MUSIC/SP

Version 5

Release 1

Administrator's Reference

April 1998

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Preface

About this Book

This publication describes how to operate and maintain MUSIC/SP. It contains detailed instructions for using the system utility programs provided with MUSIC/SP. It is directed towards hardware and software support personnel, operators, systems administrators, and systems programmers. This version corresponds to MUSIC/SP Version 5, Release 1.

For installation procedures and routine maintenance, refer to the *MUSIC/SP Administrator's Guide*. This guide describes the menu-driven system administrator facility.

How this Book is Organized

This publication is organized into the following five parts, appendixes, and an index.

I. *Planning for MUSIC/SP*.
Part I provides information about hardware requirements. It contains information about how to run MUSIC/SP under VM.

II. *Operating MUSIC/SP*.
This part includes three chapters providing information about loading the system, the system console, and routine maintenance.

III. *Customizing MUSIC/SP*.
This part describes the methods for customizing MUSIC/SP to suit your installation. Some of the topics include: System Reconfiguration, Terminal Configuration and tailoring, and Job Submission.

IV. *MUSIC/SP System Utilities*.
This part includes a description of the system utility programs available on MUSIC/SP.

V. *Internals of MUSIC/SP*.
This part describes the details about the internal workings of MUSIC/SP. Some of the topics include: Region Sizes, File System, Load Library, and System Programming.

MUSIC/SP Publications

The following is a list of all the current MUSIC/SP publications. These hardcopy publications can be ordered through the MUSIC Product Group. Online versions (softcopy) of the user publications can be accessed with the MUSIC/SP command called "MAN".

- *MUSIC/SP Administrator's Guide* (April 1996), describes how to install and operate MUSIC/SP.
- *MUSIC/SP Administrator's Reference* (April 1998), describes the internals of MUSIC/SP; utility programs and supervisory commands; gives detailed storage estimates; and documents console messages.

- *MUSIC/SP User's Reference Guide* (October 1997), describes how to use MUSIC/SP; its command language; terminal and batch set up; and job processing using the various language processors.

- *MUSIC/SP Guide for New Users* (April 1996), introduces new users to the use of MUSIC/SP via an IBM 3270-type workstation. It describes the FSI (Full Screen Interface) menu facility. New users learn how to use many programs on MUSIC/SP for such tasks as editing and running programs.

- *MUSIC/SP Office Applications Guide* (April 1996), describes the features of the TODO (Time, Office, and Documentation Organizer) facility. This includes the scheduling function, spell checking, and MUSIC/SCRIPT (text processing).

- *MUSIC/SP Mail and Conferencing Guide* (April 1996), describes electronic mail on MUSIC/SP. This includes Mail Profile, Mail Directory, using POP clients, and conferencing programs.

- *MUSIC/SP Internet Guide* (April 1996), describes the programs available on MUSIC/SP that provide communication between users through electronic conferencing and discussion lists. Emphasis is placed on access to the Internet with programs such as TELNET (logging on other computers), FTP (File Transfer Protocol), WEB (World-Wide Web), RN (Newsreader), and GOPHER (document search and retrieval protocol).

  Note: A separate guide devoted to the WEB on MUSIC can be found at the following site: http://musicm.mcgill.ca

- *MUSIC/SP Campus-Wide Information Systems* (*CWIS*) *Guide* (April 1996), describes how to create and maintain a Campus-Wide Information System, Help facility, or Classified Ads facility; how to do full-text searching; and how to provide gopher access. MUSIC/SP's resources are used to provide online distribution of information to a wide audience.

- *MUSIC/SP Teacher's Guide* (April 1996), describes various MUSIC/SP facilities related to the academic environment. Emphasis is placed on communication between teacher and student and easy methods for learning how to use MUSIC applications.

- *MUSIC/SP Client/Server* (*MCS*) *Booklet* (April 1996) provides an overview of MCS. Full documentation is available on the MCS diskette.

- *MUSIC/SP Personal Computer Workstation User's Guide* (May 1994), describes the components of the Personal Computer Workstation (PCWS). It is intended for the novice or experienced user of a personal computer, who wishes to connect to MUSIC/SP or another host system. Note that documentation for *PCWS for Windows* is available on the PCWS diskette.

- *MUSIC/SP World-Wide Web Support*, (June 1997), describes how to produce Web documents ready to display on your Web browser or MUSIC's Web browser.

Trademarks

Part I. Planning

Chapter 1. Introduction

Overview

The basic information required to install and administer the MUSIC/SP system is contained in the *MUSIC/SP Administrator's Guide*. The ADMIN program provides a menu driven approach to system configuration and maintenance but offers little explanation about the tasks that are being performed automatically as the result of the various menu selections. This may be of benefit in a lot of situations but on occasion a more detailed knowledge of the system is required. This manual contains reference material that is of interest to the administrator or systems programmer who wishes to obtain more detailed background information on MUSIC/SP.

MUSIC/SP often runs as a guest operating system under VM/SP or VM/XA. In this case the hardware requirements discussed below, are provided by VM in the form of a virtual machine defined in the VM directory. Under VM, MUSIC/SP can share devices such as printers, tape drives, disks, and terminals with other virtual machines. *Chapter 2 - Running MUSIC/SP under VM* discusses configuration and performance issues specific to running the system under VM.

If required, MUSIC/SP can run without VM. In this case MUSIC/SP controls the entire processor and all the associated devices.

Hardware Requirements

Processor

MUSIC/SP will run on any processor supported by VM. Specifically this ranges from the IBM 9370 up to the IBM 30xx processing complexes.

Storage

The storage required to run MUSIC/SP depends on the number of active terminals. Allowing 1 megabyte for every 32 active terminals will provide enough storage for good performance in the typical situation. Additional storage can be used to enhance performance by reducing paging and swapping loads and making highly used applications memory resident. The pre-configured system requires 2 megabytes.

Channels

A multiplexer with channel address of 0 is required. The system console and printer are accessed through this channel. Terminals may also be on channel 0. At least one selector or block multiplexer channel is required to access the tape and disk units. Performance gains can be achieved if more than one channel is available for disks. MUSIC/SP uses paging and swapping techniques to manage user tasks and the I/O overhead involved in these functions can be reduced if it is spread over a number of channels.

Terminals are normally accessed through channel 0. If this is not possible, then they can be attached to channels 1 through 15 provided no tapes or disks are also on that channel.

Disk

MUSIC/SP requires at least 2 disk volumes, totaling at least 320 megabytes of space for a typical configuration. Any of the following disk devices can be used: 3310, 3330, 3340, 3350, 3370, 3375, 3380, 3390, 9332, 9335, 9345 or 0671. Logical volumes can be either dedicated devices or minidisks under VM. The pre-configured system can only be installed on 3350, 3370, 3380, 3390, 9332, 9335, 9345, or 0671 disks.

Tapes

One 2400, 3400, 9346, 9347, 9348, 8809 series tape drive, or 3480 cartridge tape drive is required for system generation and efficient system backup.

Tape Drives on IBM 9371 Processor

The following notes applies to tape drives on the IBM 9371 processor only. Tape drives on other models of the 9370 processor family do not have this requirement.

When running MUSIC/SP on the 9371, special care must be used when defining the address associated with the tape device. This is true for the 9346 (1/4 in) or the 9348 (1600/6250). The address selected MUST be on a unique channel. No other devices can exist on the channel with the tape unit. If you followed the sample configurations in this book, then channel 4 can be used.

When running under VM, this can be accomplished by specify the VIRTUAL address on the ATTACH or DEDICATE statement.

When running NATIVE (without VM), the physical address of the tape unit is specified via the Configuration Setup screen. Refer to the *9371 I/O Installation and Configuration Guide* (SA24-4220).

Unit Record Devices

Card Reader — A 2540, 2501 or 3505 card reader is supported. It is not required unless the installation requires the ability to read cards.

Card Punch — A 2540, 3525 or 1442 Mod II card punch is supported. It is not required unless the installation requires the ability to punch cards.

Printer — A 1403, 3211, 3203, 3262, 3289 or 5203 is required for the printer. An upper and lower case print chain (such as TN) is desirable when you wish to print MUSIC/SCRIPT documents. In addition, printers supported by the 3270 subsystem and asynchronous ASCII printers can be attached directly to MUSIC/SP for additional printer support. Under VM, MUSIC/SP has access to the VM system printers and any network printers run by RSCS.

Console — The system requires a printer-keyboard console such as a 1052, 3210, 3215 or the equivalent functions on an emulated console.

Transmission Control Units

Asynchronous terminals such as the IBM 2741, ASCII, and Personal Computers programmed to emulate asynchronous terminals, require a transmission control unit. 3270 terminals and terminals connected via a protocol convertor such as the 7171, do not require one. MUSIC/SP can use any of the following transmission control units: 2701, 2702, 2703, or 37xx (in emulator mode), Integrated Communications Adapter (ICA). The transmission control units such as the 2702, 2703, 3705 (or equivalent) must be plugged

correctly in order that IBM-type terminals function correctly under MUSIC/SP.

On 270x series, the ports to be used by IBM terminals must be specified as 2741 break type. MUSIC/SP supports 1050 terminals on the same type of line as the 2741 type.

On 37xx series, generate the lines to be used for IBM terminals as '1050' with 'UNITXC=NO'. Note that with older versions of the emulator program, you must specify 'UNITXC=NO' on each LINE macro as the specification on the GROUP macro was not sufficient. If no 1050s are to be used with the 37xx, then you may specify the terminal type as 2741 instead of 1050.

On 37xx series, specify the option 'CHECK=DCD' on the GROUP macro to ensure MUSIC/SP will be informed of unusual line disconnects.

ASCII (TTY) type lines should be specified such that the RETURN key is an end of line signal. The *transmit on* (X-ON) and *transmit off* (X-OFF) should also be line end characters. For example, when generating a 3705 emulator program, specify CHAREC=(XONOFF,B1) on the GROUP macro. If your control unit is NOT set to handle RETURN as the end of line character, then you must specify the RNA option on the MUSIC/SP TTY device specification card during MUSIC nucleus generation step (NUCGEN).

4331/4361 Communications Adapter Notes

Up to eight start/stop (s/s) terminals may be attached to the 4331 and 4361 processor's Communication Adapter (CA). IBM hardware RPQ 7S0276 is required to support ASCII s/s terminals on the CA. The following configuration options must be specified.

- PERM REQUEST TO SEND - YES
- READ INTERRUPT - YES
- WRITE INTERRUPT - YES
- UNIT EXCEPT SUPPRESS - YES

Options not mentioned here are terminal dependent, and should be set as required.

Disk Device Recommendations

When comparing disk devices it is particularly important to compare their average access time as well as their transfer rate. The device's capacity usually depends on the block size used. Just comparing their maximum capacity can be very misleading. Please refer to the device tables in the chapter "Direct Access Storage". The tables show device capacities for blocksizes 512 (used for files) and 4096 (used for swap and page data sets).

The following contains notes on each of the devices.

3380 This device has superior data transfer rate and access times. Its transfer time is particularly useful to handle the block-paging and swapping functions of MUSIC/SP. The Extended Capability Models of the 3380 line can have double the capacity of the earlier Standard Models. These higher capacity models, called the AE4 and BE4, are identified as the 3380 E in the above table.

Be careful when estimating its true data capacity on MUSIC/SP. Notice that the capacity of a 3380 device with 512-byte records is about one half that of the published maximum capacity. Make sure that the processing unit's channels are fast enough to handle the device.

3370 Although not as fast as a 3380, the 3370 is a good general purpose disk. It can be attached to the 4331 and 4361 processors. The 3370 is a FBA-type device. Although it is supported by MUSIC/SP and VM it may not be supported by the other operating systems that you may want to run under VM.

3375 This device is very similar to the 3370 except that it uses the CKD format rather than the FBA format the 3370 does.

3310 The 3310 is supported, but the 3370 offers much better performance.

3330 The 3330 is supported, but the 3370 offers much better performance.

3340 3340's are supported, but the other devices offer better performance characteristics. Avoid attaching them to the 4331 or 4361 processing unit through the built-in adapter as this may cause unexpected performance problems.

3350 3350's are supported but the 3370 or 3375 devices have a better performance.

933x These disks are part of the 9370 system and have similar characteristics as the 3370.

0671 These are the FBA type disks that can attach to the 9371 processor.

3380 Model AA4 Device Addressing Notes

This topic describes notes relating to the 3380 Model AA4. This discussion does not apply to the Extended Capability 3380 models.

On the 3380 model AA with two controllers, either controller can access any of the four internal paths to the drives. This allows each access mechanism to be accessible from either controller and any two of the internal paths can transfer data simultaneously. Normally, one would want the controllers to be on separate channels, so that the processing unit can access any two of the access mechanisms simultaneously so long as they are on different internal paths.

All MUSIC/SP disk I/O is queued at the channel level. That is, if there is an active request on a channel, MUSIC/SP will wait for it to complete, before doing anything else on that channel. Also MUSIC/SP will access a disk via only one address. Thus for each access mechanism, only one address may be specified to MUSIC/SP. Access mechanisms that are to be accessed simultaneously must have the addresses chosen such that they are on different channels.

To set this up one must know which access mechanisms are on different internal paths. Access mechanisms which share an internal path should be defined to MUSIC/SP as being on the same channel.

Access Mech	Path
0,1,8,9	0
2,3,10,11	1
4,5,12,13	2
6,7,14,15	3

Example

Suppose a 3380 model AA and B (access mechanisms 0-7) is connected to storage directors (3880s) 14x and 24x. Each access mechanism can be accessed by either the 14x or 24x address but you can only tell MUSIC/SP about one of them. Suppose that four disks are required on each channel, then the following addresses could be defined to MUSIC/SP.

- 140,141,142,143 for channel 1
- 244,245,246,247 for channel 2

This is only one of many ways the addresses could be assigned. A big mistake would be to define devices at 140 and 241. MUSIC/SP would attempt to access them as if they were on different channels whereas they actually share a common path in the 3380.

For more detailed information see *IBM 3380 Direct Access Storage Description and User's Guide* (GA26-1664).

FE Service Aids

Reporting Disk and Processing Unit Errors

MUSIC offers both the installation and the IBM Field Engineer (FE) information to determine whether system errors were caused by the software or hardware.

Serious hardware problem, such as uncorrectable equipment checks or permanent data checks are logged out on the console immediately and the console alarm is sounded. The error messages are documented in *Appendix A. Console Messages and Wait States Codes* of this manual.

MUSIC will also write an OBR record for disk and tape errors to VM's LOGREC file. These records may be printed using the VM EREP program.

The internal statistics log of the 3330 disk drive may be dumped with a utility program called BUFLOG. The use of this program is described later in this manual.

The hardware makes a distinction between *hard* and *soft* machine checks. Upon encountering soft machine checks, the system attempts to recover from the error and continue processing. When encountering hard machine checks or when soft machine checks have reached a maximum threshold value, the system will shut down immediately. The system administrator has the option of running the EREP program or reloading MUSIC. The last machine and channel check logs are maintained in main storage.

On a number of processing unit models, the hardware maintains the last checks internally, so it may not be necessary to immediately run the EREP program. Refer to the appropriate S/370 reference manual pertaining to processing unit operations.

E-Mail Discussion Lists

The LISTSERV software on BITNET provides a forum for you to discuss topics of interest with other computer users. MUSIC users can join MUSIC-L which discusses general MUSIC issues. A system administrator can join the list called MUG. The MUG list is a closed list and your subscription must be confirmed by the list owner (security issues related to MUSIC are sometimes discussed).

To join a list, send e-mail to the address of the list and include the SUBSCRIBE command as the text of the message. For example, to join the MUSIC-L list send mail to "LISTSERV@MARIST.BITNET" and include one line of text only, as follows:

```
SUBSCRIBE MUSIC-L John Smith
```

You will receive confirmation by e-mail about being added to the list.

Note: The MAIL facility offers a selection on the menu called "List Manager". This item provides an easy method for subscribing to discussion lists.

Chapter 2. Running MUSIC/SP Under VM

Overview - Running MUSIC/SP Under VM

This chapter contains information about the configuration and performance of MUSIC/SP running under VM.

(Unless otherwise mentioned, the term VM in this manual will be used to refer to VM/ESA and its predecessor products VM/SP, VM/XA, and VM/370.)

Although MUSIC/SP is running as a virtual machine under VM, it is important to remember that the single MUSIC/SP machine is supporting a large number of interactive users. MUSIC/SP is a guest operation system, not just another user. As such, the VM performance options, that apply to guest operating systems, should be applied to guarantee optimum performance to your MUSIC/SP users. This chapter outlines some of these key performance options and also gives specific details as to how MUSIC/SP should be configured as a virtual machine.

Configuration Notes

You must specify the REALTIMER, ECMODE, BMX, and VCUNOSHR options in the VM directory entry for the MUSIC virtual machine.

The terminals may be defined in the directory either by the DEDICATE or SPECIAL specification statements. When DEDICATE is used those terminals are permanently attached to the MUSIC/SP virtual machine and cannot access the other facilities of VM. When SPECIAL is given, each user must enter a DIAL MUSIC (or equivalent) command to be connected with MUSIC. Users who use 3767s and 2741s through the DIAL command must press carriage control immediately after VM has acknowledged that the line is dialed to MUSIC.

WARNING: Do not mix 3270s, asynchronous terminals, or unit record devices on the same virtual subchannel. The subchannel is indicated by the middle digit of the device address. For example, if a 3270 is defined on address 0E2 make sure that no other non-3270 device has an address in the range from 0E0 to 0EF. Failure to observe this rule will result in severe performance problems.

MUSIC and VM Performance Considerations

MUSIC can take advantage of any of the VM hardware assist options available on your processing unit. These assists can significantly reduce the VM overhead for MUSIC.

Always configure production MUSIC systems under VM in such a way that VM never has to page any part of MUSIC. This can be done by running MUSIC in a V=R region or by issuing the VM LOCK command to lock all of MUSIC's pages in storage. (MUSIC will work in a paged configuration, but the end users will typically complain of erratic response. This is caused by VM freezing the entire MUSIC system any time any user gets any page exception.)

The use of additional main storage for the MUSIC Fixed Linkpack Area (FLPA) will improve MUSIC's performance only if the same amount of real main storage is added to MUSIC. For example, suppose your

MUSIC system is configured as a 2MB virtual machine with all the pages locked in main storage and you want to add 2MB. Do not be tempted to run MUSIC as a 4MB virtual machine with only 2MB locked. In this case, you must run with all 4MB of MUSIC locked in storage.

Run MUSIC as a V=R machine for optimal performance. This will reduce the amount of processor time VM will need to support MUSIC, and as a result, will be able to spend more time servicing other machines. The V=R option does not give MUSIC any special performance over other virtual machines. During system initialization, when MUSIC detects that it is in a V=R region, it will automatically issue a /CP SET NOTRAN ON command so that CCW translation is bypassed.

Do *not* use the DEDICATED CHANNEL option under VM as it will increase the VM overhead. However, it is desirable for MUSIC to have exclusive use of the real channels that are used to access its disks. The use of a second or third real channel for swapping may improve MUSIC's performance even if this channel is shared with other virtual machines.

Some performance improvement will occur if you define each MUSIC disk device as being on a separate channel even when they are not. For example, using the virtual addresses of 130, 230, and 330 is preferable to defining them as 130, 131, 132. This is because MUSIC queries disk requests at a channel and VM may be able to queue the request at a device level. Note, however, that you cannot use this technique to give the appearance of multiple channels for swapping and paging when multiple channels do not really exist.

VM Commands that Effect Performance

A facility exists to issue commands to VM each time MUSIC is loaded. Refer to the topic "Modifying the System Catalog" in *Chapter 6 - System Reconfiguration* for further details. A number of commands can be issued at this time to enhance MUSIC performance.

The SET RUN ON command should always be issued to guarantee that the MUSIC virtual machine keeps running when it enters CP mode or the console screen fills up.

The use of the SET FAVORED and PRIORITY commands of VM will give MUSIC top service under VM. The SET FAVORED 99 option can be used to give MUSIC top service even though MUSIC may only require a fraction of the total processing unit time.

The SET STBYPASS command cannot be used with MUSIC/SP.

Detecting the Environment

MUSIC automatically detects the environment it is running in as explained at the beginning of this chapter. Certain flags are set at location 240 (hex) in MUSIC to reflect the environment it sees at IPL time.

Defining the Spooled Reader

To simulate the operation of a real card reader, it is necessary to use the VM command SPOOL RDR CONT for MUSIC's batch reader. This CONT option can be set up as one of automatic commands issued at MUSIC IPL time. See the topic "Modifying the System Catalog" in *Chapter 6 - System Reconfiguration* for more information.

The virtual reader (class M and A) for the VMREADX program must *not* have the CONT option. The batch reader must not be spooled class * (i.e. to read all classes) if VMREADX is used. Normally MUSIC's batch reader is spooled to read class J files.

Defining the Spooled Printer

MUSIC will normally automatically skip to a new page when the printer senses a channel 12 punch on the carriage tape. This function will normally not be simulated when the printer is spooled through VM. However, the VM spooled printer can be set up to accomplish this operation when the printer is defined to VM as a 3211. The virtual FCB (forms control buffer) must be loaded with an appropriate LOADVFCB command to VM. For example: "DEF 3211 E", "LOADVFCB E FCB MUS1". Refer to the appropriate VM publication. It is advisable to add the FCB specification to VM's nucleus *before* attempting to generate MUSIC under VM. An example of an FCB specification suitable for MUSIC is:

```
FCB MUS1,6,66,(4,1,64,12),1
```

Do not spool the virtual printer or punch with the CONT (continuous) option, since this would cause the automatic CLOSE command to be ignored when it is issued by MUSIC at the end of each batch job.

Defining Extra Unit Record Devices

Various MUSIC utility programs require that extra unit record devices be defined in the MUSIC directory. The devices need not be defined if the programs will not be used. SUBMIT, GSUB, OLDSUB, VMSUBM, and AUTOSUB **require** virtual punches on addresses 011 through 013. If more punches are defined, the programs should be configured to take advantage of them. AUTOPR and VMPRINT require a virtual printer. The default address for this is 017, but this can be changed if the programs are reconfigured. VMREADX requires a class M virtual reader on 018 and class A on 019. Consult *Chapter 8 - Job Submission and Retrieval Programs* for further information on the programs mentioned above.

Using Minidisks for MUSIC/SP Disk Volumes

VM *minidisks* can be used for MUSIC disk volumes. However, the installation should be aware of the following: (a) these pseudo devices cannot be accessed without VM, and (b) additional CPU overhead will be incurred as VM has to perform address translation on them. In most cases the CPU overhead should not exceed a few percent and so it may be acceptable to use minidisks in cases where your CPU is not loaded. Care should be taken when they are formatted to ensure that the number of cylinders on the minidisk is correctly specified to the MUSIC Disk Format Utility (FORMAT).

Minidisks for MUSIC do not have to start at CYL 0 on the real pack as is required by some other operating systems.

Minidisks can be used even if you are running V=R. VM will normally go through CCW translation for I/O to these devices. However, I/O to full pack minidisks will not go through CCW translation when accessed in full read/write mode. (*Full pack* means 808 cylinders for 3330-11, 404 for 3330-1, 698 for 3340 M70, 349 for 3340 M35, 555 for 3350, 959 for 3375, 885 for 3380, and 203 for 2314. It means 126016 blocks for 3310 and 558000 blocks for 3370 devices. Consult the coding the VM module DMKVSC near label TSTNDED for details.)

MUSIC Console Under VM

The console alarm used by MUSIC to alert the operator to unusual conditions under MUSIC will normally never sound under VM. The VM operating system will normally type the message `RRRR....RING....GGGG` instead. If this proves to be operationally undesirable, it may be changed by one of two techniques. One is to dedicate the real machine console to MUSIC and the other is to modify VM's supervisor to sound the real alarm if it is the MUSIC machine.

The operation of MUSIC's virtual console on a 3270 is not recommended for production operation. This is due to the fact the VM's 1052 simulation on a 3270 will cause the console to stop printing once the screen is full. This screen full condition will be cleared only after about 1 minute has elapsed. If the screen contains any message which sounded the alarm, then this automatic clear will not be done by VM. When the screen is full, the console will not be available to MUSIC to print any more messages.

If MUSIC discovers that it has a high-priority message to print (such as DROPPED, or I/O error etc), the system may loop until the message can be displayed. This situation can be avoided by running MUSIC in a disconnected state and having the console messages sent to the VM operator's console using the secondary operator facility. To set this up specify OPERATOR as the secondary operator parameter on the CONSOLE statement in the VM directory entry for MUSIC.

Once MUSIC is initialized it can be disconnected (/CP DISC command), and all console messages that would have gone to MUSIC's console will be sent to OPERATOR. Console commands can be sent to MUSIC while it is in this state using the SEND command.

You can also set it up so that MUSIC can be entirely controlled from OPERATOR and you never have to physically log on to MUSIC at all. Include an IPL statement in MUSIC's directory that will load from MUSIC's SYSRES pack when logged on. MUSIC can now be started from OPERATOR using the AUTOLOG command. If the data parameter of the AUTOLOG command is =AUTO, MUSIC will execute a quick startup and require no further operator intervention to get going.

The MUSIC CONSOLE utility can be used to view console messages from a priviledged userid.

Miscellaneous Notes

It will simplify the generation and operation of MUSIC under VM if the MUSIC virtual machine were given VM operator privileges.

The MUSIC IPLable main storage dump program will operate under VM, however certain parts of the resulting dump will not be valid. They are the CAW and a 4K area in the middle of the virtual storage used by the VM IPL simulator.

Sample VM Directory Entry for MUSIC

The following sample defines a virtual machine called *MUSIC* which, by default, has 4 megabytes (4096K) of main storage. All operator privileges are given to MUSIC here, though only the G class is mandatory. Even with the full set of VM privileges, the MUSIC terminal user will not be able to issue privileged VM commands. Class C or E is required to take advantage of all the MUSIC system's performance facilities under VM.

The 4MB of storage shown in this example will have to be increased to support many simultaneous users. Users of VM/ESA ESA option can specify storage sizes up to 64MB for virtual machines. VM/ESA 370 option and previous versions of VM were usually limited to 16MB as a maximum size.

Note that the console is defined as a 3215 device. It must not be defined as a 3270 (although a 3270-type terminal can be used). OPERATOR, the default VM userid of the system operator, is specified as the secondary operator. This allows MUSIC to be run disconnected and have the console messages sent to the operator's console.

The batch card reader, printer and punch are defined in this example as being spooled. This option can be dynamically changed to real devices as required. Consult the VM documentation for the procedure to do this.

The printer is defined as a 1403 in the example. It is best to define it as a 3211 as mentioned under the heading "Spooled Printer" above. Before defining it as a 3211, make sure that you have the VFCB defined. The definition as a 1403 will work sufficiently well during MUSIC installation.

The OPTION statement requires the REALTIMER, ECMODE and BMX specifications. The option VCUNOSHR is available with fix VM24061 to VM/SP Release 4. VCUNOSHR will improve MUSIC's performance and should be used if available. The VIRT=REAL option will improve performance as described in the above text. The DEDICATE statements are used here to attach the disk packs and teleprocessing lines for the exclusive use by MUSIC. The SPECIAL statement defines an address available for a 3270 to be connected to when the user dials MUSIC. The spooled punch devices 11 through 13 are those for the MUSIC SUBMIT and VMSUBM interfaces to use. The spooled printer at address 17 is for use by the VMPRINT and AUTOPR utilities. The class M reader at address 18 is used by the VMREADX program.

```
USER MUSIC MUSIC 4M 16M ABCDEG 5
OPTIONS REALTIMER ECMODE BMX VCUNOSHR
IPL 120
CONSOLE 01F 3215 T OPERATOR
DEDICATE 120 C00
DEDICATE 220 C01
SPOOL 00C 2540 READER J
SPOOL 00D 2540 PUNCH
SPOOL 00E 1403
SPOOL 011 2540 PUNCH
SPOOL 012 2540 PUNCH
SPOOL 013 2540 PUNCH
SPOOL 017 1403
SPOOL 018 2540 READER M
SPOOL 019 2540 READER A
SPECIAL 520 3270
SPECIAL 521 3270
SPECIAL 522 3270
SPECIAL 523 3270
etc...
```

Part II. Operating MUSIC/SP

Chapter 3. Loading the System

Initial Program Load (IPL)

The system initialization procedures require the mounting of all necessary disk packs. When the disks are properly set up, the operator initializes MUSIC by performing the IPL operation. Under VM, this is done by simply entering the command "IPL xxx" where *xxx* is the address of the MUSIC system residence disk pack normally called MUSICX. The system responds with various messages and questions as shown below.

No Messages?

If no messages appear, it could be caused by the MUSIC system not being able to communicate via the generated console address. If this is the case, you can get MUSIC to recognize the new address by depressing the REQUEST key on the console. (VM simulates this with the PA1 key on a 3270.)

Another reason for no messages is that the display console is working in 3270 mode. This is not supported by MUSIC. (VM can simulate the 3215 mode on a 3270, which is the usual mode of a virtual console under VM.)

Sample IPL of MUSIC

The following shows a sample IPL of MUSIC. The arrows (-->) identify the lines entered by the operator.

```
1--->ipl 140

     M066 MUSIC/SP, Level=xxxxxxxxxxx
     M077 Enter operator id or special options or HELP
2--->rwm
     12:51 PM MON MAR 04, 1985 Type 'OK' or new values
3--->ok
     12:51 M097 The following volumes are permanent:
     12:51 M105 MUSICX on unit 140 SYS
     12:51 M070 No disk drives are available for mounts.
     12:51 M139 Storage size  2048K. Pageable storage 1456K
     12:51 M140 MAXMPL=  6, MAXRRS= 232K, Num RCBs=   23
     12:51 M092 System initialization completing.
     12:51 M300 BATCH IDLE
```

Item 1 above is the operator entering the IPL command to VM.
Item 2 operator identification. (The system does not check this identification.)
Item 3 verification of the time and date.

A full explanation of the messages printed above can be obtained by consulting *Appendix A. Console Messages and Wait State Codes* in this manual.

Special Options

The following special options can be entered at the time the system is expecting the operator's initials. After taking note of the option, the system will prompt again for the operator's initials or for more special options. (Entering a blank line or =AUTO or a line that does not start with the "=" character allows the system IPL to continue beyond this point.)

(blank) Fast start up of the system. The prompt for the time and date checking will not be issued. The time and date information is obtained directly from VM and will be correct unless the values were entered incorrectly when VM was started.

=AUTO Fast start up of the system. This is the same as entering a blank line.

=NOTERM Means bring up the system but do not allow terminal users to sign on yet. Batch jobs can run. This NOTERM option can be used when the operator wants to run a MUSIC batch job when no terminals are on the system. It can also be used to allow just a few terminals on. This would be done by issuing a /ADD command for that terminal.

The operator can later allow all terminals to sign on by issuing the /ADD ALL console command.

=EDIT Specifies that the operator wants to make temporary changes in the system catalog. The use of this option is explained in the topic "Modifying the System Catalog" in *Chapter 6 - System Reconfiguration*.

=CATxxxx Instructs the system to use the alternate system catalog name of SYS1.MUSIC.CATxxxx instead of the default SYS1.MUSIC.CATALOG. The system catalog lists the names of all the system data sets, link pack area members, etc.

=RESET Erases all the accounting records on the system. This is normally only done when initializing the accounting data set for the first time.

=CONFIG Allows the operator to temporarily change the I/O configuration. This could be used if you wanted to IPL MUSIC on a backup processing unit. The MUSIC/SP starter system always requires the reconfiguration step as it has no I/O configuration defined. The use of this option is fully explained in the topic "Reconfiguring Temporarily at IPL Time" later in this chapter.

=LOADPRT Informs the system that MUSIC's printer is to be loaded with the appropriate FCB and UCB images. This is normally only used in the case that the printer is being directly controlled by MUSIC and is not being spooled through VM. The use of this option is fully explained in the topic "Initializing the Printer" later in this chapter.

=RDROFF Prevents MUSIC batch from selecting jobs from the internal reader. This is equivalent to the console command /RDR OFF.

Specifying Time and Date

MUSIC obtains the time and date information from the hardware's time of day clock and also from VM. It is unlikely that VM will have incorrect information unless these values were incorrectly entered when VM was started. In this case, you might want to re-IPL VM.

It is possible to change the time and date information at MUSIC IPL time. This new information will be used only within MUSIC and will not affect other virtual machines running under VM. To change the information, enter a non-blank operator id. The system will then issue a prompt showing the current time and date values. The operator then has to put in the correct information using exactly the same format. The time and date must be abbreviated by their first three letters. The following example shows how to change the time to 5pm.

```
        03:46 PM MON MAR 04, 1985 TYPE 'OK' OR NEW VALUES
----> 05:00
```

The time is normally entered using a 12-hour clock. To enter a time between 12:00 and 1:00 o'clock, either a.m. or p.m., enter it as 12:xx, not as 00:xx. Enter 12:00 AM for 12 noon but enter 12:01 PM for one minute later. (You may also use the 24 hour notation if you specify HR instead of AM or PM.)

When a new value is entered, checks are performed to ensure that all values are valid and that the day of the week entered coincides with the date.

Initializing the Printer

If the printer can only print upper case characters then the printer should be initialized with the FOLD option. (The FOLD option will print lower case characters as upper case characters.)

The printer should have the correct carriage tape or FCB (Forms Control Buffer) and the UCS (Universal Character Set) buffer image must match the print train in use. If the printer is spooled through VM, refer to *Chapter 2 - Running MUSIC/SP under VM* for details.

Printers, such as the 1403, which have a carriage tape, should have the tape punched with channel 1 and channel 12 punches to identify the top and bottom of the page respectively. When MUSIC detects a channel 12 punch it will automatically do a skip to channel 1 causing a *skip to next page* operation. Printers, such as the 3211, must have an appropriate FCB image loaded to accomplish the same function. This FCB image, along with the UCS image, which defines the character set, may be loaded during system initialization by operator commands, or while the system is running using the SETBUF utility program which is described later in this manual. The following details show how to load the appropriate buffer images during system initialization.

The operator must inform the system of the need to load the printer buffers by specifying the =LOADPRT option when prompted for the *Operator ID*. Subsequently MUSIC will prompt for further information as follows.

a) M135 Fold option on buffer load - yes/no (Default no)

- respond yes or no as required. The fold option will cause lower case characters to be printed as upper case.

b) M125 Enter FCB name

- this will not appear for printers which have a carriage tape.
- Valid responses are:

```
MUS6 - 6 lines per inch
MUS8 - 8 lines per inch
```

c) M130 Enter UCS name

- The UCS defines the printer's character set and is dependent on the type of printer and character chain used. Valid responses are listed below.

```
UCS BUFFERS IMAGES AVAILABLE ARE:

3203/1403  PRINTERS

AN    NORMAL AN ARRANGEMENT
HN    NORMAL HN ARRANGEMENT
PCAN  PREFERRED SET, AN
PCHN  PREFERRED SET, HN
QN    PL/I - 60 GRAPHICS
QNC   PL/I - 60 GRAPHICS
RN    FORTRAN, COBOL COMMERCIAL
YN    HIGH SPEED ALPHAMERIC
TN    TEXT PRINTING - 120 GRAPHICS
PN    PL/I PRINTING 60 GRAPHICS
SN    TEXT PRINTING - 84 GRAPHICS


3211 PRINTERS

A11   STANDARD COMMERCIAL
H11   STANDARD SCIENTIFIC
G11   ASCII
P11   PL/I
T11   TEXT PRINTING


3289 PRINTERS

F48   48 CHARACTER GRAPHICS
F64   64 CHARACTER GRAPHICS
F96   96 CHARACTER GRAPHICS
F127  127 CHARACTER GRAPHICS


3262 PRINTER

P48   48 CHARACTER EBCDIC
P52   52 CHARACTER AUSTRIA/GERMANY
P64   64/72 CHARACTER EBCDIC
P63   PREFERRED 64 CHARACTER EBCDIC
P96   96 CHARACTER EBCDIC
P116  116 CHARACTER FRENCH CANADIAN
P128  128 CHARACTER KATAKANA
```

Reconfiguring Temporarily at IPL Time

MUSIC's device addresses and terminal configuration can be respecified at IPL time. This feature is primarily used when the MUSIC starter system is used. Reconfiguration can also be done at a later date should

you require to IPL MUSIC on another processing unit.

The reconfiguration is only in effect for the current IPL and completely replaces the configuration specified at nucleus generation time. Permanent reconfiguration is done by using the nucleus generation procedure (NUCGEN program).

If only the console address needs changing then this reconfiguration step is not required. Simply press the console REQUEST key after the IPL is done.

The reconfiguration process is started by the operator specifying the special operator ID of =CONFIG. MUSIC will then prompt the operator for the required information. If you have no printer, reader, or punch, then enter --- for its address.

A typical dialogue is shown below. The lines entered by the operator are identified in this example by a -> character to the left of the line. Enter a blank line to end the disk/tape configuration section. The TERM control option is no longer used; enter a blank line when prompted.

```
   M066 MUSIC/SP, Level=xxxx
   M077 Enter operator id or special options or HELP
-> =config

   M115 Temporary system I/O reconfiguration. Enter all addresses
                                                 in form 'cuu'
   Enter console address
-> 01f
   Enter printer address or --- if none
-> 00e
   Enter reader address or --- if none
-> 00c
   Enter punch address or --- if none
-> 00d

   Disk/tape configuration:  Enter one device per line
   in format 'tttt-cuu' where 'tttt' is one of the following
   2314
   3340
   3330
   3350   (Native mode)
   2305   for 2305 Model 1
   2306   for 2305 Model 2
   F512   for 3310 or 3370 or 933x FBA device
   3375
   3380
   7TRK   for 7-track tape drive
   9TRK   for 9-track tape drive
   8809   8809 tape drive

-> 3380-247
-> 3380-143
-> 9trk-180
->

   Terminal configuration
   Enter terminal control option as 'xxxx'
   (Usual response will be a blank line
   See Operations Manual 'TERM' configuration card for full details.)
```

```
->

   Enter terminal info in format 'tttt-cuu'
   Where 'tttt' is one of the following terminal types
   Enter a blank line to terminate terminal configuration
   2741
   3767
   1050
   TELE  for tty-type terminals
   3270

-> tele-030
-> tele-031
-> 3270-0f0
-> 3270-0f1
->
   Configuration complete
   M077 Enter operator id or special options or HELP
-> de
```

Editing the System Catalog

During normal system initialization, the operator is given the opportunity to modify the MUSIC system catalog. If any errors are found within the catalog, the system will automatically invoke the catalog editing facility. The edited catalog is in effect for the current IPL of MUSIC only. Permanent changes to the catalog are made using the EDTCAT utility program described in *Chapter 17 - System Utility Programs*.

The catalog modification is carried out in several steps.

1. If the catalog is to be edited the operator must respond with =EDIT when prompted for the operator ID. This will cause the catalog editing procedure to be invoked later in the system initialization process.

2. The operator is asked which catalog cards are to be displayed. A blank line entered at this time will cause the editor to advance to the next step. A response of ALL will cause the entire catalog to be displayed. The operator may display a single entry of the catalog by entering the 8 character label field (cols 1-8) of the required card. This step continues until a blank line is entered.

3. This step allows the deletion of specific cards identified by their 8 character label field (cols 1-8). A blank line ends this step.

4. Step four allows the addition of lines to the catalog. Refer to *Chapter 19 - Direct Access Storage* for the format of these entries. A blank line is entered to end this step.

5. At this time the operator may repeat the whole procedure if more changes are to be made or end the editing function by entering a blank line.

Shutting Down MUSIC/SP

A specific procedure should be followed when operation of MUSIC is to be terminated for any reason, to ensure that: all records and files on the system disk packs are properly saved for the next run; all system

maintenance functions in progress are properly terminated; and users are notified of the shutdown.

- The /MESSAGE ALL command (with no other message text) can be used to issue a shutdown warning message. (See *Chapter 4 - The System Console* for full details.)

- Wait for the appropriate length of time given in the above warning message (e.g. 5 minutes). This lets users finish their work and sign off.

- Check that there is no batch job running, and no /PAUSE or tape mount requests pending. To do this, use the operator commands "/go" and "/batch".

- Shut down some BTRM sessions, specifically those for RDMAILER and SYSLG (the System Log Message Server). This is to avoid losing any log records. To do this you must know the TCB numbers of these BTRMs. You can get them by entering the commands "enqtab rdmail" and "enqtab syslog" in a terminal session. (Normally these TCB numbers will remain constant until you change MUSIC's terminal configuration.) To shut down the BTRMs, enter the operator commands "/reply n1 stop" and "/reply n2 stop", where n1 is the TCB number of RDMAILER and n2 is the TCB number of SYSLG. If there is more than 1 RDMAILER, issue the command for each. You should stop RDMAILER before SYSLG. Wait for the message "Sys Log Server Btrm is shut down" to appear.

- As soon as possible after the above step, enter the operator command "/stop". This shuts down MUSIC.

The system responds with:

```
ACCOUNTING FILE CLOSED. MUSIC IS SHUT DOWN
```

VM will often follow this message with one similar to the following:

```
CP ENTERED; DISABLED WAIT PSW xxxxxxxxxx
```

This VM message can be ignored.

Terminal Processing

The console operator normally need not be concerned with what users are doing at their terminals. In a few instances, however, the operator receives messages concerning individual remote terminals.

If an equipment malfunction occurs at a terminal, the system informs the operator by typing an I/O error message on the console and cancelling the terminal session. The line will normally be automatically re-enabled to allow its use by another user. A similar message occurs if the specified device address does not exist or is in the *not operational* state. Some I/O errors can be caused by users disconnecting or powering off their terminals. Consult "Terminal I/O Messages" in Appendix A for specific details about these messages.

If too many errors occur on a particular terminal or if the terminal had been explicitly dropped by the operator, then the system issues the message:

```
M201 TERMINAL nnn DROPPED, ADDR=xxxx
```

The console alarm is also sounded. This message indicates that the system has made the terminal unavailable for use. The operator can make the terminal available again via the "/ADD nnn" command after verifying the reason for the occurrence of the message.

The following is a brief summary of console commands that effect terminal processing.

/ADD	make a terminal available after it has been dropped.
/CANCEL	cancel the program running on a terminal.
/DROP	drop a terminal.
/FIND	find a TCB number based on user code.
/HALT	terminate current I/O and drop a terminal.
/MESSAGE	send a message to a terminal.
/RESET	reset a terminal session.

Batch Processing

In addition to terminal processing, jobs may be brought on cards or submitted from a terminal to run at the central site. These jobs run concurrent with terminal processing and are called batch jobs. The card reader, punch, printer, and console as well as tape and disk are used instead of remote terminal equipment.

The operator can read card jobs by placing the cards in the card reader and then readying the unit.

Jobs submitted from a terminal will be processed according to the submitted job class. Apart from the lack of cards, these batch jobs proceed in a similar fashion to ones on cards. Refer to the topic "Batch Processing with VM" for information that is specific to VM and the topic "Batch Processing Using the Internal Reader" for other batch related information.

An attempt will be made to start the card reader after system initialization has been completed. At other times, the reader will start when it becomes ready. Output may be on either the card punch or printer (or both), depending on the user program. In addition, system messages, referring to the job, that require operator intervention are sent to the console.

Batch's priority is normally set to run jobs only during those instants when no terminal needs service. The "/CTL B-HI" console command can be used to alter this priority.

MUSIC processes only one batch job at a time. That is, after reading one complete job, it will completely finish executing it before reading the next one. Printed or punched output from a batch job may start while the job is still executing. Also, once the job ends execution, the system will commence reading the next job even though the last job has not finished printing or punching.

When a batch job requests tape work files, or nonpermanent user data set volumes, the operator is informed when and where to mount the required volumes. The operator must not ready the volume(s) until the system requests them. The operator should not ready a tape drive until the tape has been successfully loaded (threaded). When processing is complete, the user-designated external labels are typed on the console for proper identification of those tapes to be saved.

MUSIC's printer must have an appropriate carriage tape or FCB loaded. It must also be loaded with the correct UCS image. See the topic "Initializing the Printer" in this chapter for details.

Punched output is selected into pocket P2 of the IBM 2540 Card Read Punch. If a punch check occurs, the card in error is selected into pocket P1. To continue processing, the punch feed must be emptied and the punch made ready. All cards in pocket P1 should be thrown away. A separator card is punched in front of each deck produced. This card is similar to the /ID card submitted with the job except it has the last eight columns punched as asterisks to facilitate identification.

The operator can cancel the current batch job once it has started execution by pressing REQUEST on the console and entering /CANCEL.

Batch Processing with VM

MUSIC Batch operating with VM, when VM has *spooled* reader, printer and punch devices, will appear to operate somewhat differently to that described above. The real devices will be controlled by VM and operate as described in the VM publications. MUSIC jobs read in from VM readers will require an appropriate VM USERID control card in front of them. Card decks punched from MUSIC will normally have VM separators in addition to the MUSIC one. Two blank cards will follow those punched by the user.

Output of MUSIC jobs spooled by VM will normally only start to print or punch after the entire job has finished. MUSIC will automatically issue VM CLOSE and SPOOL commands at the end of each job unless the /CTL NOVMCLOSE or /CTL NOVMSPOOL MUSIC console commands have been used.

MUSIC VM Reader Classes

If your installation allows terminal users to directly submit MUSIC batch jobs, then the following notes apply. (Each installation may change some of these conventions. For example, overnight class may be defined to be after 5pm.)

When a user submits a job through the MUSIC SUBMIT facility, a two character job class is specified. The first identifying the kind of job and the second when the job is allowed to run. The meaning of the first character is given below:

- A No special handling and no tape requests.
- S Job requires special handling such as special paper but does not require magnetic tape.
- T Job requires magnetic tape.

Specifying class S or T will cause the program to ask you to enter a message that will be sent to the operator just before the job is run.

The job will be held to be run overnight by specifying the *letter* O as the second character of the job class such as CLASS='AO'. (Overnight class should not be started before 6pm weekdays.) Specifying the second letter as 'A' will allow the job to be started at any time. Note that the default class is 'AO' and that the MUSIC charge rates are cheapest when the overnight class is eligible to run.

These two character classes will appear as 1 character VM reader file classes. The following correspondencies are made:

User Class	VM Reader Class
AA	J
SA	S
TA	T
AO	E
SO	F
TO	G

MUSIC will normally automatically run the reader class J. If reader files S and T appear, you should run them when you can. For example, to run class T you first make sure the tapes are available to MUSIC, then you can run all class T jobs by typing the VM command "SPOOL C CLASS T". After the tape jobs have been read you should reset the MUSIC reader to CLASS J.

Similar procedures should be followed for all the classes. Note that class E, F, and G must not be run before 6 pm weekdays. They can be run any time on Saturday and Sunday. (The VM command "Q RDR" may be of help to list the jobs waiting to run. The "Q RDR ALL" command will also list the MUSIC code of the submitter together with the MUSIC job name.)

Batch Processing Using the Internal Reader

Installations could use the *internal reader* to submit jobs to run at batch although most VM installations would normally use the VM spooled reader facility described above to perform this function. In either case, the user will use the SUBMIT facility.

After the MUSIC system has been initialized, the system will process the first job in the internal reader queue number 1, if any. After processing that job, the system will take the next one in the queue. Jobs from the internal reader will always be executed before those submitted on cards.

The /RDR operator command can be used to change the queue number if it is desired to run another class of jobs. This command can also be used to see what queues have jobs waiting for execution.

MUSIC Internal Reader Classes

If your installation allows terminal users to directly submit MUSIC batch jobs, then the following notes apply. (Each installation may change some of these conventions. For example, overnight class may be defined to be after 5pm.)

When a user submits a job through the MUSIC SUBMIT facility, a two character job class is specified. The first identifying the kind of job and the second when the job is allowed to run. The meaning of the first character is given below:

A No special handling and no tape requests.
S Job requires special handling such as special paper but does not require magnetic tape.
T Job requires magnetic tape.

Specifying class S or T will cause the program to ask you to enter a message that will be sent to the operator just before the job is run.

The job will be held to be run overnight by specifying the *letter* O as the second character of the job class such as CLASS='AO'. (Overnight class should not be started before 6pm weekdays.) Specifying the second letter as 'A' will allow the job to be started at any time. Note that the default class is 'AO' and that the MUSIC charge rates are cheapest when the overnight class is eligible to run.

These two character classes will appear as numeric internal reader numbers. The following correspondencies are made:

User Class	Internal Reader Class
AA	1
SA	2
TA	3
AO	4
SO	5
TO	6

MUSIC will normally automatically run the reader class 1. If reader files 2 and 3 appear, you should run them when you can. For example, to run class 3 you first make sure the tapes are available to MUSIC, then you can run all class 3 jobs by typing the MUSIC command "/RDR 3". After the tape jobs have been read you should set the MUSIC reader to class 1.

Similar procedures should be followed for all the classes. Note that class 4, 5, and 6 must not be run before 6 pm weekdays. They can be run any time on Saturday and Sunday. (The MUSIC command "/RDR Q" may be of help to see what queues have jobs in them.)

Allowing Internal Reader Submission

When MUSIC is first installed, the SUBMIT program is configured to submit jobs through VM. To change SUBMIT to use the internal reader, simply edit the file $PGM:OLDSUB and alter the INTRDR=FALSE parameter in the file to read INTRDR=TRUE.

Controlling Auxiliary Printers

328x type printers or ASCII printers may be defined to the system as auxiliary printers. When the system in IPLed, these devices are automatically *signed on* under the code $MON and the printer program started. Console commands which effect terminals also apply to these devices (/ADD, /CANCEL, /DROP, /RESET etc.). In addition, the following commands are provided to allow some operator control over these devices:

```
/REPLY n STOP                    /REPLY n CANCEL
/REPLY n GO                      /REPLY n HOLD
```

n	Terminal identification number of the printer.
STOP	Stop the printer.
GO	Resume or start printing.
CANCEL	Stop printing the current file and go on to the next one in the print queue. The file which was printing is deleted from the system.
HOLD	Stop printing the current file and go on to the next one in the print queue. The file which was printing is placed at the bottom of the print queue.

The OUTPUT and PQ commands may be issued from a MUSIC terminal to determine the status of various printers and the state of the output queue. If it is required to restart the program controlling the printer the best method is to use the /CANCEL command to stop the program and the /RESET command to restart the program when required.

Chapter 4. The System Console

Overview

After the MUSIC system is initialized, the processing unit console can be virtually left alone. Except for the processing of batch jobs, the system is operator-free. System errors that can cause problems will sound the console alarm, and the console operator can respond. When such problems arise or when system or terminal status information is desired, there are available a variety of system console commands. These commands can perform the following types of functions: controlling batch and terminal job execution, sending messages to terminals, enabling and disabling TP lines, and interrogating and changing internal switches and constants.

Some processing units, such as the S/370 125, will sound the console alarm when no processing unit activity has taken place for one minute. This is not to be taken as an error condition.

System Console Commands

The following describes the console commands that can be used from the processing unit console. It should be noted that all system responses shown are prefixed by the time of day in the form xx:xx. All references to terminals are by logical unit number. *terminal n* refers to the terminal identified by internal number *n.*

The operator is cautioned not to keep the console in read status for long periods of time. Otherwise, it is possible for a backlog of messages to build up to the point that the system will loop waiting for these messages to be printed.

The / (slash) is optional with the commands.

/ABEND n

Explanation**:** Forces a program check in the program in process on terminal *n.* Use the identification of B for batch.

System Response**:** `*OK`

/ADD n

Explanation**:** A request that terminal *n* be added. If this port is already enabled, the request is ignored.

System Response**:** `*OK`

Note: If /ADD ALL was entered, all nonactive terminals are added including those previous dropped.

/BATCH

Explanation**:** Shows the status of the job running at batch. It redisplays any outstanding /PAUSE statements and tape mounts. It also shows how long the job has been running or waiting for tape mounts,

etc. This time is in the format HH:MM for hours and minutes. Abbreviation: /BAT.

System Response**:** Status messages.

/CANCEL n (or /CAN n)

Explanation**:** The current job on terminal *n* is to be canceled. If *n* is omitted, the current batch job is canceled.

System Response**:** `*OK` (if the command was issued for a terminal).

/CP command-for-VM

Explanation**:** The text following the /CP command is sent to the control program of VM. VM commands are documented in IBM *VM/370*: *Command Reference for General Users* (GC20-1820) and *VM/370*: *Operator's Guide* (GC20-1806).

System Response**:** MUSIC responds with either a *OK message, or a message giving the VM error code in response to the command. In addition to this, the VM control program may also type a response on the console. Note that any command that requires a privilege class that the MUSIC virtual machine does not have will be rejected by VM and an error message printed.

/CTL B-HI

Explanation**:** Sets scheduling priority of batch jobs equal to that of terminal jobs, so they can compete for processing unit time on an equal basis.

System Response**:** `*OK`

/CTL B-LO

Explanation**:** Sets batch scheduling priority lower than that for terminal jobs. This is the default setting.

System Response**:** `*OK`

/CTL CD-ON

Explanation**:** User codes can be authorized such that they can be used on batch only with permission of the console operator. See the RESTR option of the CODUPD utility. This command allows these restricted codes to be used. This command has no effect on user codes that are not allowed on batch at all or on those that are allowed on batch with no restrictions.

System Response**:** `*OK`

/CTL CD-OFF

Explanation**:** Disallows batch-restricted job. This is the default setting. (See /CTL CD-ON description.)

System Response**:** `*OK`

/CTL NOVMCLOSE

Explanation**:** This command stops MUSIC from issuing a VM CLOSE command at the end of each batch job when the output devices are spooled. The VM SPOOL command for these devices will also not be performed. The /CTL VMCLOSE command is used to enable these operations again.

System Response**:** `*OK`

/CTL NOVMSPOOL

Explanation**:** This command stops MUSIC from issuing a VM SPOOL command at the end of each batch job when the output devices are spooled. (MUSIC normally issues a "SPOOL xxx TO SYSTEM" command at the end of batch jobs using VM spooled output devices.)

System Response**:** `*OK`

/CTL PRTCHK-ON

Explanation**:** Perform normal error correction on batch printer operations. This is the default setting.

System Response**:** `*OK`

/CTL PRTCHK-OFF

Explanation**:** Perform no correction on I/O error conditions (except printer not ready) on the batch printer. This command can be used while loading the UCS buffer (on printers so equipped) to ignore errors until the buffer is properly loaded.

System Response**:** `*OK`

/CTL PWCHK-ON
/CTL PWCHK-OFF

Explanation**:** These commands determine whether the contents of batch password cards are to be checked. The default is PWCHK-ON.

System Response**:** `*OK`

/CTL PURGE

Explanation**:** Allows files to be purged from batch via /PURGE jobs.

System Response**:** `*OK`

/CTL NOPURGE

Explanation**:** Restricts purging of files from batch. This is the default setting.

System Response**:** `*OK`

/CTL VMCLOSE

Explanation**:** This command will reset the action taken by the /CTL NOVMCLOSE command. MUSIC normally will issue a CLOSE command at the end of each batch job which uses VM spooled output devices.

System Response**:** `*OK`

/CTL VMSPOOL

Explanation**:** This command will reset the effect caused by the /CTL NOVMSPOOL command. MUSIC normally will issue a "SPOOL xx SYSTEM" command at the end of each batch job that uses VM spooled output devices.

System Response**:** `*OK`

/DAILY message text

Explanation**:** Display message text on all terminals at sign-on time.

System Response**:** `*OK`

Note: The message will continue to be transmitted until the system is loaded or until a /DAILY command with no message text is issued.

/DISABLE PUNCH

Explanation**:** All batch punched output is to be deleted. This enables the system to operate even if the card punch is not available. All output skipped by means of this command cannot be recovered. To re-enable, issue the /ENABLE PUNCH command.

System Response**:** `*OK`

/DROP n

Explanation**:** Terminal *n* is to be dropped. It will not be available for use unless added via the /ADD command. Note that the line will not be dropped until some sort of terminal activity occurs. For a terminal in read status, the line will not be dropped until the attention or return key is depressed. (see /HALT and /RESET).

System Response**:** `DRPNG n`

/DUMP nnnnnn

Explanation**:** Dump 32 bytes of main storage starting at the location designated. The address *nnnnnn* is virtual. Only locations in the first 4K of storage, or in the nucleus or above, can be specified.

System Response**:** `32 bytes of main storage as specified.`

/ENABLE PUNCH

Explanation**:** The batch punch is to be enabled. This is the default setting.

System Response**:** `*OK`

/FIND string

Explanation**:** The TCB number and device address of all users whose userid starts with the characters specified in *string* will be displayed on the console. *String* may be from 1 to 16 characters long.

/GET UCB cuu

Explanation**:** Display the storage location of the disk or tape UCB, and the volume name (if available). *cuu* is the device address.

System Response**:** `cuu UCB AT xxxxxx, VOL=vvvvvv`

/GO

Explanation**:** This command is used to resume batch job processing following a halt due to a /PAUSE statement. Use /NOGO to tell MUSIC not to run the job and to cause it to be canceled. See /PAUSE (M310 message) under "Batch Processing Messages" in Appendix A.

System Response**:** `*OK`

/HALT n

Explanation**:** This command has the same effect as /DROP except that it causes *any* current I/O activity to be immediately terminated. Normally the specified line will immediately be DROPPED. /HALT ALL will cause a /HALT command to be issued to all lines on which there is a currently signed on user.

System Response**:** `*OK`

/LOCATE module

Explanation**:** This command displays the address in main storage for the *module* name in the system nucleus module. Abbreviation: /LOC.

/MESSAGE n message text

Explanation**:** Send the message text to terminal *n.*

System Response**:** `*OK`

Note: If ALL is entered instead of *n*, the message is sent to all active terminals. If the message text is omitted, the text transmitted will be `SYSTEM IS SHUTTING DOWN IN 5 MINUTES.` At this time a DAILY message of `SYSTEM IS ABOUT TO SHUT DOWN` is also automatically scheduled. The operator is cautioned not to send another message until sufficient time has occurred for the first message to be sent. Otherwise, it is possible for the first user to receive the same

message that was intended only for the second user. In this case however, the second user will receive the correct message. Abbreviations: /MES, /MSG.

/NOGO

Explanation**:** This command is used to resume batch processing following a halt caused due to a /PAUSE statement. Use /GO to allow the job to be processed. Use /NOGO to tell MUSIC not to run the job and to cause it to be canceled. See /PAUSE (M310 message) under "Batch Processing Messages" in Appendix A.

System Response**:** `*OK`

/QUEUE (or /Q)

Explanation**:** Display the number of active terminals and the terminal currently being dispatched in a user region.

System Response**:** `CPU ccc ACTIVE nnn`

ccc The terminal number of the user currently resident in user region. A batch job appears as 000. If no user is currently being dispatched, this field is displayed as ---. The --- may also mean that all regions are waiting for I/O to complete.
nnn The number of active terminals (i.e. terminals signed on).

/RDR n or OFF or Q

Explanation**:** This command is used to control the internal batch reader. Specifying "/RDR 2" will cause batch to start processing batch internal reader queue number 2. Specifying OFF will stop the system from selecting any further jobs from the internal reader. Specifying Q will display the classes that have jobs waiting to run.

System Response**:** `*OK` or classes that have jobs waiting to run.

/REP nnnnnn hhhh
/REP nnnnnn 'cccc'

Explanation**:** The storage location *nnnnnn* is to be modified by the value of *hhhh.* Up to 44 bytes can be modified in one command. The h's are any hexadecimal digits and the number of characters must be even. For convenience, a comma may be inserted between pairs of h's as in the following example: 0700,4700,0000. Character data may be specified by enclosing it in single quotes. The address *nnnnnn* is virtual. Only locations in the first 4K of storage, or in the nucleus or above, can be specified. Alternate command name: /STORE.

System Response**:** `*OK`

/REPLY n xxxxxxxx

Explanation**:** Places 8 characters of information into the post code field (in the XTCB) of the specified terminal, and reactivates the program. The characters are taken from the *xxxxxxxx* parameter, extended with blanks if necessary. A terminal number of 0 can be used for Batch. This command can be used to communicate with the AUTOPR programs controlling any auxiliary printers. Abbreviation: /R.

System Response: `*OK`

/RESET n

Explanation: The user on the specified terminal will be signed off. A RESET command is also sent to VM. The line is then made available for subsequent users. If the terminal in question is a BTRM, running a background job such as AUTOPR or VMREAD, this command will restart the background job.

System Response: `*OK`

/SEARCH (or /SEA)

Explanation: Displays the TCB number, userid and real address of all sessions associated with the virtual terminal address "addr".

/STATUS (or /S)

Explanation: Display a list of active terminals. (The WHOALL or WHOACT utility programs provide this information and more.)

System Response: A list of active terminals is displayed. If more than 28 are active, only the first 28 are shown and an asterisk is placed at the end of the line indicating the overflow.

/STOP

Explanation: Shuts down the system immediately.

System Response: `12:54 ACCOUNTING FILE CLOSED. MUSIC IS SHUT DOWN.`

/STORE nnnnnn hhhh
/STORE nnnnnn 'cccc'

Explanation: The /STORE command is the same as the /REP command. Abbreviations: /STOR, /STO.

/SYSTOP

Explanation: Same as /STOP.

System Response: `ACCOUNTING FILE CLOSED. MUSIC IS SHUT DOWN.`

/TCB n

Explanation: The contents and location of the TCB for terminal specified by *n.*

System Response: `TCB nnnnnnnnnnnnnnn`
LOC xxxxxx

Where *n's* are hexadecimal display of first eight bytes of TCB. The first 4 characters are the TCB

number in hexadecimal and the next 4 are the physical line address associated with the TCB. The *x's* are location (hex) of TCB for terminal *n.*

/VARY cuu, OFFLINE

Explanation**:** This command is used to remove a tape unit from the list of available drives from which the system selects the unit to be used for the next tape job. Abbreviation: OFF for OFFLINE.

System Response**:** `*OK`

/VARY cuu, ONLINE

Explanation**:** This command is used to re-add a tape unit to the list of available drives from which the system selects units to be used for the next tape job. The command can be used to inform the system that a tape unit previously found in not operational state is now available for use. Abbreviation: ON for ONLINE.

System Response**:** `*OK`

/WHO n

Explanation**:** An inquiry to know who is (or was) on the terminal designated by *n.* (The WHOALL or WHOACT utility programs provide this information and more.)

System Response**:** `NNN UUUUUUU *`

where:

NNN	is the terminal number (TCB number).
UUUUUUU	is the userid. If this field is printed as |||||||, then someone is (or has) been connected to the line without signing on.
*	This character identifies that a user is currently active on this line.

Auxiliary Operator CONSOLE Facility

The CONSOLE utility allows a privileged user at a 3270-type terminal to view the most recent messages on the MUSIC/SP main operator console, and to enter MUSIC and VM operator commands. It is invoked by the command "console" (or "cons" for short).

The MUSIC console handler records the latest console activity in an 8K buffer in main storage. This includes MUSIC operator messages, tape mount requests, system error messages, and operator input (MUSIC commands only). The CONSOLE utility displays the contents of this buffer.

The display does not automatically show new console activity. You must refresh the display by pressing the ENTER key, in order to see any new console messages.

Privileges required:

FILES and CREAD are needed to display console messages. MAINT is needed to enter operator commands.

Screen Display

```
16:39 M402 SIGN ON: CCGM000, UAD=0A2, TCB= 17
16:40 M402 SIGN ON: CCFP000, UAD=0A3, TCB= 18
16:41 M306 /ID MUSJOB   CCFP 000 999 999 999
16:42 *OK
16:42 M402 SIGN ON: CCGM000, UAD=0A4, TCB= 19
16:43 M300 BATCH IDLE
16:52 M402 SIGN ON: CCEL000, UAD=0A2, TCB= 17
16:55 M408 CMD FROM  16 CCDE000: s
16:55   1   2   3   4   5   6  15  16  17  18
16:56 M405  16 CCDE000 VM CMD: q ti
16:58 M405  16 CCDE000 VM CMD: yyyy
16:59 M306 /ID CCDE1    CCDE 000 MAX 999 999
16:59 M300 BATCH IDLE
17:06 M405  18 CCFP000 VM CMD: q e
17:07 M405  18 CCFP000 VM CMD: q e
17:09 M408 CMD FROM  18 CCFP000: batch
17:09 M315 NO BATCH JOB ACTIVE
OpCmd: _

PF1-Help   3-Exit   7-Up    8-Down   9-Browse    10-Edit   12-Retrieve
ENTER-Refresh                       17:11  Auxiliary MUSIC/SP Console
```

Figure 4.1 - Console Screen Display

The top part of the screen displays part of the contents of the console buffer. When the program starts, the most recent console messages (the "bottom" of the buffer) are shown. PF keys 7 and 8 are used to page up or down in the buffer.

The field labelled OpCmd is an input area where you can type a MUSIC operator command. After typing the command, press ENTER to submit the command to MUSIC's console handler and display the new contents of the console buffer. A VM command (for the MUSIC virtual machine) can be entered by typing "cp xxx", where xxx is the VM command, for example "cp query time".

The output of a VM command is displayed temporarily at the top of the screen. If there are many lines of VM output, it is displayed in non-full-screen mode (unit 6). Press ENTER or PA2 when "More..." appears in the bottom right corner, to continue the display.

Some potentially destructive commands ask you to confirm the command by typing "yes" (or "y") in the command area and pressing ENTER. Type anything else to cancel the command.

The screen line following the command input area is used for displaying messages from the CONSOLE utility.

The bottom two lines show the definitions of the 3270 action keys (PF keys and ENTER), and show the time of day when the last action key was pressed.

Action Keys

PF1-Help — Displays HELP information on how to use the CONSOLE facility. This includes a brief description of some of the more common MUSIC operator commands.

PF3-Exit — Exits from the CONSOLE facility.

PF7-Up — Displays the previous page of console messages (further back in time).

PF8-Down — Displays the next page of console messages (further ahead in time).

PF9-Browse — Copies the entire console message buffer to file @CONLOG and then BROWSEs that file. This gives you the full power of the MUSIC Editor for displaying and searching.

PF10-Edit — Same as PF9, except the Editor is used, instead of Browse.

PF12-Retrieve — Each time this key is pressed, the previous input line is displayed in the input area. You can then modify the text, if you want, and press ENTER to re-execute the command. The last 5 input lines are remembered. Repeatedly pressing PF12 cycles through these lines.

ENTER — Pressing the ENTER key does several things:

1. It executes the operator command, if you have typed one in the input area (or retrieved a previous input line via PF12).
2. It refreshes the console messages, i.e. it gets and displays any new messages that have occurred since the last time the ENTER key was pressed. If there are no new messages, "No change" is displayed.
3. It moves to the bottom of the console messages, to display the most recent ones.

Some Common MUSIC Operator Commands

Refer to "System Console Commands" for a full description of these and other commands. *n* is a terminal (TCB) number, which you can get from various messages or by the FIND command. The minimum abbreviation is shown in capital letters.

ADD n — Adds terminal *n* if it has been dropped.

BATch — Shows the status of the current batch job, if any.

CANcel n — Cancels the job running on terminal *n*. Cancels the current batch job if *n* is not specified.

CP xxx — Executes a VM command *xxx*.

DUMp x — Displays 32 bytes of MUSIC's main storage at hex address *x*. See also STORE.

FIND uuu — Finds and displays terminal numbers for all userids that start with the string *uuu*. *uuu* can be 1 to 7 characters long. An asterisk (*) in the output means that the userid is signed on.

GO — Allows a batch job to execute after a /PAUSE statement in the job has suspended the job. See also NOGO. This is used to respond to an M310 message.

HALT n — Stops and drops terminal *n*. This can be used to terminate a BTRM job.

MESsage n text
MSG — Sends a message to terminal *n*.

NOGO — Rejects a batch job after a /PAUSE statement in the job has suspended the job. See also GO. This is used to respond to an M310 message.

Queue — Displays the number *n* of the terminal currently being executed, and the number *m* of signed on terminals, as: "CPU n ACTIVE m"

RDR Q/OFF/m	Displays information about the internal reader queue (RDR Q), or stops the internal reader from processing jobs (RDR OFF), or sets a new reader class number (RDR *m).*
Status	Displays the terminal numbers of the first few signed-on terminals.

STOre x tttt
REP
	Changes MUSIC main storage at hex address *x*. The new bytes are specified by *tttt* in hex or as characters in single quotes. See also DUMP. Examples:
	
	`STORE 81AB84 47F0`
	`STO 8E0 'MUSICX'`

STOP	Shuts down MUSIC.
VARY cuu OFF	Makes a tape device unavailable for MUSIC jobs. *cuu* is the virtual address of the tape drive.
VARY cuu ON	Makes a tape device available for MUSIC jobs. *cuu* is the virtual address of the tape drive.
WHO n	Shows the userid on terminal *n.* An asterisk (*) means that the user is signed on.

System Errors and Restart Procedures

A system error or an error caused by a machine malfunction may, depending on its severity, cause the system to shut down. For most disk errors, the system may be restarted. A more detailed discussion of the restart procedure can be found in *Chapter 3 - Loading the System*.

The procedures to be followed after a serious I/O error occurs will vary with the type of error and with installation standards. If the system can be restarted without errors, it is likely that the trouble was caused by a temporary hardware malfunction. If it is determined that a permanent error exists on a disk pack, it must be repaired. Backup copies may be restored. This procedure, however, loses any changes made since the backup was taken. Alternately, the MUSIC system programmer can be consulted. Often errors can be corrected without loss of data.

Taking A System Dump

If it is decided that the system should be restarted, the operator should note the console status indicators (PSW, system light, wait light -- see the appropriate processing unit operators' procedures). A main storage dump should be taken if the cause of the failure is not known. This can be done by loading from the disk pack labeled MUSIC1. A full storage dump will be placed onto a data set on that pack. After the system is restarted, this dump can be printed using the storage print utility (PRDUMP) described in *Chapter 17 - System Utility Programs*.

The dump program will normally print the message `DUMP OK` when it has finished. The message `DUMP DID NOT ALL FIT ON DISK` will be issued if the disk data set was too small to hold the dump. The portion that did fit will be correct. By default, the dump data set will hold 16 megabytes (16384K) of storage.

The dump program expects a console address of 01F or 009 working in 1052 mode. If this is not the case then no messages will print and a disabled wait state with PSW ending FF03 will result, although the dump

operation will not be affected.

The stand-alone dump program is placed on the MUSIC1 volume by the DMPGEN program. Refer to the DMPGEN job in file $GEN:DMPGEN.SAMPLEJOB for the required control statements. A DMPGEN job should be run whenever the size or location of the dump data set is changed. Note that the dump data set (normally PGMDMP on volume MUSIC1) must have only 1 extent.

Chapter 5. Routine Maintenance

Overview

The following is a guide to what programs and utilities should be run daily and weekly. They assume an environment where MUSIC is in full production use and that daily backup and accounting information are critical. Full documentation of the utilities are described in *Chapter 17 - System Utility Programs* of this publication. Techniques of dumping full packs are discussed later in this chapter.

Daily Activities

Perform the following steps on a daily basis at a time when the system is not usually busy.

- Run jobs to print statistical counters. These jobs invoke the COUNTS, WAITS, IOTIME and LIBSPACE programs. These outputs are useful for tuning MUSIC and for tracking the usage of Save Library space.
- At this point you can optionally re-load the system to reset the statistical counters and close the accounting file. Usually you should issue the "/MESSAGE ALL" command five minutes before shutdown to warn the users of the shutdown.
- Run the CODUMP utility to produce a backup copy of the code table. (Store this tape in a secure place as it contains the passwords for all MUSIC codes.)
- Run the session accounting program ACTDMP to produce accounting records for the day's activity.
- Run the NOWDOL utility to update the NOW$ field in each code record. This step uses the records produced by the ACTDMP utility.
- Run the MFARCH and MFCHEK utilities to dump to tape all files that have changed since the last backup operation.
- Run the DSARCH utility to dump to tape all UDS files that have the BACKUP attribute.

Once a Week Activities

The following should be run once a week in addition to the above. They need not all be done on the same night.

- Run MFACCT to produce Save Library accounting records to be used with your billing program.
- Run DSACT (DSACT1, DSACT2) to produce UDS accounting records to be used with your billing program.
- Dump entire disk volumes. These backups are used only in disastrous situations such as if an entire pack is dropped or otherwise made unusable. Dumping entire packs takes considerable longer than the

special MUSIC backup utilities. All packs should be dumped once a week for backup purposes. You must make sure to dump the packs that have MUSIC Save Library data sets at the same time. Dumping them on different nights means that the Save Library data sets cannot be used from the restored copies. Make sure that the MUSIC system is shut down while these dumps are taken.

The VM DDR utility can be used to dump all supported disk types. See the *MUSIC/SP Administrator's Guide* for a description of how to perform these full pack dumps.

- Run ELOG.CLEANUP to delete any empty editor log files. (The AUTOSUB utility can be used to automatically run this job.)

- The output from the LIBSPACE utility should be inspected to make sure that there is a sufficient amount of free space on the Save Library. Careful note should be made of the amount of space available in the largest 5 extents of each space as that might limit the saving of large files. Additional space can be added as explained under the heading "Adding Space to the Save Library" in *Chapter 6 - System Reconfiguration*.

Maintaining the User Code Table

The dumping and restoring of the user code table is accomplished using the MUSIC utility CODUMP.

The frequency of the dumping of the user code table is determined by the installation. It is also necessary to occasionally restore the code table as this serves to compress its index records and eliminate lost space due to deleted user codes. A detailed description of the use of this utility can be found in *Chapter 17 - System Utility Programs* of this manual.

Maintaining the News Facility (/NEWS)

The /NEWS command allows general users to obtain information about recent items of interest at your installation. This command runs the file $PGM:NEWS.DATA. To modify the message, simply edit this file and find the line starting with NEWS. Items added immediately after that line will be displayed first. The lines entered are displayed line by line as they exist on the file.

Broadcast Messages At Sign-on

It is possible to set up two files containing broadcast messages that will be displayed on the user's terminal at sign-on time. These messages are in addition to the one resulting from the /DAILY operator command. The two file names are $PGM:ALERT.FILE and $PGM:ALERT.NEWS. They can each contain an 80-byte 1-line message, with optional carriage control in column 1. The files must be public (PUBL attribute). If either file does not exist or is empty, the corresponding message is not issued. One of the files could be used by operations staff and the other by software support staff.

Typical usage would be to create a $PGM:ALERT.NEWS file, with a message such as "Type NEWS for info on ...", whenever an item is added to NEWS. Delete the file after a day or two.

Maintaining the HELP Facility

The HELP facility maintains a log file of request for topics that do not currently exist. This file can be examined by editing the file $HLP:@GO.NOINFOLOG. You may delete lines from this file once the requests have been noted. You can add extra HELP files. Consult the *MUSIC/SP Campus-Wide Information Systems* (*CWIS*) *Guide* for full details. This guide discusses IDP (Information Display Program) for creating and editing help facilities.

Use IDP to MUSIC's main help facility: $HLP:HELP. Edit the file $HLP:@GO.HOURS to update your installation's hours of operation. Edit $HLP:@GO.ROUTE to update your installation's route destinations. Edit $HLP:@GO.FORMS to update your installation's code numbers for special forms.

Maintaining the New User Automatic Userid Facility

This program front-ends the new user registration process. The putative new user is presented with four or five screens, each of which can contain explanatory text that the site can modify. Various operating modes such as no code allocation, code allocation with disabled access until validated, or immediate code allocation with notification of what has been done, are selectable via the parameter file. Anonymous e-mail to the system administrator can be sent if there is a problem that needs lookin at. Validation against a MUSIC data file is available (the file contains names and id information). Fix-ups to generate a unique userid are automatically done, and may also be disabled if this is not desirable.

This should be run on a userid such as NEWUSER with the CODES, LSCAN and FILES privileges, AUTOPR($INT:NEWUSER), NONCAN, NOMULTI, RESTR, MAX$(NOLIMIT).

The following files contain the text for message screens:

$INT:NEWUSER.MSG1	text for the initial welcome screen
$INT:NEWUSER.MSG2	text used to prompt for user information
$INT:NEWUSER.MSG3	text used to query for a password
$INT:NEWUSER.MSG4	text announcing success (may require validation depending on your site's parameter settings)
$INT:NEWUSER.MSG6	text used to indicate an error (user not allowed to register, for example)

The file $INT:NEWUSER.VALIDUSRS contains a list of users allowed to register. To use this list, specify the OTHERINFO VALIDATE option in the parameter file. The new user's name and "other-info" data will be matched against what is in the file. Only a successful match will allow the user to continue.

The file $INT:NEWUSER.PARMS contains the following keywords:

```
TITLE            <text> | OFF
NOTIFY           <e-mail address> | OFF
ALLOCATE_USERID  IMMEDIATE | DEFER
ACTIVATE_USERID  ON | OFF
GENERATE_USERID  SERIAL | NAME | RANDOM
USERID_PREFIX    <text>
CODEPARMS        <codupd commands>
```

```
PHONEINFO        REQUIRED | OPTIONAL
ADDRESSINFO      REQUIRED | OPTIONAL
OTHERINFO        REQUIRED | OPTIONAL | VALIDATE
FIXUPS           ON | OFF
TESTMODE   (Note: use ONLY for testing, not for production)
```