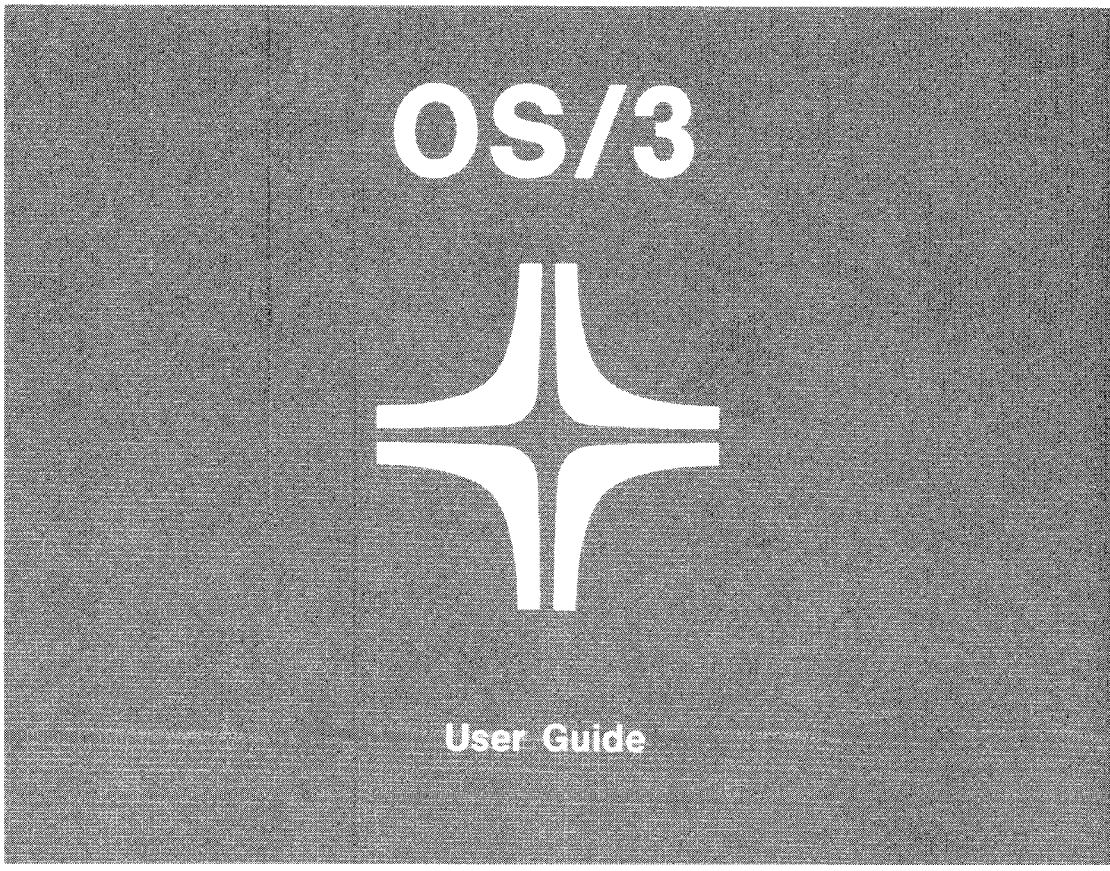
MAPPER 80
Operator and Coordinator



Environment: System 80

SPERRY

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PRINTED IN U.S.A.

PAGE STATUS SUMMARY

ISSUE: UP-9737
RELEASE LEVEL: 8.1 Forward

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Preface

This manual is one of a series designed to instruct and guide the SPERRY Operating System/3 (OS/3) MAPPER 80 software user. It specifically describes the preparation of job control streams along with the registration and maintenance of modes, types, runs, departments, and users. It also describes MAPPER 80 software installation and modification including data base considerations.

This manual is divided into the following sections:

- Section 1. Introduction

  Provides a brief overview.

- Section 2. Operation of the MAPPER 80 Software

  Describes the preparation of job control streams, unsolicited operator commands, and system messages.

- Section 3. MAPPER 80 Coordinator Functions

  Explains the procedures for registering and maintaining modes, types, users, and departments.

- Section 4. Installation and Modification of the MAPPER 80 Software

  Describes MAPPER 80 media along with the software installation process.

- Section 5. MAPPER 80 Software Considerations

  Explains data base backup and recovery procedures.

Four other MAPPER 80 documents (current versions) are also available:

1. Manual functions user guide, UP-9735

   Describes all the manual functions and how they manipulate reports or data within reports.

2. Run functions user guide, UP-9734

   Describes a powerful set of procedure-like run functions that call sequences of manual functions to manipulate reports or the data within them.

3. Forms generation and utilities user guide, UP-9736

   Describes how to generate report forms and make use of the MAPPER 80 utilities.

4. Introduction, UP-10000

   Provides a brief overview of MAPPER 80 software.

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1. Introduction

This manual is a guide for MAPPER 80 coordinators and console operators. It discusses the operational aspects of generating the MAPPER 80 software and the considerations involved in daily operation. The MAPPER 80 coordinator can learn about the special functions used to register new modes, types, and users in the software. MAPPER 80 installation and data base backup and recovery are also described.

In addition, the user should understand the information presented in the four MAPPER 80 documents listed in the preface and the DMS system support functions reference, UP-7909.3 (current version).

2. Operation of the MAPPER 80 Software

This section discusses the following MAPPER 80 operations:

- Initialization of a MAPPER 80 session
- Operating procedures
- MAPPER 80 messages

2.1. INITIALIZATION OF A MAPPER 80 SESSION

To initialize a MAPPER 80 session, perform the following steps:

1. Load ICAM by keying in the command

   $\begin{Bmatrix} cn \\ mn \end{Bmatrix}$Δ[KEEP]

   You can also load ICAM from a job control stream with the statement

   //CCΔ'$\begin{Bmatrix} cn \\ mn \end{Bmatrix}$ΔKEEP'

   See the ICAM network definition and operations user guide, UP-8947 (current version), for more information.

2. Run the GUST (global users service task) job control stream.

   NOTE:

   The first two steps in the MAPPER 80 initialization are not required in local workstation configurations.

3. Run the DBMS (data base management service) job control stream and wait for the DBMS INITIALIZED message to appear.

4. Run the MAPPER 80 job control stream and wait for the MAPPER INITIALIZATION COMPLETED message to appear.

   NOTE:

   A MAPPER 80 job control stream can only specify eight workstations. When you require more than eight workstations, run additional MAPPER 80 job control streams with individual names (MAPPER 1, MAPPER 2) to keep them all unique within the system.

Figures 2–1, 2–2, and 2–3 provide examples of GUST, DBMS, and MAPPER 80 job control streams.

```
// JOB GUST,,3100
// OPTION SYSDUMP
// DVC 22 // LFD PRNTR
// EXEC ML$$GI
/&
```

Figure 2–1. GUST Job Control Stream

```
UNIVAC OS/3 LIBRARIAN
DATE 83/07/28 TIME 12.39

BLOCK   REC             NAME       TYPE    DATE      TIME      COMMENTS


.. COMMAND .........    FIL          D1=LIB1

                        D 1 - VSN IS MAPPER, LFD IS  LIB1    , FILE LABEL IS MAPPERSJCS

.. COMMAND .........    COP,D        D1,S,MAPPERDB

002904  076             MAPPERDB    SOR    83/07/28   12.36
002904  134             // JOB MAPPERDB,,5000
002904  158             // OPTION JOBDUMP
002904  177             // DVC 20 // LFD PRNTR
002904  201             // DVC 21 // LFD PRNTX
002905  065             // DVC 50 // VOL MAPPER // LBL MAPPERSDBSFILE // LFD DBLINK
002905  066             // DVC 50 // VOL MAPPER // LBL MAPPERSDBSBQBL // LFD DBBQBL
002905  127             // DVC 50 // VOL MAPPER // LBL MAPPERSDBSCQBL // LFD DBCQBL
002905  188             // DVC 50 // VOL MAPPER // LBL MAPPERSDBSJRNL // LFD JRNL
002906  059             // EXEC DBMS
002906  077             /$
002906  081             DBMS SECTION.
002906  096                MAXIMUM NUMBER OF DBMS RUN-UNITS IS 2.
002906  138                JOURNAL FILE IS JRNL.
002906  163                MAXIMUM NUMBER OF IMS-THREADS IS 8.
002906  202                MAXIMUM NUMBER OF IMS-TERMINALS IS 8.
002907  005                SUPPRESS SUB-SCHEMA DATE TIME CHECK.
002907  045                SUPPRESS JOURNAL CHECKPOINTS.
002907  078             DMCL SECTION.
002907  093                DMCL IS MPDB.
002907  110                ACTIVATE DMCL.
002907  128             END.
002907  134             /*
002907  138             /&
```

Figure 2–2. DBMS Job Control Stream

```
ELCCK   REC          NAME       TYPE    DATE      TIME      COMMENTS


.. COMMAND .........  COPY.D     D1,S,MAPPER

CC2907  164          MAPPER     SOR     83/07/28  12:38
CC2907  222          // JOB MAPPER,,7CCCC,,17 ------------------------------- (1)
CC2908  005          // OPTION JOBDUMP
CC2908  024          // DVC 20   // LFD PRNTR-------- (2)
CC2908  051          // DVC 50   // VOL MAPPER   // LBL MAPPER$FMTE   // LFD FMT1
CC2908  112          // DVC 50   // VOL MAPPER   // LBL MAPPER$FMTE   // LFD FMT2
CC2908  173          // DVC 50   // VOL MAPPER   // LBL MAPPER$FMTE   // LFD FMT3
CC2909  005          // DVC 50   // VOL MAPPER   // LBL MAPPER$FMTE   // LFD FMT4  } (3)
CC2909  066          // DVC 50   // VOL MAPPER   // LBL MAPPER$FMTE   // LFD FMT5
CC2909  127          // DVC 50   // VOL MAPPER   // LBL MAPPER$FMTE   // LFD FMT6
CC2909  188          // DVC 50   // VOL MAPPER   // LBL MAPPER$FMTE   // LFD FMT7
CC2910  005          // DVC 50   // VOL MAPPER   // LBL MAPPER$FMTE   // LFD FMT8
CC2910  066          // DVC 200   // USE SFS,FMT1   // LFD WKST1
CC2910  111          // DVC 201   // USE SFS,FMT2   // LFD WKSP1
CC2911  156          // DVC 202   // USE SFS,FMT3   // LFD WKST2
CC2911  201          // DVC 203   // USE SFS,FMT4   // LFD WKSP2  } (4)
CC2911  005          // DVC 204   // USE SFS,FMT5   // LFD WKST3
CC2911  050          // DVC 205   // USE SFS,FMT6   // LFD WKSP3
CC2911  095          // DVC 206   // USE SFS,FMT7   // LFD WKST4
CC2911  140          // DVC 207   // USE SFS,FMT8   // LFD WKSP4
CC2911  185          //DM01 WORK1 } (5)
CC2911  199          //DM02 WORK2
CC2912  064          // EXEC MAPPER,LOD,5 (6)
CC2912  086          /$
CC2912  090          RES=RUN (7)
CC2912  099          WKST1=T01-WKSP1=PC1 }
CC2912  120          WKST2=T02           } (8)
CC2912  131          WKST3=T03           }
CC2912  142          WKST4=T04           }
CC2912  153          /*
CC2912  157          /&
```

NOTES:

(1) Job definition, main storage size is X'70000' and number of tasks is 17.

(2) Printer assignment

(3) Screen format library assignment

(4) Workstation and auxiliary printer assignments

(5) Sort work file assignment

(6) Main MAPPER 80 job execution, task priority of 5

(7) RUN functions made resident to increase performance

(8) MAPPER 80 specification of workstations and auxiliary printers

Figure 2–3. MAPPER 80 Job Control Stream

2.1.1. Calculation of Main Storage Size

Use the following formula to determine the main storage required for a MAPPER 80 job:

```
Main storage size = 95 + (65 x n) + (27 x m)
```

where:

n
: Number of workstations (one to eight).

m
: Number of auxiliary printers (one to nine).

When you specify the RES=RUN parameter in the MAPPER 80 job control stream, add an additional 33 kilobytes to the calculated main storage size. See 2.1.3 for information on the RES=RUN parameter.

Example:

For two workstations and one auxiliary printer, calculate the main storage size as follows:

```
n = 2, m = 1
252 = 95 + (65 x 2) + (27 x 1)
```

- Add 33 for the RES=RUN parameter

```
285 = 252 + 33
```

- Multiply by 1024 to get number of bytes in decimal

```
291,840 = 285 x 1024
```

- Convert decimal to hexadecimal

```
decimal = hexadecimal
291,840 = 47,400
```

- Specify hexadecimal value 47,400 in the main storage line of the MAPPER 80 job control stream.

```
// JOB MAPPER,,47400,,7
```

NOTE:

The main storage required for the sort work area is included in the formula just mentioned. Main storage that exceeds the calculated amount is automatically allocated to the sort work area.

2.1.2. Calculation of the Number of Tasks

Use the following formula to calculate the number of tasks specified in the MAPPER 80 job control stream:

```
Number of tasks = (t x 2) + 1
```

where:

t
: Combined number of workstations and auxiliary printers.

Example:

For two workstations and one auxiliary printer:

```
t = 3
7 = (3 x 2) + 1
```

- Specify 7 tasks next to the main storage size in the MAPPER 80 job control stream.

```
// JOB MAPPER,,47400,,7
```

2.1.3. MAPPER 80 Job Control Stream Parameter Cards

This subsection describes the workstation definition, auxiliary printer definition, and RES=RUN parameter cards specified in the MAPPER 80 job control stream.

- Workstation Definition Parameter

  This parameter card defines a workstation as follows:

```
file-name=terminal-id
```

  where:

  file-name
  : Is the LFD name of the workstation (one to eight characters).

  terminal-id
  : Is three characters beginning with letter T.

  Example:

```
WKST1=T01
```

- Auxiliary Printer Definition Parameter

  This parameter card is specified when an auxiliary printer is added to a workstation previously defined by the workstation definition parameter. It is specified as follows:

  ```
  <workstation definition>-filename=terminal-id
  ```

  where:

  `file-name`
  Is the LFD name of the auxiliary printer (one to eight characters).

  `terminal-id`
  Is three characters beginning with P.

  Example:

  ```
  WKST1=TØ1-WKSP1=PØ1
  ```

  NOTE:

  Terminal-ids specifying workstations and auxiliary printers must be unique across all MAPPER 80 jobs in the system. Specify a maximum of nine parameter cards in each MAPPER 80 job, with each card beginning in column 1.

- RES=RUN Parameter

  This parameter card specifies that the RUN processing modules be loaded and remain resident within the MAPPER 80 job region. See 2.1.3 and the RES=RUN discussion in the MAPPER 80 manual functions user guide for additional information concerning this parameter.

2.2. OPERATING PROCEDURES

After executing the MAPPER 80 initialization, the coordinator can enter the proper LOGON and CONNECT sequence to connect the workstation to the MAPPER 80 job. This procedure is described in the MAPPER 80 manual functions user guide.

When the MAPPER 80 session is over, the user terminates the MAPPER 80 job as follows:

1. Enter the STATUS unsolicited command to the MAPPER 80 job to ensure that workstations and auxiliary printers are free.

2. Enter the SHUTDOWN unsolicited command to the MAPPER 80 job (MAPPER).

3. Enter the SHUTDOWN DBMS unsolicited command to the DBMS job (MAPPERDB). See 2.2.1.

4. Shut down GUST or ICAM.

2.2.1. Unsolicited Operator Commands

MAPPER 80 software supports four unsolicited operator commands. Use the following format to execute them:

```
NØ <unsolicited command>
```

Example:

```
NØ SNAP
```

The commands are:

1. STATUS or STA

   This command displays the workstation status and user information. With STATUS or STA command, the following types of messages are displayed on the screen:

   `MP832 TØ1 (WKST1) ***FREE***`
   The workstation using the terminal-id T01 is not connected to a MAPPER 80 job.

   `MP832 TØ1 (WKST1) USER=IDLE`
   The workstation with terminal-id T01 is connected to a MAPPER 80 job but is not signed on.

   `MP832 TØ1 (WKST1) USER=JDOE DPT=ØØ7`
   The workstation with terminal-id T01 is signed on and in use.

   `MP832 PØ1 (WKSP1) CONNECTED:QUEUE=n`
   The auxiliary printer with terminal-id P01 is connected to a MAPPER 80 job, and there are n reports waiting in the queue to be outputted to that auxiliary printer.

2. CLEAR AUX

   This command clears the queue waiting to be output to the auxiliary printer. With the CLEAR AUX command, the following messages are displayed on the screen:

   `MP833 AUX-QUEUE CLEAR COMPLETED`
   The queue is completely cleared.

   `MP833 AUX-QUEUE NONE!`
   There are no reports in the queue.

3. SHUTDOWN

This command terminates the MAPPER 80 job. With the SHUTDOWN command, the following messages are displayed on the screen:

`MP800 MAPPER 80 JOB TERMINATED`
The MAPPER 80 job terminated normally.

`MP831 P01 (WKSP1) AUX-QUEUE REMAINS!!`
The auxiliary printer with terminal-id P01 still has reports requiring output in the queue, and termination cannot execute.

`MP831 T01 (WKST1) CONNECTED!!!`
The workstation with terminal-id T01 is still connected to the MAPPER 80 job, and termination cannot execute.

`MP831 P01 (WKSP1) CONNECTED!!`
The auxiliary printer with terminal-id P01 is still connected to the MAPPER 80 job, and termination cannot execute.

4. SNAP, <file-name>

This command prints the contents of the process buffer used during operation of the workstation or auxiliary printer. With the SNAP, <file-name> command, the following message is displayed on the screen, and the contents of the process buffer are output to the printer.

```
SNAP DUMP CMPL
SNAP,WKST1
```

NOTE:

When the printer is not in burst mode, information cannot be printed until the MAPPER 80 job is complete. If necessary, enter a command to change to burst mode. For example:

```
PR△BX,JOB=MAPPER
```

2.3. MAPPER 80 CONSOLE MESSAGES

The following system messages are output from the MAPPER 80 job to the system console:

`MP800 MAPPER 80 JOB TERMINATED`
The MAPPER 80 job terminated normally.

`MP801 MAPPER 80 JOB INITIALIZATION COMPLETED`
Initialization of the MAPPER 80 job is complete.

MP802 T01 (WKST1) OPENED
Initialization of a workstation with terminal-id T01 is complete.

MP810 PRINTER OPEN ERROR
A request to open the printer file has generated an error. The user must correct the device assignment of the printer and resubmit the job.

MP811 ASSIGNED MEMORY SIZE IS INSUFFICIENT
The main storage allocated to the MAPPER 80 job is insufficient. The user must increase main storage and resubmit the job.

MP812 MISSING INPUT PARAMETER
A parameter specification is missing from the parameter card in the MAPPER 80 job control stream. The user must correct the missing parameter and resubmit the job.

MP813 ILLEGAL INPUT PARAMETER
The format of the parameter is incorrect. The user must correct the format and resubmit the job.

MP814 ILLEGAL TERMINAL ID
The terminal-id designated on the parameter card is incorrect. The user must reexecute with the correct terminal-id.

MP815 FAILURE IN DATA BASE INITIALIZATION
An error has occurred in the data base initialization process because:

- the number of workstations and auxiliary printers is greater than the DMS run units specified in the DBMS job control stream;
- DBMS main storage is insufficient; or
- the volume of the work/result area in the MAPPER 80 file is insufficient.

The user must correct the cause and resubmit the job.

MP816 WORKSTATION OPEN ERROR
An error occurred in the workstation open process. The user must correct the workstation assignment and resubmit the job.

MP817 DUPLICATED FILE NAME
A workstation LFD name is duplicated in the job control stream. The user must correct the LFD name and resubmit the job.

MP818 DUPLICATED TERMINAL ID

A terminal-id is duplicated in the job control stream or, because another MAPPER 80 job is in progress, a lock has occurred. The user must correct the duplicated terminal-id or, in the case of a lock, reexecute after a short wait.

MP819 TOO MANY INPUT PARAMETERS

More than eight workstations or auxiliary printers or more than nine parameter cards are specified in the job control stream. The user must correct the number and resubmit the job.

MP820 FAILURE IN MODULE LOADING

Either the module designated as resident by the parameter cards or the process buffer is not in the library. The user must check the library contents.

MP830 INVALID REQUEST

An invalid unsolicited message was keyed in. The user must correct the message input.

MP831 {T01 / P01} {WKSTn / WKSPn} CONNECTED!!

This is a reply to the SHUTDOWN command. The workstation or auxiliary printer with terminal-id T01 or P01 is still connected to the MAPPER 80 job, and termination cannot execute. The user must disconnect the workstation or auxiliary printer and retry.

MP832 T01 (WKST1) ***FREE***

This is a reply to STATUS command. The workstation with terminal-id T01 is not connected to a MAPPER 80 job.

MP832 T01 (WKST1) USER=IDLE

This is a reply to STATUS command. The workstation with terminal-id T01 is not signed on.

MP832 T01 (WKST1) USER=JDOE=007

This is a reply to the STATUS command. The workstation with terminal-id T01 is signed on and in use.

MP832 P01 (WKSP1) CONNECTED:QUEUE=n

This is a reply to the STATUS command. The auxiliary printer with erminal-id P01 is connected to a MAPPER 80 job, and n reports are waiting in the queue to be output to the auxiliary printer. (When n equals 0, there are no reports in the output queue.)

MP832 PØ1 (WKSP1) FREE***:QUEUE=n

This is a reply to the STATUS command. The auxiliary printer with terminal-id P01 is not connected to a MAPPER 80 job, but there are n reports waiting in the queue to be output to the auxiliary printer. (When n equals 0, there are no reports in the output queue.)

MP833 AUX-QUEUE CLEAR COMPLETED

This is a reply to the CLEAR AUX command. The auxiliary printer output queue is completely cleared.

MP833 NO AUX-QUEUE

This is a reply to the CLEAR AUX command. There are no reports in the auxiliary output queue.

MP834 PØ1 (WKSP1) AUX-QUEUE REMAINS!!

This is a reply to the SHUTDOWN command. Reports remain in the output queue of the auxiliary printer with terminal-id P01, and termination cannot execute. The user must wait until the queue is clear, or execute the CLEAR AUX unsolicited command.

MP88Ø TØ1 (WKST1) SESSION ABORTED. YOU MUST CONNECT

The workstation with terminal-id T01 is disconnected from the system console. The user must reestablish the SESSION path ($$SON) and reconnect the workstation to the MAPPER 80 job.

MP881 TØ1 (WKST1) D/M ERROR DETECT. YOU MUST FREE, CONNECT

An error occurs in the connection between the workstation and terminal-id T01, and attempts to correct the error are unsuccessful. You must free the workstation and reconnect. Once the connection is complete, key in Y in response to this message.

MP882 PØ1 (WKSP1) ERROR OCCURRED, RETRYING!

A data management error or auxiliary printer hardware error occurred in the connection between the auxiliary printer and terminal-id P01; although output is reattempted, the error is not eliminated. Use the FREE command to disconnect the defective auxiliary printer. Then connect a new auxiliary printer with the same file name (COP swap operation).

MP898 TØ1 (WKST1) ABNORMAL TERMINATION CODE = nn

An abnormal condition occurred during operation of the workstation with terminal-id T01. The nn is the error code indicating the status of the problem. Table 2–1 gives a list of error codes.

MP899 MAPPER 8Ø JOB ABNORMALLY TERMINATED

This is a reply to termination due to an error code displayed on the screen.

Table 2–1. Error Codes

Code Number	Description
40	Error in workstation OPEN operation
41	Error in workstation CLOSE operation
42	(Future release)
43	(Future release)
44	(Future release)
45	Unrecoverable error in screen format
46	Error in shared code MPFPC2 call operation
47	Incorrect message format
48	Same as code 47
49	Error in a message input request from workstation
50	Transient module load area not found
51	Error in transient module load request
52	(Future release)
53	Linking not possible between modules
54	Not possible to continue the process
55	Error in the shared code MPRUN2 call operation
56	(Future release)
57	(Future release)
58	(Future release)
59	(Future release)
60	Abnormal conditions in DBMS
61	Error in a data base access request
62	Invalid FPR request to MPDP

NOTE:

After an error code appears on the screen, the MAPPER 80 job is cancelled. Generate a job dump to determine the cause of the problem.

3. MAPPER 80 Coordinator Functions

When the MAPPER 80 software is first installed and generated, only the coordinator and training modes exist. At this point, the coordinator is responsible for generating and registering the other user modes and types. The coordinator is also responsible for mode maintenance, such as modifying characteristics and deleting redundant modes.

NOTE:

Mode numbers 994, 996, and 998 are the coordinator and training modes. Of these, 994 is type A, which is available to all users.

3.1. MODE REGISTRATION AND MAINTENANCE

The MAPPER 80 software provides the following interactive functions for mode registration and maintenance.

- MGEN New mode generation
- MMOD Modification of mode characteristics
- MDEL Mode deletion
- MDSP Mode display

3.1.1. MGEN Function – New Mode Generation

This function generates a new user mode and registers it in the MAPPER 80 data base. In this new mode are the eight MAPPER 80 types labeled B through I. At this point, the types are in OPEN status.

A type in OPEN status cannot store user reports. It is like an 8-drawer filing cabinet just installed in an office. The user of the cabinet is unknown; the drawer key is not handed out; and no decision has been made about the contents of the drawers.

To register a new mode, the coordinator:

1. Signs on the MAPPER 80 software
2. Keys in the MGEN function
3. Presses the XMIT key

The following screen appears:

```
                    ********************************
                    *  F U N C T I O N [ MGEN ]  *
                    ********************************

        [ ENTER REQUESTED INFORMATION ]

           MODE NO.          ( ___ )     : EVEN NO. RANGE '0' - '992'

           PASSWORD
             *  FOR EVEN NO < ______ > : ALPHABETIC, NUMERIC
             *  FOR ODD  NO < ______ > : ALPHABETIC, NUMERIC

           MODE NAME      ( ____________ )
                                        : ALPHABETIC, NUMERIC


-------------------------------------------------------------------------------
           [ ENTER NEW FUNCTION REQUEST ]
              FUNCTION     < ____ >
              PARAMETER    < ____________________________ >            S910
```

The coordinator then:

1. Enters the number of the new mode
2. Enters the new password (optional)
3. Enters the new mode name
4. Presses the XMIT key

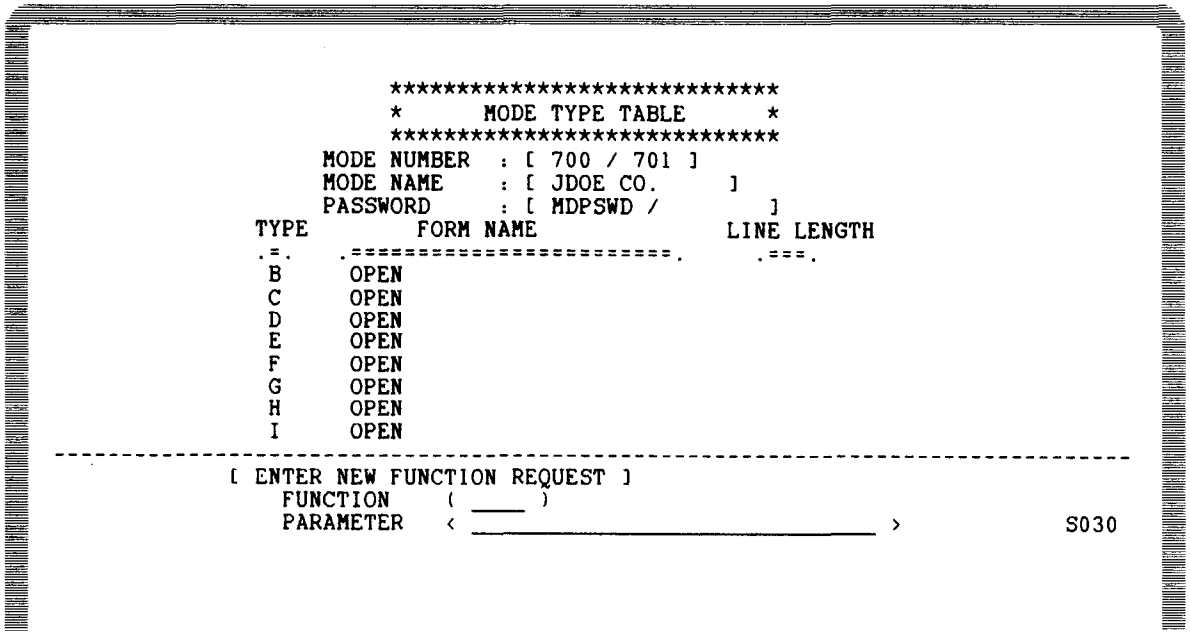
The following is a completed MGEN function screen:

```
                    ******************************
                    *  F U N C T I O N [ MGEN ]  *
                    ******************************

          [ ENTER REQUESTED INFORMATION ]

             MODE NO.          ( 700 )     : EVEN NO. RANGE '0' - '992'

             PASSWORD
               *  FOR EVEN NO < mdpswd > : ALPHABETIC, NUMERIC
               *  FOR ODD  NO < _______ > : ALPHABETIC, NUMERIC

             MODE NAME      ( jdoe_co.____ )
                                        : ALPHABETIC, NUMERIC


-------------------------------------------------------------------------------
             [ ENTER NEW FUNCTION REQUEST ]
                 FUNCTION    < ____ >
                 PARAMETER   < ____________________________ >            S910
```

NOTE:

You can specify two types of passwords, one for accessing even-numbered modes and one for accessing odd-numbered modes. If you use a mode password, specify it correctly when executing a mode function. It is not necessary to use a password.

After MGEN terminates normally, the following mode type table appears:



NOTE:

In a newly generated mode, the status for types B through I is OPEN.

3.1.2. MMOD Function – Modification of Mode Characteristics

This function allows the coordinator to change mode characteristics such as password and mode name.

The coordinator:

1. Keys in the MMOD function
2. Presses the XMIT key

The following function request screen appears:

```
                        ********************************
                        *  F U N C T I O N [ MMOD ]  *
                        ********************************

          [ ENTER REQUESTED INFORMATION ]

             MODE NO.       ( ___ )     : EVEN NO. RANGE '0'    '998'

             PASSWORD
               *  FOR EVEN NO < _______ > : ALPHABETIC, NUMERIC
               *  FOR ODD  NO < _______ > : ALPHABETIC, NUMERIC

             MODE NAME      < ____________ >
                                          : ALPHABETIC, NUMERIC


-------------------------------------------------------------------------------
             [ ENTER NEW FUNCTION REQUEST ]
                FUNCTION    < ____ >
                PARAMETER   < ____________________________ >            S920
```

The coordinator then:

1. Enters the MODE number (even number)
2. Enters new data in the fields to be changed
3. Presses the XMIT key

After MMOD terminates normally, the mode type table appears again, and you can see the newly changed mode characteristics.

NOTE:

To erase an existing password, key in CLEAR in the password field.

3.1.3. MDEL Function – Mode Deletion

This function deletes a specific mode from the MAPPER 80 data base. It is the same as taking a filing cabinet out of the office and discarding it.

Before you can execute this function, all types in the deleted mode must be in OPEN staus. In other words, the filing cabinet must be completely empty before you can remove it from the office (3.2.2).

To delete a mode, the coordinator:

1. Keys in the MDEL function
2. Enters the mode number to be deleted
3. Presses the XMIT key

The MDEL function request screen is:

```
                    ******************************
                    *  F U N C T I O N [ MDEL ]  *
                    ******************************

 [ ENTER REQUESTED INFORMATION ]

    MODE NO.       ( ___ )     : EVEN NO. RANGE '0' - '998'









--------------------------------------------------------------------------------
          [ ENTER NEW FUNCTION REQUEST ]
             FUNCTION    < ____ >
             PARAMETER   < ____________________________ >            S930
```

After normal termination of MDEL, the user logo appears on the screen. When this happens, you know the mode has been deleted from the data base.

3.1.4. MDSP Function – Mode Display

This function displays a specific mode on the screen. Use it to verify the contents of a mode before executing the MDEL or MMOD function.

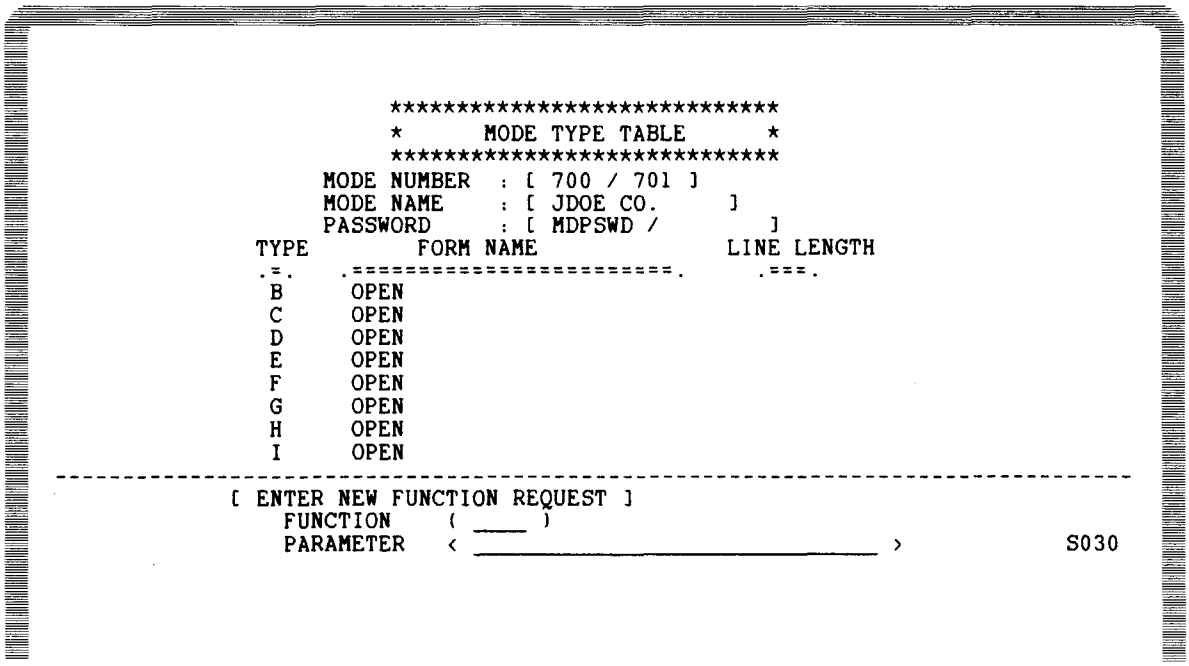
The coordinator:

1. Keys in the MDSP function
2. Enters the number of the mode to be displayed
3. Presses the XMIT key

The MDSP function request screen is:

```
                    ******************************
                    *  F U N C T I O N [ MDSP ]  *
                    ******************************

          [ ENTER REQUESTED INFORMATION ]

             MODE NO.       ( ___ )     : '0' - '999'









-------------------------------------------------------------------------------
               [ ENTER NEW FUNCTION REQUEST ]
                  FUNCTION    < ____ >
                  PARAMETER   < ____________________________ >            S940
```

When MDSP terminates normally, the mode type table of the mode appears on the screen. The password appears in this table, allowing the coordinator to verify the correct password.



The operator can also display a mode type table by using the TYPE (T) function. But since an operator has no access to the mode registration and maintenance functions, the mode password does not appear on this mode type table.

3.2. TYPE REGISTRATION AND MAINTENANCE

The mode and OPEN status types are generated by the MGEN function, but you still cannot store any user reports. At this stage, the drawers of the filing cabinet are not labeled, and there are no established report headings. Now the coordinator must register the types so that an operator can store and generate reports.

The following functions register and maintain a type:

- TGEN
- TDEL

The coordinator uses these functions after signing on.

3.2.1. TGEN Function – Type Generation

This function registers type characters and generates a blank RID 0 for the type. For detailed information of RID 0, see the MAPPER 80 forms generation and utilities user guide.

NOTE:

The TGEN function is like the MDEL function because a type must be in OPEN status before you can implement the function. After TGEN is complete, the type is no longer in OPEN status.

The coordinator:

1. Keys in the TGEN function
2. Presses the XMIT key

The following function request screen appears:

```
                    ********************************
                    *  F U N C T I O N [ TGEN ]  *
                    ********************************

        [ ENTER REQUESTED INFORMATION ]

           MODE NO.       ( ___ )     : EVEN NO. RANGE '0' - '998'

           T Y P E        ( _ )       : 'A' - 'I'

           FORM NAME      ( ________________________ )
                                      : ALPHABETIC, NUMERIC
           LINE LENGTH    ( ___ )     : '80' - '132'


-------------------------------------------------------------------------------
           [ ENTER NEW FUNCTION REQUEST ]
              FUNCTION    < ____ >
              PARAMETER   < ____________________________ >              S950
```

The coordinator then:

1. Enters the mode number
2. Enters the type
3. Enters form name
4. Specifies line length
5. Presses the XMIT key

After normal termination of the TGEN function, the mode type table appears on the screen. You can now verify the data just entered.

To verify the blank RID 0 in a newly generated type, the coordinator:

1. Enters (M) function at bottom of screen
2. Presses the XMIT key

The function request screen appears and the coordinator then:

1. Enters mode number of the RID 0 to be displayed
2. Presses the XMIT key

The mode type table appears, and the coordinator then executes the D (display) function. The blank RID 0 can now be verified. See the manual functions user guide for detailed information on the D function.

3.2.2. TDEL Function – Type Deletion

This function deletes a type by returning it to OPEN status. However, before deleting a type, all reports must be erased.

The coordinator:

1. Keys in the TDEL function
2. Enters the mode number that contains the type
3. Enters the type number to be deleted

The TDEL function request screen is:

```
                    ********************************
                    *  F U N C T I O N [ TDEL ]  *
                    ********************************

        [ ENTER REQUESTED INFORMATION ]

           MODE NO.       ( ___ )     : EVEN NO. RANGE '0' - '998'

           T Y P E        ( _ )       : 'A' - 'I'









-------------------------------------------------------------------------------
           [ ENTER NEW FUNCTION REQUEST ]
              FUNCTION     < ____ >
              PARAMETER    < ____________________________ >              S960
```

After normal termination of the TDEL function, the mode type table appears. The deleted type returns to OPEN status.

The coordinator can reuse the deleted type by using the TGEN function for the OPEN status type.

3.3. REGISTRATION AND MAINTENANCE OF DEPARTMENT AND USER

Each MAPPER 80 user must have a user identification name registered in the system. Type B of coordinator mode 998 is set aside for this purpose. All coordinator and operator characteristics must be registered in a report known as the user-ID list.

All MAPPER 80 users must be members of specific departments. Each department has its own ID (identification) number. The user identification is a combination of department number and user name. User identification names within a department must be unique.

The following are examples of user identification names:

Department Number	User Name	User Identification
001	Smith	smi001
002	Baker	bak002

The user-ID list is a MAPPER 80 report, and its RID number corresponds to the department number. For example, the user-ID list of department number 3 is a report in mode 998, type B, RID 3.

A coordinator can perform the following operations with the MAPPER 80 software:

- Coordinator interactive functions (MGEN, MMOD, MDEL, MDSP, TGEN, TDEL)
- MODE (M) function for modes other than the user-ID list mode
- Display mode passwords in the mode type table

NOTE:

For information concerning the MODE (M) function, see the manual functions user guide.

When the MAPPER 80 system is installed, the user-ID list of department 1 (RID 1) is available immediately after system generation. Department 1 (RID 1) is specifically reserved for registering the coordinator of the entire MAPPER 80 system. When you have different coordinators for each department, register them in their respective departments and give them default mode 998. For example, the coordinator of department 3 would be registered in department 3 (RID 3) with default mode 998.

The following is an example of the initial user-ID list showing the 998 coordinator mode default:

```
LINE> 1     FMT>   RL>       SHFT>      HLD CHR>    HLD LN>    PSWD>           >
.DATE  83/07/05  10:57:59  TYPE=B  RID=001  83/05/25  MAPPER       <   12 LINES>
. <<< USER ID. LIST >>>
*             D MOD        MTD  PUAXD  AXAADR  IFSSSS  UD  LCMMS  RTD  PA  MMMMT
*  USER ID    F NO. PASWRD OPS  WLLLL  RROTRP  XDRULL  DE  CGAUT  UOA  RX  GMEDG
*============.=.===.======.=================================================
 MAPPER       D 998 CORDNT



                    ..... END REPORT .....
```

Immediately after system installation, the coordinator signs on:

```
                    **********************************
                    *  M A P P E R  8 0 ( 2.00 )  *
                    *                             *
                    *        < I D L E >          *
                    *                             *
                    *    WORK STATION   [ T01 ]   *
                    *         83 / 07 / 07        *
                    **********************************

 [ SIGN ON ]

        USER ID          ( mapper______ )
        DEPARTMENT NO    ( 1__ )
        PASSWORD         < cordnt >

-------------------------------------------------------
I    *** N O T E S ***                                 I
I      ( --- ) --- REQUIRED                            I
I      < --- > --- OPTIONAL                            I
-------------------------------------------------------        S010
```

After this, the coordinator registers the user, the mode, and himself as coordinator (3.1 and 3.2).

User registration and maintenance consist of the following procedures:

- Department registration
- User (including coordinator) registration
- Multimode access
- Modification and deletion of registration content
- Department deletion

Implement these procedures via interactive functions such as report change functions or line updating functions.

3.3.1. Department Registration

To register a department, the coordinator:

1. Keys in the ADD REPORT (AR) function
2. Enters department number in the REPORT NO. field
3. Enters type B
4. Presses the XMIT key

NOTE:

See the manual functions user guide for explanation of the ADD REPORT (AR) function.

The following is an example of a department registration function request screen:

```
                    ********************************
                    *  F U N C T I O N [ AR   ]  *
                    ********************************

          [ ENTER REQUESTED INFORMATION ]

             REPORT NO.     < 7__ >     : '1' - '999' (IF YOU OMIT THE REPORT NO.
                                                       FREE RID WILL BE ASSIGNED)
             T Y P E        ( b )       : 'A' - 'I'




-------------------------------------------------------------------------------
                [ ENTER NEW FUNCTION REQUEST ]
                   FUNCTION     < ____ >
                   PARAMETER    < ____________________________ >            S310
```

After the AR function terminates, a new user-ID list consisting of headings and blank tab lines appears on the screen. If you want, use an SOE UPDATE function and enter the department name in line 2.

3.3.2. User Registration

To register a user, the coordinator:

1. Displays the user-ID list of the user department
2. Enters the following data into blank or reusable lines by an SOE UPDATE function:
   - User ID (12 characters, column 2)
   - 'D' into the mode option field (1 character, column 15)
   - Default mode number (3 digits, column 17)
   - User password (6 characters, column 21)

NOTE:

When there are no blank lines in a report, use the ADD LINE or DUPLICATE LINE function to ensure registrable lines. See the manual functions user guide for an explanation of SOE UPDATE, ADD LINE, and DUPLICATE LINE functions.

The following is a user-ID list with user characteristics entered in the appropriate fields:

```
LINE> 1     FMT>   RL>       SHFT>      HLD CHR>    HLD LN>    PSWD>          >
.DATE  83/07/06  14:03:36  TYPE=B  RID=007  83/05/25  MAPPER       <   16 LINES>
. <<< USER ID. LIST >>>
*              D MOD        MTD  PUAXD  AXAADR  IFSSSS  UD  LCMMS  RTD  PA  MMMMT
*  USER ID     F NO. PASWRD OPS  WLLLL  RROTRP  XDRULL  DE  CGAUT  UOA  RX  GMEDG
*============.=.===.======.=====================================================
 JDOE          D 102

                    ..... END REPORT .....
```

When a user is not authorized to update reports, the default mode should be an odd number. Specify leading zeros in the mode number field, and reserve all columns after column 27 for future registration functions.

3.3.3. Multimode Access

A user can access modes other than the default mode by using the MODE (M) function, but the coordinator must register that user in these other (secondary) modes.

To register secondary modes, follow the user registration procedures (3.3.2) but leave the password and mode default fields blank.

The following screen shows the user JDOE with access to three secondary modes:

```
LINE> 1     FMT>   RL>       SHFT>      HLD CHR>    HLD LN>    PSWD>          >
.DATE  83/07/14  10:41:52  TYPE=B  RID=007  83/05/25  MAPPER       <   16 LINES>
. <<< USER ID. LIST >>>  (JDOE DEPARTMENT)
*             D MOD        MTD  PUAXD  AXAADR  IFSSSS  UD  LCMMS  RTD  PA  MMMMT
*  USER ID    F NO. PASWRD OPS  WLLLL  RROTRP  XDRULL  DE  CGAUT  UOA  RX  GMEDG
*============.=.===.======.=================================================
 JDOE          D 102
 DMS           D 300 PSWD00
 MAPR          D 100
 STATUS        D 262
 TEST          D 700
 JDOE            103
 JDOE            264
 JDOE            301


                     ..... END REPORT .....
```

3.3.4. Modification and Deletion of Registered Information

To modify the user ID name, mode option, mode number, or password, use an SOE UPDATE function.

To delete registered information, use the DELETE LINE function.

3.3.5. Department Deletion

If a department becomes redundant because of organizational changes, use the DELETE REPORT function to remove it from the user-ID list.

Always display pertinent department information before deleting. Removing an active department from the user-ID list could cause serious problems.

3.4. SUMMARY OF MODE, TYPE, AND USER REGISTRATION AND MAINTENANCE

Figure 3–1 summarizes MAPPER 80 registration and maintenance operations:

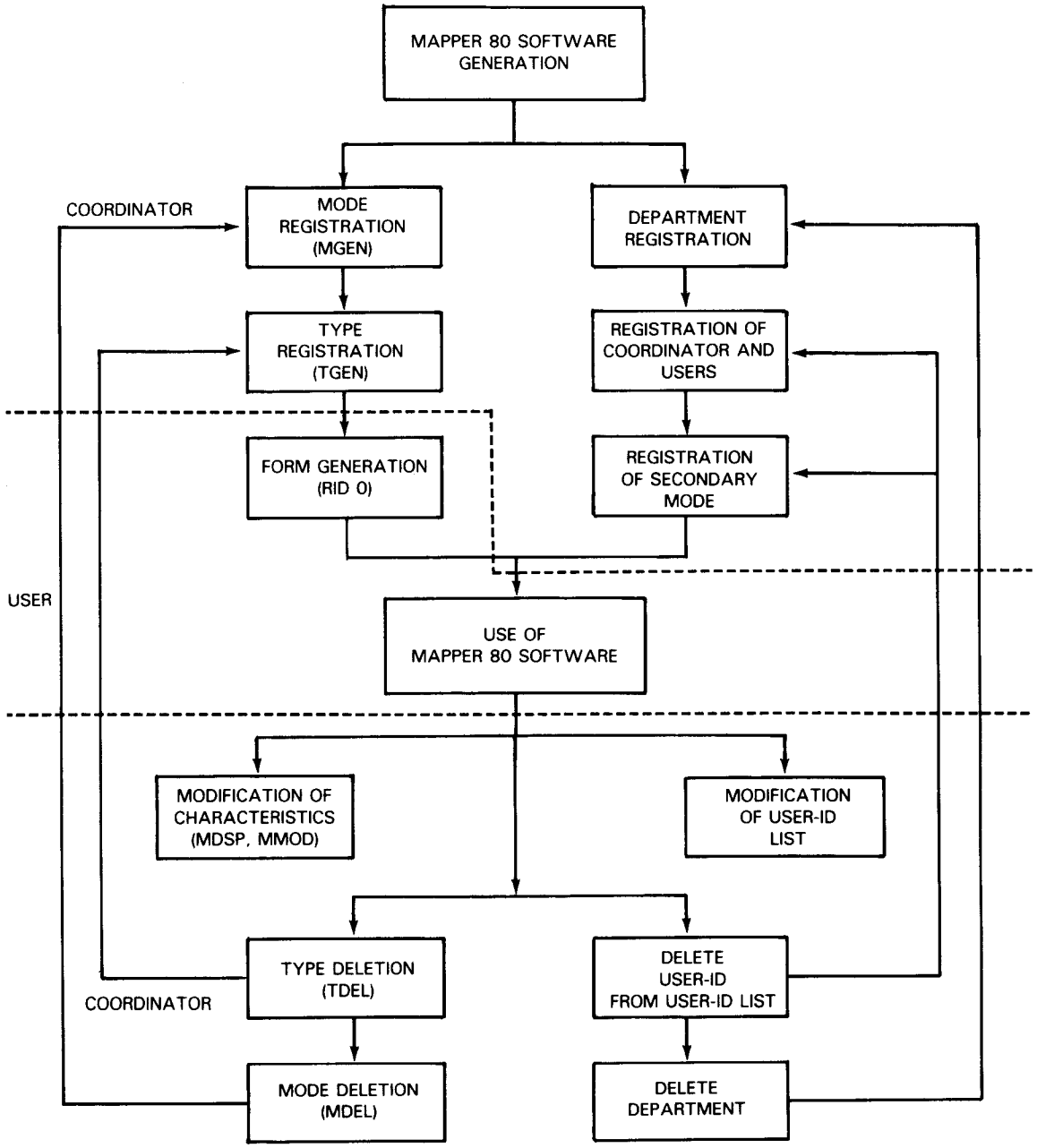


Figure 3–1. Summary of MAPPER 80 Registration and Maintenance Operations

3.5. RUN REGISTRATION

Before a user designs and executes a run, the coordinator must register that run in a report. This report is called a run list.

3.5.1. Run List

Run list reports are located in coordinator mode 998, type C, RID 1 to 999. Since the RID 0 reports for mode 998 are built into the MAPPER 80 software, the RID 0 of mode 998, type C, is ready to use immediately after system generation.

In run registration, each RID registers the runs for a specific department. Therefore, RID numbers must correspond to the previously registered department numbers. For example, runs executed by a user in department 6 must be registered in RID 6.

3.5.2. Common Run List

RID 1 of mode 998, type C, is used to store the coordinator's runs and to record runs that are shared by users with different departments. These shared runs are called common runs, and RID 1 contains the common run list.

When a run activates, the system checks to see whether the specified run is registered in the user department RID. If the run is not found in the department RID, the system next reads the common run list.

Depending on the desired method of operation, you can register all runs in the common run list, eliminating individual department run lists.

Figure 3–2 shows the run list format for registering a run.

After the user designs a run, the coordinator registers that run in the run list. Use the ADD REPORT (AR) function to generate new RID numbers corresponding to the departments. Use an SOE UPDATE function to add the run to the run list.

NOTE:

You must register the department (3.3.1) before you can register runs in the run list for that department.

```
.DATE  83/07/25  14:31:06  TYPE=C  RID=000  83/07/25  MAPPER                                    ** TERMINAL=T01 USER=MAPPER        **

*            .            .   .   .T.   . .        .        .  MAX   . MAX  .                  .        .            . . .        .
* NAME RUNID .  USER ID   .UNT.MOD.P.RID.F. B TIME . E TIME .  I/O   . LLP  .     M O D E S    . ACTUAL .RESPONSIBLE .M.ST.PK TIME.
*============.============.===.===.=.===.=.========.========.========.======.==================.========.============.=.==.=======.
 ************.************.***.***.*.***.*.********.********.********.******.******************.********.************.*.**.*******.



.DATE  83/01/01  11:20:00  TYPE=C  RID=000  83/01/01  MAPPER
. <<< RUN LIST >>>
*            .            .   .   .T.   . .        .        .  MAX   . MAX  .                  .        .            . . .        .
* NAME RUNID .  USER ID   .UNT.MOD.P.RID.F. B TIME . E TIME .  I/O   . LLP  .     M O D E S    . ACTUAL .RESPONSIBLE .M.ST.PK TIME.
*============.============.===.===.=.===.=.========.========.========.======.==================.========.============.=.==.=======.



04          04          04  C1  C4C1  C4C4      04      01      01     C4                 04      04          C4C4 04      0

X
X
X
X
X
X
                  ..... END REPORT .....
```

Figure 3–2. Run List Format

3.5.3. Run List Data

Table 3–1 describes the information that is entered in a run list.

Table 3–1. Run List Information

Item Number	Item Name	Column Number	Description
1	NAME RUN-ID	12	■ Run name ID (columns 1 to 12), left-justified ■ Must begin with alphabetic character
2	USER ID	12	The user-id of authorized user: ■ If shared run, leave blank. ■ If common run, then set to ALL△△△△△△△△△.
3	UNT	3	User terminal-id needed to execute the run. If no restrictions, leave blank.
4	MOD	3	Mode where run is stored (000–994)
5	TP	1	Type where run is stored (A–I)
6	RID	3	RID where run is stored (001–999)
7	F	1	Not in use. Leave blank.
8	B TIME	8	Reserved for future release. Leave blank.
9	E TIME	8	Reserved for future release. Leave blank.
10	MAX.I/O	8	Reserved for future release. Leave blank.
11	MAX.LLP	8	Reserved for future release. Leave blank.
12	MODES	19	Number of accessible modes, up to five (for example, 10, 24, 100, 120, 201). To access all modes in a MAPPER 80 data base, specify A△△△△△△△△△△△△△ALL. If mode number is odd, used as read only by the run
13	ACTUAL	8	Reserved for future release. Leave blank.
14	RESPONSIBLE	12	Run designer name (optional)
15	M	1	Run is registered in more than one department (optional).
16	ST	2	Run status (optional)
17	PK TIME	7	Not in use. Leave blank.

4. Installation and Modification of the MAPPER 80 Software

This section is divided into two parts. The first part describes the installation of MAPPER 80 software, including the supplied data base with the training data already installed. This training data base is sized large enough to allow you to create your own reports. The second part describes how to create your own larger data base, including the training data.

When you first receive the system, install and use the training data base first, creating and using some reports of your own. When you advance to creating your own data base, carry these reports over into the larger data base.

4.1. CONTENTS OF THE MAPPER 80 SOFTWARE

As with other System 80 program products, MAPPER 80 software includes modules that reside in the main system libraries on your SYSRES volume. MAPPER 80 software includes load, object, source, job control, and shared code modules. In addition, the MAPPER 80 package includes three data files:

1. MAPPER$FMTE

2. MAPPER$TRAINING$FILE

3. MAPPERDDFILE

Each of the five types of modules resides in group C$MAPPER in the appropriate system library. Following the initial installation of the MAPPER 80 package, the three data files also reside in your SYSRES volume.

The main data file of the MAPPER 80 software is the data base (DMS data base) that contains your report data. This data base is too large to be released with the package and is too large to reside on your SYSRES volume. Creating and initializing the main data base and its associated recovery files on the MAPPER 80 volume are the subject of this section.

4.1.1. MAPPER 80 Modules

MAPPER 80 software includes five groups of modules: load, object, source, job control, and shared code.

- MAPPER 80 load modules

  Most of the load modules support the interactive and run functions. The MAPPER 80 utilities are also provided as load modules. In addition, a precompiled DMS DMCL (device media control language) makes installing the training data base easier.

- MAPPER 80 object modules

  The object modules are part of the MAPDMS utility.

- MAPPER 80 source modules

  This group contains the source of the DMS DMCL module that you modify and recompile to create your own MAPPER 80 data base.

- MAPPER 80 job control modules

  Most of the job streams shown in the MAPPER 80 manuals are included in this library (the library versions may differ slightly from the manual due to corrections or enhancements). Modify this job control to reflect your own operating system and MAPPER 80 environment.

- MAPPER 80 shared code modules

  MAPPER 80 software uses shared code modules as part of the interactive and run fucntions.

4.1.2. MAPPER 80 Format File (MAPPER$FMTE)

This library contains the screen formats associated with the MAPPER 80 software. Those formats named Sxxx are the main MAPPER 80 interactive screens, while those named Exxx are the error messages that appear while using the interactive and run functions. This library may also contain your written screen formats used with the @SFS run function.

4.1.3. MAPPER 80 Training Data File (MAPPER$TRAINING$FILE)

This MIRAM file contains the JDOE training data in the form created by the MAPDUM utility. It is a source of the training data when you create your own MAPPER 80 data base.

4.1.4. MAPPER 80 Data Dictionary (MAPPERDDFILE)

This is a DMS data base file containing the MAPPER 80 data dictionary. The data dictionary is not required when installing the training data base. Use it when building a MAPPER 80 data base of your own during the recompilation of the DMS DMCL.

4.2. INSTALLATION OF MAPPER 80 SOFTWARE

Now that you know something about the modules that make up the MAPPER 80 software, you can install it.

Each of the five types of modules is installed within group C$MAPPER in the appropriate system library by the MAPPER 80 package initial installation. This initial installation also transfers the three data files from the transmittal medium to your SYSRES volume. The procedures described in this manual assume that the initial package installation is complete and the modules and three data files are present on the SYSRES volume.

It is not practical to put the main MAPPER 80 data base and its associated recovery files on your SYSRES volume because of space considerations. This subsection outlines the steps necessary to prep a data disk with the VSN of MAPPER and to create the MAPPER 80 training data base on this volume.

4.2.1. Prepping the MAPPER 80 Data Disk (DSKPRP)

Figure 4–1 shows the job control stream to prep the MAPPER 80 volume.

```
// JOB MAPREP
// DVC 20  // LFD PRNTR
// DVC 50  // VOL MAPPER(NOV)  // LFD DISKIN
// EXEC DSKPRP
/$
SERNR=MAPPER
IPLDK=N
VOL1
/*
/&
```

Figure 4–1. Job Control Stream to Prep MAPPER 80 Volume

4.2.2. Allocating the Data Base

In this step, allocate the main MAPPER 80 data base and its associated recovery files. These files are explained in Section 5. Figure 4–2 shows the job control stream to allocate the MAPPER 80 data base.

```
// JOB MAPALOC1
// DVC 20  // LFD PRNTR
// DVC 50  // VOL MAPPER
// EXT ST,C,0,BLK,(2048,8215)
// LBL MAPPER$DB$FILE  // LFD DBLINK
// DVC 50  // VOL MAPPER
// EXT ST,C,100,BLK,(2048,1000)
// LBL MAPPER$DB$CQBL  // LFD DBCQBL
// DVC 50  // VOL MAPPER
// EXT ST,C,100,BLK,(2048,1000)
// LBL MAPPER$DB$BQBL  // LFD DBBQBL
// DVC 50  // VOL MAPPER
// EXT ST,C,100,BLK,(2048,1000)
// LBL MAPPER$DB$JRNL  // LFD JRNL
// DVC 50  // VOL MAPPER
// EXT ST,C,100,BLK,(2048,500)
// LBL MAPPER$DD$QBL  // LFD MPDDQBL
/&
```

Figure 4–2. Job Control Stream for Main Data Base Allocation

At this point, you may run a volume table of contents (VTOC) of the MAPPER 80 volume to make sure all files are allocated. You could move the three data files (especially MAPPER$FMTE) from the SYSRES volume to the MAPPER 80 volume but, to keep the procedure as simple as possible, assume that they remain on the SYSRES volume.

4.2.3. Initializing the Data Base (DBINT)

Since the MAPPER 80 data base is a DMS data base, the DMS initialization utility must initialize the data base pages. Figure 4–3 details the job control stream to accomplish data base initialization.

```
// JOB MAPDBINT,,10000
// DVC 20  // LFD PRNTR
// DVC 50  // VOL MAPPER  // LBL MAPPER$DB$FILE  // LFD DBLINK
// EXEC DBINT
/$
DMCL IS MPDB.
ACTIVATE DMCL.
INITIALIZE ALL AREAS.
END.
/*
/&
```

Figure 4–3. Job Control Stream for Data Base Initialization

4.2.4. Formatting the Data Base for MAPPER 80 Software (MAPDMY)

The remaining three steps in the installation procedure require the DBMS job (MAPPERDB) to be running. Use the following command to run the MAPPERDB job (described in the MAPPER 80 operation section of this manual):

```
RV MAPPERDB
```

MAPPER 80 software uses the DMS data base in a specific way. It requires a special utility to format the data base pages for its own use. Figure 4–4 shows the job control stream for this utility.

```
// JOB MAPDMY,,10000
// DVC 20  // LFD PRNTR
// EXEC MAPDMY
// PARAM ALL
/&
```

Figure 4–4. Job Control Stream to Format the Data Base

4.2.5. Generating the Coordinator and Common Modes (MAPGEN)

To register MAPPER 80 modes 994 and 998, use the job control stream shown in Figure 4–5.

```
// JOB MAPGEN,,10000
// DVC 20  // LFD PRNTR
// EXEC MAPGEN
/$
MODE=998
COORDINATOR
USER ID.  LIST
RUN       LIST
MODE=994,SIZE=132
COMMON
COMMON CABINET
/*
/&
```

Figure 4–5. Job Control Stream for Registering MAPPER 80 Modes 994 and 998

4.2.6. Installing the Training Data (MAPRES)

The JDOE training data supplied in file MAPPER$TRAINING$FILE is in the form of a MAPDUM backup of mode 102 from a MAPPER 80 data base (Section 5). This data is restored to data base form, as shown in the job control stream in Figure 4–6.

```
// JOB MAPRES1,,10000
// DVC 20  // LFD PRNTR
// DVC RES  // LBL MAPPER$TRAINING$FILE  // LFD DISKIN
// EXEC MAPRES
/$
#IN DISKIN
#MODE 000-998
#END
/*
/&
```

Figure 4–6. Job Control Stream to Restore Training Data

This completes the installation of the MAPPER 80 software. If you plan to execute MAPPER 80 software at this point, you must reboot the system at least once since the MAPPER 80 shared code modules were installed by the initial package installation procedure. If so, the DBMS job (MAPPERDB) may remain running. Otherwise, shut it down by using the unsolicited command:

```
NØ SHUTDOWN DBMS
```

At some point, before beginning work on your MAPPER 80 applications, read Section 5 and plan the backup strategy for your data base. For the time being, the supplied training data file can serve as your backup file. To restore this data to the training data base, execute MAPRES1 (Figure 4–6.)

4.3. DEVELOPING A NEW MAPPER 80 DATA BASE

This subsection presents the steps necessary to define and build your own MAPPER 80 data base. Increasing the size of the data base means accommodating more of your own reports.

4.3.1. Saving Your Present User Reports

If you used the training data base to enter some reports of your own, you must complete the following step. If the training data base you installed in the first part of this chapter still contains only the JDOE training data, you may skip this step, since the backup file for the training data is supplied with the system. Figure 4–7 shows the job control stream for the MAPDUM utility to save the present data.

```
// JOB MAPDUM,,1ØØØØ
// DVC 2Ø  // LFD PRNTR
// DVC 5Ø  // VOL MAPPER
// EXT MI,C,1Ø,CYL,2Ø
// LBL MAPPER$TEMP  // LFD DISKOT
// EXEC MAPDUM
/$
#OUT DISKOT
#MODE 1Ø2
#MODE (user mode/s)
#MODE 998
# END
/*
/&
```

Figure 4–7. Job Control Stream for the MAPDUM Utility

NOTE:

The MAPPERDB job must be operating before you run the MAPDUM utility. Shut down the DBMS again after MAPDUM is complete.

4.3.2. Modifying the Source DMCL

A DMCL module must exist for every DMS data base. This module describes the physical characteristics of the data base (for example, its page size), the number of pages, the number of physical files, and the relationship of the logical data base areas to physical files. It also describes the recovery provisions (online and offline) used for each logical area. Some of these data base characteristics are overriden at DBMS start-up time, so it is not always necessary to recompile the DMCL. However, increasing the number of data base pages (the primary motivation for recompiling the MAPPER 80 data base DMCL) is not one of the characteristics changed on start-up.

The name of the MAPPER 80 DMCL module is MPDB. It is supplied both in compiled form (so that the training data base can be quickly installed) and in source form as module MPDBREL. Figure 4–8 shows the content of the module.

```
000067  063          000010 IDENTIFICATION                  DIVISION.
000067  099          000020 DEVICE-MEDIA  NAME  IS  BY  DEFAULT  MPDB  OF  SCHEMA  MAPSCH.
000067  170          000030* * *   D M C L   F O R   M A P P E R   D A T A   B A S E   * * *
000068  005          000040 DATA                            DIVISION.
000068  031          000050 DEVICE-MEDIA                 SECTION.
000068  064          000060     PAGE  CONTAINS  2048  CHARACTERS.
000068  109          000070     JOURNAL  FILE  IS  JRNL.
000068  145          000080*       FOR BATCH/INTERACTIVE (MAPDMY/MAPDUM/MAPRES/MAP????)
000069  005          000090     MAXIMUM  NUMBER  OF  RUN-UNITS  IS  2.
000069  055          000100*       FOR MAPPER80 MPDP INTERFACE (MAPPER80)
000069  106          000120     ASSIGN  16  DATA  BASE  BUFFERS.
000069  150          000130     ASSIGN  4  SPACE  INVENTORY  BUFFERS.
000069  199          000140*       QBL-FILE FOR BATCH
000070  005          000150     QUICK-BEFORE-LOOKS  FILE  IS  DBB4BL
000070  053          000160     VALUE  OF  ID  IS  MAPPER$DB$BQBL.
000070  099          000170*       QBL-FILE FOR MPDP
000070  129          000180     IMS QUICK-BEFORE-LOOKS  FILE  IS  DBC4BL
000070  181          000190     VALUE  OF  ID  IS  MAPPER$DB$CQBL.
000070  227          000200 FILE                            SECTION.
000071  005          000210 FILE  NAME  IS  DBLINK
000071  036          000220     VALUE  OF  ID  IS  MAPPER$DB$FILE
000071  081          000230     ALLOCATE  8200  PAGES.
000071  115          000240 AREA                            SECTION.
000071  140          000250 AREA  LOOKS  INCLUDE  QUICK-BEFORE-LOOKS
000071  189          000260                               AFTER-LOOKS.
000071  213          000270 AREA  NAME  IS                 CAB-CNT-AREA
000072  005          000280     CONTAINS  1000  PAGES
000072  038          000290       WITHIN  FILE  DBLINK
000072  070          000300         ALLOCATE  1000  PAGES.
000072  104          000310 AREA  NAME  IS                 CAB-IMG-AREA
000072  143          000320     CONTAINS  3000  PAGES  EXPANDABLE  5000  PAGES
000072  201          000330       WITHIN  FILE  DBLINK
000073  005          000340         ALLOCATE  3000  PAGES.
000073  039          000350 AREA  NAME  IS                 WRK-CNT-AREA
000073  078          000360     CONTAINS  200  PAGES
000073  110          000370     LOOKS  INCLUDE  NO-LOOKS
000073  146          000380       WITHIN  FILE  DBLINK
000073  178          000390         ALLOCATE  200  PAGES.
000073  211          000400 AREA NAME  IS                 WRK-IMG-AREA
000074  005          000410     CONTAINS  4000  PAGES  EXPANDABLE  500  PAGES
000074  062          000420     LOOKS  INCLUDE  NO-LOOKS
000074  098          000430       WITHIN  FILE  DBLINK
000074  130          000440         ALLOCATE  4000  PAGES.
000074  164          000450* * *   D M C L   F O R   M A P P E R   D A T A   B A S E   * * *
```

Figure 4–8. DMCL (Device Media Control Language) Module

As you look at this listing, notice that certain items are designated by different symbols. These items are the ones to consider in your modification of the MAPPER 80 DMCL:

( ) Related to the size of the MAPPER 80 data base. Calculate the size of each of these areas and alter the values if necessary (4.3.3).

< > Related to the DMS environment. With this, you declare the number of workstations attached to the MAPPER 80 software. Change these values to fit your working environment.

——— Reserved names within the MAPPER 80/DMS environment. You should not alter them.

Use the OS/3 general editor (EDT) to modify the source DMCL as follows:

```
@READ MPDBREL,$Y$SRC
   .
   .
   .
(user modifications)
   .
   .
   .
@WRITE MPDB,$Y$SRC
@HALT
```

NOTE:

Data base pages must be 2K and can't be changed.

4.3.3. MAPPER 80 Data Base Sizing

The JDOE training data base provided with MAPPER 80 software is a small application of MAPPER 80 software. There is just enough space for a few modes, types, and RIDs. There are several formulas used to calculate the amount of main storage your MAPPER 80 data base requires. The information needed to perform the calculations with these formulas is:

- The number of modes, types, RIDs
- The average number of lines per report
- The total number of remote workstations, terminals, auxiliary printers, and local workstations

The following are variables used in the formulas:

DB	Number of data base pages (computed)
MD	Number of modes
TYP	Total number of types
RPT	Total number of reports
AVL	Average number of lines per report
LLR	Number of lines of the largest report
LINES	Number of lines per data base page
WKS	Number of workstations

Except for DB, all these variables are input to the formulas. Determine these figures before you proceed to calculate your MAPPER 80 data base size. It doesn't hurt to overestimate and think of future expansion.

Consider each of the following four areas (DMS logical areas) of the MAPPER 80 data base separately in determining the overall size of the data base. When you calculate the size of each area, total these figures to provide the total number of DMS data base pages.

1. CAB-CNT-AREA (cabinet control area)

   Use the following formula to calculate the number of data base pages required for this area:

   ```
   DB = (MD x 5) + TYP + (RPT x 1.2)
   ```

2. CAB-IMG-AREA (cabinet image area)

   Use this formula to calculate the proper number of data base pages for this area:

   $$DB = \left(\frac{AVL}{LINES} + 5\right) \times RPT$$

   where:

   LINES
   : Is 1896 / (LINE LENGTH + 36).

Examples:

Line Length (bytes)	LINES Value
80	16
132	11

NOTE:

When calculating the value for LINES, truncate any fractional value.

3. WRK-CNT-AREA (work control area)

   Use this formula to determine the number of data base pages required for this area:

   $$DB = WKS \times 10$$

   NOTE:

   This is without hard copy.

4. WRK-IMG-AREA (work image area)

   Use this formula to calculate the number of data base pages:

   $$DB = \left(\frac{LLR}{LINES}\right) \times WKS \times 10$$

   NOTE:

   Because an entire report may be contained in a result, allocate enough space for placing the largest possible report in this area.

   Examples:

Report	LLR	Line Length (bytes)	(LLR/LINES)
1	2000	80	125
2	1000	132	91

Sizing Considerations:

- Allow extra space in each area.
- After calculating the number of data base pages for each area, insert the four resulting values in your DMCL. The total allocated data base size is given by the DMS DMCL compiler as part of its output.
- The size of the data base page is 2K (2048 bytes).

4.3.4. Compiling the DMCL (DMCLP)

Compile the DMCL module by using the DMS DMCL compiler, DMCLP. Prior to running DMCLP, start up the DBMS (data base management system). However, for a DMS compilation, the DBMS start-up parameters are slightly different from those used in the MAPPERDB job, so you must use the job control stream shown in Figure 4–9.

```
// JOB MAPPERDD,,20000
// DVC 20  // LFD PRNTR
// DVC 21  // LFD PRNTX
// DVC RES  // LBL MAPPER$DD$FILE  // LFD DDLINK
// DVC 50  // VOL MAPPER  // LBL MAPPER$DD$QBL  // LFD MPDDQBL
// EXEC DBMS
/$
DBMS SECTION.
   MAXIMUM NUMBER OF DBMS RUN-UNITS IS 1.
   SUPPRESS SUB-SCHEMA DATE TIME CHECK.
DMCL SECTION.
   DMCL IS MPDD.
   ACTIVATE DMCL.
END.
/*
/&
```

Figure 4–9. Job Control Stream for DBMS Start-Up

After the DBMS is running, the actual compilation of the DMCL follows. Figure 4–10 shows the DMCL job control stream.

```
// JOB DMCLP,,15000
// DVC 20  // LFD PRNTR
// DVC 21  // LFD PRNTX
// DVC RES  // LBL $Y$SRC  // LFD SRC
// DVC RES  // LBL $Y$LOD  // LFD LOD
// EXEC DMCLP
/$
DMCL IS MPDD.
COMPILE DMCL
USE SOURCE FILE SRC MODULE MPDBREL
USE OUTPUT FILE $Y$RUN MODULE MPDB.
END.
/*
// WORK1
// WORK2
// EXEC ASM
// PARAM IN=MPDB/$Y$RUN
// WORK1
// EXEC LNKEDT
// PARAM OUT=LOD
/$
 LOADM MPDB
 INCLUDE MPDB,$Y$RUN
/*
/&
```

Figure 4–10. Job Control Stream for DMCL Compilation

After the DMCL compilation is done, shut down the DBMS.

4.3.5. Allocating the Data Base File

The data base file allocation is the same as that shown in 4.2.2 except that the associated recovery files are already present. Also, you must modify the job control stream shown in Figure 4–11 by inserting the proper number of pages (blocks). This number is determined from the listings output by DMCLP.

```
// JOB MAPALOC2
// DVC 20  // LFD PRNTR
// DVC 50  // VOL MAPPER  // LBL MAPPER$DB$FILE  // LFD A
// SCR A
// DVC 50  // VOL MAPPER
// EXT ST,C,0,BLK,(2048,nnnn)
// LBL MAPPER$DB$FILE  // LFD DBLINK
/&
```

Figure 4–11. Modified Job Control Stream for Allocating the Data Base File

4.3.6. Initializing the Data Base (DBINT)

This step is the same as the DBINT execution in 4.2.3.

4.3.7. Formatting the Data Base for MAPPER 80 (MAPDMY)

The remaining three steps require the DBMS job (MAPPERDB) to be running. Start up the DBMS and run the MAPDMY utility the same as in 4.2.4.

4.3.8. Generating the Coordinator and Common Modes (MAPGEN)

The procedure to execute the MAPGEN utility is the same as in 4.2.5.

4.3.9. Installing the Training Data and User Reports (MAPRES)

If no user reports were saved in the first step of this procedure, install the JDOE training data by using the job control stream given in Figure 4–6. If you did save the contents of a previous data base in the first step (4.3.1), then use the job control stream shown in Figure 4–12 to restore the contents to the new data base:

```
// JOB MAPRES2,,10000
// DVC 20  // LFD PRNTR
// DVC 50  // VOL MAPPER  // LBL MAPPER$TEMP  // LFD DISKIN
// EXEC MAPRES
/$
#IN DISKIN
#MODE 102
#MODE (user mode/s)
#MODE 998
#END
/*
/&
```

Figure 4–12. Job Control Stream for Data Base Restoration

This completes the creation of your new MAPPER 80 data base. If you don't plan to run the MAPPER 80 job at this point, remember to shut down the DBMS. If you want to continue the job, proceed with initialization of the MAPPER 80 job control stream.

5. MAPPER 80 Software Considerations

5.1. DATA BASE CONCEPTS

The MAPPER 80 system is based on the DMS data base system. The coordinator can back up the data base and reorganize it if necessary. Since DMS is explained in its own manuals, this section does not try to describe DMS concepts. It provides only the MAPPER 80 information required to run the DMS utilities. If changes to the job control streams are required, the MAPPER 80 coordinator should refer to the DMS system support functions reference, UP-7909.3 (current version).

The MAPPER 80 data base is divided into the four logical areas shown in Figure 5–1.

Area Name	Purpose
CAB-CNT-AREA	Controls modes, types, and reports
CAB-IMG-AREA	Contains report images
WRK-CNT-AREA	Controls work/result images
WRK-IMG-AREA	Contains work/result images

Figure 5–1. MAPPER 80 Data Base Areas

The first two areas contain all the permanent information in the data base. The last two areas are used only during an interactive session to store temporary results. All four areas reside in a single file.

In addition to the main data base file, there are three related files used with the data base file when the MAPPER 80 system is in operation. Figure 5–2 shows the data base and related files.

File	Purpose
MAPPERDBFILE	Contains the MAPPER 80 data base
MAPPERDBCQBL	DMS interactive quick-before-looks file for the MAPPER 80 data base
MAPPERDBBQBL	DMS batch quick-before-looks file for the MAPPER 80 data base
MAPPERDBJRNL	DMS journal file for the MAPPER 80 data base

Figure 5–2. MAPPER 80 Data Base and Related Files

A brief description of these DMS files is useful as background to the discussion of the backup and recovery considerations covered in the following subsections.

1. MAPPERDBFILE

   The main MAPPER 80 data base. It contains all four of the logical areas shown in Figure 5–1.

2. MAPPERDBCQBL

   The quick-before-looks (QBL) file used during an interactive MAPPER 80 session. It is used for the RB (roll-back) function. Primarily, DMS uses it in its automatic recovery operation in case of a system crash. The MAPPER 80 coordinator does not normally need to be concerned with this file. The MAPPER 80 software specifies quick-before-looks only on the first two data base areas.

3. MAPPERDBBQBL

   The equivalent batch quick-before-looks (QBL) file. In the MAPPER 80 use of DMS, all the utility programs interface with DMS as batch programs.

4. MAPPERDBJRNL

   The DMS journal file, used by DMS during an interactive session to write before- and after-looks of the data base pages. If there are other DMS applications running along with the MAPPER 80 software, they all share the same journal file. The MAPPER 80 system specifies only after-looks, and then only for the first two data base areas.

5.2. DATA BASE BACKUP

There are two approaches to the backup of a MAPPER 80 data base. First, you can copy the entire data base by using one of three methods. Second, you can rely upon the looks files provided by DMS online and offline recovery.

Since your MAPPER 80 data is important, our recommendations for data base backup and recovery include a combination of both approaches.

The three methods to copy the entire data base are:

1. Use the OS/3 DMPRST utility.

   This method has the advantage of being simple and also fast. Figure 5–3 shows the job control stream commonly used to execute DMPRST.

```
// JOB MAPBKUP1
// DVC 2Ø    // LFD PRNTR
// DVC 5Ø    // VOL MAPPER    // LFD DISCIN
// DVC 9Ø    // VOL MAPBKP(PREP)    // LFD TAPEOT
// EXEC DMPRST
// PARAM IN=DISC
// PARAM OUT=TAPE
// PARAM TYPE=FILE
/$
 FILE MAPPER$DB$FILE
/*
/&
```

Figure 5–3. Job Control Stream for DMPRST Utility

2. Use the DMS DBDUM utility.

   This method is a little slower than using the DMPRST utility. Figure 5–4 shows the job control stream to execute DBDUM.

```
// JOB MAPBKUP2,,10000
// DVC 20   // LFD PRNTR
// DVC 50   // VOL MAPPER
// LBL MAPPER$DB$FILE   // LFD DBLINK
// DVC 90   // VOL MAPBKP(PREP)
// LBL MAPPER$DB$BACKUP // LFD DUMP
// EXEC DBDUM
/$
DMCL IS MPDB.
ACTIVATE DMCL.
DUMP ALL AREAS WITH STATS TO DUMP ON ERROR STOP.
END.
/*
/&
```

Figure 5–4. Job Control Stream for DBDUM Utility

3. Use the MAPDUM utility.

   This method of copying the MAPPER 80 data base is different from the first two. Those methods produced physical copies of the entire contents of the data base file. The work/result areas were copied along with the permanent report data. The MAPPER 80 MAPDUM utility is instead a logical copy program. Use it to copy only the permanent report data (or any portion of it) to a MIRAM file. It is controlled with parameters that specify to MAPDUM which modes you want to copy.

   Figure 5–5 shows a typical MAPDUM job control stream to save the contents of the entire MAPPER 80 data base.

Since MAPDUM is a DMS application program, you must have job MAPPERDB (DBMS) running before you execute MAPDUM. Also, notice that the MAPPER 80 data base file is not mentioned in the job stream (it appears in the MAPPERDB job). Subsection 5.2.1 gives the complete information of the parameters for the MAPDUM utility.

```
// JOB MAPBKUP3,,10000
// DVC 20   // LFD PRNTR
// DVC 90   // VOL MAPBKP(PREP)
// LBL MAPPER$DB$BACKUP   // LFD TAPEOT
// EXEC MAPDUM
/$
#MODE 000-998
#END
/*
/&
```

Figure 5–5. Job Control Stream for MAPDUM Utility

Any of these three methods can output to disk as well as to tape. Whichever of the three methods (DMPRST, DBDUM, or MAPDUM) you choose to back up your MAPPER 80 data base, test it out by dumping the data base and then restoring it on a different disk pack. Accomplishing this will give you confidence that your chosen backup method will work if your data base is ever destroyed. Back up the data base at frequent intervals. It's also prudent to keep several backup copies and rotate them at each backup cycle.

NOTES:

1. *Your data base backup copy must represent a consistent state of the data base. Therefore, make the copy only after the interactive MAPPER 80 job terminates.*

2. *DMPRST also uses data set label diskettes, while DBDUM and MAPDUM can use format label diskettes.*

5.2.1. MAPDUM Utility

MAPDUM is a backup utility program provided with the MAPPER 80 software. Besides being useful for backing up the information in the data base, MAPDUM is used in the data base expansion (reorganization) procedure.

MAPDUM utility is a logical copy program. It does not copy whole pages of the data base but rather extracts the MAPPER 80 information from them and saves it in its own format in a separate MIRAM file that may be on tape, disk, or format label diskettes.

MAPDUM is mode oriented. You specify which mode or modes you wish to copy and MAPDUM saves all the type, RID 0, and RID n contents from the specified mode.

Figure 5–5 shows a sample of the job control statements to execute MAPDUM. Again, MAPDUM runs as a DMS application program so the DBMS job (MAPPERDB) must be running before MAPDUM executes. This is the reason why the MAPDUM job control doesn't contain a reference to the MAPPER 80 data base file, only to the backup file. The backup file specification is a standard OS/3 device specification for either tape or disk. You must use the LFD name of DISKOT for disk and format label diskette, or TAPEOT for tape.

The MAPDUM control statements are #OUT, #MODE, and #END. Their rules are:

Control Statement #OUT:

`#OUT DISKOT`
: Specifies the output device type. There is only one form of the #OUT control statement. It is used when output is to disk. When output is to tape, omit this control statement. If supplied, it must occur before any other control statements.

Control Statement #MODE:

`#MODE nnn[-mmm]`
: Specifies the modes to be saved. This control statement specifies a single mode to be saved. Use the optional part to specify a range of modes. Any number of #MODE statements may occur in the MAPDUM job stream.

Control Statement #END:

`#END`
: Terminates the control statements.

NOTE:

Each MAPDUM control statement must begin in column 1.

Examples of MAPDUM control statements are:

```
/$
#MODE DISKOT          Specifies output is to disk.
#MODE Ø62             Saves mode 62.
#MODE 1ØØ-2ØØ         Saves modes 100 to 200.
#MODE 994-998         Saves modes 994 to 998.
#END
/*
```

The following messages are output by MAPDUM:

```
MPDØ1     MAPDUM START
MPDØ2     MAPDUM END
MPDØ5     #MODE nnn-mmm
MPD11     PARAM CARD ERROR (CARD IGNORED)
MPD15     MAPDUM REQUESTED MODE [nnn] NOT FOUND
```

5.3. DATA BASE RECOVERY

There are three ways to recover a MAPPER 80 data base when a system crash or fatal error occurs. The first way is to rely on the automatic quick start recovery feature of DMS. This uses the data base page images in the quick-before-looks file (QBL) to restore the data base to its last consistent state. There is no user involvement in the recovery process. Restarting the DBMS job initiates recovery, and DMS displays appropriate recovery messages.

The DMS quick-before-looks files are only for the two primary data base areas. Therefore, when a crash and automatic restart occur, the work/result areas are not recovered. This is not a serious problem because no permanent report information is stored in these areas. However, a system set up this way does require some additional care when recovering with the automatic DMS quick recovery.

The following steps effect a restart:

1. Run a partial DMS initialization (DBINT) only for the work/result areas.

2. Start up the DBMS job control stream to recover the permanent report areas of the data base.

3. Run a partial MAPPER 80 job initialization (MAPDMY) only for the work/result areas.

4. Start up the MAPPER 80 job. The MAPPER 80 software automatically performs final intialization of the work/result areas.

The MAPPER 80 data base is now ready for normal use. Note that the only difference from normal start-up is the addition of the partial initialization steps DBINT and MAPDMY.

Figure 5–6 shows the job control stream for the partial DBINT.

```
// JOB MAPINT1,,10000
// DVC 20   // LFD PRNTR
// DVC 50   // VOL MAPPER
// LBL MAPPER$DB$FILE  // LFD DBLINK
// EXEC DBINT
/$
DMCL IS MPDB.
ACTIVATE DMCL.
INITIALIZE AREA WRK-CNT-AREA,
    WRK-IMG-AREA ON ERROR STOP.
END.
/*
/&
```

Figure 5–6. Job Control Stream for Partial DBINT Utility

Figure 5–7 shows the job control stream for the partial MAPDMY.

```
// JOB MAPINT2,,
// DVC 20   // LFD PRNTR
// EXEC MAPDMY
// PARAM WRK
/&
```

Figure 5–7. Job Control Stream for Partial MAPDMY Utility

The second way to recover the MAPPER 80 data base is to restore a copy of the data base made by using one of the three methods described in 5.2. This means running one of the utilities: DMPRST, DBRES, or MAPRES.

Figure 5–8 shows the job control stream to restore the data base by using the DMPRST utility.

```
// JOB MAPREST1
// DVC 20   // LFD PRNTR
// DVC 50   // VOL MAPPER   // LFD DISCOT
// DVC 90   // VOL MAPBKP   // LFD TAPEIN
// EXEC DMPRST
// PARAM IN=TAPE
// PARAM OUT=DISC
// PARAM TYPE=FILE
/$
ΔFILE MAPPER$DB$FILE
/*
/&
```

Figure 5–8. Job Control Stream Using DMPRST Utility to Restore Data Base

Figure 5–9 shows the job control stream to restore the data base by using the DBRES utility.

```
// JOB MAPREST2,,10000
// DVC 20   // LFD PRNTR
// DVC 50   // VOL MAPPER
// LBL MAPPER$DB$FILE  // LFD DBLINK
// DVC 50  // VOL MAPPER
// LBL MAPPER$DB$CQBL  // LFD DBCQBL
// DVC 50  // VOL MAPPER
// LBL MAPPER$DB$BQBL  // LFD DBBQBL
// DVC 90  // VOL MAPBKP
// LBL MAPPER$DB$BACKUP  // LFD DUMP
// EXEC DBRES
/$
DMCL IS MPDB.
ACTIVATE DMCL.
RESTORE FROM DUMP ON ERROR STOP.
RESTORE ALL AREAS.
END.
/*
/&
```

Figure 5–9. Job Control Stream Using DBRES Utility to Restore Data Base

Figure 5-10 shows the job control stream to restore the data base by using the MAPRES utility.

```
// JOB MAPREST3,,10000
// DVC 20   // LFD PRNTR
// DVC 90   // VOL MAPBKP
// LBL MAPPER$DB$BACKUP  // LFD TAPEIN
// EXEC MAPRES
/$
#MODE 000-998
#END
/*
/&
```

Figure 5-10. Job Control Stream Using MAPRES Utility to Restore Data Base

NOTE:

When you use the MAPRES utility, the DBMS control stream must be running.

With the DMPRST utility, it is important to scratch and reallocate the DMS QBL files. If this is not done when the DBMS starts up, the automatic quick recovery will recover some data base page images into the freshly restored data base and destroy it. For the DBRES utility, scratch and reallocation are done internally. For the MAPRES utility, quick recovery occurs before MAPRES is acutally run since it requires the DBMS to be already running.

The third way to recover the MAPPER 80 data base is an extension of the second way (just described). After the DMPRST, DBRES, or MAPRES utility restores the data base to a known state, the DMS forward recovery operation (DMS DBREC utility) can roll the data base forward from the backup state to the very last consistent state prior to the crash. The DBREC utility uses the after-looks from the DMS journal file. In the recommended configuration, the MAPPER 80 data base has after-looks only for the first two (primary) data base areas. Therefore, you still must use the partial intialization steps described earlier (DBINT and MAPDMY).

Before using DBREC, the journal file must be properly closed. You accomplish this via the job control stream for the DMS JFFIX utility shown in Figure 5–11.

```
// JOB MAPREST4,,10000
// DVC 20 // LFD PRNTR
// DVC 50 // VOL MAPPER
// LBL MAPPER$DB$JRNL // LFD JRNL
// EXEC JFFIX
/$
DMCL IS MPDB
FIX DISK JOURNAL JRNL
END.
/*
/&
```

Figure 5–11. Job Control Stream for DMS JFFIX Utility

Figure 5–12 shows the job control stream for DBREC.

```
// JOB MAPREST5,,15000
// DVC 20  // LFD PRNTR
// DVC 50  // VOL MAPPER
// LBL MAPPER$DB$FILE  // LFD DBLINK
// DVC 50  // VOL MAPPER
// LBL MAPPER$DB$CQBL  // LFD DBCQBL
// DVC 50  // VOL MAPPER
// LBL MAPPER$BQBL  // LFD DBBQBL
// EXEC DBREC
/$
DMCL IS MPDB.
ACTIVATE DMCL.
RECOVER FORWARD TO FINAL
    AREA CAB-CNT-AREA, CAB-IMG-AREA
    USE JOURNAL FILE JRNL.
END.
/*
/&
```

Figure 5–12. Job Control Stream for DBREC Utility

5.3.1. MAPRES Utility

The MAPRES utility takes the MAPPER 80 report information from a MIRAM file previously created with MAPDUM and restores the specified reports to the MAPPER 80 data base.

MAPRES is mode oriented, meaning you specify which modes you want to restore. These specified modes should be dumped by MAPDUM.

A sample of the MAPRES job control stream is shown in Figure 5–10. Since MAPRES is a DMS application program, the DBMS job must be running before MAPRES executes. The LFD name for the backup file must be TAPEIN for tape or DISKIN for disk and format label diskettes.

The MAPRES control statements are:

Control Statement #IN:

`#IN DISKIN`

Specifies the input device type. There is only one form of the #IN control statement. Use it when input is from disk. When input is from tape, omit this control statement. If supplied, it should occur before any other control statement.

Control Statement #KEY:

`#KEY CHECK`

Specifies that the data will be restored to its original data base location. When you specify the #KEY CHECK control statement, MAPRES attempts to restore each saved data base page image to its original data base page. It also makes sure the page is not already occupied. If it is, MAPRES terminates abnormally. When this situation occurs, rerun MAPRES without the #KEY CHECK control statement.

You should usually run MAPRES by using the #KEY CHECK control statement. If not, internal indexes are not restored. In this situation, the binary find (BF) function cannot be used on the restored reports until each report is manually duplicated.

Control Statement #MODE:

```
#MODE nnn[-mmm]
```

Specifies the modes to be restored. This control statement specifies a single mode you want restored. Use the optional part of the format to specify a range of modes. Any number of #OUT mode statements may occur in the MAPRES job control stream.

Control Statement #END:

```
#END
```

Terminates the control statements.

NOTE:

Each MAPRES control statement must begin in column 1.

Examples of MAPRES control statement are:

```
/$
#IN DISKIN          Specifies input is from disk
#MODE Ø62           Restores mode 62
#MODE 1ØØ-2ØØ       Restores modes 100 through 200
#MODE 994-998       Restores modes 994 through 998
#END
/*
```

The following messages are output by MAPRES:

```
MPSØ1 MAPRES START
MPSØ2 MAPRES END
MPSØ5 #MODE nnn-mmm
MPS11 #PARAM CARD ERROR (CARD IGNORED)
MPS12 REPORT IMAGE STORED AT DIFFERENT DBKEY
MPS15 MAPRES REQUESTED MODE (nnn) NOT FOUND
```

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