60436000

CONTROL DATA CORPORATION

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CONTROL DATA

NOS VERSION 1 APPLICATIONS PROGRAMMER'S INSTANT

CDC® COMPUTER SYSTEMS:
CYBER 170 SERIES
CYBER 70
MODELS 71, 72, 73, 74
6000 SERIES

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REVISION RECORD	
REV	DESCRIPTION
A	Manual released.
(07-75)	
B	Revised to support NOS 1.1. Changes
(03-76)	include new DJ (844-41 Disk Storage
	Subsystem) device-type designation;
	new parameters for CONVERT, DAYFILE,
	ENQUIRE, LDI, LO72, and FTN commands;
	addition of EDIT and BASIC 3 commands
	and corrections to character-set
	tables. New features, as well as
	changes, deletions, and additions to
	information in this manual, are
	indicated by bars in the margins or
	by a dot near the page number if the
	entire page is affected.
C	Revised to support NOS 1.2 at PSR
(01-17-77)	corrective code level 439. Changes
	include addition of the MFL, ROUTE,
	SETASL, SETJSL, and COBOL5 control
	statements; new directives for the
	PROFILE control statement; new
	security options for entering password
	charge number, and project number;
	new device types LS (580-16 line
	printer) and LT (580-20 line printer),
	and addition of 844-44 disk storage
	subsystem to device type DJ; new

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REVISION RECORD (CONTD)	
REV	DESCRIPTION
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	(SRU limit error); and miscellaneous
	corrections and clarifications. This
	manual obsoletes all previous
	editions.
D	Revised to reflect NOS 1.2 at PSR
(07-15-77)	level 452. Documentation of TCOPY
	and MAP control statements, exten-
	sions to COPY and VERIFY control
	statements, and support of CDC CYBER
	Model 171 Computer Systems is also
	included.
E	Revised to reflect NOS 1.3. Support
(04-12-78)	of 844 full tracking, user access to
	ECS, CDC CYBER Control Language, 580
	PFC extensions, ATS/block ID, and CDC
	CYBER Common Utility control state-
	ments are added. This edition
	obsoletes all previous editions.
F	Revised to reflect NOS 1.3 at PSR
(09-27-78)	level 477. Miscellaneous technical
	and editorial changes have been made.
G	Revised to reflect NOS 1.4. Changes
(08-31-79)	include addition of the FCOPY,
	TRMDEF, ALGOL5, APL, COMPASS,
	FTN5, and F45 control statements;
	support of CYBER 170 model 176;
	support of 885/7155 disk drive;
	support of extended character sets;
	and miscellaneous corrections and
	additions. This edition obsoletes
	all previous editions.
H	Revised to update manual to the first
(01-24-80)	corrective code release following NOS
	1.4 and to include Mass Storage
	Subsystem support and to make

REVISION RECORD (CONTD)

REV	DESCRIPTION
	typographical and technical
	corrections.

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LIST OF EFFECTIVE PAGES

New features, as well as changes, deletions, and additions to information in this manual, are indicated by bars in the margins or by a dot near the page number if the entire page is affected. A bar by the page number indicates pagination rather than content has changed.

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PREFACE

The Network Operating System (NOS) Version 1.4 provides network capabilities for time-sharing and transaction processing, in addition to local and remote batch processing on CONTROL DATA® CYBER 170 Series Computer Systems, CDC® CYBER 70 Series, Models 71, 72, 73, and 74 Computer Systems, and CDC® 6000 Series Computer Systems.

AUDIENCE

This instant is designed for users familiar with NOS. It is intended to serve as a quick reference tool for the user, not as a stand-alone document.

ORGANIZATION

This instant provides condensed descriptions of system control statements, control language formats, and loader, product set, and system utility control statement formats. Character set tables are also provided.

For condensed descriptions of console commands, system oriented control statements, central memory tables, and function requests, refer to the NOS Systems Programmer's Instant.

CONVENTIONS

Extended memory for the CYBER 170 Models 171, 172, 173, 174, 175, 720, 730, 750, and 760 is extended core storage (ECS). Extended memory for CYBER 170 Model 176 is large central memory (LCM) or large central memory extended (LCME). ECS and LCM/LCME are functionally equivalent, except as follows:

- LCM/LCME cannot link mainframes and does not have a distributive data path (DDP) capability.
- LCM/LCME transfer errors initiate an error exit, not a half exit. Refer to the COMPASS Reference Manual for complete information.

Model 176 supports direct LCM/LCME transfer COMPASS instructions (octal codes 014 and 015). Refer to the COMPASS Reference Manual for complete information.

In this manual, ECS refers to all forms of extended memory on the CYBER 170 Series. However, in the context of a multimainframe environment or DDP access, model 176 is excluded.

RELATED PUBLICATIONS

The following manuals provide detailed descriptions of these subjects.

Control Data Publication	Publication No.
ALGOL Version 4 Reference Manual	60496600
ALGOL Version 5 Reference Manual	60481600
APL Version 2 Reference Manual	60454000
BASIC Version 3 Reference Manual	19983900
COBOL Version 4 Instant	60327600
COBOL Version 4 Reference Manual	60496800
COBOL Version 5 Instant	60497000
COBOL Version 5 Reference Manual	60497100
COMPASS Version 3 Reference Manual	60492600
CYBER Interactive Debug Reference Manual	60481400
CYBER Loader Instant	60449800
CYBER Loader Reference Manual	60429800
FORTRAN Extended Version 4 Reference Manual	60497800
FORTRAN Extended Version 4 Instant	60497900
FORTRAN Version 4-5 Conversion Aids Reference Manual	60483000
FORTRAN Version 5 Reference Manual	60481300
Modify Instant	60450200
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SYSTEM CONTROL STATEMENT FORMATS

PERMANENT FILE OPTIONS

The following control statement parameters and descriptions are options on various permanent file commands.

Parameter	Description
UN=usernum	Specifies alternate user number for file residing in another user's catalog.
PW=passwrd or PW	Specifies one- to seven-character password that must be specified whenever alternate users access file. If second form is used, password is read from single-line record in INPUT file containing only password.
CT=ct	Specifies category of permission for alternate users.

ct	Description
P or PR or PRIVATE	Private files available for access only by originator or those with explicit permission.
S or SPRIV	Semiprivate files available for access by any user who knows file name, user number, and password and whose permitted mode of access to the file is not NULL.
PU or PUBLIC or LI	Public files available for access by all users who know file name, user number, and password.

M=m	Specifies file or user permission mode.

m	Description
W or WRITE	Allows user to write, read, append, execute, modify, or purge file.

Parameter	Description

m	Description
M or MODIFY	Allows user to modify, append, read, or execute direct access file.
A or APPEND	Allows user to append information to end of file.
R or READ	Allows user to read or execute file.
RM or READMD	Allows user to read or execute direct access file while another user is accessing file in modify mode.
RA or READAP	Allows user to read or execute a direct access file while another user is accessing file in append mode.
E or EXECUTE	Allows user to execute file.
N or NULL	Removes permission previously granted with PERMIT control statement.

R=r† Specifies type of device on which permanent file resides or is to reside.

r	Description
DE	Extended core storage.
DIi	844-21 Disk Storage Subsystem (half track) ($1 \leq i \leq 8$).
DJi	844-4x Disk Storage Subsystem (half track) ($1 \leq i \leq 8$, x=1 or 4).
DKi	844-21 Disk Storage Subsystem (full track) ($1 \leq i \leq 8$).

†Files which become MSF resident and then are staged back to disk might not reside on the device type specified by the R=r parameter.

Parameter	Description

r	Description
DLi	844-4x Disk Storage Subsystem (full track) ($1 \leq i \leq 8$, x=1 or 4).
DMi	885 Disk Storage Subsystem (half track) ($1 \leq i \leq 3$).
DP	Distributive data path.
DQi	885 Disk Storage Subsystem (full track) ($1 \leq i \leq 3$).

S=space	Specifies amount of space in PRUs desired for direct access file.
PN=packnam	Specifies one- to seven-character pack name used in conjunction with R keyword to identify device to be accessed in permanent file request.
SS=subsyst or SS	Specifies subsystem to be associated with file.

Subsystem	Description
NULL or NUL	NULL subsystem.
BASIC or BAS	BASIC subsystem.
FTNTS or FTN	FORTRAN Extended version 4 subsystem.
FORTRAN or FOR	FORTRAN version 5 subsystem.
EXECUTE or EXE	EXECUTE subsystem.
BATCH or BAT	BATCH subsystem.

If only SS is specified, the current subsystem is associated with the file.

NA	Specifies no abort, even if error is encountered. If NA is specified on ATTACH, suspends job until currently unavailable resource becomes available.
CE	Clears file error status.

Parameter	Description
BR=br	Backup requirements. Specifies whether file data should be backed up on a dump tape.

br	Description
MD	If current version of file has image on alternate storage, file is not backed up; otherwise, file is backed up on dump tape.
N	File is not backed up on dump tape.
Y	Current version of file must be backed up on dump tape.

PR=pr	Preferred residence. Specifies whether the user prefers that the file resides on MSF.

pr	Description
M	Preferred residence is MSF when file is not being used.
N	Preferred residence is not specified.

RT	Real time. Specifies file is not attached if file data is to be staged to disk from alternate storage or if utility interlock prevents ATTACH processing. System considers ATTACH statement complete and initiates file data staging to disk, if required.

TAPE MANAGEMENT OPTIONS

The following control statement parameters and keywords may appear on various tape management control statements.

Parameter	Description
D=den	Specifies tape density.

den	Description
LO or 200	200 bits per inch (bpi) (seven-track).
HI or 556	556 bpi (seven-track).
HY or 800	800 bpi (seven-track).
HD or 800	800 characters per inch (cpi) (nine-track).
PE or 1600	1600 cpi (nine-track).
GE or 6250	6250 cpi (nine-track).

Keywords LO, HI, HY, HD, PE, and GE may be specified instead of D=den on REQUEST and ASSIGN control statements.

FC=fcount	Specifies maximum block size in frames that may be read or written.
C=ccount	Specifies maximum size block in 6-bit characters that may be read or written.

Parameter	Description
CV=conv or N=conv	Specifies conversion mode for nine-track tapes.

conv	Description
AS	ASCII/display code conversion.
US	Same as AS.
EB	EBCDIC/display code conversion.

MT	Specifies seven-track tape.
NT	Specifies nine-track tape.
PO=p_1,p_2, ...,p_n	Specifies processing options.

p_i	Description
A	Abort job on irrecoverable read or write parity error.
N	Do not abort job on irrecoverable read or write parity error.
R	Enforce ring out.
W	Enforce ring in.
U	Inhibit unload.
F	Force unload.
E	Ignore all hardware read/write errors.
I	Ignore block being read when end of tape (EOT) is encountered; illegal option for internal (I, SI) formats.
P	Accept block being read when EOT is encountered; illegal option for internal (I, SI) formats.

Parameter	Description

Pi	Description
S	Specify where system is to stop when EOT is encountered. For unlabeled tapes, stop at first tape mark after EOT, and for labeled tapes, stop at tape mark plus EOF1 or EOV1.
L	Disable issuing of tape error recovery messages to job's dayfile; only first and last error messages are issued.
M	Enable issuing of all tape error recovery messages to job's dayfile.
G	Disable hardware error correction on write operations (effective for 6250-cpi density only).
H	Enable hardware error correction on write operations (effective for 6250-cpi density only).

F=format — Specifies data format.

format	Description
I	Internal.
S	Stranger tape.
L	Long block stranger tape.
SI	System internal.
F	Foreign.

NS=ns — Noise size.

Parameter	Description
LB=ℓ	Specifies whether tape is to be treated as labeled or unlabeled.

ℓ	Description
KU	Unlabeled.
KL	Labeled.
NS	Nonstandard labels.

VSN=vsn	Specifies one- to six-character volume serial number that uniquely identifies reel of tape.
CK	Specifies that lfn is to be used as checkpoint file with information written at previous end-of-information (EOI).
CB	Specifies that lfn is to be used as checkpoint file with information written at beginning-of-information (BOI).
FI=fileid or L=fileid	Specifies 1- to 17-character file identifier.
FA=fa	Specifies file accessibility. If FA=A, only owner of tape can access file. For other fa, all future accesses must specify character as fa parameter. FA omitted implies unlimited access.
OFA=fa	Indicates current file accessibility of labeled tape which is to be blank labeled (refer to FA description for explanation of fa).
SI=setid or M=setid	Specifies one- to six-character set identifier for multifile set.

Parameter	Description
SN=secno or V=secno	Specifies one- to four-digit file section number.
QN=seqno or P=seqno	Specifies one- to four-digit file sequence number.
G=genno	Specifies one- to four-digit generation number.
E=gvn	Specifies one- to two-digit generation version number.
CR=cdate or C=cdate	Specifies creation date in form yyddd.
RT=rdate	Specifies retention date in form yyddd.
OWNER= usernum/ familyname	Identifies owner of labeled tape.
LSL=lsl	Specifies label standard level. If LSL=1, labels and data format are ANSI standard. If omitted, indicates that format requires agreement of interchange parties.
LO=ltype	Specifies type of labels to list.

ltype	Description
A	Lists all required and optional ANSI labels.
R	Lists all required labels.
O	Lists all optional labels.
V	Lists all VOL1-9 labels.
H	Lists all HDR1 labels.
F	Lists all EOF1-9 labels.
E	Lists all EOV1-9 labels.
U	Lists all UVL1-9 labels.

Parameter	Description
L=out	Specifies file on which labels are to be listed.
U	Unloads tape after blank labeling.
T=retcycle	Specifies one- to three-digit retention cycle, indicating number of days file is to be retained.
R	Directs system to read existing ANSI label.
W	Directs system to write standard ANSI labels.
VA=va	Specifies volume accessibility; one character specifies restrictions on who has access to information on reel.

SYSTEM CONTROL STATEMENTS

APPEND (pfn, lfn_1,lfn_2, ...,lfn_n/PW= passwrd,UN= usernum,PN= packnam,R=r, NA)	Copies local files lfn_1 through lfn_n to end of indirect access permanent file pfn.†
ASCII.	Changes time-sharing terminal to ASCII mode.
ASSIGN (nn, lfn, {D=den / den}, {FC=fcount / C=ccount}, CV=conv, {MT / NT}, PO=p_1p_2,..., pn, F=format,NS=ns, LB=ℓ, VSN=vsn, {CK / CB})	Assigns file lfn to device or device type specified by nn.† Device types are listed in the FILE control language format, section 2.

†Some parameters of this control statement are defined in Permanent File Options or Tape Management Options in this section.

ATTACH(lfn$_1$=pfn$_1$,lfn$_2$=pfn$_2$,..., lfn$_n$=pfn$_n$/UN=usernum, PW=passwrd, M=m,PN=packnam,R=r,NA,RT)	Attaches permanent files pfn$_1$ through pfn$_n$ as local files lfn$_1$ through lfn$_n$ for direct access. †
BKSP(lfn,n,m)	Backspaces file lfn n logical records (default is one record). m is C for coded mode, and m is B for binary (default is binary).
BLANK(D=den, {MT / NT},VSN=vsn, FA=fa, VA=va, OFA=ofa, CV=conv, OWNER=usernum/familyname, LSL=lsl,U)	Blank labels a magnetic tape. †
CATALOG(lfn, N=n,L=fname, U,CS,D,R)	Catalogs file lfn.

N=0	Catalogs until empty file is encountered.
N=n	Catalogs n files; default is 1.
N	Catalogs to end of information.
L=fname	Specifies output file.
U	Select user library list.
CS	Suppresses character set list for OPL/OPLC type records.
D	Suppresses comment field and page heading following first 1.
R	Rewinds lfn before and after cataloging.

† Some parameters of this control statement are defined in Permanent File Options or Tape Management Options in this section.

CATLIST(LO=p, FN=pfn,UN= usernum,PN= packnam,R=r, L=lfn,NA,DN=dn)

Lists information about user's permanent files and permanent files he can access in catalogs of alternate users. †

LO=p List options

p	Description
F	Selects listing of pertinent information about each file in user's catalog.
FP	Selects listing of permission information recorded for each alternate user of specified file.
0	Selects short list that includes only names of files in user's catalog (this value assumed if LO omitted).
P	Selects short list that indicates user numbers of alternate users who have accessed specified file.

FN=pfn Selects permanent file name.

L=lfn Selects output file name (default is OUTPUT).

DN=dn Selects device number.

CHANGE(nfn= ofn/CT=ct,M=m, PW=passwrd, PN=packnam, R=r,SS= subsyst,NA,CE, PR=pr,BR=br)

Allows originator of permanent file to alter any of several parameters. If nfn=ofn is specified, file name ofn in user's catalog is changed to nfn. †

CHARGE (chargenum, projectnum) or CHARGE.

Specifies user's charge and project numbers for user profile control validation. If second form is used, parameters are read from single-line record in INPUT file in format chargenum,projectnum.

† Some parameters of this control statement are defined in Permanent File Options in this section.

CKP(lfn_1, lfn_2,..., lfn_n)	Directs system to take checkpoint dump; each lfn_i is included in dump.
CLEAR. or CLEAR(*)	Releases all local files.
CLEAR(*, lfn_1,lfn_2, ...,lfn_n)	Releases all local files except those specified.
COMMENT. comments or *comments	Enters comments in system and user's dayfile.
COMMON(lfn_1, lfn_2,..., lfn_n)	Accesses file that was already assigned library file type (LIFT) or assigns locked local file to LIFT.
CONVERT(P= lfn_1,N= lfn_2,RS=n, 64,TS=t,NM,R, RC=m)	Converts text files to 64-character set.

P=lfn_1	Reads input from file lfn_1 (default is OLD).
N=lfn_2	Writes output on file lfn_2 (default is NEW).
RS=n	Specifies maximum record size in characters; $1 \leq n \leq 500$ (default is 300).
64	Converts from 63- to 64-character set; if omitted, no conversion takes place. Must be specified if TS is not.
TS=t	Converts old time-sharing record (61-character set) to new time-sharing record (63-character set) with terminal type t:

t	type
TTY or NAMIAF	ASCII code with standard print.
COR	Correspondence code with standard print.
COR-APL	Correspondence code with APL print.
MEM-APL	Memorex (ASCII code) 1240 with APL print.
BLK-EDT	Block transmission (ASCII code) with standard print.

NM — Converts TS to normal mode (default is ASCII mode) with the following effects.

If TS is specified, display code 70 (circumflex) is converted to 76. If NM is omitted, conversion is to 7402.

If TS and 64 are specified, display code 63 (colon) is converted to 00. If NM is omitted, conversion is to 7404.

R — Rewinds input and output files prior to processing.

RC=m — Converts m decimal records (if omitted, m=1 assumed).

COPY(I=lfn$_1$, O=lfn$_2$, V=x, M=c, TC=tc, N=ccnt, BS=bsize, CC=chct, EL=el, PO=po, L=lfn$_3$

Copies lfn$_1$ to lfn$_2$ until EOI is encountered or copy termination condition is satisfied. Parameters are both order-dependent and order-independent.

I=lfn$_1$ — Specifies name of file to copy from. Default is INPUT.

O=lfn$_2$ — Specifies name of file to copy to. Default is OUTPUT.

V=x — If specified, files are rewound before copy and rewound, verified, and rewound after copy.

M=c

C1	Coded mode set on lfn$_1$ only.
C2	Coded mode set on lfn$_2$ only.
other	Coded mode set on both files.

TC=tc — Specifies copy termination condition that defines use of copy count specified by the N parameter. Default is EOD.

F EOF	N parameter defines number of files to copy.
I EOI	N parameter ignored. Copy to EOI.
D EOD	N parameter defines number of double EOFs to copy to.

N=ccnt — Specifies copy count as further defined by termination condition. Default is 1.

BS=bsize — Specifies maximum block size for S or L tape. Default is 1000B for S tape and 2000B for L tape.

CC=chct — Specifies maximum number of characters per block for S or L tape.

EL=el — Specifies error limit. Maximum numbers of nonfatal errors to allow before abort. EL=U denotes unlimited. Default is 0.

PO=po — One or more of the following:

- E — Processes parity error blocks. Default is skip.
- D — Deletes noise blocks during copy from mass storage, I, or SI tape to S or L output tape. Defaults are blank pad to noise size for coded mode and binary zero pad for binary mode.
- R — Allows record splitting during copy from mass storage, I, or SI tape to S or L output tape. Default is abort if record is encountered that is too large.
- M — Specifies copy operation that eliminates EOFs on lfn_2. Default is to include EOFs.

L=lfn_3 — Specifies alternative output file to receive parity error messages.

COPYBF(lfn_1, lfn_2,n,C)	Copies n binary files (default is one file) beginning at current position of lfn_1 to lfn_2 (defaults are lfn_1=INPUT and lfn_2=OUTPUT). If C is specified, copy S or L format coded tape to coded line format.
COPYBR(lfn_1, lfn_2,n,C)	Copies n binary records (default is one record) beginning at current position of lfn_1 to lfn_2 (defaults are lfn_1=INPUT and lfn_2=OUTPUT). If C is specified, copy S or L format coded tape to coded line format.
COPYCF(lfn_1, lfn_2,n, fchar,lchar, NA)	Copies n coded files (default is one file) beginning at current position of lfn_1 to lfn_2 (defaults are lfn_1=INPUT and lfn_2=OUTPUT). Portion of each line image to copy is specified by fchar (first character position) and lchar (last character position). If omitted, fchar is 1 and lchar is 136. If NA is specified, do not abort if line terminator missing at EOR.
COPYCR(lfn_1, lfn_2,n, fchar,lchar, NA)	Copies n coded records (default is one record) beginning at current position of lfn_1 to lfn_2 (defaults are lfn_1=INPUT and lfn_2=OUTPUT). Portion of each line image to copy is specified by fchar and lchar. If omitted, fchar is 1 and lchar is 136. If NA is specified, do not abort if line terminator missing at EOR.
COPYEI(lfn_1, lfn_2,x,C)	Copies lfn_1 (current position to EOI) to lfn_2 (defaults are lfn_1=INPUT and lfn_2=OUTPUT). If x is specified, files are rewound before copy and rewound, verified, and rewound after copy. If C is specified, copy S or L format coded tape to coded line format.
COPYSBF (lfn_1, lfn_2,n,NA)	Copies n coded files (default is one file) beginning at current position of lfn_1 to lfn_2, shifting each line image one character to right and adding leading space. Defaults are lfn_1=INPUT and lfn_2=OUTPUT. If NA is specified, do not abort if line terminator missing at EOR.

COPYX(lfn_1, lfn_2,x,b,C)
or
COPYX(lfn_1, lfn_2,type/name,b,C)

Copies logical records from lfn_1 to lfn_2 beginning at current position of lfn_1 and continuing until terminator specified by x or type/name is encountered. Files are then backspaced according to b parameter. If C is specified, copy S or L format coded tape to coded line format. Defaults are lfn_1=INPUT and lfn_2=OUTPUT.

x — Specifies terminator type:

00	Zero record.
n	n records (default is 1).
name	Record name.

type/name — Specifies name is first seven characters of record; type is:

ABS	Multiple entry point overlay.
CAP	Fast dynamic load capsule.
OPL	Modify OPL deck.
OPLC	Modify OPL common deck.
OPLD	Modify OPL directory.
OVL	CPU overlay.
PP	PP program.
PPU	PPU program.
PROC	CCL procedure.
REL	Relocatable CPU program.
TEXT	Unrecognizable as a program.
ULIB	User library program.

b — Specifies backspace control:

- 0 No backspace (default).
- 1 Backspace lfn_1.
- 2 Backspace lfn_2.
- 3 Backspace lfn_1 and lfn_2.

CSET(m) — Changes a time-sharing terminal's character set to m (ASCII or NORMAL).

CTIME. — Enters accumulated CPU time in system and user's dayfile.

DAYFILE(lfn, strng,op,pd, pl)
or
DAYFILE(L= lfn,FR=strng, OP=op,PD=pd, PL=pl) — Writes user's dayfile on lfn (default is OUTPUT) according to the following options.

FR=strng — Searches for literal string strng in dayfile. ($ delimiters are required unless strng is command or control statement of seven characters or less.)

OP=op — Specifies search option:

- T Search time field.
- M Search message field.
- I Incremental dump.
- F Full dump.

Default is OP=M if FR is specified; otherwise, default is OP=F.

PD=pd — Specifies print density (3, 4, 6, or 8 lpi); default is 6 lpi.

PL=pl — Specifies page size; if omitted, page size is determined from print density.

pd	Default pl
3	30
4	40
6	60
8	80

DEFINE(lfn$_1$=pfn$_1$,lfn$_2$=pfn$_2$,...,lfn$_n$=pfn$_n$/PW=passwrd,CT=ct,M=m,R=r,S=space,PN=packnam,NA,PR=pr,BR=br) — Creates empty direct access permanent file.†

DISPOSE(lfn$_1$=q$_1$,lfn$_2$=q$_2$,...,lfn$_n$=q$_n$/ot=usernum) — Releases files to specified output queues.

q$_1$	Queue type
PR	Print.
PH	Punch coded O26.
P9	Punch coded O29.
PB	Punch binary.
P8	Punch 80-column format.

Origin types are specified with ot parameter where BC is local batch origin and EI is remote batch origin. The number of remote batch (EI) user is specified with usernum.

† Some parameters of this control statement are defined in Permanent File Options in this section.

DMD(fwa,lwa)
or
DMD(lwa)
or
DMD.

Dumps central memory from first word address to last word address minus 1; output contains display code equivalences. If lwa alone is specified, fwa=0 is assumed. If neither fwa nor lwa is specified, DMD dumps exchange package and 40_8 locations before and after program address in exchange package.

DMDECS(fwa,lwa)
or
DMDECS(lwa)

Dumps ECS memory from first word address to last word address minus 1; output contains display code equivalences. If lwa only is specified, fwa=0 is assumed.

DMP(fwa,lwa)
or
DMP(lwa)
or
DMP.

Dumps central memory from first word address to last word address minus 1. If lwa alone is specified, fwa=0 is assumed. If neither fwa nor lwa is specified, DMP dumps exchange package and 40_8 locations before and after program address in exchange package.

DMPECS(fwa,lwa)
or
DMPECS(lwa)
or
DMPECS(fwa)
lwa,f,lfn)

Dumps ECS memory from first word address to last word address minus 1. If lwa only is specified, fwa=0 is assumed. If print format f and file lfn are specified, dump is output on file lfn and contains display code equivalences. Print format f is included only for compatibility with NOS/BE.

DOCMENT(I=lfn_1,S=lfn_2,L=lfn_3,N=nn,T=type,C=cc,P=pp,NT,NR,TC)

Enables user to extract external or internal documentation from a file containing COMPASS source code.

I=lfn_1 Name of file that contains page footing information in following format:

Column	Contents
1	Blank.
2-45	Document title.

	Column	Contents
	46-55	Publication number.
	56-60	Revision level.
	61-70	Revision date.
$S=lfn_2$		Name of file containing source statement images.
$L=lfn_3$		Name of file to receive output.
N=nn		Number of copies.
T=type		Documentation type (INT for internal or EXT for external).
C=cc		Key character for documentation.
P=pp		Number of print lines per page.
NT		Negate table generator.
NR		Source file not rewound.
TC		List of table of contents.

ENQUIRE(OP=$p_1p_2\cdots p_n$,JN=jnm, FN=lfn_1, O=lfn_2)
or
ENQUIRE(p_1 $p_2\cdots p_n$)

Lists information about user's job specified by options (up to seven options can be listed for each ENQUIRE control statement).

OP=p_i or p_i — Type of information returned.

p_i	Description
A	Causes B, D, R, U, J, L, and F options to be processed.
B	Returns information concerning user identification and priorities.
D	Returns list of resources demanded by user and resources currently assigned.

Pi	Description
F	Returns status of files at user's control point.
J	Returns contents of control registers, error flag field, and succeeding control statements.
L	Returns user's loader information.
R	Returns system resources used.
S	Returns SRUs used.
T	Returns accumulated CPU time.
U	Returns initial amount of resources available to user for job step time limit (seconds), job step SRUs, account block SRUs, and remaining resources available for dayfile messages, control statements, dispose files, and mass storage.
JN=jnm	Returns status of remote batch job jnm (last three characters of name assigned by system) initiated with SUBMIT, ROUTE, or LDI control statement.
JN	Returns status of all active jobs associated with current user number.
FN=lfn_1	Returns status of file lfn_1.
ON=lfn_2	Specifies file to receive output (default is OUTPUT).

ENTER./statement$_1$/statement$_2$/.../statement$_n$	Allows batch user to enter series of control statements on one line.	
	/	Specifies any character used to separate individual control statements that is not used within any of the statements.
	statement$_i$	Specifies any NOS batch control statement for which user is validated.
EVICT(lfn$_1$, lfn$_2$,..., lfn$_n$)	Releases file space for lfn$_i$ but for most files does not release file attachment to job. Tape files and files with write lockout set are returned to system.	
EXIT.	Indicates where in control statement record to resume control statement processing if error is encountered or where to terminate normal control statement processing.	
FCOPY(P=lfn$_1$,N=lfn$_2$,PC=ic$_1$,NC=ic$_2$,R)	Converts file from one code format to another code format.	
	P=lfn$_1$	Converts file lfn$_1$ (default is OLD).
	N=lfn$_2$	Writes converted output on file lfn$_2$ (default is NEW).
	PC=ic$_1$	Specifies internal characteristic of lfn$_1$ (default and only recognized value is ASCII). ASCII is 6/12 display code.
	NC=ic$_2$	Specifies internal characteristic of lfn$_2$ (default and only recognized value is ASCII8). ASCII8 is 12-bit ASCII code.
	R	Rewinds lfn$_1$ and lfn$_2$ before and after conversion (default is no rewind).

GET(lfn_1=pfn_1,lfn_2=pfn_2,...,lfn_n=pfn_n/UN=usernum,PW=passwrd,PN=packnam,R=r,NA)

Retrieves copy of indirect access permanent file pfn_i for use as local file lfn_i.†

GTR(lfn_1,lfn_2,D,NR,S,NA) selection directives

Copies records specified by selection directives from lfn_1 to lfn_2, starting at current EOI of lfn_2. Defaults are lfn_1=OLD and lfn_2=LGO.

D	Causes a directory record to be written at end of lfn_2.
NR	Specifies that files lfn_1 and lfn_2 are not rewound after operation. If not specified, both files are rewound before and after operation.
S	Processes lfn_1 as sequential file.
NA	Does not abort even if error is encountered.

selection directives	Description
type/name	Retrieves record of specified type (refer to COPYX for types) and name.
name	Retrieves record specified.
0	Inserts zero-length record on file lfn_2.
type/$name_1$-$name_2$	Retrieves records $name_1$ through $name_2$ of type specified. If $name_1$ is not found, no records are retrieved. If $name_1$ is found, $name_2$ is not found, and NA is specified, all records from $name_1$ to EOF are retrieved.

† Some parameters of this control statement are defined in Permanent File Options in this section.

HTIME.	Issues dayfile message giving the CYBER 170 model 176 accumulated clock cycle count for the job.
jobname(Pp,Tt, CMFl).....cm or jobname(p,t, fl,fe)....cm	Specifies name and information for individual jobs.
	p — Priority level; currently assigned by system.
	t — Job step time limit. Default is 64 seconds.
	fl — Maximum CM field length.
	fe — Maximum ECS field length.
	cm — Conversion mode (located in columns 79 and 80). cm=26 for conversion of coded cards on O26 mode and cm=29 for conversion in O29 mode.
KRONREF(P= lfn_1, L= lfn_2,S=lfn_3, G=lfn_4)	Generates cross-reference listing of symbols used by decks on MODIFY OPL.†
	P=lfn_1 — OPL input on file lfn_1 (default is OPL).
	L=lfn_2 — List output on file lfn_2 (default is OUTPUT).
	S=lfn_3 — System text from overlay lfn_3 (default is SYSTEXT).
	G=lfn_4 — System text from local file lfn_4 (default is TEXT).

† System text referenced by the G and S parameters must contain symbol definitions.

LABEL(lfn,D=den,FC=fcount,CV=conv,{MT/NT},PO=p_1p_2,...,p_n,F=format,NS=ns,LB=ℓ VSN=vsn, {CK/CB}, {FI=fileid/L=fileid},FA=fa, {SI=setid/M=setid}, {SN=secno/V=secno}, {QN=seqno/P=seqno},G=genno, E=gvn, {CR=cdate/C=cdate}, {RT=rdate/T=retcycle}, {W/R})

Assigns lfn to tape unit and creates a new or accesses existing tape.†

LBC(addr)

Loads binary corrections, beginning at addr, into central memory.

LDI(lfn,id,m)

Copies batch job images on lfn to mass storage and submits them to input queue with identifier id. If m is specified, jobnames of all jobs loaded are written on user's dayfile.

LENGTH(lfn)

Returns status of file lfn.

LIBGEN(F=lfn_1,P=lfn_2,N=lfn_3,NX=n)

Generates user library file.

F=lfn_1	Name of source file containing records to be placed on user library file lfn_2 (default is LGO).
P=lfn_2	Name of file on which the library is to be written (default is ULIB).
N=lfn_3	Name of user library being generated (default is lfn_2).
NX=n	If n is nonzero, no cross-references are given (default is n=0).

† Some parameters of this control statement are defined in Tape Management Options in this section.

LIMITS.	Lists validation information for user named on current USER statement.
LISTLB(lfn, {SI=setid / M=setid}, {QN=seqno / P=seqno}, LO=ltype,L=out)	Reads ANSI labels on file lfn and writes them on file specified by out.†
LIST80(lfn_1, lfn_2,NR)	Reads file lfn_1 containing a COMPASS assembly listing and writes it, compressed to 80 columns, on lfn_2. NR specifies that lfn_1 is not rewound.
LOC(fwa,lwa) or LOC(lwa) or LOC.	Enters octal correction statement images from INPUT into central memory in specified area.
LOCK(lfn_1, lfn_2,..., lfn_n)	Sets write interlock bit in FNT/FST entry for local file lfn_i.
LO72(I=lfn_1, S=lfn_2,L= lfn_3,H=xxx, LP,NR,Nx=y, Ix=y,Ox=y,IT)	Reformats files to 72 columns.
	I=lfn_1 — Reformat parameters are on file lfn_1 (default is INPUT).
	S=lfn_2 — Data to be reformatted is on file lfn_2 (default is SCR).
	L=lfn_3 — Reformatted data is listed on file lfn_3 (default is OUTPUT).
	H=xxx — Number of characters per output line up to 150 (default is 72).

†Some parameters of this control statement are defined in Tape Management Options in this section.

	LP	Output is formatted for line printer.
	NR	Output file is not rewound.
	Nx=y	Number of characters to be moved (up to six fields):
		x (1 to 6) Number of field being moved.
		y Number of characters being moved.
	Ix=y	Field from which data originates where x is as in Nx and y is starting column of originating field.
	Ox=y	Destination to which data is going where y is the starting column of destination field.
	IT	When specified, terminal option to alter control statement parameters is suppressed.
MFL(nnnnnn, mmmm) or MFL (CM=nnnnnn, EC=mmmm)		Sets maximum CM field length for each job step to nnnnnn and maximum ECS field length for each job step to mmmm*1000_8.
MODE(m,n)		Sets CPU program exit mode to m ($0 \leq m \leq 7$).†
NEW(lfn/ND)		Allows user to create new primary file. The old primary file is returned and all local files are returned unless ND keyword is specified.

† n is included for compatibility with earlier versions of NOS. The system forces n=7, regardless of value specified in control statement.

NOEXIT. Suppresses transfer to statement following next EXIT statement if error occurs.

NORERUN. Clears rerun status of job.

NOTE(lfn,nr) /line$_1$/ line$_2$/.../ line$_n$ Allows user to create file containing lines specified on control statement.

lfn — Name of file being created; default is OUTPUT.

nr — No rewind of lfn; if not specified, lfn is rewound before and after each access.

/ — Any character not used within line$_i$ that separates individual line$_i$ entries; must immediately follow NOTE statement terminator.

line$_i$ — Character string that constitutes one line of data in file lfn.

A series of NOTE statements, each with nr specified, can be used to create files containing more lines than can be entered with one NOTE statement. Series is followed with PACK statement.

OFFSW(s_1, s_2,...,s_n) Clears pseudo-sense switches for reference by user's program.

OLD(lfn/ND) Allows user to get indirect access permanent file specified by lfn and make it the primary file. Any previous primary file is returned and all local files are returned unless ND keyword is specified.

ONEXIT. Reverses effect of NOEXIT statement.

ONSW(s_1, s_2,...,s_n) Sets pseudo-sense switches for reference by user's program.

OUT. Releases output files from control point to output queue.

PACK(lfn_1, lfn_2,x)	Packs lfn_1 into one record on lfn_2. If x is specified, lfn_1 is not rewound prior to pack.
PACKNAM (PN=packnam) or PACKNAM (packnam)	Directs subsequent permanent file requests to specified auxiliary device.
PARITY(p)	Changes time-sharing terminal's parity to p (ODD or EVEN).†
PASSWOR(oldpswd,newpswd) or PASSWOR.	Changes user's password from oldpswd to newpswd. If second form is used, parameters are read from single-line record in INPUT file in format oldpswd, newpswd.
PBC(fwa,lwa)	Writes one record from specified area in central memory on PUNCHB.
PERMIT(pfn, $usernum_1$= m_1,$usernum_2$=m_2, ...,$usernum_n$= m_n/PN= packnam,R=r,NA)	Allows user to explicitly permit another user to access private or semiprivate file in his permanent file catalog with permission m_i.††
PRIMARY(lfn)	Allows user to return current primary file and make lfn the primary file.
PROTECT(p1) or PROTECT(EC=p1)	Turns specified keyword on or off to control job processing.
	p1 — ON preserves ECS over job steps, and OFF cancels ECS preservation; default is OFF.
PURGALL (CT=ct,AD=ad, MD=md,CD=cd, DN=dn,TY=ty, TM=tm,PN= packnam,R=r, NA)	Purges all permanent files in user's catalog as specified by parameters.†
	ct — File category.
	ad — Last access date.
	md — Last modification date.

†PARITY does not apply to IAF.

††Some parameters of this control statement are defined in Permanent File Options in this section.

	cd	Creation date.
	dn	Device number.
	ty	File type (INDIR, DIRECT, or ALL).
	tm	Time of day on date specified by ad, md, or cd.
PURGE(pfn$_1$, pfn$_2$,..., pfn$_n$/UN=usernum,PW=passwrd,PN=packnam,R=r,NA)	Allows user to remove file from permanent file device.†	
RBR(n,name)	Loads one binary record from specified file. If n is less than four characters and is numeric, TAPEn is file name. If n contains nonnumeric character or is four or more characters long, n itself is file name. If n is omitted, TAPE is file name. name is one- to seven-character name used in record prefix.	
RENAME (nlfn$_1$=olfn$_1$,nlfn$_2$=olfn$_2$,..., nlfn$_n$=olfn$_n$)	Changes name of file olfn$_i$ to nlfn$_i$ in FNT/FST.	
REPLACE (lfn$_1$=pfn$_1$,lfn$_2$=pfn$_2$,..., lfn$_n$=pfn$_n$/UN=usernum,PW=passwrd,PN=packnam,R=r,NA)	Replaces indirect access permanent file pfn$_i$ with copy of local file lfn$_i$.†	

†Some parameters of this control statement are defined in Permanent File Options or Tape Management Options in this section.

REQUEST(lfn, {D=den / den}, {FC=fcount / C=ccount}, CV=conv, {MT / NT}, PO=$p_1p_2,\ldots,p_n$, F=format,NS=ns, LB=ℓ VSN=vsn, {CK / CB})

Requests operator to assign device to lfn.†

RERUN.

Sets rerun status for job.

RESEQ(lfn,t, xxx,yy)

Resequences source files that have leading sequence numbers or adds sequence numbers to unsequenced files.

lfn — Name of file to be sequenced.

t — Type of file:

t	Description
B	BASIC source.
T	Text source.
other or omitted	Any number at beginning of line is considered sequence number.

xxx — New line number of first statement.

yy — Line number increment.

RESOURC ($rt_1=u_1$, $rt_2=u_2,\ldots,$ $rt_n=u_n$)

Specifies maximum number of tape units and disk packs.

rt_i	Description
MT	Magnetic tape (seven-track).
LO	Magnetic tape (seven-track) 200 cpi.

†Some of the parameters in this control statement are defined in Permanent File Options or Tape Management Options in this section.

rt_i	Description
HI	Magnetic tape (seven-track) 556 cpi.
HY	Magnetic tape (seven-track) 800 cpi.
NT	Magnetic tape (nine-track) 800/1600 cpi unit.
HD	Magnetic tape (nine-track) 800/1600 cpi unit.
PE	Magnetic tape (nine-track) 800/1600 or 1600/6250 cpi unit.
GE	Magnetic tape (nine-track) 1600/6250 cpi unit.
DIi	844-21 Disk Storage Subsystem (half track) ($1 \leq i \leq 8$).
DJi	844-4x Disk Storage Subsystem (half track) ($1 \leq i \leq 8$, x=1 or 4).
DKi	844-21 Disk Storage Subsystem (full track) ($1 \leq i \leq 8$).
DLi	844-4x Disk Storage Subsystem (full track) ($1 \leq i \leq 8$, x=1 or 4).
DMi	885 Disk Storage Subsystem (half track) ($1 \leq i \leq 3$)
DQi	885 Disk Storage Subsystem (full track) ($1 \leq i \leq 3$)

NT may not be specified concurrently in the same job step with HD, PE, or GE.

The maximum number of units of resource type rt_i that job will use concurrently is specified with u_i.

RESTART(lfn, nnnn,x_i) Restarts previously terminated job from a specified checkpoint.

lfn	Checkpoint file.
nnnn	Number of checkpoint from which to restart.

x_i	Description
RI	Control statement file on lfn is not restored.
NA	RESTART does not abort if required file is not available.
FC	If file is local to restart job, RESTART does not replace it with file on checkpoint dump.

RETURN(lfn$_1$, lfn$_2$,..., lfn$_n$) Releases file space of lfn$_i$ and/or job attachment.

RETURN(*) Releases file space and/or job attachment for all files.

RETURN(*, lfn$_1$,lfn$_2$, ...,lfn$_n$) Releases file space and/or job attachment for all files except those specified.

REWIND(lfn$_1$, lfn$_2$,..., lfn$_n$) Rewinds files and positions them to BOI.

REWIND(*) Rewinds all files and positions them to BOI.

REWIND(*, lfn$_1$,lfn$_2$, ...,lfn$_n$) Rewinds all except specified files and positions them to BOI.

RFL(nnnnnn, mmmm)
or
RFL(CM= nnnnnn, EC=mmmm) Sets initial running CM field length for each job step to nnnnnn and initial running ECS field length for each job step to mmmm*1000$_8$.

ROLLOUT
or
ROLLOUT(t)

Rolls out user's job and releases all memory assigned to job. t specifies rollout time period in job scheduler delay intervals (assume 1 second as the default scheduler interval) ($0 \leq t \leq 777700_8$).

ROUTE(lfn,DC=dc,DEF,EC=ec,FC=fc,FID=xx,FM=fm,IC=ic,ID=id,PRI=xx,REP=rc,SC=sc,ST=xx,TID=xx,UN=un)

Prepares file lfn for entry in input or output queue and optionally places it in selected queue.

DC=dc Disposition code.

dc	Significance
IN	Release file to input queue.
LP	Print on any line printer.
LR	Print on 580-12 line printer.
LS	Print on 580-16 line printer.
LT	Print on 580-20 line printer.
PB	Punch system binary.
PH	Punch coded.
PR	Print on any line printer.
PU	Punch coded.
P8	Punch 80-column binary.
PL	Plotter.
SB	Punch system binary.
SC	Rescind prior routing and make file local.

DEF Deferred routing of file to queue until later job step or end of job.

EC=ec External characteristics for print or punch files.

ec	Significance for Print File
A4†	ASCII 48-character set.
A6	ASCII graphic 64-character set.
A9	ASCII graphic 95-character set.
B4†	BCD 48-character set.
B6	CDC graphic 64-character set.

ec	Significance for Punch Code
ASCII	ASCII code.
O26	O26 mode.
O29	O29 mode.
SB	System binary.
80COL	80-column binary.

FC=fc Two-character alphanumeric forms code.

FM=fm Family name of devices to which file is routed.

FM For EIOT job, route to terminal of origin. For origin types other than EIOT, route to terminal specified by job's FM and UN at time of ROUTE. If omitted, route to terminal of origin.

†Not supported. Provided for NOS/BE compatibility.

IC=ic Internal characteristics.

ic	Significance
DIS	Display code.
ASCII	ASCII code.
BIN	Binary.

ID or ID=id Route to central site. In second form, local device id receives file after it is routed to central site.

REP=rc File repeat count. Cannot be used with Export/Import.

SC=sc Spacing code for 580 line printer with PFC.

TID For EIOT job, route to terminal of origin. For origin type other than EIOT, route to terminal specified by job's FM and UN at time of ROUTE. If omitted, route to terminal of origin.

TID=C Route to central site.

UN=un User number of user to whom file is routed.

UN For EIOT job, route to terminal of origin. For origin types other than EIOT, route to terminal specified by job's FM and UN at time of ROUTE. If omitted, route to terminal of origin.

RTIME. Issues accumulated time since deadstart in seconds to dayfile.

SAVE(lfn_1=pfn_1,lfn_2=pfn_2,...,lfn_n=pfn_n/PW=passwrd,CT=ct,M=m,SS=subsyst,PN=packnam,R=r,NA,BR=br) Retains copy of local file lfn_i as indirect access file pfn_i.†

SETASL(s) Specifies new account block SRU limit for job.

SETCORE(p) or SETCORE(-p) Sets each word within field length to fill character specified by p. If -p, complement of p is set. Default is p=0.

p	Fill Characters
0	0
ZERO	Zeros (0)
INDEF	Indefinite (1777 000...000)
INF	Infinite (3777 000...000)

SETID(lfn_1=x_1,lfn_2=x_2,...,lfn_n=x_n) Assigns new identification code x_i for lfn_i.

SETJSL(s) Specifies new job step SRU limit for subsequent job steps.

SETPR(p) Specifies new CPU priority for user's job (may be increased only if job is system origin or contains SSJ= entry point).

† Some of the parameters for this control statement are defined in Permanent File Options in this section.

SETTL(t) Specifies new time limit for subsequent job steps.

SKIPEI(lfn) Positions lfn at EOI.

SKIPF(lfn,n,m) Bypasses n files (default is one file), in the forward direction, from current position on lfn. m is C for coded mode, and m is B for binary (default is binary).

SKIPFB(lfn, n,m) Bypasses n files (default is one file), in the reverse direction, from current position on lfn. m is C for coded mode, and m is B for binary (default is binary).

SKIPR(lfn, n, ℓ,m) Bypasses n records (default is one record), in the forward direction, from current position on lfn. ℓ specifies EOR level. m is C for coded mode, and m is B for binary (default is binary).

SORT(lfn,NC=n) Sorts file, lfn, or line or statement images in numerical order based on leading line numbers consisting of n digits.

STIME. Issues current value of the SRU accumulator to user's dayfile.

SUBMIT(lfn,q, NR)c Submits batch job on lfn to input queue for processing.

q Specifies disposition of job output:

B Disposed to local batch queue and printed/punched at central site.

N Disposed to local batch queue, dropped at job termination.

E Disposed to remote batch queue, printed at remote batch terminal.

	NR	Inhibits rewind of file specified by cREAD.
	c	Specifies escape character used to identify reformatting directives (if omitted, / is assumed).
	Reformatting directives:	
	cJOB	Reformats submit file (selects cNOTRANS, cSEQ, and cPACK).
	cEOR	Writes end-of-record.
	cEOF	Writes end-of-file.
	cSEQ	Removes subsequent line numbers.
	cNOSEQ	Reverses effect of cSEQ.
	cPACK	Removes subsequent EOR and EOF marks.
	cNOPACK	Reverses effect of cPACK directive.
	cTRANS	Indicates transmission mode.
	cNOTRANS	Reverses effect of cTRANS directive.
	cREAD,lfn	Inserts file lfn in place of cREAD directive in submit file.
	cREWIND, lfn	Rewinds file lfn to BOI.
	c_1EC=c_2	Changes escape code character from c_1 to c_2.
SUI(n)	Allows user to access permanent file catalog without using USER statement. n specifies user index number (SYOT only).	

SUMMARY(OP=p_1p_2...p_n,JN=jnm, FN=lfn_1, O=lfn_2)
or
SUMMARY(p_1 p_2...p_n)

Lists information about user's job specified by options. All options are identical to those for ENQUIRE control statement. If no parameters are specified, default is OP=R.

SWITCH(s_1, s_2,...,s_n)

Sets pseudo-sense switches for reference by user's program.

TCOPY(I=lfn_1,O=lfn_2, F=f,TC=tc, N=ccnt,CC=chct,EL=el PO=po, L=lfn_3)

Copies E, B, X, or SI-coded format tape to mass storage file, I tape, or SI-binary tape and also generates E or B format tape from mass storage file, I tape, or SI-binary tape. To use TCOPY, E, B, X, or SI-coded tape must be assigned in S (stranger) tape format. Parameters are both order-dependent and order-independent.

I=lfn_1 — Name of file to copy from. Default is INPUT.

O=lfn_2 — Name of file to copy to. Default is OUTPUT.

F=f — Data format that specifies type of conversion for copy operation. This can be E, B, X, or SI. Default is X.

TC=tc — Copy termination condition that defines use of copy count specified by N parameter. Default is EOD.

tc	Description
F EOF	N specifies number of files to copy.
I EOI	N is ignored. Copy to EOI.
D EOD	N specifies number of double EOFs to copy to.

	N=ccnt	Copy count used by copy termination condition TC. Default is 1.
	CC=chct	Maximum character count per line for E or B tape. Defaults are 136 for E tape and 150 for B tape.
	EL=el	Error limit that sets number of nonfatal errors allowed before abort. EL=U specifies unlimited. Default is 0.
	PO=po	Extended error processing.

po	Description
E	Process input blocks with parity errors or block-too-large errors. Default is skip error blocks.
T	When generating E or B format tape, truncate data beyond maximum line size; discard continuation line. Default is split lines exceeding maximum line size into multiple lines.

	L=lfn$_3$	Alternate file to receive parity error messages.
TDUMP(I=lfn$_1$,L=lfn$_2$, O, A, R=rcount,F=fcount, N=lines,NR)	Lists a file in octal or alphanumeric form.	

	I=lfn$_1$	Input file name (default is TAPE1).
	L=lfn$_2$	Output file name (default is OUTPUT).
	O	Octal dump only (default is O and A).
	A	Alphanumeric dump only (default is O and A).
	R=rcount	Number of records to dump.
	F=fcount	Number of files to dump.
	N=lines	Maximum lines that can be dumped.
	NR	Do not rewind lfn$_1$ before dump.

TRMDEF(L=lfn, tc$_1$=v$_1$, ...,tc$_n$=v$_n$) Changes characteristics of IAF terminal.

	L=lfn	Writes redefinition information on file lfn (default is OUTPUT).
	tc$_i$	Specifies characteristic to be changed.

tc	Description
AL	Abort line character.
BS	Backspace character.
B1	User break 1 character (interrupt).
B2	User break 2 character (terminate).
CI	Carriage return idle count.
CN	Cancel line character.
CT	Control character.

	tc	Description
	EP	Echoplex mode.
	IN	Input device.
	LI	Line feed idle count.
	OP	Output device.
	PA	Parity.
	PG	Page wait.
	PL	Page length.
	PW	Page width.
	SE	Special editing.
	TC	Terminal class.
v_i		Specifies value for characteristic. Special characters must be delimited by $. Refer to the IAF Reference Manual for value ranges and defaults.

UNLOAD(lfn_1, lfn_2,..., lfn_n)	Releases file space and/or job attachment for files specified without decrementing resource demand count.
UNLOAD(*)	Releases file space and/or job attachment for all files without decrementing resource demand count.
UNLOAD(*, lfn_1,lfn_2, ...,lfn_n)	Releases file space and/or job attachment for all files except those specified without decrementing resource demand count.
UNLOCK(lfn_1, lfn_2,..., lfn_n)	Clears write interlock bit for local file lfn_1.

UPMOD(P=lfn_1,N=lfn_2,M=lfn_3,F,NR)

Converts Update-formatted program library to Modify-formatted program library file.

P=lfn_1	Updates program library from file lfn_1 (default is OLDPL).
N=lfn_2	Modifies program library on file lfn_2 (default is OPL).
M=lfn_3	Modifies program library name is lfn_3 (default is OPL).
F	Converts to file mark.
NR	Does not rewind lfn_1.

USECPU(n)

Specifies which CPU is to be used for processing: CPU0 for n=1, CPU1 for n=2, and either CPU for n=0.

USER(usernum, passwrd, familyname)

Sets validation and permanent file base for user number.

usernum	User number.
passwrd	User's password.
familyname	Identifies family of permanent devices.

VERIFY(lfn_1, lfn_2,p_1, p_2,...,p_n)

Performs binary comparison of all data from current position of files specified.

lfn_1	Name of first file (if omitted, TAPE1 is assumed).
lfn_2	Name of second file (if omitted, TAPE2 is assumed).

p_i	Description
N=0	Terminates on first empty file encountered on either file.

	p_i	Description
	N=x	Verifies x files (default is 1).
	N	Terminates when EOI is encountered on either file.
	E=y	Lists first y errors (if omitted, 100 is assumed).
	E	E=0; lists no errors.
	L=lfn_3	Lists errors on lfn_3 (default is OUTPUT).
	A	Aborts if errors occur.
	C	Sets coded mode on both files.
	C1	Sets coded mode on lfn_1 only.
	C2	Sets coded mode on lfn_2 only.
	BS=bsize	Specifies maximum block size for S or L tape. Defaults are 1000_8 for S tape and 2000_8 for L tape.
	R	Rewinds both files before and after.

VFYLIB(lfn_1, lfn_2,lfn_3, NR)	Performs binary comparison of files lfn_1 and lfn_2 and lists replacements, deletions, and insertions on lfn_3. If NR is specified, lfn_1 and lfn_2 are not rewound. Defaults are lfn_1=OLD, lfn_2=NEW, and lfn_3=OUTPUT.
VSN(lfn_1= vsn_1,lfn_2= vsn_2,..., lfn_n=vsn_n)	Associates volume serial number vsn_i with file lfn_i.

WBR(n,rl)	Writes binary record of length rl from central memory on specified file, beginning at its current position. Refer to RBR for description of n.
WRITEF(lfn,x)	Writes x file marks on lfn.
WRITER(lfn,x)	Writes x empty records on lfn.

CONTROL LANGUAGE FORMATS

| BEGIN,pname, pfile,r_1, r_2,...,r_n.

Initiates processing of CCL procedure.

pname — Name of procedure; default is next procedure on pfile.

pfile — Name of file on which procedure pname is located; default is PROCFIL.

r_i — A parameter having one of following forms.

- v — A value; may be null. Length is 1 to 40 characters. If any except slash or leading minus are nonalphanumeric, v must be literal.
- fk — Same keyword used in related parameter on procedure header statement.
- fk=v — Value v is substituted for keyword fk. v may be null.

| CALL(lfn, {C / S=ccc} RENAME (oldnam$_1$= newnam$_1$, oldnam$_2$= newnam$_2$,..., oldnam$_n$= newnam$_n$)
or
CALL(lfn, {C / S=ccc} (oldnam$_1$= newnam$_1$, oldnam$_2$= newnam$_2$,..., oldnam$_n$= newnam$_n$)

Inserts KCL† procedure file (lfn) at specified position in control statement stream.

C — Control statement record after CALL is replaced by lfn.

S=ccc — Next control statement to be processed is ccc.

oldnam$_i$= newnam$_i$ — Each occurrence of file name or statement label oldnam$_i$ is replaced by newnam$_i$.

† The system control language available under NOS prior to the introduction of CCL (refer to the NOS Reference Manual, volume 1).

DISPLAY (expression)

Evaluates expression in CCL or KCL statement and displays result in dayfile. Expression can be any legal control language expression.

DT(dt)

Determines information about type of device on which file resides (CCL or KCL function used only within expressions of FILE function). Value of DT function is true if dt matches two-character mnemonic of file specified in FILE function format.

dt — Two-character mnemonic indicating device type (refer to list of device types in description of FILE function).

ELSE,ls.

Terminates skipping when used in conjunction with IFE, provided label strings match (CCL). Initiates skipping if IFE statement has not done so (refer to description of IFE statement).

ls — Label string; 1 to 10 alphanumeric characters, beginning with alphabetic character.

ENDIF,ls.

Terminates skipping when used in conjunction with IFE, ELSE, or SKIP statements, provided label strings match (CCL). Otherwise, it is ignored.

ls — Label string; 1 to 10 alphanumeric characters, beginning with alphabetic character.

ENDW,ls.

Terminates the iterative processing of a group of control statements when used in conjunction with WHILE statement, provided label strings match (refer to WHILE statement) (CCL).

ls — Label string; 1 to 10 alphanumeric characters, beginning with an alphabetic character.

FILE(lfn, expression)

Determines attributes of file lfn when used as expression or part of expression in CCL or KCL statement.

lfn	File name.
expression	Any expression consisting of operators, DT function, and/or special FILE symbolic names; FILE expression cannot include NUM or another FILE function.

Symbolic Names for FILE Expression

Names with values:

EQ	Equipment status table (EST) ordinal (0 through 77_8).
ID	File ID (0 through 67_8).

Names with true/false values:

MS	File is on mass storage.
LK	File is locked.
OP	File is opened.
EX	Execute-only file.
AS	File is assigned to user's control point.

File types:

LO	Local.
PR	Print.
IN	Input.
PH	Punch.
LI	Library.
PM	Direct access permanent file.
PT	Primary.

Device types:

CP	415 Card Punch.
CR	405 Card Reader.
DE	Extended core storage.
DI	844-21 Disk Storage Subsystem (half-track).
DJ	844-4x Disk Storage Subsystem (half-track) (x is 1 or 4).
DK	844-21 Disk Storage Subsystem (full-track).
DL	844-4x Disk Storage Subsystem (full-track) (x is 1 or 4).
DM	885 Disk Storage Subsystem (half-track).
DP	Distributive data path.
DQ	885 Disk Storage Subsystem (full-track).
DS	Console display.
LP	Any line printer.
LR	580-12 Line Printer.
LS	580-16 Line Printer.
LT	580-20 Line Printer.
MS	Mass storage.
MT	Magnetic tape drive (seven-track).
NE	Null equipment.
NP	255x Network Processing Unit.
NT	Magnetic tape drive (nine-track).
ST	6671 Multiplexer or 2500-100.†
TT	Time-sharing multiplexer (6671, 6676, or 2550-100).

† Does not apply to IAF.

GOTO(stmt)

Transfers control to another location within control statement file (KCL). stmt is name of any control statement or digit (0 through 9) followed by up to six alphanumeric characters.

IF(expression)
stmt.
or
IF(SS=ssname)
stmt.

Conditionally causes skipping of statements that follow (KCL). If conditions given in expression are true, stmt is processed. The expression is considered true if it is evaluated to nonzero value.

stmt	Any legal control statement.
expression	Any legal KCL expression.
ssname	Any legal subsystem name.

IFE,exp,ls.

Conditionally causes skipping of statements that follow (CCL). If exp is true, statements are processed. If false, statements are skipped until ELSE or ENDIF statement with matching ls is reached.

exp	CCL expression; character strings must be integer constants, symbolic names, or CCL functions.
ls	Label string; 1 to 10 alphanumeric characters, beginning with alphabetic character.

NUM(name)

Determines if name has numeric value when used as expression or part of expression in CCL or KCL statement. If name is numeric, functional value is true; otherwise, it is false.

name	Character string; 1 to 40 characters in length.

REVERT.

Causes processing to return to calling job or procedure (CCL).

REVERT,
ABORT.

Issues an abort instead of a normal termination after processing returns (CCL).

SET(sym=exp)

Allows user to specify subsystem or set software registers to control flow of job (CCL or KCL).

sym — A symbolic name as follows:

R1	Control register 1.
R2	Control register 2.
R3	Control register 3.
R1G	Global control register.
EF	Error flag.
EFG	Global error flag.
DSC	Dayfile skipped control statement flag.

exp — Any legal expression.

SKIP,ls.

Causes unconditional skipping of control statements that follow.

ls — Label string; 1 to 10 alphanumeric characters, beginning with alphabetic character.

WHILE,exp,ls.

Delimits group of control statements and causes them to be processed iteratively as long as WHILE expression is true when used in conjunction with ENDW (CCL). When WHILE expression is no longer true, CCL processes WHILE statement and then skips all following statements until ENDW statement with matching ls is found.

exp — CCL expression.

ls — Label string; 1 to 10 alphanumeric characters, beginning with alphabetic character.

Names with fixed arithmetic values:

ARE	Arithmetic error.
BCO	Local batch origin.
CPE	CPU abort.
EIO	Remote batch origin.
ECE†	ECS parity error.
FLE	File limit error.
FSE	Forced error.
MNE	Monitor call error.
MSE†	Mass storage limit.
ODE	Operator drop.
OKE	Operator kill drop.
ORE	Override error.
PEE	CPU parity error exit.
PPE	PPU abort.
PSE	Program stop error.
RRE	Rerun error.
SRE	SRU limit error.
SSE	Subsystem abort error.
SYE	System abort.
SYO	System origin.
TKE	Track limit error.
TLE	Time limit error.
TXO	Time-sharing origin.

†Valid in CCL expressions only.

Names with variable arithmetic values which depend upon job state:

CMM	Maximum CM field length.
CMN	Nominal CM field length.
DSC†	Dayfile skipped control statement flag.
ECM	Maximum ECS field length.
ECN	Nominal ECS field length.
EF	Previous error flag.
EFG†	Global error flag.
EM	Current exit mode.
FL	Job field length.
MFL†	Maximum CM field length.
MFLL†	Maximum ECS field length.
NOS	Network operating system (NOS).
OT	Job origin type.
PNL†	Procedure nesting level:

0	Job control statements
1	First level procedure
.	.
.	.
50	50th level procedure

R1	Contents of control register 1.
R1G†	Contents of global control register 1.
R2	Contents of control register 2.
R3	Contents of control register 3.

†Valid in CCL expressions only.

SS — Job subsystem; in expressions, SS can be equivalenced to:

ACCESS
BASIC
BATCH
EXECUTE
FORTRAN
FTNTS
NULL
TRANACT†

SYS†† — Host operating system.

TIME†† — Current time of day.

VER†† — Version of operating system.

Names with Boolean value:

SWn — Setting (1 is on and 0 is off) of sense switch n ($1 \leq n \leq 6$).

TRUE — True value

T — True value.

FALSE — False value.

F — False value.

CCL Procedure File Statements

.PROC,pname, p_1,p_2, ...,p_n. — Begins and names CCL procedure and identifies any formal keywords and their default values.

pname — Name of procedure; any 1 to 7 alphanumeric character, except BEGIN.

p_i — Parameter having one of following forms.

fk — Formal keyword.

fk=d_1 — Formal keyword with default.

†TRANACT is not valid for IAF.
††Valid in CCL expressions only.

	fk=d_1 /d_2	Formal keyword with two defaults.
	fk=	Formal keyword with null default.
	fk/d_2	Formal keyword with first default null.
.DATA,lfn	Allows data needed by CCL procedure to be stored within that procedure.	
	lfn	File to which data is written.
.EOR	Records end-of-record on CCL data file specified by .DATA command.	
.EOF	Records end-of-file on CCL data file specified by .DATA command.	
.*	Allows user to include comments within CCL procedure which do not appear in dayfile.	

CYBER LOADER CONTROL STATEMENT FORMATS

EXECUTE (eptname, p_1,p_2, ...,p_n)

Causes completion of load and execution of loaded program.

eptname	Name of entry point in one of loaded modules at which execution is to begin.
p_i	Execution-time parameters to be passed to loaded program.

LDSET ($option_1$, $option_2$, ...,$option_n$)

Provides user with control of load operations. Multiple parameters for LDSET options are separated by slashes (for example, LIB=LIB1/LIB2/LIB3).

$option_i$	Description
LIB=$libname_i$	Specifies one or more libraries composing local library set.
MAP=p_1/lfn_1 or MAP=/lfn_1 or MAP=p_1	Controls generation of load map. MAP is written to file lfn_1. Map content is specified by p.

p	Significance
N	No map.
S	Statistics.
B	Block map.
E	Entry point map.
X	Entry point cross-references.

PRESET=p_2 or PRESETA=p_2	Specifies values to which unused memory is set prior to execution of load program. For PRESETA, the lower 17 bits (CM) or lower 24 bits (ECS) of each word contain its address.

$option_i$	Description
	PRESET=p_2
	Octal Preset Value
p_2	
NONE	No presetting for ECS; same as zero for CM.
ZERO	00...0
ONES	77...7
INDEF	177700...0
INF	377700...0
NGINDEF	600...0
NGINF	400...0
ALTZERO	2525...2525
ALTONES	5252...5252
DEBUG	600...040040...0
	PRESETA=p_2
	Octal Preset Value
p_2	
NONE	No presetting for ECS; same as zero for CM.
ZERO	00...0addr
ONES	77...7addr
INDEF	177700...0addr
INF	377700...0addr
NGINDEF	600...0addr
NGINF	400...0addr
ALTZERO	2525...2525addr
ALTONES	5252...5252addr
DEBUG	600...04004addr

$option_i$	Description
ERR=p_3	Selects one of three methods of handling loader errors. p_3 — Significance ALL — Program aborted for fatal, nonfatal, and terminal errors. FATAL — Program aborted for fatal and terminal errors. NONE — Terminal errors cause job abortion.
REWIND and NOREWIN	Alters default option for rewinding files prior to loading.
USEP=$pname_i$	Causes indicated object modules to be loaded regardless of whether or not they are needed to satisfy external references.
USE=$eptname_i$	Forces loading of object modules to ensure that specified entry points are included in load.
SUBST=$pair_i$†	Changes external references to entry point names to other entry point names. $pair_i$ is a pair of entry point names in the form: $eptname_1$-$eptname_2$. As a result of SUBST, reference to $eptname_1$ becomes reference to $eptname_2$.
OMIT=$eptname_i$†	Directs that specified entry point names are to remain unsatisfied, regardless of whether module containing these entry point names is loaded.
FILES=lfn_i	Permits Record Manager users to ensure that library programs are loaded for processing of specified files.

†Not available for programs loaded from a library generated with a cross-reference ULIB directory.

LIBLOAD (libname, eptname$_1$, eptname$_2$, ...,eptname$_n$)

Performs load of modules from library.

libname	Name of library containing object modules having specified entry point names (eptname$_i$).

LOAD(lfn$_1$, lfn$_2$,..., lfn$_n$)

Loads object modules.

lfn$_i$	Name of file to load.

MAP(p)

Specifies default options for load maps.

p	Significance
OFF	No map.
PART	Block map. Statistics.
ON	Statistics. Entry point map. Entry point cross-reference map.
FULL	Block map. Statistics. Entry point map, entry point cross-reference map.

NOGO(lfn, eptname$_1$, eptname$_2$, ...,eptname$_n$)

Causes completion of load.

lfn	Name of logical file on which core image module is to be written.
eptname$_i$	Names of entry points to be included in header.

SATISFY (libname$_1$, libname$_2$, ...,libname$_n$)

Satisfies external references.

libname$_i$	Name of system or user library.

SLOAD(lfn, name$_i$,..., name$_n$)

Requests loader to load modules from local file.

lfn	Local file name.
name$_i$	Names of modules to be loaded in order encountered on lfn.

SYSTEM UTILITY CONTROL STATEMENT FORMATS

EDIT(lfn_1,m, lfn_2,lfn_3)
or
EDIT(FN=lfn_1, M=m,I=lfn_2, I=lfn_2,L=lfn_3)

Calls Text Editor program.

FN=lfn_1 — Edits text file lfn_1.

M=m — Mode of file processing:

ASCII or AS	ASCII mode edit file.
NORMAL or N	NORMAL mode edit file.

Default is NORMAL mode.

I=lfn_2 — Reads edit commands from file lfn_2 (default is INPUT).

L=lfn_3 — Writes output on file lfn_3 (default is OUTPUT).

LIBEDIT(p_1, p_2,..., p_n)

Edits and replaces uniquely identifiable records on file with records from one or more correction files.

p_i	Description
B=lfn	Uses file lfn for replacement file (if omitted, LGO is assumed). B=0 indicates no replacement file is used.
C	Copies new library file over old library file after processing.
D	Ignores errors and continues.

pi	Description
I=lfn	Reads directives from next record on file lfn (if omitted, INPUT is assumed). I=0 indicates no directives input is used.
L=1	Lists only directives, modifications, and errors on file specified by LO parameter (if omitted, complete listing). L=0 indicates only errors are listed.
LO=lfn	Lists output on file lfn (if omitted, OUTPUT is assumed).
N=lfn	Writes new program library on file lfn (if omitted, NEW is assumed).
P=lfn	Reads old program library from file lfn (if omitted, OLD is assumed). P=0 indicates no old program library is used.
R	Does not rewind library files after processing.
V	Calls VFYLIB after LIBEDIT processing.
Z	LIBEDIT statement contains input directives.

If C, D, R, or V parameters are omitted, the indicated action does not occur.

The following parameters are common to several LIBEDIT directives.

rname	Specifies record name.
rid	Specifies reference point for correction.

p_i	Description
type/ rname	Reference record is of specified type; types are listed under *TYPE directive in this section.
rname	Reference record is implied type.
*	Reference point is EOF (*BEFORE only).

gid Indicates records or groups of records to be inserted, deleted, or replaced.

type/ rname	Single record of specified type; types are listed under *TYPE directive in this section.
$type_1$/ $rname_1$- $type_2$/ $rname_2$	Groups of records beginning with $rname_1$ of $type_1$ and ending with $rname_2$ of $type_2$ where $rname_i$ is record identifier and $type_i$ is type of named record.

Directive	Description
*ADD lib, gid_1, gid_2,..., gid_n	Appends records to specified library lib for transcription to new library.
*BEFORE rid, gid_1, gid_2,..., gid_n	Inserts records from current replacement file before specified old library record for transcription to new library file (*B also legal).

Directive	Description
*BUILD dname	Constructs and appends directory record in modify format to new library file. dname specifies name of directory record.
*COMMENT rid comment	Adds comment to prefix table for program on replacement file or old library file.
*COPY lfn_2, lfn_1	Copies new library file lfn_2 to old library file lfn_1 after processing corrections.
*DATE rid comment	Adds current date and specified comment (up to 40 characters) to prefix table.
*DELETE gid_1, gid_2,..., gid_n	Suppresses copying of specified records from old library file to new library file (*D also legal).
*FILE lfn	Declares secondary file lfn that contains replacement records.
*IGNORE gid_1, gid_2,..., gid_n	Ignores records on current replacement file during record processing.
*INSERT rid,gid_1, gid_2,..., gid_n	Inserts records from current replacement file after specified old library record for transcription to new library file (*I, *A, and *AFTER also legal).
*NOREP lfn_1, lfn_2,..., lfn_n	Declares specified replacement files lfn_i to be no-replace files.

*RENAME rid,name	Assigns new name to record on old library or current replacement file for transcription to new library file.
*REPLACE gid_1, gid_2,..., gid_{nn}	Replaces records on old library file with records of same name from current replacement file that has been declared no-replace file.
*REWIND lfn	Rewinds file lfn before and after editing.
*TYPE type or *NAME type	Specifies default type of internal record format. If omitted, TEXT is assumed.

type	Description
ABS	Multiple entry point overlay.
CAP	Fast dynamic load capsule.
OPL	Modify OPL deck.
OPLC	Modify OPL common deck.
OPLD	Modify OPL directories.
OVL	CPU overlay program.
PP	PP program.
PPU	PPU program.
PROC	CCL procedure.
REL	Relocatable CPU program.
TEXT	Unrecognizable as a program.
ULIB	User library.

MODIFY(p_1, p_2,...,p_n) Edits a Modify-formatted program library file.

p_i	Description
A	Writes compressed compile file.
C=lfn	Writes compile output to file lfn (default is COMPILE).
CB=lfn	Sets assembler argument B=lfn (default is B=LGO).
CG=lfn	Sets assembler argument G=lfn (default is G=SYSTEXT).
CL=lfn	Sets assembler argument L=lfn (default is L=OUTPUT).
CS=lfn	Sets assembler argument S=lfn (default is S=SYSTEXT).
CV=cs	Sets character set to cs (63 or 64).
D	Ignores directive errors.
F	Modifies all decks.
I=lfn	Reads directive input from file lfn (default is INPUT).
L=lfn	Lists output on file lfn (default is OUTPUT).
LO=lo†	Selects list options (if omitted, C, D, E, M, S, T, and W are selected).

lo	Description
A	Active lines.
C	Directives other than INSERT, DELETE, RESTORE, MODNAME, I, or D.
D	Deck status.

† Multiple options can be selected for LO parameter (for example, LO=CEM).

lo	Description
E	Errors.
I	Inactive lines.
M	Modifications made.
S	Statistics.
T	Input text.
W	Compile file directives.

N=lfn Writes new program library on file lfn (default is NPL).

NR Does not rewind compile file.

P=lfn Writes old program library on file lfn (default is OPL).

Q=prog Sets A option, and calls program when modification is complete.

S=lfn Writes source output on file lfn (default is SOURCE).

U Modifies only decks on DECK directives.

X=prog Rewinds input directives and output listing files, sets A option, and calls program when modification is complete.

Z Specifies that MODIFY statement contains input directives.

OPLEDIT(p_1, p_2,..., p_n) Removes modification decks and identifiers from Modify-formatted file.

p_i	Description
D	Debugs; ignore errors.
F	Modifies all decks.

Pi	Description
I=lfn	Uses directive input from file lfn (default is INPUT).
L=lfn	Lists output on file lfn (default is OUTPUT).
LO=xxx	Lists options (if omitted, all options are assumed).

xxx	Description
001	Errors.
002	Input directives.
010_8	Modifications made.
040_8	Deck status.
100_8	Directory lists.

M=lfn	Writes output from *PULLMOD directives on file lfn (if omitted, M=MODSETS is assumed).
N=lfn	Writes new program library on file lfn (default is NPL).
P=lfn	Uses file lfn for old program library (default is OPL).
U	Generates *EDIT directives for all decks (if omitted, generates *EDIT directives for common decks).
Z	Uses directive input following terminator in control statement; I=lfn is ignored.

NOTE

Do not put terminator after directives.

PROFILE(p_1, p_2,...,p_n)

Enables master user to update and enquire about project profile file for user profile control.

p_i	Description
CN=cnum	Writes control values valid for charge number cnum to output file (valid only with OP=I).
CV	Converts directives on input file from NOS 1.0 or 1.1 format to NOS 1.2, 1.3, or 1.4 format (valid only with OP=U or OP=T).
I=lfn	Reads input from file lfn (default is INPUT).
L=lfn	Lists output on file lfn (default is OUTPUT).
LO=lo	Specifies list option (valid only with OP=L).

lo	Description
CM	Charge number list.
FM	Full list (default).
PM	Project number list.

OP=opt Specifies PROFILE processing option.

opt	Description
I	Inquire option.
L	List option (used with LO).
T	Time-sharing update.
U	Updates project profile file.

P=lfn Specifies file lfn as project profile file (default is PROFILB).

p_i	Description
PN= pnum	Writes control values and valid user numbers for project number pnum to output file (valid only with OP=I and CN=cnum).

Directives used by master user in the following format add or update information on each charge number.

/cn, dir_1, dir_2, ...,dir_n	Specifies PROFILE directives dir_i for charge number cn.

dir_i	Description
APN=pn	Adds or activates project number.
AUN=un	Adds user number.
CN=cn	Specifies charge number (same as /cn).
DPN=pn	Deactivates project number.
DUN=un	Deletes user number.
ISV=x	Sets index for SRU validation limit.
PEX= yymmdd	Specifies project number expiration date.
PN=pn	Specifies project number.
SMA=sma	Sets SRU master user accumulator.
SML=sml	Sets SRU master user limit register.
TI=ti	Specifies time of day before which user cannot use project number.
TO=to	Specifies time of day after which user cannot use project number.

UPDATE(p_1, p_2,...,p_n)

Edits an Update-formatted program library file.

p_i	Description
A	Copies sequential old program library to new random program library.
B	Copies random old program library to sequential new program library.
C=lfn	Writes compile file output on file lfn (if omitted, COMPILE file is assumed). If C=0, suppresses compile file output.
D	Defines compile output for 80 columns of data (if omitted, 72 columns for data are assumed).
E	Edits program library.
F	Selects full update mode.
G=lfn	Writes output from PULLMOD on file lfn (if omitted, append output from PULLMOD to source file).
H=n	Specifies character set of program library.

n	Description
3	63-character set.
4	64-character set.
omitted	Character set indicated on old program library.

I=lfn	Specifies input file lfn (if omitted, file INPUT is assumed).

p_i	Description
K=lfn	Writes compile output decks on lfn (if lfn is omitted, file COMPILE is assumed). If K is omitted, compile file output is determined by C parameter.
L=char	Specifies content of output file. char is any A, F, and 0 through 9 list options. If omitted, for creation run, A, 1, and 2 options are assumed; for correction run, A, 1, 2, 3, and 4 options are assumed; for copy run, A and 1 options are assumed.
M=lfn	Specifies merge input file lfn (if lfn is omitted, file MERGE is assumed).
N=lfn	Writes new program library on file lfn (if omitted, file NEWPL is assumed). If omitted for correction run, suppresses new program library generation.
O=lfn	Writes output on file lfn (if omitted, file OUTPUT is assumed).
P=lfn/ s_1/ s_2/ .../ s_7	Specifies file lfn for old program library (if lfn is omitted, file OLDPL is assumed). Secondary old program libraries reside on files s_i (if omitted, no secondary old program libraries exist).
Q	Processes only decks on COMPILE directives.

Pi	Description
R=lfn	Rewinds specified file before and after update. If R is omitted, rewinds all files.

lfn	Description
C	Compile.
N	New program library.
P	Old program library and merge library.
S	Source and PULLMOD.
omitted	Rewind no files.

S=lfn	Writes source output on file lfn (if lfn is omitted, file SOURCE is assumed). If S is omitted, suppresses source output unless selected by T parameter.
T=lfn	Writes source output excluding common decks on file lfn (if lfn is omitted, file SOURCE is assumed). If T is omitted, suppresses source output unless selected by the S parameter.
U	Does not halt execution for fatal errors.
W	Specifies sequential format for new program library.
X	Writes compile file in compressed format.
8	Composes compile file output of 80-column card images (if omitted, 90-column card images are assumed).
*=char	Specifies master control character char.
/=char	Specifies comment control character char.

XEDIT(lfn_1, p_1,p_2,..., p_n)dcs

Initiates XEDIT.

lfn_1 Name of file to be edited (default is primary file).

p_i	Description
AS	Processes file in ASCII mode. Upon exiting XEDIT, terminal is returned to mode in effect before editing session. If user omits the AS parameter, mode that terminal is in before he enters XEDIT command remains in effect.
B	Assumes job is of batch origin.
C	Creates new file lfn_1.
FR	Takes first editing command from first line of file lfn_1.
I=lfn_2	Takes editing commands from file lfn_2. If I=0, commands are taken from dcs field. If I is omitted, file INPUT is assumed.
L=lfn_3	Places XEDIT output on file lfn_3. If L=0, no output is generated. If L is omitted, file OUTPUT is assumed.
NH	Suppresses printing of the XEDIT header.
P	Retrieves and edits permanent file lfn_1.

dcs Delimited command sequence processed before XEDIT takes commands from file INPUT or file lfn_2.

PRODUCT SET CONTROL STATEMENT FORMATS

ALGOL(p_1, p_2,...,p_n) Calls ALGOL 4 compiler.

p_i	Description
A	Assembly language form of binary output on file specified by L parameter.
A=0	No assembly language listing.
A omitted	Same as A=0.
B=lfn	Binary output on file lfn.
B	Same as B=LGO.
B=0	No binary output.
B omitted	Same as B=LGO.
C=n†	Comments interpretation for special delimiters.

n	Significance
0	No comments interpretation.
1	Debugging directives detected.
2	Overlay directives detected.
3	Array bound checking directives detected.

C	Same as C=0.
C omitted	Same as C=0.
D=lfn	Symbol file created on file lfn.

† Multiple options for the C parameter are separated by slashes (for example, C=3/2/1).

Pi	Description
D	Same as D=DUMPFIL.
D=0	Symbol file suppressed.
D omitted	Same as D=0.
E	Job aborted to EXIT statement in the event of fatal compilation error.
E=0	Abort suppressed in the event of fatal compilation error.
E omitted	Same as E=0.
F	Compilation terminated after first pass in the event of fatal error.
F=0	Compilation continued until normal end.
F omitted	Same as F=0.
G	Stack swapping to ECS considered and when program is executed, swapping procedures are activated automatically. This option must not be selected when using machine without ECS; otherwise, unpredictable results leading to fatal error are obtained.
G=0	No swapping considered.
G omitted	Same as G=0.
I=lfn	Source input on file lfn.
I	Same as I=INPUT.
I=0	No source input.
I omitted	Same as I=INPUT.

Pi	Description
K=n	n significant characters interpreted by compiler on source line (n≤126).
K	Same as K=72.
K omitted	Same as K=72.
L=lfn	Listable compiler output on file lfn.
L	Same as L=OUTPUT.
L=0	Only fatal diagnostics listed on file OUTPUT.
L omitted	Same as L=OUTPUT.
N	Advisory diagnostics listed on file specified by L parameter.
N=0	Listing of advisory diagnostics suppressed; only diagnostics fatal to code generation listed.
N omitted	Same as N.
O=n	Level of compiler optimization.

n	Description
0	Program compiled in fast compile mode.
1	Linguistic optimization.
2	Same as O=1 and also subscript and for statement optimization.

Pi	Description
O	Same as O=0.
O omitted	Same as O=0.
P=lfn	Assembly language form of binary output punched in standard assembly language card format on file lfn.
P	Same as P=PUNCH.
P=0	No assembly language punching generated.
P omitted	Same as P=0.
Q=lfn	Interactive file created on file lfn for ALGOL interactive debugging aids (AIDA).
Q	Same as Q=QFILE.
Q=0	No interactive compilation and file generated.
Q omitted	Same as Q=0.
R	Cross-reference map listed on file specified by L parameter.
R=0	No cross-reference map generated.
R omitted	Same as R=0.
S=n	Array storage location.

n	Description
0	All arrays allocated to CM.
1	Virtual arrays allocated to ECS.

p_i	Description
S	Same as S=0.
S omitted	Same as S=0.
U=lfn	Implicit outer blockheads contained on file lfn.
U	Same as U=COMPILE.
U=0	No file for implicit outer blockheads.
U omitted	Same as U=0.
X	Real/integer correspondence between formal and actual parameters allowed.
X=0	Real/integer correspondence between formal and actual parameters not allowed.
X omitted	Same as X.

ALGOL5(p_1, p_2,...,p_n) Calls ALGOL 5 compiler.

p_i	Description
B=lfn	Binary output on file lfn.
B	Same as B=BIN.
B=0	No binary output.
B omitted	Same as B=LGO.
CD=cd†	Comment directives option.

cd	Options Honored
I	≠INCLUDE≠
L	≠LIST≠, ≠NOLIST≠, ≠EJECT≠
O	≠OBJLIST≠, ≠OBJNOLIST≠
S	≠CHECKON≠, ≠CHECKOFF≠

†Multiple options for CD and DB parameters are separated by slashes (for example, CD=I/S and DB=D/P).

pi	Description
CD omitted	No comment directives.
DB=db†	Debugging option.

db	Significance
D	Information required for execution time symbolic dump included in object code.
DA	Same as DB=D, plus array elements.
P	Presets non-own variables at block entry to negative for real and integer and to true for Boolean.
SB	Performs subscript bounds checking for arrays, regardless of ≠CHECKON≠ and ≠CHECKOFF≠ directives.

DB omitted	No debugging options.
EL=el	Error level control.

el	Significance
C	List catastrophic errors.
F	List fatal errors plus level C errors.
T	List trivial errors plus level C, F, and W errors.
W	List warning errors plus level C and F errors.

†Multiple options for CD and DB parameters are separated by slashes (for example, CD=I/S and DB=D/P).

Pi	Description
EL	Same as EL=F.
EL omitted	Same as EL=W.
ET=e	Compiler aborts if executable code contains errors of at least C, F, T, or W severity indicated by e. Levels are indicated by EL parameter. Job resumes after EXIT control statement.
ET	Same as ET=F.
ET=0	Next control statement in job is executed after termination, despite any errors detected during compilation.
ET omitted	Same as ET=C.
I=lfn	Source input on file lfn.
I	Same as I=COMPILE.
I omitted	Same as I=INPUT.
L=lfn	Listable compiler output on file lfn.
L	Same as L=LIST.
L=0	Only fatal diagnostics listed on file OUTPUT.
L omitted	Same as L=OUTPUT.

pi	Description
LO=lo†	Listing options.

lo††	Significance
O	Object and source listing.
R	Source listing and reference map.
S	Source listing only.

LO	Same as LO=R.
LO omitted	Same as LO=S.
N	Source input contains circumludes only.
N omitted	Source input contains program and separately compiled procedures only.
OPT=IS	Instruction scheduling performed.
OPT omitted	No extra optimizations performed.
PD=n	Print density control

n	Description
6	Six lines per inch.
8	Eight lines per inch.

PD	Same as PD=8.
PD omitted	Same as PD=6.
PS=n	Output page size is n printable lines per page ($4 \leq n \leq 32768$).
PS omitted	Same as PS=60 if PD=6; same as PS=80 if PD=8.

†Multiple options for LO parameter are separated by slashes (for example, LO=O/S).

††Any option can be negated by prefixing it with minus sign.

Pi	Description
PW=n	Maximum of n characters in line of printed output ($50 \leq n \leq 136$).
PW omitted	Same as PW=72 if output file is terminal file; same as PW=126 if output is printer file.
RES	ALGOL symbols are recognized as reserved words and are delimited by blanks.
RES omitted	ALGOL symbols are delimited by ≠ character.
S=circ	Circumlude circ from library ALG5LIB is available during compilation.
S=lib-circ	Circumlude circ from library lib is available during compilation.
S omitted	Only standard circumlude is available for compilation.
SEQ	Input file in sequenced line format.
SEQ=0	Input file in standard line format.
SEQ omitted	Same as SEQ=0.
SGM	Special code provided to allow segmentation of program.
SGM omitted	No special code provided to allow segmentation of program.
SW=n	Columns 1 through n of each source line are compiled.
SW	Same as SW=80.
SW omitted	Same as SW=72.
V	Virtual arrays to be allocated in extended memory.
V omitted	Virtual arrays to be allocated in central memory.

APL(p_1,p_2, ...,p_n) Calls APL2 interpreter.

p_i	Description
I=lfn	Source input on file lfn.
I omitted	Same as I=INPUT.
L=lfn	Output on file lfn.
L=0	No APL output.
L omitted	Same as L=OUTPUT.
LO=b	Batch output options; any or all can be specified.

b	Significance
E	Batch output echos input.
P	Prohibits prompt.
B	Inserts blank in first column of each output line.

LO=0	No batch output options.
LO omitted	Same as LO=0.
MN=mnfl	Set minimum field length mnfl.
MN omitted	System sets minimum field length.
MX=mxfl	Set maximum field length mxfl.
MX omitted	System sets maximum field length of 24 576 words (60 000 octal) or maximum allowed, whichever is less.
PW=password	Password to use another user's workspace.
PW omitted	No password.

Pi	Description
TT=tty	Terminal type.†

tty	Significance
COR	Correspondence APL terminal.
TYPE	Typewriter-pairing APL terminal.
BIT	Bit-pairing APL terminal.
ASCAPL	Not presently used.
TTY33	Teletype 33 terminal.
ASCII	Full ASCII terminal not equipped to print APL character set. Also used for non-APL correspondence terminal.
BATCH	Devices that support ASCII graphic 64-character set such as local and remote batch ASCII printer.
TT383	Teletype 38 terminal.
713	Full ASCII terminal.

TT omitted	If job was entered from interactive terminal, same as TT=ASCAPL. If job was entered from batch or remote batch, same as TT=BATCH.
UN= usernum	User number of initial workspace.
UN omitted	User number of initial workspace specified to be same number used to sign on.

†Network terminals may have their terminal type auto-recognized (refer to the IAF Reference Manual).

p_i	Description
WS=wsname	wsname is active workspace.
WS omitted	Clear workspace is used.

BASIC(p_1, p_2,...,p_n) Calls BASIC 3 compiler.

p_i	Description
AS	Source program and data encoded in extended ASCII character set.
AS=0	Only normal (non-ASCII) characters contained in source program and data files.
AS omitted	Same as AS=0.
B=lfn	Binary output on file lfn.
B	Same as B=BIN.
B=0	Compilation specified to memory; no binary output file.
B omitted	Same as B=0.
BL	Separable output listing generated.
BL omitted	Listings generated in compact form.
DB=db†	CYBER Interactive Debug and trace control.

db††	Significance
B	Force binary generation and/or program execution.

†Multiple options for the DB parameter are separated by slashes (for example, DB=B/DL).

††Insert 0/ before option to turn off default or previously specified value.

Pi		Description
	db†	Significance
	DL	Activate program tracing as controlled by REM TRACE debug lines.
	ID	Generate CYBER Interactive Debug information. Same as DB=B/DL/ID.
	TR	Trace all statements regardless of REM TRACE debug lines.
DB	Same as DB=B/DL.	
DB=0	CYBER Interactive Debug and trace feature not activated.	
DB omitted	Same as DB=0, except that CYBER Interactive Debug is activated if DEBUG or DEBUG(ON) command was issued previously.	
E=lfn	Compiler error diagnostics on file lfn.	
E	Same as E=ERRS.	
E omitted	Compiler error diagnostics on file specified by L parameter. If L=0, they are written on file OUTPUT.	
EL=el	Error level control; errors are listed on file specified by E parameter.	
	el	Description
	F	List fatal compiler diagnostics.
	W	List warning diagnostics and fatal compiler diagnostics.

†Insert 0/ before option to turn off default or previously specified value.

p_i	Description
EL omitted	Same as EL=W.
GO	Compiled BASIC program executed.
GO=0	Execution prohibited.
GO omitted	Compiled-to-memory code executed; binary output (B parameter specified) not generated.
I=lfn	Source input on file lfn.
I	Same as I=COMPILE.
I omitted	Same as I=INPUT.
J=lfn	Execution time input on file lfn.
J	Same as J=INPUT.
J=0	No execution time input file.
J omitted	Same as J=INPUT.
K=lfn	Execution output on file lfn.
K	Same as K=OUTPUT.
K omitted	Same as K=OUTPUT.
L=lfn	Listable compiler output on file lfn.
L	Same as L=OUTPUT.
L=0	No listable compiler output generated.
L omitted	For batch origin jobs, same as L=OUTPUT. For time-sharing origin jobs, same as L=0.

Pi	Description
LO=lo†	Listing options; listing on file specified by L parameter.

lo	Description
O	Object code and source listing.
S	Source listing.
0/O	Object code listing.

LO	Same as LO=S.
LO=0	No list options selected.
LO omitted	Same as LO=S.
PD=n	Print density control for files specified by K and L parameters.

n	Description
6	Six lines per inch.
8	Eight lines per inch.

PD	Same as PD=8.
PD omitted	Print density is installation default.
PS=n	Page size for file specified by L parameter is n printable lines per page ($4 \leq n \leq 32768$).
PS omitted	If PD is omitted or specifies print density default, page size is installation default. If PD specifies a nondefault print density, page size is calculated by: PS=PD*(default PS)/(default PD)

† Multiple options for the LO parameter are separated by slashes (for example, LO=O/S).

COBOL(p_1, p_2,...,p_n) Calls COBOL 4 compiler.

p_i	Description
A	Leading blanks treated as zeros.
A omitted	Leading blanks not treated as zeros.
B=lfn	Binary output on file lfn.
B	Same as B=LGO.
B=0	No binary output.
B omitted	Same as B=LGO.
BUF	Minimum buffer size compatible with COBOL version 3.
BUF omitted	Buffer size calculated by COBOL version 4 formula.
C	Copy made from source, rather than library.
C omitted	Copy made from library.
D	Execution inhibited when E diagnostic issued.
D omitted	Execution not inhibited by E diagnostic.
DB	Check made for subscript range errors.
DB omitted	No check made for subscript range errors.
DB1	COBOL trace selected.
DB1 omitted	COBOL trace not selected.
E=prog	prog is name of main overlay of absolute program to be generated.

pi	Description
E omitted	Relocatable code generated.
F	Computational data items interpreted as computational-1 items.
F omitted	Computational data items interpreted as computational items.
H	Sort efficiency increased.
H omitted	Sort efficiency decreased because program files are allocated buffer space before sort starts.
I=lfn	Source input on file lfn.
I	Same as I=INPUT.
I omitted	Same as I=INPUT.
K=lfn	Facilities of CDCS employed; file containing subschema is lfn.
K=0	Neither CDCS facilities nor subschema file used.
K omitted	Same as K=0.
L=lfn	Listable compiler output on file lfn. The L parameter can appear with one of the following suffixes to produce special listings (for example, LM=lfn).

pi	Description

Suffix	Description
C	List of items copied from user libraries.
M	Data map.
O	Object code in octal.
R	Data-name, procedure name cross-reference.
X	Extended diagnostics.

L	Same as L=OUTPUT.
L=0	Only C and E diagnostics listed on file OUTPUT.
L omitted	Same as L=OUTPUT.
N	E diagnostic issued if non-ANSI feature is detected.
N omitted	No E diagnostic issued if non-ANSI feature is detected.
OB=lfn	Binary output from overlay segments on file lfn.
OB omitted	Subcompile feature not used.
P	A strictly ANSI program executed; non-ANSI reserved words allowed in source program.
P omitted	No reserved words allowed in source program.
PD=n	Print density control for output generated by COBOL compiler.

n	Description
3	Three lines per inch.
4	Four lines per inch.
6	Six lines per inch.
8	Eight lines per inch.

Pi	Description
PD	Same as PD=8.
PD omitted	Print density is installation default.
PS=n	Output page size is n lines per page ($4 \leq n \leq 99999$).
PS omitted	If PD is omitted, page size is installation default. If PD is specified, page size is calculated by: PS=PD*(default PS)/(default PD)
S=lfn	Source library for COPY or INCLUDE statement on file lfn.
S	Same as S=COLIB.
S omitted	Same as S=COLIB.
SUB	Subcompile selected.
SUB omitted	Subcompile not selected.
SUBM	COBOL program identified as a subprogram.
SUBM omitted	COBOL program is main program.
T	Tape sort, rather than disk sort, requested.
T omitted	Disk sort requested.
U	ASCII collating sequence specified.
U omitted	Standard Control Data collating sequence specified.
V	Sort code compiled for overlay.

p_i	Description
V omitted	Overlay does not contain sort.
W	Independent segments provided in their last used state.
W omitted	Independent segments provided in initial state.
Z	Compatibility with COBOL version 3 ensured, C and W parameters turned on.
Z omitted	COBOL version 4 environment.

COBOL5(p_1, p_2,...,p_n) Calls COBOL 5 compiler.

p_i	Description
ANSI=s	Non-ANSI language extensions treated as errors with severity specified by s.

s	Significance
F	Fatal error.
T	Trivial error.

ANSI	Same as ANSI=T.
ANSI omitted	Non-ANSI extensions allowed.
APO	Nonnumeric literal delimiter is ASCII apostrophe character (display code value of 70).
APO omitted	Nonnumeric literal delimiter is quotation mark (display code value of 64).
B=lfn	Binary output on file lfn.
B	Same as B=BIN.
B=0	No binary output.
B omitted	Same as B=LGO.

pi	Description
BL	Separable output listing generated.
BL omitted	Listings generated in compact form.
CC1	Computational data items stored and processed as computational-1 items.
CC1 omitted	Computational data items stored and processed as computational items.
D=lfn	Subschema for CDCS interface on file lfn.
D	Subschema for CDCS interface on file whose name is that of the subschema.
D=0	Subschema for CDCS interface not used.
D omitted	Same as D=0.
DB=db†	Debugging options.

db	Significance
B	Binary output generated regardless of errors in source.
DL	Debugging lines (D in column 7) in source compiled as executable code.
SB	Subscript and index references checked during execution to ensure that all references to tables are within table bounds.
TR	Paragraph trace during execution.

†Multiple options for DB parameter are separated by slashes (for example, DB=DL/SB).

p_i	Description
DB	Same as DB=B/DL/SB.
DB=0	No debugging options selected.
DB omitted	Same as DB=0.
E=lfn	Error information specified by EL parameter on file lfn.
E	Same as E=ERR.
E=0	Same as E=OUTPUT.
E omitted	Same as E=OUTPUT.
EL=el	Error level control; errors are listed on file specified by E parameter.

el	Significance
C	List catastrophic errors.
F	List fatal errors plus level C errors.
T	List trivial errors plus level C, F, and W errors.
W	List warning errors plus level C and F errors.

EL	Same as EL=F.
EL omitted	Same as EL=W.
ET=e	Compiler aborts if executable code contains errors of at least C, F, T, or W severity indicated by e. Levels are indicated by the EL parameter. Job resumes after EXIT control statement.
ET omitted	Next control statement in job is executed after termination, despite any errors detected during compilation.

Pi	Description
FDL=lfn	Fast dynamic loader processing available; FDL file is lfn.
FDL	Same as FDL=FDLFILE.
FDL omitted	Fast dynamic loader processing not available.
FIPS=N	Language features above Federal Information Processing Standard level n diagnosed ($1 \leq n \leq 4$).
FIPS omitted	No diagnostics for Federal Information Processing Standard levels issued.
I=lfn	Source input on file lfn.
I	Same as I=COMPILE.
I omitted	Same as I=INPUT.
L=lfn	Listable compiler output on file lfn.
L	Same as L=LIST.
L=0	No listable compiler output generated.
L omitted	Same as L=OUTPUT.
LBZ	Leading blanks in numeric fields treated as zeros in arithmetic statements and comparisons.
LBZ omitted	Numeric fields containing blanks are in error.

pi	Description
LO=lo†	Listing options.

lo	Significance
M	A map that correlates program entities and attributes such as data class, size, and physical storage.
O	Generated object code with COMPASS mnemonics.
R	Cross-reference of program entities and locations of definitions and use within the program.
S	Source program.
-S	Source program not listed.

LO	Same as LO=M/R/S.
LO=0	No list options selected.
LO omitted	Same as LO=S.
MSB	Program compiled as a subroutine that includes COBOL initiation.
MSB omitted	Normal program compiled.
PD=pd	Print density control for E and L parameter listings.

pd	Significance
3	Double space at six lines per inch.
4	Double space at eight lines per inch.

† Multiple options for the LO parameter are separated by slashes (for example, LO=O/S).

pi	Description pd	Significance
	6	Single space at six lines per inch.
	8	Single space at eight lines per inch.
PD	Same as PD=8.	
PD omitted	Same as PD=6.	
PS=n	Output page size is n printable lines per page.	
PS omitted	Page size is calculated by: PS=PD*(default PS)/ (default PD).	
PSQ	Sequence numbers in columns 1 through 6 used for diagnostics.	
PSQ omitted	Compiler-generated sequence numbers used for diagnostics; sequence numbers in columns 1 through 6 not processed.	
PW=n	Maximum of n characters in line of printed output.	
PW	Same as PW=72.	
PW omitted	Same as PW=136.	
SB	Program compiled as a subprogram.	
SB omitted	Program compiled as a main program.	
SY	Source program checked for syntax but executable code not generated.	
SY omitted	Source compiled and executable code generated.	

p_i	Significance
TDF=lfn	Termination dump to be taken; tables needed for dump written on file lfn.
TDF	Same as TDF=TDFILE.
TDF omitted	Termination dump not taken from this compilation.
U=lfn	COMPASS line images of generated program written on file lfn in format acceptable for Update utility.
U	Same as U=COMPS.
U=0	COMPASS assembly language images not produced.
U omitted	Same as U=0.
UC1	Computational-1 items converted to integer format before processing.
UC1 omitted	Computational-1 items processed in Computational-1 format.
X=lfn	Update random program library containing text for COPY statements on file lfn.
X	Same as X=NEWPL.
X=0	Same as X=OLDPL.
X omitted	Same as X=OLDPL.

COMPASS(p_1, p_2,...,p_n) Calls COMPASS assembler.

p_i	Description
A	Abort to EXIT if assembly errors are detected.
A omitted	Do not abort job step for assembly errors.

p_i	Description
B=lfn	Binary output on file lfn.
B	Same as B=LGO.
B=0	No binary output.
B omitted	Same as B=LGO.
D	Assembly errors do not inhibit object code written to file specified by B parameter.
D omitted	Assembly errors inhibit object code.
E=lfn	Error list on file lfn.
E	Same as E=ERRS.
E=0	No error list.
E omitted	Same as E=OUTPUT.
F=name	Call COMPASS by name (COMPASS or FTN control statement).
F= number	Call COMPASS by number (COMPASS=0, FTN=2).
F	Same as F=0
F omitted	Same as F=0.
G=lfn	First system text overlay loaded from file lfn.
G=lfn/ ovl	First system text overlay with name ovl loaded from file lfn.
G	Same as G=SYSTEXT.
G=0	No system text loaded.
G omitted	Same as G=0.

pi	Description
I=lfn	Source input on file lfn.
I	Same as I=COMPILE.
I omitted	Same as I=INPUT.
L=lfn	Listable assembler output on file lfn.
L	Same as L=OUTPUT.
L=0	No full list.
L omitted	Same as L=OUTPUT.
LO=lo	Listing options:

lo	Significance
A	List statements actually assembled.
B	List binary control statements.
C	List control statements.
D	Include details.
E	Include echoed lines.
F	List IF-skipped lines.
G	List generated code.
L	List master list control.
M	List macros and opdefs.
N	List nonreferenced symbols.
R	Accumulate and list references.

pi		Description
	lo	Significance
	S	List system macros and opdefs.
	T	List nonreferenced system symbols.
	X	List XTEXT lines.
	$$$$	Select all options.
LO	Same as LO=CFGX.	
LO=0	Same as LO=BLNR.	
LO omitted	Same as LO=0	
ML=nnnnnnnnn	nnnnnnnnn is value of MODLEVEL micro.	
ML	Current date in form yyddd used for MODLEVEL micro.	
ML omitted	Same as ML.	
N	Suppress page ejects caused by normal listing control.	
N omitted	Do not suppress page ejects.	
O=lfn	Short list output on file lfn.	
O	Same as O=OUTPUT.	
O=0	No short list output.	
O omitted	Same as O=OUTPUT.	
P	Page numbering proceeds continually from subprogram to subprogram.	
P omitted	Page numbering begins at 1 for each subprogram.	

p_i	Description
PC=string	String is value of PCOMMENT micro (up to 30 characters).
PC	Value of PCOMMENT micro equals 30 blanks.
PC omitted	Same as PC.
S=ovl	System text overlay, ovl, loaded from library set.
S=lib/ovl	System text overlay, ovl, loaded from user library file or system library, lib.
S=0	System text file not loaded.
S	Same as S=SYSTEXT.
S omitted	If no G parameters other than G=0, same as S=SYSTEXT. Otherwise, same as S=0.
X=lfn	External test for XTEXT pseudo instruction on file lfn.
X	Same as X=OPL.
X omitted	Same as X=OLDPL.

DEBUG(p) Activates or terminates CYBER Interactive Debug Facility.

p_i	Description
OFF	Debug mode terminated.
ON	Debug mode activated. Default.
RESUME	Debug session suspended by last execution of SUSPEND command is resumed.

FTN(p_1,p_2,...,p_n)

Calls FORTRAN Extended Version 4 compiler.

p_i	Description
A	Branch to EXIT statement if fatal compilation error occurs.
A=0	Control transfers to next control statement, regardless of installation default, if fatal compilation errors occur.
A omitted	Same as A=0.
B=lfn	Binary output on file lfn.
B	Same as B=LGO.
B=0	No binary output.
B omitted	Same as B=LGO.
BL	Separable output listing generated.
BL=0	Listings generated in compact format.
BL omitted	Same as BL=0
C	COMPASS assembler used for symbolic object code.
C=0	FORTRAN internal assembler selected regardless of installation default.
C omitted	Same as C=0.
D=lfn	Debug input obtained from file lfn.
D	Same as D=INPUT. OPT=0 and T options selected.
D=0	Debug statements ignored.
D omitted	Same as D=0.

Pi	Description
DB	CYBER Interactive Debug Facility turned on; line number table and symbol table generated. TS option selected.
DB=ID	Same as DB.
DB=0	No debug tables generated; CYBER Interactive Debug Facility turned off if DEBUG statement turned it on.
DB omitted	Same as DB=0.
E=lfn	Object code on file lfn output as COMPASS statement images for input to Update.
E	Same as E=COMPS.
E=0	Normal binary object file generated.
E omitted	Same as E=0.
EL=el	Error level control.

el	Significance
A	List fatal and non-ANSI. List informative for OPT=0, 1, or 2. List notes and warnings for TS mode.
F	List fatal.
I	List fatal. List informative for OPT=0, 1, or 2. List notes and warnings for TS mode.
N	List fatal. List notes and warnings for TS mode.
W	List fatal. List warnings for TS mode.

p_i	Description
EL omitted	Same as EL=I.
ER	Code for object time reprieve included.
ER=0	No object time reprieve code included.
ER omitted	Same as ER if in TS or OPT=0 mode. Same as ER=0 if OPT=1 or 2.
G=lfn	First system text overlay loaded from file lfn.
G=lfn/ ovl	First system text overlay with name ovl loaded from file lfn.
G	Same as G=SYSTEXT.
G=0	No system text loaded.
G omitted	Same as G=0.
GO	Binary loaded and executed after compilation.
GO=0	Binary not loaded and executed.
GO omitted	Same as GO=0.
I=lfn	Source input on file lfn.
I	Same as I=COMPILE.
I omitted	Same as I=INPUT.
L=lfn	Listable compiler output (BL, EL, OL, R, and SL options) on file lfn.
L	Same as L=OUTPUT.
L=0	Only fatal diagnostics and statements that caused them listed on file OUTPUT.

pi	Description
L omitted	Same as L=OUTPUT.
LCM=m	Address mode for level 3 (ECS) data.

m	Significance
D	Direct mode; select 17-bit address.
I	Indirect mode; select 21-bit address.

LCM	Same as LCM=D.
LCM omitted	Same as LCM=D.
ML=nnnnnnn	nnnnnnn is value of MODLEVEL micro.
ML	Current date in form yyddd used for MODLEVEL micro.
ML omitted	Same as ML.
OL	Object code listed on file specified by L parameter.
OL=0	Object code not listed.
OL omitted	Same as OL=0.
OPT=n	Level of optimization.

n	Significance
0	Fast compilation. T and ER options selected.
1	Standard compilation and execution.
2	Fast execution.

OPT	Same as OPT=2.
OPT omitted	Same as OPT=1.

Pi	Description
P	Page numbering proceeds continually from subprogram to subprogram.
P=0	Page numbering begins at 1 for each subprogram.
P omitted	Same as P=0.
PD=n	Print density control for compiler listings.

n	Significance
6	Six lines per inch.
8	Eight lines per inch.

PD	Same as PD=8.
PD omitted	Same as PD=6.
PL=n	n is maximum number of execution time records written on file OUTPUT. $n \leq 9999999$ or $n \leq 777777_8$.
PL omitted	Same as PL=5000.
PMD	Enables postmortem dump.
PMD=0	Disables postmortem dump.
PMD omitted	Same as PMD=0.
PS=n	Compiler output page size is n printable lines per page.
PS omitted	Same as PS=60 if PD=6; same as PS=80 if PD=8.
PW=n	Maximum of n characters in line of printed output.
PW	Same as PW=72.
PW omitted	Same as PW=126 if output goes to printer; same as PW=72 if output goes to terminal.

pi	Description
Q	Quick mode; full syntactic scan performed. Object code suppressed.
Q=0	Normal compilation.
Q omitted	Same as Q=0.
R=n	Reference map options.

n	Description
0	No map.
1	Short map.
2	Long map.
3	Long map with common block and equivalence groups.

R	Same as R=2.
R omitted	Same as R=1.
ROUND =s	In-line code computation for indicated operations rounded. s=+-*/ (multiple options allowed).
ROUND	Same as ROUND=+-*/.
ROUND =0	Computation not rounded.
ROUND omitted	Same as ROUND=0.
S=ovl	System text overlay, ovl, loaded from library set when COMPASS is called to assemble intermixed COMPASS programs.
S=lib/ ovl	System text overlay, ovl, loaded from user library file or system library, lib.
S	Same as S=SYSTEXT.

Pi	Description
S=0	System text file not loaded, when COMPASS is called to assemble intermixed COMPASS programs.
S omitted	Same as S=SYSTEXT if G=0; same as S=0 if G≠0.
SEQ	Source file in sequenced line format. TS option selected.
SEQ=0	Source file in standard FORTRAN format.
SEQ omitted	Same as SEQ=0.
SL	Source program on file specified by L parameter.
SL=0	No source program listed.
SL omitted	Same as SL.
STATIC	Dynamic memory management at execution time by CRM inhibited.
STATIC=0	Dynamic memory management used at execution time by CRM.
STATIC omitted	Same as STATIC=0.
SYSEDIT	I/O references done indirectly through table search at object time.
SYSEDIT=0	I/O references done directly.
SYSEDIT omitted	Same as SYSEDIT=0.
T	Full error traceback.
T=0	No error traceback.
T omitted	Same as T=0.

p_i	Description
TS	Time-sharing mode; compilation speed and field length optimized.
TS omitted	Same as OPT=1.
UO	Compiler can perform potentially unsafe optimizations; ignored unless OPT=2 specified.
UO=0	Unsafe optimization not performed.
UO omitted	Same as UO=0.
X=lfn	External text for XTEXT pseudo instruction on file lfn.
X	Same as X=OPL.
X omitted	Same as X=OLDPL.
Z	Zero-word parameter list passed.
Z=0	Zero-word parameter list not passed.
Z omitted	Same as Z=0.

FTN5(p_1, p_2,...,p_n)

Calls FORTRAN 5 compiler.

p_i	Description
ANSI=s	Non-ANSI language extensions treated as errors with severity specified by s.

s	Significance
F	Fatal error.
T	Trivial error.

ANSI	Same as ANSI=T.

Pi	Description
ANSI=0	Non-ANSI extensions allowed.
ANSI omitted	Same as ANSI=0.
ARG=arg	Format of external procedure argument lists generated by compiler.

arg	Description
COMMON	Specify interlanguage communication format.
-COMMON	Reverse specification of interlanguage communication format.
FIXED	Specify that all references have same number of arguments.
-FIXED	Reverse specification that all references have same number of arguments.

ARG=0	Same as ARG=-COMMON/-FIXED.
ARG	Same as ARG=-COMMON/FIXED.
ARG omitted	Same as ARG=0.
B=lfn	Binary output on file lfn.
B=0	No binary output.
B	Same as B=BIN.
B omitted	Same as B=LGO.
BL	Separable output listing generated.

pi	Description
BL=0	Listings generated in compact format.
BL omitted	Same as BL=0.
CS=USER	User-specified weight table.
CS=FIXED	Fixed weight table.
CS	Same as CS=FIXED.
CS omitted	Same as CS=USER.
DB=db†	Debugging options.

db	Description
ER	Enable error recovery.
ID	Turn on CYBER Interactive Debug Facility; generate line number table, symbol table, and special object code.
PMD	Enable postmortem dump.
SB	Check that array element references are within array.
SL	Check that substring references are within string.
ST	Same as DB=ID, except do not generate special object code.
TB	Enable full error traceback.

†Multiple option for DB parameter are separated by slashes (for example, DB=ER/ID).

p_j	Description
DB=0	No debugging options.
DB	Same as DB=ER/ID/PMD/SB/SL/ST/TB.
DB omitted	Same as DB=0.
DO=do†	DO loop control.

do	Significance
LONG	Permit trip count to exceed 131 071.
OT	Set minimum trip count to 1.

DO=0	No DO loop control.
DO	Same as DO=OT.
DO omitted	Same as DO=0.
DS	Treat C$ direcives as comments.
DS=0	Recognize and process C$ directives.
DS omitted	Same as DS=0.
E=lfn	Error line and diagnostics on file lfn.
E	Same as E=ERRS.
E omitted	Same as E=OUTPUT.

†To select both options for the DO parameter, separate them with slashes (for example, DO=LONG/OT).

Pi	Description
EL=el	Error level control.

el	Significance
C	List catastrophic errors.
F	List fatal errors plus level C errors.
T	List trivial errors plus level C, F, and W errors.
W	List warning errors plus level C and F errors.

EL	Same as EL=F.
EL omitted	Same as EL=T.
ET=e	Compiler aborts if executable code contains errors of at least C, F, T, or W severity indicated by e. Levels are indicated by EL parameter. Job resumes after EXIT control statement.
ET=0	Next control statement in job is executed after termination, despite any errors detected during compilation.
ET	Same as ET=F.
ET omitted	Same as ET=0.
G=lfn	First system text overlay loaded from file lfn.
G=lfn-recname	First system text overlay with record recname loaded from file lfn.
G=0	No system text loaded.
G	Same as G=SYSTEXT.
G omitted	Same as G=0.

p_i	Description
GO	Binary loaded and executed after compilation.
GO=0	Binary not loaded and executed after compilation.
GO omitted	Same as GO=0.
I=lfn	Source input on file lfn.
I	Same as I=COMPILE.
I omitted	Same as I=INPUT.
L=lfn	Listable compiler output on file lfn.
L=0	Only fatal diagnostics and statements that caused them listed on file OUTPUT.
L	Same as L=LIST.
L omitted	Same as L=OUTPUT.
LCM=m	Address mode for level 3 (ECS) data.

m	Significance
D	Direct mode; select 17-bit address.
G	Giant mode.
I	Indirect mode; select 21-bit address.

LCM	Same as LCM=I.
LCM omitted	Same as LCM=D.

pi	Description
LO=lo†	Listing options.

C	Significance
A	Write variables and common blocks with their attributes to output file.
M	Write map to output file.
O	Write object code to output file.
R	Write errors reference listing to output file.
S	Write source listing to output file.

LO	Same as LO=A/R/S.
LO=0	No listing.
LO omitted	Same as LO=A/S.
ML=nnnnnnn	nnnnnnn is value of MODLEVEL micro.
ML=0	Current date in form yyddd used for MODLEVEL micro.
ML	Same as ML=0.
ML omitted	Same as ML=0.
OPT=n	Level of optimization.

n	Significance
0	Fast compilation.
1	Standard compilation and execution.
2	Fast execution.
3	Fast execution plus potentially unsafe optimization.

†Multiple options for LO parameter are separated by slashes (for example, LO=O/S).

Pi	Description
OPT	Same as OPT=2.
OPT omitted	Same as OPT=0.
PD=n	Print density control for compiler listings.

n	Significance
6	Six lines per inch.
8	Eight lines per inch.

PD	Same as PD=8.
PD omitted	Same as PD=6.
PL=n	n is the maximum number of execution time records written on file OUTPUT. $n \leq 9999999999$.
PL	Same as PL=5000.
PL omitted	Same as PL=5000.
PN	Page numbering proceeds continuously from subprogram to subprogram.
PN=0	Page numbering begins at 1 for each subprogram.
PN omitted	Same as PN=0.
PS=n	Compiler output page size is n printable lines per page.
PS omitted	Same as PS=60 if PD=6; same as PS=80 if PD=8.

p_i	Description
PW=n	Maximum of n characters in line of printed output ($50 \leq n \leq 136$).
PW	Same as PW=72.
PW omitted	Same as PW=136.
QC	Quick mode; full syntactic scan performed. Object code suppressed.
QC=0	Normal compilation.
QC omitted	Same as QC=0.
REW=lfn†	Rewind specified files before compilation.

lfn	Description
B	Binary output file.
E	Error file.
I	Input file.
L	Output file.

REW	Same as REW=B/I.
REW=0	Do not rewind any files.
REW omitted	Same as REW=0.

†Multiple options for REW parameter are separated by slashes (for example, REW=I/B).

pi	Description
ROUND =s†	In line code computation for indicated operations rounded.
	s Description
	A Addition.
	S Subtraction.
	M Multiplication.
	D Division.
ROUND	Same as ROUND=A/S/M/D.
ROUND =0	Computation not rounded.
ROUND omitted	Same as ROUND=A/S/M.
S=ovl††	System text overlay, ovl, loaded from library set when COMPASS is called to assemble intermixed COMPASS programs.
S=lib/ ovl	System text overlay, ovl, loaded from user library file or system library, lib.
S=0	System text overlay not loaded when COMPASS is called to assemble intermixed COMPASS programs.
S	Same as S=SYSTEXT if G parameter is not specified. Same as S=0 if G parameter is specified.
S omitted	Same as S.
SEQ	Source file in sequenced line format.

†Multiple options for ROUND parameter are separated by slashes (for example, ROUND=A/S).

††Multiple names can be specified by separating them with slashes; up to maximum of seven names.

p_i	Description
SEQ=0	Source file in standard FORTRAN format.
SEQ omitted	Same as SEQ=0.
X=lfn	External text for XTEXT pseudo instruction on file lfn.
X	Same as X=OPL.
X omitted	Same as X=OLDPL.

F45(p_1,p_2, ...,p_n)

Calls Conversion Aid Program for FORTRAN Extended Version 4 to FORTRAN Version 5.

p_i	Description
CC=*	Change $ indicating a comment line to *.
CC=C	Change $ indicating a comment line to C.
CC	Same as CC=*.
CC omitted	Same as CC=C.
CI=idname	Generate Update/Modify directive *IDENT idname where idname is correction identifier.
CI	Generate Update/Modify directive *IDENT dddhhmm where dd is number of day of year, hh is hour of day, and mm is minutes.
CI=0	Do not generate an *IDENT directive, even if LO=M, LO=F, PO=M, or PO=F is specified.

Pi	Description
CI omitted	Same as CI.
DD	Delete statements with C$ in columns 1 and 2.
DD=0	Convert statements with C$ in columns 1 and 2 to comments by replacing $ with a blank.
DD omitted	Same as DD.
ET	Skip to job's EXIT statement if one of following conditions exist: • FORTRAN syntax errors. • Statements requiring manual action. • Requests for Update/Modify output files when input is not on COMPILE file.
ET=0	Terminate normally.
ET omitted	Same as ET=0.
I=lfn	Source input on file lfn.
I	Same as I=COMPILE.
I omitted	Same as I=INPUT.
L=lfn	Listable output on file lfn.
L	Same as L=LIST.
L=0	No output listing.
L omitted	Same as L=OUTPUT.

p_i	Description
LO=lo	Listing options.

lo	Significance
E	Error listing.
F	Full listing.
M	Modification listing.
S	Short listing.

LO	Same as LO=F.
LO omitted	Same as LO=S.
MC=$char$	Master control character is char.
MC omitted	Same as MC=$*$.
MD	Flag statements containing machine-dependent usages.
MD omitted	Ignore machine-dependent usages.
P=lfn	Source output on file lfn.
P	Same as P=PUNCH.
P=0	No source output.
P omitted.	Same as P=0.
PD=n	Print density control for compiler listings.

n	Significance
6	Six lines per inch.
8	Eight lines per inch.

PD	Same as PD=8.
PD omitted	Same as PD=6.

p_i	Description
PO=n	Source output options.

n	Significance
F	Full source output file.
M	Modification file.
S	Short source output file.

PO	Same as PO=M.
PO omitted	Same as PO=S.
SI	Input file in sequenced line format.
SI=0	Input file is standard FORTRAN format.
SI omitted	Input file format determined from columns 1 through 5 of first input line.
SO=n1/n2/n3	Sequenced output file where n1 is first sequence number, n2 is increment, and n3 is number of digits in first output sequence number.
SO	Same as SO=10/10/5 unless sequence numbers are determined by format of input file.
SO	Unsequenced output files.
SO omitted	Mode of output file determined from mode of input file.

PLI(p_1, p_2,...,p_n) Calls PL/I compiler.

p_i	Description
B=lfn	Binary output on file lfn.
B	Same as B=BIN.

p_i	Description
B omitted	Same as B=LGO.
BL	Separable output listing generated.
BL omitted	Listings generated in compact format.
COL= m/n/p	Source text on input file in columns m through n; carriage control character in column p; $1 \le m \le n$, $1 \le n \le 100$, $0 \le p \le 100$, and $p \le m$ or $p \le n$. If p=0, standard carriage control is applied to source listing.
COL= m/n	Same as COL=m/n/0.
COL	Same as COL=2/72/1.
COL omitted	Same as COL=1/72/0.
DB	Loadable binary code produced regardless of errors.
DB=B	Same as DB.
DB=0	Loadable binary code produced unless level C or F errors are in compilation.
DB omitted	Same as DB=0.
E=lfn	Error information specified by EL parameter written on file lfn.
E	Same as E=ERRS.
E=0	No error file output generated.
E omitted	Same as E=OUTPUT.

pi	Description
EL=el	Error level control; errors are listed on files specified by E and L parameters.

el	Significance
C	List compiler errors only.
F	List fatal errors plus level C errors.
I	List informational diagnostics plus level C, F, T, and W errors.
T	List trivial errors plus level C, F, and W errors.
W	List warning errors plus level C and F errors.

EL	Same as EL=F.
EL omitted	Same as EL=W.
ET=et	Job aborted if executable code contains errors of the severity specified by et. Order of severity is I, T, W, F, and C with C the highest. Job resumes after the next appropriate EXIT statement.
ET	Same as ET=F.
ET=0	Job not aborted despite errors diagnosed during compilation.
ET omitted	Same as ET=0.
GO	Binary object code loaded and executed after compilation.

pi	Description
GO=0	Binary object code loaded and executed by PLI control statement.
GO omitted	Same as GO=0.
I=lfn	Source input on file lfn.
I	Same as I=COMPILE.
I omitted	Same as I=INPUT.
INRULE	INRULE default attributes applied to identifiers and descriptors. Identifiers that do not begin with letters I through N or are partially declared default to FLOAT DECIMAL rather than FIXED BINARY.
INRULE =0	Standard default attributes applied to identifiers and descriptors. Default is FIXED BINARY.
INRULE omitted	Same as INRULE=0.
L=lfn	Listable compiler output on file lfn.
L	Same as L=LIST.
L=0	No listable compiler output generated.
L omitted	Same as L=OUTPUT.
LO= lo†	Listing options.

lo	Significance
A	Complete set of attributes for each identifier.
O	Generated object code.

†Multiple options for the LO parameter are separated by slashes (for example, LO=A/R).

p_i	Description
	lo — Significance
	R — Reference list.
	S — Source program without reference to COL parameter.
LO	Same as LO=A/R/S.
LO=0	No list options selected.
LO omitted	Same as LO=A/S.
PD=n	Print density control for E and L parameter listings.
	n — Significance
	6 — Single space at six lines per inch.
	8 — Single space at eight lines per inch.
PD	Same as PD=8.
PD omitted	Same as PD=6.
PS=n	Page size is n printable lines per page.
PS omitted	Same as PS=60 if PD=6; same as PS=80 if PD=8.

SORTMRG(p_1, p_2,...,p_n) Calls Sort/Merge program.

p_i	Description
nC	Directives in SORT version (n-3) format; n is 6 or 7.
nC omitted	Same as 7C.

Pi	Description
I=lfn/r	Sort/Merge directives on file lfn with following rewind options.
	r — Significance
	NR — File not rewound before opening.
	R — File rewound before opening.
I	Same as I=COMPILE.
I omitted	Same as I=INPUT.
MO=n	Intermediate merge order; $2 \leq n \leq 64$. If insufficient memory is available, fatal error occurs.
MO omitted	Installation default merge order based on the amount of memory available.
O=lfn/r	Listings on file lfn with same rewind options as for I parameter.
O	Same as O=OUTPUT.
O omitted	Same as O=OUTPUT.
OWN=lfn/r	Owncode binaries on file lfn with same rewind options as for I parameter.
OWN	Same as OWN=LGO.
OWN omitted	Same as OWN=INPUT.

CYBER COMMON UTILITY CONTROL STATEMENT FORMATS

COPYL(oldlfn, replfn,newlfn, last,flag)

Copies oldlfn to newlfn (defaults are OLD and NEW), substituting records from replfn (default is LGO) for matching records on oldlfn and using each record of replfn only once. All parameters are optional and order-dependent.

last — Last record on oldlfn to be processed; if not specified, all records on oldlfn are processed.

flag — Processing options:

- R — Rewind oldlfn and newlfn before processing.
- A — Append to end of newlfn all replfn records that do not match any on oldlfn.
- T — Omit check for matching type of record.
- E — Copy oldlfn to end-of-information.

COPYLM(oldlfn, replfn,newlfn last,flag)

Same as COPYL except that COPYLM performs multiple replacement; that is, the first matching record encountered on replfn replaces each matching record from oldlfn.

ITEMIZE (lfn_1,p_1, p_2,...,p_n)

Lists information about records on a binary file. All parameters are optional. lfn_1 is order-dependent, and the other parameters are order-dependent.

lfn_1 — Logical file name of the binary file to be itemized; default is LGO.

p_i	Description
BL	Burstable listing; each file output starts at top of page.
BL omitted	Compact listing; page eject only when current page is nearly full.

Pi	Description
E	Output expanded to list further information.
E omitted	No expansion.
L=lfn$_2$	Output listed on file lfn$_2$.
L omitted	Same as L=OUTPUT.
N	File itemized until end-of-information encountered.
N=0	File itemized until empty file is processed.
N=n	n files itemized.
N omitted	Same as N=1.
NR	No rewind of lfn.
NR omitted	Rewind lfn before and after operation.
PD	Print density set at eight lines per inch.
PD omitted	Print density set at six lines per inch.
PW	Print width set at 72-character lines.
PW=n	Print width is 136 character lines if n≤136; print width is 72 character lines if n≤136.
PW omitted	Same as PW if listing file is a terminal; otherwise, same as PW=136.
U	All records within ULIB type records itemized.
U omitted	Only the user library directory listed.

SPECIAL SYSTEM INFORMATION

EXCHANGE PACKAGE DUMP

The user can dump his exchange package using a DMP or DMD statement. Figures 7-1 and 7-2 show actual exchange package dumps. The format of the first dump is produced by a CYBER 170 Model 171, 172, 173, 174, 175, 720, 730, 750, or 760; a CYBER 70, Model 71, 72, 73, or 74; or a 6000 Series Computer System. The second dump format is produced only by the CYBER 170 Model 176 Computer System.

```
EXCHANGE PACKAGE.

P          0  A0     200  B0       0      (A0)  0000 0000 0000 0000 0000
RA    275100  A1       1  B1       1      (A1)  0000 0000 0000 0000 0000
FL       200  A2      60  B2       2      (A2)  1505 1520 0000 0000 0061
EM      7007  A3      57  B3   13310      (A3)  0000 0000 0000 0000 0000
RAE        0  A4       1  B4     201      (A4)  0000 0000 0000 0000 0000
FLE        0  A5     111  B5     111      (A5)  0000 0000 0061 0004 6000
MA      1600  A6       1  B6     200      (A6)  0000 0000 0000 0000 0000
              A7       1  B7   37756      (A7)  0000 0000 0000 0000 0000

X0   0000 0000 0000 0000 0000
X1   0000 0000 0000 0000 0000
X2   1505 1520 0000 0000 0061
X3   0000 0000 0000 0000 0000
X4   0000 0000 0000 0000 0000
X5   0000 0000 0000 0000 0000
X6   1505 1520 0000 0000 0061
X7   0000 0000 0000 0000 0000

(RA)    0000 0001 1100 0000 0000
(RA+1)  0000 0000 0000 0000 0000
```

Figure 7-1. Exchange Package Dump

```
EXCHANGE PACKAGE.

P        112   A0     200   B0       0      (A0)  0000 0000 0000 0000 0000
RA    430500   A1       1   B1       1      (A1)  0000 0000 0000 0000 0000
FL       200   A2      60   B2       2      (A2)  1505 1520 0000 0000 0061
PSD    60040   A3      57   B3   13310      (A3)  0000 0000 0000 0000 0000
RAE        0   A4       1   B4     201      (A4)  0000 0000 0000 0000 0000
FLE        0   A5     111   B5     111      (A5)  0000 0000 0061 0004 6000
MA      1400   A6       1   B6     200      (A6)  0000 0000 0000 0000 0000
EEA     1400   A7       1   B7   37756      (A7)  0000 0000 0000 0000 0000

X0   0000 0000 0000 0000 0000
X1   0000 0000 0000 0000 0000
X2   1505 1520 0000 0000 0061
X3   0000 0000 0000 0000 0000
X4   0000 0000 0000 0000 0000
X5   0000 0000 0000 0000 0000
X6   1505 1520 0000 0000 0061
X7   0000 0000 0000 0000 0000

(RA)   0001 0001 1200 0000 0000
(RA+1) 0000 0000 0000 0000 0000
```

Figure 7-2. Exchange Package Dump for CYBER 170 Model 176

The following are the exchange package fields and their contents.

Label	Contents
P	Program address at which execution stopped.
RA	Reference address; starting address of central memory field length.
FL	Field length in central memory.
EM	Exit mode. Each bit set indicates that if this hardware-detected error occurs, the program aborts. The bit positions are numbered with 0 as the rightmost bit.

†Does not apply to CYBER 170 model 176.

Label	Contents	
	Bit Position	Error
	11	CM data error.†
	10	Central memory control (CMC) input error.†
	9	ECS flag register operation parity error.†
	8-5	Not used.
	4-3	Hardware error exit status bits.††
	2	Indefinite operand.
	1	Operand out of range.
	0	Address out of range.

The EM field in figure 7-1 has bit positions 11, 10, 9, 2, 1, and 0 set.

PSD††† Program status designator (PSD) register. Each bit set indicates setting of mode flag or error condition. The bit positions are numbered with 0 as rightmost bit.

Bit Position	Flags
17	Exit mode.
16	Monitor mode.
15	Step mode.
14	Indefinite mode.
13	Overflow mode.
12	Underflow mode.

†Applies to CYBER 170 models 171, 172, 173, 174, 175, 720, 730, 750, and 760 only.
††Applies to CYBER 70 model 74 only.
†††Applies to CYBER 170 model 176 only.

Label	Contents	
	Bit Position	Error Conditions
	11	LCME error.
	10	CM error.
	9	LCME block range error.
	8	CM block range error.
	7	LCME direct range error.
	6	CM direct range error.
	5	Program range error.
	4	Not used.
	3	Step condition.
	2	Indefinite condition.
	1	Overflow condition.
	0	Underflow condition.

The PSD field in figure 7-2 has bit positions 14, 13, and 12 set.

RAE	ECS reference address; starting address of ECS field length.
FLE	ECS field length.
MA	Monitor address (normal exit address for CYBER 170 model 176).
EEA	Error exit address (CYBER 170 model 176).
Ai	Contents of address registers.
(Ai)	Contents of central memory word addressed by named address register.
Bi	Contents of increment registers.
Xi	Contents of operand registers.
(RA)	Contents of reference address word.
(RA+1)	Contents of request word following the reference address word.

CHARACTER SETS

NOS supports the following character sets.

- CDC graphic 64- (or 63-) character set (table 7-2).
- ASCII 128-character set (tables 7-1 and 7-3).
- ASCII graphic 64- (or 63-) character set (tables 7-1 and 7-2).
- ASCII graphic 95-character set (table 7-2).

Each installation has the option of selecting either the 64-character set or the 63-character set. However, only one can be in effect at any given time. The differences between the 64- and 63-character sets are described in Character Set Anomalies elsewhere in this section. Any future reference to 64-character set implies either 63- or 64-character set unless otherwise stated.

CODE SETS

NOS supports the following code sets.

- Display code.
- 6/12 display code.
- 12-bit ASCII code.

CHARACTER SET ANOMALIES

The following paragraphs describe anomalies between the 63- and 64-character sets and other problems that may arise in their use.

If an installation is using the 63-character set rather than the 64-character set, two characters are interpreted differently. The colon and the percent for the 64-character set are exactly as shown in the unshaded table entries in this section. If an installation has selected the 63-character set, the character set tables in this section should be modified by deleting the line immediately preceding each shaded line. The characters and codes in the shaded lines reflect the correct table entries for sites using the 63-character set.

When the user is in time-sharing ASCII mode at a 64-character set site, the colon is translated to 6/12 display code 7404_8 on input, and on output, the occurrence of the 7404_8 code results in the printing of a colon. The 6/12 display code 00 is not defined on input; however, the occurrence of the 6/12 display code 00 on output at a 64-character set site results in the printing of a colon (the colon is always 63_8 on input and output at 63-character set sites).

In either the 63- or the 64-character set, the use of undefined 6/12 display codes in output files may produce unpredictable results and should be avoided.

The use of colons (display code 00) in 64-character set files may cause problems. Refer to Card File Data Conversion in the NOS Reference Manual, volume 1 for further information.

LINE PRINTER USAGE

NOS supports line printers that print files in the character sets corresponding to the indicated print train as follows:

Character Set	Print Train
CDC graphic 64-character set	596-1
ASCII graphic 64-character set	596-5
ASCII graphic 95-character set	596-6

TABLE 7-1. TIME-SHARING CHARACTER SETS

ASCII Graphic (64 Char)	ASCII Character (128 Char)	Display Code	6/12 Display Code	12-Bit ASCII Code
: colon†		00†		
Display code 00 is undefined at sites using the 63-character set.				
A	A	01	01	0101
B	B	02	02	0102
C	C	03	03	0103
D	D	04	04	0104
E	E	05	05	0105
F	F	06	06	0106
G	G	07	07	0107
H	H	10	10	0110
I	I	11	11	0111
J	J	12	12	0112
K	K	13	13	0113
L	L	14	14	0114
M	M	15	15	0115
N	N	16	16	0116
O	O	17	17	0117
P	P	20	20	0120
Q	Q	21	21	0121
R	R	22	22	0122
S	S	23	23	0123
T	T	24	24	0124
U	U	25	25	0125
V	V	26	26	0126
W	W	27	27	0127
X	X	30	30	0130
Y	Y	31	31	0131
Z	Z	32	32	0132
0	0	33	33	0060
1	1	34	34	0061
2	2	35	35	0062
3	3	36	36	0063
4	4	37	37	0064
5	5	40	40	0065
6	6	41	41	0066
7	7	42	42	0067
8	8	43	43	0070
9	9	44	44	0071
+	+	45	45	0053
-	-	46	46	0055
*	*	47	47	0052

†The interpretation of this character or code may depend on its context. Refer to Character Set Anomalies elsewhere in this section.

TABLE 7-1. TIME-SHARING CHARACTER SETS (Contd)

ASCII Graphic (64 Char)	ASCII Character (128 Char)	Display Code	6/12 Display Code	12-Bit ASCII Code
/	/	50	50	0057
(	(	51	51	0050
)	)	52	52	0051
$	$	53	53	0044
=	=	54	54	0075
space	space	55	55	0040
, comma	, comma	56	56	0054
. period	. period	57	57	0056
# num. sign	# num. sign	60	60	0043
[l. bracket	[l. bracket	61	61	0133
] r. bracket	] r. bracket	62	62	0135
% †	% †	63†	63†	0045
: colon	: colon	63	63	0072
" quote	" quote	64	64	0042
_ underline	_ underline	65	65	0137
¬	¬	66	66	0041
& ampersand	& ampersand	67	67	0046
' apostrophe	' apostrophe	70	70	0047
?	?	71	71	0077
<	<	72	72	0074
>	>	73	73	0076
@		74		
\ rev. slant	\ rev. slant	75	75	0134
∧ circumflex		76		
; semicolon	; semicolon	77	77	0073
	@		7401	0100
	∧ circumflex		7402	0136
	: colon †		7404†	0072
	%		7404	0045
	` grave accent		7407	0140
	a		7601	0141
	b		7602	0142
	c		7603	0143
	d		7604	0144
	e		7605	0145
	f		7606	0146
	g		7607	0147

†The interpretation of this character or code may depend on its context. Refer to Character Set Anomalies elsewhere in this section.

TABLE 7-1. TIME-SHARING CHARACTER SETS (Contd)

ASCII Graphic (64 Char)	ASCII Character (128 Char)	Display Code	6/12 Display Code	12-Bit ASCII Code
	h		7610	0150
	i		7611	0151
	j		7612	0152
	k		7613	0153
	l		7614	0154
	m		7615	0155
	n		7616	0156
	o		7617	0157
	p		7620	0160
	q		7621	0161
	r		7622	0162
	s		7623	0163
	t		7624	0164
	u		7625	0165
	v		7626	0166
	w		7627	0167
	x		7630	0170
	y		7631	0171
	z		7632	0172
	{ left brace		7633	0173
	| vert. line		7634	0174
	} right brace		7635	0175
	~ tilde		7636	0176
	DEL		7637	0177
	NUL		7640	4000
	SOH		7641	0001
	STX		7642	0002
	ETX		7643	0003
	EOT		7644	0004
	ENQ		7645	0005
	ACK		7646	0006
	BEL		7647	0007
	BS		7650	0010
	HT		7651	0011
	LF		7652	0012
	VT		7653	0013
	FF		7654	0014
	CR		7655	0015
	SO		7656	0016
	SI		7657	0017

TABLE 7-1. TIME-SHARING CHARACTER SETS (Contd)

ASCII Graphic (64 Char)	ASCII Character (128 Char)	Display Code	6/12 Display Code	12-Bit ASCII Code
	DLE		7660	0020
	DC1		7661	0021
	DC2		7662	0022
	DC3		7663	0023
	DC4		7664	0024
	NAK		7665	0025
	SYN		7666	0026
	ETB		7667	0027
	CAN		7670	0030
	EM		7671	0031
	SUB		7672	0032
	ESC		7673	0033
	FS		7674	0034
	GS		7675	0035
	RS		7676	0036
	US		7677	0037

TABLE 7-2. BATCH CHARACTER SETS

CDC Graphic (64 Char)	ASCII Graphic (64 Char)	ASCII Graphic (95 Char)	Display Code	6/12 Display Code	12-Bit ASCII Code	Punch Code	
						026	029
: colon†	: colon†		00†			8-2	8-2
Display code 00 is undefined at sites using the 63-character set.							
A	A	A	01	01	0101	12-1	12-1
B	B	B	02	02	0102	12-2	12-2
C	C	C	03	03	0103	12-3	12-3
D	D	D	04	04	0104	12-4	12-4
E	E	E	05	05	0105	12-5	12-5
F	F	F	06	06	0106	12-6	12-6
G	G	G	07	07	0107	12-7	12-7
H	H	H	10	10	0110	12-8	12-8
I	I	I	11	11	0111	12-9	12-9
J	J	J	12	12	0112	11-1	11-1
K	K	K	13	13	0113	11-2	11-2
L	L	L	14	14	0114	11-3	11-3
M	M	M	15	15	0115	11-4	11-4
N	N	N	16	16	0116	11-5	11-5
O	O	O	17	17	0117	11-6	11-6

†The interpretation of this character or code may depend on its context. Refer to Character Set Anomalies elsewhere in this section.

TABLE 7-2. BATCH CHARACTER SETS (Contd)

CDC Graphic (64 Char)	ASCII Graphic (64 Char)	ASCII Graphic (95 Char)	Display Code	6/12 Display Code	12-Bit ASCII Code	Punch Code	
						026	029
P	P	P	20	20	0120	11-7	11-7
Q	Q	Q	21	21	0121	11-8	11-8
R	R	R	22	22	0122	11-9	11-9
S	S	S	23	23	0123	0-2	0-2
T	T	T	24	24	0124	0-3	0-3
U	U	U	25	25	0125	0-4	0-4
V	V	V	26	26	0126	0-5	0-5
W	W	W	27	27	0127	0-6	0-6
X	X	X	30	30	0130	0-7	0-7
Y	Y	Y	31	31	0131	0-8	0-8
Z	Z	Z	32	32	0132	0-9	0-9
0	0	0	33	33	0060	0	0
1	1	1	34	34	0061	1	1
2	2	2	35	35	0062	2	2
3	3	3	36	36	0063	3	3
4	4	4	37	37	0064	4	4

TABLE 7-2. BATCH CHARACTER SETS (Contd)

CDC Graphic (64 Char)	ASCII Graphic (64 Char)	ASCII Graphic (95 Char)	Display Code	6/12 Display Code	12-Bit ASCII Code	Punch Code	
						026	029
5	5	5	40	40	0065	5	5
6	6	6	41	41	0066	6	6
7	7	7	42	42	0067	7	7
8	8	8	43	43	0070	8	8
9	9	9	44	44	0071	9	9
+	+	+	45	45	0053	12	12-8-6
-	-	-	46	46	0055	11	11
*	*	*	47	47	0052	11-8-4	11-8-4
/	/	/	50	50	0057	0-1	0-1
(	(	(	51	51	0050	0-8-4	12-8-5
)	)	)	52	52	0051	12-8-4	11-8-5
$	$	$	53	53	0044	11-8-3	11-8-3
=	=	=	54	54	0075	8-3	8-6
space	space	space	55	55	0040	no punch	no punch
, comma	, comma	, comma	56	56	0054	0-8-3	0-8-3
. period	. period	. period	57	57	0056	12-8-3	12-8-3

TABLE 7-2. BATCH CHARACTER SETS (Contd)

CDC Graphic (64 Char)	ASCII Graphic (64 Char)	ASCII Graphic (95 Char)	Display Code	6/12 Display Code	12-Bit ASCII Code	Punch Code	
						026	029
≡ equiv.	# num. sign	# num. sign	60	60	0043	0-8-6	8-3
[1. bracket	[1. bracket	[1. bracket	61	61	0133	8-7	12-8-2
] r. bracket	] r. bracket	] r. bracket	62	62	0135	0-8-2	11-8-2
% †	% †	% †	63†	63†	0045	8-6	0-8-4
: colon	: colon	: colon	63	63	0072	8-2	8-2
≠	" quote	" quote	64	64	0042	8-4	8-7
↱	_ underline	_ underline	65	65	0137	0-8-5	0-8-5
∨	!	!	66	66	0041	11-0	12-8-7
∧	& ampersand	& ampersand	67	67	0046	0-8-7	12
↑	' apostrophe	' apostrophe	70	70	0047	11-8-5	8-5
↓	?	?	71	71	0077	11-8-6	0-8-7
<	<	<	72	72	0074	12-0	12-8-4
>	>	>	73	73	0076	11-8-7	0-8-6
≤	@		74			8-5	8-4
≥	\ rev. slant	\ rev. slant	75	75	0134	12-8-5	0-8-2
¬	^ circumflex		76			12-8-6	11-8-7
; semicolon	; semicolon	; semicolon	77	77	0073	12-8-7	11-8-6

†The interpretation of this character or code may depend on its context. Refer to Character Set Anomalies elsewhere in this section.

TABLE 7-2. BATCH CHARACTER SETS (Contd)

CDC Graphic (64 Char)	ASCII Graphic (64 Char)	ASCII Graphic (95 Char)	Display Code	6/12 Display Code	12-Bit ASCII Code	Punch Code	
						026	029
		@		7401	0100		
		^ circumflex		7402	0136		
		: colon†		7404†	0072		
		%		7404	0045		
		` grave accent		7407	0140		
		a		7601	0141		
		b		7602	0142		
		c		7603	0143		
		d		7604	0144		
		e		7605	0145		
		f		7606	0146		
		g		7607	0147		

†The interpretation of this character or code may depend on its context. Refer to Character Set Anomalies elsewhere in this section.

TABLE 7-2. BATCH CHARACTER SETS (Contd)

CDC Graphic (64 Char)	ASCII Graphic (64 Char)	ASCII Graphic (95 Char)	Display Code	6/12 Display Code	12-Bit ASCII Code	Punch Code	
						026	029
		h		7610	0150		
		i		7611	0151		
		j		7612	0152		
		k		7613	0153		
		l		7614	0154		
		m		7615	0155		
		n		7616	0156		
		o		7617	0157		
		p		7620	0160		
		q		7621	0161		
		r		7622	0162		
		s		7623	0163		
		t		7624	0164		
		u		7625	0165		
		v		7626	0166		
		w		7627	0167		

TABLE 7-2. BATCH CHARACTER SETS (Contd)

CDC Graphic (64 Char)	ASCII Graphic (64 Char)	ASCII Graphic (95 Char)	Display Code	6/12 Display Code	12-Bit ASCII Code	Punch Code	
						026	029
		x		7630	0170		
		y		7631	0171		
		z		7632	0172		
		{ left brace		7633	0173		
		| vert. line		7634	0174		
		} right brace		7635	0175		
		~ tilde		7636	0176		

TABLE 7-3. ASCII TO 6/12 DISPLAY CODE CONVERSION

ASCII Character (128 Char)	12-Bit ASCII Code		6/12 Display Code
	Octal	Hex	
NUL	4000	00	7640
SOH	0001	01	7641
STX	0002	02	7642
ETX	0003	03	7643
EOT	0004	04	7644
ENQ	0005	05	7645
ACK	0006	06	7646
BEL	0007	07	7647
BS	0010	08	7650
HT	0011	09	7651
LF	0012	0A	7652
VT	0013	0B	7653
FF	0014	0C	7654
CR	0015	0D	7655
SO	0016	0E	7656
SI	0017	0F	7657
DLE	0020	10	7660
DC1	0021	11	7661
DC2	0022	12	7662
DC3	0023	13	7663
DC4	0024	14	7664
NAK	0025	15	7665
SYN	0026	16	7666
ETB	0027	17	7667
CAN	0030	18	7670
EM	0031	19	7671
SUB	0032	1A	7672
ESC	0033	1B	7673
FS	0034	1C	7674
GS	0035	1D	7675
RS	0036	1E	7676
US	0037	1F	7677
space	0040	20	55
!	0041	21	66
" quote	0042	22	64
# number sign	0043	23	60
$	0044	24	53
% †	0045	25	63†
%	0045	25	7404
& ampersand	0046	26	67
' apostrophe	0047	27	70

† The interpretation of this character or code may depend on its context. Refer to Character Set Anomalies elsewhere in this section.

TABLE 7-3. ASCII TO 6/12 DISPLAY CODE CONVERSION (Contd)

ASCII Character (128 Char)	12-Bit ASCII Code		6/12 Display Code
	Octal	Hex	
(	0050	28	51
)	0051	29	52
*	0052	2A	47
+	0053	2B	45
, comma	0054	2C	56
-	0055	2D	46
. period	0056	2E	57
/	0057	2F	50
0	0060	30	33
1	0061	31	34
2	0062	32	35
3	0063	33	36
4	0064	34	37
5	0065	35	40
6	0066	36	41
7	0067	37	42
8	0070	38	43
9	0071	39	44
: colon†	0072	3A	7404
: colon	0072	3A	63
; semicolon	0073	3B	77
	0074	3C	72
=	0075	3D	54
	0076	3E	73
?	0077	3F	71
@	0100	40	7401
A	0101	41	01
B	0102	42	02
C	0103	43	03
D	0104	44	04
E	0105	45	05
F	0106	46	06
G	0107	47	07
H	0110	48	10
I	0111	49	11
J	0112	4A	12
K	0113	4B	13
L	0114	4C	14
M	0115	4D	15
N	0116	4E	16
O	0117	4F	17

†The interpretation of this character or code may depend on its context. Refer to Character Set Anomalies elsewhere in this section.

TABLE 7-3. ASCII TO 6/12 DISPLAY CODE CONVERSION (Contd)

ASCII Character (128 Char)	12-Bit ASCII Code		6/12 Display Code
	Octal	Hex	
P	0120	50	20
Q	0121	51	21
R	0122	52	22
S	0123	53	23
T	0124	54	24
U	0125	55	25
V	0126	56	26
W	0127	57	27
X	0130	58	30
Y	0131	59	31
Z	0132	5A	32
[left bracket	0133	5B	61
\ reverse slant	0134	5C	75
] right bracket	0135	5D	62
^ circumflex	0136	5E	7402
_ underline	0137	5F	65
` grave accent	0140	60	7407
a	0141	61	7601
b	0142	62	7602
c	0143	63	7603
d	0144	64	7604
e	0145	65	7605
f	0146	66	7606
g	0147	67	7607
h	0150	68	7610
i	0151	69	7611
j	0152	6A	7612
k	0153	6B	7613
l	0154	6C	7614
m	0155	6D	7615
n	0156	6E	7616
o	0157	6F	7617
p	0160	70	7620
q	0161	71	7621
r	0162	72	7622
s	0163	73	7623
t	0164	74	7624
u	0165	75	7625
v	0166	76	7626
w	0167	77	7627

TABLE 7-3. ASCII TO 6/12 DISPLAY CODE CONVERSION (Contd)

ASCII Character (128 Char)	12-Bit ASCII Code		6/12 Display Code
	Octal	Hex	
x	0170	78	7630
y	0171	79	7631
z	0172	7A	7632
{ left brace	0173	7B	7633
| vertical line	0174	7C	7634
} right brace	0175	7D	7635
~ tilde	0176	7E	7636
DEL	0177	7F	7637

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