PART 2 THE SYSTEM MACHINE

GENERAL

Each P800M configuration running under MAS, as has been explained previously, contains:
- A system machine;
- Optionally, one or more foreground machines;
- Optionally, a background machine.

MAS itself runs in the system machine and the user's tasks in the other machines.

Prior to the first user session a System Generation must be performed. This is described in Appendix A of this manual.

Prior to every subsequent user session, if MAS was previously deleted, it must be loaded into the bare configuration by a procedure known as Initial Program Load (IPL). This is described in Chapter 4, Operation.

After IPL, MAS initialises its internal tables and makes certain checks on the devices declared at system generation time. Error messages that may be output at this point are listed in Chapter 4.

MAS is now ready to process System Command Language (SCL) commands and Operator Commands, both of which are mentioned in this Chapter.

SCL statements define the characteristics of each machine. Operator commands control the operation of each machine. SCL and operator commands complement the facilities provided by the Foreground Command Language (FCL) and Background Command Language (BCL) commands.

SYSTEM COMMAND LANGUAGE (SCL)

SCL commands define the user applications to be peformed in the current MAS session before the machine is started, and allow re-definition whilst it is being processed.

This Chapter describes the SCL commands related to the system machine and the specific SCL commands for defining foreground or background machines.

MAS receives SCL Commands through the command interactive device, using file-code /E0. Filecodes /02 and /01 are used to log and correct SCL commands, respectively. These file-codes need not be assigned to separate devices.

FILECODES

Filecode /E0 represents any interactive device, such as the console or a VDU. MAS will output:

    FCL:

whenever it is waiting for the next SCL command. (FCL is output when either SCL or FCL commands may be input, because they are both processed by the same MAS routine.) The system manager is then free to enter another command when required.

Filecode /02 represents a file on which all accepted commands will be logged. It must be a sequential output file, such as a printer, sequential disc file, paper tape punch or console. If it is assigned to the same device as filecode /E0, the commands (if accepted) are logged immediately below the entered command. Filecode /02 may be assigned to NO if the commands are not to be logged.

Filecode /01 represents a device from which erroneous commands may be corrected. This device must be interactive.

CORRECTIONS

An erroneous command results in the following being output to filecode /01:
- The erroneous command;
- An error message;
- The message:
  FCL:

MAS then waits for the command to be re-input from the console, which is assigned to filecode /01. This correction procedure is repeated until the command is accepted as correct. MAS will now continue reading commands through filecode /E0, unless the correction given is BYE, which ends the FCL sessionfor the machine.

It is not always possible to change the type of command during a correction. In some cases the erroneous command may have been partly processed. Commands of this type are denoted as such in the descriptions, in alphabetical order, which appear in Chapter 7.

Error Messages

Two error messages apply to all SCL commands; they are:
- INPUT COMMAND I/O ERROR
  An I/O error occurred when trying to read the next command through filecode /E0 or /01.
- COMMAND UNKNOWN
  The three character mnemonic is not one of the set of permitted commands.

Other error messages are related to one or more SCL commands, and are explained in the descriptions of the SCL commands which appear in Chapter 7.

Syntax

The rules for the construction of all commands are described in Appendix B to this manual.

Processing SCL Commands

The task which processes the SCL or FCL commands relevant to one user machine runs concurrently with other tasks in the bare machine. Whenever the SCL/FCL task is suspended awaiting operator input, these other tasks continue.

Waiting and Stopping

Once MAS has indicated that it is ready to accept a further SCL command by the message:
  FCL:
the SCL task will be held in the wait state. It will be restarted when the next valid command has been entered.

To stop the SCL task, the SCL command 'BYE' is necessary. The area assigned to the task and the devices used for filecodes /E0, /01 and /02 are freed and the task exits. No further SCL commands can be given.

It is necessary to stop the task in hand whenever a task is to be started for another user machine and there are not enough free devices for use through filecodes /E0, /01 and /02 for the new task.

For example, after defining all user machines for this MAS session with SCL commands the BYE command could be given. The SM (start machine) operator command could then be given for one of the defined foreground machines and MAS will be able to re-use the same devices as were used in the definition. When all the commands necessary to start the application in the user machine have been given, the BYE command can be given again. This starting sequence can then be repeated until all required machines are running.

Once a BYE command has been given, the only control over that machine is by SCL or operator commands to the system machine. If the BYE command is given to the system machine, the only control is by operator commands.

COMMANDS

SCL commands allow the system manager:
- To set the time and date;
- To obtain the time and date;
- To define user machines;
- To indicate that certain devices and memory pages are not available to MAS;
- To dump memory and disc areas assigned to the system machine;
- To indicate that floating-point registers are not to be saved when a particular task is interrupted.

CATALOGUED PROCEDURES

A catalogued procedure is a string of SCL commands related to a particular task, which is catalogued under a procedure name.

SCL commands which are expected to be repeated in the same, or nearly the same, format may be saved as a catalogued procedure. Once set up they may be invoked by a single catalogued procedure call, where the parameter values may be specified or changed at the time the procedure is called.

SCL catalogued procedures are held in a file named S:PROC on the system DAD, which is accessed through filecode /F6.

The construction and use of catalogued procedures are described in Chapter 2 of this manual.

ABT Abort a Program ABT

Effect on Background

Format ABT

Remarks

When used in the system machine the ABT command aborts the program, running in the Background machine. As the routine, interpreting the command is the same for System and Foreground, a program name may be given. However, a specified program is searched in the system machine and a system program cannot be aborted.

Errors

One of the following error messages will be output if an ABT command is rejected:

PARAM ERROR

A parameter was given, that could not be a program name.

SYSTEM PROG CANNOT BE ABORTED

A program name was given to the command, the program was searched in the system machine and found.

PROG INACTIVE

The Batch machine was not yet started or did read an :EOB command.
A program name was given in the command, which could not be found in the system machine.

BCP PROCESSOR CANNOT BE ABORTED

The program running in the Batch machine was the BCP processor.

PROG ALREADY ABORTED

The background program was already in the abort state.

Effect on System

Format 1 ASG fc1,fc2
Assign a filecode to another filecode

Format 2 ASG fc1,dn[da[ln]]
Assign a filecode to a physical device

Format 3 ASG fc1,DDdc,ft,fn
Assign a filecode to a disc catalogued file

Format 4 ASG fc1,DDdc,ft[,[ng][,NC]]
Assign a filecode to a disc temporary file

Format 5 ASG fc1,dk,dad
Assign a filecode to a DAD

fc1	is the filecode to be assigned and for which an entry is to be created in the system machine filecode table.
fc2	is a filecode which already exists in the system machine filecode table and to which the filecode `fc1' is to be assigned.
dn	is a 2-character device-type code; see Chapter 3.
da	is the device address; if omitted, the first device type dn that is found by MAS will be assigned.
ln	is a 2-character linenumber that can be specified for devices connected to the AMA8. This linenumber may also be added to the AMA8 device address in the da parameter.
DDdc	is the DAD filecode, DDF0 thru DDFF. (This DAD filecode must havebeen assigned in the system machine)
ft	is the file-type code, UF, SC, LM or OB. (also EF is accepted)
fn	is the file-name. (The file with file-name `fn', file-type `ft' and version 0 must exist in the directory of the first user of DAD `dc'.)
ng	is the number of granules to be reserved; the default value is 1, the maximum value is depending on the next parameter.
NC	is for non-consecutive granules; the default is consecutive.
dk	is the filecode of the disc containing the DAD.
dad	is the DAD name: 1-6 ASCII characters, left justified.

Errors

One of the following error messages will be output if an ASG command to the system machine is rejected:

WRONG FILECODE
An illegal fc1 parameter was given (all formats)

NOT ENOUGH PLACE IN DYNAMIC AREA
No place in the system dynamic area could be found to allocate buffers for assignment tables (all formats)

TOO MANY PARAM
More parameters were specified than expected (formats 1, 2 and 3)

I/O ERROR
Reading a buffer from disc (e.g. a GRANTB or a VTOC) an I/O error occurred (formats 1, 3, 4 and 5)

TOO MANY FC ASSIGN
The number of filecodes assigned in the system machine became greater than the maximum number of filecodes allowed, as recorded in the CVT (communication vector table). For adaption of this value see Appendix A, System Generation. (all formats)

DELETE FC ERR ST=abcd

The filecode to be assigned was already assigned and had to be deleted. This deletion went wrong. For an explanation of the status codes see Appendix C LKM 24 (all formats).

2ND FC NOT ASGN

In the Format 1 assign, the filecode fc2 was not assigned.

WRONG PARAMETER

In the Format 2 assign, the dn[da[ln]] parameter did not contain 2, 4 or 6 characters.

DEVICE UNKNOWN

The dn[da[ln]] specified a device that was not generated into the system (format 2) or the /Cx filecode was not assigned.(format 5)

WRONG FILE TYPE

The ft parameter was not SC, LM, OB, UF or EF. (format 3 and 4)

ERROR IN LAST PARAMETER

In the Format 3 assign, a 5th parameter was specified, but it was not NC.

DAD NOT FOUND

The specified DAD filecode did not exist (format 3 and 4)

DAD OVERFLOW

More granules requested than there were free ones in the DAD (format 3)

TOO MANY SECTORS

In the Format 3 assign, for a consecutive file more than 32767 sectors were requested or for a non-consecutive file, more granules were requested than could be recorded in the GRANTB.

WRONG FILENAME

An illegal filename was given (format 4) or file-type EF was given for a temporary file (when file-type EF is given, MAS automatically assumes a format 4 assign and expects the next parameter to be a filename)

DAD FILECODE DOES NOT EXIST

No F0 - FF was given in the dc parameter (format 4)

NO USERID

An attempt was made to assign a file in a DAD that contained no Userids in its Catalog (format 4)

FILE UNKNOWN

The file to be assigned did not exist (format 4)

ASSIGN ERROR STATUS=/xxx

An assign to a TDFM file failed (foramt 4) for an explanation of the status, see Appendix C LKM 23.

DATA DISC CANNOT BE ASSIGNED

A Format 5 assign was given for a DAD on an type F3 flexible disc.

WRONG DAD NAME

The DAD name in the Format 5 assign contained more than 6 characters.

DAD NOT FOUND

A DAD with the specified name did not exist on the disc, indicated by the /Cx filecode (format 5)

Note:

If an error occurred during the assign, it is possible that the old assignment does not exist anymore, because the error has been found after deletion of the old assignment.

Effect on System, Foreground and Background

Format 1 BYE [m1[,m2]...]

Format 2 BYE [$$,][m1[,m2]...]

$$ is an indication to the system that the open spool files have to closed and unspooled. This feature is only available from MAS release 8.50.

m is the name of a machine. If this optional parameter is entered, the specified machine(s) will be started as if an 'SM' (when BYE machid or BYE SYSTEM) or 'SB' (when BYE BATCH) command had been given.

Remarks

The use of the BYE command will cause the current SCL task to exit. All dynamic storage used by it will be freed and no more commands can be entered for this task. After a BYE command has been processed, the devices assigned to filecodes /E0, /01 and /02 are available to other tasks within the current machine.

Till MAS release 8.50, the lay-out of the BYE command is Format-1. The open spool files are not closed and unspooled. To unspool these files, the CLS command should be used.

Effect on Background, System and Foreground.

Format CLK hh,mm[,ss]

hh	is the hour; two digits, in the range 00 to 23.
mm	is the minute; two digits, in the range 00 to 59.
ss	is the second; two digits, in the range 00 to 59, with a default value of 00.

Remarks

The CLK command is given to set the clock in the system machine, and normally should only be given just after IPL (Initial Program Load) and before starting any user machine. If a power failure occurs the CLK command can be used to reset the clock when the power is restored. However, the CLK command can be given at any time.

If the CLK command changes the clock value from, say, 23,30,00 to 01,45,00 or vice versa, the date is not changed.

A self-explanatory error message will be output if a CLK command is rejected.

Effect on Background, System and Foreground.

Format 1 CLS [m1[,m2]....]

Format 2 CLS [/fc1|ALL]

m1,m2 are machine names. It is an optional parameter, if entered the specified machine will be started, as with an SM or SB operator command.

fc1 is a spooled filecode. The spooled file assigned to this filecode will be closed and unspooled.

ALL indicates that all spooled filecodes have to be closed and unspooled.

Remarks

Format 1 of the CLS command applies for MAS releases until MAS 8.50. The same functions as for the BYE command are performed, but also all spool files are closed and unspooled.
Format 2 of the CLS command applies from MAS 8.50, it closes and unspools one or all spool files.

Effect on Foreground.

Format CMA p[,lib]

p is the number of 2K pages (1 to 16) in the communications area. This defines Segment 0, which is addressable by all memory and disc-resident programs in this foreground machine using virtual addresses not exceeding 32KW. If 16 pages are specified, the foreground machine comprises solely Segment 0 and no disc-resident programs or other segments will be allowed for this foreground machine.

lib specifies the number of characters in the Public Library Area that is, the size of all programs loaded by LOD commands into Segment 0. The remainder of Segment 0 is available for dynamic buffers, to be obtained when any user program in this foreground machine issues an LKM 4 (Get Buffer). The default value is zero.

Remarks

The CMA command must immediately follow the DCF command referring to the same machine.

Errors

One of the following error messages will be output if a CMA command is rejected:

WRONG NUMBER OF PAGES
DCF OR DCB COMMAND IS EXPECTED
TOO MANY PARAMETERS
NUMBER OF PAGES >16
WRONG PUBLIC LIBRARY SIZE
PUBLIC LIBRARY SIZE TOO BIG
NOT ENOUGH FREE PAGES
ONLY ONE CMA ALLOWED

Note: Because Segment 0 is always part of the current active program area, this area + Segment 0 must not be greater than 32KW.

Effect on Background, System and Foreground.

Format DAT dd,mm,yy

dd	is the day; two digits representing a valid day.
mm	is the month; two digits in the range 01 to 12.
yy	is the year; two digits representing the last two digits of a year in the twentieth century. Thus 28,02,00 is accepted as the 28th February, 1900.

Remarks

The DAT command is given to set the date in the System (Initial Program Load). If a fatal power failure occurs the DAT command can be used to reset the date when the power is restored. However, the DAT command can be given at any time.

A self-explanatory error message will be output if a DAT command is rejected.

Effect on Background.

Format DCB [size][,level]

size specifies the number of pages to be reserved exclusively for a non-swappable background machine. If omitted, a swappable background machine is assumed.

level specifies the software level of all programs which will be run in the background machine. If omitted, the highest free level but two less than the level of the Idle Task is assumed. If specified, it must never be a lower level than the default value, and cannot be connected to any other program.

Errors

One of the following error messages will be output if a DCB command is rejected:

COMMAND NOT ALLOWED (DCB command not given in the System Machine)
MACHINE ID ALREADY EXISTS (DCB command already given without KIM BATCH)
WRONG BATCH SIZE (first parameter is not numeric or >16)
WRONG PARAMETER (2nd parameter not numeric)
TOO MANY PARAMETERS (more than two parameters given)
WRONG LEVEL NUMBER (level of Idle Task-1 was specified)
NOT ENOUGH PLACE TO CREATE MACHINE (no place in system dynamic area)
LEVEL NOT FREE (the specified level was already occupied)
LEVEL NUMBER TOO HIGH (specified level > than level of Idle Task)
NO PLACE TO CREATE BATCH (nr of requested pages not available)
D:CI NOT ASSIGNED (for a swappable Batch, the swap DAD D:CI was not found)

Effect on Foreground.

Format DCF m[,n]

m is the name of this foreground machine (a maximum of six ASCII characters). The names SYSTEM and BATCH are not allowed. Each foreground machine in any one session must have a unique name.

n is the number of memory resident segments, other than Segment 0 (the communications area). The default value is zero. (There must be 'n' SEG commands, one for each segment, defining the size of these segments.) The maximum number of segments is 9. This value is recorded in the CVT (communication vector table) and can be changed during system generation. See Appendix C.

Remarks

The DCF command must be the first SCL command in the set defining a foreground machine.

If all the memory-resident foreground programs, including their dynamic buffers obtained by LKM 4, occupy less than 16 pages, there is no need to specify any memory-resident segments. Segment 0 must then be specified on all FCL LOD commands given after the machine has been started.

However, disc-resident programs for a foreground machine must be less than 16 - v pages (where v is the number of pages in Segment 0). Segment 0 should therefore only contain memory-resident programs which are required by the disc-resident programs and/or memory-resident programs of the same machine (but not those loaded into Segment 0).

Some machine names starting with 'X:' like X:IO, X:MASG, X:IDLE cannot be used as these names are used internally in the monitor.

For a Foreground machine, a Program Control Table (PCT) is created, which has to be connected to a level. The highest free level is searched and connected to the Foreground machine, however, the levels for the Idle Task I/O (Idle Task level-1) and the Batch (Idle Task level-2) are not taken.

Errors

One of the following error messages will be output if the DCF command is rejected:

COMMAND NOT ALLOWED (DCF given not in System machine)
WRONG PARAMETER (illegal machine name)
MACHINE ALREADY EXISTS
WRONG NUMBER OF SEGMENT (second parameter not numeric)
TOO MANY PARAMETERS
DCF COMMAND UNALLOWED DURING DCF
MACHINE NAME > 6 CHARACTERS
DCF BATCH NOT ALLOWED
DCF SYSTEM NOT ALLOWED
TOO MANY SEGMENTS REQUESTED (more than value in CVT)
NO SPACE TO CREATE MACHINE (no space in system dynamic area)
NO FREE LEVEL, CREATION IMPOS.

Effect on Background and Foreground.

Format DEN

Remarks

The DEN command indicates to MAS that all the commands to declare a machine have been entered. A further machine may now be declared. If no more machines are required to be declared, the BYE command may be given and the machines started, or other system commands (like MAP, DUM) can be given.

Errors None.

Purpose To define an assignment of a Datacom line.

Effect on Foreground and Background.

Format 1 DLC lc1,dn[da[l]]

Format 2 DLC lc1,lc2

lc1	is the linecode to be assigned.
dn	is a device name as described in Appendix A.
da	is the device address. If omitted, the first device with the name dn is taken.
l	is a linenumber. Only applicable for LSM16 and AMA8.
lc2	is an already assigned linecode, to which this linecode has to be assigned by equivalence.

Remarks
The assignment is made in the consecutive linecode table or in an alternate block, depending on the value of lc1 and the DLN command.
When the user has the intention to give a DLN command, this must be done before any DLC command is given.

Errors
One of the following error messages is output if the DLC command is rejected:

LINE CODE ERR
Incorrect value of lc1 given.
LINE CODE NOT NUMERIC
LINE CODE MISSING
No parameter was given in the DLC command.
INV. LINE CODE
lc1 is negative, zero or greater than 255.
DEV NAME ERROR
DEV NAME MISSING
Only one parameter given.
INV DEV NAME
NO device is not allowed.
2ND LINE CODE ERROR
lc2 is negative, zero or greater than 255.
TOO MANY PARAM
DYN AREA OVERFLOW
DEV. UNKNOWN
The specified device is unknown or not generated in the system.
2ND LINECODE NOT ASSIGNED
DEV ADDR ERROR
ASSIGN ERR (ST=xxxx)
The assignment gave an error (see Appendix C, LKM 48).

Purpose — To define the number of consecutive linecodes that can be used in the machine to be declared.

Effect on — Foreground and Background.

Format — DLN n

n — is the number of consecutive linecodes. It is an integer value from 0-255. Before the DLN command, no DLC (define linecode) command may be given.

Remarks

If no DLN command is given, the default value from the CVT is taken.
The DLN command causes the system to reserve a block in the System Dynamic Area of n+1 words. The first word contains the number of linecodes (n), the other words contain the address of an LCB (if assigned). Each line that is assigned to a linecode not greater than n is inserted in this block on the displacement that corresponds with the linecode assigned. When a line is assigned to a linecode greater than n then a alternate linecode assign block is created, which is chained to the other blocks containing linecode assignments (i.e. alternate blocks and the block containing the consecutive linecodes). The advantage of having a block with consecutive linecodes is that it costs less System Dynamic area.

Errors

One of the following error essages will be output when the command is rejected:

OF DTC L.C. ERROR
n is incorrect
OF DTC L.C. NOT NUMERIC
TOO MANY DTC L.C.
n is negative, zero or greater than 255.
WHAT IS THE 2ND PARAM?
More than one parameter given.
DYN AREA OVERFLOW
SEQUENCE ERROR
Some linecode was already assigned, receiving the DLN command.

Purpose To define or redefine the number of lines per page for a Teletype or line printer.

Effect on All machines.

Format DLP dn[da],lp

dn is the device name (TY or LP).
da is the device address (2 hexadecimal digits without the preceding slash (/) character).
lp is the number of lines/page. The permissible range is 1-99 or NO. If NO is given, no top of form skipping is performed.

Remarks

If the device address parameter (da) is omitted, all devices of type 'dn' will have the requested number of lines per page.

Errors

One of the following error messages will be output if this command is rejected:

DEV. NAME ERROR
DEV. NAME MISSING
DEV. ADDR NOT HEXA
INCORRECT DEV. NAME & ADDR.
UNKNOWN DEVICE
OF LINES PER PAGE MISSING
INVALID # OF LINES/PAGE
OF LINES/PAGE ERROR
TOO MANY PARAM
PAGE CONCEPT NOT APPLICABLE

Effect on Background, System and Foreground.

Format DOF dnda

dn is a two character non-disc device-type code. (Device-type codes are listed in Chapter 3.) A disc cannot be specified.

da are two hexadecimal digits, representing the device address.

Remarks

The DOF command is used by the systems manager to inform MAS that a device may not be used. It is entered because a device requires repair, or if systems generation specified a device which has not yet been installed. Its function is identical to the OF operator command.

Errors

One of the following error messages will be output if a DOF command is rejected:

DEV. NAME ERROR
DEV. NAME IS NUMERIC
DEV. NAME IS MISSING
INCORRECT DEV. NAME & ADDR
DEV. ADDR NOT HEXA
UNKNOWN DEVICE
DISK DEVICE
WHAT IS THE 2ND PARAM?

Effect on Background, System and Foreground.

Format DON dnda

dn is a two character non-disc device-type code. (Device-type codes are listed in Chapter 3.)

da are two hexadecimal digits, representing the device address.

Remarks

The DON command is used by the systems manager to inform MAS that a device, previously specified by a DOF or OF operator command, may now be assigned under MAS. Its function is identical to the ON operator command.

Errors

One of the following error messages will be output if a DON command is rejected:

DEV. NAME ERROR
DEV. NAME IS NUMERIC
DEV. NAME IS MISSING
INCORRECT DEV. NAME & ADDR
DEV. ADDR NOT HEXA
UNKNOWN DEVICE
DISK DEVICE
WHAT IS THE 2ND PARAM?

Purpose — To set or redefine the timeout value for a non-disc device.

Effect on — All machines.

Format — DTO dn[da],tm

- dn — is the device name (2 ASCII alphabetic characters).
- da — is the device address (2 hexadecimal digits without '/').
- tm — is the timeout value (expressed in minutes in the range 0-255). Zero means no timeout.

Remarks

If the da parameter is omitted, the timeout value will be set for all devices of type dn.

Errors

If this command is rejected, one of the following error messages will be output:

TOO MANY PARAM
DEV. NAME ERROR
UNKNOWN DEVICE
DISK DEVICE
INVALID TIMEOUT (greater than 255)
DEV. ADDR. NOT HEXA.
INCORRECT DEV. NAME & ADDR.
TIMEOUT ERROR
TIMEOUT MISSING
DEV NAME MISSING

Effect on System and Foreground.

Format DUF fc,from[,to]

fc is either a DAD filecode /F0 to /FF or a filecode assigned to a discfile. The file-code must have been assigned at system generation or by an ASG command.

from is the first sector to be dumped.

to is the last sector to be dumped, if omitted, only the from sectoris dumped.

For a DAD, from and to are DAD or file relative sector numbers.

For a disc file, relative sector 0 is the third sector. It is the sector following the fileheader and the granule table sector.

Remarks

The DUF command will dump the specified sectors, in hexadecimal format, to the device assigned to system machine filecode /02.

Errors

One of the following error messages will be output if a DUF command is rejected:

FC PRT NOT ASGN
PARAM ERROR
PARAM MISSING
DAD FC NOT ASGN
OUT OF LIMITS FILE
DYNAMIC AREA OVERFLOW
READ FILE I/O ERROR
2ND ADDR LESS THAN 1ST ADDR
FC FORBIDDEN
FC ASSIGN TO PHYS DEVICE

Effect on System.

Format DUM from,to

from is an upto six digit hexadecimal number representing the 18-bit (P857/P858) or 20-bit address of the first word to be dumped.

to is an upto six digit hexadecimal number representing the 18-bit or 20-bit address of the last word to be dumped.

Remarks

The memory locations specified within the system machine are dumped to the device assigned to filecode /02. If this device is not ready MAS sends a message to the operator.

Errors

One of the following error messages will be output if a DUM command is rejected:

FC PRT NOT ASGN
DYNAMIC AREA OVERFLOW
PARAM ERROR
PARAM MISSING

Effect on Background and Foreground.

Format FCD {dk | fc,dn[da[l]]| dc,dkl,dd}

fc is a filecode.
dn is a two-character non-disc device-type code. (Device-type codes are listed in Chapter 3.)
da is a device address, a 6-bit hexadecimal number. This address is only required if there is more than one device of type 'dn' and the filecode is to be assigned to one other than the first one in the systems generation device table.
dc is a DAD code in the range /F0 thru /FF.
dk is a disc code in the range /C0 thru /CF.
dd is a DAD name contained in the VTOC (Volume Table of Contents) on disc 'dkl'.
l is a line number that can be specified with a device address connected to an AMA8 device. The linenumber can also be added to the AMA8 device address.
dkl is a disc code in the range /C0 thru /CF, which has to be declared in a previous FCD command for the same machine.

The FCD command defines a filecode for a file when the machine is created.

Remarks

The three types of format for a FCD command, as shown above, define filecodes for physical discs, physical devices and DADs, respectively.

After a machine has been defined, additional filecodes may be defined by the ASG command or by LKM.

Errors

One of the following error messages will be output if an FCD command is rejected:

WRONG FILE CODE
WRONG PARAMETER
NO MORE SPACE FOR FC CREATION
DISC CODE MUST BE Cx
WRONG DAD NAME
FILE CODE UNKNOWN
/Fx MUST BE USED WITH /Cx
NUMBER OF FC TOO BIG
/Cx NOT ASSIGN

Floating Point Off

Purpose — Floating-point registers are not to be saved.

Effect on — Background, System and Foreground.

Format — FOF

Remarks

The FOF command cancels the effect of a previous FON command. The contents of floating-point registers will no longer be saved after this command has been processed. There is no theoretical limit to the number of times that the FON and FOF commands may be given in a MAS session. Also, there is no check, whether the floating point processor was on.

Errors

If the floating-point hardware feature is not present in the P800 configuration and a FOF command is given, it will be rejected with the following error message:

```
NO FLOATING POINT OPTION
```

Purpose Floating-point registers are to be saved.

Effect on Background, System and Foreground.

Format FON

Remarks

The FON command causes MAS to save the contents of floating-point registers if the task using them is interrupted. This command should be given before any task begins to use floating-point arithmetic, otherwise the register contents will be lost if the task is interrupted. The FON command is cancelled by the FOF command.

Errors

If the floating-point hardware feature is not present in the P800 configuration and a FON command is given, it will be rejected with the following error message:

NO FLOATING POINT OPTION

Effect on Foreground and Background

Format KIM {machine-name | BATCH}

machine-name is a valid machine name (maximum six ASCII characters).
BATCH refers to the background machine.

Remarks

The KIM command 'kills' the foreground machine called 'machine-name', or the background machine if 'BATCH' is specified. This command cannot be used to delete a machine whilst it is running.

If the command is rejected and one of the error messages listed below is printed, the machine still exists.

Errors

One of the following error messages will be output if the KIM command is rejected:

```
PARAM ERROR OR MISSING
UNKNOWN MACHINE
MORE THAN ONE PARAM
SYSTEM MACHINE
PRG  <Prog. Name>   ACTIVE
PRG  <Prog. Name>   PAGES TAB DESTROYED
PRG  <Prog. Name>   INV. CHAIN. ADD. IN SG *
PRG  <Prog. Name>   SYST. DAD /F1 INCORR. **
PRG  <Prog. Name>   BEING SWAPPED OUT.
PRG  <Prog. Name>   BEING ABORTED.
FCL RUNNING FOR THAT MACHINE
```

* Programs in a segment are chained; the chain word has been overwritten.

** DAD filecode /F1, normally assigned to D:CI, is not assigned.

Effect on Background.

Format KLM n

n is the secondary load module name, as specified on the LSM command which was used to load it. Giving a KLM commnad in the system machine applies on a Background secondary load module.

Remarks

The command is rejected if the secondary load module is connected to a primary load module (in the BATCH) which is still active.

Error messages

PARAMETER ERROR
SEC. LOAD MOD. ALREADY DELETED
SEC. LOAD MOD. STILL CONNECTED.

Effect on Foreground.

Format LAB s

s is the maximum number of scheduled labels which may, at any one moment, be invoked by any one program run for a foreground machine user. The maximum value is 255.

Remarks

The LAB command varies the value which is specified during systems generation. It enables the maximum number of scheduled labels to be reset without re-generating the system.

Errors

The following error message is output if the LAB command is rejected:
WRONG PARAMETER

Purpose

To load a secondary load module into memory, which can be called by primary load modules in the Batch machine.

Format

LSM n,fc[,R|,W]

n is a 4 ASCII character name of a secondary load module, output by the Linkage Editor and catalogued in the first Userid of the DAD fc

fc specifies the DAD filecode from which the secondary load module is to be loaded. Giving the LSM command in the SYSTEM machine, the DAD filecode is searched in the filecode table of the BATCH machine.

R is entered if the secondary load module is to be considered as read-only.

W is entered if the secondary load module may be modified.

The default is R .

Error Messages

One of the following error messages will be output if the command is rejected:

UNKNOWN SECONDARY LOAD MODULE
SEC LOAD MOD IS SEGMENTED
SEC LOAD MODULE ALREADY LOADED
DAD FILECODE ERROR
DYN AREA OVERFLOW
PARAMETER ERROR
DAD SECTOR TOO LONG
I/O ERROR
TOO FEW FREE PAGES
SEC. LOAD MOD. TOO LONG
NO DECLARED BATCH MACHINE
SLM NAME EXCEEDS 4 CHARACTERS

Effect on System, Foreground and Background.

Format MAP [filecode]

filecode is the print file filecode; the default is /01.

Remarks

The MAP command prints the status of all programs in all machines.

The format of the print file is as follows:

Example of a MAP print-out

```
SM T
FCL:LOD 0,MAIN,/F6
PROG :  MAIN   USER LOADING ADDR. :   /F3E4
FCL:SWP FUNPO,/F6
FCL:REP 5,1,PREP,/F7
PROG :  PREP   USER LOADING ADDR. :   /DFE2
FCL:RON PRON,/F7
FCL:MAP
T       ** 10.00.00 ** 16.11.78 *
MAIN    SOO  LEV=000 INA LOADED AT F3E4
FUNPO   SWP  LEV=000 INA NOT LOADED
PREP    REE  LEV=000 INA LOADED AT DFE2
PRON    RON  LEV=000 INA NOT LOADED
FCL:BYE SYSTEM
SM SYSTEM
FCL:MAP
SYSTEM ** 10.00.09 ** 16.11.78
X:IO    RES  LEV=000 INA SYSTEM PROGRAM
X:MASG  RES  LEV=003 ACT SYSTEM PROGRAM RUNNING
X:USVC  RES  LEV=001 INA SYSTEM PROGRAM
X:SWIO  RES  LEV=002 INA SYSTEM PROGRAM
X:ALGR  RES  LEV=009 INA SYSTEM PROGRAM
X:RTC   RES  LEV=012 INA SYSTEM PROGRAM
X:OCOM  RES  LEV=008 INA SYSTEM PROGRAM
SYSTEM  RES  LEV=010 ACT SYSTEM PROGRAM MAIN WAIT AT 953C
X:IDLE  RES  LEV=119 ACT SYSTEM PROGRAM RUNNING
X:DUMP  RES  LEV=013 INA SYSTEM PROGRAM
T       RES  LEV=116 INA SYSTEM PROGRAM
FCL:BYE
```

Errors

One of the following error messages will be output if a MAP command is rejected:

INVALID PRINT FILE CODE
PRINT F.C. ASSGN TO NO DEVICE

Maximum Number of Blocking Buffers

Purpose — Define maximum number of blocking buffers.

Effect on — Background and Foreground.

Format — MBF x

x — is the maximum number of disc file management blocking buffers.

Remarks

The MBF command varies the number of buffers specified during systems generation. It enables the number of buffers to be reset without re-generating the system.

Errors

The following error message is output if an MBF command is rejected:
MBF VALUE IS NOT NUMERIC

Effect on Background and Foreground.

Format MFC f

f is the maximum number of filecodes that can be assigned in the machine being generated. It is a numeric value not greater than 255.

Remarks

The MFC command varies the size of the table specified during system generation. It enables the size of the table to be reset without re-generating the system.

Errors

The following error message is output if an MFC command is rejected:
MFC VALUE IS NOT NUMERIC
NUMBER OF FC TOO BIG

Purpose — to introduce a new device without the necessity of generating a new system.

Effect on — Background, System and Foreground.

Format — NDV dnda[,i][,p]

dn — is a two-character device-type code; see Chapter 3. This device type must have been specified during system generation.

da — is two hexadecimal digits representing the device address of the new device.

i — is the interrupt level (1 to 61) which specifies the address of the hardware interrupt routine which will process this interrupt signal and the hardware level of this routine.
If the device is attached to a controller which has already been declared, this parameter is not allowed.

p — specifies the number of lines per page, and should only be given if the device is a line printer.

Remarks

The NDV command allows the systems manager to add a new device to the system without undertaking a system generation.

Errors

One of the following error messages will be output if an NDV command is rejected:

DEV. ALREADY DECLARED
UNKNOWN DEV. NAME
DEV. INT. MISSING
DEV. INT. ERROR
DEV. INT. NOT NUMERIC
3RD PARAM ERROR
WHAT IS THE 3RD PARAM?
TOO MANY LINES/PAGE
0 LINES/PAGE
WHAT IS THE 4TH PARAM?
DYN AREA OVFL
DEV. CONT. ALREADY USED
DISK DEVICE
TOO MANY DEVICES
DEVICE NAME ERROR
DEVICE NAME IS NUMERIC
DEVICE NAME MISSING
INCORRECT DEV NAME&ADDR
DEV. ADDR NOT HEXA
INV DEV INT LEVEL

Purpose To print a map of all machines.

Format PCM [fc]

fc is the print filecode; the default value is /01.

Remarks

Per machine the occupied pages with their related MMU registers are listed. Also information is given for what the page is used (segments, swappable programs).
The last line printed by the command gives in hexadecimal the number of free pages in the whole machine.

Error Messages

INVALID PRINT FILECODE
PRINT F.C. ASSGN. TO NO DEVICE.

Effect on System and Foreground.

Format PFC [filecode]

filecode is the print file filecode. The default value is /01.

Remarks

The PFC command prints per machine all assigned filecodes. The filecodes are printed on the device assigned to the specified filecode.

The format of the print-out is as follows:

```
***SYSTEM FILE CODES
01 TY 10
02 LP 07
E0 TY 10
EF TY 10
C0 DK 02  X1215 REMOVABLE PACK 1215
C2 DK 12  X1215 REMOVABLE PACK 0012F0 DD     SUPERV  C0  DK  02
F1 DD     D:CI    C0  DK  02
FCL:
```

Errors

One of the following error messages will be output if the PFC command is rejected:

INVALID PRINT FILE CODE
PRINT F.C.ASSGN TO NO DEVICE

Effect on System and Foreground.

Format PLC [filecode]

filecode is the print filecode. The default is /01.

Remarks

The PLC command prints all linecodes assigned in all machines. The linecodes are printed on the device assigned to the specified filecode.

Errors

INVALID PRINT FILECODE
PRINT FILECODE ASSIGNED TO NO DEVICE

Effect on System and Foreground.

Format PLV [filecode]

filecode is the print file filecode. The default value is /01.

Remarks

The PLV command prints all the software levels in use in the whole machine. The levels in use are printed on the device assigned to the specified filecode.

Errors

One of the following error messages will be output if the PLV command is rejected:

INVALID PRINT FILE CODE
PRINT F.C. ASSGN TO NO DEVICE

Effect on Background, System and Foreground.

Format POF p

p is a page number in the range 0 to 63 (P857/P858) or 255 (P859/P854/P876).

Remarks

The POF command is used by the system manager to inform MAS that a memory page is unavailable for allocation, for instance because a permanent error occurred in the page. Only non-occupied pages can be set off.

Errors

One of the following error messages will be output if a POF command is rejected:

```
PAGE # ERROR
PAGE # IS NOT NUMERIC
PAGE # MISSING
INVALID PAGE #
PAGE ALREADY USED OR NOT EXISTING
WHAT IS THE 2ND PARAM?
DYN AREA OVERFLOW
```

Effect on Background, System and Foreground.

Format PON p

p is a page number in the range 0 to 63 or 255, dpending on the CPU type.

Remarks

The PON command is used by the systems manager to inform MAS that a memory page, previously specified by a POF command in this session, may now be allocated.

Errors

One of the following error messages will be output if a PON command is rejected:

NO PAGE OFF
PAGE # ERROR
PAGE # IS NOT NUMERIC
PAGE # MISSING
INVALID PAGE #
WHAT IS THE 2ND PARAM?
PAGE WAS NOT OFF

Effect on System, Foreground and Background.

Format PRG program-name,filecode,print-code

program-name is a valid program name (maximum six ASCII characters).
filecode is the print file filecode.
print-code indicates which registers are to be printed:
A = all registers (including scheduled label registers);
M = main registers only (excluding scheduled label registers);
S = scheduled label registers only.

Remarks

The PRG command prints the contents of program registers according to a print-code.

Errors

One of the following error messages will be output if the PRG command is rejected:

INVALID PROGRAM NAME
PROG. NAME MISSING
PROG. NAME TOO LONG
PROG. NAME UNKNOWN
INVALID PRINT F.C.
PRINT F.C. MISSING
PRINT F.C. NOT ASSIGN
INVALID PRINT CODE
PRINT CODE MISSING
PRINT CODE TOO LONG
PRINT CODE UNKNOWN
SYS DYN AREA OVERFLOW

Print Program Status

Effect on System and Foreground.

Format PRS program-name[,filecode]

program name is a current program name;
filecode is the print file filecode. The default is filecode /01.

Remarks

The PRS command prints the status of the specified program on the device assigned to the print file according to the lay-out of one line of the MAP command.

Errors

One of the following error messages will be output if a PRS command is rejected:

PARAM ERROR
PROG NAME MISSING
PROG NAME UNKNOWN
PRINT F.C. PARAM ERROR (output filecode error)
PRINT F.C. BAD ASSGN (output filecode not assigned)
INVALID PRINT FILE CODE
PRINT F.C. ASSGN TO NO DEVICE

Effect on Foreground and Background.

Format RAB program-name

program-name is any current program name.

Remarks

The RAB command clears the abort state of the specified program.

If a foreground program is aborted it is suspended, in order to allow the user to debug the program by dumping memory/registers. A aborted program can be restarted by the FCL commands RUN or ACTivate, without removing the abort state, but it can only be (re-)activated by the timer or clock, or by another program, after the abort state has been cleared by means of the RAB command.

Errors

One of the following error messages will be output if a RAB command is rejected:

PARAM ERROR
PROG NAME MISSING
PROG NAME UNKNOWN
PROG INACTIVE
PROG NOT ABORTED
RAB NOT ALLOWED, EVC # 0 (the aborted program has an outstanding event. The abort state can only be cleared when the event is ready).

Effect on System and Foreground.

Format RDV device-address

device-address is a valid device address.

Remarks

The RDV command is used to release an I/O operation. It has the same effect as the RD operator command.

The command may be used after an I/O error has been signalled by the PU operator message (Physical Unit Intervention Required), which terminated with 'RY'.

Errors

One of the following errors will be output if an RDV command is rejected:

PARAM ERROR
DEVICE ADDRESS MISSING
DEVICE ADDRESS UNKNOWN
DEVICE NOT IN RETRY
DISK DEVICE CANNOT BE RELEASED

Effect on Background.

Format RST [A7-value]

A7-value is a value which will be loaded into register A7 before the specified program is restarted. If omitted, zero is loaded by default.

Remarks

When used in a foreground machine the RST command restarts the specified program.

When used in the background machine, the RST command restarts the BCL Processor.

Errors

One of the following error messages will be output if a RST command is rejected:

PARAM ERROR
BAD A7 PARAM VALUE
PROG NOT IN PAUSE

Effect on System and Foreground.
Format RYD device-address
device-address is a valid device address.

Remarks

The RYD command is used to retry an I/O operation. The command may be used after an I/O error has been signalled by the PU operator message (Physical Unit Intervention Required), which terminates with `RY'. The effect is the same as the RY operator command.

Errors

One of the following error messages will be output if an RYD command is rejected:

PARAM ERROR
DEVICE ADDRESS MISSING
DEVICE ADDRESS UNKNOWN
DEVICE NOT IN RETRY

Effect on System.

Format SCR filecode

filecode is the filecode to be removed from the filecode table for the system machine.

Remarks

The SCR command causes the filecode table entry to be scratched form memory.

Errors

One of the following error messages will be output if an SCR command is rejected:

FILE CODE MISSING
FILE CODE ERROR
FILE CODE IS NOT NUMERIC
FILE CODE TOO BIG
I/O ERROR
SCR ERROR
DELETE ERROR
SPOOLED DVCE
D:CI IN USE

Effect on Foreground.

Format SEG k,x

k identifies the segment being defined. It is a positive integer not equal to a value given in another SEG command for this machine and not more than the value 'n' in the DCF command for this machine.

x is the number of 2K pages (minimum 1) in this segment. The maximum is 16 - p, where 'p' is the number of pages specified in the CMA command for this machine.

Remarks

One SEG command must be given for each segment implied by the DCF command. SEG commands must follow the CMA command for the same foreground machine. They can not be given if the machine has no memory-resident segments apart from Segment 0.

Errors

One of the following error messages will be output if a SEG command is rejected:

SECOND COMMAND MUST BE CMA
WRONG PARAMETER
WRONG SEGMENT NUMBER
SEGMENT NUMBER 0 NOT ALLOWED
WRONG NUMBER OF PAGES
OF PAGES 0 UNALLOWED
SEGMENT NUMBER ALREADY DEFINED
NOT ENOUGH FREE PAGES
OF 'PAGES FOR ROOT + SEGMENT > 16

Effect on System.

Format TIM

Remarks

The time and date will be output to the device with the system filecode /01.

Error

If the timer does not contain a value that can be converted to a valid time, then the error message:

THE DATE IS DESTROYED

is output to the device with the system filecode /01.

Effect on System.

Format WRD dc,s,d,v0[,v1]...

dc	is the DAD filecode.
s	is the DAD relative sector number.
d	is the displacement in characters from the beginning of sector `s'.
v0 to vn	is a list of one or more values to be placed in sector `s'. `v0' is placed `d' words from the beginning of the sector, `v1' is placed d+1 words from the beginning, and so on until `vn' which is placed `d+n' words from the beginning. In other words the values in the value-list are placed consecutively and contiguously from the address represented by the displacement `d'.

Remarks

The WRD command is used by the systems manager to alter one or more words on a DAD which is assigned to the system machine. The WRD command cannot access sectors with a length of more than 512 words.

Errors

One of the following error messages will be output if a WRD command is rejected:

FILE CODE MISSING
FILE CODE ERROR
FILE CODE IS NOT NUMERIC
INVALID FILE CODE
SECTOR NUMBER ERROR
SECTOR NUMBER NOT NUMERIC
SECTOR NUMBER MISSING
INVALID SECTOR NUMBER
FILE CODE NOT ASSIGNED
FILE CODE IS NOT A DAD
SECTOR NBR OUT OF DAD
SECTOR SIZE TOO BIG
DISPL. ERROR
DISPL. NOT NUMERIC
DISPL. MISSING
DISPL. TOO BIG
READ ERR. STAT=yyyy
VAL xxxx ERROR
VAL xxxx NOT NUMERIC
VAL xxxx DISPL. OUT OF SECTOR
VAL xxxx TOO BIG
VALUE MISSING
WRITE ERROR. STAT= yyyy
(xxxx is replaced by the number of the parameter in error.)

Effect on Background, System and Foreground.

Format WRM a,v0[,v1 ... vn]

a	is a five digit hexadecimal number representing the 18- or 20-bitabsolute machine address of the first word to be written. The maximum value is /3FFFF or /7FFFF depending on the CPU type.
v0 to vn	is a list of one or more values to be placed in memory. 'v0' is placed in memory address 'a', 'v1' is placed in memory address 'a+2', and so on until 'vn' which is placed in memory address 'a+2n'. In other words, the values in the value-list are placed consecutively and contiguously from memory address 'a'. Each value must not contain more than 4 hexadecimal digits.

Remarks

The WRM command is used by the systems manager to alter one or more words of memory from filecode /E0 of the system machine.

The command cannot be given on the device assigned to the system filecode /E1. The command is similar to the WM operator command.

Errors

One of the following error messages will be output if the WRM command is rejected:

WRONG PARAMETER
WRONG LOCATION
WRONG VALUE
NO VALUE

Note: The format of this command differs from that of the FCL WRM command.