NBS TECHNICAL NOTE 1163

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

A Systems Programmer's Guide for Installing OMNITAB 80

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A Systems Programmer's Guide for Installing OMNITAB 80

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Contents

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Shirley G. Bremer and Sally T. Peavy

OMNITAB 80 is a general-purpose package which permits direct use of a computer without prior knowledge of computer languages. Every effort has been made to produce a system as computer independent as possible to make installation on any large computer configuration relatively easy.

This Technical Note provides assistance to the systems programmer, with the task of installing OMNITAB 80, by pointing out where difficulties may occur and how to resolve them. The Note is intended more as reference material, since all modifications for a particular configuration are made prior to the distribution of the OMNITAB 80 system.

OMNITAB 80 is a large system requiring a large computer. Overlay or segmentation is virtually essential. A method, that is employed at the National Bureau of Standards, for overlaying OMNITAB 80 is outlined. The method should be useful for other computer configurations.

Key words: ANSI FORTRAN; computer independent; double precision; general-purpose computer program; installation of OMNITAB 80; named common blocks; OMNITAB 80; overlay; segmentation; system parameters; transportable computer software.

OMNITAB 80 is a general-purpose interpretive system which permits direct use of a computer without a prior knowledge of computer languages. The OMNITAB 80 system allows users to utilize a computer to solve their problems in an effective and accurate manner.

OMNITAB was conceived by Joseph Hilsenrath in the early 1960's to permit scientists, engineers, and laboratory technicians the use of a large high-speed computer in the solution of their problems without the assistance of computer programmers. The system was developed and implemented further by his co-workers. Since 1968 the Statistical Engineering Division in the Center for Applied Mathematics has maintained and developed the OMNITAB system. OMNITAB 80 has been completely rewritten and expanded, while carefully maintaining the original spirit and philosophy. The current version is NBS OMNITAB 80 Version 6.

This paper is one of three which constitute the documentation for OMNITAB 80. A user's reference manual is given in Hogben et al. (1970), supplemented in Hogben et al. (1977) and soon to be revised. Test problems with results are given in Peavy et al. (1981). The material in this Note, without the introduction, is included with the distribution of OMNITAB 80 and is available from the Office of Standard Reference Data, A323 Physics Building, National Bureau of Standards, Washington, DC 20234. No attempt is made here to carefully define terms, such as worksheet, which are unique with OMNITAB 80. It is assumed the reader is familiar with Hogben et al. (1970) and (1977).

Extensive effort has been exerted to produce virtually computer independent procedures in order to make OMNITAB 80 transportable. The OMNITAB 80 system has been rewritten in a subset of American National Standards Institute (ANSI) FORTRAN and checked with the PFORT Verifier. Any ANSI FORTRAN statement, which can not be successfully compiled on a specific computer has been avoided. Output from OMNITAB 80 is in 120 character per line format. The maximum number of alphanumeric characters stored per variable has been limited to three. In some instances, the steps taken may have resulted in a loss of efficiency.

Most of the material in this Note, especially chapter 4, is intended as a reference, since the modifications listed are implemented according to the specifications requested by the recipient of the OMNITAB 80 system. However, if the systems programmer needs to make further changes or change the specifications requested at some later time, this paper should help answer most of questions that may arise. The only chapter the installer may have to pay any particular attention to is chapter 1, if overlay or segmentation is necessary for his or her computer configuration.

The OMNITAB 80 system is large and, therefore, overlay or segmentation may be necessary. Chapter 1 contains a structure chart of the overlay design used at the National Bureau of Standards' site. Careful attention was paid to the overlay in order to minimize the flip-flopping of segments in and out of the computer. Procedures executing the most frequently used commands are contained in the segment which is resident in the computer at all times. This

segment is in level 1 or the lowest level. Furthermore, procedures executing related commands, such as matrix or array commands, were grouped together in the same segment. In some cases, in order to solve the overlay problem, it was necessary to duplicate a procedure in another segment under a different procedure name. This was avoided as much as possible and was kept to a minimum. Overlay or segmentation techniques vary greatly with different computer operating systems, and this is one area the systems programmer may have to expend some effort in installing the OMNITAB 80 system, if overlay is needed.

Special attention and thought were given to make it easy to change pertinent system parameters for implementation on computers with different memory size, word length and logical input-output units. All input-output FORTRAN statements use an integer variable in referencing an I/O unit rather than a specific logical unit. These variables are defined in the BLOCK DATA DATA1 procedure and only this procedure needs modification if the present assigned values are not compatible with the user's particular computer configuration. There are a few instances where alphanumeric characters must be packed to the full capacity of the computer word (four characters per word are assumed). Again one needs to modify only the procedure PREPAK; see chapter 4, section 4B. These features have enabled systems programmers to successfully install the OMNITAB 80 system on many different large computers (e.g., Burroughs, CDC, DEC, GE, IBM, and UNIVAC) with a minimum of effort.

Needless to say, such a large-scale general-purpose system necessitates extensive documentation for the user as well as for the systems programmer installing OMNITAB 80. The purpose of the information presented in this publication is to assist in the installation process. As stated previously, most of the modifications are included in the OMNITAB 80 tape received, except for the overlay. However, readers experiencing difficulties in the installation of the OMNITAB 80 system are requested to report their problems so that improvements may be made and passed on to others.

The authors wish to acknowledge the valuable contributions of Dr. David Hogben, and the assistance of Mrs. Carla G. Messina and Mrs. Nancy Gogniat in the computerized phototypesetting of this Note.

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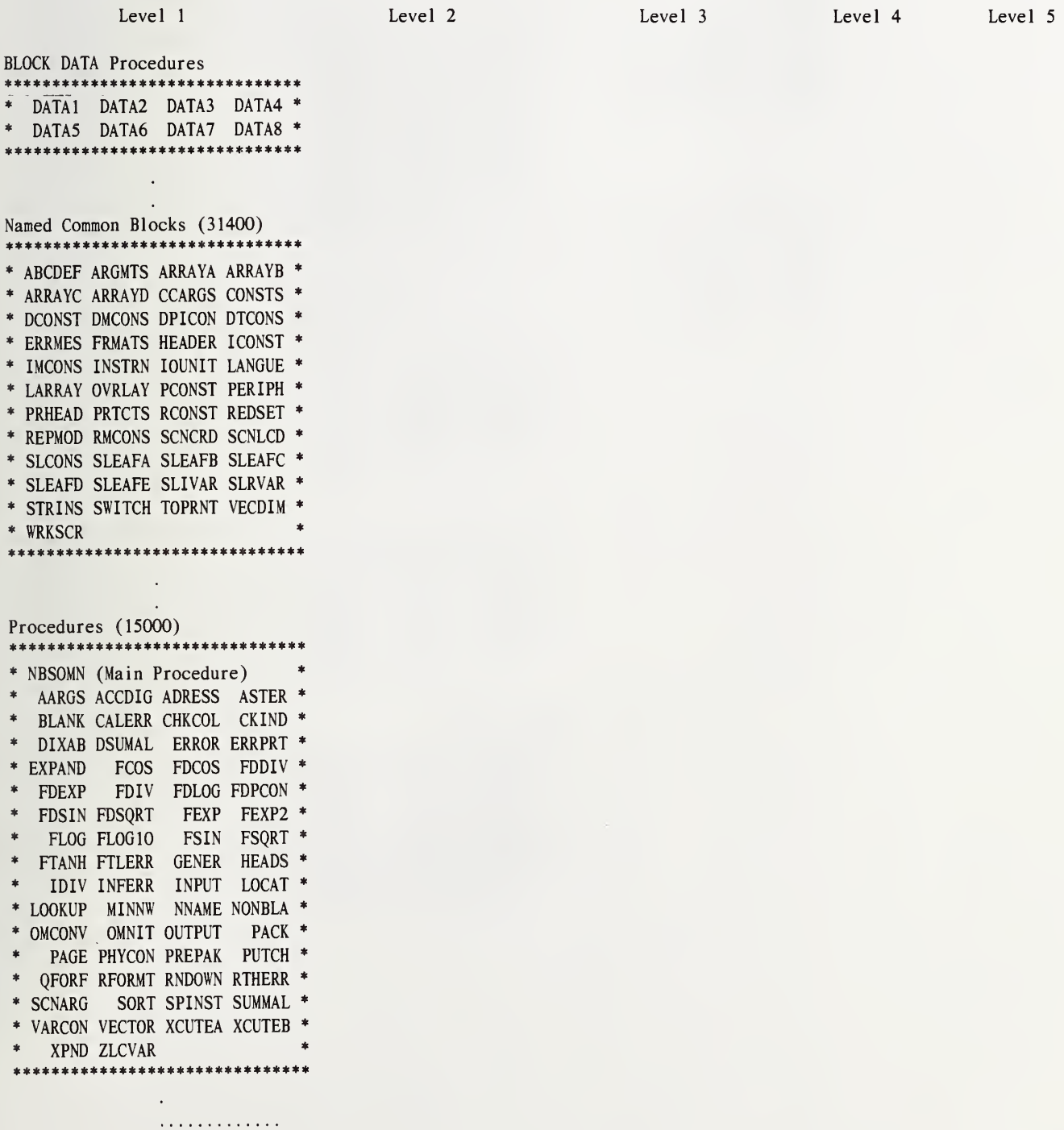
1. OMNITAB 80 OVERLAY STRUCTURE CHART

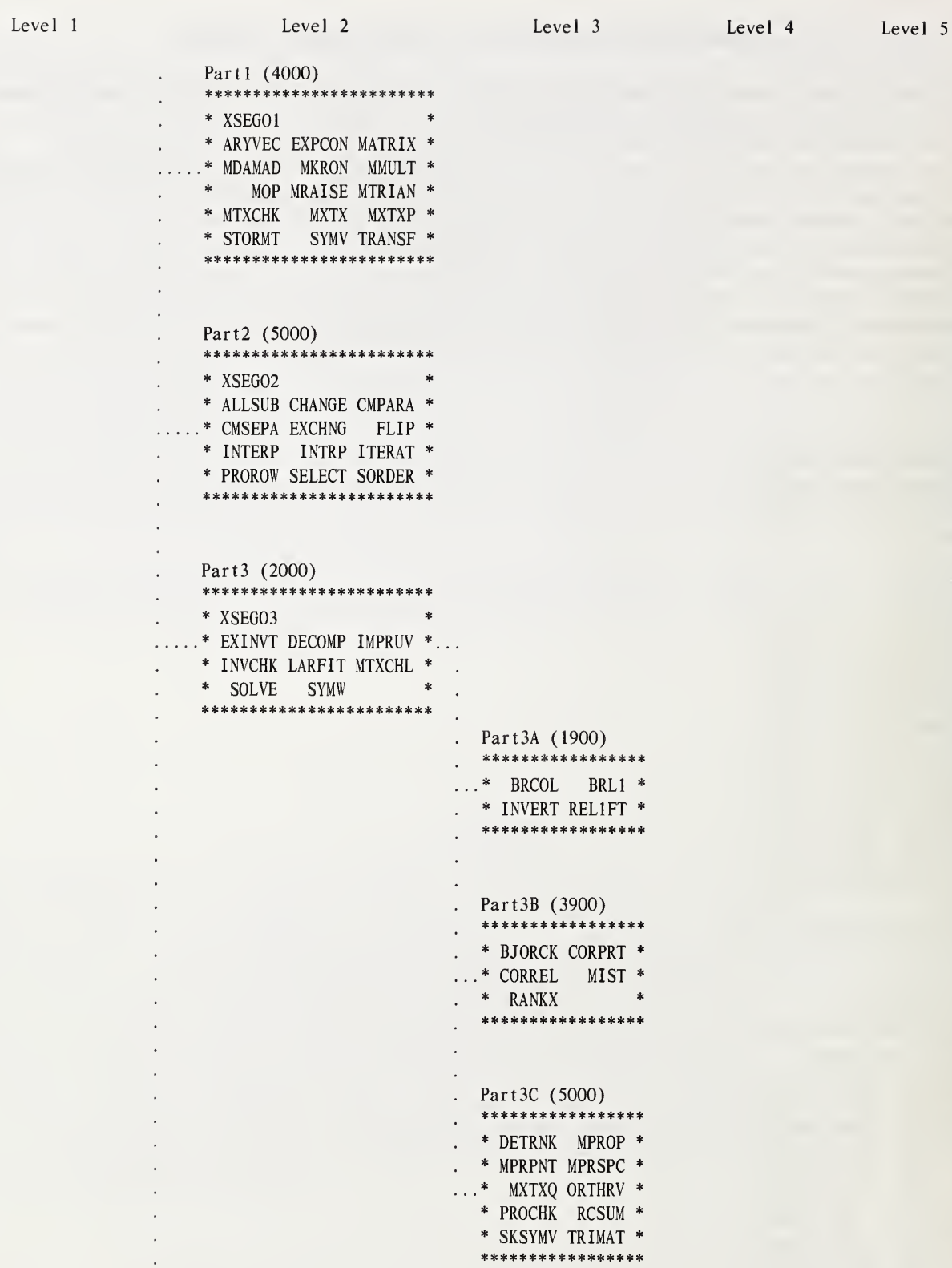
OMNITAB 80 is a very large system and thus may require segmentation or overlay. The overlay structure chart shows how sets of procedures may overlay one another. The chart, which has five levels of overlay, is read from top to bottom and from left to right. Procedures are grouped into parts.

The main segment contains all the parts of level 1, is resident in the computer at all times and must not be overlaid with any other part from higher levels. It consists of the most frequently used procedures, BLOCK DATA procedures, named common blocks, and procedures which are used by more than one part.

Parts in level 2 overlay each other and each part is appended to level 1. The same applies to parts in levels 3 through 5 and each part is appended to the immediate lower level.

The number enclosed in parentheses above each box indicates the approximate computer locations needed for that part or segment. It is assumed that a computer location is 36 binary bits long, and that a single precision floating point number and a computer instruction each occupy one computer location.




Level 1
Level 2
Level 3
Level 4
Level 5
Part1 (4000)
* XSEGO1 *
* ARYVEC EXPCON MATRIX *
* MDAMAD MKRON MMULT *
* MOP MRAISE MTRIAN *
* MTXCHK MXTX MXTXP *
* STORMT SYMV TRANSF *
Part2 (5000)
* XSEGO2 *
* ALLSUB CHANGE CMPARA *
* CMSEPA EXCHNG FLIP *
* INTERP INTRP ITERAT *
* PROROW SELECT SORDER *
Part3 (2000)
* XSEGO3 *
* EXINVT DECOMP IMPRUV *
* INVCHK LARFIT MTXCHL *
* SOLVE SYMW *
Part3A (1900)
* BRCOL BRL1 *
* INVERT REL1FT *
Part3B (3900)
* BJORCK CORPRT *
* CORREL MIST *
* RANKX *
Part3C (5000)
* DETRNK MPROP *
* MPRPNT MPRSPC *
* MXTXQ ORTHRV *
* PROCHK RCSUM *
* SKSYMV TRIMAT *

```
.    Part4 (6800)
.    ************************
.    * XSEG04               *
.    * ABRIDG APRINT FIXFLO *
.    * MTXCHM PCKFMT PRINTX *
.    * PRTABR PRTMNL  PUNCH *
.....*  READX REDATA  RESET *
.    * RPRINT    SET  SPACE *
.    *   STMT  UNITX UNXRDC *
.    * UNXSET UNXSPC UNXWRT *
.    * XFORMT  XHEAD        *
.    ************************
.
.
.    Part5 (6600)
.    ************************
.    * XSEG05               *
.    * COMPLX DEFINZ DIMENS *
.    *  ERASE EXTREM  GQUAD *
.....* KEYBRD  LABEL LABPNT *
.    *   LIST  MISC2   MOVE *
.    * MSCROW NOTEPR PDMOTE *
.    * SETUP  XSTOP         *
.    ************************
.
.
.    Part6 (5300)
.    ************************
.    * XSEG06               *
.    *  ARITH  BEGIN COMPIL *
.....*   EVAL EVALOM  FUNCT *
.    *    IFS LOCATE REPCHK *
.    * REPINC  STORE        *
.    ************************
.
.
.    Part7 (4100)
.    ************************
.    * XSEG07               *
.....* COALES MEIGEN MORTHO *
.    * MTXCHN   SYMX   TQL2 *
.    *  TRED2               *
.    ************************
.
.
.    Part8 (6400)
.    ************************
.    * XSEG08               *
.    * ATOMIC CVTDEG DIFFER *
.....*  GRAPH ONLPLT ONPLTB *
.    * ONPLTG ONPLTH  PRTDD *
.    * SCALE3 STREDD THERMO *
.    ************************
.
.
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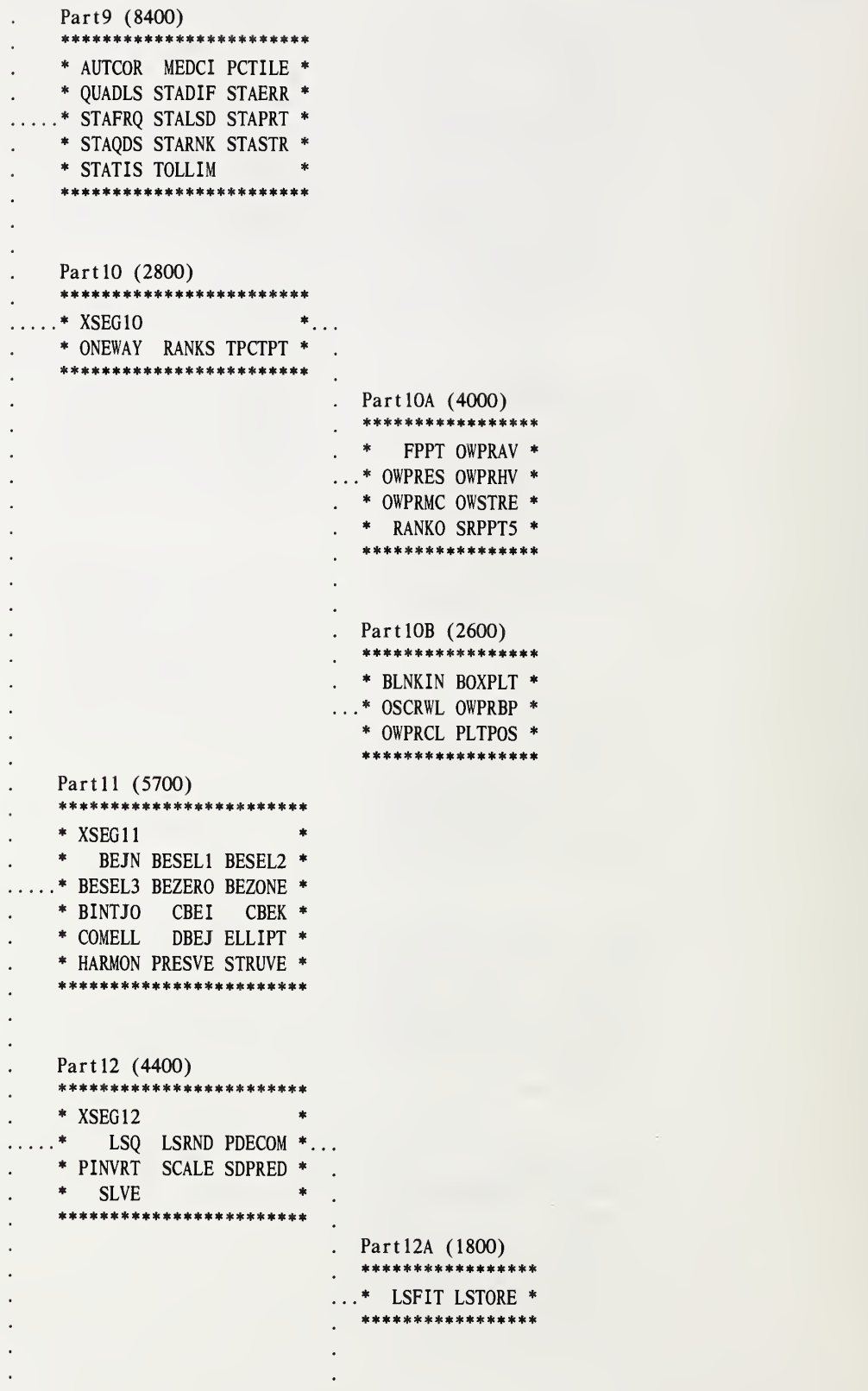
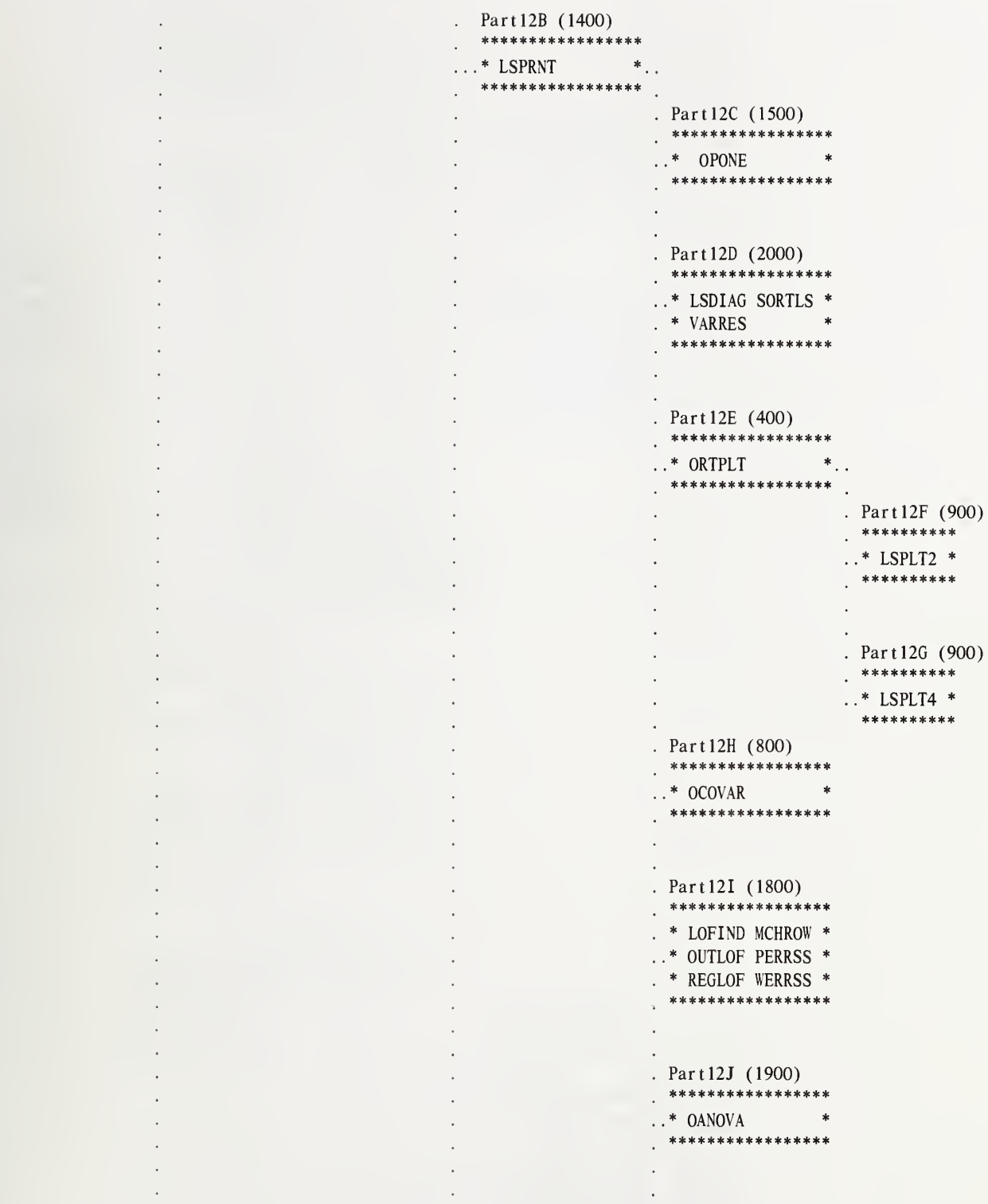

Part9 (8400)
* AUTCOR MEDCI PCTILE *
* QUADLS STADIF STAERR *
* STAFRQ STALSD STAPRT *
* STAQDS STARNK STASTR *
* STATIS TOLLIM *
Part10 (2800)
* XSEG10 *
* ONEWAY RANKS TPCTPT *
Part10A (4000)
* FPPT OWPRAV *
* OWPRES OWPRHV *
* OWPRMC OWSTRE *
* RANKO SRPPT5 *
Part10B (2600)
* BLNKIN BOXPLT *
* OSCRWL OWPRBP *
* OWPRCL PLTPOS *
Part11 (5700)
* XSEG11 *
* BEJN BESEL1 BESEL2 *
* BESEL3 BEZERO BEZONE *
* BINTJO CBEI CBEK *
* COMELL DBEJ ELLIPT *
* HARMON PRESVE STRUVE *
Part12 (4400)
* XSEG12 *
* LSQ LSRND PDECOM *
* PINVRT SCALE SDPRED *
* SLVE *
Part12A (1800)
* LSFIT LSTORE *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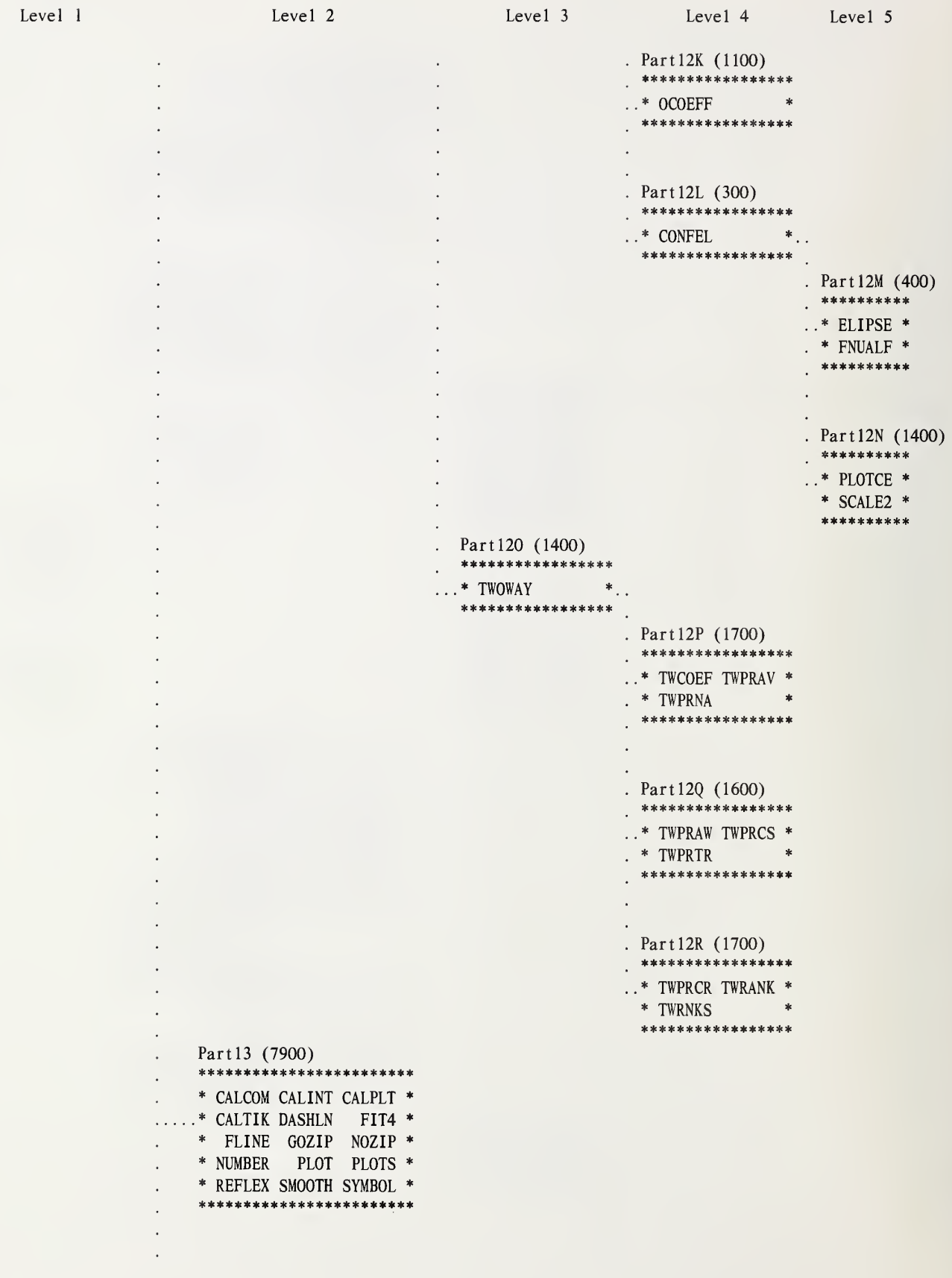
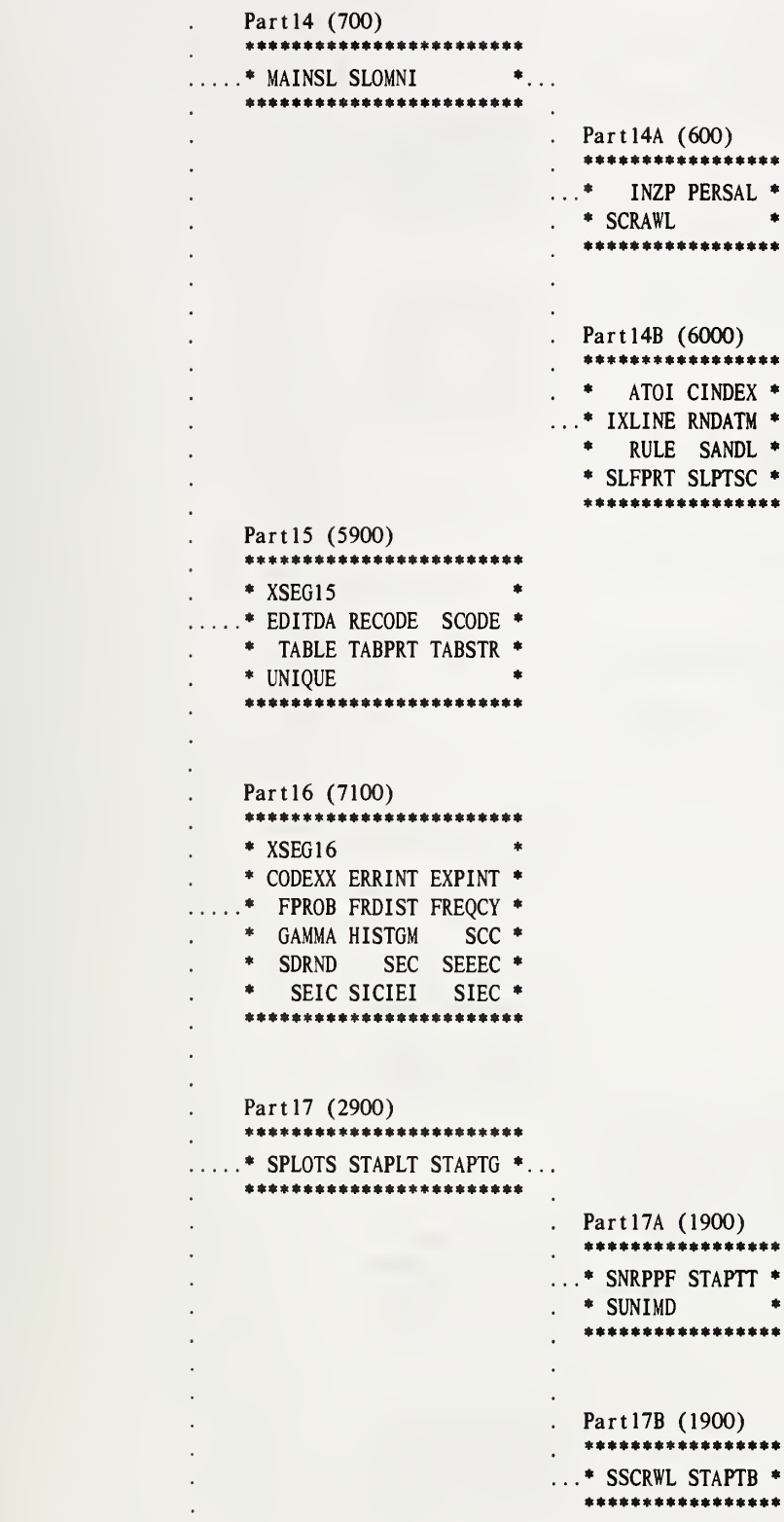
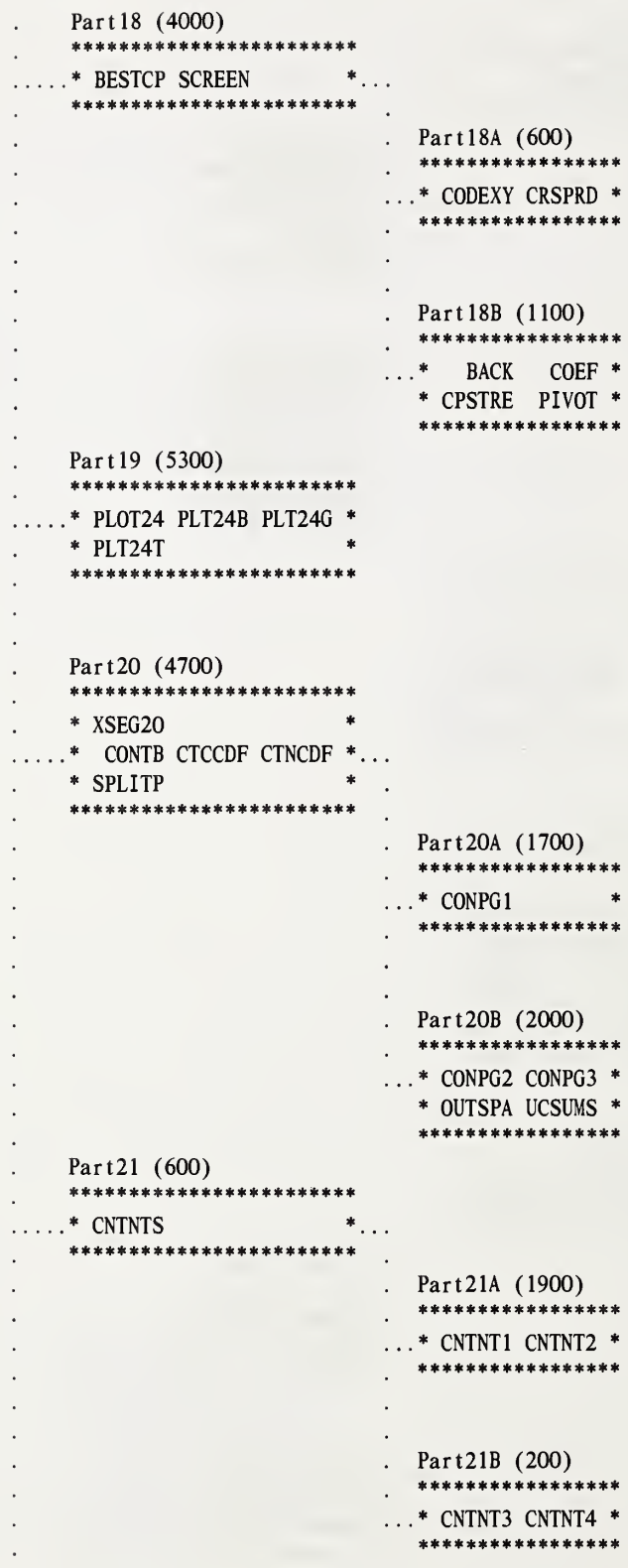
Level 2
Level 3
Level 4
Level 5
Part12B (1400)
* LSPRNT *
Part12C (1500)
* OPONE *
Part12D (2000)
* LSDIAG SORTLS *
* VARRES *
Part12E (400)
* ORTPLT *
Part12F (900)
* LSPLT2 *
Part12G (900)
* LSPLT4 *
Part12H (800)
* OCOVAR *
Part12I (1800)
* LOFIND MCHROW *
* OUTLOF PERRSS *
* REGLOF WERRSS *
Part12J (1900)
* OANOVA *


Level 1
Level 2
Level 3
Level 4
Level 5
Part12K (1100)
* OCOEFF *
Part12L (300)
* CONFEL *
Part12M (400)
* ELIPSE *
* FNUALF *
Part12N (1400)
* PLOTCE *
* SCALE2 *
Part120 (1400)
* TWOWAY *
Part12P (1700)
* TWCOEF TWPRAV *
* TWPRNA *
Part12Q (1600)
* TWPRAW TWPRCS *
* TWPRTR *
Part12R (1700)
* TWPRCR TWRANK *
* TWRNKS *
Part13 (7900)
* CALCOM CALINT CALPLT *
* CALTIK DASHLN FIT4 *
* FLINE GOZIP NOZIP *
* NUMBER PLOT PLOTS *
* REFLEX SMOOTH SYMBOL *


Part14 (700)
* MAINSL SLOMNI *
Part14A (600)
* INZP PERSAL *
* SCRAWL *
Part14B (6000)
* ATOI CINDEX *
* IXLINE RNDATM *
* RULE SANDL *
* SLFPRT SLPTSC *
Part15 (5900)
* XSEG15 *
* EDITDA RECODE SCODE *
* TABLE TABPRT TABSTR *
* UNIQUE *
Part16 (7100)
* XSEG16 *
* CODEXX ERRINT EXPINT *
* FPROB FRDIST FREQCY *
* GAMMA HISTGM SCC *
* SDRND SEC SEEEC *
* SEIC SICIEI SIEC *
Part17 (2900)
* SPLOTS STAPLT STAPTG *
Part17A (1900)
* SNRPPF STAPTT *
* SUNIMD *
Part17B (1900)
* SSCRWL STAPTB *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* BESTCP SCREEN *
Part18A (600)
* CODEXY CRSPRD *
Part18B (1100)
* BACK COEF *
* CPSTRE PIVOT *
Part19 (5300)
* PLOT24 PLT24B PLT24G *
* PLT24T *
Part20 (4700)
* XSEG20 *
* CONTB CTCCDF CTNCDF *
* SPLITP *
Part20A (1700)
* CONPG1 *
Part20B (2000)
* CONPG2 CONPG3 *
* OUTSPA UCSUMS *
Part21 (600)
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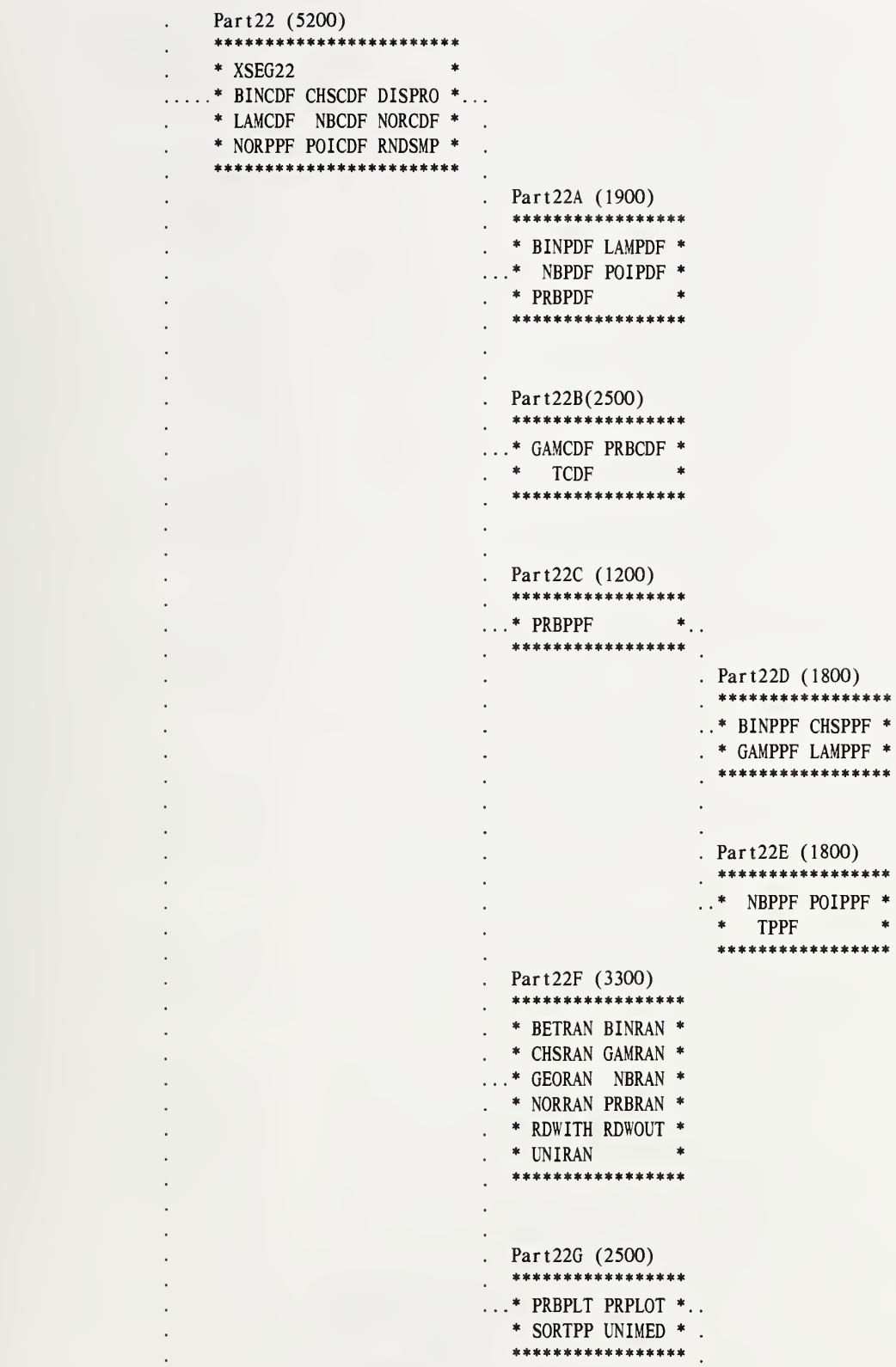
Part21B (200)
* CNTNT3 CNTNT4 *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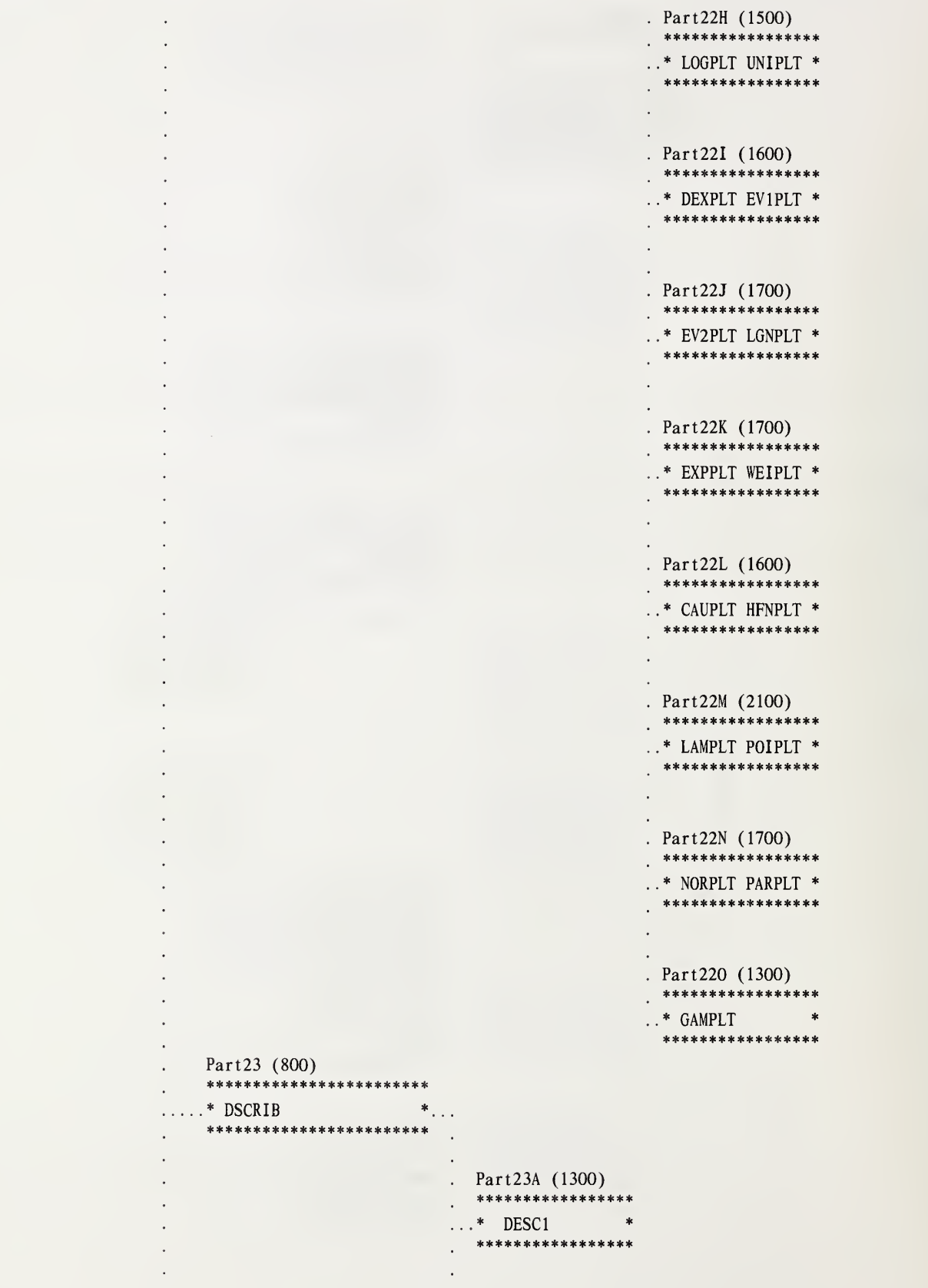
Part22 (5200)
* XSEG22 *
* BINCDF CHSCDF DISPRO *
* LAMCDF NBCDF NORCDF *
* NORPPF POICDF RNDSMP *
Part22A (1900)
* BINPDF LAMPDF *
* NBPDF POIPDF *
* PRBPDF *
Part22B(2500)
* GAMCDF PRBCDF *
* TCDF *
Part22C (1200)
* PRBPPF *
Part22D (1800)
* BINPPF CHSPPF *
* GAMPPF LAMPPF *
Part22E (1800)
* NBPPF POIPPF *
* TPPF *
Part22F (3300)
* BETRAN BINRAN *
* CHSRAN GAMRAN *
* GEORAN NBRAN *
* NORRAN PRBRAN *
* RDWITH RDWOUT *
* UNIRAN *
Part22G (2500)
* PRBPLT PRPLOT *
* SORTPP UNIMED *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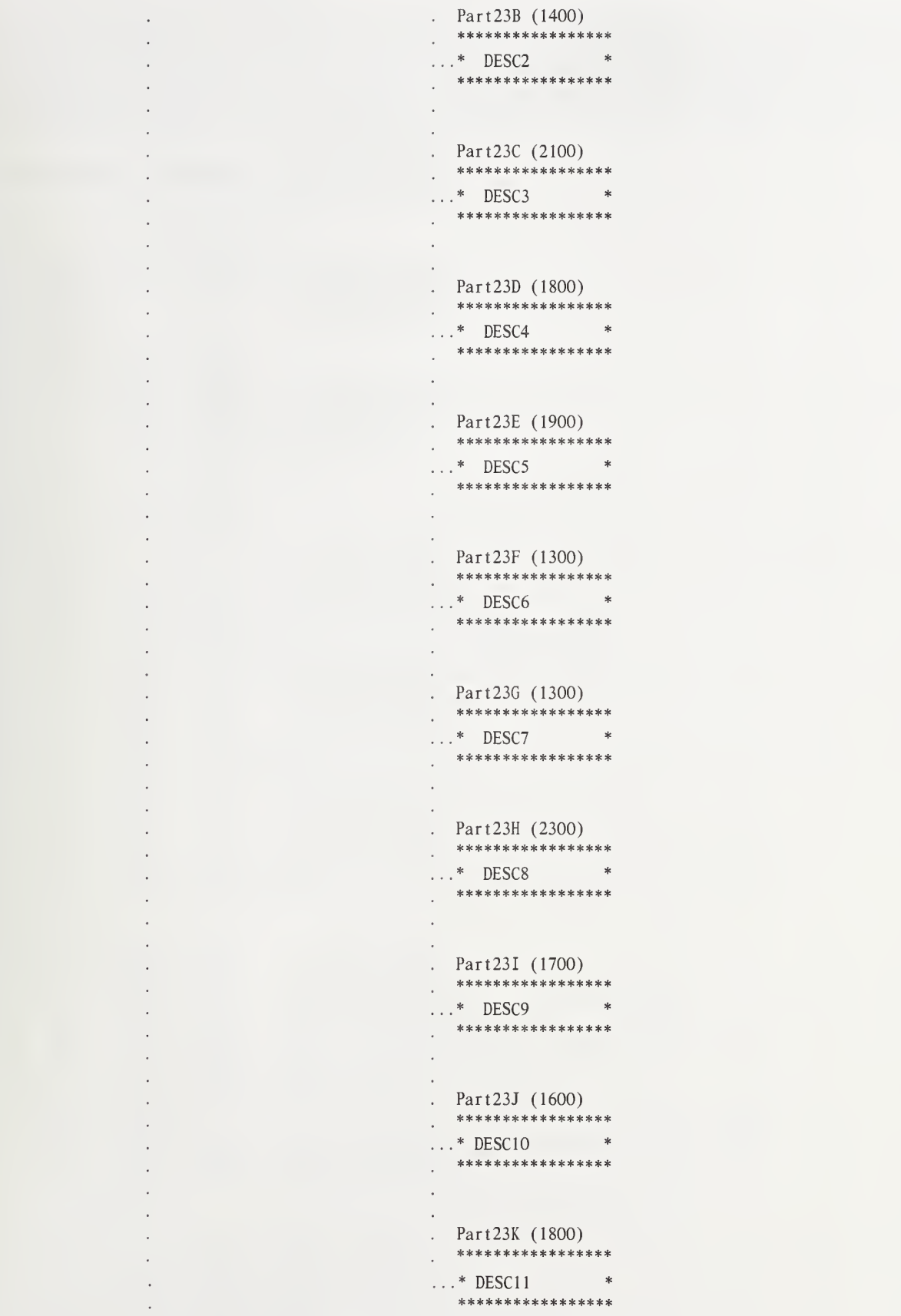
Part22I (1600)
* DEXPLT EV1PLT *
Part22J (1700)
* EV2PLT LGNPLT *
Part22K (1700)
* EXPPLT WEIPLT *
Part22L (1600)
* CAUPLT HFNPLT *
Part22M (2100)
* LAMPLT POIPLT *
Part22N (1700)
* NORPLT PARPLT *
Part220 (1300)
* GAMPLT *
Part23 (800)
* DSCRIB *
Part23A (1300)
* DESC1 *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DESC3
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DESC5
Part23F (1300)
DESC6
Part23G (1300)
DESC7
Part23H (2300)
DESC8
Part23I (1700)
DESC9
Part23J (1600)
DESC10
Part23K (1800)
DESC11


Part24 (2800)
* CONVRT ISORT LANGUA *
* MVELNG STRLNG *
Part24A (500)
* ENGLSH *
Part24B (1000)
* FRENCH GERMAN *
Part24C (1000)
* ITALAN SPANSH *
Part24D (1000)
* DANISH NORWEG *
Part24E (1000)
* JAPANE YUGOSL *
Part24F (1000)
* DUTCH PORTUG *
Part24G (1000)
* SLOVEN SWEDSH *

2. CROSS REFERENCE OF PROCEDURES

Frequently it is necessary to comprehend the interrelationship between procedures. This is particularly true if the overlay structure to be implemented is drastically different from the one described in the previous chapter. The cross referencing is given in three sections. The first section lists the procedure and all the procedures it references. The second section lists the procedure and all the procedures referencing that particular procedure. The third section lists the intrinsic FORTRAN functions used by OMNITAB 80 procedures and the procedures referencing the functions.

2A. Procedures and External References to Other Procedures

```
Procedure        External References

 AARGS:  ERROR,   FDIV,  FEXP2
ABRIDG: CHKCOL,  ERROR,   PAGE, PREPAK, RFORMT, RPRINT
ACCDIG: FLOG10
ADRESS:  ERROR
ALLSUB: ADRESS,  ERROR,   FDIV
APRINT:  CKIND,  ERROR, MTXCHM,   PAGE, PREPAK, RFORMT
 ARITH: ACCDIG, ADRESS,  ERROR,   FDIV,  FEXP2
ARYVEC:  CKIND, DSUMAL,  ERROR, FDPCON, MTXCHK
 ASTER:  AARGS,  NNAME, NONBLA, PHYCON, VARCON
  ATOI:  IDIV
ATOMIC: ADRESS,  CKIND,  ERROR,   IDIV
AUTCOR:   FDIV,  FSQRT, SUMMAL
  BACK:  FDIV
 BEGIN:  ERROR
  BEJN:  ERROR,  FDDIV
BESEL1: ADRESS,   DBEJ,  ERROR,  FDDIV,  FDEXP,   IDIV
BESEL2: ADRESS,   CBEI,   CBEK,  ERROR,  FDCOS,  FDDIV,  FDEXP,   IDIV
BESEL3: ADRESS,   BEJN, BEZERO, BEZONE, BINTJO,   DBEJ,  ERROR,  FDDIV
BESTCP: ADRESS, CHKCOL, CRSPRD,  ERROR,  HEADS,   IDIV,   PAGE, SCREEN
BETRAN:   FDIV, GAMRAN
BEZERO:  FDDIV, FDSQRT,   IDIV
BEZONE:  FDDIV, FDSQRT,   IDIV
BINCDF: DSUMAL,  FDDIV,   FDIV, FDPCON, FDSQRT,   IDIV
BINPDF:  FDDIV, FDPCON
BINPPF: BINCDF, FDPCON,  FSQRT,   IDIV, NORPPF
BINRAN: GEORAN, UNIRAN
BINTJO:   BEJN,   DBEJ,  FDDIV
BJORCK: DSUMAL,  FDDIV, FDPCON, FDSQRT
BOXPLT: BLNKIN,   IDIV
 BRCOL: FDPCON
  BRL1:  BRCOL,   FDIV, SUMMAL
CALCOM: ADRESS,  ERROR,   IDIV
CALINT: CALCOM, CALPLT
CALPLT: CALTIK, DASHLN,   FDIV,  FLINE,  GOZIP,  NOZIP,   PLOT,  PLOTS, SMOOTH
CALTIK:  ERROR,   FDIV, NUMBER,   PLOT, RFORMT, SYMBOL
CAUPLT:  ERROR,   FCOS,   FDIV,   FSIN,  FSQRT, PRPLOT, RFORMT, SORTPP, SUMMAL, UNIMED
  CBEI:  FDCOS,  FDDIV,  FDEXP,  FDSIN, FDSQRT
  CBEK:  ERROR,  FDCOS,  FDDIV,  FDEXP,  FDLOG,  FDSIN, FDSQRT
CHKCOL: ADRESS,  ERROR
CHSCDF: DSUMAL,  FDDIV,  FDEXP,   FDIV,  FDLOG, FDPCON, FDSQRT,  FSQRT,   IDIV, NORCDF
CHSPPF: DSUMAL,  FDDIV,  FDEXP,   FDIV,  FDLOG, FDPCON
CHSRAN: NORRAN, SUMMAL
CINDEX:   ATOI,   IDIV
CMPARA:   FDIV
CMSEPA: CHKCOL,  CKIND, CMPARA,  ERROR,   IDIV
CNTNTS: CNTNT1, CNTNT2, CNTNT3, CNTNT4,  ERROR,   IDIV
COALES:  CKIND,  ERROR,   FDIV, SUMMAL
CODEXX: DSUMAL,  FDDIV, FDPCON, FDSQRT
CODEXY: DSUMAL,  FDDIV, FDPCON, FDSQRT
  COEF:   FDIV,  PIVOT, RFORMT
```

Procedure	External References
COMELL:	ERROR, FDDIV, FDLOG, FDSQRT
COMPIL:	ERROR, EVAL
COMPLX:	ADRESS, ERROR, FDCOS, FDDIV, FDPCON, FDSIN, FDSQRT
CONFEL:	ELIPSE, FNUALF, PLOTCE, SUMMAL
CONPG1:	FLOG10, IDIV, MINNW, PAGE, PUTCH, RFORMT
CONPG2:	IDIV, PAGE
CONPG3:	ERROR, FDIV
CONTB:	ADRESS, CKIND, CONPG1, CONPG2, CONPG3, CTCCDF, DSUMAL, ERROR, FDIV, FDLOG, FSQRT, IDIV, SUMMAL
CONVRT:	IDIV
CORPRT:	BJORCK, ERROR, FDIV, FLOG, FSQRT, FTANH, IDIV, MIST, PAGE, QFORF
CORREL:	CHKCOL, CORPRT, ERROR, FDIV, FSQRT, IDIV, INVCHK, QFORF, RANKX, SUMMAL
CRSPRD:	CODEXY, FDPCON
CTCCDF:	DSUMAL, FDDIV, FDEXP, FDIV, FDLOG, FDPCON, FDSQRT, FSQRT, IDIV, NORCDF
CTNCDF:	FDIV, FEXP
CVTDEG:	ADRESS, ERROR, FDIV, VECTOR
DANISH:	MVELNG
DASHLN:	FSQRT, PLOT, WHERE
DBEJ:	FDCOS, FDDIV, FDEXP, FDLOG, FDSIN, FDSQRT, IDIV
DECOMP:	FDIV
DEFINZ:	ADRESS, ERROR, VECTOR
DESC1:	ERROR
DESC10:	ERROR
DESC11:	ERROR
DESC2:	ERROR
DESC3:	ERROR
DESC4:	ERROR
DESC5:	ERROR
DESC6:	ERROR
DESC7:	ERROR
DESC8:	ERROR
DESC9:	ERROR
DETRNK:	FDIV
DEXPLT:	ERROR, FDIV, FLOG, FSQRT, PRPLOT, RFORMT, SORTPP, SUMMAL, UNIMED
DIFFER:	ADRESS, ERROR, FDIV, IDIV, PRTDD, STREDD
DIMENS:	ERROR
DISPRO:	ERROR, PRBCDF, PRBPDF, PRBPLT, PRBPPF, PRBRAN
DIXAB:	FDDIV, FDEXP, FDIV, FDLOG
DSCRIB:	DESC1, DESC10, DESC11, DESC2, DESC3, DESC4, DESC5, DESC6, DESC7, DESC8, DESC9, ERROR, LOOKUP
DSUMAL:	IDIV
DUTCH:	MVELNG
EDITDA:	CHKCOL, ERROR, IDIV
ELIPSE:	FDIV, FSQRT
ELLIPT:	ADRESS, COMELL, ERROR, FDPCON
ENGLSH:	MVELNG
ERASE:	CHKCOL, ERROR, VECTOR
ERRINT:	FDDIV, FDEXP
ERROR:	ERRPRT, RNDOWN
ERRPRT:	CALERR, FTLERR, INFERR, RTHERR
EVAL:	ERROR, FCOS, FDIV, FEXP, FLOG, FSIN, FSQRT, FTANH
EVALOM:	ADRESS, BLANK, COMPIL, ERROR, NONBLA
EV1PLT:	ERROR, FDIV, FLOG, FSQRT, PRPLOT, RFORMT, SORTPP, SUMMAL, UNIMED
EV2PLT:	ERROR, FDIV, FLOG, FSQRT, PRPLOT, RFORMT, SORTPP, SUMMAL, UNIMED
EXCHNG:	ADRESS, ERROR, IDIV
EXINVT:	CORREL, INVERT, MPROP
EXPAND:	ERROR, XPND
EXPCON:	CKIND, ERROR, MTXCHK
EXPINT:	ERROR, FDDIV, FDEXP, FDLOG
EXPPLT:	ERROR, FDIV, FLOG, FSQRT, PRPLOT, RFORMT, SORTPP, SUMMAL, UNIMED
EXTREM:	CHKCOL, ERROR, VECTOR

Procedure	External References
FCOS:	ERROR
FDCOS:	ERROR
FDEXP:	ERROR
FDLOG:	ERROR
FDSIN:	ERROR
FDSQRT:	ERROR
FEXP:	ERROR
FEXP2:	ERROR, FEXP, FLOG
FIT4:	FSQRT, PLOT, WHERE
FIXFLO:	ERROR, IDIV
FLINE:	FIT4, PLOT, REFLEX, SYMBOL, WHERE
FLIP:	CHKCOL, ERROR, IDIV
FLOG:	ERROR
FLOG10:	ERROR
FNUALF:	FDIV
FPPT:	FDIV, FEXP, FSQRT, QFORF, TPCTPT
FPROB:	ADRESS, ERROR, QFORF
FRDIST:	ADRESS, ERROR, FREQCY
FRENCH:	MVELNG
FREQCY:	FDIV, FLOG10
FSIN:	ERROR
FSQRT:	ERROR
FUNCT:	ADRESS, ERROR, FCOS, FDIV, FEXP, FLOG, FLOG10, FSIN, FSQRT, FTANH, VECTOR
GAMCDF:	DSUMAL, FDDIV, FDEXP, FDLOG, FDPCON
GAMMA:	DSUMAL, ERROR, FDDIV, FDPCON
GAMPLT:	ERROR, FDDIV, FDEXP, FDIV, FDLOG, FEXP, FLOG, FSQRT, PRPLOT, RFORMT, SORTPP, SUMMAL, UNIMED
GAMPPF:	DSUMAL, FDDIV, FDEXP, FDLOG, FDPCON
GAMRAN:	FDIV, FLOG, FSQRT, NORRAN, UNIRAN
GENER:	ADRESS, ERROR, FDPCON
GEORAN:	FDIV, FLOG, UNIRAN
GERMAN:	MVELNG
GQUAD:	ADRESS, ERROR, FDDIV, FDPCON
GRAPH:	ERROR, SCALE3
HARMON:	ADRESS, ERROR, FCOS, FDIV, FSIN, IDIV
HEADS:	IDIV, PREPAK
HFNPLT:	ERROR, FDIV, FSQRT, NORPPF, PRPLOT, RFORMT, SORTPP, SUMMAL, UNIMED
HISTGM:	ADRESS, ERROR, FDIV, FLOG10, HEADS, IDIV, PAGE, RFORMT
IFS:	ADRESS, ERROR, FDIV
IMPRUV:	DSUMAL, FDIV, FDPCON, FLOG10, SOLVE
INPUT:	IDIV, OMCONV
INTERP:	CHKCOL, CKIND, ERROR, FDIV, FSQRT, INTRP
INTRP:	FDIV, IDIV
INVCHK:	DECOMP, FDIV, FSQRT, IMPRUV, SOLVE
INVERT:	ADRESS, CKIND, ERROR, INVCHK, MTXCHL
ISORT:	IDIV
ITALAN:	MVELNG
ITERAT:	CHKCOL, ERROR, FDIV, IDIV
JAPANE:	MVELNG
KEYBRD:	ERROR, IDIV, PRTCA
LABEL:	AARGS, ERROR, LABPNT, LOCAT, NONBLA, PREPAK
LABPNT:	ERROR, IDIV
LAMCDF:	FDIV, FEXP
LAMPDF:	FDIV, LAMCDF
LAMPLT:	ERROR, FDIV, FLOG, FSQRT, PRPLOT, RFORMT, SORTPP, SUMMAL, UNIMED
LAMPPF:	FDIV, FLOG
LANGUA:	CONVRT, DANISH, DUTCH, ENGLSH, ERROR, FRENCH, GERMAN, IDIV, ISORT, ITALAN, JAPANE, NORWEG, PAGE, PORTUG, SLOVEN, SPANSH, STRLNG, SWEDSH, YUGOSL
LARFIT:	BRL1, CHKCOL, ERROR, REL1FT
LGNPLT:	ERROR, FDIV, FEXP, FSQRT, NORPPF, PRPLOT, RFORMT, SORTPP, SUMMAL, UNIMED

Procedure	External References
LOFIND:	MCHROW
LOGPLT:	ERROR, FDIV, FLOG, FSQRT, PRPLOT, RFORMT, SORTPP, SUMMAL, UNIMED
LOOKUP:	IDIV
LSDIAG:	ADRESS, ERROR, FDIV, FSQRT, PAGE, RFORMT, SORTLS, SUMMAL, VARRES
LSFIT:	ACCDIG, ADRESS, DSUMAL, ERROR, FDIV, FDPCON, FSQRT, IDIV, LSQ, LSRND, SUMMAL
LSPLT2:	FDIV, PAGE
LSPLT4:	FDIV, PAGE
LSPRNT:	CONFEL, HEADS, IDIV, LSDIAG, OANOVA, OCOEFF, OCOVAR, OPONE, ORTPLT, PAGE, REGLOF, RFORMT
LSQ:	DSUMAL, ERROR, FDIV, FDPCON, FSQRT, IDIV, PDECOM, PINVRT, SCALE, SDPRED, SLVE
LSRND:	FDDIV, FDPCON, FLOG10, IDIV
LSTORE:	FDIV, IDIV, SUMMAL
MAINSL:	FLOG10, PERSAL, RULE, SANDL
MATRIX:	CKIND, ERROR, FDIV, FEXP2, MTXCHK
MDAMAD:	CKIND, ERROR, MTXCHK
MEDCI:	FDIV, FSQRT, QFORF
MEIGEN:	ADRESS, CKIND, ERROR, MTXCHN, SYMX, TQL2, TRED2
MINNW:	RFORMT
MISC2:	ADRESS, CHKCOL, CKIND, ERROR, FEXP2, MOVE, VECTOR
MIST:	IDIV, PAGE
MKRON:	CKIND, ERROR, MTXCHK
MMULT:	CKIND, DSUMAL, ERROR, FDPCON, MTXCHK
MOP:	ADRESS, CKIND, ERROR, MTXCHK
MORTHO:	ADRESS, ERROR, FDIV, FDSQRT, FSQRT, IDIV
MOVE:	ADRESS, ERROR
MPROP:	ADRESS, CKIND, ERROR, FDIV, MPRPNT, MPRSPC, MTXCHL, ORTHRV, RCSUM, SUMMAL
MPRPNT:	HEADS, IDIV, PAGE, PREPAK, RFORMT
MPRSPC:	DETRNK, INVCHK, PROCHK, TRIMAT
MRAISE:	CKIND, DSUMAL, ERROR, FDPCON, MTXCHK
MSCROW:	ADRESS, DSUMAL, ERROR, FDIV, FDPCON, FSQRT, SUMMAL, VECTOR
MTRIAN:	DSUMAL, ERROR, FDIV, FDPCON, FSQRT, MTXCHK, SYMV
MXTX:	CKIND, ERROR, MTXCHK, MXTXP, STORMT, TRANSF
MXTXP:	DSUMAL, FDPCON
MXTXQ:	DSUMAL, FDPCON
NBCDF:	DSUMAL, FDDIV, FDIV, FDPCON, FDSQRT, IDIV
NBPDF:	FDDIV, FDPCON
NBPPF:	FDIV, FDPCON, FEXP, FLOG, FSQRT, IDIV, NBCDF, NORPPF
NBRAN:	BINRAN, GEORAN
NBSOMN:	OMNIT
NORCDF:	FDIV, FEXP
NORPLT:	ERROR, FDIV, FSQRT, NORPPF, PRPLOT, RFORMT, SORTPP, SUMMAL, UNIMED
NORPPF:	FDIV, FLOG, FSQRT
NORRAN:	FDIV, FLOG, FSQRT, IDIV, UNIRAN
NORWEG:	MVELNG
NOTEPR:	PAGE
NUMBER:	FLOG10, SYMBOL
OANOVA:	FDDIV, FDIV, FDPCON, HEADS, IDIV, PAGE, QFORF, RFORMT
OCOEFF:	ACCDIG, FDIV, HEADS, IDIV, PAGE, RFORMT
OCOVAR:	FDIV, FSQRT, IDIV, PAGE, RFORMT
OMNIT:	ERROR, EXPAND, IDIV, INPUT, LOOKUP, NNAME, OUTPUT, PGSIZE, REDATA, SCNARG, SPINST, STMT, STORE, XCUTEA
ONEWAY:	CHKCOL, ERROR, FDIV, FLOG, FPPT, FSQRT, HEADS, IDIV, OWPRAV, OWPRBP, OWPRCL, OWPRES, OWPRHV, OWPRMC, OWSTRE, PAGE, QFORF, RANKO, SORT, SUMMAL, TPCTPT
ONLPLT:	ADRESS, CHKCOL, ERROR, GRAPH, IDIV, MINNW, ONPLTB, ONPLTG, ONPLTH, PUTCH, RFORMT
ONPLTG:	FDIV, IDIV, MINNW, PUTCH, RFORMT
ONPLTH:	ERROR, FDIV, HEADS, IDIV, PAGE
OPONE:	FDIV, FSQRT, HEADS, IDIV, PAGE, RFORMT

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Procedure          External References
ORTHRV:  MXTXQ
ORTPLT:   FDIV,  FSQRT, LSPLT2, LSPLT4
OSCRWL:   FDIV,   IDIV
OUTLOF:   FDIV,   PAGE,  QFORF, RFORMT
OUTPUT:   IDIV
OUTSPA:  HEADS,   PAGE,  QFORF, RFORMT
OWPRAV: RFORMT
OWPRBP: BLNKIN, BOXPLT, OSCRWL,   PAGE, PLTPOS, RFORMT
OWPRCL:   FDIV,  FSQRT,   IDIV,   PAGE, RFORMT, TPCTPT
OWPRES: FLOG10,  MINNW, RFORMT
OWPRHV:   FDIV,  QFORF, RFORMT
OWPRMC:   FDIV,  FSQRT,   PAGE, RFORMT,   SORT, SRPPT5
  PACK:   IDIV
  PAGE:   IDIV
PARPLT:  ERROR,   FDIV,  FSQRT, PRPLOT, RFORMT, SORTPP, SUMMAL, UNIMED
PDECOM:   FDIV, FDPCON,   IDIV
PDMOTE: CHKCOL,  ERROR
PERRSS:   FDIV, SUMMAL
PERSAL:   INZP, RFORMT, SCRAWL,   SORT
PINVRT:   FDIV, FDPCON,   IDIV
 PIVOT:   FDIV
PLOTCE:  ERROR,   IDIV,  MINNW, RFORMT, SCALE2,   SORT
PLOT24: ADRESS,  ERROR,  HEADS,   IDIV, PLT24B, PLT24G, PLT24T
PLTPOS:   FDIV
PLT24B:   IDIV,  MINNW,   PAGE, RFORMT
PLT24G: ADRESS,   FDIV,   IDIV,  MINNW, RFORMT
PLT24T:   IDIV,  MINNW,   PAGE, RFORMT
POICDF: DSUMAL,  FDDIV,  FDEXP, FDPCON, FDSQRT,   IDIV, NORCDF
POIPDF:  FDDIV,  FDEXP, FDPCON
POIPLT: CHSCDF,  ERROR,   FDIV,  FSQRT, NORPPF, PRPLOT, RFORMT, SORTPP, SUMMAL, UNIMED
POIPPF:  FDEXP, FDPCON,  FSQRT,   IDIV, NORPPF, POICDF
PORTUG: MVELNG
PRBCDF: ADRESS, BINCDF, CHSCDF,  DIXAB,  ERROR,  FDDIV,  FDEXP,   FDIV, FDPCON,   FLOG,
        GAMCDF, LAMCDF,  NBCDF, NORCDF, POICDF,   TCDF
PRBPDF: ADRESS, BINPDF,  DIXAB,  ERROR,  FDDIV,  FDEXP,  FDLOG, FDPCON, FDSQRT, LAMPDF,
         NBPDF, POIPDF
PRBPLT: ADRESS, CAUPLT, DEXPLT,  ERROR, EV1PLT, EV2PLT, EXPPLT, GAMPLT,  HEADS, HFNPLT,
          IDIV, LAMPLT, LGNPLT, LOGPLT, NORPLT,   PAGE, PARPLT, POIPLT, UNIPLT, WEIPLT
PRBPPF: ADRESS, BINPPF, CHSPPF,  ERROR,  FDCOS,  FDDIV,   FDIV,  FDLOG, FDPCON,  FDSIN,
          FEXP, GAMPPF, LAMPPF,  NBPPF, NORPPF, POIPPF,   TPPF
PRBRAN: ADRESS, BETRAN, BINRAN, CHSRAN,  ERROR,   FCOS,   FDIV,   FEXP,   FLOG,   FSIN,
         FSQRT, GAMRAN, GEORAN,   IDIV,  NBRAN, NORRAN, UNIRAN
PREPAK:  ERROR,   IDIV,   PACK
PRESVE: ADRESS,  ERROR, FDPCON, STRUVE, VECTOR
PRINTX: CHKCOL,  ERROR,  HEADS,   PAGE, PREPAK, RFORMT, RPRINT
PROCHK: ORTHRV, SKSYMV,   SYMW
PROROW: ADRESS, CHKCOL,  ERROR, SUMMAL
PRPLOT:  ERROR,   FDIV,   IDIV, RFORMT
PRTABR:  ERROR, RFORMT
 PRTCA: NUMFLD
 PRTDD: CHKCOL,  ERROR,  HEADS,   IDIV,   PAGE, RFORMT
PRTMNL:  ERROR,   PAGE, RFORMT
 PUNCH: CHKCOL,  ERROR, PREPAK
 QFORF:  DIXAB,   FDIV, FDPCON
QUADLS:  FDDIV,   FDIV, FDPCON, FDSQRT,  FSQRT
 RANKO:   FDIV,   SORT
 RANKS: ADRESS,  ERROR,  RANKO
 RANKX:   FDIV
 RCSUM: DSUMAL, FDPCON, SUMMAL
RDWITH: UNIRAN
RDWOUT: UNIRAN
 READX: ADRESS, CHKCOL,  ERROR, PREPAK
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Procedure	External References
RECODE:	ADRESS, ERROR, FDIV, SCODE, UNIQUE
REDATA:	ERROR
REGLOF:	ADRESS, LOFIND, OUTLOF, PERRSS, SORT, SUMMAL, WERRSS
REL1FT:	ERROR, INVCHK, SUMMAL
REPCHK:	ERROR
REPINC:	ERROR, EXPAND, IDIV, LOCATE, REPCHK, XPND
RESET:	ERROR
RFORMT:	ERROR, FDDIV, FLOG10, IDIV
RNDOWN:	FDIV
RNDSMP:	ADRESS, ERROR, RDWITH, RDWOUT, UNIRAN
RPRINT:	ADRESS, CHKCOL, ERROR, HEADS, IDIV, PAGE, PRTABR, PRTMNL, RFORMT
RULE:	FLOG10, SANDL
SANDL:	CINDEX, IDIV, IXLINE, PAGE, PREPAK, RFORMT, RNDATM, SLFPRT, SLPTSC
SCALE:	ERROR, FDDIV, FDIV, FDPCON, FDSQRT
SCALE2:	FDIV, FLOG10, IDIV
SCALE3:	FDIV, FLOG10, IDIV
SCC:	CHKCOL, CODEXX, ERROR, FDIV, FSQRT, IDIV, SORT, SUMMAL
SCNARG:	AARGS, ASTER, BLANK, ERROR, IDIV, NONBLA, ZLCVAR
SCRAWL:	FDIV, IDIV
SCREEN:	BACK, COEF, CPSTRE, ERROR, FDIV, IDIV, PAGE, PIVOT
SDPRED:	FDIV, FDPCON, FSQRT, IDIV
SDRND:	FDDIV, FDPCON, FLOG10, IDIV
SEC:	ADRESS, ERRINT, ERROR, FDPCON, GAMMA, SICIEI, VECTOR
SEEEC:	ADRESS, ERROR, IDIV
SEIC:	ADRESS, ERROR, SDRND, VECTOR
SELECT:	ADRESS, CHKCOL, ERROR, FDIV, IDIV
SET:	ADRESS, ERROR
SETUP:	IDIV, XSTOP
SICIEI:	ERROR, FDCOS, FDDIV, FDEXP, FDLOG, FDSIN, FDSQRT
SIEC:	ADRESS, ERROR, EXPINT, FDPCON, VECTOR,
SKSYMV:	FDIV
SLFPRT:	CINDEX, IDIV, IXLINE, RFORMT, RNDATM
SLOMNI:	ADRESS, ERROR, MAINSL
SLOVEN:	MVELNG
SLPTSC:	FDIV, IDIV, RFORMT, RNDATM
SLVE:	FDIV, FDPCON, FLOG10, FSQRT, IDIV
SMOOTH:	FSQRT, PLOT, REFLEX, WHERE
SNRPPF:	FDIV, FLOG, FSQRT
SOLVE:	FDIV, SUMMAL
SORDER:	CHKCOL, ERROR, SORT
SORT:	IDIV
SORTPP:	ERROR, IDIV
SPACE:	ERROR, PAGE
SPANSH:	MVELNG
SPINST:	ERROR, OUTPUT, PAGE, PLOT, PLOTS, SETUP, XFORMT, XHEAD, XSTOP
SPLITP:	ADRESS, ERROR, FDDIV, FDIV, FDPCON, OUTSPA, UCSUMS
SPLOTS:	ADRESS, ERROR, IDIV, STAPLT
SSCRWL:	FDIV, IDIV
STAERR:	CHKCOL, CKIND, ERROR
STAFRQ:	FDIV
STALSD:	RFORMT
STAPLT:	FDIV, FSQRT, RFORMT, SNRPPF, SORT, SSCRWL, STAPTB, STAPTG, STAPTT, SUMMAL, SUNIMD
STAPRT:	FDIV, FSQRT, HEADS, MINNW, PAGE, RFORMT, STALSD
STAPTB:	IDIV, MINNW, RFORMT
STAPTG:	FDIV, IDIV, MINNW, RFORMT
STAPTT:	HEADS, IDIV, MINNW, PAGE, RFORMT
STAQDS:	ERROR, QFORF, QUADLS, SUMMAL
STARNK:	FDIV
STATIS:	AUTCOR, DSUMAL, ERROR, FDIV, FDPCON, FSQRT, IDIV, MEDCI, PCTILE, QFORF, SORT, STADIF, STAERR, STAFRQ, STAPRT, STAQDS, STARNK, STASTR, SUMMAL, TOLLIM
STORE:	ERROR, LOCATE

Procedure	External References
STREDD:	CHKCOL
STRUVE:	BEJN, DBEJ, FDDIV
SUMMAL:	ERROR, FDPCON, IDIV
SUNIMD:	ERROR, FDIV, IDIV
SWEDSH:	MVELNG
SYMBOL:	FCOS, FSIN, PLOT
SYMV:	ACCDIG
SYMW:	ACCDIG
SYMX:	ACCDIG
TABLE:	CHKCOL, ERROR, FDIV, FSQRT, HEADS, IDIV, SCODE, SORT, SUMMAL, TABPRT, TABSTR, UNIQUE
TABPRT:	ERROR, IDIV, MINNW, PAGE, RFORMT
TABSTR:	CHKCOL, ERROR
TCDF:	DSUMAL, FDDIV, FDEXP, FDIV, FDPCON, FDSQRT, FSQRT, IDIV, NORCDF
THERMO:	ADRESS, ERROR, FDDIV, FDEXP, FDLOG, FDPCON, FLOG
TOLLIM:	FDIV, FSQRT, SUMMAL
TPCTPT:	ERROR, FDIV
TPPF:	DSUMAL, FDCOS, FDDIV, FDIV, FDPCON, FDSIN, FDSQRT, NORPPF
TQL2:	FDIV, FSQRT
TRANSF:	CKIND, DSUMAL, ERROR, FDPCON, MTXCHK
TRED2:	FDIV, FSQRT
TWCOEF:	ERROR, FDIV, FSQRT, SUMMAL
TWOWAY:	ACCDIG, ADRESS, CHKCOL, ERROR, FDIV, HEADS, IDIV, LSQ, SUMMAL, TWCOEF, TWPRAV, TWPRAW, TWPRCR, TWPRCS, TWPRNA, TWPRTR
TWPRAV:	FDIV, PAGE, QFORF, RFORMT, SUMMAL
TWPRAW:	FDIV, PAGE, QFORF, RFORMT, SUMMAL
TWPRCR:	PAGE, RFORMT, TWRNKS
TWPRCS:	PAGE, RFORMT
TWPRNA:	FDIV, QFORF, RFORMT, SUMMAL
TWPRTR:	FDIV, FSQRT, IDIV, PAGE
TWRANK:	FDIV
TWRNKS:	FDIV, SUMMAL, TWRANK
UCSUMS:	DSUMAL, SUMMAL
UNIMED:	ERROR, FDIV, IDIV
UNIPLT:	ERROR, FDIV, FSQRT, PRPLOT, RFORMT, SORTPP, SUMMAL, UNIMED
UNIQUE:	SORT
UNIRAN:	FDIV
UNITX:	IDIV, UNXRDC, UNXSET, UNXSPC, UNXWRT
UNXRDC:	AARGS, CHKCOL, ERROR, OMCONV, PREPAK
UNXSET:	AARGS, ADRESS, ERROR, OMCONV
UNXSPC:	ERROR, IDIV
UNXWRT:	CHKCOL, ERROR, IDIV, PREPAK, RFORMT
VARRES:	FDIV
WEIPLT:	ERROR, FDIV, FLOG, FSQRT, PRPLOT, RFORMT, SORTPP, SUMMAL, UNIMED
WERRSS:	FDIV, SUMMAL
XCUTEA:	CNTNTS, DSCRIB, ERROR, GENER, PAGE, PHYCON, PLOT24, SPLOTS, XCUTEB, XSEG01, XSEG02, XSEG03, XSEG04, XSEG05, XSEG06, XSEG07, XSEG08, XSEG15, XSEG16, XSEG22
XCUTEB:	BESTCP, CALINT, LANGUA, SLOMNI, STATIS, XSEG01, XSEG02, XSEG03, XSEG04, XSEG05, XSEG07, XSEG08, XSEG10, XSEG11, XSEG12, XSEG15, XSEG16, XSEG20, XSEG22
XFORMT:	ERROR, PCKFMT
XHEAD:	AARGS, ERROR, PREPAK
XPND:	ADRESS, IDIV
XSEG01:	ARYVEC, EXPCON, MATRIX, MDAMAD, MKRON, MMULT, MOP, MRAISE, MTRIAN, MXTX
XSEG02:	ALLSUB, CHANGE, CMSEPA, EXCHNG, FLIP, INTERP, ITERAT, PROROW, SELECT, SORDER
XSEG03:	EXINVT, LARFIT
XSEG04:	ABRIDG, APRINT, FIXFLO, PRINTX, PUNCH, READX, RESET, SET, SPACE, UNITX
XSEG05:	COMPLX, DEFINZ, DIMENS, ERASE, EXTREM, GQUAD, KEYBRD, LABEL, LIST, MISC2, MOVE, MSCROW, NOTEPR, PDMOTE
XSEG06:	ARITH, BEGIN, EVALOM, FUNCT, IFS, REPINC
XSEG07:	COALES, MEIGEN, MORTHO
XSEG08:	ATOMIC, CVTDEG, DIFFER, ONLPLT, THERMO
XSEG10:	ONEWAY, RANKS

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Procedure        External References

XSEG11: BESEL1, BESEL2, BESEL3, ELLIPT, HARMON, PRESVE
XSEG12:  LSFIT, LSPRNT, LSTORE, TWOWAY
XSEG15: EDITDA, RECODE,  TABLE
XSEG16:  FPROB, FRDIST, HISTGM,    SCC,    SEC,  SEEEC,   SEIC,   SIEC
XSEG20:  CONTB, SPLITP
XSEG22: DISPRO, RNDSMP
 XSTOP: ERRPRT,   PAGE
YUGOSL: MVELNG
ZLCVAR:   IDIV,  LOCAT,   PACK
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2B. Procedures Referencing a Particular Procedure

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Procedure        Referenced By Procedures

 AARGS:  ASTER,  LABEL, SCNARG, UNXRDC, UNXSET,  XHEAD
ABRIDG: XSEG04
ACCDIG:  ARITH,  LSFIT, OCOEFF,   SYMV,   SYMW,   SYMX, TWOWAY
ADRESS: ALLSUB,  ARITH, ATOMIC, BESEL1, BESEL2, BESEL3, BESTCP, CALCOM, CHANGE, CHKCOL,
        COMPLX,  CONTB, CVTDEG, DEFINZ, DIFFER, ELLIPT, EVALOM, EXCHNG,  FPROB, FRDIST,
         FUNCT,  GENER,  GQUAD, HARMON, HISTGM,    IFS, INVERT, LSDIAG,  LSFIT, MEIGEN,
         MISC2,    MOP, MORTHO,   MOVE,  MPROP, MSCROW, ONLPLT, PLOT24, PLT24G, PRBCDF,
        PRBPDF, PRBPLT, PRBPPF, PRBRAN, PRESVE, PROROW,  RANKS,  READX, RECODE, REGLIF,
        RNDSMP, RPRINT,    SEC,  SEEEC,   SEIC, SELECT,    SET,   SIEC, SLOMNI, SPLITP,
        SPLOTS, THERMO, TWOWAY, UNXSET,   XPND
ALLSUB: XSEG02
APRINT: XSEG04
 ARITH: XSEG06
ARYVEC: XSEG01
 ASTER: SCNARG
  ATOI: CINDEX
ATOMIC: XSEG08
AUTCOR: STATIS
  BACK: SCREEN
 BEGIN: XSEG06
  BEJN: BESEL3, BINTJO, STRUVE
BESEL1: XSEG11
BESEL2: XSEG11
BESEL3: XSEG11
BESTCP: XCUTEB
BETRAN: PRBRAN
BEZERO: BESEL3
BEZONE: BESEL3
BINCDF: BINPPF, PRBCDF
BINPDF: PRBPDF
BINPPF: PRBPPF
BINRAN:  NBRAN, PRBRAN
BINTJO: BESEL3
BJORCK: CORPRT
 BLANK: EVALOM, SCNARG
BLNKIN: BOXPLT, OWPRBP
BOXPLT: OWPRBP
 BRCOL:   BRL1
  BRL1: LARFIT
CALCOM: CALINT
CALERR: ERRPRT
CALINT: XCUTEB
CALPLT: CALINT
CALTIK: CALPLT
CAUPLT: PRBPLT
  CBEI: BESEL2
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Procedure	Referenced By Procedures
CBEK	BESEL2
CHANGE	XSEGO2
CHKCOL	ABRIDG, BESTCP, CMSEPA, CORREL, EDITDA, ERASE, EXTREM, FLIP, INTERP, ITERAT, LARFIT, MISC2, ONEWAY, ONLPLT, PDMOTE, PRINTX, PROROW, PRTDD, PUNCH, READX, RPRINT, SCC, SELECT, SORDER, STAERR, STREDD, TABLE, TABSTR, TWOWAY, UNXRDC, UNXWRT
CHSCDF	POIPLT, PRBCDF
CHSPPF	PRBPPF
CHSRAN	PRBRAN
CINDEX	SANDL, SLFPRT
CKIND	APRINT, ARYVEC, ATOMIC, CMSEPA, COALES, CONTB, EXPCON, INTERP, INVERT, MATRIX, MDAMAD, MEIGEN, MISC2, MKRON, MMULT, MOP, MPROP, MRAISE, MXTX, STAERR, TRANSF
CMPARA	CMSEPA
CMSEPA	XSEGO2
CNTNTS	XCUTEA
CNTNT1	CNTNTS
CNTNT2	CNTNTS
CNTNT3	CNTNTS
CNTNT4	CNTNTS
COALES	XSEGO7
CODEXX	SCC
CODEXY	CRSPRD
COEF	SCREEN
COMELL	ELLIPT
COMPIL	EVALOM
COMPLX	XSEGO5
CONFEL	LSPRNT
CONPG1	CONTB
CONPG2	CONTB
CONPG3	CONTB
CONTB	XSEG2O
CONVRT	LANGUA
CORPRT	CORREL
CORREL	EXINVT
CPSTRE	SCREEN
CRSPRD	BESTCP
CTCCDF	CONTB
CTNCDF	CTCCDF
CVTDEG	XSEGO8
DANISH	LANGUA
DASHLN	CALPLT
DBEJ	BESEL1, BESEL3, BINTJO, STRUVE
DECOMP	INVCHK
DEFINZ	XSEGO5
DESC1	DSCRIB
DESC1O	DSCRIB
DESC11	DSCRIB
DESC2	DSCRIB
DESC3	DSCRIB
DESC4	DSCRIB
DESC5	DSCRIB
DESC6	DSCRIB
DESC7	DSCRIB
DESC8	DSCRIB
DESC9	DSCRIB
DETRNK	MPRSPC
DEXPLT	PRBPLT
DIFFER	XSEGO8
DIMENS	XSEGO5
DISPRO	XSEG22

Procedure	Referenced By Procedures
DIXAB:	PRBCDF, PRBPDF, QFORF
DSCRIB:	XCUTEA
DSUMAL:	ARYVEC, BINCDF, BJORCK, CHSCDF, CHSPPF, CODEXX, CODEXY, CONTB, CTCCDF, GAMCDF, GAMMA, GAMPPF, IMPRUV, LSFIT, LSQ, MMULT, MRAISE, MSCROW, MTRIAN, MXTXP, MXTXQ, NBCDF, POICDF, RCSUM, STATIS, TCDF, TPPF, TRANSF, UCSUMS
DUTCH:	LANGUA
EDITDA:	XSEG15
ELIPSE:	CONFEL
ELLIPT:	XSEG11
ENGLSH:	LANGUA
ERASE:	XSEGO5
ERRINT:	SEC
ERROR:	AARGS, ABRIDG, ADRESS, ALLSUB, APRINT, ARITH, ARYVEC, ATOMIC, BEGIN, BEJN, BESEL1, BESEL2, BESEL3, BESTCP, CALCOM, CALTIK, CAUPLT, CBEK, CHANGE, CHKCOL, CMSEPA, CNTNTS, COALES, COMELL, COMPIL, COMPLX, CONPG3, CONTB, CORPRT, CORREL, CVTDEG, DEFINZ, DESC1, DESC10, DESC11, DESC2, DESC3, DESC4, DESC5, DESC6, DESC7, DESC8, DESC9, DEXPLT, DIFFER, DIMENS, DISPRO, DSCRIB, EDITDA, ELLIPT, ERASE, EVAL, EVALOM, EV1PLT, EV2PLT, EXCHNG, EXPAND, EXPCON, EXPINT, EXPPLT, EXTREM, FCOS, FDCOS, FDEXP, FDLOG, FDSIN, FDSQRT, FEXP, FEXP2, FIXFLO, FLIP, FLOG, FLOG10, FPROB, FRDIST, FSIN, FSQRT, FUNCT, GAMMA, GAMPLT, GENER, GQUAD, GRAPH, HARMON, HFNPLT, HISTGM, IFS, INTERP, INVERT, ITERAT, KEYBRD, LABEL, LABPNT, LAMPLT, LANGUA, LARFIT, LGNPLT, LOGPLT, LSDIAG, LSFIT, LSQ, MATRIX, MDAMAD, MEIGEN, MISC2, MKRON, MMULT, MOP, MORTHO, MOVE, MPROP, MRAISE, MSCROW, MTRIAN, MXTX, NORPLT, OMNIT, ONEWAY, ONLPLT, ONPLTH, PARPLT, PDMOTE, PLOTCE, PLOT24, POIPLT, PRBCDF, PRBPDF, PRBPLT, PRBPPF, PRBRAN, PREPAK, PRESVE, PRINTX, PROROW, PRPLOT, PRTABR, PRTDD, PRTMNL, PUNCH, RANKS, READX, RECODE, REDATA, REL1FT, REPCHK, REPINC, RESET, RFORMT, RNDSMP, RPRINT, SCALE, SCC, SCNARG, SCREEN, SEC, SEIC, SELECT, SET, SICIEI, SIEC, SEEEC, SLOMNI, SORDER, SORTPP, SPACE, SPINST, SPLITP, SPLOTS, STAERR, STAQDS, STATIS, STORE, SUMMAL, SUNIMD, TABLE, TABPRT, TABSTR, THERMO, TPCTPT, TRANSF, TWCOEF, TWOWAY, UNIMED, UNIPLT, UNXRDC, UNXSET, UNXSPC, UNXWRT, WEIPLT, XCUTEA, XFORMT, XHEAD
ERRPRT:	ERROR, XSTOP
EVAL:	COMPIL
EVALOM:	XSEGO6
EV1PLT:	PRBPLT
EV2PLT:	PRBPLT
EXCHNG:	XSEGO2
EXINVT:	XSEGO3
EXPAND:	OMNIT, REPINC
EXPCON:	XSEGO1
EXPINT:	SIEC
EXPPLT:	PRBPLT
EXTREM:	XSEGO5
FCOS:	CAUPLT, EVAL, FUNCT, HARMON, PRBRAN, SYMBOL
FDCOS:	BESEL2, CBEI, CBEK, COMPLX, DBEJ, PRBPPF, SICIEI, TPPF
FDDIV:	BEJN, BESEL1, BESEL2, BESEL3, BEZERO, BEZONE, BINCDF, BINPDF, BINTJO, BJORCK, CBEI, CBEK, CHSCDF, CHSPPF, CODEXX, CODEXY, COMELL, COMPLX, CTCCDF, DBEJ, DIXAB, ERRINT, EXPINT, GAMCDF, GAMMA, GAMPLT, GAMPPF, GQUAD, LSRND, NBCDF, NBPDF, OANOVA, POICDF, POIPDF, PRBCDF, PRBPDF, PRBPPF, QUADLS, RFORMT, SCALE, SDRND, SICIEI, SPLITP, STRUVE, TCDF, THERMO, TPPF
FDEXP:	BESEL1, BESEL2, CBEI, CBEK, CHSCDF, CHSPPF, CTCCDF, DBEJ, DIXAB, ERRINT, EXPINT, GAMCDF, GAMPLT, GAMPPF, POICDF, POIPDF, POIPPF, PRBCDF, PRBPDF, SICIEI, TCDF, THERMO

Procedure	Referenced By Procedures
FDIV:	AARGS, ALLSUB, ARITH, AUTCOR, BACK, BETRAN, BINCDF, BRL1, CALPLT, CALTIK, CAUPLT, CHSCDF, CHSPPF, CMPARA, COALES, COEF, CONPG3, CONTB, CORPRT, CORREL, CTCCDF, CTNCDF, CVTDEG, DECOMP, DETRNK, DEXPLT, DIFFER, DIXAB, ELIPSE, EVAL, EV1PLT, EV2PLT, EXPPLT, FNUALF, FPPT, FREQCY, FUNCT, GAMPLT, GAMRAN, GEORAN, HARMON, HFNPLT, HISTGM, IFS, IMPRUV, INTERP, INTRP, INVCHK, ITERAT, LAMCDF, LAMPDF, LAMPLT, LAMPPF, LGNPLT, LOGPLT, LSDIAG, LSFIT, LSPLT2, LSPLT4, LSQ, LSTORE, MATRIX, MEDCI, MORTHO, MPROP, MSCROW, MTRIAN, NBCDF, NBPPF, NORCDF, NORPLT, NORPPF, NORRAN, OANOVA, OCOEFF, OCOVAR, ONEWAY, ONPLTG, ONPLTH, OPONE, ORTPLT, OSCRWL, OUTLOF, OWPRCL, OWPRHV, OWPRMC, PARPLT, PDECOM, PERRSS, PINVRT, PIVOT, PLTPOS, PLT24G, POIPLT, PRBCDF, PRBPPF, PRBRAN, PRPLOT, QFORF, QUADLS, RANKO, RANKX, RECODE, RNDOWN, SCALE, SCALE2, SCALE3, SCC, SCRAWL, SCREEN, SDPRED, SELECT, SKSYMV, SLPTSC, SLVE, SNRPPF, SOLVE, SPLITP, SSCRWL, STAFRQ, STAPLT, STAPRT, STAPTG, STARNK, STATIS, SUNIMD, TABLE, TCDF, TOLLIM, TPCTPT, TPPF, TQL2, TRED2, TWCOEF, TWOWAY, TWPRAV, TWPRAW, TWPRNA, TWPRTR, TWRANK, TWRNKS, UNIMED, UNIPLT, UNIRAN, VARRES, WEIPLT, WERRSS
FDLOG:	CBEK, CHSCDF, CHSPPF, COMELL, CONTB, CTCCDF, DBEJ, DIXAB, EXPINT, GAMCDF, GAMPLT, GAMPPF, PRBPDF, PRBPPF, SICIEI, THERMO
FDPCON:	ARYVEC, BINCDF, BINPDF, BINPPF, BJORCK, BRCOL, CHSCDF, CHSPPF, CODEXX, CODEXY, COMPLX, CRSPRD, CTCCDF, ELLIPT, GAMCDF, GAMMA, GAMPPF, GENER, GQUAD, IMPRUV, LSFIT, LSQ, LSRND, MMULT, MRAISE, MSCROW, MTRIAN, MXTXP, MXTXQ, NBCDF, NBPDF, NBPPF, OANOVA, PDECOM, PINVRT, POICDF, POIPDF, POIPPF, PRBCDF, PRBPDF, PRBPPF, PRESVE, QFORF, QUADLS, RCSUM, SCALE, SDPRED, SDRND, SEC, SIEC, SLVE, SPLITP, STATIS, SUMMAL, TCDF, THERMO, TPPF, TRANSF
FDSIN:	CBEI, CBEK, COMPLX, DBEJ, PRBPPF, SICIEI, TPPF
FDSQRT:	BEZERO, BEZONE, BINCDF, BJORCK, CBEI, CBEK, CHSCDF, CODEXX, CODEXY, COMELL, COMPLX, CTCCDF, DBEJ, MORTHO, NBCDF, POICDF, PRBPDF, QUADLS, SCALE, SICIEI, TCDF, TPPF
FEXP:	CTNCDF, EVAL, FEXP2, FPPT, FUNCT, GAMPLT, LAMCDF, LGNPLT, NBPPF, NORCDF, PRBPPF, PRBRAN
FEXP2:	AARGS, ARITH, MATRIX, MISC2
FIT4:	FLINE
FIXFLO:	XSEG04
FLINE:	CALPLT
FLIP:	XSEG02
FLOG:	CORPRT, DEXPLT, EVAL, EV1PLT, EV2PLT, EXPPLT, FEXP2, FUNCT, GAMPLT, GAMRAN, GEORAN, LAMPLT, LAMPPF, LOGPLT, NBPPF, NORPPF, NORRAN, ONEWAY, PRBCDF, PRBRAN, SNRPPF, THERMO, WEIPLT
FLOG10:	ACCDIG, CONPG1, FREQCY, FUNCT, HISTGM, IMPRUV, LSRND, MAINSL, NUMBER, OWPRES, RFORMT, RULE, SCALE2, SCALE3, SDRND, SLVE
FNUALF:	CONFEL
FPPT:	ONEWAY
FPROB:	XSEG16
FRDIST:	XSEG16
FRENCH:	LANGUA
FREQCY:	FRDIST
FSIN:	CAUPLT, EVAL, FUNCT, HARMON, PRBRAN, SYMBOL
FSQRT:	AUTCOR, BINPPF, CAUPLT, CHSCDF, CONTB, CORPRT, CORREL, CTCCDF, DASHLN, DEXPLT, ELIPSE, EVAL, EV1PLT, EV2PLT, EXPPLT, FIT4, FPPT, FUNCT, GAMPLT, GAMRAN, HFNPLT, INTERP, INVCHK, LAMPLT, LGNPLT, LOGPLT, LSDIAG, LSFIT, LSQ, MEDCI, MORTHO, MSCROW, MTRIAN, NBPPF, NORPLT, NORPPF, NORRAN, OCOVAR, ONEWAY, OPONE, ORTPLT, OWPRCL, OWPRMC, PARPLT, POIPLT, POIPPF, PRBRAN, QUADLS, SCC, SDPRED, SLVE, SMOOTH, SNRPPF, STAPLT, STAPRT, STATIS, TABLE, TCDF, TOLLIM, TQL2, TRED2, TWCOEF, TWPRTR, UNIPLT, WEIPLT
FTANH:	CORPRT, EVAL, FUNCT
FTLERR:	ERRPRT
FUNCT:	XSEG06
GAMCDF:	PRBCDF
GAMMA:	SEC
GAMPLT:	PRBPLT
GAMPPF:	PRBPPF
GAMRAN:	BETRAN, PRBRAN

Procedure	Referenced By Procedures
GENER:	XCUTEA
GEORAN:	BINRAN, NBRAN, PRBRAN
GERMAN:	LANGUA
GQUAD:	XSEGO5
GRAPH:	ONLPLT
HARMON:	XSEG11
HEADS:	BESTCP, HISTGM, LSPRNT, MPRPNT, OANOVA, OCOEFF, ONEWAY, ONPLTH, OPONE, OUTSPA, PLOT24, PRBPLT, PRINTX, PRTDD, RPRINT, STAPRT, STAPTT, TABLE, TWOWAY
HFNPLT:	PRBPLT
HISTGM:	XSEG16
IDIV:	ATOI, ATOMIC, BESEL1, BESEL2, BESTCP, BEZERO, BEZONE, BINCDF, BINPPF, BOXPLT, CALCOM, CHSCDF, CINDEX, CMSEPA, CNTNTS, CONPG1, CONPG2, CONTB, CONVRT, CORPRT, CORREL, CTCCDF, DBEJ, DIFFER, DSUMAL, EDITDA, EXCHNG, FIXFLO, FLIP, HARMON, HEADS, HISTGM, INPUT, INTRP, ISORT, ITERAT, KEYBRD, LABPNT, LANGUA, LOOKUP, LSFIT, LSPRNT, LSQ, LSRND, LSTORE, MIST, MORTHO, MPRPNT, NBCDF, NBPPF, NORRAN, OANOVA, OCOEFF, OCOVAR, OMNIT, ONEWAY, ONLPLT, ONPLTG, ONPLTH, OPONE, OSCRWL, OUTPUT, OWPRCL, PACK, PAGE, PDECOM, PINVRT, PLOTCE, PLOT24, PLT24B, PLT24G, PLT24T, POICDF, POIPPF, PRBPLT, PRBRAN, PREPAK, PRPLOT, PRTDD, REPINC, RFORMT, RPRINT, SANDL, SCALE2, SCALE3, SCC, SCNARG, SCRAWL, SCREEN, SDPRED, SDRND, SEEEC, SELECT, SETUP, SLFPRT, SLPTSC, SLVE, SORT, SORTPP, SPLOTS, SSCRWL, STAPTB, STAPTG, STAPTT, STATIS, SUMMAL, SUNIMD, TABLE, TABPRT, TCDF, TWOWAY, TWPRTR, UNIMED, UNITX, UNXSPC, UNXWRT, XPND, ZLCVAR
IFS:	XSEGO6
IMPRUV:	INVCHK
INFERR:	ERRPRT
INPUT:	OMNIT
INTERP:	XSEGO2
INTRP:	INTERP
INVCHK:	CORREL, INVERT, MPRSPC, REL1FT
INVERT:	EXINVT
INZP:	PERSAL
ISORT:	LANGUA
ITALAN:	LANGUA
ITERAT:	XSEGO2
IXLINE:	SANDL, SLFPRT
JAPANE:	LANGUA
KEYBRD:	XSEGO5
LABEL:	XSEGO5
LABPNT:	LABEL
LAMCDF:	LAMPDF, PRBCDF
LAMPDF:	PRBPDF
LAMPLT:	PRBPLT
LAMPPF:	PRBPPF
LANGUA:	XCUTEB
LARFIT:	XSEGO3
LGNPLT:	PRBPLT
LIST:	XSEGO5
LOCAT:	LABEL, ZLCVAR
LOCATE:	REPINC, STORE
LOFIND:	REGLOF
LOGPLT:	PRBPLT
LOOKUP:	DSCRIB, OMNIT
LSDIAG:	LSPRNT
LSFIT:	XSEG12
LSPLT2:	ORTPLT
LSPLT4:	ORTPLT
LSPRNT:	XSEG12
LSQ:	LSFIT, TWOWAY
LSRND:	LSFIT
LSTORE:	XSEG12

Procedure	Referenced By Procedures
MAINSL:	SLOMNI
MATRIX:	XSEGO1
MCHROW:	LOFIND
MDAMAD:	XSEGO1
MEDCI:	STATIS
MEIGEN:	XSEGO7
MINNW:	CONPG1, ONLPLT, ONPLTG, OWPRES, PLOTCE, PLT24B, PLT24G, PLT24T, STAPRT, STAPTB, STAPTG, STAPTT, TABPRT
MISC2:	XSEGO5
MIST:	CORPRT
MKRON:	XSEGO1
MMULT:	XSEGO1
MOP:	XSEGO1
MORTHO:	XSEGO7
MOVE:	MISC2, XSEGO5
MPROP:	EXINVT
MPRPNT:	MPROP
MPRSPC:	MPROP
MRAISE:	XSEGO1
MSCROW:	XSEGO5
MTRIAN:	XSEGO1
MTXCHK:	ARYVEC, EXPCON, MATRIX, MDAMAD, MKRON, MMULT, MOP, MRAISE, MTRIAN, MXTX, TRANSF
MTXCHL:	INVERT, MPROP
MTXCHM:	APRINT
MTXCHN:	MEIGEN
MVELNG:	DANISH, DUTCH, ENGLSH, FRENCH, GERMAN, ITALAN, JAPANE, NORWEG, PORTUG, SLOVEN, SPANSH, SWEDSH, YUGOSL
MXTX:	XSEGO1
MXTXP:	MXTX
MXTXQ:	ORTHRV
NBCDF:	NBPPF, PRBCDF
NBPDF:	PRBPDF
NBPPF:	PRBPPF
NBRAN:	PRBRAN
NNAME:	ASTER, OMNIT
NONBLA:	ASTER, EVALOM, LABEL, SCNARG
NORCDF:	CHSCDF, CTCCDF, POICDF, PRBCDF, TCDF
NORPLT:	PRBPLT
NORPPF:	BINPPF, HFNPLT, LGNPLT, NBPPF, NORPLT, POIPLT, POIPPF, PRBPPF, TPPF
NORRAN:	CHSRAN, GAMRAN, PRBRAN
NORWEG:	LANGUA
NOTEPR:	XSEGO5
NUMBER:	CALTIK
NUMFLD:	PRTCA
OANOVA:	LSPRNT
OCOEFF:	LSPRNT
OCOVAR:	LSPRNT
OMCONV:	INPUT, UNXRDC, UNXSET
OMNIT:	NBSOMN
ONEWAY:	XSEG10
ONLPLT:	XSEGO8
ONPLTB:	ONLPLT
ONPLTG:	ONLPLT
ONPLTH:	ONLPLT
OPONE:	LSPRNT
ORTHRV:	MPROP, PROCHK
ORTPLT:	LSPRNT
OSCRWL:	OWPRBP
OUTLOF:	REGLOF
OUTPUT:	OMNIT, SPINST

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Procedure        Referenced By Procedures

OUTSPA: SPLITP
OWPRAV: ONEWAY
OWPRBP: ONEWAY
OWPRCL: ONEWAY
OWPRES: ONEWAY
OWPRHV: ONEWAY
OWPRMC: ONEWAY
OWSTRE: ONEWAY
  PACK: PREPAK, ZLCVAR
  PAGE: ABRIDG, APRINT, BESTCP, CONPG1, CONPG2, CORPRT, HISTGM, LANGUA, LSDIAG, LSPLT2,
        LSPLT4, LSPRNT,   MIST, MPRPNT, NOTEPR, OANOVA, OCOEFF, OCOVAR, ONEWAY, ONPLTH,
         OPONE, OUTLOF, OUTSPA, OWPRBP, OWPRCL, OWPRMC, PLT24B, PLT24T, PRBPLT, PRINTX,
         PRTDD, PRTMNL, RPRINT,  SANDL, SCREEN,  SPACE, SPINST, STAPRT, STAPTT, TABPRT,
        TWPRAV, TWPRAW, TWPRCR, TWPRCS, TWPRTR, XCUTEA,  XSTOP
PARPLT: PRBPLT
PCKFMT: XFORMT
PCTILE: STATIS
PDECOM:    LSQ
PDMOTE: XSEGO5
PERRSS: REGLOF
PERSAL: MAINSL
PGSIZE:  OMNIT
PHYCON:  ASTER, XCUTEA
PINVRT:    LSQ
 PIVOT:   COEF, SCREEN
  PLOT: CALPLT, CALTIK, DASHLN,   FIT4,  FLINE, SMOOTH, SPINST, SYMBOL
PLOTCE: CONFEL
PLOT24: XCUTEA
PLTPOS: OWPRBP
PLT24B: PLOT24
PLT24G: PLOT24
PLT24T: PLOT24
POICDF: POIPPF, PRBCDF
POIPDF: PRBPDF
POIPLT: PRBPLT
POIPPF: PRBPPF
PORTUG: LANGUA
PRBCDF: DISPRO
PRBPDF: DISPRO
PRBPLT: DISPRO
PRBPPF: DISPRO
PRBRAN: DISPRO
PREPAK: ABRIDG, APRINT,  HEADS,  LABEL, MPRPNT, PRINTX,  PUNCH,  READX,  SANDL, UNXRDC,
        UNXWRT,  XHEAD
PRESVE: XSEG11
PRINTX: XSEGO4
PROCHK: MPRSPC
PROROW: XSEGO2
PRPLOT: CAUPLT, DEXPLT, EV1PLT, EV2PLT, EXPPLT, GAMPLT, HFNPLT, LAMPLT, LGNPLT, LOGPLT,
        NORPLT, PARPLT, POIPLT, UNIPLT, WEIPLT
PRTABR: RPRINT
 PRTCA: KEYBRD
 PRTDD: DIFFER
PRTMNL: RPRINT
 PUNCH: XSEGO4
 PUTCH: CONPG1, ONLPLT, ONPLTG
 QFORF: CORPRT, CORREL,   FPPT,  FPROB,  MEDCI, OANOVA, ONEWAY, OUTLOF, OUTSPA, OWPRHV,
        STAQDS, STATIS, TWPRAV, TWPRAW, TWPRNA
QUADLS: STAQDS
 RANKO: ONEWAY,  RANKS
 RANKS: XSEG10
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Procedure        Referenced By Procedures

 RANKX: CORREL
 RCSUM:  MPROP
RDWITH: RNDSMP
RDWOUT: RNDSMP
 READX: XSEG04
RECODE: XSEG15
REDATA:  OMNIT
REFLEX:  FLINE, SMOOTH
REGLOF: LSPRNT
REL1FT: LARFIT
REPCHK: REPINC
REPINC: XSEG06
 RESET: XSEG04
RFORMT: ABRIDG, APRINT, CALTIK, CAUPLT,   COEF, CONPG1, DEXPLT, EV1PLT, EV2PLT, EXPPLT,
        GAMPLT, HFNPLT, HISTGM, LAMPLT, LGNPLT, LOGPLT, LSDIAG, LSPRNT,  MINNW, MPRPNT,
        NORPLT, OANOVA, OCOEFF, OCOVAR, ONLPLT, ONPLTG,  OPONE, OUTLOF, OUTSPA, OWPRAV,
        OWPRBP, OWPRCL, OWPRES, OWPRHV, OWPRMC, PARPLT, PERSAL, PLOTCE, PLT24B, PLT24G,
        PLT24T, POIPLT, PRINTX, PRPLOT, PRTABR,  PRTDD, PRTMNL, RPRINT,  SANDL, SLFPRT,
        SLPTSC, STALSD, STAPLT, STAPRT, STAPTB, STAPTG, STAPTT, TABPRT, TWPRAV, TWPRAW,
        TWPRCR, TWPRCS, TWPRNA, UNIPLT, UNXWRT, WEIPLT
RNDATM:  SANDL, SLFPRT, SLPTSC
RNDOWN:  ERROR
RNDSMP: XSEG22
RPRINT: ABRIDG, PRINTX
RTHERR: ERRPRT
  RULE: MAINSL
 SANDL: MAINSL,   RULE
 SCALE:    LSQ
SCALE2: PLOTCE
SCALE3:  GRAPH
   SCC: XSEG16
SCNARG:  OMNIT
 SCODE: RECODE,  TABLE
SCRAWL: PERSAL
SCREEN: BESTCP
SDPRED:    LSQ
 SDRND:   SEIC
   SEC: XSEG16
 SEEEC: XSEG16
  SEIC: XSEG16
SELECT: XSEG02
   SET: XSEG04
 SETUP: SPINST
SICIEI:    SEC
  SIEC: XSEG16
SKSYMV: PROCHK
SLFPRT:  SANDL
SLOMNI: XCUTEB
SLOVEN: LANGUA
SLPTSC:  SANDL
  SLVE:    LSQ
SMOOTH: CALPLT
SNRPPF: STAPLT
 SOLVE: IMPRUV, INVCHK
SORDER: XSEG02
  SORT: ONEWAY, OWPRMC, PERSAL, PLOTCE,  RANKO, REGLOF,    SCC, SORDER, STAPLT, STATIS,
        TABLE, UNIQUE
SORTLS: LSDIAG
SORTPP: CAUPLT, DEXPLT, EV1PLT, EV2PLT, EXPPLT, GAMPLT, HFNPLT, LAMPLT, LGNPLT, LOGPLT,
        NORPLT, PARPLT, POIPLT, UNIPLT, WEIPLT
 SPACE: XSEG04
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Procedure	Referenced By Procedures
SPANSH:	LANGUA
SPINST:	OMNIT
SPLITP:	XSEG20
SPLOTS:	XCUTEA
SRPPT5:	OWPRMC
SSCRWL:	STAPLT
STADIF:	STATIS
STAERR:	STATIS
STAFRQ:	STATIS
STALSD:	STAPRT
STAPLT:	SPLOTS
STAPRT:	STATIS
STAPTB:	STAPLT
STAPTG:	STAPLT
STAPTT:	STAPLT
STAQDS:	STATIS
STARNK:	STATIS
STASTR:	STATIS
STATIS:	XCUTEB
STMT:	OMNIT
STORE:	OMNIT
STORMT:	MXTX
STREDD:	DIFFER
STRLNG:	LANGUA
STRUVE:	PRESVE
SUMMAL:	AUTCOR, BRL1, CAUPLT, CHSRAN, COALES, CONFEL, CONTB, CORREL, DEXPLT, EV1PLT, EV2PLT, EXPPLT, GAMPLT, HFNPLT, LAMPLT, LGNPLT, LOGPLT, LSDIAG, LSFIT, LSTORE, MPROP, MSCROW, NORPLT, ONEWAY, PARPLT, PERRSS, POIPLT, PROROW, RCSUM, REGLOF, REL1FT, SCC, SOLVE, STAPLT, STAQDS, STATIS, TABLE, TOLLIM, TWCOEF, TWOWAY, TWPRAV, TWPRAW, TWPRNA, TWRNKS, UCSUMS, UNIPLT, WEIPLT, WERRSS
SUNIMD:	STAPLT
SWEDSH:	LANGUA
SYMBOL:	CALTIK, FLINE, NUMBER
SYMV:	MTRIAN
SYMW:	PROCHK
SYMX:	MEIGEN
TABLE:	XSEG15
TABPRT:	TABLE
TABSTR:	TABLE
TCDF:	PRBCDF
THERMO:	XSEG08
TOLLIM:	STATIS
TPCTPT:	FPPT, ONEWAY, OWPRCL
TPPF:	PRBPPF
TQL2:	MEIGEN
TRANSF:	MXTX
TRED2:	MEIGEN
TRIMAT:	MPRSPC
TWCOEF:	TWOWAY
TWOWAY:	XSEG12
TWPRAV:	TWOWAY
TWPRAW:	TWOWAY
TWPRCR:	TWOWAY
TWPRCS:	TWOWAY
TWPRNA:	TWOWAY
TWPRTR:	TWOWAY
TWRANK:	TWRNKS
TWRNKS:	TWPRCR
UCSUMS:	SPLITP
UNIMED:	CAUPLT, DEXPLT, EV1PLT, EV2PLT, EXPPLT, GAMPLT, HFNPLT, LAMPLT, LGNPLT, LOGPLT, NORPLT, PARPLT, POIPLT, UNIPLT, WEIPLT

```
Procedure        Referenced By Procedures

UNIPLT: PRBPLT
UNIQUE: RECODE,  TABLE
UNIRAN: BINRAN, GAMRAN, GEORAN, NORRAN, PRBRAN, RDWITH, RDWOUT, RNDSMP
 UNITX: XSEGO4
UNXRDC:  UNITX
UNXSET:  UNITX
UNXSPC:  UNITX
UNXWRT:  UNITX
VARCON:  ASTER
VARRES: LSDIAG
VECTOR: CVTDEG, DEFINZ,  ERASE, EXTREM,  FUNCT,  MISC2, MSCROW, PRESVE,    SEC,   SEIC,
          SIEC
WEIPLT: PRBPLT
WERRSS: REGLOF
XCUTEA:  OMNIT
XCUTEB: XCUTEA
XFORMT: SPINST
 XHEAD: SPINST
  XPND: EXPAND, REPINC
XSEGO1: XCUTEA, XCUTEB
XSEGO2: XCUTEA, XCUTEB
XSEGO3: XCUTEA, XCUTEB
XSEGO4: XCUTEA, XCUTEB
XSEGO5: XCUTEA, XCUTEB
XSEGO6: XCUTEA
XSEGO7: XCUTEA, XCUTEB
XSEGO8: XCUTEA, XCUTEB
XSEG10: XCUTEB
XSEG11: XCUTEB
XSEG12: XCUTEB
XSEG15: XCUTEA, XCUTEB
XSEG16: XCUTEA, XCUTEB
XSEG20: XCUTEB
XSEG22: XCUTEA, XCUTEB
 XSTOP:  SETUP, SPINST
YUGOSL: LANGUA
ZLCVAR: SCNARG
```

2C. FORTRAN Intrinsic Functions and Procedures Referencing Intrinsic Functions

```
Intrinsic   Referenced By Procedures
Function

  ALOG:   FLOG
ALOG10:   EVAL, FLOG10
  ATAN:   EVAL,  FUNCT
   COS:   FCOS
 DATAN: BINCDF,  NBCDF, PRBCDF,   TCDF,   TPPF
DATAN2: COMPLX
  DCOS:  FDCOS
  DEXP:  FDEXP
  DLOG:  FDLOG
  DSIN:  FDSIN
 DSQRT: FDSQRT
   EXP:   FEXP
   SIN:   FSIN
  SQRT:  FSQRT
  TANH:  FTANH
```

3. COMMON BLOCKS

All common areas used by the OMNITAB 80 system are defined in named common blocks.

3A. Named Common Blocks

Listed in this section are the common statements and the arguments within the named common block. All these statements are included in the main procedure of OMNITAB 80 whose first statement is PROGRAM NBSOMN.

```
COMMON /ABCDEF/ LA(74)
COMMON /ARGMTS/ ARGS(100), IARGS(100), KIND(100), NARGS
COMMON /ARRAYA/ IR(280,2), NIRMID, NIRQTR, NIRTRD
COMMON /ARRAYB/ IALPH(6), ICL(10,2), ICOLHD(7), ICP(6), ID(8,2)
COMMON /ARRAYC/ IDIST(30), IL(14,2), IPROP(5), IRD(29,3)
COMMON /ARRAYD/ ITB(14), ITP(9,2), NALPH(5), NL(19)
COMMON /CCARGS/ HGT, XDH, IFG, ISPD, NPER, NTPE, NCNT(2), NRL
COMMON /CONSTS/ DEG, E, HALFPI, PI, RAD
COMMON /DCONST/ DEHT, DFOR, DHALF,'DONE, DSIX, DTHRE, DTWO, DZERO
COMMON /DMCONS/ DMAXDP, DMXINT, DSNCOS, DXEXP
COMMON /DPICON/ DHLFPI, DPI, DSQRPI, D2BYSP
COMMON /DTCONS/ DALOG2, DEULER
COMMON /ERRMES/ ISE, KMES, LLIST, MESS(15), MNOE, NERR, NRM, NROLD
COMMON /FRMATS/ IFMTS(11), IFMTX(11), INUM, IOSWT, LFMT(100)
COMMON /HEADER/ ITLE(60,6), LNCNT, NOCARD(80), NOMNIT(80), NPAGE
COMMON /ICONST/ IFIVE, IFOUR, IHRD, IONE, ITEN, ITHRE, ITWO, IZERO
COMMON /IMCONS/ IEXP, MMXINT, MXINT, NBC, NBM, NSBB
COMMON /INSTRN/ L1, L2, NCOL, NERROR, NRMAX, NROW
COMMON /IOUNIT/ INUNIT, IPUNCH, ISCRT, KBDOUT, LTAPE, MPRNT, NPRNT
COMMON /IOUNIT/ LPTAPE
COMMON /LANGUE/ LANGC, LANGP
COMMON /LARRAY/ NDIST, NID, NIL, NIR, NIRD, NITB, NITP, NPROP
COMMON /PCONST/ PC(40), JPC, NT(40)
COMMON /PERIPH/ LURCD, NBLKPR, NCHPR
COMMON /PRHEAD/ IFMT(18,6), IFMTPR(5), IHEAD(6,50), NHEADS, NWORDS
COMMON /PRTCTS/ IPLACE, NCHTIT(4), NLENGT, NLSWT, NSIGD
COMMON /OVRLAY/ JREPST
COMMON /RCONST/ RFIVE, RFOR, RHALF, RONE, RTEN, RTHRE, RTWO, RZERO
COMMON /REDSET/ IFLAG, ISRFLG, JY, NDROW, NNARG
COMMON /REPMOD/ ARGTAB(100), COM(2000), INDEX(6,8), LEVEL, NSTMTH
COMMON /RMCONS/ RALOG, RER, REXP, RMIFY, RMXINT, RPIFY, RSD, RTRG
COMMON /SCNCRD/ ARG, ARG2, KARG, KRDPOS, MODE
COMMON /SCNLCD/ LENCRD, LKARD, KARD(83), KRDEND, NEWCRD(80)
COMMON /SLCONS/ MXLIN, MXWDTH
COMMON /SLEAFA/ TEST(3), IDTHST, ILEAF, IPET, ISIGNF, IOUT
COMMON /SLEAFB/ JLSWT, JZ, KZ, LUPPER, LZ, NZ
COMMON /SLEAFC/ IJ, IM, INN, INNI, IPERJ, IPRT, IQN, IRS, ISWT, IW
COMMON /SLEAFD/ IXN, JPERST, JSPA, KC, KDPTH, LMAXA, LRND, MSAL
COMMON /SLEAFE/ NDIV, NSAL, NSALST, NSALTP, NSP, NSPP, NSTOP
COMMON /SLIVAR/ IB(40), IC(6), IN, IP, IPER, IZ, JSTRT, NDSL, NWSL
COMMON /SLRVAR/ RI(5), SV(6)
COMMON /STRINS/ IOVFL, IRMV, LCOM, NCOM, NSTMT, NSTMTX
COMMON /SWITCH/ IHCNT, ILABEL, ISBFT, KRDKNT, NCRT, NDEMD
COMMON /TOPRNT/ IPRINT, ISIGD, LENGTH, LHEAD(96), LWC, LWIDE, NCW
COMMON /VECDIM/ RSUM(172), VWXYZ(8), NAME(8), NTPR(120)
COMMON /WRKSCR/ A(13500), RC(12500), NRC, NS, NS2
```

3B. General Use of Named Common Blocks

Variables related to a particular set of procedures are contained within a specific named common block. For example, variables in named common block TOPRNT are associated with procedures executing the PRINT instructions. This section describes the primary function of the variables for each named common block.

Named Common Block	Description
ABCDEF	Character set used by OMNITAB and defined in BLOCK DATA DATA7 procedure.
ARGMTS	Variables specifically related to instruction arguments.
ARRAYA	Arrays containing the internal computer representation of OMNITAB commands and the coresponding values of L1 and L2.
ARRAYB	Same as ARRAYA.
ARRAYC	Same as ARRAYA.
ARRAYD	Same as ARRAYA.
CCARGS	Variables used by CALCOMP procedures.
CONSTS	Variables for transcendental constants defined in BLOCK DATA DATA3 procedure.
DCONST	Variables for frequently used double precision constants. All variables are typed double precision and defined in BLOCK DATA DATA3 procedure.
DMCONS	Variables for double precision computer dependent constants. Variables are typed double precision and defined in BLOCK DATA DATA3 procedure.
DPICON	Variables assigned values of pi and combinations of pi. Variables are typed double precision and defined in BLOCK DATA DATA3 procedure.
DTCONS	Variables assigned the values of log(2) to base ten and Euler constant. Variables are typed double precision and defined in BLOCK DATA DATA3 procedure.
ERRMES	Variables used by procedures printing error messages.
FRMATS	Variables used for FORMAT commands.
HEADER	Variables used for TITLE and HEAD instructions.
ICONST	Variable names of frequently used constants defined in BLOCK DATA DATA3 procedure.
IMCONS	Variable names of integer machine dependent constants defined in BLOCK DATA DATA3.
INSTRN	Variables needed in executing instructions.
IOUNIT	Variable names for input-output units defined in BLOCK DATA DATA1 procedure.
LANGUE	Variables needed for multilingual procedures.
LARRAY	Variables assigned actual entries in arrays in common blocks ARRAYA, ARRAYB, ARRAYC and ARRAYD and defined in BLOCK DATA DATA8 procedure.
PCONST	Variables assigned fundamental physical constants in BLOCK DATA DATA4 procedure.
PERIPH	Variable names used with peripheral input-output instructions.
PRHEAD	Variables needed for storing column headings, labels and formats.
PRTCTS	Variables needed for reading and printing instructions.
OVRLAY	Switch needed in overlay of XSEG06 procedure.
RCONST	Variable names of frequently used real constants defined in BLOCK DATA DATA3.
REDSET	Variables used for reading data.
REPMOD	Variables used for repeat mode.
RMCONS	Variable names of computer dependent real constants defined in BLOCK DATA DATA3.
SCNCRD	Variables used in scanning OMNITAB instruction.
SCNLCD	Same as SCNCRD.
SLCONS	Variable names for stem-and-leaf procedures defined in BLOCK DATA DATA3 procedure.
SLEAFA	Variables used by stem-and-leaf procedures.
SLEAFB	Same as SLEAFA.
SLEAFC	Same as SLEAFA.
SLEAFD	Same as SLEAFA.
SLEAFE	Same as SLEAFA.
SLIVAR	Same as SLEAFA.
SLRVAR	Same as SLEAFA.
STRINS	Variables used for storing instructions in repeat mode.
SWITCH	Variables used as switches.
TOPRNT	Variables used in printing.
VECDIM	Miscellaneous dimensioned vectors.
WRKSCR	Array vectors used for the worksheet and scratch areas.

3C. Sizes of Named Common Blocks

```
ABCDEF    74, ARGMTS   301, ARRAYA   563, ARRAYB    55, ARRAYC   150, ARRAYD    56, CCARGS    10,
CONSTS     5, DCONST    16, DMCONS     8, DPICON     8, DTCONS     4, ERRMES    22, FRMATS   124,
HEADER   522, ICONST     8, IMCONS     6, INSTRN     6, IOUNIT     8, LANGUE     2, LARRAY     8,
OVRLAY     1, PCONST    81, PERIPH     3, PRHEAD   415, PRTCTS     8, RCONST     8, REDSET     5,
REPMOD  2150, RMCONS     8, SCNCRD     5, SCNLCD   166, SLCONS     2, SLEAFA     8, SLEAFB     6,
SLEAFC    10, SLEAFD     8, SLEAFE     7, SLIVAR    53, SLRVAR    11, STRINS     6, SWITCH     6,
TOPRNT   102, VECDIM   308, WRKSCR 26003
```

3D. Named Common Blocks and Procedures Referencing the Blocks

Named Common Block	Procedures
ABCDEF:	ABRIDG, APRINT, ATOI, BESTCP, BLNKIN, BOXPLT, CINDEX, COMPIL, CONPG1, CONPG2, CONPG3, CONVRT, DATA7, ERRPRT, EVAL, FIXFLO, HEADS, HISTGM, KEYBRD, LABEL, LABPNT, LANGUA, LSDIAG, LSPLT2, LSPLT4, LSPRNT, LSTORE, MINNW, MPRPNT, NBSOMN, OCOVAR, OMCONV, ONLPLT, ONPLTG, ONPLTH, OUTLOF, OUTSPA, OWPRAV, OWPRBP, OWPRCL, OWPRES, OWPRHV, OWPRMC, PACK, PAGE, PCKFMT, PERSAL, PLOTCE, PLT24B, PLT24T, PREPAK, PRINTX, PRPLOT, PRTABR, PRTMNL, PUNCH, READX, RFORMT, RNDATM, RPRINT, SANDL, SETUP, SLFPRT, SLPTSC, SPINST, STALSD, STAPLT, STAPRT, STAPTB, STAPTT, TABPRT, TWPRAV, TWPRAW, TWPRCR, TWPRCS, TWPRNA, UNXRDC, UNXSET, UNXWRT, XSTOP
ARGMTS:	ABRIDG, ADRESS, ALLSUB, APRINT, ARITH, ARYVEC, ATOMIC, BEGIN, BESEL1, BESEL2, BESEL3, BESTCP, CALCOM, CALPLT, CHANGE, CHKCOL, CKIND, CMSEPA, CNTNTS, COALES, COMPIL, COMPLX, CONPG1, CONTB, CORPRT, CORREL, CVTDEG, DEFINZ, DIFFER, DIMENS, DSCRIB, EDITDA, ELLIPT, ERASE, ERROR, EVALOM, EXCHNG, EXPAND, EXPCON, EXTREM, FIXFLO, FLIP, FPROB, FRDIST, FUNCT, GENER, GQUAD, GRAPH, HARMON, HISTGM, IFS, INFERR, INTERP, INVERT, ITERAT, KEYBRD, LARFIT, LIST, LSDIAG, LSFIT, LSPLT2, LSPLT4, LSPRNT, LSTORE, MATRIX, MDAMAD, MEIGEN, MISC2, MIST, MKRON, MMULT, MOP, MORTHO, MOVE, MPROP, MPRPNT, MPRSPC, MRAISE, MSCROW, MTRIAN, MTXCHK, MTXCHL, MTXCHM, MTXCHN, MXTX, NBSOMN, OANOVA, OCOEFF, OCOVAR, OMNIT, ONEWAY, ONLPLT, ONPLTB, ONPLTG, ONPLTH, OPONE, ORTPLT, OUTSPA, OWPRES, OWSTRE, PDMOTE, PLOT24, PRBCDF, PRBPDF, PRBPLT, PRBPPF, PRBRAN, PRESVE, PRINTX, PROROW, PRTABR, PRTDD, PRTMNL, PUNCH, RANKS, READX, RECODE, REDATA, REGLOF, REL1FT, REPINC, RESET, RNDSMP, RPRINT, SANDL, SCC, SCNARG, SEC, SEEEC, SEIC, SELECT, SET, SETUP, SIEC, SLFPRT, SLOMNI, SORDER, SPACE, SPLITP, SPLOTS, STAERR, STAPRT, STAPTT, STAQDS, STASTR, STATIS, STORE, STREDD, TABLE, TABSTR, THERMO, TRANSF, TWOWAY, TWPRAV, TWPRAW, TWPRTR, UNXRDC, UNXSET, UNXSPC, UNXWRT, VARRES, XPND
ARRAYA:	DATA5, LANGUA, LOOKUP, MVELNG, NBSOMN, SETUP, STRLNG
ARRAYB:	DATA6, HEADS, LOOKUP, MVELNG, NBSOMN, STRLNG
ARRAYC:	DATA6, LANGUA, LOOKUP, MVELNG, NBSOMN, STRLNG
ARRAYD:	DATA6, DSCRIB, LOOKUP, MVELNG, NBSOMN, SPINST, STRLNG, VARCON
CCARGS:	CALACT, CALCOM, CALINT, CALPLT, NBSOMN, SETUP, SPINST
CONSTS:	AARGS, CAUPLT, COMPLX, DATA3, ELIPSE, FUNCT, HARMON, LSPLT2, LSPLT4, NBSOMN, PRBPDF, PRBRAN, SETUP
DCONST:	BEJN, BESEL1, BESEL2, BESEL3, BEZERO, BEZONE, BINCDF, BINPDF, BINPPF, BINTJO, BJORCK, CBEI, CBEK, CHSCDF, CHSPPF, CODEXX, CODEXY, COMELL, COMPLX, CONTB, CRSPRD, CTCCDF, DATA3, DBEJ, DIXAB, DSUMAL, ERRINT, EXPINT, FDCOS, FDDIV, FDEXP, FDLOG, FDSIN, FDSQRT, GAMCDF, GAMMA, GAMPLT, GAMPPF, GENER, GQUAD, IMPRUV, NBCDF, NBPDF, NBSOMN, PDECOM, PINVRT, POICDF, POIPDF, PRBCDF, PRBPDF, PRBPPF, QUADLS, RCSUM, SCALE, SCREEN, SDPRED, SEC, SICIEI, SLVE, SPLITP, STAPRT, STATIS, STRUVE, SUMMAL, TCDF, THERMO, TPPF
DMCONS:	BESEL1, BESEL2, BESEL3, DATA3, DEBJ, DIXAB, ERRINT, EXPINT, FDCOS, FDEXP, FDSIN, NBSOMN, SETUP, SICIEI
DPICON:	BEZERO, BEZONE, BINCDF, CBEK, CHSCDF, COMELL, CTCCDF, DATA3, DBEJ, DIXAB, ERRINT, EXPINT, NBCDF, NBSOMN, POICDF, PRBCDF, PRBPDF, PRBPPF, SICIEI, STRUVE, TCDF, TPPF
DTCONS:	CBEK, DATA3, DBEJ, EXPINT, NBSOMN, SICIEI

Named Common Block	Procedures
ERRMES:	ATOMIC, CMSEPA, CORREL, DATA2, DIMENS, EDITDA, ERASE, ERROR, FRDIST, GENER, GQUAD, ITERAT, LIST, MISC2, NBSOMN, OMNIT, OUTPUT, PDMOTE, READX, RESET, RNDSMP, SET, SETUP, SPLOTS, UNXRDC, UNXSET, XSEG12, XSTOP
FRMATS:	ABRIDG, APRINT, DATA8, FIXFLO, KEYBRD, LSFIT, MORTHO, NBSOMN, OPONE, PRINTX, PRTABR, PRTMNL, PUNCH, READX, REDATA, RPRINT, SETUP, UNXRDC, UNXWRT, XSEG12
HEADER:	ABRIDG, APRINT, CALPLT, DATA8, KEYBRD, NBSOMN, NOTEPR, ONLPLT, ONPLTG, PAGE, PRINTX, PRPLOT, SETUP, SPACE, SPINST, TABPRT
ICONST:	AARGS, ABRIDG, ACCDIG, ADRESS, ALLSUB, APRINT, ARITH, ARYVEC, ASTER, ATOI, ATOMIC, AUTCOR, BACK, BEGIN, BEJN, BESEL1, BESEL2, BESEL3, BESTCP, BETRAN, BEZERO, BEZONE, BINCDF, BINPDF, BINPPF, BINRAN, BINTJO, BJORCK, BLANK, BOXPLT, BRL1, CALACT, CALCOM, CALINT, CALPLT, CALTIK, CAUPLT, CHANGE, CHKCOL, CHSCDF, CHSPPF, CHSRAN, CINDEX, CKIND, CMSEPA, CNTNTS, COALES, CODEXX, CODEXY, COEF, COMELL, COMPIL, COMPLX, CONFEL, CONPG1, CONPG2, CONPG3, CONTB, CONVRT, CORPRT, CORREL, CPSTRE, CRSPRD, CTCCDF, CVTDEG, DATA3, DBEJ, DECOMP, DEFINZ, DESC10, DETRNK, DEXPLT, DIFFER, DIMENS, DISPRO, DIXAB, DSCRIB, DSUMAL, EDITDA, ELIPSE, ELLIPT, ERASE, ERROR, ERRPRT, EVAL, EVALOM, EV1PLT, EV2PLT, EXCHNG, EXPAND, EXPCON, EXPINT, EXPPLT, EXTREM, FDDIV, FDIV, FEXP2, FIXFLO, FLIP, FPPT, FPROB, FRDIST, FREQCY, FTLERR, FUNCT, GAMCDF, GAMMA, GAMPLT, GAMPPF, GAMRAN, GENER, GEORAN, GQUAD, GRAPH, HARMON, HEADS, HFNPLT, HISTGM, IDIV, IFS, IMPRUV, INFERR, INPUT, INTERP, INTRP, INVCHK, INVERT, INZP, ISORT, ITERAT, IXLINE, KEYBRD, LABEL, LABPNT, LAMCDF, LAMPDF, LAMPLT, LAMPPF, LANGUA, LARFIT, LGNPLT, LIST, LOCAT, LOCATE, LOFIND, LOGPLT, LOOKUP, LSDIAG, LSFIT, LSPLT2, LSPLT4, LSPRNT, LSQ, LSRND, LSTORE, MAINSL, MATRIX, MCHROW, MDAMAD, MEDCI, MEIGEN, MINNW, MISC2, MIST, MKRON, MMULT, MOP, MORTHO, MOVE, MPROP, MPRPNT, MPRSPC, MRAISE, MSCROW, MTRIAN, MTXCHK, MTXCHL, MTXCHM, MTXCHN, MXTX, MXTXP, MXTXQ, NBCDF, NBPDF, NBPPF, NBRAN, NBSOMN, NNAME, NORPLT, NORPPF, NORRAN, NOTEPR, OANOVA, OCOEFF, OCOVAR, OMCONV, OMNIT, ONEWAY, ONLPLT, ONPLTB, ONPLTG, ONPLTH, OPONE, ORTHRV, ORTPLT, OSCRWL, OUTLOF, OUTPUT, OUTSPA, OWPRAV, OWPRBP, OWPRCL, OWPRES, OWPRHV, OWPRMC, OWSTRE, PACK, PAGE, PARPLT, PCKFMT, PCTILE, PDECOM, PDMOTE, PERRSS, PERSAL, PHYCON, PINVRT, PLOTCE, PLOT24, PLT24B, PLT24G, PLT24T, POICDF, POIPDF, POIPLT, POIPPF, PRBCDF, PRBPDF, PRBPLT, PRBPPF, PRBRAN, PREPAK, PRESVE, PRINTX, PROCHK, PROROW, PRPLOT, PRTABR, PRTDD, PRTMNL, PUNCH, QFORF, QUADLS, RANKO, RANKS, RANKX, RCSUM, RDWITH, RDWOUT, READX, RECODE, REDATA, REGLOF, REL1FT, REPINC, RESET, RFORMT, RNDATM, RNDOWN, RNDSMP, RPRINT, RULE, SANDL, SCALE, SCALE2, SCALE3, SCC, SCNARG, SCRAWL, SCREEN, SDPRED, SDRND, SEC, SEEEC, SEIC, SELECT, SET, SETUP, SICIEI, SIEC, SKSYMV, SLFPRT, SLOMNI, SLPTSC, SLVE, SNRPPF, SOLVE, SORDER, SORT, SORTLS, SORTPP, SPACE, SPINST, SPLITP, SPLOTS, SSCRWL, STADIF, STAERR, STAFRQ, STALSD, STAPLT, STAPRT, STAPTB, STAPTG, STAPTT, STAQDS, STARNK, STASTR, STATIS, STMT, STORE, STORMT, STREDD, STRLNG, STRUVE, SUMMAL, SUNIMD, SYWV, SYMW, SYMX, TABLE, TABPRT, TABSTR, TCDF, THERMO, TOLLIM, TPPF, TQL2, TRANSF, TRED2, TRIMAT, TWCOEF, TWOWAY, TWPRAV, TWPRAW, TWPRCR, TWPRCS, TWPRNA, TWPRTR, TWRANK, TWRNKS, UCSUMS, UNIMED, UNIPLT, UNIQUE, UNIRAN, UNITX, UNXRDC, UNXSET, UNXSPC, UNXWRT, VARCON, VARRES, VECTOR, WEIPLT, WERRSS, XCUTEA, XCUTEB, XFORMT, XHEAD, XPND, XSEG05, XSEG06, XSEG12, XSTOP, ZCLVAR
IMCONS:	ATOI, DATA3, DIXAB, DSUMAL, ERRINT, EXPINT, FEXP2, NBPPF, NBSOMN, POIPPF, SEEEC, SETUP, SICIEI, SUMMAL, TQL2
INSTRN:	AARGS, ABRIDG, ADRESS, ALLSUB, APRINT, ARITH, ARYVEC, ATOMIC, BEGIN, BESEL1, BESEL2, BESEL3, BESTCP, CALCOM, CALINT, CALPLT, CHANGE, CMSEPA, COALES, COMPIL, COMPLX, CONPG1, CONTB, CORPRT, CORREL, CVTDEG, DEFINZ, DESC1, DESC10, DESC11, DESC2, DESC3, DESC4, DESC5, DESC6, DESC7, DESC8, DESC9, DIFFER, DIMENS, DISPRO, DSCRIB, EDITDA, ELLIPT, ERASE, ERROR, EVALOM, EXCHNG, EXINVT, EXPAND, EXPCON, EXTREM, FIXFLO, FLIP, FPROB, FRDIST, FUNCT, GENER, GQUAD, GRAPH, HARMON, HISTGM, IFS, INFERR, INTERP, INVERT, ITERAT, KEYBRD, LABEL, LABPNT, LANGUA, LARFIT, LIST, LOOKUP, LSDIAG, LSFIT, LSPRNT, LSQ, LSTORE, MATRIX, MDAMAD, MEIGEN, MISC2, MIST, MKRON, MMULT, MOP, MORTHO, MOVE, MPROP, MPRPNT, MPRSPC, MRAISE, MSCROW, MTRIAN, MTXCHK, MTXCHL, MTXCHM, MTXCHN, MXTX, NBSOMN, OANOVA, OCOEFF, OCOVAR, OMNIT, ONEWAY, ONLPLT, ONPLTB, ONPLTG, ONPLTH, OPONE, OUTPUT, OUTSPA, OWPRAV, OWPRES, PAGE, PDMOTE, PLOT24, PLT24G, PRBCDF,

Named Common Block	Procedures
INSTRN:	PRBPDF, PRBPLT, PRBPPF, PRBRAN, PRESVE, PRINTX, PROROW, PRPLOT, PRTABR, PRTDD,
(contd)	PRTMNL, PUNCH, RANKS, READX, RECODE, REDATA, REGLOF, REL1FT, REPINC, RESET,
	RNDSMP, RPRINT, SCC, SCNARG, SCREEN, SEC, SEEEC, SEIC, SELECT, SET,
	SETUP, SIEC, SLOMNI, SORDER, SPACE, SPINST, SPLITP, SPLOTS, STAERR, STAPRT,
	STAQDS, STASTR, STATIS, STORE, STREDD, TABLE, TABPRT, TABSTR, THERMO, TRANSF,
	TWCOEF, TWOWAY, TWPRAV, TWPRAW, TWPRTR, UNITX, UNXRDC, UNXSET, UNXSPC, UNXWRT,
	VARRES, VECTOR, XCUTEA, XCUTEB, XHEAD, XPND, XSEG01, XSEG02, XSEG03, XSEG04,
	XSEG05, XSEG06, XSEG07, XSEG08, XSEG10, XSEG11, XSEG12, XSEG15, XSEG16, XSEG20,
	XSEG22, XSTOP
IOUNIT:	CALACT, CALCOM, CALERR, CALINT, DATA1, ERROR, ERRPRT, INPUT, INTERP, INVERT,
	KEYBRD, LABPNT, LIST, NBSOMN, OMNIT, OUTPUT, PAGE, PCKFMT, PUNCH, READX,
	RNDOWN, SCNARG, SETUP, SPINST, UNITX, UNXRDC, UNXSET, UNXSPC, XSTOP
LANGUE:	DATA8, LANGUA, LOOKUP, NBSOMN, SPINST
LARRAY:	DATA8, LANGUA, LOOKUP, MVELNG, NBSOMN, SETUP, STRLNG, TABLE, TABPRT
OVRLAY:	NBSOMN, XCUTEA, XSEG06
PCONST:	DATA4, NBSOMN, PHYCON, SETUP
PERIPH:	NBSOMN, SETUP, UNXRDC, UNXSET, UNXSPC, UNXWRT
PRHEAD:	DATA2, NBSOMN, PCKFMT, PREPAK, SETUP, ZLCVAR
PRTCTS:	APRINT, DATA1, DIXAB, HEADS, KEYBRD, LSRND, NBSOMN, ONLPLT, PAGE, PRTABR,
	RPRINT, SDRND, SEIC, SETUP, SPINST, UNXWRT
RCONST:	AARGS, ACCDIG, ALLSUB, ARITH, ASTER, ATOMIC, AUTCOR, BESEL1, BESEL2, BESEL3,
	BESTCP, BETRAN, BINCDF, BINPDF, BINPPF, BINRAN, BJORCK, BRL1, CALCOM, CALPLT,
	CALTIK, CAUPLT, CHSCDF, CHSPPF, CMPARA, CMSEPA, CNTNTS, COALES, COMPIL, CONFEL,
	CONPG1, CONPG3, CONTB, CORPRT, CORREL, CTCCDF, CTNCDF, CVTDEG, DATA3, DECOMP,
	DETRNK, DEXPLT, DIXAB, EDITDA, ELIPSE, ERASE, ERRINT, EVAL, EV1PLT, EV2PLT,
	EXPAND, EXPPLT, FCOS, FDIV, FEXP, FEXP2, FLOG, FLOG10, FNUALF, FPPT,
	FPROB, FRDIST, FREQCY, FSIN, FSQRT, FTANH, FUNCT, GAMCDF, GAMMA, GAMPLT,
	GAMPPF, GAMRAN, GENER, GEORAN, HARMON, HFNPLT, HISTGM, IFS, IMPRUV, INTERP,
	INTRP, INVCHK, ITERAT, LABEL, LAMCDF, LAMPDF, LAMPLT, LAMPPF, LARFIT, LOFIND,
	LOGPLT, LSDIAG, LSFIT, LSPLT2, LSPLT4, LSPRNT, LSQ, LSRND, LSTORE, MATRIX,
	MEDCI, MISC2, MOP, MORTHO, MPROP, MPRPNT, MPRSPC, MRAISE, MSCROW, MTRIAN,
	NBCDF, NBPDF, NBPPF, NBRAN, NBSOMN, NORCDF, NORPLT, NORPPF, NORRAN, OANOVA,
	OCOEFF, OCOVAR, OMNIT, ONEWAY, ONLPLT, ONPLTG, ONPLTH, OPONE, ORTHRV, ORTPLT,
	OSCRWL, OUTSPA, OWPRCL, OWPRES, OWPRHV, OWPRMC, PACK, PARPLT, PCTILE, PDECOM,
	PDMOTE, PERRSS, PHYCON, PINVRT, PIVOT, PLOTCE, PLOT24, PLT24G, POICDF, POIPDF,
	POIPLT, POIPPF, PRBCDF, PRBPDF, PRBPLT, PRBPPF, PRBRAN, PROROW, PRPLOT, PRTABR,
	PRTMNL, QFORF, QUADLS, RANKO, RANKX, RDWITH, RDWOUT, READX, RECODE, REGLOF,
	REL1FT, REPINC, RFORMT, RNDOWN, RPRINT, RULE, SCALE, SCALE2, SCALE3, SCC,
	SCNARG, SCRAWL, SCREEN, SDPRED, SDRND, SEC, SEEEC, SELECT, SETUP, SIEC,
	SKSYMV, SLFPRT, SLOMNI, SLPTSC, SLVE, SNRPPF, SORDER, SPINST, SPLITP, SSCRWL,
	STAFRQ, STAPLT, STAPRT, STAPTG, STAQDS, STARNK, STASTR, STATIS, SUNIMD, SYMV,
	SYMW, SYMX, TABLE, TABPRT, TABSTR, TCDF, THERMO, TOLLIM, TPCTPT, TPPF,
	TQL2, TRED2, TRIMAT, TWCOEF, TWOWAY, TWPRAV, TWPRAW, TWPRCR, TWPRCS, TWPRNA,
	TWPRTR, TWRANK, TWRNKS, UNIMED, UNIPLT, UNXRDC, UNXSET, UNXWRT, VARCON, VARRES,
	WEIPLT, WERRSS, XPND
REDSET:	NBSOMN, OMNIT, READX, REDATA, SET
REPMOD:	BEGIN, ERROR, IFS, LOCATE, NBSOMN, OMNIT, REPINC, RNDOWN, SCNARG, SETUP,
	STORE, UNXRDC, UNXSET, UNXWRT, XCUTEA
RMCONS:	AARGS, ACCDIG, ARITH, BESEL1, BESEL2, BESEL3, BRL1, CNTNTS, DATA3, DETRNK,
	DSUMAL, FCOS, FDPCON, FEXP, FEXP2, FPPT, FPROB, FSIN, FTANH, FUNCT,
	LARFIT, LSDIAG, LSFIT, LSPRNT, LSQ, LSTORE, MISC2, MORTHO, MPROP, NBPPF,
	NBSOMN, OCOEFF, ONLPLT, ONPLTG, ONPLTH, ORTHRV, PRBCDF, PRBPDF, PRBPPF, PRBRAN,
	PRPLOT, QFORF, SCREEN, SELECT, SETUP, SKSYMV, SORTLS, SUMMAL, SYMV, SYMW,
	SYMX, TABLE, TABPRT, TABSTR, TOLLIM, TWOWAY
SCNCRD:	AARGS, ASTER, BEGIN, BLANK, EVALOM, INPUT, LABEL, LABPNT, NBSOMN, NNAME,
	NONBLA, OMNIT, OUTPUT, PCKFMT, PHYCON, READX, SCNARG, SET, SETUP, SPINST,
	STMT, UNXRDC, UNXSET, VARCON, XFORMT, XHEAD

Named Common Block	Procedures
SCNLCD:	ASTER, BEGIN, BLANK, CNTNTS, DATA1, EVALOM, INPUT, KEYBRD, LABEL, LABPNT, NBSOMN, NNAME, NONBLA, OMNIT, OUTPUT, PCKFMT, SCNARG, SETUP, SPINST, STMT, XFORMT, XHEAD
SLCONS:	ATOI, DATA3, NBSOMN, PERSAL, SANDL, SLFPRT, SLPTSC
SLEAFA:	MAINSL, NBSOMN, RULE, SANDL, SLFPRT, SLPTSC
SLEAFB:	MAINSL, NBSOMN, RULE, SANDL, SLFPRT, SLPTSC
SLEAFC:	NBSOMN, SANDL, SLFPRT
SLEAFD:	NBSOMN, SANDL, SLFPRT
SLEAFE:	NBSOMN, SANDL, SLFPRT
SLIVAR:	MAINSL, NBSOMN, PERSAL, RULE, SANDL, SLFPRT, SLPTSC
SLRVAR:	MAINSL, NBSOMN, PERSAL, RULE, SLFPRT, SLPTSC
STRINS:	BEGIN, INPUT, NBSOMN, OMNIT, OUTPUT, SCNARG, SETUP, STORE
SWITCH:	APRINT, CALTIK, ERROR, FTLERR, INFERR, INPUT, KEYBRD, LABEL, LABPNT, LSPRNT, LSTORE, MPRPNT, NBSOMN, OMNIT, PAGE, PLOTCE, PREPAK, PRTABR, PRTMNL, RNDOWN, RPRINT, SCNARG, SETUP, STAPRT, STATIS, XSTOP, ZLCVAR
TOPRNT:	ABRIDG, APRINT, BESTCP, BOXPLT, CALERR, CAUPLT, CNTNTS, CNTNT1, CNTNT2, CNTNT3, CNTNT4, COEF, CONPG1, CONPG2, CONPG3, CONTB, CORPRT, CORREL, DESC1, DESC10, DESC11, DESC2, DESC3, DESC4, DESC5, DESC6, DESC7, DESC8, DESC9, DEXPLT, DIFFER, DSCRIB, ERROR, EV1PLT, EV2PLT, EXPPLT, FIXFLO, FTLERR, GAMPLT, HEADS, HFNPLT, HISTGM, INFERR, KEYBRD, LABPNT, LAMPLT, LANGUA, LGNPLT, LOGPLT, LSDIAG, LSFIT, LSPLT2, LSPLT4, LSPRNT, MAINSL, MIST, MPRPNT, NBSOMN, NORPLT, NOTEPR, OANOVA, OCOEFF, OCOVAR, ONEWAY, ONLPLT, ONPLTG, ONPLTH, OPONE, ORTPLT, OUTLOF, OUTSPA, OWPRAV, OWPRBP, OWPRCL, OWPRES, OWPRHV, OWPRMC, PAGE, PARPLT, PERSAL, PLOTCE, PLOT24, PLT24B, PLT24G, PLT24T, POIPLT, PRINTX, PRPLOT, PRTABR, PRTDD, PRTMNL, RFORMT, RNDOWN, RPRINT, RTHERR, SANDL, SCREEN, SEEEC, SEIC, SETUP, SLFPRT, SLOMNI, SLPTSC, SPACE, SPINST, STAPLT, STAPRT, STAPTB, STAPTG, STAPTT, STATIS, TABPRT, TWOWAY, TWPRAV, TWPRAW, TWPRCR, TWPRCS, TWPRNA, TWPRTR, UNIPLT, UNXWRT, WEIPLT, XSTOP
VECDIM:	DSCRIB, DSUMAL, LOOKUP, NBSOMN, NOTEPR, OMNIT, RESET, SCNARG, SETUP, SPINST, SUMMAL, XPND
WRKSCR:	ABRIDG, ALLSUB, APRINT, ARITH, ARYVEC, ATOMIC, BESEL1, BESEL2, BESEL3, BESTCP, BETRAN, BINRAN, CALCOM, CALPLT, CAUPLT, CBEK, CHANGE, CHSRAN, CMSEPA, COALES, COMPIL, COMPLX, CONFEL, CONPG1, CONPG2, CONPG3, CONTB, CORPRT, CORREL, CVTDEG, DATA1, DBEJ, DEFINZ, DEXPLT, DIFFER, DIMENS, EDITDA, ELLIPT, EVAL, EV1PLT, EV2PLT, EXCHNG, EXPCON, EXPPLT, EXTREM, FLIP, FPROB, FRDIST, FTLERR, FUNCT, GAMMA, GAMPLT, GENER, GQUAD, GRAPH, HARMON, HFNPLT, HISTGM, IFS, INTERP, INVERT, ITERAT, LABEL, LABPNT, LAMPLT, LANGUA, LARFIT, LGNPLT, LOGPLT, LSDIAG, LSFIT, LSPLT2, LSPLT4, LSPRNT, LSTORE, MATRIX, MDAMAD, MEIGEN, MISC2, MKRON, MMULT, MOP, MORTHO, MOVE, MPROP, MPRPNT, MPRSPC, MRAISE, MSCROW, MTRIAN, MXTX, NBRAN, NBSOMN, NORPLT, OANOVA, OCOEFF, OCOVAR, OMNIT, ONEWAY, ONLPLT, ONPLTB, ONPLTG, ONPLTH, OPONE, ORTPLT, OUTLOF, OUTSPA, OWPRAV, OWPRBP, OWPRCL, OWPRES, OWPRHV, OWPRMC, OWSTRE, PARPLT, PCKFMT, PDMOTE, PERRSS, PLOTCE, PLOT24, PLT24B, PLT24G, PLT24T, POIPLT, PRBCDF, PRBPDF, PRBPLT, PRBPPF, PRBRAN, PRESVE, PRINTX, PROROW, PRTABR, PRTDD, PRTMNL, PUNCH, RANKS, RDWOUT, READX, RECODE, REDATA, REGLOF, REL1FT, RNDSMP, RPRINT, SCC, SCNARG, SCREEN, SEC, SEEEC, SEIC, SELECT, SETUP, SIEC, SLOMNI, SORDER, SPINST, SPLITP, SPLOTS, STAERR, STAPLT, STAPRT, STAPTB, STAPTG, STAPTT, STAQDS, STASTR, STATIS, STREDD, TABLE, TABPRT, TABSTR, THERMO, TRANSF, TWCOEF, TWOWAY, TWPRAV, TWPRAW, TWPRCR, TWPRCS, TWPRNA, TWPRTR, TWRNKS, UCSUMS, UNIPLT, UNXRDC, UNXSET, UNXWRT, VARRES, VECTOR, WEIPLT, WERRSS, XPND, XSTOP, ZLCVAR

4. COMPUTER DEPENDENT MODIFICATIONS

Modifications in this chapter may be necessary for different computer configurations. If the order form for the OMNITAB 80 system includes requests for these modifications, they will be implemented when the tape is generated. Otherwise, the implementor of the system must ascertain if these modifications are needed.

4A. Worksheet and Scratch Area

The standard OMNITAB 80 system contains a worksheet of 12,500 words consisting of 201 rows and 62 columns. The number of rows and columns can be modified by the user with the DIMENSION instruction as long as the total size of the worksheet remains the same (i.e., number of rows times number of columns is less than or equal to worksheet). The system also contains a scratch area, equivalent to the worksheet plus 1000 words. Modifying the size of the worksheet entails the following corrections: (1) the number of rows and columns in the worksheet; (2) the array sizes of the worksheet and the scratch area; and (3) the dimension size of arrays A(.) and RC(.) in named common block WRKSCR.

Let NSIZE be the size of worksheet required. (NSIZE must be a constant and not a variable.)

(1) In SETUP change

```
DATA ICL /   62 /
DATA ICN /  201 /

Where ICL = number of columns and
      ICN = number of rows

to

DATA ICL / KCOL /
DATA ICN / KROW /

Where KCOL*KROW is less than or equal to NSIZE
```

(2) In BLOCK DATA DATA1 change

```
DATA NRC / 12500 /
DATA NS  / 13500 /

to

DATA NRC / NSIZE /
DATA NS  / NSIZE+1000 /
```

(3) The named common block

```
COMMON /WRKSCR/ A(13500),RC(12500),NRC,NS,NS2

must be changed to

COMMON / WRKSCR/ A(NSIZE + 1000),RC(NSIZE),NRC,NS,NS2

in the following  procedures:

ABRIDG, ALLSUB, APRINT,  ARITH, ARYVEC, ATOMIC, BESEL1, BESEL2, BESEL3, BESTCP,
BETRAN, BINRAN, CALCOM, CALPLT, CAUPLT,   CBEK, CHANGE, CHSRAN, CMSEPA, COALES,
COMPIL, COMPLX, CONFEL, CONPG1, CONPG2, CONPG3,  CONTB, CORPRT, CORREL, CVTDEG,
 DATA1,   DBEJ, DEFINZ, DEXPLT, DIFFER, DIMENS, EDITDA, ELLIPT,   EVAL, EV1PLT,
EV2PLT, EXCHNG, EXPCON, EXPPLT, EXTREM,   FLIP,  FPROB, FRDIST, FTLERR,  FUNCT,
 GAMMA, GAMPLT,  GENER,  GQUAD,  GRAPH, HARMON, HFNPLT, HISTGM,    IFS, INTERP,
INVERT, ITERAT,  LABEL, LABPNT, LAMPLT, LANGUA, LARFIT, LGNPLT, LOGPLT, LSDIAG,
 LSFIT, LSPLT2, LSPLT4, LSPRNT, LSTORE, MATRIX, MDAMAD, MEIGEN,  MISC2,  MKRON,
```

```
 MMULT,    MOP, MORTHO,   MOVE,  MPROP, MPRPNT, MPRSPC, MRAISE, MSCROW, MTRIAN,
  MXTX,  NBRAN, NBSOMN, NORPLT, OANOVA, OCOEFF, OCOVAR,  OMNIT, ONEWAY, ONLPLT,
ONPLTB, ONPLTG, ONPLTH,  OPONE, ORTPLT, OUTLOF, OUTSPA, OWPRAV, OWPRBP, OWPRCL,
OWPRES, OWPRHV, OWPRMC, OWSTRE, PARPLT, PCKFMT, PDMOTE, PERRSS, PLOTCE, PLOT24,
PLT24B, PLT24G, PLT24T, POIPLT, PRBCDF, PRBPDF, PRBPLT, PRBPPF, PRBRAN, PRESVE,
PRINTX, PROROW, PRTABR,  PRTDD, PRTMNL,  PUNCH,  RANKS, RDWOUT,  READX, RECODE,
REDATA, REGLOF, REL1FT, RNDSMP, RPRINT,    SCC, SCNARG, SCREEN,    SEC,  SEEEC,
  SEIC, SELECT,  SETUP,   SIEC, SLOMNI, SORDER, SPINST, SPLITP, SPLOTS, STAERR,
STAPLT, STAPRT, STAPTB, STAPTG, STAPTT, STAQDS, STASTR, STATIS, STREDD,  TABLE,
TABPRT, TABSTR, THERMO, TRANSF, TWCOEF, TWOWAY, TWPRAV, TWPRAW, TWPRCR, TWPRCS,
TWPRNA, TWPRTR, TWRNKS, UCSUMS, UNIPLT, UNXRDC, UNXSET, UNXWRT, VARRES, VECTOR,
WEIPLT, WERRSS,   XPND,  XSTOP, ZLCVAR,
```

4B. Column Headings

Users of the OMNITAB 80 system may head columns with the HEAD command. Any column may be headed, provided the total number of headings specified is a maximum of 50. However, this number may be increased or decreased if an installation so desires. Headings are stored in a push-down array and, if more headings are used, the headings at the bottom of the array are lost. This is true no matter how many headings an installation permits.

Let NHEAD = number of column headings permitted. (NHEAD must be an integer constant.)

(1) In PREPAK change

```
COMMON /PRHEAD/ IFMT(18,6), IFMTPR(5), IHEAD(6,50), NHEADS, NWORDS
```

to

```
COMMON /PRHEAD/ IFMT(18,6), IFMTPR(5), IHEAD(6,NHEAD), NHEADS, NWORDS
```

(2) In BLOCK DATA DATA2 change

```
DATA NHEADS /50/
```

to

```
DATA NHEADS /NHEAD/
```

4C. Formats

Formats specified by the user of the OMNITAB 80 system must be packed. The array IFMTPR(.) embodies the format descriptor (18A4) to read the user specified formats and may require changes if the number of of characters per computer word is not four.

Let NCHAR = number of characters that can be packed per word for a particular configuration.

```
K = 72/NCHAR+M     M=0  If 72/NCHAR has no remainder
                   M=1  If 72/NCHAR has a remainder
```

In BLOCK DATA DATA2 change

```
DATA NWORDS / 18 /
DATA IFMTPR(2) / 2H18 /
DATA IFMTPR(4) / 1H4  /
```

to

```
DATA NWORDS /  K /
DATA IFMTPR(2) / 2HK   /
DATA IFMTPR(4) /1HNCHAR/
```

4D. Input and Output Units

There are eight integer variables which reference input-output units rather than a specific logical unit. BLOCK DATA DATA1 defines the logical unit for each of these integer variables. It may be necessary to assign different values to the variables listed below:

```
INUNIT: logical input unit - usually a card reader.
 NPRNT: logical output unit - for batch or terminal use.
 MPRNT: logical output unit - for printer when using a terminal.
IPUNCH: logical card punch unit.
 ISCRT: logical auxiliary (temporary) output unit.
KBDOUT: logical on-line unit or keyboard.
LPTAPE: logical unit or tape to store intermediate output for
        plotting on the Calcomp Plotter.
 LTAPE: first logical unit to be used with OMNITAB commands: READ UNIT "L" and WRITE UNIT "L".
        The qualifier  "L"  is one of the six characters  A, B, C, D, E OR F and refers to the
        logical unit used. The value assigned to LTAPE is the corresponding logical unit of A.
        The next five  consecutive logical units are  automatically assigned to  the remaining
        qualifiers (i.e., qualifier B refers to logical unit LTAPE + 1 and F to LTAPE + 5).
```

4E. Computer Dependent Constants

Listed are scaler variables which are defined in various common blocks and contain computer dependent constants. These variables are defined in DATA statements in BLOCK DATA DATA3, and the constants contained in these DATA statements need changing for different computer configurations.

```
   DEG: number of degrees in one radian (57.2957795).
     E: base of natural logs (2.71821818).
HALFPI: value of pi/2.0 (1.5707963).
    PI: value of pi (3.14159265).
   RAD: number of radians in one degree (1.74532925E-2).
DMAXDP: largest machine double precision value (0.8988465674311579D308).
DSNCOS: used by FDSIN and FDCON functions to trap when an argument becomes too large (0.7205759403792794D17).
 DXEXP: used by FDEXP function to trap when an argument becomes too large (704.0D0).
DHLFPI: double precision value of pi/2.0 (1.570796326794897D0).
   DPI: double precision value of pi (3.141592653589793D0).
DSQRPI: double precision value of the square root of pi (1.772453850905516D0).
D2BYSP: double precision value of 2.0/(square root of pi) (1.128379167095513D0).
DALOG2: log (2) to the base 10 in double precision (0.6931471805599453D0).
DEULER: Euler's constant in double precision (0.5772156649015329D0).
MMXINT: mantissa of largest real number (2*27-1).
 MXINT: largest machine integer (2*35-1).
   NBC: number of binary bits in the characteristic of a double precision number (11).
   NBM: number of binary bits in the mantissa of a double precision number (60).
  NSBB: number of significant binary bits in the mantissa of a real number (27).
 RALOG: characteristic of largest real number (38.0).
   RER: used in checking values close to zero (1.0E-8).
  REXP: used by FEXP function to trap when an argument becomes too large (88.0).
 RMIFY: negative value of the largest real number (- infinity) (-1.0E37).
 RPIFY: largest positive real number (+ infinity) (1.0E38).
  RTRG: used by FSIN and FCOS functions to trap when an argument becomes too large (2.097152E6).
```

The scaler variable NSIDG contains the number of decimal digits in a real number. This variable is defined in a DATA statement in BLOCK DATA DATA1 and the constant contained in the DATA statement may need to be changed for different computers.

```
NSIGD =  7, for a 32 bit computer (IBM)
      =  8, for a 36 bit word computer (UNIVAC)
      = 10, for a 48 bit word computer (BURROUGHS)
      = 13, for a 60 bit word computer (CDC)

CAUTION: NSIGD must be small enough so that 10**(NSIGD+1) is a valid computer integer.
         (This is why NSIGD equals 13 and not 14 for a 60 bit word computer.)
```

5. OMNITAB 80 COMMAND NAMES

Each OMNITAB 80 instruction is scanned for command name and arguments. Two integer variables, L1 and L2 which are arguments in named common block INSTRN, are uniquely defined for each command name. In executing the command, these variables are used to reference the proper procedure.

5A. Commands

Listed in this section are the command names, the associated values of integer variables L1 and L2, and the primary procedure for executing that command.

Command	L1	L2	Procedure	Command	L1	L2	Procedure
AADD	18	4	MATRIX	AAVERAGE	18	10	COALES
ABRIDGE	6	1	ABRIDG	ABRIDGE A	6	2	ABRIDG
ABRIDGE B	6	3	ABRIDG	ABRIDGE C	6	4	ABRIDG
ABRIDGE D	6	5	ABRIDG	ABRIDGE E	6	6	ABRIDG
ABRIDGE F	6	7	ABRIDG	ABS	12	31	FUNCT
ABSOLUTE	12	31	FUNCT	ACCURACY	11	6	ARITH
ACOALESCE	18	9	COALES	ACOS	12	6	FUNCT
ACOSD	12	14	FUNCT	ACOSH	12	28	FUNCT
ACOT	12	8	FUNCT	ACOTD	12	16	FUNCT
ACOTH	12	30	FUNCT	ADD	11	1	ARITH
ADEFINE	15	1	MOP	ADIV	18	7	MATRIX
ADIVIDE	18	7	MATRIX	AERASE	15	2	MOP
ALABEL	16	4	LABEL	AMOVE	23	6	MOVE
AMULT	18	6	MATRIX	AMULTIPLY	18	6	MATRIX
ANTILOG	12	22	FUNCT	APRINT	4	1	APRINT
APRINT A	4	2	APRINT	APRINT B	4	3	APRINT
APRINT C	4	4	APRINT	APRINT D	4	5	APRINT
APRINT E	4	6	APRINT	APRINT F	4	7	APRINT
APROPERTIES	27	2	MPROP	ARAISE	18	8	MATRIX
ASIN	12	5	FUNCT	ASIND	12	13	FUNCT
ASINH	12	27	FUNCT	ASUB	18	5	MATRIX
ASUBTRACT	18	5	MATRIX	ATAN	12	7	FUNCT
ATAND	12	15	FUNCT	ATANH	12	29	FUNCT
ATOMIC	31	3	ATOMIC	ATRANSPOSE	18	3	MATRIX
AVERAGE	17	11	SCC	AZERO	15	2	MOP
BACKSPACE UNIT A	50	23	UNITX	BACKSPACE UNIT B	50	24	UNITX
BACKSPACE UNIT C	50	25	UNITX	BACKSPACE UNIT D	50	26	UNITX
BACKSPACE UNIT E	50	27	UNITX	BACKSPACE UNIT F	50	28	UNITX
BEGIN	14	1	BEGIN	BESIN	30	38	BESEL3
BESJN	30	32	BESEL3	BESKN	30	39	BESEL3
BESTCP	22	6	BESTCP	BETA CUMULATIVE	55	39	DISPRO
BETA DENSITY	55	8	DISPRO	BETA RANDOM	56	39	DISPRO
BINOMIAL CUMULATIVE	55	54	DISPRO	BINOMIAL DENSITY	55	23	DISPRO
BINOMIAL PERCENTILE	56	23	DISPRO	BINOMIAL RANDOM	56	54	DISPRO
BIONE	30	6	BESEL1	BIZERO	30	5	BESEL1
BJONE	30	2	BESEL1	BJZERO	30	1	BESEL1
BKONE	30	8	BESEL1	BKZERO	30	7	BESEL1
BOLDISTRIBUTION	31	9	THERMO	BRIEF	14	17	KEYBRD
BYONE	30	4	BESEL1	BYZERO	30	3	BESEL1
CADD	32	1	COMPLX	CALCOMP AXIS	32	14	CALINT
CALCOMP FAST	32	12	CALINT	CALCOMP PAPER	32	13	CALINT
CALCOMP PLOT	32	10	CALINT	CALCOMP SIZE	32	9	CALINT
CALCOMP SLOW	32	11	CALINT	CALCOMP SPEED	32	8	CALINT
CALCOMP TAPE	32	15	CALINT	CAUCHY CUMULATIVE	55	42	DISPRO
CAUCHY DENSITY	55	11	DISPRO	CAUCHY PERCENTILE	56	11	DISPRO
CAUCHY PLOT	57	11	DISPRO	CAUCHY RANDOM	56	42	DISPRO
CDIVIDE	32	4	COMPLX	CEIONE	30	26	BESEL2
CEIZERO	30	25	BESEL2	CEKONE	30	28	BESEL2
CEKZERO	30	27	BESEL2	CENSOR	25	3	SELECT

Command	L1	L2	Procedure	Command	L1	L2	Procedure
CENSOR EQ	25	7	SELECT	CENSOR GE	25	8	SELECT
CENSOR GT	25	9	SELECT	CENSOR LE	25	6	SELECT
CENSOR LT	25	10	SELECT	CENSOR NE	25	11	SELECT
CERF	21	19	SEC	CGS	13	10	PHYCON
CHANGE	21	13	CHANGE	CHISQUARED CUMULATIVE	55	36	DISPRO
CHISQUARED PERCENTILE	56	5	DISPRO	CHISQUARED RANDOM	56	36	DISPRO
CHOOSE	17	8	EDITDA	CIONE	30	22	BESEL2
CIZERO	30	21	BESEL2	CKONE	30	24	BESEL2
CKZERO	30	23	BESEL2	CLOSE UP	23	1	MISC2
CMULTIPLY	32	3	COMPLX	CODE	11	12	RECODE
COMPARE	14	15	IFS	CONTENTS	15	6	CNTNTS
CONTINGENCY	24	15	CONTB	CORRELATION	24	11	CORREL
COS	12	2	FUNCT	COSD	12	10	FUNCT
COSH	12	24	FUNCT	COSINTEGRAL	21	21	SEC
COT	12	4	FUNCT	COTD	12	12	FUNCT
COTH	12	26	FUNCT	COUNT	23	2	MISC2
CPLOT	13	15	ONLPLT	CPOLAR	32	6	COMPLX
CREAD UNIT A	46	1	UNITX	CREAD UNIT B	46	8	UNITX
CREAD UNIT C	46	15	UNITX	CREAD UNIT D	46	22	UNITX
CREAD UNIT E	46	29	UNITX	CREAD UNIT F	46	36	UNITX
CRECTANGULAR	32	5	COMPLX	CRT	14	23	KEYBRD
CSET UNIT A	49	1	UNITX	CSET UNIT B	49	8	UNITX
CSET UNIT C	49	15	UNITX	CSET UNIT D	49	22	UNITX
CSET UNIT E	49	29	UNITX	CSET UNIT F	49	36	UNITX
CSUBTRACT	32	2	COMPLX	CTOF	31	1	THERMO
DANSK	34	7	LANGUA	DAYS	14	16	SEEEC
DEFINE	21	3	DEFINE	DELETE	17	7	EDITDA
DEMOTE	23	11	PDMOTE	DESCRIBE	15	7	DSCRIB
DEUTSCH	34	3	LANGUA	DEXPONENTIAL CUMULATIVE	55	48	DISPRO
DEXPONENTIAL DENSITY	55	17	DISPRO	DEXPONENTIAL PERCENTILE	56	17	DISPRO
DEXPONENTIAL PLOT	57	17	DISPRO	DEXPONENTIAL RANDOM	56	48	DISPRO
DIFFERENCES	11	7	DIFFER	DIM	23	12	DIMENS
DIMENSION	23	12	DIMENS	DIV	11	4	ARITH
DIVDIFFERENCES	11	8	DIFFER	DIVIDE	11	4	ARITH
DUPLICATE	23	5	MISC2	EEXPINTEGRAL	21	27	SIEC
EINSTE	31	5	THERMO	EINTEGRAL	21	22	SEC
ELLIPTICAL FIRST	30	30	ELLIPT	ELLIPTICAL SECOND	30	31	ELLIPT
ENDFILE UNIT A	50	2	UNITX	ENDFILE UNIT B	50	3	UNITX
ENDFILE UNIT C	50	4	UNITX	ENDFILE UNIT D	50	5	UNITX
ENDFILE UNIT E	50	6	UNITX	ENDFILE UNIT F	50	7	UNITX
ENGLISH	34	1	LANGUA	ERASE	21	10	ERASE
ERROR	21	18	SEC	ESPANOL	34	4	LANGUA
EVALUATE	16	6	EVALOM	EXCHANGE	21	11	EXCHNG
EXECUTE	14	3	REPINC	EXIONE	30	10	BESEL1
EXIZERO	30	9	BESEL1	EXKONE	30	12	BESEL1
EXKZERO	30	11	BESEL1	EXP	12	18	FUNCT
EXPAND	23	4	MISC2	EXPINTEGRAL	21	26	SIEC
EXPONENTIAL	12	18	FUNCT	EXPONENTIAL CUMULATIVE	55	47	DISPRO
EXPONENTIAL DENSITY	55	16	DISPRO	EXPONENTIAL PERCENTILE	56	16	DISPRO
EXPONENTIAL PLOT	57	16	DISPRO	EXPONENTIAL RANDOM	56	47	DISPRO
EXTREME	29	4	CMSEPA	EXTREME CUMULATIVE	55	44	DISPRO
EXTREME DENSITY	55	3	DISPRO	EXTREME PERCENTILE	56	3	DISPRO
EXTREME PLOT	57	13	DISPRO	EXTREME RANDOM	56	44	DISPRO
F CUMULATIVE	55	38	DISPRO	F PROBABILITY	24	5	FPROB
F RANDOM	56	38	DISPRO	FIT	22	3	LSFIT
FIXED	13	3	FIXFLO	FLEXIBLE	13	12	FIXFLO
FLIP	21	12	FLIP	FLOATING	13	4	FIXFLO
FOURPLOT	13	18	PLOT24	FRACTIONAL	12	33	FUNCT
FRANCAIS	34	2	LANGUA	FREQUENCY	24	10	FRDIST
FTOC	31	2	THERMO	FULL	14	18	KEYBRD

Command	L1	L2	Procedure	Command	L1	L2	Procedure
GAMMA	15	8	SEC	GAMMA CUMULATIVE	55	37	DISPRO
GAMMA PERCENTILE	56	6	DISPRO	GAMMA PLOT	57	6	DISPRO
GAMMA RANDOM	56	37	DISPRO	GAUSS QUADRATURE	24	4	GQUAD
GENERATE	13	1	GENERA	GEOMETRIC CUMULATIVE	55	57	DISPRO
GEOMETRIC DENSITY	55	26	DISPRO	GEOMETRIC PERCENTILE	56	26	DISPRO
GEOMETRIC RANDOM	56	57	DISPRO	HALFNORMAL CUMULATIVE	55	34	DISPRO
HALFNORMAL DENSITY	55	3	DISPRO	HALFNORMAL PERCENTILE	56	3	DISPRO
HALFNORMAL PLOT	57	3	DISPRO	HALFNORMAL RANDOM	56	34	DISPRO
HARMONIC	30	37	HARMON	HCOSINTEGRAL	21	25	SEC
HERMITE	19	3	ALLSUB	HIERARCHY	21	14	SORDER
HISTOGRAM	24	8	HISTGM	HSININTEGRAL	21	24	SEC
IFEQ	14	10	IFS	IFGE	14	12	IFS
IFGT	14	11	IFS	IFLE	14	14	IFS
IFLT	14	9	IFS	IFNE	14	13	IFS
INCREMENT	14	6	REPINC	INSERT	29	3	CMSEPA
INTEGER	12	32	FUNCT	INTERACTIVE	14	4	KEYBRD
INTERPOLATE	25	4	INTERP	INTJO	30	29	BESEL3
INVERT	16	1	INVERT	ISETUP	28	2	ITERAT
ISOLATE	28	3	ITERAT	ITALIANO	34	5	LANGUA
ITERATESE	28	1	ITERAT	JAPANE	34	8	LANGUA
KBIONE	30	14	BESEL2	KBIZERO	30	13	BESEL2
KBKONE	30	16	BESEL2	KBKZERO	30	15	BESEL2
KEXIONE	30	18	BESEL2	KEXIZERO	30	17	BESEL2
KEXKONE	30	20	BESEL2	KEXKZERO	30	19	BESEL2
LABEL	16	3	LABEL	LAGUERRE	19	2	ALLSUB
LAMBDA CUMULATIVE	55	43	DISPRO	LAMBDA DENSITY	55	12	DISPRO
LAMBDA PERCENTILE	56	12	DISPRO	LAMBDA PLOT	57	12	DISPRO
LAMBDA RANDOM	56	43	DISPRO	LARFIT	22	7	LARFIT
LEGENDRE	19	5	ALLSUB	LENGTH	14	20	KEYBRD
LIST	21	15	LIST	LOCAL	14	22	KEYBRD
LOG	12	20	FUNCT	LOGE	12	20	FUNCT
LOGISTIC CUMULATIVE	55	49	DISPRO	LOGISTIC DENSITY	55	18	DISPRO
LOGISTIC PERCENTILE	56	18	DISPRO	LOGISTIC PLOT	57	18	DISPRO
LOGISTIC RANDOM	56	49	DISPRO	LOGNORMAL CUMULATIVE	55	33	DISPRO
LOGNORMAL DENSITY	55	2	DISPRO	LOGNORMAL PERCENTILE	56	2	DISPRO
LOGNORMAL PLOT	57	2	DISPRO	LOGNORMAL RANDOM	56	33	DISPRO
LOGTEN	12	21	FUNCT	MADD	18	1	MATRIX
MATCH	25	5	SELECT	MAX	21	5	EXTREM
MAXIMUM	21	5	EXTREM	MAXMIN	29	4	CMSEPA
MDEFINE	15	1	MOP	MDIAGONAL	15	4	MOP
MEDIAN	17	14	SEC	MEIGEN	17	5	MEIGEN
MERASE	15	2	MOP	MIDENTITY	15	3	MOP
MIN	21	6	EXTREM	MINIMUM	21	6	EXTREM
MINVERT	16	1	INVERT	MKRONEKER	17	3	MKRON
MLABEL	16	5	LABEL	MMATVEC	26	3	EXPCON
MMOVE	23	6	MOVE	MMULT	17	1	MMULT
MMULTIPLY	17	1	MMULT	MOLWT	31	4	THERMO
MORTHO	22	5	MORTHO	MOVE	23	6	MOVE
MPRINT	7	1	APRINT	MPRINT A	7	2	APRINT
MPRINT B	7	3	APRINT	MPRINT C	7	4	APRINT
MPRINT D	7	5	APRINT	MPRINT E	7	6	APRINT
MPRINT F	7	7	APRINT	MPROPERTIES	27	1	MPROP
MRAISE	17	2	MRAISE	MSCALAR	18	6	MATRIX
MSUB	18	2	MATRIX	MSUBTRACT	18	2	MATRIX
MTRANSPOSE	18	3	MATRIX	MTRIANGULARIZE	17	4	MTRIAN
MULT	11	3	ARITH	MULTIPLY	11	3	ARITH
MVECDIAGONAL	26	1	EXPCON	MVECMAT	26	2	EXPCON
MZERO	15	2	MOP	M(AD)	52	1	MDAMAD
M(AV)	53	1	ARYVEC	M(DA)	52	2	MDAMAD
M(V'A)	53	2	ARYVEC	M(XAX')	51	3	MXTX

Command	L1	L2	Procedure
M(X'AX)	51	2	MXTX
M(X'X)	51	2	MXTX
NEDERLANDS	34	11	LANGUA
NEGBINOMIAL DENSITY	55	24	DISPRO
NEGBINOMIAL RANDOM	56	55	DISPRO
NEGEXPONENTIAL	12	19	FUNCT
NHISTOGRAM	24	9	HISTGM
NICE NCPLOT	13	22	ONLPLT
NICE PLOT	13	16	ONLPLT
NORMAL CUMULATIVE	55	32	DISPRO
NORMAL PERCENTILE	56	1	DISPRO
NORMAL RANDOM	56	32	DISPRO
NORSK	34	6	LANGUA
NPRINT	8	1	PRINTX
NPRINT B	8	3	PRINTX
NPRINT D	8	5	PRINTX
NPRINT F	8	7	PRINTX
NTABLE CPERCENTAGE	35	26	TABLE
NTABLE FREQUENCY	35	15	TABLE
NTABLE MEDIAN	35	22	TABLE
NTABLE PERCENTAGE	35	23	TABLE
NTABLE RANGE	35	21	TABLE
NTABLE RPROPORTION	35	27	TABLE
NTABLE SUM	35	16	TABLE
OMNIT	17	6	EDITDA
ORDER	21	9	SORDER
PARETO CUMULATIVE	55	46	DISPRO
PARETO PERCENTILE	56	15	DISPRO
PARETO RANDOM	56	46	DISPRO
PARSUM	20	1	MSCROW
PERCENTAGE	17	15	SCC
PFATOMIC	31	7	THERMO
PLOT	13	5	ONLPLT
POISSON DENSITY	55	25	DISPRO
POISSON PLOT	57	25	DISPRO
POLYFIT	22	1	ORTHO
PRINT	2	1	PRINTX
PRINT B	2	3	PRINTX
PRINT D	2	5	PRINTX
PRINT F	2	7	PRINTX
PRODUCT	21	2	PROROW
PROPORTION	17	16	SCC
PUNCH A	3	2	PRINTX
PUNCH C	3	4	PRINTX
PUNCH E	3	6	PRINTX
RAISE	11	5	ARITH
RANKS	24	3	RANKS
READ A	5	2	READX
READ C	5	4	READX
READ E	5	6	READX
READ UNIT A	45	1	UNITX
READ UNIT C	45	4	UNITX
READ UNIT E	45	6	UNITX
RECIPROCAL	12	35	FUNCT
REMOTE	14	21	KEYBRD
REPLACE	17	10	RECODE
RESET V	1	3	RESET
RESET X	1	5	RESET
RESET Z	1	7	RESET
RETAIN	17	9	EDITDA
REWIND UNIT B	50	10	UNITX

Command	L1	L2	Procedure
M(XX')	51	1	MXTX
NCPLOT	13	16	ONLPLT
NEGBINOMIAL CUMULATIVE	55	55	DISPRO
NEGBINOMIAL PERCENTILE	56	24	DISPRO
NEGEINTEGRAL	21	23	SEC
NEW PAGE	13	8	PAGE
NICE CPLOT	13	21	ONLPLT
NICE NPLOT	13	20	ONLPLT
NO LIST	21	16	LIST
NORMAL DENSITY	55	1	DISPRO
NORMAL PLOT	57	1	DISPRO
NORMLAGUERRE	19	1	ALLSUB
NPLOT	13	7	ONLPLT
NPRINT A	8	2	PRINTX
NPRINT C	8	4	PRINTX
NPRINT E	8	6	PRINTX
NTABLE AVERAGE	35	17	TABLE
NTABLE CPROPORTION	35	28	TABLE
NTABLE MAXIMUM	35	20	TABLE
NTABLE MINIMUM	35	19	TABLE
NTABLE PROPORTION	35	24	TABLE
NTABLE RPERCENTAGE	35	25	TABLE
NTABLE STDDEV	35	18	TABLE
NULL	21	17	XCUTEB
ONEWAY	24	13	ONEWAY
PAGE PLOT	13	6	ONLPLT
PARETO DENSITY	55	15	DISPRO
PARETO PLOT	57	15	DISPRO
PARPRODUCT	20	2	MSCROW
PARTFUNCTION	31	8	THERMO
PERFORM	14	3	REPINC
PFTRANSLATIONAL	31	6	THERMO
POISSON CUMULATIVE	55	56	DISPRO
POISSON PERCENTILE	56	25	DISPRO
POISSON RANDOM	56	56	DISPRO
PORTUGESE	34	10	LANGUA
PRINT A	2	2	PRINTX
PRINT C	2	4	PRINTX
PRINT E	2	6	PRINTX
PRINT NOTE	13	13	NOTEPR
PROMOTE	23	10	PDMOTE
PUNCH	3	1	PRINTX
PUNCH B	3	3	PRINTX
PUNCH D	3	5	PRINTX
PUNCH F	3	7	PRINTX
RANGE	17	13	SCC
READ	5	1	READX
READ B	5	3	READX
READ D	5	5	READX
READ F	5	7	READX
READ UNIT B	45	3	UNITX
READ UNIT D	45	5	UNITX
READ UNIT F	45	7	UNITX
RECODE	11	11	RECODE
REPEAT	14	3	REPINC
RESET	1	1	RESET
RESET W	1	4	RESET
RESET Y	1	6	RESET
RESTORE	14	8	REPINC
REWIND UNIT A	50	9	UNITX
REWIND UNIT C	50	11	UNITX

Command	L1	L2	Procedure	Command	L1	L2	Procedure
REWIND UNIT D	50	12	UNITX	REWIND UNIT E	50	13	UNITX
REWIND UNIT F	50	14	UNITX	RMS	20	3	MSCROW
ROUND	13	14	SEIC	ROW SUM	21	1	PROROW
ROWSUM	21	1	PROROW	SAMPLE WITHR	15	9	RNDSMP
SAMPLE WITHOUTR	15	10	RNDSMP	SAPROPERTIES	27	4	MPROP
SCAN	14	2	BEGIN	SCORRELATION	24	12	CORREL
SDIFFERENCES	11	9	DIFFER	SDIVDIFFERENCES	11	10	DIFFER
SEARCH	25	2	SELECT	SELECT	25	1	SELECT
SEPARATE	29	2	CMSEPA	SET	13	2	SET
SET UNIT A	48	1	UNITX	SET UNIT B	48	8	UNITX
SET UNIT C	48	15	UNITX	SET UNIT D	48	22	UNITX
SET UNIT E	48	29	UNITX	SET UNIT F	48	36	UNITX
SFIT	22	4	ORTHO	SHORTEN	23	3	MISC2
SI	13	11	PHYCON	SIN	12	1	FUNCT
SIND	12	9	FUNCT	SINH	12	23	FUNCT
SININTEGRAL	21	20	SEC	SKIP UNIT A	50	16	UNITX
SKIP UNIT B	50	17	UNITX	SKIP UNIT C	50	18	UNITX
SKIP UNIT D	50	19	UNITX	SKIP UNIT E	50	20	UNITX
SKIP UNIT F	50	21	UNITX	SLOVENE	34	13	LANGUA
SMPROPERTIES	27	3	MPROP	SOLVE	16	2	INVERT
SONEWAY	24	14	ONEWAY	SORT	21	8	SORDER
SPACE	13	9	SPACE	SPLIT PLOT	24	16	SPLITP
SPOLYFIT	22	2	ORTHO	SQRT	12	17	FUNCT
SQUARE	12	34	FUNCT	SSTATISTICAL	24	2	STATIS
SSTEM LEAF	33	2	SLOMNI	STATISTICAL	24	1	STATIS
STATPLOTS	15	5	SPLOT	STDDEV	17	12	SCC
STEM LEAF	33	1	SLOMNI	STRUVE ONE	30	36	PRESVE
STRUVE ZERO	30	35	PRESVE	STWOWAY	24	7	TWOWAY
SUB	11	2	ARITH	SUBTRACT	11	2	ARITH
SUM	20	4	MSCROW	SVENSKA	34	13	LANGUA
T CUMULATIVE	55	50	DISPRO	T PERCENTILE	56	19	DISPRO
T RANDOM	56	50	DISPRO	TABLE AVERAGE	35	3	TABLE
TABLE CPERCENTAGE	35	12	TABLE	TABLE CPROPORTION	35	14	TABLE
TABLE FREQUENCY	35	1	TABLE	TABLE MAXIMUM	35	6	TABLE
TABLE MEDIAN	35	8	TABLE	TABLE MINIMUM	35	5	TABLE
TABLE PERCENTAGE	35	9	TABLE	TABLE PROPORTION	35	10	TABLE
TABLE RANGE	35	7	TABLE	TABLE RPERCENTAGE	35	11	TABLE
TABLE RPROPORTION	35	13	TABLE	TABLE STDDEV	35	4	TABLE
TABLE SUM	35	2	TABLE	TAN	12	3	FUNCT
TAND	12	11	FUNCT	TANH	12	25	FUNCT
TAPE	50	29	UNITX	TCHEBYSHEV	19	6	ALLSUB
TERMINAL	14	19	KEYBRD	TWOPLOTS	13	17	PLOT24
TWOWAY	24	6	TWOWAY	UCHEBYSHEV	19	4	ALLSUB
UNIFORM CUMULATIVE	55	41	DISPRO	UNIFORM DENSITY	55	10	DISPRO
UNIFORM PERCENTILE	56	10	DISPRO	UNIFORM PLOT	57	10	DISPRO
UNIFORM RANDOM	56	41	DISPRO	UNIT	50	29	UNITX
VOCABULARY	34	14	LANGUA	WEIBULL CUMULATIVE	55	45	DISPRO
WEIBULL DENSITY	55	14	DISPRO	WEIBULL PERCENTILE	56	14	DISPRO
WEIBULL PLOT	57	14	DISPRO	WEIBULL RANDOM	56	45	DISPRO
WIDTH	14	5	KEYBRD	WRITE UNIT A	47	1	UNITX
WRITE UNIT B	47	8	UNITX	WRITE UNIT C	47	4	UNITX
WRITE UNIT D	47	22	UNITX	WRITE UNIT E	47	29	UNITX
WRITE UNIT F	47	36	UNITX	YUGOSLAV	34	9	LANGUA
ZEROS BJONE	30	34	BESEL3	ZEROS BJZERO	30	33	BESEL3

5B. Exceptions

Values for integer varibles L1 and L2 are not assigned for the following commands. The primary procedure which executes these commands is SPINST.

FINISH, FORMAT A, FORMAT B, FORMAT C, FORMAT D, FORMAT E, FORMAT F, HEAD, NOTE, NOTE1, NOTE2, OMNITAB, STOP, TITLE1, TITLE2, TITLE3, TITLE4, TITLEX, TITLEY

6. ERROR DIAGNOSTICS

Instructions are scanned and checked by the OMNITAB system for errors. Error messages are printed from the procedure ERROR (n). This chapter lists the messages with corresponding numbers (n) and procedures calling the ERROR procedure.

6A. Error Messages

Error messages are divided into three catagories: (i) fatal errors (1 - 46); (ii) arithmetic faults (101 - 115); and (iii) informative diagnostics (201 - 260). The informative diagnostics related to the Calcomp instructions are grouped separately (301 - 304). Fatal errors cease the execution of subsequent OMNITAB instructions, unless the INTERACTIVE instruction has been used. Execution of instructions is not affected by arithmetic faults or informative diagnostics.

(i) Fatal Errors.

```
ERROR   1: COMMAND DOES NOT EXIST.
ERROR   2: INCORRECT STATEMENT NUMBER.
ERROR   3: INCORRECT ARGUMENT IN INSTRUCTION.
ERROR   4: FIRST COMMAND MUST BE OMNITAB.
ERROR   5: INSTRUCTION IS NOT ALLOWED IN REPEAT MODE.
ERROR   6: INSTRUCTIONS BETWEEN BEGIN AND FINISH CANNOT BE NUMBERED.
ERROR   7: FUNCTION NAME NOT FOLLOWED BY A LEFT PARENTHESIS.
ERROR   8: LAST TERM IN EXPRESSION IS EITHER AN OPERATOR OR A FUNCTION.
ERROR   9: NRMAX = 0.
ERROR  10: (n) IS AN INCORRECT NUMBER OF ARGUMENTS.
ERROR  11: COLUMN NUMBER(S) OUTSIDE (n) COLUMN WORKSHEET.
ERROR  12: TOO MANY NUMBERED INSTRUCTIONS.
ERROR  13: INSTRUCTION NUMBER NOT FOUND
ERROR  14: ALL NUMBERS IN THE COLUMN ARE THE SAME.
ERROR  15: DIMENSIONED WORKSHEET EXCEEDS LIMIT OF (n).
ERROR  16: ROW NUMBER(S) OUTSIDE (n) ROW WORKSHEET.
ERROR  17: ARRAY OR MATRIX OUTSIDE (n) ROW X (n) COLUMN WORKSHEET.
ERROR  18: INTEGER ARGUMENT IS LESS THAN -8191.
ERROR  19: NUMBERED PERFORM INSTRUCTION EXECUTES ITSELF.
ERROR  20: IMPROPER TYPE OF ARGUMENT.
ERROR  21: INSTRUCTION MUST BE STORED.
ERROR  22: MATRIX IS (NEARLY) SINGULAR.
ERROR  23: INSUFFICIENT SCRATCH AREA.
ERROR  24: DEGREE IS GREATER THAN NUMBER OF NON-ZERO WEIGHTS.
ERROR  25: NEGATIVE WEIGHTS MAY NOT BE USED.
ERROR  26: INCONSISTENT ROW AND COLUMN NUMBERS.
ERROR  27: MISSING OR INCORRECT FORMAT OR QUALIFIER.
ERROR  28: EACH AND EVERY GROUP HAS ONLY ONE MEASUREMENT.
ERROR  29: NUMBER OF ARGUMENTS SHOULD BE (n).
ERROR  30: AN INCREMENT INSTRUCTION CAN NOT INCREMENT ITSELF.
ERROR  31: MATRIX IS NOT SYMMETRIC.
ERROR  32: STORAGE COLUMN NUMBERS CANNOT EQUAL OTHER COLUMN NUMBERS.
ERROR  33: ITERATIVE REFINEMENT FALILED TO CONVERGE TO A SOLUTION.
ERROR  34: NRMAX IS (n) AND MUST BE GREATER THAN OR EQUAL TO (n).
ERROR  35: VALUE OF SOME MEASUREMENT IS NOT ACCEPTABLE.
ERROR  36: I,J,K AND/OR L ARE NOT DEFINED CORRECTLY, OR RULE
           CANNOT DETRMINE PROPER PARAMETER VALUES FOR THESE DATA.
ERROR  37: THE ARGUMENTS *NRMAX*, **NRMAX**, *V*, OR **V**
           CAN ONLY BE INCREMENTED WITH 0.0.
ERROR  38: FUNCTION NOT DEFINED FOR SPECIFIED PARAMETER VALUE.
ERROR  39: LABEL OF A COLUMN (ARRAY, MATRIX) CANNOT BE A NUMBER.
ERROR  40: LABEL MUST HAVE AT LEAST 1 AND LESS THAN 13 CHARACTERS.
ERROR  41: NUMBER OF LABELS EXCEEDS (n) COLUMNS IN THE WORKSHEET.
ERROR  42: LABEL IN ALABEL OR MLABEL MUST BE FOLLOWED BY 4 NUMBERS.
ERROR  43: THE CHARACTER = IS MISSING.
ERROR  44: THE NUMBER OF LEFT AND RIGHT PARENTHESES ARE NOT EQUAL.
ERROR  45: ILLEGAL OPERATOR, EXPRESSION OR FUNCTION.
ERROR  46: ALL WEIGHTS ARE ZERO.
```

(ii) Arithmetic Faults.

Each arithmetic fault message is preceded by:

```
ARITHMETIC FAULT IN ABOVE INSTRUCTION. ZERO RETURNED (n) TIMES.

ERROR 101: SQRT, LOG OR RAISE OF NEGATIVE NUMBER.
ERROR 102: EXPONENT TOO SMALL OR TOO LARGE.
ERROR 103: VALUE OUT OF RANGE AND INVERSE FUNCTION CANNOT BE EVALUATED.
ERROR 104: X TOO LARGE FOR SIN(X) OR COS(X).
ERROR 105: VALUE SCALED TO AVOID OVERFLOW OR UNDERFLOW.
ERROR 106: DIVISION BY ZERO.
ERROR 107: TRIGONOMETRIC FUNCTION NOT DEFINED.
ERROR 108: ONE OF THE VALUES COMPARED IS ZERO. ABSOLUTE TOLERANCE USED.
ERROR 109: X FOR ELLIPTICAL INTEGRALS IS GREATER THAN OR EQUAL TO ONE.
ERROR 110: OVERFLOW FROM USE OF THE SUM ALGORITHM.
ERROR 111: FUNCTION NOT DEFINED FOR NEGATIVE OR ZERO VALUES.
ERROR 112: FUNCTION NOT DEFINED FOR NEGATIVE VALUES.
ERROR 113: FUNCTION NOT DEFINED FOR ZERO VALUES.
ERROR 114: Y = F(X) IS NOT DEFINED FOR A SPECIFIED VALUE OF X.
ERROR 115: FUNCTION NOT DEFINED FOR SPECIFIED PARAMETER VALUE.
```

(iii) Informative Diagnostics.

```
ERROR 201: TOO MUCH DATA AFTER SET, READ OR GENERATE.
           ALL DATA WERE LOST AFTER ROW (n).
ERROR 202: THE INSTRUCTION WAS EXECUTED, BUT CANNOT BE STORED.
ERROR 203: VALUE REQUESTED WAS NOT FOUND.
ERROR 204: COLUMN NUMBER INCORRECT OR NOT FOUND.
ERROR 205: THE INSTRUCTION WAS IGNORED BECAUSE ...
           ITS MEANING IS NOT CLEAR.
ERROR 206: FUNCTION NOT DEFINED FOR SPECIFIED PARAMETER VALUE.
ERROR 207: A VALUE OF DEGREES OF FREEDOM LESS THAN 1 WAS RESET TO 1.
ERROR 208: A VALUE OF DEGREES OF FREEDOM WAS TRUNCATED TO AN INTEGER.
ERROR 209: TITLE NUMBER MUST BE 1, 2, 3 OR 4 AND 1 WAS USED.
ERROR 210: NO. ROWS NOT = TO NO. COLS. LARGEST SQUARE MATRIX WAS USED.
ERROR 211: AN INCORRECT ASTERISK STRING IMPLYING THROUGH WAS IGNORED.
ERROR 212: UNNECESSARY ARGUMENTS IN INSTRUCTION WERE IGNORED.
ERROR 213: MATRIX EXTENDS BEYOND (N) ROW BY (N) COLUMN WORKSHEET.
           ONLY PART OF THE MATRIX IS STORED IN THE WORKSHEET.
ERROR 214: INSUFFICIENT SCRATCH AREA.
ERROR 215: NRMAX = (N) IS NOT LARGE ENOUGH TO ALLOW ITERATION.
ERROR 216: 1ST COLUMN OF ISETUP OR ISOLATE IS NOT MONOTONIC,
           OR IS CONSTANT.
ERROR 217: ITERATION DID NOT FIND ANY ROOTS.
ERROR 218: (n) ROW WORKSHEET IS TOO SHORT TO ACCOMMODATE ALL THE VALUES
           GENERATED BY THIS INSTRUCTION.
ERROR 219: NO EXTREMA WERE FOUND.
ERROR 220: A TRIAD OF X'S WITH AT LEAST TWO IDENTICAL VALUES,
           WAS FOUND AND IGNORED.
ERROR 221: ONLY THE FIRST ARGUMENT IN THE INSTRUCTION WAS USED.
ERROR 222: FORMAT WAS NOT FOUND.  READABLE FORMAT WAS USED.
ERROR 223: THE INSTRUCTION WAS IGNORED BECAUSE ...
           ONE, SOME OR ALL WEIGHTS ARE NEGATIVE.
ERROR 224: THE INSTRUCTION WAS IGNORED BECAUSE ...
           ALL WEIGHTS ARE ZERO.
ERROR 225: THE INSTRUCTION WAS IGNORED BECAUSE ...
           VALUE OF FUNCTION IS TOO LARGE OR TOO SMALL.
ERROR 226: COLUMN NOT LONG ENOUGH TO STORE ALL NUMBERS.
           FIRST (n) NUMBERS WERE STORED.
ERROR 227: NOT ENOUGH DATA IN COLUMN TO RESTORE MATRIX/ARRAY.
           DATA AVAILABLE WERE USED.
ERROR 228: THE OPTIMAL SOLUTION IS PROBABLY NOT UNIQUE.
```

```
ERROR 229: MORE THAN 50 HEAD COLUMN INSTRUCTIONS AND/OR LABELS
           HAVE BEEN USED. ONLY THE LAST 50 HAVE BEEN RETAINED.
ERROR 230: ATTEMPT TO PROMOTE FROM BELOW NRMAX = (n).
           FIRST ARGUMENT IS RESET TO = (n).
ERROR 231: ATTEMPT TO DEMOTE BELOW THE (n) ROW WORKSHEET.
           DATA BELOW ROW (n) IS LOST.
ERROR 232: X FOR ELLIPTICAL INTEGRALS IS 1.0 OR GREATER.
           THE RESULT IS SET EQUAL TO 0.0.
ERROR 233: NEGATIVE VALUE(S) WERE ENCOUNTERED BY PARTITION FUNCTION.
           ZEROES STORED.
ERROR 234: POSITIVE, INSTEAD OF NEGATIVE, TEMPERATURES USED.
ERROR 235: FOR Y = F(X,THETA), X OR THETA WAS TRUNCATED TO AN INTEGER.
ERROR 236: THE INSTRUCTION WAS IGNORED BECAUSE ...
           COMMAND BEGINS WITH S AND STORAGE MUST BE REQUESTED.
ERROR 237: NUMBER OF SIGNIFICANT DIGITS AFTER DECIMAL POINT
           HAS BEEN SET TO (n).
ERROR 238: THE INSTRUCTION WAS IGNORED BECAUSE ...
           ALL POINTS ARE OUTSIDE SPECIFIED LIMITS.
ERROR 239: FIRST OF EQUAL ROW OR COLUMN TOTALS USED TO COMPUTE LAMBA.
ERROR 240: PARTIAL CORRELATION COEFFICIENTS ARE NOT DEFINED.
           MEASUREMENTS MUST EXCEED (n) VARIABLES.
ERROR 241: THE INSTRUCTION WAS IGNORED BECAUSE ...
           LOWER LIMIT OF AXIS EQUALS UPPER LIMIT.
ERROR 242: PRINTING OF STEM AND LEAF DISPLAY IS NOT POSSIBLE.
           INSTRUCTION WAS TREATED AS SSTEM LEAF.
ERROR 243: (N) ROWS IN WORKSHEET IS NOT ENOUGH FOR COMPLETE STORAGE.
ERROR 244: DISPLAY IS (n) LINES, ONLY FIRST 99 DISPLAYED.
ERROR 245: THE INSTRUCTION WAS IGNORED BECAUSE ...
           WIDTH = (n) IS TOO SMALL OR TOO LARGE.
ERROR 246: THE INSTRUCTION WAS IGNORED BECAUSE ...
           WIDTH = (n) IS TOO SMALL FOR A PLOT.
ERROR 247: WIDTH = (n) IS INSUFFICIENT FOR PAGE PLOT. BEST PLOT GIVEN.
ERROR 248: THE INSTRUCTION WAS IGNORED BECAUSE ...
           ALL NUMBERS IN THE COLUMN ARE THE SAME.
ERROR 249: COMPUTING PROBLEMS ENCOUNTERED. RESULTS MAY BE MEANINGLESS.
ERROR 250: THE INSTRUCTION WAS IGNORED BECAUSE ...
           COLUMN WAS HEADED BY LABEL INSTRUCTION.
ERROR 252: NRMAX HAS BEEN RESET FROM (n) TO (n).
ERROR 253: IMPLIED THROUGH FOR LABELS MUST BE IN ALPHABETICAL ORDER.
ERROR 254: LENGTH = (n) IS TOO LARGE AND IS RESET FOR NORMAL USE.
ERROR 255: THE INSTRUCTION WAS IGNORED BECAUSE ...
           LENGTH = (n) IS TOO SMALL FOR A PLOT.
ERROR 256: ITERATION FAILED TO FIND AN EIGENVALUE (OR EIGENVECTOR),
           (n) UNORDERED VALUES FOUND.
ERROR 257: NRMAX IS (n) AND MUST BE GREATER THAN OR EQUAL TO (n).
ERROR 258: VALUE OUTSIDE ALLOWABLE RANGE. RESULT WAS SET EQUAL to 1.0.
ERROR 259: PRINTING PROBLEM. PLEASE CALL SALLY PEAVY, 301-921-3651.
ERROR 260: COLUMN (ARRAY, MATRIX) HAS BEEN PREVIOUSLY LABELED.
```

Calcomp Informative Diagnostics.

```
ERROR 301: CALCOMP PLOTTING SPEED SPECIFIED IS NOT CORRECT,
           ZIP CODE OR HIGH SPEED ASSUMED.
ERROR 302: CALCOMP PAPER WIDTH IS NOT 12 OR 30 INCHES,
           OR HEIGHT IS TOO LARGE.
ERROR 303: EITHER SYMBOL OR JOINING SPECIFIED IS INCORRECT.
           SYMBOL . OR NO JOINING IS USED.
ERROR 304: TITLEX OR TITLEY IS TOO LONG FOR GRAPH. TITLE IS OMITTED.
```

6B. Procedures Referencing ERROR

This section lists the procedures of the OMNITAB 80 system which reference the ERROR procedure and the error numbers.

Procedure	Error Number
AARGS:	3, 102
ABRIDG:	205, 222
ADRESS:	11
ALLSUB:	9, 10, 20
APRINT:	205, 222
ARITH:	9, 10, 20, 29, 106, 212
ARYVEC:	3, 10, 17
ATOMIC:	3, 10, 20, 221, 226, 252
BEGIN:	2, 5, 10, 20, 205, 221
BEJN:	225
BESEL1:	10, 20, 101, 105
BESEL2:	10, 20, 105
BESEL3:	10, 20, 225
BESTCP:	3, 9, 10, 20, 24, 25
CALCOM:	3, 10, 28, 205, 212, 238, 301, 302, 303
CALTIK:	304
CAUPLT:	106
CBEK:	101
CHANGE:	10, 20
CHKCOL:	10, 20
CMSEPA:	3, 9, 10, 11, 16, 130, 219, 220, 252
CNTNTS:	3, 10
COALES:	10, 17, 20, 23, 203
COMELL:	101, 109
COMPIL:	3, 7, 8, 10, 43, 44
COMPLX:	9, 10, 20, 106
CONPG3:	239
CONTB:	23, 205, 245
CORPRT:	29, 213, 240
CORREL:	3, 10, 15, 16, 23, 26, 34, 236, 249
CVTDEG:	9, 10, 20, 234
DEFINZ:	9, 10, 16, 20
DESC1:	1
DESC2:	1
DESC3:	1
DESC4:	1
DESC5:	1
DESC6:	1
DESC7:	1
DESC8:	1
DESC9:	1
DESC10:	1
DESC11:	1
DEXPLT:	106
DIFFER:	9, 10, 20, 106, 214, 236, 245
DIMENS:	10, 15, 20, 252
DISPRO:	1
DSCRIB:	1
EDITDA:	9, 10, 20, 252
ELLIPT:	9, 10, 20
ERASE:	9, 252
EVAL:	8, 45
EVALOM:	9, 10, 20
EV1PLT:	106
EV2PLT:	38, 106
EXCHNG:	10, 20

Procedure	Error Number
EXPAND:	10, 20, 211
EXPCON:	3, 10, 17, 226, 227
EXPINT:	106
EXPPLT:	106
EXTREM:	9, 10
FCOS:	104
FDCOS:	104
FDEXP:	102
FDLOG:	101
FDSIN:	104
FDSQRT:	101
FEXP:	102
FEXP2:	101
FIXFLO:	10, 20, 237
FLIP:	9, 10
FLOG:	101
FLOG10:	101
FPROB:	10, 20, 207, 208, 258
FRDIST:	9, 10, 20, 226, 252
FSIN:	104
FSQRT:	101
FUNCT:	9, 10, 11, 29, 101, 102, 103, 107
GAMMA:	114
GAMPLT:	38, 106, 249
GENER:	3, 10, 20, 201, 252
GQUAD:	3, 10, 20, 252
GRAPH:	241
HARMON:	3, 9, 10, 20
HFNPLT:	106, 249
AARGS:	3, 102
HISTGM:	3, 9, 10, 20
IFS:	9, 10, 21, 108, 212
INTERP:	3, 10
INVERT:	10, 11, 17, 20, 22, 23, 210
ITERAT:	3, 9, 10, 17, 215, 216, 217, 218, 252
KEYBRD:	202, 205, 221, 245, 254
LABEL:	3, 11, 20, 39, 40, 41, 42, 212, 253
LABPNT:	251
LAMPLT:	106
LANGUA:	23, 245
LARFIT:	3, 9, 10, 20, 22, 23, 226, 228
LGNPLT:	106, 249
LOGPLT:	106
LSDIAG:	20
LSFIT:	3, 9, 10, 20, 23, 24, 25, 32, 213, 236
LSQ:	22, 33
MATRIX:	3, 10, 17
MDAMAD:	3, 10, 17
MEIGEN:	3, 10, 17, 20, 23, 31, 210, 255
MISC2:	3, 9, 10, 16, 20, 203, 252
MKRON:	3, 10, 17
MMULT:	3, 10, 17, 26
MOP:	3, 10, 17, 20
MORTHO:	9, 10, 11, 17, 20, 23, 24, 25, 26, 213
MOVE:	10, 16, 20
MPROP:	3, 10, 17, 20, 22, 23, 110, 236
MRAISE:	3, 10, 17
MSCROW:	9, 10, 16, 20, 23
MTRIAN:	3, 10, 17, 22, 31, 35
MXTX:	3, 10, 17
NORPLT:	106, 249

Procedure Error Number

OMNIT: 1, 2, 4, 6, 252
ONEWAY: 9, 10, 23, 28, 35, 236
ONLPLT: 9, 20, 246, 247, 255, 258
ONPLTH: 238, 241
PARPLT: 38, 106
PDMOTE: 9, 10, 16, 20, 230, 231, 252
PLOTCE: 255
PLOT24: 9, 10, 20, 23
POIPLT: 38, 106, 249
PRBCDF: 1, 9, 10, 114, 115, 207, 208, 235, 249, 258
PRBPDF: 1, 9, 10, 114, 115, 208, 235, 249
PRBPLT: 1, 9, 10, 20, 23, 206, 248
PRBPPF: 1, 9, 10, 114, 115, 207, 208, 249
PRBRAN: 1, 3, 9, 10, 20, 38, 207, 208
PREPAK: 229, 250, 260
PRESVE: 10, 20
PRINTX: 205, 222
PROROW: 3, 9, 10, 20
PRPLOT: 241, 246
PRTABR: 3
PRTDD: 245
PRTMNL: 3
PUNCH: 205, 222
RANKS: 9, 10, 20
READX: 10, 20, 27, 201, 252
RECODE: 3, 9, 10, 20, 23
REDATA: 201
REL1FT: 226, 249
REPCHK: 5
REPINC: 3, 10, 11, 13, 16, 18, 19, 20, 30, 37
RESET: 3, 10, 252
RFORMT: 259
RNDSMP: 3, 10, 20, 23, 226, 252
RPRINT: 3, 9, 10, 16, 20
SCALE: 22
SCC: 9, 10
SCNARG: 18, 211
SCREEN: 3, 22, 23
SEC: 9, 10, 20, 111, 113
SEEEC: 9, 10, 20, 105, 111
SEIC: 3, 9, 10, 20
SELECT: 3, 9, 10, 20
SET: 10, 16, 20
SICIEI: 106
SIEC: 3, 9, 10, 20, 111, 112
SLOMNI: 9, 10, 14, 20, 23, 35, 36, 226, 236, 242, 243, 244, 248
SORDER: 9, 10
SORTPP: 9
SPACE: 3, 10
SPINST: 4, 202, 209, 252
SPLITP: 3, 9, 10, 20
SPLOTS: 10, 20, 23, 248, 257
STAERR: 3, 10, 11, 214, 236
STAQDS: 15, 46, 223, 224
STATIS: 14, 248
STORE: 12
SUMMAL: 110
SUNIMD: 9
TABLE: 3, 9, 10, 20, 23
TABPRT: 245
TABSTR: 213, 226

```
Procedure   Error Number

THERMO:   3,   9,  10,  11,  17,  20,  23,  25, 224, 229, 233
TPCTPT: 207
TRANSF:   3,  10,  17
TWCOEF: 226
TWOWAY:   3,  10,  11,  17,  20,  22,  23,  24,  25,  32
UNIMED:   9
UNIPLT: 106
UNXRDC:   3,  10,  27,  28, 201, 252
UNXSET:   3,  10,  16,  20, 201, 252
UNXSPC:   3,  10,  27
UNXWRT:  27, 205, 245
WEIPLT:  38, 106
XFORMT: 205
 XHEAD: 204
```

6C. Error Numbers and External References

Listed with each error number are the procedures which may invoke the associated error message. This is useful if one wishes to determine the procedure that caused that message to be printed.

```
ERROR   n                                   Procedures

ERROR   1:  DESC1,  DESC2,  DESC3,  DESC4,  DESC5,  DESC6,  DESC7,  DESC8,  DESC9, DESC10,
           DESC11, DISPRO, DSCRIB,  OMNIT, PRBCDF, PRBPDF, PRBPLT, PRBPPF, PRBRAN
ERROR   2:  BEGIN,  OMNIT
ERROR   3:  AARGS, ARYVEC, BESTCP, CALCOM, CMSEPA, CNTNTS, COMPIL, CORREL, EXPCON,  GENER,
            GQUAD, HARMON, HISTGM, INTERP, ITERAT,  LABEL, LARFIT,  LSFIT, MATRIX, MDAMAD,
           MEIGEN,  MISC2,  MKRON,  MMULT,    MOP,  MPROP, MRAISE, MTRIAN,   MXTX, PRBRAN,
           PROROW, PRTABR, PRTMNL, RECODE, REPINC,  RESET, RNDSMP, RPRINT, SCREEN,   SEIC,
           SELECT,   SIEC,  SPACE, SPLITP, STAERR,  TABLE, THERMO, TRANSF, TWOWAY, UNXRDC,
           UNXSET, UNXSPC
ERROR   4:  OMNIT, SPINST
ERROR   5:  BEGIN, REPCHK
ERROR   6:  OMNIT
ERROR   7: COMPIL
ERROR   8: COMPIL   EVAL,
ERROR   9: ALLSUB,  ARITH, ATOMIC, BESTCP, CMSEPA, COMPLX, CVTDEG, DEFINZ, DIFFER, EDITDA,
           ELLIPT,  ERASE, EVALOM, EXTREM,   FLIP, FRDIST,  FUNCT, HARMON, HISTGM,    IFS,
           ITERAT, LARFIT,  LSFIT,  MISC2, MORTHO, MSCROW, ONEWAY, ONLPLT, PDMOTE, PLOT24,
           PRBCDF, PRBPDF, PRBPLT, PRBPPF, PRBRAN, PROROW,  RANKS, RECODE, RPRINT,    SCC,
              SEC,  SEEEC,   SEIC, SELECT,   SIEC, SLOMNI, SORDER, SORTPP, SPLITP, SUNIMD,
            TABLE, THERMO, UNIMED
ERROR  10: ALLSUB,  ARITH, ARYVEC, ATOMIC,  BEGIN, BESEL1, BESEL2, BESEL3, BESTCP, CALCOM,
           CHANGE, CHKCOL, CMSEPA, CNTNTS, COALES, COMPIL, COMPLX, CORREL, CVTDEG, DEFINZ,
           DIFFER, DIMENS, EDITDA, ELLIPT, EVALOM, EXCHNG, EXPAND, EXPCON, EXTREM, FIXFLO,
             FLIP,  FPROB, FRDIST,  FUNCT,  GENER,  GQUAD, HARMON, HISTGM,    IFS, INTERP,
           INVERT, ITERAT, LARFIT,  LSFIT, MATRIX, MDAMAD, MEIGEN,  MISC2,  MKRON,  MMULT,
              MOP, MORTHO,   MOVE,  MPROP, MRAISE, MSCROW, MTRIAN,   MXTX, ONEWAY, PDMOTE,
           PLOT24, PRBCDF, PRBPDF, PRBPLT, PRBPPF, PRBRAN, PRESVE, PROROW,  RANKS,  READX,
           RECODE, REPINC,  RESET, RNDSMP, RPRINT,    SCC,    SEC,  SEEEC,   SEIC, SELECT,
              SET,   SIEC, SLOMNI, SORDER,  SPACE, SPLITP, SPLOTS, STAERR,  TABLE, THERMO,
           TRANSF, TWOWAY, UNXRDC, UNXSET, UNXSPC
ERROR  11: ADRESS, CMSEPA,  FUNCT, INVERT,  LABEL, MORTHO, STAERR, THERMO, TWOWAY
ERROR  12:  STORE
ERROR  13: REPINC
ERROR  14: SLOMNI, STATIS
ERROR  15: CORREL, DIMENS, STAQDS
ERROR  16: CMSEPA, CORREL, DEFINZ,  MISC2,   MOVE, MSCROW, PDMOTE, RPRINT,    SET, UNXSET
ERROR  17: ARYVEC, COALES, EXPCON, INVERT, ITERAT, MATRIX, MDAMAD, MEIGEN,  MKRON,  MMULT,
              MOP, MORTHO,  MPROP, MRAISE, MTRIAN,   MXTX, THERMO, TRANSF, TWOWAY
```

ERROR 18: REPINC, SCNARG
ERROR 19: REPINC
ERROR 20: ALLSUB, ARITH, ATOMIC, BEGIN, BESEL1, BESEL2, BESEL3, BESTCP, CHANGE, CHKCOL,
COALES, COMPLX, CVTDEG, DEFINZ, DIFFER, DIMENS, EDITDA, ELLIPT, EVALOM, EXCHNG,
EXPAND, FIXFLO, FPROB, FRDIST, GENER, GQUAD, HARMON, HISTGM, INVERT, LABEL,
LARFIT, LSDIAG, LSFIT, MEIGEN, MISC2, MOP, MORTHO, MOVE, MPROP, MSCROW,
ONLPLT, PDMOTE, PLOT24, PRBPLT, PRBRAN, PRESVE, PROROW, RANKS, READX, RECODE,
REPINC, RNDSMP, RPRINT, SEC, SEEEC, SEIC, SELECT, SET, SIEC, SLOMNI,
SPLITP, SPLOTS, TABLE, THERMO, TWOWAY, UNXSET
ERROR 21: IFS
ERROR 22: INVERT, LARFIT, LSQ, MPROP, MTRIAN, SCALE, SCREEN, TWOWAY
ERROR 23: COALES, CONTB, CORREL, INVERT, LANGUA, LARFIT, LSFIT, MEIGEN, MORTHO, MPROP,
MSCROW, ONEWAY, PLOT24, PRBPLT, RECODE, RNDSMP, SCREEN, SLOMNI, SPLOTS, TABLE,
THERMO, TWOWAY
ERROR 24: BESTCP, LSFIT, MORTHO, TWOWAY
ERROR 25: BESTCP, LSFIT, MORTHO, THERMO, TWOWAY
ERROR 26: CORREL, MMULT, MORTHO
ERROR 27: READX, UNXRDC, UNXSPC, UNXWRT
ERROR 28: CALCOM, ONEWAY, UNXRDC
ERROR 29: ARITH, CORPRT, FUNCT
ERROR 30: REPINC
ERROR 31: MEIGEN, MTRIAN
ERROR 32: LSFIT, TWOWAY
ERROR 33: LSQ
ERROR 34: CORREL
ERROR 35: MTRIAN, ONEWAY, SLOMNI
ERROR 36: SLOMNI
ERROR 37: REPINC
ERROR 38: EV2PLT, GAMPLT, PARPLT, POIPLT, PRBRAN, WEIPLT
ERROR 39: LABEL
ERROR 40: LABEL
ERROR 41: LABEL
ERROR 42: LABEL
ERROR 43: COMPIL
ERROR 44: COMPIL
ERROR 45: EVAL
ERROR 46: STAQDS
ERROR 101: BESEL1, CBEK, COMELL, FDLOG, FDSQRT, FEXP2, FLOG, FLOG10, FSQRT, FUNCT
ERROR 102: AARGS, FDEXP, FEXP, FUNCT
ERROR 103: FUNCT
ERROR 104: FCOS, FDCOS, FDSIN, FSIN
ERROR 105: BESEL1, BESEL2, SEEEC
ERROR 106: ARITH, CAUPLT, COMPLX, DEXPLT, DIFFER, EV1PLT, EV2PLT, EXPINT, EXPPLT, GAMPLT,
HFNPLT, LAMPLT, LGNPLT, LOGPLT, NORPLT, PARPLT, POIPLT, SICIEI, UNIPLT, WEIPLT
ERROR 107: FUNCT
ERROR 108: IFS
ERROR 109: COMELL
ERROR 110: MPROP, SUMMAL
ERROR 111: SEC, SEEEC, SIEC
ERROR 112: SIEC
ERROR 113: SEC
ERROR 114: GAMMA, PRBCDF, PRBPDF, PRBPPF
ERROR 115: PRBCDF, PRBPDF, PRBPPF
ERROR 201: GENER, READX, REDATA, UNXRDC, UNXSET
ERROR 202: KEYBRD, SPINST
ERROR 203: COALES, MISC2
ERROR 204: XHEAD
ERROR 205: ABRIDG, APRINT, BEGIN, CONTB, KEYBRD, PRINTX, PUNCH, UNXWRT, XFORMT,
ERROR 206: PRBPLT
ERROR 207: FPROB, PRBCDF, PRBPPF, PRBRAN, TPCTPT
ERROR 208: FPROB, PRBCDF, PRBPDF, PRBPPF, PRBRAN

ERROR 209: SPINST
ERROR 210: INVERT, MEIGEN
ERROR 211: EXPAND, SCNARG
ERROR 212: ARITH, CALCOM, IFS, LABEL
ERROR 213: CORPRT, LSFIT, MORTHO, TABSTR
ERROR 214: DIFFER, STAERR
ERROR 215: ITERAT
ERROR 216: ITERAT
ERROR 217: ITERAT
ERROR 218: ITERAT
ERROR 219: CMSEPA
ERROR 220: CMSEPA
ERROR 221: ATOMIC, BEGIN, KEYBRD
ERROR 222: ABRIDG, APRINT, PRINTX, PUNCH
ERROR 223: STAQDS
ERROR 224: STAQDS, THERMO
ERROR 225: BEJN, BESEL3
ERROR 226: ATOMIC, EXPCON, FRDIST, LARFIT, REL1FT, RNDSMP, SLOMNI, TABSTR, TWCOEF
ERROR 227: EXPCON
ERROR 228: LARFIT
ERROR 229: PREPAK, THERMO
ERROR 230: PDMOTE
ERROR 231: PDMOTE
ERROR 232:
ERROR 233: THERMO
ERROR 234: CVTDEG
ERROR 235: PRBCDF, PRBPDF
ERROR 236: CORREL, DIFFER, LSFIT, MPROP, ONEWAY, SLOMNI, STAERR
ERROR 237: FIXFLO
ERROR 238: CALCOM, ONPLTH
ERROR 239: CONPG3
ERROR 240: CORPRT
ERROR 241: GRAPH, ONPLTH, PRPLOT
ERROR 242: SLOMNI
ERROR 243: SLOMNI
ERROR 244: SLOMNI
ERROR 245: CONTB, DIFFER, KEYBRD, LANGUA, PRTDD, TABPRT, UNXWRT
ERROR 246: ONLPLT, PRPLOT
ERROR 247: ONLPLT
ERROR 248: PRBPLT, SLOMNI, SPLOTS, STATIS
ERROR 249: CORREL, GAMPLT, HFNPLT, LGNPLT, NORPLT, POIPLT, PRBCDF, PRBPDF, PRBPPF, REL1FT
ERROR 250: PREPAK
ERROR 251: LABPNT
ERROR 252: ATOMIC, CMSEPA, DIMENS, EDITDA, ERASE, FRDIST, GENER, GQUAD, ITERAT, MISC2,
OMNIT, PDMOTE, READX, RESET, RNDSMP, SPINST, UNXRDC, UNXSET
ERROR 253: LABEL
ERROR 254: KEYBRD
ERROR 255: MEIGEN, ONLPLT, PLOTCE
ERROR 256:
ERROR 257: SPLOTS
ERROR 258: FPROB, ONLPLT, PRBCDF
ERROR 259: RFORMT
ERROR 260: PREPAK
ERROR 301: CALCOM
ERROR 302: CALCOM
ERROR 303: CALCOM
ERROR 304: CALTIK

7. DOUBLE PRECISION STATEMENTS

Output from the OMNITAB 80 system is in real mode, (i.e., single precision arithmetic). In order to insure as much accuracy as possible, some of the internal calculations are done in double precision arithmetic. This section lists procedures containing typed double precision statements.

7A. Procedures With Double Precision Statements

```
ARYVEC,   BEJN, BESEL1, BESEL2, BESEL3, BESTCP, BEZERO, BEZONE, BINCDF, BINPDF,
BINPPF, BINTJO, BJORCK,   CBEI,   CBEK, CHSCDF, CHSPPF, CODEXX, CODEXY, COMELL,
COMPLX,  CONTB, CRSPRD, CTCCDF,  DATA3,   DBEJ,  DIXAB, DSUMAL, ELLIPT, ERRINT,
EXPINT,  FDCOS,  FDDIV,  FDEXP,  FDLOG, FDPCON,  FDSIN, FDSQRT, GAMCDF,  GAMMA,
GAMPLT, GAMPPF,  GENER,  GQUAD, IMPRUV,  LSFIT,    LSQ,  LSRND,  MMULT, MORTHO,
 MPROP, MPRPNT, MPRSPC, MRAISE, MSCROW, MTRAIN,   MXTX,  MXTXP,  MXTXQ,  NBCDF,
 NBPDF,  NBPPF, NBSOMN, OANOVA, ORTHRV, PDECOM, PINVRT, POICDF, POIPDF, POIPPF,
PRBCDF, PRBPDF, PRBPPF, PRESVE, PROCHK,  QFORF, QUADLS,  RCSUM, RFORMT,  SCALE,
   SCC, SCREEN, SDPRED,  SDRND,    SEC,  SETUP, SICIEI,   SIEC,   SLVE, SPLITP,
STAPRT, STATIS, STRUVE, SUMMAL,   TCDF, THERMO,   TPPF, TRANSF, UCSUMS
```

7B. Procedure Name and Typed DOUBLE PRECISION Statements

```
Proc.   DOUBLE PRECISION Statement

ARYVEC: DOUBLE PRECISION DX(1)
        DOUBLE PRECISION DSUM
  BEJN: DOUBLE PRECISION R(100)
        DOUBLE PRECISION A, B, C, D, E, F, G, P, Q, X, Y, Z
        DOUBLE PRECISION FDDIV
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DPCA, DPCB, DPCC, DPCD, DPCE
        DOUBLE PRECISION DPCF, DPCG
BESEL1: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DMAXDP, DMXINT, DSNCOS, DXEXP
        DOUBLE PRECISION DXEX, Y, X, XEX
        DOUBLE PRECISION DBEJ, FDDIV, FDEXP
BESEL2: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DMAXDP, DMXINT, DSNCOS, DXEXP
        DOUBLE PRECISION E, P, Q, S, T, Y, X, XEX, Z
        DOUBLE PRECISION DPCA
        DOUBLE PRECISION FDCOS, FDDIV, FDEXP
BESEL3: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DMAXDP, DMXINT, DSNCOS, DXEXP
        DOUBLE PRECISION X, Z
        DOUBLE PRECISION DAONE, DARES, DATWO
        DOUBLE PRECISION AA(100), B(100), W(100)
        DOUBLE PRECISION BINTJO, DBEJ, FDDIV
BESTCP: DOUBLE PRECISION SQRTCT (58)
BEZERO: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
        DOUBLE PRECISION A(1), B(1)
        DOUBLE PRECISION AA, AB, AC, X, Y
        DOUBLE PRECISION FDDIV, FDSQRT
        DOUBLE PRECISION DPC(22)
        DOUBLE PRECISION DPCA, DPCB, DPCC, DPCD, DPCE, DPCF, DPCG
BEZONE: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
        DOUBLE PRECISION A(1), B(1)
        DOUBLE PRECISION R, S, T, X, Y
        DOUBLE PRECISION FDDIV, FDSQRT
        DOUBLE PRECISION DPC(22)
        DOUBLE PRECISION DPCA, DPCB, DPCC, DPCD, DPCE, DPCF
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Proc.   DOUBLE PRECISION Statement

BINCDF: DOUBLE PRECISION TERM(1)
        DOUBLE PRECISION DX, ANU1, ANU2, Z, SUM, AI, COEF1, COEF2
        DOUBLE PRECISION ARG, COEF
        DOUBLE PRECISION THETA, SINTH, COSTH, A, B
        DOUBLE PRECISION FDDIV, FDSQRT
        DOUBLE PRECISION DATAN
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
BINPDF: DOUBLE PRECISION DP
        DOUBLE PRECISION DQ, DNUM, DDEN, DPDIVQ, TERM
        DOUBLE PRECISION FDDIV
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
BINPPF: DOUBLE PRECISION DPPAR
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
BINTJO: DOUBLE PRECISION FUNCTION BINTJO (X,A)
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION A(2), B, C, X, Z
        DOUBLE PRECISION DBEJ, FDDIV
        DOUBLE PRECISION DPCA, DPCB, DPCC, DPCD, DPCE, DPCF, DPCG, DPCH
BJORCK: DOUBLE PRECISION C(3,3), D(3), R(3), Y(4)
        DOUBLE PRECISION DSUM
        DOUBLE PRECISION FDDIV, FDSQRT
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
  CBEI: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION A, B, C, D, R, S
        DOUBLE PRECISION AA, E, F, G, H, P, Q, T, U, V, W, X, Y, Z
        DOUBLE PRECISION FDCOS, FDDIV, FDEXP, FDSIN, FDSQRT
        DOUBLE PRECISION DPCA, DPCB, DPCC, DPCD, DPCE
  CBEK: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
        DOUBLE PRECISION DALOG2, DEULER
        DOUBLE PRECISION B, C, D, DA, R, S
        DOUBLE PRECISION AA(40), AAB(80), AB(40)
        DOUBLE PRECISION AC, AD, AE, E, F, G, H, P, Q, T, U, V, W, X, Y, Z
        DOUBLE PRECISION FDCOS, FDDIV, FDEXP, FDLOG, FDSIN, FDSQRT
        DOUBLE PRECISION DPCA, DPCB, DPCC, DPCD
CHSCDF: DOUBLE PRECISION TERM(5)
        DOUBLE PRECISION DX, CHI, SUM, AI, DCDFN
        DOUBLE PRECISION DNU
        DOUBLE PRECISION DFACT, DPOWER
        DOUBLE PRECISION DW
        DOUBLE PRECISION D1, D2, D3
        DOUBLE PRECISION B11, B21
        DOUBLE PRECISION B31, B32, B41, B42, B43
        DOUBLE PRECISION DPCA
        DOUBLE PRECISION FDDIV, FDEXP, FDLOG, FDSQRT
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
CHSPPF: DOUBLE PRECISION D(10), DTERM(9)
        DOUBLE PRECISION Z, Z2, Z3, Z4, Z5, DEN, A, B, C, G
        DOUBLE PRECISION XMINO, XMIN, AI, XMAX, DP, DX, PCALC, XMID
        DOUBLE PRECISION XLOWER, XUPPER, XDEL
        DOUBLE PRECISION SUM, TERM, CUT1, CUT2, AJ, CUTOFF, T, DNU, DGAMMA
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION FDDIV, FDEXP, FDLOG
        DOUBLE PRECISION DPCA, DPCB, DPCC
CODEXX: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DN, SQRTCT, SUMX
        DOUBLE PRECISION FDDIV, FDSQRT
        DOUBLE PRECISION DX(1)
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Proc. DOUBLE PRECISION Statement

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CODEXY: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DN, SQRTCT, SUMX
        DOUBLE PRECISION FDDIV, FDSQRT
        DOUBLE PRECISION DX(1)
COMELL: DOUBLE PRECISION FUNCTION COMELL (Z,I)
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
        DOUBLE PRECISION A, B, C, D, E, P, Q, X, Z
        DOUBLE PRECISION FDDIV, FDLOG, FDSQRT
        DOUBLE PRECISION DPCA, DPCB, DPCC, DPCD, DPCE, DPCF
        DOUBLE PRECISION DPCG, DPCH, DPCI, DPCJ, DPCK, DPCL
        DOUBLE PRECISION DPCM, DPCN, DPCO, DPCP, DPCQ
COMPLX: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION D(5)
        DOUBLE PRECISION X, Y
        DOUBLE PRECISION FDCOS, FDDIV, FDSIN, FDSQRT
        DOUBLE PRECISION DATAN2
 CONTB: DOUBLE PRECISION DXS(3)
        DOUBLE PRECISION DNR, DNC, DGSUM, DCLSUM, DRWSUM
        DOUBLE PRECISION DLNR, DLNC, DLNN, DX, SXLNX, SXID, SXDJ
        DOUBLE PRECISION DISUMR,DISUMC,DSUMN3,DSUMD2,DSPRHO,DGSUM2,DGSUM3
        DOUBLE PRECISION DPT, DPS, DPD, DPSS, DPDD, DPSD, DAMP, DDMP, DAX
        DOUBLE PRECISION DPCA, DPCB
        DOUBLE PRECISION DAIPM, DAIPP, DAIQM, DAIQP, DSCANJ, DSRAIN
        DOUBLE PRECISION DSUMAC, DSUMAM, DSUMAP, DSUMAR
        DOUBLE PRECISION DSUMC, DSUMCC, DSUMCL, DSUMCT
        DOUBLE PRECISION DSUMDM, DSUMDP, DSUMIM, DSUMMJ
        DOUBLE PRECISION DSUMR, DSUMRK, DSUMRR, DSUMRT, DSUMST
        DOUBLE PRECISION FDLOG, FDDIV, FDSQRT
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
CRSPRD: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION CTERM(1)
        DOUBLE PRECISION F, SUMNEG, SUMPOS, SUMX
CTCCDF: DOUBLE PRECISION TERM(5)
        DOUBLE PRECISION DX, CHI, SUM, AI, DCDFN
        DOUBLE PRECISION DNU
        DOUBLE PRECISION DFACT, DPOWER
        DOUBLE PRECISION DW
        DOUBLE PRECISION D1, D2, D3
        DOUBLE PRECISION B11, B21
        DOUBLE PRECISION B31, B32, B41, B42, B43
        DOUBLE PRECISION DPCA
        DOUBLE PRECISION FDDIV, FDEXP, FDLOG, FDSQRT
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
 DATA3: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
        DOUBLE PRECISION DMAXDP, DMXINT, DSNCOS, DXEXP
        DOUBLE PRECISION DALOG2, DEULER
  DEBJ: DOUBLE PRECISION FUNCTION DBEJ (X,N,M)
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
        DOUBLE PRECISION DMAXDP, DMXINT, DSNCOS, DXEXP
        DOUBLE PRECISION DALOG2, DEULER
        DOUBLE PRECISION S(120), ST(240), T(120)
        DOUBLE PRECISION B, C, D, DA, E, H, Y, X
        DOUBLE PRECISION FDCOS, FDDIV, FDEXP, FDLOG, FDSIN, FDSQRT
        DOUBLE PRECISION DPCA, DPCB, DPCC, DPCD, DPCE, DPCF, DPCG
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 DIXAB: DOUBLE PRECISION BETAX, BETAAB, PDF, CDF
        DOUBLE PRECISION TDV(2), FNV(2), FDV(2)
        DOUBLE PRECISION AN, BLN, BN, BXLN, CA, CB, CX, DEL, DX
        DOUBLE PRECISION FC, FD, FIX, FIXALN, FIXLN, FN, FNM1, FNM2
        DOUBLE PRECISION GN, GNM1, GNM2, HA, HB, PREV, PT4, PT9, PWRLN
        DOUBLE PRECISION RE, REP, REPM, RIA, RIB
        DOUBLE PRECISION SCF, SCFT, SGF, SGN, SMIN, SUMA, TA, TB, TC, TD
        DOUBLE PRECISION TEMP, TEMPB, TEMPC, TN, TOLER
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
        DOUBLE PRECISION DMAXDP, DMXINT, DSNCOS, DXEXP
        DOUBLE PRECISION FDDIV, FDEXP, FDLOG
DSUMAL: DOUBLE PRECISION DSUM
        DOUBLE PRECISION S, DDX
        DOUBLE PRECISION R(86), DX(1)
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
ELLIPT: DOUBLE PRECISION X
        DOUBLE PRECISION COMELL
ERRINT: DOUBLE PRECISION ERF, ERFC, X
        DOUBLE PRECISION AN, BN, CONS, C1, DN, F, FN, FNM1
        DOUBLE PRECISION FNM2, GN, GNM1, GNM2, P, PREV, RNBC, SCF
        DOUBLE PRECISION SUM, TN, TOLER, ULCF, WN, Y, YSQ
        DOUBLE PRECISION FDDIV, FDEXP
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
        DOUBLE PRECISION DMAXDP, DMXINT, DSNCOS, DXEXP
EXPINT: DOUBLE PRECISION ENX, EXPENX, RN
        DOUBLE PRECISION AM, ASUM, BM, D, EXPNX, F, FM, FMM1, FMM2
        DOUBLE PRECISION GM, GMM1, GMM2, ONPTFV, PREV, PSI, PTERM
        DOUBLE PRECISION RM, RNM1, RRN, SUM, T, TEMP
        DOUBLE PRECISION TM, TOLER, ULPS, X, XLOG
        DOUBLE PRECISION FDDIV, FDEXP, FDLOG
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
        DOUBLE PRECISION DMAXDP, DMXINT, DSNCOS, DXEXP
        DOUBLE PRECISION DALOG2, DEULER
 FDCOS: DOUBLE PRECISION FUNCTION FDCOS(X)
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DMAXDP, DMXINT, DSNCOS, DXEXP
        DOUBLE PRECISION DCOS, X
 FDDIV: DOUBLE PRECISION FUNCTION FDDIV (FN,FD,IND)
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION FN, FD
 FDEXP: DOUBLE PRECISION FUNCTION FDEXP (X)
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DMAXDP, DMXINT, DSNCOS, DXEXP
        DOUBLE PRECISION X, DEXP
 FDLOG: DOUBLE PRECISION FUNCTION FDLOG(X)
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION X, DLOG
FDPCON: DOUBLE PRECISION X
        DOUBLE PRECISION XX, D
 FDSIN: DOUBLE PRECISION FUNCTION FDSIN (X)
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DMAXDP, DMXINT, DSNCOS, DXEXP
        DOUBLE PRECISION X, DSIN
FDSQRT: DOUBLE PRECISION FUNCTION FDSQRT (X)
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION X, DSQRT
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Proc.   DOUBLE PRECISION Statement

GAMCDF: DOUBLE PRECISION D(10), DTERM(9)
        DOUBLE PRECISION DX, DGAMMA, AI, TERM, SUM, CUT1, CUT2, CUTOFF, T
        DOUBLE PRECISION Z, Z2, Z3, Z4, Z5, DEN, A, B, C, G
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DPCA, DPCB
        DOUBLE PRECISION FDDIV, FDEXP, FDLOG
 GAMMA: DOUBLE PRECISION DZMULT(26), DZRAIS(26), DPROD(26)
        DOUBLE PRECISION DZ, DSMNEG, DSMPOS, DM, DG
        DOUBLE PRECISION FDDIV
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
GAMPLT: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DC(10)
        DOUBLE PRECISION DB, DCO, DEN, DQ, DZ, DZ2, DZ3, DZ4, DZ5
        DOUBLE PRECISION FDDIV, FDEXP, FDLOG
        DOUBLE PRECISION DPCA
GAMPPF: DOUBLE PRECISION D(10), DTERM(9)
        DOUBLE PRECISION DP, DGAMMA
        DOUBLE PRECISION Z, Z2, Z3, Z4, Z5, DEN, A, B, C, G
        DOUBLE PRECISION XMINO, XMIN, AI, XMAX, DX, PCALC, XMID
        DOUBLE PRECISION XLOWER, XUPPER, XDEL
        DOUBLE PRECISION SUM, TERM, CUT1, CUT2, AJ, CUTOFF, T
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION FDDIV, FDEXP, FDLOG
        DOUBLE PRECISION DPCA, DPCB, DPCC
 GENER: DOUBLE PRECISION DA, DELTA, ENDER, S
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DPCA
 GQUAD: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION C, B, BMA, BPA, DELGQ, STORE1, STORE2
        DOUBLE PRECISION FDDIV
        DOUBLE PRECISION DPCA, DPCB, DPCC, DPCD
IMPRUV: DOUBLE PRECISION DXA(1)
        DOUBLE PRECISION DSUM
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
 LSFIT: DOUBLE PRECISION DYW(1)
        DOUBLE PRECISION DSUMY2
   LSQ: DOUBLE PRECISION DX(1)
        DOUBLE PRECISION SUM
 LSRND: DOUBLE PRECISION Z
        DOUBLE PRECISION DPCA, DRNDA, DRNDB
        DOUBLE PRECISION FDDIV
 MMULT: DOUBLE PRECISION X(1)
        DOUBLE PRECISION DSUM
MORTHO: DOUBLE PRECISION DK2, SUM
        DOUBLE PRECISION FDSQRT
 MPROP: DOUBLE PRECISION X(1)
MPRPNT: DOUBLE PRECISION X(1)
MPRSPC: DOUBLE PRECISION X(1)
MRAISE: DOUBLE PRECISION X(1)
        DOUBLE PRECISION DSUM
MSCROW: DOUBLE PRECISION X(1)
        DOUBLE PRECISION DSUM
MTRIAN: DOUBLE PRECISION X(2)
        DOUBLE PRECISION DSUM1, DSUM2
  MXTX: DOUBLE PRECISION AP(3000)
 MXTXP: DOUBLE PRECISION XP(1)
        DOUBLE PRECISION DSUM
 MXTXQ: DOUBLE PRECISION XP(1)
        DOUBLE PRECISION DSUM
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Proc.   DOUBLE PRECISION Statement

 NBCDF: DOUBLE PRECISION TERM(1)
        DOUBLE PRECISION DX2, ANU1, ANU2, Z, SUM, AI, COEF1, COEF2
        DOUBLE PRECISION ARG, COEF
        DOUBLE PRECISION THETA, SINTH, COSTH, A, B
        DOUBLE PRECISION FDDIV, FDSQRT
        DOUBLE PRECISION DATAN
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
 NBPDF: DOUBLE PRECISION DP
        DOUBLE PRECISION DQ, DNUM, DDEN, TERM
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION FDDIV
 NBPPF: DOUBLE PRECISION DPPAR
NBSOMN: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
        DOUBLE PRECISION DMAXDP, DMXINT, DSNCOS, DXEXP
        DOUBLE PRECISION DALOG2, DEULER
OANOVA: DOUBLE PRECISION FDDIV
ORTHRV: DOUBLE PRECISION XP(1)
PDECOM: DOUBLE PRECISION DSUM
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
PINVRT: DOUBLE PRECISION DSUM
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
POICDF: DOUBLE PRECISION TERM(1)
        DOUBLE PRECISION DX, CHI, SUM, AI, DGCDF
        DOUBLE PRECISION FDDIV, FDSQRT, FDEXP
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
POIPDF: DOUBLE PRECISION DPARAM
        DOUBLE PRECISION DEN, TERM
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION FDDIV, FDEXP
POIPPF: DOUBLE PRECISION DLAMBA
        DOUBLE PRECISION FDEXP
PRBCDF: DOUBLE PRECISION DX, DPARAM
        DOUBLE PRECISION BETAX, BETAAB, DPDF, DCDF
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION FDDIV, FDEXP
        DOUBLE PRECISION DATAN
PRBPDF: DOUBLE PRECISION DX, DPARAM, DMULT
        DOUBLE PRECISION BETAX, BETAAB, DPDF, DCDF
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION FDDIV, FDEXP, FDLOG, FDSQRT
PRBPPF: DOUBLE PRECISION DP, DPARAM, DARG
        DOUBLE PRECISION FDDIV, FDCOS, FDLOG, FDSIN
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
PRESVE: DOUBLE PRECISION W(100)
        DOUBLE PRECISION X, Y, Z
PROCHK: DOUBLE PRECISION XP(1)
 QFORF: DOUBLE PRECISION BETAX, BETAAB, PDF, CDF
QUADLS: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION B(4), C(3,3), D(3), R(3)
        DOUBLE PRECISION FDDIV, FDSQRT
 RCSUM: DOUBLE PRECISION X(1)
        DOUBLE PRECISION S
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
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Proc.   DOUBLE PRECISION Statement

RFORMT: DOUBLE PRECISION Z, ZLOWER, ZUPPER
        DOUBLE PRECISION DFIVE, DTEN
        DOUBLE PRECISION FDDIV
 SCALE: DOUBLE PRECISION DSUM
        DOUBLE PRECISION FDDIV, FDSQRT
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
   SCC: DOUBLE PRECISION SUMX, SQRTCT
SCREEN: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
SDPRED: DOUBLE PRECISION DSUM
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
 SDRND: DOUBLE PRECISION FDDIV
        DOUBLE PRECISION DPCA, DRNDA, DRNDB, Z
   SEC: DOUBLE PRECISION CHI, CHII, CI, CII, DY, DYI, EI, EXNEI
        DOUBLE PRECISION SHI, SI, DX, Z
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
 SETUP: DOUBLE PRECISION DMAXDP, DMXINT, DSNCOS, DXEXP
SICIEI: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DMAXDP, DMXINT, DSNCOS, DXEXP
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
        DOUBLE PRECISION DALOG2, DEULER
        DOUBLE PRECISION FDCOS, FDDIV, FDEXP, FDLOG, FDSIN, FDSQRT
        DOUBLE PRECISION X, SI, CI, CII, EI, EXNEI, SHI, CHI, CHII
        DOUBLE PRECISION A(4)
        DOUBLE PRECISION AELL, AM, AMIN, ASUMSC, BMI, BMR, COST
        DOUBLE PRECISION EXPHT, EXPL, FI, FIP, FMI, FMM1I, FMM1R
        DOUBLE PRECISION FMM2I, FMM2R, FMR, FR, FRP, GMI, GMM1I, GMM1R
        DOUBLE PRECISION GMM2I, GMM2R, GMR, PSLL, PSLSC, PTM, RE, RESQ
        DOUBLE PRECISION RESQP, RK, RM, SCC, SFMI, SFMR, SGMI, SGMR, SGN
        DOUBLE PRECISION SINT, SUMC, SUME, SUMEO, SUMET, SUMOT, SUMS
        DOUBLE PRECISION SUMSC, T, TEMP, TEMPA, TEMPB, TM, TMAX, TMM1
        DOUBLE PRECISION TOLER, TOLSQ, TT, TTT, XLOG, XMAXEI, XMAXHF
  SIEC: DOUBLE PRECISION ENX, EXPENX, RN, X
  SLVE: DOUBLE PRECISION DX, DSUM, DY
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
SPLITP: DOUBLE PRECISION D(7)
        DOUBLE PRECISION DR, DW, DS
        DOUBLE PRECISION RSS, WSS, SSS, RWBSS, WSBSS, CF, TSUMSQ
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION FDDIV
STAPRT: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
STATIS: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DSUM, DWA(1)
STRUVE: DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
        DOUBLE PRECISION C(1)
        DOUBLE PRECISION A, B, P, Q, R, S, X, Z
        DOUBLE PRECISION DBEJ
        DOUBLE PRECISION FDDIV
        DOUBLE PRECISION DPCA, DPCB, DPCC, DPCD, DPCE, DPCF, DPCG, DPCH
SUMMAL: DOUBLE PRECISION R(86), S
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
  TCDF: DOUBLE PRECISION TERM(3)
        DOUBLE PRECISION DX, DNU, C, CSQ, S, SUM, AI
        DOUBLE PRECISION DCDF, DCDFN
        DOUBLE PRECISION DPCA, B11
        DOUBLE PRECISION B21, B22, B23, B24, B25
        DOUBLE PRECISION B31, B32, B33, B34, B35, B36, B37
        DOUBLE PRECISION D1, D3, D5, D7, D9, D11
        DOUBLE PRECISION FDDIV, FDEXP, FDSQRT
        DOUBLE PRECISION DATAN
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
```

Proc. DOUBLE PRECISION Statement

```
THERMO: DOUBLE PRECISION QQ(10)
        DOUBLE PRECISION X, EXX, EXDIF, G, QO, Q1, Q2
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION FDDIV, FDEXP, FDLOG
        DOUBLE PRECISION DPCA, DPCB
  TPPF: DOUBLE PRECISION DNU, DP, DPPFN, DPPF, DCON, DARG, Z, S, C
        DOUBLE PRECISION TERM(5)
        DOUBLE PRECISION TERM1, TERM2, TERM3
        DOUBLE PRECISION SQRT2, B21
        DOUBLE PRECISION B31, B32, B33, B34
        DOUBLE PRECISION B41, B42, B43, B44, B45
        DOUBLE PRECISION B51, B52, B53, B54, B55, B56
        DOUBLE PRECISION D1, D3, D5, D7, D9
        DOUBLE PRECISION DEHT, DFOR, DHALF, DONE, DSIX, DTHRE, DTWO, DZERO
        DOUBLE PRECISION DHLFPI, DPI, DSQRPI, D2BYSP
        DOUBLE PRECISION FDCOS, FDDIV, FDSIN, FDSQRT
        DOUBLE PRECISION DATAN
        DOUBLE PRECISION DPCA, DPCB, DPCC, DPCD, DPCE
TRANSF: DOUBLE PRECISION X(1)
        DOUBLE PRECISION DSUM
UCSUMS: DOUBLE PRECISION UCSS
        DOUBLE PRECISION DTEMP(1)
        DOUBLE PRECISION DSUM
```

8. EQUIVALENCE STATEMENTS

Equivalence statements are used to optimize computer storage between the procedures in the OMNITAB 80 system. The array A(.) defined in named common block WRKSCR is available to all the procedures and most variables and/or array names are equivalenced to this array. Alphanumeric and special characters used by the system are defined in array LA(.) in named common block ABCDEF and variables are often equivalenced to elements within this array.

8A. Procedures With EQUIVALENCE Statements

ABRIDG, APRINT, ARYVEC, ATOI, BESEL3, BESTCP, BOXPLT, CALPLT, CBEK, CINDEX,
COMPIL, COMPLX, CONFEL, CONPG2, CONPG3, CONTB, CORREL, DBEJ, DSUMAL, ERRPRT,
GAMMA, HISTGM, INVERT, LABEL, LABPNT, LANGUA, LARFIT, LSFIT, LSPLT2, LSPLT4,
MEIGEN, MMULT, MORTHO, MPROP, MPRPNT, MPRSPS, MRAISE, MSCROW, MTRIAN, MXTX,
ONEWAY, ONLPLT, ONPLTG, ONPLTH, OPONE, ORTPLT, OWPRBP, OWPRCL, OWPRES, PCKFMT,
PERSAL, PLOTCE, PLOT24, PLT24B, PLT24G, PLT24T, PRBPLT, PRESVE, PRINTX, PRPLOT,
PRTABR, PRTMNL, READX, REL1FT, RFORMT, RNDATM, RPRINT, SCREEN, SICIEI, SLOMNI,
SORT, SPLITP, STAPLT, STAPRT, STAPTB, STAPTG, STAPTT, STAQDS, STASTR, STATIS,
SUMMAL, THERMO, TRANSF, TWOWAY, UCSUMS, UNXRDC, UNXSET, UNXWRT, XSEG12, XSTOP,
ZLCVAR

8B. Procedures and EQUIVALENCE Statements

```
Proc.   EQUIVALENCE Statement

ABRIDG: EQUIVALENCE (MARG(1), A( 1))
        EQUIVALENCE ( IBLANK,LA(45))
APRINT: EQUIVALENCE (N(1),A(1))
ARYVEC: EQUIVALENCE (DX(1),A(1))
  ATOI: EQUIVALENCE (IBLANK,LA(45)), (IEQUAL,LA(46)),  (IPLUS,LA(40))
        EQUIVALENCE (IMINUS,LA(39)), (IASTER,LA(41)), (ISLASH,LA(37))
        EQUIVALENCE  (ILPAR,LA(42)),  (IRPAR,LA(43)), (ICOMMA,LA(44))
        EQUIVALENCE (IPEROD,LA(38))
BESEL3: EQUIVALENCE (AA(1),A(1)), (B(1),A(1)), (W(1),A(1))
BESTCP: EQUIVALENCE (B(1),A(1))
BOXPLT: EQUIVALENCE (LEXTRM,LA(41)), (LHINGE,LA(18)), (LMEDAN,LA(23))
        EQUIVALENCE (LBLANK,LA(45)), (  LTOP,LA(39)), ( LSIDE,LA(19))
CALPLT: EQUIVALENCE (NBF(1),A(1))
  CBEK: EQUIVALENCE (AAB(1),A(1)), (AA(1),AAB(1)), (AB(1),AAB(41))
CINDEX: EQUIVALENCE (IBLANK,LA(45)), (IEQUAL,LA(46)), ( IPLUS,LA(40))
        EQUIVALENCE (IMINUS,LA(39)), (IASTER,LA(41)), (ISLASH,LA(37))
        EQUIVALENCE ( ILPAR,LA(42)), ( IRPAR,LA(43)), (ICOMMA,LA(44))
        EQUIVALENCE (IPEROD,LA(38))
COMPIL: EQUIVALENCE (  IWORD(1,1),A(1)), (    IB(1),A(1441))
        EQUIVALENCE (    IL(1),A(1521)), (    IR(1),A(1601))
        EQUIVALENCE (  LENW(1),A(1681)), ( ITYPE(1),A(1761))
        EQUIVALENCE (   IW2(1),A(1841)), (    W2(1),A(1921))
        EQUIVALENCE (ITYPEH(1),A(2001)), (IW2HOL(1),A(2081))
        EQUIVALENCE (W2HOLD(1),A(2161)), (IPARAM(1),A(2241))
        EQUIVALENCE ( IPARN(1),A(2321))
COMPLX: EQUIVALENCE (I1,IARGS(1)), (I2,IARGS(2)), (I3,IARGS(3))
        EQUIVALENCE (I4,IARGS(4)), (I5,IARGS(5)), (I6,IARGS(6))
CONFEL: EQUIVALENCE (X(1),A(1)), (Y(1),A(1))
CONPG2: EQUIVALENCE (ISA(1),A(1))
        EQUIVALENCE (       NR,ISA( 1)), (       NC,ISA( 2))
        EQUIVALENCE (     NRNC,ISA( 3))
        EQUIVALENCE (   IDF(1),ISA(21))
        EQUIVALENCE (CHISQR(1),  A(30)), (  PROB(1),  A(40))
```

```
CONPG3: EQUIVALENCE (   CONCOF,  A( 7)), (   GAMKRU,  A( 8))
        EQUIVALENCE (    ALAMA,  A( 9)), (   SELAMA,  A(10))
        EQUIVALENCE (    ALAMB,  A(11)), (   SELAMB,  A(12))
        EQUIVALENCE (     ALAM,  A(13)), (    SELAM,  A(14))
        EQUIVALENCE (      PHI,  A(15)), (    SEKGM,  A(16))
        EQUIVALENCE (   SEKTAU,  A(17)), (   SESPRH,  A(18))
        EQUIVALENCE (    SPRHO,  A(19)), (   TAUKEN,  A(20))
 CONTB: EQUIVALENCE (ISA(1),A(1))
        EQUIVALENCE (    AX(1),ISA( 1)), (   AAP(1),ISA( 1))
        EQUIVALENCE (   AAM(1),ISA( 1)), (   ADP(1),ISA( 1))
        EQUIVALENCE (   ADM(1),ISA( 1)), (ASAVCO(1),ISA( 1))
        EQUIVALENCE ( AXMCV(1),ISA( 1)), (AMAXIM(1),ISA( 1))
        EQUIVALENCE (AMAXMJ(1),ISA( 1)), (ACLSUM(1),ISA( 1))
        EQUIVALENCE (ARWSUM(1),ISA( 1)), ( AXCRMV(1),ISA( 1))
        EQUIVALENCE (     E(1),  A( 1)), (     D(1),  A( 1))
        EQUIVALENCE (   FTD(1),  A( 1))
        EQUIVALENCE (       NR,ISA( 1)), (       NC,ISA( 2))
        EQUIVALENCE (     NRNC,ISA( 3)), (   IGSUMR,ISA( 4))
        EQUIVALENCE (   CONCOF,  A( 7)), (   GAMKRU,  A( 8))
        EQUIVALENCE (    ALAMA,  A( 9)), (   SELAMA,  A(10))
        EQUIVALENCE (    ALAMB,  A(11)), (   SELAMB,  A(12))
        EQUIVALENCE (     ALAM,  A(13)), (    SELAM,  A(14))
        EQUIVALENCE (      PHI,  A(15)), (    SEKGM,  A(16))
        EQUIVALENCE (   SEKTAU,  A(17)), (   SESPRH,  A(18))
        EQUIVALENCE (    SPRHO,  A(19)), (   TAUKEN,  A(20))
        EQUIVALENCE (   IDF(1),ISA(21))
        EQUIVALENCE (CHISQR(1),  A(30)), (PROBAB(1),  A(40))
CORREL: EQUIVALENCE (AVG(1),A(1)), (SD(1),T(1)), (SD(1),A(1))
        EQUIVALENCE (IPS(1),AVG(  1))
  DBEJ: EQUIVALENCE (ST(1),A(1)), (S(1),ST(1)), (T(1),ST(121))
DSUMAL: EQUIVALENCE (IEQ,W), (RSUM(1),R(1))
ERRPRT: EQUIVALENCE (LASTRK,LA(41))
 GAMMA: EQUIVALENCE (DZRAIS(1),A(1)), (DPROD(1),A(101))
HISTGM: EQUIVALENCE (N(1),A(1))
INVERT: EQUIVALENCE (IIA(1),A(1))
 LABEL: EQUIVALENCE (IA(1),A(100))
LABPNT: EQUIVALENCE (IA(1),A(100)), (IP(1),A(1))
LANGUA: EQUIVALENCE ( IBLANK, LA(45)), ( IASTER, LA(41))
        EQUIVALENCE (KENG(1,1),A(   1)), (KFOR(1,1),A(1101))
        EQUIVALENCE (  KHAY(1),A(2201)), (KAST(  1),A(2751))
        EQUIVALENCE (  NN(  1),A(2851)), (  MM(  1),A(2863))
        EQUIVALENCE (IHIERY(1),A(   1))
LARFIT: EQUIVALENCE (X(1,1),A(1)), (ISCRAT(1),A(1))
 LSFIT: EQUIVALENCE (IIRGS(1),LFMT(1))
LSPLT2: EQUIVALENCE (IU(1),A(1))
LSPLT4: EQUIVALENCE (IU(1),A(1))
MEIGEN: EQUIVALENCE (IA(1),A(1))
 MMULT: EQUIVALENCE (X(1),A(1))
MORTHO: EQUIVALENCE (IIRGS(1),LFMT(1))
 MPROP: EQUIVALENCE (X(1),A(1)), (IIA(1),A(1))
MPRPNT: EQUIVALENCE (X(1),A(1)), (N(1),A(1))
MPRSPC: EQUIVALENCE (X(1),A(1)), (IIA(1),A(1))
MRAISE: EQUIVALENCE (X(1),A(1))
MSCROW: EQUIVALENCE (X(1),A(1))
MTRIAN: EQUIVALENCE (X(1),A(1))
  MXTX: EQUIVALENCE (AP(1),A(1))
```

Proc. EQUIVALENCE Statement

```
ONEWAY: EQUIVALENCE (A1(1),A(1)), (A2(1),A(1))
        EQUIVALENCE (A3(1),A(1)), (A4(1),A(1)), (A5(1),A(1))
        EQUIVALENCE ( B1(1),A(1)), (B2(1),A(1)), (B3(1),A(1))
        EQUIVALENCE ( B4(1),A(1)), (B5(1),A(1)), (B6(1),A(1))
        EQUIVALENCE ( B7(1),A(1)), (B8(1),A(1)), (B9(1),A(1))
        EQUIVALENCE (B10(1),A(1))
ONLPLT: EQUIVALENCE (   IBLANK,   LA(45)), (IXPR,LA(34))
        EQUIVALENCE ( MTITX(1),ITLE(I,5))
        EQUIVALENCE (   IAA(1),  A(   1))
        EQUIVALENCE (MPRINT(1), IAA(  1)), (  IPR(1),IAA( 201))
        EQUIVALENCE (KSPACE(1), IAA(461))
ONPLTG: EQUIVALENCE (  IDGT(1),   LA( 3))
        EQUIVALENCE (  MTIT(1),ITLE(1,6))
        EQUIVALENCE (  IAA(1),  A(   1))
        EQUIVALENCE (MPRINT(1), IAA(  1)), (  IPR(1),IAA( 201))
        EQUIVALENCE                         ( INM(1),IAA( 421))
        EQUIVALENCE (  YSS(1),  A(501))
ONPLTH: EQUIVALENCE ( LHEAD(1),  IH(1,1)), (  IAA(1),  A(   1))
        EQUIVALENCE (  IPR(1),IAA( 201))
        EQUIVALENCE (KSPACE(1), IAA(461))
 OPONE: EQUIVALENCE (IIRGS(1),LFMT(1))
ORTPLT: EQUIVALENCE (IU(1),A(1))
OWPRBP: EQUIVALENCE (IBLANK,LA(45)), (IHIGH,LA(18)), (ILOW,LA(22))
OWPRCL: EQUIVALENCE (IBLANK,LA(45)), (IHIGH,LA(18)), (ILOW,LA(22))
OWPRES: EQUIVALENCE (IBLANK,LA(45)), (IHIGH,LA(18)), (ILOW,LA(22))
PCKFMT: EQUIVALENCE (IAA(1),A(1))
PERSAL: EQUIVALENCE (IBLANK,LA(45)), (IEQUAL,LA(46)), ( IPLUS,LA(40))
        EQUIVALENCE (IMINUS,LA(39)), (IASTER,LA(41)), (ISLASH,LA(37))
        EQUIVALENCE ( ILPAR,LA(42)), ( IRPAR,LA(43)), (ICOMMA,LA(44))
        EQUIVALENCE (IPEROD,LA(38))
PLOTCE: EQUIVALENCE (IA(1),A(1))
PLOT24: EQUIVALENCE (LIMITY(1),A(1)), (LIMITX(1),A(1))
        EQUIVALENCE (YBLIM (1),A(1)), (YTLIM (1),A(1))
        EQUIVALENCE (XBLIM (1),A(1)), (XTLIM (1),A(1))
PLT24B: EQUIVALENCE (YLABLE(1),A(1))
        EQUIVALENCE (    XX(1),A(1)), (ISTORE(1),A(1))
        EQUIVALENCE (JGRAPH(1),A(1))
        EQUIVALENCE (NPTOUT(1),A(1)), (NPTIN (1),A(1))
        EQUIVALENCE (KB(1),A(1)), (KD (1),A(1))
        EQUIVALENCE (KS(1),A(1)), (KT (1),A(1))
        EQUIVALENCE (KW(1),A(1))
        EQUIVALENCE (JHOLD(1,1),A(1)), (NHOLD(1,1),A(1101))
PLT24G: EQUIVALENCE (    X2(1),A(1)), (    Y2(1),A(1))
        EQUIVALENCE (  XMIN(1),A(1)), (   X20(1),A(1))
        EQUIVALENCE (   X40(1),A(1)), (   X60(1),A(1))
        EQUIVALENCE (   X80(1),A(1)), (  XMAX(1),A(1))
        EQUIVALENCE (YLABLE(1),A(1))
        EQUIVALENCE (JGRAPH(1),A(1))
        EQUIVALENCE                   (    KS(1),A(1))
        EQUIVALENCE (    KW(1),A(1)), (    KD(1),A(1))
        EQUIVALENCE (    KB(1),A(1)), (    KT(1),A(1))
        EQUIVALENCE (LIMITY(1),A(1)), (LIMITX(1),A(1))
        EQUIVALENCE (YBLIM (1),A(1)), (YTLIM (1),A(1))
        EQUIVALENCE (XBLIM (1),A(1)), (XTLIM (1),A(1))
        EQUIVALENCE (NPTOUT(1),A(1)), (NPTIN (1),A(1))
```

```
PLT24T: EQUIVALENCE (Y2(1),A(1))
        EQUIVALENCE (YLABLE(1),A(1))
        EQUIVALENCE (    XX(1),A(1)), (ISTORE(1),A(1))
        EQUIVALENCE (JGRAPH(1),A(1))
        EQUIVALENCE                   (    KS(1),A(1))
        EQUIVALENCE (    KW(1),A(1)), (    KD(1),A(1))
        EQUIVALENCE (    KB(1),A(1)), (    KT(1),A(1))
        EQUIVALENCE (NPTOUT(1),A(1)), (NPTIN (1),A(1))
        EQUIVALENCE (JHOLD(1,1),A(1)), (NHOLD(1,1),A(1101))
PRBPLT: EQUIVALENCE (B(1),A(1)), (A(1),C(1))
PRESVE: EQUIVALENCE (A(1),W(1))
PRINTX: EQUIVALENCE (MARG(1),A(1)), (IBLANK,LA(45))
PRPLOT: EQUIVALENCE (MTIT(1),ITLE(1,6))
        EQUIVALENCE (  IBLANK,LA(45)), (    IXPR,LA(34))
PRTABR: EQUIVALENCE (    NP(1),A(   1)), (NWIDTH(1),A(1001))
        EQUIVALENCE ( NDECS(1),A(1101)), (NBLANK(1),A(1201))
        EQUIVALENCE (NCOUNT(1),A(1401)), (NWMAX(1),A(1501))
        EQUIVALENCE (NSIGDS(1),A(1601)), (ITYPE(1),A(1701))
PRTMNL: EQUIVALENCE (    NP(1),A(   1))
        EQUIVALENCE (NWIDTH(1),A(1001)), (NDECS(1),A(1101))
        EQUIVALENCE (NBLANK(1),A(1201)), ( IRGS(1),A(1301))
        EQUIVALENCE (NCOUNT(1),A(1401)), (NWMAX(1),A(1501))
        EQUIVALENCE (NSIGDS(1),A(1601)), (ITYPE(1),A(1701))
 READX: EQUIVALENCE (JARGS(1),ARGS(1))
REL1FT: EQUIVALENCE (IIA(1),A(1))
RFORMT: EQUIVALENCE (IBLANK,LA(45)), (IEQUAL,LA(46)), ( IPLUS,LA(40))
        EQUIVALENCE (IMINUS,LA(39)), (IASTER,LA(41)), (ISLASH,LA(37))
        EQUIVALENCE ( ILPAR,LA(42)), ( IRPAR,LA(43)), (ICOMMA,LA(44))
        EQUIVALENCE (IPEROD,LA(38))
RNDATM: EQUIVALENCE (IBLANK,LA(45)), (IEQUAL,LA(46)),  (IPLUS,LA(40))
        EQUIVALENCE (IMINUS,LA(39)), (IASTER,LA(41)), (ISLASH,LA(37))
        EQUIVALENCE  (ILPAR,LA(42)),  (IRPAR,LA(43)), (ICOMMA,LA(44))
        EQUIVALENCE (IPEROD,LA(38))
RPRINT: EQUIVALENCE (    NP(1),A(   1))
        EQUIVALENCE (NWIDTH(1),A(1001)), (NDECS(1),A(1101))
        EQUIVALENCE (NBLANK(1),A(1201)), ( IRGS(1),A(1301))
        EQUIVALENCE (NCOUNT(1),A(1401)), (NWMAX(1),A(1501))
        EQUIVALENCE (NSIGDS(1),A(1601)), (ITYPE(1),A(1701))
SCREEN: EQUIVALENCE (  XC(1),XI(1))
        EQUIVALENCE (  XI(1), A(1)), ( XN(1), A(1))
        EQUIVALENCE ( ILI(1), A(1)), (ILN(1), A(1))
        EQUIVALENCE (  MD(1), A(1)), ( NC(1), A(1))
        EQUIVALENCE (  CL(1), A(1)), ( RM(1), A(1))
        EQUIVALENCE (  CI(1), A(1)), ( CN(1), A(1))
        EQUIVALENCE (  CO(1), A(1)), ( ID(1), A(1))
        EQUIVALENCE ( IPI(1), A(1)), (IPN(1), A(1))
        EQUIVALENCE (  NI(1), A(1)), ( NN(1), A(1))
        EQUIVALENCE (TOLL(1), A(1)), ( YI(1), A(1))
        EQUIVALENCE (  YN(1), A(1)), ( ZC(1), A(1))
SICIEI: EQUIVALENCE (FMR,A(1)), (FMI,A(2)), (GMR,A(3)), (GMI,A(4))
SLOMNI: EQUIVALENCE (II,ISTEM(1)), (JJ,ISTEM(2))
        EQUIVALENCE (KK,ISTEM(3)), (LL,ISTEM(4))
  SORT: EQUIVALENCE (AB,IAB), (ABC,IABC)
SPLITP: EQUIVALENCE (INDEX(1),A(1))
```

Proc. EQUIVALENCE Statement

```
STAPLT: EQUIVALENCE (    X2(1),A(1)), (    Y2(1),A(1))
        EQUIVALENCE (    SV(1),A(1))
        EQUIVALENCE (    XX(1),A(1))
        EQUIVALENCE (ISTORE(1),A(1)), (JGRAPH(1),A(1))
        EQUIVALENCE (NSTORE(1),A(1))
        EQUIVALENCE (    KB(1),A(1))
        EQUIVALENCE (    KD(1),A(1)), (    KS(1),A(1))
        EQUIVALENCE (    KT(1),A(1)), (    KW(1),A(1))
        EQUIVALENCE (  XMIN(1),XX(1)), (   X20(1),XX(1))
        EQUIVALENCE (   X40(1),XX(1)), (   X60(1),XX(1))
        EQUIVALENCE (   X80(1),XX(1)), (  XMAX(1),XX(1))
STAPRT: EQUIVALENCE (A(101),ISA(1)), (A(101),SA(1))
STAPTB: EQUIVALENCE (YLABLE(1),A(1))
        EQUIVALENCE (    SV(1),A(1))
        EQUIVALENCE (NSTORE(1),A(1))
        EQUIVALENCE (    KS(1),A(1))
        EQUIVALENCE (    KW(1),A(1)), (   KD(1),A(1))
        EQUIVALENCE (    KB(1),A(1)), (   KT(1),A(1))
        EQUIVALENCE (JHOLD(1,1),A(1)), (NHOLD(1,1),A(1101))
STAPTG: EQUIVALENCE (X2(1),A(1)), (Y2(1),A(1))
        EQUIVALENCE (YLABLE(1), A(1))
        EQUIVALENCE (JGRAPH(1),A(1))
STAPTT: EQUIVALENCE (YLABLE(1),A(1))
        EQUIVALENCE (    SV(1),A(1))
        EQUIVALENCE (    KB(1),A(1)), (    KD(1),A(1))
        EQUIVALENCE (    KS(1),A(1)), (    KT(1),A(1))
        EQUIVALENCE (    KW(1),A(1))
        EQUIVALENCE (NSTORE(1),A(1))
        EQUIVALENCE (JHOLD(1,1),A(1)), (NHOLD(1,1),A(1101))
STAQDS: EQUIVALENCE (A(101),SA(1))
STASTR: EQUIVALENCE (A(101),ISA(1)), (A(101),SA(1))
STATIS: EQUIVALENCE (DEV2,R(1)), (DEV3,R(2)), (DEV4,R(3))
        EQUIVALENCE (A(101),ISA(1)), (A(101),SA(1))
SUMMAL: EQUIVALENCE (IEQ,W), (R(1),RSUM(1))
THERMO: EQUIVALENCE (QQ(1),A(1))
TRANSF: EQUIVALENCE (X(1),A(1))
TWOWAY: EQUIVALENCE ( COEF(1),RC(1)), (  RES(1),RC(1))
        EQUIVALENCE (   SC(1),RC(1)), (SYHAT(1),RC(1))
        EQUIVALENCE ( SQFC(1),RC(1)), (  RSS(1),RC(1))
        EQUIVALENCE (STREA(1), A(1)), (STREB(1), A(1))
UCSUMS: EQUIVALENCE (YSUM(1),A(1))
UNXRDC: EQUIVALENCE (IA(1),A(1)), (IB(1),A(1))
UNXSET: EQUIVALENCE (IA(1),A(1)), (IB(1),A(1))
UNXWRT: EQUIVALENCE (IA(1),A(1))
XSEG12: EQUIVALENCE (IIRGS(1),LFMT(1))
 XSTOP: EQUIVALENCE (ITEMP(1),A(1))
        EQUIVALENCE (LASTRK,LA(41))
        EQUIVALENCE (LCOMMA,LA(44))
        EQUIVALENCE (    LZ,LA(36))
        EQUIVALENCE ( LPLUS,LA(40))
        EQUIVALENCE ( LZERO,LA( 1))
ZLCVAR: EQUIVALENCE (IAA(1),A(1)), (IAC(1,1),A(1))
```

9. DATA AND FORMAT STATEMENTS

The FORTRAN DATA statement is used to define data for some variables, arrays and array element names. The data assigned to the variables are of three types: integer, real, and double precision.

Variables containing data which are computer configuration dependent are defined in named common blocks and are assigned values in BLOCK DATA procedures of which there are eight: DATA1, DATA2, DATA3, DATA4, DATA5, DATA6, DATA7, and DATA8 (see sec. 4E of chapter 4 for details).

A number of variables are not included in any named common block and therefore are assigned values within the procedures in which they are used. The procedures are listed for completeness. In general, the data do not need to be modified even if some of the data have 8 or more significant digits for real numbers and 14 or more significant digits for double precision numbers, since most FORTRAN compilers will truncate to the nearest acceptable digit.

The last section lists procedures that contain FORMAT statements.

9A. Procedures With Integer Constants Defined in DATA Statements

AARGS, ABRIDG, APRINT, ASTER, BESEL3, BESTCP, BINPPF, BLANK, CAUPLT, CINDEX,
CNTNTS, COEF, COMPIL, CONPG1, CONPG2, CONVRT, DANISH, DATA1, DATA2, DATA5,
DATA6, DATA7, DATA8, DEXPLT, DIFFER, DISPRO, DSCRIB, DUTCH, ENGLSH, EVAL,
EV1PLT, EV2PLT, EXPPLT, FIXFLO, FRENCH, GERMAN, HEADS, HFNPLT, IMPRUV, ITALAN,
JAPANE, KEYBRD, LABPNT, LANGUA, LGNPLT, LOGPLT, LOOKUP, MAINSL, MIST, MPROP,
MPRPNT, NONBLA, NORPLT, NORWEG, NOTEPR, OANOVA, OCOEFF, OCOVAR, OMCONV, OMNIT,
OUTLOF, OUTSPA, PACK, PAGE, PARPLT, PCKFMT, PLOTCE, PLOT24, PLT24B, PLT24T,
POIPPF, PORTUG, PRBPLT, PREPAK, PRTDD, PRTMNL, REPCHK, SANDL, SCRAWL, SEEEC,
SLFPRT, SLOMNI, SLOVEN, SLPTSC, SPACE, SPANSH, SPINST, SSCRWL, STALSD, STAPTT,
STASTR, STMT, STORE, STRLNG, SWEDSH, TWPRCR, TWPRCS, UNIPLT, VARCON, WEIPLT,
XFORMT, XSTOP, YUGOSL, ZLCVAR

9B. Procedures With Real Constants Defined in DATA Statements

ATOMIC, BINCDF, BINRAN, CALCOM, CALPLT, CALTIK, CHCCDF, CHSCDF, CONFEL, CORPRT,
CORREL, CTCCDF, CTNCDF, CVTDEG, DATA3, DATA4, EXPAND, FPPT, FREQCY, GAMPLT,
GAMPPF, HARMON, HISTGM, INTERP, LABEL, LAMCDF, LAMPLT, LAMPPF, LSDIAG, LSFIT,
LSPLT2, LSPLT4, LSPRNT, MEDCI, NBCDF, NBPPF, NBRAN, NORCDF, NORPPF, ONEWAY,
ONLPLT, ONPLTG, ONPLTH, ORTPLT, OWPRAV, OWPRES, OWPRHV, OWPRMC, PLTPOS, PLT24G,
POICDF, POIPLT, PRBRAN, PRPLOT, RANKO, RANKX, REPINC, RPRINT, RULE, SCALE2,
SCALE3, SCNARG, SCREEN, SETUP, SLVE, SNRPPF, SORDER, SPLITP, SRPPT5, STAPLT,
STAPRT, STAPTB, STAPTG, STATIS, SUNIMD, TABLE, TABPRT, TCDF, THERMO, TOLLIM,
TPCTPT, TWRANK, TWRNKS, UNIMED, UNIRAN, XPND

9C. Procedures With Double Precision Constants Defined in DATA Statements

BEJN, BESEL2, BEZERO, BEZONE, BINTJO, CBEI, CBEK, CHCCDF, CHSCDF, CHSPPF,
COMELL, CONTB, CTCCDF, DATA3, DBEJ, DIXAB, ERRINT, EXPINT, GAMCDF, GAMMA,
GAMPLT, GAMPPF, GENER, GQUAD, LSRND, RFORMT, SDRND, STRUVE, TCDF, TPCTPT,
TPPF

9D. Procedures With FORMAT Statements

ABRIDG, APRINT, BESTCP, CALERR, CALINT, CAUPLT, CNTNTS, CNTNT1, CNTNT2, CNTNT3,
CNTNT4, CONPG1, CONPG2, CONPG3, CORPRT, DESC1, DESC2, DESC2, DESC3, DESC4,
DESC5, DESC6, DESC7, DESC8, DESC9, DESC10, DESC11, DEXPLT, DSCRIB, ERROR,
ERRPRT, EV1PLT, EV2PLT, EXPPLT, FTLERR, GAMPLT, HFNPLT, INFERR, INPUT, INTERP,
INVERT, LABPNT, LAMPLT, LGNPLT, LIST, LOGPLT, LSDIAG, LSPLT2, LSPLT4, LSPRNT,
MIST, MPRPNT, NORPLT, NOTEPR, OCOEFF, OCOVAR, ONLPLT, ONPLTG, ONPLTH, OPONE,
OUTLOF, OUTPUT, OUTSPA, OWPRAV, OWPRBP, OWPRCL, PAGE, PARPLT, PCKFMT, PLOTCE,
PLT24B, BLT24T, POIPLT, PRINTX, PRPLOT, PRTDD, READX, RNDOWN, RTHERR, SANDL,
SCREEN, SLFPRT, SLPTSC, SPACE, SPINST, STAPRT, TWPRAV, TWPRAW, TWPRNA, TWPRCR,
TWPRCS, TWPRTR, UINPLT, UNXRDC, UNXSET, UNXSPC, UNXWRT, WEIPLT

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5. AUTHOR(S) Shirley G. Bremer
Sally T. Peavy

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10. SUPPLEMENTARY NOTES

Supersedes NBS Technical Note 550.

[ ] Document describes a computer program; SF-185, FIPS Software Summary, is attached.

11. ABSTRACT (A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here)

OMNITAB 80 is a general-purpose package which permits direct use of a computer without prior knowledge of computer languages. Every effort has been made to produce a system as computer independent as possible to make installation on any large computer configuration relatively easy.

This Technical Note provides assistance to the systems programmer, with the task of installing OMNITAB 80, by pointing out where difficulties may occur and how to resolve them. The Note is intended more as reference material, since all modifications for a particular configuration are made prior to the distribution of the OMNITAB 80 system.

OMNITAB 80 is a large system requiring a large computer. Overlay or segmentation is virtually essential. A method, that is employed at the National Bureau of Standards, for overlaying OMNITAB 80 is outlined. The method should be useful for other computer configurations.

12. KEY WORDS (Six to twelve entries; alphabetical order; capitalize only proper names; and separate key words by semicolons)

ANSI FORTRAN; computer independent; double precision; general-purpose computer program; installation of OMNITAB 80; named common blocks; OMNITAB 80; overlay; segmentation; system parameters; transportable computer software.

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