, and legal precedent and process have been the primary avenues for handling disputed

situations. Data gathering that promotes transfer of relevant information about the effects of recent decisions might supplement this traditional approach. It should also be pointed out that there is virtually no evaluation measurement system for regulated telecommunications commerce; thus, the groundwork laid by an evaluation of this regulatory change could be very valuable. At the very least, however, the project should help improve the evaluation of this deregulation's impact on industry.

Therefore, the public message services deregulation provides an opportunity for the Commission (1) to analyze and implement appropriate procedural changes and (2) perhaps more important, to study an actual shift from a monopoly to a competitive market. We hope that the information gained will help clarify the advantages and disadvantages of competition in the telecommunications industry and assist policy makers as they plan for the future.

ETIP is particularly interested in determining whether deregulation will stimulate innovation in public message services technology, and in increasing its understanding of the relationship between innovation and the many factors, including regulation, which influence the introduction of state-of-the-art technologies into the marketplace. Several technologies presently available or under experimentation could contribute to truly innovative and perhaps improved public message services. These technologies include facsimile, electronic mail, satellite relay, personalized computer communications, etc. Figure II-1 illustrates major innovations of the past and some technologies and services currently on the market or under development. (For a more detailed description of these technologies, see Chapter III.)



Source: Interview with PCC Staff and <u>PCC Information Bulletin</u>, "A Short History of Electrical Communication," February 1977.

FIGURE II-1: TECHNOLOGIES WHICH HAVE AFFECTED, OR MIGHT AFFECT, THE PUBLIC MESSAGE SERVICES MARKET, AND SOME POSSIBLE INNO-VATIVE SERVICES/APPLICATIONS THAT MIGHT OCCUR IN THE FUTURE
As we suggested earlier, the primary purpose of this project is to gather empirical data on the actual effects of a specific deregulation. These data will help us to completely or partially answer the questions discussed above and elsewhere in this report.

A. THE SETTING FOR THE DEREGULATION

An historical review shows that, under the competitive conditions prevalent in the early years of the industry, both telephone and telegraph services experienced market failure. As a result, both telephony and telegraphy were classified as natural monopoly markets (that is, a market which one firm can supply at a lower per-unit cost than two or more firms). Some other forces that contributed to monopoly conditions included early patent laws, intercorporate agreements, duplicative and unprofitable services, the Depression and World War II. (See Chapter III.) Therefore, some observers believe that the advantages and disadvantages of competition in the telecommunications industry were therefore never adequately tested, and some assert that present market conditions are different and warrant reexamining the role of competition in the industry.

As mentioned, during the 1960s, innovations in the data processing and electronics technologies began to influence telecommunications. In response to these changes in the telecommunications environment, the Federal Communications Commission made a series of decisions which opened markets to competition and began to make the advantages of new services available to the public. Some observers believed that the established carriers (AT&T and The Western Union Telegraph Company) did not have the technical or service capabilities required to meet new market demands for data communications and

nontraditional private line service offerings. (See Chapter III, Section C2, "Regulatory Decisions Favoring Competition.")

During the past 20 years, AT&T and Western Union have upgraded services and technical capability and now offer the full range of customized private line and terminal equipment services. AT&T has also proposed services which, with AT&T's ownership of the underlying transmission network and its manufacturing and financial resources, may surpass those offered by competing smaller carriers. Western Union is also embarking on new ventures, especially in the unregulated sector; the company has recently increased its involvement in government contract work. It now offers Mailgram service¹ in conjunction with the United States Postal Service (USPS) and intends to collaborate with USPS shortly in Electronic Computer-Originated Mail service (ECOM), an outgrowth of Mailgram. In this arrangement, Western Union's primary responsibility will be to accept and transmit messages.

The Commission must decide whether to authorize these new services proposed by the established carriers. Many other important decisions are also pending. The Commission must review an earlier decision to allow Satellite Business Systems to merge its operations with IBM, COMSAT, and Aetna Life Insurance Company; it must consider whether to extend the moratorium on AT&T's entrance into the satellite communications market; and it must review Xerox's requests to enter the telecommunications industry through a proposed subsidiary, Xerox Telecommunications Network, and to acquire Western Union International. These decisions could affect the success or failure of a competitive public message services market. For example, would the presence of the USPS's ECOM service or of Xerox's office facsimile services inhibit smaller firms from entering the message service markets?

^{1.} In terms of quality and speed, Mailgram is a class of priority message service between the telegram and First Class Mail.

We do not presently know which companies will apply to provide PMS domestically. Common carriers that are already operating might step forward, or new firms might apply for licensure as common carriers in order to offer PMS.

Members of the Specialized Common Carrier group (SCCs) are expected to enter the PMS market.¹ Two characteristics of the SCCs are important. First, these carriers are very diverse in size and resources. Second, they engage in complex competitive relationships in both regulated and unregulated markets.

These two facts present the Commission with a difficult situation in which it must establish standards for competition and develop a system for smooth transition to an open market which will treat diverse carriers fairly and still protect the public interest. Commission staff are considering alternate approaches for addressing this situation in the present deregulation. For example, should only Western Union, and no other public message carriers, be held to stringent regulations (such as those presently governing reporting requirements or conditions for office closure)? Or should the same rigid rules apply to all public message carriers? Or should rules be substantially relaxed for new entrants, while Western Union is required to adhere to more stringent rules until the shift to competition is well under way? Evaluation data on the effects of a decision such as this and experience gained in guiding the deregulation could be useful to the Commission in other areas.

Although public message services deregulation is a unique situation which directly affects only a small part of the industry, there may be core issues present which can be linked to questions in other problem areas

^{1.} Chapter IV presents a complete list of carriers generally regarded as specialized, and a more thorough discussion of characteristics of the SCCs.

confronting the Commission. ETIP and The Urban Institute staff analyzed: (1) issues raised by individuals and organizations who filed formal comments on pending Commission decisions regarding five inquiries,¹ and (2) testimony before Congress regarding H.R. 13015, the Communications Act of 1978. Nine possibly generic issues were identified. They are:

- I. What is the appropriate economic justification for continuing monopoly regulation?
- II. Should regulation be maintained in order to preserve a certain minimum level of quality in the service or technical system efficiency?
- III. Does a regulated or an unregulated environment provide better distribution of service to low-density areas?
 - IV. Will deregulation encourage technological innovation?
 - V. How should the regulatory boundaries of an agency be altered when new services and technology arise in peripheral unregulated markets?
 - VI. How does one prevent regulated carriers from making anticompetitive intrusions into the unregulated marketplace?
- VII. How does one assure just and reasonable charges and nondiscriminatory rates?
- VIII. What is the tradeoff between streamlining procedures and maintaining the quality of regulatory decisions?
 - IX. How should the transition from monopoly to competition be handled?

The analyses suggested that information gained from the evaluation might be used in two ways: (1) to develop empirical equipment and/or service standards on which to base Commission decisions and (2) to test the possibility of generalizing from core issues, which cut across inquiries as well as across broad policy questions being debated in Congress.

^{1.} These inquiries include: the Western Union Monopoly Inquiry; the MTS/WATS Inquiry; the Telex/TWX Inquiry; the Gateway Inquiry; and the Computer Inquiry. Chapter III and Appendix E, "Potential Uses of Information and Potential Measurable Issues," describe the inquiries. For an explanation of the inquiry process, see Chapter IV.

The fifth generic issue above can be used to present an example of the first type of use. It is possible that the deregulation will result in the use of innovative types of computerized message switching technology. Information gained from systematic observation of the equipment in use and its effects on PMS applications and commerce might help the Commission to determine what "intelligence" threshold, or service category, would identify transmission systems that are primarily data processing. Such transmission systems are not subject to telecommunications regulation. Since no formal standards have been defined, Commission decisions about which hybrid equipment and/or services should be regulated are currently made on an case-bycase basis.

The second use of evaluation information reflects the fact that each major area of inquiry is related to many underlying technical, economic, and/or political issues. For example, in the Western Union Monopoly Inquiry, which contains issues of direct concern to the PMS deregulation, individuals and organizations submitted the following questions to the Commission.

- Can Western Union inhibit public message services competition by subsidizing with Telex/TWX revenue?
- What rate structure should be used when Western Union interconnects with other carriers providing PMS?
- How vital is PMS to the public?
- Should the Commission prescribe technical standards or customer service standards for PMS or will a competitive market structure be adequate to insure that carriers meet customer needs?
- Is public message services a natural monopoly, characterized by economies of scale, or has it evolved into a "resale" service?1

1. Resale carriers lease facilities from other carriers; they own no facilities of their own.

Over time, answers to these questions might also provide empirical evidence to answer questions about the characteristics of natural monopoly markets, rate structure, issues of definition, etc., which are debated in connection with other telecommunications markets. Chapter III presents examples showing the interrelationship of generic issues and the ways they relate to some specific questions.

Information about outside factors which may affect the deregulation is also needed. One of these factors is congressional activity, such as the Communications Act of 1978. Less obvious factors include investment and ownership patterns, research and development funding, and corporate decision making. For example, facsimile systems which can be fully integrated into other communications networks are currently being developed and may be a very important component in electronic message systems. This technology might affect the nature of new public message services. Corporations might base decision making regarding expenditures in this area on market analyses, intercorporate agreements, investor interest, high-risk or low-risk characteristics, potential competition, probable technical difficulty, and time/cost factors until a fully integrated system can be achieved. Any of these factors--or Commission activities--could affect whether fully integrated message-switchable facsimile systems become available in the marketplace. (For other examples of potential outside influences on the PMS market or telecommunications in general, see Chapter III.)

In short, many variables can influence the development of an industry. In addition to those listed above, these are: marketing capability, consumer attitudes, supply and demand factors, corporate diversification, economies of scale, inflation, employees and unions, etc. Since most of these can be observed clearly in a study of telecommunications, and since decisions

made by Congress or the courts could have a direct impact on this deregulation, some mechanism in the evaluation design to monitor industry dynamics and related events in telecommunications seems appropriate.

The following sections of this chapter will concentrate on the evaluation itself. Specifically, we will summarize the dominant elements, the plan (or logic) in terms of the main events we expect, and the findings so far on this project's potential for useful evaluation. (It should be noted at this point that the plan is subject to change by either the Commission or ETIP.)

B. PRESENT SITUATION

The principal elements operative in this evaluation are discussed in detail in Chapter IV of this report. They include: the Commission's mandate contained in the Communications Act of 1934 and in the Code of Federal Regulations Volume 47 (47 CFR) governing telecommunications; the Commissioners; the Common Carrier Bureau (CCB) of the Commission, which is directly responsible for common carrier regulation; PMS commerce before deregulation; and PMS commerce after deregulation.

1. COMMISSION MANDATE AND CODE OF FEDERAL REGULATIONS VOLUME 47

Written policy and rules, such as the Communications Act of 1934 and 47 CFR, are important because of their relationship to Commission actions and Congressional policy intent as well as to Common Carrier Bureau organization and procedures, and its effects on telecommunications commerce.

The Commission's mandate is contained in Title I of the Communications Act of 1934. Specifically, the mandate makes the Commission responsible for:

. . . regulating interstate and foreign commerce in communications by wire and radio so as to make available . . . to all the people of the United States a rapid, efficient, Nation-wide, and worldwide wire and radio communication service with adequate facilities at reasonable charges . . .

Title II of the Act gives the Commission the tools and powers to regulate the industry; for example, the carriers are required to file rate schedules with the Commission.

Each Part of 47 CFR contains rules and stipulations governing general or specific operational responsibilities of the Commission. Each branch of the Common Carrier Bureau is assigned one or more Parts of 47 CFR relating to common carrier regulation, including public message services. (See Chapter IV for a description of Parts of 47 CFR most relevant to PMS.) Figure II-2 depicts the Commission organization with special emphasis on the Common Carrier Bureau, and lists the parts of 47 CFR administered by each CCB branch.

The rules and stipulations of 47 CFR define which carrier activities are subject to Commission review. (See Chapter IV for a more detailed description of 47 CFR.) Common Carrier Bureau staff develops forms and protocols for handling common carrier applications, which must be consistent with 47 CFR requirements and the intent of language specified in these rules.



Source: 47 CFR, Part O, and interviews with CCB staff, Summer 1978 FIGURE II-2: FCC ORGANIZATION AND CCB 47 CFR RESPONSIBILITY

2. THE COMMISSIONERS

The Commissioners make decisions about contemporary issues. These selections set precedents for subsequent Commission actions, including routine staff decisions. The Commissioners also control resources and, to some extent, the agenda of activities of Common Carrier Bureau staff. In these ways, the Commissioners influence the character of telecommunications regulation and commerce.

3. THE COMMON CARRIER BUREAU

Most CCB staff are either attorneys, economists, engineers, public utility specialists, managers, or administrators. Most common carrier interaction with CCB branch operations involves applications to change business practices. For example, if Western Union wanted to change the location of a station, it would first submit an application to the Domestic Facilities Branch of CCB to obtain authorization to construct additional transmission lines. If authority to provide new services or a rate change is desired, the carrier must also submit a tariff to the Tariff Review Branch. Different types of applications are known as filings; filings are usually approved, disapproved (or denied), or withdrawn. Commission approval or disapproval is termed a ruling. Tariff applications, however, are not "approved." For example, Part 61 of 47 CFR (concerning rates) stipulates that a tariff filing may be considered effective if there is no Commission decision to the contrary within a prescribed period of time. In other words, the tariff becomes effective within a certain period if the Commission finds no compelling reason to deny it.

The number and types of activities required to produce a ruling seem to vary according to application classification (for example, station license). Most filings are routine and require only simple, low-cost activities to produce a ruling. However, some are quite complex and require a heavy investment in activities. Bureau operations are best suited to routine types of filings. Activities seem to be devised to handle large carriers, especially the established carriers.

Difficult or disputed applications are handled by relying on staff expertise in specific areas of common carrier regulation, rather than on

any one group or formalized procedure. Only when CCB staff authority and expertise cannot resolve a problem filing are Commission lawyers and the legal process called into play.

4. PMS COMMERCE BEFORE DEREGULATION

To put it simply, the job of the telecommunications industry is to move a message, written or verbal, from A to B. It is a \$43-billion-a-year business based on the ancient concept of "courier." What was once the province of runners, riders, and assorted vehicles of hand delivery is fast becoming a completely automated system of information transfer, characterized by computers, microwave technology, and other innovations that will probably bring an electronic message age to the public in a relatively short time.

There are eight key players in the interstate telecommunications industry: three types of senders, three types of receivers, the carriers, and the regulator. Figure II-3 illustrates how the players on the hardcopy or "record" side of telecommunications interrelate. The boxes on the left represent government, private (e.g., large corporations), and general public senders (e.g., residential and small business), while the broken connecting lines between the two columns of boxes represent the current carriers and their transmission facilities. The boxes on the right are government, private, and public receivers of written messages. The figure illustrates that message exchanges involving the public as sender <u>or</u> receiver are the subject of the proposed deregulation. Excluded, are government-to-government and private-to-private exchanges utilizing privately owned networks. The check marks indicate that key record message exchanges for this evaluation are public to public, private to public, and government to public.



FIGURE II-3: BASIC REPRESENTATION OF WRITTEN MESSAGE TELECOMMUNICATIONS IN TERMS OF SENDERS, RECEIVERS, CARRIERS, AND REGULATOR

In 1943, The Western Union Telegraph Company was granted virtual monopoly status as supplier of message record services to the general public. Since then, the volume of public record messages has dropped precipitously from a high of about 231 million in 1943 to about 37 million in 1973--an 84 percent slide. After bottoming out in 1973, there has been a slight recovery, as illustrated by a 45 million message volume for 1977. Nonetheless, the volume of public record messages has declined a full 80 percent since the monopoly was granted. As of 1977, PMS revenues represented less than .3 percent of the total revenue generated through regulated telecommunications.

The Western Union services which could be exposed to competition include: Mailgram, full rate telegram, domestic transmission portion of messages to and from locations outside of the United States, and money order service. In 1977, these four services generated 95 percent of the total PMS revenues. Other

public message services, such as the press telegram service, generated only minor revenue.

In 1977, the basic facts regarding the high-revenue generating services traditionally considered PMS were as follows:

- The full rate telegram preceded other public message services and, at one time, was the most common. In 1977, it accounted for 17.3 percent of the PMS dollar revenue and only 9 percent of the total message volume.
- Mailgram accounted for the largest volume, 53.8 percent. Western Union Telegraph Company revenue generated by Mailgram totaled over \$44 million or 53.8 percent of the PMS revenue and about 9 percent of the company's total revenue in 1977.
- Domestic transmission of transoceanic communications or "cablegrams" was the second most active public message service in 1977, generating 17 percent of the message volume and 13.1 percent of PMS revenue.
- Telegraphic money order, providing 14 percent of the volume and about 32 percent of the revenue, was the third largest service class with 6 million money transfers in 1977. (Just as a jurisdictional problem may occur in connection with the service outgrowth of Mailgram, ECOM, there is a possibility that a similar problem may develop when the telegraphic money order is deregulated. Whether electronic fund transfers should be regulated is also a current issue.)

Figure II-4 illustrates our model of current PMS commerce. This model is still subject to further validation by industry. Chapter VI contains a more detailed depiction of this model and compares it to a model illustrating expectations about changes in PMS commerce as a result of deregulation.

5. PMS COMMERCE AFTER DEREGULATION

As we mentioned, the carriers and services which will opt to serve this market cannot be identified at this stage of the deregulation. Most of the information which follows is presented to suggest, based on our analysis to date, potential effects and impacts of the deregulation.

Electronic message service is a wide open field. Most of the new specialized carriers serve business markets but have capabilities for resale



or transmission which could be used to provide a variety of services, including those traditionally considered public message services and even some outside the bounds of regulated telecommunications. For example, some services of the USPS mail could probably be provided by regulated PMS carriers.

The competition for public message services is already under way. For example, we found it possible to move hardcopy text from one location to another using word processing firms. The service is inconvenient and expensive, but workable. We also suspect that it would be possible to purchase, on a walk-in or phone-in basis, interstate transfer via small private computer terminals. In addition, a December 16, 1978, <u>Washington</u> <u>Post</u> article announced that a company is now offering transmission and hookup service to interconnect personal computers. At the moment, these patchwork arrangements seem to signal the market for such services. Also, competition might come from any number of major corporations with extensive private communications networks. For example, a large hotel chain could easily open its message transfer system to the public and establish itself as a public message services carrier.

However, the United States Postal Service and some of the specialized common carriers seem the most likely competitors in an open PMS market. The USPS might capture a large share of the market with its proposed ECOM service. For the specialized carriers, however, the deregulation will be the first opportunity to enter legally into the market. Likely entrants from the specialized carrier group are discussed in detail in terms of service operations, revenue, capital, employees, etc., in Chapter IV of the report. Essentially, findings show that would-be competitors in an open PMS market

differ dramatically in size from Western Union and the USPS. However, they are surprisingly similar in their basic capability to provide message services.

C. LOGIC OF THE EVALUATION

Figure II-5 illustrates a logic or chain of events of the evaluation in relation to our current model of PMS commerce (Figure II-4). The figure points out the distinction between the first five events, which center around achieving reformulated PMS commerce, and Events VI and VII, which focus on processing and analyzing information.

The "intervention" is defined by activities which could occur during the first three events. Event I activities might be characterized as preparatory; e.g., drafting a set of revised rules to govern a deregulated PMS market. Event II concerns obtaining Commission authorization for the deregulation. The first major activities occur during this phase: (1) approval of the Memorandum, Opinion, & Order, (MO&O), which announces the deregulation and explains the Commission's rationale for deregulating PMS; and (2) approval of the finalized rulechange. Event III deals with streamlining Commission procedures for handling PMS filings.

As of January 1979, most Event I activities have occurred. However, the time schedule expected for revising the PMS rules has slipped. Although the MO&O was approved by the Commission on January 25, 1979 (an Event II activity), the revised draft rulemaking has not yet been scheduled for submission to the Commission (an Event I activity.) The draft of revised 47 CFR rules and regulations is scheduled for release within 90 days of the Commission's approval



of the MO&O. These rules are expected to deal with market entry and exit as well as business operations while a firm is actually engaged in PMS commerce. The Commission is expected to consider adopting a revised rulemaking after an analysis of comments received during a public notification period.

Event IV involves carriers applying to the Commission to enter the PMS market. Although carriers may apply as soon as the MO&O is approved, interested firms are not expected to act until they have had an opportunity to review the actual rulechange. Therefore, a more practical time for new entrants to begin to market public message services is probably March or April 1979, assuming that presentation of the draft rulechange before the Commission occurs in February. During Event V, staff of CCB, ETIP and the ETIP contractor plan to monitor commerce as PMS services and operations change.

Events VI and VII involve continued observation of commerce, analysis of evaluation findings, and transfer of knowledge gained from the evaluation. Both of these events are already under way. They are portrayed as final stages of the research since these types of activities will increase and step into the forefront toward the end of the evaluation period. Also, in actuality, products occurring at any time could be either subjects of analysis or results of analysis by evaluators. Hopefully, these analysis and information transfer activities will be timely in terms of the information needs of those expected to use evaluation findings and in relation to real world events that might affect deregulation activities.

The hypothesized effects of the intervention would affect (1) Commission process (for example, workload) and (2) the commercial sector and innovation. In an initial attempt to set boundaries for this proposed evaluation, a preliminary model for ongoing measurements and a preliminary measurement set have been developed. The model is presented in Chapter VI of this

report and is illustrated with hypothetical examples, such as the way one would track innovation in terminal equipment used for public message services. Although measures outlined presently appear feasible at some level of rigor, more work is needed to determine the degree of feasibility and rigor possible.

As already noted, we expect to update the model as industry trends develop and user needs are better defined. Specifically, we expect to make revisions as the intervention becomes better defined and as we validate the model and measures with industry and others. Events I through VI all conclude by reassessing the potential for useful evaluation. This step should insure that measures and comparisons assess agreed-upon goals, and that activities achieve both interim and downstream objectives.

It is already apparent that more measurements could be taken than can reasonably be accomplished, and priorities will have to be established in this regard. Also, many potential users of the evaluation information have been identified. (See Appendices E and F and Section D of this chapter.) Chapter V of this report suggests that an Evaluation Group composed of staff from the Commission, ETIP, and the ETIP contractor, could be organized to make those decisions that will guide the conduct of the project. Also, evaluators should soon finalize criteria for judging the significance of observed changes in relation to the Commission's mandate and CCB and ETIP goals. For example, for purposes of the evaluation, what yardstick of customer satisfaction should be used to measure whether public service standards used by different carriers are adequate? Decisions such as these require a broad consensus of opinion; therefore, discussions should begin as soon as possible. (Description under Event VI below includes an explanation of how the criteria might be applied.)

A Design Group of similar composition could also be formed to perform the primary research tasks of collecting and analyzing data.

Each event is discussed briefly below. For a detailed description of participants and activities, and potential products, measures, and information uses for all events, see the seven figures contained in Chapter V.

1. EVENT I--CCB DRAFTS MO&O AND RULEMAKING TO END PMS MONOPOLY

Event I produced a draft MO&O intended to end the <u>de jure</u> monopoly of Western Union. As mentioned, the revised PMS rules are not yet ready for submission before the Commission. Other products completed during Event I include: an early Urban Institute working paper, which contains data gathered as of May 1978 regarding Common Carrier Bureau procedures; and this report, a partial evaluation assessment of the proposed project.

Also during Event I, representatives of relevant CCB branches participated on a committee which conducted preliminary analysis of certain relevant sections of 47 CFR. This process helped to point out areas where further legal research was required. Also early participation by each branch which will be affected by the rulemaking should help to implement a streamlined CCB process for administering those rules (Event III). In other words, use of the CCB committee should facilitate a smooth transition from Commission policy intent to changed regulatory process as events progress.

2. EVENT II--COMMISSIONERS AUTHORIZE REVISED RULEMAKING TO GO INTO EFFECT

As mentioned, the MO&O was approved by the Commission on January 25, 1979. So far, no petitions contesting the decision have been received

by the Commission. If the deregulation is challenged now, or during the public notice comment period for the proposed rulemaking, the evaluation timetable could slip, perhaps considerably. For example, a telegraph workers union might raise an objection to the deregulation which would necessitate court action.

In addition to the final MO&O, Event II should produce the final rulemaking, a revised definition of public message services, comments from industry regarding the new rules, and comments regarding this report.

3. <u>EVENT III--COMMON CARRIER</u> BUREAU STREAMLINES PROCESS

The third event implements procedural change within those CCB divisions and branches that will administer the revised rules and regulations governing public message services. The process for implementing this streamlined CCB process cannot be designed yet since the rulemaking is not finalized. The central expectation of the event is characterized by faster processing times for routine matters, fewer disputed regulatory rulings, and general reductions in the workload associated with PMS regulation. On the practical level, Event III activities should produce simpler formats for required reports from PMS carriers, improved work checklists, and improved criteria for branch-level decisions regarding applications, expedited CCB procedures, etc.

Hopefully, the branches will begin to implement a revised PMS regulatory process in March or April 1979. A set of measures to monitor this new process will be developed.

4. <u>EVENT IV--CARRIERS AND OTHERS</u> APPLY TO OFFER PMS SERVICES

This event may be the crucial phase of the transition from <u>de jure</u> monopoly to competition. Different (non-Western Union) common carriers are expected to apply to provide PMS and to offer new services based on innovative technologies. Chapter IV discusses two likely entrants, and the kinds of information that would be collected about entrants. We expect the data on carriers entering the market to form the basis for establishing measures of effects on market structure. These effects should be observable during Event V. In another Event IV activity, ETIP and its contractor will gather information about the actual process of PMS deregulation using measures set up in Event III.

5. <u>EVENT V--MARKET STRUCTURE</u> IS OBSERVED TO CHANGE

Event V could begin as early as May 1979. It is contingent on (1) the rulechange being submitted before the Commission, and (2) the reactions of carriers to the new rules. If new PMS facilities are established by carriers, and innovative technologies and better services are introduced, we expect that consumers will opt to buy public message services and that their general sense of satisfaction will improve. Another possibility is that consumers will reject new public message services. This result could warrant investigation into reasons for rejection, such as inadequate consumer education.

During Event V, ETIP and its contractor will trace the actual changes in commerce that result from Event IV activities. In turn, the data generated through these activities will provide the basis for analysis. Information obtained from CCB files and documents is expected to be supplemented by information from companies, consumers, equipment manufacturers,

etc. The Evaluation and Design Groups will probably exchange information with members of industry and other interested parties. (For a review of information sources available at CCB and elsewhere, see Appendix D and Chapter IV.)

6. <u>EVENT VI--FINDINGS OF</u> SYSTEMATIC EVALUATION

This event is expected to produce evaluation and research findings related to changed regulatory process and commercial impacts, such as technological innovation, resulting from the deregulation. During this phase, ETIP and its contractor are also expected to apply evaluation criteria for success to the data on the deregulation. The task is expected to have three components. The first establishes whether a commercial effect (or anticipated event) has occurred and whether it can be linked to the deregulation. If the link is established, the second component compares data gathered about the actual event with the hypothesized expectations about the event. These hypothesized expectations are based on the criteria for judging the significance of observed changes previously agreed upon by ETIP, the ETIP contractor, and the Commission staff. The third component is expected to establish whether information gained from the evaluation will lend itself to generalization.

7. EVENT VII--KNOWLEDGE TRANSFER

The seventh event will be the transfer of knowledge gained through systematic evaluation of the deregulation. The result, often termed feedback, is expected to be indicated by useful application of specific findings from the evaluation and research described above. Reports resulting from the evaluation are expected to cover topics such as impact of deregulation,

rulechange process, barriers to deregulation, and techniques and methods for managing regulatory change. Event VII will end when the last evaluation product has been completed as per the terms of the FCC/ETIP working agreement.

D. POTENTIAL USERS AND USES OF EVALUATION INFORMATION

As mentioned, there are numerous individuals and organizations who might benefit from the research findings on the issues in this discussion of public message services and other common carrier regulation. The direct users, of course, are the sponsors of the project: ETIP and CCB staff. In cooperation with officials at the Commission and the Department of Commerce, they control the resources used to shape evaluation activities.

Another group of potential users is composed of those who actually participate in public message services commerce and are subjects of the evaluation (but who have no control over evaluation resources). These include Western Union, resale common carriers, firms in the peripheral equipment industry, and investors.

Other users are those who are involved in some aspect of telecommunications commerce but do not participate directly in public message services. This group includes all those associated with the evaluation by virtue of their willingness to act when presented with new information about the effects of deregulation. Some potential users of information are government agencies, such as the National Telecommunications and Information Administration and the Justice Department. Some groups are veterans in the ongoing dialogue about telecommunications regulation. Among these are AT&T, RCA, IT&T, and a host of less well known suppliers. Others, like the specialized

common carriers, are relatively new companies on the scene. Of course, even a partial list is incomplete without labor and consumer groups.

We have identified in the course of this research numerous ways in which measurement information might be used by sponsors and other classes of users. For example, ETIP could use research findings to increase its understanding of the relationship between regulation and technological innovation and could make this information available to specified policy makers. The Complaints and Service Standards Branch of the CCB might use measurement information to help define public service standards. The National Telecommunications and Information Administration might use results of the deregulation evaluation to reformulate its policy on competition. (See also Appendices E and F and Chapter VI.)

E. SUMMARY OF ASSESSMENT FOR USEFUL EVALUATION

The project does present several important opportunities for both the Commission and ETIP, which were discussed earlier in this chapter. In summary, these include:

- An opportunity to test the role of competition in a telecommunications market that has traditionally been considered a natural monopoly;
- An opportunity to gain knowledge regarding: (1) the effects of regulation on technological innovation and (2) the complex of outside factors which may facilitate or hinder introduction of innovative services and technologies into the marketplace;
- An opportunity for the Commission to analyze and implement procedural changes, including a more purposeful data-gathering approach, which might be transferrable to the process of deregulating other monopoly markets and also more routine activities;
- An opportunity for the Commission to develop empirical standards on which to base its decisions; and,

• An opportunity to test the possibility of generalizing from information on technical, economic, and political core issues present in the public message services deregulation to other areas of inquiry. (The evaluation can also serve as a vehicle for moving to broader sets of generic issues. As noted in Chapter III, the Commission has before it several decisions which will influence innovation.)

In addition, we believe that this evaluation (properly monitored and analyzed) will be of great interest to the research community. The process by which public message technologies and services enter the marketplace is a case study which should prove valuable in formulating and examining existing theories about innovation in telecommunications and in other industries as well.

Given the relatively modest size of the present PMS market, an evaluation process of the magnitude contemplated for this ETIP administrative experiment is reasonable only if the project is expanded to encompass a larger segment of telecommunications than a narrowly defined public message services market. Such an expansion might occur in any of several ways.

One way the project might expand is related to formulating the definition of public message services. The MO&O most likely refers to public message services in a very general way in order to allow as much leeway as possible for new, innovative types of services. The tightness of the PMS definition will probably be determined after the public notice period for the rulechange. After the final definition of the PMS market is issued, it could affect the size of the project. A relatively broad definition could result in large impacts; that is, many firms, offering a wide variety of new services using different technologies, could decide to enter a broadly defined PMS market to seek the advantages of deregulation. The project could also be sequentially expanded by applying the information obtained

to pending decisions and/or by transferring the evaluation process itself to other decisions.

Finally, following is a summary of concerns with which ETIP, its contractor, and the Commission will have to deal in the near future in order to increase the potential for a useful evaluation effort.

- Public message services deregulation goals need to be more precisely stated. For example, there is general agreement that the regulations governing deregulated public message services should be fewer than regulations during the monopoly. However, it is not yet clear whether the smallest possible set of regulations is desirable or just a smaller set than the previous one.
- The project needs better standards for performance. For evaluation to show that competition exists, an acceptable indicator of the threshold between a monopoly and competitive state is necessary. Is competition simply the presence of a minimum number of companies in a specific market or is competition achieved when each carrier gains a certain minimum percentage of the market?
- A mechanism to transfer evaluation information to appropriate CCB staff is needed in order to link findings about the process and effect of public message services deregulation to other areas of inquiry, such as Telex/TWX or MTS/WATS.
- A plan is needed to guide distribution of evaluation information to the outside world.
- Measurement priorities must be established for sponsors of the evaluation and those outside of the evaluation who might use evaluation findings. A full-scale evaluation design probably will be based on the choices of ETIP and CCB staff who participate in decision making, and by findings of an analysis of early "participant" reactions to the deregulation. Essentially, the tradeoff will be between decisions about priority uses of information and the actual resources available for information collection.
- Since the events being monitored are not taking place in a controlled policy environment, they are subject to effects of outside events, such as decisions by the Congress and the courts. Therefore, a method is needed to track reaction to the deregulation and related developments in other areas of regulated telecommunications. This will insure that the deregulation is properly understood within the context of the telecommunications industry and that expectations for use of evaluation information are reasonable.



III. FINDINGS ABOUT THE SETTING FOR THE EVALUATION

A. ORGANIZATION

Chapter III presents necessary findings and background information for understanding the proposed public message services deregulation--and the evaluation--in the context of the telecommunications industry.¹ This information is presented to help relate the proposed deregulation to historical and current events, assess the progress of our work, and suggest directions for future evaluation efforts.

A brief review of telecommunications history from 1830 until 1943 begins this chapter. This review describes various observers' assessments of conditions that contributed to the need for government regulation and conferring monopoly power on AT&T and Western Union.

After some information needs which exist in the area of telecommunications regulation are examined, the circumstances which led to a renewal of Commission decisions favoring competition are described. The process by which the Commission tests decision making and policy formulation is illustrated by an examination of major recent decisions (such as the <u>Specialized</u> Common Carrier and the Execunet Decisions).

For greater insight into industry conditions we shift the focus to current matters which probably require Commission attention. Some of these are: electronic message service and the United States Postal Service; the AT&T Domestic Satellite (Domsat) Moratorium; Xerox's proposed entry into telecommunications; and the Satellite Business Systems controversy.

^{1.} The term deregulation is used here to denote a change in policy, practice, and/or rules which reduces (but does not necessarily eliminate) the burden on the regulatee.

Next we briefly describe specialized common carriers and discuss the promise of competition which they bring to the industry. The diversity of these carriers and the complex competitive relationships in which they are involved illustrate the difficulty of establishing standards for fair competition. A look at specialized common carrier intercorporate relationships, investment patterns, and examples of industry links with government research and development pinpoints areas for additional study by the Commission and the academic community.

When current events are discussed, alternatives for future telecommunications (especially public message services) come more sharply into focus. For example, will the message delivery vehicle be television set, facsimile, computer terminal, or messenger? Will we transmit primarily by air, or by wire? Will a government or quasi-government agency have jurisdiction over the provision of public message services? Will the market sustain one, a few, or many companies competing in an open marketplace? By monitoring the proposed deregulation, empirical evidence may be obtained that is pertinent to issues such as these.

The Commission inquiry process is a tool for communicating with industry and other concerned parties. This process is described at the end of the chapter. Issues in telecommunications are identified by content analyses of public comments regarding inquiries that are directly or indirectly related to the public message services deregulation, and of congressional testimony. These issues are then linked to generic issues of regulation and innovation. The opportunity for using the evaluation to test whether one can generalize and apply the information obtained to other inquiries and broad issues is discussed.

In summary, this chapter shows the complexity of the telecommunications environment in which the deregulation is taking place. The FCC is only one

of a number of forces which influence telecommunications and innovation in that industry. Other influences include court decisions and government research and development, as well as changes initiated by the industry itself. Thus, to properly interpret the deregulation and its effects on innovation, it will be necessary in future work to conduct research into a variety of areas, at both the theoretical and operational levels. For example, theories given in various literatures (for example, on market structure and innovation) and specific links to those literatures in terms of measures need further examination. Also, the findings in this chapter, for the most part, come from secondary sources (documents, literature, etc.), and selected parts will be further validated by more direct contact with industry.

In this chapter we try to show that the Commission can strengthen its influence in encouraging commerce and innovation by adopting a more structured data gathering approach than it has used in the past. The evaluation, properly conducted and linked to generic issues, could initiate such an approach and also provide ETIP with information on the relationship between regulatory process and technological innovation.

B. HISTORICAL PERSPECTIVE: THE ROAD TO REGULATION

1. PATENT PROTECTION AND INDEPENDENT AGREEMENT BETWEEN POTENTIAL COMPETI-TORS ASSURE EACH A MARKET SHARE

The beginning of telecommunications dates back to the invention of the telegraph by Samuel Morse in the late 1830s. At first, several small companies offered telegraph service to the public. From 1866 to 1876, through a series of mergers, Western Union achieved a prominent position in the industry

and became the sole source provider in many locations. A technological advance in 1876--the invention of the telephone--was an important event that went unnoticed by most, including Western Union. When its business communications customers opted to use telephone service rather than telegraph, Western Union acknowledged telephony as a competitive alternative service. In 1878, the Western Union Telegraph Company attempted to enter the telephone business. Its monopoly protected by a federal patent, the Bell Company sued Western Union; Western Union counter-sued. A settlement was reached in 1879:

Bell purchased Western Union's telephone equipment, paid Western Union a small royalty, and convenanted not to enter the telegraph business during the life of the disputed patents. In return, Western Union agreed to stay out of telephony for the same period and drop its patent suits. Thus, Western Union protected its monopoly status in the telegraph sector, and AT&T no longer had to worry about competition in the telephony field from a financially superior rival. This private agreement laid the groundwork for an industry structure [in which] Western Union is the telegraphy monopolist and AT&T is the predominant telephony monopolist.

2. <u>COMPETITION IN PROVISION OF TELEPHONE</u> SERVICE EXPERIENCES MARKET FAILURE

In 1893, federal protection of the Bell monopoly ended, and a 20-year period of fierce competition began. Bell aggressively forced independent telephone companies out of business, and in 1913 the Kingsbury Commitment (an agreement between AT&T and the Justice Department) required Bell to interconnect independent telephone company lines with its own and to refrain from purchasing or acquiring control of telephone independents operating in the same market as Bell subsidiaries. But the company was free to purchase noncompeting independent telephone companies. Bell found numerous opportunities to acquire companies in areas where Bell was not operating

^{1.} U.S. Federal Communications Commission. "An Overview of the Domestic Telecommunications Industry and the Commission's Policies Concerning Terminal Equipment and Private Line Services," (Undated) p.4. (Hereafter known as "Domestic Telecommunications.")

but where competition among groups of other independent telephone companies had led to unprofitable, duplicative telephone services--and subsequent market failure. Through these acquisitions, Bell greatly increased its holdings between 1913 and 1921.

The Kingsbury Commitment did not deter the growth of Bell. One noted economist has suggested why attempts to influence market structure are sometimes inadequate.

If patents are backed up by massive control of sources of materials and power, . . . the conditions are present for a new product monopoly that may outlast the original patents and be hard to convert to competition, especially when a legal system . . . is geared to combat identifiable monopolistic actions, rather than bring about or maintain whatever conditions may be needed for effective competition . . . This would mean preventing the acquisition of sources of material and power from going to such lengths that its natural and probable effect would be to preclude the entry of competitors.¹

Also, this new, technology-oriented industry was in a developmental stage; the potential effect of transmission network unification and geographic expansion on market structure was probably not foreseen.

This market failure which compelled telephone independents to sell out to Bell (and eventually to seek relief from the antitrust laws mandating competition), was explained by the "natural monopoly" concept. Today, however, economists cite difficulties inherent in identifying a true natural monopoly:

Traditional definitions of natural monopoly suggest that where one firm can supply the market at a lower per-unit cost than two or more firms, competition leads to the elimination of all firms but one . . . The problem of determining empirically whether a monopoly is justified by cost conditions--whether a natural monopoly exists-is difficult; attempting to do so by inference from the actions and cost data of a regulated utility is nearly impossible.²

 Clark, John Maurice. <u>Competition As A Dynamic Process</u>, The Brookings Institute, Washington, D.C., November 1961, p. 210. (Specifically discusses the aluminum industry and Section 7 of the Clayton Act dealing with mergers.) 2. Waverman, Leonard. "Regulation of Intercity Telecommunications," Promoting Competition in Regulated Markets (1975), pp. 203-204.

3. <u>TELEPHONE INDEPENDENTS SEEK</u> LESSENING OF ANTITRUST LAWS

The plight of the independent telephone companies led to the Willis Graham Act of 1921, which exempted telephone companies--but not telegraph companies--from the restraints of antitrust acts once consolidation or merger was approved by the Interstate Commerce Commission as being in the "public interest."¹ Formerly only the courts had this authority.

At that time, jurisdiction over the communications industry was split. The Interstate Commerce Commission had authority over interstate rates charged by "telegraph, telephone, and cable companies"; the Postmaster General inspected telegraph operations. The first bill designed to end this and give responsibility to one agency was introduced to Congress in 1929. Consolidation was not achieved, however, until the 1930s. The domestic marketplace was suffering from shrinking demand as a result of the Depression, when President Roosevelt's New Deal Legislation proposed creation of a Federal Communications Commission and the Communications Act of 1934 was passed.

4. COMPETITIVE TELEGRAPH MARKET FAILS

Although passage of the Kingsbury Commitment and Willis Graham Act was prompted by the struggle between independent telephone companies, telegraph companies were encountering similar problems. In the 1920s Western Union's

^{1.} The "public interest" concept was originally used to show the advantages of competition in the transportation industry. See Loeb, Guy. The Communications Act Policy Toward Competition: The Sound of One Hand Clapping, Harvard University, Program on Information Resources Policy, Working Paper W-77-1, March 1977. An early judicial decision (Federal Radio Commission v. Nelson Brothers Bond & Mortgage Company, 289 U.S. 266, 285 [1933]) in the telecommunications sector, however, set the precedent that "monopoly was in the public interest unless proven otherwise, so that the role of competition was never really tested." Waverman, Leonard. op. cit., p. 202.

market share was again threatened by alternative services; namely, long distance telephone service and Air Mail postal service. During the Depression, AT&T introduced TWX which "struck at the heart of Western Union's market, the commercial record traffic market";¹ TWX was competing with Western Union's Telex service. (Both services consist of interconnecting teleprinters, equipment used in a printing telegraph system. There are similarities to regular telephone service in that customers dial calls from station to station, but communicate using teleprinter equipment rather than telephones. See also Glossary.)

By 1943 only Western Union and one other company, Postal Telegraph, were operating on a major scale. Some problems in the telegraph industry were noted in an official Commission opinion and included paralleling of facilities, duplication of operations, and wasteful expenditures of resources and manpower. Postal and Western Union were both in financial difficulties. It seemed evident that telegraph competition had not produced a healthy market. Consequently, telegraphy was classified as a natural monopoly, and Western Union was officially designated the telegraph monopolist.

... telegraph service appears to fall within the field of "natural monopolies" such as the telephone, power and gas distribution utilities, where it has actually been found by experience that one company adequately regulated can be expected to render a superior service at lower cost than that provided by competing companies.²

World War II was also a very important factor in convincing government officials (the President of the United States and the Secretaries of War, Navy, and Commerce) that, "unification of the domestic telegraph operations of this country into a single company was in the general public interest

^{1.} See "Domestic Telecommunications," op. cit., p. 12.

^{2.} Merger Case, 10 FCC 148, 162 (1943).

and essential to the effective prosecution" of the war.¹ Thirteen years passed before a significant challenge to this "natural monopoly" was brought before the Commission.

In 1956 the Commission denied the request of Press Wireless, a carrier, for authority to lease and operate temporary telegraph facilities for overseas transmission of press reports about the Democratic National Convention. This service would have competed with Western Union's domestic transmission of transoceanic messages. The Commission denied Press Wireless' request on the grounds that competitors would "creamskim" or serve only the choicest customers while leaving Western Union the responsibility of being "last resort" carrier.

It appears to us, that although Western Union is not entitled as a matter of law to the exclusive grant for pickup and delivery of international traffic in the hinterland, the obligation it has to provide such service at all times, whether traffic be light or heavy, carries with it the privilege of continuing to provide service and reap the revenues of a heavy traffic volume, unless it is demonstrated that it is unable to do so in a manner which will serve the public interest, or some other carrier will provide service which is so superior as to support a finding that a public interest would be served by a grant of its application.

C. REGULATED TELECOMMUNICATIONS: PROPENSITY FOR CHANGE

As the influence of forces (technological, economic, competitive, political, etc.) which gave rise to and shaped early developments in the telecommunications industry declined, and as dependence on regulation increased, dominant characteristics of market structure surfaced. Basically, two established companies, AT&T and Western Union, served two discrete markets: terminal equipment and private line.³

^{1.} Ibid.

^{2.} Press Wireless, 21 FCC 331 (1956).

^{3.} AT&T and Western Union tariffs define private line services as point-to-point, dedicated communications lines reserved for specific customers on a 24-hour-a-day, seven-day-a-week basis.
The industry structure which existed in the terminal equipment and private line markets by the mid-1960s may have been appropriate for that time. The basic, switched telephone network was used almost exclusively for voice communications between individual subscribers, and the only terminal used to any significant extent was the ubiquitous, black dial telephone. Thus, the terminal equipment market essentially consisted of a single product line, and there probably was little incentive to attract new entrants or little reason for the FCC to allow additional entrants in this homogeneous market.

The private line market, while composed of four basic markets, was--to a considerable extent--an equally homogeneous market. Telegraph grade private lines were principally used by the newspaper wire services. Telephone grade private lines were used by broadcasters. Audio and video private lines were used by the television networks. Each of these four submarkets constituted a single product line for which each of the potential classes of users had essentially the same communications requirements. Under such circumstances, it was not unreasonable to assume that Western Union and AT&T would satisfy all the private line communications needs of potential users.¹

According to some experts, the established carriers were not able to adequately satisfy communications service demands produced by the technical revolution of the 1960s. The Commission felt it was necessary to allow new entrants into the private line and terminal equipment markets in order to satisfy these needs.² During the same period of time, however, Bell Labs produced major innovations that had important effects on the industry. In his article entitled "O Pioneers," Nathan Reingold discusses major innovations in different industries and describes how the interest of Bell Labs in basic research as opposed to applied research had a major impact on both the electronics and telecommunications industries.

^{1. &}quot;Domestic Telecommunications," op. cit., pp. 14-15.

^{2.} For example see, U.S. Department of Commerce, Office of Telecommunications, Policy Research Division. <u>Federal Regulations Relevant to the</u> <u>Structural Development of the Telecommunications Indusries</u>, November 1977, p. 19, and U.S. Federal Communications Commission, "Domestic Public Point-to-Point Microwave Radio Service--Specialized Common Carrier Services," <u>Federal</u> Register 36, No. 111, June 9, 1971.

In 1927 H.D. Arnold, then president of Bell Laboratories, wrote [that Bell was interested] simply in producing more electrons to run its radios and telephones and, soon, its television sets. And Bell wanted its electrons cheaply. But the best road to this end, Arnold explained, "must include a thorough understanding of the broad facts of electron emission." Work in this area won Bell Laboratories physicist C.J. Davisson the Nobel Prize (1937). Bell received another Nobel for developing the transistor (1956).¹

In this view, Bell Labs' interest in increasing cost effectiveness was probably a major factor leading to an important innovation. Scholars have cited many variables which influence the introduction of innovative technology into a market, including: investments, research and development (R&D) funding, resource allocation, marketing capability, customer attitudes, supply and demand factors, patents, acquisitions and mergers, geographic location, economies of scale, cross subsidization, corporate diversification, staff expertise, potential and existing competition, inflation, employees and unions, etc., as well as regulation. How these factors influence one another is not well understood.²

Why does an innovation occur? What conditions and/or type of market structure would be optimal for encouraging innovation? Are large firms or small firms more likely to produce an innovation? What is the nature of innovation? These questions are currently being debated and studied. Nelson and Winter, economists at Yale University, are pioneers in investigating

Reingold, Nathan. "O Pioneers," <u>The Wilson Quarterly</u>, Summer 1978, p. 63.

^{2.} Nelson, Richard R., and Winter, Sidney G. "In Search of Useful Theory of Innovation," <u>Research Policy</u> 6 (1977), 36-76; Nelson and Winter. "Neoclassical vs. Evolutionary Theories of Economic Growth," <u>Economic Journal</u> 84 (December 1974) 886; "Factor Price Changes, and Factor Substitution in an Evolutionary Model," <u>Bell Journal of Economics</u> 6 (Autumn 1975) 446; and "Dynamic Competition and Technical Progress," in B. Balassa and R. Nelson (eds.) <u>Private Incentives, Social Values and Public Policy: Essays in Honor of William Fellner</u> (Amsterdam, North Holland, 1976). <u>See also Section E of</u> this chapter regarding investment, R&D funding, and corporate strategy.

the applicability of dynamic theory to the study of innovation. They suggest that:

[A] Imost any nontrivial change in product or process, if there has been no prior experience, is an innovation. That is, we abandon the sharp distinction between moving along a production function and shift to a new one that characterizes the studies surveyed earlier . . . we treat any innovation as involving considerable uncertainty both before it is ready for introduction to the economy, and even after it is introduced, and thus we view the innovation process as involving a continuing disequilibrium. At any time there is coexistence of ideas that will evolve into successful innovations and those that will not, and actual use of misjudged or obsolete technologies along with profitable ones. Over time selection operates on the existing set of technologies, but new ones continually are introduced to upset the movement toward equilibrium.¹

Public message services deregulation could set the stage to test statements such as the one above and also offers an opportunity to learn what factors influence innovation. For example, what will the mix of technologies be after deregulation? Will state-of-the-art and obsolete technologies be used together to provide PMS? Which technologies and services will be most profitable? How will public message services technologies evolve over time? A case study that examines the effects of deregulation and whether a shift toward competition in PMS occurs--and why--should produce useful information for both the Commission and academics interested in gaining a better understanding about factors influencing an industry's propensity for change. ETIP is especially interested in gaining information about the relationship of regulation to innovation.

The next sections will provide background information on past Commission decisions and how they have affected the market structure of the telecommunications industry and the availability of innovative technology in the marketplace.

^{1.} Nelson and Winter, op. cit., p.48.

1. INFLUENCE OF THE REGULATOR ON THE INDUSTRY

Recent major decisions made by the Commission have resulted in a significant restructuring the telecommunications industry. Each of these decisions involved a great deal of time and effort for both Commission staff and members of industry. At any given time, however, routine decisions and special decisions with "minor" consequences are made. Decisions that coincide with a shift in policy may either advance or may not advance the new policy direction.

Each Commission decision, whether routine or special, is made on an <u>ad hoc</u> basis, with special consideration to the merits of the particular set of circumstances, rather than on a policy basis, with a one-dimensional, goaloriented approach. Implications of such an approach are discussed below. In the marketplace, Commission policy formulation is experienced as a series of inquiries and subsequent decisions (or rulemakings).

The inquiry process (described in Chapter IV) is meant to provide the Commission with information on which to base its decisions and to gauge the effects of policy change on market structure. The announcement of a formal inquiry includes a request that parties with a stake in the Commission's actions send in comments and evidence in support of their positions. The legalistic, adversary relationship that exists under inquiry conditions also imposes <u>ex parte</u> restrictions on direct contact between Commission staff and industry. The type and quality of information on which Commission decisions are based depends on what information each commenting party decides to submit. Logically each commentor will base his decision on advice of legal, technical, and corporate staffs and their unique expertise and interests. Under these conditions, assigning Commission staff to inquiries

according to their knowledge of the issue makes great sense, and this is what the Commission does. But one weakness of the regulatory process is that as in certain complex areas of research, there is no formal mechanism to insure that "the whole adds up to more than the sum of the parts and knowledge extends beyond the particulars."¹

2. REGULATORY DECISIONS FAVORING COMPETITION

In the 1950s, the Commission began to reexamine its policy favoring monopoly. Technological advances, many of which occurred outside of the traditional communications common carrier industry in the fields of data processing and electronics, spurred this process.²

The so-called "technical revolution" in the 1950s produced a plethora of demands for new, specialized, communication services which were not generally available from the established carriers. Because of this demand, and the emergence of new communications firms who were willing and able to satisfy these specialized needs, the FCC embarked on a new common carrier policy which has had, and continues to have, tremendous impact on the structural development of the entire common-carrier industry. . . . For the most part, the Commission has not adopted specific regulations to implement this policy; instead it has authorized entry into the particular markets through a series of rulemaking decisions based on conclusions reached in inquiries initiated to determine whether competition from new entrants would be a viable and valuable addition to the market.³

Five Commission decisions will be discussed: (1) the <u>Terminal Equipment</u> <u>Decision</u> (1956); (2) <u>Microwave Common Carrier Decision</u> (1959), (3) <u>Specialized</u> <u>Common Carrier Decision</u> (1971); (4) the <u>Value-added Carrier Decision</u> (1973); and (5) the Resale and Shared Use Decision (1976).

^{1.} Nelson and Winter, op. cit., p. 50.

^{2.} Examples are the modern digital computer and the increased reliance of computer systems on communications, (e.g., remote batch processing and timesharing). Breakthroughs in electronics include the transistor, integrated circuits, and the minicomputer. For detailed account of these and other technological advances, see "Domestic Telecommunications," op. cit.

^{3.} U.S. Department of Commerce, Office of Telecommunications, Policy Research Division: Federal Regulations Relevant to the Structural Development of Telecommunications Industries, November 1977, p. 19.

a. FCC DECISION OPENS TERMINAL EQUIPMENT MARKET

Until 1956, telephone carrier tariffs prohibited connecting to the system any device not provided by the telephone company. Complaints to the FCC, first by a company called Hush-A-Phone and then by the Carterfone Company, resulted in the Commission decision that not only AT&T's tariff, but all tariffs which prohibit the "use of harmless as well as harmful devices" interconnected with the communications system, are unlawful.¹

The terminal equipment question is still being investigated, but FCC decisions have had an impact on the structure of the market. There are currently 300 companies which manufacture, supply, or vend "nontraditional" communications terminals. These include "communicating typewriters, small business computers, computer peripherals, computer terminals, facsimile equipment, ² answering devices, dictation equipment, and intercom equipment used with the switched telephone network."³

b. FCC APPROVES LICENSING OF PRIVATE POINT-TO-POINT MICROWAVE COMMUNICA-TIONS SYSTEMS

The next example of the FCC's shift in the competitive/monopoly balance is its decision regarding microwave common carriers.

And, early in 1945, the FCC in essence granted a monopoly of the frequency spectrum usable for microwave transmission to common carriers. Subsequently, the FCC gave [AT&T] a virtual monopoly of the use of microwave by refusing to force AT&T to interconnect with private systems and by not allowing [Western Union Telegraph Company] to interconnect with Bell System Companies.

In later years, however, the FCC attempted to diminish the monopoly it had itself granted. In 1959, noting the low rate of increase in private microwave systems, the commission broadened the range of

1. FCC Decision, 1968b, pp. 424-425.

^{2.} Equipment which provides transmission of pictures, maps, diagrams, etc. The image is scanned at the transmitter, reconstructed at the receiving station, and duplicated on some form of paper.

^{3. &}quot;Domestic Telecommunications," op. cit., p. 50.

industries in which individual firms could build their own systems, and by 1965, few additional private systems having been constructed, the number of industries that could acquire frequencies was again enlarged, and, in addition, firms were allowed to share microwave systems. After its 1969 decision authorizing a private-for-hire carrier between St. Louis and Chicago prompted 1,800 further applications for such service, the commission in 1972 announced its intention to allow competition in the provision of point-to-point intercity services. Thus in the space of about a quarter century the FCC reversed its policy from one of granting a new monopoly on intercity communications to AT&T to one of allowing limited competition. The commission gave the same reasons--efficiency and economy--for allowing competition as for granting monopoly. The commission felt in the mid-1940s that microwave communications was a natural monopoly; yet by 1971 it felt, that the natural monopoly had exhausted all economies of scale.

c. THE EMERGENCE OF THE SPECIALIZED COMMON CARRIERS (SCCs)

The technical revolution of the 1960s created a demand in the marketplace for new private line services. Types of services that were not available to communications users through the established carriers even as late as 1971 included: two-way transmission of different bandwidths; part-time use; sharing of channels; and use of carrier's facilities for installation of subscriber's private equipment.^{2,3}

Applications from companies interested in entering the market typically pointed out technological advances they could offer the public: channels could be terminated into the full single bandwidth of the channel or into a number of channels; thousands of channel and termination combinations were possible and feasible. A growing need for communications channels designed especially for data transmission was also emphasized. A series of FCC decisions from

^{1.} Waverman, Leonard, op. cit., pp. 202-203.

^{2. &}lt;u>See</u>, U.S. Federal Communications Commission. "Domestic Public Pointto-Point Microwave Radio Service--Specialized Common Carrier Services," Federal Register, Vol. 36, No. 111, Part II, June 9, 1971.

^{3.} See the glossary for definitions of specific terms such as bandwidths, channels, and facilities.

1971 to 1976 (including the <u>Value-added Carrier</u> and <u>Resale and Shared Use Deci</u>sions) stimulated the introduction of innovative private line pricing systems and services into the marketplace, to the advantage of the high-volume business user of communications services.¹

d. THE VALUE-ADDED CARRIER DECISION

This decision, initiated by a petition from Packet Communications Inc. (PCI), permitted "value-added" carriers² to tailor existing carrier facilities to meet user needs:

The PCI Order recognized that the entry of value-added carriers into the communications services market would affect the structure of the communications industry. The Commission determined that entry should, nevertheless, be permitted because it would introduce new and improved means for meeting consumers' data transmission requirements in a manner not available from any generalized or specialized carriers.³

e. THE RESALE AND SHARED USE DECISION

The <u>Resale and Shared Use Decision</u> made it possible "for user groups to share services, and for for-profit companies to combine data processing and communications to offer integrated, regulated services, by seeking waivers of [a previous Commission] stipulation that there be maximum separation of data processing and communications within the company."⁴

^{1.} For a complete description of these decisions, <u>see</u> "Domestic Telecommunications," <u>op</u>. <u>cit</u>., pp. 73-104. <u>See also</u>, U.S. Federal Communications Commission. "Domestic Public Point-to-Point Microwave Radio Service--Specialized Common Carrier Services," <u>Federal Register</u>, Vol. 36, No. 111, Part II, June 9, 1971.

^{2.} Value-added, or resale, carriers lease channels from other carriers and add to those channels the value of their own computers and software in order to provide more efficient data transmission; i.e., permit computers of incompatible speeds, codes, formats, etc., to communicate with one another.

^{3. &}quot;Domestic Telecommunications," op cit., p 79.

^{4.} Kalba, Konrad K., <u>et al.</u> <u>Electronic Message Systems: The Tech-</u> nological, Market and Regulatory Prospects, Kalba Bowan Associates, Inc., April 1978, pp. 192-193.

3.

REGULATORY DECISIONS BOLSTERING MONOPOLY

Although each of the above decisions represents a policy shift favoring competition, other decisions have favored monopoly conditions. For example, in 1971, the Commission approved Western Union's acquisition of AT&T's TWX service.

55

Section 222 and its legislative history also indicate Congress' desire that Western Union acquire TWX from AT&T. This was reemphasized by the Senate Interstate and Foreign Commerce Committee in the "Tobey Report" (Senate Document No. 53, 83rd Cong., 1st sess., June 22, 1953) on the problems of domestic telegraph industry. Moreover, a 1966 FCC Investigation into Western Union's declining financial condition made a similar recommendation. On January 15, 1969 AT&T finally agreed to sell TWX to Western Union. The FCC authorized the purchase on July 28, 1970, and the sale was completed on April 1, 1971.¹

The same rationale, to protect the public interest and continued viability of the marketplace, is the basis for all Commission decisions. This policy "tug of war" may be inevitable in dealing with such complex situations. The ways in which any particular Commission decision(s) will actually affect market structure over time can never be known with certainty because all the related interacting forces can never be perfectly understood.

Thus an airtight prescription which will protect the public interest and the market for all time and in all situations may not be possible. If an optimal market structure does exist, it certainly will not be discovered without trial and error. However, if certain principles of interrelationships in complex situations were established and if better information about specific situations over time were available, decision makers might operate with more certainty. This evaluation will try to determine whether this is true. The <u>Execunet</u> decision, which follows, is an example of a decision which might have been improved had such principles been established and better information been available.

1. "Domestic Telecommunications," op. cit., p. 13.

The <u>Execunet</u> case (1976) concerned the application of MCI Telecommunications Corporation to offer a service which would compete with basic public telephone service (MTS and WATS), rather than private line service.¹

In the <u>Execunet</u> decision, the Commission . . . reaffirmed its decision to limit competition to private line service. In so doing, the Commission described private line service as a service which (a) either originates or terminates communications at a specific location designated by the customer via an access channel which is dedicated to the customer's private use and which, therefore, is not used as part of a service offering to the general public; and (b) accesses only those distance locations . . specifically_designated . . . to meet . . . private communications needs.

This decision preserved the long distance telephone service monopoly and protected the stability of the nationwide rate averaging system which subsidizes small "ma and pa" telephone companies in low-volume areas of the country.

In mid-1978, the Court of Appeals overturned the Commission decision regarding the <u>Execunet</u> service on the grounds that the <u>Specialized Common</u> <u>Carrier Decision</u> (which allowed MCI entry into the private line market in the first place) did not "explicitly and affirmatively" exclude this type of service from the market. The Supreme Court refused the Commission's request that it rehear the decision. The Commission objected to the lower court's decision on the grounds that:

[T]he Commission has not yet made the important policy determinations this decision presupposes, and because the decision ignores the established principle that carriers have no obligations under common law to interconnect their services or facilities . . . [court] panel's action also conflicts with settled Supreme Court precedent establishing limitations on the power of reviewing courts in relation to administrative agencies.

^{1.} See Appendix B for background information and chronology of major events in the <u>Execunet</u> controversy.

^{2. &}quot;Domestic Telecommunications," op. cit., p. 101.

^{3. &}quot;Rehearing Ruling Awaited on FCC, AT&T and Execunet Appeals to Court," <u>Telecommunications Reports</u>, Vol. 44, No. 18, May 18, 1978, p. 18.

As the <u>Execunet</u> case illustrates, so little is known and understood about possible causal relationships in the marketplace that major decisions are sometimes based primarily on legal precedents which are subject to interpretation from many different viewpoints. When legal boundaries are not set by other factors, such as expert opinion based on empirical evidence, the courts may question the decisions of the Commission. However, it may be impossible for regulators to arrive at "firm policy determinations" until situations demanding decision making arise. One solution to this difficult problem might be a partnership of decision makers and academics who would share information and analysis techniques.

The next sections will probe more deeply the current transition of the telecommunications industry and the situations which now demand decision making by the FCC. Although discussions will focus on AT&T, Western Union, and the specialized carriers, we will also explore: influences from the unregulated sector, potential areas of competition, and the implications of technological innovation for new markets, especially public message services. New technologies and those stakeholders who are potential providers of public message services can also be identified as major forces that directly or indirectly affect the telecommunications industry. The contribution that evaluation of the deregulation of Western Union's public message services might make to understanding of the relationship among innovation, regulation, and other forces will also be explored.

D. TELECOMMUNICATIONS IN TRANSITION: DYNAMICS OF CHANGE

FCC decisions allowing new entrants into the private line and terminal equipment markets put pressure on the established carriers to update their offerings. This section will attempt to review AT&T and Western Union strategies to retain dominance and will identify current and potential competitors. It will also discuss other important forces in telecommunications as well as the Commission inquiry process, which provides the agency with a mechanism to communicate with industry.

1. AMERICAN TELEPHONE AND TELEGRAPH

a. POSSIBLE ADVANTAGE OVER LARGE AND SMALL COMPETITORS--OWNERSHIP OF THE NETWORK

Since the <u>Specialized Common Carrier Decision</u>, AT&T has reestablished itself as a supplier of the full range of private line offerings, including data transmission. In fact, according to a special report in <u>Business Week</u>, AT&T is developing marketing expertise and gearing up for a competitive marketplace. Its prime competitor may not be another communications firm, but a giant of the data processing industry, International Business Machines (IBM).

[deButts, ex-Chairman of AT&T] has set in motion a plan designed to change Bell from a regulated telephone company into a fiercely competitive supplier of all forms of communications systems, including computerized services that bear little resemblance to what AT&T has traditionally represented. The new direction will take AT&T into certain battle with the country's most technologically sophisticated and marketing-wise company--International Business Machines Corp. And . . . the word "telephone"--at least as we know the telephone today--will have about as much place in the company's name as the word "telegraph."

^{1. &}quot;Behind AT&T's Change At The Top, The Biggest Corporate Reorganization in History Puts Ma Bell on a Collision Course with IBM," <u>Business Week</u>, November 6, 1978, p. 115.

Currently before the Commission is an application from AT&T to provide an Advanced Communication Service (ACS). Resolution of this case will depend on the outcome of the Commission's redefinitions of data processing and communications services and on other factors such as the implications of the 1956 Consent Decree agreement between AT&T and the Justice Department. Currently, the Commission's maximum separation policy is in force. If a service is essentially data processing, it is unregulated and a carrier must offer it through a separate subsidiary. If it is communications, then the data processing firm must offer it through a subsidiary tariffed as a common carrier. However, modern communications requires some data processing functions; the Commission's objective seems to be to expand the opportunities of its carriers without damaging the data processing industry through overregulation. The data processing capabilities of the planned ACS system warrant describing this digital network "intelligent." What effect would this have on the data processing industry and on the terminal equipment market? How will ACS affect competition in the telecommunications marketplace since its services are similar to those offered by the specialized carriers?

[On the basis of market] research, [AT&T has] determined that ACS would find a user response in the data communications marketplace. We find the connection of approximately 137,000 customer terminals and computers to the ACS network by 1983 out of a total 3,600,000 terminals and computers estimated to then be in use.

. . . ACS provides a data communications solution for a number of intercompany applications, including: (i) Order entry from a manufacturer or distributor to its suppliers; (ii) transmission and control of freight shipment documents between shippers, freight carriers, and consignees; (iii) reservations processing between travel agents and airlines, car rental firms, and hotel and motel companies; (iv) claims processing between medical centers or doctors' offices and health insurance companies; and, (v) insurance policy and claims processing between independent insurance agencies and insurance companies.¹

1. "Data Communications Service of Far Wider Application Than Present Offerings, Known as Advanced Communications Service, Outlined by AT&T in Petition to FCC for Declaratory Ruling Service Is Allowed," <u>Telecommunications</u> Reports, Vol. 44, No. 28, July 17, 1978.

The following excerpt from the prospectus of Telenet Corporation, a specialized common carrier, expresses concern about another AT&T service and its reliance on laws fostering competition:

AT&T has introduced a new communications processing service, Transaction Network Services (TNS), which is oriented toward the banking and retail industries and is presently offered on an intrastate basis in the states of Minnesota and Washington . . . The company understands that consideration is being given within AT&T to the establishment of a new public data network which might offer communications processing capabilities similar in certain respects to those offered by the Telenet network . . .

AT&T has vastly greater resources than the Company, and the introduction of AT&T data communications services similar to those offered by the Company could have an adverse effect . . . The Company is also dependent upon AT&T for the majority of its existing transmission lines; however, AT&T is required by the Communications Act of 1934 and the antitrust laws to furnish such facilities to all customers on a nondiscriminatory basis.

b. AT&T AND FIBER OPTICS

In Atlanta, Georgia, in 1976, AT&T installed the first Bell (and the first domestic) experimental fiber optics system. There are currently six common carrier-owned fiber optics systems in the United States--two belonging to AT&T and five owned by cable television companies. There are 56 operating systems worldwide. According to a recently established newsletter, <u>Fiber Optics and Communications</u>, this figure represents an increase of over 53 percent worldwide since February 1978. Market surveys indicate that fiber optics will come into its own around 1982, when the costs of interconnecting fiber optics equipment will be less. Applications for this emerging transmission technology are numerous.²

^{1.} Prospectus submitted by Telenet Corporation to the Securities Exchange Commission, December 21, 1977, pp. 21-22.

^{2.} Neither Western Union nor any of the specialized common carriers, to our knowledge, have yet experimented with fiber optical systems. For more information, <u>see Fiber Optics and Communications Newsletter</u>, published by Information Gatekeepers Inc., Vol. 1, No. 7, August 1978.

c. AT&T AND TELETEXT-VIEWDATA SYSTEMS

Teletext-Viewdata systems, developed jointly by the British Post Office (BPO), TV manufacturers, and the British Broadcasting Corporation, were recently discussed at a National Academy of Sciences symposium which was initiated by the National Research Council's Board of Telecommunications-Computer Applications. One advantage of new services such as these would be that greater use would be made of residential telephone lines, now used only 20 minutes a day on the average in the United States.

On June 1, 1978, the new services went into operation experimentally in Britain. The systems provide access to a computer-based information system that uses an ordinary TV set as the display terminal and transmits through the British telephone network. Users have access to information supplied by more than a hundred information providers. Proponents say that it will complement existing similar services rather than compete with them. Systems such as these will probably provide an alternative to mail service. They could handle mail orders, charity donations, and travel arrangements. Some believe that this innovation may result in a new industry: electronic publishing. If systems such as these are successful in the long-run, home terminals might bring these services directly to the public.¹

The success of the British system would have important implications for the types of decisions made in the United States. However, many legal and technical problems would have to be resolved. The question of standards, for example, was a focus of controversy at the symposium. Other areas of concern included:

^{1.} For a complete description, <u>see</u>: "Science in Europe/British May Use Telephones, TV's, to Tap Data Bank," <u>Science</u>, Vol. 201, July 7, 1978, pp. 33-34.

- need for digital switching to be implemented and paid for, probably by the public;
- the impact on competition and current restrictions on resellers;
- the government's role in relation to systems that could add to literacy and open the door to services such as electronic mail and electronic funds transfer;
- current law which states that AT&T may not provide Viewdata service when it provides the wire; and,
- current Commission computer rules which specify that if Viewdata is considered data processing, AT&T may not provide it even though one benefit of Viewdata is increased use of telecommunications facilities.¹

In September 1978, the British Post Office announced that the Viewdata service would become available to users in the United States in 1979. This announcement was the result of an agreement "in principal" on a U.S. license for the service with Insac Data Systems Ltd., a firm set up by Great Britain's National Enterprise Board to market British computer systems and software overseas.

Under the agreement, Insac will open a viewdata service from a computer in the U.S. within six months of the start of a public Prestel in the United Kingdom, planned for the first quarter of 1979. Insac service will receive from the BPO exclusive rights to the use of viewdata computer programs and know-how in the U.S. and it will also have full access to the results of the BPO's continuing research, development and operating experience . . .2

d. AT&T, XEROX AND IBM

On November 16, 1978, Xerox filed a petition with the Federal Communications Commission to enter the telecommunications industry through a subsidiary, Xerox Telecommunications Network. This situation potentially

^{1.} See "Potential Impact of Computer Based Information Systems on Phone Plant Among Issues Explored at National Academy Viewdata-Teletext Symposium," <u>Telecommunications Reports</u>, Vol. 44, No. 43, October 30, 1978, pp. 32-33.

^{2. &}quot;BPO Announces Agreement to Make Viewdata Service Available in U.S.," Telecommunications Reports, Vol. 44, No. 36, September 11, 1978, p. 31.

involves a three-way competition between AT&T, Xerox, and IBM (depending on forthcoming Commission decisions). Xerox plans to build and operate a nationwide digital communications network and lease channels on common carrier satellites such as RCA Corporation's Satcom or the Western Union Corporation's Westar.

On the ground, Xerox's planned digital network could bypass AT&T's network completely and might give resellers an additional alternative for leasing transmission facilities. It might also provide alternate facilities for systems such as Teletext-Viewdata. The implications for satellite competition are also complex.

(1) AT&T AND THE DOMSAT MORATORIUM: A three-year moratorium on AT&T's provision of specialized private line services via satellite is coming to an end. RCA American Communications and Western Union are petitioning the Commission to extend the moratorium.

(2) AT&T AND SATELLITE BUSINESS SYSTEMS: In partnership, IBM, the Communications Satellite Corporation (COMSAT), and Aetna Life and Casualty Company, have parented Satellite Business Systems. The District Court of Appeals recently overturned Satellite Business Systems' FCC authorization to construct its system. The court based its decision on Section 11 of the Clayton Act and indicated that, before granting any authorizations, the Commission is required to hold a hearing on potential antitrust violations which might result from the merger of IBM, Aetna and COMSAT. The case may hinge on the Commission's decision on the importance of the satellite market; in other words, how important is satellite telecommunications market in relation to the telecommunications market as a whole? In the meantime, Satellite Business Systems is reportedly continuing operations as scheduled.¹

^{1.} For additional details, see "SBS And The Courts," EMMS, Vol. 2, No. 18, September 15, 1978, pp. 7-9.

(3) SUMMARY: Xerox, IBM, and AT&T (like others in the industry) are relying on some convergence of data processing and communications. For example, besides the telecommunications subsidiary, Xerox can also call on the talents of two other operations with which it has merged: Xerox Business Systems (offering facsimile, word processing, and non-impact printer services) and Xerox Computer Services.¹

The initial target market of Xerox, AT&T, and IBM telecommunications services is commercial, but there are slight variations:

[SBS] seeks to provide a large-capacity, digital, intracompany communications service for only the largest companies. . . . AT&T, on the other hand, through [ACS] is proposing a nationwide network to switch digital computer data between terminals of different speeds and formats. The AT&T service would be land-based, while the I.B.M. system would operate through satellite directly to earth stations located on the customer's premises.

. . . The [Xerox] system would speed up communication times between long distance facsimile machines, computers, word processing equipment, and distributed data processing networks.

. . . The service [according to a Xerox official] would make high speed communication available to the small businessman, "the five man law firm or the regional shopping chain". . . 2

Xerox is calling the ultimate service for the business communications market the "office of the future." Xerox has been experimenting with its Office Information Systems for some time and supposedly was to install an "office of the future" information system at the White House. However, due to technical problems, the Secret Service felt that the Xerox system might camouflage eavesdropping taps. A solution to this service problem would be fiber optics. It seems logical that Xerox would be investigating a conversion to this technology and onlookers are already wondering about this possibility. For additional details, see "Fiber Optics, Xerox, The Secret Service, and The Office of the Future," Fiber Optics and Communications Newsletter, Vol. 1, No. 7, August 1978, p. 3.
 Schuster, Peter J. "Xerox is Entering Telecommunications, Will

Challenge AT&T, IBM," <u>New York Times</u>, November 17, 1978. For more information see, "Xerox Asks FCC to Allocate Super High Frequencies for Nationwide Digital Broadband Network, to Provide New Common Carrier Electronic Message Service," Telecommunications Reports, Vol. 44, No. 46, November 20, 1978, pp. 1-4.

Although AT&T, SBS, and the Xerox systems are aimed at the commercial markets, it is hoped that the benefits of these technological advances will eventually be made available to the public.

2. WESTERN UNION TELEGRAPH COMPANY

a. RESPONSE TO A COMPETITIVE ENVIRONMENT

In spite of Section 222 and its monopoly status, Western Union has for some time encountered competition from both the regulated and unregulated sectors. As early as September 1973, a study of the domestic telegraph industry was prepared for the Office of Telecommunications Policy (now NTIA).² The study attempted to identify public message services users and any available service alternatives. Among alternatives, the report listed telephone, teleprinter, public mail, and local messenger services; private network ownership (for large-volume users); Bankwire, American Express, and the

1. The Western Union Telegraph Company is controlled by the Western Union Corporation (Delaware) which, as holding company controls 92 percent of the Company's stock. In addition, Western Union Corporation administers the following subsidiaries:

- The Western Union Telegraph Company
- PR Newswire Association, Inc.
- Western Union Realty Corporation
- Western Union Data Services Co., Inc.
- Western Union Overseas, N.V.
- Western Union Teleprocessing, Inc.
- Distronics Corporation
- Western Union Computer Utilities, Inc.
- Western Union of Hawaii, Inc.
- National Sharedata Corporation
- Telstat Systems, Inc.
- CPI Microwave, Inc.
- Western Union Electronic Mail, Inc.
- Western Union Space Communications, Inc.

2. The Office of Telecommunications Policy, formerly located in the White House, is now located within the Department of Commerce and is known as

the National Telecommunications and Information Administration.

Postal Service (for money order service); leased lines, teleprinter, and public message telephone service (for press messages).

It may suffice, however, to indicate that many kinds of substitutes are technologically possible and probably economically feasible. The public has often been compelled to change its habits with the obsolescence or unavailability of a commodity or a service: the municipal streetcar. . . the family doctor who no longer makes housecalls, etc. If there were no technology available to compete with the telegram, the problem would take on a different perspective. But the service is heading toward its own demise. During the time period when virtually all communications services have experienced vast service expansion (1942-1972), PMS traffic has dropped 90 percent . . . Obviously, communications users, whose numbers have not declined, have successfully sought and achieved workable service alternatives. Outdated regulatory constraints will continue to deter further substitutes. To continue this situation any longer is to . . . deny the public adequate public message service.1

Also in the 1970s, specialized common carriers were emerging as a result of the 1971 decision to open competition in nontraditional telecommunications fields such as data communications. The specialized common carriers currently offer services (such as facsimile service) which can be converted to public message services. Some experts believe that the FCC <u>Resale and Shared Use</u> <u>Decision</u> may be especially important in opening the public message services market to competition.

. . . . today's telegraph service is essentially a value added communications service which could be offered by competing resale suppliers. The public message service is an offering of service rather than an offering of facilities or hardware. This service is provided by adding value or augmenting basic transmission capacity generally obtained from the telephone company . . .

^{1.} Gabel, Richard and Karydes, Marianne. <u>Policy Research Estimate</u> prepared for the Office of Telecommunications Policy, September 1973, pp. 33-34. <u>See also</u>, the Appendix, pp. 45-51, which presents specifically value-added alternative services.

Value added services using computerized message switching, multiplexing,¹ message storage and retrieval are not characterized by pervasive economies of scale²

Evidence suggests that Western Union would be receptive to leasing its transmission lines to resale carriers. As public message services volume declined, the Company explored new sources of revenue. One was leased transmission line service. Also, the company has an extensive investment in a computerized message switching system (introduced in the 1960s) and, even today, the system is not being used for the variety of applications and services originally expected. However, it is interesting to note that a steady decline in number of Western Union telegraph offices and agencies stopped in 1976. See Figure III-1. Upcoming Commission decisions will probably have a significant effect on Western Union's future service offerings.

As this paper hopes to show, traditional telegraphy (and perhaps traditional telephony as well) has been supplanted by new technologies and alternative services. We still do no know whether the public--business and residential--will be better served by one, a few, or many telecommunications firms or what characteristics the service(s) will have. We hope to learn during this project whether the public message services market can be revived and why or why not.

The rest of this section will discuss Western Union's operation and current interest in electronic message service.

^{1.} Message switching is a technique that involves receiving a message, storing it until the proper outgoing circuit or station is available, and then retransmitting it to its destination. Multiplexing means dividing a transmission facility into two or more channels--a channel being a path for electrical transmission between two or more points. See also Glossary.

^{2.} National Telecommunications and Information Administration, U.S. Department of Commerce. "Comments before the Federal Communications Commission In the Matter of Regulatory Policies Concerning the Provision of Domestic Public Message Services by Entities Other than the Western Union Telegraph Company and Proposed Amendments to Parts 63 and 64 of the Commission Rules," Common Carrier Docket No. 78-96, June 22, 1978, pp. 16-17, p. 31.





b. THE INFOMASTER SYSTEM:

During the 1960s, Western Union consolidated and modernized key elements of its service operation. The company introduced: (1) Infomaster, a central computer switching facility (which made it competitive with other electronic message services); and (2) three <u>Central Telephone Bureaus</u> which provide access to PMS and other services through IN-WATS telephone lines. It also consolidated and closed many offices and agencies. Commission authorization was granted for each of these moves. Western Union attributes \$212 million of its development cost to public message services-related improvements. A recent <u>New York Times</u> article succinctly described the changing nature of Western Union's public message telegraph service:

"The public decided the telegram issue for us," said Mr. McFall [Chairman of Western Union]. . . "Volume just declined steadily. We modernized offices--didn't make any difference. We cut the price 25 percent--no improvement, we advertised in 13 cities and didn't generate a single telegram."

The fact that Western Union cut back on its offices across the nation and replaced them with part-time "agents" such as florist shops, grocers and others sharply reduced company overhead--and, critics say, cut service.

Customers complain about the service . . . A woman in New Milford, Conn., wondered why a money order that she sent never reached her son in Oro Station, Canada. If the sending clerk had checked before dispatching the money order, he would have discovered that there was no office anywhere near Oro Station. A message cancelling the money order was returned to the woman-four months later.

The article continues with a discussion of the evolution of telegraphy service from a labor-intensive to a capital-intensive market.

To replace the thousands of personnel who once punched out messages from store-front offices across the nation, Western Union now relies on three centers where operators take messages on a tollfree number on the telephone. The messages are punched directly into a computer [Infomaster] in rural Virginia, near Washington. The computer relays the message to local offices or--much more likely to local post offices, where letter carriers deliver them the next day as Mailgrams . . .

The computer center, which has an identical back-up system near St. Louis is a technological marvel, and is thought to be the largest electronic switchboard in civilian use. It receives all of Western Union's traffic, including telegrams, messages across the TWX and Telex leased network, and even incoming international data from Western Union International, a separate and independent company. . .

1. Holsendolph, Ernest. "Western Union's Monopoly Challenged; Western Union Cheers," New York Times, March 19, 1978.

The company, which has already spent \$1 billion on expansion, is thinking ahead . . . to the day when satellite communications will be received by individuals in 15-foot or smaller [microwave] dishes on rooftops . . . 1

In the meantime, electronic data technology and telephone lines have become primary alternatives to traditional public message telegraph service.

c. WESTERN UNION AND THE UNITED STATES POSTAL SERVICE (USPS)

In 1970, the Commission authorized a joint Western Union/USPS offering, the Mailgram. Mailgram is somewhat slower and less expensive than other public message services; customers' messages are transmitted via Western Union facilities to a post office for inclusion as preferential mail in the next day's postal delivery. The USPS is expanding the Mailgram concept by introducing an Electronic Computer-Originated Mail service (ECOM), which is raising many questions in the areas of communications regulation, data processing, and postal regulation. Like telegram service, mail service, which was originally labor intensive, now also finds itself competing with capital-intensive, declining-cost, telecommunications services.

On September 7, 1978, the U.S. Postal Service Board of Governors approved a new electronic mail service and submitted it to the independent Postal Rate Commission as a new subclass of First Class Mail.

The USPS and Western Union Telegraph Co. have signed a contract, covering a 15-month preliminary phase and including an option for the Postal Service to continue for an additional three years of operation, for provision of the electronic computer originated mail (ECOM) service, which, it was said, could begin as early as Dec. 15.

Selected mailers with the necessary computer capability and sufficient volume would be able to transmit messages electronically to 25 specifically equipped "serving post offices" [SPOs] around the country. At these locations, the messages would be electronically printed, mechanically enveloped, and then processed through the normal mail

^{1.} Holsendolph, Ernest, op. cit.

stream. ECOM messages would receive two-day delivery anywhere in the country, and would cost between 30 and 55 cents per message, depending upon the customer's volume.

Under this agreement, Western Union would provide the switching and transmission capability [via Infomaster] for the new service, while the USPS would have responsibility for marketing and message delivery.¹

Within the same month, Western Union wrote a letter to the Commission, stressing that, in connection with its planned provision of transmission service for ECOM, the company would not be engaged as a common carrier for hire.

Western Union pointed out that the Commission's rules contemplate noncommon carrier activities by common carriers, and the FCC has determined that the transfer of flowers, candy and gifts is not a communications service. Since mail, like flowers, candy, and gifts, is not subject to the Commission's jurisdiction, its handling on behalf of the Postal Service should not be regarded as a common carrier service.²

The Commission has subsequently ruled that Western Union must submit a tariff on the ECOM service. On January 25, 1979, the Commission voted to hold a formal inquiry regarding the ECOM question.

(1) IMPLICATIONS OF ECOM: <u>EMMS</u>, a newsletter published by International Resources Development, Inc., recently printed an article analyzing the longand short-term implications of the ECOM system.³ The article raised the following questions:

How will ECOM affect Mailgram? (Its growth is expected to slow by 15 percent during the next five years.) Will ECOM reduce the value of other high priority message services such as Datagram and Faxgram?

1. "Electronic Mail Service for High Volume Users, Expected to be Ready by Dec. 15, announced by USPS; Western Union to Provide Transmission." <u>Tele-</u> communications Reports, Vol. 44, No. 36, September 11, 1978, p. 14.

2. "In Letter of FCC, WU Says Its ECOM Activity Will Not Be Common Carriage." <u>Telecommunications Reports</u>, Vol. 44, No. 38, September 25, 1978, p. 15.

3. For details, see, "USPS Announced Electronic Mail Service: Crosses Regulatory Rubicon," EMMS, Vol. 2, No. 18, September 15, 1978, pp. 4-6.

- Does ECOM make the USPS a common carrier subject to Commission regulation? Is the USPS acting like a resale or value-added common carrier?
- Does ECOM qualify USPS as a computer service bureau? How will the data processing industry react to a possible intrusion by the USPS?
- If USPS moves further into electronic mail, it could offer bill consolidation services and develop a data base on financial transactions for almost every citizen in the United States. How will this affect privacy issues? Will companies and the general public want to use the USPS in this capacity?
- Will the presence of the USPS inhibit smaller companies from entering the electronic message services field?

(2) ECOM AND FACSIMILE: Advanced facsimile networks are already on the market and there is an interest at the international level in compatible fax machines. The latest research in facsimile technology is being devoted to fully integrated facsimile and message switching systems. David Mack, manager of Network Marketing for a firm called Rapicom, believes that Message Switchable Fax will become:

[A] key component of future electronic mail systems and, in some cases, the only component.

This belief is based on the advantages of facsimile in general [and the fact that] the advantages that used to apply only to TWX/ Telex and other keyboard systems . . . are available to the facsimile user.1

This facsimile network option is in the first stages. A separate keyboard and other peripheral devices are still necessary for proper entry into a message switching network. Success in marketing and creating demand for this facsimile option will undoubtedly be an important factor in whether

^{1. &}quot;Rapicom and the New Facsimile Era," <u>EMMS</u>, Vol. 2, No. 18, September 15, 1978, pp. 9-10. <u>See also</u>, "The Facsimile Market Verges On A New Era," EMMS, Vol. 2, No. 16, August 15, 1978.

this innovation is pursued. Primary stakeholders in the manufacture of facsimile equipment include, besides Rapicom: Graphic Sciences, Inc., Qwip, Xerox, and 3M.

(3) ECOM AND CONGRESS: A Senate Government Affairs Committee Report said that the USPS "immediately should pursue opportunities to provide services which utilize existing electronic communications with the unique collection and delivery systems of the Postal Service," and "for the future, the Postal Service should determine within the next two years whether the communications needs of the American public require electronic collection, transmission and delivery."¹

The Commerce, Science and Transportation Committee emphasized that:

"the most persuasive case for Postal Service involvement in electronics will be made where it can be shown that services can be made available to the public by the Postal Service which would not be made available by the private sector" . . . The committee said it expects USPS to "look beyond the types of services it may be able to provide to such additional matters as how to structure its procurement practices to have the least disruptive effect upon the competitive market."²

3. THE SPECIALIZED COMMON CARRIERS

Expert Commission staff believe that once the regulatory restrictions on public message services competition are lifted, challengers to Western Union's dominance in this market may come from the specialized common carriers. A review of specialized common carrier tariffs verified that this group has the transmission capabilities, and some of them (e.g., Graphnet, MCI, and Southern Pacific Communications Corporation) already offer services which are convertible

^{1. &}quot;Bill Limiting Electronic Postal Service Awaits Turn On Floor Of Senate": <u>Telecommunications Reports</u>, Vol. 44, No. 38, September 15, 1978, p. 13.

^{2.} Ibid.

to PMS (namely, facsimile services) on a subscriber basis. Specialized common carrier offerings are generally described as intercity communications channels of various types, bandwidths, and data speeds designed to provide transmission of voice, data, and/or facsimile, and other special-type, dedicated services. A simple way to categorize these carriers, and the one used by the Commission, is:

- The Specialized Satellite Common Carriers

 American Satellite Corporation (ASC)
 Satellite Business Systems, Inc. (SBS)
 Southern Satellite Corporation
 RCA American Communications (RCA Americom)
- The Specialized Microwave Common Carriers

 Goeken Communications, Incorporated
 ITT-United States Transmission Systems (USTS)
 MCI Telecommunications
 Southern Pacific Communications Company (SPCC)
 Transportation Microwave, Inc.
 Western Telecommunications, Inc.
- The Specialized Value-Added or Resale Common Carriers
 -- ITT-Corporate Communications Systems (CCS)
 -- Graphnet Systems
 - -- Telenet Corporation
 - -- Terenet Corpora
 - -- Tymnet

This classification system is based on primary transmission mode. For example, although a satellite carrier may have access to microwave and other types of transmission facilities, its main transmission mode is satellite.

The discussion of the specialized carriers will concentrate on two aspects of their operations: (1) their diversity, and, (2) their complex competitor relationships.

a. DIVERSITY

As their name implies, the specialized common carriers are different from the traditional common carriers and even different from one another. For example, Southern Pacific Communications Corporation is nationwide; Goeken Communications' services are offered only in the Chicago, Illinois, and Milwaukee, Wisconsin, areas. Southern Pacific constructs its own transmission channels; Telenet prefers to concentrate on development of specialized microcomputer-based systems called "Telenet Processors," which are used as network access concentrators.¹ Southern Pacific offers a wide range of specialized services; Telenet and Tymnet offer only data tansmission services; Graphnet offers only facsimile. We do not presently know a great deal about the financial conditions of these companies. Some are suspected to be operating at a loss; however, only one specialized carrier to date has gone bankrupt.

The diversity of these carriers illustrates a major problem facing the Commission: how to establish fair standards for competition. When diverse carriers serve overlapping markets, the possibility of establishing standards that all carriers will perceive as fair is probably small. However, in encouraging a competitive environment, the Commission will certainly aid AT&T and Western Union, and all carriers under its license, regardless of characteristics.

b. A WEB OF COMPETITORS

As we stated above, the specialized common carriers are diverse. Common carriers, including the specialized ones, do not necessarily compete only with carriers of similar size and resources. A common carrier identifies its competitors in terms of service capabilities or markets, and common accessibility to geographic locations via a network. The following excerpt

^{1.} Concentrators improve efficiency of data or voice transmission by allowing terminals or lines to compete for and share transmission channels.

from a prospectus of the Telenet Corporation describes its immediate and potential competition and illustrates the complex competitive relationships which can exist.

Only one firm, a wholly-owned subsidiary of Tymshare Inc. [Tymnet], presently provides data communications network service in direct competition with the Company . . . However, two other firms have received FCC authorization to establish and operate public packet switching networks [Graphnet and another subsidiary of ITT which is not included in the list of specialized carriers since it does not yet have a tariff on file], in both cases to furnish data and message communication services. . . In addition, it is possible that one or more firms operating large private data communication networks, such as General Electric Company, Information Services Division or other time-sharing computer service companies, may seek FCC authority to provide communication services on a value-added carrier basis.

The Company also competes with private-line and circuit switched² data transmission services offered by telephone and telegraph companies, specialized microwave common carriers and domestic satellite carriers. . . . A variety of traditional and new circuit switched common carrier services is also available to . . . users. Traditional offerings . . . include regular long-distance telephone services and Wide Area Telecommunications Service (WATS), furnished by the telephone companies, and the telex and TWX services furnished by the Western Union Telegraph Company. New circuit switched service offerings specifically designed for data transmission include the Datadial service of Southern Pacific Communications Company and [AT&T's] Dataphone Switched Digital Service . . . Although capable of higher speed operation, the Telenet network is today used predominantly for low-speed data transmission (1,200 bits per second and below). To the extent that the Company becomes more active in the high-speed marketplace it will be in direct competition with these new circuit switched services. . . .

^{1. &}quot;A packet switching network operates by converting data from customer terminals and computers into short blocks called packets for transmission through a network. The packets are rapidly stored and forwarded from one switching center to another." Prospectus of Telenet Corporation dated December 21, 1977, p. 16.

^{2.} A switched network in which switching is accomplished by disconnecting and reconnecting circuits in different configurations in order to set up a continuous pathway between the sender and the receiver.

The Company's planned deferred-delivery message switching service, which is the subject of a pending FCC application . . . will compete with unregulated private message-switching systems, some of which utilize the Telenet network for transmission. Other competitive alternatives to the Company's planned message service include such public services as telephone, telex, TWX, telegram and mail service.¹

E. INVESTMENT, R&D FUNDING, AND CORPORATE STRATEGY

In studying how technological innovation is introduced into the telecommunications marketplace we might address many issues that, at first, may not seem to be related to technology. Among these are investment patterns, research and development funding, and corporate decision making, as well as the effects of government regulation. Some academics now believe that technological innovation is primarily a function of economics, and that factors such as economies of scale and cost and demand factors play the major roles. Others believe that factors such as key individuals are more crucial. Before deciding whether to--or even how to--conduct research and development which might lead to innovation, the controlling executives of a firm might examine political climate, regulatory control, ease of funding, advantageous intercorporate agreements, level of risk, potential competition, etc. All these factors can affect innovation and/or the market structure of an industry. The first early agreement between AT&T and Western Union laid the groundwork for a subsequent monopoly market structure which was also encouraged by other economic, political, and technological factors. Although these influences on market structure and on the introduction of technological innovation into a market have existed since the beginning of

1. Telenet Corporation. Prospectus submitted to the Securities Exchange Commission, December 21, 1977, pp. 21-22.

telecommunications, we do not know much more today than we did in the past about the relationships of these influences.

In this section, we will take a brief look at the ownership and investment patterns of some specialized common carriers and the possibility of transferring ideas and money from the public to the private sectors.¹ These situations illustrate this complex environment, which cannot be directly controlled by the regulator. Decisions made by the major "actors" in this environment also affect market structure and innovation. We will present some examples of technology transfer and also an example of a decision made outside of the Commission that might affect PMS.

Information presented in this section has been gathered from tariff filings, prospectuses, promotional materials such as press releases, Department of Commerce library materials, or telephone conversations with stockbrokers and carrier employees, and it will require further verification by industry. So far, the work represents a small initial effort. As mentioned at the beginning of this chapter, further examination of theories in various literature is needed. Measurement links to the literature are also needed.

^{1.} This sort of transfer is not limited to the specialized carriers. The established carriers may have as much or more direct contact with government research. For example, Western Union does very little independent research and development. But, Western Union Space Communications has contracted with NASA to construct components for NASA's tracking and data relay satellite system, and those components may be used by the advanced Westar system for commercial purposes. <u>See</u>, "Western Union Spacecom Asks Continued Waiver for TDRSS/AW Construction," <u>Telecommunications Reports</u>, Volume 44, No. 28, July 17, 1978, p. 17.

1. AN EXAMPLE INVOLVING OWNERSHIP AND INVESTMENT PATTERNS OF THE SPECIALIZED COMMON CARRIERS AND AN EXAMPLE OF TRANSFER OF TECHNOLOGICAL INNOVATION

As mentioned, Telenet Corporation faces a great deal of competition. Larger companies, such as AT&T, are beginning to introduce services that might be described as imitating the data communications services which are now offered only by Telenet and one other specialized carrier. Telenet's chances of surviving in a competitive market with AT&T, Western Union, and larger specialized common carriers, as well as the international carriers (Telenet operates in 22 foreign countries) seemed small. However, on December 12, 1978, General Telephone and Electronics (GTE), the nation's largest independent telephone company, announced its intention to purchase Telenet for four times the small firm's asset value. This move indicated their belief in the continued viability of Telenet's packet switching technology. A review of investment patterns prior to this announced sale shows that, although Telenet operated at a loss, securities brokers and underwriters continued to invest heavily in the firm. (See Figure III-2.)

The takeover by GTE also poses some interesting and unusual regulatory issues because of the size of the companies involved and their diverse characteristics. Telenet can be fully competitive with the larger carriers if it is able to call on the resources of GTE. Previously the Commission has been less stringent in its regulation of specialized carriers such as Telenet than in its regulation of larger carriers such as AT&T and Western Union. For example, the Commission rules require very specific cost support documentation from AT&T, but allow reviewers to use their discretion in judging the adequacy of cost support supplied by other carriers. The Commission is presently reviewing its regulatory requirements in this area.



Source: Review of Miscellaneous Documents including Prospectuses, Tariffs, Telephone Interviews with Stockbrokers, and standard works. Note that all information presented here must be further verified.

l Iffs, Telephone Interviews with Stockbrokers, and standard works. Ifled.

80

PATTERNS OF OWNERSHIP AND INVESTMENT--EXAMPLES FROM SCCs FIGURE III-2:

Figure III-2 illustrates ownership and sources of funding from stock sale for twelve specialized common carriers. The figure shows that the SCC parent companies are both regulated and unregulated and include some large companies such as Fairchild Industries and IT&T. Parent companies have varying degrees of control over their subsidiaries. It is possible for decisions which may affect the carrier's actions in the marketplace to occur outside of the carriers's own management. Parent companies also represent other industries: data processing, transportation, insurance, investments, and banking. Both IT&T and Fairchild Industries, of course, are well-known conglomerates involved in both regulated and unregulated businesses. IT&T is active in insurance, publishing, and the hotel industry; Fairchild, in manufacturing, space electronics, and military and commercial aircraft production.

Also, when an investment firm has a certain amount of stock in a company, it can place one of its members on the company's board of directors. For example, Allen & Company, a large, high-risk venture firm, has a member on MCI's board of directors. The same underwriters can also own stock in competing companies. How are decisions made under these circumstances? Can withdrawal of support affect a company's survival?

Telenet Corporation was primarily responsible for the introducting packet switching commercially in 1975. This firm presents an interesting example of technology transfer. Telenet Corporation's stock is sold directly on the market because its parent companies are investment firms. Starting with Telenet, we can trace relationships involving many diverse companies:

- Telenet has 82 underwriters. One is Allen & Company.
- Allen & Company also underwrites Graphic Scanning and MCI.

- Directors on the board of MCI include a member of Allen & Company and one director who (according to a 1978 edition of Standard and Poor) is or was a director of Xerox, IBM, and RCA.
- The founder of MCI is John Goeken, head of Goeken Communications, who still owns stock, but is not involved in MCI decision making.

Packet switching was developed by the Advanced Research Projects Agency (Arpanet) of the Department of Defense in cooperation with a high-risk research and development firm, Bolt, Beranek and Newman Inc. (BBN), one of Telenet's parent companies. What other factors convinced Arpanet, BBN, and perhaps others to develop packet switching? Was easy transfer to the private sector taken into consideration?

Matters such as those described above are not under the control of the regulator. How important are they? How can the regulating agency monitor the effects of outside forces, in order to better predict industry trends? Do these outside forces affect the Commission's ability to fulfill its responsibilities as outlined by the mandate of the Communications Act of 1934? Questions such as these illustrate the problems facing the Commission in further developing and defining the rationale, scope, and practice of regulation in this area.

2. SOME EXAMPLES OF TYPES OF INFLUENCES ON INNOVATION IN TELECOMMUNICATIONS

The preceding section described a technology transfer from the Department of Defense to the telecommunications industry. The Advanced Research Project Agency presents one example of how some government programs can influence innovation.
Besides packet switching, another interest of this agency was to sponsor development of an electronic mail system by BBN, the Hermes message system.¹ This system was an outgrowth of the Data-Based Message Service (DMS) developed for the Advanced Research Projects Agency by M.I.T., the University of Southern California Information Sciences Institute, and BBN.

Interestingly many veterans of Advanced Research Projects Agency work are also involved in the Personal Computer Network (PCNET) project, which is composed of computer hobbyists in Palo Alto. This group is designing a system which would allow hobbyists' computers to be interconnected over ordinary telephone lines for messages, data processing, or file transfers.

The importance of these hobbyist activities should not be underestimated. First, they are a means of quickly introducing a large number of people to the possibilities of [electronic message systems]. Second, the low capital cost of hobbyist equipment sharply reduces the economic and technical barriers for a would-be entrepreneur working out of his garage to offer hybrid data processing/ communication services. Together these trends could result in the creation of a broad constituency for more relaxed regulation of computer communication.²

An example of a formal technology transfer program can be seen at NASA. One ongoing program at this agency is the Space Industrialization Concept. (See Appendix C.) NASA also contracts with some carriers, such as Western Union's Space Communications, Inc., or even parent companies such as Fairchild, to help conduct their space program. For example, Fairchild participated in

2. See Kalba, Konrad K., et al.: op. cit., p. 86.

^{1.} Hermes is only one electronic message system; many are being developed by firms such as Digital Broadcasting Corporation and Scientific Timeshare Corporation, as well as by AT&T, Western Union, and the Postal Service. For a complete description of these systems, see Kalba, Konrad K., et al.: Electronic Message Systems: The Technological, Market and Regulatory Prospects, April 1978.

construction of the space shuttle, Enterprise. This type of government/industry activity might also influence innovation.

Another factor that might influence innovation is congressional activity. In September 1978, H.R. 14046, the Public Service Satellite Communications Bill, was introduced into Congress. Actual research activity will be administered by NASA if the bill is funded. However, members of the House are specifically concerned with communications technology applications which might be in the public interest, but which are not within the capability of commercial communications firms to provide in the near future. Some applications mentioned in the bill are below.

It is in the public interest to encourage the planning and development of noncommercial communications satellite services in such areas as health care delivery, education, search and rescue, electronic mail, teleconferencing, and environment data collection which cannot presently be made available at affordable cost by technology now being used by common carriers for producing conventional telephone and television services.¹

F. THE COMMISSION'S INQUIRY PROCESS: FORUM FOR DIALOGUE WITH THE INDUSTRY

In the preceding sections, a number of cases pending decision before the Commission were discussed. The Commission addresses these cases directly or indirectly by means of an inquiry process in which interested parties are allowed to comment formally on these cases. A decision regarding Advanced Communications Service will be related to any rulemaking resulting from the Computer Inquiry. Conversely, each inquiry involves several policy issues.

^{1.} Representatives Ottinger, Rose, and Fuqua. H.R. 14046, Public Service Satellite Communications System Bill, presented to the Committee on Science and Technology, September 1978.

Because the Commission traditionally makes decisions on a case-by-case basis, there has perhaps been less interest in seeing the similarities among cases. We propose to test the feasibility of transferring knowledge gained from one inquiry to another, and to use the PMS deregulation as a vehicle for developing a more purposeful data-gathering approach. Information gathered by evaluation staff may be used by the Commission in evaluating its procedures.

We began to examine commonalities among cases by conducting content analyses on materials that were either directly or indirectly related to the public message services deregulation. Specifically, the analyses included:

• Comments submitted to the Commission by parties wishing to participate in the decision-making processes of five inquiries:

--Western Union Monopoly Inquiry --Computer Inquiry --Telex/TWX Inquiry --Gateway Inquiry --MTS/WATS Inquiry

Witness testimony, before the Subcommittee on Communications of the House Interstate and Foreign Commerce Committee, in regard to H.R. 13015, the Communications Act of 1978.

During the analysis, we found that specific issues in each case could be used to help identify generic issues which cut across cases. This process is illustrated in Figure III-3. In the figure, generic issues are listed in the lefthand column. Their specific expression in each inquiry is shown across the columns. It should be noted that the generic issue has not been identified in every inquiry. This does not necessarily mean that there is not one. In time, this list will be expanded to include other generic issues. More work on this matter must be done as the evaluation progresses.

A generic issue of great interest to ETIP is, "Will deregulation encourage technological innovation?" (Issue IV). In the Western Union Monopoly Inquiry, the specific issue is, "Will deregulation encourage entry of innovative public message services technology?" Figure III-3 shows that the

s of communi- bes Telex/TWX service have can the international marketp ave natural characteristics varranting support the addition of new characteristics continued monopoly status? securities interfere with the in- connection of the internation connection of new interfere interferent inton services be adversely inton services be adversely inton service monon into a streated? inton service monon into a streated? inton service monon into a streated? inton service monon international carriers inton service monon international carriers intones pholic message service intones pholic message service intones international services be adversely intones pholic message service to the intonesting atternational carriers ability to introduce intonesting atternational carriers ability to introduce introversing be international carriers introsesting be international and domestic introsesting introduce intoversing be international atternational carriers ability to introduce introverset be adversely affected? introsesting introduce intoverset be adversely affected? introsesting be international and domestic introverset be adversely affected intoverset be international atternational and domestic introverset be adversely affected introduce intoverset be adversely affected intoverset be international and domestic introduce international atternational and domestic international atternational and domestic international and domestic international atternational atternational atternational is add cartan is add cartan is of data is add communi- is internations international atternational atternational is add communi- is internations international atternational atternational is add communi- ition and encound be it into the adversely would fair come it into the adversely atternations in the advers
Will unlimited competitive in will unlimited competitive in connection of the internation carriers interface with the tun- nicral efficiency of Meeseen Union's network? Will Wester Union's network? Will Wester Union's public message intone acriters intereased, will Wester Union's public message service services be adversely affected? If Plax/TWX rates are not Union's public message intone acriters intone acriters international acriters intone acriters intone acriters international acriters intone acriters intone acriters intone acriters international acriters international international acriters international acriters internati
If Telex/TWX rates are not if the international carriers increased, will Western compete in domestic delivery block of public message inhout message service articles affected? affected? affected? affected? will additional gateways contains processing the adversely ability to introduce inhout the total additional gateways contribute to the international and domestic and inhibit of adata and the adversely ability to introduce innovative service to the international additation and domestic as a subsidiration what is the minimum price is public message service was subsidiration what is the minimum price is addited? The adversely additation inhibit through sub- which could be the international additation in the adversely addited art comparises in the adversely additated and adversely control which could be the international additated art comparises in the adversely additated and and encould be three approcessing inhibit cross subsidiration inhibit cross subsidiration traditions be abolished?
<pre>msion of regula- ate processing inhibit inhibit and fitional gateways con- tribute to the international carries ability to introduce innovative service to the international and domestic markets? if a gateway today? if a gateway today? if a gateway today? subsidization what is a gateway today? if public message service was introduce in the inhibut more internations of data a compariant ossible? if public message service was inhibit cross subsidiaa- through sub- by the Commission to it inhibit cross subsidiaa- through sub- iterition require that gateway inhibit cross subsidiaa- terition set data inhibit cross subsidiaa- control which could be it public message service was inhibit cross subsidiaa- terition set abilished? if public message service was inhibit cross subsidiaa- porter that gateway inhibit cross subsidiaa- ter that gateway inhibit cross subsidiaa- ter the gateway to the gateway that gateway inhibit cross subsidiaa- ter the gateway to the gateway the gateway inhibit cross subsidiaa- ter the gateway the gateway the gateway inhibit cross subsidiaa-</pre>
<pre>I processing be if A the concept be if A the concept be ins of caracturation and caracturation is a gateway today? The concept be is and caracturation is a gateway today? if A the concept be is should the concept be is should the concept be it is a gateway today? Should the concept be is and caracturation what is the minimum price is the public message service was used in the concept be it is a gateway today? Through sub- by the control which could be it is a processing in the concest be in the concessing in the concessing in the control which could be it is a processing in the concessing is a processing in the concessing in the concessing is a processing in the concessing in the concessing is a processing in the concessing in the concessing in the concessing is a processing in the concessing in the concessi</pre>
subsidization What is the minimum price If public message service was n when carriers control which could be deregulated, would fair compe imposed on Western Union tition require that gateway through sub- by the Commission to restrictions be abolished? ? If ye procedures than denorate fair lawity encodents
such practices?
Are the rates discrimina- What type of rate structure troy against the inter- should be used by ATST and national carriers? What are the basis for Flex/ international carriers if TWX rates in costs? allowed?
LESSONS LEARNED RECARDING INFORMATION NEEDS MIGHT BE APPLICABLE TO MANY ISS HAVE ECONOMIC, TECHNOLOGICAL, AND SEFVICE ASPECTS
LESSONS LEARNED MICHT BE APPLICABLE TO ANY ATTEMPT TO INFLUENCE CHANCE IN N

evaluation may also shed light on a number of other important and relevant research questions. These might be investigated as the project advances. To clarify the interrelationships of these questions, two generic issues are discussed in more detail below.

1. FAIR CHARGES AND INTERCONNECTION

The seventh generic issue listed in Figure III-3 concerns nondiscriminatory service charges and interconnection. The Commission is presently considering whether to grant permanent authority for the international carriers to operate in all existing gateways, and is examining the fairness of Western Union's charges to international carriers for landline haul (domestic transmission) of messages to and from the gateways.¹ The following questions arise:

- What is fair competition? Should Western Union be required to serve other carriers and interconnect for message transmission?
- How does one determine whether a rate increase is justifiable-in terms of increased costs or in terms of the need to maintain revenue?
- Is the domestic public message services market viable?
- How can consumers of regulated services be assured that the rates they are paying are reasonable?
- How can the Commission improve rate regulation? Are better accounting techniques called for, and if so, what kinds of economic information should be required by the Commission?

Just as international record carriers interconnect with Western Union, competitive carriers may interconnect with AT&T's network. Although the basic issue has certain similarities, the question of interconnecting with

^{1.} Gateway refers to a location where international carriers take over message transmission from the domestic carrier. Originally, gateway was a term of art that largely meant Washington, New York, and San Francisco. Gateways today are New York, Washington, Miami, New Orleans, and San Francisco.

AT&T is more complicated. AT&T's long-distance telephone monopoly was granted in part to protect the viability of small telephone companies throughout the nation, especially in rural, low-density areas. The current telephone rate structure is based on a system of division of revenues in which AT&T reimburses these small companies for use of their local facilities for interstate transmission. This system does not presently take into account interconnection and reimbursement from other common carriers.¹ If other carriers with Execunet-like services are allowed to interconnect, how should the system of division of revenues be changed? The following questions should be answered even before that one:

- Is competition in long-distance telephone service in the public interest?
- What is the dividing line between private line and long-distance telephone service (MTS/WATS and Execunet-type services)?

The question of the survival of small telephone companies is an important issue in telecommunications today. In fact, the Rural Electrification Commission (which loans large amounts of money to these companies) has even suggested that the nation's rural telephone operators should be allowed to provide "total telecommunications" services so that they can meet the impact of advancing telecommunications competition. Pending legislation on this issue calls for a new definition of telephone service:

[Telephone service] shall be deemed to mean any telecommunications service for the transmission of voice, data, sounds, signals, pictures, writing, or sign of all kinds by wire, radio, light, or other electromagnetic systems, and shall include all lines, facilities, or systems used in the rendition of such service, including community antenna and cable television facilities, but shall not be deemed to mean

^{1.} AT&T has proposed a system known as ENFIA which might alleviate this problem.

message telegram service, or radio broadcasting services or facilities within the meaning of section 3(0) of the Communications Act.1

It should be noted that one of the PMS deregulation activities is to redefine message telegram. This problem of definition and others are discussed below.

2. REDEFINITION OF OBSOLETE SERVICES

The fifth generic issue listed on Figure III-3 concerns redefining regulatory services when traditional definitions become obsolete. The descriptors "telegram" and "telegraph" no longer seem adequate. In the case of this proposed deregulation therefore, the definitional question is "What are public message services?" Technological descriptions provided the necessary boundaries at one time. This is no longer true. For example, electronic message service is an alternative public message service. But what is electronic message service?

[Electronic message service] is not traditional voice telephone service, traditional telegraph service, or traditional telex or TWX. It is not video or slow scan video. It is not terminal to computer or computer to computer data communications . . . [and] for the purposes of this study, the various forms of facsimile service can be considered a variation of [electronic message service] only to the extent they are part of an integrated service which is primarily digital and character-oriented.

The definitions do not represent a consensus on the part of the authors of this report--nor, we suspect, of FCC members and staff-concerning EMS boundaries . . . By focusing on emerging terminalto-terminal, digital message systems, the burden of also covering conventional facsimile systems, TWX and telex, the "hybrid" systems (i.e., involving both electronic transmission and manual delivery) such as Western Union's Mailgram (and others being considered by the U.S. Postal Service), financial transaction systems, or

^{1. &}quot;Dramatic Change in Rural Telephone Systems to Broadband Facilities Providing 'Total Communications' as Common Carriers Proposed in REA Study; Proponents See Rural Systems Better Able To Meet Competition." <u>Telecommuni</u>cations Reports. Vol. 44, No. 17, May 1, 1978, pp. 3-7.

telephone based audio message systems--to mention only a few of the technologies and services that could be encompassed under the [electronic message service] rubric--has been lessened.l

Once public message service is defined, we must determine how to regulate this market and how to accomplish a transition. Separating regulated and nonregulated business of a carrier in order to define fair rate of return and identify cost allocations is a difficult problem. Also, just as alternatives to PMS have developed, demand for heterogeneous services and the seeming inadequacy of technological descriptions to define service categories may also produce alternatives to services such as Telex/TWX that were granted protection in the past in order to maintain revenue for a monopoly carrier and/or to insure the public adequate service.

The number of alternative Telex/TWX services is increasing. The subject of the Telex/TWX inquiry is whether Western Union's proposed rate increase for Telex/TWX services is justified. Telex/TWX revenue is used to subsidize the provision of public message services by Western Union. If public message services seem viable, is it desirable to continue the Telex/TWX monopoly? Will data gathered from analysis of the public message services deregulation help to answer questions like the following:

- If public message services is a viable market, does it exhibit characteristics which might help to distinguish competitive from natural monopoly markets?
- Is the costly and complicated process of separating cost allocations of carriers engaged in regulated and nonregulated services warranted? Or should all services be deregulated and, if so, to what extent?

^{1.} Kalba, Konrad K., <u>et al.</u>: <u>Electronic Message Systems</u>: <u>The</u> <u>Technological</u>, <u>Market and Regulatory Prospects</u>, Kalba Bowen Associations, Inc. and the Center for Policy Alternatives, Massachusetts Institute of Technology in fulfillment of FCC Contract Number 0236, April 1978, pp. 2-3.

- Would closing the Telex/TWX market to competition hinder the development of a competitive marketplace for the industry as a whole? In particular, what impact would closing the Telex/TWX market to competition have on value-added carriers?
- Can the transition from monopoly to competition be handled similarly for other market segments if the public message services deregulation is smooth and beneficial?

This problem of defining regulatory boundaries also occurs in the other inquiries. Examples from the Computer Inquiry, the Gateway Inquiry, and the MTS/WATS Inquiry follow.

A solution to the Computer Inquiry seems to require a redefinition of data processing. The Commission has already decided that data processing should remain unregulated, but wants to establish a new definition which is more sensitive to the role of hybrid services and distributed networks that rely on intelligent terminals. Most inquiry commentors expressed the belief that a clearcut technical distinction between data communications and data processing is impossible. However, the Commission believes that some definitional distinction is necessary unless data processing services are also to be regulated.

In the Gateway Inquiry, the definition of the term "gateway" is at issue. In this age of satellites, the technical justification for gateway traffic systems has largely disappeared. The international record carriers believe they are able to deliver their services more cheaply and efficiently through the telephone system (WATS line) than through Western Union. Should the gateway concept be retained? If so, then criteria for defining a gateway must be developed.

In the WATS/MTS inquiry, an important question is whether the two services are "like" services. According to the Commission rules, like charges should be billed for like services. Discriminatory pricing is a central issue here. Are users of monopoly services being charged excessively to subsidize

lower prices in competitive markets? In particular, are higher rates for MTS being used to subsidize WATS? The same facilities are used for both MTS and WATS, which AT&T claims are distinct services. If WATS and MTS are like services, then the Commission must increase its surveillance of AT&T in order to insure that no discriminatory charges are made. What standards should there be for like services? How much regulatory interference should there be? Would a decision in this inquiry have any effect on the use of WATS as a public message services alternative?

Concepts that need defining include: a market; the threshold of competition in a market; a natural monopoly market; and even the telecommunications industry itself. A workable and realistic redefinition of public message services may suggest ways to define these other concepts as well. The search for clear definitions is actually a search for regulatory boundaries. By altering its perception of those services, it is altering the scope of its activities.

Unclear regulatory definitions are often blamed for a carrier's reluctance to offer new services and equipment. For example, AT&T has requested a declaratory ruling on whether it can offer the Advanced Communications Service, because definitions of communications and data processing are unclear. If confusing regulatory definitions do indeed cause industry uncertainty, then the Commission and ETIP may want information to help formulate flexible, realistic definitions or perhaps even uncover an alternative to the entire definitional process. Some work at the operational level in industry will probably be nessary to determine, for example, how messages are actually transmitted.

G. SUMMARY

This chapter has attempted to show that the telecommunications environment in which the proposed deregulation will take place is complex and changing. As the evaluation progresses, research into the areas discussed will be required for correct interpretation of the evaluation findings. The chapter has also shown that such issues as cross-subsidization, rate of return, cost allocation, network integrity, market structure, price discrimination, definitions, regulatory reporting requirements, equipment and service standards, etc., are well-entrenched issues which arise among different inquiries and within the context of broad debates.

The effects of the deregulation of the public message services market, properly monitored and analyzed, might provide information to policy makers, regulators, and other stakeholders for regulating and guiding the evolution of the marketplace to an optimal state, with greater assurance and less hesitancy than in the past. For example, if knowledge about issues can be generalized from case to case, guidelines for determining fair rate of return, fair competition, etc., which would facilitate decision making, might be developed. This project should contribute to a more purposeful data-gathering approach. It may not only provide knowledge for ETIP, but might also help the Commission to increase its influence on the market structure of the telecommunications industry.

.

IV. PRESENT SITUATION

A. OVERVIEW

The present situation in regulated telecommunications has been likened to a three-dimensional chess game. Since there is considerable uncertainty at any given moment, the next move is always problematic. The deregulation of public message services is a small move in this large and complicated intercourse.¹

Although its relevance to the "public" side of regulated telecommunications is important, the proposed deregulation is also noteworthy because it should lead to actual open competition for public message exchanges. We expect competition to lead to lowered costs for PMS, which in turn should increase demand. However, if new companies do not emerge to offer public message services, or if the public opts not to buy new public message services, then the service cost reductions and technological innovations that we expect will not occur. Along with the deregulation, other things must happen. For example, any petitions objecting to the deregulation must be handled. Common carriers must apply to the Commission to offer public message services in the marketplace. Finally, customers must be available to support a profitable operation for more than one public message carrier.

The main events, which are expected to mark progress of the evaluation towards a successful conclusion, are known as the logic. Section B of this

^{1.} The term deregulation is used here to denote a change in policy, practice, or rules which reduces (but does not necessarily eliminate) the burden on the regulatee.

chapter introduces the events. Within each event, many activities will occur to signal the success or failure of expectations of ETIP and the Common Carrier Bureau of the Federal Communications Commission. The dominant elements in the logic are, of course, the Commission and public message services commerce. The balance of this chapter presents our findings to date about these two components.

Section C contains a description of the Commission, emphasizing the role of the Commissioners and the Common Carrier Bureau (the Commission's arm in common carrier regulation). The Communications Act of 1934 and the official rules and regulations as expressed in the Code of Federal Regulations Volume 47 (47 CFR) also are treated as a separate, important component of the Commission's regulatory process.

A description of Western Union's approach to competition (as perceived by onlookers) and an historical view of the company were included in Chapter III. In Section D of this chapter, we will scrutinize more closely Western Union operations, service offerings, and public message services and their relationships to other services offered by the company. Speculations on the potential market for PMS will be offered. Our study shows that current volume of services traditionally considered PMS may be a misleading indicator for the potential volume of electronically transmitted public record messages. For instance, a significant portion of First Class Mail (15 billion pieces, or almost a third) seems to be candidate for electronic message transmission perhaps by the USPS' ECOM service.¹ Using this figure, the potential volume of messages categorized as PMS is much larger (330 times) than the current message volume statistics would indicate.²

 See "USPS Announced Electronic Mail Service: Crosses Regulatory Rubicon," EMMS, Vol. 2, No. 18, September 15, 1978, pp. 9-10.
Message volume for 1977 is 4,529,684. U.S. Federal Communications Commission, Statistics of Common Carriers, 1977 Computer Printouts, Table 24.

The final section of this chapter discusses selected other services and carriers which might be affected by the deregulation. Potential public message services competition from the USPS and the specialized common carriers will be examined. Also, we describe the resources of two specialized resale carriers, Graphnet Systems and Telenet, since some members of this group will probably enter the deregulated PMS market.

The evolution of a competitive marketplace seems to depend on whether small companies such as Graphnet and Telenet can compete with larger carriers. An analysis of their service characteristics and resources indicates that, despite sizable differences between Western Union and these carriers in terms of capital investment in service network, the smaller companies have a nearly equivalent functional capability to supply public message services. Both Graphnet and Telenet are very innovative firms; Graphnet develops its own equipment interface packages, and Telenet introduced packet switching technology commercially. The detailed description of the specialized resale carriers also illustrates the type of background information which would be gathered and analyses which would be conducted on any entrants into the deregulated market. This information would have to be validated by more direct contacts in the industry (just as material on the Commission was validated by staff of that agency).

B. LOGIC OF THE EVALUATION

In January 1979, the Commission approved a policy change to open the PMS market to competition. The public message services deregulation has been chosen as the vehicle for conducting an experimental evaluation of the effects of deregulation. The evaluation's primary purpose is to obtain

information about the agency, the industry, and the commercial impacts of changes in the regulatory process.

The hypothesis of the evaluation is that a competitive PMS market will be an environment in which carriers offer a greater variety of superior and less expensive public message services to the market. The changed rules and regulations governing PMS commerce must conform with the policy intent of the Commission--reducing PMS regulation and encouraging competition.

Formal interviews and informal discussions with ETIP and CCB staff, and examination of relevant data and documents, have pinpointed seven major events which we expect to occur. We will measure the effects of the deregulation and will determine specifically whether these events--or logic-occur. Other measurements will be chosen in part according to actual effects of the deregulation. For example, one event in the logic calls for the CCB to develop a streamlined process for administering PMS regulation. The first step would be be confirm that the event had occurred. Other decisions regarding the event would follow: should it be investigated in terms of Commission staff time, turnover rate, industry costs, greater simplicity, improved attitude or responsiveness of industry, etc.? The level of rigor with which each issue should be investigated would also considered. In this way, the data is more likely to be useful. The following events represent a logic for the proposed evaluation.

- EVENT I: The CCB drafts a MO&O and rulechange intended to end Western Union's monopoly, open commerce to competition, and reduce future regulation of PMS.
- EVENT II: After public notification and appropriate deliberation, the Commission authorizes CCB revised rulemaking to go into effect.
- EVENT III: The CCB streamlines the process for administering ongoing PMS regulation as per the open-competition policy established by the Commission.

- EVENT IV: Established carriers and other interested businesses submit applications to enter the open (deregulated) PMS market.
- EVENT V: The structure of PMS commerce is observed to change in terms of carriers, customers, services, transmission facilities and equipment, prices and profits.
- EVENT VI: Systematic evaluation and research demonstrates improvement in PMS commerce as per the Commission's mandate for common carrier commerce, and CCB and ETIP goals for the evaluation.
- EVENT VII: CCB and ETIP transfer knowledge gained through study as evidenced by useful applications of findings.

Chapter V presents a detailed description of participants and activities, and potential products, measures, and information uses for each event. The evaluation is still in an early phase, and therefore, expectations concerning major events are subject to redefinition by ETIP or the Federal Communications Commission.

Figure IV-1 illustrates the relationship of the expected events to a model of current PMS commerce which is used for measurement purposes. (See Figure VI-3.) The figure points out the distinction between the first five events, which focus on achieving reformulated public message services commerce, and Events VI and VII which focus on processing information on whether Events I to V occurred as expected.

The main elements of the evaluation's logic can be broken down as follows: the Federal Communications Commission (regulator of PMS); the status of PMS before deregulation; and the status of PMS after deregulation. Each of these is described below.



C. THE FEDERAL COMMUNICATIONS COMMISSION: REGULATOR OF PMS

The regulation process associated with PMS is similar to that employed is the other sectors of commerce. The Commission's regulatory process has four major parts: the Communications Act of 1934; a Commission composed of seven members; the Code of Federal Regulations, containing telecommunications regulations; and the Common Carrier Bureau, which routinely administers the policy and rules governing common carrier regulation. Findings to date about these elements are presented below.

1. THE COMMUNICATIONS ACT OF 1934

The Commission receives its authority from the Communications Act of 1934, as amended. The mandate, or statement-of-purpose clause, is contained in Title I, Section I:

For the purpose of regulating interstate and foreign commerce in communications by wire and radio so as to make available, so far as possible, to all the people of the United States a <u>rapid</u>, <u>efficient</u>, <u>Nation-wide</u>, and <u>worldwide wire</u> and radio communication service with adequate facilities at <u>reasonable charges</u>, for the purpose of national defense, for the purpose of promoting life and property through the use of wire and radio communication, and for the purpose of securing a more effective execution of this policy by centralizing authority heretofore granted by law to several agencies and by granting additional authority with respect to interstate and foreign commerce in wire and radio communication, there is hereby created a commission to be known as the "Federal Communications Commission," which shall be constituted as hereinafter provided, and which shall execute and enforce the provisions of this Act. [Emphasis added.]

Title II of the Act gave the Commission tools and powers to regulate telecommunications, similar to those used by the Interstate Commerce Commission for transportation regulation. In fact, it incorporated provisions of the Interstate Commerce Act. Under the "new" powers granted to the Commission, it could require carriers to:

- interconnect with other carriers and establish through routes (formalization of the Kingsbury Commitment);
- file rate schedules;
- submit contracts made by any carriers; and,
- obtain a certificate of public convenience and necessity from the FCC should expansion or construction of new interstate lines be desired.

Also, the Commission was given authority to review not only carriers' charges, but their "practices, classifications and regulations" and to determine whether these were fair. The Commission could also initiate investigations of proposed changes in rates and suspend proposed rate schedules for up to five months pending investigation. In addition, Congress instructed the Commission to keep abreast of new technologies, so that their benefits would be made available to the public of the United States. Title III adopted the substance of the Radio Act of 1927 to govern broadcasting and all radio licensing. Titles IV through VI set forth general administrative procedures that were used in most federal regulation in 1937.¹

2. THE COMMISSIONERS

Decisions regarding major disputed cases are made by the Commissioners. Their findings in these cases set precedents for subsequent Commission actions, including routine staff decisions. The Commissioners also control resources and, to some extent, the agenda of activities of Common Carrier Bureau staff. In both capacities, the Commissioners influence the character of telecommunications regulation and commerce, including public message services.

^{1. &}lt;u>See</u> Loeb, Guy. <u>The Communications Act Policy Toward Competition:</u> The Sound of One Hand Clapping, March 1977.

3. CODE OF FEDERAL REGULATIONS, VOLUME 47

The Code of Federal Regulations is a codification of the general and permanent rules, published in the <u>Federal Register</u>, for the Executive departments and agencies of the Federal Government, including the FCC. CCB rulings comply with Volume 47 of the Code of Federal Regulation (47 CFR), which applies to telecommunications. Each Part within 47 CFR contains rules governing general or specific operational responsibilities. For example, Part 0 defines Commission organization, including delegations of authority, Privacy Act regulations, meeting procedures, etc. Part 1 is known as "Practice and Procedure" and describes hearing and rulemaking proceedings as well as general rules regarding procedures for complaints, tariffs, applications, and other reports involving common carriers.

There are over 300 pages of regulations which apply to common carrier commerce, including public message services. The Parts of 47 CFR that are most relevant to public message services are the eight below:

- Part 21 "Domestic Public Radio Service" (requirements for licensing basic transmission facilities)
- Part 35 "Uniform System of Accounts for Wire Telegraph and Ocean-Cable Carriers" (stipulations for approximately fifty categories of accounting, ranging from "communication plant" to "retirement units")
- Part 41 "Telegraph and Telephone Franks" (requirements governing provision of "free" service)
- Part 42 "Preservation of Records of Communications Common Carriers" (hundreds of "items" ranging from "corporate and general" to "operations" that must be retained by regulated common carriers)
- Part 43 "Reports of Communication Common Carriers and Certain Affiliates" (twelve types of reporting requirements ranging from "annual reports of carriers and certain affiliates" to "reports regarding services performed by telegraph carriers")
- Part 61 "Tariffs" (filing requirements for "change in rate structure of an existing tariffed service," for "new service offerings," and for assorted other circumstances)

- Part 63 "Extension of Lines and Discontinuance of Service" (specific requirements for extension of transmission lines, and discontinuance, reduction and impairment of licensed common carrier facilities)
- Part 64 "Miscellaneous Rules Relating to Common Carriers" (includes domestic telegraph speed of service studies such as "instructions for the conduct of terminal handling speed of service studies" and "participation in data processing by communication common carriers")

Together, these requirements determine what business decisions are subject to Commission review, and the character of the review. Parts 61, "Tariffs," and 63, "Extension of Lines and Discontinuance of Service by Carriers," are considered most important because they govern the services carriers can offer, the prices they can charge, and whether or not they can expand or contract the facilities used in the provision of services. With open public message services commerce, market forces are expected to exercise control over prices so tariff requirements are expected to be more lax. Requirements for requests to construct additional facilities will also be reduced by the deregulation. A statement justifying the need for additional facilities, for instance, will probably not be required.

These written policies and rules are important in their relationship to Commission actions and Congressional intent and to Common Carrier Bureau organization and process and the behavior of commerce. For example, the stipulations in 47 CFR must be within the purview of the 1934 Act as per its latest amendment. Also, the Commission's decisions specify the language of each stipulation. In turn, CCB staff develop forms and protocols for handling carriers' applications that must be consistent with the intent specified in language in 47 CFR. Finally, the stipulations define which carrier actions are subject to FCC review. For these reasons 47 CFR is an essential component of public message services commerce. In general,

the present language in 47 CFR reflects the recent monopoly tradition. Stipulations require very close scrutiny of prices and rate of return.

4. THE COMMON CARRIER BUREAU

Figure IV-2 outlines the basic organization of the Federal Communications Commission. Staff are assigned to one of thirteen major units. About 12 percent of the Commission's 1,900 employees are assigned to the Common Carrier Bureau (CCB).



Source: FCC Office of Public Information Bulletin, "The FCC In Brief" FIGURE IV-2: BASIC ORGANIZATION OF FCC

^{1.} Appendix D, "Findings about Information Sources Available at the Commission and Elsewhere," is a more detailed account of the research activities of ETIP and its contractor at the Commission during the initial phase of the project.

Staff members assigned to each branch of the Common Carrier Bureau develop "specializations" in administering specific Parts of 47 CFR. Figure IV-3 illustrates the organization of the Bureau in relation to the Parts of 47 CFR administered by each branch.

Most of the staff are either attorneys, economists, engineers, public utility specialists, managers, administrators, or secretaries and assistants. A great deal of common carrier interaction with CCB operations involves applications to change business practices. For example, if The Western Union Telegraph Company wanted to change the location of a station, it would first submit an application to the Domestic Facilities Branch of the Facilities and Service Division of CCB for approval to construct additional transmission lines. (This is known as a request for 214 authority as per Part 63 of 47 CFR.) Then, if authority to offer a new service or to change a rate is desired, the carrier must also submit a tariff to the Tariff Review Branch of the Tariff Division, in compliance with Part 61 of 47 CFR.

These different types of applications are known as filings; filings are approved, disapproved (or denied), or withdrawn. Agency approval or disapproval is known as a ruling. Tariff applications, however, are not "approved." For example, Part 61 of 47 CFR concerning rates stipulates that a tariff filing may be considered effective if there is no Commission decision to the contrary within a prescribed period of time. In other words, the tariff is deemed effective if the Commission finds no compelling reason to deny it. A carrier has the right to make a tariff filing at any time.

The number and types of activities required to act on a filing seem to vary according to application classification and the amount of disagreement between CCB staff and the carrier submitting the filing about



47 CFR, Part 0, and interviews with CCB staff, Summer 1978 Source:

FIGURE IV-3: CCB ORGANIZATION AND 47 CFR RESPONSIBILITY

COMMON CARRIER BUREAU

Office

the application's content. Most filings are routine and require only simple, low-cost activities to produce a ruling. However, some are quite complex and require a heavy investment in activities. Examples of the latter case would be a disputed filing about which CCB has received a complaint or a filing from a monopoly carrier, which must fulfill many agency requirements before a change can be authorized.

Western Union's PMS filings represent only a small portion of the regular workload for CCB. Using one indicator of workload, we found that about 1.3 percent of 1,876 tariff filings received between September 1976 and April 1978 related specifically to PMS. This represented about 14 percent of Western Union's total tariff filings during the 20-month period. A similar study of a smaller sample of filings that involved extension of lines and supplements to existing equipment also showed that only a very small percentage of filings was related to public message services.¹

Figure IV-4 illustrates another finding on CCB operations. Tariff filings from companies other than those with Bell or Western Union account for 64 percent of the total. Essentially, the international record carriers, specialized carriers, and other enterprises that are comparatively small in terms of yearly revenue, generate the majority of the CCB's filing workload.²

Also, preliminary data, taken from courtesy logs and used as a proxy of total tariff filings show that CCB has been experiencing a significantly increased workload. Figure IV-5, total tariff filings per month, demonstrates this phenomenon.

^{1.} CCB Tariff Review Branch Courtesy Logs, September 1976 through April 1978, and sample of facilities filings reviewed by UI staff, Summer 1978. See Appendix D also.

^{2.} A study of CCB staff time actually spent on different types of tariffs has not been conducted. A count of tariffs is not a completely accurate representation of staff time allocation because, as tariff reviewers have indicated, applications involving monopoly services are more time-consuming to process.



Although PMS accounts for only a small portion of CCB activity, we are told that the processing method for public message services filings is similar to the branch procedures described in the following sections. The style of CCB operation and the types of common carrier information used by staff of each branch are emphasized. For more detailed information, see Appendix D.

a. DOMESTIC FACILITIES AND INTERNA-TIONAL AND SATELLITE BRANCHES

International and Satellite Branch handles all of the international carriers and the domestic satellite carriers. Domestic Facilities handles all other types of carriers. Basically, both branches process the same types of applications. The discussion below will focus on the Domestic Facilities Branch.

Domestic Facilities is divided into four groups: the telephone and telegraph group handles filings from the two established monopoly common carriers; the second group handles specialized common carrier filings; the third group handles filings of other types of carriers such as microwave common carriers; and the fourth group advises those who are applying for 214 authority for the first time. The branch currently maintains files on approximately 15,000 transmission stations which it has licensed.

A sample of 183 facilities applications was analyzed for number of applications per carrier, type of applications, and geographic extension, of network.¹ An additional 51 applications were studied in greater detail. Of these, 40 specifically complied with Section 63.03 of Part 63 which concerns supplementing existing facilities, considered to be a minor action.

^{1.} Part 63 does allow companies such as Western Union to submit blanket filings covering a set of applications. The sample described in this section does not include any blanket filings.

Filings were submitted by Bell, independent telephone companies, or jointly by Bell and independent companies. Separate filings must be processed for each point-to-point extension of a carrier's network. A review of all facilities applications for a carrier would seem to be necessary for an accurate understanding of the nature and extent of the planned expansion. The average processing time was 17.5 calendar days. All applications were approved.

These filings also reveal which carriers are leasing, renting, or purchasing facilities from other carriers rather than constructing their own. All requests (new constructions, purchases, etc.) gave probable costs, for example, maximum yearly rental costs. Two requests were for special temporary authority (e.g., satellite transmission of Madison Square Garden events to cable television stations). These two requests took 20 and 21 days to process--slightly longer than the average--and were also approved.

The remaining 11 filings concerned Section 63.01 and requested the following types of changes: installing/extending of cable and carrier systems and rerouting interstate channels. These are considered to be major actions because environmental impact must be taken into consideration before approval can be granted. Each application on file contained a "Telephone Wire Application" form, and copies of the requests were sent to the Secretary of Defense and Governor of the state affected by the proposed change. The average processing time was 42.5 days--twice as long as for other types of facilities applications.

b. TARIFF REVIEW BRANCH

As we mentioned previously, Part 61 of 47 CFR governs tariffs. Many of the specific sections of Part 61 deal with definitions and format. Section 61.38 concerns economic support data. Section 61.58 concerns notice requirements.

All tariffs must bear the stamp of the Secretary of the Commission if hand delivered, or the mailroom stamp if mailed. Stamped tariffs are routed

to Tariff Review. In September 1976, to offset a time lag that had developed, Tariff Review requested that the carriers provide them with courtesy copies of the tariff filings at the same time that the original is delivered to the Secretary's Office or mailed. Another reason for this request was that, since emergence of the specialized common carriers and more competition in the marketplace, Tariff Review receives more requests for information about tariff filings and has a greater need for current information than ever before.

A daily log of tariff courtesy copies that are received is kept. This log records which carriers filed and also contains a brief summary of each tariff filing. Submitting a courtesy copy, however, is not mandatory, and another official count is compiled in tabular form showing <u>only</u> a count of the original tariffs received monthly.

All courtesy copy logs as of April 1978 were analyzed. A comparison of courtesy copy count to official count showed that approximately 18 percent of all tariffs were not included in the courtesy log. One Tariff Review staff member hypothesized that this 18 percent consisted of minor filings, but no one has determined exactly which filings are submitted without courtesy copies. Analysis of the courtesy copies revealed the distribution of tariff activity by type of carrier and the fluctuations over time in volume of tariff filings by type of tariff for each carrier. (See Appendix D for examples.) We understand that Tariff Review is considering making courtesy copies mandatory.

Each reviewer specializes in a particular type of carrier. One staff member, for example, handles all specialized carriers. This is a recent innovation in their procedures. However, because review process for monopoly carriers is so time consuming, these carriers are divided among reviewers.

One reviewer is assigned AT&T, another is assigned Western Union, and so forth. Reviewers also assist newly licensed common carriers submitting tariffs for the first time.

Two checklist forms are used by the tariff review staff: one for the tariff itself and the other for cost support material (61.38). Both checklists assist the reviewer in examining the format only. Content analyses of cost support data are not included on the checklist form and, in fact, are not written unless a problem exists. Sometimes even if a petition is received, the cost support analysis will be described verbally to the attorney handling the case.

Each reviewer has the option to recommend consulting the Tariff Review supervisor about problem filings, for example, those that may prompt a petition or complaint. A tariff that involves a complaint or a problem may take one to two weeks to be checked out finally by "higher-ups" in the Bureau.

Staff time spent in the Tariff Review process is difficult to measure. One reviewer interviewed said that:

Even for an established carrier, to check the format of a new tariff may take half an hour or 45 minutes depending on the length of the tariff in order to make sure they have all the pieces, proper notations, symbology, etc. Western Union's format is standardized and might take only 5 minutes to check. However, total review time for Western Union tariffs may run into hours because of the monopoly situation. A revised tariff, on the other hand, may take only five minutes. Time required for a reviewer to analyze cost data also varies. A detailed analysis of AT&T may take half a day--or a year; others can be completed in half an hour.¹

Some of a reviewer's time is also spent in contact with the carriers themselves. A great deal of time may be spent assisting a smaller carrier

1. UI Staff Notes: Interview with FCC/CCB staff, Tariff Review, Summer 1978.

which is less familiar with tariff requirements. In this situation, the reviewer may check the carrier's tariff format before the tariff is actually filed, so that the tariff does not have to be rejected for a simple error in symbology, organization, etc., and resubmitted. Tariffs are not reviewed for content until submitted. (See Appendix D for sample checklists used by tariff reviewers.)

Although reviewers are assigned to specific categories of carriers, all tariffs are routed through every reviewer before the staff person assigned actually takes over--part of a makeshift system of checks and balances. Research staff found only an informal system for tracking the tariff and cost support material through the review process.

Appendix D contains examples, obtained from a review of the public files, of information on the number of applications and the types of common carriers regulated by the Commission. In examining these tariffs, we paid particular attention to service and financial information about Western Union and the specialized carriers. Types of information contained in the tariff included: carrier's name, names of other carriers participating in the tariff, types of services (classes and subclasses), rates, and points of service. The detail and clarity of the information varied.

We prepared a draft memorandum describing Graphnet, a specialized resale carrier, almost entirely from information in Graphnet's tariff. With FCC permission, we contacted Graphnet's Washington representative and submitted copies of the memorandum for verification. On the whole, the tariff information was accurate, but it did not seem to give a complete picture of the company's operations. For example, information probably of interest to the evaluation that was not contained in the tariff included: the fact that

the company develops its own equipment interface packages, and the fact that it manufacturers some specialized hardware devices.

Table IV-1 gives notice periods and petition periods for different types of applications. Figure IV-6 shows the time constraints under which Tariff Review staff must work in order to complete analysis of a problem tariff prior to a Commission meeting.

c. TARIFF PROCEEDINGS BRANCH

In some instances, Tariff Review receives a petition regarding a tariff filing and orders a formal legal proceeding. Tariff Proceedings then becomes involved. This branch operates in association with Tariff Review and receives its analysis if a potentially serious violation, such as discrimination, unfair profits, or predatory prices, is identified. It is important to note that Tariff Proceedings deals with the same issues as Tariff Review but brings to bear a more formal and legalistic approach. This branch has a staff of ten professionals, primarily attorneys.

d. COMPLAINTS AND SERVICE STANDARDS

The fifteen staff members of this branch monitor the quality of services provided under carrier tariffs, process complaints, and examine applications for change of service.

About 3,000 complaints a year are received. Processing activities vary according to the type and seriousness of the complaint. Some are referred to other authorities such as a state public utilities commission. Some require only minor actions, such as an apology and reimbursement of a consumer by a carrier. More serious complaints can lead to the type of special proceedings for resolving difficult filing disputes.

NOTICE PERIOD*	PETITION PERIOD	TYPE APPLICATION			
		(Unofficial Designation)			
15 days	petitions must be received	minor; unimportant			
	within 7 days	as far as rates			
70 days	petitions must be received	medium; e.g., new			
	within 15 days	equipment			
90 days	petitions must be received	major; e.g., rate			
	within 25 days	change activity;			
		controversial			
*Tariff automatically becomes effective on the scheduled effective date if no					
action taken by the Commission to either suspend or reject the tariff filing.					
If a party does file a petition or objection, or if FCC staff has questions,					
FCC can order extension to 90 days. FCC is not really locked into these time					
periods since Congress passed law that it could use its own discretion regarding					
90-day notice period.					
Source: 47 CFR, Section 61.58; interview with CCB staff, August 1978.					





FIGURE IV-6: SCALE SHOWING TIME CONSTRAINTS AND STEPS OF TARIFF ANALYSIS IN PREPARATION FOR REGULARLY SCHEDULED COMMISSION AGENDA MEETING (90-day Notice Period)

e. ACCOUNTING AND AUDITS BRANCHES

These branches have staffs of 7 and 20 members respectively. (About half of the Audit staff is assigned to field offices in New York.) These branches help develop accounting methods and category definitions and audit regular reports for compliance with procedures and accepted standards of accounting accuracy. Altogether, data in 114 categories ranging from "radiotelegraph rent expenses" to "interest costs" and "regulatory expenses" are examined.

f. ECONOMIC STUDIES

The Economic Studies Branch publishes the <u>Statistics of Common Carriers</u> which contains nearly complete information on the monopoly carriers (including COMSAT, the international monopoly satellite carrier), the independent telephone companies, and the international record carriers. (However, there is almost no information available about the specialized common carriers.) The latest published data on the carriers is two years old. More current information can be obtained from computer printouts that are compiled before publication of the Statistics.

Part of the branch's operation is to review monthly and annual reports from carriers and to draw on random inspections by CCB Field Office personnel and others. This review captures data on total message traffic per office and message handling speed, and on other concerns as well, including service accessibility to consumers, number of personnel, etc.

g. THE FCC INQUIRY PROCESS AND LINE SUPPORT ACTIVITIES

To handle a problem filing, the Commissioners may initiate a formal inquiry proceeding. The inquiry process, illustrated in Figure IV-7, involves a great deal of time and effort for both Commission staff and members of



Source: Urban Institute interviews with CCB staff, Summer 1978 FIGURE IV-7: STEPS IN THE FCC/CCB INQUIRY PROCESS

industry and government. At any given time, however, routine decisions and special decisions with "minor" consequences are made. Decisions that coincide with a shift in policy may advance or may not advance the new policy direction.

In the marketplace, Commission policy formulation is experienced as a series of inquiries and subsequent decisions (or rulemakings). This inquiry process, which elicits comments from interested parties, was set up to provide the Commission with necessary information for its decisions. The process also provides the Commission with an indicator of the effect of policy change on market structure. The legalistic, adversary relationship that exists under inquiry conditions also imposes <u>ex parte</u> restrictions on direct contact between Commission staff and industry. The type and quality of information on which the Commission decisions are based
depends partially on what information each commenting party decides to submit. Logically, each commentor will base his decision on advice of legal, technical, and corporate staffs, and their unique expertise and interests.

Under these circumstances, assigning Commission staffs to inquiries according to their knowledge of the issue makes great sense, and this is what the Commission does. The Telex/TWX Inquiry, for example, was assigned to Tariff Division staff; the Computer Inquiry, which was difficult to categorize, was assigned to Policy and Rules staff. Common Carrier Bureau administration, support groups, and division managers play a less direct role in most regulatory issues; they provide analytic, strategic and staff support. Important cases call for more analytic and tactical support. In these cases, responsibility for processing a filing is commonly divided among staffs from many CCB branches and divisions.

When the inquiry process does not resolve the problem, the matter is designated for a hearing. The Hearing Division is responsible for both preparation and presentation of the CCB's case, and responsibility for the ruling is passed on to the Administrative Law Judges. If a case cannot be settled, it can be brought before the Federal or United States District Courts, the Court of Appeals, or even the Supreme Court (if that legal body should agree to hear the case).

5. SUMMARY

Although the Commission has authority to take action against a carrier over unfair rates and other violations, its operations seem to be directed more toward responding to complaints than initiating action. This statement is based on the opinion of Commission staff. No existing comparison (to our knowledge) shows the average ratio of self-initiated activity to total activity within the Commission.

However, a dramatic increase over the last three decades in conditions warranting special decision making by the Commission can be documented. For example, prior to 1950, <u>FCC Decisions and Reports</u> totaled 14 volumes, from 1950 to 1965, another 30 volumes were added, and from June 1965 to date, over 55 volumes were added.¹ The differences in cost and staff time between complex decision making and routine decision making has not been adequately studied either. Further, the industry costs of complying with regulation are unknown, although they are assumed to be high.

Allocating more time and resources to decision making does not seem to be an adequate solution. The problem is highly complex--perhaps so complex only a fragmented approach is possible. However, any experimental evaluation program which is implemented should try to produce information to assist Commission staff in making these decisions. If useful information can be gained and staff expertise and time are used efficiently, cases requiring special decision making should decrease. Industry and government costs might be reduced, or perhaps more importantly, common resources could be allocated to other areas.

Next we will explore the current status of public message services commerce.

D. THE WESTERN UNION TELEGRAPH COMPANY AND PMS COMMERCE

1. THE WESTERN UNION TELEGRAPH COMPANY

Western Union's plant is worth about \$1.2 billion when allowance for depreciation and amortization is deducted from the company's \$1.7 billion investment in terrestrial facilities and a satellite. Fully 93 percent,

^{1.} FCC Public Information Office: Information Bulletin, Information Services and Publications, March 1978.

or approximately \$1.6 billion of the investment, is in existing terrestrial facilities including \$159 million in plant under construction. About 5.5 percent, or \$93 million of the plant investment, can be attributed to the satellite. The Western Union network is built around Infomaster, a central processing computer that routes, bills, and records most of the messages handled.

The Western Union Telegraph Company estimates that in 1977 the cost of operating the PMS portion of the Infomaster network was about \$143 million. In addition, the Company reports that it has allocated \$212 million during the last ten years for development of the PMS operation.

Since 1942 the number of persons employed by Western Union has been reduced by 81 percent. Today there are about 12,000 employees divided about equally among three functional categories--line operation, construction and maintenance, and other.¹ Figure IV-8 illustrates the relationship among these categories. A comparison of the percentage of employees staffing the line operation function now and the percentage 20 to 30 years ago shows that modern telegraphy is now less labor intensive. In preparing for competition, carriers--including AT&T--are putting much more emphasis on marketing than they did in the past.²

^{1.} The categories are broken down as follows: line operation includes telegraph operators and messengers; construction and maintenance includes foremen, linemen, cablemen, and laborers; and other includes supervisors, engineers, clerical, sales and building services staff;

^{2.} For example, see, "Behind AT&T's Change at the Top," Business Week, November 6, 1978, pp. 114-139.



* Total 11,654 based on all employees except officials and managerial assistants.

Source: FCC <u>Statistics of Common Carriers</u>, 1977. Table 28, "Employees of the Western Union Telegraph Company Classified by Occupational Groups, and their Average Basic Hourly Rates of Pay as of October 31, 1977."

FIGURE IV-8: THE WESTERN UNION TELEGRAPH COMPANY, PERCENTAGE OF EMPLOYEES BY FUNCTION

2. PMS REVENUE AND SERVICE CHARACTERISTICS

Though a distant second to the Bell System in terms of total revenue from telecommunications, The Western Union Telegraph Company dominates the hardcopy message side of the industry.

The 45,296,842 messages classified PMS exchanged in 1977 represent less than one message per year for every four Americans. In sum they account for less than .3 percent of the \$43 billion in revenues generated through regulated telecommunications. The services which might be exposed to competition by the proposed deregulation include:

1.	Mailgram
2.	Full Rate Telegram
3.	Domestic handling of international public message services
4.	Money Order
5.	Telex/TWX (when in conjunction with PMS)
6.	Personal Opinion
7.	Tel(T)ex
8.	Press
9.	Night Letter

10. INFO-COM

The first four services account for 95 percent of PMS revenue, so the discussion below will focus on them.

Figure IV-9 indicates the percentage of messages in each of these classes for 1977. By far the largest percent, 53.8, are Mailgrams. A



Source: FCC's <u>Statistics of Common Carriers</u> (computer printouts), Message Revenues of Domestic and Overseas Telegraph Carriers Shown According to Class of Message, Year Ended December 31, 1977.

FIGURE IV-9: DISTRIBUTION OF PUBLIC MESSAGE SERVICES VOLUME BY PERCENT PER CLASS OF MESSAGE Mailgram is accepted and transmitted by Western Union, and delivered by the United States Postal Service. It offers next-day delivery by USPS letter carriers. For use of its transmission network, Western Union receives a portion of USPS revenue generated by Mailgram. In 1977, Mailgram revenue received by Western Union was over \$44 million, or about 8 percent of the company's total revenue.

The full rate telegram is the predecessor of the other public message services and at one time was the most common. In 1977, it accounted for only about 9 percent of the messages. Full rate telegram service enables any member of the public to transmit hardcopy throughout the nation for expedited delivery. A customer may initiate a message by calling one of three Centralized Telephone Bureaus (CTBs), presenting it over the counter at one of 5,200 Western Union stations, having it picked up by messenger, or by using a tieline to Western Union's message transmission network. A copy of every telegram is retained in Western Union's records in case the communication must be verified later. Options associated with full rate telegram include:

- common text for multiple addresses,
- confirmation of telephone-delivered telegrams by Mailgram or regular mail, and
- a report to the sender documenting time of delivery.

Domestic transmission of transoceanic communications or "cablegrams" is currently the second most active public message service. (Seventeen percent of total volume compared to Mailgram's fifty-four percent.) After these outgoing or incoming messages are received from the international carriers, Western Union handles them like full rate telegrams.

Telegraphic money order is the third largest service class, with 6 million money transfers in 1977. Through this service, the general public may use Western Union's network to transfer funds electronically from anywhere in the United States to any of the company's domestic stations.

Table IV-2 presents a detailed breakdown of messages and revenue for 1977 for each class of public message service. The far right column shows the average amount of revenue generated per message, which is \$3.24 overall. The average revenue per message for the four top services is \$4.47. Perhaps the most noteworthy characteristic of the figures in this column is the comparatively wide range of values. For example, Western Union reportedly generates \$1.72 per Mailgram, while press messages, an infrequently used service, bring in \$13.68 per message. The rate-per-word for press messages is lower than for Mailgram; however, press messages are usually much longer, and this accounts for the difference in revenue.

The public message services represent an estimated 28 percent of Western Union's \$525,905,946 in annual operating revenue. Figure IV-10 illustrates the relationship among revenue from PMS and Telex, TWX, and nontransmission services like leasing transmission channels to the Government Services Administration and Department of Defense.

1977
REVENUES,
AND
MESSAGES
PMS
UNION
WESTERN
IV-2:
TABLE

lype of Service	Number of Messages	Percent of Total	Revenue (Dollars)	Percent of Total	Dollars Revenue per message
1. Full-Rate	4,038,682	8.9	25,435,707	17.3	6.30
2. Night Letter	676,753	1.5	2,231,314	1.5	3.30
3. Tel(T)ex	106,283	• 2	318,847	• 2	3.00
4. Infocom	88,997	• 2	263,210	• 2	2.96
5. Telex/TWX TCS	1,681,526	3.7	9,461,539	6.5	5.63
6. Personal Opinion	275,575	• 6	551,951	• 4	2.00
7. Mailgram	24,357,086	53.8	41,876,574	28.5	1.72
8. Press	48,421		662,401		13.68
9. Money Order	6,327,386	14.0	46,738,195 ^a	31.8	7.39
10. Domestic Trans-					
mission of					
Transoceanic	7,696,133	17.0	19,153,522	13.1	2.49
TOTAL	45,296,842	100.0	146,693,260		1
Average	4,529,684	ł	14,669,326	1	3.24
-					

a - includes estimated "non-transmission" revenue from money order.

Source: FCC. <u>Statistics of Common Carriers</u> (computer printouts), 1977, Table 24.



Source: FCC. Statistics of Common Carriers, 1976

FIGURE IV-10: WESTERN UNION OPERATING REVENUE BY TYPE OF SERVICE, 1976.

a. PMS REVENUE AND VOLUME IN PERSPECTIVE

During the last ten years the proportions of revenue from various classes of service have shifted dramatically. For example, the latest data show that (non-PMS) Telex and TWX account for about 40 percent of Western Union revenue while in 1967 only 9 percent came from TWX. The PMS portion, on the other hand, dropped from about 45 percent in 1967 to about 28 percent in 1976. Between 1945 and 1976, Western Union's total actual operating revenue almost tripled. Figure IV-11 illustrates this increase over time. Corrected for inflation, however, the figure would show little growth.





As Figure IV-12 below demonstrates, AT&T and other telephone carriers, account for the largest portion of regulated interstate telecommunications commerce, 83 percent. The rest is scattered among television, with 9 percent, radio, with 4 percent, non-PMS telegraph, with 1.7 percent, "other" (including COMSAT, Land Mobile, Specialized Microwave and Miscellaneous), with 2 percent, and PMS, with .3 percent.



Source: FCC. Statistics of Common Carriers, 1976.

FIGURE IV-12: DISTRIBUTION OF REVENUE IN REGULATED TELECOMMUNICATIONS COMMERCE, 1976.

b. PMS AND INFOMASTER

Figure IV-13 provides an outline of the Infomaster system, with special emphasis on PMS. The network can be seen as a collection of local telephone loops and AT&T long lines, intermediate stations, and Infomaster that connects



sender to receiver. Most messages (64 percent according to the FCC) that are fed into the Infomaster network are accepted or delivered via telephone or terminal.

Figure IV-14 illustrates the relationship of Infomaster to the entire set of Western Union services. It is important to note that Infomaster is over ten years old. By computer standards, that equals roughly two generations. Thus there is some question about the adaptability of Infomaster compared with that of a central processor used by a newer carrier. One area where Infomaster seems vulnerable is in its flexibility in receiving input from senders. Western Union has quite strict limitations, and a large number of potential customers for PMS have terminals that cannot be interconnected to the Infomaster network. According to Graphnet, there are an estimated one million terminals that cannot be reached by Western Union.¹

E. POTENTIAL COMPETITORS IN DEREGULATED PUBLIC MESSAGE SERVICES COMMERCE

Electronic message transfer is a wide open field. Most of the new specialized carriers primarily serve business markets. Most have capabilities for resale or transmission that could be applied to provide a variety of services including both traditional public message services and PMS alternatives outside the bounds of regulated telecommunications. For example, a major portion of USPS First Class Mail service could be provided by regulated PMS carriers.

One set of recognizable signs of potential competition for the PMS market leads to an underground movement built on a patchwork of privately

^{1.} Federal Communications Commission Docket No. 78-96. Reply Comments on Behalf of Graphnet Systems, Inc., dated August 1978, p. 61.



leased commercial systems. For example, we found it possible to move hardcopy text by using "services" offered by word processing firms. This was inconvenient and expensive, but workable. We suspect that it is also possible to purchase, on a customer walk-in or phone-in basis, interstate transfer services that use small private computer terminals. For the moment, these patchwork arrangements seem to signal the market for such services rather than actual competition.

Much more significant forms of competition to potential PMS providers may come from any number of major corporations with extensive private communications networks. For example, a large hotel chain could easily open its message transfer system to the public and establish itself as a public message services carrier.

However, the United States Postal System and the specialized common carriers are more certain competitors in an open PMS market. The USPS might capture a large share of the market with its proposed ECOM service. For the SCCs, this deregulation will allow their first official entry into the market.

The most important comparisions between these potential competitors are:

- the great difference in size and capital resouces between Western Union or USPS and the SCCs such as Graphnet, and,
- the great similarity between Western Union and the SCCs in capability to provide telecommunications services.

For example, Western Union has about 100 times more employees than Telenet or Graphnet, while USPS has nearly 6,000 times more. The total combined operating revenues for all of the SCCs represent only about .2 percent of the total yearly revenue from regulated telecommunications commerce.¹ The discussion below regarding the USPS and the specialized carriers is presented primarily to show how the services and operations of new entrants to the public message services market would contrast with those of Western Union. More such comparisons must be made in the future.

1. THE UNITED STATES POSTAL SERVICE MAIL

The United States Postal Service's upcoming Electronic Computer-Originated Mail (ECOM) demonstration to be held in Rockville, Maryland, will be targeted at a market for approximately 15 billion electronic message transfers. (See Chapter III for a description of ECOM, Western Union's involvement, and other implications of the service, such as possible intrusion into data processing industry.) The new service will be aimed initially at 750 large corporations with computer capacity and billing volume sufficient to make ECOM a viable alternative to regular mail.² Reportedly, a significant number of Mailgrams originate from the computers or terminals of large companies and are transmitted to the general public. ECOM is expected to slow the growth rate for Mailgram, but not to reverse it because a large percentage of Mailgrams are voice-originated. Experts predict that computer-originated message transmission will have a growing, rather than static, market as more and more firms acquire compatible equipment. Postmaster General William F. Bolger said that:

[T]he best estimate is that hardcopy is going to be there in future years despite forecasts that telephone-television connections and home printouts might reduce volume.

1. FCC. <u>Statistics for Common Carriers</u>, 1976; and FCC staff estimate of specialized common carrier revenue, summer 1978.

2. "Postal Service Plans Test of Electronic Mail Delivery." <u>The</u> Washington Post, November 22, 1978.

According to a newspaper article, an RCA study estimated that the current volume of First Class Mail would rise another 4 percent by 1980, bringing the yearly total to 100 billion--or about 1.2 pieces per American per day.¹ The RCA study also estimates that candidates for electronic computeroriginated messages may make up one quarter of this total. Based on these figures, and assuming for a moment that public message services and ECOM would vie for the same customers, USPS could expect to send 555 messages for every message sent by public message services.

Other postal services also compete with PMS. Although volume of some special classes is small in comparison with First Class Mail, it still represents about five times more yearly exchanges than the entire public message services market. For example, the Certified and Special Delivery classes of Registered Mail account for about 270 million pieces per year.²

2. THE SPECIALIZED COMMON CARRIERS

Table IV-3 breaks down service characteristics of AT&T, Western Union, and eight specialized common carriers into 38 categories ranging from transmission capabilities to service options. (See the Glossary at the end of this report for definitions of terms used in this table.) Information in this table will have to be further verified by the carriers. Also, the service and technology characteristics of carriers are subject to a high rate of change according to CCB staff interviewed. The table shows that at this time carriers such as Southern Pacific Communications Corporation (SPCC), MCI, American Satellite (ASC), RCA American, and Telenet have developed

1. Ibid. 2. United States Postal Service. Annual Report of the Postmaster General, Fiscal 1977.

TABLE IV-3: SERVICE CHARACTERISTICS OF TEN CARRIERS (WESTERN UNION AND AT&T COMPARED TO EIGHT SPECIALIZED COMMON CARRIERS)

SERVICE	I	1	1		1	1	1	1		I.	T&T	
CHARACTERISTICS	WUTC	AT&T	MCI	SPCC	RCA	ASC	Telenet	Tymnet	Graphnet	CCS	USTS	Total
TRANSMISSION CAPABILITIES:	<u> </u>		<u> </u>						· · · · · · · · · · · · · · · · · · ·			
Microwave	<u>X</u>		X	<u>X</u>						X		. 5
Satellite	<u> </u>	X			X	<u> </u>						4
Coaxial	ļ	X			 			_ <u>_</u>				1
Open wire and other	X	X									ļ	2
Analog	X		X_	X	<u> </u>		<u> </u>	<u> </u>		X		7
Digital				X		ļ	X	<u> </u>		ļ	<u> </u>	3
Audio/Video channels	X	X			X							3
Voice channels	X	X	X	<u>X</u>	X	<u>X</u>				X		
Facsimile channels	X	X	X	<u>X</u>	X	X						6
Low-speed data channels	X	X	X	X				<u>X</u>		X		6
Medium-speed data channels	X	X	X	X	<u> </u>	X	X	<u>X</u>			ļ	8
High-speed data channels	<u>x</u>	X		X	X	<u> </u>	X	X		?	·	7
Voice-grade channels	X	X	X	X	X	X	X					7
Telegraph-grade channels	X	X		X								3
Wideband channels	X	X	X	X	X	X				-	1	6
SWITCHING CAPABILITIES:		ļ										
Real-time	X	X	X	X			X	X		X		7
Store and forward	X	ļ						X		ļ		2
Space Division	<u>X</u>	X	X	X						ļ		4
Time Division		Ä		X		ļ	X	X		ļ		4
Packet Switching							X	X	X			3
STATION TYPES.												
Voice station	Y	Y	x	Y	Y	Y				 	1	6
Data terminal	Y	v v		- A Y	A V	Y Y	v			+	1	6
Faccipile station	N V	_ <u>_</u>		V I		v v	v v			1		4
Talatypauritar	A Y	v		2	Y	v						4
										1		
RATE STRUCTURES:												
Metered use	X	X	X	X			X	X		1		6
riat rate	X	Х	X	X	X	X		X				7
Per-message rate	X	X						X				3
										1		
SERVICE OPTIONS												
Full-period service	X	X	X	X	X	X	X	X		X		9
Part-time service	X		X		X							4
Message pick-up/delivery									X			3
Dedicated	X	X	X	X	X	Х	X	X		X		9
Allocated	X	Х	X	X			¥	Y		Ī		5
Short-term service	X	X	X	X	X	X	X	X				8 1
Long-term service	X	X		X	X	X						5
Non-regulated services	X		X					-				2
Domestic service	X	X	X	X	X	X	X	X		X		9
International service		X			X	X	X	X		1		5
Transponder service					X							1
TOTAL PER CARRIER	32	32	20	25	21	18	17	18	2	8	2	

Source: Urban Institute Staff Interview with CCB Staff Summer 1978 Note: This chart must be further verified through direct industry contact. comprehensive telecommunications capabilites. Western Union offers every basic type of transmission, rate structure, station type, and service option. Its only "deficient" area is switching, where Tymnet leads everyone including AT&T by offering every type but "space division." With "time division" and "packet switching," which fosters heavily loaded high-speed data transmission, Tymnet and Telenet appear to be in the vanguard of telecommunications transmission capability. Companies that would probably compete in an open PMS market vary dramatically in size indications such as number of employees, capital, yearly revenue, etc.; yet there is a similarity in their basic capability to provide electronic message services.

One explanation for this might be that the cost of operating a telecommunications network has been significantly reduced by the introduction of vastly superior forms of interconnect, transmission, and switching equipment, and consequent reductions in labor costs. Also the resale characteristics of this market may have substantially reduced, over the past few years, the initial capital required to start and operate an electronic message service. For example, Western Union claims to have spent recently over \$250 million on new facilities directly related to PMS.¹ On the other hand, Graphnet asserts that only a \$4.75 million investment in owned equipment would be required to duplicate Western Union's public message services operation if transmission facilities are leased.² Assuming these estimates are accurate would mean that starting and operating a PMS-like message transfer service is over fifty times less costly today than it was when Western Union was investing in PMS facilities.

 [&]quot;Comments on Behalf of Western Union," Docket No. 78-96, p. 29.
"Reply Comments on Behalf of Graphnet Systems, Inc.," CC Docket 78-96, p. 41.

The balance of this section will focus on two specialized resale carriers rather than the general group. The discriptions will emphasize the following: (1) information of the type that would be collected for any carrier entering the public message services market; and (2) the current and projected status of some actual services which are expected to be affected by the deregulation.

a. GRAPHNET SYSTEMS, INC.

Graphnet is a 99.8-percent owned subsidiary of Graphic Scanning Corporation, a nonregulated company engaged primarily in providing specialized data and message processing and delivery services. (Graphic is unregulated, because it describes its primary service as data processing rather than communications.) Graphic's Dial-A-Check service for the trucking industry competes with Western Union's money order service. Its customized services may also make competitive inroads into the PMS market.

In December 1976, Graphic entered into a five-year contract with Citibank for Graphic's development and provision of customized automated data and message processing systems and services. Among the services offered under the agreement are the processing and delivery of information by computer to terminals with teletypewriter, facsimile, "electronic mail" and electronic funds transfer capabilities.¹

A Graphnet service offering is known as the Fax Gramtm. This service is advertised as an alternative to Western Union's telegram service. Facsimile service lends itself to a variety of applications, including:

Manufacturing: Engineering proposals. Drawing Bids, Specifications. Banking: Money transfers. Credit details. Legal: Depositions. Contracts. Wills and Trust Agreements. Medical: Medical histories. Electrocardiogram test results. Insurance: Policies. Claims. Medical Reports. Signatures.

1. Graphic Scanning Corporation. Prospectus dated April 13, 1977, filed at the Securities Exchange Commission, April 15, 1977, p. 13.

General Business: Correct a crucial error in an ad to a client customer. Alert law makers and public officials on legislation critical to your business. Activate a last-minute promotion to the trade. Critical news announcements to the media.¹

Graphnet Systems had 150 employees, claimed 20,000 customers, and generated \$6.5 million in operating revenue in 1977. Sixty percent of the employees were in sales. So far, Graphnet has invested \$14.5 million in a sophisticated computer system. The Graphnet operation could be considered a small-scale equivalent of electronic message services provided through USPS. Although cautious, Graphnet indicates the possibility of electronically transmitting information that is customarily sent through regular mail or Mailgrams.

[T]he expanded network will have the capability of electronically transmitting computer and other machine-generated business data and documentation now customarily transmitted by mail and, to a limited extent, by alternative electronic means such as mailgram, and that a potential market exists for such a service. However, any attempt to implement and market this service on a larger scale would be dependent on completion of the expanded network described above, the generation of substantial additional capital, a favorable regulatory environment and favorable competitive conditions. Accordingly, no assurance can be given that Graphnet will be able to market such service or, if such marketing commences, that it will prove profitable. Western Union is the dominant factor in this market.²

According to Graphnet, the Commission's delay in authorizing it to handle inbound international messages has hampered its efforts to expand. Graphnet officials cite about \$500,000 in lost revenue and a \$14 million loss to stockholders within the first two days of the FCC action nearly two years ago. Essentially, Graphnet argues that it has been curtailed in its ability to draw financing to support network expansion.³

^{1.} Graphnet promotional material. "Announcing the FaxGram". The Faster Gram."

^{2.} Graphic Scanning. Prospectus, 1977, submitted to the Securities Exchange Commission, p. 13.

^{3. &}quot;Reply Comments on Behalf of Graphnet Systems, Inc.," Docket No. 78-96, Appendix D, pp. 3-6. See also Appendix G.

Figure IV-15 illustrates Graphnet's current system, which uses leased facilities. This system uses a variety of delivery and acceptance modes, and can process raw input from customers into preprogrammed formats according to their instructions. A number of ancillary operations are also possible. The system can: (1) check the accuracy of individual operators who submit raw information, (2) monitor characteristics of current input, and (3) produce monitoring reports about daily processing. In addition, the company attempts to anticipate customer requirements for interconnection of new terminals, and Graphnet officials report they have developed approximately 90 equipment interface packages.

Unlike established common carriers, which have developed networks which required their users to adapt their communications needs to the operating criteria of such networks, Graphnet's system . . . affords each customer substantial flexibility to satisfy his particular communications requirements.¹

Of course, one of the main determinants of expanded services will be pricing. Figure IV-16 reproduces a chart used by Graphnet to advertise its services. It shows a price comparison between Graphnet and Western Union messages originated by Dataphone, word processor (CRT), computer, or teleprinter and delivered by messenger. According to the chart, this subclass of Fax Gram⁽¹⁾ service is less expensive and faster than Western Union's telegram service. Note, however, that this is simply a price comparision from a consumer's viewpoint.

1. Graphic Scanning Prospectus, op cit., p. 13.





GRAPHNET COMPUTERIZED STORE-AND-FORWARD FACSIMILE COMMUNICATIONS SYSTEM FIGURE IV-15:



Source: Graphnet Promotional Material, Summer 1978 FIGURE IV-16: COST COMPARISON OF FAX GRAM AND TELEGRAM

b. TELENET COMMUNICATIONS CORPORATION

As we mentioned in Chapter III, Telenet's parent companies are investment firms and securities brokers.¹ The company's 1977 prospectus mentions that it has incurred substantial losses because of investment in new construction. Regardless, Telenet stock is termed "very steady considering the age of the company," and it has amassed assets of \$6.5 million.

^{1.} Note that General Telephone & Equipment, the nation's largest independent telephone company, has announced it intends to purchase Telenet. This action would substantially increase this specialized resale common carrier's resources.

The company is headquartered in Vienna, Virginia, near its central computer facility. In 1977, it had 114 employees and 165 major customers in addition to customers who subscribe for data transfer on an hourly basis. At last report, Telenet generates about \$1.5 million of revenue per year. Telenet has concentrated on providing low-cost data transfer services. Its public data network serves 81 cities and is being expanded yearly. Most terminals or computers interfacing with its system operate up to 1,200 bits per second, but its leased network is designed to accommodate transmission speeds of up to 56,000 bits per second.¹

Telenet has made a contribution in the area of interconnecting computers and terminals that operate at different speeds and according to different protocols. The company is a pioneer in packet switching. It started to build a packet switching system for its leased transmission facilities in late 1972, tested the network in 1975 and began operation in 1976. (Also, see Chapter III's section on research and development funding.) Products such as Telenet's TP4000 Host/Terminal Interface Processor incorporate this new technology. The company is also associated with advances in data concentration that allow more messages to be transmitted per line per minute. For example, Telenet and Digital Communications Corporation are working together to develop a family of microcomputer-based systems called "Telenet Processors." These machines pack and concentrate messages before transmission to improved transmission efficiency.

Telenet appears to have taken a unique approach to the organization of its network. (See Figure IV-17.) It has a distinctly regional or decentralized character, with major computerized switching centers, known

^{1.} Telenet Corporation, Prospectus, submitted to the Securities Exchange Commission in 1977. All information presented here is subject to further direct verification with Telenet.



Source: Telenet Promotional Material, received at The Urban Institute Summer 1978.

FIGURE IV-17: THE TELENET NETWORK, 1977

as Class One offices, around the nation. This characteristic could be a vital asset in the future. In a report to the Commission on electronic message systems, Kalba Bowen warned the Commission that there may be a sudden surge of license applications to CCB for small computer terminal interconnects, ¹ such as the surge that occurred when CB radios became

^{1.} Kalba, Konrad K., et al. Electronic Message Systems: The Technological Market and Regulatory Prospects, April 1978.

popular. Introducing many new computer devices on the nation's long lines system could call for operations and technologies to control local and regional input into the system. Telenet's control centers seem to fit that need. This does not, however, mean to imply that the nation's long lines system is a static resource. Other companies would also be entitled to request Commission authorization to build such facilities.

•

V. A LOGIC FOR THE EVALUATION

A. OVERVIEW

A logic for the evaluation is organized around the seven main events we expect to occur during the proposed deregulation. The actual intervention is defined by activities which are expected to occur during the first three events. Event I activities might be characterized as preparatory; e.g., completing a review of legal authority for deregulation.¹ Event II concerns obtaining Commission authorization for PMS deregulation. The first major activities occur during this phase: (1) approval of the Memorandum, Opinion, & Order (MO&O), which announces the policy change and explains the Commission's rationale for deregulating PMS; and (2) approval of the final rulechange. Event III deals with streamlining Commission procedures for handling PMS filings.

As of January 1979, most Event I activities have occurred. However, the time schedule planned for revising the PMS rules has slipped. Although the MO&O was approved by the Commission on January 25, 1979 (an Event II activity), the revised draft rulemaking has not yet been scheduled for submission to the Commission (an Event I activity). The draft of revised 47 CFR rules and regulations is scheduled for release within 90 days of the Commission's approval of the MO&O. These rules are expected to deal with market entry and exit as well as business operations while a firm is actually engaged in PMS commerce. The Commission is expected to consider

^{1.} The term deregulation is used here to denote a change in policy, practice, and/or rules which reduces (but does not necessarily eliminate) the burden on the regulatee.

adopting a revised rulemaking after an analysis of comments received during the public notice period.

Event IV involves carriers applying to the Commission to enter the PMS market. Although carriers may apply as soon as the policy change is approved, interested firms are not expected to act until they have had an opportunity to review the actual rulechange. Therefore, a more practical time for new entrants to begin to market public message services is probably March or April 1979, assuming that presentation of the draft rulechange before the Commission occurs in February. During Event V, staff of ETIP, the ETIP contractor, and CCB plan to monitor commerce as PMS services and operations change.

Events VI and VII involve actual observation of commerce, analysis of evaluation findings, and transfer of knowledge gained as a result of monitoring the effects of the deregulation. Both of these events are already under way. They are portrayed as final stages of the evaluation since these types of activities will increase and step into the forefront toward the end of the project. Also, in actuality, products occurring at any time could be either subjects of analysis or results of analysis by evaluators. Hopefully, these analysis and information transfer activities will be timely in terms of the information needs of those expected to use evaluations findings and in relation to real world events that might affect the deregulation and evaluation activities.

The hypothesized effects of the intervention would affect (1) Commission process (for example, workload) and (2) the commercial sector and innovation. In an initial attempt to set boundaries for this proposed evaluation, a preliminary model for ongoing measurements and a preliminary

measurement set have been developed. The model is presented in Chapter VI of this report and is illustrated with hypothetical examples, such as the way one would track innovation in terminal equipment used for public message services. Although measures outlined presently appear feasible at some level of rigor, more work is needed to determine the degree of feasibility and rigor possible.

As already noted, we expect to update the model as industry trends develop and user needs are better defined. Specifically, we expected to make revisions as the intervention progresses and as we validate the model and measures with industry and others. Events I through VI all conclude by reassessing the potential for useful evaluation. This step should ensure that measures and comparisons assess agreed-upon goals, and that activities achieve both interim and downstream objectives. Each event is discussed below.

B. EVENT I: COMMON CARRIER BUREAU DRAFTS AN MO&O AND RULEMAKING INTENDED TO END WESTERN UNION'S MONOPOLY, OPEN PUBLIC MESSAGE SERVICES COMMERCE TO COMPETITION, AND REDUCE FUTURE PMS REGULATION

1. EXPECTATIONS

In general, the Common Carrier Bureau would like to see a successful resolution of the Western Union Monopoly Inquiry. The Commissioners' vote to authorize the findings and evaluation of the new rules and requirements by those involved will determine success.

2. ACTIVITIES

Event I did produce a draft MO&O to end the Western Union public message services monopoly. Next, revised rules and requirements for the eight most

relevant Parts of 47 CFR will be promulgated. (See Chapter IV for a detailed description of relevant Parts of 47 CFR.) When authorized by the Commission, the draft Memorandum, Opinion, & Order, is expected to formalize a substantive shift toward competition in FCC/CCB official policy and rules for public message services.

The MO&O will probably not attempt to define public message services. This is to permit as much leeway as possible for new types of technologies and services to enter the market. It is most likely that the final rulechange will contain the revised definition of public message services. All references to "telegraph" are expected to be deleted, and the public, nonexclusive, private handling, and hardcopy characteristics of public message services will probably be emphasized.

During Event I, representatives of relevant CCB branches participated on a committee which conducted preliminary analysis of Parts of 47 CFR. This process helped to point out areas where further legal research was required. Also, early participation by each branch which will be affected by the rulechange should help to facilitate implementation of a streamlined CCB process for administering those rules (Event III).

As of this writing, the specific and final changes of 47 CFR in regard to PMS are not known. Therefore, a comparison of the draft rulechange and the original PMS rules cannot be presented. We can, however, contribute to a better understanding of the types of changes proposed and the implications that specific changes might have for the outcome of the deregulation. Table V-1 shows how three sections of Part 63 might be compared with hypothetical requirements for public message services carriers. The first three columns of the table list current stipulations: 63.01 applies to information required

TABLE V-1:HYPOTHETICAL STIPULATIONS FOR PMS CARRIERS COMPARED TO CURRENT
CONTENT REQUIREMENTS IN SECTIONS OF PART 63 OF 47 CFR

	62 01 Stinulations Pot	Information	Current1.	
6	05.01 Stipulations Ke:	Poguirod From		Taformation
	in Typical Applications	For Extensions	For Supple-	Required
	To Extend Encilition	Towolwing Small	ror suppre-	From PMS
	TO Extend Facilities	Projects	Facilities	Carriers
		(por 63, 03)	ractificies	Calliels
None	and Address	(per 05.05)	(per 03+04)	v
a. Name	and Address	X V	X V	X Y
D. Locat	Title and Address of Official		X V	X V
C. Name	, fitte and Address of Official	A V	x v	×
d. State	ement of common carrier status	Δ	Δ	A
e. State	ement Regarding Extension into	V		v
Lei Chan	rritory Not Currently Served	A V	v	×*
State	ement Regarding Type of Services	Δ	A	A **
I. Point	ilitics Leasted	v	v	v
Fac	cilities Located	Δ	Δ	A
g. Desci	ription of Existing Facilities,	v		v
Spe	ecifically channels	Δ		A
n. Desci	ription of Proposed Facilities,		v	
Cna	annels		A	^
W11	res, Conductors, Coaxial Cables			
	asses of Uffices			
11	Telegraph, Method of Pickup	V		
	and Delivery	Δ		
1. Prese	ent and Estimated Future			
Red	quirements			v
Rei	routing Contemplated			X
Ci	rcuits			X
Tr:	affic Load Trends			Å
j. Map o	or Sketch Showing			
Roi	ute			
	nership Structure			
Fa	cilities to be Removed			
Ci	ties, Towns, Villages		37	v
Roi	ute Mileage		X	A
Im	portant Operating Centers			
	ate Boundary Lines			
Sp	ecial Typographical Features			
k. As A	pplicable,		TT I	
If	Construction: The Cost Estimate		X	
If	Leased: Terms, Lessor, Rental	X	X	
If	Purchased: Vendor, Assets	X	X	
If	Other: Type, Terms, Description	X	X	
1. Fact	ors Showing Public Need	X		
m. Econ	omic Justification, e.g., Added			
Re	venue and Cost	X		
n. Othe	r Services Available; Why Exist-			
in	g Facilities Not Adequate	X		
o. Prop	osed Tariff Charges/Regulation	X		
p. Acco	unting Methods Explanation and			
Pr	oposed Method Performed	X	X	
q. Stat	ement About Whether New Con-			
st	ruction Requires Environmental			
Im	pact Statement	X		X
		1		
* R	evised definition of public messag	e •		

from carriers for authorization to extend facilities; 63.03 contains stipulations for extension of facilities for small projects (under a certain dollar amount); 63.04 contains stipulations for supplementing facilities. As you can see, the second and third columns contain fewer stipulations than the first. However, even for extensions involving small projects, stipulations 1., m., and n. apply. These require statements on public need; economic justification; and the inadequacy of current facilities. These stipulations would be important under monopoly conditions. They hinder companies from entering a market. A PMS rulechange might delete these requirements; if so, the burden on the regulatee would be reduced.

Figure V-1 illustrates the activities directly associated with Event I. From left to right, the solid black line shows the flow of activities from one event to the next. The broken line illustrates measurement and analysis tasks, and information feedback to potential users of evaluation findings. Likely participants are shown in parenthesis next to each numbered activity. All CCB Branches, m. in the Participants Key, refers to the representative from each CCB branch participating in an Evaluation Group (see Event II). The identity of other participants should be self explanatory. A similar descriptive chart has been prepared for each of the other major events which follows. These charts outline our best understanding to date of the plan for the evaluation and represent a starting point for development of the evaluation design.

Since most of the activities of the deregulation are projected and therefore tentative, the sponsors have singled out some possible occurrences that could alter the course of the deregulation. As a rule, these occurrences might seriously impair or even stop the progress of the deregulation. For this event, three are: (1) a finding that the Commission does not have the authority to deregulate; (2) a finding by ETIP's contractors





ч*	ARTICIPANTS KEY:				
ť	. Commission	k.	CCB Economics Division	s.	Other Common Carrie
Ą	. Commission and Counsel Staff	1.	CCB Accounts and Audits Division	t.	Attorneys and Indus
o	. Chief, CCB	с.	All CCB Branches	n.	Bell System
p	. CCB Management	ч Ц	ETIP	۰.	Suppliers of Equipn
Ð	. CCB Plans and Policy	•	ETIP Contractor		Raw Materials
чн	. CCB Policy and Rules	р.	Those Submitting Comments and/or	ω.	Investors
60	. CCB Program Evaluation		Petitions to the Commission	×.	States and Localiti
4	. CCB Facilities	Р	Public (Including Consumer	у.	Carrier Employees
• –	. CCB Complaints and Service Standards		Interest Groups)	2.	Academic Community
	. CCB Tariff	τ.	Western Union		

Industry Experts

arriers

quipment and

alities

FIGURE V-1: EVENT I PARTICIPANTS, ACTIVITIES, AND POTENTIAL PRODUCTS, MEASURES, AND INFORMATION USES

that expectations for the deregulation are implausible as measured by ETIP criteria (see Chapter VI), and (3) an FCC finding that the draft rulemaking violates Commission mandate or policy. The first two problems did not occur; and the third is not expected to occur.

TIMEFRAME

Although all Event I activities were expected to be completed by January 1979, activities 8, 9, 11, 13, and 15, must still be accomplished.

C. EVENT II: AFTER PUBLIC NOTIFICATION, COMMISSIONERS AUTHORIZE CCB REVISED PMS RULEMAKING TO GO INTO EFFECT

1. EXPECTATIONS

If the Commissioners' reaction to the rulemaking is positive and if the notice period does not generate major conflicts, the Common Carrier Bureau will have been successful. Ultimately, both ETIP and CCB will judge the success of Event II by its actual downstream effects on the structure of PMS commerce.

2. ACTIVITIES

The Commissioners will determine Event II activities because they alone make all substantive changes in official policy and must authorize the MO&O and rulechange. The Commission process for public notice, comment, and review of proposed new rules will be the first opportunity for broadbased scrutiny and reaction to the deregulation. (See Chapter IV for a description of this
process.) During this stage, it is possible that the MO&O will be challenged. Another Commission deliberation could result, <u>or</u> the courts could "restrain" the Commission from putting the rulemaking into effect.

Also, by virtue of its association with the project, ETIP will become generally visible in telecommunications for the first time and can be expected to answer questions about its role in this project. The Common Carrier Bureau will be integrally involved in this event as well, examining comments during the public notice period and supporting the Commission's decision-making process.

A sample measurement set for the evaluation will probably be made available for review by organizations that comment on the proposed rulemaking. Their suggestions and information needs will thereby be taken into consideration during the evaluation design. Table V-2 presents a draft of such a measurement set. The columns on the table show expected events of the deregulation, issues that might be measured, one or more possible measures for each issue; and the source of measurement information, out of four possibilities, that would probably be used. This table illustrates how ongoing decision making about what to measure, how to measure, how much rigor of measurement and analysis is needed, etc., depends on the actual occurrence of expected events. We hope, by this process, to assure that measurement information is useful and that resources for evaluation are not wasted. Comments received during the public notice period will indicate industry's willingness to participate in this evaluation. Their cooperation will be important to our data collection effort. However, the Commission will maintain legal authority to require certain information.

TABLE V-2: SAMPLE SET OF MEASURES

Expected Events of Deregulation	Potentially Measurable Issues	Measures	Source(s) of Measurement Information
Event III has occurred; CCB streamlines process	What minimum report- ing requirements and controls on rate of return are necessary in order to manage and learn from the deregulation?	 Ongoing monitoring of deregulation Comparison of in- tent of rulechange with actual effects 	 Industry/FCC Industry/FCC
11	What regulations should be in force during transition to competition?	 Ongoing monitoring of deregulation Reactions of car- riers, including Western Union 	• Industry/FCC • Industry
11	Is the public interest adequately protected?	 Survey of con- sumer reaction to the policy change Complaints Monitoring of aggregate PMS and alternates available 	 Consumers Consumers Industry/FCC
Event IV has occurred; carriers enter PMS market	Does PMS deregula- tion encourage technological inno- vation in market?	 Survey of PMS technology Analysis of rulechange 	• Industry/FCC • FCC
Event IV has occurred; carriers do not enter the PMS market	If deregulation does not lead to competition, what are the reasons?	 Survey of com- munications firms remaining outside Survey of con- sumers who opt not to huy PMS 	IndustryConsumers
Event V has occurred; observed change	Will new and im- proved PMS be available to the general public?	 Array of services available Types of customers 	 Industry/FCC Industry/ Consumers
Event V has occurred; observed change	Will cost of PMS be reasonable?	 Inventory of prices Description of pric- ing requirements 	• Industry/FCC • FCC
Event V has occurred; observed change	How adequate are new public message services?	 Survey of cus- tomer satisfaction Comparison to satisfaction with alternate services 	 Consumers Consumers/ PMS and other
Event VI has occurred; systematic evaluation	What is a rigorous definition of PMS?	• Commission defini- tion compared to market realities	• Industry/FCC

Details of Event II description are illustrated as Figure V-2, which employs the same conventions as Figure V-1. Some measures for Event II products include an estimate of the match between policy intent and the actual rulechange, an estimate of the match between anticipated and actual reactions of regulated commerce to the rulechange, and a calculation of the percentage change of significant PMS rules in 47 CFR after the rulemaking is approved. Table V-1 illustrates under Event I activities some hypothetical revised rules for PMS and shows in microcosm how revisions and deletions of stipulations from Parts of 47 CFR might be tracked. Table V-3 presents hypothetical findings for an actual measure.

During Event II we can also begin to address most of the conditions that could undercut the potential for full evaluation of the effects of the deregulation. We recommend that an Evaluation Group of representatives from the CCB, ETIP, and the ETIP contractor be formed. This group would meet regularly to accomplish such tasks as establishing priorities for transferring

	Percent Stipulations	Percent Stipulations	Number of		
Part of CFR	Revised	Deleted	Stipulations		
21	10	0	500		
35	7	0	90		
41	20	10	10		
42	5	2	900		
43	10	10	10		
61	10	3	200		
63	4	63	120		
64	30	10	80		
		<u> </u>			
(a) Parts ap	plicable to current PMS	carrier; see Chapter IV	for a		
descript	description of each relevant Part.				

TABLE V-3: PERCENTAGE CHANGE IN 47 CFR RULES AND REQUIREMENTS^a (Hypothetical)



EVENT II: AFTER PUBLIC NOTIFICATION, COMMISSIONERS AUTHORIZE CCB REVISED PMS RULEMAKING TO GO INTO EFFECT

information from the evaluation, and overseeing the distribution of evaluation resources. Evaluators should also begin developing criteria for judging the significance of observed changes in relation to the Commission's mandate and CCB and ETIP goals. For example, for purposes of the evaluation, what yardstick of customer satisfaction should be used to measure whether public service standards used by different carriers are adequate? Decisions about criteria require a broad consensus of opinion and therefore discussions should begin as soon as possible.

Because resolving most evaluation problems will require specific measurement information and other data, a Design Group should be formed to collect information needed for project administration decisions. This Design Group would meet regularly and would receive direction from the Evaluation Group. Common Carrier Bureau staff, ETIP staff, and ETIP contractor staff would make up this group. The primary benefit of this composition would be the exchange of ideas about how to proceed. The ETIP contractor would undertake most applied tasks (such as data gathering).

TIMEFRAME

Event II started in January 1979. The proposed rulechange must be presented before the Commission within 90 days after the approval of the MO&O. The public notice period for new rules can take from 30 to 45 days, and congressional legislation requires the Commission to defer final authorization for an additional 23 days. Therefore, Event II may require from two to five months to complete.¹

^{1.} A 30-day public notice period includes 20 days for comments and 10 days for reply comments. Since the PMS deregulation is an important action, Commission staff will probably have to designate a 45-day public notice period (30 days for comments; 15 for reply comments).

D. EVENT III: COMMON CARRIER BUREAU STREAMLINES THE PROCESS FOR ADMINISTERING ONGOING PUBLIC MESSAGE SERVICES REGULATION

1. EXPECTATIONS

CCB's success criteria for this event are the following (a) is the operation modified in a manner consistent with policy intent; (b) is the new operation likely to lead to difficulties among carriers, such as disputes about fair process; and, (c) will the new operation reduce staff allocations to PMS transactions?

The ETIP criteria for Event III success focus on the question of whether the new operations for PMS transactions will in fact mean less costly and less intrusive ongoing regulation. If this is the case, ETIP will want to determine how the operation was streamlined and how to determine what effects the modified operation has on PMS commerce (an Event IV activity).

2. ACTIVITIES

The day-to-day activities of CCB staff who process public message services applications are expected to change. The Bureau's Domestic Facilities Branch, Tariff Review Branch, and Complaints and Services Standards Branch will probably be the key participants in Event III. Common Carrier Bureau management is expected to provide guidance and direction to CCB branches, consistent with the intent of the rulemaking.

An effort to modify conventional Common Carrier Bureau operations will probably stimulate innovative approaches for processing public message services transactions. The practical benefits expected include more comprehensible application forms, simpler formats for required reports from carriers, and

definitions and protocols for processing carrier and consumer filings. Checklists and criteria for branch-level decisions regarding applications, and procedures for resolving disputes between carriers and complaints from PMS customers might also be improved.

Event III could present difficulties or opportunities for the project. Implementing new operating practices is not always a pro forma exercise. The literature about federal policy initiatives refers to some situations where implementation activities <u>have not</u> resulted in changed agency operations considered consistent with the new policy. In some instances, the policy could not be implemented at the operations level. At CCB, this is not expected to be a problem. Branch staff seemed eager to identify ways to streamline the process.

The description elements for Event III are illustrated in Figure V-3.

TIMEFRAME

Some of the activities for Event III are already under way; representatives of the relevant CCB branches participated on the rule analysis committee. During the committee meetings, the subject of how to implement the changes in branch level operations frequently arose. This type of branchlevel participation should promote a smooth transition from policy intent, as expressed in the rulemaking, to regulatory process, as indicated by plans and protocols for PMS transactions. The bulk of activities for this event will probably occur only after the Commission has authorized new rules and requirements for PMS. Thus, assuming the draft rulechange is submitted before the Commission in February, the branches will begin to complete plans for implementing a revised PMS regulatory process in March or April 1979.





PAR	TICIPANTS KEY:					
a.	Commission	k.	CCB Economics Division	σ	Other Common Carriers	
þ.	Commission and Counsel Staff	1.	CCB Accounts and Audits Division	t.	Attorneys and Industry Expe	pert
; ;	Chief, CCB	Ē	All CCB Branches	'n.	Bell System	
-р	CCB Management	'n.	ETIP	۷.	Suppliers of Equipment and	-
e.	CCB Plans and Policy	•	ETIP Contractor		Raw Materials	
÷	CCB Policy and Rules	ь.	Those Submitting Comments and/or	м.	Investors	
	CCB Program Evaluation		Petitions to the Commission	х.	States and Localities	
ч	CCB Facilities	÷	Public (Including Consumer	у.	Carrier Employees	
	CCB Complaints and Service Standards		Interest Groups)	z.	Academic Community	
	CCB Tariff	г.	Western Union			

FIGURE V-3: EVENT III PARTICIPANTS, ACTIVITIES, AND POTENTIAL PRODUCTS, MEASURES, AND INFORMATION USES

E. EVENT IV: CARRIERS AND OTHER INTERESTED BUSINESSES SUBMIT APPLICATIONS TO OFFER PUBLIC MESSAGE SERVICES

1. EXPECTATIONS

Although it is the keystone of the deregulation, Event IV is beyond direct control of either the Commission or ETIP. If new carriers and businesses currently operating as common carriers apply to enter the public message services market, the deregulation will fail to accomplish a major goal--structural change and service improvement in PMS commerce.

CCB expects the establishment of an open PMS market and approval of the rulechange will prompt one or more companies to pursue new customers in the market. Also, within the timeframe for transition and limitations, specified in the Commission's rulechange, Western Union may opt to discontinue or alter the public message services it now provides. In any case, Western Union will continue in public message services through its association with the United States Postal Service. (See Chapters III and IV.)

ETIP plans to use measurement information about Event IV to start tracing probable effects of the deregulation on commerce, particularly in the area of technological innovation. In addition, measures of modified Common Carrier Bureau operation will be used to determine the effects of efforts to streamline regulatory process: Did the deregulation make it easier for carriers and services to enter the public message services market?

2. ACTIVITIES

The activities for Event IV will focus on a number of decisions that will be made by members of commerce, for example:

- Should PMS market potential be assessed?
- Should an operation for servicing PMS customers be designed and tested?
- Should raw material for offering public message services be purchased?
- Should applications to enter the PMS market be filed with the Commission?

As the list indicates, a decision to enter PMS is weighed by company management against the "cost" of regulatory requirements and against considerations related to profitable enterprise (e.g., market potential). Event IV also involves activities of attorneys, market analysts, equipment suppliers, state public utility commissioners, and the AT&T system representatives. All of these groups are very likely to participate in launching new public message services enterprises.

The combination of activities will probably vary with each company according to its prior experience with telecommunications. Companies with well-developed telecommunications computerized message switching systems, or facsimile capability, and experience with the Commission may be easily capable of offering these services. Other companies with similarly impressive technical capability may have more difficulty entering the PMS market if they lack experience in operating as a common carrier.

Common Carrier Bureau activities are expected to produce station licenses, tariff filings, and other documents that will be required for entering open PMS commerce. These documents and certificates--evidence of competition in PMS commerce--will result from applications filed with the Common Carrier Bureau in response to Event II and processed under the Bureau's modified regulatory operation, developed as part of Event III.

In another Event IV activity, ETIP and its contractor will take measurements of the regulatory process for PMS applications. We will use measures established during Event III. Similarly, data we gather about carriers entering the market should form the foundation of measures for impacts on market structure that we expect to observe during Event V.

Description elements for Event IV are presented in Figure V-4.

TIMEFRAME

As we mentioned, market entrants could start offering public message services around March or April 1979. We expect Event IV to extend over a long period of time because businesses will probably be entering the public message services market at various times throughout the evaluation.

F. EVENT V: PUBLIC MESSAGE SERVICES MARKET STRUCTURE IS OBSERVED TO CHANGE

1. EXPECTATIONS

Event V is expected to monitor a change in the structure of public message services commerce. The number of companies in the business, the services available to customers, the prices for services, the facilities and equipment used to provide services, and share of the market garnered by each company supplying public message services will indicate the change. This event should focus on the realization of ETIP's goals and the Commission's intentions in opening PMS commerce.



FIGURE V-4: EVENT IV PARTICIPANTS, ACTIVITIES, AND POTENTIAL PRODUCTS, MEASURES, AND INFORMATION USES

2. ACTIVITIES

PMS customers are primary participants in Event V, because their purchases are essential to successful commerce. If customers purchase public message services, revenues might be sufficient to promote innovative services. The deregulation might also generate new customers for some established public message services, such as money orders, and thereby bolster PMS commerce.

It is also possible that customers will initially reject new public message services offerings, or that the deregulated PMS market will simply lead to uncontrolled anti-competitive practices by the well endowed established carriers. For example, a short period of open competition in public message services might be followed by virtual monopoly if another carrier captures the market; without regulation, the Electronic Computer-Originated Mail service proposed by the USPS might supplant fledgling public message services carriers.

During Event V, ETIP and its contractor will trace changes in commerce that occur as a result of Event IV activities. The data generated through these activities will provide in turn the basis for analyses in Event VI. The evaluators are expected to work closely with CCB staff and use existing data for tracing activities, but information from companies, customers, equipment manufacturers, etc., is also expected to be required. The Evaluation and Design Groups will probably be in contact with participants in public message services commerce.

Figure V-5 illustrates the description elements for Event V.

3. TIMEFRAME

Event V could begin as early as March or April 1979.



168

FIGURE V-5: EVENT V PARTICIPANTS, ACTIVITIES, AND POTENTIAL PRODUCTS, MEASURES, AND INFORMATION USES

G. EVENT VI: SYSTEMATIC EVALUATION AND RESEARCH DEMONSTRATES IMPROVEMENT IN PMS COMMERCE

1. EXPECTATIONS

One of ETIP's major expectations is that Event VI will supply evidence for the hypothesis that removing of regulatory barriers leads to technological innovation. ETIP recognizes that innovation in commerce can take a variety of forms (e.g., variations of established technological applications, or original applications of new technologies). (See also Figure II-1 which illustrates some experimental technologies that could be used to provide public message services.) The most important innovations will be those that serve the longterm general public interest.

ETIP also expects to learn how evaluation process and method apply to the development of an administrative experiment and to the identification of "generic" regulatory issues.

Though ETIP and CCB expect somewhat different products, both expect to define success by the credibility and usefulness of these products.

2. ACTIVITIES

The main participants in Event VI will be ETIP and its contractor. They will apply criteria for success to the combined data collected during the deregulation, Events I to V.¹ The task is expected to have three components. The first establishes whether a commercial effect (or anticipated event) has occurred and whether it can be linked to the deregulation. If

^{1.} Criteria for success are expected to derive from the Commission mandate for orderly, safe, and affordable telecommunications services, and ETIP criteria for a successful administrative experiment (see Chapter VI).

the link can be established, the second component compares data gathered about the actual event with the hypothesized expectations about the event. These hypothesized expectations are based on the criteria for judging the significance of observed changes previously agreed upon by ETIP, the ETIP contractor, and the Commission staff. The third component is expected to establish whether information gained from the evaluation will lend itself to generalization. This event represents ETIP's influence at the Commission. Since CCB evaluation of a major policy change is rare, ETIP's influence should result in an improved evaluation process for the Commission.

Specific activities for Event V will produce evaluation information and involve: collecting and synthesizing data; modeling and analysis; drafting, typing, editing, and reviewing reports; designing briefings; presenting briefings and reports; etc. Analyses undertaken in Event VI are expected to build on the type of measurement application illustrated in Chapter VI, Figure VI-4, Expectations For Measurement Associated With The PMS Deregulation.

ETIP has defined some other analyses that should culminate during Event VI. These range from assessing deregulation effects on CCB and the Commission and developing a model that describes relationships between regulatory process and industry performance, to making determinations about how deregulation leads to competition. If the project stalls, we will attempt to explain why the deregulation did not result in competition or technological innovation.

Figure V-6 illustrates the description elements for Event VI.

EVENT VI: SYSTEMATIC EVALUATION AND RESEARCH DEMONSTRATES IMPROVEMENT IN PMS COMMERCE



*PA	RTICIPANTS KEY:				
а.	Commission	k.	CCB Economics Division	°.	Other Common Carriers
þ.	Commission and Counsel Staff	1.	CCB Accounts and Audits Division	t.	Attorneys and Industry Exp
0	Chief, CCB	ш.	All CCB Branches	п.	Bell System
•р	CCB Management	п.	ETIP	v.	Suppliers of Equipment and
e.	CCB Plans and Policy	••	ETIP Contractor		Raw Materials
ŕ.	CCB Policy and Rules	ь.	Those Submitting Comments and/or	. ч	Investors
60	CCB Program Evaluation		Petitions to the Commission	х.	States and Localities
4	CCB Facilities	÷	Public (Including Consumer	у.	Carrier Employees
	CCB Complaints and Service Standards		Interest Groups)	2.	Academic Community
	CCB Tariff	ŗ.	Western Union		

eys and Industry Experts

FIGURE V-6: EVENT VI PARTICIPANTS, ACTIVITIES, AND POTENTIAL PRODUCTS, MEASURES, AND INFORMATION USES

3. TIMEFRAME

Preparation for Event VI has already begun. The recording, tracing, and reassessing of evaluation potential associated with each event should produce most of the data that will be needed for Event VI analyses. A date for event completion has not been determined, and will be contingent on the development of the project. A rapid negative or positive reaction from industry would result in an earlier completion date. Although the timing in both cases would be similar, Event VI products would be quite different. Event VI activities will not be completed as quickly if the change in regulatory process and commerce is slow, but worth tracking. However, Event VI activities are expected to be timely in relation to actual changes associated with the deregulation and to the information needs of those who will probably use the evaluation findings.

H. EVENT VII: CCB AND ETIP TRANSFER KNOWLEDGE GAINED FROM EVALUATION, AS EVIDENCED BY PRODUCTS AND USEFUL APPLICATIONS OF FINDINGS

1. EXPECTATIONS

The Common Carrier Bureau expects that evaluation information from Event VI will be useful to general CCB administration of common carrier regulations. For example, the information might be particularly well applied to internal management operations, such as procedures for developing a rulemaking.

ETIP is interested in using evaluation feedback to refine its approach to administrative experimentation and to transfer knowledge to the universe of experts and decision makers in the fields of commercial policy, regulatory policy, administrative experimentation, or evaluation. ETIP also expects

to use evaluation findings in marketing its approach to other agencies that might wish to establish an ETIP administrative experiment.

2. ACTIVITIES

CCB and ETIP will share responsibility for Event VII knowledge transfer activities. ETIP and its contractor are expected to support the following activities:

- ongoing identification of real users of evaluation information,
- final preparation and distribution of evaluation information,
- assessment of usefulness of distributed materials, and
- follow up response to questions and comments which the distributed materials provoke.

Reports resulting from the evaluation are expected to cover topics such as:

- impact of deregulation
- policy setting process description and analysis
- rule change process and steps in deregulation
- interim status
- requirements for regulation in a new competitive market
- implementation (transition to competition)
- regulatory system performance
- barriers to deregulation
- model solutions to generic problems
- techniques and methods for managing regulatory change

These reports should answer specific questions on the progress of the deregulation and substantive evaluation findings and may help to build a data base which could be applied to other areas of the telecommunications industry and to industry dynamics in general.

Figure V-7 presents the description elements for Event VII.

3. TIMEFRAME

Event VII is under way as this document and others that feed back evaluation findings show. Event VII will end when the last evaluation product has been completed as per the terms of the ETIP/FCC working agreement.







Academic Community

Interest Groups)

Western Union

Ľ.

Complaints and Service Standards

Tariff

CCB

.

-

VI. AN ASSESSMENT OF THE POTENTIAL FOR USEFUL EVALUATION

A. OVERVIEW

In this chapter we discuss many potential targets for evaluation findings, and ask how measurement and analysis effort should be allocated among these areas. In this initial effort to define the evaluation, we will (1) identify a number of measurement information needs (Section B) and (2) construct a preliminary model for organizing measurements, to show how specific measures might be applied (Section C). The chapter concludes with a brief summary of findings to date on the potential for useful evaluation of the proposed deregulation of PMS (Section D).¹

B. NEED FOR MEASUREMENT INFORMATION

This section identifies the individuals and organizations that are expected to use evaluation information (i.e., the "market" for data on evaluation progress).

1. ETIP AND FCC

The sponsor class, composed of CCB and ETIP staff, is closest to the actual evaluation. Together with officials at FCC and the Department of Commerce, they control resources used to shape activities. As sponsors, ETIP

^{1.} The term deregulation as used here denotes a change in policy, practice and/or rules which reduces (but does not necessarily eliminate) the burden on the regulatee.

and CCB share a need for rather specific data that can be used to guide the project's ongoing activities.

ETIP and CCB expect to gain measurement information not only for internal administration of the project and general performance monitoring, but also for specific interests of their own. For example, ETIP wants data that will help to define the relationship between regulatory processes and commercial innovation. We have also detected a substratum of important information needs in the CCB; for example, information on terminal equipment might help the CCB to construct a system for differentiating "intelligent" communications terminals from data processing equipment. Figure VI-1 illustrates other potential uses for information among different groups within ETIP and the Commission.

Although measurement information needs such as these are very challenging, they are small compared with the larger problem of the Commission's overall measurement information shortage. There is virtually no formal framework for comprehensive measurement of the effects of regulation on telecommunications commerce, and there are more measurable issues that might be tracked than there are evaluation resources. As we mentioned earlier, an Evaluation Group will have primary responsibility for allocating these resources. However, we welcome any suggestions that might contribute to a truly representative measurement model. Developing a feasible measurement framework that will provide useful information at a reasonable cost is a continuing task of this effort.





SPECIAL INTEREST MEASUREMENT NEEDS OF SPONSORS FIGURE VI-1:

FACILITIES BRANCH

214 Authorization

innovative technology on the national commun-

leations network and

Bob James Helene Bauman

•To assess effect of In- help determine real ex-creased competition and tent of possible danger

USES OF MEASUREMENT DATA FOR FACILITIES

tent of possible dangers from dupilcation of fac-

from dupitcation of to Hilties, congestion in network, etc.

Reviews petitions for compliance with law, FCC, rules and regulations, 1

regarding station 11-

censes (radio/micro), extension of lines and sonstruction_permits_

• To increase state-of-

tween deregulation and availability of innova-tive technology to the

the-art applications and define links be-

Ice

public

2. <u>OTHERS WHO MIGHT USE</u> EVALUATION INFORMATION

Another class of users is organizations and individuals who actually participate in PMS commerce and are thereby subjects of the evaluation. This diverse group of "participants" consists of carriers, who provide services; customers, who purchase services; manufacturers and vendors, who supply raw materials for public message services operation; labor unions, who represent public message services employees; etc. The activities of these participants will directly affect the results of the evaluation. Since their interests are at stake, this group will have a great deal of use for measurement information.

Other potential users of the information are involved in some aspect of telecommunications commerce, but do not participate directly in public message services. This group of "onlookers," the largest and presently least defined class, includes all those associated with the project by virtue of their willingness to act if presented with new information about the effects of deregulation. CCB staff responsible for non-PMS matters, for example, might alter their activities in light of evaluation findings. For example, the tariff stipulations for price changes are being revised in response to the PMS deregulation. If the new stipulations appear to improve price regulation, they will probably be tested by CCB staff in other, non-PMS, sectors of telecommunications commerce.

Another onlooker, the National Telecommunications and Information Administration (NTIA) of the Department of Commerce, would like to determine whether public message services can be made profitable and whether deregulation will result in improved quality and quantity of services. We presume that NTIA

would reexamine its general policy on deregulation if substantiated information showed that deregulation did not lead to the introduction of new and better public message services.

Figure VI-2 below shows some outside organizations that might use measurement information. They are divided into participants and onlookers according to the categories defined above.¹ Specific questions that concern participants and onlookers have been identified. The entries on Table VI-1 are a sample from the larger set included in Appendix E. The far right column contains our best current understanding of potential use of measurement data. The middle columns include information on where to pursue measurement data. Questions about specific uses for data are on the left. The far left columns identify the source documents used to gather this information.

Sources for the measurable issues which appear on this table are: (1) comments of RCA Global Communications regarding Graphnet and Telenet's applications to enter the international market and (2) the FCC's <u>Authorized</u> <u>User Decision</u>. This table illustrates how information from the evaluation might be used to clarify the issue of whether the international market should be fully open to competition; for example:

- If many innovative technologies for providing PMS develop, resulting information might show whether state-of-the-art technology decreases or increases technical inefficiences of the underlying network (Issue No. 5).
- If market demand for public message services increases after deregulation, more evidence might become available showing whether the international market for PMS and other data communications services can support competition (Issues Nos. 7 and 8).

^{1.} We have identified roughly 250 specific individuals and organizations in the onlooker category. Appendix F is a list of members of this group organized in terms of association with the following major cases currently facing the Commission: the Computer Inquiry, the Gateway Inquiry, the Telex/ TWX Inquiry, the WATS/MTS Inquiry, and the Western Union Monopoly Inquiry.





POTENTIAL USERS OF MEASUREMENT INFORMATION--PARTICIPANTS AND ONLOOKERS FIGURE VI-2:

TABLE VI-1: A PAGE FROM APPENDIX E'S SECTION ON GRAPHNET/TELENET APPLICATION TO ENTER INTERNATIONAL MARKET SHOWING SAMPLE USE OF MEASUREMENT INFORMATION

je.

18		POTENTIAL		DOHATH FOR MEASUREMENT		USE OF THYOMMATICH
Document		MEASURABLE ISSUES	VCC/CCB	PHIS	Other	
CC 78-181		 Can technical inefficien- cies due to incompatible terminals be lessened by allow- ing carriers with state-of-the- art technology into marketplace? 	- Number of stata- of-the-art applications	 Comparison of carrier equipmenti equed equed error detection variad capbilities aubelasues of mervica Customer surveys 		- Duca competitiva marketplace oncour- age 9-0-A technolog- ical innuvation for ical innuvation for Yor anayo only? For which types?
		6. Nov will the influx of d.p./com. mervicus such as that oftered by many domestic carters [Graphmer] and WUI Dataphons affect the int'l com. market?	- Turiff filingu - 214 filingu - Complainca	- New equipacent offerings - Industry structure - Prufit levels, sarket alarce - Effect on private line service offeringe	- Change in Inc'l - cun, market - Reactions of other cuuncilss	Ability to better forecast wathet gruwth Bruwth - Understunding of hon new technolugy changas the need an ohape of regulation furces lapting on regulated mather
		7. Now great is the need in the int'l eachet for low cost data comm.?		- Consumer survey - 12 Inductry measures of the public interest	- Tottillal consumer antrey	- Ability to decuct Mien regulated industries and not responding to puten tial new markets tial new markets interest regulation
		8. Can the int'l comm. market support competition?		- Impact on IKCa	- Economic atrength of new entrants - Viability of the new worvics pro- vided	- Ability to under- atund when it is Appropriate to deregulate
uthorized uthorized lected PCC 2nd 59 1966)	sim.	9. What protocol or operating or agreements are meeted for lawful contracts butween IRCs and domeatic cariers?	- Prescut contracta - Tariff filinge - Complaints - Petfilons	- Domuelle certler IRC Interaction	- IAGe vervicue aféected by cuntracte	 Development of atandard for "laft" dealings of regu- lated carriers with industries not cueptately under FCC contrut
		10. Should CONSAT Intercon- nection utandards for domestic cartiers be indentical to thuse for fRCa?	- COMSAT Agrau- menta	- System affletency queations		
		11. Should remelere bu considured carriers to be fully regulated?		- Characteristice of recala market - Reactions of customark		 befinition of tugu- lacory authurity and obligationa befinition of what a curriar is in a new, technological; charging fluid

• If a variety of innovative PMS technologies and applications evolves after deregulation, information about the characteristics of new public message services and the carriers which provide them might help to determine whether resellers should be fully regulated (Issue No. 11).

These examples make many assumptions about the effects of deregulation. Measurement decisions will probably be revised as actual reactions of industry to the deregulation become known.

C. EVALUATION MEASUREMENT

1. MODEL FOR MEASUREMENT

Figure VI-3 illustrates our current understanding of the status and associations of these components. The diagram provides an essentially static view of the dynamics of PMS commerce, but it represents a starting point or baseline for subsequent measurement efforts. The basic form was constructed using discussions and interviews with CCB staff and others with knowledge about PMS regulation and commerce.

The basic measurement approach is related to the elements (or components) of the evaluation, described in Chapter IV. The FCC is represented in terms of the Commission (A), PMS policy and rules (B), CCB organization and process (C); the PMS sector of regulated telecommunications commerce, represented by Western Union (WUTC), USPS, and the other carriers in PMS during the evaluation (D); service networks (E); message senders (F); message receivers (G); raw materials and support (H); the general public and onlookers (I); and the status of PMS commerce (J).

Descriptions of the boxes and arrows in Figure VI-3 are presented in Tables VI-2 and VI-3. The first table describes the basic role of each



FIGURE VI-3: COMPONENTS OF PMS REGULATION AND COMMERCE, CURRENT STATUS

TABLE VI-2: DESCRIPTION OF COMPONENTS OF PMS REGULATION AND COMMERCE

	Component	Description
A.	The Commission (7-members: Commissioners)	 Sets policy for PMS within bounds prescribed by Congress and Courts; oversees PMS according to mandate for orderly, efficient and reasonably priced services Determines which services covered by PMS resources
Β.	Official FCC/CCB Policy and Rules for PMS	 Represents the combined documented policy and rules which FCC/CCB employ to administer ongoing PMS regulation (e.g., 47 CFR)
C.	CCB Organiza- tion and Process	 Administers "process" of the offices, divisions, and branches according to official PMS policy and rules.
D.	PMS Sector of Commerce	 Company(ies) that develop and supply public message services (e.g., management and company policy) Submits filings and applications to CCB re PMS
E.	Network (owned/leased)	 Represents facilities, equipment, and labor involved in moving messages from acceptance through delivery.
F.	Message Senders	 Purchasers of public message services (individuals or organizations) Includes access modes (tieline, teleprinter, etc.)
G.	Message Receivers	 Receives messages via PMS (individuals or organizations) Includes mode of reception (tieline, teleprinter, etc.)
H.	Raw Materials and Support	 Firms supplying basic goods necessary for the con- duct of the carriers' business, particularly the service operation Includes investors and inventors
I.	General Public and Onlookers	 Those not regularly participating in PMS commerce, but perhaps commenting to the Commission about PMS
J.	Status of Commerce	 Percentage of total telecommunications commerce attributable to PMS

TABLE VI-3: LINKS BETWEEN COMPONENTS OF PMS REGULATION AND COMMERCE

Number of Link	Description of Link
1.	 The Commission's authority to administer regulation for PMS and resources for processing filings
2.	 The CCB's PMS-related items for Commission deliberation and/or authorization (e.g., notice of inquiry, notice of opinion and rulemaking) Statistics of common carriers Public message service rulings
3.	 The requirements of official CCB/FCC policy and rules for PMS CCB activities like "act on tariff applications" within 90 days of petition by carrier
4.	 Applications and filings from carriers responding to policy and rules for PMS regulation
5.	 The rulings of CCB's regulatory process in response to carrier applications and filings
6.	 The directives carriers supply to manage their service network
7.	• Need of and money from customers who purchase PMS services
8.	 Messages to sender via service operation All contracts with carrier regarding message reception
9.	• Service network revenue
10.	• Need and money to purchase basic goods for service network
11.	• The basic goods in terms of finances, equipment, lease arrangements, expert advice, etc., supplied for service operation
12.	 The comments, complaints, recommendations, etc., regarding public message services

component in ongoing PMS commerce and regulation. The second table provides information about the links between individual components. For example, arrow 3, from PMS policy and rules (B), to CCB organization and process for regulating PMS (C) represents the CCB staff activities that are governed by specific stipulations of 47 CFR. Review of carrier tariff filings is such an activity.

Possible indicators of the status of each component in the deregulation are listed inside the boxes. (Data describing indicators are based on our preliminary findings discussed in Chapter IV.) For example, senders (F) currently spend about \$146 million on public message services per year. These funds and other indicators (e.g., amount of social use) link senders to the service network (E, Infomaster) that transmits messages (8) to receivers (G) and generates revenues (9) for regulated companies which actually supply public message services, that is, the carriers (D).

Figure VI-4 builds on the previous diagrams and tables. The left portion (identical to Figure VI-3) represents current status of PMS commerce and regulation, while the right portion shows how indicators are expected to change after public message services deregulation. Our preliminary set of indicators of change is listed in the column on the far right. Each indicator is associated with a particular component (shown in Figure VI-3). The arrows across the top represent the events (described in more detail in Chapter V) which are expected to mark progress of the project. For example, an indicator that the intervention has started is "Vote for PMS Item." Before the intervention begins, the Commission agenda will have the PMS MO&O and rulechange items pending; after these items are approved, the agenda is expected to have no PMS items pending.



The information derived from measurement activities is expected to facilitate an empirical understanding of potential effects and impacts of the deregulation. For example, the deregulation might cause Western Union to discontinue some services and stations, with a resulting reduction in certain kinds of jobs. "Telegraph operator" jobs might decline as the composition of Western Union's service network and offerings shifts, and the Communications Workers of America or the United Telegraph Workers Union might respond by protesting. Measurement information for "number of employees by type" would help to resolve this type of problem by indicating the pattern of employment loss for the last ten years.

Figure VI-5 illustrates how the deregulation might produce some of these effects. The center box represents an implemented open competition policy for public message services. The middle portions represent some of the effects the policy change is expected to generate within specific groups associated with PMS. The outside boxes contain a fuller description of who or what will experience these effects. For example, the lower left shows that international record carriers such as RCA Globcom, Western Union International, and Hawaii Telephone might ultimately be affected if deregulation brings changes in public message services technology.

2. EVALUATION MEASURE CONSTRUCTION AND APPLICATION

a. MEASURE CONSTRUCTION

In practice, each of the indicators for potential measurement shown on Figure VI-4, such as "attributable cost of regulation" or "process rate," combines many smaller, more specific measures. The same is true for the measures described in Figure VI-5. For example, if PMS is revived, we might expect


FIGURE VI-5: EXTENDED IMPACT OF DEREGULATION

Inquiry, Telex/TWX Rate Case, WATS/MTS Inquiry, Gateway Inquiry, and the Computer Inquiry; and (2) witness testimony before Congress regarding the Communications Act of 1978.

to find computer business equipment manufacturers increasing the production of terminals for sending or receiving public message services. In that case, a measurement scheme for capturing the "change in rate or productivity for terminals" might be necessary.

Since the applications and filings submitted to the Commission are important indicators of how the structure of commerce might shift (and are in fact the first tangible clue that it is about to shift), the "process rate" measure is essential to tracking the effects of the deregulation. This measure is based on the yearly number of PMS applications and filings in compliance with relevant Parts of 47 CFR per carrier. (See Basic Indicator "C" on Figure VI-4.) Figure VI-6 illustrates a system for aggregating data to measure the process rate for public message services regulation.

b. MEASURE APPLICATION--A HYPOTHETICAL EXAMPLE

The deregulation is expected to touch off numerous effects that should become evident upon close examination of the structure of PMS regulation and commerce. To establish which effects can be attributed to PMS deregulation, the most prominent lines of effect will have to be traced, in a series of evaluation iterations. Figure VI-7 on page 195 illustrates this process. It should be emphasized, however, that the figure is hypothetical and actual measurement would require much more definition. All traditional terminal equipment would have to be identified, along with specific manufacturers, sales prior to deregulation, etc.

Also, as an illustration only, the following typology of categories of teleprocessing terminals is presented. A list of PMS terminal equipment, compiled as part of the evaluation, might be similar to this:



FIGURE VI-6: BASIC CONFIGURATION OF THE "PROCESS RATE" MEASURE

- A. Low-Speed Teletypewriters (0-1200 bps)
 - Buffered or unbuffered
 - Limited intelligence
 - Used on dial-up or leased lines
 - Population Applications--time sharing, message switching
- B. Low-, Medium-, and High-Speed Video Displays (300-9600 bps)
 - Alphanumeric or graphic
 - Mostly buffered with moderate intelligence
 - Used on dial-up or leased lines
 - Popular applications--fast-response data base inquiry systems
- C. Remote Job Entry Systems (2400-9600 bps)
 - Card reader, printer, operator console as a minimal configuration
 - CRT display, tape, diskette capability optional
 - Mostly buffered, frequently programmable
 - Used on dial-up or leased lines
 - Popular applications--card reader, line printer, access to batch job queue
- D. Transaction Terminals (300 bps-50,000 bps Loop Line)
 - Low cost per workstation, driven by buffered, shared controllers
 - Mostly buffered and designed around particular application
 - Used mostly on leased lines
 - Popular applications--retail point-of-sale, banking, credit checking, supermarket checkout
- E. Intelligent Terminals (2400-9600 bps)
 - Buffered, programmable, highly modular
 - Substantial functional capability independent of host CPU (e.g., local data entry, transaction edit and/or verification, and data base look-up independent of hose CPU)
 - Can function as combination of remote data entry station controller, remote display controller, communications concentrator or applications processor
 - Can control such devices as teleprinters, CRTs (both local and remote), transaction terminals, tapes, diskettes, disks, and on-line storage
 - Used on either dial-up or leased lines and can perform substantial functions without connection to host CPU¹

Figure VI-7 illustrates how we determine what change can be attributed to the deregulation initiative and what cannot. The sequence from left to right shows the evaluation phases that would take place if the deregulation was found to have caused an increase in manufacture of innovative, or nontraditional,

^{1.} FitzGerald, Jerry and Tom Eason. <u>Fundamentals of Data Communications</u>, John Wiley and Sons, Inc., 1978, p. 85.



195

To those who use Evaluation Information terminal equipment used for public message services (e.g., some new type of facsimile device). The ovals across the top indicate the types of answers which each phase of measurement activity should produce. For example, the first phase should establish that deregulation has occurred. Findings associated with a host of specific Commission measures, including those listed in the boxes over phase one, would lend the support for this conclusion.

After deregulation is demonstrated, the second measurement phase should establish the existence of competition, using many measures including those listed in the figure. One ancillary effect of competition is a change in the amount and types of equipment used in PMS. During phase three, categories of equipment, like those listed in the figure, are examined separately to determine which category(ies) show the greatest change. In this example, the number of sending and receiving terminals in PMS is found to be the category most changed by the competition resulting from deregulation.

In phase four, the shift in number of terminals is examined more carefully. The figure illustrates a simple pre/post, control group format for determining the relative magnitude of the shift in terms of percentage of communications terminals connected with PMS. The control group in this illustration might be terminals connected exclusively with private networks. Terminals would be subdivided into types. All types--traditional and nontraditional--might initially be included in this assessment.

The shaded areas at the top of the bars on the "post" graphs indicate the increase in terminal use for public message services after the deregulation. The upper graph represents control group use; the lower graph, general public message services use. Comparing the graphs reveals a significant change in PMS terminal use after deregulation. Comparing the

types of terminal equipment used for PMS before deregulation with types used after deregulation, we can calculate the percentage of nontraditional terminal equipment used. Phase four findings demonstrate that the number and types of nontraditional terminals used in public message services applications is high.

Phase five measurement determines the status of "new" terminals, in terms of years in PMS-type functions. For example, existing types of private terminals that are converted to PMS applications are not as "new" as terminals manufactured, after deregulation, specifically for PMS. The graph for this phase shows the results of a hypothetical survey of the average age of terminals in PMS operation by type and model number. Phase five results in the finding that a specific percentage of terminals in use for public message services were manufactured and purchased after the deregulation.

The terminal type and model number information collected during phase five should introduce phase six measurement activities, which consist of identifying manufacturers of nontraditional terminals that are introduced into PMS <u>after</u> deregulation. The companies chosen to illustrate phase six were selected from a list of over 300 manufacturers of "nontraditional terminal devices."¹

Phase six activities identify one company, Centronics, as a prime supplier for terminals for public message services applications. Closer examination in phase seven shows that Centronics' monthly per-unit production of innovative terminals is rising dramatically. The shaded portion of the graph illustrates this finding.

^{1.} U.S. Federal Communications Commission. "An Overview of the Domestic Telecommunications Industry and the Commission's Policies Concerning Terminal Equipment and Private Line Service," (undated), pp. 50-66.

Thus, if results of these phases are found to be credible, systematic evaluation should allow us to attribute effects on technological innovation (in terms of innovative terminals) to the deregulation. The example sketched above represents one sample of many measurement possibilities which might be pursued during the evaluation. Evaluation findings such as those illustrated above might contribute to a more intensive analysis designed to determine whether the effects of deregulation are peculiar to the public message services environment. The plan for that level of analysis will be included in an applied evaluation design that will be developed as the intervention becomes better defined.

D. FINDINGS CONCERNING THE POTENTIAL FOR USEFUL EVALUATION

This section briefly assesses the proposed ETIP/FCC project in relation to characteristics that indicate high potential for useful evaluation in an administrative experiment. The following characteristics are included:

- There should be short- and long-term goals which can be expressed in measurable terms.
- There should be a set of in-place or planned activities that sponsors agree can be expected to lead to achievement of both interim and downstream goals.
- There should be measures and comparisons for assessing progress and whether or not goals have been accomplished.
- There should be defined uses for evaluation findings, including data about interim progress.

Using these characteristics to measure this project's potential for useful evaluation, we find first that public message services deregulation goals are still imprecisely stated. For example, there is general agreement

that any regulations imposed on PMS carriers should be less burdensome than those imposed on Western Union during the monopoly period. However, it is not yet clear whether "less regulation" means the smallest possible set of rules or just a smaller set than the previous one.

Second, the project needs better standards for performance. For the evaluation to show that competition exists, an acceptable indicator of the threshold between monopoly and competitive market conditions should be available: Is competition a certain number of carriers present in a market, or should percentage of market share also be taken into consideration? It will be necessary for ETIP and CCB to establish more precise, measurable goals and more acceptable measures of status in relation to those goals.

Third, no mechanism presently exists in CCB for transferring information from the PMS evaluation to other areas of telecommunications regulation where it might be used. In order to relate findings about the revised regulatory process and the effects of the deregulation to other areas of inquiry, such as Telex/TWX or MTS/WATS, this organizational mechanism for information transfer must be in place.

There is also the question of how ETIP and CCB plan to distribute findings from the evaluation to the outside world. For instance, members of other organizations, such as the National Telecommunications and Information Administration, might be invited to participate in the project's Evaluation Group. (The Evaluation Group is discussed in Chapter V.)

Both ETIP and CCB must be more specific in chosing priorities among their many interests, for measurement in connection with the evaluation. Some priorities must also be established for those outside of the project who might use evaluation findings. Since more measurements might be

taken and more uses for results might be found than can be accomplished, a full-scale evaluation design for the project will have to be based on the choices of ETIP and CCB staff participating in the Evaluation Group, and on findings from analyses of early "participant" reactions to the Commission policy change and rulemaking. Basically, the tradeoff will be between decisions concerning priorities and the actual resources available for information collection.

Finally, since any change in public message services regulation will take place in a fast-changing policy environment, it will be subject to the effects of decisions made outside of the Commission, by other entities, such as the Congress and the courts. Unanticipated policy shifts might require modification of the evaluation design. Therefore, a function for tracking reaction to the deregulation and developments in other areas of regulated telecommunications should be established. This will insure that PMS deregulation is seen in the context of the telecommunications industry as a whole and that expectations for use of evaluation findings are reasonable.

Given the relatively modest size of the present PMS market, an evaluation of the magnitude contemplated here is reasonable only if it can be expanded to affect a larger segment of telecommunications. Such an expansion might occur in a number of ways. The final definition of public message services, for example, might affect the scope of the project. A relatively broad definition might result in large impact; that is, a large number of firms, offering a wide variety of new services using different technologies, might decide to enter a broadly defined PMS market, to seek the advantages of deregulation. The project might also be expanded sequentially by application of the information obtained to pending Commission decisions and/or by transfer of the

evaluation process itself to those decisions. (See Chapter III for examples of regulatory situations requiring Commission decision making.)

The project does present several important opportunities, which were mentioned earlier in this report, for both the Commission and ETIP. In summary, these include:

- An opportunity to test the role of competition in a telecommunications market traditionally considered a natural monopoly;
- An opportunity to gain knowledge regarding: (1) the effects of regulation on technological innovation and (2) the complex of factors which may facilitate or hinder introduction of innovative services and technologies into the marketplace;
- An opportunity for the Commission to analyze and implement procedural changes, including a more purposeful data-gathering approach, which might be transferrable to the process of deregulating other monopoly markets or more routine activities;
- An opportunity for the Commission to test new empirical standards on which to base its decisions; and,
- An opportunity to test whether information gained about technical, economic, and/or political core issues can be generalized from the public message services deregulation to other areas of inquiry. (The evaluation may also serve as a vehicle for moving to broader sets of generic issues. As noted in Chapter III, the Commission has before it several decisions which will influence innovation.)

We believe that this evaluation (properly monitored and analyzed) will be of great interest to government, industry, and the research community. The

process by which public message services and technologies enter the marketplace should prove valuable information for all concerned with the telecommunications industry.

BIBLIOGRAPHY

ARTICLES

- Abelson, Philip H. "The New Discoveries," <u>The Wilson Quarterly</u>, Summer 1978, pp. 65-73.
- "Behind AT&T's Change at the Top." <u>Business Week</u>, November 6, 1978, pp. 114-139.
- "Charles Ferris--The Big Wheel at the FCC." <u>National Journal</u>, October 21, 1978, pp. 1684-1685.
- EMMS--Electronic Mail & Message Systems. Vol. 2, No. 16, August 15, 1978, (complete issue).
- EMMS--Electronic Mail & Message Systems. Vol. 2, No. 18, September 15, 1978, (complete issue).
- "Exxon Moves onto IBM Turf." Business Week, February 13, 1978, p. 80.

Fiber Optics and Communications Newsletter. Vol. 1, No. 7, August 1978.

- Holmfeld, John D. "Dilemmas Down the Road," <u>The Wilson Quarterly</u>, Summer 1978, pp. 74-81.
- Holsendolph, Ernest. "Western Union's Monopoly Challenged; Western Union Cheers," <u>New York Times</u>, March 19, 1978.
- Jacobs, Ira. "Atlanta Fiber System Experiment: Overview," <u>The Bell</u> <u>System Technical Journal</u>, Vol. 57, No. 6, Part 1, July-August 1978, pp. 1717-1721.
- Jones, William H. "Analysts Charting AT&T Woes," <u>The Washington Post</u>, September 18, 1977, Section F, pp. 1 and 5.
- Kamien, Morton, I., and Nancy L. Schwartz. "Market Structure and Innovation: A Survey," Journal of Economic Literature, Vol. 8, March 1975, pp. 1-37.
- Mitnick, Barry M. "Deregulation as a Process of Organizational Reduction," <u>Public Administration Review</u>, July/August 1978, pp. 350-357.
 - _____. "Factor Price Changes and Factor Substitution in an Evolutionary Model," <u>Bell Journal of Economics</u> 6, Autumn 1975, p. 446.
 - . "Forces Generating and Limiting Concentration under Schumpeterian Competition," <u>The Bell Journal of Economics</u>, Autumn 1978, pp. 524-543.
 - . "In Search of Useful Theory of Innovation," <u>Research Policy</u> 6 (1977), pp. 36-76.
 - . "Neoclassical vs. Evolutionary Theories of Economic Growth,"+ <u>Economic Journal</u> 84, December 1974.

"The New Telephone Industry," Business Week. February 13, 1978, pp. 68-78.

ARTICLES, Continued

- "Postal Service Plans Test of Electronic Mail Delivery," <u>The Washington Post</u>, November 22, 1978.
- "R&D Spending Patterns." Business Week, July 3, 1978, pp. 58-65.
- Reingold, Nathan. "O Pioneers!" The Wilson Quarterly, Summer 1978, pp. 55-64.
- "Satellites: How the `Birds` Are Changing TV," <u>TV Guide</u> (Washington-Baltimore Edition), Dec 9-15, 1978, pp. 4-8.
- "Science in Europe/British May Use Telephones, TV's, to Tap Data Bank." Science, Vol. 201, July 7, 1978, pp. 33-34.
- Schuyten, Peter J. "Xerox is Entering Telecommunications." <u>The New York</u> Times, November 17, 1978.
- Schwartz, M.I., et al. "The Chicago Lightwave Communications Project," <u>The</u> <u>Bell System Technical Journal</u>, Vol. 57, No. 6, July-August 1978, pp. 1881-1889.

Telecommunications Reports. Vol. 44 (1978).

"The Thoughts of Chairman Ferris," TV Guide, July 15, 1978, pp. 6-10.

- Trebling, Harry M. "Plight of the Telegraph Service," <u>MSU Business Topics</u>, Summer 1967. Graduate School of Business Administration, Michigan State University, pp. 43-54.
- Uttal, Bro. "Selling is No Longer Mickey Mouse at AT&T," <u>Fortune</u>, July 17, 1978, pp. 98-104.
- "Vanishing Innovation." Business Week, July 3, 1978, p. 46.
- von Puttkamer, Jesco. "Developing Space Occupancy: Perspectives on NASA Future Programme Planning," Journal of the British Interplanetary Society, Vol. 29 (1976), pp. 147-173.

. "The Next 25 Years: Industrialization of Space: Rationale for Planning," <u>Journal of the British interplanetary Society</u>, Vol. 30 (1977), pp. 257-264.

- Watkins, Myron W. "Competition as a Dynamic Process," <u>The American Economic</u> <u>Review</u>, Vol. 5, No. 5, pp. 1070-77.
- White, George R., and Margaret B. W. "How to Stop a Technological Winner," <u>Harvard Business Review</u>, March-April 1978, pp. 146-152.
- Wiley, Richard E. "Common Carriers Would Face Market, Not FCC," Legal Times of Washington, Vol. 1, No. 7, July 17, 1978.
- Williamson, Oliver E. "Dominant Firms and the Monopoly Problem: Market Failure Considerations," <u>Harvard Law Review</u>, Vol. 85 (1972), pp. 1512-1531.

GOVERNMENT DOCUMENTS

- American Satellite Corporation. <u>Domestic Communications Satellite Service:</u> <u>Regulations and Rates Applying to Interstate Services Between Points</u> <u>in the United States and to Such Interstate Service When Connected with</u> <u>Overseas Facilities of Other Carriers</u>, Federal Communications Commission, Tariff F.C.C. No. 1, issued March 26, 1974, effective July 1, 1974.
- American Telephone & Telegraph Company, Long Lines Department. <u>Wide Area</u> <u>Telecommunications Services (WATS), In the Matter of</u>, Docket No. 21402 before the U.S. Federal Communications Commission.
- "Code of Federal Regulations, Title 47," Federal Communications Commission, (Communications Act of 1934).
- Fairchild Industries, Inc. "Prospectus," dated February 9, 1978.
- Graphic Scanning Corporation. "Prospectus," dated April 13, 1977, filed with the Securities Exchange Commission.
- Graphnet Systems, Inc. <u>Memorandum Opinion and Order and Notice of Inquiry</u> <u>Proposed Rule Making</u>, before the U.S. Federal Communications Commission, CC Docket No. 78-95, File No. W-P-C-1430; and CC Docket No. 78-96; adopted March 9, 1978, and released March 28, 1978.
- International Telephone and Telegraph Corporation. "Form 10-K-Annual Report," received March 30, 1978, filed with the Securities and Exchange Commission.
- MCI Communications Corporation. "Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934," filed June 29, 1978, with the Securities Exchange Commission.

"Prospectus," dated September 29, 1977.

- National Aeronautics and Space Administration. <u>Report on NASA Five-Year</u> <u>Planning, Fiscal Years 1978 through 1982</u>, draft, dated February 14, 1977, Washington, D.C.: National Aeronautics and Space Administration.
- National Aeronautics and Space Administration, Technology Utilization Office. <u>Spinoff 1977: An Annual Report</u>, by James J. Haggerty, January 1977, Washington, D.C., Government Printing Office, 116 pp.
- Radio Corporation of America. "Form 10-K: Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934," filed April 3, 1978, with the Securities and Exchange Commission.
 - . "RCA Stock Option Plans," dated May 1, 1978, filed with the Securities Exchange Commission.
- Tele-Communications, Inc. "Supplement dated December 23, 1977, to Prospectus dated October 13, 1977: The Tele-communications, Inc., Employee Stock Purchase Plan," filed with the Securities Exchange Commission.

GOVERNMENT DOCUMENTS, Continued

- Telenet Communications Corporation. Letter of transmittal, transmittal No. 33, and prospectus to U.S. Federal Communications Commission (Cost support materials re: application for volume discount), Tariff F.C.C. No. 1, Section 61.38 data, received December 28, 1977, Tariffs Branch, F.C.C.
- Tymnet, Inc. <u>Data Communications Services</u>, Federal Communications Commission, Tariff F.C.C. No. 1, Section 61.61 data, received at The Urban Institute, Summer 1978.
- Tymshare, Inc., "50,631 Shares, Tymshare, Inc., Common Stock" (Prospectus), filed December 8, 1977, with the Securities and Exchange Commission.
- U.S. Congress. House of Representatives. <u>A Bill to provide for a research,</u> <u>development, and demonstration program to establish an experimental</u> <u>public service satellite communications systems</u>, H.R.. 14046, 95th Congress, 2nd Session, 1978.
- U.S. Department of Commerce, Bureau of Standards. Experimental Technology Incentives Program. <u>Experiments in Communications Regulation</u>, Project Plan for ETIP Project 161, August 1, 1977.
- U.S. Department of Commerce, Office of Telecommunications. <u>Federal Regulations Relevant to the Structural Development of Telecommunications</u> <u>Industries</u>, by R. B. Johnson, Office of Telecommunications Report 77-135, Springfield, Virginia: National Technical Information Service, November 1977.
- U.S. Federal Communications Commission. "Domestic Public Point-to-Point Microwave Radio Service--Specialized Common Carrier Services," <u>Federal</u> <u>Register</u> 36, No. 111, June 9, 1971, pp. 11144-11173.

. "In the Matter of Regulatory Policies Concerning the Provision of Domestic Public Message Services by Entities Other than the Western Union Telegraph Company and Proposed Amendment to Parts 63 and 64 of the Commission's Rules," Common Carrier Docket No. 78-96, 1978.

• "Memorandum of Law," by Dick Severy to David Irwin, dated December 7, 1977.

• "An Overview of the Domestic Telecommunications Industry and the Commission's Policies Concerning Terminal Equipment and Private Line Services" (no date).

Press Wireless, 21 FCC 331 (1956).

• Report by the Federal Communications Commission on International <u>Telecommunications Policies</u>, statement by Richard E. Wiley, Chairman, before House Committee on Interstate and Foreign Commerce on International Communications Services, March 23, 1977.

• Statistics for Common Carriers, 1976.

GOVERNMENT DOCUMENTS, Continued

- U.S. Federal Communications Commission/Common Carrier Bureau. <u>Points</u> <u>Memo: Public Record Message Services Experiment--FCC/Experimental</u> <u>Technology Incentives Program (ETIP)</u>, June 1978.
- U.S. Federal Communications Commission/Public Information Office. <u>Infor-</u> mation Bulletin: Broadcast Services, January 1977.
- Information Bulletin: Cable Television, January 1977.
- Information Bulletin: Educational Radio, January 1977.
- Information Bulletin: Educational Television, July 1977.
- Information Bulletin: Field Operations Bureau, June 1977.
- . Information Bulletin: Information Services and Publications, (No date).
- Information Bulletin: Regulation of Wire and Radio Communication, April 1977.
- <u>Information Bulletin:</u> Safety and Special Radio Services, April 1977.
- Information Bulletin: Safety and Special Radio Services,
 April 1977.
- Information Bulletin: Subscription Television (STV-Pay TV), June 1977.
- United States Transmission Systems, Inc. <u>Explanation and Data Supporting</u> <u>United States Transmission Systems, Inc., Specialized Leased Channel</u> <u>Service</u>, Federal Communications Commission Tariff FCC No. 1, filed August 29, 1977.
 - Justification for tariff revisions, U.S. Federal Communications Commission, Tariff F.C.C. No. 1, Section 61.38, filed August 29, 1977.
- Western Union Telegraph Company. <u>Public Message Telegram Service Regu-</u> <u>lations and Schedules of Charges.</u> Federal Communications Commission Tariff F.C.C. No. 255, received at The Urban Institute Summer 1978.

PRESENTATIONS

- Disher, John H. (Director, Advanced Programs, Office of Space Flight, National Aeronautics and Space Administration). "Plans and Projections for Space Industrialization," <u>at</u> Special Seminar Series: Near Earth Space Utilization, MIT Department of Aeronautics & Astronautics, Fall 1976.
- Freitag, Capt. Robert F. (Deputy Director, Advanced Programs, Office of Space Flight, National Aeronautics and Space Administration). "NASA Philosophy Concerning Space Stations as Operations Centers for Construction and Maintenance of Large Orbiting Energy Systems," <u>at</u> the International Astronautical Federation Congress, Anaheim, California, October 10-16, 1976.
- Kline, Richard L. "The Space Station and Space Industrialization," <u>at</u> the Bicentennial Space Symposium, jointly sponsored by the AAS and AIAA, Washington, D.C., October 6-9, 1976.

PROMOTIONAL MATERIALS

American Satellite Corporation. "ASC President Assures Business Leaders
 of Continuing Availability of Roof-Top Satellite Systems," September
 7, 1978.

• The American Eagle, Vol. 3, Number 1, Spring 1978.

. "American Satellite 5-Meter Antenna Stations Now Enjoy Exclusive `Routine Approval` from FCC," September 7, 1978.

. "Background American Satellite Corporation," submitted to Science Policy Research Division, Congressional Research Service, Library of Congress," September 1, 1978.

. "SDX: Satellite Data Exchange Service," received at The Urban Institute, Fall 1978.

. "Sperry Univac to Expand New Satellite Communications Network," September 7, 1978.

Graphnet Systems, Inc. "Fax Gram: The Faster Gram by Graphnet," received at The Urban Institute, Summer 1978.

. "Fax Gram: User Guide" (1975).

ITT Corporate Communications Services, Inc. "CCSE: Corporate Communication Switching Equipment" (06-2-11-77), received at The Urban Institute Fall 1978.

. "ITT Unit Inaugurates New Telephone Service For Interoffice Business Communications," Press Release, August 17, 1978. PROMOTIONAL MATERIALS, Continued

. "SPNS: Switched Private Network Service," received at The Urban Institute, Fall 1978.

_____. "Your Switching Alternative for Private Communication Services," (CCS 0178), (no date).

ITT United States Transmission Systems, Inc. Letter from J.C. Reynolds, President, to Sharon Kirby, The Urban Institute, dated October 5, 1978; and general service descriptions included.

. "One of the Best Business Connections You Can Make" (0478), received at The Urban Institute October 8, 1978.

. "USTS Private Line-Rate Schedule," effective date September 1, 1978.

- RCA America Communications, Inc. "What every company president should know about domestic satellite communications," by Andrew F. Inglis, President, received at The Urban Institute, September 18, 1978.
- Tymnet, Inc. Configuration of Network Map, received at The Urban Institute, Fall 1978.
- General information on services, received at The Urban Institute, Fall 1978.

. "How to Use Tymnet," dated April, 1978, received at The Urban Institute, Fall 1978.

• Letter from Ronald A. Bamberg, Manager Corporate Marketing, to Sharon Kirby, The Urban Institute, dated September 26, 1978.

. "Subscribers Directory," dated April 1978, received at The Urban Institute, Fall 1978.

Western Tele-Communications, Inc., "Background Information," received at The Urban Institute, Summer 1978.

. "Company Statistics as of December 31, 1977," received at The Urban Institute, Summer 1978.

• Descriptive materials regarding system, received at The Urban Institute, Summer 1978.

. Network Configuration Map, "Microwave Systems," received at The Urban Institute, Summer 1978.

. "WTCI Receives Government Contract for Fiber-Optic System," received at The Urban Institute, Summer 1978.

. "WTCI To Do Remote Video Transmissions For The 1978 U.S. Open," received at The Urban Institute, Summer 1978.

OTHER STUDIES

- Borchardt, Kurt. <u>Actors and Stakes: A Map of the Communications Arena</u> (Computers-and-Communications), Harvard University, Program on Information Resources Policy, Working Paper W-78-8, June 1978.
- Gabel, Richard and Marianne Karydes. <u>Policy Research Estimate--Prepared for</u> the Office of Telecommunications Policy, September 1973.
- Kalba, Konrad K., et al. Electronic Message Systems: The Technological <u>Market and Regulatory Prospects</u>, (Submitted to the Federal Communications Commission in fulfillment of FCC Contract Number 0236), April, 1978.
- Loeb, Guy Hamilton. <u>The Communications Act Policy Toward Competition:</u> <u>The Sound of One Hand Clapping</u>, Harvard University, Program on Information Resources Policy, Working Paper W-77-1, March 1977.

MISCELLANEOUS MATERIALS

- Bell, Jay. "The FCC/ETIP Regulatory Experiment," Working Paper 1198-70-01 (draft), The Urban Institute, Washington, D.C., May 3, 1978.
- Dunn and Bradstreet. <u>Million Dollar Directory 1978</u>, Dunn and Bradstreet, New York, New York, 1978.
- Moody's Investors Service. <u>Moody's Bank and Finance Manual</u>, Moody's Investors Service, Inc., New York: New York, 1978.
- Moody's Industrial Manual, (2 volumes), Moody's Investors Service, Inc., New York: New York, 1978.
- National Register Publishing Company, <u>Director of Corporate Affiliations</u>, 1978, National Register Publishing Company, Skokie, Illinois, 1978.
- Rosenthal, Congressman Benjamin S. <u>The Reluctant Messenger</u>, Washington, D.C., September 1974, 70 pp.
- Standard and Poor's Register of Corporations, Directors and Executives: <u>United States and Canada, 1978</u>. (3 volumes), Standard and Poor, New York, New York, 1978.
- Transcomm, Inc., <u>Evaluation of Experimental Feasibility at the Federal</u> <u>Communications Commission</u>, <u>Final Report</u>, ETIP Project No. 154, Order 713410, February 13, 1978.
- United States Postal Service. <u>Annual Report of the Postmaster General</u>, <u>Fiscal 1977</u>.

GENERAL BACKGROUND MATERIALS ON TECHNOLOGICAL INNOVATION

Books:

National Science Board, National Science Foundation. <u>Science Indicators</u> <u>1976</u>, 304 pp., Washington, D.C., Government Printing Office, 1977. [Note especially Chapter 7.]

Articles:

- Abernathy, William J., and James M. Utterback. "Patterns of Industrial Innovation," <u>Technological Review</u>, June/July 1978, pp. 41-47.
- Ancker-Johnson, Betsy. "Current Policies and Options for the Future," <u>The</u> <u>International Journal of Research Managment</u>, Vol. XX, No. 1, January 1977, pp. 7-12.
- Anderson, Frederick, <u>et al.</u> "A New Strategy for Environmental Control," <u>from Environmental Improvement Through Economic Incentives</u>. <u>Resources</u>, No. 59, (April-July 1978).
- "The Breakdown of U.S. Innovation." <u>Business Week</u>, February 16, 1976, pp. 56-68.
- Clark, Timothy B. "Carter's Assault on The Costs of Regulation," <u>National</u> Journal, August 12, 1978, pp. 1281-1285.
- Levy, Lawrence. "Needed: Institutional Breakthroughs," <u>The International</u> Journal of Research Management, Vol. XX, No. 1, January 1977, pp. 21-24.
- Lewis, Jordan D. "Its Impact on Technological Change," <u>The International</u> Journal of Research Management, Vol. XX, No. 1, January 1977, pp. 13-16.
- Nason, Howard K. "Perceptions of Barriers to Innovation," <u>The International</u> Journal of Research Management, Vol. XX, No. 1, January 1977, pp. 17-20.
- Schnee, Jerome, and Erol Caglarcan. "The Changing Pharmaceutical R&D Environment," <u>Business Economics</u>, Vol. 11, No. 3, May 1976, pp. 31-38.
- Williams, Robert J. "Politics and the Ecology of Regulation," <u>Public</u> <u>Administration</u>, Vol. 54, Autumn 1976, pp. 319-331.

Miscellaneous:

- Gordon, Nancy M. "Regulatory Processes: A Conceptual Framework" September 10, 1975 (Developed at National Academy of Sciences.)
- National Science Foundation. "Applied Science and Research Applications (ASEA): Programs in Brief" (no date).

GLOSSARY OF TERMS

USED IN THE REPORT

This glossary contains definitions of technical terms used in telecommunications as well as terms specific to telecommunications regulation such as ruling or filing. The sources for definitions were (1) internal materials provided by staff of the Common Carrier Bureau; (2) interviews with Common Carrier Bureau staff; and, (3) terms used in <u>Fundamentals of Data Communications</u> by Jerry FitzGerald and Tom S. Eason, John Wiley & Sons, New York, New York, 1978. The latter terms are asterisked in list. ALLOCATED: Common user services (e.g., telephone, Telex).

ANALOG TRANSMISSION: Transmission technique where an electrical parameter such as frequency or amplitude of a carrier's signal varies continuously with intelligence being transmitted.

BPS: Bits, pulses, or units of information per second.

- *BANDWIDTH: The difference between the highest and lowest frequencies in a band, such as 3000 cycles bandwidth in a voice grade line (300-3300 cycles).
- *BAUD: A unit of signaling speed equal to the number of discrete conditions or signal events per second.
- BROADCAST COMMUNICATIONS: Distinguished from point-to-point communications because the message travels publicly to anyone with appropriate reception equipment.
- *CARRIER, COMMON: Organizations licensed and regulated by the U.S. Federal Communications Commission or the various state public utility commissions which supply communication services to users at published prices.
- CARRIER SYSTEM: A means of obtaining a number of channels over a single path by modulating each channel upon a different "carrier" frequency and demodulating at the receiving point to restore the signals to their original form.
- *CHANNEL: A path for transmission of electromagnetic signals. Synonym for line and link. Compare with circuit.
- *CIRCUIT: A means of two-way communication between two data terminal installations. Compare with channel, line.
- COAXIAL CABLE: Cable with a sheathed outer conductor tube surrounding conductor material having a common axis.
- *COMMUNICATION PROCESSOR, FRONT-END: An auxiliary processor that is placed between a computer central processing unit and transmission facilities. This device normally handles housekeeping functions such as management of lines, translation of codes, etc., which would otherwise interfere with efficient operation of the central processing unit. Synonym for front-end computer.
- *COMPUTER, CENTRAL: In data transmission, the computer that lies at the center of the network and generally does the basic centralized functions for which the network was designed. Synonym for host computer.
- *CONCENTRATOR: Equipment designed to improve the efficiency of data or voice transmission by allowing terminals or lines to compete for and share transmission channels.

- *DATA COMMUNICATIONS: 1. The movement of encoded information by means of electrical transmission systems. 2. The transmission of data from one point to another.
- DATA TERMINAL EQUIPMENT: For example, a modem. May also include computertype terminals in certain cases.
- DEDICATED: Full-time private line (e.g., point-to-point voice channel).
- DIAL-UP: The use of a dial or push-button telephone to initiate a stationto-station telephone call.
- DIGITAL: Transmission technique where intelligence is coded into discrete pulse forms.
- DIRECT DISTANCE DIALING (DDD): The automatic establishment of toll calls in response to signals from the calling device of the originating customer.
- EXCHANGE: A defined area (usually a city, town, or village and its environs) served by a communications common carrier, within which the carrier furnishes service at the exchange rate and under the regulations applicable in that area as prescribed in the carrier's filed tariffs.
- *FACILITIES: The elements of the telephone plant that provide a complete connection, exclusive of the customer's equipment.
- FACSIMILE (FAX): Transmission of pictures, maps, diagrams, etc. The image is scanned at the transmitter, reconstructed at the receiving station and duplicated on some form of paper.
- FILING: Any formal request, other than tariff filings, from regulated carriers and consumers for FCC action. A typical example finds a carrier submitting forms to gain FCC approval of a plan to expand existing facilities.
- FLAT RATE: Fixed charge regardless of amount of use (non-usage sensitive).
- *FOREIGN EXCHANGE (FX): Service that connect a customer's telephone to a telephone company's central office not normally servicing the customer's location.
- FULL PERIOD SERVICE: 24 hours/day, 7 days/week.
- HARDCOPY: A printed copy of machine output in readable form for human beings; for example, reports, listing, or summaries.
- *HARDWARE: A generic, somewhat slang term used to include all equipment, both computer and communications, contained in a system. Contrast with software.

HERTZ: Cycles per second.

HIGH SPEED DATA: Above 9600 bps.

- INTERFACE: A share boundary, for example, the boundary between two subsystems
 or two devices.
- LASER: An acronym for Light Amplification by Stimulated Emission of Radiation, denotes a device which produces an extremely intense beam of light controlled in both intensity and direction.
- LINE, LEASED (OR PRIVATE): A line furnished to a subscriber for his exclusive use.
- LINE, LOCAL LOOP: A communications line connecting several terminals in the region of a single controller to that controller.
- LINE SWITCHING: The switching technique of temporarily connecting two lines together so that the stations directly exchange information.

LOCAL LOOP: See Loop, Local.

LONG-TERM: Service over one month.

LOOP, LOCAL: That part of a communication circuit between the customer's location and the nearest central office.

LOW SPEED DATA: 0 to 150 bps.

MEDIUM SPEED DATA: Above 150 to 9600 bps.

*MESSAGE: A communication of information from a source to one or more destinations, usually in code. A message is usually composed of three parts: (1) a heading, containing a suitable indicator of the beginning of the message together with some of the following information--source, destination, date, time, routing; (2) a body containing information to be communications; and (3) an ending containing a suitable indicator of the end of the message.

MESSAGE PICK UP AND DELIVERY: E.g., telegram service.

MESSAGE SWITCHING: The switching technique of receiving a message, storing it until the proper outgoing circuit and station are available, and then retransmitting it or forwarding it toward its destination.

MICROWAVE: Terrestrial microwave relay carrier.

- *MODEM: A contraction of the words "modulator-demodulator." A modem is a device for performing necessary signal transformation between terminal devices and communication lines. They are normally used in pairs, one at either end of the communication line.
- MODULATION: The process by which some characteristic of one wave is varied in accordance with another wave. This technique is used in data sets to make business-machine signals compatible with communication facilities.
- MODULATION, PULSE CODE (PCM): A form of modulation in which the modulating signal is sampled and the sample quantified and coded so that each element of information consists of different kinds or number of pulses and spaces.

*MULTIDROP (MULTIPOINT): A line or circuit interconnecting several stations.

- MULTIPLEXING: The subdivision of a transmission channel into two or more separate channels. This can be achieved by splitting the frequency range of the channel into narrower frequency bands (frequency division multiplexing) or by assigning a given channel successively to several different users at different times (time division multiplexing).
- *OFFICE: The common designation for any facility in the public switched network at which switching takes place.

*OFFICE, TOLL: An office that terminals a toll trunk.

- *ON-LINE: 1. Pertaining to equipment or devices under the direct control of a central processing unit. 2. Pertaining to a user's ability to interact with a computer. 3. Pertaining to a user's access to a computer via a terminal.
- OPEN WIRE AND OTHER: Open wire is wire usually strung from telephone poles. Other types include undersea cable and optical systems.
- PACKET SWITCHING: A form of real-time (with on-line delays) time division switching exclusively for data transmission where data pulses are separated into individually addressed packets of constant length.
- PER MESSAGE RATE: Usage sensitive on a message-by-message basis. Customer billed only for length of time it takes to send message; or billing may be based on the number of words per message, as in telegram service.
- PICTURE-PHONE: An AT&T tradename for a telephone service that permits the user to see as well as talk with the person at the distant end.
- POINT-TO-POINT COMMUNICATIONS: Distinguished from broadcast communications because the message moves privately from a single sender to a single receiver.

- PRIVATE LINE: A channel or circuit furnished a subscriber dedicated to his exclusive use. Same as private wire.
- REAL-TIME SWITCHING: Circuit-to-circuit switching on immediate basis; e.g., circuit switching used in message telephone service (MTS).
- RULEMAKING: The formal process of bringing about change in the official rules and regulations.
- RULING: The final disposition reached when a filing has been processed by FCC.
- SATELLITE: Geostationary satellite in space.
- SERVICE BUREAU: An installation where the user can lease processing time on a central processor and peripheral equipment. The user supplies the programs and data to be processed, the bureau processes the data and delivers the results to the user. The program and data for processing may be delivered or sent between user and center in any of several forms: cards, punched tape, magnetic tape, etc. Data communications may be used between the user and the center to move the information electrically. The bureau may also provide such services as keypunching the data and preparing it for processing. See also computer utility.
- *SOFTWARE: A generic, somewhat slang term for a computer program, sometimes taken to also include documentation and procedures associated with such programs.
- SHORT TERM: Service up to one month.
- SPACE DIVISION SWITCHING: Each channel physically separated during switching--thus, separated by space; e.g., No. 5 XBar machine of AT&T. May be common control or step by step.
- STORE-AND-FORWARD SWITCHING: Synonymous with message switching, used for switching written records such as teletypewritergenerated message which need not be transmitted on real-time basis.
- *SWITCHED NETWORK: A system consisting of a number of terminal points that are able to access one another through a series of communication lines and switching arrangements.
- *SWITCHED NETWORK, LINE-SWITCHING: A switched network in which switching is accomplished by disconnecting and reconnecting lines in different configurations in order to set up a continuous pathway between the sender and the recipient.

- *SWITCHED NETWORK, STORE-AND-FORWARD: A switched network in which the storeand-forward principle is used to handle transmissions between senders and recipients.
- *TERMINAL, CRT: CRT is the acronym for Cathode Ray Tube, i.e., a video display device associated with a terminal. See terminal, video.
- TELEGRAPH-GRADE: Up to 150 signal events per second (baud) carried on direct (on/off) basis.
- TELEGRAPHY: A system of communication for the transmission of graphic symbols, usually letters or numerals, by use of a signal code.
- *TELEPRINTER: A teletype or teletype device, consisting of a keyboard and a printing device.

TELETYPEWRITER: Same as teleprinter.

- TERMINAL: 1. A point at which information can enter or leave a communications network. 2. An input/output device designed to receive or send source data in an environment associated with the job to be performed and capable of transmitting entries to and obtaining output from the system of which it is a part.
- *TERMINAL, VIDEO: A terminal using a video display as a readout device, in contradistinction to a teleprinter, which uses a printer device. Synonym for CRT Terminal.
- TIME DIVISION SWITCHING: Separation is in time realm. Also called Time Division Multiplex; e.g., may be used with PCM (pulse code modulation).
- *TIMESHARING: A method of operation (in an on-line system) in which computer facilities are shared by several users for different purposes during the same time period. Although the computer actually services each user in sequence, the high speed of the computer makes it appear that the users are handled simultaneously.
- TRANSPONDER SERVICE: Case where carrier leases the entire capacity of one satellite transponder (approximately 36 megahertz) to a customer.
- *TRUNK: A communication channel between switching devices or central offices.

- *WORD: 1. In communications, six characters (five plus a space). 2. In computers, the unit of information transmitted, stored and operated upon at one time.
- VOICE CHANNEL: Any channel used to transmit human voice signal (may be analog, digital, and of various bandwidths).
- VOICE-GRADE CHANNEL: Designates a channel which is a nominal 4 kilohertz channel which may be suitable for transmitting data, telegraph, and facsimile as well as voice.

WIDEBAND CHANNELS: Analog channels greater than or equal to 48 kilohertz.

NBS-114A (REV. 9-78) 1. PUBLICATION OR REPORT NO. 2. Gov't. Accession No. 3. Recipient's Accession No. U.S. DEPT. OF COMM. **BIBLIOGRAPHIC DATA** NBS TN 1104 Vol. 1 SHEET 4. TITLE AND SUBTITLE 5. Publication Date September 1979 The FCC Public Message Services Policy Change: 6. Performing Organization Code An ETIP Evaluability Assessment Report 7. AUTHOR(S) James Bell, Sharon Kirby, The Urban Institute; 8. Performing Organ. Report No. Roland G. Weiss, NBS; Steve Watson, The Urban Institute 9. PERFORMING ORGANIZATION NAME AND ADDRESS 10. Project/Task/Work Unit No. NATIONAL BUREAU OF STANDARDS The Urban Institute 11. Contract/Grant No. DEPARTMENT OF COMMERCE 2100 M St., NW WASHINGTON, DC 20234 Washington, DC 20037 7-35822 13. Type of Report & Period Covered 12. SPONSORING ORGANIZATION NAME AND COMPLETE ADDRESS (Street, City, State, ZIP) Interim Same as above 14. Sponsoring Agency Code **15. SUPPLEMENTARY NOTES** Document describes a computer program; SF-185, FIPS Software Summary, is attached. 16. ABSTRACT (A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.) This document is a report of work in progress toward evaluating effects of the recent decision of the Federal Communications Commission to open public message services to competition. It is one product of the Regulatory Processes and Effects Project of the Center for Field Methods (ETIP). The broader project, described elsewhere, is attempting to analyze the effects of changes in regulatory

processes on industrial innovation. The joint ETIP/FCC project will involve measuring whether the FCC policy change leads to increases in competition, technological innovation, and public benefit.

The first two chapters provide an introduction and synopsis. Chapter II examines the setting in which the decision occurs in terms of historical developments, industry trends, and views held by various observers. Chapter IV describes the: Commission's mandate for regulation, process for implementing this mandate in terms of regulations and operations, and current industry status. The fifth chapter describes the evaluation logic. The last chapter is an assessment which shows that there are many choices to be made to target the evaluation. A glossary of terms and bibliography are included. Seven appendices are bound separately.

17. KEY WORDS (six to twelve entries; alphabetical order; capitalize only the first letter of the first key word unless a proper name; separated by semicolons) Administrative experimentation; economic deregulation; evaluability assessment; evaluation; Experimental Technology Incentives Program; Federal Communications Commission; regulatory experimentation; regulatory policy; technology innovation; telecommunications.

Coefficients coefficients		
18. AVAILABILITY XX Unlimited	19. SECURITY CLASS (THIS REPORT)	21. NO. OF PRINTED PAGES
For Official Distribution. Do Not Release to NTIS	UNCLASSIFIED	232
Order From Sup. of Doc., U.S. Government Printing Office, Washington, D.C. 20402, SD Stock No. SN003–003–02117–2	20. SECURITY CLASS (THIS PAGE)	22. Price
Order From National Technical Information Service (NTIS), Springfield, VA. 22161	UNCLASSIFIED	pri per set

USCOMM-DC



A typical plant can save about 20 percent of its fuel—just by installing waste heat recovery equipment. But with so much equipment on the market, how do you decide what's right for you?

Find the answers to your problems in the *Waste Heat Management Guidebook*, a new handbook from the Commerce Department's National Bureau of Standards and the Federal Energy Administration.

The Waste Heat Management Guidebook is designed to help you, the cost-conscious engineer or manager, learn how to capture and recycle heat that is normally lost to the environment during industrial and commercial processes.

The heart of the guidebook is 14 case studies of companies that have recently installed waste heat recovery systems and profited. One of these applications may be right for you, but even if it doesn't fit exactly, you'll find helpful approaches to solving many waste heat recovery problems. In addition to case studies, the guidebook contains information on:

- sources and uses of waste heat
- determining waste heat requirements
- economics of waste heat recovery
- commercial options in waste heat recovery equipment
- Instrumentation
- engineering data for waste heat recovery
- assistance for designing and installing waste heat systems

To order your copy of the Waste Heat Management Guidebook, send \$2.75 per copy (check or money order) to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. A discount of 25 percent is given on orders of 100 copies or more mailed to one address.

The Waste Heat Management Guidebook is part of the EPIC industrial energy management program aimed at helping industry and commerce adjust to the increased cost and shortage of energy.

U.S. DEPARTMENT OF COMMERCE/National Bureau of Standards FEDERAL ENERGY ADMINISTRATION/Energy Conservation and Environment

NBS TECHNICAL PUBLICATIONS

PERIODICALS

JOURNAL OF RESEARCH—The Journal of Research of the National Bureau of Standards reports NBS research and development in those disciplines of the physical and engineering sciences in which the Bureau is active. These include physics, chemistry, engineering, mathematics, and computer sciences. Papers cover a broad range of subjects, with major emphasis on measurement methodology, and the basic technology underlying standardization. Also included from time to time are survey articles on topics closely related to the Bureau's technical and scientific programs. As a special service to subscribers each issue contains complete citations to all recent NBS publications in NBS and non-NBS media. Issued six times a year. Annual subscription: domestic \$17.00; foreign \$21.25. Single copy, \$3.00 domestic; \$3.75 foreign.

Note: The Journal was formerly published in two sections: Section A "Physics and Chemistry" and Section B "Mathematical Sciences."

DIMENSIONS/NBS

This monthly magazine is published to inform scientists, engineers, businessmen, industry, teachers, students, and consumers of the latest advances in science and technology, with primary emphasis on the work at NBS. The magazine highlights and reviews such issues as energy research, fire protection, building technology, metric conversion, pollution abatement, health and safety, and consumer product performance. In addition, it reports the results of Bureau programs in measurement standards and techniques, properties of matter and materials, engineering standards and services, instrumentation, and automatic data processing.

Annual subscription: Domestic, \$11.00; Foreign \$13.75

NONPERIODICALS

Monographs—Major contributions to the technical literature on various subjects related to the Bureau's scientific and technical activities.

Handbooks—Recommended codes of engineering and industrial practice (including safety codes) developed in cooperation with interested industries, professional organizations, and regulatory bodies.

Special Publications—Include proceedings of conferences sponsored by NBS, NBS annual reports, and other special publications appropriate to this grouping such as wall charts, pocket cards, and bibliographies.

Applied Mathematics Series—Mathematical tables, manuals, and studies of special interest to physicists, engineers, chemists, biologists, mathematicians, computer programmers, and others engaged in scientific and technical work.

National Standard Reference Data Series—Provides quantitative data on the physical and chemical properties of materials, compiled from the world's literature and critically evaluated. Developed under a world-wide program coordinated by NBS. Program under authority of National Standard Data Act (Public Law 90-396). NOTE: At present the principal publication outlet for these data is the Journal of Physical and Chemical Reference Data (JPCRD) published quarterly for NBS by the American Chemical Society (ACS) and the American Institute of Physics (AIP). Subscriptions, reprints, and supplements available from ACS, 1155 Sixteenth St. N.W., Wash., D.C. 20056.

Building Science Series-Disseminates technical information developed at the Bureau on building materials, components, systems, and whole structures. The series presents research results, test methods, and performance criteria related to the structural and environmental functions and the durability and safety characteristics of building elements and systems. Technical Notes-Studies or reports which are complete in themselves but restrictive in their treatment of a subject. Analogous to monographs but not so comprehensive in scope or definitive in treatment of the subject area. Often serve as a vehicle for final reports of work performed at NBS under the sponsorship of other government agencies. Voluntary Product Standards-Developed under procedures published by the Department of Commerce in Part 10, Title 15, of the Code of Federal Regulations. The purpose of the standards is to establish nationally recognized requirements for products, and to provide all concerned interests with a basis for common understanding of the characteristics of the products. NBS administers this program as a supplement to the activities of the private sector standardizing organizations.

Consumer Information Series—Practical information, based on NBS research and experience, covering areas of interest to the consumer. Easily understandable language and illustrations provide useful background knowledge for shopping in today's technological marketplace.

Order above NBS publications from: Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

Order following NBS publications—NBSIR's and FIPS from the National Technical Information Services, Springfield, Va. 22161.

Federal Information Processing Standards Publications (FIPS PUB)—Publications in this series collectively constitute the Federal Information Processing Standards Register. Register serves as the official source of information in the Federal Government regarding standards issued by NBS pursuant to the Federal Property and Administrative Services Act of 1949 as amended, Public Law 89-306 (79 Stat. 1127), and as implemented by Executive Order 11717 (38 FR 12315, dated May 11, 1973) and Part 6 of Title 15 CFR (Code of Federal Regulations).

NBS Interagency Reports (NBSIR)—A special series of interim or final reports on work performed by NBS for outside sponsors (both government and non-government). In general, initial distribution is handled by the sponsor; public distribution is by the National Technical Information Services (Springfield, Va. 22161) in paper copy or microfiche form.

BIBLIOGRAPHIC SUBSCRIPTION SERVICES

The following current-awareness and literature-survey bibliographies are issued periodically by the Bureau:

Cryogenic Data Center Current Awareness Service. A literature survey issued biweekly. Annual subscription: Domestic, \$25.00; Foreign, \$30.00.

Liquefied Natural Gas. A literature survey issued quarterly. Annual subscription: \$20.00. Superconducting Devices and Materials. A literature survey issued quarterly. Annual subscription: \$30.00. Send subscription orders and remittances for the preceding bibliographic services to National Bureau of Standards, Cryogenic Data Center (736.00) Boulder, Colorado 80303. OFFICIAL BUSINESS

Penalty for Private Use, \$300

POSTAGE AND FEES PAID U.S. DEPARTMENT OF COMMERCE COM-215



SPECIAL FOURTH-CLASS RATE BOOK



QC 00.

979

NBS TECHNICAL NOTE 1104

Volume 2

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

The FCC Public Message Services Policy Change: An ETIP Evaluability Assessment Report

NATIONAL BUREAU OF STANDARDS

The National Bureau of Standards' was established by an act of Congress on March 3, 1901. The Bureau's overall goal is to strengthen and advance the Nation's science and technology and facilitate their effective application for public benefit. To this end, the Bureau conducts research and provides: (1) a basis for the Nation's physical measurement system, (2) scientific and technological services for industry and government, (3) a technical basis for equity in trade, and (4) technical services to promote public safety. The Bureau's technical work is performed by the National Measurement Laboratory, the National Engineering Laboratory, and the Institute for Computer Sciences and Technology.

THE NATIONAL MEASUREMENT LABORATORY provides the national system of physical and chemical and materials measurement; coordinates the system with measurement systems of other nations and furnishes essential services leading to accurate and uniform physical and chemical measurement throughout the Nation's scientific community, industry, and commerce; conducts materials research leading to improved methods of measurement, standards, and data on the properties of materials needed by industry, commerce, educational institutions, and Government; provides advisory and research services to other Government agencies; develops, produces, and distributes Standard Reference Materials; and provides calibration services. The Laboratory consists of the following centers:

Absolute Physical Quantities² — Radiation Research — Thermodynamics and Molecular Science — Analytical Chemistry — Materials Science.

THE NATIONAL ENGINEERING LABORATORY provides technology and technical services to the public and private sectors to address national needs and to solve national problems; conducts research in engineering and applied science in support of these efforts; builds and maintains competence in the necessary disciplines required to carry out this research and technical service; develops engineering data and measurement capabilities; provides engineering measurement traceability services; develops test methods and proposes engineering standards and code changes; develops and proposes new engineering practices; and develops and improves mechanisms to transfer results of its research to the ultimate user. The Laboratory consists of the following centers:

Applied Mathematics — Electronics and Electrical Engineering² — Mechanical Engineering and Process Technology² — Building Technology — Fire Research — Consumer Product Technology — Field Methods.

THE INSTITUTE FOR COMPUTER SCIENCES AND TECHNOLOGY conducts research and provides scientific and technical services to aid Federal agencies in the selection, acquisition, application, and use of computer technology to improve effectiveness and economy in Government operations in accordance with Public Law 89-306 (40 U.S.C. 759), relevant Executive Orders, and other directives; carries out this mission by managing the Federal Information Processing Standards Program, developing Federal ADP standards guidelines, and managing Federal participation in ADP voluntary standardization activities; provides scientific and technological advisory services and assistance to Federal agencies; and provides the technical foundation for computer-related policies of the Federal Government. The Institute consists of the following centers:

Programming Science and Technology - Computer Systems Engineering.

¹Headquarters and Laboratories at Gaithersburg, MD, unless otherwise noted; mailing address Washington, DC 20234. ²Some divisions within the center are located at Boulder, CO 80303.


The FCC Public Message Services Policy Change: An ETIP Evaluability Assessment Report -- Volume 2

James Bell¹ Sharon Kirby¹ Roland G. Weiss² Steve Watson¹

¹The Urban Institute 2100 M Street, NW Washington, DC 20037

²Center for Field Methods Experimental Technology Incentives Program National Bureau of Standards Washington, DC 20234



U.S. DEPARTMENT OF COMMERCE, Juanita M. Kreps, Secretary Luther H. Hodges, Jr., Under Secretary

Jordan J. Baruch, Assistant Secretary for Science and Technology

JS NATIONAL BUREAU OF STANDARDS, Ernest Ambler, Director

Issued September 1979



National Bureau of Standards Technical Note 1104/2 Nat. Bur. Stand. (U.S.), Tech. Note 1104/2, 110 pages (Sept. 1979) CODEN: NBTNAE

> U.S. GOVERNMENT PRINTING OFFICE WASHINGTON: 1979

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 Stock No. 003–003–02117–2 Price \$11. Sold in sets only. (Add 25 percent additional for other than U.S. mailing)

AB STRACT

This document is a report of work in progress toward evaluating effects of the recent decision of the Federal Communications Commission to open public message services to competition. It is one product of the Regulatory Processes and Effects Project of the Center for Field Methods (ETIP). The broader project, described elsewhere, is attempting to analyze the effects of changes in regulatory processes on industrial innovation. The joint ETIP/FCC project will involve measuring whether the FCC policy change leads to increases in competition, technological innovation, and public benefit.

The first two chapters provide an introduction and snyopsis. Chapter III examines the setting in which the decision occurs in terms of historical developments, industry trends, and views held by various observers. Chapter IV describes the: Commission's mandate for regulation, process for implementing this mandate in terms of regulations and operations, and current industry status. The fifth chapter describes the evaluation logic. The last chapter is an assessment which shows that there are many choices to be made to target the evaluation. A glossary of terms and bibliography are included. Seven appendices are bound separately.

KEY WORDS: Administrative experimentation; Economic deregulation; Evaluability assessment; Evaluation; Experimental Technology Incentives Program: Federal Communications Commission; Regulatory experimentation; Regulatory policy; Technological innovation; Telecommunications.

ACKNOWLEDGEMENTS

This report could not have been completed without the assistance and cooperation of many people. First and foremost we would like to thank the Federal Communications Commission staff who provided invaluable information both about Commission operations and about issues that are currently being debated within the telecommunications industry. In particular, we wish to acknowledge:

- o David Irwin, Chief of Policy and Rules;
- o James Smith, Policy and Rules;
- o Charles Oliver of Program Evaluation;
- Frank Patella, Judy Nitsche, Ken Levy, and Daniel Harrold of Tariff Review and Tariff Proceedings;
- o Jim Ferris, Complaints and Service Standards; and
- Robert James (Domestic Division) and Helene Bauman (International Division) of the Facilities Branch.

We would especially like to thank Leonard Sawicki, Program Evaluation Branch, who provided assistance throughout the effort including reviews and comments on the preliminary drafts of this report.

Staff of both The Urban Institute and The Experimental Technology Incentives Program of the Department of Commerce participated on committees reviewing this report and offered advice during the course of research. We would like to thank Victor Berlin, Bud Libman, and Dan Fulmer of ETIP and Robert Sadacca, John Waller, Joe Nay, Lucile Graham, Michael Mulkey, Bill Foskett, Paul Nalley, John Heinberg, and Richard Schmidt of The Urban Institute.

Our initial contact with the industry produced a gratifying response. We would like to thank the common carriers which expressed interest in our experimental evaluation of the effects of changes in interstate telecommunications regulation. In some cases, carriers submitted information about their operations.

The telecommunications industry is indeed fast moving and complex. We found that the publication <u>Telecommunications Reports</u> provided valuable information about developments in the industry. Mr. Fred Henck, publisher of <u>Reports</u>, very kindly gave us permission to quote his journal. We also appreciate the fine job done by Erica Sweeney who edited this report. Finally, we would like to thank the many people who helped to prepare the report. Staff who assisted us include: Kraig Jones, (Ms.) Mike Malone, Mary Sarley, John Fortunato-Schwandt, Ilona Bush, and Barbara Shunney. We are especially grateful to Copper Wilson who, in spite of coming to the project during the final report writing, took responsibility for primary secretarial support, worked long hours to meet deadlines, and also made valuable contributions to the content of the report.

> James Bell Sharon Kirby Roland Weiss Steven Watson

PR EFAC E

Regulatory agencies and regulatory reform are subjects of great interest today, and the effects of regulation on technological innovation and productivity in American industry are of special concern. Many reforms and changes in the regulatory process are being proposed, and some are being made. Each change represents an "experiment" in the operation of our society, even if no one carefully determines the result of that "experiment."

Since 1974, the Experimental Technology Incentives Program (ETIP)-located in the Center for Field Methods of the National Bureau of Standards-has pursued an understanding of the relationships between government policies and technology-based economic growth. This goal is based on three premises:

- Technological change is a significant contributor to social and economic development in the United States.
- o Federal, State, and local government policies can influence the rate and direction of technological change.
- Current understanding of this influence and its impact on social and economic factors is incomplete.

ETIP seeks to improve public policy and the policy research process in order to facilitate technological change in the private sector. The program does not pursue technological change <u>per se</u>. Rather, its mission is to examine and experiment with government policies and practices in order to identify and assist in the removal of government-related barriers and to correct inherent market imperfections that impede the innovation process.

ETIP assists other government agencies in the design and conduct of joint projects. Key agency decision makers are intimately involved in these experiments to ensure that the results are incorporated in the policymaking process. ETIP provides its agency partners with both analytical assistance and funding for the experiments while it oversees the evaluation function.

In 1977, The Urban Institute's Program Evaluation Group was awarded a significant contract (\$856,000 over 15 months) as a result of competitive bidding on a U.S. Department of Commerce Request For Proposal. Under this contract the Program Evaluation Group provided analytic support and data collection services to ETIP. This work was the foundation for the Regulatory Processes and Effects Project (RPE). The Regulatory Processes and Effects Project, through this analytic support work, will analyze the process and

attempt to document the results of ETIP's regulatory projects, which investigate whether private sector innovation is generated by changes in regulatory agencies. In December 1978, the Regulatory Processes and Effects Project moved from The Urban Institute to the Performance Development Institute (PDI) as the result of a competitive award process.

Regulatory Processes and Effects Project teams are conducting short, exploratory efforts, significant explorations of expectations and reality, and assessments of fully developed regulatory process changes under various regulatory situations.¹ The following regulatory agencies are (or have been) involved:

> Environmental Protection Agency (Air, Pesticides, and Water), Federal Communications Commision, Food and Drug Administration, Federal Energy Regulatory Commission, Federal Trade Commission, Interstate Commerce Commission, Nuclear Regulatory Commission, Occupational Safety and Health Administration, and State Public Utility Commissions (Electric Power).

The Regulatory Processes and Effects Project not only helps to develop actual regulatory administrative experiments, but also helps formulate a generalizable body of methods for implementing and assessing the effects of regulatory changes on commerce, industry, and technological innovation.

1. ETIP prefers to use the strategy of "administrative experimentation" when applicable. An administrative experimentation stragegy (1) helps to bring about a change in the performance or operation of an agency, and (2) improves the understanding of the relationship between the change introduced and the results observed. Thus, an administrative experiment is conducted more in the sense of carefully evaluated change, and not in the social sciences sense of change controlled by the researcher, according to certain prescribed rules, solely for research purposes. A "quasi-experimental" research design may be the best that one can do. See, for example, Campbell, Donald T., "Administrative Experimentation, Institutional Records and Nonreactive Measures," <u>Improving Experimental Design and Statistical Analysis</u>, Stanley, J.C., ed., Chicago: Rand McNalley, 1967. Thompson, Charles W. N., and Rath, Gustave J. "The Administrative Experiment: A Special Case of Field Testing Or Evaluation," Human Factors, Vol. 16, No. 3, June 1974, pp. 238-252. Thompson, Charles W. N. "Administrative Experiments; The Experience of Fifty-Eight Engineers and Engineering Managers," IEEE Transaction on Engineering Management, Vol. EM-21, No. 2, May 1974, pp. 42-50.

In each situation, team members from ETIP, the ETIP contractor (PDI), and the regulatory agency jointly analyze an initiative in regulation, or its implementation as an experiment, and/or perform an assessment of its effects. Other interested parties are also involved, and the work is conducted under the management and review structure of the Regulatory Processes and Effects Project. Consequently, knowledge gained from similar projects can be shared.

This document concerns the development of an effort with the Federal Communications Commission (FCC). In fall 1976, ETIP regulatory staff began to investigate the possibility of developing a joint project with the FCC. With the assistance of a small contract (Transcom, Inc.), it conducted preliminary background research on the Commission and developed three ideas in the area of international telecommunications.

Preliminary discussions continued between ETIP and FCC for several months. During this time, the discussions revealed the need for a considerable amount of definitional and economic research on the telecommunications industry. The Common Carrier Bureau (CCB) Program Evaluation staff proposed alternatives that included public message telegraph services deregulation,²,³ and a Commission attorney began to investigate the legal issues involved.

In June 1977, ETIP and FCC staff agreed that there was sufficient mutual interest in the development of a joint project to justify requesting formal Commission approval for continued work. The Commission granted formal approval in July 1977. ETIP and Commission staff then developed a joint project plan and interagency agreement. The plan, used by ETIP to obtain National Bureau of Standards' approval, describes:

> a project to be carried out with the Federal Communications Commission (FCC) to identify, design, implement, and assess

3. The term deregulation is used here to denote a change in policy, practice, and/or rules which reduces (but does not necessarily eliminate) the burden on the regulatee.

^{1.} The initial proposals were entitled: "Eliminating Time Delay in the Section 214 International Facilities Construction Authorization Process"; "Elimination of The Requirement That International Record Carrier Rates Be 'Cost Justified' with Section 61.38 Support Data (Rate Deregulation For Existing Carriers)"; and "Expanded Communications Carrier Ownership of Satellite Earth Stations for International Telecommunications." Transcom, Inc. International Telecommunications Experimental Ideas For The Experimental Technology Incentives Program, December 7, 1976, 34 pages.

^{2.} Sawicki, Leonard S. Program Evaluation, Common Carrier Bureau of the Federal Communications Commission, Draft of Internal Working Memorandum (undated).

one or more administrative experiments • • • intended to obtain knowledge of the agency and commercial impacts of changes in the FCC regulatory process.¹

ETIP and Commission staff agreed that the public message telegraph services deregulation, if implemented, might be a change to investigate. Common Carrier Bureau staff expressed an interest in also using the proposed project as a prototype or test of ETIP's evaluation process, and suggested that, if successful, the process might be used in other areas within the Commission.

In October 1977, the staffs of the CCB, ETIP, and The Urban Institute began conducting research. The following activities were included:

- o A review of legal authority was completed in December 1977.²
- o The Urban Institute interviewed CCB staff about Commission procedures and specific plans for public message services deregulation.
- The Urban Institute drafted, verified, and revised an initial report of findings based on these interviews.³
- o CCB staff drafted a briefing memorandum outlining the characteristics of the change.⁴
- o In July 1978, the Western Union Monopoly Inquiry proceeding became part of the focus of the ETIP/Urban Institute research effort to evaluate the impact of a decision, if implemented, to open competition.

An official Memorandum, Opinion, and Order opening public message services commerce to competition was prepared by CCB staff and approved by the Commission on January 25, 1979. The Commission does not view this decision to change its policy as an experiment. The decision was made for reasons of policy and not for purposes of research. What is regarded as experimental is the evaluation process being developed, and the ways in which it can be applied. The Commission has expressed a strong interest in evaluation results as noted by Commissioner Ferris.

^{1.} U.S. Department of Commerce, Bureau of Standards, Experimental Technology Incentives Program. <u>Experiments in Communications Regulation</u>, Project Plan for ETIP Project 161, August 1, 1977.

^{2.} U.S. Federal Communications Commission. "Memorandum of Law," from Richard Severy to David Irwin, dated December 7, 1977.

^{3.} Bell, James: <u>The FCC/ETIP Regulatory Experiment</u>, Working Paper Number 1198-70-01 (Draft), The Urban Institute, Washington, D.C., May 3, 1978.

^{4.} U.S. Federal Communications Commission. "Points Memorandum," by David Irwin, <u>et al</u>., Summer 1978.

. . . I intend to ensure that the Commission monitors the effects of this policy change. This evaluation will be undertaken by staff of the Common Carrier Bureau in cooperation with the Experimental Technology Incentives Program (ETIP) of the National Bureau of Standards. This will enable the Commission to check its expectations of public benefits, based on today's reasoned judgment, against subsequent events in the marketplace.¹

A proposed rulechange will be presented before the Commission, probably in April or May, 1979, and will be finalized after a public notice period. The process that the Commission and ETIP will use to manage the evaluation of the impact of the PMS deregulation over time is currently being developed.

This report contains our findings to date about the operations of the Commission and a logic for the proposed project, and assesses important situations and issues in telecommunications. Using these findings and ETIP/ FCC criteria for success, the report also discusses the possibility of developing a useful evaluation. It represents the result of approximately 27 person months of ETIP and Urban Institute staff time.

This project will also facilitate communications between the Commission, industry, and others, such as Congress, that might be interested. We hope that the report will encourage their interest and suggestions. We also hope that this report and subsequent products of the evaluation will contribute to our understanding of evaluation process and methodology, theories about innovation, effects of regulation, and other subjects of interest to members of government, the research community, and industry.

The Regulatory Processes and Effects Project has been screening regulatory situations which might be appropriate for evaluation as administrative experiments. During the coming year, the methods we are developing will be made more widely available to users. We welcome inquiries from regulatory agencies that wish to draw upon our experience to date. For further background the reader may wish to consult the <u>Management Plan for</u> the Regulatory Processes and Effects Project and the latest proposal to ETIP, Proposal in Response to ETIP Solicitation No. E0-78-3603.

This document was prepared and submitted under Department of Commerce Contract #7-35822 by the Regulatory Processes and Effects Project. The report represents work in progress at this time, and will be revised and updated

^{1.} U.S. Federal Communications Commission News Release. "FCC Ends Western Union Telegram Monopoly; Conditionally Approves Graphnet's Application for Domestic Service (CC Docket Nos. 78-95-96)," Report No. 14735, Action in Docket Case, January 25, 1979--CC, Separate Statement of Chairman Charles D. Ferris.

periodically, as we advance and receive additional information. These reports are used for information exchange on the development of methodology and on substantive results.

It should be noted that the usefulness of the findings about this deregulation can be increased or decreased by the competency of the evaluation. The evaluation must be perceived as thorough and impartial, and it must produce useful findings.

		Page
ABSTI	RACT	iii
ACKNOWLEDGEMENTS		
PREFACE		
CONTENTS (Volume II)		xiii
Α.	PUBLIC MESSAGE SERVICES CHRONOLOGY (1844 Through January 1979) Developed by Steven Watson and Sharon Kirby.	
В•	EXECUNET CHRONOLOGY WITH BRIEF INTRODUCTION (July 1975 Through June 1978), Developed by Sharon Kirby.	
C.	SPACE INDUSTRIALIZATION CONCEPT AND IMPLICATIONS FOR TELECOMMUNICA by Copper Wilson and Roland Weiss.	FIONS,

- D. FINDINGS ABOUT INFORMATION SOURCES AVAILABLE AT THE FEDERAL COMMUNICATIONS COMMISSION AND ELSEWHERE, By Sharon Kirby and James Bell.
- E. POTENTIAL USES OF INFORMATION AND POTENTIAL MEASURABLE ISSUES, Developed by Steven Watson, James Bell, Sharon Kirby, Paul Nalley and Roland Weiss.
- F. POTENTIAL USERS OF INFORMATION, Developed by Sharon Kirby.
- G. FCC NEWS RELEASE ANNOUNCING END OF WESTERN UNION MONOPOLY AND CONDITIONAL APPROVAL OF GRAPHNET'S APPLICATION FOR DOMESTIC SERVICE (CC Docket Nos. 78-95-96).

.

APPENDIX A: PUBLIC MESSAGE SERVICES CHRONOLOGY (1844 Through January 1979)

(SOURCE: <u>TELECOMMUNICATIONS REPORTS</u>)

Developed by

Steven Watson Sharon Kirby

.

PUBLIC MESSAGE CHRONOLOGY

"Public message telegraph service is ordinary telegram service, in which the carrier. . .accepts either written or oral messages at a public office or via the public telephone network, transmits those messages to its public office in another city, and delivers the messages either in written or oral form to the designated recipient. No customer terminal equipment is required. Unlike the customer using public long distance telephone service, the telegram customer does not subscribe in advance to any service and get his premises connected to the network." <u>Graphnet Systems, Inc.</u>, 64 FCC 2d 1023 (1977)

- 1844 First telegraph line established between Baltimore and Washington.
- 1856 Western Union is authorized by acts of the Wisconsin and New York Legislatures to provide the service.
- 1861 A transcontinental system is established.
- 1880s The Postal Telegraph Cable Co. becomes a domestic competitor with Western Union.
- 1910 The Mann-Elkins Act established the Interstate Commerce Commission's regulatory authority over telephone and telegraph communications.
- 1929 Western Union's regular telegram service hits its peak. Main competitor becomes Postal Telegraph.
- 1934 The <u>Communications Act</u> is passed and the Federal Communications Commission created.
- 1943 Congress adds domestic merger section 222 to the 1934 Communications Act. The purpose of this legislation is to assure that the merger of Western Union and the Postal Telegraph Co. would not violate antitrust laws.

FCC holds hearing (Docket 6517 10 FCC 148 [1943]) and finds that the public interest would be best served by a monopoly in the domestic public telegraph service. Certain "natural monopoly" conditions of the market were cited. The House Interstate Commerce Committee's general preference for a competitive market structure is overcome by the financial difficulties faced by the Postal Telegraph Co. and by the need to assure a sound telegraph industry to meet the contingencies of war. Western Union granted monopoly.

1945 Western Union telegram service hits second peak and enters declining period. There begins a growth of leased telegraph services--which in 1977 only constituted approximately 28 percent of Western Union revenues. 1956 <u>Press Wireless</u> 21 F.C.C. 311 (1956). The FCC denies the request by another carrier to initiate a service that would partially compete with already extant service offerings by Western Union. Western Union's monopoly position is found justified at that time. The Commission stated:

> • • • •Although Western Union is not entitled as a matter of law to the exclusive grant of pick-up and delivery of international traffic in the hinterland, the obligation it has to provide such service at all times, whether traffic be heavy or light, carries with it the privilege of continuing to provide service and reap the revenues of a heavy traffic volume unless it is unable to do so in a manner which will serve the public interest, or some other carrier will provide service which is so superior as to support a filing that a public interest would be served by a grant of its application.

- 1958 Western Union enters the exchange (Telex) telegraphy business, which will soon begin subsidizing other Western Union operations-including PMS.
- 1959 <u>Above 890 Decision</u>. Microwave technology has partially eroded former economies of scale in the communications industry. In Docket 11866, the FCC clears the way for the private operation of point-to-point, long-distance microwave facilities.
- 1969 Western Union begins a major moderization effort centering upon its new computer switching facility.
- January 1970 Western Union begins its <u>Mailgram</u> service. This service is a means of communications by which customers input messages to Western Union which are then transmitted via WU facilities to a post office of the USPS for inclusion as preferential mail in the next day's postal delivery. Within a decade this service will constitute half of all public messages.
- April 1971 Western Union acquires TWX from AT&T.
 - 1971 <u>Specialized Common Carrier Decision</u> Docket 18920. This decision established the current FCC policy in favor of competitive entry into the specialized commmunications field. This decision leads to private line services such as MCI and Southern Pacific.
- 1972 <u>Free Direct Access</u> 40 FCC 2d 1082 (1972). WU believes that the FCC interpretation of Section 222 in this case represents a bar to the delivery of the hinterland portion of any international message by any entity other than Western Union.

- 1973 Western Union inagurates its three <u>Central Telephone Bureaus</u>, which provide natural access to Western Union services through In-Wats telephone service. Today almost three-fourth's of all public messages are requested in this manner.
- 1974 Graphnet Systems, Inc., 44 FCC 2d 800 (1974). Graphnet authorized to perform specialized "facsimile" transmissions, in which it "photographs: messages by an electronic scanning process, sends the signals over inter-city transmission facilities, and delivers hard copy images of the original messages to facsimile terminals at the destination point."
- 1976 Resale and Shared Use Decision, Docket 20097.
- January 1977 FCC authorized Graphnet and Telenet to offer international communications services. International record carriers (IRCs) oppose. Permission not yet granted by overseas administrators.

Graphnet contracts with ITT World Communications and RCA Global Communications (Globcom) and FCC approves implementation of outbound portion of the agreements in tariff--but not inbound.

- June 1977 Graphnet files a Section 214 application for authority to provide certain communications services between the gateway locations of the U.S. IRCs and Graphnet subscribers in the hinterland of the U.S. Approval of such authority poses a direct threat to Western Union's monopoly concerning public message services. FCC rules that Graphnet tariff does not extend to inbound delivery of international communications. Graphnet files petition for reconsideration.
- September 1977 Several filings by Graphnet regarding proposed tariff services. Files amendment to its tariff in order to clarify that authorizations granted re ITT Worldcom and Globcom extend to any IRCs with which they enter agreements. Files a supplement to its petition for reconsideration of the FCC order which rejected tariff revision intended to implement that portion of intercarrier agreement with ITT Worldcom providing for handling of inbound international messages. Graphnet says its supplemental pleading prompted by Court of Appeals Execunet decision and Globcom's "free direct access" pleading. Logic: Graphnet believes limitation to one-way service weakens its competitive position and makes it nearly impossible to compete with Western Union, which offers both inbound and outbound service to its customers.

Western Union files another opposition pleading. Logic: Western Union (WU) believes result would be to "exacerbate the diversion of WU's landline haul revenues that is already occurring by virtue of the implementation of the Graphnet-ITT agreement."

- October 1977 The U.S. Court of Appeals for the District of Columbia denies a motion of Graphnet for summary reversal of the FCC's order granting the application of ITT Domestic Transmission Systems, Inc., to provide a domestic data service. Court grants a FCC motion to remand the matter for futher proceedings.
- January 1978 TRT Telecommunications Corporation says Graphnet's application to provide services between gateway locations of the U.S. IRCs and hinterland locations "should be conditioned so as to require that all outbound traffic transferred by it to the IRCs be distributed in accordance with the international formula." Logic: "The ultimate consequence of approving the present Graphnet scheme could be to undermine the international formula provisions that have been so carefully worked out by the Commission within literally the past few weeks and to substitute for them an arrangement which would make the distribution of outbound traffic a function of factors having no relationship whatever to the public interest."

WU asks FCC to deny Graphnet's amended application to provide for direct delivery to any subscriber terminal and for mail or telephone delivery to the general public. Logic: Public convenience does not require the service; diversion of significant volumes of traffic would have an adverse effect on WU and its users; and proposed service would violate the Commission's free direct access policy. Also, WU said, amended application would undermine the purposes of the new "international formula."

In a related filing, WU says that if Graphnet's application is granted and company becomes a public message carier, "there would be no basis on imposing on Western Union, but not Graphnet, the special requirements of regulations" such as specified in Parts 63 and 64 of the regualtions. (Part 63 deals with the requirement that WU secure FCC approval before replacing public offices with agencies or reducing the hours or quality of services at public offices. Part 64 requires WU to conduct speed of service studies of all types of messages, including those delivered by telephone, messenger, telefax, TWX, telex and over-the-counter.

March 1978 FCC denies RCA Globcom's petition for reconsideration of its order allowing Graphnet and Telenet to offer international communications services.

> FCC orders hearings on WU's proposal to earn by 1981 a 28 per cent rate of return on investment in its TWX and Telex message communications services. (TWX/Telex subsidizes PMS.)

FCC endorses staff decision to let Graphnet provide private-line (PL) facsimile service to ll European countries, and for Telenet to provide PL data transmission to Britain. Assume foreign approvals may be difficult to obtain. Graphnet asks the U.S. Court of Appeals to review the FCC's decision rejecting certain Graphnet tariff revisions which would have permitted the company to delivery to its subscribers overseas-originated message communications, and denying Graphnet's petition for reconsideration of the June 1977 FCC order which rejected tariff change proposing to offer the same services at no additional charge to the sender or recipient.

At Commission meeting, FCC members suggest less detailed telegraph regulation. At approval of routine rule change involving speed of service reports, Chairman Ferris asks, "Why are we involved in this?"

Western Union Monopoly Inquiry FCC 78-96. The FCC issues a M.O.&O. initiating an inquiry into the regulatory policies concerning the provision of domestic public message services by entities other than Western Union Telegraph Company. Hinchman notes that public message service has changed considerably in its character since the grant of monopoly in 1943 and that message volume has decreased considerably. Technological innovation may even make the traditional market obsolete. Inquiry subjects to include: alternative ways to provide PMTS; how widespread is demand; PMS' future; essentiability of PMS to public in light of other alternatives such as Mailgram. Scope of inquiry to be as narrow as possible in order to avoid delay of Graphnet decision. In addition, Commission says it plans to also review its "free direct access" policy.

June 1978 ITT and Globcom consolidate briefs regarding FCC decision to allow Graphnet and Telenet to offer international communications services. They say that FCC decision permits Graphnet, Telenet "to compete with the existing international carriers, without subjecting these new competitors to same competitive restrictions it previously planned on the IRCs."

> Western Union Information Systems withdraws from the commercial market. Logic: Less dependence on Bell. As a result of move, TWX will transfer from Bell facilities to Western Union; provision made for growth of TWX network; and introduction of higher speed exchange services made possible.

Deadline for comments in FCC's telegraph inquiry postponed to June 15 at request of Western Union.

- 1978 The USPS begins experiments in electronic message services which would supplant public message services of Western Union.
- January 1979 Commission announces a formal inquiry proceeding in connection with ECOM service.

APPENDIX B: EXECUNET CHRONOLOGY WITH BRIEF INTRODUCTION (July 1975 Through June 1978)

(SOURCE: <u>TELECOMMUNICATIONS REPORTS</u>)

Developed by

Sharon Kirby

THE MCI EXECUNET CONTROVERSY

Execunet is a metered-use service offered by MCI Telecommunications Corporation whereby a subscriber operating any push button telephone (or rotary dial telephone and tone generator) can reach any telephone in a distant city served by MCI simply by dialing a local MCI number followed by an access code and telephone number in the distant city. In July 1975, taking the position that Execunet was not a private-line service and was not included in the 214 authorization, the Federal Communications Commission (FCC) issued two ordering clauses: (1) it rejected MCI's tariff insofar as Execunet was concerned and (2) it ordered MCI to cease and desist offering Execunet.

MCI objected on the grounds that FCC had participated in <u>ex parte</u> meetings with the American Telephone and Telegraph Company (AT&T) before public hearings had been held; that the FCC rejected MCI's tariff more than eight months after the tariff had been in effect (a situation that had not been tolerated in the case of <u>FCC v. Home Box Office</u>); and, finally, that Execunet is a private line, foreign exchange (FX) service and the 214 authorizations issued to MCI contain no limits or restrictions to private line.

These events mark the beginning of a controversy which is now requiring the FCC to reexamine past decisions on policy, basic interpretation of the Communications Act, and the market structure of an important and fast-growing segment of the telecommunications industry. The effects of the Execunet issue are reaching far beyond the question of simply whether or not to allow marketing of Execunet or similar services such as MCI's service 12 or Southern Pacific Communication Corporation's (SPC) Sprint service. The following chronology describes the issues, people, and organizations involved as well as the specific events occurring from July 1975 to June 1978 and was compiled from information abstracted from Telecommunications Reports.

Date	Event
July 2, 1975	FCC's initial order bars Execunet service by MCI
July 2, 1975 to November 19, 1976	Original stay allowing Execunet marketing by MCI is in effect
April 1977	Execunet is put under court stay preventing its expansion to new customers or service points.
April 28, 1977	Oral argument on FCC's decision that MCI Execunet service is not a proper offering.
May 1977	Customer writes letter to FCC questioning legality of MCI's service 12 (an interstate, any-telephone to any- telephone service, with local exchange termination).
June 1977 _	AT&T asks FCC to order MCI to stop marketing and providing service 12; charges offering is public messagenot private line.
	MCI opposes AT&T's request for FCC order. MCI states service 12 is "hard-wired variety of Execunet" (lesser- included Execunet) and protected under court stay.
July 1977	MCI concedes service 12 is unauthorized, AT&T says in further plea for cease and desist order; charges MCI with misapplying stay order.
August 1977	Court of Appeals reverses, remands FCC ruling. As a result, stay on MCI Execunet marketing to be lifted. [Case Decision 75-1635] Mandate to be issued August 18.
	Logic: Commission has not so far determined that public interest would be served by a monopoly in the interstate message telephone service field.
	FCC asks court to stay its mandate for 30 days, during which time the agency will ask Supreme Court for a writ of certiorari (review). AT&T and U.S. Independent Telephone Association also request stay of Execunet I decision mandate.
August 15, 1977	Order not to issue mandate prior to September 19, 1977
August 19, 1977	U.S. Court of Appeals vacates an order it reissued earlier in week which would have granted three motions

for stay of Execunet decision mandate.

- Date Event
- August 22, 1977 U.S. Court of Appeals reissues stay of mandate in Execunet case pending ruling by Supreme Court.
- August 25, 1977 Court denies MCI's motion to restore the original stay of July 1975 which allowed Execunet marketing by MCI.

Week of

September 19, 1977 Following a petition for FCC review of Bureau action rescinding Chicago-Omaha 214 authorization grants to N-Triple-C Inc. (an MCI subsidiary), MCI asks the agency to deny a 1978 blanket construction application filed by AT&T, eight Bell-associated companies and three independents.

> "Sept. 19 [FCC] asked the U.S. Supreme Court to review and reverse the ruling of the Court of Appeals for the District of Columbia remanding the FCC's decisions that Execunet is not an authorized private line service to the agency . . .

"[According to the FCC brief] the question for the (Supreme Court) is: whether the Court of Appeals erred in holding that specialized common carriers such as MCI have authority to provide ordinary long distance telephone service, despite the fact that the FCC, with the express approval of the Ninth and Third Circuits, had consistently regarded its specialized common carrier policy as limited to private line services and had not made the requisite statutory finding that competition in ordinary long distance service would serve the public convenience and necessity. . .

"The decision leaves in doubt the scope of authority under certificates and licenses granted to domestic satellite carriers, 'value added' carriers, and a number of categories of miscellaneous carriers with similarly limited grants. The decision also imposes on the Commission a new interpretation of the certification process under section 214 which will require scrutiny of applications beyond the proposed services and which may bring into question the validity of numerous grants made under the agency's own interpretation of that statute."¹

1. Telecommunications Reports, Volume 43, No. 38, September 26, 1977.

Date	Event
Week of September 19, 1977	"MCI and SPC [opposed] the requests of the FCC, American Telephone and Telegraph Co., and U.S. Independent Telephone Association for Supreme Court review of the lower court's decision
	"SPC declared that 'This case presents (1) a narrow question of statutory interpretation, i.e., whether sec- tion 214 of the Communications Act permits the Commission to impose restrictions by implication on a carrier's cer- tificate of public convenience and necessity without an affirmative finding that the restrictions are required, and (2) a narrow question of fact, i.e., whether the Commission has done so by restricting specialized car- riers to private line services [the court] has made no ruling on the lawfulness of Execunet, or of the AT&T monopoly in (message toll) services [MTS], or on the proper dividing line, if any, which may be drawn between MTS and private line services. All these matters are left to the Commission to decide.""
	Justice Department indicates that no decision will be made on the department's position unless the Supreme Court de- cides to review Execunet.
October 1977	AT&T sees "substantial evidence" that MCI is violating FCC and court orders on Execunet. Asks Commission for cease and desist order; cites MCI advertising, orders for "unusual quantities" of local service for use in connection with Execunet and service 12.
Week of November 7, 1977	MCI replies to FCC's request stating it is an excuse to carry on propaganda campaign; MCI asks equal time on tele- phone news; denied marketing Execunet service, in response to charges, MCI states it would welcome FCC review of its order and installation files.
December 1977	Solicitor General, Justice Department, agrees that high court should review Execunet.
January 16, 1978	Supreme Court denies writ of certiorari petitions.
	FCC reaction: will not issue further facilities authorizations to specialized common carriers unless they provide specifically and solely for private line services.

Date	Event
January 19, 1978	FCC formally reports AT&T filing of petition for a declaratory ruling and expedited relief "affirming that petitioners have no present obligation to provide additional connections to local exchange service to other common carriers for their use in provision of service offerings which are not private line services." [File docket 19896]
	Logic: Specialized common carrier decision. The opponents of AT&T's petition parry with the antitrust issue.
Last week of January 1978	FCC Chairman Ferris says, contrary to "some speculation," decision does not automatically open entire long-distance market to competition. Specialized carrers free to use established facilities to introduce new services, but Commission must have proceeding of some kind before addi- tional facilities can be authorized. Looks toward broad inquiry in the future.
First week of February 1978	AT&T maintains its position, and notes that petition is "not directed to the connections petitioners provide to inter- national record carriers and value-added carriers in their provision of existing services"which are not functionally equivalent to MTS. Continental Telephone Corporation petitions FCC to bar
	Execunet-type services. In responding to Continental's position, Southern Pacific declares FCC, to grant the petition, must make the fol- lowing assumptions: (1) Execunet-type service will divert revenues from interstate MTS rather than merely capturing a portion of growth segments of the market (10%) not currently served by any carrier; (2) present results of the separations procedure must be protected from any potential impact from authorized services of specialized common carriers; (3) that public interest is served by the Commission's taking an affirmative action protecting the monopoly of existing carriers solely on the basis of unsubstantiated and unquantified allegations of potential impact upon that monopoly by specialized common carriers; and (4) that the status quo Continental

seeks to preserve involves a lawful rate structure for

interstate MTS.

Date

Event

- February 2, 1978 U.S. Court of Appeals for D.C. Circuit issues its order vacating Commission rulings regarding Southern Pacific Sprint issue (Execunet-like service). Southern Pacific maintains that court's order "makes it clear that the exceedingly narrow interpretation of the Court's mandate in the Execunet case urged by Bell will not be countenanced."
- February 3, 1978 Southern Pacific files new Sprint tariff.

February 22 to 23, 1978 National Association of Regulatory Utility Commissions (NARUC) Executive and Communication Committees meets in Washington. At suggestion of New York Commissioner Larkin, initiates project to develop interest findings in connection with current competitive environment in telecommunications. Responsibilities of project include: analyzing impact of competition on consumers; defining role of NARUC; developing ways to improve states' input into FCC deliberations.

February 23, 1978 FCC grants AT&T request for declaratory ruling that it is not obligated to connect for Execunet; rejects Southern Pacific's Sprint V tariff; and launches market study into MTS, WATS to determine if public interest necessitates monopoly or competitive environment.

> "The FCC observed that 'A principal question we intend to explore has to do with the industry's division of revenues and settlements. While the Commission has approved jurisdictional separations--the procedures for allocating plant operating and investment costs between state and federal jurisdictions--and there is presently pending a federalstate joint board proceeding, docket 20981, looking toward possible revisions in the current jurisdictional separations, the division of revenues and settlements have traditionally been industry devised.

"'It may be timely to exercise our jurisdiction under section 201(a) of the [Act] to establish the division of charges.' The FCC added the belief that it is 'necessary to formulate policy' in the area of interstate MTS and WATS [Wide Area Telephone Service] subsidy to local exchange service.

Event

"It continued, 'We therefore propose to determine what reimbursement interstate services should make to local operating companies for the use of local plant, on a cost causational basis; what additional charges, if any, should be levied on interstate services to support local exchange services; and whether and how these charges can be equitably imposed on all interstate services.

"'For the purposes of this issue, we will be examining all interstate services of all carriers, not just MTS and WATS. With these questions satisfactorily resolved, we will be able to examine the industry structure question for MTS and WATS on its intrinsic merits, unbeclouded by an issue that can be independently resolved.'

"The FCC went on, 'Another area that warrants attention is the industry practice of rate averaging for MTS so that uniform rates prevail nationwide. The Commission has never approved or prescribed any particular rate structure for MTS. It appears essential to reach a public interest determination on this rate averaging practice here, since a finding in favor of a uniform rate structure nationwide-at least for some kind of basic MTS service available to all persons--would seem to imply a single integrated offering and possibly foreclose competitive offerings of the same kind of MTS service.'

"It declared, 'a further important area concerns the extent to which the MTS facilities and service may be severable. . The sole question in this proceeding goes to the possible duplication of intercity facilities and the feasibility of competition in the provision of the intercity portion of interstate services. Within the latter framework, questions arise as to whether the MTS and WATS services are a monolithic whole or whether WATS could feasibly be provided on a competitive basis even if the public interest should decree that MTS, or at least basic MTS, must be a single, integrated offering.

"'If we should decide that the public interest requires a single, integrated offering of basic MTS service, a question would remain as to whether competition should be permitted in the fringe areas of MTS. To the extent

Date

Event

that WATS and fringe MTS services may now siphon off traffic from the basic MTS service, is such siphoning in the public interest, and should this determination vary depending on whether the WATS and fringe MTS services are open or closed to competition?'

"Further, the Commission reported, 'We will, of course, be exploring such factors as the best means of achieving low costs and charges to the public, technical and operating efficiency, network planning and management, innovation, and how best to satisfy the service needs and desires of the public. . . In the event of a determination that some measure of competition would be in the public interest, the associated question of interconnection under section 201 of the Act would also be determined.""1

Chairman Ferris issues ll-page statement on MTS, WATS inquiry--first policy declaration in this area.

- February 24, 1978 Southern Pacific files petitions for review by the D.C. Court of Appeals of two FCC actions: grant of AT&T declaratory ruling and rejection of its Sprint tariff.
- February 27, 1978 FCC announces that MCI letter stating it is unlawful for FCC to delay authorizations of specialized common carriers while granting them to telephone companies will be considered a comment on Continental Telephone Company's request to bar expansion of Execunet services.
- March 1978 Regarding MCI's request for mandate enforcement, FCC says that there is nothing in the court's mandate which would require action different from ones it took.

MCI, Southern Pacific reply to opponents in Execunet mandate. MCI again expresses belief that "Execunet should be classified as shared FX service, and hence a legitimate private line service." Southern Pacific submits FCC must vacate Sprint V opinion as directly in conflict with the Court's Execunet decision.

^{1.} Telecommunications Reports, Volume 44, No. 9, March 6, 1978.

March 1978 continued Continental asks FCC to defer action on its petition at least until the U.S. Court of Appeals for the District of Columbia rules on MCI's pending appeal of two FCC orders which serve to moot the need for an order prohibiting Execunet service's future growth. Commenting on MCI's letter, Continental says MCI did not "effectively challenge the Commission's basic authority

Event

"effectively challenge the Commission's basic authority to grant section 214 applications for new facilities on the condition that they not be used to provide specified services until and the unless the Commission determines that the public convenience and necessity requires such services." The Execunet decision does not obviate the need to make a public interest determination under section 214(a) of the Act before granting MCI's applications for new facilities.

March 22, 1978 Commission turns down an associated petition of MCI to enforce the Court of Appeals' mandate and require AT&T to provide local connection facilities to Execunet.

> Logic: There is "no valid public interest basis for granting the instant petition." The Commission also reminds MCI that, when it rejected SPC's Sprint V tariff, it pointed to the carrier's opportunity to seek a specific interconnection proceeding under section 201(a) of the Act.

April 1978 For the first time in history, NARUC names officials of a non-member governmental entity--specifically, three Rural Electrification Administration (REA) telephone officials--as observers on its prinicipal communications committees. Appointments: Ballard named to the NARUC Communications Committee; Norris to the staff subcommittee on communications; and Rose to the staff subcommittee on separations and toll rate disparity.

> REA expresses concern about impact of competition on small and rural telephone companies and plans to makes information on their operations developed over 28 years by REA available to policy makers. Central issue: Can small telephone companies continue to serve the public under the emerging common carrier policies of the FCC?

B-9

Date

Date

April 1978

Event

continued REA will provide information as called for by the FCC, Congressional committees, the new NTIA at Commerce and associations with similar concerns such as the National Telephone Cooperative Association, Organization for the Protection and Advancement of Small Telephone Companies, and the REA Borrowers Association. REA officials point out that, systemwide (930 small companies), the borrowers obtain about 55 percent of their total revenues from toll. They have calculated that the loss of 50 percent of toll revenues (not inconceivable in time without some mitigation) would result in local services rates on the average two and a half times as high. Lower percentage losses, of course, would have proportionate impact on local exchange rates. And, an REA official emphasizes that "The REA borrower bleeds as much whether his throat is cut by Bell or MCI. And this is not a theory."

April 7, 1978 AT&T files motion to dismiss MCI antitrust complaint in its entirety.

> Logic: Complaint involves matters already considered and mostly settled by FCC; for example, "the extent to which the general service carriers were obligated to interconnect with the specialized common carriers and to provide joint services that would permit the specialized common carrier to provide a greater range of services over a greater geographical area than they were prepared to provide on their own," "the prices, terms and conditions under which the Bell System would provide local facilities to the specialized common carriers," and "the appropriateness of the responses of the Bell system to the creation of the specialized common carriers, particularly the question of the nature and extent of any adjustments in the Bell System's rates for interstate telecommunications services." AT&T also says, "A long line of cases has firmly established the principle that antitrust jurisdiction cannot properly be asserted over matters that are subject to pervasive regulatory jurisdiction."

April 1978 U.S. Court of Apeals for the District grants MCI's motion for an "order directing compliance of the [Execunet] mandate of this court."

Date Event

April 1978 continued

Logic: MCI's facilities authorizations encompassed Execunet service precisely because the specialized carrier (policy decision) did not explicitly and affirmatively exclude this type of service from consideration. The court ruled that AT&T has an obligation to provide interconnections for Execunet.

Mandate under stay; FCC awaits decision on whether U.S. Court of Appeals for District will rehear the ruling.

April 1978 MCI petitions FCC to deny AT&T 1979 blanket construction applications.

Logic: The instant application [of AT&T] cannot be granted--unless the applications of all carriers are granted under the same terms as such applications are granted to Bell--until the MTS/WATS inquiry is terminated and the Commission is able to make a decision--based on substantial evidence in the record--that it is in the public interest to authorize competition in the provision of public voice services, or that the public interest requires the granting of exclusive authorizations to Bell rather than to any other carriers.

<u>AT&T response:</u> The continued provision of adequate and efficient MTS and WATS is required pending the outcome of the MTS and WATS proceedings. It would indeed be a perversion of the Commission's processes--and the purpose of the MTS and WATS proceeding--if the Bell companies were denied the temporary authority granted here.

April 1978

MCI, in petition for reconsideration, against asks Commission to reject AT&T multischedule private line (MPL) voice grade tariff and reinstate voice private line rates.

Logic: MCI states the Commission has refused to reject the MPL tariff primarily because of the desire to maintain order in the voice grade private line market and asserts that, since the specialized common carrier policy case was decided, the Bell series 2000/3000 private line voice grade rates against which the other common carriers must struggle to survive have been patently unlawful, lacking in adequate cost support and predatory in their effect on competition.

Date

Event

May 1978

While awaiting word on rehearing the U.S. Court of Appeals Execunet ruling, FCC takes position, "en banc court should take the case because Execunet II effectively writes section 201(a) out of the Act, because the Commission has not yet made the important policy determinations this decision presupposes, and because the decision ignores the established principle that carriers have no obligation under common law to interconnect their services or facilities . . . [court] panel's action also conflicts with settled Supreme Court precedent establishing limitations on the power of reviewing courts in relation to administrative agencies."

Appellate tribunal turns down requests for rehearing; FCC seeks U.S. Supreme Court review of most recent decision. Denial appears to put telephone companies' applications into hearing process, if plan is to expand MTS/WATS over competitive routes; FCC says clear all carriers' applications over competitive routes are involved. As a result, FCC passes over projected extension of Dataphone digital service (DDS) to 96 cities.

Unofficial notice outlining policy was given to affected common carriers by FCC:

"Below are listed three categories of facilities: (1) those not used for MTS/WATS/Execunet-type services; (2)(a) those used for MTS/WATS/Execunet services between non-competitive service points; and (2)(b) those used for MTS/WATS/Execunet services between competitive service points. Pending completion of the MTS/WATS and PMS [public message service] market structure investigations (and absent a reversal of the court's interconnection order), the bureau proposes to deal with each of these categories as follows:

"(1) Facilities required to expand competitive service offerings (other than MTS, WATS, PMS or their equivalents), either quantitively or geographically, will be authorized. Grant will be subject to other conditions or considerations, as appropriate. However, in order to have a particular application included in this category, applicants will be required to demonstrate with specificity that these facilities will not be
Date

Event

used to expand existing MTS. WATS, PMS or equivalent service offerings, either in quantity or geographic scope. In addition, applicants must show that the requested facilities will not be used to offload any existing services in order to allow diversion of previously granted facilities for expansion of public message-type services.

"(2)(a) Facilities required to maintain acceptable quality standards for public service offerings, i.e. MTS, WATS, PMS, between points not currently served by competitive offerings will be authorized subject to whatever other conditions and considerations exist. In order to have an application considered in this category, applicants must demonstrate with specificity: (a) the potential impairment of service quality posed by failure to authorize; (b) the absence of directly competing alternatives offered by other carriers; and (c) the measures which will be taken to ensure that the facilities will not be used to offload traffic from competitive routes in such manner as to provide the applicant a competitive advantage in serving those routes during the pendency of the investigation. This would recognize, however, the hierarchical nature of some services.

"(2)(b) Facilities required to extend or to expand MTS, WATS, PMS, or their equivalents, where competition currently exists in the public message market, or where a potentially competitive service is offered, will not be authorized until it has been determined, through an appropriate hearing, whether the public interest will best be served through the introduction or expansion of such competitive public message service offerings, or through some allocation of the public message services on this route among one or more carriers. This hearing generally will be undertaken as part of the MTS/WATS and PMS investigations. However, individual hearings may be instituted where the applicant shows good cause in the public interest for such actions."¹

^{1.} Telecommunications Report, Volume 44, No. 19, May 15, 1978.

Date E

<u>Event</u>

- May 1978 FCC receives preliminary comments on MTS/WATS market structure inquiry which suggest three alternatives facing Commission: (1) present natural monopoly approach "possibly with some regulated competition"; (2) free and open competition; or (3) creation of a separate entity to own all long-distance transmission facilities employed for any purpose. Lessees of facilities from this separate entity would be free to operate in an openly competitive and unregulated marketplace, offering packages of services and prices which they determine to be advantageous from a competitive business standpoint.
- May 1978 The Office of Consumer Affairs urges the Commission to take all necessary steps to promote public participation in the decision-making process since the basic issues involve social choices regarding the nature of the future telecommunications systems. It said, "Participation in the process of deciding these issues should not be limited to those parties with recognized technical expertise in the area, especially since most of those parties have an economic interest in the outcome of the proceeding."
- May 1978 In its first action of a tariff administration-type relation to Execunet, in response to MCI tariff revisions to add 16 cities to Execunet service, FCC tells MCI that under section 61.38 of the FCC's rules, tariff revisions require 70 days notice instead of 15, and more support data.
- May 12, 1978 Oral argument in Justice Department's antitrust suit against AT&T.
- May 18, 1978 In major policy change, International Communications Association (ICA) members authorize regulatory liaison committee to take more active role in regulatory and legislative matters; Vennum, Deakir, Isaacs, Fallat, and Heide in top positions. President Carter sends letter referring to creation of NTIA and suggesting close cooperation between ICA and NTIA.

Commenting on Execunet decision at May 15 to 19 annual ICA conference, FCC Chairman Ferris says, "some services whose impact on the public interest is yet unknown may be implemented; and some of the Commission's established procedures are in disarray;

Date Event

and some portions of the Communications Act, after 44 years of interpretation, are unrecognizable." Hinchman declares that the public is presently vulnerable in two areas: potential deaveraging of nationwide MTS/WATS rates and potential loss of MTS/WATS revenues which now defray part of the cost of local exchange facilities. He says that if the telephone industry chose to file deaveraged rates, it would be very difficult for the Commission or anyone else to challenge such a rate structure, whatever it might be, given the paucity of relevant cost and related information presently available.

Late May 1978 FCC CCB directs MCI to subject its tariff revision adding ten cities to Execunet to be effective August 2 on full 90 days statutory notice. AT&T files a petition to reject both ten-city extension and a prior six-city extension.

Stay on Execunet decision still in effect pending petitions for review. Opponents of stay contend issue disposed of when Supreme Court refused to review Execunet I; petitioners declare whole new set of reviewable issues raised by Execunet II--most notably, interconnection issue. AT&T and MCI offer widely divergent forecasts of what revenue effect will be if specialized common carriers go ahead with full-fledged offerings.

FCC again passes over DDS 96-city extension, which is tied to FCC reexamination of its 214 authorization policies and passes over MCI's petition for reconsideration of the FCC's latest order in multischedule private line docket 20814.

Series of recommended legislative changes offered by the organization representing specialized common carriers to the House Commerce Group--the Ad Hoc Committee for Competitive Telecommunications (ACCT). ACCT urges Congress to make clear FCC has primary jurisdiction over anything to do with interstate service. Calls for time limits on FCC of 12 months to decide rate cases and six months for facilities authorizations. Says FCC should be empowered to exempt competitive activities from tariff filing requirements of the Act. ACCT proposes that Congress ask FCC to move ahead and recommend legislative changes in the following areas: (1) questions as to the proper

Date

<u>Event</u>

procedures for determining toll settlements and jurisdictional separations; (2) criteria for carrier accounting, depreciation and other costing practices; (3) questions about the impact of competition on rates and the availability of service, and methods of mitigating any desirable effects; (4) questions of monopoly and competitive roles in the interstate communications industry; and (5) questions about the need to require the separation of monopoly and competitive services.

- June 1978 Supreme Court refuses writ of certiorari on Execunet II. Court of Appeals stay is terminated.
- "Communications Act of 1978" (HR 13015) introduced in June 7, 1978 the House. Would rely mostly on competition to make available diverse, efficient services at affordable rates. Proposes end to separations process, with new "universal service compensation fund" to comprise network access payments from intercity carriers set and distributed by new Communications Regulatory Commission. FCC would be abolished and NTIA would be moved to the Executive Branch. Would virtually eliminate role of state commissions in regulating inter-state-connected services. Proposes end to tariff suspensions, and refund provisions for competitive services. Recommends sweeping changes in administration of international services and facilities. Permits any common carrier to provide any telecommunications service through a separate subsidiary. Only exception would be that carriers providing services found to be noncompetitive could not engage in communications manufacturing.
 - JUNE 1978 FCC lifts freeze on processing of all carriers' 214 applications. Interim policy proposed will not be followed. In essence, providing for wide open grants of authority for all types of services, pending outcome of MTS/WATS market inquiry.

Chairmen of the Senate and House communications subcommittees write the FCC endorsing the concept of the AT&T exchange network facilities for interstate access (ENFIA) tariffs and the Commission indicates it will take up the next moves of the MTS/WATS inquiry in July, quite possibly including establishment of a federal/state joint board to consider separations changes and interim establishment of a network access charge applicable to all interstate carriers and services connected to the public switched telephone network. The interim network access charge is considered by some a possible alternative to the ENFIA approach in supporting local service to which all intercity carriers have access under recent developments.

B-17

CHRONOLOGY: THE MCI EXECUNET CONTROVERSY

June 1978 continued In view of related events of past year leading to several court orders addressing ex parte contacts (including Execunet), FCC adopts interim procedures for recording of public ex parte contacts in rulemaking procedures.

Requests for rejection or suspention of MCI's tariff filings extending availability of its Execunet services to 16 more cities moves closer to decision at FCC, as MCI opposes the AT&T's suspension request and AT&T replies to MCI's answers to its earlier rejection petition.

MCI opposes request to FCC by Lincoln, Nebraska Telephone & Telegraph Company that MCI's tariff extending Execunet to additional cities (including Lincoln) be suspended. MCI says that diversion of revenues by Execunet service from Lincoln Telephone (with the facilities in question) would actually be less than 10.8 percent of Lincoln Telephone's "study" results. Further, MCI expresses the view that the independents are as bound as Bell Co. by the FCC's 1974 ruling, later affirmed in court, that non-discriminatory local connections must be furnished.

In response to request for more information from FCC, AT&T official announces that in addition to segregating costs now included in the "other" categories of FDC-7 (fully distributed cost) studies, such as those for facilities now provided by the AT&T long lines department to other common carriers and to WU under contract, the new categories will include "the costs for facilities presently provided by Bell System operating companies to other common carriers and IRCs under the Bell System operating companies' tariffs and to Western Union under contract.

The Justice Department says that development of local exchange and intercity long distance services under regulation, as well as manufacturing activities, show pattern of antitrust violations by AT&T.

FCC denies MCI's petition for rejection of the AT&T MPL tariff and a return to previous rates.

NARUC/REA subcommittee on study of competition holds its first meeting with outside organizations to define the public interest in communications. Outside groups: Citizens Communications Center, Common Cause, Consumers' Union, Consumer Federation of America, and the United Church of Christ's Office of Telecommunications.

The Institute of Electrical & Electronics Engineers forms U.S. Activities Board Committee on Telecommunications Policy.

June 1978 Continued At the Pennsylvania Independent Telephone Association convention, Chairman Theodore F. Brophy warned that the telephone industry is in danger of repeating, the basic mistakes of the French high command at the outset of World War II, when it was defeated by an approximately equal force in 35 days. "France fell because of bad leadership. A similar kind of bad leadership, among ourselves and others in our position, could bring about the destruction of the American telephone industry. . . . First, I'm afraid some of us still believe that traditional telephone companies can survive, and even grow, through a policy of static defense--through an entrenched reliance on the past . . . Second, we must learn completely the lesson we've only begun to glimpse: that our competitors will not observe the rules of the game. There's no better illustration of that than Execunet."

APPENDIX C: SPACE INDUSTRIALIZATION CONCEPT AND IMPLICATIONS FOR TELECOMMUNICATIONS

Ъy

Copper Wilson Roland Weiss



SPACE INDUSTRIALIZATION

I. THE CONCEPT AND THE LINK

One example of a formal technology transfer program is the Space Industrialization program conducted by NASA. The concept of Space Industrialization was defined by a director of NASA's Advanced Programs Office as follows:

Space Industrialization is the use of space flight for commercial or utilitarian purposes; that is, the use of space to produce a salable/profitable product or a service which companies as a business expense or citizens through their taxes are willing to pay for. Other basic uses of space, of course, include Scientific Research and Exploration, typified by the Voyager and Apollo programs and National Security. But . . . I believe the prospects [for space industrialization] are bright enough to say that they may form the nucleus for a third industrial revolution.

The main attributes of space include:

- overview of the earth (essential to communications); and
- high space orbits which give extended lifetime to space systems.

Other attributes of the space environment which may also be relevant are:

- zero-gravity;
- a near-perfect vacuum which makes manufacture of certain products in space more cost-effective and efficient than manufacture on earth (particularly in the electronics and pharmaceuticals industries);
- the presence of an unlimited reservoir for disposal of waste heat or storage or disposal of waste products; and
- uninterrupted solar energy.

1. Disher, John H., Advanced Programs, Office of Space Flight, NASA, Washington, D.C., "Plans and Projections for Space Industrialization," a talk for the Near Earth Space Utilization Special Seminar Series of the MIT Department of Aeronautics and Astronautics, December 8, 1976, (unnumbered). NASA's five-year plan delineates the steps it believes are important in their Space Industrialization plan. One aspect of the five-year plan calls for bringing new "communications systems into operational use which will make available to the American people a variety of new communications services. It will create opportunities for new service businesses. . . ."¹

In October 1977, Robert Cooper, Director of NASA/Goddard Space Flight Center, stated:

The research and development for future systems will include studies by NASA of large space antennas with multiple beam capabilities, propagation characteristics, spacecraft transponders, low-cost ground terminals, satellite switching techniques and multiple access arrangements.²

NASA indicates that, at this stage, the main utilization of space satellites is in the area of communications (other uses are weather satellites, navigation, mapping, and earth resources surveying). Commercial communications firms such as Ford Aerospace & Communications Corporation and Western Union's Space Communications, Inc., are using satellites to perform various services. John H. Disher, Director of Advanced Programs, Office of Space Flight, believes that "Communications by itself constitutes a multibillion dollar Space Industry."³

NASA's long range plan for communications via satellite includes a public service platform which in NASA's belief is an important step to the industrialization of space. This proposed communications platform would have three antenna groupings covering a wide range of possible services such as personal communications, advanced television, electronic mail, teleconferencing, etc.⁴

C-2

^{1.} NASA. "Report on NASA Five-Year Planning, Fiscal Years 1978 through 1982," Washington, D.C., October 12, 1976, p. 52 (draft).

^{2.} Cooper, Robert. Director, NASA/Goddard Space Flight Center, "Remarks," for the PSSC Second Annual Conference on Satellite Communications for Public Service, Washington, D.C., October 5, 1977.

^{3.} Disher, John H., op. cit., p. 2.

^{4.} Kline, Richard L. "The Space Station and Space Industrialization," a paper presented at the Bicentennial Space Symposium, Washington, D.C., October 6-8, 1976, p. 4.

Inherent in NASA's concept of Space Industrialization is a relationship between government and private enterprise:

Space Industrialization, by developing the permanent and productive use of environments beyond Earth, must be based on the economic principles of cost effectiveness and commercial competition. This in itself presupposes the introduction of "stepping stones" to the overarching concept of Space Industrialization in order to facilitate the transfer of the investment capitalization from the public (Federal Government) sector to private industry. Since capital costs and interest rates are significantly affected, as is inflation, by the length of time and the extent to which investment capital is tied down unproductively in development (requiring discounting), return (pay-back) times on investment and the time until breakeven must be minimized. In addition, the higher the confidence level that influential features of the future Space Industrialization systems/programs can be maintained within acceptable tolerances, the lower the risk to the investor. [Emphasis added.]

This "transfer of investment capitalization" could be of interest to investors, those in various industries, and to proponents of space exploration.

Figure 1 shows NASA's description of a four-stage process for transfer of a space industrialization "product" from the public to the private sector. In the first stage the concept is developed with government funding. Government subsidized process evaluation occurs in the second stage with industry participation. In the last two stages, industry--without government subsidization--utilizes the process and carries out production of the product.

Candidate activities for such process may include: information transmission for public services (which would encompass, among other services, data transmission, person-to-person communications, and electronic mail); manufacturing in low-earth orbit; lunar and solar industrialization; space light illumination; and space microwave power (long-distance relay of power from source to user center).

von Puttkamer, Jesco. "The Next 25 Years: Industrialization of Space: Rationale for Planning," <u>British Interplanatory Society</u>, Vol. 30, No. 7, July 1977, p. 259.



FIGURE 1: NASA PLANS FOR STEPS IN TRANSITION OF FINANCIAL SUPPORT FROM GOVERNMENT TO INDUSTRY

Source: Disher, John H., op. cit.

SPACE PROCESSING PRODUCT EVALUTION

C-4

Over the past years, many aerospace-derived innovations have been transferred to private and public sectors. Many of these innovations and improvements, carried out under NASA contract and within NASA itself, have been announced in a NASA Technology Utilization Office publication called <u>Tech</u>. <u>Briefs.¹</u> Many technological transfers may be possible in the future, including manufacturing.

B. SUMMARY

NASA's Space Industrialization concept is just one formal technology transfer program. Others may exist. Technological transfer may occur between industries with little or no obvious connection. For example, Allen and Company, a high-risk investment firm, is an underwriter of specialized common carriers in the communications industry. Allen and Company is also involved in the drug industry: they introduced oral contraceptives on the market several years ago. Technological transfer may also occur between more obviously connected industries such as between industries that use microwave transmissions. Government subsidization of initial or later steps may be the primary factor for transfer to occur or even for the innovation to occur. Or private industry, such as high-risk research and development firms, may be the connecting link.

Since the influence of government R&D spending on the telecommunications industry over the next fifty years might be important, three aspects would

C-5

^{1.} Haggerty, James. <u>Spinoff 1977, An Annual Report</u>, NASA, January 1977, 116 pp.

seem to demand attention: (1) how innovation is transferred from the public to the private sector, (2) the actual amount of impact on innovation across industries of high-risk research and development efforts funded by the government, and (3) what implications do factors such as these have for the role of the regulator in fulfilling its responsibilities.

APPENDIX D: FINDINGS ABOUT INFORMATION SOURCES AVAILABLE AT THE FEDERAL COMMUNICATIONS COMMISSION AND ELSEWHERE

Ъу

Sharon Kirby James Bell

This appendix is a draft report which describes the preliminary | tasks undertaken by ETIP, its contractor, Commission staff, and | a few telecommunications industry-related organizations in order| to identify sources of measurement information (especially within the Commission), and to gather material used to prepare the evaluability assessment report. TABLE OF CONTENTS

A.	INTRODUCTION	D- 1
B∙	EVALUATOR OBSERVATION OF CCB OPERATIONS	D - 4
	 FACILITIES TARIFF REVIEW THE RULES REGARDING TARIFF TARIFF REVIEW OPERATIONS INFORMATION ABOUT REVIEWER'S TIME INFORMATION ABOUT THE CARRIERS FOUND IN TARIFF REVIEW ANALYSIS OF OFFICIAL TARIFFS OTHER SOURCES BESIDES TARIFF AND FACILITIES 	D- 4 D- 7 D- 7 D- 7 D- 9 D-13 D-19 D-23
C•	INFORMATION SOURCES OUTSIDE OF CCB •	D-23
D.	SUMMARY	D-25

FIGURES, TABLES AND EXHIBITS

FIGURE D-1:	FCC OPERATIONAL ACTIVITY	D- 2
FIGURE D-2:	ACTIVITY INTERFACES AMONG ENTITIES IDENTIFIED IN EARLY PHASE	
	OF EVALUATOR CONTACT-BASED ON INTERVIEWS WITH FCC STAFF	D- 3
TABLE D-1:	SAMPLING OF 214 APPLICATIONS BY SPECIALIZED COMMON	
	CARRIERS CONDUCTED MAY 1978 BY UI STAFF	D- 5
TABLE D-2:	NOTICE/PETITION PERIOD GUIDELINES AS SPECIFIED IN	
	SEC. 61.38 OF 47 CFR	D- 8
EXHIBIT D-1:	SAMPLE OF TARIFF CHECKLIST FORMAT	D-10
EXHIBIT D-2:	SAMPLE OF COST SUPPORT MATERIAL CHECKLIST	D-11
EXHIBIT D-3:	EXPLANATION OF 61.38	D-12
TABLE D-3:	DISTRIBUTION OF TARIFF ACTIVITY BY TYPE OF CARRIER	D-14
TABLE D-4:	WESTERN UNION TARIFF ACTIVITY FROM SEPTEMBER 1976	
	THROUGH APRIL 1978	D -1 4
FIGURE D-3:	TOTAL NUMBER OF FILINGS MONTHLY	D-15
FIGURE D-4:	PERCENTAGE OF TOTAL FILINGS FOR EACH CARRIER TYPE (BASED	
	ON APPROXIMATELY 82% OF OFFICIAL FILINGS)	D-16
FIGURE D-5:	TARIFF FILINGS BY TYPE CARRIERSEPTEMBER 1976 THROUGH	
	APRIL 1978 D-17 and	D-18
FIGURE D-6:	WESTERN UNION TARIFF FILINGS BY TYPE	D-18
FIGURE D-7:	COUNT OF COMMON CARRIERS-AS OF AUGUST 1978	D-20
FIGURE D-8:	COMPARISION BETWEEN MCI FAXNET AND SOUTHERN PACIFIC	
	FAX DATA SERVICES	D-22
FIGURE D-9:	CONTENTS OF STATISTICS OF COMMON CARRIERS	D-24

APPENDIX D

A. INTRODUCTION

In early 1978, Urban Institute staff conducted interviews with FCC Common Carrier Bureau staff. Urban Institute Working Paper 1198-70-01, which resulted from those interviews, contains descriptions of FCC Common Carrier Bureau (CCB) organization including roles played by the different groups and some specific activities of the Domestic Branch of the Facilities and Services Division; the Tariff Review and Tariff Proceedings Branch; Complaints and Service Standards Branch; and the Hearings Division. The working paper is written in terms of PMS regulatory situations; however, these same operations and procedures apply to all types of services regulated. The CCB administration and support groups (e.g., Policy and Rules, Economics Division, etc.) were described as

> playing a less direct role in producing most line regulation outcomes. They provide analytic, strategic and staff support. A very important filing will prompt greater administrative interest, and analytic and tactical support. In such cases, it is not uncommon for staff from many CCB branches and divisions to be assigned partial responsibility for processing the filing.¹

The managers of the FCC-CCB branches and divisions are the staff's communications links with the administration and support groups. The Chief of the CCB is their link with the commissioners and policymakers.

The following displays depict information gained from these earlier interviews in terms of activities and participants:

- Figure D-1: FCC Operational Activity
- Figure D-2: Main Activity Interfaces of Entities Identified

^{1.} Bell, James. <u>The FCC/ETIP Regulatory Experiment</u>, (Draft) The Urban Institute, Working Paper Number 1198-70-01, May 3, 1978, p. 19.



ADDITUTESTRATIVE SUPPORT

FIGURE D-1: FCC OPERATIONAL ACTIVITY



As you will note from Figure D-2, the early discussions concentrated almost entirely on FCC operations; Agency interactions with carriers (as relates to the carriers getting into business, doing business with emphasis on performance, and getting out of business); and the traditional legal process which has been the linchpin of the regulatory operations.

B. EVALUATOR OBSERVATION OF CCB OPERATIONS

Figure D-2, the interface activities, shows that the two main areas of interaction among entities is in the Tariff Review and Facilities sections. These two divisions were selected for further investigation.

1. FACILITIES

A sampling of 183 specialized carrier applications required under Section 214 was taken. Requirements for Section 214 authority are described in Part 63 of the Code of Federal Regulations (47 CFR). These regulations are concerned with extensions and supplements of facilities (actual transmission systems, plants, equipment, etc.), and discontinuances, impairments and reductions in service (either voluntary or involuntary). The findings of the sampling mentioned above are shown in Table D-1.

An additional 51 applications were studied in greater detail. Of these, 40 applications were specifically in compliance with Section 63.03 of Part 63, which concerns supplementing existing facilities and which is considered a minor action. The types of companies filing were Bell, independent telephone companies, or joint filings by Bell and independent telephone companies. The average FCC processing time was 17.5 calendar days. Filings were based on geographic networks; in other words, although permission for one huge expansion may be sought by a company, separate filings must be processed

TABLE D-1: SAMPLING OF 214 APPLICATIONS BY SPECIALIZED

COMMON CARRIERS CONDUCTED MAY 1978 BY UI STAFF

Name of Applicant	Number of Applications	% of Total (N=183)	Locations N	umber of Cities Cited
MCI Telecommunic tions Corp.	a- 71	40%0%	OH,NY,IL, OK,NJ,MI, CT,CA, CO, MO,DE,GA, AZ,IN,MD	141
Western Union Telegraph Co.	21	11.5	IN,OH,AK,DC, GA,TX,NY,CA LA,IL,OR,WA	66
Data Transmissic Corporation	on 11	6.0	OH,IL,GA,MO, DE,PA,MA,MI	Not Shown
Southern Pacific Communications Corp.	9	5.0	MD,DE,OH,CA, CT,MA,NY,PA, GA,	Not Shown
Telenet Communications	44	24.0	MA,NY,NJ,CA,I VA,DC,TX,ME,V MN,OH,MO,MA,C	IL, Not Shown 7T, CO
Graphnet Inc.	3	. 5	Canada, Mexic and locations	co Various U.S. s in cities
USTS	17	9.0	U.S. NJ,MD,VA,PA,G NC,DC,NY	SA, 82
Microwave Comm. Inc.	7	4.0	IL,MO	Not Shown
TOTAL.	183	100 0%		

Source: UI Staff Sampling of Facilities Filings, Summer 1978

for each point-to-point geographic area. A simple count of filings might be misleading as far as actual number of projects--depending on how "project" is defined.

Another type of information which can be gleaned from these filings is which carriers are leasing, renting or purchasing facilities from other carriers rather than constructing their own. All requests (new constructions, purchases, etc.) gave probable costs; for example, maximum yearly rental which would be paid. Two requests were for special temporary authority; for example, satellite transmission of Madison Square Garden events to cable television. These requests took 20 and 21 days to process--slightly longer than the average. Of these 40 filings, all had been approved.

The remaining 11 filings concerned 63.01 of Part 63 which concerns the following types of changes: installation/extension of cable and carrier systems or rerouting of interstate channels. This is considered a major action--perhaps because environmental impact is a factor in approving these requests. Each file contained a "Telephone Wire Application" form and copies of the requests were sent to the Secretary of Defense and Governor of the state affected by the proposed change. The average processing time was 42.5 days--twice as long as for the other type of application.

The Western Union Telegraph Company applications were not studied in detail. However, a review of Part 63 indicates that in addition to requests for facilities extensions and supplements, Western Union must also submit an application to Facilities if it wishes to close or reduce hours at any its agencies or offices. Most of these sections of Part 63 will probably be deleted and/or simplified in some way by the deregulation. The changed procedures for this type of Facilities application could be used as a measurement of change in the amount of paperwork for both Western Union and the FCC.

In summary, direct observation gave the following information:

- The basic responsibilities of Facilities was as described in the early phase;
- 2. Operational aspects of Facilities were not verified or observed;
- 3. Types of information which could be developed from the files were: carrier's name; type of carrier; amount of activity; type of activity, being undertaken; type of transmission facilities; name of underlying carrier, if any; service locations by state; FCC processing time; and number of filings approved/disapproved;
- 4. Several new entities were added to the environment: the Defense Department, State Governments, and environmentalists.

2. TARIFF REVIEW

In April/May 1978, several interviews were conducted with Tariff Review staff. The basic operation of the Tariff Division was described in the early phase; however, these later interviews filled in a great deal of detail.

a. THE RULES REGARDING TARIFF

Part 61 of 47 CFR are the rules governing tariff. Many of the specific rules have to do with definitions and format. Section 61.38 concerns economic support data. Section 61.58 concerns notice requirements. Table D-2 shows the relationship of notice and petition periods.

b. TARIFF REVIEW OPERATIONS

In September 1976, to offset the time lag that developed as a filing was routed from the Secretary's Office (or the Mailroom) to the Tariff Review Section, the carriers were requested to provide courtesy copies to the Tariff Review Section at the same time they sent the original filing to the Secretary's office. Another reason for this request was that today, especially with the

TABLE D-2: NOTICE/PETITION PERIOD GUIDELINES AS SPECIFIED IN SEC. 61.38 OF 47 CFR

NOTICE PERIOD*	PETTTION PERTOD	TYPE APDI TCATTON					
NOTIOL IERIOD	I DITTION IERIOD	(III - CC - 1 D - to to)					
		(Unofficial Designation)					
15 days	petitions must be received	minor; unimportant					
	within 7 days	as far as rates					
70 days	petitions must be received	medium: e.g., new					
	within 15 days	equipment					
90 dave	notitions must be reacived	majort o g rato					
90 days	petitions must be received	major, e.g., race					
	within 25 days	change activity;					
		controversial					
* Tariff automatically b	ecomes effective on the schedul	led effective date if					
no action taken by the Commission to either suspend or reject the tariff							
filing. If a party does file a petition or objection, or if FCC staff has							
questions. FCC can order extension to 90 days. FCC not really locked into							
these time periods since Congress passed law that it could use its own							
liese time periods since congress passed iaw, that it could use its own							
discretion regarding 90-day notice period.							
Source: 47 CFR, Section 61.58; interview with CCB staff, August 1978.							

emergence of the specialized carriers (which will be discussed later in this paper) and existence of greater competition in the marketplace, the FCC-CCB Tariff Review Section receives many requests for information about who has submitted filings, what the filings apply for, etc., from the public.

A daily log of tariff courtesy copies received is kept. This log records which carriers filed and also a brief summary about each application. The courtesy copies, however, are not mandatory. Another official count is compiled in tabular form showing <u>only</u> the total number of tariffs received monthly. An analysis was done of all courtesy copy logs as of April 1978--almost 2,000. This was compared with the total official court. This showed that approximately 82 percent of carriers submit courtesy copies of filings. One FCC staff person suggested that the other 18 percent were probably minor filings by radio common carriers; but a later study of all official tariffs did not seem to bear this out. If the courtesy logs were used as a proxy of tariff activity, a greater effort would be needed to examine which types of carriers are not submitting courtesy copies. Or, the Agency could simply make courtesy copies mandatory. They are considering this anyway for the sake of efficiency.

Two checklist forms are used by the tariff review staff: one is for the tariff itself and the other is for the cost support material. (See Exhibits D-1 and D-2 below.)

The tariff checklist assists the reviewer in examining the tariff for format; the cost support checklist also assists in a review of format. Exhibit D-3 is a Commission description regarding background information about Section 61.38 on cost support requirements.

Each reviewer has the option to make recommendations about whether or not to consult the supervisor on a possible problem filing; e.g., a filing which may prompt a petition. The last section on the tariff review checklist asks about supervisory action. If there is a complaint or possible problem area, it may take one or two weeks for the tariff to be finally checked out by "higher-ups" in the Tariff Branch. As far as cost support sections of filings, analysis of cost support data are not written unless a problem exists. And even if a petition is received, usually the cost support analysis is verbally described to the attorney.

c. INFORMATION ABOUT REVIEWER'S TIME

Staff effort expended in the tariff review process is difficult to measure in "time." A staff member interviewed said that, even for an established

NO: 15

D-10 CARRIER: TRANS. DATE: 1.3/30/17%

TARIFF: # 2 CONTACT: Genus Gourig

Purpose: inchesical digs for lange users, vance und there 1. 2a. Associated Special Permission No: _ 2b. Confo 2b. Conformance: .-(61.151-61.153)

3. Items Reviewed:

a. Correct filing fee submitted? - 4 blank prices Issue and Effective Date (61.54, 61.58, 61.59) ь. Authority for less than statutory notice shown? (61.60-61.64, 61.66, 61.67) NA c. Notice to customers required? us 02 Provision made? Transmittal Letter (61.33) d. e. Cost support data required? (2) Received? Check Sheet (61.113) f. g. No. of copies (61.34) h. Copy supplied to duplicating contractor? i. Tariff format (61.37, 61.52-61.55, 61.112-61.115) j. Use of symbols (61.55, 61.71, 61.118) 1 k. Supplements (61.56, 61.116, 61.191 thru 61.193) 1. Adoption Notice and Supplements (61.171 thru 61.174) m. Other (list) Is the tariff reasonable, non-discriminatory? 4. 5. Is the tariff clear, legible, understandable? 6. Is the tariff consistent with other service offerings of this carrier? of other carriers? NE 7. Are there any known possible complications? (If explanation required for 4, 5, 6 or 7, use reverse side) Should an inter-office memo be prepared for information purposes? lit 3. AV. 9. Should a public notice be issued? 10. Recommendations of reviewer: accept

Supervisory action:

Reviewer: Date: 1/3//77

EXHIBIT D-1: SAMPLE OF TARIFF CHECKLIST FORMAT

CARRIER:

TRANSMITTAL	NO. 7346	TWX/Tel	Lex	DATE RECEIV	VED:	12-2-77	
TARIFF NO:	240/258	TARIFF:	NEW _		RECEI	[VED	<u>x</u>
DATE TARIFF	BECOME EFFECTIVE:			March 1.	1978		

Explanation and Data Supporting Changes and/or New Tariff Offering

		Para. 61.38	Cost Data
	Item	Reference	Reference
1.	An explanation of the changed or new matter		p. 1-2
2.	The reason for the filing	(a)(i)	<u>p. 2-8</u>
1			
3.	The basis of ratemaking employed		p. 8-17
4.	A cost of service study for all elements of cost		
	for the most recent 12-month period (changed		
	matter only)	(a)(2)(i)	<u>p. 49-68</u>
5.	A study containing a projection of cost for a		
	3-year period beginning at the date of the filing		
	of the tariff matter (changed and new matter)		
6.	3-year estimates of the effect of the new or		
	changed matter upon:		
	a) traffic and revenues from the service to		
	which changed matter applies		<u>p. 18-39</u>
	b) traffic and revenue from other services	(a)(2)(ii)	
	classification of the carrier		Att. D
	c) upon the overall traffic and revenue of the		
	carrier		Att. D
7.	Complete explanation of the basis for the		
	estimates		OK
8.	Four sets of working papers which support the		
	information in items 4 through 6	(b)(i)	OK
9.	Statistical Studies		
	(if provided)	(b)(2)	OK
10.	Form and content of material submitted with		
I	rate increase	(d)	ОК

Recommendation of Reviewer: Accept

61.38 of the Commission's Rules

Background:

61.38 was adopted by the Commission effective October 20, 1970 under Docket No. 18703.

The need for an amendment to Part 61 in terms of requiring more comprehensive material to be filed with tariffs had been recognized for some time. The above proceeding was instituted by the Commission on its own motion by a Notice of Proposed Rule Making released on October 17, 1969. The main purposes of this notice were:

1) to give greater notice to the public of tariff changes and 2) increase the efficiency of the Commission and its staff through the submission of more detailed data by the carriers whenever tariff changes were submitted to the Commission for filing. Many of the carriers had been providing only the minimum amount of information necessary to comply with the existing requirements of Section 61.33 and the staff was unable to make an resolution of the tariff filings without requiring extension additional information and data to support the filing.

It is the intent of the 61.38 rule reduce the number of tariff filings ordered for hearing. With better information available to the staff it is believed that many hearings might be avoided and the public interest better served. Even in tases when a hearing were ordered the availability of this information would shorten the time necessary for determining the lawfulness of a filing.

EXHIBIT D-3: EXPLANATION OF 61.38

carrier, to check the format of a new tariff may take half an hour or 45 minutes depending on the length of the tariff, in order to make sure they have all the pieces, proper notations, symbology, etc. Western Union's format is standardized and might take only five minutes to check. However, total review time of Western Union tariffs may run into hours because of the monopoly situation at present. A revised tariff on the other hand might take only 5 minutes. Parts which must be clear and which are checked carefully are: what service the carrier is offering and what are the obligations and liability of both carrier and customer. Time required for a reviewer to analyze cost data also varied. A detailed analysis of AT&T can take half a day--or a year. Others can be done in half an hour. Mathematics is usually not checked.

Another part of a reviewer's time is devoted to contact with the carriers themselves. Exact amount of time varies. With smaller carriers there may be a great deal of contact because the format of the tariff is checked before actual filing so that the filing does not have to be rejected and resubmitted because of a simple error. One tariff reviewer said that sometimes an entire day is spent assisting carriers and answering questions. A reviewer also engages in meetings with other FCC staff to discuss problem or disputed cases.

As the above description indicates, no records are kept of how reviewers' time is spent. Unless some mechanism for measurement of this is built into the evaluation design, the evaluators will be unable to determine changes in this area except through staff interviews. There is also no formal system for tracking the tariffs and cost support sections through the review process.

d. INFORMATION ABOUT THE CARRIERS FOUND IN TARIFF REVIEW

Following are several tables and plots which show the types of information which can be gathered from an analysis of tariffs.

CARRIER TYPE	PERCENTAGE OF TOTAL (N=1876)
Specialized Common Carriers International Record Carriers Domestic Satellite Carriers Western Union AT&T Other (includes, multipoint distribution, radio common carriers, maritime, micro- wave, RCA Alascom, Comsat, and independent telephone companies)	9% 30 7 10 26 18
	100%

Source: FCC:CBB Tariff Review Courtesy Logs: September 1976 through April 1978 (based on approximately 82% of total filings)

DATE				TARIFF	TYPE		0.1
		Private 1	ine	PMTS	Telex/TWX	Satellite	Other
				\sim			
Sept. 76		1		0	1	3	2
Oct.		2		1	2	1	3
Nov.		1		1	2	2 -	1
Dec.		1		0	2	2	1
Jan. 77		1		0	1	1	1
Feb.		0		1	3	0	1
Mar.		1		1	1	1	5
Ap ril		2		2	2	2	2
May		5		1	4	2	2
June		4		1	1	1	2
Ju1y		2		2	2	1	4
Aug.		2		6	1	4	3
Sept.		3		1	1	1	1
Oct.		2		0	1	1	2
Nov.		2		1	2	4	3
Dec.		0		3	5	2	1
Jan. 78		3		2	3	1	4
Feb.		2		2	3	1	2
Mar.		1		0	2	2	3
Apr.		3		0	1	2	2
Source:	Tariff	Courtesy	Logs	(Approximate	-lv 82% of	Total Tarif	f Filing

TABLE D-3: DISTRIBUTION OF TARIFF ACTIVITY BY TYPE OF CARRIER

TABLE D-4: WESTERN UNION TARIFF ACTIVITY FROM SEPTEMBER 1976 THROUGH APRIL 1978





FIGURE D-4: PERCENTAGE OF TOTAL FILINGS FOR EACH CARRIER TYPE (BASED ON APPROXIMATELY 82% OF OFFICIAL FILINGS)





e. ANALYSIS OF OFFICIAL TARIFFS

Next, a review was made of all tariffs on file and all cost support material for the specialized common carriers. Figure D-7 shows the number and types of common carriers regulated by the Agency. The established carriers, such as Western Union, usually have a separate tariff for each type of service category. The tariffs are numbered sequentially for each carrier. So, in locating a tariff, one must know the carrier, the tariff number, and title of the tariff. We have compiled indexes of the tariffs by carrier type.

We divided the specific information that we wanted into two categories: service and financial. Carriers selected for further investigation were: Western Union and the specialized common carriers (SCCs). The reason for this was that initially the Tariff staff had made the statement that the specialized carriers were the most likely entrants into the PMS markets. And, the review of all tariffs supported their theory. The specialized carriers were the only types--besides Western Union and AT&T--which offered a range of services which could be generally described as intercity communications channels of various bandwidths, types and data speeds designed to provide transmission of voice, data, and/or facsimile and other special/type, dedicated services.

Types of information found in the tariffs include: carriers' names; other carriers participating in the tariff; types of services--classes and subclasses of service when appropriate; rates; and points of service. The detail and comprehensibility of this information varies from tariff to tariff. In short, service and operation and rate information can be found in the tariffs, but it is difficult to work with. As long as a carrier conforms to certain basic requirements in format, it can use its own methods and terminology in writing the tariff. They don't all provide the same services-and the range of services is almost unlimited since the specialized carriers

Monopoly/Established Carriers: (AT&T, Western Union and Comsat)	3	
O markitizer O multimere		
Competitive Carriers:	2	
Domestic Satellite	9	
Multiple Distribution Service	12	
Microwave	70	
Mobile Radio Common Carriers	383*	
Maritime or Coastal Harbor Services	90	
Telephone Companies:		
Miscellaneous	4	
(All American Cable & Radio: Cuban	-	
American Telephone & Telegraph. ITT		
Virgin Island: United States Liberia)		
CATV Independents	10	
Mide Spectrum	24	
Wide Spectrum	54	
Independent Telephone Companies	28	
Bell Associated Companies	25	
CATV Bell Associated	3	
Hawaiian:	2	
(Western Union of Hawaii and Hawaiian Telephone)		
A lockers	1	
(RCA Alascom)	T	
International Record Carriers:	5	
Caradaliani Mismanana Compionas	7	
Specialized Microwave Carriers:	/	
(MCI, III-CCS, Transportation Microwave,		
U.S. Transmission Systems, Goeken, South- ern Pacific, and Western Telecommunications)		
Createlized Demostic Catellites	4	
Specialized Domestic Satellite:	4	
(RCA Americom, Southern Satellite Systems,		
Satellite Business Systems, and American		
Satellite)		
Other Specialized Carriers:	3	
(Graphnet, Telenet, and Tymnet)		
TOTAL	725	
NOTE: Although there are 383 tariffs on file most of	these radio carriers	
are NOT interstate and according to current law do not	have to have a	
tariff on file. I assume that only approximately 20 or	30 of these tariffe	
are required and have had actual tariff activity during	the last couple	
of years. So, this would dreatically change the sourt of	, the fast couple	
725 - (353) = 372 Common Carriers the are required to (die Terdff	
Source: Review of ALL CCR Toriff Filing of ALL	1070 Gent with the F	
bource. Review of ALL COD faring filings as of August	1978 Conducted by UI S	taff.

FIGURE D-7: COUNT OF COMMON CARRIERS--AS OF AUGUST 1978
offer custom private line services which include services from unique customeroriented combinations of voice/data/facsimile transmission to special construction of transmission systems to providing telephone equipment.

Tariff sections describing "same" services, however, are somewhat more standardized. For example, Figure D-8 shows tables comparing MCI Communications Corporation rates for its Faxnet Service and Southern Pacific Communications Corporation FAX Data rates. Both are facsimile services. Now, other common carriers offer it on a subscriber basis to their customers. This information on rates, however, was not in tabular form in the tariffs. The terminal types were in one section; the class/delivery types in another section; and the actual rates in another. In other words, the tariffs are not easily worked with. And, for now at least, there is no guarantee that all information sought will be found in them in every case. Before describing other sources of information that we investigated after reviewing the tariffs, we will mention findings regarding a review of the tariff of Graphnet Systems, Inc., a specialized common carrier.

Graphnet only offers one service--facsimile. Graphnet's network configuration, service classifications, refund and liability policy, billing methods and rates were covered in an Urban Institute draft memorandum which detailed the information found in Graphnet's tariff.

With FCC permission, Graphnet's Washington representative was contacted and copies of the memorandum were submitted to him for verification. Subsequently, a meeting was held attended by Urban Institute, ETIP and Graphnet staff On the whole, the tariff information was accurate, but it did not seem to give a complete picture of Graphnet. For example, missing information included financial information, customer types, the fact that Graphnet manufactures specialized hardware devices and advertises itself as a universal service

D-21

D	2	2
U-	<u>ک</u>	4

			<u>F/</u>	XNET-MCI RA	TES (entr	y or exit)	•
		Ch	Daytime	Page	Cha	Nightime	100
Class:		1	2	3	1	2	3
Delivery	:	15 min.	2 hours	Overnight	15 min.	2 hours	Overnight
We want a s 1 f							
Terminal'	•	¢ 40	\$ 22	e 24	e 20	\$ 22	č 17
R		3.40	2• 32 32	2. 24 24	9•40 28	ə• 44 22	Ş•⊥/ 17
C		. 30	• 34	- 18	- 20	. 17	-13
n		. 20	. 16	. 12	. 1.4	. 11	.07
D		• 20	• 10	* 1 4	. 14	• • • •	•07
Mont	thly acce	es charge	\$10 Re	ental for Fax	Terminal:	\$42/mon	th
*Authoria A B C	ed Fax 1 carrier custome custome	Cerminal 1 provided provide provide	Cypes: 1 analog fa 2d analog f 2d analog f	ax terminal) fax terminal fax terminal	page/4 mi 1 page/4 m 1 page/3 m	inutes minutes minutes	
D	custome	er-provide	ed analog i	fax terminal	1 page/2 m	ninutes	
FAXNET FO	ORWARDING	SERVICE					
Class 4:	U.S. Ma surchar	iil (regul ge where	ar or spec permissibl	cial delivery Le); postage	≥/\$1.00/\$.	10 per page
Class 5:	Pickup where p	by subsci ermissibl	iber, add: le	ressee or age	en4; \$1.00,	/\$.10 per 1	page surcharge
FAXNET FO	ORWARDING	FACILITI	LES LOCATE	D IN:			
Los Angel	Les, Chic	ago, New	York, Clev	veland, Phila	adelphia, I	Dallas and	Houston
			SPCC F	AX DATA RATES	(entry d	or exit)	
		Cł	Daytim narge Per 1	e Page	Cha	Nightime arge Per Pa	1ge
Class:		Cł	Daytim narge Per 1 2	e Page3	Cha	Nightime arge Per Pa 2	age3
Class: Delivery:	:	Ch 1 15 min.	Daytime harge Per 1 2 2 hours	e Page 3 Overnight	Cha 1 15 min.	Nightime arge Per Pa 2 2 hours	age 3 Overnight
Class: Delivery:	:	Cr 1 15 min.	Daytim harge Per 1 2 2 hours	e Page 3 Overnight	Cha 1 15 min.	Nightime arge Per Pa 2 2 hours	age 3 Overnight
Class: Delivery: Terminal	: **	Cr 1 15 min.	Daytim harge Per 1 2 2 hours	e Page 3 Overnight	Cha 1 15 min.	Nightime arge Per Pa 2 2 hours	age 3 Overnight
Class: Delivery: Terminal: I	:	<u>Ct</u> 1 15 min. \$.50	Daytimo harge Per 1 2 2 hours \$.40	e Page 3 Overnight \$-30	<u>Cha</u> 1 15 min. \$.32	Nightime arge Per P: 2 2 hours \$-24 2'	age 3 Overnight \$.20
Class: Delivery: Terminal: I II	: : **	<u>Ct</u> 1 15 min. \$.50 .50	Daytimo harge Per 1 2 2 hours \$.40 .40	e Page 3 Overnight \$.30 .30	<u>Cha</u> 1 15 min. \$.32 .32	Nightime arge Per P: 2 2 hours \$.24 .24	age 3 Overnight \$.20 .20
Class: Delivery: Terminal: I II III	: : ##	Ch 1 15 min. \$.50 .50 .375	Daytim harge Per 1 2 2 hours \$.40 .40 .30	e Page 3 Overnight \$-30 -30 -225	Cha 1 15 min. \$.32 .32 .24	Nightime arge Per P: 2 2 hours \$.24 .24 .18	age 3 Overnight \$.20 .20 .15
Class: Delivery: Terminal: I II III IV	2 1. ф.ф.	Ct 1 15 min. \$.50 .50 .375 .25	Daytim harge Per 1 2 2 hours \$.40 .40 .30 .20	e Page 3 Overnight \$- 30 - 30 - 225 - 15	Cha 1 15 min. \$.32 .32 .24 .16	Nightime arge Per P: 2 2 hours \$.24 .24 .18 .12	age 3 Overnight \$.20 .20 .15 .10
Class: Delivery: Terminal: I II III IV V	5 : ##	Ct 1 15 min. \$.50 .50 .375 .25 .125 .125	Daytim <u>arge Per 1</u> 2 2 hours \$.40 .40 .30 .20 .10	e Page 3 Overnight \$.30 .30 .225 .15 .075	Cha 1 15 min. \$.32 .32 .24 .16 .08	Nightime arge Per P: 2 2 hours \$.24 .24 .18 .12 .06	age 3 Overnight \$.20 .20 .15 .10 .05
Class: Delivery: Terminal: I II III IV V VI***	5 ; ##	Ct 1 15 min. \$.50 .50 .375 .25 .125 .125	Daytim <u>arge Per 1</u> 2 2 hours \$.40 .40 .30 .20 .10 .10	e Page 3 Overnight \$.30 .30 .225 .15 .075 .075	Cha 1 15 min. \$.32 .32 .24 .16 .08 .08	Nightime arge Per P: 2 2 hours \$.24 .24 .18 .12 .06 .06	age 3 Overnight \$.20 .20 .15 .10 .05 .05
Class: Delivery: Terminal: I II III IV V VI*** Monthly o	: :** Charges:	Ct 1 15 min. \$.50 .50 .375 .25 .125 .125 Analog \$	Daytim <u>harge Per 1</u> 2 2 hours \$.40 .40 .30 .20 .10 .10 \$49/Digital	e Page 3 Overnight \$- 30 . 30 . 225 . 15 . 075 . 075 1 \$600	Cha 1 15 min. \$.32 .32 .24 .16 .08 .08	Nightime arge Per P: 2 2 hours \$.24 .24 .18 .12 .06 .06	age 3 Overnight 20 .15 .10 .05 .05
Class: Delivery: Terminal: I II III IV V VI*** Monthly o	: :** charges:	Ct 1 15 min. \$.50 .50 .375 .25 .125 .125 .125 Analog \$	Daytim <u>harge Per 1</u> 2 2 hours \$.40 .40 .30 .20 .10 .10 \$49/Digital	e Page 3 Overnight \$.30 .30 .225 .15 .075 .075 1 \$600	Cha 1 15 min. \$.32 .32 .24 .16 .08 .08	Nightime arge Per P. 2 2 hours \$.24 .24 .18 .12 .06 .06	age 3 Overnight \$.20 .20 .15 .10 .05 .05
Class: Delivery: Terminal: I II III IV V VI*** Monthly o	: :** charges: zed Fax	Cr 1 15 min. \$.50 .50 .375 .25 .125 .125 Analog \$ Terminal	Daytim <u>harge Per 1</u> 2 2 hours \$.40 .40 .30 .20 .10 .10 \$49/Digital	e Page 3 Overnight \$.30 .225 .15 .075 .075 1 \$600	Cha 1 15 min. \$.32 .32 .24 .16 .08 .08	Nightime arge Per P: 2 2 hours \$.24 .24 .18 .12 .06 .06	age 3 Overnight 20 .15 .10 .05 .05
Class: Delivery: Terminal: I II III IV V VI*** Monthly of **Authori I carr	: :** charges: zed Fax ier-prov	Ct 1 15 min. \$.50 .50 .375 .25 .125 .125 Analog \$ Terminal ided anal	Daytim <u>harge Per 1</u> 2 2 hours \$.40 .40 .30 .20 .10 .10 \$49/Digital Types: og 1 page/	e Page 3 Overnight \$- 30 . 30 . 225 . 15 . 075 . 075 1 \$600	Cha 1 15 min. \$.32 .32 .24 .16 .08 .08	Nightime arge Per P: 2 2 hours \$.24 .24 .18 .12 .06 .06	age 3 Overnight 20 .15 .10 .05 .05
Class: Delivery: Terminal: I II IV V VI*** Monthly of **Authori I carr	: :** charges: zed Fax ier-prov: omer-prov	Ct 1 15 min. \$.50 .50 .375 .25 .125 .125 Analog \$ Terminal ided anal	Daytim <u>harge Per 1</u> 2 2 hours \$.40 .40 .30 .20 .10 .10 \$49/Digita: Types: og 1 page/ log 1 page/	e Page 3 Overnight \$-30 .30 .225 .15 .075 .075 1 \$600 4 minutes //4 minutes	<u> </u>	Nightime arge Per P: 2 2 hours \$.24 .24 .18 .12 .06 .06	age 3 Overnight \$.20 .20 .15 .10 .05 .05
Class: Delivery: Terminal: I II IV V VI*** Monthly o **Authori I carr II cust	: :** charges: zed Fax fer-prov omer-pro omer-pro	l 1 15 min. \$.50 .50 .375 .25 .125 .125 Analog S Terminal ided anal vided ana	Daytim harge Per 1 2 2 hours \$.40 .40 .30 .20 .10 .10 \$49/Digital Types: og l page/ log l page/ log l page/	e Page 3 Overnight \$.30 .225 .15 .075 .075 1 \$600 4 minutes /4 minutes /4 minutes	<u>Cha</u> 1 15 min. \$-32 .24 .16 .08 .08	Nightime arge Per P: 2 2 hours \$.24 .18 .12 .06 .06	age 3 Overnight \$.20 .20 .15 .10 .05 .05
Class: Delivery: Terminal: I II IV V VI*** Monthly o **Authori I carr II cust IV cust	: :** charges: zed Fax ier-prov omer-pro omer-pro	l 1 15 min. \$.50 .50 .375 .25 .125 .125 Analog S Terminal ided anal vided ana	Daytim harge Per 1 2 2 hours \$.40 .40 .30 .20 .10 .10 .49/Digital Types: og I page/ log I page/ log I page log I page	e Page 3 Overnight \$.30 .225 .15 .075 .075 1 \$600 4 minutes /4 minutes /3 minutes /2 minutes	Cha 1 15 min. \$.32 .32 .24 .16 .08 .08	Nightime arge Per P: 2 2 hours \$.24 .24 .18 .12 .06 .06	age 3 Overnight \$.20 .20 .15 .10 .05 .05
Class: Delivery: Terminal: I II IV V VI*** Monthly o **Authori I carr II cust III cust IV cust V cust	: ** zed Fax ier-prov omer-pro omer-pro omer-pro	l 1 15 min. \$.50 .50 .375 .25 .125 .125 Analog S Terminal ided anal vided ana vided ana vided ana	Daytim harge Per 1 2 2 hours \$.40 .40 .30 .20 .10 .10 \$49/Digital Types: og 1 page/ log 1 page log 1 page log 1 page	e Page 3 Overnight \$.30 .225 .15 .075 .075 1 \$600 4 minutes /4 minutes /3 minutes /2 minutes	Cha 1 15 min. \$.32 .32 .24 .16 .08 .08	Nightime arge Per P: 2 2 hours \$.24 .18 .12 .06 .06	age 3 Overnight \$.20 .20 .15 .10 .05 .05
Class: Delivery: Terminal: I II II V V VI*** Monthly o **Authori I carr II cust III cust IV cust V cust VI carr	: ** zed Fax ier-prov omer-pro omer-pro omer-pro omer-pro	l 15 min. \$.50 .50 .375 .25 .125 .125 Analog \$ Terminal ided anal vided ana vided ana vided ana vided ana vided ana	Daytim harge Per 1 2 2 hours \$.40 .40 .30 .20 .10 .10 \$49/Digital Types: og 1 page/ log 1 page log 1 page log 1 page tal 1 page	e Page 3 Overnight \$.30 .225 .15 .075 .075 1 \$600 4 minutes /4 minutes /2 minutes e/1 minute	Cha 1 15 min. \$.32 .32 .24 .16 .08 .08	Nightime arge Per P: 2 2 hours \$.24 .24 .18 .12 .06 .06	age 3 Overnight \$.20 .20 .15 .10 .05 .05
Class: Delivery: Terminal: I II IV V VI*** Monthly o **Authori I carr II cust III cust IV cust V cust V cust VI carr	: ** zed Fax ier-prov omer-pro omer-pro omer-pro ier-prov 6000 pag	l 15 min. \$.50 .50 .375 .25 .125 .125 Analog S Terminal ided anal vided ana vided ana vided ana vided dig ided digi ided digi	Daytim harge Per 1 2 2 hours \$.40 .40 .30 .20 .10 .10 \$49/Digital Types: og 1 page/ log 1 page log 1 page ital 1 page tal 1 page	e Page 3 Overnight \$.30 .225 .15 .075 .075 1 \$600 4 minutes /4 minutes /3 minutes /2 minutes /2 minutes /2 minutes	Cha 1 15 min. \$.32 .32 .24 .16 .08 .08	Nightime arge Per P. 2 2 hours \$.24 .24 .18 .12 .06 .06	age 3 Overnight \$.20 .20 .15 .10 .05 .05
Class: Delivery: Terminal: I II IV V VI*** Monthly of **Authori I carr II cust III cust V cust V cust VI carr **First	: ** charges: zed Fax ler-prov omer-prov omer-prov omer-prov for-prov 6000 pag FORWARD	l 1 15 min. \$.50 .50 .375 .25 .125 .125 Analog S Terminal ided anal vided ana vided an	Daytim large Per 1 2 2 hours \$.40 .40 .30 .20 .10 .10 \$49/Digital Types: og 1 page/ log 1 page/ log 1 page/ log 1 page log 1 page/ log 1 page/	e Page 3 Overnight \$- 30 . 225 . 15 . 075 . 075 1 \$600 4 minutes /4 minutes /4 minutes /2 minutes /2 minutes /1 minute	<u> 1</u> 15 min. \$.32 .24 .16 .08 .08	Nightime arge Per P: 2 2 hours \$.24 .18 .12 .06 .06	age 3 Overnight \$.20 .15 .10 .05 .05
Class: Delivery: Terminal: I II IV V VI*** Monthly of **Authori I carr II cust III cust V cust V cust VI carr **First FAX DATA	: :** charges: zed Fax ier-prov omer-prov omer-prov omer-prov 6000 pag FORWARD	Ct 1 15 min. \$.50 .50 .375 .25 .125 .125 Analog S Terminal ided anal vided anal vided anal vided anal vided anal vided dig ided digi ies per te ING SERVI	Daytim harge Per 1 2 2 hours \$.40 .40 .30 .20 .10 .10 \$49/Digital Types: og 1 page/ log 1 page/ log 1 page log 1 page ital 1 pag tal 1 page minal CE:	e Page 3 Overnight \$.30 .225 .15 .075 .075 1 \$600 4 minutes /4 minutes /2 minutes /2 minutes /2 minutes	Cha 1 15 min. \$.32 .24 .16 .08 .08	Nightime arge Per P: 2 2 hours \$.24 .18 .12 .06 .06	age 3 Overnight \$.20 .15 .10 .05 .05
Class: Delivery: Terminal: I II IV V VI*** Monthly of **Authori I carr II cust III cust V cust VI carr **First FAX DATA Class D:	: :** charges: zed Fax ier-prov omer-prov omer-prov omer-prov 6000 pag <u>FORWARD</u> United postag	Ct 1 15 min. \$.50 .50 .375 .25 .125 .125 Analog S Terminal ided anal vided anal vided anal vided anal vided anal vided digi ided digi ided digi Esper te ING SERVI States P e/\$1.00/\$	Daytim harge Per 1 2 2 hours \$.40 .40 .20 .10 .10 \$49/Digital Types: og 1 page/ log 1 page/ log 1 page/ log 1 page ital 1 pag tal 1 pag tal 1 page cE: ost Office	e Page 3 Overnight \$-30 .225 .15 .075 .075 1 \$600 4 minutes /4 minutes /2 minutes /2 minutes /2 minutes /1 minute	Cha 1 15 min. \$.32 .24 .16 .08 .08 .08	Nightime arge Per P: 2 2 hours \$.24 .18 .12 .06 .06	age 3 Overnight \$.20 .15 .10 .05 .05
Class: Delivery: Terminal: I II IV V VI*** Monthly o **Authori I carr II cust II cust II cust V cust VI carr **First <u>FAX DATA</u> Class D: Class E:	: :** charges: zed Fax ier-prov. omer-prov omer-prov omer-prov for-prov 6000 pag FORWARD United postag pickup surcha	Ct 1 15 min. \$.50 .50 .375 .25 .125 .125 Analog S Terminal ided anal vided ana vided sana vided ana vided	Daytim harge Per 1 2 2 hours \$.40 .40 .30 .20 .10 .10 .49/Digital Types: og page/ log page/	e Page 3 Overnight \$.30 .225 .15 .075 .075 1 \$600 4 minutes /4 minutes /4 minutes /2 minutes /2 minutes /1 minute e (regular or age surcharge ess, or agent	Cha 1 15 min. \$.32 .24 .16 .08 .08 .08 special d where per ; \$1.00/\$.	Nightime arge Per P. 2 2 hours \$.24 .18 .12 .06 .06 .06 .06 .06 .10 .10 .10 .10 .10 .10 .10 .10	age 3 Overnight \$.20 .15 .10 .05 .05
Class: Delivery: Terminal: I II IV V VI*** Monthly of **Authori I carr II cust II cust III cust V cust VI carr **First <u>FAX DATA</u> Class D: Class E: Surcharg	: :** charges: zed Fax ier-prov. omer-pro: omer-pro: omer-prov for-prov 6000 pag FORWARD United postag pickup surcha ge for de	l 1 15 min. \$.50 .50 .375 .25 .125 .125 Analog S Terminal ided anal vided ana vided ana vided ana vided ana vided ana vided digi ided digi es per te ING SERVI States P e/\$1.00/\$ by custo rge where livery to	Daytim Parge Per 1 2 2 hours \$.40 .40 .30 .20 .10 .10 .49/Digital Types: og page/ log page/	e Page 3 Overnight \$.30 .225 .15 .075 .075 1 \$600 4 minutes /4 minutes /4 minutes /2 minutes /2 minutes /1 minute e(regular or age surcharge ess, or agent ble terminal	Cha 1 15 min. \$.32 .24 .16 .08 .08 .08 .08 .08 .08 .08 .08	Nightime arge Per Par 2 2 hours \$.24 .18 .12 .06 .06 .06 .06 .06 .06 .06 .06	age 3 Overnight \$.20 .15 .10 .05 .05

COMPARISON BETWEEN MCI FAXNET AND SOUTHERN PACIFIC FAX DATA SERVICES capable of interface with any equipment by means of equipment interface packages it develops.

3. OTHER SOURCES BESIDES TARIFF AND FACILITIES

Within the FCC, the Economic Studies Branch of the Commission was contacted to establish the types of information they might have available. The information on the established carriers such as Western Union is very complete; however, the SCC information is sketchy. "The Statistics of Common Carriers" is a publication of the Economics Group. It has a great deal of valuable financial information; however, the lastest published data is two years old. The UI has recently obtained copies of the FCC's computer print-out sheets with compilations of unpublished 1977 financial information. Figure D-9 shows the types of information shown in these reports. UI staff have begun compiling a notebook of information on each specialized common carrier.

C. INFORMATION SOURCES OUTSIDE OF CCB

It seemed obvious that a major source of information about the carriers were the carriers themselves. In early September 1978, a mailing was sent to approximately 10 of the remaining 14 specialized carriers besides Graphnet. As of November 1978, approximately half had responded, expressed interest in our study, and sent information including public relations material, network descriptions, rate information, and press releases.

Another source of information about the specialized common carriers was discovered by reading a newsletter known as <u>Telecommunications Reports</u>. This publication reports on all events in the common carriers industry, including contracts, mergers, investments, financial reports, court cases, and Congressional/Federal/State and Agency activity as well as conventions,

D-23

GENERAL TABLES -- TELEPHONE AND TELEGRAPH PART 1.

- Selected Data of Telephone and Telegraphy Carriers Reporting to the Commission for the Year Ended December 31, 1977
- 2. Tax Accruals and Excise Taxes Collected From Users of Commication Service as Reported by Telephone and Telegraph Carriers

TELEPHONE CARRIERS

- 3. List of Telephone Carriers Reporting to the Commission for the Year Ended December 31, 1977, whose reports were used in the Statistical Tabulations
- Averages and Ratios Computed from Selected Data Submitted by Telephone Carriers
 Number of Telephones in the United States as of the Close of the Year, 1882-1977
- 6. Telephone Development by States
- 7. Telephone Development in Large Exchange Areas in the United States
- 8. Selected Data Shown by States or other Areas, of Telephone Carriers Reporting Annually to the Commission
- 9. Selected Data Showing Development Through the Years 1944-1977, Inclusive, of Telephone Carriers Filing Annual Reports with the Commission Employees of Telephone Carriers Reporting Annually to the Commission Classified by Occupational Groups, and Their Average Basic Hourly Rates of Pay as of December 31, 1977
- 11. Local Service Revenues, Toll Service Revenues and Total Operating Revenues from January 1968 to December 1977, Inclusive, of Telephone Carriers Reporting Monthly
- Communication Plant of Telephone Carriers Reporting Annually To The Commission
 Overseas and Marine Communications Services Furnished by Telephone Carriers Reporting Annually to the Commission
- 14. Revenues from Overseas Communications Services Reported by Telephone Carriers for the Years 1951 to 1977, Inclusive 15. Analysis of Overseas Telephone Traffic by Country or Point AT&T
- 16. Statistics of Telephone Carriers Reporting Annually to the Commission, as of December 31, 1977, and for the Year Then Ended 17. Statistics of Selected Large Telephone Carriers Not Subject to the Reporting Requirements of the Commission, as of December 31, 1977, and fot the Year Then Ended
- 18. Capitalization Ratios for Reporting Telephone Carriers
- Interest Coverage Ratios for Reporting Telephone Carriers
 Rate of Keturn on Utility Rate Base for Reporting Telephone Carriers

PART 3. DOMESTIC AND OVERSEAS TELEGRAPH CARRIERS

- 21. List of Domestic and Overseas Telegraph Carriers Reporting to the Commission for the Year Ended December 31, 1977, Whose Reports Were Used in the Statistical Tabulations
- 22. Averages and Ratios Computed from Selected Data Submitted by Domestic and Overseas Telegraph Carriers 23. Selected Data Showing Development Through the Years 1942-1977, Inclusive, of Principal Domestic and Overseas Telegraph Carriers Filing Annual Reports with the Commission
- 24. Message Revenues of Domestic and Overseas Telegraph Carriers Shown According to Class of Message 25. Revenues from Overseas Communications Services Reported by Telegraph Carriers for the Years 1958 to 1977, Inclusive
- 26. Analysis of Overseas Message Telegraph Traffic by Country or Point
- 27. Analysis of Overseas Telex Traffic by Country or Point
- 28. Employees of Western Union Telegraph Company Classified by Occupational Groups, and Their Average Basic Hourly Rates of Pay as of October 31, 1977 29. Employees of Principal Overseas Telegraph Carriers Classified by Occupational Groups, and Their Average Basic Hourly Rates of Pay
- as of October 31, 1977 30. Monthly Revenues from January 1963 to December 1977, Inclusive, of Overseas Telegraph Carriers
- 31. Indexes of Various Classes of Domestic Record Communications
- 32. Communication Plant of Western Union Telegraph Company 33. Communication Plant of Overseas Telegraph Carriers
- 34. Statistics of Domestic and Overseas Telegraph Carriers Reporting Annually to the Commission, as of December 31, 1977, and for the Year Then Ended

- Rates for Long Distance Message Telecommunications Service -- United States Mainland Alaska Rates for Long Distance Message Telecommunications Service -- United States Mainland Alaska Rates for Long Distance Message Telecommunications Service -- United States Mainland Hawaii Rates for Long Distance Message Telecommunications Service -- United States Mainland Canada Rates for Long Distance Message Telecommunications Service -- United States Mainland Mawaii Rates for Long Distance Message Telecommunications Service -- United States Mainland Mexico Rates for Long Distance Message Telecommunications Service -- United States Mainland Mexico Rates for Long Distance Message Telecommunications Service -- United States Overseas

- Year Then Ended 35. Rates for Interstate Long Distance Telecommunications Service -- United States Mainland 36. Rates for Long Distance Message Telecommunications Service -- United States Mainland J 37. Rates for Long Distance Message Telecommunications Service -- United States Mainland D 38. Rates for Long Distance Message Telecommunications Service -- United States Mainland D 39. Rates for Long Distance Message Telecommunications Service -- United States Mainland D 40. Rates for Long Distance Message Telecommunications Service -- United States Overseas 41. Rates for Public Message Telegram Service for United States Mainland and United States I Minuelon Leinging and Mordes Rates for Public Message Telegram Service for United States Mainland and United States Mainland - Alaska, Canada, Saint Pierre -
- Miquelon Islands, and Mexico
- 42. 43. 44. 45. 46. Usage Rates for Intra - United States Telex Service Usage Rates for United States - Alaska Telex service Usage Rates for United States - Mexico Telex Service
- Rates for International Overseas Telex Service from the United States Rates for Overseas Message Telegraph Service from the United States
- Rates for Intra United States Teletypewriter Exchange Service
- 48. 49. Rates for Money Order Service for Intra - United States, United States - Alaska and United States - Hawaii
- Rates for Intra United States, United States Alaska and United States Hawaii Mailgram Service Filed by Telephone, by Tie Line or Over the Counter

PART 5. COMMUNICATIONS SATELLITE CORPORATION

- 0. Balance Sheets of Communications Satellite Corporation on December 31, 1977 and 1976
- 1. Income Statements of Communications Satellite Corporation for the Years Ended December 31, 1977 and 1976 52. Selected Facility and Usage Data of Communications Satellite Corporation

PART 6. HOLDING COMPANIES AND INTERCORPORATE RELATIONS

53. Intercorporate Relations of Communications Carriers and Controlling Companies, December 31, 1977 54. Changes Affecting Coverage of Table 53

Source: FCC Statistics of Common Carriers: computer print out sheets of unpublished data for 1977 obtained by UI Staff 9/78.

FIGURE .D-9: CONTENTS OF STATISTICS OF COMMON CARRIERS

educational courses, research reports, and new publications. One new publication mentioned in the <u>Reports</u> specifically concerned the specialized common carriers and is published by a group known as the Ad Hoc Committee on Competitive Telecommunications. A telephone call to that group confirmed that they were lobbyists representing the specialized carriers and the newsletter was specifically geared to equipment manufacturers to give them economic information about the specialized common carriers.

Another source of information is the Securities Exchange Commission. A few of the carriers, like Telenet, have prospectuses on file which are very complete and contain information in a very readable and usable form. Information that is sometimes found in a prospectus includes history of services, competitors, equipment manufacturers and computer companies dealt with by the company, and future plans. Many of the specialized carriers are subsidiaries of other companies and, sometimes the controlling company will have information on file. The carrier in this case, however, is only described as a part of the whole.

D. SUMMARY

In summary, direct observation gave the following information:

- 1. The responsibilities of Tariff were described in the early phase.
- 2. The basic operation of Tariff was as described in the early phase.
- 3. Hard measurement data on changes in FCC staff time and time to process tariffs might be difficult to obtain. Information requirements about new companies entering the PMS market (and any control group used) could be met--most easily by establishing contact with the carriers themselves.
- 4. The types of carriers in the environment, by type and name, have been identified. New entries in the environment include: employees (unions), equipment manufacturers, computer companies, lobbyists, investors, and the Securities Exchange Commission (SEC).

D-25



APPENDIX E: POTENTIAL USES OF INFORMATION AND POTENTIAL MEASURABLE ISSUES

Developed by

Steven Watson James Bell Sharon Kirby Paul Nalley Roland Weiss



	Page
CONTENTS	E-1
HOW TO USE THE TABLES	E-1
 Sponsors's Issues Participants' Issues Gateway Inquiry Issues Telex/TWX Rate Case Issues WATS/MTS Inquiry Issues Computer Inquiry 	E-2 E-8 E-11 E-12 E-13 E-14
 Graphnet and Telenet - Domestic Carriers Applying for Authorization to Enter International Market Testimony of Witnesses at HR 13015 Hearings, August 1978 	E-14 E-18

HOW TO USE THE TABLES

Specific questions that concern sponsors, participants and onlookers have been identified, and are listed on the following tables. The far right column contains our best current understanding of potential use of measurement data. Moving across the table, the middle columns include notations about where to pursue measurement data. Potential measurable issues related to possible uses of data are on the left. The far right columns identify the source documents used to gather this information. See Chapter VI of the report for an example of how these tables illustrate the way information gained from the evaluation might be used. These tables and the numerous possibilities for measurement they represent also point out the need for decisions about what to measure. There are more possible measurements than can be tracked within the resources of the evaluation. It should be noted, however, that these decisions are also dependent on actual effects of the deregulation. SPONSOR'S ISSUES

SOURCE	POTENTLAL MEASURABLE ISSUES	DOMAIN(S) ARE TA	WHERE REAL WORLD ACTIV IRCETED FOR MEASUREMENT DEVELOPMENT	SBILI	POTENTIAL USES OF MEASUREMENT DATA
Document		PCC/CCB PMTS Regulatory Operation: (Rule, Stendard Definition, Pro- codure, Procees)	PHTS Industry- Market-Place (Cartisrs, Con- sumers, Equipment Suppliers)	Per <u>tpheral</u> Market- Places/Industries	
A. FCC/CCB A. FCC/CCB Notice of Lnquiry: Western Union	 Are alternative services currently available that meet "public need" for PMTS services? 		PMTS customer PMTS customer for PMTS-11ke services	Availability of PMTS-like services in non- PMTS domestic market-places	To define standarde for public need viz PMTS
Monopoly	 Are subsidies required to keep provision of PMTS services economically viable? 		Profit and rate-of- return to carriers who provide PMTS services		To define procedures for determining rate of return in PMTS
	3. If required, are "direct" or "cross" subsidies beat for PMTS?				To define tradeoffa between employing direct and cross subsidies for PMTS
	4. If required, what should be the immediate and future source of subsidies for PHTS?				To define perferred subsidy funding sources for PHTS immedistely and future
	 What different regulatory standerds and procedures should be established for PMTS? 	Drafted changea In regulatory standards and procedures	Industry market- place participant reactions to FCC PMTS deregulation initiatives		To define "different" set of regulations for PMTS, other common carrier industry market-place
	6. What different regulatory standards and procedures should be established for private record services?				To define "different" set of regulations for PMTS, other common cartier industry market-place
	 Should Western Union be relieved of regulatory requirements associated apecifically with PMTS? 	Drafted changes In regulatory standards and procedures	Western Union reaction of NOI for PMTS		To define set of lessened regulatory requirements for Western Union as "former monopoly carrier"
	 How should rules governing dis- continuance, impairment and modification of services be adjusted in light of deregulaton of Western Unions PMTS offering? 	brafted changes in Part 63 of FCC rules and regula- utions	carrier reaction to change Part 63 requirements		To define set of minimum Part 63 regulatory requirement for PMTS
	 How many of Vestern Union's 5,000 offices/agencues are r required? 		Number of Western Union PMTS Station closings/usage rate		To define minimum number of HUTC stations required

POTENTIAL USES OF MEASURPHENT DATA		To define fair lassening of ragulation for former monopoly carriera in competitive field like PHTS	To define reletionship batteen dareguletion and development of competition in terma nf cartier entry in PHTS	To define reletionship between deregulation and technological innovation in the PHTS	To define relationship between desegulation and new servics offaring in PMTS	To define link between derrgulation of pricing requiremente and rete charged for acrvican in resi market-place	To dafine the trede-offa batueen typas of fund allocations	To define e coherent policy-across services for former monopoly PHTS cerrier	To define end radafina daregulation ground rulae for PHTS	
ACT IV ITIES BHENT	<u>Otheri</u> Paripheral Market- Places/Induatries						Uses of ETIP/FCC funded dereguletion ectivities			-
LIN(S) WHERE REAL WORLD ARE TARGETED FOR MEASUR DEVELOPMENT	PHTS Industry- Martet-Placa (Cartlers, Can- euaars, Euuipment Suppliere)	Vestern Union Feections to HOI	Number of cetebliahed and new cerriere who anter PHTS	Distribution of technology in PMTS	Arrey of earvicee evailable to PMTS customare	Inventory of price for PMTS marvices			Public (certier and common) rection to NOI	
DON	PCC/CCB PHTS Regulatory Operation (Rule Standerd Datinition, Fro- cedure, Process)	Draft description of changes proposed for PHTS regulatory operetion ra Western Union	Draft description of deregulated oparation	Dreft description of policy and incentives for new technology in PHTS	Draft deacription of policy and incantives for new services in PHTS	Draft deacription of pricing re- quirement in dereguietion peckaga	Dreft adminia- tretive experiment and avaluation deaign	Draft administrative experiment and evaluation design	Draft dereguletion HOI	
POTENTIAL MEASURABLE ISSUES		 To what extent can regulation of Waetarn Union's PMTS ha leasanad? 	. To what artant can other certiese or nav carriers be etimulated by lasaaned re- guletions to antar the PHTS field?	 Will state-of-the-art record seases technologies be intro- duced into the PMTS field? 	Will new and laproved record messegs services be availabla to business and gamrel public?	Will cost to the public of new and curtently evellable asrvices be resonable under deregulation?	. Now will ETP monay granted to FGC be ellocated?	Nov will need for coordination between Weetern Union related Commissions' news ba seared?	Mhat vill be ground rules for deregulation?	How doem the solution "going to mariat-place" compare to "legal procedures" as e meens of deregulation?
GRCE	Source Source	 B. CCB Policy B. CCB Policy I. CCB Policy I. Purs Da- Purs Da- 	reguletion 2.	ini (jeni		<u>, , , , , , , , , , , , , , , , , , , </u>		<i>.</i>		<u>.</u>
so	Source Organization									

POTENTIAL USES OF MEASUREMENT DATA		To defina method of monitoring "edequecy" of sarvica mandate		To dafina miniaum Part 63 raquirement for PMTS carriera	To dafine minisum reporting requirements for PHTS	To define link between deregulation and tartier fatbility in terms of service offering optione	To define what companies anter PMTS and why	To defina set of minisum rata of return" requirements for da- regulated PMTS	To dafina minimus antry raquiremente for PMTS	To dafine regulatory spproach to transit and to compatition for former monopoly PHTS carriar	To define a coherent policy for managing tha deregulated services of carriers still associated vith services undar traditional resulation
lties	<u>Otheri</u> Pertpheral Market- Placee/Industriee								-		
S) WHERE REAL WORLD ACTIV TARCETED FOR MEASUREMENT DEVELOPMENT	PMTS Induerry- Market-Flace (Cartiere, Con- eumere, Equipment Suppliere)	Custoner aatisfaction with altarnativa PMTS-lika servicaa	Inventory of PtffS aervicea	Carrier reactiona to Part 63 changes	Amount of reporting re PMTS	Number of new aervice offeringa under PKTS per carrier Cerrier opinion	Reaction to deregulation	Profit and rata of return of PHTS carrisra in ds- regulatad PHTS	Certiar reaction in terms of eotry and axpansion in PMTS fiald	Mastarn Union raaction to rulas govarning transition to compatition	
DOHAIN ARE	PCC/PCB PHTS Pegulatory Operation (Rula, Standard Definiton, Pro- cedura, Pro-		Dreft dsregulation package	Draft deregulation of Part 63				Draft daragulation	Draft daregulation	Draft daragulation	Draft deregulation Putura PHTS ralated ratinga
POTENTIAL MEASURABLE ISSUES		10. How adequata and practical ara aubatituta PhTS serviceat	 Mhat types of services vill become available in deregulated PMTS field? 	 How can requirements for carrier reporting <u>vis</u> operational change- modification, discontinuance, impetreent be lassemed? (see Part 63) 	13. How can reporting requirements for PHTS carriera be leesened?	14. To what extent are PMTS carrier obusiness options in terms of offering new and related services made more flexibla as a fault of deregulation	15. What comparies will enter tha deregulated PMTS1	16. What minimum reporting require- ment and controls on rateof return star necessary in order to managa and lagarn from tha daregulation of PHTS?	Whet are minimum antry requirements for deregulated PMT61	17. How much flatibility should Western Union have while com- parition is developing in PHTS?	16. How will CCB and the Commission define future changes in PMTS policy, standards and proceduras?
RCE	δουτςe Document		1=			<u>.</u>	<u>.</u>	<u></u>			
sou	Source Organization										

POTENTIAL USES OF MEASUREMENT DATA		To defina further procase managing ranation to com- patitive market-place for PHTS	To define "limita" to daragulation within Section 222		Ttaca tha linka betwean policy changea and adminiatrative implementation.			Improva regulatory clarity through preciae definitions.	Ipprova administrative experimentation by linking policy changes to specific rule changes
LIVITIES T	Paripheral Markat- Places/Industrice							Onlooker perceptions	
(3) WHERE REAL WORLD ACT TARGETED FOR MEASURDIEN DEVELOPHENT	PHTS PHTS Induetry- Market-Place (cartare, Con- aumert, Equipment Suppliere)	Carriar reactions to intarim pariod §round-ruias	Section 222 actions against Commission in ramponse to PHTB dereguletion					Herkat-placa realitiea	
DOMAN	FCC/CCB PMTS Regulatory Operation: (Ruie, Standard Definition, Pro- cedure, Process)	Draft dergulation	Draft deregulation review by Commission Counsel	Related court declaiona PCC deciaiona	Lina regulation description of sctivities	Lina regulation workload		FCC definitions	CCB rulas committas
POTENTIAL MEASURABLE ISSUES		 How much flexibility abould new carriars have while a suitable level of compatition is developing in PHTS? 	 To what extent will violation of Act Section 222 aunders ba avoidad while deroguiating PHTS? 	 To what extent will deregulation of PMTS fit with other CCB policy decisions, cases and other panding and peet legal actional 	 How will daregulation affact "lina regulation" practicaa? 	 What will be the overall affect of regulation oo line regulations workload? 	 How can workload increase for CCB iine regulatione ba avoided? 	 What is a rigorous definition of "public racord earvices"? 	Which apecific ruise in Parta 21, 42, 43, 52, 61, 63, and 64B can be deteced or redraftad to ceusa "leseened" ragulation of PHT31
RCE	Document	64	20	31		6 7 7 7	24	25	30
sou	Source Organizeting								

			·							
POTENTIAL USES OF MEASURLYIENT DATA		læprovemant in tha plaueibility of administrative axperimentation.				Idantify ragulatory blocks to ionovation	Identify ragulatory blocka to compatition	Identify non-regulatory blocks to innovation	Identify beforehand logtances of "natural" monopoly. Identify carriar anticompetitiva practicea	Identify factora leading to ahortcominga in 7CC internal raview. Transfer findinga to other experimenta.
ACTIVITIES IBHENT	<u>Otheri</u> Pariphorol Herket- Places/Industias							Burvey of technology auppliare manufacturing firma	Survey of count. related firma driven out or remaining outaida PHTS markat	
LN(S) WHERE REAL WOMLE Re targeted for Measur Development	PHTS Industry- Matket-Place (Cartae, Con- aumars, Equipment Suppliars)					PHTS markat responses PHTS technology.by non-regulated firms for "similar"	Prices, aervica divaraity, markat sheres, etc. in new PMTS market		Fricas, aarvica divarsity	
DOHAI	RCC/JCGB PHTS Regulatory Operationi (Rula: Standard GRula: Process)					Specific policy- rule changea				Evaluation of rule-change committee proceea
POTENTIAL REASURABLE ISSUES		7. How will CCB monitor and guide futura decisions related to Western Uniona' and other carriers' non-PHTS services in auch a way that the PHTS deregulation "will not be inadvertaotly thwartad"	 How will "general public and industry/ market-place avareness of the deragula- tion be secured? 	 What is the best vehicls for publiciting the deregulation? 	0. How should FTLP's fuods and account with FCC be allocated?	 How doas PHTS deregulation help to define the link between relargiton of regulatory requiraments and tha introduction of technological innovations? 	 How doee deregulation of PHTS lead to an opuning of compatition? 	 If deregulation of PHTS doea not lead to technological innovation, what ara tha main reasona? 	4. If deregulation of PHTS doea not laad to an opening of competition, what ara tha main reasona?	 How should the development of an adalmistrative experiment like PHTS deregulation be monitored and evaluated? What method and process?
LRCE	Source Document	2	3	2	10	A. "ETIP Project Plan #169: Analytical Support and Data Col	lection in Regulatory Adainiatra- tiva Ex- periaenta"	<u> </u>		
SOI	Source Organization					11. 211P				

POTENTIAL USES POTENTIAL USES OF MEASUREMENT DATA		Modal of regulation-industry interface	Resolution of "generic" regulatory problema	Ability to transfer experimental knowledge to acother regulatory field.		
TIVITIES	<u>Other</u> Partpheral Market- Places/Industriae			Related concerna in other regulatory fielda		
) WHERE REAL WORLD AC Argeted for Measurehe Develophent	l PHTS Induetry- Market-Placa (Cartiars, Com- eumers, Equipment Suppliars)					
DOHAIN (S ARE T	PCC/CCB PHTS Regulatory Operation: Rula Standard Definition, Pro- cedura, Procesa)				PCC/OCB regulatory atructura	
POTENTIAL POTENTIAL ISSUES	6.	 Kov can a modal deacription of the links batween regulatory procese and industry proving ba developed using the PHTS administrative expuriment? 	7. Will resolution of "generic regulation problems" such as those identifiad during the course of the PHTS deregulation ceues improvement io industry's performance?	 How will generic regulatory feeuea releted to PHTS be ideotified and and defined? 	9. What will be the impact of PHTS deregulation of CCB and PCCP	
	Зоитсе Восивец					
sourc	5007Ce 075852788370 ,					

ISSUES	
PARTICIPANTS'	

USE OF INFORMATION			- Better understanding of when deregulation ia viable.	- Ability to discern proper times to use direct, as opposed to indirect, aubaidization.	- Understanding of when regulation ia outmoded through technological change.		
	OTHER		New Marketa Created.		Examination of diversion to Bank Money Order Systems. Comparison of coata and aervicea.		
MEASUREMENT	PMTS INDUSTRY	PMTS Revenuea Volume	No. of Entranta Volume Quality, Price Location, Distri- bution of Service,		PHTS Money Order System		 Introduction Introduction of new technology Change in carrier operations Change in PMTS station/station
DOMAIN OF	Pcc/ccB	Carrier Cost Filings					
FOTENTIAL MEASURABLE ISSUE		 Is there a need to continue cross sub- sidization of PMTS? 	 Will marketplace activity in terms of actinuing and new service offerings be sufficient to elim- inate need for direct subsidization. 	 Does direct subsidi- zation allow the re- gulator, consumer and Congress to be aware of the <u>true</u> cost of maintaining a service? 	. To what extent does competition for PMTS money order already exist?	. To what extent do USPS record message service plans, such as EMS, effect regu- lation of PMTS.	5. Can PMTS servicea be made profitable?
	DOCUMENT	WESTERN UNION (WU) MONOPOLY INQUIRY COMMENTS	~				
SOURCE	ORGANIZATION	VIIN					

SOU	RCE DOCUMENT	TABL POTENTIAL MEASURABLE ISSUE	E II-4: PARTICIPANTS' IS: DOMAIN OF FCC/CCB	sues Measurement PMTS Industry	OTHER	USE OF INFORMATION
	MU MONOPOLY INQUIRY COMMENTS	 How do PMTS Services vary from other Value- vary from other Value- Added Service? <u>Or</u>, affice WU now plays largely a <u>brokerage</u> role, are alternative services available in the case of deregu- lation? 	Reporting Requirements Facility filinga Tariff filinga Coat Support	 Quality Quality Revenue Ratea Assesatbility Volume Types of Servicea Types of Servicea Facilities and Facilities and Profit Profit Message type Special con- siderationa 	- Compare with Extating Alter- natives (Such an Bank Money Ordera).	 Better definition of marketa to be regulated or deregulated. Development of com- parative services with which to develop stan- dards or regulatory expectations.
		 Is a certain mini- mum level of PMTS vital to the public? 			- Customer Surveya	
		 Does PMTS exhibit Does PMTS exhibit any of the econ- omics of scale or natural monopoly characteristics justifying regu- lstion? 		- Economies of Scale		- Better identi- fication of matural monopoly conditions.
		10. Is WU presently acting as a carrier of last resort?	Tariff filings	- Distribution of WU Services, Hours, etc.		
	•	11. What is the present quality of WU ser- vices, and would' deregulation imp- rove quality.	Tariff filings and Reporting Require- ments	- Quality of WU Services - Cuatomer Surveys		- Development of minimum quality stan- dards.
		12. Will deregulation lead to new entranta who will develop new and improved ser- vices?	Tariff filings and Reporting Require- ments	- New Entrant Servicea		- Evaluation of the benefits of deregu- lation.
		 Is it true that de- regulation of PMTS would not undermine protection afforded consumers under the 1934 Act? 			- Legal Opinions, Consumer Surveya	

	USE OF INFORMATION		- Definition of the proper extent of regu- lation necessary to achieve public interest.				
		OTHER					
ISSUES	OF MEASUREMENT	PMTS INDUSTRY	- Induatry Rates - Facilities	 yearly total PMTS pessge volume. PMTS share of total message exchange. yearly total in common carrier messages. total PMTS revenue. number PMTS Accept- ance Stations. configuration of ance Stations. configuration of ance station of ance station. configuration of ance station. cost of PMTS-like services volume of non-PMTS carriera, e.g. WU/ TELEX, domestic haul of inter- number of extra- market benefits to operation of service. arret benefits to operation of service. aftsi's apecial bill- ing for WU., USPS PTIVALE EXPISES Laws. 	WU revenues	- Revenue Levels - Service Offerings	
E II-4: PARTICIPANTS'	DOMAIN OF P	FCC/CCB	Tariff Filings Facility Findings Reporting Require- ments		Tariff filinga Reporting Require- menta		
TAI	POTENTIAL MEASURABLE ISSUES		 Is it true that the Commission'a author- ity to regulate pri- mary communications transmission facil- ities will assure Consumer protect- ions? Is control of longlines enough? 	 In what way can the status of PMTS in status of PMTS in common carrier marketplace be aasessed? 	 Would deregulation result in economic harm to WU? 	 If new entries occur, should certain exemp- tions be granted WU or other carriera? 	 Will Telex continue to be a protected mono- poly under PMS deregu- lation?
		DOCUMENTS	MU MONOPOLY 14 INQUIRY COMMENTS	WU MONOFOLY INOUTRY COMMENTS	HU MONOPOLY INQUIRY COMMENTS		
	SOURCE	ORCANI ZATION	NTLA	NTIA	WESTERN		

GATEWAY INQUIRY ISSUES

USE OF INFORMATION		- Ability to predict effect of competi- tion on regulated industry revenues.	=	- Help to determine the link between competition and improved technol- ogy.	- Develop flexibil- ity in applying regulatory defini- tions.	What is the method by which a regula- tory agency can encourage the effects of compe- tition?	- How can the inter- connection with a semi-public utility be fairly con- trolled?	- When do non-market technical consid- erations warrant regulation?	- When is competi- tion incompatible with service continuity?
1	/ Other			- Comparison with total comm. mar- ket SOA technol- ogy.		- Public satisfac- tion with ser- vices			
DOMAIN FOR MEASUREMEN	PMTS	- Measures of loss of volume and revenues from domestic trans- mission losses.	- Measures of revenue loss. - Does PMS market ex- pand or change?	- Measurement of tech- nological changes.	- Network technology	- Marketplace costs	- IRC-WU interconnec- tion costs.	- System efficiency and maintenance.	 Financial viability of market partici- pants. Service continuity
1	FCC/CCB				- FCC authority under Comm. Act				
POTENTIAL	MEASURABLE ISSUES	 What would be the economic fupact on WU of free direct access or additional gateway authorizations? 	 What would be the Impact on WU of allowing pickup and delivery of PMS via leased channels in the hinterland? 	 Will free direct access and additional gateways encourage new technology? 	 What is a gateway? 	 Will free direct access and new gateways increase services and decrease costs? 	 What should WU charge IRCs to interconnect? 	 How would a competitive system affect the efficiency of network investment, main- tenance decisions? 	 Can the market sustain competition?
RCE	Document	FCC 76-174 75-894 75-893		-					÷
sour	Organization	Western Union		IRCs - ITT and RCA	-				

ISSUES
CASE
RATE
XML/
TELEX

USE OF INFORMATION		- Refinement of rate of return regula- tions	-	2	 Ability to better evsluate regulated industry's proposed rste changes Better understand- ing of regulation's effect on competi- tiveness 	- Better differentia- tion of regulated markets	- Ability to svoid discriminatory charges, excessive charges	 Refinement of rate of return regula- tions Identification of cross-subsidization
	/ Other							- Returns of similar, non- regulated services
DOMAIN FOR MEASUREMENT	/ PMTS	- Rate and cost structure of submitting carrier	- Carrier cost structure	 Comparison of short-haul and long-haul user costs Comparison of services to determine "likeness" 	 Examination of traffic diversion to Af&T Examination of price elasticities 	- Cost comparison of domestic and int'l users	2	- Cost of service - Returns of other regulated services
	FCC/CCB	- 61.38 material submitted by carrier	- Cost support material sub- mitted by the carrier	- Tariff filings	- AT&T rate structure			- Tariff filings
POTENTIAL	T MEASURABLE ISSUES	1. Is the justification of the rate increases submitted by WU deficient under Sect. 61.38 and costing guidelines set forth in Docket 18128?	 Will rates be more closely sligned with costs under the new rste structure? 	 Do the proposed changes in rate structure, as applied Telex/TWX, contain an unlswful discrimination [under Section 202(a)] between short-haul and long-haul use of the <u>same</u> Telex and TWX services? 	4. Do the rate changes meet an slleged need to secure a competitive advantsge with AT&T WATS used with Datsphone?	 Is there a cost-of-service difference between public and IRC Telex/TWX services? 	6. What should the IRCs be psying for the WU interconnec- tion?	7. Will the proposed rates result in an unjust rate of return for these Telex/TWX services? [Section 201(b)]
ш	Document	FCC M0&0 May 25, 1978 Docket 78-97 Telex/TWX Rate Case						
SOURC	Organization	IRCs - Specifically; ITT, RCA, WUL, TRT						

н	1
Ξ	Ł
-	1
n	£ .
n	L
-	i.
	Ł
	Ł
e	
E.	1
-	1
∍	1
2	
-	Ł
	L
	Ł
	1
D	L
-	1
5	
2	٤.
2	1
1	Ł
٦	1
q	£.
F.	1
	σ.

SOUR	CE 7 Proviment	POTENTIAL REGIRE		DOMAIN FOR MEASUREMENT	T	USE OF INFORMATION
5		MEASURABLE ISSUES	/ rcc/ccb	PMIS	/ Other	
	WATS/MTS INQUIRY COMMENTS	 Are WATS and MTS "like" or unlike services under Section 202(a) of the Act? (Is the same rate required of the two services?) 		 Examine function and technology of the two AT&T services. Survey of customer perceptions. 		- Ability to determine the uniqueness of a given service and in turn the appropriate regulatory stance toward that service.
		 Are the comparably lower rates for WATS justificable on the basis of cost difference? 		- Examine rate and cost alignments of WATS-MTS		- Refined control of regulated industries through improved accounting measures.
		3. Should further expansion of WATS be restricted?			- Complaints of WATS competitors	
		 4. Is Section 202(a) an effective tool in controlling discriminatory rates by carriers? 	 Examination of evidence pre- sented in hear- ings concerning Section 202(a) CCB cost data collected 	 Actual carrier costs and charges to var- ious customers. Compare WATS and MTS customer costs and rates charged. 		- Development of external checks on carrier provided cost information.
	24,	5. Should the Comm. allow the resale and sharing of WATS by AT&T customers?				
		6. What types of standards or guidelines should be used to determine "like" services?	 Current FIC practices Speed with which decisions are made Amount of litiga- tion 	- Discussions with AT&T and its customers		- Avoidance of a case- by-case approach through the develop- ment of comprehen- sive guidelines.
		7. Is <u>outward</u> MATS identical to MTS? (See Issue 1.)		 Comparison of outward WATS and DDD message handling. Compare facilities used 		- See Issue l.
		8. Does the new WATS billing procedure actually add cost to the MTS system?	- FCC accounting guidelines			

COMPUTER INQUIRY

					È	14	
USE OF INFORMATION /		- Development of methods to prevent unfair competition of regulated indus- try in unregulated fieldssuch as data processing	- Control standards for regulated industry participa- tion in ancillary services	- Development of criteria for defin- ing proper regula- tory boundaries	- What is the effect of regulation on service offerings?	- Identify natural 4 monopoly areas warranting regula- tion	- Determine types of new services which should be allowed a protective regu- latory umbrella
T	/ Other	- Actions of car- rier's "separate" subsidiary	- Carrier involve- ment in terminal market	- D.P. market			
DOMAIN FOR MEASUREMEN	PMTS	- Carrier accounts	- Network condition		- Resale offerings	- Comp. Comm. market cost conditions	- TNS offering
	FCC/CCB	- Carrier filings	- Reporting require- ments - Complaints - Facilities filings		- FCC requirements		- Tariff filing - Petitions
/ POTENTIAL	MEASURABLE ISSUES	 Should the maximum separa- tion policy in 64.702 be contin- ued to prevent carrier cross- subsidization? 	2. Will carrier provision of terminal equipment divert their resources from this primary duty to provide adequate exchange and private line service?	 Should the FCC regulate d.p. services? 	4. Would regulation impede resale activities?	5. Are there natural monopoly characteristics associated with computer comm. indicating a need for regulation?	6. Is Bell's offering of TNS appropriate for a carrier?
KCE	Document	Docket 20828 Computer Linquiry Comments			 B. CBEMA Motion to enlarge issues 		
100S	Organization	CBEMA					

. ...

SOUR	CE	POTENTIAL	/	DOMAIN FOR MEASUREMENT		USE OF INFORMATION
Organization	Document	MEASURABLE ISSUES	/ FCC/CCB	PMTS	Other	
Seattle Firat Nat'l Bank	Docket 20802 Comments	 To what extent csn comm. common carriers participate in accelerating computer technol- ogy development? 		- Carrier technology and R & D	- Comparison with non-reg. technol- ogy	- Comparison of regu- lated vs. non-regu- lated rates of tech- nology use
		2. Should the FCC regulate d.p.?				- Determine proper regulating bound- aries. Effect of regulation on formerly unregulated services
		 To what extent should d.p. organizations sell comm. func- tions along with d.p. packages in a non-regulated manner? 	- Tariff filings	- Compariaon with carrier offeringa	- D.P. market	- Determine when the service offerings of unregulsted industry warrant regulatory control
	<u> </u>	4. Is the hybrid service concept required for defini- tional clarity?	- FCC definitions	- Industry commenta	- Legal opiniona	- Achievement of clearer industry guidelines and security through definitional clarity
Boeing Computer Services	2	 Will the proposed defini- tion hinder flexibility in the structuring of service offer- ings by either comm. carriers or unregulated computer service companies? 	- FCC definitiona	- Comm. carriera survey	- D.P. market offerings survey	" - Methodology for measuring regulatory impact on industry
		 Are the new definitions enforceable? 				- Development of realistic regula- tions
		 Can the FCC legally define the border areas between comm. and d.p.? 			- Legal opinions	- Definition of regu- latory boundaries
AT&T	:	 What are the proposed defi- nitions to 64.7027 				- Achievement of regu- latory clarity
IBM	=	 Should the FCC practice indirect regulation through competition 				- Development of regu- latory tools aimu- lating market incen- tives
		2.				

NOTE: Many onlookers raised the same issue. For the sake of conciseness they are not repeated here.

GRAPHNET AND TELENET - DOMESTIC CARRIERS APPLYING FOR AUTHORIZATION TO ENTER INTERNATIONAL MAKKET

2	ш	POTENTIAL MEASURABLE TSSUES		DOMAIN OF MEASUREMENT		USE OF INFORMATION
/ Documen	t	CAUCAT AUGUS	FCC/CCB	PHTS	Other	
FCC 77-2 78-1	81	 Would domestic carriers pro- viding data services as through services have a competitive advan- tage over the IRCs because they: a) can perform pickup and delivery in hinterland b) don't share the same rate base? 	- Carrier report- ing requirements Sec. 63 cost data	- Profit and rate of return of carriers market shares		- Set standards for "fair" competition between companies with differing regu- latory requirements
=		 Do resale carriers have an advantage because they don't invest in facilities? 	=	" - Comparative costs		- Rate regulation refinement
		3. Do IRCs have an advantage because of their int'l markets?	2	- Marketing techniques		
FCC 7	7-2 8-181	4. Why is separations policy that int'l services should be provided as interconnected ser- vice from authorized gateway by IRCs and not via "thru" services via domestic carriers not appli- cable to Graphnet/Telenet ser- vices? Will customers prefer single-source carrier? (ia)	=	- Profit and rate of return of carriers - Customer surveys		- Determine the proper regulatory framework to control domestic- int'l interface in a <u>fair</u> manner
Sec.	214	 If domestic carriers allowed to, in effect, use cities in which they lease/operate domes- tic network as gateway cities, is this unfair advantage over the int'l carriers? 	•	 Profit and rate of return of carriers Study of carriers' share of market 		- Regulatory structure to prevent unfair competition of regu- lated industries with others
se c.	214	 Rather than depriving public of service is case-by-case approach combined with reporting requirements adequate to imple- ment and effect change while still protecting public interest? Telenet interprets FCC deci- sion to authorize int'l service offerings prior to agreement with foreign government as trantamount to 214 authority for any domestic carrier simply to amend tariff and to extend service to addi- tional geographic points (similar to MCI court interpretation that 214 authority includes permisation to offer any service on equipment) 	- System monitoring proceeding that mini- policye.g., as i	to be avare of any legal tht turn tables on FCC in Execunet decision	- Reactions from foreign admin- istrations	 Development of alternative to regulation on a case-by-case approach Exercise in deterain- ing regulatory authority limits under Section 214
Sec.	222	 Are Graphnet facsimils ser- vices truly new markets or public message service? 	- Tariff filings - Carrier reports	- Monitor impact on IRCs - What types of custom- ers utilize Graphnet aervices? - Technical description of services	- Reactions from foreign admin- istrations	- How do you identify a true new market? - Ability to define regulated services (1.e., PHTS).
Sec.	222 214 1	4. If Graphnet's service is PMS, is competition in int'l market- place (nstionalized) feasible?				

USE OF INFORMATION		- Does competitive market)ace encour- sge S-O-A technolog- ical innovation for all market segmentså For some only? For which types?	- Ability to better forecast market growth understanding of how new technology changes the need and shape of regulation - How do competitive forces impinge on regulated marker?	 Ability to detect when regulated industries are not responding to poten- tial new markets Definition of public interest regulation 	 Ability to under- stand when it is sppropriate to deregulate 	 Development of standard for "fair" dealings of regu- lated cariers with industries not completely under FCC control 		 Definition of regulatory authority lstory authority ad obligations Definition of whst a cartler is in a new, technologicsily changing field 	I
	Other		- Change in int'l com. market - Reactions of other countriea	- <u>Potential</u> consumer survey	 Economic strength of new entrants Viability of the new service pro- vided 	- IRCs services affected by contracts			I
DOMAIN FOR MEASUREMENT	PMTS	 Comparison of carrier equipment: speed compatibility compatibility error detection varied cspabilities abclasses of service Customer surveys 	- New equipment offerings - Industry structure - Profit levels, market shares - Effect on private line service offerings	 Consumer survey 12 industry messures of the public interest 	- Impact on IRCa	- Domestic carrier IRC interaction	- System efficiency questions	- Characteristics of resale market - Reactions of customera	1
_	Fcc/ccb	- Number of state- of-the-art applications	- Tariff filings - 214 filings - Complaints			- Present contracts - Tariff filings - Complaints - Petitions	- COMSAT sgree- ments		1
POTENTIAL		 Gan technical inefficien- cies due to incompatible terminals be lessened by sliow- ing carriers with state-of-the- art technology into marketplace? 	6. How will the influx of d.p./com. services such as that offered by many domestic carries [Graphnet] and WUI Dataphone sffect the int'l com. market?	 Now great is the need in the int'l market for low cost data comm.? 	8. Can the int'l comm. market support competition?	9. What protocol or operating or sgreements are needed for lawful contracts between IRCs and domestic carriers?	10. Should CONSAT intercon- nection standards for domestic carriers be indentical to those for IRCa?	 Should resalers be considered carriers to be fully regulated? 	 Should data services be provided as interconnected services through authorized gateways by IRGs or be pro- vided as through services by domestic carriers?
CE	Document	FCC 78-181	A. FCC 77-2 FCC 78-181			B. Authorized User Decision 4 FCC 2nd 593 (1966)			FCC 78-181
SOUF	Organization	RCA	RCA						TRT

1978
AUGUST
HEARINGS,
13015
H
AT
WITNESSES
B
TESTIMONY

/USE OF INFORMATION		- Linkage between competition and innovation	- Development of technical stan dards to use even in a competi- tive environ- ment when necessary.	- Improve regula- tion through better identi- fication of un- fair competitive practices employed by monopolies.		- Identification of monopoly pur- chasing practices whichsstifle com- facturing and new innovation.
	/ Other	- Innovation in the new registration program's term- inal equipment.	- Consumer com- plaints	- Pricing practices of monopolies in the competitive		 Comparison of Western Electric sales to Bell system with other companies. Examination of the <u>Evanination</u> of the <u>Evanination</u> of the <u>Evanination</u> of the manufacturers. Does Bell purchase outside innova- tions or try to develop its own alternative pro- ducts? Dell techniques for marketing manufactured pro- ducts to customers. Bell System pressure tactics forcing operating companies to buy from Western
DOMAIN FOR MEASUREMENT	STN9			- Western Union prices and costs - Bell System rates and costs		
	FCC/CCB		- FCC Laboratory technical standards			- FCC examination of the public interest standard applied to vertical integration.
POTENTIAL	CIUCAL SUCCESSION	 What are the effects of competitive interconnection on the marketplace? 	 What is the effect of interconnection on technical efficiency of the network? 	 Is predatory pricing possible for monopolies drawing upon their monopoly profits? 	 Would a separate Bell subsidiary for Western Electric ensure "fair competition? 	 Does Bell have a classed purchasing system, with Bell operating companies delib- erately choosing to purchase manufacturing goods from Western Electric?
DURCE	Document	HR 13015 testimony				HR 13015 testimony
l sc	Organization	CBEMA				IIT

USE OF INFORMATION		- Linkage between regulatory streamlining and regulatory preformance.	- Information on linkage between deregulation and technolog- ical and ser- vice innovation.	- Identification of carrier barriers to a successful de- regulation experiment.	- Ability to identify cross- subsidization in a regulated firm.	- The ability to improve regula- tion by in- creasing regu- latory certainty.	- Ability to identify appro- priate monopoly structure.
DOMAIN FOR MEASUREMENT	Other	- Industry com- plaints.	- Development of new services in the resale market		- Academic litera- ture, such as that written by Richard Gabel.	 History of en- forcement of anti- trust laws. Business Marketing and Consulting. 	 Independent equip- ment manufacturer surveys. Economists
	PMTS			 Are there discrim- inating <u>intercon-</u> nection <u>agreements</u> between the under- lying carrier and the entering com- panies. % Market shares of participants. 	- AT&T and Independent Telephone Companies settlements proce- dure.	- PMTS ser ice offerings comparisons	- AT&T-Western Electric + GTE and Automatic Electric Relationships
	Fcc/ccb	 Actions on petitions for rulemaking Administrative law Proceedings Industry and public participation Ievels Number of challenges to final decisions 		- CCB Policy and Rule Changes			
POTENTIAL MEASURABLE ISSUES		 What would be the effect of strict time limits for the completion of rule- making actions? 	 Does regulation serve the public interest by encouraging new markets? 	 Will a regulatory policy of competition quickly lead to actual competition in the market- place? 	 How does the present separations and settle- ments procedure work? 	4. How does one define a market?	 What is the effect of vertical integration of the Bell System?
SOURCE	Document	HR 13015 testimony	HR 13015 testimony				
	brganiżation	NTIA (Henry Geller)	Charles Ferris, FCC Chairman				

USE OF INFORMATION		- Identification of cross- subsidization.	 Prevention of "unfair" prac- tices by regu- lated carriers. 	- Ability to make a regulatory agency transi- tion from strict regulation to competition.	- The prevention of "unfair" and anti-competitive practicus by regulated carriers.	 Identification of proper monopoly structure 	- Linkage between regulation and competition innovation.	- Linkage between regulation and competition innovation.	- Improve regula- tion through better identifi- cation of costs and tross- subsidies.	 Improve regula tion through better defini- tional certainty 	- Better regulatory cost Ldentifica- tion	- Traces of effects of competition.
DOMAIN OF MEASUREMENT	0ther	- Bell costs and service charges	- Consumer surveys -		 Survey of service and customer rates and costs. Leasing arrange- ments comparisons. 	 Market Innovation. Purchasing arrangements. Bell organiza- tional structure. 	 Terminal equipment innovation. Terminal market structure. 	 CATV market structure Consumer surveys 	- Separation and settlement pro- cedure. - Costs and Reven- ues of telephone campanies.	- Market structure in communications segments.	- Deprectation prac- tices of carriers compared with other industries.	- Prices, market structure, ser- vices, network efficiency.
	PMTS											
	Fcc/ccb		- Tariff filings	- FCC tariff and facility authority	- FCC tariffs - 214 filings					- FCC definitions		
POTENTIAL MEASURABLE ISSUES		 Will Bell's monopoly ser- vices cross-subsidize the competitive services unless precluded by regulatory action? 	 Can Bell be discriminatory in the treatment of customers through the way it structures its tariff 	 Which FCC powers sre needed to restrain monopoly carriers? 	4. Does Bell discriminate in its provision of and charges for local distribution and long-haul transmission facilities?	5. What sre the industry effects of Bell's vertical integration?	 What would be the effect of opening the terminal equip- ment market to full compe- tition? 	 What would be the impact of the abolition of federal jurisdiction over CATV? 	 How well does the present separations and settlements procedures work? 	 How does one distinguish between "competitive" and "non-competitive" services? 	 What would be the result of the provisions concerning depreciation? 	 What are the consequences of forced interconnection with competitions?
Source	Document	HR 13015 testimony					HR 13015 testimony					
	Organization	Philip Walker <u>Telenet</u>					GTE					

APPENDIX F: POTENTIAL USERS OF INFORMATION

Developed by

Sharon Kirby





INVOLVEMENT IN PMTS DEREGULATION

Possible issue links between other FCC special inquiries and the Western Union Monopoly Inquiry

- I. PARTICIPANTS IN OTHER SPECIAL FCC INQUIRIES
 - a. Computer Inquiry Docket 16979 and Docket 20828

o FCC STAFF

1. James Smith Policy and Rules

INDIVIDUALS EXPRESSING CONCERNS TO FCC RE COMPUTER INQUIRY

- 2. Jim Buckley and Associates
- 3. Ad Hoc Telecommunications Committee Jeremiah Courtney, Esq.
- 4. Aeronautical Radio, Inc. Charles R. Cutler, Esq. Kirkland, Ellis and Rowe
- 5. American Bankers Association Gerald M. Lowrie
- 6. American Newspaper Publishers Association; Associated Press; Commodity News Services, Inc. Aloysius B. McCabe, Esq. Kirkland, Ellis and Rowe
- 7. American Satellite Corporation Michael D. Campbell, Esq.
- 8. American Telephone & Telegraph Co. 18. ITT World Communications, Inc. Alfred A. Green, Esq.
- 9. Applied Data Research, Inc. Carol A. Cohen, Esq.
- 10. Remote Processing Services Section (RPSS) Of the Association of Data Processing Service Organizations; Indepenent Data Communications Manufacturers Association, Inc. Herbert E. Marks, Esq. Wilkinson, Cragun & Barker
- 11. Boeing Computer Services, Inc. Ben Harty, Esq., Vice President

- 12. Citicorp; Bunker Ramo Corporation Tedson J. Meyers, Esq.
- 13. Computer and Business Equipment Manufacturers Association (CBEMA); McDonnell Douglas Corporation Joseph M. Kittner, Esq.
- 14. GTE Domestic Telephone Operating Companies Ruth L. Prokop, Esq.
- 15. Incoterm Corporation Andrew M. Wolfe, Esq.
- 16. International Business Machines (IBM) David R. Anderson, Esq.
- 17. ITT Domestic Transmission Systems, Inc Agatha M. Modugno, Esq.
 - Joseph J. Jacobs, Esq.
 - 19. MCI Telecommunications Corporation; Microwave Communications, Inc.; and N-Triple-C, Inc. Michael H. Bader, Esq.
 - 20. National Burglar and Fire Alarm Association
 - 21. National Communications Services Eugene Strange, President
 - 22. National Data Corporation William B. Moriarty, II

INDIVIDUALS EXPRESSING CONCERNS TO FCC RE COMPUTER INQUIRY

- 23. Bowne and Company, Inc. Paul S. Hoffman, Vice President
- 24. NCR Corporation, Industry Standards and Relations Thomas W. Kerns, Systems Standards
- 25. Executive Office of the President Office of Telecommunications Policy General Counsel
- 26. Computer Law and Tax Report Robert P. Bigelow, Editor
- 27. Communications Satellite Corp. William K. Coulter, Esq.
- 28. COMSAT General Corporation James T. Roche, Esq.
- 29. Computer and Communications Industry Association Terry G. Mahn, Esq.
- Continental Telephone Corporation Thomas L. Jones, Esq.
- 31. Control Data Corporation Philip C. Onstad, Management Telecommunications Policies
- 32. Electronic Industries Association John Sodolski, Staff Vice President
- 33. French Telegraph Cable Company Henry Goldberg, Esq.
- 34. General Electric Company David Sherman, Esq.
- 35. General Services Administration Spence W. Perry, Esq.
- 36. GTE Data Services, Inc.; GTE Automatic Electric Inc. Allen R. Frischkorn, Jr., Esq.
- 37. RCA American Communications, Inc. David R. Ellis, Esq.

- 38. RCA Global Communications, Inc. Donald J. Elardo, Esq.
- Rochester Telephone Corporation David J. Cook, Esq.
- 40. Rutgers Journal of Computers and the Law John R. Bonica
- 41. Sander Associates, Inc.F. Sherwood Lewis, Esq.
- 42. Satellite Business Systems F. Thomas Tuttle, Esq. Counsel, Regulatory Matters
- 43. Scientific Time Sharing Corp. Philip S. Abrams, Vice President
- 44. Seattle First National Bank David B Goldstein, Esq.
- 45. Securities Industry Automation Corporation
- 46. Southern Pacific Communications Company John V. Kenney, Esq.
- 47. Sperry Rand Corporation, Sperry Univac Division Frank M. Lesher, Esq.
- 48. Stanford Research Institute Lloyd I. Krause
- 49. Telenet Communications Corporation Philip M. Walker, Esq.
- 50. Tele-Sciences Corporation Fred W. Morris, President
- 51. Thrift Transfer Services, Inc. Merrikay S. Hall, Esq.
- Allen R. Frischkorn, Jr., Esq. 52. TRT Telecommunications Corporation Roderick A. Mette, Esq.

F-3

INDIVIDUALS EXPRESSING CONCERNS TO FCC RE COMPUTER INQUIRY

- 53. Tymnet, Inc. William M. Combs, President
- 54. United Computer Systems, Inc. John O. Somers, Esq.
- 55. United States Independent Telephone Association Thomas J. O'Reilly, Esq.
- 56. United Systems Service, Inc., on behalf of the member companies of the United Telephone System
- 57. Utilities Telecommunications Council Charles M. Meehan, Esq.
- 58. David McCable 618 A Street, S.E., Apt. 4 Washington, D.C. 20003
 - b. <u>Gateway Investigation</u> Docket 19660
 - o FCC STAFF

- 59. Western Union International, Inc. Stephen C. Weingarten, Esq.
- 60. Western Union Telegraph Company Joel Yohalem, Esq.
- 61. The Annenberg School of Communications University of Southern California James H. Carlisle
- 62. U.S. Department of Justice Kenneth Robinson, Esq.
- 63. Xerox Corporation John L. Wheeler
- 64. Raymond Panko 808 Coleman Avenue, Apt. 12 Menlo Park, California 94025

65. Helene Bauman (Facilities)
66. Kent Nakamura (Tariff)
67. John Copes (International Division)

INDIVIDUALS EXPRESSING CONCERNS TO FCC RE GATEWAY INQUIRY

- 68. ITT World Communications, Inc. 72. Western Union International, Inc.
- 69. RCA Global Communications, Inc.
- 70. TRT Telecommunications, Inc.
- 71. COMSAT
 - c. MTS/WATS Inquiry Docket 21402 (78-72)
 - o <u>FCC STAFF</u>

76. Dan Harrold (Tariff)

- 73. Western Union Telegraph Company
- 74. American Satellite Corporation
- 75. Mobile Marine Radio, Inc.

- 77. ABC Broadcasting
- 78. CBS Broadcasting
- 79. NBC Broadcasting
- 80. American Petroleum Institute
- 81. American Trucking Association, Inc.
- 82. Telenet Communications Corp.
- 83. Ad Hoc Telecommunications Users Committee
- 84. Southern Pacific Communications Co.
- 85. Western Union Telegraph Co.
- 86. National Data Corporation
- 87. Committee of Corporate Telephone Users
- 88. American Bankers Association
- 89. Aeronautical Radio Inc. and Air Transport Association of America
- 90. National Retail Merchants Assoc.
- 91. Aerospace Industries Association of American
- 92. MCI Telecommunications Corporation
- 93. American Telephone & Telegram Co.
- 94. Administrator of General Services on behalf of Executive Agencies of the United States
- 95. 3M Corporation
- 96. American Motel and Hotel Association
- 97. Republic Distributors Inc.
- 98. Computerized Automotive Reporting Services Inc., Realtron Corporation, Roberts Advertising

- 99. Tele-communications Association
- 100. Pitney Bowes
- 101. Record Shack of Cleveland, Inc.
- 102. Campaign Communications Institute of America, Inc.
- 103. Congress of the United States, on behalf of House of Representatives
- 104. Army Times Publishing Company
- 105. Tri-Clover Division, Ladish Company
- 106. The Loading Service Company, Inc.
- 107. Poly-Tech
- 108. EMC Corporation
- 109. Peterbilt-Timpte of Wisconson, Inc.
- 110. Minneapolis Auto Equipment, Inc.
- 111. Ultimate Numbering Machine Service, Inc.
- 112. Our Own Hardware Company, Minnesota
- 113. Ramada Inn
- 114. Data 100 Corporation
- 115. Midwest/Northern, Inc., Minnesota "The Fun Food People"
- 116. Budget Motels and Hotels of America
- 117. Echo Communications, Inc.
- 118. Inventory Data Systems
- 119. Littrell Parts
- 120. Mountain Co., Inc. Mt. Rushmore Concession
- 121. Hanco, Bloomington, Minnesota
- 122. Associated School Supply Corporation Los Angeles, California

- 123. Century Communications Corp.
- 124. Jockey International
- 125. Steven Fabrics
- 126. Business and Institutional Furniture Company
- 127. Board of Commissioners Josephine County, Oregon
- 128. Chicago Cutlery Company
- 129. Imported Auto Parts
- 130. Palm Beach Beauty Products
- 131. National Communications Service Vienna, Virginia
- 132. M. Lowenstein & Sons, Inc. Rock Hill, South Carolina
- 133. Timoa Inns, Inc. Peoria, Illinois
- 134. Ohio Rural Electric Cooperatives Columbus, Ohio
- 135. Meredith Corporation Des Moines, Iowa
- 136. Seattle First National Bank
- 137. International Communication Management, Inc.
- 138. Supra Products, Inc. Salem, Oregon
- 139. Ellerbe Bloomington, Minnesota
- 140. American Family Insurance Group Madison, Wisconsin
- 141. Marquette Electronics, Inc. Milwaukee, Wisconsin
- 142. Lyon Brokerage Company, Inc. Minneapolis, Minnesota

- 143. Wiedemann Industries, Inc. Muscatine, Iowa
- 144. Oregon Shakespearean Festival Association
- 145. Broan Manufacturing Co., Inc. Hartford, Wisconsin
- 146. Parker Automotive Minneapolis, Minnesota
- 147. Ashland Oil, Inc. Telecommunications & Radio/ Electronics Division Ashland, Kentucky
- 148. Interstate Manufacturing and Supply Company Minneapolis, Minnesota
- 149. Quint Cities Ford Truck Sales Davenport, Iowa
- 150. Gary Van Zeeland Talent Inc.
- 151. Federal Financial Corporation
- 152. Grain Terminal Association
- 153. Harry and David Fine Food and Gifts, Oregon
- 154. Holmsten Ice Rinks, Inc.
- 155. Federal Financial Corporation
- 156. Elixir Industries
- 157. Amert Construction
- 158. The Travelers Insurance Companies
- 159. Mast Keystone
- 160. Bradley Automotive
- 161. The Service Auto Glass Company
- 162. Taylor Music
- 163. Omega Securities, Inc., Oregon
d. <u>TELEX/TWX Rate Inquiry</u> Docket 78-97

o FCC STAFF

164. Ken Levy Tariff Proceedings

INDIVIDUALS/ORGANIZATIONS EXPRESSING CONCERN IN TELEX/TWX INQUIRY 169. ITT World Communications Inc. 165. American Telephone & Telegraph 166. Western Union International Inc. 170. RCA Global Communications, Inc. 167. American Facsimile Systems 171. FTC Communications, Inc. 168. TRT Telecommunications Corp. e. Issue re domestic carriers (Graphnet and Telenet) competing in international marketplace INDIVIDUALS/ORGANIZATIONS EXPRESSING CONCERN IN DOMESTIC/INTERNATIONAL MARKETPLACE COMPETITION 172. RCA Global Communications, Inc. 175. Telenet Corporation 173. TRT Telecommunications Corp. 176. Western Union International 174. Graphnet Corporation INVOLVEMENT IN PMTS DEREGULATION II. THE CONGRESS OF THE 177. Lionel Van Deerlin, Rewrite of the Commu-UNITED STATES Calif., Chairman nications Act, HR 13015 Subcommittee on Communica-Members Titles I, III on Common Carrier Regulation tions of the Committee on 178. John M. Murphy, N.Y. 179. Charles Carney, Ohio Interstate and Foreign Commerce 180. Timothy Wirth, Colo. 181. Marty Russo, Ill. 182. Edward Markey, Mass. 183. Thomas Luken, Ohio 184. Albert Gore, Jr., Tenn. 185. Barbara Mikulski, Mo. 186. Henry A. Waxman, Calif. 187. Louis Frey, Jr., Fla. 188. W. Henson Moore, La. 189. Carlos Moorhead, Calif. 190. Marc L. Marks, Pa. 191. Samuel Devine, Ohio 192. Harley Staggers, W. Va.

o FCC Staff

General Rule Rewrite

193. Ruth Reel (Division)

INDIVIDUALS/ORGANIZATIONS WHICH HAVE TESTIFIED BEFORE SUBCOMMITTEE RE REWRITE OF TITLE I, III OF THE COMMUNICATIONS ACT

- 194. State of Alaska Robert M. Walp, Governor's Office of Telecommunications
- 195. GTE Automatic Electric, Inc. Theodore Brophy, Chairman
- 196. State of New York Charles Zielinski, Chairman Public Service Commission
- 197. Central Telephone & Utilities Corporation Robert P. Reuss, Chairman
- 198. American Telephone & Telegraph Richard R. Hough, Executive Vice President William M. Ellinghaus Vice Chairman
- 199. Communications Workers of America Glenn E. Watts, President
- 200. International Business Machines Wallace Doud, Vice President
- 201. Continental Telephone Corporation Charles Wohlstetter, Chairman
- 202. United Telecommunications, Inc. Paul H. Henson, Chairman
- 202. Satellite Business Systems Philip N. Whittaker, President
- 203. Telenet Communications Corporation Philip M. Walker, Vice President
- 204. U.S. Independent Telephone Association J. Philip Bigley, President
- 205. Organization for the Protection and Advancement of Small Telephone Companies (OPASTCO) Glen Bergland, Member, Board of Directors

- 206. MCI Communications Corporation William G. McGowan, Chairman
- 207. National Telephone Cooperative Association David C. Fullarton, Executive Vice President
- 208. Telecommunications Policy Task Force
- 209. Graphnet Systems, Inc. Edward Taptich, Esquire
- 210. North American Telephone Association James Lovell, President, Fisk Telephone Systems, Inc.
- 211. Computer and Business Equipment Manufacturers Association (CBEMA) Vico E. Henriques, President
- 212. Association of Data Processing Service Organizations, Inc. (ADAPSO) Fred S. Lafer, Vice President, Automatic Data Processing, Inc.
- 213. American Electronics Association Kenneth Oshman, President, Rolm Corporation
- 214. American Satellite Corporation Michael D. Campbell, Vice President
- 215. Independent Data Communications Manufacturers Association, Inc. (IDCMA) Arthur Carr, Member, Board of Directors
- 216. Scott Buttner Communications, Inc. Joel Effron, President
- 217. Teleprompter Corporation Cable Television Division

F-8

INDIVIDUALS/ORGANIZATIONS WHICH HAVE TESTIFIED BEFORE SUBCOMMITTEE RE REWRITE OF TITLE I, III OF THE COMMUNICATIONS ACT

- 218. University of Chicago Department of Economics Professor Dennis Carlton
- 219. Computer & Communications Industry 233. Central Station Electrical Pro-Association (CCIA) Philip S. Nyborg, V.P.
- 220. International Telephone and Telegraph Corporation (ITT) Frank P. Barnes, Senior V.P.
- 221. General Telephone and Electronics Corporation Dr. Lee L. Davenport V.P. and Chief Scientist
- 222. New Jersey Bell Telephone Co. Morris Tanenbaum, President
- 223. Bell Telephone Laboratory Ian Ross, Executive V.P.
- 224. Illinois Bell Telephone Company Charles Marshall, President
- 225. National Cable Television Assoc. Robert L. Schmidt, President
- 226. Tele-Communications Association Daniel L. Grove, President
- 227. International Communications Assoc. Westinghouse Electric Corporation Robert E. Bennis, Chairman
- 228. New York State Commission on Cable Television Thomas E. Ryan, Exec. Director
- 229. Community Antenna Television Assoc. Stephen R. Effros, Exec. Dir.
- 230. Securities Industry Automation Corporation (SIAC) Vincent Moore, Jr., Sr. V.P.
- 231. United Telephone Company Paul Brewer

- 232. National Burglar and Fire Alarm Association Joseph F. Duncan, President
- tection Association Richard Clark, President
- 234. Ad Hoc Committee on Competitive Telecommunications Herbert N. Jasper
- 235. National Data Corporation L. C. Whitney, President
- 236. National Federation of Local Cable Programmers David Hoke, Advocacy Committee Chairperson

FEDERAL GOVERNMENT STAFF TESTIFYING:

- 237. DEPARTMENT OF STATE Lee R. Marks, Deputy Legal Adviser
- 238. U.S. DEPARTMENT OF JUSTICE John H. Shenefield, Assistant Attorney General, Antitrust Div.

FCC STAFF TESTIFYING:

- 239. The Honorable Charles D. Ferris
- 240. Commissioner Lee
- 241. Commissioner Quello
- 242. Commissioner Washburn
- 243. Commissioner Fogarty
- 244. Commissioner White
- 245. Commissioner Brown

EXECUTIVE BRANCH STAFF TESTIFYING:

246. National Telecommunications and Information Administration The Honorable Henry Geller Assistant Secretary for Communications



APPENDIX G: FCC NEWS RELEASE ANNOUNCING END OF WESTERN UNION MONOPOLY AND CONDITIONAL APPROVAL OF GRAPHNET'S APPLICATION FOR DOMESTIC SERVICE (CC Docket Nos. 78-95-96)





Federal Communications Commission 1919 M Strest, NW. Washington, D.C. 20554



or recorded listing of releases and texts call 632-0002

For general information call 632-7260

Report No. 14735

ACTION IN DOCKET CASE

January 25, 1979 - CC

FCC ENDS WESTERN UNION TELEGRAM MONOPOLY; CONDITIONALLY APPROVES GRAPHNET'S APPLICATION FOR DOMESTIC SERVICE (CC DOCKET NOS. 78-95-96)

The Commission has determined that the public interest would be served by adoption of a policy of multiple entry into the domestic public message telegraph service field, historically the monopoly domain of the Western Union Telegraph Company.

The result of this decision is that the Western Union Telegraph Company (WU) will no longer have an FCC-granted monopoly in the provision of domestic telegraph service and that other carriers may apply to offer services similar to WU's. (In 1943 the Commission made a public interest finding and approved a merger between WU and the Postal Telegraph Company, which in effect gave WU a monopoly in the domestic public message service field.)

The Commission also granted the application of Graphnet Systems, Inc. to interconnect with International Record Carriers (IRCs) and deliver inbound international messages from the IRCs to locations within the United States on condition that Graphnet accepts the responsibility for delivery of the messages and that the IRCs do not bear the costs of the hinterland haul. A division of revenues arrangement and other like bona fide compensation for the hinterland haul are permissible.

> (There are five authorized gateways within the United States -- Miami, New York, New Orleans, San Francisco and Washington, D. C. -- where an IRC may pick up or deliver international telegraph messages. The hinterland is any domestic location other than the five authorized gateways.)

On March 9, 1978, the Commission began its inquiry to determine whether WU should retain its monopoly on telegraph services.

The action was the result of Graphnet's application to interconnect with any IRC and to deliver international public message domestically.

In setting the investigation, the Commission said Graphnet's application raised a number of policy issues in view of the fact that the FCC had never endorsed an open entry policy for domestic public message telegraph services. The issues included in the investigation were:

- -- Should domestic public telegraph service be provided on a sole source basis, free from competition?
- -- Assuming the market were to be opened to competition, should different regulatory standards and procedures be established than those that were designed to regulate WU's monopoly?
- -- Would the potential economic impact of competition on WU be contrary to the public interest?

At that time, the Commission held that until the inquiry was completed, it could not make the necessary findings to grant Graphnet's application. In its decision today, the Commission said it must first address the threshold question of whether Congress has given the FCC discretion to permit an end to WU's monopoly in the delivery of public message telegrams. It noted that Section 222 of the Communications Act is permissive and not mandatory, and the FCC was not required to approve the WU-Postal merger but was given discretionary authority to exempt it from the operation of the antitrust laws as follows:

> It shall be lawful, upon application to and approval by the Commission as hereinafter provided, for any two or more domestic telegraph carriers to effect a consolidation or merger.

Thus, it said, Section 222's focus was the antitrust laws and not limitation of entry in the future by others. Moreover, the Commission said the legislative history clearly manifested Congress's understanding that it was bestowing authority to take the WU-Postal merger out of the operation of the antitrust laws, and no more. It said Section 222 left telegraph carriers the option of merging or not merging; and its decision over the WU-Postal merger lest the same option for other carriers. Thus, the FCC found that neither Section 222 nor its decision approving the merger represented a policy determination that future entry or participation in domestic telegraphy would be foreclosed.

The Commission said telegram service has declined in importance both as a source of revenue to WU and a means of public communications. It said telegram service has evolved away from the traditional messengerdelivered yellow telegram, toward a system highly reliant on the telephone and other services outside the corporate control of WU.

WU's reliance on telephone acceptance is increasing, the FCC said, pointing out that the percentage of messages originated by telephone in 1971 was 44 percent. It said that currently some 64 percent of telegrams and cablegrams are originated at WU's three Centralized Telephone Bureaus. 14 percent at WU's public offices and agencies and 22 percent via WU's Telex and TWX terminals located on the customer's premises.

Telegraph revenues also are a decreasing portion of WU's total revenues, it said, noting that telegram revenues have fall from about 80 percent of WU's total revenues in 1947 to less than 10 percent in 1976. This has occurred, the FCC said, despite the growth of total operating revenues for WU from \$199.7 million to \$527.5 million during the same period.

It said the changes in the character of telegram usage and declining volume were intertwined with the increasing price of telegrams and the development of substitutes. It said some usage has shifted to telephone and the relative prices of the two services changed over time telephone becoming cheaper while telegrams become more expensive. Also, other record services have grown, taking portions of traffic which are not best handled on the telephone, the Commission said.

The Commission noted that there are many services to which public message telegraph traffic has been diverted, i.e., Telex, Mailgram, telephone company services such as private line telegraph and WATS, dataphone terminals, facsimile machines, nontariffed information processing and forwarding services, etc.

(over)

The FCC emphasized that nearly every new record service that has been developed since the merger has been oriented toward high-volume business users, adding that WU's monopoly has been a barrier to making these services available to the general public.

It noted that WU's argument for retention and expansion of its monopoly is premised on the belief that public message telegraph service cannot be profitable. However, the Commission said that technological innovation can make a previously unprofitable enterprise profitable by lowering the costs of the enterprise, or alternatively by increasing efficiency.

The Commission said in light of its previous decisions allowing competition in private line and domestic satellite services and allowing the resale of other services by a common carrier to a second entity for eventual service to the public, efficient low-cost substitute services have become available.

Taking all of this into consideration, the question was whether there was a vital public need for WU's telegraph service today that cannot be met by alternative sources of supply.

Because of the limited effect on WU's revenues and service, the fact that low-cost alternatives to WU's service can be developed, the fact that WU's service is in many ways limited, and because of the FCC's belief that there is an untapped demand for low-cost public record services, the Commission concluded that a public record or message service could be viable under conditions of competitive supply.

In spite of its confidence that the public would be served by allowing multiple entry in the public message telegraph market, the Commission said it would carefully and continuously monitor changes in the service and would focus on the entire record service field to determine changes (if any) in overall service available to the public.

It said its primary concern would be the level of aggregate service that is available to the public, adding that the effect on service rendered by any particular company was of concern only insofar as it has an impact on the <u>overall</u> level of service that is available to the public from all sources. The Commission noted that it would soon be proposing new rules to govern the public message service, including removing some of the restrictions on WU to make it easier for the company to adapt to competition.

The conditioned grant to Graphnet represents the first application of the Commission's policy of multiple entry in the PMS market. The public interest finding by the FCC concerning Western Union's monopoly removed a substantial legal barrier to Graphnet's entry -- the 1943 Merger Decision.

Equally important to Graphnet's application was the question whether the Commission's "Free Direct Access" policies governed Graphnet's proposed service. "Free Direct Access" refers to situations where the International Record Carriers (IRCs) absorb the cost of hinterland delivery from their authorized gateway cities. The Commission has banned such activity because it constituted an expansion of gateways without proper authorization. The Commission is reexamining its "Free Direct Access" policy in another proceeding, Docket 19660). The Commission found that the "Free Direct Access" policies are not applicable to hinterland delivery of telegraph messages by domestic PMTS carriers so long as these carriers accept responsibility for the telegraph messages involved and it is clear that the IRC is not bearing the cost of hinterland delivery. Now that multiple entry's authorized in domestic PMTS, Graphnet can operate in the same manner as Western Union. Since WU's delivery to the hinterland of IRC's messages is not an extension of their gateways, neither is service by Graphnet if similarly offered.

The Commission noted that it will review any tariffs filed by Graphnet to assure that there is no violation of its Free Direct Access policies.

Graphnet's application is also conditioned on the outcome of the Commission's inquiry concerning the monopoly provision of the Message Telecommunications Service (MTS) and Wide Area Telecommunications Service (WATS) by AT&T.

Action by the Commission January 25, 1979 by Memorandum Opinion and Order (FCC 79-42). Commissioner Ferris (Chairman), Lee, Quello, Washburn, Fogarty, White, and Brown. with Chairman Ferris issuing a separate statement.

_ _ _ _ _ _ _ _ _ _

This is an unofficial announcement of the Commission's action. Release of the full text of the Commission's order constitutes official action. See MCI v. FCC, 515 F. 2d 385 (D. C. Circ. 1975).

– FCC –

IN RE: Separate Statement of Chairman Charles D. Ferris Public Message Telegraph Inquiry (CC Docket Nos. 78-95 and 78-96)

I strongly endorse the Commission's decision today adopting a policy of open entry into the public message service market. I expect this competitive policy to lead to lower prices, innovative service offerings, and more rapid implementation of new technology in this area.

Public use of domestic telegrams has fallen dramatically since the end of World War II. The number of messages and the number of Western Union offices have exhibited parallel declines. The nature of the telegram has changed as well, with Western Union increasingly using the telephone network to accept telegrams and using unaffiliated messenger services to physically deliver them.

During the past 30 years, a number of substitutes of varying degree for telegram have also been developed and marketed. In fact, Western Union--with its Telex and Mailgram offerings--appears to have been its own most formidable competitor for telegram business.

We will soon initiate another proceeding concerning proposed rule changes for public message telegraph service carriers. My initial belief is that we should minimize government regulation of this market. I also look forward to the opportunity this proceeding will give us to examine to what degree--if at all-regulation is necessary or appropriate in this kind of competitive market. In addition, I currently believe that whatever the rules, they must apply equally to Western Union and the new entrants to insure that the resulting competition is fair. I will, of course, base my ultimate decision on the comments and evidence filed in that proceeding.

Finally, I intend to insure that the Commission monitors the effects of this policy change. This evaluation will be undertaken by staff of the Common Carrier Bureau in cooperation with the Experimental Technology Incentives Program (ETIP) of the National Bureau of Standards. This will enable the Commission to check its expectation of public benefits, based on today's reasoned judgment, against subsequent events in the marketplace.

BIBLIOGRAPHIC DATA	1. PUBLICATION OR REPORT NO.	2. Gov't. Accession	lo. 3. Recipient's Ac	cession No.			
SHEET	NBS TN 1104 Vol. 2						
TITLE AND SUBTITLE			5. Publication Da	ate 1070			
The FCC Public M An ETIP Evaluabi	6. Performing Org	6. Performing Organization Code					
Roland G. Weiss	, Sharon Kirby, The Urban NBS; Steve Watson, The	n Institute; Urban Institute	6. Performing Org	gan. Report No.			
PERFORMING ORGANIZATIO	N NAME AND ADDRESS		10. Project/Task/	Work Unit No.			
NATIONAL BUREAU OF S DEPARTMENT OF COMME WASHINGTON, DC 20234	TANDARDS The Urban The Urb	Institute , NW , DC 20037	11. Contract/Grant No. 7-35822				
2. SPONSORING ORGANIZATIO	IN NAME AND COMPLETE ADDRESS (Sta	reet, City, State, ZIP)	13. Type of Repor Interim	13. Type of Report & Period Covered Interim			
bane as above			14. Sponsoring Agency Code				
. SUPPLEMENTARY NUTES							
recent decision services to comp Effects Project described elsew	of the Federal Communica petition. It is one produ- of the Center for Field) here, is attempting to an	tions Commission uct of the Regul Methods (ETIP).	to open publ: atory Processo The broader p	ic message es and			
measuring wheth technological in The first two cl the setting in v industry trends Commission's man terms of regular chapter describe shows that there glossary of term separately.	dustrial innovation. The er the FCC policy change nnovation, and public ben hapters provide an introd which the decision occurs , and views held by vario hdate for regulation, pro tions and operations, and es the evaluation logic. e are many choices to be ns and bibliography are i	alyze the effect joint ETIP/FCC leads to increase efit. uction and synop in terms of his us observers. C cess for impleme current industr The last chapte made to target t ncluded. Seven	s of changes : project will : es in competif sis. Chapter : torical develo hapter IV des nting this man y status. Tho r is an assess he evaluation appendices ar	project, in regulator involve tion, III examines opments, cribes the: ndate in e fifth sment which . A e bound			
<pre>measuring wheth technological in The first two cl the setting in w industry trends Commission's man terms of regular chapter describe shows that there glossary of term separately.</pre> 7. KEY WORDS (six to twelve en separated by semicolons) assessment; eval Communications (technology innov	dustrial innovation. The er the FCC policy change nnovation, and public ben hapters provide an introd which the decision occurs , and views held by varion ndate for regulation, pro tions and operations, and es the evaluation logic. are many choices to be ns and bibliography are in nutries; elphabetical order; capitalize only Administrative experiment uation; Experimental Tech commission; regulatory exp vation; telecommunications	alyze the effect joint ETIP/FCC leads to increase efit. uction and synop in terms of his us observers. C cess for impleme current industr The last chapte made to target t ncluded. Seven the first letter of the first tation; economic nnology Incentive perimentation; res.	s of changes : project will : es in competit sis. Chapter : torical develo- napter IV des- nating this man y status. The r is an assess he evaluation appendices are deregulation; es Program; Fe egulatory poli	project, in regulator involve tion, III examines opments, cribes the: ndate in e fifth sment which . A e bound per name; ; evaluabilit ederal icy;			
 processes on The measuring whether technological in The first two of the setting in which industry trends Commission's man terms of regular chapter describe shows that there glossary of term separately. 7. KEY WORDS (six to twelve expension) assessment; eval Communications (Communications (Communica	dustrial innovation. The er the FCC policy change nnovation, and public ben hapters provide an introd which the decision occurs , and views held by varion ndate for regulation, pro tions and operations, and es the evaluation logic. are many choices to be ns and bibliography are in nuries; elphabetical order; capitalize only Administrative experiment uation; Experimental Tech commission; regulatory exp ration; telecommunications	alyze the effect joint ETIP/FCC leads to increase efit. uction and synop in terms of his us observers. C cess for impleme current industr The last chapte made to target t ncluded. Seven the first letter of the first tation; economic nnology Incentive perimentation; res. 19. SECUI (THIS	s of changes : project will : es in competit sis. Chapter : torical develo- napter IV des- nating this man y status. The r is an assess he evaluation appendices are deregulation; es Program; Fe egulatory poli RITY CLASS REPORT)	<pre>project, in regulator involve tion, III examines opments, cribes the: ndate in e fifth sment which . A e bound per name; ; evaluabilit ederal icy; 21. NO. OF PRINTED PAGE</pre>			
<pre>measuring whether technological in The first two cl the setting in w industry trends Commission's man terms of regular chapter describe shows that there glossary of term separately.</pre> 7. KEY WORDS (six to twelve en separated by semicolons) assessment; eval Communications (technology innov 8. AVAILABILITY	dustrial innovation. The er the FCC policy change nnovation, and public ben hapters provide an introd which the decision occurs , and views held by varion ndate for regulation, pro tions and operations, and es the evaluation logic. e are many choices to be ns and bibliography are in nuries; elphabetical order; capitalize only Administrative experiment uation; Experimental Tech Commission; regulatory exp ration; telecommunications	alyze the effect joint ETIP/FCC leads to increase efit. uction and synop in terms of his us observers. C cess for impleme current industr The last chapte made to target t ncluded. Seven the first letter of the first tation; economic nnology Incentive perimentation; res. 19. SECUI (THIS UNCL	s of changes : project will : es in competit sis. Chapter : torical develo- hapter IV des- nting this man y status. The r is an assess he evaluation appendices are deregulation; es Program; Fe egulatory poli RITY CLASS REPORT) ASSIFIED	project, in regulator involve tion, III examines opments, cribes the: ndate in e fifth sment which . A e bound per name; ; evaluabili ederal icy; 21. NO. OF PRINTED PAGE 110			
<pre>measuring whether technological in The first two cl the setting in w industry trends Commission's man terms of regular chapter describe shows that there glossary of term separately.</pre> 7. KEY WORDS (six to twelve en separately. 7. K	dustrial innovation. The er the FCC policy change nnovation, and public ben hapters provide an introd which the decision occurs , and views held by varion ndate for regulation, pro tions and operations, and es the evaluation logic. e are many choices to be ms and bibliography are in ntries; elphabetical order; capitalize only Administrative experiment uation; Experimental Tech commission; regulatory exp ration; telecommunications XX Unlimited Do Not Release to NTIS J.S. Government Printing Office, Washington -02117-2	alyze the effect joint ETIP/FCC leads to increase efit. uction and synop in terms of his us observers. C cess for impleme current industr The last chapte made to target t ncluded. Seven the first letter of the first tation; economic nnology Incentive perimentation; res. 19. SECUI (THIS UNCL 20. SECUI (THIS	s of changes : project will : es in competit sis. Chapter : torical develo- hapter IV des- nting this man y status. The r is an assess he evaluation appendices are deregulation; es Program; Fe egulatory poli RITY CLASS REPORT) ASSIFIED RITY CLASS PAGE)	<pre>project, in regulator involve tion, III examines opments, cribes the: ndate in e fifth sment which . A e bound per name; ; evaluabili ederal icy; 21. NO. OF PRINTED PAGE 110 22. Price</pre>			

USCOMM-DC



A typical plant can save about 20 percent of its fuel—just by installing waste heat recovery equipment. But with so much equipment on the market, how do you decide what's right for you?

Find the answers to your problems in the Waste Heat Management Guidebook, a new handbook from the Commerce Department's National Bureau of Standards and the Federal Energy Administration.

The Waste Heat Management Guidebook is designed to help you, the cost-conscious engineer or manager, learn how to capture and recycle heat that is normally lost to the environment during industrial and commercial processes.

The heart of the guidebook is 14 case studies of companies that have recently installed waste heat recovery systems and profited. One of these applications may be right for you, but even if it doesn't fit exactly, you'll find helpful approaches to solving many waste heat recovery problems. In addition to case studies, the guidebook contains information on:

- sources and uses of waste heat
- determining waste heat requirements
- economics of waste heat recovery
- commercial options in waste heat recovery equipment
- Instrumentation
- engineering data for waste heat recovery
- assistance for designing and installing waste heat systems

To order your copy of the *Waste Heat Management Guidebook,* send \$2.75 per copy (check or money order) to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. A discount of 25 percent is given on orders of 100 copies or more mailed to one address.

The Waste Heat Management Guidebook is part of the EPIC industrial energy management program aimed at helping industry and commerce adjust to the increased cost and shortage of energy.

U.S. DEPARTMENT OF COMMERCE/National Bureau of Standards FEDERAL ENERGY ADMINISTRATION/Energy Conservation and Environment



(please detach here)

SUBSCRIPTION ORDER FORM

Send Subscription to:

Enter my Subscription To DIMENSIONS/NBS at \$11.00. Add \$2.75 for foreign mailing. No additional postage is required for mailing within the United States or its possessions. Domestic remittances should be made either by postal money order, express money order, or check. Foreign remittances should be made either by international money order, draft on an American bank, or by UNESCO coupons.

				·	50																								Account No.
1													NAM	ME-F	IRST,	LAST												1	
		1		1			1	1				1																	
									СС	DMP/	ANY	NAN	AE O	R A	DDIT	ONA	L AE	DDRE	SS L	INE		 						٦	
																													MAIL ORDER FORM TO:
				_									STR	EET	ADD	RESS												٦	Superintendent of Documents
			_			1		1						L					1				1						Government Printing Office
Î						-		CITY	(5	STAT	E		Γ	Z	IP C	COD	E	٦	Washington, D.C. 20402
İ		1		1										1									L			1			
	LEA	SE	P	RIN	T																								

- Remittance Enclosed (Make checks payable to Superintendent of Documents)
- Charge to my Deposit Account No.



NBS TECHNICAL PUBLICATIONS

PERIODICALS

JOURNAL OF RESEARCH—The Journal of Research of the National Bureau of Standards reports NBS research and development in those disciplines of the physical and engineering sciences in which the Bureau is active. These include physics, chemistry, engineering, mathematics, and computer sciences. Papers cover a broad range of subjects, with major emphasis on measurement methodology, and the basic technology underlying standardization. Also included from time to time are survey articles on topics closely related to the Bureau's technical and scientific programs. As a special service to subscribers each issue contains complete citations to all recent NBS publications in NBS and non-NBS media. Issued six times a year. Annual subscription: domestic \$17.00; foreign \$21.25. Single copy, \$3.00 domestic; \$3.75 foreign.

Note: The Journal was formerly published in two sections: Section A "Physics and Chemistry" and Section B "Mathematical Sciences."

DIMENSIONS/NBS

This monthly magazine is published to inform scientists, engineers, businessmen, industry, teachers, students, and consumers of the latest advances in science and technology, with primary emphasis on the work at NBS. The magazine highlights and reviews such issues as energy research, fire protection, building technology, metric conversion, pollution abatement, health and safety, and consumer product performance. In addition, it reports the results of Bureau programs in measurement standards and techniques, properties of matter and materials, engineering standards and services, instrumentation, and automatic data processing.

Annual subscription: Domestic, \$11.00; Foreign \$13.75

NONPERIODICALS

Monographs—Major contributions to the technical literature on various subjects related to the Bureau's scientific and technical activities.

Handbooks—Recommended codes of engineering and industrial practice (including safety codes) developed in cooperation with interested industries, professional organizations, and regulatory bodies.

Special Publications—Include proceedings of conferences sponsored by NBS, NBS annual reports, and other special publications appropriate to this grouping such as wall charts, pocket cards, and bibliographies.

Applied Mathematics Series—Mathematical tables, manuals, and studies of special interest to physicists, engineers, chemists, biologists, mathematicians, computer programmers, and others engaged in scientific and technical work.

National Standard Reference Data Series—Provides quantitative data on the physical and chemical properties of materials, compiled from the world's literature and critically evaluated. Developed under a world-wide program coordinated by NBS. Program under authority of National Standard Data Act (Public Law 90-396). NOTE: At present the principal publication outlet for these data is the Journal of Physical and Chemical Reference Data (JPCRD) published quarterly for NBS by the American Chemical Society (ACS) and the American Institute of Physics (AIP). Subscriptions, reprints, and supplements available from ACS, 1155 Sixteenth St. N.W., Wash., D.C. 20056.

Building Science Series-Disseminates technical information developed at the Bureau on building materials, components, systems, and whole structures. The series presents research results, test methods, and performance criteria related to the structural and environmental functions and the durability and safety characteristics of building elements and systems. Technical Notes-Studies or reports which are complete in themselves but restrictive in their treatment of a subject. Analogous to monographs but not so comprehensive in scope or definitive in treatment of the subject area. Often serve as a vehicle for final reports of work performed at NBS under the sponsorship of other government agencies. Voluntary Product Standards-Developed under procedures published by the Department of Commerce in Part 10, Title 15, of the Code of Federal Regulations. The purpose of the standards is to establish nationally recognized requirements for products, and to provide all concerned interests with a basis for common understanding of the characteristics of the products. NBS administers this program as a supplement to the activities of the private sector standardizing organizations.

Consumer Information Series—Practical information, based on NBS research and experience, covering areas of interest to the consumer. Easily understandable language and illustrations provide useful background knowledge for shopping in today's technological marketplace.

Order above NBS publications from: Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

Order following NBS publications—NBSIR's and FIPS from the National Technical Information Services, Springfield, Va. 22161.

Federal Information Processing Standards Publications (FIPS PUB)—Publications in this series collectively constitute the Federal Information Processing Standards Register. Register serves as the official source of information in the Federal Government regarding standards issued by NBS pursuant to the Federal Property and Administrative Services Act of 1949 as amended, Public Law 89-306 (79 Stat. 1127), and as implemented by Executive Order 11717 (38 FR 12315, dated May 11, 1973) and Part 6 of Title 15 CFR (Code of Federal Regulations).

NBS Interagency Reports (NBSIR)—A special series of interim or final reports on work performed by NBS for outside sponsors (both government and non-government). In general, initial distribution is handled by the sponsor; public distribution is by the National Technical Information Services (Springfield, Va. 22161) in paper copy or microfiche form.

BIBLIOGRAPHIC SUBSCRIPTION SERVICES

The following current-awareness and literature-survey bibliographies are issued periodically by the Bureau:

Cryogenic Data Center Current Awareness Service. A literature survey issued biweekly. Annual subscription: Domestic, \$25.00; Foreign, \$30.00.

Liquefied Natural \overline{G}_{B5} . A literature survey issued quarterly. Annual subscription: \$20.00. Superconducting Devices and Materials. A literature survey issued quarterly. Annual subscription: \$30.00. Send subscription orders and remittances for the preceding bibliographic services to National Bureau of Standards, Cryogenic Data Center (736.00) Boulder, Colorado 80303. .

OFFICIAL BUSINESS

Penalty for Private Use, \$300

POSTAGE AND FEES PAID U.S. DEPARTMENT OF COMMERCE COM-215



SPECIAL FOURTH-CLASS RATE BOOK







