RTE-IVB QUICK REFERENCE GUIDE

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A

SYSTEM AND BREAKMODE COMMANDS

AB,optn — --

Abort currently executing batch job. Under session, the command is valid only when entered from the system console.

optn	0 Disc tracks not released. 1 Release all disc tracks.

AS,program,partition# — 50

Assign a program to always execute in same partition. To unassign, set partition = 0.

BL — 10

Examine current buffer limits

BL[,lower[,upper]] — 60

Modify current buffer limits.

lower	Limit specified in number of words (default=0).
upper	Limit specified in number of words (default=existing limit).

BR[,program] — 10/60

Set break flag for any program in user's session. User programs tests for a set break flag with subfunction I=IFBRK (DUMMY). Required capability (Default=current session program.)

Set break flag in any program in the system. Requires capability of 60.

DN,,lu — 60

Set I/O device down.

lu	system logical unit.

DN,eqt — 60

Set I/O controller down.

eqt	equipment table entry number.

EN,mstr scty code[,option] --

Enable system console as a session terminal. Command only valid when entered from the system console.

mstr scty code Two character FMP master security code.

option 0 master security code not required in "OP" commands (default).
1 master security code is required in "OP" commands.

EQ,eqt 10

Print description and status of an I/O controller. Status information is printed as.

select code DV.nn D B Unn status

select code is the I/O select code number.

DV.nn is the driver routine.

D is D if DMA required; 0 if not.

Unn is B if automatic output buffering; 0 if not.

status is the logical status:
0 = available.
1 = I/O controller down.
2 = I/O controller busy.
3 = waiting for DMA assignment.

UNbuffer
EQ,eqt, 60
BUffer

Change the automatic buffering designation for a particular I/O device.

FL 10

Eliminate buffered output to a session terminal. Only valid in break mode, and not valid from system console.

GO[IH][,program][,pl[,...[,p5]]]]] 30/60

Reschedule any program in users session, where parameters are passed by program only when it has suspended itself. GOIH inhibits passing of command string. Requires capability of 30.

Reschedule any program in the system. Requires capability of 60.

HE[,keyword[,lu]]

1

Detailed error explanation.

keyword an eight character error code (default=last error logged).

lu device for explanation (default=user's terminal).

IT,program[,res,mpt[,hr,min[,sec[,tms]]]]

50

Set automatic execution time value for a program. ON command must follow to schedule the program. Not specifying optional parameters removes "program" from the timelist (program must be dormant).

res resolution code:

1 tens of ms
2 seconds
3 minutes
4 hours

mpt multiplier (0-4095) used with res.

hr,min
sec,tms Initial start time.

LU,lu

60

Print EQT entry number, device subchannel number, associated with a system lu, and whether the device is up or down. See SL command for similar function.

LU,lu,0

60

Reassign system lu to be bit bucket.

LU,lu,eqt[,subchannel #]

60

Reassign new EQT entry number to system lu. If EQT number has subchannels, use subchannel #.

OF,program[,numb]

30/60

Terminate a session program. Requires capability of 30.

Terminate any program in the system. Requires capability of 60.

numb 0 remove from time list; disc tracks not released (default).

1 terminate immediately; release disc tracks

8 terminate immediately and permanently from system (must be issued to segments as well as the main).

ON[IH],program[,NOW][,parameters] 50

Schedule a program for execution. Program's entry in time list is affected. ONIH inhibits passing of command string.

NOW	Schedule program immediately.
parameters	1-5 parameters passed to program when it is scheduled.

OP[,mstr scty code[,command]] --

Enter a system level command from a low capability session. Command only valid when entered from the system console.

mstr scty code	Two character FMP master security code. If specified in the "EN" command the security code is required.
command	The system command to be executed.

PR,program,priority 50

Change program priority where priority = 1-32767 (decimal).

QU[,quantum[,limit]] 10/60

Examine system timeslice quantum and fence. Requires capability of 10.

Modify system timeslice quantum and fence. Requires capability of 60.

quantum	system timeslice quantum, value 0-32767 millisecs (default=1500).
limit	priority level fence to begin timeslicing (default=50).

RS 10

Abort and reschedule a session's copy of FMGR.

RT,program 30

Release all disc tracks assigned to a program.

RU[IH],program[,parameters] 30

Schedule a program for immediate execution. Program's entry in time list is not affected. 1-5 parameters are optionally passed to program when it is scheduled. RUIH inhibits saving of command string. The breakmode RU actually runs "program" not a renamed copy of "program".

SL[,lu] $\boxed{10}$

Display session lu information.

lu session lu for which linkage information is desired. (Default=information for all session lu's in user's session switch table.)

SS[,program] $\boxed{30/60}$

Suspend non-dormant session program. Requires capability of 30. If program name not specified, the current session program is suspended.

Suspend non-dormant system program. Requires capability of 60.

ST,name $\boxed{10}$

Determine status of named program. Status is printed as:

pr S res mpt hr min sec ms T

pr Decimal priority.

S current state of program:

0 Dormant
1 Scheduled
2 I/O suspend
3 General wait
4 Unavailable memory suspend
5 Disc allocation suspend
6 SS or EXEC 7 suspend
9 Background segment

res/mpt/hr/min/sec/ms 0 or time program is next scheduled to run.

T Program currently in time list.

ST[,numb] $\boxed{10}$

Determine name or partition number of program currently executing.

numb 0 — Display name and partition number of program currently executing in memory. 0 displayed if none executing.

Partition # — Display name of program currently residing in that partition. 0 if none.

SZ,program $\boxed{30}$

Display the named program's size information as follows:

AAAAA BB CCCC DD

AAAAA	last word plus 1 of program.
BB	required partition size. Program code + EMA.
CCCC	EMA size (EMA programs only).
DD	MSEG size (EMA programs only).

SZ,program,size[,MSEG size] $\boxed{30}$

Change size of "program".

program	program name.
size	Non-EMA program: required program size. EMA program: required EMA size.
MSEG size	new MSEG size (EMA program only).

TE,message $\boxed{10}$

Send message to system console.

TI $\boxed{10}$

Print current year, Julian day and time.

TM,year,day[,hr[,min[,sec]] $\boxed{60}$

Set real time clock.

year	four digits (e.g., 1957).
day	three digits Julian date (e.g., 063 = March 4).

TO,eqt[,numb] $\boxed{10/60}$

Examine device time out parameters. Requires capability of 10.

Change device time out parameters. Where numb is number of 10 ms intervals used as new time out value. Requires capability of 60.

UP,eqt

10

Make I/O controller (and all associated lu's) available.

UR,partition

50

Release reserved partition.

WH[,lu[,option]]
or
WH[,option]

10

Schedule WHZAT program.

lu the session lu for display. (default=user's terminal).

option
default User's session programs.
AL Display status of all suspended and scheduled programs.
SM Similar to AL except, state 3 programs without father son relationships are not listed.
PA Display status of all partitions.

SECTION

B

FMGR COMMANDS

PARAMETERS

namr=name[:security[:cartridge
[:type[:file size[:record size]]]]]

or

namr=logical unit number

security
- <0 Write and read protected
- 0 Not protected (default)
- >0 Write protected

cartridge
- <0 lu number
- 0 First available cartridge (default)
- >0 FMGR cartridge reference number

file type
- 0 Non-disc file
- 1 128-word record length, random access
- 2 User selected record length, random access
- 3 (and greater) variable record length, sequential access
- 4 Source program
- 5 Relocatable program
- 6 RTE load module
- 7 Absolute program
- >7 User defined

file size Specified in blocks (2 sectors = 1 block = 128 words).
- +n = allocate n blocks.
- −n = allocate n 128 block multiples.
- −1 = allocate remaining space on cartridge.

record size Used only when file is type 2.

SCHEDULING FMGR

RU,FMGR[,namr[,list[,severity code[,log]]]]

namr File name or lu containing command input.

log lu of log device (default=input or LU1).

list lu of list device (default=LU1).

severity code Display commands and error codes.
- 0 Display all commands and errors (default).
- 1 Display no commands, all errors.
- 2 Display no commands, no errors except those requiring response. Terminates job on serious error.
- 3 Same as 2 except job not terminated.
- 4 Display no commands, no errors, and do not abort job.

AC,crn[,P/G[,size[,id[,# dir. tracks]]]] 10

Allocate a cartridge to the session user from the spare cartridge pool,

crn	Cartridge reference number to be assigned to the allocated cartridge.
P/G	Private (P) or group (G) cartridge designation (default=P).
size	Number of tracks needed on cartridge.
id	ASCII identifier of cartridge (default=DC00XX;XX is system lu number of terminal).
#dir. tracks	# of tracks used by file directory (default=1).

AN,message 20

Print message on list device.

CA,global#[,pl[opl,p2[...,op(n),p(n+1)]]] 40

Calculate global parameter values.

global#	Integer preceding G in G-type global, or "integer:P" for P-type globals.
pl-pn	Values used in calculations; if omitted, global is nulled.
opl-opn	Operations performed on operands pl-pn.

+ add two operands
− subtract second operand from first
/ divide second operand by first
* multiply two operands
O OR
X XOR (exclusive OR)
A AND

CL[AL] 10

Display list of user accessible cartridges.

AL	Display list of all cartridges in system.

CN[,namr[,function[,subfnctn]]] 20

Issue control request to non-disc device.

namr Type 0 file name or lu (default=LU8).

function Control code, mnemonic (for octal see EXEC 3 call).

mnemonic

RW	rewind (default=MT,CTU)
EO	end-of-file
TO	top-of-form (default=LP,CRT)
FF	forward space file
BF	backspace file
FR	forward space record
BR	backspace record
LE	leader (default=paper tape punch)

subfnctn Carriage control.

+n to space n lines before next print operation.

−n page eject on line printer or space −n lines on terminal.

CO,cartridge1,cartridge2 20

Copy all files from active cartridge 1 to active cartridge 2.

CR,namr 20

Create a disc file — data not transferred, namr subparameters required:

file type (must not be 0).
file size (must not be 0).
record size (when type=2).

```
           REad ,BSpace,EOf    ,BInary
CR,namr,lu,WRite,FSpace,LEader,AScii
           BOth ,BOth   ,PAge  ,cntrl          20
                        ,cntrl
```

Create a non-disc (type 0) file — data not transferred.

namr	File name, security code, and crn.
lu	Lu of non-disc device (positive).
REad WRite BOth	Legal input/output (no default).
BSpace FSpace BOth	Legal spacing (default=FS for READ devices, no space all others).
EOf LEader PAge cntrl	Control subfunction (default=EO for mass storage devices, LE for paper tape punch, PA for line printer).
BInary AScii cntrl	Type of data (default=AS).

CS,lu,attribute   30

Modify or change spool options set up by SL command.

lu	Lu defined at set up.
attribute	One of the following:

RWind	reset file to first record
PUrge	change SAve flag to PUrge
SAve	change PUrge flag to SAve
PAss	remove HOld option
ENd	write EOF and terminate spool. Spool file placed in outspool queue (default).
BUffer	change to buffering
NBuffer	change to no buffering

NPass	change lu and/or priority information, by specifying the 2 additional parameters:
	[,outlu[,priority]]
	outlu = new lu.
	priority = new priority.

CT,name[,function[,subfnctn[,message]]]

20

Issue control request to terminal.

name Type 0 file or terminal lu number.

function/
subfnctn Octal code:
11B Space down a specified number of lines.
subfunction:

0 skip 2 lines.
+n skip n lines.
−n skip n lines.

20B Enable terminal (default)
21B Disable terminal
22B Set time out. Subfunction: value in units of 10 msecs.

message Message to be written to terminal.

DC,cartridge[,RR]

10

Logically remove a cartridge from session user's environment by setting inactive bit in session control block. Non-session, deletes entry in system cartridge list.

cartridge Positive cartridge reference number or negative lu.

RR Session only — deletes cartridge entry in system cartridge list.

[,cartridge[,security]]
DL or
,namr[,security]

10

List the file directory of one or all of the mounted cartridges.

cartridge Cartridge reference number, positive for label or negative for lu. Zero or none specified lists all.

namr Mask specifying the file entries in the directory to be output. Minus signs (−) can be used as place holders for more flexibility.

security Two-character FMP master security code.

If the master security code is 0, default in command will not obtain long list showing security codes — a code (any code) must be supplied.

DP[,p1[,p2[,p3...[,pn]]]] 20

Display parameter value or global names. pl-pn are parameters to be displayed

DU,namr1,namr2[,record format[,file#[,#files]]] 20

Transfer data from an existing file or lu to another existing file or lu. Does not create namr2.

namr1 Source of data

namr2 Destination of data

record format Format of data or EOF control (default=namr1 format, or ASCII if non-disc device).

ASCII	ASCII records.
BReloc	Binary relocatable records with checksum.
BNary	Binary records without checksum.
BAbs	Binary absolute records with checksum.
MTape	Magnetic tape ASCII records.
MS	Magnetic tape SIO (System Input/Output) records are written on namr2. Standard records are expected on namr1.
MSBR	Magnetic tape SIO binary relocatable records (same as MS+BR).
MSBA	Magnetic tape SIO binary absolute records (same as MS+BA).
IHibit	Inhibits EOF on namr2 and leader punching.
SAve	Save embedded EOF's in namr1.

file# File or subfile on namr2 where transfer starts (default=1).

#files Number of files to be transferred from namr1 (default=1).

EX 1

Terminate FMGR.

```
    SP
EX,    [,RG[,KI]]                    1
    RP
```

Initiate log-off process.

SP/RP Save/release private cartridges.

RG Release group cartridges.

KI Abort any active session programs.

HE[,keyword[,lu]]

1

Detailed error code explanation.

keyword Identifiers related to error code (session default=last error posted). Non-session, keyword must be specified.

lu Device for explanation output (default=user's terminal).

IF,p1,xx,p2[,skip]

40

Compare two values (usually globals) and skip a specified number of commands. Command not allowed from interactive device, must be in procedure file or batch job.

p1,p2 Values to be compared.

xx ASCII operators as follows:

EQ pl = p2
NE pl = p2
LT pl < p2
GT pl > p2
GE pl ≥ p2
LE pl ≤ p2

skip Number of commands to skip (positive or negative). Use −2 to skip back to previous command (default=1).

IN,mstr scty code,crtrdge,lbl,id[,1st trk[,#dir trks[,#sec/trk[,bad trks]]]]

60

Initialize a cartridge.

mstr sec code Ignored if specified.

crtrdge Cartridge reference number, positive for label or negative lu. (Must be −lu if new.)

lbl New cartridge reference label and must be >0.

id Cartridge information label.

1st trk First track to be used on the cartridge. If LU2, must be 8 greater than last system track (default=track 0).

#dir trks Number of directory tracks (1 to 48), (default=1).

#sec/trk Number of 64-word sectors per track. If LU2/3, parameter is ignored.

bad trks Bad track list. Up to six track numbers separated by commas.

IN,master security code – – new security code 60

Change master security code. New code is separated from old code by two minus (–) signs.

LI,namr[,format[,ln1[,ln2]]] 10

List contents of a file or lu on list device.

format Specifies list format.

S Source (default for type 0,3,4 files).
B Binary (default for all other type files).
D Directory information only.

ln1 Starting line.

ln2 Ending line.

LL,namr 20

Change current assignment of list device, namr may be either file or lu number.

LO,lu 40

Change lu number of log device where lu is an interactive device.

MC,lu[,P/G[,size[,id[,#dir trks[,label]]]]] 10

Make an unmounted cartridge available for use.

lu Lu number of cartridge to be mounted, it must be in user's session switch table.

P/G Private or group cartridge (session default=P) non-session meaningless, but its space must be provided.

size # of tracks needed on cartridge.

id ASCII identifier of cartridge (default DC00XX; XX is system lu number of terminal).

#dir trks # of tracks used by the file directory (default=1).

label Cartridge reference number to be assigned to the cartridge.

ME[,namr[,clear]] 10

Display contents of user's message file.

namr File name or non-disc lu to receive messages (default=user's terminal).

clear 1 (clear message file).
0 (do not clear=default).

OF,program 30

Terminate program within caller's current session.

OF,program 60

Terminate any program within the system.

PA[,lu[,message]] 40

Suspend execution of the current job or procedure file, and transfer control to a specified device, and optionally print a message.

lu Lu to which control transfers (default=log device).

message 1-80 ASCII characters.

PK[,cartridge] 20

Recover tracks and directory entries assigned to purged files and close gaps between files.

cartridge Cartridge reference number, positive for label or negative for lu (default=all user accessible cartridges).

PU,namr 20

Remove a file and its extents from system.

RN,namr,nuname 20

Change a file name to a new name.

namr Existing file name and parameters.

nuname New name unique to the cartridge, namr subparameters may not be changed.

RP,namr,program[,pname] 30

Restore program file "namr" using the ID segment of "program", renaming the restored program to pname.

RP,namr[,pname] 30

Restore program file "namr", which must be a type 6 file on LU2/LU3, renaming the restored program to pname.

RP,,program 30

Release "program's" ID segment where "program" is a program with its ID segment in memory.

RT,program 30

Release all disc tracks assigned to a dormant program.

RU,program:IH[,parameters] 30

Schedule "program" for immediate execution, inhibit automatic renaming feature.

RU[IH],program[,parameters] 30

Schedule "program" for immediate execution. IH inhibits passing of command string.

program Name of program to be executed or namr of type 6 file containing program or procedure file to be executed.

parameters 1-5 parameters to be passed to program or 1-9 parameters passed to a procedure file.

SE[,p1[,p2[,...[p9]]] 40

Set or clear global parameters 1G-9G where p1-p9 are values to be converted to global parameters. If all parameters omitted, globals are nulled. If any one parameter omitted, corresponding global unchanged.

SL[,lu] 10

Display linkage information for session logical unit number.

lu Session logical unit number (default=list information for all session lu's in user's Session Switch Table).

SL,lu[,namr[,attribute[,outlu[,priority[,prog]]]]] 30/50

Spool setup and outspool control.

lu The session lu to which a spool file is to be associated. The lu must not be LU2 (system disc), LU3 (auxiliary disc), any lu associated with a disc driver, a spool lu, or if in a job system LU5 (standard spool input device).

namr Name of existing file to be used as a spool file (default=system assigns spool pool file).

attribute Defines characteristics of spool access. Any 3 attribute codes can be combined, no delimiters necessary.

attribute codes:

NO = Queue file for immediate outspool.
RE = Read only.
WR = Write only.
BO = Both read and write.
WN = Write now.
BU = Buffered.
PU = Purge.
SH = Write spool headers.
ST = Standard file format.

default for attribute codes:

	outlu specified	outlu not specified
namr specified	WRITE,HOLD, SPOOL HEADERS, SAVE	WRITE,HOLD, SPOOL HEADERS, PURGE
namr not specified	WRITE,HOLD, SPOOL HEADERS, SPOOL POOL FILE	BOTH,HOLD, STANDARD FORMAT,SPOOL POOL FILE

priority Outspool priority (default=session — 99, batch — priority of job).

prog If specified, program "prog" will be scheduled, with wait, by the spool system when spool lu is closed. Note the spool file will not be outspooled, "prog" must properly dispose of the file. Requires capability of 50.

outlu Session lu for outspooling.

SL,Session lu,system lu

30/50

Map a new session lu to system lu currently in the user's Session Switch Table. Requires capability of 30.

Add a System lu to user's Session Switch Table. Requires capability of 50.

System lu May be specified as — (a dash) to delete lu mappings which have been created during user's session.

SM,user,namr,message

10

Send message and/or file to another user's message file.

user Log on ID of message recipient, (user.group).

namr Name of file or non-disc lu containing data to be sent.

message String entered from sender's terminal.

,PR

SP,namr[or [,capability]]

,GR

30

Place a disc resident program and its ID segment in a type 6 file created by this command. Note that namr can not be an lu. First 5 characters of file name must be identical to disc program name. namr subparameters default to:

security	0
cartridge	first cartridge in cartridge list
file type	type 6
file size	size of program
record size	128

ST,namr1,namr2[,record format[,eof] [,file #[, #files]]]

20

Transfer data from an existing file or lu to another file or lu. namr2 created by this command.

namr1 Source of data.

namr2 Destination of data.

record format Format of data or EOF control (default=namr1 format or ASCII if non-disc device).

ASCII ASCII records.
BReloc Binary relocatable records with checksum.
BNary Binary records without checksum.
BAbs Binary absolute records with checksum.
MTape Magnetic tape ASCII records.
MS Magnetic tape SIO (System Input/Output) records are expected on namr1. Standard records are written on namr2.
MSBR Magnetic tape SIO binary relocatable records (same as MS+BR).

eof Eof control.

IHibit Inhibits EOF on namr2 and leader punching.
SAve Save embedded EOF's in namr1.

file # File or subfile on namr1 where transfer starts (default=1).

#files Number of files to be transferred from namr1 (default=1).

SV,severity[,global #][,IH]

20

Change the system log device severity code to a new number.

severity 0 display all commands and errors (default).
1 display no commands, all errors.
2 display no commands, no errors except those requiring response. A serious error terminates job.
3 display same as 2, except job not terminated.
4 display no commands, no errors, job not terminated.

global # Optional G global number (1-9) into which current severity code is to be placed.

IH Optional parameter to inhibit echo of command entry.

SYcommand

1

Execute RTE system command from FMGR.
Preface command by SY (use no delimiter, e.g., SYTI).

TE,message

10

Send message to the operator via the system console.

TR[,xfer[,parameters]]

1

Transfer control to a file or lu, passing parameters as globals.

xfer A negative integer that denotes a transfer back that many files, or the name of a file or lu.

parameters The parameters to be set into the globals (1G-9G). Skipped parameters are not changed.

WH[,lu[,option]]
or
WH[,option]

10

Schedule WHZAT program.

lu The session lu for display.

option	default	User's session programs.
	AL	Display status of all the suspended and scheduled programs.
	SM	Similar to AL except state 3 programs without father son relationships are not listed.
	PA	Display status of all partitions.

??[error#]

10

Request FMGR error code explanation.

error# FMGR error code (default=last error issued).

*COMMENT LINE

10

COMMAND STACKING

:Ln "n" is the number of lines to list (default is to list the entire command stack).

:P Display or edit the pending line in the command stack. Edit options are CNTL/R, CNTL/I, CNTL/S, CNTL/T and CNTL/C. See the Chapter on the Interactive Editor.

:n Position pending line to the "n"th line in the command stack.

:^n or Rn Position"n" lines preceding pending line.

:/n Position "n" lines past pending line.

:-n Delete "n" lines from command stack from the pending line.

Once a lines has been displayed as the pending line, it may be executed by typing a carriage return.

SECTION

C

BATCH AND SPOOLING COMMANDS

AB 30

Terminate batch job.

CS,lu,attribute 30

Modify or change spool options set up by SL command.

lu	lu defined at set up.
attribute	one of the following:

RWind	reset file to first record.
PUrge	change SAve flag to PUrge.
SAve	change PUrge flag to SAve.
PAss	remove HOld option.
ENd	write EOF and terminate spool. Spool file placed in outspool queue (default).
BUffer	change to buffering.
NBuffer	change to no buffering.

NPass	change lu and/or priority information, by specifying the 2 additional parameters:
	[,outlu[,priority]]
	outlu = new lu
	priority = new priority

EOJ[,RP[,RG]] 30

End of spooled job.

RP	Dismount job's private session cartridges. (Default=leave mounted.)
RG	Dismount job's group session cartridges. (Default=leave mounted.)

JOB[,name[:hr:min:sec][,user[,priority[,spool priority][,sp]]]] 30

Initiate job for spooling.

name Job name.

:hr:min:sec CPU time limit for job in hours, minutes, seconds.

user Session user account ID in the form "user.group/password". If a job is submitted outside of a session when session is installed this parameter must be specified.

priority Job priority in range from 1-255 (default = 99).

spool priority Outspool priority (default=priority).

sp Specify:

NO Outspool now,or
NS No outspooling.

SL,lu[,namr[,attribute[,outlu[,priority[,prog]]]]] 30/50

Spool setup and outspool control.

lu The session lu to which a spool file is to be associated. The lu must not be LU2 (system disc), LU3 (auxiliary disc), any lu associated with a disc driver, a spool lu, or if in a job system LU5 (standard spool input device).

namr name of existing file to be used as a spool file (default=system assigns spool pool file).

attribute defines characteristics of spool access. Any 3 attribute codes can be combined, no delimiters necessary.

attribute codes:

NO = Queue file for immediate outspool
RE = Read only
WR = Write only
BO = Both read and write
WN = Write now
BU = Buffered
PU = Purge
SH = Write spool headers
ST = Standard file format

default for attribute codes:

	outlu specified	outlu not specified
namr specified	WRITE,HOLD, SPOOL HEADERS, SAVE	READ, HOLD, STANDARD FORMAT, SAVE
namr not specified	WRITE,HOLD, SPOOL HEADERS, SPOOL POOL FILE	BOTH, HOLD, STANDARD FORMAT, SPOOL POOL FILE, PURGE

priority Outspool priority (default=session-99, Batch-priority of job).

prog If specified, program "prog" will be scheduled, with wait, by the spool system when spool lu is closed. Note the spool file will not be outspooled, "prog" must properly dispose of the file. Required capability of 50.

outlu Session lu for outspooling.

RUN,JOB,namr [,priority] 30

Run batch job.

namr File name of file containing single job to be spooled, or logical unit of input device containing jobs to be spooled; (default=session terminal, or logical unit 5 if outside of session).

priority Priority of job (default=99).

TL:hr:min:sec 30

Set run time limit.

:hr:min:sec Time limit for execution of any programs with RU command subsequent to TL command. If omitted, job time limit is used.

XE,namr[,priority] 30

Job input control.

namr Identifies input device containing a job to be placed in job queue, may be a logical unit or the name of an existing file.

priority Job priority (default=99).

SECTION

D

GASP COMMANDS

CONTENT PAGE

RU,GASP[,lu]

Schedule GASP to prompt for command from lu (default=user's terminal).

RU,GASP,command

Schedule GASP, execute command, then terminate.

lu — Logical unit of interactive device on which GASP commands are entered. In a session environment lu must be specified if it is different from the session logical unit.

command — Any GASP operator command.

^**AB**,job # ,[u.g]

Before a job is processed, it may be removed with the AB command.

job # — Number assigned to job by spool system; use DJ to display job numbers.

u.g — Aborts all jobs owned by session account (user.-group).

```
          ,priority
^CJ,job #<,H        >
          ,R
```

Change job priority or status. Only used for a job in I, R, or RH status.

job # — Number assigned to job by spool system; use DJ to display job numbers.

priority — New job priority; only allowed before job is active.

H — Hold job from processing; changes R status to RH, and I to IH.

R — Release job for processing; changes RH status to R.

```
                  ,priority
^CS,spoolfile<,H          >
                  ,R
```

Change status of outspool file or change spool priority if outspool file is not active.

spoolfile Name of spool file as displayed by DJ.

priority New outspool priority.

H Hold spool file; if active, changes status to AH; if waiting, changes status to H.

R Release spool file that has been held in AH or H status.

^DA

Deallocate spooling. Before using DA, the spool system must be shut down, all files must be closed, and all current job processing and/or outspooling should be completed.

Only the system manager can execute this command.

Response:

KILL SPOOLING? The system prints this message in response to DA in order to give you a chance to change your mind.

```
            ,job #
^DJ[AL]<      or        [,u.g]>
            ,jobname
```

Display the job number, job name, job status, priority, user.group, and the spool pool files assigned to the job except for the job input spool.

AL Causes all jobs (session and non-session) to be reported.

job # Job number of particular job to be displayed.

jobname Name of the job or jobs to be displayed.
If both job # and jobname are omitted, all jobs currently in the system for the current user are displayed.

u.g Reports only jobs belonging to the user.group account of u.g. If the '@' character is used for either the user or group, then all session users or groups (or both) are reported.

^DS[AL][,lu[,u.g]]

Display the spool file name, job number, user.group name, outspool priority, spool status, and the logical unit to which the file is being or will be outspooled.

AL Causes all spools (session and non-session) to be reported.

lu Outspool logical unit; only files directed to this lu are displayed; if omitted, all files in the outspool queue are displayed. If in session, lu is the session lu, and the lu displayed is the system lu that the session lu maps to.

u.g Reports only files belonging to the account of u.g. If the '@' character is used for either the user or group, then all users or groups (or both) are reported.

^EX

Terminate GASP.

```
      ,spoolfile
^KS<              > [,u.g]
      ,lu
```

Remove outspool file from the outspool queue.

spoolfile Name of spool file to be removed.

lu Logical unit of device to which file is being outspooled. When running under session, lu is the session logical unit number.

u.g Kills all spool files owned by session account u.g.

^RS,spoolfile[,lu]

Restart active outspool file from the beginning.

spoolfile Name of active or active-held spool file in outspool queue.

lu New logical unit to which file is to be outspooled; if omitted, logical unit previously assigned is used for spool output.

^SD<,B[ATCH] ,S[POOL]>

Hold all spooled jobs, all spooled output, or both.

B Hold all pending jobs: spool files are not affected.

S Hold all pending spool files; job processing is not affected.

none If both B and S are omitted, then both job processing and outspooling are held. Inspooling by JOB may continue.

^SU<,B[ATCH] ,S[POOL]>

Start up spool system after it has been shut down with SD.

B Jobs held with SD are released; does not restart outspooling.

S Outspools held with SD are released; does not restart job processing.

none Both jobs and outspools held by SD are restarted.

^UP[,RS]

Up outspool device.

RS Restart active files from the beginning.

SECTION

E

ACCOUNT COMMANDS

ACCOUNT ID FORMAT

USER.GROUP

@."group" — All users in group.

"user".@ — All users named "USER".

@.@ — All users.

EX[IT]

Terminate the account program.

HE[LP][,keyword[,list]]

List valid commands and scheduled HELP utility.

LI[ST],A[CCT][,<list namr>]

List session wide information.

LI[ST],G[ROUP],<group>[,<list namr>]

List one or more group account entries.

LI[ST],U[SER],<user.group>[,<list namr>]

Lists one or more user account entries.

TE[LL],<user.group>[<,namr>][,<MESSAGE>]

Send a message to a single active user or group, or to all active sessions.

/A

Abort current command.

```
                     [NO[ECHO]]]]
TR [,control[,list<
                     [EC[HO]]]]
```

Invoke a transfer from within a command.

/E

End current phase.

SECTION

F

EDITR COMMANDS

CONTENT PAGE

RU,EDITR[,lu[,len]]

lu	LU of interactive input device (default=user's terminal).
len	Line length in characters (default=150).

EDITR RESPONSE

/source file?
/

POSSIBLE USER RESPONSES

0	Start edit with new, empty file.
:	Abort EDITR immediately.
namr	File to be copied to EDITR's work area.
{ }	(blank) Current LS area copies to EDITR's work area.

EDITR prompt character "/" (default).

CONTROL COMMANDS

Xx	Change prompt character to x.
CNTL/G	Invoke or delete bell.
Tx	Change tab control character, leave stops.
Txsl,...sn	Set tab character to x and stops to sl...sn (default=";"7,21).
Wcoll,col2	Set window (column) boundaries (default=1,150).
#xxx start# increment#	Add the column identifier (xxx), and line sequence numbers.
=n	Set line length to n (default=150).
K	Kill trailing blanks
Mnamr	Merge file "namr" after pending line.

DISPLAY COMMANDS

P	Display and/or edit pending line.
Ln,[lu]	List n lines on LU lu (default= pending and next line).
n	Display line n, make it pending line.
/n	Advance pending line n lines.
+n	Advance pending line n lines.
/n,[lu]	Advance to line n displaying changed lines on lu.
+n,[lu]	Advance to line n displaying changed lines on lu.
N	Display pending line number.
ND	Display line number of current line in destination work area.
H	Display number of characters in pending line.
HL	Display header.
^n	Go back n lines in destination work area (default=1).
S	Display approximate number of words in destination file.

LINE EDITS

P	Edit pending line then display it.
C	Edit pending line then advance pending line.
O	Duplicate pending line.
Rtext	Replace pending line with "text".
Itext	Insert "text" before pending line.
{ } text	Insert "text" after pending line.
−n	Delete n lines (default=1).

CHARACTER EDITS

CNTL/R	Replace characters.
CNTL/I	Insert characters.
CNTL/S	Insert characters.
CNTL/C	Cancel characters.
CNTL/T	Truncate characters.

SEARCH COMMANDS

First Field

Bfind field	Find a line with "find field" from SOF to EOF.
Ffind field	Find a line with "find field" from pending line to EOF.
Dfind field	Delete lines from pending line to "find field".
Jfind field	Jump to "find field" and make it pending line.

Find Field

";"	Find field tabbed.
"esc"	Find field of indefinite length.
"/"	Find field within window.
"CNTL@"	Find 0 length line.

EXCHANGE COMMANDS

Gold/new	Character replace on pending line.
Yold/new	Exchange on pending line, display next occurrence of pattern.
Xold/new range	Enable exchange pattern over range of lines, with list.
Vold/new range	Unconditional character replace, with list.
Uold/new range	Unconditional character replace, no list.

TERMINATIONS

A	Abort, leaving source file unchanged.
ECnamr	Create a FMGR file with edited version.
ER	Replace old file with edited version.
ERnamr	Replace existing file "namr" with edited version.

SECTION

G

INTERACTIVE UTILITIES

FORTRAN AND ASSEMBLER

```
    ASMB
RU,      ,namr1[,namr2[,namr3[,lc[,cs]]]]
    FTN4
```

namr1 Disc file or lu for source file.

namr2 Disc file, lu, or "–" for list. "–" creates file 'namr1 for listing if namr1 begins with &.(default= user's terminal).

namr3 Name of file or "–" for relocatable code. "–" creates file %namr1 for relocatable code if namr1 begins with &.(no default).

lc Line count per page.

cs Optional control statement which overrides the source file control statement. Options are as follows:

FORTRAN

L Output source to list, namr2.

A Output Assembly listing to namr2.

T Output symbol table for each main or subprogram to list, namr2.

M Output a mixed listing of both the source and the object program to list, namr2.

C Output a cross reference symbol table listing to namr2.

F Perform page eject.

D Compile debug lines.

n Error routine n supplied. n is a decimal digit 1-9 which specifies an error routine, ERRn.

Q Include the approximate relocatable address of each statement on the listing.

ASSEMBLER

A Absolute assembly, the addresses generated by the assembler are interpreted as absolute locations in memory.

R Relocatable assembly, the object program may be loaded anywhere in memory.

L Output source listing to namr2. This includes both the opcode, and the address of the operand if it is a memory reference instruction.

Q Output source listing to namr2. This includes only the operand address for single word memory reference instructions, otherwise the entire object code will be listed.

T Output symbol table to list namr2.

N,Z Selective assembly, sections of the program are to be included or excluded at assembly time depending upon the option specified.

C Output a cross reference symbol table to namr2.

F The floating point machine instructions are to be used instead of the software simulation routines for:
FIX,FLT,FDV,FMP,FAD,FSB.

X No EAU hardware on machine.

COMPL AND CLOAD

```
   COMPL
RU,       ,namr1[,namr2[,namr3[,cs]]]
   CLOAD
```

These utilities automatically invoke the appropriate compiler or assembler for a specified source file. CLOAD, in addition, schedules LOADR.

namr1 Name of source file.

namr2 Disc file, lu, or "–" for list file. "–" creates file 'namr1 for list file if namr1 begins with &. For CLOAD namr2 must be an lu. (default= user's terminal).

namr3 Name of file or "–" for relocatable code. "–" creates file %namr1 for relocatable code if namr1 begins with &. (no default).

cs Optional control statement which overrides the source file control statement.

LOADR OPERATION

```
RU,LOADR[,command[,input[,list[,opcode
          [,format[,partn[,size]]]]]]]
```

command A command file namr, or input device lu. (default= user's terminal or LU5 if batch).

input The file name of the relocatable main program or the lu of the relocatable input. (no default).

list List lu, or file name namr. If a file name is specified, the file must not already exist unless its' name begins with ('). (default= user's terminal or LU5 if batch).

opcode Default = BGNCTE
BG Background program
RT Real time program
LB Large background program
SC System COMMON
RC Reverse COMMON
NC No COMMON
SS Use subsystem global (SSGA).
PE Permanent program.
TE Temporary program.
RP Replace permanent program (do not also specify PE).

format DB Append DBUGR subroutine to the program.
LE List entry points and base page links.
NL No listing desired.
DC Don't copy, multiple copies of the program are not desired.
MP Use current page links, except for external references.
CP Use current page links, including external references.
BP Use base page links only. (default).

partn The specific partition number in which program is to be executed.

size Allows a logical address space larger than the program size. Permits use of a dynamic buffer at the end of the program.

LOADR COMMANDS

SE — Searches the system disc library for undefined externals.

SE,namr — Searches the file namr for undefined externals.

MS,namr — Searches the file namr for undefined externals. The file is searched multiple times to satisfy backward references.

RE,namr — Loads file namr, which may be a program, subroutine, or segment.

LO,XXXXXB — Changes the load address of the next module to be relocated to the specified address.

LI,YYYY — Set up file YYYY as a library file. Up to 10 files may be specified.

SL — Search all files specified in the library command.

TR,namr — Go to file namr for succeeding LOADR commands.

TR — Return to command file suspended when the undefined external was encountered.

FO — Force load a program or segment.

DI — Print list of undefined externals.

EC — Echo input commands on list device.*

EN
EX
/E — End of command input.

AB
/A — Abort the LOADR immediately.

AS,XX — Assigns the relocated program to partition XX.*

SZ,YY — Allows a logical address space larger than the program size. Permits the use of a dynamic buffer at the end of the program.*

LL,namr — Lu or file name for listing. If a file it must not already exist, unless its name begins with (').*

OP,opcode — Specifies an opcode parameter. See opcode section of LOADR OPERATION.*

FM,format — Specifies a format parameter, see format section of LOADR OPERATION.*

*FOOTNOTE: Specification of the * commands must precede specification of any RELOCATE, or SEARCH command.

SAVE DISC CARTRIDGE (WRITT)

```
RU,WRITT [ ,-lu(c) [ ,lu(m) [ ,IH [,DC] ] ] ]
         [ ,+crn
```

−lu(c) is the logical unit (LU) number of the cartridge to be saved on mag tape.

+crn is the cartridge reference number (CRN) of the cartridge to be saved on mag tape.

lu(m) is the logical unit (LU) number of the mag tape unit (default is LU 8). Either a positive or negative LU can be specified.

IH inhibits tape rewind (default is to rewind).

DC disable overlay check.

RESTORE DISC CARTRIDGE (READT)

```
RU,READT [ ,-lu(c) [ ,lu(m) [ ,P [ ,size [,IH] ] ] ] ]
         [ ,+crn              [ ,G
```

−lu(c) is the logical unit (LU) number of the cartridge to which the previously saved cartridge is to be restored.

+crn is the cartridge reference number (CRN) of the cartridge being restored.

lu(m) is the logical unit (LU) number of the mag tape unit (default is LU 8). Either a positive or negative LU can be specified.

P designates that the cartridge is to be restored as a private cartridge.

G designates that the cartridge is to be restored as a group cartridge.

size is the desired size of the cartridge to which the mag tape contents is to be restored. The size is specified in number of tracks (default is the size of the cartridge saved on the mag tape).

IH inhibits tape rewind (default is to rewind).

SECTION

H

EXEC CALLS

EXEC CODE	PAGE
1	H-3
2	H-3
3	H-5
4	H-13
5	H-16
6	H-7
7	H-7
8	H-8
9	H-8
10	H-8
11	H-11
12	H-12
13	H-9
14	H-9
15	H-13
16	H-13
17	H-3
18	H-3
19	H-5
20	H-3
21	H-4
22	H-8
23	H-8
24	H-8
25	H-10
26	H-11

PARAMETERS

Parameters enclosed in [square] brackets are optional.

Parameters enclosed in <angle> brackets are optional in some cases and required in others.

Single underlined parameters have values returned by the system.

Double underlined parameters have values returned by the system in some cases, and user supplied in other cases.

I/O,READ/WRITE

EXEC
1,2,17,18,20

CALL EXEC (ICODE,ICNWD,IBFR,ILEN
[,IPRM1][IPRM2],ICLAS)

ICODE
1 = READ
2 = WRITE
17 = Class READ
18 = Class WRITE
20 = Class WRITE/READ

ICNWD Control word, see I/O Control for format. If Z bit (12) is set, an additional control buffer specified by IPRM1,IPRM2 is passed to the driver or to the program doing the GET call.

IBFR Data buffer.

ILEN Data length (+ words, – chars).

IPRM1 Optional, or disc track number (for disc transfers), or address of additional control buffer (if Z bit is set).

IPRM2 Optional, or disc sector (for disc transfers), or length of additional control buffer (if Z bit is set).

ICLAS Class number — required with Class I/O only.
ICLAS=0 to allocate a class number.

Returns

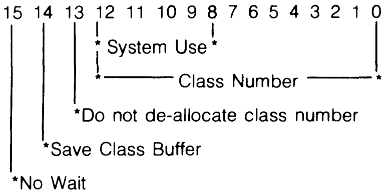
Normal I/O
A = Status, EQT wd. 5 (if unbuffered device).
B = Transmission log (if unbuffered device).

Class I/O
A = 0 — Request completed.
A = –1 — No class number (if no wait bit is set).
A = –2 — No memory or buffer limit exceeded (if no wait bit is set).
B = Meaningless.

I/O, CLASS GET — EXEC 21

CALL EXEC (21,ICLAS,IBUFR,ILEN[,IP1][,IP2][,IP3])

ICLAS



IBUFR — Data buffer.

ILEN — Buffer length (+ words, – characters).

IP1 — IPRM1 value returned from a class READ/WRITE or CONTROL call.

IP2 — IPRM2 value returned from a class READ/WRITE or CONTROL call.

IP3 — Returned value of original request code (ICODE).

1 = 17/20 (READ,WRITE/READ)
2 = 18 (WRITE)
3 = 19 CONTROL)

Returns

A-register — If data, then A15 = 0 and A = status (EQT wd. 5).

If no data, and no wait bit is set, then A15 = 1 and A= –(numb + 1) where numb is number of requests made to class but not yet serviced by driver.

B-register — If data, then B = transmission log (positive words or characters depending on original request). If no data, then B = meaningless.

I/O CONTROL — EXEC 3,19

CALL EXEC(ICODE,ICNWD<,IPRAM>
,ICLAS[,IOP1][,IOP2])

ICODE 3 = Control
19 = Class Control

ICNWD Control word, see Function Codes below for octal bits 6-10.

```
| 15 ——— 11  10  9  8  7  6  5  4  3  2  1  0 |
            |              |              |
            *-function——   |—logical ——   *
                 code           unit
```

IPRAM Optional or required for some control functions.

TTY
n space n lines
0 no line feed

LINE PRINTER
+n space n lines
−n top-of-form
0 no line feed

ICLAS Class number — required with class control only. ICLAS=0 to allocate a class number.

IOP1
IOP2 (when ICODE = 19) Passed through to Class I/O GET request.

Returns

Normal I/O A = Status, EQT wd. 5 (if unbuffered device).
B = Meaningless

Class I/O A = Class number
B = Meaningless

Function Code	ICNWD Octal-bits 6-10. See particular driver manual for more information.

00 Clear device
01 Write end-of-file (MT,CTU)
02 Backspace one record (MT,CTU)
03 Forward space one record (MT,CTU)
04 Rewind (MT,CTU)
05 Rewind standby (MT,REWIND CTU)
06 Actual status of device (MT,CTU)
07 Set end-of-paper tape
10 Generate paper tape leader.
11 List output line spacing, use IPRAM
12 Write gap in case of error (MT)
13 Forward space one file (MT,CTU)
14 Backward space one file (MT,CTU)
15 Conditional top-of-form (LP)
20 Enable terminal (CRT)
21 Disable terminal (CRT)
22 Set time-out, use IPRAM (CRT)
23 Ignore further requests until:
  a) Device queue empty
  b) Input request encountered
  c) Restore Control request received
24 Restore output processing
26 Write end-of-data (CTU)
27 Locate file number, use IPRAM (CTU)

PROGRAM COMPLETION EXEC 6

CALL EXEC (6 [,INAME][,INUMB][,IPRM1,...,IPRM5])

CALL RMPAR(IPRM1,...IPRM5) parameter pick-up.

INAME	Terminate INAME or if 0, terminate calling program.
INUMB	0 Normal completion (default). −1 Serial reusability. 1 **Terminate saving resources.** 2 Terminate on next schedule: save tracks. 3 Terminate immediately and release tracks.
IPRM1- **IPRM5**	Up to 5 optional parameters passed to caller next time he executes (INAME = 0 only).

Returns

A-register	Unchanged.
B-register	Unchanged or address of optional parameters (if specified).

PROGRAM SUSPEND EXEC 7

CALL EXEC (7)

If program is rescheduled with a GO command that includes parameters, use RMPAR for parameter pick up.

A-register	Unchanged.
B-register	Unchanged or parameter address.

PROGRAM SWAP CONTROL — EXEC 22

CALL EXEC (22,IOPTN)

IOPTN	0 Swap; 1 Do not swap.

Returns

A-register	Meaningless
B-register	Unchanged

PROGRAM SCHEDULE — EXEC 8,9,10,23,24

CALL EXEC (ICODE,INAME[,IPRM1, ...,IPRM5][,IBUFR,ILEN])

ICODE	8 = Segment load 9 = Immediate, wait 10 = Immediate, no wait 23 = Queue, wait 24 = Queue, no wait
INAME	Name of program or segment to be scheduled.
IPRM1- IPRM5	Up to 5 optional parameters passed to program specified in INAME.
IBUFR	Buffer to pass to son. Not used for EXEC 8.
ILEN	Length of buffer (+ words, − characters). Son recovers buffer using String Passage (ICODE = 14) EXEC call. Not used for EXEC 8.

Returns

A-register	0 if schedule successful. Program status if son not scheduled (immediate schedule only). If EXEC 8, the segment's ID segment address.
B-register	Unchanged, or address of IPRM1-IPRM5 if they were used.

STRING PASSAGE EXEC 14

CALL EXEC (14,IRCOD,IBUFR,ILEN)

IRCOD Retrieve/write code:

1 Retrieve buffer or command string.
2 Write buffer to father.

IBUFR Buffer location.

ILEN Buffer length (+ words, – characters).

Returns

A-register 0 = successful; 1 = no string found.

B-register Transmission log.

STATUS, DEVICE EXEC 13

CALL EXEC (13,ICNWD,IST1[,IST2][,IST3])

ICNWD Lu of device.

IST1 Returned value of EQT word 5, see Device Status table.

IST2 Returned value of EQT word 4, see EQT table.

IST3 Returned value specifying whether device is "up" or "down".

Returns Meaningless.

STATUS, PARTITION — EXEC 25

CALL EXEC (25,IPART,IPAGE,IPNUM,ISTAT)

IPART Partition number.

IPAGE Returned value of starting page number.

IPNUM Returned value of the number of pages with base page included (−1 returned if illegal partition number).

ISTAT Return for partition status:

15	14	13	12	11—— 7 ——0
RS	RT	M	S	C—0—ID SEG NO.

RS = 1 if partition reserved
RT = 1 if partition is real time
M = 1 if partition is mother
S = 1 if partition is subpartition
C = 1 if chain is in effect

Returns

A-register Meaningless.

B-register Unchanged.

MEMORY SIZE EXEC 26

CALL EXEC (26,IFAW,ILMEM,INPGS[,IMAP])

IFAW Returned value of first available word address after program.

ILMEM Returned value, the number of words between end of program and end of program's address space.

MPGS Returned value, number of pages in partition.

IMAP Returned value of user map (32 word array).

Returns

A-register Meaningless.

B-register unchanged.

TIME REQUEST EXEC 11

CALL EXEC (11,ITIME[,IYEAR])

ITIME Return for time value as follows:

ITIME (1) = 10's of milliseconds
ITIME (2) = Seconds
ITIME (3) = Minutes
ITIME (4) = Hours
ITIME (5) = Julian day of year

IYEAR Returned value of year (e.g., 1975) (optional).

Returns

A-register Meaningless.

B-register Unchanged.

TIMED EXECUTION (Absolute Start) EXEC 12

CALL EXEC (12,INAME,IRESL,IMULT,
IHRS,IMIN,ISEC,IMSEC)

INAME	Schedule INAME or if 0, schedule calling program.
IRESL	Resolution code, see initial offset EXEC 12.
IMULT	Execution multiple (set= 0 means run once).
IHRS IMIN ISEC IMSEC	Defines absolute start time.

Returns

A-register	Meaningless.
B-register	Unchanged.

TIMED EXECUTION (Initial Offset) EXEC 12

CALL EXEC (12,INAME,IRESL,IMULT,IOFST)

INAME Schedule INAME or if 0, schedule calling program.

IRESL Resolution code.

1 = 10's/ms
2 = Seconds
3 = Minutes
4 = Hours

IMULT Execution multiple (set = 0 means run once).

IOFST Relative start time (negative value) from current time.

Returns

A-register.	Meaningless.
B-register	Unchanged.

TRACK ALLOCATION — EXEC 4,15

CALL EXEC (ICODE,ITRAK,ISTRK,IDISC,ISECT)

ICODE — 4 = local.
15 = global.

ITRAK — Number of tracks.

B15 = 1 — Program not suspended if tracks not available.
B15 = 0 — Program suspended if tracks not available.

ISTRK — Returned value of starting track number (−1 if tracks not available.)

IDISC — Returned value of disc lu, where tracks were allocated.

ISECT — Returned value of number of sectors per track.

Returns — Meaningless.

TRACK RELEASE — EXEC 5,16

CALL EXEC (ICODE,ITRAK[,ISTRK][,IDISC])

ICODE — 5 = local.
16 = global.

ITRAK — Number of tracks (If ICODE=5, then −1 = all tracks, ISTRK and IDISC unnecessary.)

ISTRK — Starting track number.

IDISC — Disc lu.

Returns — Local.

A-register — Meaningless.

B-Register — Meaningless.

Returns — Global

A-register — Status.

0 = Tracks released.
−1 = No tracks released, one in use.
−2 = No tracks released, one not global.

B-register — Meaningless.

LOGICAL UNIT LOCK PROGRAM CALL

CALL LURQ (IOPTN,LUARY,NOLU)

IOPTN — Octal control word as follows:

0x0000 = Unlock specified lu's.
1x0000 = Unlock all lu's program currently has locked.
0x0001 = Lock with wait specified lu's.
1x0001 = Lock without wait specified lu's.
x(bit 14) is no abort bit; 1 = don't abort.

LUARY — Array of lu's to be locked/unlocked. Ignored when IOPTN = 1x0000.

NOLU — Number of lu's to be locked/unlocked. Ignored when IOPTN = 1x0000.

Returns

A-register
0 = Lock successful.
−1 = RN not available.
1 = lu already locked.

B-register — Unchanged.

RESOURCE MANAGEMENT

CALL RNRQ (ICODE,IRN,ISTAT)

ICODE Control word as follows:

Bits 15 no wait.
14 no Abort.
13
.
. reserved for system use.
.
.
5 clear
4 global allocate option.
3 local
2 clear
1 global set option.
0 local

IRN Resource number.

ISTAT Status word.

0 = Normal deallocate return.
1 = RN is clear (unlocked).
2 = RN is locked locally to caller.
3 = RN is locked globally.
4 = No RN available now.
6 = RN locked locally to other program.
7 = RN was locked globally when request was made.

Returns

A-register Meaningless.

B-register Unchanged.

SECTION

I

FMP CALLS

PARAMETERS

Parameters enclosed in [square] brackets are optional.

Parameters enclosed in <angle> brackets are optional in some cases and required in others.

Single underlined parameters have values returned by the system.

Double underlined parameters have values returned by the system in some cases, and user supplied in other cases.

NOTE: The FMP calls beginning with E (eg. ECREA) can define larger files, up to 32767x128 blocks. The FMP calls not beginning with E (eg. CREAT) can only define files up to 16383 blocks, and 32767 records.

IDCB — A 144 word or longer, array used as the data control block (DCB).

IERR — Error return, see FMGR error codes for meaning. If call is successful:

OPEN,OPENF IERR= file type.
CREAT IERR= number of sectors.

INAM — Six ASCII characters. First character not a blank or number, no embedded blanks, and (+,−:) are not allowed. All six placed must be accounted for, and a Fortran DATA statement can be used to specify INAM.

IBUF — User buffer.

ISC — File security code:

<0 read/write protected.
=0 not protected (default).
>0 write protected only.

ICR — Cartridge reference:

>0 cartridge reference number.
<0 logical unit number.
=0 first one found (default). Order of search; private cartridges, then group cartridges, then system cartridges.

IREC — Next record number, double word for "E" type calls.

IOFF — Block offset of next record.

IRB — Relative block address of next record, double word for "E" type calls.

IDCBS — Actual size of DCB in words (only when IDCB > 144).

APOSN AND EAPOS

```
     APOSN
CALL        (IDCB,IERR,IREC<,IRB<,IOFF>>)
     EAPOS
```

Position a disc file (typically type 3) to a known record address. Record addresses are usually obtained through LOCF for APOSN, and ELOCF for EAPOS. IRB and IOFF are required for files with variable length records.

CLOSE AND ECLOS

```
     CLOSE
CALL        (IDCB<,IERR>[,ITRUN])
     ECLOS
```

Close DCB and make file available to others, can also truncate file size.

ITRUN One word variable for CLOSE, double word variable for ECLOS.

+n number of blocks to be deleted from the end of the file when it is closed.
−n retain main file, delete extents.
0 standard close (default).

CREAT AND ECREA

```
     CREAT
CALL        (IDCB,IERR,INAM,ISIZE,ITYPE
     ECREA
               [,ISC][,ICR][,IDCBS]<,JSIZE>)
```

Create a disc file.

ISIZE Two entry array describing file size. for CREAT a two word array, for ECREA a double word integer for each entry.
first entry — file size in blocks.
second entry — record length in words (used for type 2 files only).

ITYPE File type (1-32767).

JSIZE Created file size in sectors; optional double word parameter returned by ECREA only.

CRETS

CALL CRETS (IDCB,IERR,NUM,INAM
[,ISIZE][,ITYPE][,ISC]
[,ICR][,IDCBZ][,JSIZE])

CRETS creates a temporary or scratch disc file by making an entry in the File Directory and allocating disc space for the file. CRETS can define files up to 32767x128 blocks in size.

NUM Scratch file number, a one-word integer 0-99.

ISIZE A double word integer for each entry.
first entry — file size in blocks.
second entry — record length in words (used for type 2 files only).

ITYPE File type (1-32767).

JSIZE Created file size in sectors; optional double word parameter returned if call was successful.

FCONT

CALL FCONT(IDCB,IERR,ICON1<,ICON2>)

Control I/O functions on a non-disc type 0 file.

ICON1 Control word, see EXEC 3 call for options.

ICON2 Additional control, see EXEC 3 call for options.

FSTAT

CALL FSTAT(ISTAT[,ILEN][,IFORM][,IOP][,IADD])

Return status of mounted cartridges.

ISTAT Cartridge status buffer returned as FORMAT I or FORMAT II.

FORMAT I		
WORD	**CONTENTS**	**CARTRIDGE**
1	Logical Unit Number	First cartridge
2	Last FMP track	
3	Cartridge Reference Number	
4	Lock Word	
5	Logical Unit Number	Second cartridge
6	Last FMP track	
7	Cartridge Reference Number	
8	Lock Word	
9	Logical Unit Number	
•	•	•
•	•	•
•	•	•
	0 no more discs	

where: Lock word is ID segment address of locking program or 0 (not locked).

FORMAT II		
WORD	**CONTENTS**	**CARTRIDGE**
1	Lock word Logical unit #	First cartridge
2	Last FMP track	
3	Cartridge Reference Number	
4	ID	
5	Lock word Logical unit #	Second cartridge
6	Last FMP track	
7	Cartridge Reference Number	
8	ID	
9	Lock word Logical unit #	
•	•	•
•	•	•
•	•	•
	0 no more discs	

where: Lock word is the offset of the ID segment in the Keyword Table or 0 (not locked)
ID identifies who mounted the cartridge.

ILEN Length in words of status buffer (default= 125).

IFORM Zero for FORMAT I.
Non- zero for FORMAT II.

IOP Type of cartridges to return information about:
1 = all cartridges mounted to the system.
0 = (under session) all private, group, and system cartridges mounted to that session.
0 = (non session) mounted system and non session cartridges.

IADD 0 if entire cartridge list was returned.
Non-zero if entire cartridge list could not be returned.

IDCBS

ISIZE=IDCBS(IDCB)

Return actual DCB buffer area used (use only if IDCB > 144).

LOCF AND ELOCF

```
      LOCF
CALL        (IDCB,IERR,IREC[,IRB][,IOFF]
      ELOCF   [,JSEC][,JLU][,JTY][,JREC])
```

Retrieve status and location information from the data control block on an open file.

JSEC File size in sectors; one word variable for LOCF, double word variable for ELOCF.

JLU File lu.

JTY File type.

JREC Optional return for:
record length (type 1 or 2 files).
read/write code (type 0 files).
meaningless (type 3 and above).

NAMF

CALL NAMF(IDCB,IERR,INAM,MNAM[,ISC][,ICR])

Close the DCB, if open, and rename file INAM to MNAM.

OPEN AND OPENF

```
        OPEN
CALL            (IDCB,IERR,INAM
        OPENF       [,IOPTN][,ISC][,ICR][,IDCBS])
```

Open a file for access.

INAM ASCII file name, or an integer containing a binary lu (OPENF only).

IOPTN Open control word, defaults are:
— exclusive use, only the calling program can access the file.
— standard sequential output.
— file type defined at creation is used for access.

```
15 —— 11  10  9  8  7  6  5  4  3  2  1  0
 0 ——— 0  |__function__|  0  0  F  T  U  E
          |    code    |        |
          |                     |
          |— type 0 options ————|
```

E bit 0 exclusive open;
1 non exclusive open.

U bit 0 non update open;
1 update open.

T bit 0 file type defined at creation (disc only);
1 force file type to 1.

F bit 0 use function code defined at creation (type 0 files only);
1 use function code defined in bits 6-10 of IOPTN (for function codes see EXEC 3 call).

POSNT AND EAPOS

```
     POSNT
CALL        (IDCB,IERR,NUR[,IR])
     EPOSN
```

Position files relative to current file position or to a specific record number in any file type.

NUR	Record position, a one word variable for POSNT or double word variable for EPOSN.
IR	Position mode flag, the relationship between NUR and IR is:

NUR	IR = 0 OR OMITTED RELATIVE POSITION	IR ≠ 0 ABSOLUTE POSITION
NUR > 0	Position forward number of records specified	Position to record number specified
NUR = 0	No operation	No operation
NUR < 0	Position backward number of records specified	Error

POST

CALL POST(IDCB[,IERR])

Write contents of DCB to the disc, and save records in a file opened for non exclusive use. To lock the file for exclusive use with RNRQ call, use the following sequence:

1. call OPEN;
2. read file to pick up resource number;
3. call POST to clear DCB, no data is transferred;
4. call RNRQ to lock the file;
5. call READF to read the record to be modified;
6. modify the record and call WRITF to write it out;
7. call POST to transfer the updated record;
8. call RNRQ to unlock the file.

PURGE

CALL PURGE(IDCB,IERR,INAM<,ICS><,ICR>)

Delete named file INAM and all its extents, the file must not be open.

READF AND EREAD

```
      READF
CALL          (IDCB,IERR,IBUF[,IL][,LEN][,NUM])
      EREAD
```

Read a record from an open file to the user buffer. If type 0 file, the number of words should be specified.

IL — Length of IBUF (read buffer), defaults are:

file type = 0 zero length record.
file type = 1 128 word record.
file type > 1 actual record length.

LEN — Actual read length, set to −1 for EOF.

NUM — A one-word variable (for READF), or double-word variable (for EREAD) used to specify the record number to be read (default= start at current record number).

RWNDF

```
CALL RWNDF(IDCB[,IERR])
```

Rewind a magnetic tape or position a disc file to the first record in the file.

WRITF AND EWRIT

```
      WRITF
CALL          (IDCB,IERR,IBUF[,IL][,NUM)
      EWRIT
```

Write a record from the user's buffer to an open file. For type 0 or type 3 and above, a specified number of words is written. For type 1 and 2 files the exact record length is written.

IL — Length of write buffer, defaults are:

file type = 0 zero length record.
file type = 1 128 word record.
file type = 2 actual record length.
file type > 2 zero length record.

NUM — Record number to be written. (default=start at current record number).

SECTION

J

SMP CALLS

CONTENT PAGE

PARAMETERS

ISMP 3 word array containing name of program SMP.

ISLU Spool lu returned by SPOPN call. Each subsequent spool call must specify this lu.

SPOPN

CALL SPOPN(IBUFR,ISLU)

Make a spool file active and ready for use.

IBUFR 16 word set up buffer structured as follows:

word contents

0 =0 if no batch input checking desired.

1 >0 session lu for the spool file; or
=0 SMP allocates a session lu for the spool file; or
=1 a direct map to system lu is set up.

5 security code.
6 cartridge reference number.
7 driver type, in octal.
8 disposition flags:

```
15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
—|—|—————————|——|——|-|-| |-|—
BU BI               W/R    ST SP  HO  SA
```

BU 1= buffered; 0= not buffered.
BI 1= batch input; 0 otherwise;
W/R 10B= write; 01B= read; 00B= write/read.
ST 1= standard file; 0= spool file.
SP 1= spool pool file; 0= user file.
HO 1= hold outspool; 0= outspool now.
SA 1= save file; 0= purge.

9 spool priority (1-9999).
10 spool status (used by SMP,GASP).
11 if batch — job number; if not batch — directory entry number of session program.
12-14 set to 0 or program parameter of SL command.
15 outspool lu.

ISLU Spool lu return.

WORKING CALLS

CALL EXEC(23,ISMP,XX,ISLU)

XX
=1 Change purge to save.
=2 Change save to purge.
=3 Queue for outspooling.
=4 EOF and queue for outspooling.
=5 Change spool options; use additional parameters NOL and NPR following ISLU for this call only.
NOL new outspool lu (default=previous lu).
NPR new outspool priority (default=previous value).
=6 Set buffer flag.
=7 Clear buffer flag.

RETRIEVE RECORD POSITION

CALL EXEC(23,ISMP,8,ISLU)

CALL RMPAR(IPRM) — for parameter pick up.

IPRM 5 word array containing pointers to record position.

word 1 =
word 2 =
word 3 =
} contain an internal coding of the current position of the referenced file.

word 4 = not used but should be included in array.
word 5 = not used but should be included in array.

CHANGE RECORD POSITION

CALL EXEC(23,ISMP,9,ISLU,IPRM1,IPRM2,IPRM3)

IPRM1-3 Record position from the RETRIEVE RECORD call.

TABLES

CONTENT PAGE

ASCII/BYTES

	BYTE POSITION		
CHAR	Left	Right	Dec.
A	040400	000101	65
B	041000	000102	66
C	041400	000103	67
D	042000	000104	68
E	042400	000105	69
F	043000	000106	70
G	043400	000107	71
H	044000	000110	72
I	044400	000111	73
J	045000	000112	74
K	045400	000113	75
L	046000	000114	76
M	046400	000115	77
N	047000	000116	78
O	047400	000117	79
P	050000	000120	80
Q	050400	000121	81
R	051000	000122	82
S	051400	000123	83
T	052000	000124	84
U	052400	000125	85
V	053000	000126	86
W	053400	000127	87
X	054000	000130	88
Y	054400	000131	89
Z	055000	000132	90
a	060400	000141	97
b	061000	000142	98
c	061400	000143	99
d	062000	000144	100
e	062400	000145	101
f	063000	000146	102
g	063400	000147	103
h	064000	000150	104
i	064400	000151	105
j	065000	000152	106
k	065400	000153	107
l	066000	000154	108
m	066400	000155	109
n	067000	000156	110
o	067400	000157	111
p	070000	000160	112
q	070400	000161	113
r	071000	000162	114
s	071400	000163	115
t	072000	000164	116
u	072400	000165	117
v	073000	000166	118
w	073400	000167	119
x	074000	000170	120
y	074400	000171	121
z	075000	000172	122
0	030000	000060	48
1	030400	000061	49
2	031000	000062	50
3	031400	000063	51
4	032000	000064	52
5	032400	000065	53
6	033000	000066	54
7	033400	000067	55
8	034000	000070	56
9	034400	000071	57

	BYTE POSITION		
CHAR	Left	Right	Dec.
NUL	000000	000000	0
SOH	000400	000001	1
STX	001000	000002	2
ETX	001400	000003	3
EOT	002000	000004	4
ENQ	002400	000005	5
ACK	003000	000006	6
BEL	003400	000007	7
BS	004000	000010	8
HT	004400	000011	9
LF	005000	000012	10
VT	005400	000013	11
FF	006000	000014	12
CR	006400	000015	13
SO	007000	000016	14
SI	007400	000017	15
DLE	010000	000020	16
DC1	010400	000021	17
DC2	011000	000022	18
DC3	011400	000023	19
DC4	012000	000024	20
NAK	012400	000025	21
SYN	013000	000026	22
ETB	013400	000027	23
CAN	014000	000030	24
EM	014400	000031	25
SUB	015000	000032	26
ESC	015400	000033	27
FS	016000	000034	28
GS	016400	000035	29
RS	017000	000036	30
US	017400	000037	31
SPACE	020000	000040	32
!	020400	000041	33
"	021000	000042	34
#	021400	000043	35
$	022000	000044	36
%	022400	000045	37
&	023000	000046	38
'	023400	000047	39
(	024000	000050	40
)	024400	000051	41
*	025000	000052	42
+	025400	000053	43
,	026000	000054	44
—	026400	000055	45
.	027000	000056	46
/	027400	000057	47
:	035000	000072	58
;	035400	000073	59
<	036000	000074	60
=	036400	000075	61
>	037000	000076	62
?	037400	000077	63
@	040000	000100	64
[	055400	000133	91
\	056000	000134	92
]	056400	000135	93
^	057000	000136	94
—	057400	000137	95
`	060000	000140	96
{	075400	000173	123
:	076000	000174	124
}	076400	000175	125
~	077000	000176	126
DEL	077400	000177	127

ASCII CHARACTERS AND BINARY CODES

Effect of Control key *

000-037B | 040-077B | 100-137B | 140-177B

b7 b6 b5 →					0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1	1 1 0	1 1 1
BITS				COLUMN →	0	1	2	3	4	5	6	7
b4	b3	b2	b1	ROW ↓								
0	0	0	0	0	NUL	DLE	SP	0	@	P	`	p
0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q
0	0	1	0	2	STX	DC2	"	2	B	R	b	r
0	0	1	1	3	ETX	DC3	#	3	C	S	c	s
0	1	0	0	4	EOT	DC4	$	4	D	T	d	t
0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u
0	1	1	0	6	ACK	SYN	&	6	F	V	f	v
0	1	1	1	7	BEL	ETB	'	7	G	W	g	w
1	0	0	0	8	BS	CAN	(	8	H	X	h	x
1	0	0	1	9	HT	EM	)	9	I	Y	i	y
1	0	1	0	10	LF	SUB	*	:	J	Z	j	z
1	0	1	1	11	VT	ESC	+	;	K	[	k	{
1	1	0	0	12	FF	FS	,	<	L	\	l	¦
1	1	0	1	13	CR	GS	–	=	M	]	m	}
1	1	1	0	14	SO	RS	.	>	N	^	n	~
1	1	1	1	15	SI	US	/	?	O	_	o	DEL

32 CONTROL CODES

Upshifted Lower Case

64 CHARACTER SET

96 CHARACTER SET

128 CHARACTER SET

EXAMPLE: The representation for the character "K" (column 4, row 11) is.

	b7	b6	b5	b4	b3	b2	b1
BINARY	1	0	0	1	0	1	1
OCTAL	1		1			3	

* Depressing the Control key while typing an upper case letter produces the corresponding control code on most terminals. For example, Control-H is a backspace.

RTE SPECIAL CHARACTERS

Mnemonic	Octal Value	Use
SOH (Control A)	1	Backspace (TTY)
EM (Control Y)	31	Backspace (2600)
BS (Control H)	10	Backspace (TTY, 2615, 2640, 2644, 2645)
EOT (Control D)	4	End-of-file (TTY 2615, 2640, 2644, 2645)

INSTRUCTION CODES IN OCTAL

Memory Reference

ADA	04(0XX)---
ADB	04(1XX)---
AND	01(0XX)---
CPA	05(0XX)---
CPB	05(1XX)---
IOR	03(0XX)---
ISZ	03(1XX)---
JMP	02(1XX)---
JSB	01(1XX)---
LDA	06(0XX)---
LDB	06(1XX)---
STA	07(0XX)---
STB	07(1XX)---
XOR	02(0XX)---

↑ Binary

Shift-Rotate

ALF	001700
ALR	001400
ALS	001000
ARS	001100
BLF	005700
BLR	005400
BLS	005000
BRS	005100
CLE	000040
ELA	001600
ELB	005600
ERA	001500
ERB	005500
NOP	000000
RAL	001200
RAR	001300
RBL	005200
RBR	005300
SLA	000010
SLB	004010

Alter-Skip

CCA	003400
CCB	007400
CCE	002300
CLA	002400
CLB	006400
CLE	002100
CMA	003000
CMB	007000
CME	002200
INA	002004
INB	006004
RSS	002001
SEZ	002040
SLA	002010
SLB	006010
SSA	002020
SSB	006020
SZA	002002
SZB	006002

Input/Output

CLC	1067--
CLF	1031--
CLO	103101
HLT	1020--
LIA	1025--
LIB	1065--
MIA	1024--
MIB	1064--
OTA	1026--
OTB	1066--
SFC	1022--
SFS	1023--
SOC	102201
SOS	102301
STC	1027--
STF	1021--
STO	102101

Extended Arithmetic

ASL	1000(01X)-
ASR	1010(01X)-
DIV	100400
DLD	104200
DST	104400
LSL	1000(10X)-
LSR	1010(10X)-
MPY	100200
RRL	1001(00X)-
RRR	1011(00X)-

↑ Binary

Ext. Inst. Group

ADX	105746
ADY	105756
CAX	101741
CAY	101751
CBS	105774
CBT	105766
CBX	105741
CBY	105751
CMW	105776
CXA	101744
CXB	105744
CYA	101754
CYB	105754
DSX	105761
DSY	105771
ISX	105760
ISY	105770
JLY	105762
JPY	105772
LAX	101742
LAY	101752
LBT	105763
LBX	105742
LBY	105752
LDX	105745
LDY	105755
MBT	105765
MVW	105777
SAX	101740
SAY	101750
SBS	105773
SBT	105764
SBX	105740
SBY	105750
SFB	105767
STX	105743
STY	105753
TBS	105775
XAX	101747
XAY	101757
XBX	105747
XBY	105757

INSTRUCTION CODES IN OCTAL (CONTINUED)

Floating Point

FAD	105000
FDV	105060
FIX	105100
FLT	105120
FMP	105040
FSB	105020
.FIXD	105104
.FLTD	105124
.TADD	105002
.TDIV	105062
.TFTD	105126
.TFTS	105122
.TFXD	105106
.TFXS	105102
.TMPY	105042
.TSUB	105022
.XADD	105001
.XDIV	105061
.XFTD	105125
.XFTS	105121
.XFXD	105105
.XFXS	105101
.XMPY	105041
.XSUB	105021

Scientific Inst. Set

ALOG	105322
ALOGT	105327
ATAN	105323
COS	105324
EXP	105326
SIN	105325
SQRT	105321
TAN	105320
TANH	105330
DPOLY	105331
/CMRT	105332†
/ATLG	105333
.FPWR	105334
.TPWR	105335

Fast FORTRAN

DBLE	105201
DDINT	105217
SNGL	105202
.BLE	105207
.CFER	105231
.DFER	105205
.ENTP	105224
.ENTR	105223
.FLUN	105226
.GOTO	105221
.NGL	105214
.PACK	105230
.PWR2	105225
$SETP	105227
.XCOM	105215
.XFER	105220
.XPAK	105206
..DCM	105216
..FCM	105232
..MAP	105222
..TCM	105233

Double Integer

.DAD	105014
.DCO	105204
.DDE	105211
.DDI	105074
.DDIR	105134
.DDS	105213
.DIN	105210
.DIS	105212
.DMP	105054
.DNG	105203
.DSB	105034
.DSBR	105114

Dynamic Mapping System

DJP	105732
DJS	105733
JRS	105715
LFA	101727
LFB	105727
MBF	105703
MBI	105702
MBW	105704
MWF	105706
MWI	105705
MWW	105707
PAA	101712
PAB	105712
PBA	101713
PBB	105713
RSA	101730
RSB	105730
RVA	101731
RVB	105731
SJP	105734
SJS	105735
SSM	105714
SYA	101710
SYB	105710
UJP	105736
UJS	105737
USA	101711
USB	105711
XCA	101726
XCB	105726
XLA	101724
XLB	105724
XMA	101722
XMB	105722
XMM	105720
XMS	105721
XSA	101725
XSB	105725

BASE SET INSTRUCTION CODES IN BINARY

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
D/I	AND		001	0	Z/C	← Memory Address →									
D/I	XOR		010	0	Z/C										
D/I	IOR		011	0	Z/C										
D/I	JSB		001	1	Z/C										
D/I	JMP		010	1	Z/C										
D/I	ISZ		011	1	Z/C										
D/I	AD*		100	A/B	Z/C										
D/I	CP*		101	A/B	Z/C										
D/I	LD*		110	A/B	Z/C										
D/I	ST*		111	A/B	Z/C										

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	SRG		000	A/B	0	D/E	*LS		000	†CLE	D/E	‡SL*	*LS		000
				A/B	0	D/E	*RS		001		D/E		*RS		001
				A/B	0	D/E	R*L		010		D/E		R*L		010
				A/B	0	D/E	R*R		011		D/E		R*R		011
				A/B	0	D/E	*LR		100		D/E		*LR		100
				A/B	0	D/E	ER*		101		D/E		ER*		101
				A/B	0	D/E	EL*		110		D/E		EL*		110
				A/B	0	D/E	*LF		111		D/E		*LF		111
				NOP	000				000		000				000

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	ASG		000	A/B	1	CL*	01	CLE	01	SEZ	SS*	SL*	IN*	SZ*	RSS
				A/B		CM*	10	CME	10						
				A/B		CC*	11	CCE	11						

BASE SET INSTRUCTION CODES IN BINARY (CONTINUED)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
1	IOG	000			1	H/C	HLT	000					← Select Code →		
					1	0	STF	001							
					1	1	CLF	001							
					1	0	SFC	010							
					1	0	SFS	011							
				A/B	1	H/C	MI*	100							
				A/B	1	H/C	LI*	101							
				A/B	1	H/C	OT*	110							
				0	1	H/C	STC	111							
				1	1	H/C	CLC	111							
					1	0	STO	001			000			001	
					1	1	CLO	001			000			001	
					1	H/C	SOC	010			000			001	
					1	H/C	SOS	011			000			001	

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
1	EAG	000		MPY**		000		010			000			000	
				DIV**		000		100			000			000	
				DLD**		100		010			000			000	
				DST**		100		100			000			000	
				ASR		001		000		0	1				
				ASL		000		000		0	1				
				LSR		001		000		1	0			number	
				LSL		000		000		1	0			← of →	
				RRR		001		001		0	0			bits	
				RRL		000		001		0	0				

Notes * A or B, according to bit 11.
D/I, A/B, Z/C, D/E, H/C coded: 0/1.
**Second word is Memory Address.

†CLE: Only this bit is required.
‡SL*: Only this bit and bit 11 (A/B as applicable) are required.

EXTENDED INSTRUCTION GROUP CODES IN BINARY

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SAX/SAY/ SBX/SBY	1	0	0	0	A/B	0	1	1	1	1	1	0	X/Y	0	0	0
CAX/CAY/ CBX/CBY	1	0	0	0	A/B	0	1	1	1	1	1	0	X/Y	0	0	1
LAX/LAY/ LBX/LBY	1	0	0	0	A/B	0	1	1	1	1	1	0	X/Y	0	1	0
STX/STY	1	0	0	0	1	0	1	1	1	1	1	0	X/Y	0	1	1
CXA/CYA/ CXB/CYB	1	0	0	0	A/B	0	1	1	1	1	1	0	X/Y	1	0	0
LDX/LDY	1	0	0	0	1	0	1	1	1	1	1	0	X/Y	1	0	1
ADX/ADY	1	0	0	0	1	0	1	1	1	1	1	0	X/Y	1	1	0
XAX/XAY/ XBX/XBY	1	0	0	0	A/B	0	1	1	1	1	1	0	X/Y	1	1	1
ISX/IXY/ DSC/DSY	1	0	0	0	1	0	1	1	1	1	1	1	X/Y	0	0	I/D
JUMP INSTRUCTIONS	1	0	0	0	1	0	1	1	1	1	1	1	▨	0	1	0

JLY = 0
JPY = 1

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
BYTE INSTRUCTIONS	1	0	0	0	1	0	1	1	1	1	1	1	0	▨	▨	▨

LBT =	0	1	1
SBT =	1	0	0
MBT =	1	0	1
CBT =	1	1	0
SFB =	1	1	1

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
BIT INSTRUCTIONS	1	0	0	0	1	0	1	1	1	1	1	1	1	▨	▨	▨

SBS =	0	1	1
CBS =	1	0	0
TBS =	1	0	1

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
WORD INSTRUCTIONS	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	▨

CMW = 0
MVW = 1

EXTENDED INSTRUCTION GROUP CODES IN BINARY (CONTINUED)

MEMORY EXPANSION	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
DJP/DJS	1	0	0	0	1	0	1	1	1	1	0	1	1	▨	▨	▨

DJP	=	0	1	0
DJS	=	0	1	1

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SYB/USB/PAB PBB/SSM/JRS	1	0	0	0	1	0	1	1	1	1	0	0	1	▨	▨	▨

SYB	=	0	0	0
USB	=	0	0	1
PAB	=	0	1	0
PBB	=	0	1	1
SSM	=	1	0	0
JRS	=	1	0	1

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
XMA/XLA/XSA/ XCA/LFA	1	0	0	0	0	0	1	1	1	1	0	1	0	▨	▨	▨

XMA	=	0	1	0
XLA	=	1	0	0
XSA	=	1	0	1
XCA	=	1	1	0
LFA	=	1	1	1

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
MBI/MBF/MBW/ MWI/MWF/MWW	1	0	0	0	1	0	1	1	1	1	0	0	0	▨	▨	▨

MBI	=	0	1	0
MBF	=	0	1	1
MBW	=	1	0	0
MWI	=	1	0	1
MWF	=	1	1	0
MWW	=	1	1	1

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SYA/USA/ PAA/PBA	1	0	0	0	0	0	1	1	1	1	0	0	1	▨	▨	▨

SYA	=	0	0	0
USA	=	0	0	1
PAA	=	0	1	0
PBA	=	0	1	1

EXTENDED INSTRUCTION GROUP CODES IN BINARY (CONTINUED)

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
XMM/XMS/ XMB/XLB/ XSB/XCB/LFB	1	0	0	0	1	0	1	1	1	1	0	1	0	▨		

XMM	=	0	0	0
XMS	=	0	0	1
XMB	=	0	1	0
XLB	=	1	0	0
XSB	=	1	0	1
XCB	=	1	1	0
LFB	=	1	1	1

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
RSA/RVA	1	0	0	0	0	0	1	1	1	1	0	1	1	▨		

RSA	=	0	0	0
RVA	=	0	0	1

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
RSB/RVB/SJP/ SJS/UJP/UJS	1	0	0	0	1	0	1	1	1	1	0	1	1	▨		

RSB	=	0	0	0
RVB	=	0	0	1
SJP	=	1	0	0
SJS	=	1	0	1
UJP	=	1	1	0
UJS	=	1	1	1

SYSTEM COMMUNICATIONS AREA LOCATIONS

Octal Location	Contents	Description
SYSTEM TABLE DEFINITION		
01645	XIDEX	Address of current program's ID extension
01646	XMATA	Address of current program's MAT entry
01647	XI	Address of index register save area
01650	EQTA	FWA of Equipment Table
01651	EQT#	Number of EQT entries
01652	DRT	FWA of Device Reference Table, word 1
01653	LUMAX	Number of logical units in DRT
01654	INTBA	FWA of Interrupt Table
01655	INTLG	Number of Interrupt Table Entries
01656	TAT	FWA of Track Assignment Table
01657	KEYWD	FWA of keyword block
I/O MODULE/DRIVER COMMUNICATION		
01660	EQT1	Addresses of first 11 words of current EQT entry (see 01771 for last four words
01661	EQT2	
01662	EQT3	
01663	EQT4	
01664	EAT5	
01665	EAT6	
01666	EQT7	
01667	EQT8	
01670	EQT9	
01671	EQT10	
01672	EQT11	
01673	CHAN	Current DCPC channel number
01674	TBG	I/O address of time-base card
01675	SYSTY	EQT entry address of system TTY

SYSTEM COMMUNICATIONS AREA LOCATIONS (CONTINUED)

Octal Location	Contents	Description
SYSTEM REQUEST PROCESSOR/EXEC COMMUNICATION		
01676	RQCNT	Number of request parameters –1
01677	RQRTN	Return point address
01700	RQP1	Addresses of request parameters (set for a maximum of nine parameters)
01701	RQP2	
01702	RQP3	
01703	RQP4	
01704	RQP5	
01705	RQP6	
01706	RQP7	
01707	RQP8	
01710	RQP9	
UTILITY PARAMETERS		
01755	TATLG	Negative length of track assignment table
01756	TATSD	Number of tracks on system disc
01757	SECT2	Number of sectors/track on LU2 (system)
01760	SECT3	Number of sectors/track on LU3 (aux.)
01761	DSCLB	Disc address of library entry points
01762	DSCLN	Number of user available library entry points
01763	DSCUT	Disc address of relocatable disc resident library
01764	SYSLN	Number of system library entry points
01765	LGOTK	LGO: LU#, starting track, number of tracks (same format as ID segment word 28)
01766	LGOC	Current LGO track/sector address (same format as ID segment word 26)

SYSTEM COMMUNICATIONS AREA LOCATIONS (CONTINUED)

Octal Location	Contents	Description
UTILITY PARAMETERS, cont'd.		
01767	SFCUN	LS: LU# and disc address (same format as ID segment word 26)
01770	MPTFL	Memory protect ON/OFF flag (0/1)
01771	EQT12	Address of last four words of current EQT
01772	EQT13	
01773	EQT14	
01774	EQT15	
01775 D	FENCE	Memory protect fence address
01777	BGLWA	LWA memory background partition
D letter indicates the contents of the location are set dynamically by the dispatcher.		
SYSTEM LISTS ADDRESSES		
01711	SKEDD	Schedule list
01713	SUSP2	Wait Suspend list
01714	SUSP3	Available Memory list
01715	SUSP4	Disc Allocation list
01716	SUSP5	Operator Suspend list
PROGRAM ID SEGMENT DEFINITION		
01717	XEQT	ID segment address of current program
01720	XLINK	Linkage
01721	XTEMP	Temporary (five words)
01726	XPRIO	Priority word
01727	XPENT	Primary entry point
01730	XSUSP	Point of suspension
01731	XA	A-register at suspension
01732	XB	B-register at suspension
01733	XEO	E and overflow register suspension

SYSTEM COMMUNICATIONS AREA LOCATIONS (CONTINUED)

Octal Location	Contents	Description
SYSTEM MODULE COMMUNICATION FLAGS		
01734	OPATN	Operator/keyboard attention flag
01735	OPFLG	Operator communication flag
01736	SWAP	RT disc resident swapping flag
01737	DUMMY	I/O address of dummy interface flag
01740	IDSDA	Disc address of first ID segment
01741	IDSDP	Position within disk sector
MEMORY ALLOCATION BASES DEFINITION		
01742	BPA1	FWA user base page link area
01743	BPA2	LWA user base page link area
01744	BPA3	FWA user base page link
01745	LBORG	FWA of resident library area
01746	RTORG	FWA of real-time COMMON
01747	RTCOM	Length of real-time COMMON
01750 D	RTDRA	FWA of real-time partition
01751 D	AVMEM	LWA+1 of real-time partition
01752	BGORG	FWA of background COMMON
01753	BGCOM	Length of background COMMON
01754 D	BGDRA	FWA of background partition

DEVICE REFERENCE TABLE (DRT)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
SUBCHANNEL NO.					(RESERVED)					EQT ENTRY NUMBER						WORD 1
F	DOWNED I/O REQUEST LIST POINTER															WORD 2

WHERE

F (UP/DOWN FLAG) = 0 IF DEVICE IS UP
1 IF DEVICE IS DOWN

EQUIPMENT TABLE (EQT)

WORD	CONTENTS															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
1	R	I/O REQUEST LIST POINTER <C>														
2	R	DRIVER INITIATION SECTION ADDRESS <A>														
3	R	DRIVER CONTINUATION/COMPLETION SECTION ADDRESS <A>														
4	D <A>	B <B>	P <E>	S <E>	T <C>	SUBCHANNEL <C>					I/O SELECT CODE # <A>					
5	AV <F>		EQUIPMENT TYPE CODE <A>						STATUS <E>							
6	CONWD (CURRENT I/O REQUEST WORD) <C>															
7	REQUEST BUFFER ADDRESS <C>															
8	REQUEST BUFFER LENGTH <C>															
9	TEMPORARY STORAGE <D> OR OPTIONAL PARAMETER <C>															
10	TEMPORARY STORAGE <D> OR OPTIONAL PARAMETER <C>															
11	TEMPORARY STORAGE FOR DRIVER <D>															
12	TEMPORARY STORAGE FOR DRIVER <D> OR EQT EXTENSION SIZE, ANY <A>															
13	TEMPORARY STORAGE FOR DRIVER <D> OR EQT EXTENSION STARTING ADDRESS, IF ANY <A>															
14	DEVICE TIME-OUT RESET VALUE <B>															
15	DEVICE TIME-OUT CLOCK <C>															

LEGEND FOR EQT TABLE

R = reserved for system use.

I/O Request List Pointer = points to list of requests queued up on this EQT entry.

D = 1 if DCPC required.

B = 1 if automatic output buffering used.

P = 1 if driver is to process power fail.

S = 1 if driver is to process time-out.

T = 1 if device timed out (system sets to zero before each I/O request).

Subchan = last subchannel addressed.

I/O Select Code = I/O select code for the I/O controller (lower number if a multi-board interface).

AV = I/O controller availability indicator:

0 = available for use.
1 = disabled (down).
2 = busy (currently in operation).
3 = waiting for an available DCPC channel.

Equipment Type Code = type of device on this controller. When this octal number is linked with "DVy," it identifies the device's software driver routine. Some standard driver numbers are:

00 to 07 = paper tape devices or consoles

- 00 = teleprinter or keyboard control device
- 01 = photoreader
- 02 = paper tape punch
- 05 = 264x-series terminals
- 07 = multi-point devices

LEGEND FOR EQT TABLE (CONTINUED)

10 to 17= unit record devices

- 10 = plotter
- 11 = card reader
- 12 = line printer
- 15 = mark sense card reader

20 to 37 = magnetic tape/mass storage devices

- 23 = 9-track magnetic tape
- 31 = 7900 moving head disc
- 32 = 7905/06/20 moving head disc
- 33 = flexible disc drives
- 36 = writable control store
- 37 = HPIB

40 to 77 = instruments

STATUS = actual physical status or simulated status at the end of each operation (see Device Status Table).

CONWD = combination of user control word and user request code word in the I/O EXEC call (see EQT wd. 6).

Letters in brackets (<>) indicate the nature of each data item as follows:

<A> = fixed at generation or reconfiguration time; never changes

<B> = fixed at generation or reconfiguration time; can be changed on-line

<C> = set up or modified at each I/O initialization

<D> = available as temporary storage by driver

<E> = can be set driver

<F> = maintained by system

DEVICE STATUS TABLE A

Device/Status	7	6	5	4	3	2	1	0

Teleprinter(s)
Photoreader(s)
Punch(s)
DVR00
	X	—	End of I/O Tape	—	—	STL	TEN	—

263x 264x Terminal	BF	—	CD	—	—	—	TEN	—
Cartridge Tape Unit DVR05, DVA05	EOF	TLP	EOT	RE	LCA	CWP	EOD	CNE/DB
2892A Card Reader DVR11	HE/SOR	SF	HE/SF	PF	TE/PF	OL	ICC/HF	RNR
2607 Line Printer	—	TOF	—	ID	PSE	OL	—	—
2610/2614 Line Printer	—	TOF	—	ID	SSE	PO	—	—
2613/17/18 Line Printer	—	TOF	—	ID	ON	NR	V9	V12
2631 Line Printer DVA12	—	TOF	—	BR	ON	PO	—	—
2608A Line Printer DVB12	PW	TOF	S8	VI	ON	NR	V9	V12
2607A Line Printer DVR12	TUF	DM	ON	RY	—	—	APE	—

DEVICE STATUS TABLE A (CONTINUED)

Device/Status	7	6	5	4	3	2	1	0
7261A Card Reader DVR15	EOF	—	HF/ SF	PF	—	—	DE	RNR
7970 Mag Tape DVR23	EOF	ST	EOT	TE	I/O R	NW	PE/ TE	OL
7900 Moving Head Disc DVR31	—	NR	EOT	AE	FC	SC	DE	EE
79XX Disc Drives DVR32	PS	FS	HF	FC	SC	NR	DB	EE
79XXH, 9895 Disc Drives DVA32	PS	FS	HF	FC	SC	NR	DB	EE
See Status Table B DVR33								
59310B HPIB DVR37	—	EF	II/O	NOA	SRQA	IFC	TO	—

See Page K-21 for Key.

DEVICE STATUS TABLE B

DVR33
127323A, 12733A Disc Drives

Bits 0-7	Meaning
00000000	No Error
00000011	No Drive Power
00000101	Door Open
00000111	No Disc
00001011	Record Not Found
00001101	Track Not Found
00001111	Data Checkword Error
00010001	Data Overrun
00010011	Read "Tight Margin" Error
00011111	Transfer Incomplete
00100001	Data Block too long
00100000*	End of Track (Access track > 66)
01000000*	Disc Change
10000000*	Disc Write Protected

DVA47
Serial Link Driver

Bits 0-7	Meaning
00000001	Time out occurred
00000010	Hardware Failure
00000011	Hardware Failure on Controller
00000100	Bad System Configuration
00000101	Illegal Request

DEVICE STATUS TABLE KEY

AE	=	Address Error
AF	=	Abort Flag (NR (Bit = 7 = 0) has occurred during since last data transfer)
APE	=	Auto Page Eject
BF	=	Buffer Flushed
BR	=	Buffer Ready
BT	=	Broken Tape
CD	=	Control-D Entered
CE	=	Compare Error
CNI	=	Cartridge Not Inserted
CWP	=	Cartridge Write Protected
DB	=	Device Busy
DE	=	Data Error
DM	=	Demand (1= idle)
DR	=	Disc Ready
EE	=	Error Exists
EF	=	EQT Extension Area Full
EOD	=	End of Data
EOF	=	End of File
EOT	=	End of Track
FC	=	Flagged Track
FS	=	Driver Format Switch is Set
HE	=	Hopper Empty
HF	=	Hardware Fault
ICC	=	Illegal Card Code
ID	=	Idle
IFC	=	IFC Detected
II/O	=	Illegal I/O Request
I/OR	=	I/O Reject
LCA	=	Last Command Aborted
LCF	=	Last Character Flag
NE	=	No Error
NOA	=	Non-existent alarm program
NR	=	Not Ready
NW	=	No write (ring missing or rewinding)
OL	=	Off Line
ON	=	On Line
PD	=	Pen Down
PE	=	Parity Error

DEVICE STATUS TABLE KEY (CONTINUED)

PF	= Pick Fail
PW	= Power Fail
PO	= Paper Out
PS	= Protect Switch Set
PSE	= Print Switch Enabled
RE	= Read Error
RNR	= Reader Not Ready
RX	= Ready (0= Power On)
SAC	= Sector Address Coincidence
SC	= Seek Check
SF	= Stacker Full
SOR	= EOF Switch on during Read
SSE	= Start Switch enabled
ST	= Start of Tape
STL	= Stall required in program
S8	= Set is 8 LPI
TE	= Timing Error
TEN	= Terminal Enabled
TLP	= Tape at Load Pt
TO	= Device Time Out
TOF	= Top of Form
VI	= VFC Initialized
V9	= VFU Chan 12 detected
V12	= V9 VFU Chan 9 detected
WE	= Currently addressed track is write enabled
X	= Driver internal use

EQT WORD 6

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Status					Subfunction									Function	

Status	Subfunction	Function
00 — standard call	00000 = clear controller (if function = 11 = CONTROL call)	01 — READ call
01 — buffered call		10 — WRITE call
10 — system		11 — CONTROL call
11 — Class call		

Other subfunctions are driver specific and may or may not be defined

ID SEGMENT

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	WORD
LIST LINKAGE																0
TEMP 1																1
TEMP 2																2
TEMP 3																3
TEMP 4																4
TEMP 5																5
PRIORITY																6
PRIMARY ENTRY POINT																7•
POINT OF SUSPENSION																8
A-REGISTER																9
B-REGISTER																10
EO-REGISTERS																11
NAME 1								NAME 2								12•
NAME 3								NAME 4								13•
NAME 5								TM	ML	▨	SS	TYPE				14•
NA	▨	NP	W	A	▨	O	LP	R	D	▨		STATUS				15
TIME LIST LINKAGE																16
RES			T	MULTIPLE												17
LOW ORDER 16 BITS OF TIME																18
HIGH ORDER BITS OF TIME																19
BA	FW	M	AT	RM	RE	PW	RN	FATHER ID SEGMENT NO.								20
RP	#PGS. (NO BP)					MPFI			▨	PARTITION NO. -1						21
LOW MAIN ADDRESS																22•

0 ← XEQT

Words 0–22: MEMORY RESIDENT PROGRAMS

ID SEGMENT
(CONTINUED)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
HIGH MAIN ADDRESS + 1																23 *	
LOW BASE PAGE ADDRESS																24 *	
HIGH BASE PAGE ADDRESS + 1																25 *	
LU	PROGRAM TRACK								SECTOR							26 *	
LU	SWAP TRACK								NO. TRACKS							27	
ID EXTENSION NO.						EMA SIZE										28	
HIGH ADDRESS + 1 OF LARGEST SEGMENT																29	
TIMESLICE WORD																30	MEMORY RESIDENTS
SEQCNT				▨	DC	CP	▨	SESSION ID								31	
SESSION WORD																32	

* = WORDS USED IN SHORT ID SEGMENTS

ID SEGMENT LEGEND

TM = temporary load (copy of ID segment is not on the disc)

ML = memory lock (program may not be swapped)

SS = short segment (indicates a nine-word segment)

TYPE = specified program type (1-5)

NA = no abort (instead, pass abort errors to program)

NP = no parameters allowed on reschedule

W = wait bit (waiting for program whose ID segment address is in word 1)

A = abort on next list entry for this program

O = operator suspend on next schedule attempt

LP = load in progress; program is being dispatched from disc.

R = resource save (save resources when setting dormant)

D = dormant bit (set dormant on next schedule attempt)

Status = current program status

T = time list entry bit (program is in the time list)

BA = batch (program is running under batch)

FW = father is waiting (father scheduled with wait)

M = Multi-Terminal Monitor bit

AT = attention bit (operator has requested attention)

RM = reentrant memory must be moved before dispatching program

RE = reentrant routine now has control

PW = program wait (some other program wants to schedule this one)

RN = Resource Number either owned or locked by this program

RP = reserved partition (only for programs that request it)

DC = don't copy flag

CP = copy flag

MPFI = memory protect fence index

ID SEGMENT EXTENSION

<table>
<tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td><td></td></tr>
<tr><td>NS</td><td colspan="10">CURRENT MSEG NO.</td><td colspan="5"># PAGES MSEG</td><td>WORD 0</td></tr>
<tr><td colspan="5">MSEG START PAGE (LOGIC.)</td><td>DE</td><td colspan="10">(PHYSICAL) EMA START PAGE</td><td>WORD 1</td></tr>
<tr><td colspan="6">▨</td><td colspan="10"># TRACKS FOR EMA SWAP</td><td>WORD 2</td></tr>
</table>

WHERE:

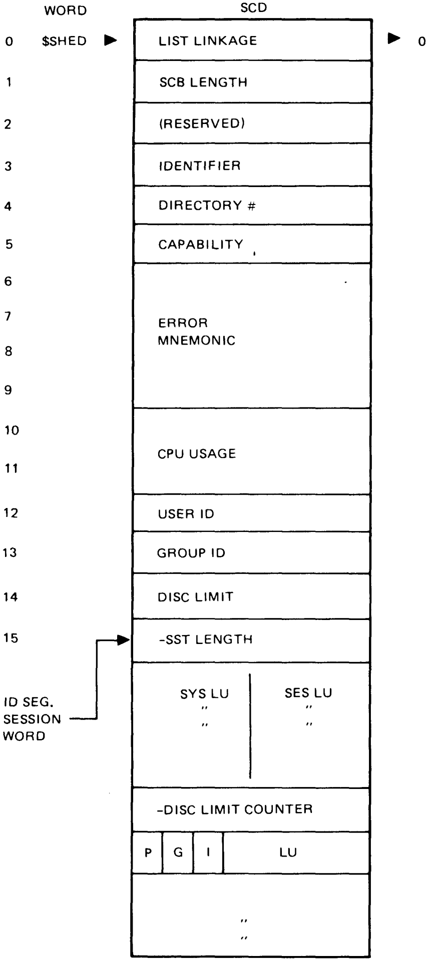
NS = 0 IF THE MSEG IS POINTING TO A STANDARD SEGMENT OF THE EMA (SET UP BY EMAP)

1 IF THE MSEG IS POINTING TO A NON-STANDARD SEGMENT (SET UP BY EMIO)

DE = 0 IF THE EMA SIZE WAS SPECIFIED BY THE USER

1 IF THE EMA SIZE IS ALLOWED TO DEFAULT TO THE MAXIMUM SIZE AVAILABLE TO THE SYSTEM.

SESSION CONTROL BLOCK (SCB)



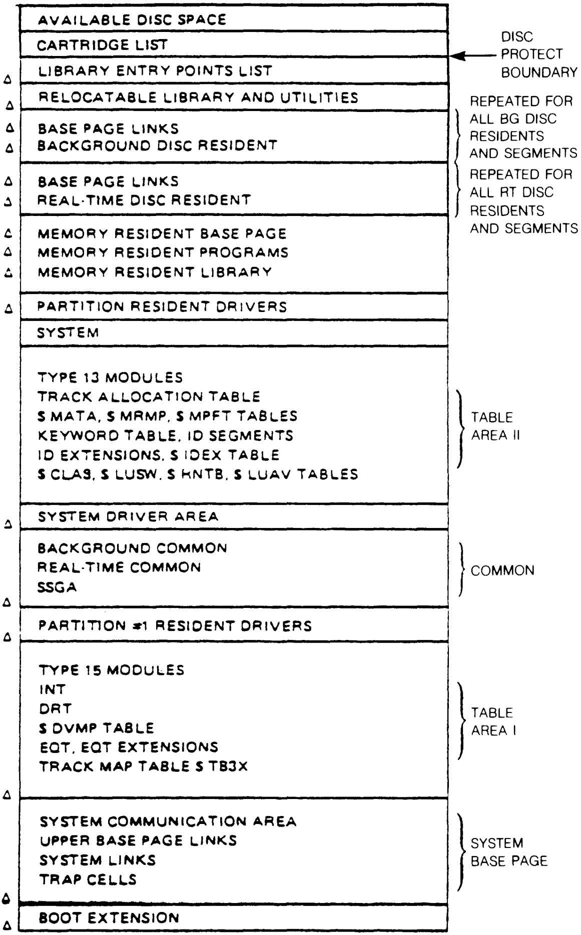
WORD		SCD	
0	$SHED ▶	LIST LINKAGE	▶ 0
1		SCB LENGTH	
2		(RESERVED)	
3		IDENTIFIER	
4		DIRECTORY #	
5		CAPABILITY	
6 7 8 9		ERROR MNEMONIC	
10 11		CPU USAGE	
12		USER ID	
13		GROUP ID	
14		DISC LIMIT	
15	ID SEG. SESSION WORD	-SST LENGTH	
		SYS LU | SES LU " | " " | "	
		-DISC LIMIT COUNTER	
		P | G | I | LU	
		" "	

P = ADDED SST ENTRY FOR THIS DISC

G = THIS IS A GROUP CARTRIDGE

I = THIS DISC CARTRIDGE IS INACTIVE

RTE-IVB SYSTEM DISC LAYOUT



AVAILABLE DISC SPACE

CARTRIDGE LIST

DISC PROTECT BOUNDARY

LIBRARY ENTRY POINTS LIST

RELOCATABLE LIBRARY AND UTILITIES

BASE PAGE LINKS
BACKGROUND DISC RESIDENT

REPEATED FOR ALL BG DISC RESIDENTS AND SEGMENTS

BASE PAGE LINKS
REAL-TIME DISC RESIDENT

REPEATED FOR ALL RT DISC RESIDENTS AND SEGMENTS

MEMORY RESIDENT BASE PAGE
MEMORY RESIDENT PROGRAMS
MEMORY RESIDENT LIBRARY

PARTITION RESIDENT DRIVERS

SYSTEM

TYPE 13 MODULES
TRACK ALLOCATION TABLE
$ MATA, $ MRMP, $ MPFT TABLES
KEYWORD TABLE, ID SEGMENTS
ID EXTENSIONS, $ IDEX TABLE
$ CLAS, $ LUSW, $ HNTB, $ LUAV TABLES

TABLE AREA II

SYSTEM DRIVER AREA

BACKGROUND COMMON
REAL-TIME COMMON
SSGA

COMMON

PARTITION *1 RESIDENT DRIVERS

TYPE 15 MODULES
INT
DRT
$ DVMP TABLE
EQT, EQT EXTENSIONS
TRACK MAP TABLE $ TB3X

TABLE AREA I

SYSTEM COMMUNICATION AREA
UPPER BASE PAGE LINKS
SYSTEM LINKS
TRAP CELLS

SYSTEM BASE PAGE

BOOT EXTENSION

Δ SECTOR BOUNDARIES

*INCLUDES ONE SYSTEM-RESERVED TRACK

DATA CONTROL BLOCK

BIT 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

16-WORD CARTRIDGE ENTRY (WORDS 0–16)

WORD									
0*	SECTOR OFFSET	SECTOR # OF FILE DIRECTORY	LU # OF FILE DIRECTORY OR OF FILE IF ON DISC						
1*	TRACK # OF FILE DIRECTORY								
2	FILE TYPE (MAY BE OVERRIDDEN AT OPEN, UNLESS TYPE 0)								
3	TRACK ADDRESS OF FILE (TYPE > = 1)	LU # OF FILE (TYPE = 0)							
4	SECTOR ADDRESS OF FILE (TYPE > = 1)	END-OF-FILE CODE (TYPE = 0)							
5	FILE SIZE IN –CHUNKS +SECTORS (TYPE > = 1)	SPACING CODE (TYPE = 0)							
6	RECORD LENGTH (TYPE = 2)	READ/WRITE CODE (TYPE = 0)							
7	SC	NUMBER OF BLOCKS IN DCB BUFFER		EX	SY	OM	IB	EF	WR
8	NUMBER OF SECTORS PER TRACK (TYPE > = 1)								
9	OPEN/CLOSE INDICATOR								
10†	TRACK # OF CURRENT FILE POSITION (TYPE > = 1)								
11†	SECTOR # OF CURRENT FILE POSITION (TYPE > = 1)								
12†	LOCATION OF NEXT WORD IN FILE (TYPE > = 1)								
13	RECORD # OF CURRENT FILE								
14	POSITION (DOUBLE WORD INTEGER)								
15	EXTENT NUMBER (TYPE > = 3)								
16	DCB BUFFER AREA								
BUFFER 128+n									

* FILE DIRECTORY ADDRESS

† CURRENT POSITION IN FILE

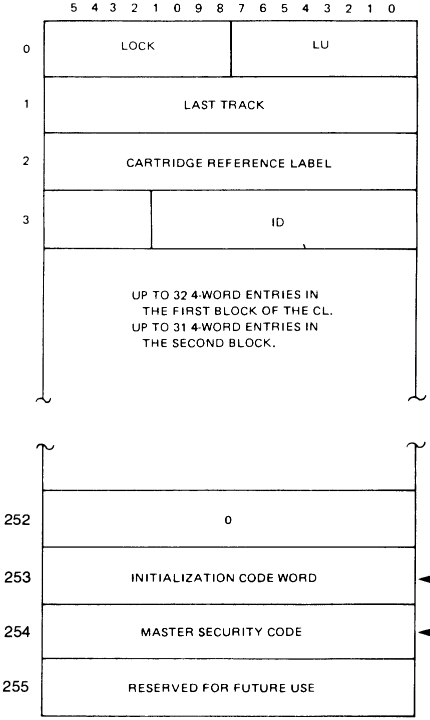
LEGEND FOR DATA CONTROL BLOCK

WORD		CONTENT
0	File Directory Address:	bits 6-12 = Physical sector # (block) of file directory bits 13-15 = Entry offset from the beginning of the block (origin 0)
4	End-of-File Code, type 0 file:	01 lu = EOF on Magnetic Tape 10 lu = EOF on Paper Tape 11 lu = EOF on Line Printer
5	Spacing Code, type 0 file:	bit 15 = 1 — backspace legal bit 0 = 1 — forward space legal
6	Read/Write Code, type 0 file:	bit 15 = 1 — input legal bit 0 = 1 — output legal
7	Security Code Check/Open Mode/Buffer Size/In Buffer/To Be Written/EOF Read Flag, all file types	
	(SC) Security Code Check	bit 15 = 1 — security codes agree = 0 — security codes do not agree
	DCB Buffer:	bits 14-7 = Number of blocks in DCB buffer
	(SY) System Disc:	bit 4 = 1 file is on a system disc = 0 not on a system disc
	(Ex) Extendibility:	bit 5 = 1 file is not extendible = 0 file is extendible

LEGEND FOR DATA CONTROL BLOCK (CONTINUED)

WORD		CONTENT
	(OM) Open Mode:	bit 3 = 1 — update open 0 — standard open
	(IB) In Buffer Flag:	bit 2 = 1 — data in DCB buffer = 0 — data not in DCB buffer
	(EF) EOF Read Flag:	bit 1 = 1 — EOF has been read = 0 — EOF has not been read
	(WR) To Be Written:	bit 0 = 1 — data in DCB buffer to be written = 0 — data in DCB buffer not to be written
9	Open/Close Indicator: if open, contains ID segment location of program performing open. If closed, set to zero.	

CARTRIDGE DIRECTORY FORMAT



SUM OF CONTENTS
OF BASE PAGE WORDS
1650 THRU 1657
AND 1742 THRU
1747 AND 1755
THRU 1764

SET WHEN SYSTEM
CARTRIDGE IS
INITIALIZED.

LOCK = 0 IF NOT LOCKED; ELSE IS KEYWORD TABLE OFFSET OF ID SEGMENT ADDRESS OF LOCKING PROGRAM

LOCKED DISCS ARE AVAILABLE ONLY TO THE LOCKER.

ID IDENTIFIES TO WHOM THE CARTRIDGE IS MOUNTED.

ID = 0000 → NON-SESSION
ID = 7777 → SYSTEM CARTRIDGE
0<ID<7777→ SESSION MONITOR
GROUP OR PRIVATE CARTRIDGE

NOTE: WORDS 124, 125, 126, AND 127 ARE UNIQUE ONLY IN THE SECOND BLOCK OF THE CL. THE FIRST BLOCK WILL HOLD 32 ENTRIES IN WORDS 0 THROUGH 127.

DISC DIRECTORY
CARTRIDGE LABEL ENTRY

WORD	CONTENT	IN PARAMETERS
	15 0	
0		BIT 15 SET TO DISTINGUISH CARTRIDGE ENTRY FROM FILE ENTRY 6 CHARACTER CARTRIDGE LABEL.
1		
2		
3	CARTRIDGE REFERENCE NUMBER	
4	FIRST AVAILABLE TRACK FOR FMP	
5	RESERVED | NEXT AVAILABLE SECTOR	
6	NUMBER OF SECTORS PER TRACK	
7	LOWEST DIRECTORY TRACK (LAST FILE TRACK + 1)	
8	NUMBER OF TRACKS IN DIRECTORY (NEGATIVE VALUE)	
9	NEXT AVAILABLE FMP TRACK	
10	FIRST BAD TRACK	
	⋮	
15	SIXTH BAD TRACK	

DISC DIRECTORY FILE ENTRY

BIT	15 … 8	7 … 0
WORD 0	6-CHARACTER FILE NAME	
1		
2		
3	FILE TYPE (1 THRU 32767)	
4	STARTING TRACK	
5	EXTENT #	STARTING SECTOR
6	FILE SIZE IN + SECTOR OR - CHUNKS	
7	RECORD LENGTH (TYPE 2 ONLY)	
8	SECURITY CODE	
9	OPEN FLAGS 15 = 1 FOR EXCLUSIVE OPEN 14-12 = RESERVED 11-8 = SEQUENCE COUNTER 7-0 = KEYWORD OFFSET OF OPENING PROGRAM'S ID SEGMENT	
10		
11		
12		
13		
14		
15		

WORD 0 = 0 IF THE LAST ENTRY IN DIRECTORY; = -1 IF FILE IS PURGED

DISC DIRECTORY TYPE 0 FILE ENTRY

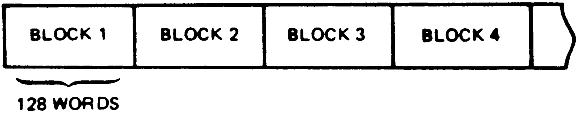
The entries for non-disc (type 0) files differ from those for disc files in words 3 through 7:

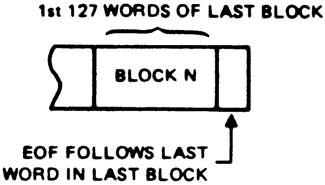
bit	15 | | 0	CR parameters:
word 3	0 (file type default)	
4	logical unit number	
5	end of file subfunction	← EO,LE,PA or control
6	spacing code	← BS,FS, or BO
7	input-output code	← RE,WR, or BO

Words 5-7 are octal codes

DISC FILE RECORD FORMATS

Fixed Length Formats (Types 1 and 2)

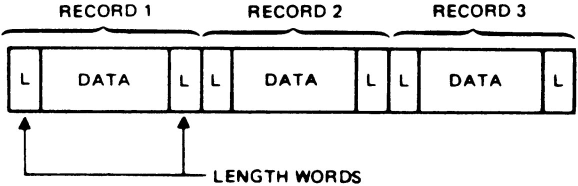


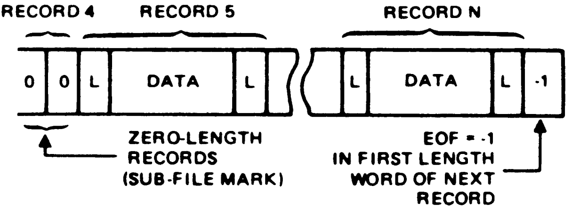

1st 127 WORDS OF LAST BLOCK
BLOCK N
EOF FOLLOWS LAST WORD IN LAST BLOCK

Type 1 Record length = Block length = 128 words

Type 2 Record length is user defined; may cross block boundaries but not past EOF

Variable Length Formats (Types 3 and Above)




RECORD 4
RECORD 5
RECORD N
0
0
L
DATA
L
L
DATA
L
-1
ZERO-LENGTH RECORDS (SUB-FILE MARK)
EOF = -1 IN FIRST LENGTH WORD OF NEXT RECORD

TYPE 6 FILE FORMAT

Files created by the SP command as memory-image program files are always accessed as type 1 files (fixed length, 128-words per record).

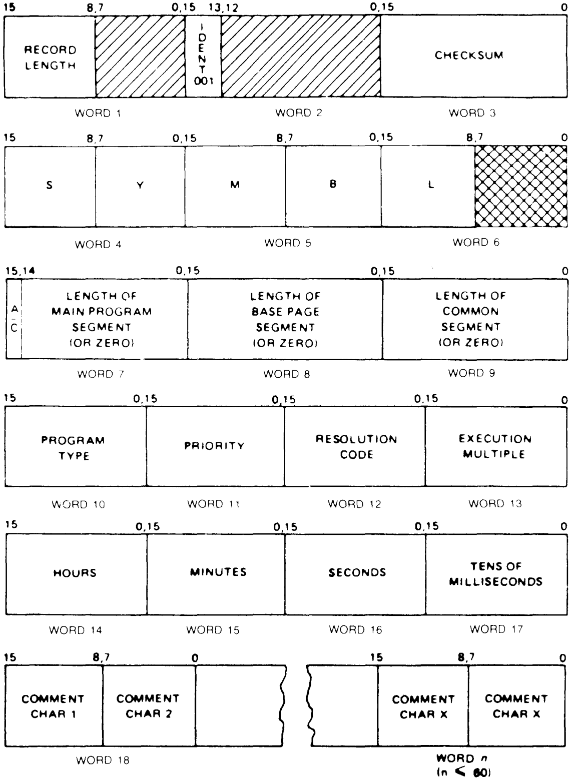
1ST TWO SECTORS CONTAIN PROGRAM'S ID SEGMENT INFORMATION

WORD	CONTENT	
0	-1	EOF UNLESS FORCED TO TYPE 1
1-5	NOT USED	
6	PRIORITY	
7	PRIMARY ENTRY POINT	
8-13	NOT USED	
14	PROGRAM TYPE	
15-16	NOT USED	
17-19	TIME PARAMETERS	
20	SUBSTATUS 1 - WORD 20 OF ID SEGMENT	
21	SUBSTATUS 2 - WORD 21 OF ID SEGMENT	
22	LOW MAIN ADDRESS	
23	HIGH MAIN ADDRESS +1	
24	LOW BASE-PAGE ADDRESS	
25	HIGH BASE-PAGE ADDRESS +1	
26-27	NOT USED	
28	ID EXT. #/EMA SIZE	
29	HIGH ADDRESS +1 OF LARGEST SEGMENT	
30-32	NOT USED	
33	CHECKSUM OF WORDS 0 - 32	SUM OF CONTENTS OF WORDS 1650 THRU 1657 AND WORDS 1742 THRU 1747 AND 1755 THRU 1764 IN BASE PAGE
34	SETUP CODE WORD	
35	ID EXTENSION - WORD 1	
36	ID EXTENSION - WORD 2	
37	NOT USED	
38	OWNER ID	IF SIGN BIT SET PROGRAM FILE PROTECTED TO THIS USER ID
39	OWNER'S GROUP ID	IF SIGN BIT SET PROGRAM FILE PROTECTED TO THIS GROUP ID
40	CAPABILITY LEVEL REQUIRED	MINIMUM CAPABILITY REQUIRED TO RU OR RP THIS PROGRAM
41-127	NOT USED	

REMAINDER OF FILE IS AN EXACT COPY OF THE PROGRAM BEING SAVED.

NAM RECORD

CONTENT



▨ HATCH-MARKED AREAS SHOULD BE ZERO-FILLED WHEN THE RECORDS ARE GENERATED

▦ CROSS-HATCHED AREAS SHOULD BE BLANK-FILLED WHEN THE RECORDS ARE GENERATED

EXPLANATION

RECORD LENGTH = 9-60 WORDS

IDENT = 001

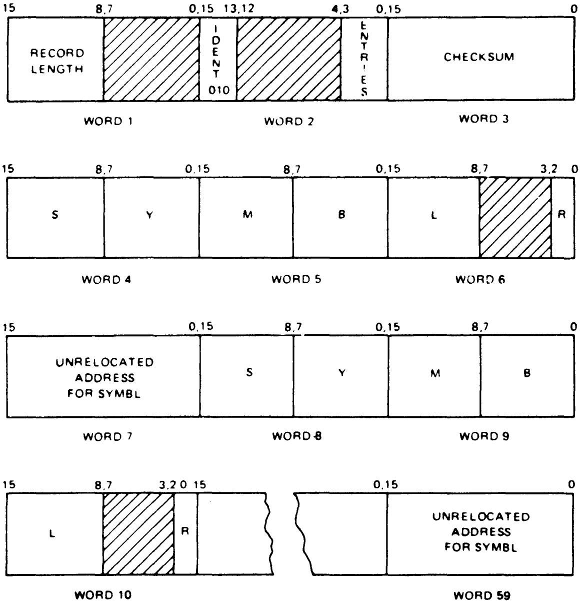
CHECKSUM ARITHMETIC TOTAL OF ALL WORDS IN RECORD EXCLUDING WORDS 1 AND 3.

SYMBL FIVE CHARACTER NAME OF PROGRAM

A/C BINARY TAPE PRECESSION
- 0 IF ASSEMBLER PRODUCED OR LENGTH IS EXACT
- 1 IF COMPILER PRODUCED AND LENGTH IS UNKNOWN

ENT RECORD

CONTENT



EXPLANATION

RECORD LENGTH = 7-59 WORDS

IDENT = 010

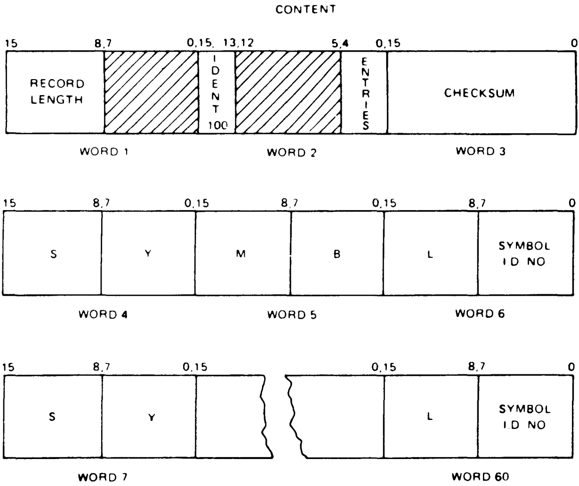
ENTRIES 1 TO 14 ENTRIES PER PROGRAM. EACH ENTRY IS FOUR WORDS LONG

SYMBL 5 CHARACTER ENTRY POINT SYMBOL

R RELOCATION INDICATOR
- = 0 IF PROGRAM RELOCATABLE
- = 1 IF BASE PAGE RELOCATABLE
- = 2 IF COMMON RELOCATABLE
- = 3 IF ABSOLUTE
- = 4 MICROCODE REPLACEMENT

WORDS 4 THROUGH 7 ARE REPEATED FOR EACH ENTRY POINT SYMBOL.

EXT RECORD



EXPLANATION

RECORD LENGTH = 6-60 WORDS

IDENT = 100

ENTRIES 1 TO 19 PER RECORD; EACH ENTRY IS THREE WORDS LONG

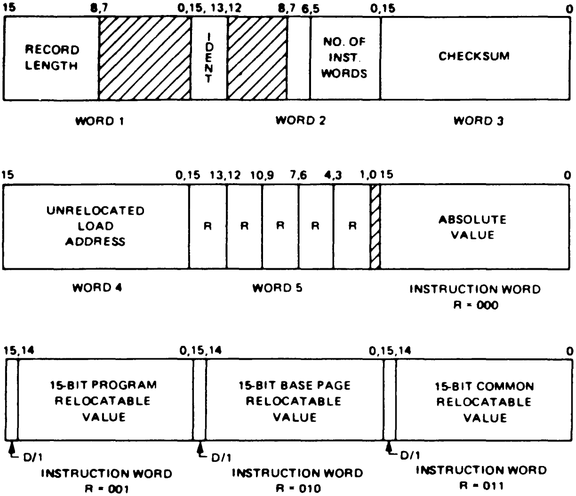
SYMBL 5 CHARACTER EXTERNAL SYMBOL

SYMBOL ID. NO. NUMBER ASSIGNED TO SYMBL FOR USE IN LOCATING REFERENCE IN BODY OF PROGRAM.

WORDS 4 THROUGH 6 REPEATED FOR EACH EXTERNAL SYMBOL (MAXIMUM OF 19 PER RECORD).

DBL RECORD

CONTENT



EXPLANATION

RECORD LENGTH = 6-60 WORDS
IDENT = 011
Z/C: RELOCATION OF LOAD ADDRESS
- = 0 FOR BASE PAGE
- = 1 FOR PROGRAM
- = 2 FOR ABSOLUTE
- = 3 FOR COMMON

NO. OF INST. WORDS 1 TO 45 LOADABLE INSTRUCTION WORDS PER RECORD

RELOCATABLE LOAD ADDRESS STARTING ADDRESS FOR LOADING THE INSTRUCTIONS WHICH FOLLOW;

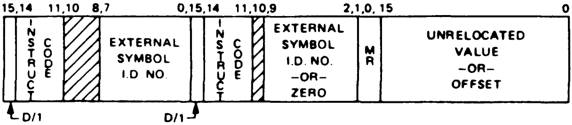
R's: RELOCATION INDICATORS

000 =	ABSOLUTE
001 =	15-BIT PROGRAM RELOCATABLE
010 =	15-BIT BASE PAGE RELOCATABLE
011 =	15-BIT COMMON RELOCATABLE
100 =	EXTERNAL REFERENCE
101 =	MEMORY REFERENCE

R_1 IS RELOCATION INDICATOR FOR INSTRUCTION WORD$_1$; R_2, FOR INSTRUCTION WORD$_2$, ETC.

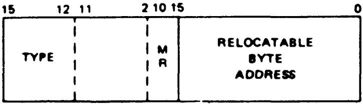
DBL RECORD (CONTINUED)

CONTENT



INSTRUCTION WORD R = 100

INSTRUCTION WORD R = 101



INSTRUCTION WORD R = 110

EXPLANATION

D/I: INDIRECT ADDRESSING

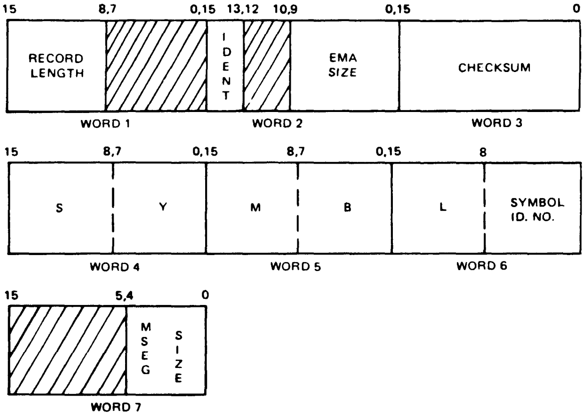
0 = DIRECT
1 = INDIRECT

MEMORY REFERENCE INSTRUCTIONS USE TWO WORDS, WITHIN THE TWO-WORD GROUP?, "MR" INDICATES RELOCATABILITY OF OPERAND SPECIFIED IN SECOND WORDS:

00	PROGRAM RELOCATABLE
01	BASE PAGE RELOCATABLE
10	COMMON RELOCATABLE
11	ABSOLUTE

EMA RECORD

CONTENT



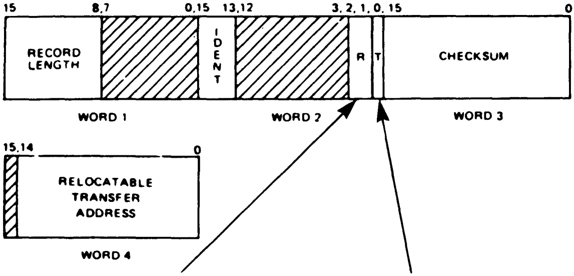
EXPLANATION

RECORD LENGTH = 7 WORD
IDENT = 110

SYMBOL ID. NO.: NUMBER ASSIGNED TO SYMBL FOR USE IN LOCATING REFERENCE IN BODY OF PROGRAM.

END RECORD

CONTENT



R RELOCATION INDICATOR FOR TRANSFER ADDRESS

- 0 IF PROGRAM RELOCATABLE
- 1 IF BASE PAGE RELOCATABLE
- 2 IF COMMON RELOCATABLE
- 3 IF ABSOLUTE

T: TRANSFER ADDRESS INDICATOR

- 0 IF NO TRANSFER ADDRESS IN RECORD
- 1 IF TRANSFER ADDRESS PRESENT

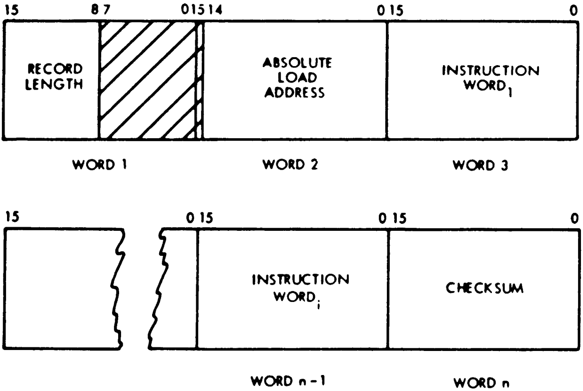
EXPLANATION

RECORD LENGTH = 4 WORDS
IDENT = 101

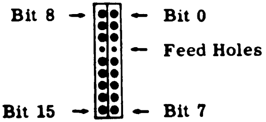
ABSOLUTE TAPE FORMAT

Absolute binary code is written to paper tape in the following format:

CONTENT



Each word represents two frames arranged as follows:



EXPLANATION

RECORD LENGTH = NUMBER OF WORDS IN RECORD EXCLUDING WORDS 1 AND 2 AND THE LAST WORD.

ABSOLUTE LOAD ADDRESS: STARTING ADDRESS FOR LOADING THE INSTRUCTIONS WHICH FOLLOW

INSTRUCTION WORDS: ABSOLUTE INSTRUCTIONS OR DATA

CHECKSUM: ARITHMETIC TOTAL OF ALL WORDS EXCEPT FIRST AND LAST

GLOBAL EQUIVALENCE

S	G	P		
0	-2	-48	Type	
		-47	1	
		-46	2	
		-45	3	
1	-1	-44	Type	
		-43	1	
		-42	2	
		-41	3	
2	0	-40	Type	
		-39	1	
		-38	2	
		-37	3	
3	1	-36	Type	
		-35	1	
		-34	2	
		-33	3	
4	2	-32	Type	
		-31	1	
		-30	2	
		-29	3	
5	3	-28	Type	
		-27	1	
		-26	2	
		-25	3	
6	4	-24	Type	
		-23	1	
		-22	2	
		-21	3	
7	5	-20	Type	
		-19	1	
		-18	2	
		-17	3	
8	6	-16	Type	
		-15	1	
		-14	2	
		-13	3	
9	7	-12	Type	
		-11	1	
		-10	2	
		- 9	3	
10	8	- 8	Type	
		- 7	1	
		- 6	2	
		- 5	3	
11	9	- 4	Type	
		- 3	1	
		- 2	2	
		- 1	3	
12	10	0	Type	
		1	1	
		2	2	
		3	3	
13	11	4	4	
		5	5	
		6	6	Last FMGR error
		7	7	Severity code
		8	8	Session identifier
		9	9	User's capability level

The standard values are shown within dark lines.

GENERAL WAIT STATE MESSAGES
(State 3)

MESSAGE	REASON FOR WAIT
LULK lu, LKPRG= progx	The listed program attempted to put a lock on logical unit lu. Program progx already has a lock on lu. The listed program will be rescheduled when progx removes its lock.
RN xx, LKPRG= progx	The listed program attempted to set resource number xx. Program progx already has a lock on the resource number. The listed program will be rescheduled when progx removes the lock.
RESOURCE	The listed program attempted to allocate a resource number. The system has no more resource numbers available. The operating system will reschedule the listed program when a resource number is available.
CLASS #	The listed program requested a class number but the system has no more available. The operating system will reschedule the listed program when a class number becomes available.
CL xx	The listed program is waiting on completion of a class GET to class number xx.
progx	The listed program scheduled progx with wait. The listed program will be rescheduled when progx completes.
progx's QUEUE	The listed program scheduled progx on the queue with wait. progx is not dormant so the listed program must wait. The listed program will be rescheduled after the scheduling of progx completes.
BL,EQT xx	Buffer limit exceeded on the controller in EQT entry xx.
EQLK xxx, LKPRG= PRGA	Program suspended for a locked EQT.
EQLK TABLE FULL	Program attempts to lock an EQT and the EQT table is full.

BOOT UP PROCEDURE

1. Select the S-register for display on the computer front panel.
2. Press CLEAR DISPLAY.
3. Set the S-register bits as follows:

Bits:	Enter:
0-2	Surface number of the disc where the RTE-IVB system subchannel starts.
3-4	0 (reserved).
5	0 for standard boot-up.
6-11	Octal select code of the disc.
12	1 to indicate a manual boot from the S-register.
13	0 (reserved).
14-15	Loader ROM selection (number of the ROM cell containing the Disc Boot Loader).

4. Press STORE.
5. Press PRESET, IBL and PRESET (again) to load contents of Disc Loader ROM.
6. Press RUN.

SECTION L

ERROR CODES

ACCOUNT ERROR CODES

ACCT-225	Session memory can not be returned to system (reboot)
ACCT-223	Illegal shut down parameter
ACCT-222	Illegal system lu
ACCT-221	Not an active session
ACCT-220	Corrupt station table spares
ACCT-219	Not enough room in file for new table
ACCT-218	Session not shut down
ACCT-215	List NAMR in transfer stack
ACCT-213	Invalid memory request
ACCT-212	Invalid number of SST spares
ACCT-211	Invalid user or group ID not available
ACCT-210	Conflict in SST definition
ACCT-209	Invalid SST entry
ACCT-208	Invalid disc limit
ACCT-207	Invalid capability
ACCT-206	Invalid disc limit
ACCT-205	Invalid command
ACCT-204	Invalid password
ACCT-203	Invalid account name
ACCT-202	Account with this name already exists
ACCT-201	No free accounts
ACCT-099	An Exec request made by D.RTR was aborted.
ACCT-046	Attempt to create extent 256. Make file size of main larger.
ACCT-041	No room in SST

ACCT-040	Lu not found in SST
ACCT-039	Conflict in SST definition
ACCT-035	Already 63 discs mounted to system
ACCT-034	Disc already mounted.
ACCT-033	Not enough room on cartridge
ACCT-032	Cartridge not found
ACCT-030	Value too large for parameter
ACCT-026	Queue full or max pending spools exceeded
ACCT-025	No SPLCON room the SPLCON is full.
ACCT-024	No more batch switches
ACCT-023	No available spool files
ACCT-022	No available spool lu's
ACCT-021	Illegal destination lu
ACCT-020	Illegal access lu
ACCT-019	Illegal access on a system disc
ACCT-018	Illegal lu; lu not assigned to system
ACCT-017	Illegal read/write on Type 0 file
ACCT-016	Illegal Type 0 or file blocks size=0
ACCT-015	Illegal name
ACCT-014	Directory full
ACCT-013	Disc locked
ACCT-012	EOF or SOF error
ACCT-011	DCB not open
ACCT-010	Not enough parameters

ACCT-009	Attempt to use APOSN or force a Type 0 file to Type 1
ACCT-008	File open or lock rejected
ACCT-007	Illegal security code or illegal write on lu2 or 3
ACCT-006	File not found
ACCT-005	Record length illegal
ACCT-004	More than 32767 records in a Type 2 file
ACCT-003	Backspace illegal
ACCT-002	Duplicate file name
ACCT-001	Disc error
ACCT 004	Illegal lu
ACCT 012	Lu not in session switch table
ACCT 013	Transfer stack overflow
ACCT 046	Insufficient capability
ACCT 200	Account not found

ASSEMBLER ERROR CODES

ERROR	PASS	DESCRIPTION
CS	1	Control statement error
DD	1	Doubly defined symbol, a name defined in the symbol table appears more than once.
EN	1	The symbol specified in an ENT statement has already been defined in an EXT statement, or is a label for an EMA pseudo-instruction.
EN UNDEF <symbol>	2	The entry point specified in an ENT statement does not appear in the label field of a machine or BSS instruction. The entry point has been defined in the Operand field of an EXT statement.
IF	1	An IFZ or an IFN follows either an IFZ or an IFN without an intervening XIF. The second pseudo instruction is ignored.
IL	1	Illegal instruction.
	1 or 2	Illegal character, a numeric term used in the Operand field contains an illegal character.
LB	1	Missing label in an EQU, RPL or EMA pseudo-instruction.
M	1 or 2	Illegal operand.

NO	1 or 2	No origin definition, the first statement in the assembly containing a valid opcode following the ASMB control statement is neither an ORG nor a NAM statement.
OP	1 or 2	Illegal Opcode.
OV	1 or 2	Numeric operand overflow, the numeric value of a term or expression has overflowed its limit.
SO		There are more symbols defined in the program than the symbol table can handle.
SY	1 or 2	A label field contains an illegal character or is greater than 5 characters, or a symbolic term in the Operand field is greater than five characters, or the source file contains more than one control statement.
UN	1 or 2	Undefined Symbol.

COMPL AND CLOAD ERROR CODES

CL- 01 The input to the COMPL & CLOAD programs must be a source file.

CL- 02 An FMP error was detected on the open request.

CL- 03 An FMP read error occurred.

CL- 04 An FMP error was detected on the close request.

CL- 05 Control statement not in first 10 lines of the program.

CL- 06 The language requested was rejected by the operating system. The language was purged from the system between the 'RP' and the EXEC request.

CL- 07 The language requested in the control statement was recognized but not found.

CL- 08 The language requested exists on the system and COMPL or CLOAD was in the process of 'RP'ing it. When the file was closed an FMP error occurred.

CL- 09 The language requested exists on the system and COMPL or CLOAD was in the process of 'RP'ing it. However, that 'RP' failed because the checksum calculated when the language was 'SP'ed did not match the system checksum.

CL- 10 The language requested exists on the system and COMPL or CLOAD was in the process of 'RP'ing the language. However, during the open request an FMP error occurred.

CL- 11 This session has more than 80 spool files currently residing on the spool disc.

CL- 12 The compiler was aborted.

CL- 13 The compilation was not successful. Errors or warnings were found.

CL- 14 This error results when the system is out of ID segments and it is impossible to 'RP' the compiler or LOADR.

CL- 15 This error means that one of the input parameters was in error.

CL- 30 CLOAD was trying to 'RP' the LOADR but encountered an FMP error on the close of the file that contained the LOADR.

CL- 31 CLOAD was trying to 'RP' the LOADR and a checksum error resulted.

CL- 32 CLOAD was trying to 'RP' the LOADR but encountered an FMP error on the FMP open request.

CL- 33 If the LOADR was not loaded at generation time or an illegal non supported memory or disc modification has been made.

CL- 34 The LOADR was loading your program but was aborted abnormally.

CL- 35 The load was not successful.

CL- 36 CLOAD was unable to create a copy of the LOADR and even the original LOADR was not available.

CL- 37 The list device for CLOAD must be an lu because both the compiler and the LOADR must talk to the device.

DISC ALLOCATION ERROR CODES

DR01 Not enough parameters were specified.

DR02 The number of tracks is <= zero or an illegal logical unit was specified.

DR03 An attempt to release a track assigned to another program was made.

EXEC CALL ERROR CODES

DM Mapping error. An attempt was made to read/write outside of the mapped address space.

MP Memory protect error. The call was not an EXEC, $L1BR, or $L1BX call.

RE A re-entrant subroutine attempted to call itself.

RQ An illegal request code is specified in an EXEC call.

TI A batch program exceeds the allowed time.

FMGR ERROR CODES

FMGR-105 D.RTR directory track buffer too small

FMGR-102 Illegal D.RTR call sequence

FMGR-101 Illegal parameter in D.RTR call

FMGR-099 Directory manager EXEC request was aborted

FMGR ERROR CODES

FMGR-048	Spool not initialized or SMP cannot be scheduled
FMGR-047	No session lu available for spool file
FMGR-046	Greater than 255 extents
FMGR-041	No room in SST
FMGR-040	Lu not found in SST
FMGR-039	Spool lu not mapped to the spool driver
FMGR-038	Illegal scratch file number
FMGR-037	Attempt to purge an active type 6 file
FMGR-036	Lock error on device
FMGR-035	Already 63 discs mounted to system
FMGR-034	Disc already mounted.
FMGR-033	Not enough room on cartridge
FMGR-032	Cartridge not found
FMGR-030	Value too large for parameter
FMGR-026	Queue full or max pending spools exceeded
FMGR-025	No SPLCON room
FMGR-024	No more batch switches
FMGR-023	No available spool files
FMGR-022	No available spool lu's
a1FMGR-021	Illegal destination lu
FMGR-020	Illegal access lu
FMGR-019	Illegal access on a system disc

FMGR-018	Illegal lu
FMGR-017	Illegal read/write on Type 0 file
FMGR-016	Illegal Type 0 or size=0
FMGR-015	Illegal name
FMGR-014	Directory full
FMGR-013	Disc locked
FMGR-012	EOF or SOF error
FMGR-011	DCB not open
FMGR-010	Not enough parameters
FMGR-009	Attempt to use APOSN or force to 1 a Type 0 file
FMGR-008	File open or lock rejected
FMGR-007	Illegal security code or illegal write on lu2 or 3
FMGR-006	File not found
FMGR-005	Record length illegal
FMGR-004	Record size of Type 2 file is 0 or undefined
FMGR-003	Backspace illegal
FMGR-002	Duplicate file name
FMGR-001	Disc error, the disc is down.
FMGR 000	Break, informative message only no error has occurred.
FMGR 001	Disc error — lu reported, disc associated with the lu is down.
FMGR 002	Initialize lu 2!
FMGR 003	Initialize lu 3!
FMGR 004	Illegal response to FMGR 002 or FMGR 003

FMGR 005	Required track not available — relative TAT position reported
FMGR 006	FMGR suspended
FMGR 007	Checksum error
FMGR 008	D.RTR not loaded
FMGR 009	ID segment not found
FMGR 010	Input error
FMGR 011	Do 'OF,XXXXX,8' on named programs
FMGR 012	Duplicate disc label or lu
FMGR 013	TR stack overflow
FMGR 014	Required ID segment not found
FMGR 015	LS track report
FMGR 016	File must be and is not on lu 2 or lu 3
FMGR 017	ID segment not set up by RP
FMGR 018	Program not dormant
FMGR 019	File not set up by SP on current system
FMGR 020	Illegal Type 0 file
FMGR 021	Illegal disc specified
FMGR 022	Copy terminated
FMGR 023	Duplicate program name
FMGR 041	Program cannot be a segment
FMGR 042	Lu cannot be switched
FMGR 043	Lu not found in SST
FMGR 044	No messages waiting
FMGR 045	Session command only
FMGR 046	Insufficient capability
FMGR 047	Spool set up failed
FMGR 048	Global set out of range

FMGR 049	Can't run RP'ed program
FMGR 050	Not enough parameters
FMGR 051	Illegal master security code
FMGR 052	Illegal lu
FMGR 053	Illegal label or ilabel
FMGR 054	Disc not mounted
FMGR 055	Missing parameter
FMGR 056	Bad parameter
FMGR 057	Bad track not in file area
FMGR 058	LG area empty
FMGR 059	Reported track unavailable
FMGR 060	A re-initialization attempt will raise the first track or lower the directory tracks into the file area and destroy a file. Enter '??' or 'NO' to stop the reinitialization. Enter 'YES' to continue.
FMGR 061	Do a "DC" and a "MC" on this CR
FMGR 062	More than 63 discs
FMGR 063	Exceeding session disc limit
FMGR 064	No discs available from disc pool that are big enough.
FMGR 065	Conflict in SST definition
FMGR 066	No room in SST
FMGR 067	Program not found
FMGR 068	Lu not in variable part of SST
FMGR 069	Job LOGON failed
FMGR 070	Sectors/track value too large

FMGR 071	Do "EX,SP" to save or "EX,RP" to release private cartridges
FMGR 072	Lu not interactive
FMGR 073	Account not found
FMGR 074	JO command expected
FMGR 075	Can't restore Type 6 PGM (user protected)
FMGR 076	Can't restore Type 6 PGM (group protected)
FMGR 077	Can't restore Type 6 PGM (insufficient capability)

FMGR UNNUMBERED

ERROR MESSAGE	MEANING
ABEND OPERATOR	The job has been aborted by operator request, or has been aborted because of spool I/O error.
JOB xxxxx ABORTED	Error encountered during job execution.
ABEND EOJ IN ssssss	An :EO or :JO command was encountered, but in a different level from the original :JO command. For example, control has transferred from PROG1 to PROG2. PROG2 contains :EO or :JO command. ssssss is the file name or logical unit number where :EO or :JO occurred.
ABEND JOB LIMIT	The job time limit (set via the :JO command) has been exceeded.
ABEND RUN LIMIT	The run time limit (set via the :TL command) has been exceeded.
FMGR WAITING ON LU xx	LU xx is down locked.

FORMAT ERROR CODES

ERROR CODE	EXPLANATION
01	a. w or d field does not contain proper digits. b. No decimal point after w field. c. w − d <= 4 for E− specification.
02	a. FORMAT specifications are nested more than one level deep. b. A FORMAT statement contains more right parentheses than left parentheses.
03	a. Illegal character in FORMAT statement. b. Format repetition factor of zero. c. FORMAT statement defines more character positions than possible for device. d. List items remain and no conversion items are accessible in FORMAT statement.
04	Illegal character in fixed field input item or number not right-justified in field.
05	A number has an illegal form (e.g., two E's, two decimal points, two signs, etc.).

FORTRAN ERROR CODES

ERROR CODE	EXPLANATION
01	Compiler control statement missing
02	Error in compiler control statement
03	Symbol table overflow
04	Labeled common
05	Implicit statement used to define default type for some character more than once
06	End of file occurred before "$"
07	Return in main program
08	Illegal complex number
09	Mismatched or missing parenthesis
10	Illegal statement
11	Illegal decimal exponent
12	Integer constant exceeds maximum integer size
13	Hollerith string not terminated
14	Constant overflow or underflow
15	Illegal sign in logical expression
16	Illegal octal number
17	Missing operand — unexpected delimiter
18	Illegal constant usage
19	Integer constant required
20	Empty Hollerith string
21	Non-octal digit in octal constant
22	Illegal usage of name

23	Do terminator defined previous to do statement
24	Illegal constant
25	Illegal subprogram name usage
26	Integer variable or constant required
27	Statement number previously defined
28	Unexpected character
29	Only statement number on source line
30	Improper DO nesting or illegal DO terminating statement
31	Statement number starts with non-digit
32	Invalid statement number or illegal usage of a statement number
33	Variable name used as subroutine name
34	Statement out of order
35	No path to this statement or unnumbered format statement
36	Doubly defined common name
37	Illegal use of dummy variable
38	More subscripts than dimensions
39	Adjustable dimension is not a dummy parameter
40	Impossible equivalence group]
41	Illegal common block extension
42	Function has no parameters or array has empty declarator list
43	Program, function or subroutine or block data not first statement
44	Name in constant list in data statement

45	Illegal exponentiation
46	Function name unused or subroutine name used
47	Format specification not a local array name, statement number or * or it is an EMA reference
48	Illegal use of EMA
49	Improper use of name
50	DO statement in logical IF
51	Control variable repeated in DO nest
52	Logical IF within logical IF
53	Illegal expression or illegal delimiter
54	Doubly defined array name
55	Logical conversion illegal
56	Operator required logical operands
57	Operator requires arithmetic operands
58	Complex illegal
59	Incorrect number of arguments for subprogram
60	Argument mode error
61	Logical IF with three branches
62	Arithmetic IF with no branches
63	Required I/O list missing
64	Free field output illegal
65	Hollerith constant with count greater than 8 used in other than format or subprogram reference
66	Program unit has no body or block data subprogram has a body

67	Source file open or access problem or EOF, END$ or $ occurs before end statement
68	External name has more than five characters
69	Octal string in stop or pause statement is too long
70	Equivalence group syntax
71	Dummy variable in data list
72	Common variable in data list or in block data subprogram
73	Mixed mode in data statement
74	Illegal use of statement function name
75	Recursion illegal
76	Double defined dummy variable
77	Statement number ignored
78	Program unit has no executable statements
79	Format does not start with left parenthesis
80	Format does not end with right parenthesis
81	Illegal equivalence group separator
82	Illegal use of array name in an equivalence group
83	Subprogram name retyped
84	Object code memory overflow
85	Possible recursion may result
86	Dummy variable in statement function cannot be subscripted

88 End or format statement in logical IF

89 Continue statement or no branch in logical IF

90 First record of subprogram is a continuation line

91 Result of rename duplicates existing external name

92 Result of rename duplicates required intrinsic

93 Data statement attempts to initialize EMA variable

94 Name in EMA statement is not formal parameter or appears twice in the statement

96 A break was detected

97 Open or write error on binary file

98 Read access error on scratch file

99 Write access error on scratch file

The use of these names as program, subprogram, or common block names may result in a recursive operation if the program, subprogram, or common block contains an implicit call to a name that duplicates its own name (see error number 85).

ABS
AINT
ALOG
ALOG10
ALOGT
ATAN
CCOS
CEXP
CLOG
CLRIO
CMPLX
CONJG
COS
CSGRT
CSIN
DABS
DATAN
DATAN2
DATN2
DBLE
DCOS
DDINT
DEXP
DLOG
DLOG10
DLOGT
DMAX1
DMIN1
DMOD
DSIGN
DSIN
DSQRT
DTAN
DTANH
ERR0
EXEC
EXP
FLOAT
IABS
IAND
IFIX
INT
IOR
ISIGN
ISSW
NOT
REAL
SIGN
SIN
SNGL
SQRT
TAN
TANH

FORTRAN 4X ERROR CODES

LIBRARY SUBROUTINE ERRORS

*Program name nn-xx

*Expression Parameter types:

R	= REAL*4
X	= EXTENDED PRECISION (REAL*6)
D	= DOUBLE PRECISION (REAL*8)
I	= INTEGER*2
J	= DOUBLE INTEGER (INTEGER*4)
C	= COMPLEX, (real(C), imag(C))

Error (nn-xx)	Expression	Error Condition
02-UN	ALOG(R)	$R \leq 0$
	ALOG10(R)	$R \leq 0$
	CLOG(C)	$C = (0,0)$
	DLOG(D)	$D \leq 0$
	DLOG10(D)	$D \leq 0$
03-UN	SQRT(R)	$R < 0$
	DSQRT(X)	$X < 0$
	DSQRT(D)	$D < 0$
04-UN	R**R	base = 0, exponent ≤ 0 or base < 0, exponent # 0
05-OR	SIN(R)	R or real(C)
	COS(R)	outside
	CSIN(C)	[−8192*PI, +8191.75*PI]
	CCOS(C)	
	CEXP(C)	
	DSIN(D)	D outside
	DCOS(D)	[−2**23, +2**23]
06-UN	R**I	base = 0, exponent ≤ 0
06-OR	R**J	exponent outside [−32768, +32767]

Error	Expression	Error Condition

07-OF	EXP(R)
	DEXP(D)
	EXP(C)
		R,D or real(C)
		> 88.03

	R**R R**D D**R D**D	overflow
08-UN	I**I I**J J**I J**J	base = 0, exponent ≤ 0
08-OF	I**I, I**J J**I, J**J	overflow

09-OR	TAN(R)
	DTAN(X)
		R or X outside
		[−8192*PI, +8191.75*PI]

	DTAN(D)	D outside [−2**23, +2**23]
10-OF	DEXP(X)	X > 88.03
	X**X X**R R**X	overflow

11-UN	DLOG(X)
	DLOG10(X)
		X ≤ 0

12-UN	X**I D**I	base = 0, exponent ≤ 0
13-UN	X**X X**R R**X R**D D**R D**D	base < 0 or base = 0, exponent ≤ 0

Error	Expression	Error Condition
14-UN	C**I	base = (0,0), exponent ≤ 0
15-UN	DATAN2(Di,D2)	$D1 = D2 = 0$
21-UN	ASIN(R)	$\vert R \vert > 1$
22-UN	ACOS(R)	$\vert R \vert > 1$
23-OR	SINH(R)	$\vert R \vert > 88.722839$

	CSIN(C)
	CCOS(C)
		$\vert \text{imag}(C) \vert > 88.722839$

24-OR	COSH(R)	$\vert R \vert > 88.722839$
26-UN	ACOSH(R)	$R < 1$
27-UN	ATANH(R)	$\vert R \vert \geq 1$
31-UN	DASIN(D)	$\vert D \vert > 1$
32-UN	DACOS(D)	$\vert D \vert > 1$
33-OR	DSINH(D)	$\vert D \vert > 88.722839$
34-OR	DCOSH(D)	$\vert D \vert > 88.722839$
36-UN	DACSH(D)	$D < 1$
37-UN	DATNH(D)	$\vert D \vert > 1$
41-OR	CTAN(C)	real(C) outside [−4096*PI, +4095.875*PI]

INPUT/OUTPUT RUNTIME ERRORS

Error Format:

program name,*RUNTIME ERROR* nnnn @xxxxx

nnnn	is the error code.
xxxxx	is the approximate logical address of the statement which caused the error.

program name is the name of the user program.

If the 'ERR = label' and 'IOSTAT = ios' specifiers are present, the I/O error code will be stored in ios and control will transfer to label, where a user routine may decode and handle the error if desired.

IOSTAT (or nnn)	**Error Condition Meaning**
450	Invalid FORTRAN UNIT specifier (negative valued), or a system unit greater than 63. (e.g., OPEN(ID,FILE ='100')).
451	STATUS parameter not 'OLD','NEW','SCRATCH', or 'UNKNOWN'.
452	STATUS 'OLD' or 'NEW' and file unnamed.
453	STATUS 'SCRATCH' and name supplied.
454	ACCESS not 'SEQUENTIAL' or 'DIRECT'.
455	FORM not 'FORMATTED' or 'UNFORMATTED'.
456	MAXREC, RECL, or BUFSIZ is less than or equal to 0.
457	BLANK not 'NULL' or 'ZERO'.
458	All item supplied names in use (99 maximum on the system simultaneously).
459	File already connected to another UNIT.
460	File type invalid for 'DIRECT' access.
461	File type invalid for 'SEQUENTIAL' access.
462	STATUS 'OLD' and file not found.
463	STATUS not 'KEEP' or 'DELETE'.
464	Attempt to perform ENDFILE on 'DIRECT' access file.
465	Invalid file specifier.
466	Exceeds maximum number of connections.
467	Exceeds maximum number of disc file connections.
470	USE specifier not 'EXCLUSIVE' or 'NONEXCLUSIVE'.

IOSTAT (or nnnn)	Error Condition Meaning
471	Non-disc UNIT (LU number) not in SST.
474	REC supplied for a 'SEQUENTIAL' access connection.
475	RECL not supplied with ACCESS ='DIRECT' or RECL supplied with ACCESS ='SEQUENTIAL'.
477	Node not equal to −1 and $FILES did not specify DS.
478	OPEN attempt on previously opened unit tried to change attributes other than "BLANK =".
479	OPEN attempted with $FILES (0,0) or failure to load library routines.
480	CLOSE attempted with $FILES (0,0) or failure to load library routines.
481	INQUIRE attempted with $FILES (0,0) or failure to load library routines.
482	Failure to load library routines for BACKSPACE, ENDFILE, or REWIND.
483	Attempt to open or inquire about a disc file with $FILES (X,0).
485	$FILES (X,0) Specified and ACCESS not 'SEQUENTIAL' (or RECL supplied).
486	Attempt to use DNODE (illegal in FTN4X).
491	FMT ERR 01 (invalid w,d specification).
492	FMT ERR 02 (improper nesting).
493	FMT ERR 03 (illegal character or 0 repeat).
494	FMT ERR 04 (illegal character in input field).
495	FMT ERR 05 (input number has an illegal form).
496	Exceeds formatter buffer size (use LGBUF) or not enough data to satisfy unformatted READ.
497	Illegal format for specified data type.
	Error numbers 500 thru 522 are coded as 500 plus the absolute value of the negative FMGR error code.
501	Disc error.
502	Duplicate file name.
504	Too many records in a Type 2 file (> (2**31 −1) in RTE-IVB, or > 32767 in RTE-L).

IOSTAT (or nnnn)	Error Condition Meaning
505	Record length illegal.
506	File not found.
507	Illegal security code or illegal WRITE to LU2 or LU3.
508	File OPEN or LOCK rejected.
512	EOF or SOF error.
513	Cartridge locked.
514	Directory full.
515	Illegal file name.
516	Illegal file type.
519	Illegal access on a system disc.
	Error numbers 525 thru 529 are coded as 500 plus the absolute value of the negative DS error code.
525	Bad FCODE (internal RFAM error).
526	Bad entry number in RFAM: DCB destroyed.
528	Too many open DS files at remote node.
529	Internal RFAM tables invalid.
	Error numbers 530 thru 547 are coded as 500 plus the absolute value of the negative FMGR error code.
530	Disc not mounted to caller's session.
532	Cartridge not found.
533	No room on cartridge.
540	Disc not in SST.
541	No room in SST.
546	Greater than 255 extents.
547	No session LU available for SPOOL file.
575	[IO02] Illegal logical unit.
576	[IO04] Illegal user buffer.
577	[IO06] Attempt to write on LU2 or LU3.
578	[IO07] Driver has rejected request.
579	[IO12] LU not defined for this session.

GASP ERROR CODES

GASP -33	Not enough room on cartridge
GASP -32	Cartridge not found
GASP -14	Directory full
GASP -13	Disc locked
GASP -12	EOF or SOF error
GASP -8	File open or lock rejected
GASP -7	Illegal security code or illegal write on lu2 or 3
GASP -6	File not found
GASP -4	More than 32767 records in a Type 2 file
GASP -2	Duplicate file name
GASP -1	Disc error, disc is down.
GASP 1	Disc associated with lu NN is down
GASP 2	Number out of range
GASP 3	Bad job number!
GASP 4	Illegal status
GASP 5	Illegal command
GASP 6	Not found
GASP 43	Lu not found in SST
GASP 46	Insufficient capability
GASP 55	Missing parameter
GASP 56	Bad parameter

I/O CALL ERROR CODES

IO00 An illegal class number was specified. Outside table, not allocated, or bad security code.

IO01 Not enough parameters were specified.

IO02 An illegal logical unit number was specified.

IO03 Illegal EQT referenced by lu in I/O call (select code=0).

IO04 An illegal user buffer was specified. Extends beyond RT/BG area or not enough system available memory to buffer the request.

IO05 An illegal disc track or sector was specified.

IO06 A reference was made to a protected track or to unassigned LG tracks.

IO07 The driver has rejected the call.

IO08 The specified disc transfer is longer than one track.

IO09 The LG tracks overflowed.

IO10 Class get call issued while one call already outstanding.

IO11 A Type 4 program made an unbuffered I/O request to a driver that did not do its own mapping.

IO12 An I/O request specified a logical unit not defined for use by this session.

IO13 An I/O request specified an lu which was either locked to another program, or pointed to an EQT which was locked to another program.

IO20 Read attempted on write only spool file.

IO21 Read attempted past end-of-file.

IO22 Second attempt to read JCL card from batch input file by other than FMGR. Revise program and re-run.

IO23 Write attempted on read only spool file.

IO24 Write attempted beyond end-of-file; usually, spool file overflow.

IO25 Attempt to access spool lu that is not currently set up.

IO26 I/O request made to a spool that has been terminated by the GASP KS command.

IOET An end-of-tape condition occurred on the specified lu.

IONR The specified lu is not ready. Make the device ready and set the EQT up.

IOTO The specified lu has timed out.

IOPE A parity error occurred in the data transmission from the specified lu.

ILL INT an illegal interrupt occurred on the specified channel.

LIBRARY ERRORS

Mathematical Subroutines

OF = Integer or Floating Point Overflow
OR = Out of Range
UN = Floating Point Undefined

Error Message	Issuing Subroutine	Where Used	Error Condition
02-UN	ALOG	ALOG	$X \leqslant 0$
		ALOGT	$X \leqslant 0$
		CLOG	$x = 0$
03-UN	SQRT	SQRT	$X < 0$
		DSQRT	
04-UN	.RTOR	.RTOR	$X = 0, Y \leqslant 0$ $X < 0, Y \neq 0$
05-OR	SIN	SIN	$\frac{1}{2}\left\vert\frac{X}{\pi} + \frac{1}{2}\right\vert > 2^{14}$
		CSNCS	
		CEXP	
		COS	
06-UN	.RTOI	.RTOI	$X = 0, Y \leqslant 0$
07-OF	EXP	EXP	$X * \log_2 e \geqslant 124$
		CEXP	$X_1 * \log_2 e \geqslant 124$
		.RTOR	$\vert X * \text{ALOG}(X) \vert \geqslant 124$
		CSNCS	$X_2 * \log_2 e \geqslant 124$
08-UN	.ITOI	.ITOI	$I = 0, J \leqslant 0$
08-OF	.ITOI	.ITOI	$I^J \geqslant 2^{15}$ or $I^J < -2^{15}$
09-OR	TAN	TAN	$X > 2^{14}$
10-OF	DEXP	DEXP	$e^X > (1\text{-}2^{-39})\ 2^{127}$
		.DTOD	$X > (1\text{-}2^{-39})\ 2^{127}$
		.DTOR	
		.RTOD	

11-UN	DLOG	DLOG DLOGT	$X \leqslant 0$ $X < 0$
12-UN	.DTOI	.DTOI	$X = 0, I \leqslant 0$
13-UN	.DTOD	.DTOD .DTOR .RTOD	$X = 0, Y \leqslant 0$ $X < 0, Y = 0$
14-UN	.CTOI	.CTOI	$X =0, I \leqslant 0$
15-UN	DATN2	DATN2	$X = Y = 0$

Utility Subroutines

Subroutine	Error
MAGTP	Returns on an illegal call.
.SWCH	Returns if element is out of range.

LOADR ERROR CODES

C-CK SUM
L 01 This is a checksum error. Most likely you specified a file to the LOADR that did not contain relocatable format code.

L-IL REC
L 02 The LOADR found a record that was not a NAM, ENT, EXT, DBL, EMA, or END record.

L-OV MEM
L 03 The size of the code loaded so far exceeds the max size that you specified or exceeds the largest possible size for a program.

L-OV BASE
L 04 Base page overflow. This program has used too many base page links.

L-OV SYM
L 04 This is a symbol table overflow.

L-CM BLK
L 06 This is a common block error.

L-DU ENT
L 07 Duplicate entry point.

L-TR ADD
L 08 No transfer address. Only subroutines were loaded.

L-RE SEQ
L 09 Record out of sequence.

L-IL PRM
L 10 The run string submitted to the LOADR was in error.

L-CO RES
L 11 Attempt to replace a memory resident program.

L-OV FIX

L 12 Fixup table overflow.

L-LM LIB

L 13 The limit on the number of libraries specified by the 'LI' command has been exceeded (10).

L-IL REL

L 14 The compiler produced an illegal record. Recompile.

L-IL PTN

L 16 You specified a partition in the load of the program, however, that partition does not exist or has been downed due to a parity error.

L-RQ PGS

L 17 The number of pages that you specified in the load of the program exceeds that number of pages in the partition you specified.

L-OV PTN

L 18 The specified program size is too large for the partition.

L-ML EMA

L 19 Illegal EMA declaration.

L-ID EXT

L 20 No ID extensions available for the EMA program.

L-SZ EMA

L 21 The programs declared EMA size is too large for this systems partition definitions.

L-SS ENT

L 24 You attempted to access an SSGA entry point but you did not 'OP,SS'.

L-IL CMD
L 25 Attempt to purge a program under batch or attempt to use the 'LI' or 'PU' commands within a LOADR command file.

L-ID SEG
L 26 Not enough short and long ID segments to finish the load.

L-RF EMA
L 27 Attempt to access an EMA external with offset or indirect.

L-UN EXT
L 28 Undefined externals exist which prohibits the load from completing.

L-EX CPY
L 29 Attempt to replace or purge a program where copies of that program exist.

L-RP CPY
L 30 Attempt to replace a copied program.

L-PE LDR
L 31 Trying to do a purge or permanent load with a copy of the LOADR.

L-DU PGM
L 32 You tried to load the same program several times but did not remove the earlier loads.

L-NO IDS
L 33 Not enough ID segments to finish the load.

L-RP PGM
L 34 You tried to replace a permanent program.

LOGON ERROR CODES

LGON 06 this is an informational diagnostic. The station (terminal) being logged onto has a configuration table entry which is a duplicate of an entry in the users account file entry.

LGON 09 Your session has exceeded the maximum session switch table size.

LGON 11 The LOGON program received the specified error when attempting to mount a private or group disc to this session.

LGON 13 LOGON detected a user SST which attempted to redefine a system disc's logical unit number.

LU LOCK ERROR CODES

LU01 A program has one or more logical units locked and is trying to lock another with wait.

LU02 Illegal logical unit reference.

LU03 Not enough parameters are furnished in the call.

LU04 Trying to lock a logical unit not defined in caller's SST.

OUTSPOOL ERROR MESSAGES

MESSAGE	CAUSE
JOB WAIT ON PT	End-of-Tape occurred between :JO and :EO commands.
JOB WAIT ON SPOOL RESOURCE	Required spool file or logical device cannot be obtained at this time.
JOB WAIT ON EXTENT	Spool file overflows available disc space.
END JOB ABNORM	JOBFIL could not be opened; or other uncorrectable error occurred; or JOB was run before spool initialization.
BAD EOF	Message appears after last line of file. ASCII file outspooling overflowed; or was otherwise incomplete.

READT/WRITT ERROR CODES

READ 001 The requested mag tape unit is down.

READ 002 The mag tape READT is trying to restore contains information in a format not restorable by READT.

READ 003 The mag tape unit you wish to use is locked to some process.

READ 004 The parameter describing the desired mag tape unit does not satisfy READT's requirements for a legal mag tape lu.

READ 005 The desired mag tape unit is off-line.

READ 006 READT rejected the use of the specified disc lu.

READ 007 The driver detected a parity error when reading from the mag tape.

READ 008 The end of tape was reached.

READ 009 The desired cartridge has a file open or the cartridge is locked to another program.

READ 010 You are operating in a nonsession environment. An lu must be specified (negative lu) since there isn't a free disc pool.

READ 011 READT rejected the size (number of tracks) you specified.

READ 012 The routine READT uses to mount a cartridge detected an error.

READ 013 The desired disc lu or the available free lus in the disc pool are not large enough to restore the cartridge that's on the mag tape.

READ 014 The FMP tracks on lu 2 or lu 3 (if 3 exits) are not restorable with READT.

READ 015 Bad transmission — memory to disc trk xxx sec yyy READT tried to transfer data from memory to a disc lu. During this process a check of the transmission log showed an unexpected value. Run READT again, if it happens once more call your system manager.

READ 016 Bad transmission — mag tape to memory rec xxx READT detected an error in transmission of data from the mag tape unit into memory. Try reading the tape again. If it happens once more call your system manager.

READ 017 READT will not move the starting location of FMP tracks on lu 2 or lu 3, nor will it restore a cartridge with a sec/trk value that's different from what's found on the disc cartridge.

WRIT 001 The device can be enabled.

WRIT 002 Only the system manager can save system discs.

WRIT 003 The mag tape you wish to use is locked to some process.

WRIT 004 The parameter describing the desired mag tape unit does not satisfy READT's requirements for a legal mag tape unit.

WRIT 005 The desired mag tape unit is off-line.

WRIT 006 A write ring is required to write information on a mag tape.

WRIT 007 The driver detected a parity error when reading from the mag tape.

WRIT 008 The end of tape was reached.

WRIT 009 The desired cartridge has a file open or the cartridge is locked to another program.

WRIT 010 The desired cartridge or disc lu could not be found.

WRIT 011 WRITT rejected the use of the specified disc lu.

WRIT 012 You cannot save FMP tracks off lu 2 or lu 3 (if 3 exits) with WRITT.

WRIT 013 WRITT tried to read data from a disc lu into memory and found the transmission irregular. Run WRITT again, if the situation occurs once more there may be a bad track on that disc lu. Save as much data as you can and notify your system manager.

WRIT 014 The transmission of data from memory to mag tape may be faulty. Run WRITT again, if it happens once more call your system manager.

RECONFIGURATION ERROR CODES

CONFIG
ERR MEANING

1 Invalid LU number or a bit bucket LU.

2 Illegal select code number.

3 New select code entered is identical to new select code assigned to disc system console or list device, or else the current select code entered is identical to the old select code for disc, system console or list device (i.e., do not reconfigure that which was already done via the SWTCH register).

10 Specified total number of pages outside the range.

11 Invalid bad page number.

12 Specified SAM extension entry beyond physical memory size due to bad pages.

13 Current running total exceeds available pages in block of good memory or exceeds size of mother partition.

14 Second parameter of partition definition entry other than RT, BG or S, or else S was entered when a subpartition definition was not expected.

15 Third parameter of partition definition entry other than R.

16 No such program, or the name of a segment was entered or invalid type was entered for partition assignment.

17 Invalid partition number.

18 Program does not fit in the assigned partition.

19 Invalid number of pages was entered for program size.

20 Number of defined partitions already equal to allowed maximum number and more undefined pages remain.

21 Page requirements of an EMA program cannot be modified.

22 Number of pages in SAM extension requires division into more than five blocks.

RESOURCE NUMBER ERRORS

RN00 There are no option bits set in the call.

RN01 Not used

RN02 The specified resource number is not defined.

RN03 An unauthorized attempt was made to clear a local resource number.

SCHEDULE CALL ERROR CODES

SC00 A batch program attempted to suspend (EXEC(7)).

SC01 Missing parameter.

SC02 Illegal parameter.

SC03 The specified program cannot be scheduled.

SC04 The specified program is not a subordinate (or "SON") to the program issuing the completion call.

SC05 The program given is not defined.

SC06 No resolution code is specified in the execution time EXEC call.

SC07 A prohibited core lock was attempted.

SC08 The program just scheduled is assigned to a partition smaller than the program itself or to an undefined partition.

SC09 The program just scheduled is too large for any partition of the same type.

SC10 There is not enough system available memory for the string passage.

SC11 EXEC schedule or timed execution request was issued and program specified is already in the time list for another session.

SMP ERROR MESSAGES

ERROR MESSAGE	MEANING
SMP:LU xx EOFER filename	File filename just outspooled to logical unit xx overflowed or was otherwise incomplete.
SMP:LU xx DOWN filename HELD	Logical unit xx down: filename placed in active hold.
SMP:FMP −nn	FMP error −nn occurred during SMP operation. Usually indicates loss of JOBFIL of SPLCON.

SYSTEM AND BREAK-MODE COMMAND ERROR MESSAGES

ERROR MESSAGE	MEANING
OP CODE ERROR	Illegal operator request code.
NO SUCH PROG	The name entered is not a main program in the system.
INPUT ERROR	A parameter is illegal.
ILLEGAL STATUS	Program is already scheduled.
CMD IGNORED — NO MEM	Not enough system available memory exists for storing the program's command string.
ILLEGAL PART'N	Partition does not match command request.
SIZE ERROR	Illegal program size specified or size of program specified larger than its assigned partition or any partition.

SYSTEM BOOT-UP HALTS (front panel)

HLT	MEANING
4	Powerfail occurred and powerfail automatic restart is enabled.
5	Memory protect switch was set and memory parity error occurred.
10B	FMGR or D.RTR cannot be scheduled at startup because there is not a large enough partition (issued by the system).
11B	Attempt was made to re-execute a non-RPL compatible ROM Loader Part # 12992A, or Bootstrap Loader.
22B	SCNFG cannot find an ID segment for Configurator extension $CNFX, $CNFX is not a Type 3 program, or a contiguous memory block of three good pages cannot be found in the user partition area.
30B	Error was encountered in the disc I/O process by one of the RPL-compatible ROM Loaders Part # 12992B and 12992F. If the disc is a 7900 the disc status is displayed in the A-register. If the disc is a 7905/20 the disc status word 1 is displayed in the B-register and disc status word 2 in the A-register.
31B	Error encountered in the disc I/O process by the Boot Extension. If the disc is a 7900, the disc status is displayed in the A-register. If the disc is 7905/06(H)/20(H)/25(H), the disc status word 1 is displayed in the B-register and disc status word 2 is displayed in the A-register.
55B	An EQT with the equipment type code of console cannot be found.

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