

**CONTROL DATA**  
CORPORATION

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**CONTROL DATA<sup>®</sup>**  
**CYBER 70 SERIES**  
**MODELS 72/73/74**  
**6000 SERIES**  
**COMPUTER SYSTEMS**

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**KRONOS<sup>®</sup> 2.1**  
**TERMINAL USER'S**  
**INSTANT MANUAL**



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## INTRODUCTION

The KRONOS® Operating System was developed by Control Data Corporation to provide a multi-mode job processing capability for CDC® CYBER 70 Series, Models 72, 73, and 74 Computer Systems, and CDC® 6000 Series Computer Systems. Multi-mode job processing is a capability provided by KRONOS that allows concurrent processing of local and remote batch and remote interactive (time-sharing) jobs.

This manual provides a brief description of the time-sharing terminal commands and the text editing commands available to the KRONOS user. The user is expected to be familiar with the KRONOS time-sharing system and interactive time-sharing processing. This manual is intended to serve only as a quick reference tool for the user. For complete information concerning time-sharing terminal commands or text editing commands, refer to the KRONOS Time-Sharing User's Reference Manual (publication no. 60407600) or the KRONOS Text Editor Reference Manual (publication no. 60408200), respectively.

Also included are the Export/Import commands available to the batch user at a 731-12, 732-12, or 734 Remote Batch Terminal or at a 200 User Terminal. Again, the reader is expected to be familiar with the remote batch processing capabilities of KRONOS. Detailed information is contained in the KRONOS Export/Import Reference Manual (publication no. 59150500) and Volume 1 of the KRONOS Reference Manual (publication no. 60407000).

# **SUMMARY OF TIME-SHARING LOG-IN/LOG-OFF PROCEDURES**

## LOG-IN SEQUENCE

1. Complete dial-in procedure to connect terminal to the KRONOS time-sharing network. Check to ensure that terminal switches (full/half duplex, even/odd parity, baud rate, etc.) are set to correct position.
2. When the dial-in procedure is complete, it may be necessary to identify the type of terminal being used in order to establish communications with KRONOS.

<u>Terminal Type</u>	<u>Identification</u>
Correspondence code terminal/standard print	Press ATTN key
Correspondence code terminal/standard print, 63 character set	Type D and press ATTN key
Correspondence code terminal/APL print	Type A and press ATTN key
Correspondence code terminal/APL print, 63 character set	Type P and press ATTN key
ASCII code terminal/standard print	Type T
ASCII code terminal/standard print, 63 character set	Type D
Memorex 1240 (ASCII code) terminal/APL print	Type M
Memorex 1240 (ASCII code) terminal/APL print, 63 character set	Type P
Block transmission (ASCII code) terminal/standard print	Type B
Block transmission (ASCII code) terminal/standard print, 63 character set	Type b

3. When communication with KRONOS is established, the system initiates the log-in sequence as follows:

74/10/21. 14.13.30.

CDC MULTI-MODE

OPERATING SYSTEM. KRONOS 2.1.X

FAMILY:

or

74/10/21. 14.13.30.

CDC MULTI-MODE

OPERATING SYSTEM. KRONOS 2.1.X

USER NUMBER:

The family request is issued only when the system is providing backup support for another KRONOS system, or when a user logs into an alternate KRONOS system (that is, more than one family of permanent file devices present in the system).

If the request for entry of a user number is issued, proceed to step 5.

4. Enter family name on same line. If system to which user normally connects during log-in is providing backup support for another KRONOS system, press carriage return only (normal family name assumed by default).

After the family name is accepted (if requested), the system requests entry of a user number.

USER NUMBER:

5. Submit user number on same line. The system then requests entry of a password.

PASSWORD

■■■■■■■■■■

6. Enter password in area that system has blacked out; if no password is assigned, press carriage return only.

If log-in has been successful, the system next requests entry of either the subsystem to be used or a valid charge and project number.

RECOVER/SYSTEM: or RECOVER/CHARGE:

7. If the RECOVER/SYSTEM: request is issued, enter the subsystem to be used (if other than default) or any other valid time-sharing command. The default subsystem is the subsystem selected automatically at log-in. †

If the RECOVER/CHARGE: request is issued, enter the CHARGE command (refer to Time-Sharing Job Commands). After the CHARGE command has been accepted, the user may enter the subsystem to be used (if other than default) or any other valid time-sharing command.

If the user is reinitiating the log-in sequence after having been accidentally disconnected from the system, he may also enter the RECOVER command in response to the RECOVER/SYSTEM: or RECOVER/CHARGE: request. This allows a user to resume operation at the point of interruption in service. For additional information concerning the RECOVER command, refer to Time-Sharing Job Commands.

## LOG-OFF SEQUENCE

When the user wishes to terminate the session, he logs off the system by entering the BYE or GOODBYE command. All current working files are then released and the terminal is disconnected from the system.

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†The default subsystem is specified in the system validation file. This file determines the internal system controls associated with each user number.



## **TIME-SHARING TERMINAL COMMANDS**

## TERMINAL CONTROL COMMANDS

ASCII	Provides capability to use the full ASCII or correspondence code set. <sup>†</sup> This command specifies that subsequent characters entered from the terminal will be translated into an extended internal character set consisting of 128 characters. The normal character set contains only the first 64 <sup>††</sup> of these characters.
AUTO, nnnnn, iii	Directs KRONOS to generate five-digit line numbers automatically. The nnnnn parameter specifies the beginning line number (default is 00100); iii specifies the increment value added for each succeeding line number (default is 10).
CSET, c	Selects terminal code set; affects input and output terminal modes.  c    ASCII        Selects ASCII code set  NORMAL    Selects NORMAL (not ASCII) code set
FULL	Selects full-duplex mode whereby each character received by the system is echoed back to the terminal. <sup>†</sup> This mode is effective only for terminals with full-duplex capability.

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<sup>†</sup>Command may be selected automatically but the system at log-in. This can be checked by entering the LIMITS command (refer to Time-Sharing Job Commands).

<sup>††</sup>Or first 61 characters, depending on the character set being used at the installation.

HALF	Clears full-duplex mode. Characters received by the system after this command is entered are not echoed back to the terminal. †
NORMAL	Clears modes established by ASCII, AUTO, PARITY, and TAPE commands.
PARITY, p	Sets terminal parity. If no parameter is supplied, odd parity is assumed. p ODD Sets odd parity EVEN Sets even parity
	The operating system initially assumes that information is transmitted in even parity to ASCII code terminals and odd parity to correspondence code terminals.
ROUT, nn	Adds a time delay to the carriage return and line feed to avoid premature printing of the next line. † The nn parameter specifies a delay equal to the time required to send nn characters to the terminal; nn may range from 0 to 30 octal. This command is not valid for correspondence code terminals.
TAPE	Permits subsequent information to be read from the paper tape reader at an ASCII code terminal. Refer to Paper Tape Input Formats for additional information.

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† Command may be selected automatically by the system at log-in. This can be checked by entering the LIMITS command (refer to Time-Sharing Job Commands).

**TERM, t**

Allows user to redefine terminal characteristics identified (or selected automatically) at log-in. † The t parameter specifies the new terminal characteristics as follows:

<u>t</u>	<u>Description</u>
TTY	ASCII code terminal/standard print
TTYD	ASCII code terminal/standard print, 63 character set
COR	Correspondence code terminal/standard print
CORD	Correspondence code terminal/standard print, 63 character set
CORAPL	Correspondence code terminal/APL print
CORAPLD	Correspondence code terminal/APL print, 63 character set
MEMAPL	Memorex 1240 (ASCII code) terminal/APL print
MEMAPLD	Memorex 1240 (ASCII code) terminal/APL print, 63 character set

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† Command may be selected automatically by the system at log-in. This can be checked by entering the LIMITS command (refer to Time-Sharing Job Commands).

<u>t</u>	<u>Description</u>
BLKEDT	Block transmission (ASCII code) terminal having full display screen editing capabilities (available only on select terminals such as Hazeltine 2000)/ standard print

BLKEDTD	Block transmission (ASCII code) terminal/standard print, 63 character set
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#### NOTE

Terminal types TTYD, CORD, CORAPLD, MEMAPLD and BLKEDTD are provided only for compatibility with previous systems and are not supported for use with product set members.

TIMEOUT	Changes terminal with no-timeout status (terminal remains connected to system until user logs off) to standard timeout status (user is automatically logged off if terminal is inactive for 10 minutes). This command is effective only if user is validated for no-timeout status (refer to KRONOS Time-Sharing User's Reference Manual for additional information).
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## SUBSYSTEM SELECTION COMMANDS

BASIC, ccc	Selects the BASIC subsystem.† The ccc parameter is optional and enables the user to specify an additional command.
BATCH, nnnnn	Selects the BATCH subsystem.† The nnnnn parameter specifies the field length in octal central memory words required for control statements to be entered.
EXECUTE, ccc	Selects the EXECUTE subsystem.† The ccc parameter is optional and enables the user to specify an additional command. The EXECUTE subsystem is used only to execute a previously compiled (object code) program. The RUN (or RNH) command must be entered to initiate execution.
FTNTS, ccc	Selects the FORTRAN Extended subsystem.† The ccc parameter is optional and enables the user to specify an additional command.
NULL	Clears the subsystem currently in use.† This command is typically entered before saving the primary file if the user does not want a specific subsystem associated with the file.

† The subsystem may be selected automatically by the system at log-in. This can be checked by entering the LIMITS command (refer to Time-Sharing Job Commands).

## TIME-SHARING JOB COMMANDS

- APL, t** Selects the APL interactive interpreter. The t parameter is optional and is used to identify the type of terminal being used. Refer to the APL\*CYBER Reference Manual (publication no. 19980400) for a list of valid terminal identifiers and complete information concerning the use of APL.
- BINARY, nnnn, ccc** Selects binary input mode whereby all characters entered from the terminal are stored, without translation, in the primary file.
- nnnn     Number of characters (1 to 4095) to be entered.
- ccc      Termination character (three-digit octal code). Allows termination of binary input mode before number of characters specified by nnnn have been entered. Add value of 200 if correspondence code terminal is used.
- BYE** Logs user off the system and disconnects the terminal.
- CHARGE, chargeno, projectno** Allows user to specify a valid charge number (chargeno) and project number (projectno) to be billed for subsequent terminal operations.
- CLEAR** Releases all working files. If a primary file is currently specified, only the primary file name is retained (content of primary file is released).

CONVERT, p<sub>1</sub>, p<sub>2</sub> . . . ,  
 p<sub>n</sub>

Converts records from one character set to another.

p<sub>i</sub> any of the following, any order

p=lfn<sub>1</sub> Input on file lfn<sub>1</sub>

p omitted Input on file OLD

N=lfn<sub>2</sub> Output on file lfn<sub>2</sub>

N omitted Output on file NEW

RS=n<sub>1</sub> Maximum record size in characters, where  $1 < n_1 < 500_{10}$ .

RS omitted Assumed maximum record size is  $300_{10}$ . (Each character is six bits.)

64 Convert from 63 to 64 character set.

64 omitted No 63 to 64 character set conversion. (TS must be specified if 64 is not.)

TS=t Convert from old to new time-sharing character set. t may be one of the following:

<u>t</u>	<u>Terminal Type</u>
TTY	ASCII code terminal/ standard print
COR	Correspondence code terminal/ standard print



CORAPL

Corre-  
spondence  
code ter-  
minal/  
APL print

MEMAPL

Memorex  
1240 (ASCII  
code) ter-  
minal/APL  
print

BLKEDT

Block  
transmis-  
sion  
(ASCII code)  
terminal/  
standard  
print

If t is omitted,  
TTY is assumed.

TS  
omitted

No time-sharing  
conversion (64  
must be specified  
if TS is not)

R

Rewind input and  
output files prior  
to processing.

R  
omitted

No rewind

RC= $n_2$

Convert  $n_2$  (decimal)  
records. If  $n_2$  is  
omitted, convert  
to EOF.

RC  
omitted

Convert one record.

CR (carriage return)	Requests abbreviated terminal status if entered in first character position of line.
DAYFILE, lfn	Writes user's dayfile (system's record of user's time-sharing activity) to working file lfn. If lfn does not currently exist, a working file by that name is created. If lfn is omitted, dayfile is output directly to terminal.
EDIT, lfn, AS	Selects the KRONOS Text Editor. The lfn parameter specifies the name of the working file to be edited (if omitted, the primary file is assumed).  If AS parameter is included, file is processed in ASCII mode. Terminal is automatically placed in ASCII mode. Terminal is returned to original mode when editing is completed. If terminal is in ASCII mode before EDIT command is entered, AS is assumed.
ENQUIRE, OP=p, JN=jobname, FN=lf <sub>n1</sub> , N=lf <sub>n2</sub>	Allows the user to obtain information on terminal and job status. Information returned depends on the parameters selected. If no parameters are selected, current job status is returned to the terminal; this form of the command may be entered during job execution.

OP=p ENQUIRE options;  
may be concatenated  
(for example,  
OP=BFJ)

- A Selects all options
- B Returns user identification and priorities information
- F Status of files at user control point
- J Returns contents of user control registers and error flag field
- L Returns loader information
- R Amount of system resources used, each resource listed separately
- S Amount of system resources used, in SRUs
- T Accumulated CPU time for this session
- U Informs the user of the amount of resource usage allowed to him

JN=jobname

Returns status of remote batch job; jobname is assigned by the system when the job is submitted

FN=fn<sub>1</sub>

Gives some information as F option on a single file,fn<sub>1</sub>; fn<sub>1</sub> must be a local file

N=lf<sub>n</sub><sub>2</sub> Specifies file to which ENQUIRE information is written; default is OUTPUT

- GOODBYE Logs user off the system and disconnects the terminal (same as BYE command).
- HELLO Logs current user off the system and reinitiates the log-in sequence.
- HELP Allows the user to obtain assistance in the use of KRONOS time-sharing commands.
- I key Interrupts a program that is currently transmitting output to an ASCII code terminal (INT, INTRPT, or BREAK key may also be used). The ATTN key can be used to perform the same function on correspondence code terminals. The I or ATTN key has no effect if the program has disabled terminal control (for example, APL).
- LENGTH, lfn Prints the file name, file length in kilo physical record units (KPRs), file type, and last status of the working file specified by lfn. If lfn is omitted, the primary file is assumed.
- LIBRARY, lfn=pf<sub>n</sub>/options Allows user to access an indirect access permanent file saved under special user number LIBRARY. File selected becomes new primary file and all current working files are released unless ND optional parameter is included (previous primary file is always released). Refer to Permanent File Commands for a complete description of the LIBRARY command.

## LIMITS

Provides a listing of the user's current validation limits. Validation limits are system controls which govern the use of certain system resources and establish initial operating characteristics for the terminal.

LIST, xxxxx, R,  
F=lfm

Lists the contents of the current primary file unless the F=lfm option is specified. List includes header information (specifies date, time, and filename).

xxxxx Line numbers where listing is to begin. Parameter is optional and valid only if the primary file is being listed. File must be sorted for correct results (performed automatically unless LIST is preceded by NOSORT command).

R Indicates end-of-record (EOR) and end-of-file (EOF) marks on output (optional).

F=lfm Lists working file lfm (optional). If specified, neither the xxxxx nor the R option may be supplied. File lfm is listed from current position to end-of-information (EOI).

LNH, xxxxx, R, F=lfm	Optional form of the LIST command in which listing does not include header information.
LOGIN	Logs current user off the system and reinitiates the log-in sequence (same as HELLO command).
NEW	Allows user to create a new primary file. All current working files are released unless ND keyword is included when new file name is entered (previous primary file is always released).
NEW, lfm/ND	Optional form of NEW command which allows user to specify NEW and the file name (lfm) in one step. Optional ND keyword prevents dropping of current working files when new primary file is created (previous primary file is always released).
NOSORT	Prevents system from automatically sorting the primary file when succeeding EDIT, LENGTH, LIST, LNH, REPLACE, RNH, RUN, SAVE, or SUBMIT command is entered.
OLD, lfm=pfm/options	Allows user to access a previously saved indirect access permanent file. File selected becomes new primary file and all current working files are released unless ND optional parameter is included (previous primary file is always released). If a specific subsystem is associated with the file, it is selected automatically. Refer to Permanent File Commands for a complete description of the OLD command.

PACK, lfn<sub>1</sub>, lfn<sub>2</sub>, NR

Compresses a file consisting of several logical records into one logical record. This command may be entered in one of the four following formats.

PACK Packs the primary file into one logical record.

PACK, Rewinds and packs  
lfn working file lfn  
into one logical  
record. File lfn  
is rewound again  
after the pack.

PACK, Rewinds and packs  
lfn<sub>1</sub>, working file lfn<sub>1</sub>  
lfn<sub>2</sub>, into one logical  
record and writes  
that file at the cur-  
rent position in  
lfn<sub>2</sub>. File lfn<sub>2</sub> is  
rewound after the  
pack; lfn<sub>1</sub> is not.

PACK, Same as preceding  
lfn<sub>1</sub>, format except that  
lfn<sub>2</sub>, no rewind (NR)  
NR parameter inhibits  
file lfn<sub>1</sub> from being  
rewound before the  
pack, unless it is  
the primary file.

PASSWOR, oldpswd,  
newpswd

Allows validated users to change their password. Both the current password (oldpswd) and the new password (newpswd) must be specified.

PRIMARY, lfn

Changes primary file from current primary file to lfn. Current primary file is returned. lfn must be an indirect access file local to the user's control point.

RECOVER, nnn

Allows user to resume processing after being disconnected from the system. This command is valid only when responding to RECOVER/SYSTEM: or RECOVER/CHARGE: request during login sequence.

nnn Terminal number being used when disconnect occurred.

RENAME, lfn<sub>1</sub>=lfn<sub>2</sub>

Changes the name of working file lfn<sub>2</sub> to file name lfn<sub>1</sub>. If file lfn<sub>1</sub> currently exists, it is released.

RESEQ, nnnnn, iiiii, t

Allows user to resequence line numbers of the current primary file.

nnnnn New line number of the first statement. Default is 00100.

iiii Increment to be added to nnnnn for subsequent lines. Default is 10.

t Type of file to be resequenced.

B Files with BASIC source code.

T Text files; line number is added to each line of file.

other Existing line numbers are resequenced; line numbers are added where none exist.



	default	User must select correct subsystem before entering RESEQ command.
RETURN, lfn		Releases working file lfn.
REWIND, lfn		Positions working file lfn at beginning-of-information (BOI).
RNH		Optional form of the RUN command in which output listings do not include header information.
RUN		Compiles and/or initiates execution of the primary file or another working file. One or more of the following options may be supplied with the RUN command.
	RUN, B=lfn	Compiles the source program and writes the resultant binary to working file lfn.
	or	
	RUN, C=lfn	Compiles and/or initiates execution of working file lfn. No compilation occurs under EXECUTE subsystem.
	RUN, I=lfn	Compiles and/or initiates execution of working file lfn. No compilation occurs under EXECUTE subsystem.
	RUN, MA=nnnnn	Uses nnnnn as the octal field length for the current job.
	RUN, MI=nnnnn	Increments the job's current field length by nnnnn octal.

RUN, T, q<sub>1</sub>,  
q<sub>2</sub>, . . . , q<sub>n</sub>      This command  
is used only  
when running  
an object code  
FORTRAN  
Extended  
program under  
the EXECUTE  
subsystem.  
Parameters  
q<sub>1</sub>, q<sub>2</sub>, . . . , q<sub>n</sub>  
are used to  
specify new  
working file  
names to be  
used in place  
of those that  
currently  
exist in the  
PROGRAM  
statement.

S key      Terminates job currently  
transmitting output to an  
ASCII code terminal. To  
perform the same function  
from a correspondence code  
terminal, press the ATTN  
key to interrupt the program,  
wait for system to respond  
with \*INTERRUPTED\*  
message, and then enter the  
STOP command. The S (or  
ATTN) key has no effect if  
the program has disabled  
terminal control (for example,  
APL).

SETTL, nnnnn      Allows user to specify a time  
limit (nnnnn octal seconds)  
for all subsequent operations  
requiring the central proces-  
sor.

SORT      Forces sorting of the current  
primary file when the next  
EDIT, LENGTH, LIST, LNH,  
REPLACE, RNH, RUN,  
SAVE, or SUBMIT command  
is entered.

SORT, lfn, NC=n	Sorts working file lfn by arranging statements in order according to the first n digits of the line number (where $1 \leq n \leq 10$ ). If NC option is omitted, sort is performed using first five digits of line number.
STATUS	Same as ENQUIRE.
STOP	Terminates any program currently in execution or waiting for input from the terminal, unless the program has disabled terminal control (for example, APL).
SUBMIT	Allows a validated user to create a batch job deck image and submit it to the local batch queue as a deferred (remote entry) batch job. Refer to Remote Job Entry Commands for additional information.
SUMMARY	Same as ENQUIRE, except default for SUMMARY lists the resources used during the session rather than current job status.
TEXT	Enables user to enter text mode. To terminate text mode from an ASCII code terminal, press the interrupt key (generally labeled INT, INTRPT, or BREAK), or if provided, the ETX (control-C) key. The ETX character must be used to terminate text mode when tape mode is in effect. If a correspondence code terminal is being used, press the ATTN key.

TRAN, termnam	Selects the KRONOS Transaction Subsystem (TRANEX). The termnam parameter specifies the name of the terminal. Refer to the TRANEX Reference Manual (publication no. 60407900) for complete information concerning TRANEX and terminal communication with TRANEX.
X, ccc...ccc	Allows user to force a valid time-sharing command (ccc...ccc) to be processed by the system as a control statement. This command is valid only under the BATCH subsystem.
CALL, lfn, S=ccc (oldnam <sub>1</sub> =newnam <sub>1</sub> , oldnam <sub>2</sub> =newnam <sub>2</sub> , ..., oldnam <sub>n</sub> = newnam <sub>n</sub> )	Initiates processing of procedure file lfn.  S=ccc      Specifies control language statement, or state-label ccc as first statement in procedure file to be processed (optional).
or	
-lfn, S=ccc (oldnam <sub>1</sub> =newnam <sub>1</sub> , oldnam <sub>2</sub> =newnam <sub>2</sub> , ..., oldnam <sub>n</sub> = newnam <sub>n</sub> )	oldnam= newnam      For each occurrence of oldnam in the procedure file, substitute newnam (optional).

## PERMANENT FILE COMMANDS

### COMMAND FORMAT

pfcmd, lfn=pfm/keyword<sub>1</sub>=option<sub>1</sub>, ..., keyword<sub>n</sub>=option<sub>n</sub>

pfcmd	Permanent file command name
lfn	Working file name used while accessing permanent file pfn
pfn	Permanent file name; if omitted, lfn is assumed to be the permanent file name

<u>Keywords</u>	<u>Options</u>	<u>Description</u>
UN=	username	Alternate user number
PW=	passwd	Password associated with permanent file
CT=	n	Permanent file category <u>n</u> P or PRIVATE S or SPRIV PU or PUBLIC
M=	m	File of user permission mode <u>m</u> A or APPEND E or EXECUTE M or MODIFY N or NULL R or READ RA or READAP RM or READMD W or WRITE
R=	r	Type of device on which file resides or is to reside. <u>r</u> <u>Device</u> DE    Extended core storage DIn    844 disk storage subsystem DP    Distributive data path MDn    841 multiple disk drive n equals number of units ( $1 < n < 8$ )
S=	space	Amount of space in decimal PRUs desired when creating a new direct access permanent file
PN=	packname	One-to-seven character packname used in conjunction with R keyword to identify auxiliary device to be accessed in permanent file request
NA		Suspend job until currently unavailable resource becomes available.

ND

Prevent release of current working files when OLD, NEW or LIBRARY command is entered.

## PERMANENT FILE COMMAND DESCRIPTIONS

APPEND, pfn, lfn<sub>1</sub>,  
..., lfn<sub>n</sub>/UN=user-  
num, PW=password,  
PN=packname, R=r,  
NA

Appends working files lfn<sub>1</sub>,  
..., lfn<sub>n</sub> at the end of the  
specified indirect access  
permanent file pfn.

ATTACH, lfn=pfn/  
UN=usernum, PW=  
password, M=m, PN=  
packname, R=r, NA

Establishes a link to per-  
manent file pfn for direct  
access usage. If the M  
keyword is omitted, the  
system assumes read-only  
permission.

CATLIST/LO=options,  
FN=pfn, UN=usernum,  
L=lfn, PN=packname,  
R=r, NA, DN=dn

Allows user to obtain speci-  
fic information about his  
permanent files or perma-  
nent files he is allowed to  
access in catalogs of alter-  
nate users.

LO=F Provides list-  
ing of perti-  
nent informa-  
tion about each  
file in catalog.

LO=0 Provides a  
short list that  
indicates only  
the names of  
files in cata-  
log. This op-  
tion is assumed  
by default.

LO=FP Provides list-  
ing of permis-  
sion informa-  
tion recorded  
for each alter-  
nate user that  
has accessed  
a specified  
permanent file.  
This option  
requires that  
a file name be  
specified (FN  
keyword).

LO=P Provides a short list that indicates only the user number of alternate users who have accessed a specified private or semiprivate permanent file. This option requires that a file name be specified (FN keyword).

L=lfn Specifies name of working file (lfn) to which CATLIST information is written. If omitted, information is returned to the terminal.

DN=dn Two-digit octal device number (1 to 77) used to specify device to be searched for files specified by LO=options keyword.

CHANGE, nfn=ofn/  
PW=password, CT=n,  
M=m, PN=packname,  
R=r, NA

Allows the originator of a permanent file to change any of several parameters without having to attach and redefine the file or retrieve and save it. The nfn parameter specifies the new file name to be assigned; ofn is the current file name. If file name is to remain the same, only ofn is specified.

DEFINE, lfn=pfm/  
PW=passwd, CT=n,  
M=m, R=r, S=space,  
PN=packname, NA

Allows a validated user to create a direct access permanent file and attach it in WRITE mode. If the optional keywords are omitted, the system assumes the following values.

PW	None
CT	PRIVATE
M	WRITE
R	} File is placed on
S	
	space available
PN	None
NA	Not applicable unless PN specified

GET, lfn=pfm/UN=  
username, PW=passwd,  
PN=packname, R=r,  
NA

Retrieves a copy of the specified permanent file for use as a working file. Used only for indirect access permanent files.

LIBRARY, lfn=pfm/  
PW=passwd,  
PN=packname

Retrieves a copy of the specified permanent file (indirect access only) from the catalog of special user number LIBRARY. File selected becomes the new primary file and all current working files are released unless ND keyword is included (previous primary file is always released). Indirect access files in the catalog of user number LIBRARY may also be accessed with the following commands.

GET, lfn=pfm/UN=LIBRARY...

OLD, lfn=pfm/UN=LIBRARY...

Direct access permanent files in the catalog of user number LIBRARY may be accessed via the following command.

ATTACH, lfn=pfm/UN=LIBRARY...



OLD, lfn=pfm/  
UN=usernum,  
PW=passwd,  
PN=packname, ND

Retrieves a copy of the specified permanent file (indirect access only). This file becomes the new primary file and all current working files are released unless ND keyword is included (previous primary file is always released). If a specific subsystem is associated with the file, it is selected automatically.

PACKNAM, PN=  
packname  
or  
PACKNAM, pack-  
name

Enables validated users to direct subsequent permanent file requests to auxiliary device specified by the packname parameter. To access normal family devices again, packname parameter must be set to zero as follows:

PACKNAM or  
PACKNAM, PN=0

PERMIT, pfn,  
usernum<sub>1</sub>=m<sub>1</sub>,  
usernum<sub>2</sub>=m<sub>2</sub>, ...,  
usernum<sub>n</sub>=m<sub>n</sub>/  
PN=packname,  
R=r, NA

Grants usernum<sub>i</sub> permission to access private file pfn. If the permission mode (m<sub>i</sub>) is omitted, the system assumes read-only permission.

PURGE, pfn/UN=  
usernum, PW=passwd,  
PN=packname, R=r, NA

Evicts the specified permanent file from permanent file storage.

REPLACE, lfn=pfm/  
UN=usernum, PW=  
passwd, PN=pack-  
name, R=r, NA

Allows validated users to replace the contents of a permanent file (pfn) with the contents of a working file (lfn). If file pfn does not exist, a new permanent file is created. Used only for indirect access permanent files.

SAVE, lfn=pfm/  
PW=passwd,CT=n,  
M=m,PN=packname,  
R=r,NA

Allows a validated user to retain a copy of the specified working file in the permanent file system. This command is used only to create indirect access permanent files. If a subsystem other than NULL is active when the primary file is saved, that subsystem becomes associated with the permanent file and is selected automatically in subsequent requests for that file. If the optional keywords are omitted, the system assumes the following values.

PW	None
CT	PRIVATE
M	WRITE
PN	None
R	} Not applicable unless PN is specified
NA	

## REMOTE JOB ENTRY COMMANDS

SUBMIT  
(lfn, q, NR)c

Allows a validated user to create a batch job deck image and submit it to the local batch queue as a deferred batch job. This remote job entry capability also provides reformatting directives to aid the user in preparing his job.

- lfn    Name of file to be submitted for processing as a deferred batch job. If lfn is omitted, the system assumes that lfn is the current primary file.
- q       Specifies disposition of job output as follows:
- B    Job output is disposed to local batch queue to be printed, punched, etc., at the central site.
  - N    Job output is disposed to local batch queue, but is dropped at job termination. This option is assumed by default.

- E Job output is disposed to Export/Import queue for printing at a remote batch terminal.
- NR No rewind option; inhibits rewind of file specified by reformatting directive cREAD. If omitted, file is automatically rewound.
- c Escape character used to identify reformatting directives in the file to be submitted (lfn). If omitted, the system assumes c=.

Each line in the submit file (lfn in the SUBMIT command) preceded by an escape character is recognized by KRONOS as a reformatting directive. The reformatting directives available are described as follows:

- cJOB Indicates that the submit file is to be reformatted. This directive must be the first line of the submit file. In addition, the first two lines following this directive must be a JOB and USER card, respectively. If the cJOB directive is omitted, the submit file is not reformatted.
- cEOR Indicates that an EOR mark is to be placed at this point in the submit file during reformatting.
- cEOF Indicates that an EOF mark is to be placed at this point in the submit file during reformatting.
- cSEQ Indicates that line numbers will be removed from all subsequent lines during reformatting (default value).
- cNOSEQ Reverses effect of cSEQ directive; no attempt is made to remove leading line numbers from subsequent lines.
- cPACK Indicates that all succeeding internal EOR and EOF marks be removed during reformatting (default value). Directive applies only to internal EOR and EOF marks that currently exist; the cEOR and cEOF reformatting directives are not affected.

cNOPACK	Reverses the effect of the cPACK directive; internal EOR and EOF marks are not discarded.
cTRANS	Indicates that all reformatting directives following this directive are processed until first line that does not contain a reformatting directive is encountered. This selects transparent mode whereby all subsequent reformatting directives are ignored until an internal EOR or EOF mark is encountered. Directives are then processed again until first line not containing a directive is encountered. This causes transparent mode to be reset unless a cNOTRANS directive was encountered. The cPACK or cNOPACK directive remains in effect during transparent mode; cSEQ or cNOSEQ does not.
cNOTRANS	Reverses the effect of the cTRANS directive and informs the system that the submit file is to be examined on a line-by-line basis during reformatting (default value).
cREAD, lfn	Requests that the system read the entire contents of the specified file (lfn) and insert it in place of the cREAD directive in the submit file during reformatting. If lfn is omitted, TAPE1 is assumed by default.
cREWIND, lfn	Requests that file lfn (specified in cREAD directive) be rewound to BOI. If lfn is omitted, TAPE1 is assumed by default.
c <sub>1</sub> EC=c <sub>2</sub>	Indicates that the escape code character is to be changed from c <sub>1</sub> (current escape code) to c <sub>2</sub> (new escape code).

## PAPER TAPE INPUT FORMATS

Program Mode	User ends each program line with: RETURN, LINE FEED, RUBOUT, RUBOUT, RUBOUT
--------------	---

Command Mode      User ends each command line with:  
                    RETURN, LINE FEED, CTRL/  
                    X-OFF, RUBOUT, RUBOUT,  
                    RUBOUT

Data Mode          User ends each data line with:  
                    RETURN, LINE FEED, CTRL/  
                    X-OFF, RUBOUT, RUBOUT,  
                    RUBOUT

## **TEXT EDITOR (EDIT) COMMANDS**

## COMMAND FORMAT

<command word><mode tag><string field(s)>;<n>\$  
<comments>

command word	One of the 22 commands available. Refer to EDIT Command Words.
mode tag	S for a string mode command; omitted for a line mode command †
:	Specifies the presence of string field(s)†
string field(s)	Series of characters which specify areas within the text to be edited. String fields must be enclosed by delimiting characters and separated by a comma. †
;	Precedes the n parameter; omitted when an n parameter is not specified
n	This parameter specifies one of the following: <ul style="list-style-type: none"><li>● Number of lines or occurrences of string fields on which an ALIGN, BLANK, CHANGE, DELETE, EXTRACT, FIND, or RS command is to be performed.</li><li>● Number of lines forward or backward that the search pointer is to be moved with the SET command.</li><li>● Length of a file or width of a line (LENGTH or WIDTH commands). An asterisk (*) instead of a number for the LENGTH command restores previously truncated information to the edit file.</li><li>● Point in the file where data is to be inserted with an ADD, INSERT, or MERGE command.</li></ul>

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†Refer to Summary of EDIT Commands and Formats for additional information.

- When omitted, n is assumed to equal 1 if applicable. An asterisk (\*) instead of a number indicates operation is to be performed at or to the end of the edit file.

No n parameter is specified in a CLEAR, DEFTAB, END, LINE, LISTAB, NUMBER, RESET, or TAB command.

\$ The dollar sign must precede any comments the user wishes inserted in the command.

## EDIT COMMAND WORDS

ADD(S) or A(S)	Specifies position(s) in edit file at which new data is to be inserted. User enters new data in response to ENTER TEXT request which results.
ALIGN or AL	Eliminates extraneous blanks from the edit file while retaining the structural integrity of words, sentences, and paragraphs.
BLANK(S) or B(S)	Replaces a specified string, line, or set of lines with blank characters. Unlike the DELETE command, BLANK does not relocate text.
CHANGE(S) or C(S)	Specifies position(s) of data in the edit file that is to be replaced by new data. Length of new data is independent of data it replaces and is entered in response to ENTER TEXT request which results.
CLEAR or CL	Removes all data from the string buffer. If this is not done, information from subsequent EXTRACT operations is appended to the information from previous EXTRACT operations.
DEFTAB or DT	Defines a single tab character that is later used (when responding to an ENTER TEXT request) to cause blank fill to the next tab stop.



DELETE(S) or D(S)	Erases one or more occurrences of a particular string of characters, one or more lines containing a particular string of characters, or one or more entire lines. The text is realigned leaving no excess blanks.
END	Terminates text editing and returns control to the subsystem currently in use.
EXTRACT or E(S)	Copies information from the edit file into the string buffer. The contents of the edit file are not affected.
FIND(S) or F(S)	Locates, advances search pointer to, and lists the specified line or last of n lines that contain a specified string in the edit file.
INSERTS or IS	Inserts new data into the edit file at a place specified by the user. Data to be inserted is embedded within the command.
LENGTH	Resets the dimensions of the edit file by limiting the number of lines on which other edit commands can operate and also resets the search pointer to the first line.
LINE or LN	Provides message indicating current position of the search pointer.
LIST or L	Provides listing of all or selected portions of the edit file.
LISTAB or LT	Provides listing of the tab stops specified in the most recent TAB command.
MERGE or M	Causes the contents of a specified file (working or permanent) to be merged into the edit file.
NUMBER(S) or N(S)	Provides a count of lines in a file or a count dependent upon the presence of a specified string of characters. Count begins at current position of search pointer.

RS	Replaces data already present in the edit file with new data. This command is similar to the CHANGE command except that only string replacements can be performed and replacement data is embedded in the command.
RESET or R	Resets the search pointer to the beginning of the edit file.
SET or S	Moves the search pointer the specified distance forward or backward in the edit file.
TAB or T	Sets tab stops at specified print columns. Default column numbers are 11, 18, 30, 40, and 50.
WIDTH or W	Defines the maximum number of character columns that can be contained in a single line of the edit file. This command is effective only when followed by the ALIGN command.

## SUMMARY OF EDIT COMMANDS AND FORMATS

```

ADD(S)
ADD(S);n
ADD(S):/string/
ADD(S):/string/;n

ALIGN
ALIGN;n
ALIGN:/string/
ALIGN:/string/;n
ALIGN:/string1/, /string2/
ALIGN:/string1/, /string2/;n

BLANK(S)
BLANK(S);n
BLANK(S):/string/
BLANK(S):/string/;n
BLANK(S):/string1/, /string2/
BLANK(S):/string1/, /string2/;n

CHANGE(S)
CHANGE(S);n
CHANGE(S):/string/
CHANGE(S):/string/;n
CHANGE(S):/string1/, /string2/
CHANGE(S):/string1/, /string2/;n

```

```
CLEAR

DEFTAB
DEFTAB:/tabchar/

DELETE(S)
DELETE(S);n
DELETE(S):/string/
DELETE(S):/string/;n
DELETE(S):/string1/, /string2/
DELETE(S):/string1/, /string2/;n

END

EXTRACT
EXTRACT;n
EXTRACT:/string/
EXTRACT:/string/;n
EXTRACT:/string1/, /string2/
EXTRACT:/string1/, /string2/;n

ES
ES;n
ES:/string/
ES:/string/;n
ES:/string1/, /string2/
ES:/string1/, /string2/;n

FIND(S)
FIND(S);n
FIND(S):/string/;n
FIND(S):/string1/, /string2/;n

INSERTS:/string1/, /string2/;n

LENGTH;n
LENGTH;*

LINE

LIST(S)
LIST(S);n
LIST(S):/string/
LIST(S):/string/;n
LIST(S):/string1/, /string2/
LIST(S):/string1/, /string2/;n

LISTAB

MERGE:/lfn/;n
MERGE:/lfn/, /string/;n
```

NUMBER(S)  
NUMBER(S):/string/  
NUMBER(S):/string1/, /string2/

RS  
RS:/string/  
RS:/string/;n  
RS:/string1/, /string2/  
RS:/string1/, /string2/;n

RESET

SET  
SET;n  
SET;-n  
SET:/string/  
SET:/string/;n

TAB  
TAB:/t<sub>1</sub>, ..., t<sub>n</sub>/

WIDTH;n

## **EXPORT/IMPORT COMMANDS**

Each Export/Import command is processed after the user presses the **SEND** key.

AGAIN, nnn A, nnn	Rewinds the output file being printed and continues printing. nnn is the number of sectors to backspace divided by $10_8$ ( $1 \leq nnn \leq 777$ ). If nnn is omitted, the entire output file is reprinted.
CONTINUE C	Restarts a print operation after a SUSPEND command.
DROP, jobident D, jobident	Discontinues central site processing of jobident.
END, ee E, ee	Aborts the job being read from the card reader (ee=CR) or line printer (ee=LP).
GO G	Indicates the user has refilled the card hopper.
IGNORE I	Restarts the operation interrupted by the INTER key.
LOGIN, usernum, passwd, famname	Allows the user to establish communications with KRONOS. The usernum and passwd parameters identify the users account (user) number and password, respectively.
L, usernum, passwd, famname	The famname parameter identifies the users permanent file family and is necessary only when the user logs into a system providing backup support for another KRONOS system.
READ, x R, x	Initiates input from the terminal card reader. x is an optional parameter that requests jobident to return to the station.
SUSPEND S	Stops a print operation but saves the current file position.
<b>SEND</b>	User presses this key to perform the same function as the IGNORE command.

## MESSAGES

## TIME-SHARING ERROR MESSAGES

<u>Message</u>	<u>Description</u>
APPEND ERROR.	An error was encountered when appending a file.
ARGUMENT ERROR.	An invalid CONVERT control state- ment option was specified.
BUFFER ARG. ERROR.	Address of information for perman- ent file manager was in error.
CATALOG OVERFLOW - FILES.	User has exceeded the number of permanent files he is allowed.
CATALOG OVERFLOW - SIZE.	User has exceeded the mass stor- age area allowed for indirect access permanent files.
CHARGE FILE BUSY.	File is not available for charge purposes; wait and try again.
CHARGE ILLEGAL AT THIS HOUR.	Project number used is not valid at this time of day.
CHARGE REQUIRED.	Charge number and project num- ber required in order to complete log-in sequence.
COMMAND NOT UNIQUE.	The characters supplied are not unique to one command.
CONTROL STATEMENT LIMIT.	The number of control statements processed has exceeded the limit for which the user was validated.
CONVERSION NOT FOUND.	The specified TS conversion table was not found.
CONVERSION NOT SPECIFIED.	Neither the TS or 64 parameter was specified on the CONVERT control statement.
DEVICE UNAVAILABLE.	User is attempting to access per- manent files on a device not avail- able for access.
DIRECT ACCESS DEVICE ERROR.	User is attempting to DEFINE or ATTACH direct access permanent file on a device not available for access.



<u>Message</u>	<u>Description</u>
EOF ENCOUNTERED BEFORE TERMINATION.	An end-of-file was encountered on the convert input file before the specified record count was exhausted.
EOI ENCOUNTERED BEFORE TERMINATION.	An end-of-information was encountered before the specified record count was exhausted.
EMPTY CATALOG.	No files exist for the options specified in a CATLIST command.
ERROR IN xxxxxxx ARGUMENTS.	The command string given contained a syntax error. xxxxxx is the name of the system program issuing the diagnostic. This is similar to ILLEGAL PARAMETER.
ERROR IN FILE TYPE.	File type specified was not recognized (for example, CT=SEMI instead of CT=SPRIV).
ERROR IN MODE.	Mode specified was not recognized.
ERROR IN PFILE ARGUMENTS.	An argument for permanent file request was illegal (refer to ILLEGAL PARAMETER message also).
EXECUTE ONLY FILE.	The user has only an E permission level on the file.
FILE NAME CONFLICT.	The convert input and output file names specified are the same.
FILE NAME ERROR.	The file name must contain only alphanumeric characters.
FILE NAME MISSING.	A file name must be specified before a listing containing the permit information can be obtained with a CATLIST command.
FILE NOT SORTED.	Primary file has one or more lines with nonnumeric line numbers. Use SORT, lfn command to obtain more informative diagnostics.

<u>Message</u>	<u>Description</u>
FILE TOO LONG.	Limit for length of indirect access permanent file has been exceeded, or limit for length of direct access file has been exceeded prior to attaching it in write, modify, or append mode.
FILE TOO LONG TO SORT.	Primary file is too long to be sorted automatically by the system. Use SORT, lfn command to obtain more informative diagnostics.
FL TOO SHORT FOR PROGRAM.	Self explanatory; increase field length with RUN command (or RFL statement in BATCH subsystem).
ILLEGAL CHARGE.	Either charge or project number does not exist, or the project number entered is not available to this user number.
ILLEGAL COMMAND.	The command name entered is not a valid command.
ILLEGAL LIST OPTION.	The list option specified in a CATLIST command is illegal.
ILLEGAL PARAMETER	May indicate: <ul style="list-style-type: none"> <li>● Parameter is outside legal bounds.</li> <li>● Parameter is not one of the acceptable sets for the command.</li> <li>● Parameter referenced does not exist.</li> </ul>
ILLEGAL TERMINAL.	The user has attempted unsuccessfully four times to log-in to the system. After this message is issued, the terminal is automatically disconnected from the system.
ILLEGAL USER ACCESS.	User has either attempted an operation that he has not been validated to perform or has exceeded his validation limits.

<u>Message</u>	<u>Description</u>
ILLEGAL WRITE ON APPEND ONLY FILE.	User has attempted to write on a permanent file with append-only permission to the file.
ILLEGAL WRITE ON MODIFY ONLY FILE.	User has attempted to write on a direct access file with modify-only permission to the file.
ILLEGAL WRITE ON READ ONLY FILE.	User has attempted to write on a permanent file with read-only permission to the file.
IMPROPER LOGIN, TRY AGAIN.	The user number, password, or family name was not accepted by the system. Either the entries themselves were invalid, or the user made a mistake in entering them at the terminal.
lfn EMPTY.	File contains no data.
lfn NOT ON MASS STORAGE.	The user has attempted to save a file that does not reside on mass storage.
LOCAL FILE LIMIT	User's local file limit was exceeded during an attempt to define a new file or retrieve an existing permanent file.
MESSAGE † LIMIT.	The number of job dayfile messages issued by the job has exceeded the limit for which the user was validated.
nnnn RECORDS CONVERTED.	nnnn records were converted.
NO CONNECT TIME AVAIL- ABLE.	Terminal connect time allowed under this project number has been expended.

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† Message functions issued by compilers or applications programs that run at the user job's control point are also counted as user dayfile messages.

<u>Message</u>	<u>Description</u>
NO CPU TIME AVAILABLE.	Central processor time allowed under this project number has been expended.
NO PRIMARY FILE.	The user has attempted an operation which requires a primary file when there was none defined.
OUTPUT FILE LIMIT.	The number of files disposed to output queues by the user's job has exceeded the limit for which the user was validated.
pfm ALREADY PERMANENT.	The specified file already exists (use REPLACE).
pfm BUSY.	The file to be attached is currently assigned to another user in conflicting mode.
pfm NOT FOUND.	The permanent file specified does not exist. If this message occurs in response to the CATLIST command, pfm may specify a user number.
PERMISSION NOT GRANTED.	The user does not have WRITE or APPEND permission on the specified permanent file.
PF UTILITY ACTIVE.	Permanent file utility (PFLOAD, PFDUMP, etc.) operation is currently taking place. Permanent file commands (OLD, LIBRARY, GET, etc.) are aborted. Control statements entered in the BATCH subsystem are placed on recall until the utility operation is complete.
PFM ILLEGAL REQUEST.	An illegal request was issued to the permanent file manager.
PRU LIMIT.	The job's mass storage PRU limit was exceeded during the making of a local copy of an indirect access file or during a write extension of an existing file.

<u>Message</u>	<u>Description</u>
RECORD SIZE EXCEEDS 500.	The maximum line length in a record to be converted is 500 <sub>10</sub> characters.
RESERVED FILE NAME.	File name is reserved by the system (for the user's protection).
TIME OUT	System has been waiting for an entry from terminal for more than 10 minutes. Following this message, the user is logged off and the terminal is disconnected.
TOO MANY PARAMETERS.	The user has submitted more parameters than the command allows.

### ERROR MESSAGES FOR SYSTEM MALFUNCTIONS

The following messages indicate system error conditions.

<u>Message</u>	<u>Description</u>
DATA BASE ERROR.	An error in the structure of the validation file has been detected. Report this error to the computer center immediately.
ROLLIN FILE BAD.	If this message is received, the user should log-off immediately. If he desires to continue, he may log-in again. The user should report this malfunction to the computer center and supply all terminal output since log-in, if possible.
SYSTEM ERROR.	This error message should never appear. If it does, the user should report the malfunction to the computer center and supply all terminal output since log-in, if possible.

## TEXT EDITOR (EDIT) ERROR MESSAGES

<u>Message</u>	<u>Description</u>
PHRASE NOT FOUND.	The search string specified in /string/ was not found in the edit file.
ILLEGAL COMMAND.	The command word is invalid.
cmd SYNTAX ERROR.	String and/or n parameter is illegal with command cmd.
ILLEGAL FILE NAME.	The file name passed with MERGE command is illegal.
MERGE ERROR, SECONDARY FILE EMPTY.	The file to be merged with edit file is empty, does not exist, or is a direct access file that was not attached to the user's job prior to entering the Text Editor.
RESERVED FILE NAME.	The file name passed with MERGE command or when invoking Text Editor is reserved for use by KRONOS. Reserved file names are: INPUT, OUTPUT, SCR, SCR1, SCR2, SCR3, SCR4, SCR5, and the name of the current edit file.
CONTROL CARD ERROR.	More than one parameter was passed when calling the Text Editor.

## EXPORT/IMPORT MESSAGES

<u>Message</u>	<u>Description</u>
●●●●●●	Export/Import accepts the last operator command.
CARD READER NOT READY	The reader is empty and the last card read was not an EOI card. Fill the input hopper, press LOAD button, and enter a GO command or an END command.

<u>Message</u>	<u>Description</u>
ILLEGAL COMMAND	The operator has typed in an illegal Export/Import command.
INVALID USER NUMBER	The user number supplied in the LOGIN command is unknown to the system.
JOBID=xxx. TYPE I TO GO	The optional parameter on the READ command was selected. xxx is the jobident for this job necessary for the DROP command.
JOB NOT FOUND	The job identified on the DROP command is unknown to the system.
NO FILE IS SUSPENDED	A CONTINUE command was sent but a file is not suspended.
NO INPUT ACTIVE	A READ command must be active before a GO command is effective.
NO OUTPUT FILE	Export/Import has received a SUSPEND command but no output file is currently active.
PLEASE LOGIN	Subscriber must log-in before typing any other command.
PRINTER NOT READY	The printer cannot complete printing of a file.
TERMINAL IDLE	No activity is currently taking place at this terminal.
USER NUMBER BUSY	The user number supplied on the LOGIN command is not in use at another terminal. Only one terminal can be logged in at one time under a single user number.
WAITING FOR STORAGE	Buffer space is currently unavailable to Export/Import at the central site. The READ command is held active until storage is available. Enter END, <b>CB</b> to rescind a READ command if this message persists.
***IDLE yy/mm/dd hh, mm, ss, tx	The terminal is connected to the central site and is communicating with Export (tx specifies the line to which the terminal is connected and is used only for program maintenance).

**NOTES**