MUSIC/SP

Version 5

Release 1

Teacher's Guide

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Preface

About this Guide

This publication describes how teachers can use MUSIC/SP (Multi-User System for Interactive Computing / System Product) to communicate with their students and manage their courses. It provides guidance in choosing various MUSIC/SP facilities related to the academic environment. It also contains information on how MUSIC/SP can be used to teach computer programming.

Previous knowledge of computer programming languages is not required to use MUSIC/SP. The guide is designed so that you may read only the chapters that interest you.

No matter which field of study, there are many tools to help you and your students throughout the school year. Several applications and services are available with MUSIC/SP, such as electronic mail, campus-wide information systems, conferencing, etc.. Many are explained in this guide along with references to other sources of information.

If you are not familiar with computers, you should refer to the *MUSIC/SP Guide for New Users* for step-by-step instructions on the basics of MUSIC/SP. More experienced computer users will find the online help, provided with each MUSIC/SP application, is all that is needed to get started.

The goals of this guide are to:

- Describe and show examples of the tools that were specifically designed to help you in the teaching process.
- Show you how you can integrate MUSIC/SP applications into your office routine and course curriculum.
- Suggest ways of using MUSIC/SP to improve communication with and between your students.
- Provide teaching aids, hints, and suggestions on how to introduce the facilities of MUSIC/SP to your class.
- Describe the various programming languages and tools that can be used, and give sample programs that can be tried in your class.

When the term *MUSIC* is used in this publication, it refers to MUSIC/SP.

Chapter Outlines

Chapter 1 - Introduction

The introduction touches on the topic of computers in education. An overview of the MUSIC system is given, explaining how MUSIC can benefit those in an academic environment.

Chapter 2 - Facilities

This chapter describes the facilities on MUSIC that are important to teachers and their students. For example, getting help, working environments, menus for teachers and students, are all explained.

Chapter 3 - Communications

There are several facilities to help you communicate with students and colleagues. This chapter describes electronic mail, conferencing, campus-wide information systems, etc..

Chapter 4 - Managing Userids and Files

This chapter gives general information about userids, and how they are assigned to students. Also, the file structure on MUSIC is described.

Chapter 5 - Managing your Course

The Course Management Facility (CM) for managing class assignments, maintaining class lists, and sending electronic mail to your class is described.

Chapter 6 - Introducing MUSIC to your Students

This chapter contains the basics that your students will need to work with MUSIC. It is a teacher's kit that includes material for transparencies such as: how to sign on, use the editor, electronic mail, and access course material, etc..

Chapter 7 - Teaching Programming

This chapter shows how students use the FSI facility for easy access to language processors and compilers. In particular, Programming with REXX is introduced and shown how it is used with MUSIC.

Chapter 8 - Electronic Mark Submission (EMS)

This chapter describes a Mark Submission program that can be tailored for your site. Teachers can add marks to classrolls and submit them electronically.

Glossary

Defines the common terms used throughout this guide.

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 1996), 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* (April 1996), 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).

- *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.

Trademarks

Chapter 1. Introduction

Introduction

This guide is designed to show teachers how to use the various MUSIC/SP facilities related to the academic environment. Experienced computer users will find the online help, provided with each MUSIC/SP facility, is all that is needed to get started. If you are not familiar with computers, the *MUSIC/SP Guide for New Users* offers an introduction to MUSIC/SP in a tutorial fashion.

No matter which field of study, there are many tools to help you and your students throughout the school year. Several applications and services are available with MUSIC/SP, such as electronic mail, campus-wide information systems (CWIS), conferencing, etc. Many are explained in this guide along with references to other sources of information.

The guide includes many chapters that are of general interest and some chapters that are more specialized. Read only the chapters that pertain to your situation.

What is MUSIC/SP?

MUSIC/SP (Multi-User System for Interactive Computing / System Product) is a package of software that includes a multi-user, multi-programming operating system together with many integrated applications. MUSIC/SP (MUSIC for short) efficiently and reliably supports a large number of concurrent users from different types of workstations (terminals and personal computers). The users have access to an efficient file system and a wide spectrum of applications and facilities. These include:

- Electronic bulletin boards
- Full text searching
- Electronic conferencing systems
- Electronic mail
- Word processing and office functions
- High level programming languages
- Application development tools
- Statistical software
- Graphics
- PC connectivity
- Online MUSIC manuals and help

Chapter 2 - Facilities briefly describes the MUSIC applications used in an academic environment, and *Chapter 3 - Communications* describes electronic communications. Once you know what is available, you are ready to try these facilities.

Why use MUSIC?

MUSIC has many features and facilities specifically developed for the academic environment. For example, included is the ability to create userids for an entire student class with one menu. Students can be prompted to fill in their names when they first sign on. Teachers can send mail to the entire class or specific individuals. They can also perform administrative functions for their students and so reduce the demands on the central support personnel. A facility is included to help teachers create and manage course information files.

MUSIC was developed at McGill University to meet their diverse computing needs. It has evolved into a flexible vehicle particularly suited to support academic institutions of all kinds. Large and small universities,

and two- and four-year colleges have found MUSIC to be an efficient, cost-effective means of fulfilling their expanding computing requirements. High-schools find that MUSIC provides them a way of offering higher education services to prepare their students for the future.

Some of the principal benefits the system provides include:

- An easy-to-use system for students, faculty and administrators. Online manuals provides quick search, and this information can be extracted for handouts.
- Teachers can communicate with students through conferencing, bulletin boards, and e-mail. These methods of communication provide students and teachers with additional office hours at their convenience. Students and teachers can communicate to colleagues on campus or throughout the world.
- Educational support features.
- Security and management controls.
- Flexibility and adaptability for varied campus uses.
- Transparent interface to many computing systems.
- Compatibility with DOS, CMS, TSO, UNIX, AIX.
- Proven reliability.
- User support organizations.

MUSIC User Organizations

MUSIC is currently used by about 200 educational institutions worldwide. They, in turn, support typically thousands of individual students. This yields an estimated 1/3 million worldwide users of MUSIC.

The MUSIC User's Group, Inc. (MUG) serves as a vehicle to exchange ideas about the use of MUSIC in schools, colleges, universities, and industry. This group holds a conference once a year in either the United States or Canada. Articles of interest to MUSIC users are published in the MUG newsletter, *MUSIC News*, and distributed to all members. The group also distributes programs and documentation developed at various sites.

Other organizations that have been established include: *MUG Japan* to serve the Japanese sites and *Grupo de Usuarios MUSIC* (*GUM*) to serve the Brazilian sites.

Electronic discussion lists for MUSIC users and administrators have been established to provide daily exchange of information through LISTSERV software.

Computers and Education

Many educators feel it is important that students have computer experience in any field of study. They are considering ways to integrate computer-related activities into the curriculum - thereby, preparing students for today's "high-tech" society.

In the past, computers have been used mainly for learning programming languages and analyzing statistics. Now students use the computer for much more, including word processing, electronic mail, and information searching. Having the computer as a new tool opens up many possibilities to make teaching and learning

more exciting.

New Communication Methods

The schoolhouse model of education with a fixed schedule of classes has been the norm for many centuries. However, it has some major deficiencies: One, is that it is basically a one-way communication vehicle. Only in small classes can two-way communication be effective. Today's reality of large classes has led to limited feedback opportunities.

New approaches, such as electronic conferencing and computer network systems, are making it increasingly possible to take education to the student instead of vice-versa.

For example, a teacher can ask students to complete assignments and provide grades and evaluative comments all via electronic mail. Class discussions can be carried through electronic conferences where everyone gets a chance to participate and see each other's responses. Students can interact with each other on projects using either electronic mail or through electronic conferences. In addition, course materials could be available as online databases, or students could have access to commercial databases for class work.

There are no geographical boundaries associated with such a class, students could be located anywhere, as is the case with distance learning.

Time devoted to Teaching Tasks

A considerable portion of a teacher's time is spent making up and grading tests, keeping track of grades, scheduling students activities, creating and revising lesson plans, and writing reports or proposals. The use of applications software can help teachers reduce the amount of time devoted to non-teaching tasks. Time saved on these administrative duties could be channeled into teaching and student activities.

Networking with your Colleagues

Many schools and colleges are electronically linked to each other. Most of these networks allow teachers to exchange information and ask questions of their colleagues. This can save valuable time since there is almost certainly someone out there that has similar interests to you. They can help you get started in new areas you want to pursue. You can exchange helpful information and even work on a common project.

See *Chapter 3 - Communications* for information about the different methods of communicating electronically.

Chapter 2. MUSIC/SP Facilities

MUSIC Facilities

Overview

This chapter introduces you to a variety of facilities provided with MUSIC. Some of these facilities are covered in more detail in later chapters. Facilities relating to electronic communications are covered in Chapter 3. Specifically, the topics covered in this chapter include:

- Menu-driven Working Environments
- Course Management Facility - CM and CI
- Online Help and Online Manuals
- The Editor
- Time, Office, and Documentation Organizer - TODO and SCRIPT
- Programming - REXX, DEBUG, PANEL, PIPE
- Tailoring Menus - TMENU

Working Environments

MUSIC can use a menu approach to walk you through the various choices of applications and options provided. You can set up your own tailored menu for your students or use ones provided with the system.

The working environment when you sign on to MUSIC, will be either MUSIC's command mode (*Go mode) or a menu environment such as the FSI (Full Screen Interface) menu environment (figure 2.1). Most new users prefer the menu approach. (*Chapter 6 - Introducing your Students to MUSIC* describes how to teach the basics of MUSIC to your students, including how to sign on. It may also help you if you are a new user.)

*Go Mode

If you receive the *Go message after signing on, then you must type in the name of the program you wish to access. For example, typing "FSI" will invoke FSI. To see a list of available commands enter "HELP COMMANDS".

FSI (Full Screen Interface)

The Full Screen Interface (FSI) allows you to access various components of the MUSIC system through a series of selection menus. Figure 2.1 shows the screen display for FSI:

```
Help   End    Up     Down   Top    Bottom Main   Scan   Find   Topic  Quit
--------------------Full Screen Interface for MUSIC------------------ Page 1/1
Command ===>

 Place the cursor on an item and press ENTER or RETURN.

 MUSIC tools:
    Mail          Electronic mail facility
    Programming   Compilers, processors, tutorials, etc
    CI            Course Information
    Internet      Internet access, news reader, gopher, etc
    More          Other general MUSIC tools
 MUSIC files:
    FLIB*         Full Library Screen for current directory
    FLIB          Filespec=> _                    < pattern
    FUTIL         Other file related utilities
 MUSIC environment:
    Help          General help and online documentation
    New Password  Change your password
    Defaults      FSI customization
    Profile       Profile utility and options
    Disconnect    Terminate your session and disconnect from MUSIC
    \Suggest      Make a suggestion or send a comment to support staff

F1=Help     F2=Suggest     F3=End       F9=Find        F12=Retrieve
```

Figure 2.1 - Main Selection Screen of FSI (*Full Screen Interface*)

Other menu facilities that you may want to access are described throughout this guide. For example, the command "CM" invokes the Course Management Facility designed especially for teachers.

Course Management Facility (CM)

The Course Management Facility allows you to communicate with your class via the MUSIC system. You use the CM command to manage the course material and the students use the CI command (Course Information) to access the information you have prepared. (CI is a full screen tool, like FSI, easy to use.) Basically, there are three components that make up CM:

- It allows you to create and manage files and make them accessible to the class in the form of notes, assignments, or a course outline. For data integrity, students can read these files but cannot change them.

  Note: Your files remain private (students cannot view them) until you specify otherwise. This is important for examination files!

- The system maintains a class mailing list. This list contains the userids and names of the students in the class. It is used to send mail to individuals or the entire class.

- You are also able to manage the students computer resource allocations and change their passwords. This is done using the TRANS$ program.

Here are examples of some files that your students can access through CI:

- course synopsis
- phone number and office hours
- evaluation scheme
- lecture schedule
- assignment schedule
- exam schedule
- reading list

These files could include notes, sample problems, assignment solutions, old exams, PC software, data, or whatever. From the CI program the student can view these files, print them, copy them to their own library and download them to PCs.

Further Information: *Chapter 5 - Managing your Course* describes the CM (Course Management Facility) and CI (Course Information) programs.

Online Help (HELP)

An extensive general help facility is provided with MUSIC. To access this facility press F1 or type "HELP" in *Go mode, or select the HELP item from the FSI menu. In addition to this facility, each MUSIC program includes help. When you need help press F1 or type "HELP" to receive information about the current screen display.

Note: If you wish to see the general help facility while using a program on MUSIC, enter "/HELP" in the command area on the screen. The slash (/) tells the current program to issue a MUSIC command (not one of its own commands).

Also, MUSIC includes a program for developing help facilities that can be easily added to your applications. The help text can provide context sensitive or field sensitive help when the help key is pressed. Once the user has requested help, he or she can page back and forth and skip from one topic to another inside the help facility, before returning to the host-application.

Online Manuals (MAN)

MUSIC manuals can be accessed online by using the command "MAN". Sections of these documents can be printed or copied to a user's file, as required. This allows you to get a hardcopy of a particular portion of the manual. It also allows you to tailor-make course handouts based on material in the manuals.

The manuals have been pre-processed for "full text searching". Your own documents could also be processed this way. The utility called "ITSBLD" is documented in the *MUSIC/SP Campus-Wide Information Systems* (*CWIS*) *Guide*. This program indexes documents such as policy manuals, minutes of meetings, video tape libraries, and user manuals. Users can then do quick online searches of the documents (as in MAN). For example, any word in a 1000 page document can be located in less than a second. The actual text is displayed with the particular word highlighted.

To access MUSIC manuals enter "MAN" when you are in *GO mode, or from FSI choose the HELP item.

Once "MAN" is invoked the program can search through text looking for specific words. The entries containing these words can be displayed on your screen or copied to a file by using the appropriate function key. Figure 2.2 shows the screen display for accessing online manuals.

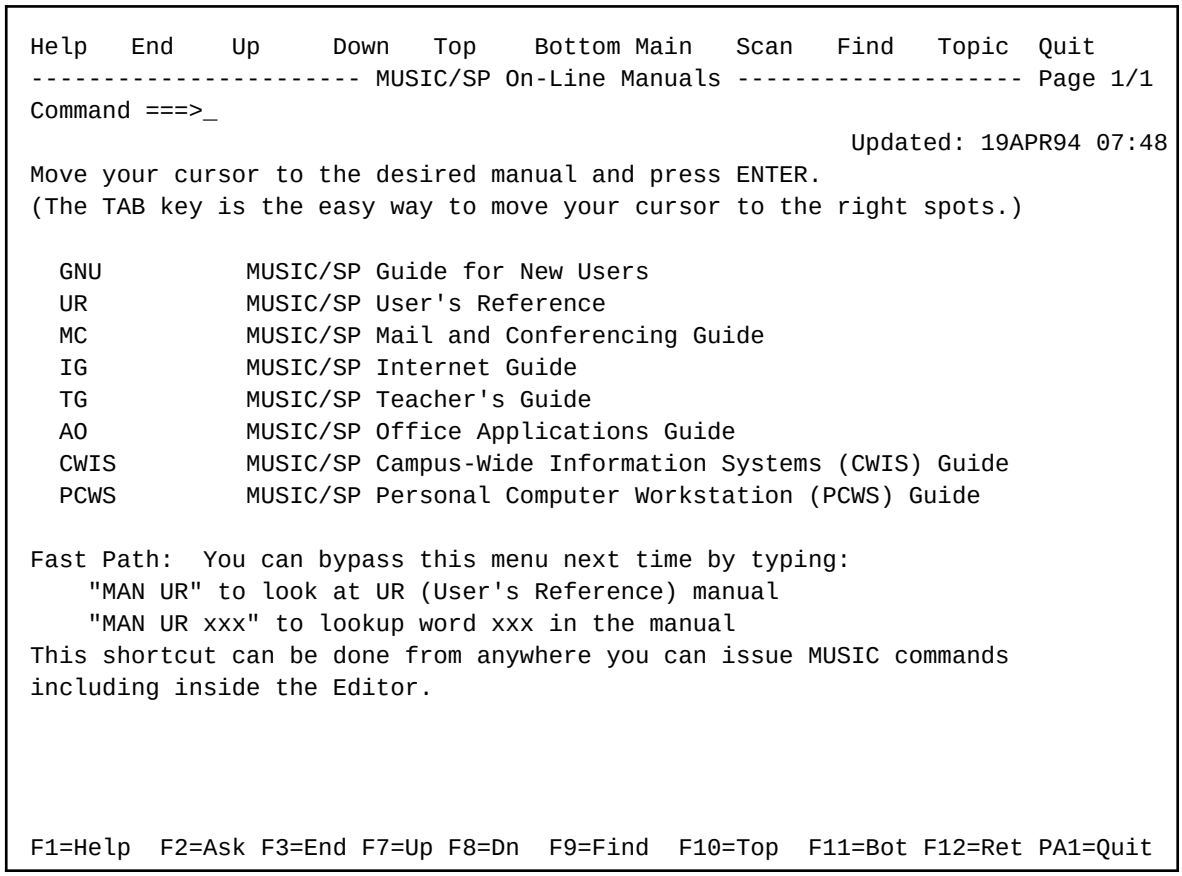


Figure 2.2 - Online Documentation

Copying Text from Online Manuals

This section shows you how to copy text from a manual into a file. The following steps describe how to create a file containing the section "Editor Concepts" found in the *MUSIC/SP Guide for New Users*.

Step 1 Enter the command "MAN". When the "MUSIC/SP On-Line Manuals" screen (figure 2.2) is displayed, move your cursor to "GNU" and press enter. The following screen appears:

```
MUSIC/SP V5.1 Guide for New Users - 27MAY96
--------------------------------------------------------------------------------
MUSIC/SP Indexed Text Searching Facility

Sample search patterns:
     manage         Look for only the word "manage"
     manage*        Look for words starting with "manage" such as "management"
     mail email     Look for entries that contain both words
     mail or email  Look for entries that contain either word

Table of contents
     =cs            Use this search word to show summary of contents
     =c             Use this search word to show full contents


--------------------------------------------------------------------------------
Enter search pattern below:

=> _

--------------------------------------------------------------------------------
F1:Help  F3:Quit search facility  F6:New search  ENTER:Begin search
```

Figure 2.3 - MUSIC/SP Guide for New Users

Step 2

To find the section on "Editor Concepts" you need to specify a search pattern as in figure 2.4 below. Type "editor concepts" and press enter.

```
--------------------------------------------------------------------------------
Enter search pattern below:

=> editor concepts_

--------------------------------------------------------------------------------
```

Figure 2.4 - Specifying a Search Pattern

Step 3

On the next screen (figure 2.5) a list of matches to your search pattern is displayed. Select the third choice "Editor Concepts" by placing the cursor anywhere on that line and pressing enter.

```
00003 Match(es) found. To view an entry: TAB cursor to entry and press ENTER

0001 >1.1.5.1  Menu Facilities
0002 >3.1.1  Overview
0003_>3.1.2  Editor Concepts









--------------------------------------------------------------------------------
Copy entire text of entries numbered  ____  to  ____ to disk
F1:Help  F3:End search  F5:Copy summary  F6:New search  F7:Up page F8:Down page
PA1:Quit search facility
```

Figure 2.5 - Search Pattern Found for Online Manual

Step 4

The following screen (figure 2.6) shows the first page of the section you have selected. Once this is displayed, press the the F5 key to copy.

```
Entry: >3.1.2  Editor Concepts
------------------------------------------------------------------------------
>3.1.2  Editor Concepts

  Before using the Editor for the first time, there are some concepts you
  should understand.  You need to know about:  rules for choosing file names,
  Editor modes, and an overview of the steps needed to start and end an edit
  session.

File Names

  A file name can be up to 17 characters in length.  Each character of the name
  can be any letter (A-Z) or any number (0-9) or any of the special characters:
  # (number sign), $ (dollar sign), @ (commercial at sign), _ (underscore), or
  . (period).  In addition, the first character of the name cannot be a number
  or a period and should not be the @ symbol.  Blank spaces cannot be used.
------------------------------------------------------------------------------
Command=>
*000098 lines of text copied to end of file ITSCOPY

F1:Help  F2:Top  F3:End view  F5:Copy  F6:New Search  F7:Uppage  F8:Downpage
F10:Prev entry    F11:Next entry  PA1: Quit search facility
```

Figure 2.6 - Copying text to a file

Once F5 is pressed the following text appears on the screen:

```
---------------------------------------------------------------------
Type in command area...

  COPY aaa   to copy to MUSIC file aaa
  COPY c:aaa to copy to pc file on drive C
  PRINT location  to print to given location
  SEND aaa to send as e-mail to given address
---------------------------------------------------------------------
```

For example, to copy "Editor Concepts" into a file called "ED.CON" enter the following in the command area:

```
copy ed.con
```

EDITOR

The Editor is a general purpose program used for creating and modifying files. You may input, insert, change and delete lines or character strings using concise and powerful commands.

Text can be marked (blocked) to identify areas to be moved, copied, deleted, globally changed, or stored in

other files.

Editor macros (programmed sequences of editor commands) can be written in the REXX language, thus extending the power and flexibility of the editor.

The editor provides you with maximum protection for data integrity by making all modifications to a temporary copy. When you are satisfied with the changes, you can instruct the editor to apply them permanently.

The editor includes a help facility to provide interactive assistance on command syntax and use of editor commands.

The Editor restart feature automatically protects users from losing all of the results of an edit session abnormally terminated due to system failure, line disconnection, etc.. This is accomplished through the use of an internal log file. Users are automatically stepped through the restart procedure if their last edit session ended abnormally. This restart could be performed even days after the failure.

Further Information: For more information see *Chapter 6 - Introducing MUSIC to your Students*.

Electronic Office

TODO

TODO (Time, Office, and Documentation Organizer) is a menu facility that offers items for the electronic office. The calendar and schedule management applications are included. You can use this facility for your own office work or as a tool in teaching electronic office concepts.

SCRIPT

This text processing program and its utilities are useful in the preparation of documents. They can be as small as single page memos or as large as texts running into the hundreds of pages. In an academic environment these could include term papers, assignments, and theses.

The spell checker uses an impressive 90,000 word dictionary.

Optionally, the IBM DW/370 product can be installed to offer additional functions.

Further Information: For complete details, see the *MUSIC/SP Office Applications Guide*.

Programming

MUSIC supports a large variety of language processors. They can be used to develop applications or to teach programming. The language processors currently supported by MUSIC are listed below:

APL
Assembler
BASIC
- IBM BASIC/MVS
- IBM VS Basic
- Waterloo BASIC

C
- IBM C/370 Version 2
- IBM C/370
- Waterloo C

COBOL
- IBM VS COBOL II
- IBM OS/VS COBOL
- WATBOL

FORTRAN
- IBM VS FORTRAN
- IBM FORTRAN IV
- WATFIV

PASCAL
- IBM VS PASCAL
- Waterloo PASCAL

PL/I

REXX

RPG
- IBM SAA RPG/370
- IBM RPG II

Further Information: For more information type "/HELP PROCESSORS" or refer to the *MUSIC/SP User's Reference Guide*. *Chapter 7 - Teaching Programming* includes examples written in VS PASCAL, VS FORTRAN and REXX.

REXX

The REXX programming language has been designed to make programming easier. It is a structured language that can be used to introduce students to modern programming concepts. Included in Chapter 7 is a topic called "Programming with REXX". This topic is designed for both the programmer and non- programmer. Sample applications are shown to illustrate the use of this modern language.

DEBUG

The Debug facility enables you to debug programs running on MUSIC at the machine language level. You can scroll up and down through main storage. The Program Status Word, any of the 16 general purpose registers, and main storage can all be modified. You can single-step through your program or set breakpoints.

Further Information: Online help is available once the program is invoked (Enter "DEBUG" to invoke the program).

PANEL

The Full Screen Panel Generator program is called PANEL. It provides a facility to present an entire screen full of information and have the user enter multiple data items with only a single I/O operation. This is referred to as full-screen I/O. The PANEL system has been written to allow easy access to full-screen I/O from high-level languages. All that is needed is some understanding of the basic concepts of screen formatting. No knowledge of 3270 protocol is required.

Further Information: For more information type "/HELP PANEL" or refer to the *MUSIC/SP User's Reference Guide*.

Subroutines

More than 100 subroutines are provided with MUSIC. They allow users of high level languages to access time, date and user information, perform bit and byte manipulation, enhance FORTRAN's I/O capability, and provide workstation prompting options, etc. Others provide for dynamic access, creation and deletion of files. Additional routines can be easily added by the installation.

Further Information: For a list of available subroutines, type "/HELP SUBROUTINES" or see the *MUSIC/SP User's Reference Guide*.

PIPE

MUSIC includes programming pipe command support via optional software, if it is available. It can be used with MUSIC to support a pipe line concept familiar to PC, AIX and UNIX users. It allows program components to be "plugged" together to form new applications. These pipes take the output of one program and "pipe" it into another. Reformatting or massaging of the data between the components can be handled by the rich set of pipe functions.

Further Information: For more information type "/HELP PIPE" or see the *MUSIC/SP User's Reference Guide*.

Computer Architecture

The Mac-1 architecture has been implemented on MUSIC, via a program called "MAC1". Mac-1 computer architecture design can be characterized as a stack oriented machine with 12-bit addressing, expanding op-codes, a single register, and a word size of 16-bits.

Mac-1 Conventional Machine Level and Mac-1 Assembly Language Level - Version 1.1 is offered through MUSIC's CSL (Computer Software Library) and FSI.

Further Information: More information can be found in the file called "MAC1.DOC".

TMENU - Tailoring User Views

TMENU is the name of the program on MUSIC for creating tailored user views (menus) on MUSIC. This facility is available for making your own menus, or tailoring existing menus to better suit your needs.

Further Information: For details refer to the *MUSIC/SP Office Applications Guide* or type "/HELP TMENU" for online help.

Note: The CM facility for teachers (described in *Chapter 5 - Managing Your Course*) also has a method for changing student menus.

Graphics and Statistics

The statistical and graphics packages that run with MUSIC provide users with the tools to get the job done. In the statistics area, STATPAK, MINITAB®, and SAS® software provide a full range of options that will satisfy both the beginning and the professional statistician.

Graphics

The following GDDM(tm) (Graphical Data Display Manager) products are supported under MUSIC and can be ordered through IBM.

GDDM/MVS (including PCLK feature) 5665-356
GDDM-PGF (Presentation Graphics Facility) 5668-812
GDDM-IMD (Interactive Map Definition) 5668-801
GDDM-IVU (Image View Utility) 5668-723

GDDM is a versatile series of IBM programs that provide presentation services in host computers. It has particularly powerful facilities for creating, showing, and storing pictures. GDDM drives displays, printers, plotters, and scanners. It handles both vector graphics and images. As well as pictures, it supports alphanumerics. Included are several easy-to-use utilities for users, together with a powerful, versatile application programming interface.

The MUSIC interface for the SAS® System (SAS Institute Inc.) also includes support for SAS/GRAPH® software. SAS/GRAPH® software is a device-intelligent system for producing information and presentation graphics.

MINITAB's high-resolution graphics is supported.

Statistical Packages

A variety of popular third-party software is supported on MUSIC. Included are: SAS® System (SAS Institute Inc.), MINITAB® (Minitab Inc.), and STATPAK (McGill University).

Inquiries about MUSIC interfaces for these software options should be made directly to the MUSIC Product Group.

Simulation (GPSS)

The IBM General Purpose Simulation System (GPSS V Program Product 5734-XS2) is a digital simulation program for conducting evaluations and experiments of systems, methods, processors, and designs. The program provides many facilities to simplify simulation programming and produce reports.

Computer Aided Learning (CAL)

The following computer aided learning products are supported under MUSIC and can be ordered through IBM. Interactive Instructional Authoring System (IIAS) program product 5668-011 and Interactive Instructional Presentation System (IIPS) program product 5668-012.

Courses are written using the IIAS product which features macros to ease the writing of course materials. IIPS is used to run the courses. It can gather wrong answers to be used as feedback to improve the courses.

Chapter 3. Communications

Introduction to Communications

MUSIC provides several ways to exchange information electronically. You and your students can communicate through electronic mail or participate in different conference topics. This chapter describes the following methods for exchanging information:

- Campus-Wide Information Systems (CWIS)
- Electronic Mail
- Conferencing
- Discussions Lists
- News Reader
- Logging on other Computers
- Transferring Files to/from other Computers
- Gopher

Campus-Wide Information System

This facility can perform the same function as the paper version of a campus bulletin board. The electronic version has many added benefits. The information can be updated by the authors and available immediately throughout the campus. Feedback on any item on the bulletin board can be automatically routed to the author of that section, bypassing the need to feed the information through an intermediary.

The following figure shows a sample CWIS that you can try by entering "CWIS.SAMP".

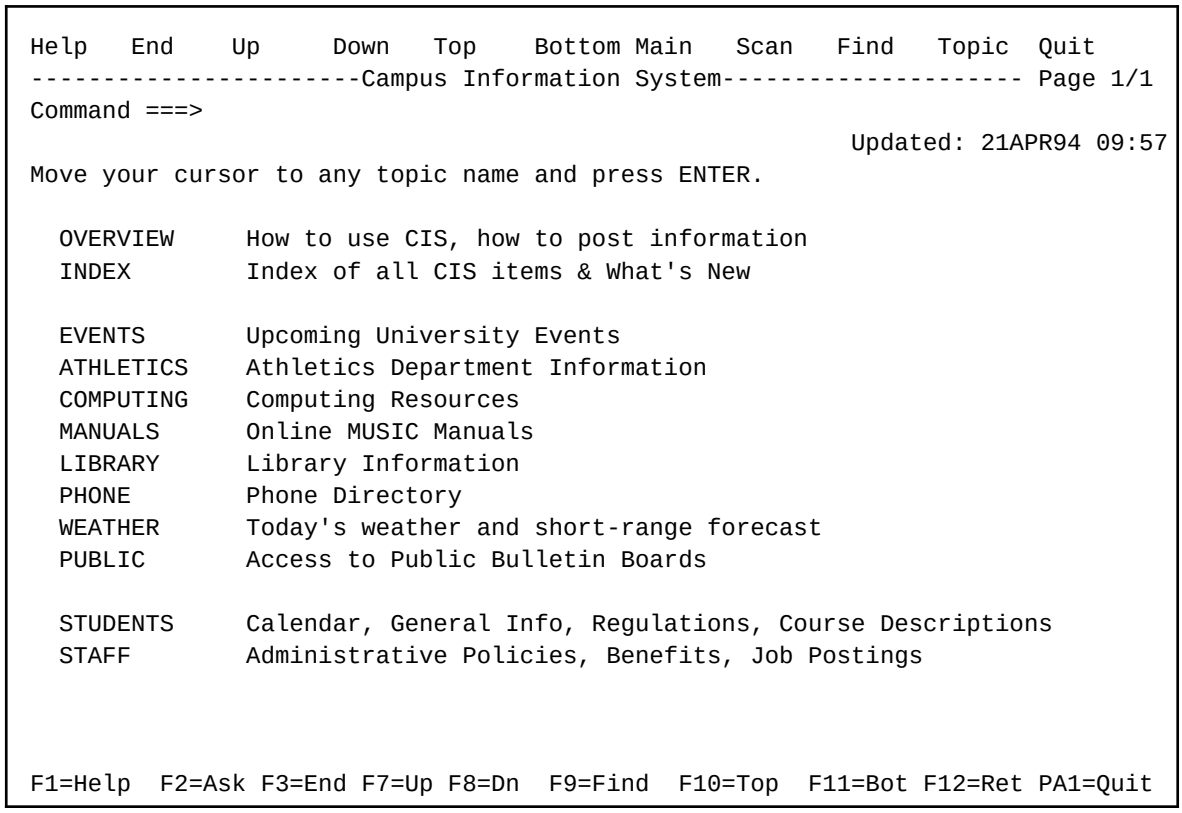


Figure 3.1 - Sample CWIS

Further Information:

The IDP (Information Display Program) is used to create and maintain a CWIS. Type "/HELP IDP" or refer to the *MUSIC/SP Campus-Wide Information Systems* (*CWIS*) *Guide* for more information.

Electronic Mail

The integrated MAIL system includes useful features for the beginning or advanced user. In an academic environment, it is invaluable for the distribution of notes and assignments. Students no longer have to go to the professor's office to ask a question and the professor need not be in the office to provide an answer. In addition, the MAIL system connects to the international academic electronic mail networks, providing your professors and researchers with electronic mail and file transfer services to their colleagues throughout the world.

BITNET and INTERNET are two international academic electronic mail networks. If your institution belongs to BITNET or INTERNET, then you can send email to other computer sites. You can also join electronic discussions (conferencing with other sites) and share files from other sites (FTP).

The MAIL facility is available for sending and receiving mail from inside or outside the MUSIC system. In addition, this facility provides you with tools to manage your incoming and outgoing mail, keep records, and tailor your own working environment.

To invoke the MAIL program, select it from the current menu or enter: `MAIL n`
where MAIL is the name of the program and *n* is the optional menu selection (listed on the main menu of

MAIL). When "MAIL" is invoked, the following menu screen appears:

```
------------------------------- Mail Facility --------------------------------
Command ===>

Enter an option from the list below or a command, then press ENTER to process
the request.
Mail For ===> Joe White                                          (ID/nickname)

 1  Read Incoming Mail
 2  Create and Send Mail
 3  Outgoing Mail (Acks and Unrec'd)
 4  Mail Directory
 5  Mail Profile
 6  Public Directory
 7  Mailbook Facility
 8  List Manager
 9  What is new in the Mail Facility
 A  Frequently Asked Questions (FAQ)
 X  Exit                                          COUNTS:
                                                      9 Incoming New Mail
                                                      7 Incoming Old Mail
                                                      3 Acknowledgements Waiting
                                                      0 Unreceived Outgoing Mail
------------------------------------------------------------------------ 13.43.28
F1=Help  F3=End  F12=Retrieve
```

Figure 3.2 - Mail Facility Screen

Sending Mail to Students

The CM facility for teachers provides an easy method for sending mail to the students in a particular class. When you choose the item "MAIL" from the CM menu, a class mail list is presented. You can select certain students or the whole class to receive your mail.

Further Information

The MAIL program provides help for each screen display as you are using the program. For information about the entire program enter "/HELP MAIL" or refer to the *MUSIC/SP Mail and Conferencing Guide*.

Conferencing

An electronic conference allows a group of users to discuss topics of mutual interest. For example, students may want to discuss ideas on a particular issue. Traditionally, this is done by getting everyone together for a meeting. This involves planning an appropriate time for the meeting as well as making sure everyone's idea is heard. Minutes of the meeting are then prepared and distributed.

Electronic conferencing allows the group to immediately start inputting solutions to the issue. Everyone has a chance to add their comments at their convenience. They can see what is said before and agree, disagree, or add additional insights into the topic.

An electronic conference typically contains several topics that you can add your comments to. Usually the topics in a conference are targeted to the same group of people.

How to Use the Conferencing Facility

Each conference is assigned a name by the owner of the conference. Suppose that a conference called SAMPLE has been set up. To look at that conference, you can issue the MUSIC command:

```
CONF SAMPLE
```

This displays a list of topics that are part of the SAMPLE conference. If you just want to see if anything new has been added to that conference since you last looked, issue the MUSIC command:

```
CONF SAMPLE NEW
```

The following diagrams show an example of the screen displays for a conference called "SAMPLE".

```
MUSIC/SP Conferencing Facility. Subject: Sample Conference

Show option: ALL (F5 flips option between NEW and ALL)
S  Topic    Last Changed    Description
- -------- ---------------- ------------------------------------------------
_ USESCONF 1994/03/30 09:43 Ideas on how CONF can be used
_ CONFCOM  1994/04/30 20:51 Comments on the conferencing facility









--------------------------------------------------------------------------------
|---> Selection options: V: View   A: Append

Command ==>


F1:Help     F2:Intro      F3:Quit     F5:Flip show   F6:Create topic
F7:Uppage   F8:Downpage              F10:Profile
```

Figure 3.3 - Viewing the Topic Selections in a Conference

You can select the topics you want to view by typing a "V" beside the topic name. For example, if the USESCONF topic is chosen, the screen would like this:

```
Viewing Topic: USESCONF Ideas on how CONF can be used
------------------------------------------------------------------------------
>:::The following added 1995/04/26 12:16 by ABCD000
>:: John Doe                          Computing Center

This topic is used to collect ideas of how conf can be used at our
site.
Here are some examples to start with:

--Used by a class to discuss a specific topic.  For example
"How does the price of oil affect the economy?"

--Used by a "work group" (department etc) to discuss or debate
topics of common interest.

--To keep copies of BITNET listserver output.  Allows a group
of users to see what is being said on a list without everyone
getting a personal copy of the new items.  Also useful to
------------------------------------------------------------------------------
Command =>


F1:Help  2:Top  3:Quit  7:Up  8:Down  9:Locate  10:Append  12:Retrieve
```

Figure 3.4 - Viewing a Topic

Managing a Conference

The CONFMAN program is used to manage a conference. This program is a menu selection from the CM facility. CM is described in *Chapter 5 - Managing Your Course*.

Further Information

For information about starting a new conference and complete documentation for the CONF program enter "/HELP CONF" or refer to the *MUSIC/SP Mail and Conferencing Guide*.

LISTSERV - Discussion Lists

Through electronic mail you can listen or participate in discussion lists on a subject of your choice. There are hundreds of topics open for discussion. This facility provides a opportunity for you to join discussions in your field with colleagues from around the world.

Your site must have the LISTSERV program. This program provides the means to sign up for a particular list. MUSIC's Mail program opens the lines of communication between you and the other members of the discussion. To find out what is available and how to sign up, send email to the following address:

```
LISTSERV@node
```

node is the name of the closest node, either at your site, or the nearest one. The body of your text should include the word

```
HELP
```

as the first line. You will receive mail shortly about other LISTSERV commands such as LIST for finding out what discussions are available, and SUBSCRIBE for signing up.

List Manager

The MAIL program includes a menu item called "List Manager". The list manager provides an easy way to join discussion lists on BITNET and the Internet. Help is provided once this selection is made.

Further Information

For more information about discussion lists see the *MUSIC/SP Mail and Conferencing Guide*.

News Reader

The news reader provides access to Network News services (USENET). USENET is a network available to users for exchanging messages and information of any kind. The news articles are grouped into categories called *newsgroups*. Newsgroups are devoted to a wide variety of subjects. These include politics, programming languages, science, recreational activities, and many, many more.

You can invoke this program by entering the command "RN" in *Go mode or use FSI's main menu selection "INTERNET". Through the RN interface you can read incoming news from a variety of news groups, post your own news items, follow-up on existing items and send electronic mail directly to the news contributors.

Help is provided once the program is invoked. The following screen shows a sample news group called "SCI.EDU".

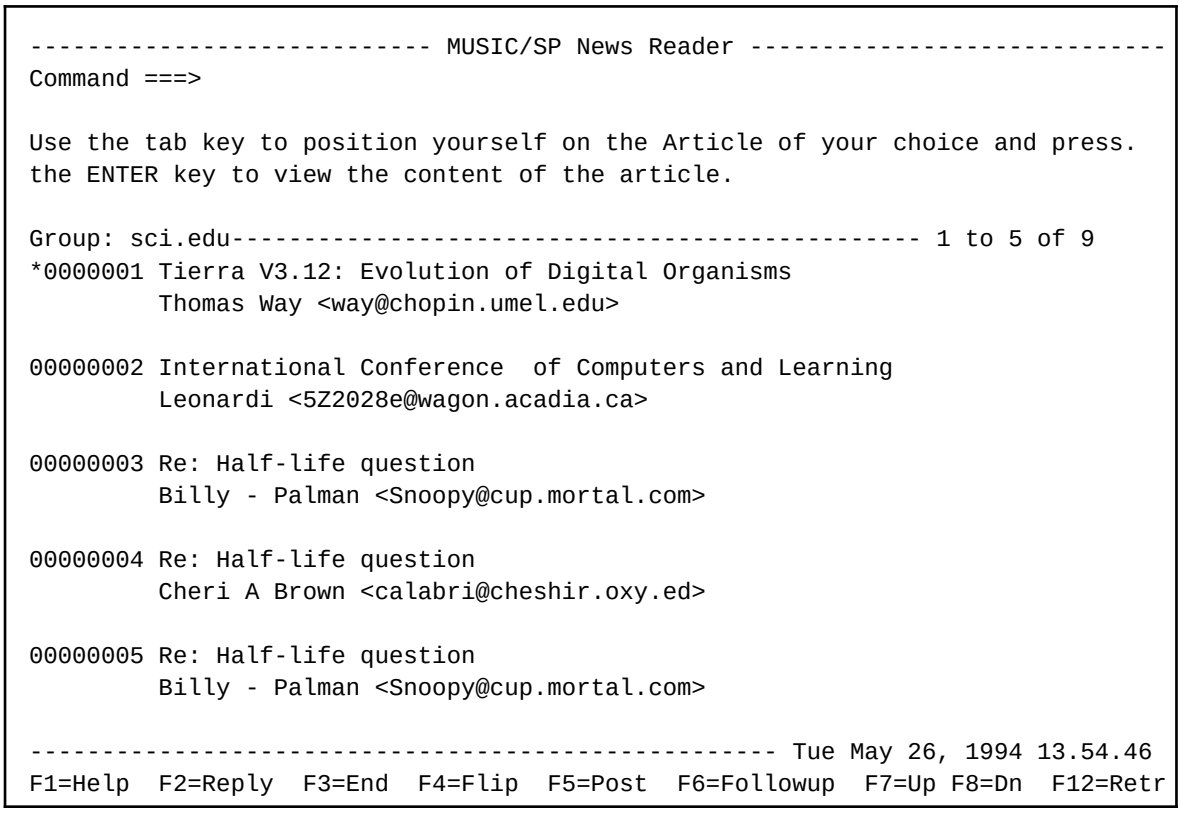


Figure 3.5 - News Reader

Further Information

Help is provided when the program is invoked by pressing F1. For more information about the News Reader see the *MUSIC/SP Internet Guide*.

TELNET - Logging on Other Computers

The TELNET command establishes a terminal connection with a remote computer through the TCP/IP Internet. You can enter this command in *Go mode or use FSI's main menu selection "INTERNET". This allows you to login to remote computers directly from MUSIC. Many sites allow you to log on by providing a userid of "anonymous".

The following screen appears when you type "TELNET".

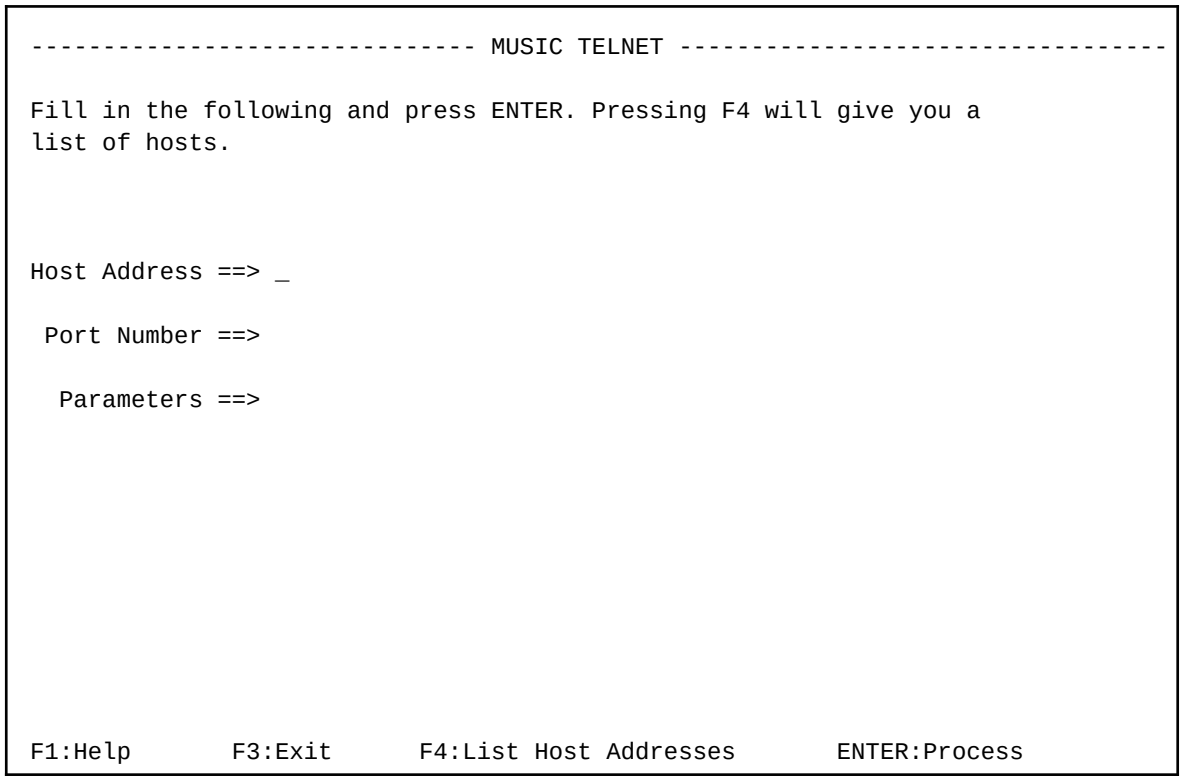


Figure 3.6 - Using TELNET to Access Other Computers

Further Information

Help is provided when the program is invoked by pressing F1. For more information about TELNET see the *MUSIC/SP Internet Guide*.

FTP - Transferring Files

FTP (File Transfer Protocol) allows you to transfer files from a remote computer. In some cases, files can also be transferred to the remote computer. MUSIC's FTP command provides an interface to the IBM TCP/IP program that runs on VM. Once connected to a remote computer, you can select files to be transferred to MUSIC.

You can invoke this program by entering the command "FTP" in *Go mode or use FSI's main menu selection "INTERNET". The following screen appears when FTP is invoked:

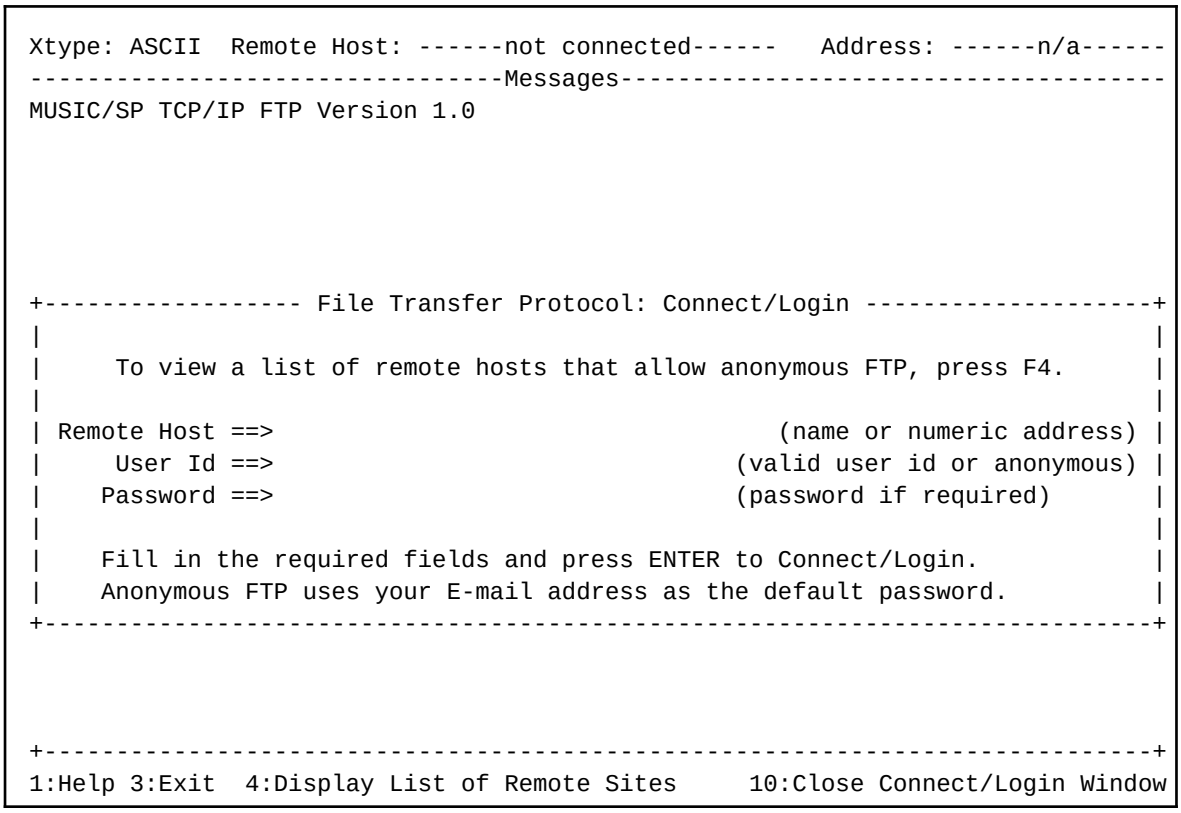


Figure 3.7 - FTP Main Screen

Note: FTP is different from using TELNET. TELNET allows you to use another computer system, FTP allows you to transfer files.

Further Information

Help is provided when the program is invoked by pressing F1. For more information about TELNET see the *MUSIC/SP Internet Guide*.

Gopher

GOPHER is a distributed document search and retrieval protocol for sites with TCP/IP connectivity. It provides an hierarchical view of the Internet. You can invoke this program by entering the command "GOPHER" or "GOPHER siteaddress" in *Go mode or use FSI's main menu selection "INTERNET".

GOPHER stands for "gopher - the rodent". It's also a term for someone who is sent out to get things, and that term applies to the gopher client. GOPHER is a program that you run on MUSIC that connects you to various objects and services on the internet, all without you having to know how to do it.

Simply typing GOPHER will bring you a menu of menus or files to look at which are somewhere on the Internet. These files and menus may be located on MUSIC or some remote machine. Once you have connected, typically you can either select a file or a menu, or occasionally an internet service such as TELNET (usually to bring you to a library or other information retrieval system). You can select items by entering the item number, or just tabbing down to the line and pressing ENTER.

If you select a file (text) you will be entered into VIEW to read the file, once it has been downloaded. Binary files are simply transferred to your MUSIC account - you must then decide what to do with them.

Further Information

Help is provided when the program is invoked by pressing F1. Refer to the *MUSIC/SP Internet Guide* for complete information.

Web

More and more people are using the Internet to access information of all kinds. Educational institutions and corporations are providing their communities with Internet access. Other individuals are gaining access through commercial services or freenets (free access in some cities).

Today, information on the Internet is no longer restricted to plain text. All types of fonts and sizes are being used along with pictures, sound, animation, and video. HTML documents created on MUSIC, or on your PC and uploaded to MUSIC, are accessible through MUSIC's Web server.

WEB Server

MUSIC's WEB server provides a platform for making your Web documents available on the Internet.

WEB Client

MUSIC provides a line-mode Web browser (client). The WEB command invokes this browser for accessing Internet Web sites. Help is available once the program is invoked.

Syntax:

```
WEB {url address}
```

For example,

```
WEB http://musicm.mcgill.ca
```

Further Information

See *Appendix A - MUSIC as Web Server for Course Material* for information about one professor's experience with using MUSIC's Web server.

Refer to the *MUSIC/SP Internet Guide* for complete information about creating Web documents.

Systems administrators should refer to the *MUSIC/SP Administrator's Reference* for information about the Web server.

Chapter 4. Managing Userids and Files

Managing Userids and Files

Overview

This chapter explains the fundamentals of assigning userids and the structure of the file system on MUSIC. This information is useful to you when dealing with the system administrator at your institution.

This chapter explains:

- the definition of userids
- assignment of student userids
- instructor's userids
- userids for group projects
- userid attributes and the PROFILE program
- MUSIC File System

Userids on MUSIC

A userid (sometimes called a "code") is a 1 to 16 character label that identifies a user to the system. The userid is the name by which the user is known to MUSIC. Each userid has a password and other options and attributes associated with it.

Userids can be made up of valid characters from the letters A to Z, the digits 0 to 9, and the special characters $ # @ _.

A userid can consist of a file ownership id followed by an optional "subcode". The subcode part can be 0 to 8 characters. The total length of the userid cannot exceed 16. Valid characters in subcodes are letters, digits, and the special characters $ # @ _.

Note: Most userids have no subcode associated with them.

File Ownership

File ownership is based solely on the ownership id (userid excluding any subcode). Two people can share the same library of files if they have the same ownership id (same userid with different subcodes). For example, the userids "ABCD1" and "ABCD2" have the subcodes "1" and "2". ABCD1 and ABCD2 own the same files even though they may have separate passwords for their userids. (Most often a userid is unique - meaning most users their own private files.)

Assignment of Student Userids

Userids exist primarily for accountability. This includes keeping track of who owns what files and who is using what computer resources. Also, it gives each user an electronic mail address.

Typically for a course, each student is assigned a single, unique userid. If accountability for computer resources is required, a different userid for each computer course is recommended. This makes it possible to keep track of the computer's resources used per course, and to set different limits for each one. If instructors feel it is justified, they can increase limits when they are exceeded. If, on the other hand, only one userid is assigned per student, it is difficult to know if a student is using the allocation properly per course.

Suggestions on Allocating Student Userids

Assign each course a sequence of userids starting with the same two characters. For example, a sequence might be AB01, AB02, AB03, ...ABZZ. Also, the teacher's userid should begin with the same two characters, for example AB00, and must have 00 as the 3rd and 4th characters in the userid. As well, the teacher's userid must have a file ownership length of 4. Larger classes can be accommodated by using several sequences.

Course Manager Userids

A supervisor privilege can be assigned to a userid. With supervisor privileges the teacher can inspect and modify any files belonging to IDs which begin with the same first two characters. If the administrator created a userid AB00 with supervisor privileges, the userid AB00 would have full access to files saved by users AB10, ABXX, etc.

Teachers usually have supervisor privileges over their student's userids. Programs for teachers such as CM, TRANS$ ask for this privilege. More information on CM and TRANS$ can be found in *Chapter 5 - Managing Your Course* and in the *MUSIC/SP Administrator's Reference*.

PROFILE Program and Userid Attributes

The system administrator assigns userids with different attributes and privileges. All userids have a profile associated with them. A userid profile contains the userid attributes like sign-on password, default tab character and tab columns, job time limits, etc. The PROFILE program is used to change or display these options.

Below, is a list of profile options for userids. A full explanation about these can be found in the *MUSIC/SP User's Reference Guide* or by entering "HELP PROFILE".

ALWAYSPROG(x)
AUTOPROG(x)
BACKSPACE(x)
BATCHPW(x)
BRIEF
DEFTIME(n)
EDMSG/NOEDMSG
EXEC/NOEXEC
HEX(x y)
INPROG/NOINPROG
ITABS(n1 n2 n3 ...)
OTABS(n1 n2 n3 ...)
PASSWORD(x)
PRINT
PRINT$
PRINTSPACE
SHOW
SHOW$
SHOWSPACE
SLASH/NOSLASH
TAB(x)
TERMINAL(x)

EDNFERR ENDFOK

By issuing the command "PROFILE SHOW" you can display the attributes of your userid. The figures below show the profiles of of a typical userid for a teacher:

```
User Profile
  USERID=AB00              FILE OWNERSHIP ID=AB00            TYPE=0
  ID=52990            NAME=Professor L. Walnut
  PRIVILEGES:  SUPV
  TIME LIMITS (IN SERVICE UNITS):
    PRIME=200  NONPRIME=300  BATCH=300  DEFAULT=70
  MAX NUMBER OF EXTRA SESSIONS PER TERMINAL:     5
  PASSWORD CAN BE CHANGED BY USER
  SNGL: CONCURRENT SESSIONS (ON DIFFERENT TERMINALS) ARE NOT ALLOWED
  NOCOM: FILES MAY BE SAVED PRIV OR SHR, BUT NOT PUBL
  NOINPROG: *IN PROGRESS MESSAGES ARE SUPPRESSED
  AUTOPROG:  $INT:FSI                  (CANCELLABLE)
  INPUT TABS:     7  73
  NO OUTPUT TABS
  FUNDS ($):       77.00 USED,      1000.00 LIMIT
  SAVE LIBRARY:  TOTAL =     98K   LIMIT =  10000K   MAX/FILE =   4000K
  MAX TRACKS PER DATA SET (UDS) AT ALLOCATION:       50
  CREATED 1994/01/30  (YEAR/MONTH/DAY)
  CODE IS NOT VALID UNTIL 1994/01/30
  LAST SIGN-ON: 1994/02/20 12:09   LAST BATCH JOB: 0
  LAST PASSWORD CHANGE:   SIGN-ON PW 1994/01/30   BATCH PW 0
  PASSWORD LIFETIME:  NO LIMIT
  USERID OF CREATOR:  $000000
```

Figure 4.1 - Profile for an Instructor's Userid

Important Attributes

The following lines taken from figure 4.1 are explained below:

```
FUNDS ($):       77.00 USED,      1000.00 LIMIT
```

It displays the dollar limit for the userid, and the amount used so far.

The installation may allocate a finite amount of funds to a userid. The amount of funds remaining is updated on a daily basis with processing unit time and connect time charges only. When there are no funds remaining, the user is prevented from signing on until more funds are allocated to the userid.

The limit for each student can be changed by the instructor (SUPV privilege) or by the system administrator.

```
SAVE LIBRARY:  TOTAL =    98K   LIMIT = 10000K   MAX/FILE = 4000K
```

It displays the current total space occupied by the files (in units of K = 1024 bytes), and also the file space limits (if any).

The installation may allocate a limit for the amount of disk space that you may use. A limit can also be set on the maximum size of any file. These limits are applied to individual userids.

The disk space allocation limits can be changed by the system administrator.

```
LAST PASSWORD CHANGE:  SIGN-ON PW 1994/01/30    BATCH PW 0
```

Displays the date of the last password change. To maintain security of the userid, passwords should be changed regularly.

Changing Passwords

Passwords can be changed by selecting "NEW PASSWORD" or "PROFILE" from the FSI menu or by entering the command "NEWPW". You will be prompted for a 1 - 8 character password.

MUSIC File System

How are Files Stored?

The group of files that you own is referred to as your *library*. Each file in your library has a unique name. In addition to your own library, you can access files in the public library and shared files in other user's libraries.

If you wish, you can archive files onto magnetic tape for backup or transport. Also, you can download or upload files to and from a personal computer. Refer to the *MUSIC/SP User's Reference Guide* for more information, or type "/HELP ARCHIVE" for archival information and "/HELP PC" for information about personal computers.

Directories: Your files can be stored in your library under one directory (flat file system) or several directories (hierarchical tree-structured file system). The commands to use a tree-structured system are the same as DOS commands (MD, CD, RD, DIR). For information about directories on MUSIC, refer to the *MUSIC/SP User's Reference Guide* or type "/HELP DIR".

File Attributes

By default, your files are saved with the PRIV (private) attribute. This means that only you can access your files when signed on to MUSIC with your userid. No one else has access to your files unless you create files with the SHR (share) attribute. (Your institution may restrict the use of the SHR attribute for some userids.)

To give a file the SHR attribute use the FILE command in the Editor when saving your file, as follows:

```
FILE filename SHR
```

or at a later time, use the MUSIC command MAKSHR as follows:

```
MAKSHR filename
```

When files have the share attribute, other MUSIC users can access them. The other user would need to know your ownership id (userid excluding any subcode) and the name of the file. For example, if your ownership id was ABCD and the file was called XYZ the other user would supply the name "ABCD:XYZ" to use it. They would not be able to change your file, but they would be able to view or copy it.

Listing Your Files

Your files can be listed in different ways. Here are some samples of these methods.

Method 1 - FSI File Management (FLIB)

From the FSI menu, you can select the FLIB item. The following screen appears. Help is provided once the screen is displayed.

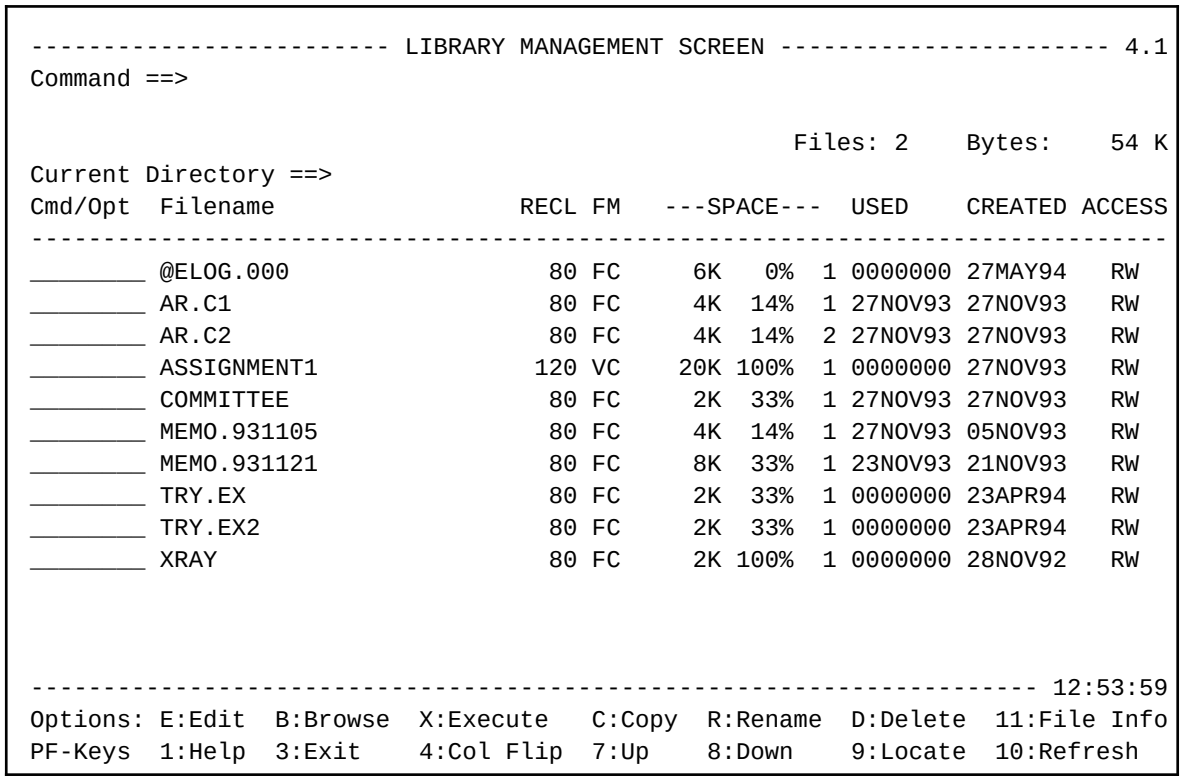


Figure 4.2 - Listing File Information (*Method 1*)

Method 2 - DIR Command

The following screen appears when you use the DIR command. For more information about this command, enter "/HELP DIR".

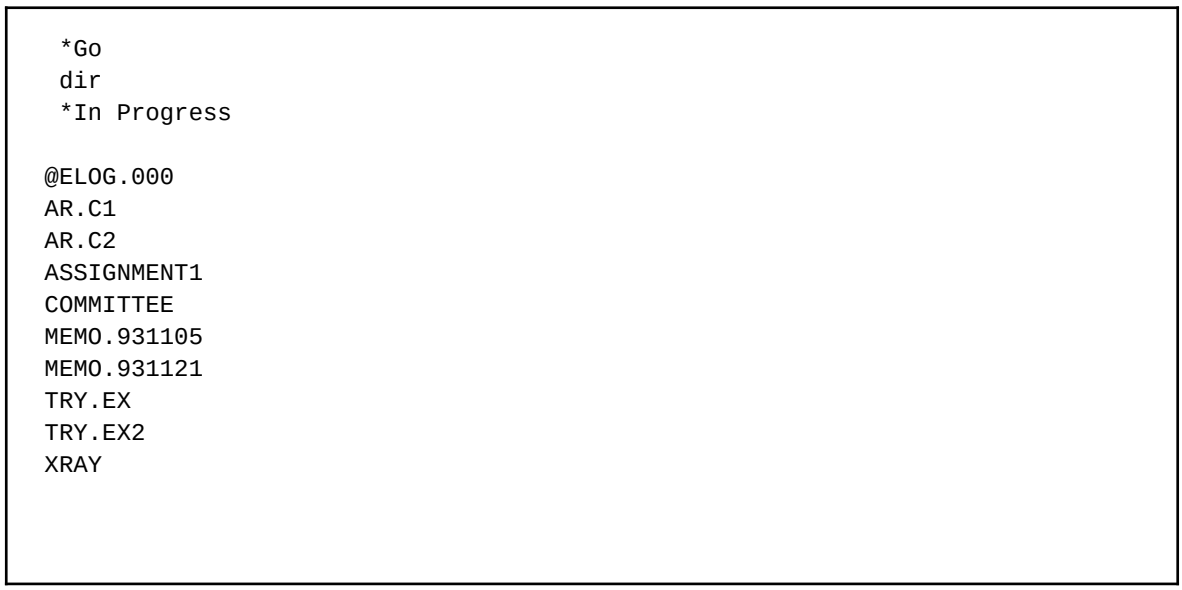


Figure 4.3 - Listing File Information (*Method 2*)

Method 3 - TREE Command

You can use the TREE command (FSI FUTIL item) and the following screen appears. Help is provided once the screen is displayed.

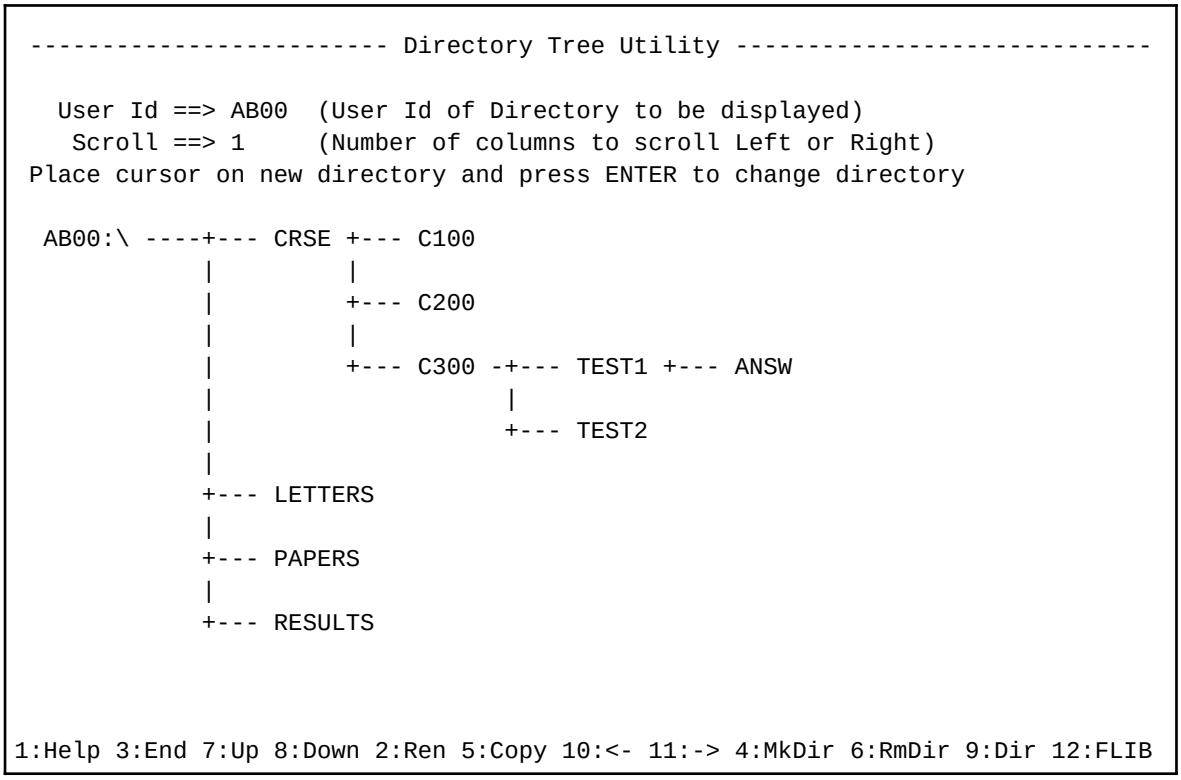


Figure 4.4 - Listing File Information (*Method 3*)

Chapter 5. Managing your Course

Course Management Facility - CM

The Course Management Facility allows you to communicate with your class via the computer. You use the CM command to manage the course material and the students use the CI command (Course Information) to access the information you have prepared.

Basically, there are three components that make up CM:

- It allows you to create and manage files and make them accessible to the class in the form of notes, assignments, or a course outline. For data integrity, students can read these files but cannot change them.

  Note: Your files remain private (students cannot view them) until you specify otherwise. This is important for examination files!

- The system maintains a class mailing list. This list contains the userids and names of the students in the class. It is used to send mail to individuals or the entire class.

- You are also able to manage the students computer resource allocations and change their passwords. This is done using the TRANS$ program. TRANS$ is described later in this chapter.

Sample Main Menu of CM

```
Help   End    Up     Down   Top    Bottom Main   Scan   Find   Topic  Quit
----------------------Course Management for EL101------------------- Page 1/1
Command ===>
     1 *NEW* mail items and    0 replies waiting
 TAB (or use arrow keys) to move cursor to a topic name and press the ENTER key

 Managing Information:
  MAIL           Receive and send electronic messages
  POP            Update the pop file
  OUTLINE        Update course outline
  NOTES          Update course notes
  ASSIGNMENTS    Assignments management
  LIST           Class list management
  DOCS           Online documentation

 Managing Student Environment:
  TAILOR         Tailor student menu with extra options
  CI             Invoke CI as a student

 Additional Tools:    CONFERENCES    Electronic CONFerences MANagement
                      FILES          View student files
                      AGENDA         Invoke TODO facility
                      TRANS$         Transfer funds and change passwords
F1=Help  F2=Ask  F3=End  F7=Up F8=Dn F9=Find F10=Top F11=Bot  F12=Cur PA1=Quit
```

Figure 5.1 - Main Menu of CM

Course Owner vs Course Supervisor

On MUSIC there are different ways of managing student userids. In order to fit in with these different methods, the Course Management Facility makes a distinction between the course OWNER and the course SUPERVISOR, though they may be the same userid.

Traditionally userids are assigned on a per class basis. The userid of each student in a class starts with the same two characters. In addition the SUPERVISOR userid starts with the same two characters and must have "00" as the 3rd and 4th characters. The SUPV privilege is assigned to this userid allowing access to student files and the TRANS$ program. Although the length of the SUPERVISOR userid may be from 4 to 16, the file ownership length of the SUPERVISOR userid must be 4.

Example

XX00	- course supervisor
XXAA	- student 1
XXAB	- student 2
XXAC	- student 3
XXAD	- student 4

The course OWNER, on the other hand, is the user who owns the information files that the students access. Although the OWNER can be the same as the SUPERVISOR, it doesn't have to be. This allows you to keep course material in your own library, rather than in the one assigned to the course supervisor. An additional advantage is that you can manage a number of different courses from a single userid.

To summarize: the OWNER userid is where the files are kept; the SUPERVISOR userid has the SUPV privilege and can transfer funds, change passwords and access the students files.

File Naming Conventions

The course notes and assignments are kept in files in your library. In order for you to manage more than one course at a time, the files are automatically saved in directories. The name of the directory is the course identification (course_id). This "course_id" is specified when you initialize the course.

In addition to the files that contain the actual course information, the following files are automatically maintained by the system.

Note: *cid* is the 1 to 8 character "course_id"

@COURSE	This file is created in the supervisor's library (that's why the password for the supervisor userid is required) containing the course_id, your userid and the course's description text. This file is used by CI to locate the course information.
@COURSES	This file contains a list of your courses.
@Cnn.*, @ECM.*, @Inn.*, CM*, and CI*	These files contain all the menus and topics that make up your local CM and CI applications. *nn* is the course number (when you have more than 1 course).
cid\POP	The text of the pop file is contained in this file. Students can view this file from the CI program.
cid\OUTLINE	The text of the course outline is contained in this file. Students can view this file from the CI program.

cid\NOTES	This is a list of the files containing course notes. The students are presented with this list by the CI program and can select the notes they wish to view.
cid\ASSIGNMENTS	This is a list of the assignment files. The students are presented with this list by the CI program and can select the assignments they wish to view.
cid\STUDMENU	This contains the items for the class menu. These are displayed as options on the main selection menu of the CI program.
cid\ALOG	This file contains a log of all operations performed on assignments by the instructor. Thus, it forms an "audit trail" of sorts for assignment marking.
cid\An\#suserid	These files contain submitted assignments for assignment *n* ("An") for a student with the userid *suserid.* These assignments may be stored directly into this file by the student using the CI program or submitted via e-mail and retrieved by the assignment marking function of CM.
cid\HDRTXT	This file contains comments and text relating to assignment marking.
cid\MARKS	This file contains the marks for the assignments for course *cid.*
cid\MARKS.FLD	This file contains the screen format for presenting the marks within the assignment marking facility.

The Class List File

The class list file simply contains a list of the students' userids and names. It is used to send mail to individuals or the entire class. The details on how this file is maintained and managed depend on how your installation administers student userids. The topic "Managing the Class List" later in this chapter provides more details.

Setting Up a Course

When you run CM for the first time you will be presented with the following screen.

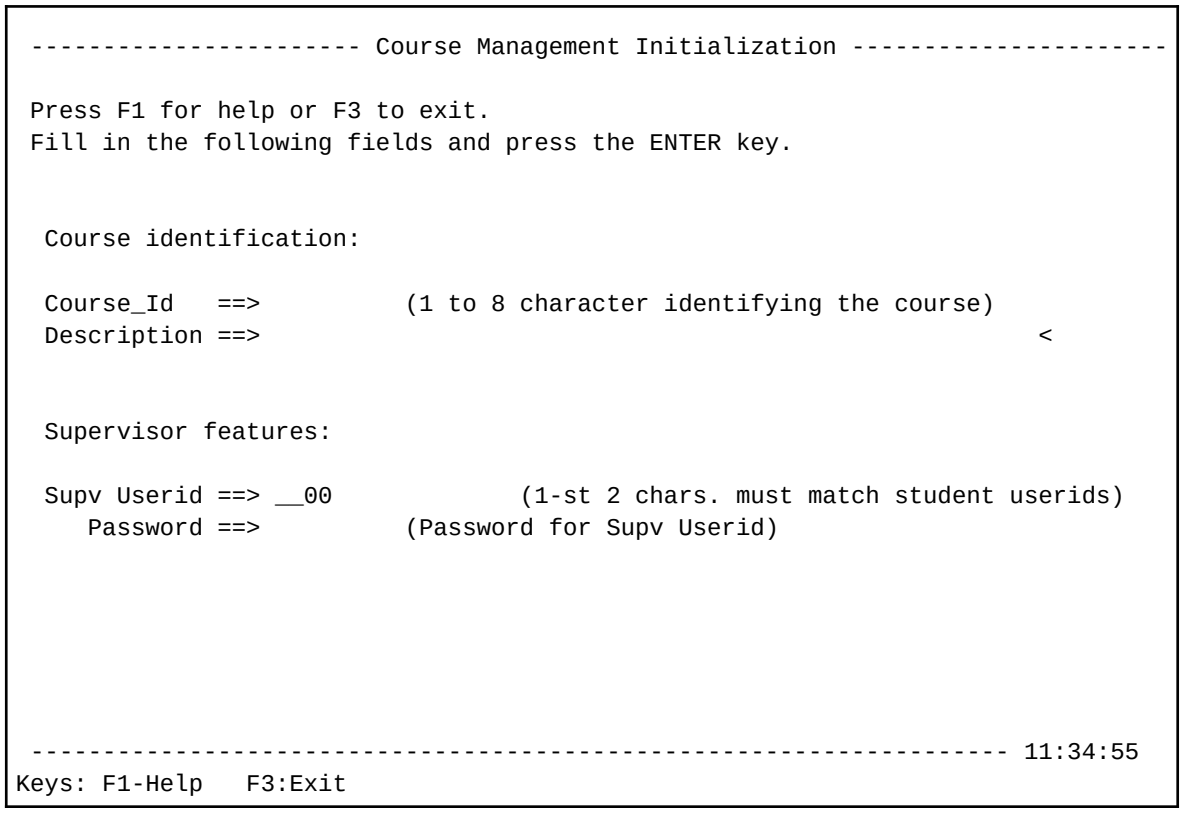


Figure 5.2 - Initializing a Course

The "Course_ID" field identifies the particular course and is used as a file name prefix for the files associated with the course. It will be displayed in the upper right hand corner of the screen in both CM and CI. You should choose something that can readily identify the course. For example you could use EL101 for the course English Literature 101.

The "Description" is some text describing the course. You can choose whatever you want. This will be displayed on the course selection screen.

Fill in the userid and password for the course supervisor in the final two fields. The userid must be 4 characters long. The first 2 characters must match those assigned to students in the class. The 3-rd and 4-th characters must be "00". If your installation does not create userids on a per class basis and thus no supervisor id exists, enter NONE in the userid field and omit the password. Characters typed in the password field will not display on the screen.

When you press ENTER the following happens:

1. An entry is placed in the file @COURSES. This contains the course_id, the supervisor userid and the description text.

2. A file is created on the supervisor userid (that's why the password is required) containing the course_id, your userid, and the description text. This file (supv:@COURSE) is used by the CI program to locate the course information *(supv* represents the supervisor userid).

The course is now successfully initialized and when you press ENTER you will be brought to the CM main menu. From there you can create the course outline, notes and assignments and send mail to your class. When you run CM for the second time you will go directly to this main menu. The following topics discuss handling multiple courses and sections within courses. If this does not apply to you, you can skip to the section called "Adding Course Material".

Multiple Courses

It is possible to manage a number of courses from a single userid. This can be used for distinct courses or for multiple sections of one course. To initialize subsequent courses, press F10 from the main menu of CM. The following is a sample screen with multiple courses.

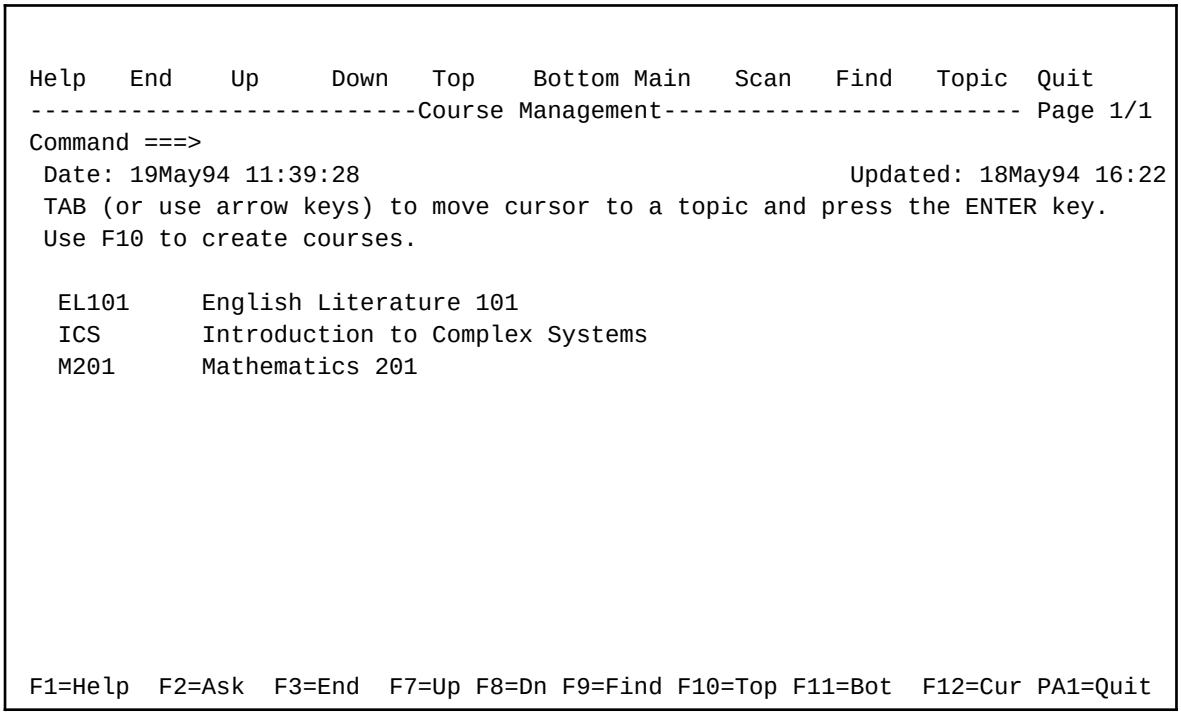


Figure 5.3 - Multiple Course Selection

If you are using CM to manage a group of courses, the "Course Selection" screen (shown above) will be automatically displayed when you enter the CM command. Once you select the course you want to work with, you are presented with the main menu. You can also enter the command "CM EL101" or "CM ICS" or "CM M201" to directly select the course you want.

Adding Course Material

As indicated before, course material such as notes, assignments and the course outline are kept in files in the course owners library. They are stored with the SHR attribute and as such can be read by students but not changed.

The file names used are prefixed with the course_id that was specified when the course was initialized. This allows you to easily identify any material that belongs to a particular course using the /LIBRARY command, or the file management function (FLIB program) of FSI. For example, if the course_id is EL101 the following command:

```
LIB EL101\*
```

will list all the files that belong to that course.

CM uses the editor to let you create the various information files. Often, however, the course material is already prepared in some other format. If the information already exists in a MUSIC file, you can use the editor MERGE command to merge it into the course file. Data that resides on PCs can be first transferred to

MUSIC using PCWS or Kermit and then merged into the course file. Note that PC word processor files should be converted to ASCII files before transferring them to MUSIC. Similarly, information that exists only on paper can be transferred to a PC using a scanner and subsequently to a MUSIC file.

The Pop File and The Course Outline

When you choose POP or OUTLINE options, the following file names are assigned:

Pop: cid\POP
Outline: cid\OUTLINE

cid is the course-id subdirectory associated with the course.

You are then placed in the EDITOR to create a new file or modify an existing file. The file is automatically stored with the SHR option to make it accessible to students.

The Pop File

The pop file contains the text of a short message you want the students to see **every** time they invoke CI. The pop file will appear as a pop-up window in the CI main menu. It can be a maximum of 16 lines by 53 columns. The following are examples of messages to be placed in the pop file:

*** There is new material in the NOTES option! ***
*** Do not forget the seminar next week! ***
*** Labs will be closed this Sunday! ***

Important: The pop file cannot be deleted. The students do not see the pop file if you keep it empty as it is when the course is assigned.

The Course Outline

Students will see the outline file every time they choose the "OUTLINE" option in the CI main menu.

Typical topics for this file include the following:

- course synopsis
- phone number and office hours
- evaluation scheme
- lecture schedule
- assignment schedule
- exam schedule
- reading list

Students are not automatically informed if you change this file during the term. If changes are made you can draw attention to them by using the POP file!

Online documents

Online small guides:

These small guides were extracted from the MUSIC/SP online manuals. You will be placed in VIEW. To make a local copy of these guides, you can try the following:

1. Place the cursor in the "Command" line (press F12)
2. Type STORE <file name>, for example STORE MYPRIVCOPY
3. Quit the VIEW by pressing F3

Online documentation:

These are the online version of the MUSIC/SP publications. Help is provided once these facilities are invoked. Following is the list of the online manuals you can have access:

TG	- Teacher's Guide
GNU	- Guide for New Users
UR	- User's Reference Guide
MC	- Mail and Conferencing Guide
IG	- Internet Guide
AO	- Office Applications Guide
CWIS	- Campus-Wide Information Systems Guide
PCWS	- Personal Computer Workstation (PCWS) Guide

MUSIC/SP Help:

The MUSIC Help Facility can be invoked by entering the "/HELP" command in the command line of every screen.

Course Notes

Although these files are called course notes, any material that you want to make available to the students can be included. It could be notes, sample problems, assignment solutions, old exams, PC software, data, or whatever. From the CI program the student can view these files, print them, copy them to their own library and download them to PCs.

A list of the available information is maintained in the file "cid\NOTES". You can add and delete items from this list as the course progresses. The students are NOT automatically informed when new material becomes available. So, if changes are made you can draw attention to them by using the POP file.

Select option NOTES from the CM main menu to access the course notes. Usually this will bring you to the course notes selection screen. However, the first time you do this, since you have no notes files defined, you will get the class notes creation screen (figure 5.4).

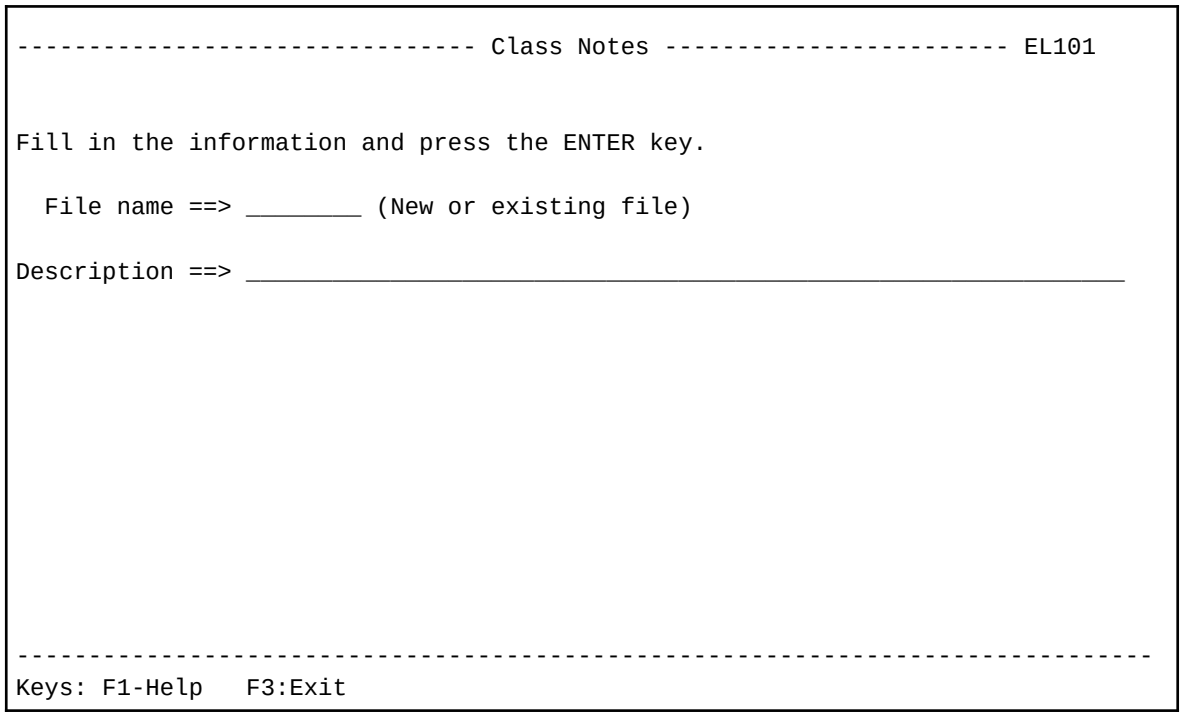


Figure 5.4 - Class Notes

To create a notes file, fill in the name and the description field and press the ENTER key. The course_id is automatically prefixed to the name and the editor is called. Using the editor, enter or merge in the information. When you have finished use the editor FILE command to store the file in the library. The file is automatically stored with the SHR option, making it accessible to the students. An entry is also placed in the list of notes. This list contains both the file name and the description and is used by both CM and CI to access the notes files.

You can continue the process of adding notes files by entering a new name and description and pressing the ENTER key. When you have finished press F3. This will bring you to the notes selection screen (figure 5.5 below).

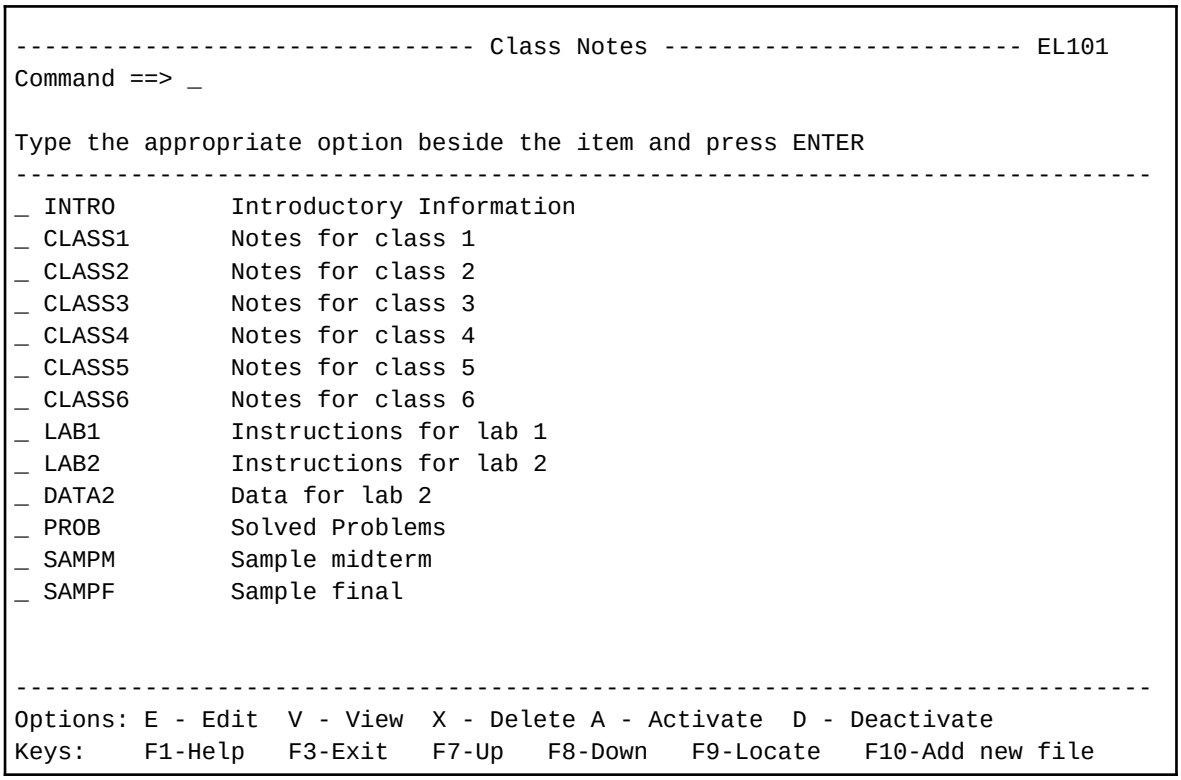


Figure 5.5 - Managing Course Notes

The notes selection screen allows you to manage files containing course notes. There are three types of operations you can do.

1. Commands

The command area at the top of the screen can be used to enter a LOCATE command to search for specific text in either the file name or the description field. This is useful when managing a large number of files. For example to locate the string "final" use:

```
locate final
```

MUSIC commands can also be entered in the command area.

2. Function Keys

In addition to the standard Help and Exit keys, F7 and F8 are used to page up and down through the list of notes. F9 is used to repeat the last locate command. F10 brings you to the notes creation screen (discussed previously) which lets you add new files to the list.

3. Selection Options

The options are entered in the margin at the left beside the file name. If more that one file is selected they are processed from top to bottom.

E - Edit allows you to make changes to the file using the editor.

V - View lets you look at the file using the view utility.

P - Purge purges the file and removes it from the list.

A - Activate makes the file accessible to students by making the file attribute SHR.

D - Deactivate changes the file attribute from SHR to PRIV making it inaccessible to students.

Often you will only want material to be available after the course has reached a certain point. This can be accomplished the first term by adding the new item at the appropriate time. In preparation for the next term the items should be DEACTIVATED. This leaves the file containing the information intact and simply makes it inaccessible to students by making it private. The next term, when the appropriate time in the course arrives, the file can be ACTIVATED.

The description associated with each file can be changed by simply typing over it.

Assignments

These files are managed in the same way as course notes but are treated as a separate group to make them distinct from other course material - since you may wish to handle them differently. The instructions for creating and maintaining assignments are basically the same as for course notes, so if you are familiar with managing notes you may wish to skip this section.

A list of the available information is maintained in the file "cid\ASSIGNMENTS". You can add and delete items from this list as the course progresses. The students are NOT automatically informed when new material becomes available. So, if changes are made you can draw attention to them by using the POP file.

Select ASSIGNMENTS from the CM main menu to access the assignments. Usually this will bring you to the assignment selection screen. However, the first time you do this, since you have no assignment files defined, you will get the assignment creation screen (figure 5.6 below).

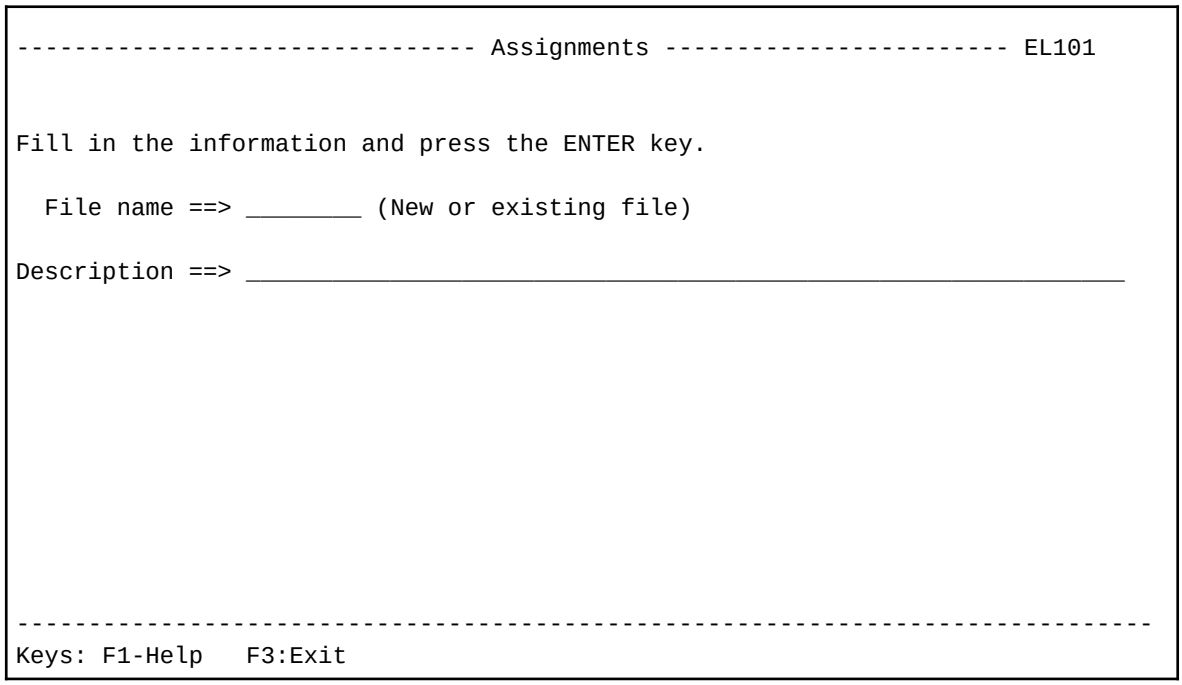


Figure 5.6 - Assignments

To create an assignment, fill in the name and the description field and press the ENTER key. The course_id is automatically prefixed to the name and the editor is called. Using the editor, enter or merge in the information. When you have finished use the editor FILE command to store the file in the library. The file is automatically stored with the SHR option, making it accessible to the students. An entry is also placed in the list of assignments. This list contains both the file name and the description and is used by both CM and CI to access the assignment files.

You can continue the process of adding assignments by entering a new name and description and pressing the ENTER key. When you have finished press F3. This will bring you to the assignment selection screen (figure 5.7 below).

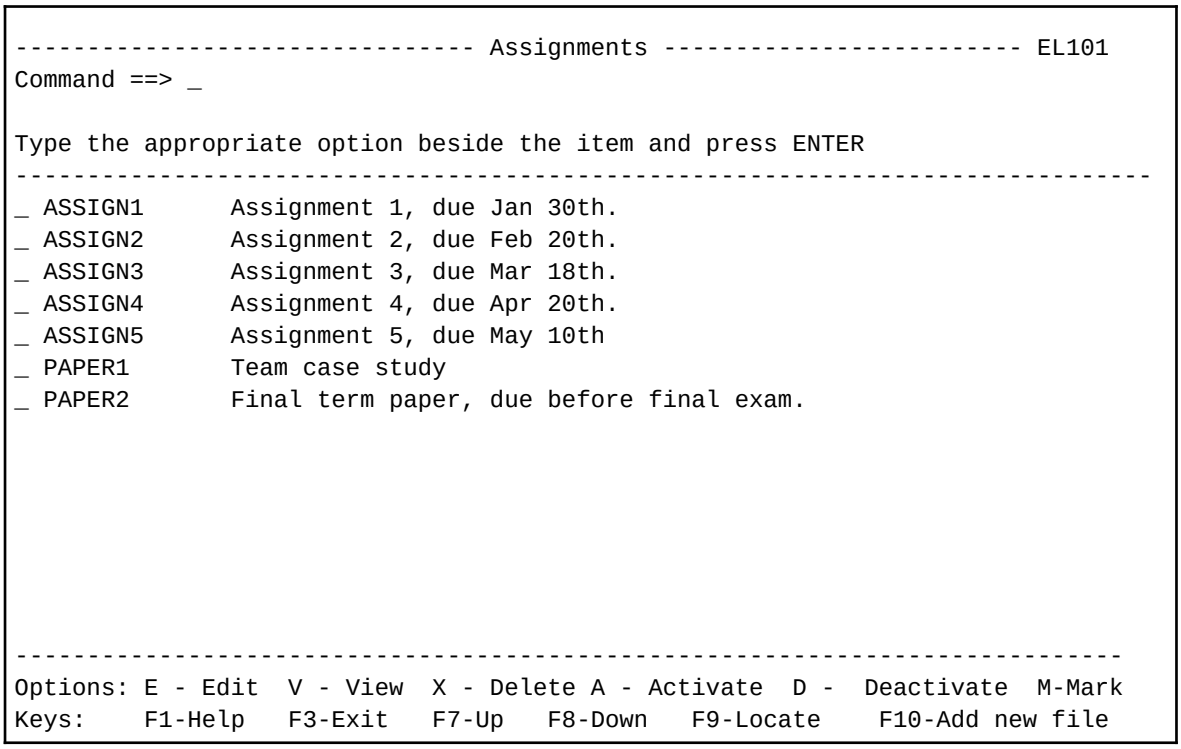


Figure 5.7 - Managing Assignments

The assignment selection screen allows you to manage the assignment files. There are three types of operations you can do.

1. Commands

The command area at the top of the screen can be used to enter a LOCATE command to search for specific text in either the file name or description fields. This is useful when managing a large number of files. For example to locate the string "final" use:

```
locate final
```

MUSIC commands can also be entered in the command area.

2. Function Keys

In addition to the standard Help and Exit keys, F7 and F8 are used to page up and down through the list. F9 is used to repeat the last locate command. F10 brings you to the assignment creation screen (discussed

previously) which lets you add new files to the list.

3. Selection Options

The options are entered in the margin at the left beside the file name. If more that one file is selected they are processed from top to bottom.

E - Edit allows you to make changes to the file using the editor.

V - View lets you look at the file using the view utility.

P - Purge purges the file and removes it from the list.

A - Activate makes the file accessible to students by making the file attribute SHR.

D - Deactivate changes the file attribute from SHR to PRIV making it inaccessible to students.

M - Mark This opens up the assignment marking menu for that assignment.

It is important to avoid changing assignment files after they are made available to the students. If this is done, use the POP facility to inform the class.

Often you will only want material to be available after the course has reached a certain point. This can be accomplished the first term by adding the new item at the appropriate time. In preparation for the next term the items should be DEACTIVATED. This leaves the file containing the information intact and simply makes it inaccessible to students by making it private. The next term, when the appropriate time in the course arrives, the file can be ACTIVATED.

Over a number of terms you will undoubtedly develop a pool of assignments from which you can choose to add to the list at the appropriate time in the course.

The description associated with each file can be changed by simply typing over it.

Marking Assignments

When you select option M for an assignment in this menu, you are presented with the Assignment Marking menu shown in Figure 5.8. This menu is intended to lead you through the process of accepting, marking, and returning assignments to the students electronically. "Canned" comments that can be included on the returned assignments can be entered here. If you start marking assignments without entering these comments, you are automatically given to opportunity to enter them. Assignment marks are maintained in a marks file, which you can use as input to some other program (eg. a spreadsheet program) to calculate your final marks.

See *Chapter 8 - Electronic Mark Submission* (*EMS*) for information about submitting final marks to other systems.

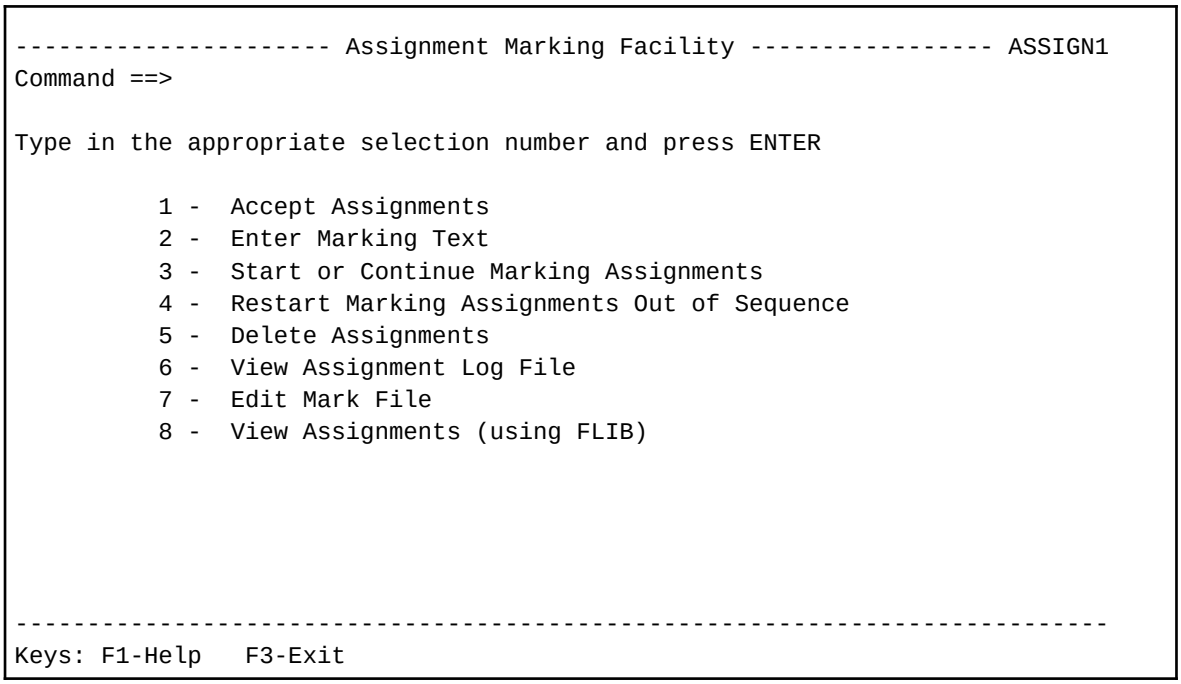


Figure 5.8 Assignment Marking Facility Main Menu

Accept Assignments

In class, assignments are collected or accepted at a particular time. The Accept Assignment option display a panel shown in Figure 5.9 that allows you to duplicate this function electronically. It retrieves submitted assignments either from your mailbox or from the directly stored assignment file. Figure 5.10 shows the panel during the process of accepting an assignment.

When an assignment is accepted, it is appended to a file unique to that student, assignment, and course. Thus if a student submits multiple copies of an assignment, each copy will be found in that file. The format of the file name is:

```
cid\An\#userid
```

where *cid* is the course, *n* is the assignment number, and *userid* is the userid of the student (eg. MATH\A2\#YY02STUDENT).

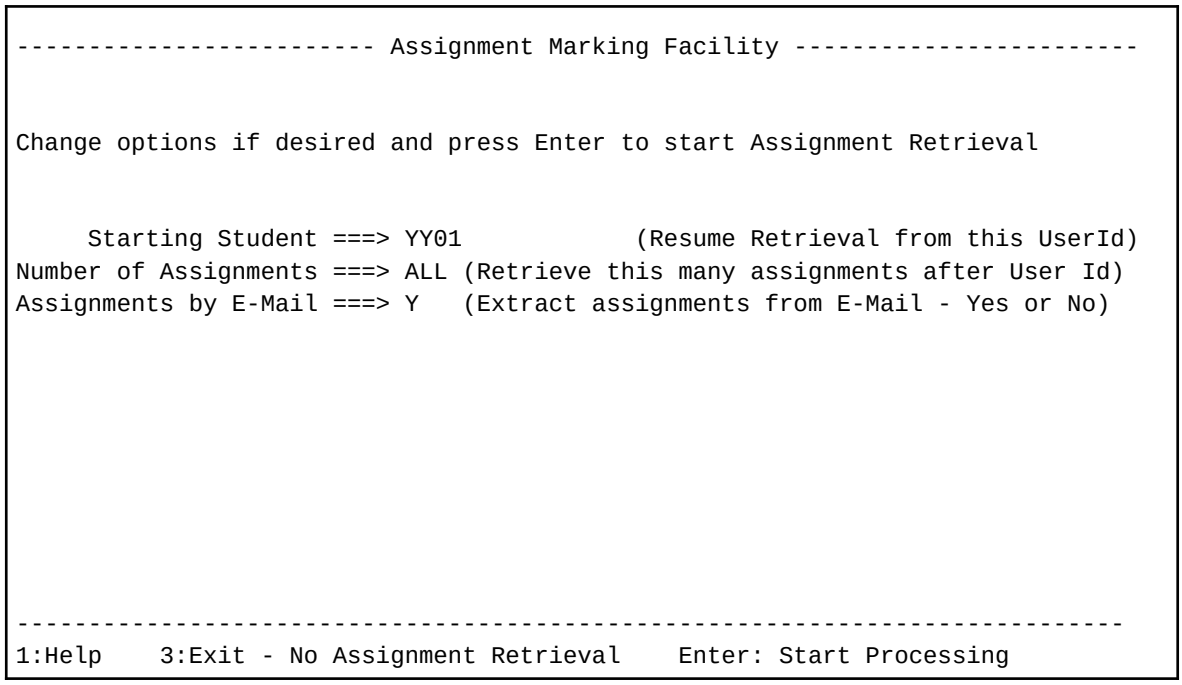


Figure 5.9 Accept Assignments Panel

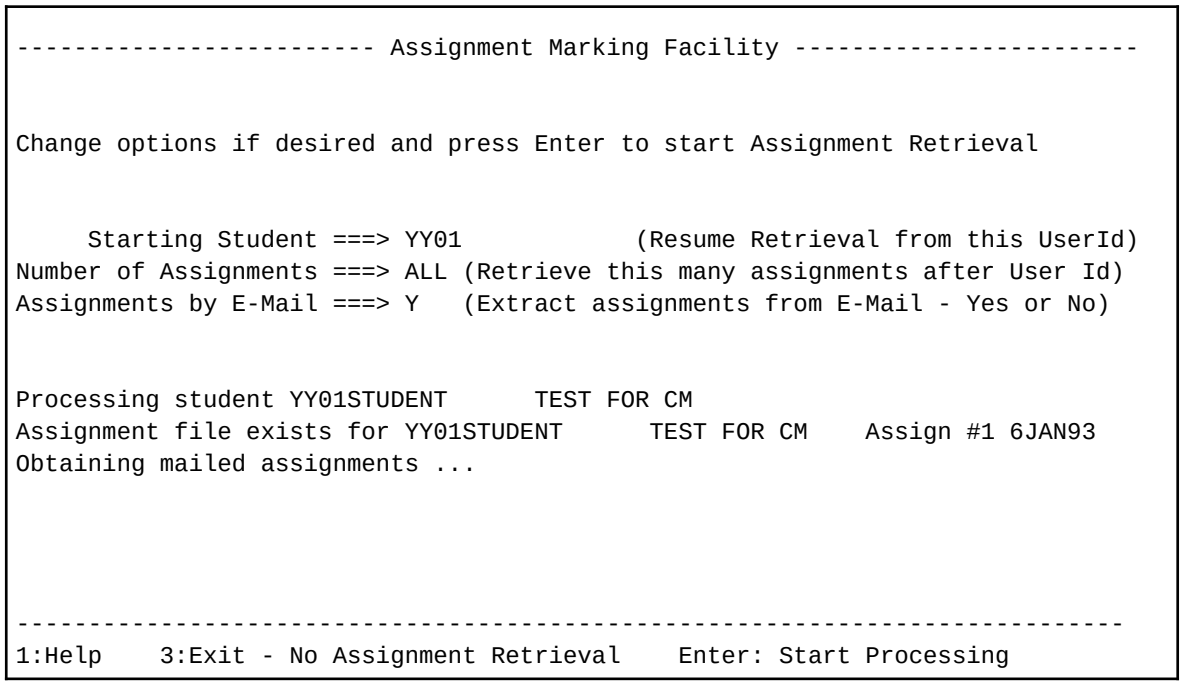


Figure 5.10 Accepting an Assignment

Enter Header Text

The panel shown in Figure 5.11 allows you to enter general header text, and positive and negative comments. These remarks are attached to the copy of the assignment that is returned to the student. When you assign a mark to an assignment, you can choose which comments to include.

Figure 5.12 shows the entry of the general header text. This text can be used to explain how the assignment was graded, what the correct or expected answers were, or anything else appropriate. Although it is intended to be prefixed to every returned assignment, you can override this when you actually mark the assignment.

Figure 5.13 shows the entry of positive comment text. (Note that the entry of negative comment text is similar.) These are not included automatically with the returned assignment. Instead, when you assign a mark you also "check off" which comments you wish to be included, if any. This method facilitates a more consistent and uniform approach to grading assignments.

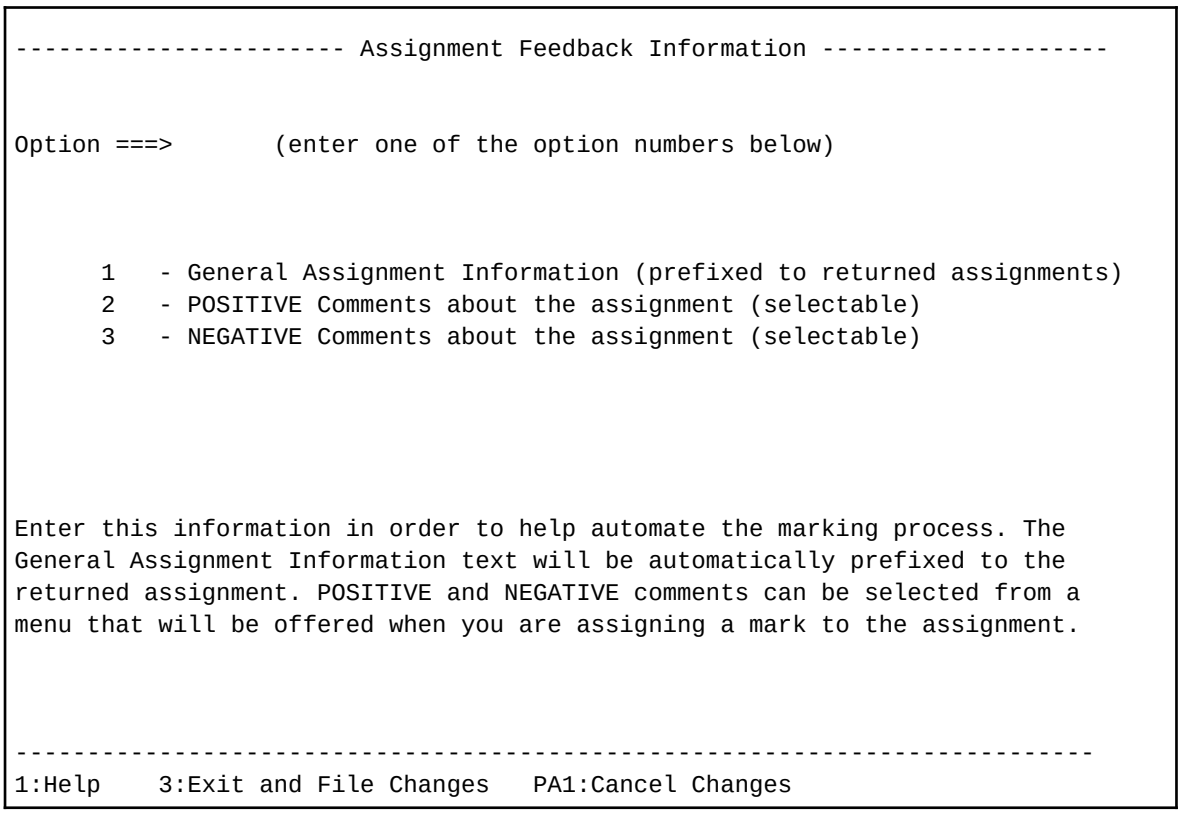


Figure 5.11 Assignment Header Text Main Menu

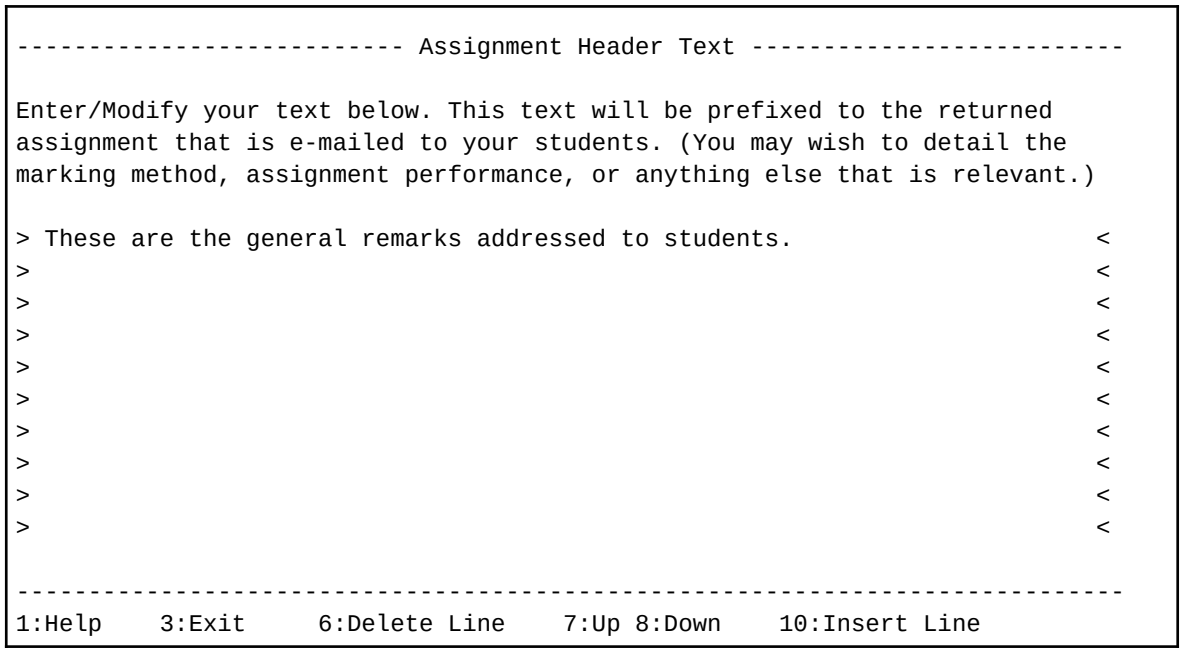


Figure 5.12 Assignment Header Text Entry

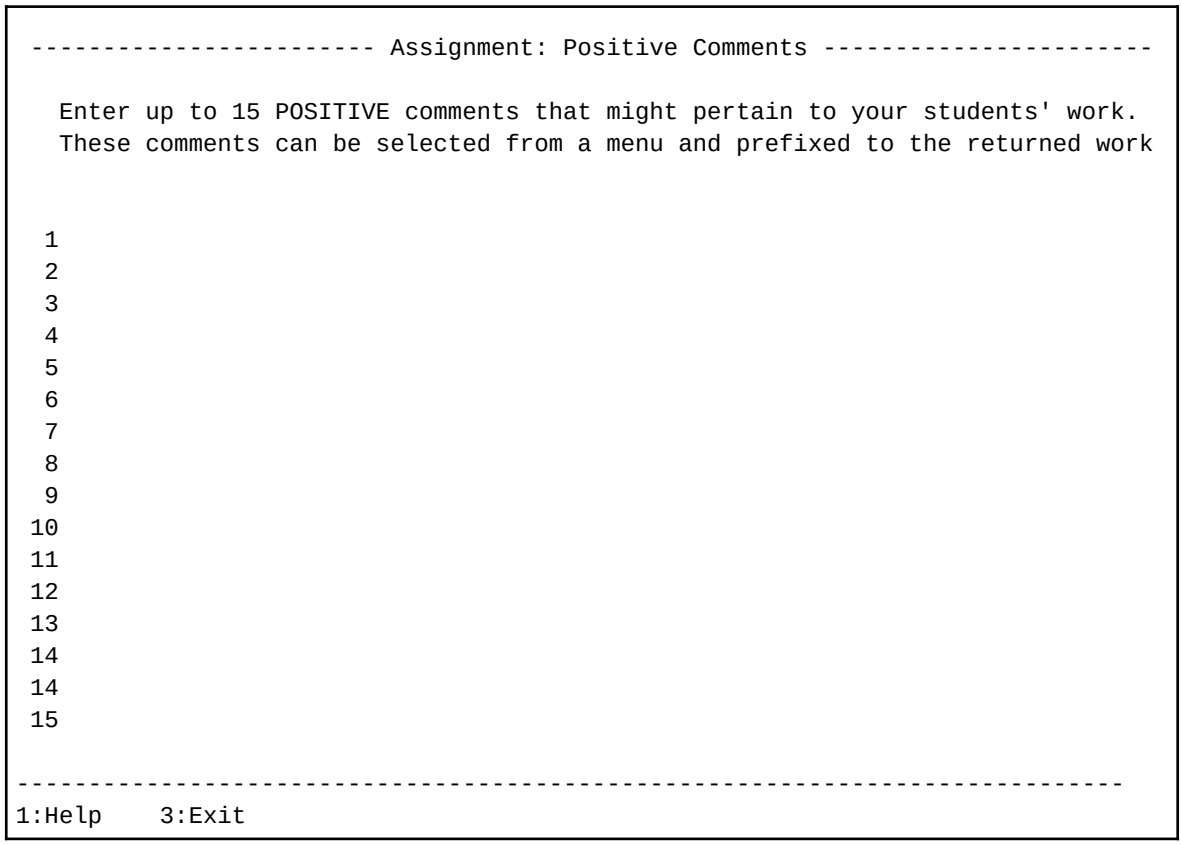


Figure 5.13 Assignment Positive Comment Text Entry

Start or Continue Marking Assignments

This item is used to start or continue marking assignments from where you left off. You are placed into the Editor, editing the submitted assignment text. The standard Editor keys are defined. However, three keys are slightly different in meaning.

F3 not only quits the edit session, it terminates the assignment marking process. You can resume this simply by re-selecting this menu option from the main menu.

F5 ends the edit session and causes the mark panel (shown in Figure 5.14) to be displayed. At this point, you can assign a mark and select the comments that you wish to be returned to the student.

F11 allows you to enter remarks during the course of reviewing the submitted assignment. Pressing F11 will insert several lines, with the center one indicated with an arrow and the cursor positioned for text entry.

To assign a mark, enter a value in the mark field. You have a choice of including the header text or not - the default is to include the header text. In order to include positive or negative comments, type over the default N in front of the comment you wish included. By default, no positive or negative comments are included. Once you are satisfied with this panel, pressing ENTER will log the marked assignment, enter the mark in your marks file, and returned a copy of the marked assignment to the student via e-mail. Pressing F3 at this point will result in the assignment not being assigned a mark.

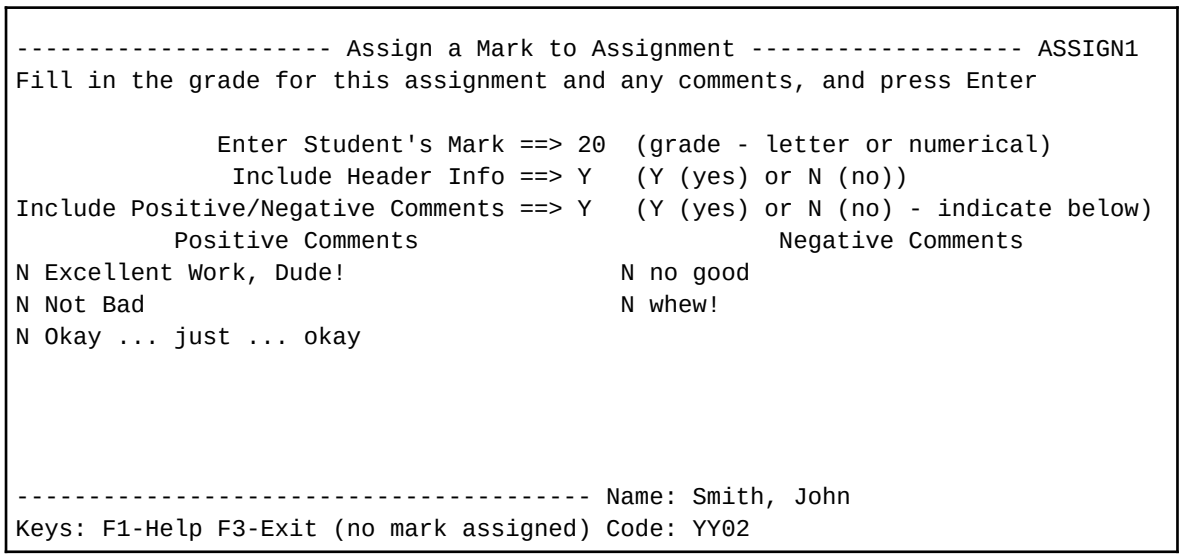


Figure 5.14 Assign Mark Screen

Restart Marking Assignments Out of Sequence

This option allows you to restart marking assignments at any point. This is useful when you've missed marking an assignment for one reason or another, and need to mark a single assignment.

Delete Assignments

Once your course has ended, you might wish to clean up your assignment files. This option will delete the assignment files for this assignment. Note that you might wish to archive these files first. In any case, the log file keeps a record of what was done to each assignment, and when it was done.

View Assignment Log File

This option simply invokes the VIEW program to display the assignment log file.

Edit Mark File

This option displays the assignment mark file in the form shown in Figure 5.15. You are within the editor, so within the command field you can enter standard editor commands. However, each line in the file is displayed as a panel, allowing you to easily identify the mark for a particular assignment.

Note that you don't have to enter marks here for assignments marked electronically with the Assignment Mark Facility. However, not all assignments are suitable for such marking, and in those cases, this option can be used to enter the marks manually.

```
MARKS FOR ASSIGN1
                                                        Top of file
Command:

Field        Data
-----        ----
UserId       YY02
Name         Smith, John
Stud.#       987-6543
Assign1      21
Assign2      78
Assign3      45
Assign4
Assign5
Assign6
Assign7
Assign8
Assign9
Assign10

================================================================================
```

Figure 5.15 Editing the Mark File

View Assignments (using FLIB)

This option simply invokes FLIB to display the submitted assignment files for the current assignment. This is useful to quickly view the assignment for a particular student, for example when the student wishes to discuss the assignment.

Submitting an Assignment from CI

In order to submit an assignment, your students should use the Submit Assignments option from within the Assignments panel under CI. The Assignments panel is similar to the instructor panel, except that the S option is used in front of an assignment to bring up the Submit Assignment display.

Note that there are two methods of submitting an assignment. The first method is to send the assignment via e-mail (which is the default). This has the benefit to the student of automatically notifying the student when

you have accepted the assignment. The second method allows the student to store the submitted assignment directly onto the instructor's account. This has the benefit for the instructor of not having to retrieve mail items, and not cluttering the mailbox with assignment submissions.

In either case, a required field is the name of the MUSIC file that contains the student's assignment. This means that before deciding to submit an assignment, the student must previously have completed it, and have it ready in a file.

Pressing ENTER will submit the assignment, and inform the student that it has been done. Errors in submitting the assignment are reported immediately. Press F3 will cancel the assignment submission and return the student to the Assignment panel.

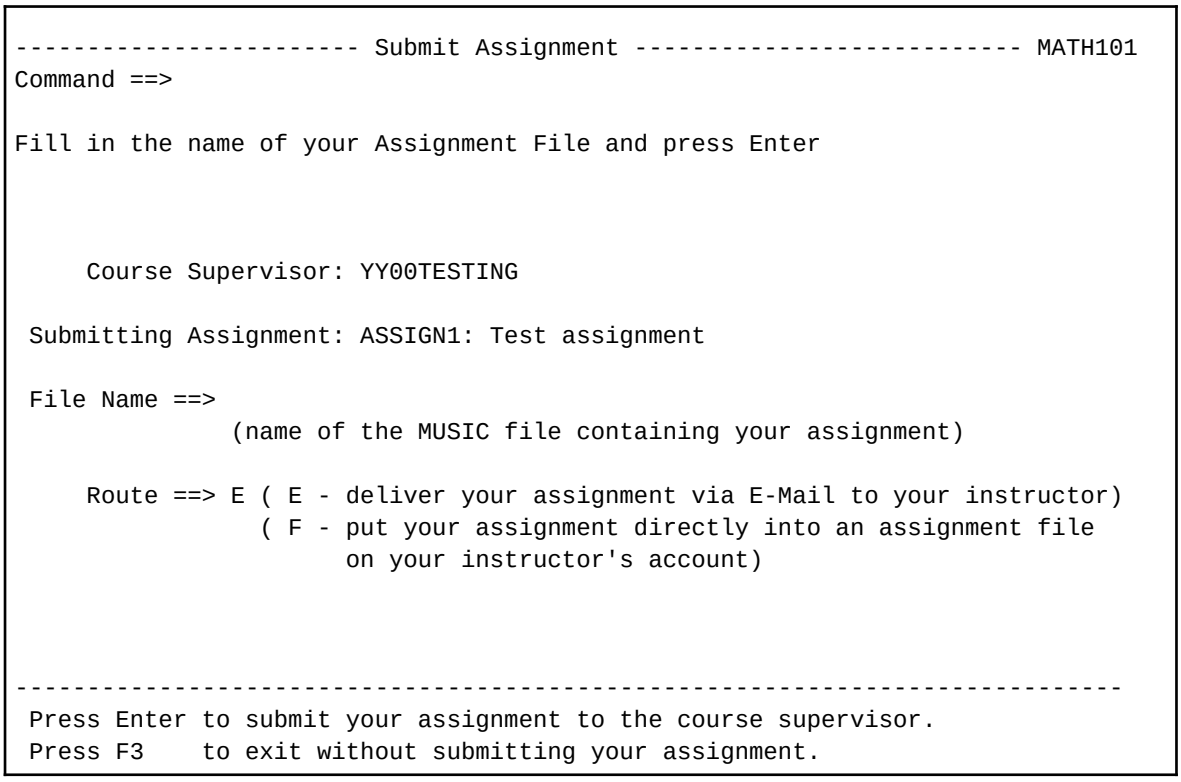


Figure 5.16 Submitting an Assignment from CI

Electronic Mail

A major feature of the CM Facility is the ability to send mail to an individual, a select group of individuals, or the entire class.

Select MAIL item from the CM main menu. Figure 5.17 shows the menu for MAIL item.

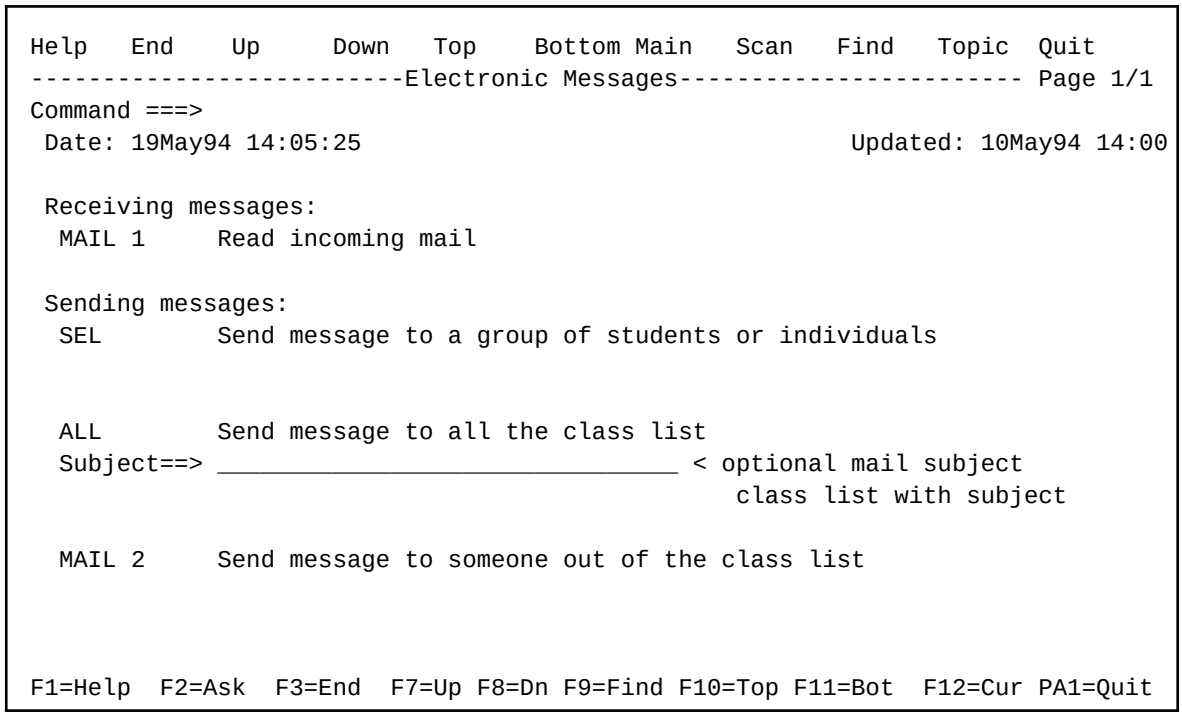


Figure 5.17 - Mail Options

MAIL 1 This option invokes the MAIL facility. When you have finished viewing the mail, exiting from the MAIL program in the usual fashion (Press F3 twice or press PA1), and you are back to the CM main menu.

SEL In this option, you are presented with the mail selection screen (figure 5.18 below). The list of names presented on the screen is taken from the class mailing list file. See the section "Managing the Class List" for details on how this file is created and managed. To send mail to an individual or a select group, fill in the subject line and place an "S" in the selection margin beside the userid of the selected students. You are placed in the editor to type in the text of the mail item. When you are finished press F5 to send the mail. You will be back to CM program in the usual fashion.

```
-------------------------- Class Mail List -------------------------- ICS
Command ==> _

Type "S" beside the appropriate userid(s) and press ENTER.

Subject ==>                                    (Optional mail subject)
_ XX00000 Course Supervisor
_ XXAA000 John Smith
_ XXAF000 Mary Brown
_ XXAY000 H.G. Wells
_ XXAD000 John Doe
_ XXBC000 Amy Wright
_ XXDD000 Sue Jones
_ XXDS000 Bill Shakespeare
_ XXAW000 Amadeus Mozart
_ XXBF000 Janet McNeil
_ XXJF000 Diago Maradona
_ XXBF000 Ken Saunders
_ XXBH000 Kathleen Logan
_ XXBJ000 Slim Pickens
_ XXAK000 Zaphod Beeblebrock
_ XXBE000 Joe Montana
_ XXAD000 A.Y. Jackson
_ XXBF000 Margret Thatcher
_ XXCT000 Perry Mason
_ XXCG000 Rusty Nail
------------------------------------------------------------------------------
Keys: F1-Help   F3-Exit   F7-Up   F8-Down   F9-Locate
```

Figure 5.18 - Class Mail List

When the class is large the LOCATE command can be quite useful in locating individual students. For example to, locate a student called Rusty, enter the following in command area.

```
Command ==> locate rusty
```

The located entry is placed at the top of the screen. The LOCATE command is not sensitive to upper and lower case. The F9 key can be used to repeat the previous locate command.

ALL To send mail to the entire class, fill in the mail subject line and press F10. You are placed in the editor to type in the text of the mail item. When you are finished press F5 to send the mail. You will be back to CM program in the usual fashion.

SEL and ALL options use SENDMAIL facility to send messages to the students.

MAIL 2 This option invokes MAIL to send messages to someone out of the class list.

More information about the MAIL program can be found in the *MUSIC/SP Mail and Conferencing Guide*.

Special Course Supervisor Features

These features are only active if you are using the course supervisor userid to manage the course. This userid is assigned a special SUPV privilege that allows you to change passwords, transfer funds, and access the files of students in your class.

Select topic TRANS$ from the CM main menu to activate the TRANS$ program. This program lets you change the students passwords and transfer computer funds from one userid to another. Full details on the TRANS$ program are given later in this chapter under the topic "Transferring Funds".

Select topic FILES from the CM main menu to view student files. You are presented with the file selection screen (figure 5.19).

```
-------------------------- View Student Files ----------------------- ICS
Command ==>

Type "S" beside the appropriate userid(s) and press ENTER.
--------------------------------------------------------------------------------
_ XX00000 Course Supervisor
_ XXAA000 John Smith
_ XXAF000 Mary Brown
_ XXAY000 H.G. Wells
_ XXAD000 John Doe
_ XXBC000 Amy Wright
_ XXDD000 Sue Jones
_ XXDS000 Bill Shakespeare
_ XXAW000 Amadeus Mozart
_ XXBF000 Janet McNeil
_ XXJF000 Diago Maradona
_ XXBF000 Ken Saunders
_ XXBH000 Kathleen Logan
_ XXBJ000 Slim Pickens
_ XXAK000 Zaphod Beeblebrock
_ XXBE000 Joe Montana
_ XXAD000 A.Y. Jackson
_ XXBF000 Margret Thatcher
_ XXCT000 Perry Mason
_ XXCG000 Rusty Nail
--------------------------------------------------------------------------------
Keys: F1-Help   F3-Exit   F7-Up   F8-Down   F9-Locate
```

Figure 5.19 - Viewing Student Files

The list of names presented on the screen is taken from the class mailing list file. See the section "Managing the Class List" for details on how this file is created and managed.

When the class is large the LOCATE command can be quite useful in locating individual students. For example to, locate a student called Rusty, enter the following in command area.

```
Command ==> locate rusty
```

The located entry is placed at the top of the screen. The LOCATE command is not sensitive to upper and lower case. The F9 key can be used to repeat the previous locate command.

Place an "S" in the selection margin beside the userid of the selected student(s) and press ENTER. CM invokes the FLIB program to give you access to files in the student's library. If you select more than one student at a time the requests are processed from top to bottom. When you exit FLIB you are returned to the student file selection screen from where you can select to view other student's files or return to the main menu by pressing F3.

Managing the Class List

The key to the electronic mail and file access features of CM and CI is the class mailing list file. This is basically a list of student names and userids. The details on how this file is maintained depend on how userids are assigned to students. There are two basic ways to assign userids for students.

1. The first way is to give the student a userid for each course. All the userids for a particular course start with the same first two characters. The course supervisor userid also starts with the same two characters and ends this "00". The system can now associate a particular userid with a specific course and automatically build this class list file under the supervisor's userid in the file called:

   @CLASS.LIST

   When a student signs on to MUSIC for the first time, their name and userid are automatically appended to this file. Note that students are only added to the class list when they sign on. Because of this it is useful to have them sign on early in the course.

2. The second way is to give the students a single personal userid that they use for all their courses. In this case there is no way to identify a particular userid with a specific course. There is also no course supervisor userid so the class list file is kept in the course owner's (that's you) library. The file name used is:

   @cid.LIST

   where *cid* is the course_id assigned by you when the course was initialized.

   The class list file is created automatically with your name on it. Students must register in your class by using the REG command. When they do this they are asked to enter their name, the course_id (cid) and the userid of the course owner. It is up to you to provide them with the last two items. If the information is correct, REG updates the class list file and adds an entry to the student's @CLASSES file indicating that he is registered for your course.

   Select LIST option on the CM main menu to manage the class list file (figure 5.20 below).

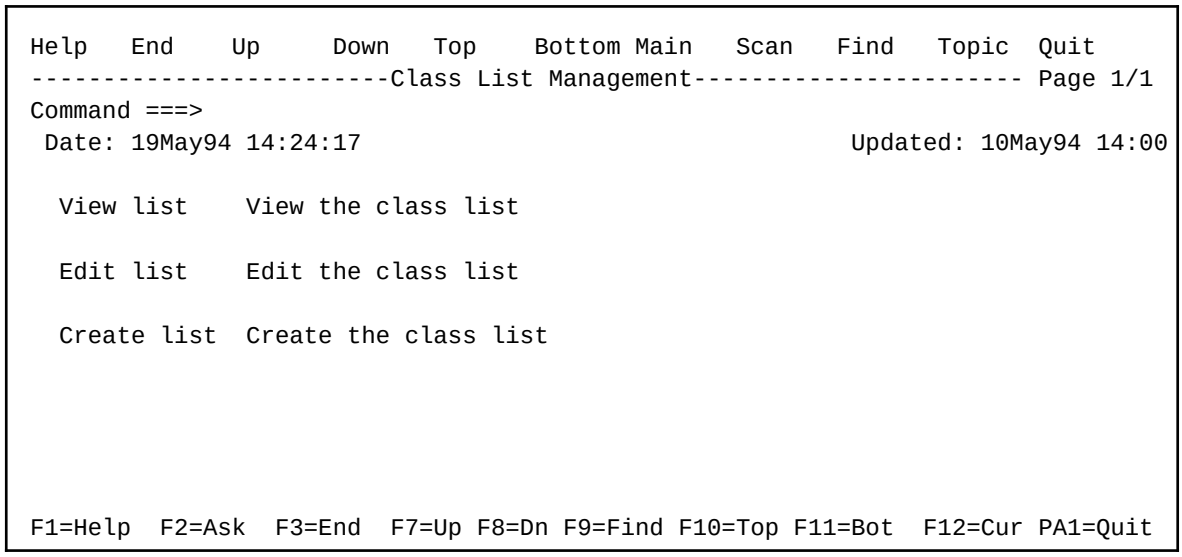


Figure 5.20 - Class List Menu

Select "View list" to view the current class list. Select "Edit list" to change fields in the list. You may want to use the editor SORT command to sort the list in a specific order. As it stands it will be in the order that the students signed on.

"Create list" option allows you to re-create the list from scratch. The information is loaded directly from the user profile records in the system code (userid) table. This option will only work if students are assigned a userid for each individual course.

Tailor Student Menu: CI

As mentioned before, teachers use the CM facility to manage the course material and the students use the CI (Course Information) menu to access the information teachers have prepared.

Usually, students have a menu with "MAIL" to "FSI" topics as shown in the following figure. However, using CM you can add new options to the menu of CI, as shown below:

```
Help   End    Up     Down   Top    Bottom Main   Scan   Find   Topic  Quit
----------------------Course Information for CINFO------------------- Page 1/1
Command ===>
 Date: 19May94 14:31:27                                  Updated: 10May94 16:30
 TAB (or use arrow keys) to move cursor to a topic name and press the ENTER key

 General Information:
  MAIL           Receive and send electronic messages
  OUTLINE        Read course outline
  NOTES          The course notes
  ASSIGNMENTS    The assignments
  DOCS           Online documentation
  FSI            The menu interface for MUSIC

  COGN           Conference about Cognitive Computing
  CONFDAT        Conference about Databases
  POLYSOLVE      Calculator


F1=Help  F2=Ask  F3=End  F7=Up F8=Dn F9=Find F10=Top F11=Bot  F12=Cur PA1=Quit
```

Figure 5.21 - Course Information (*CI*) *menu.*

To tailor the CI menu select TAILOR item from the main menu of CM. Help is provided once the following screen appears:

```
----------------------------- Tailor Student Menu -------------------- CINFO
Command =>

Fill in the following fields. Use F3 to save the changes and exit.

Topic name   => COGN       (keyword for the description)
Description  => Conference about Cognitive Computing     <
Program name => CONF COGN                                <

Topic name   => CONFDAT    (keyword for the description)
Description  => Conference about Databases               <
Program name => CONF CONFDAT                             <

Topic name   => POLYSOLVE  (keyword for the description)
Description  => Calculator                               <
Program name => POLYSOLVE                                <

Topic name   =>            (keyword for the description)
Description  =>                                          <
Program name =>                                          <

------------------------------------------------------------------- 14:35:26
Keys: F1-Help   F3-Save changes and exit   F6-Cancel  F7-UpPage    F8-DownPage
```

Figure 5.22 - Tailoring the Student Menu (*CI*)

TRANS$: Transferring Funds Between Userids on MUSIC

The TRANS$ program can be used by a course or project supervisor to transfer computing funds from one MUSIC userid to another. It can also be used to display the funds remaining in a userid, display a mini-profile of a userid, and to assign a new password to a userid. TRANS$ allows authorized persons to distribute allocated funds among the students that they supervise. The supervisor userid (the userid you are using to run TRANS$) can inspect or modify only the userids in its course or project group. These are userids which start with the same first two characters as the supervisor userid. Any userids specified must match the supervisor userid in the first two characters. For example, the authorized userid XY00 could use TRANS$ to move funds from XY15 to XY25.

To run the TRANS$ program, select item TRANS$ from the CM main menu or enter the TRANS$ command from *Go. The following screen appears:

```
------------------------------ MUSIC FUNDS TRANSFER --------------------------


SELECT OPTION ====> _

1  TRANSFER      - Transfer funds
2  ALLOCATE      - Allocate or 'top-up' funds
3  GET           - Display current funds
4  LIST          - Display mini-profile
5  CHANGE        - Change password
6  SAVE          - Save output displayed
7  HELP          - TRANS$ help facility
8  PROFILE       - MUSIC profile facility
9  END           - Terminate TRANS$









================================================================================
PF1/PF13 - Help            ENTER - Process              PF3/PF15 - End/Cancel
```

Figure 5.23 - TRANS$ Main Menu

To select an option from the menu, type the number of the desired function in the SELECT OPTION field and press enter.

TRANSFER and ALLOCATE

The TRANSFER option allows the supervisor userid to transfer a specified number of dollars from one userid to another.

Each userid on the MUSIC system has two dollar values associated with it: a current amount and a limiting amount. The current amount starts at zero and is increased each night by the charges for that day by the

NOWDOL system utility. When the current amount reaches the limiting amount, the userid may no longer be used until the limit is increased by adding more funds. This can be done by the MUSIC System Administrator, or by using the TRANS$ program to transfer funds from another userid.

The ALLOCATE option is similar to the TRANSFER, except that only enough is transferred to make the unused amount in the receiving userid the specified number of dollars.

Selecting either of these options will invoke the panel for indicating the FROM CODE, the AMOUNT and the receiving code(s). The following diagram illustrates the TRANSFER FUNDS screen.

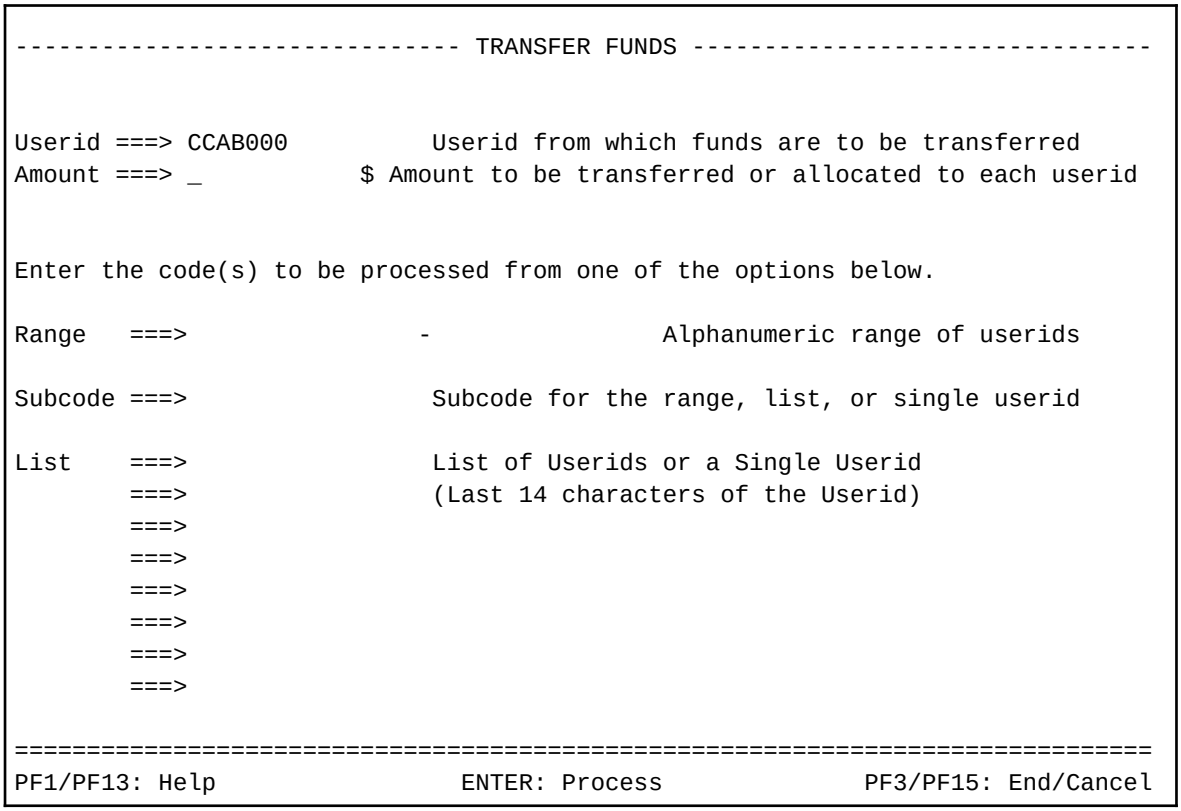


Figure 5.24 - Transfer Funds Screen

Once all the required fields are entered, TRANS$ will display acknowledgement messages or error messages for each transfer.

Note: A transfer is not allowed if it would result in the receiving userid having more than $300 unused. This is to prevent the accumulation of excessive funds in a single userid.

GET and LIST

The GET option displays the funds allocated, the funds used and the funds left in the userid(s) specified.

The LIST option displays the same information as the GET option along with the name belonging to the userid, the total Save Library space allocated and used, the time of last sign-on and batch job.

Selecting either of these options will invoke the panel for specifying the userid(s) to be displayed. The following diagram illustrates the GET COMMAND screen.

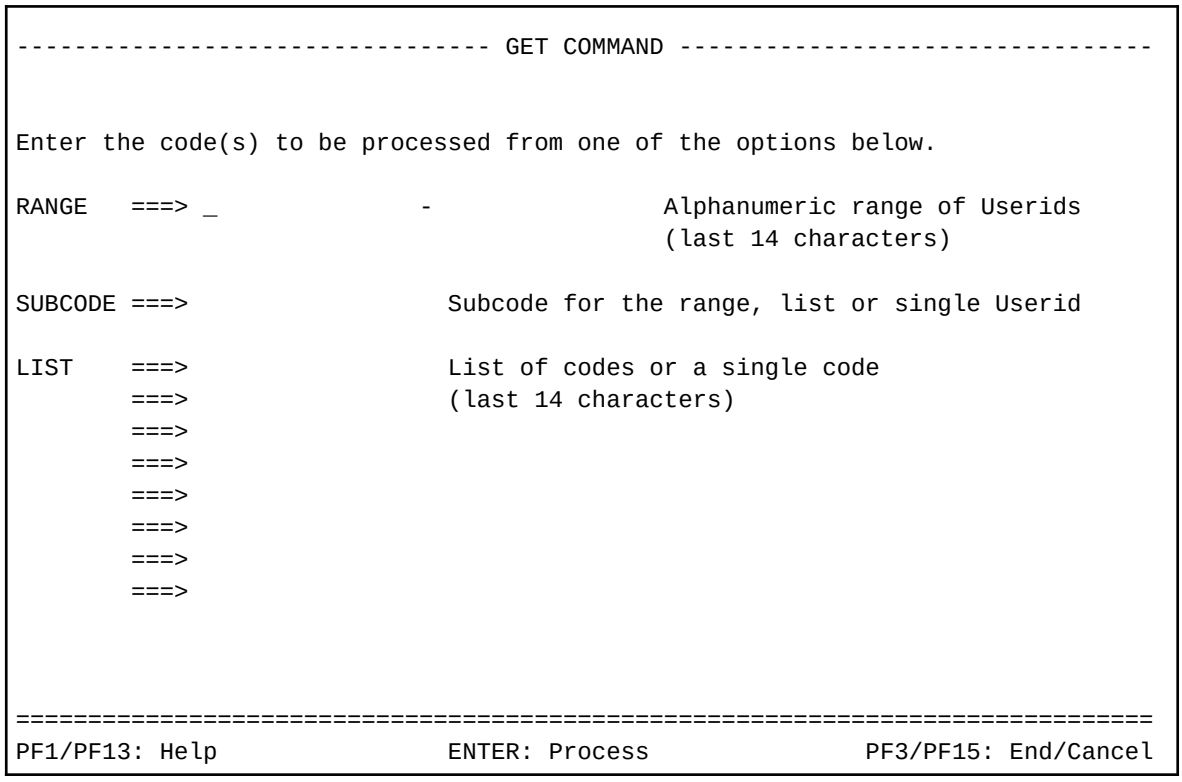


Figure 5.25 - GET Command Screen

CHANGE Password

The CHANGE option allows the supervisor userid to change the password of the userid indicated. This option will invoke the screen for specifying the userid and the new password, as shown in figure 5.26 below.

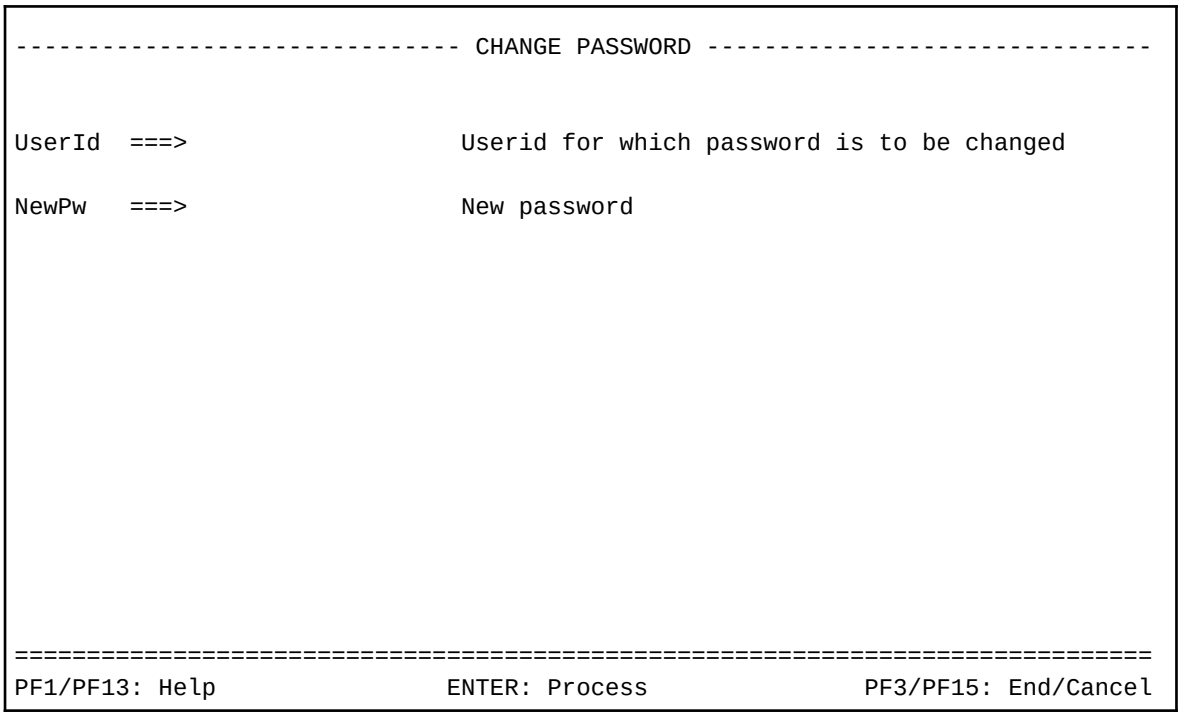


Figure 5.26 - Change Password Screen

SAVE

All information displayed from the above options can be saved in a file on a teachers' userid. Selecting this option will invoke the panel for indicating the userid and file name (figure 5.27).

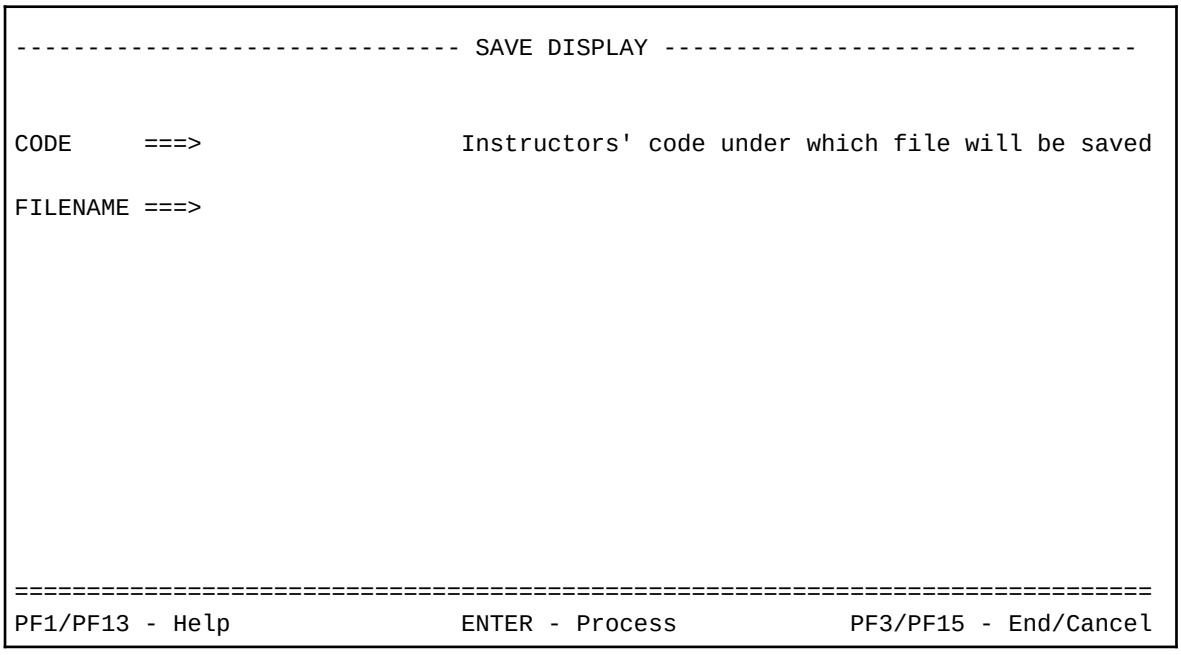


Figure 5.27 - Save Display Screen

Note: After viewing the output, you will return to the menu screen. The SAVE option must be selected at this point if you wish to save the output displayed, otherwise it will be lost.

HELP

This option displays the TRANS$ help file. The same help information can be displayed from any screen by pressing the F1 key.

PROFILE

This option takes you to the Profile facility. The Profile END command returns to the TRANS$ menu. (A short description of the PROFILE is given in *Chapter 4 - Managing Userids and Files* under the topic "PROFILE Program and Userid Attributes".)

Chapter 6. Introducing MUSIC to your Students

Teaching MUSIC

Overview

The goal of this chapter is to make the job of teaching MUSIC to your students easier. It contains pages that can be made into transparencies, along with notes to guide your presentation.

The following topics are covered:

- Definition of MUSIC
- MUSIC Applications
- The MUSIC Environment
- MUSIC File System
- Important Keys
- Signing On
- *Go Mode - MUSIC Commands
- FSI (Full Screen Interface)
- Defaults - Changing the FSI environment
- Profile - Changing Passwords
- CI (Course Information)
- Using the Editor
- Electronic Mail Facility
- Signing off

Online Documentation

In addition to the transparencies that follow, you may want to supplement your presentation with handouts from the MUSIC manuals; or advise your students on how to search these manuals to find information. See *Chapter 2 - Facilities* under the topic "Online Manuals" for information about extracting text.

Guide for New Users

The *MUSIC/SP Guide for New Users* is for anyone who is learning how to use MUSIC for the first time. This guide explains:

- Basic concepts of MUSIC/SP
- Full Screen Interface (FSI) menu facility
- Creating and modifying files using the Editor
- Running programs
- File management
- Electronic mail
- MUSIC/SP command language

There are exercises throughout the guide that provide for hands-on experience with MUSIC. The guide is set up in a task-oriented way, and students are encouraged to perform as many examples as possible, immediately and interactively.

Transparencies for Teaching MUSIC

The following section of this chapter provides pages that you can copy onto transparencies and present to your students. For each transparency there is text on the opposite page providing more details. These details should help you with your presentation.

This chapter is intended to introduce your students to MUSIC. To learn more about MUSIC, you can suggest the *MUSIC/SP Guide for New Users* as described above.

Foil 1 - What is MUSIC/SP?

1. **MUSIC/SP stands for "Multi-User System for Interactive Computing / System Product**

2. **MUSIC includes wide range of software components and facilities to help you use the computer effectively**

3. **You have access to many devices (hardware) for storing data, printing, etc.**

4. **Multi-user system supports many users simultaneously from different types of workstations**

Foil 1 - What is MUSIC/SP?

1. MUSIC/SP (MUSIC for short) is a time-sharing system that allows many users to access a mainframe computer concurrently. At the workstation, you can interact with the MUSIC system directly, telling it what to do. This *interactive* system, in turn, responds to that request at your workstation.

2. MUSIC acts like a coordinator between you and the computer's resources. It helps you use the computer's resources effectively and enables others to do their work independently of yours. MUSIC is a platform providing many services. MUSIC has many programs to help you use the computer productively. Menu-driven facilities on MUSIC provide an easy method of accessing the most common programs such as FSI (Full-Screen Interface), the Editor (for creating and revising files), and MAIL (electronic mail). These programs, or *software* are some of the applications that are part of the MUSIC system.

3. Some of the equipment or *hardware* attached to the computer are: disk for online storage of your files; magnetic tape for offline storage; and printers at the central site for large volumes of output.

4. Many types of workstations access MUSIC in different ways. For example: many types of computer terminals can be connected directly by cable to the mainframe; Personal Computers (PCs) can dial in directly over telephone lines; or PCs on a LAN (Local Area Network) can be part of large campus network attached to the mainframe.

Foil 2 - MUSIC Applications

How is MUSIC Used?

- **All resources and facilities are shared by all users doing a variety of different applications**

	CWIS	*Information*	
Electronic Mail		*Retrieval*	*Word Processing*

MUSIC/SP

Personal Scheduling	*Statistical Analysis*	*File Transfer to/from PC*	*Application Development*

Foil 2 - MUSIC Applications

MUSIC includes a wide variety of software for general users, programmers, students, and the system administrator. The following is a brief description of a few uses of MUSIC:

Electronic Mail

MUSIC's MAIL system includes features useful to novice or advanced users. In an academic environment it helps in the distribution of notes and assignments. The MAIL system connects to the international academic electronic mail networks, providing students access to other institutions throughout the world.

Campus-Wide Information Systems (CWIS)

MUSIC provides the software for creating and maintaining a CWIS (electronic bulletin board). Many MUSIC sites provide this information service for their campus and allow anonymous access.

Electronic Office

MUSIC's electronic office subsystem (TODO) includes calendar and schedule management applications. SCRIPT, a word processing program, is useful in the preparation of term papers, assignments, and theses. The SPELL program uses a 90,000 word dictionary to check your spelling.

Statistics and Graphics

Several statistical packages run with MUSIC to provide the tools for both the novice and the professional statistician.

Personal Computing

The Personal Computer Workstation (PCWS) component of MUSIC provides terminal emulation, file transfer, and programmable communications. This program is described in the *MUSIC/SP Personal Computer Workstation* (*PCWS*) *Guide*.

Programming Languages

MUSIC provides menu driven interfaces to high level language compilers. For the novice, the programs are compiled and linked in a single step, eliminating the need to handle object programs and load modules.

Application Development

Programmers have many programming tools available to them. The tools include those to design full screen panels and interface them to high level applications. This guide provides an introduction to running programs (*Chapter 7 - Teaching Programming*). For more information about programming tools, see the *MUSIC/SP User's Reference Guide*.

Foil 3 - The MUSIC Environment

1. **Userids:**
   - **authorize you to use the system**
   - **keep your files private**
   - **provide an email address**

2. **Each userid has a Profile associated with it to define such things a file space limits and passwords.**

3. **There are several Working Environments on MUSIC:**
   - **Menu Facilities: FSI, TODO, CM, CI**
   - ***Go (Command Mode)**
   - **Editor**
   - **and many more...**

4. **Online Help:**

F1 key	**- help for current screen**
HELP topic	**- help for current program**
/HELP topic	**- General Help Facility**

Foil 3 - The MUSIC Environment

1. **Userids:** Each student is given a userid to identify them to MUSIC for the purpose of file ownership, accounting, and it also provides an email address. Some campuses also provide a public userid for anonymous access to a CWIS.

2. **Profile:** Each userid has a profile containing all the userid attributes, such as, time and storage limits, sign-on passwords, and autoprogram (if any). The PROFILE program is used to view and change these attributes. Some attributes can be changed by the student (passwords), other attributes, such as funds, can be changed by the teacher, and still others can be changed by the system administrator who creates userids.

3. **Working Environments:** There are several working environments on MUSIC. By default most user-ids have an autoprogram defined in the profile. This program is automatically invoked every time the user signs on. For example, most userids have the FSI (Full Screen Interface) menu invoked when they sign on to MUSIC. (More about FSI later.)

   If there is no autoprogram assigned to your userid, then the *Go message appears on the screen. (More about this mode later.)

   Some programs on MUSIC are used so often they can also be considered a working environment. One of the most frequently used programs on MUSIC is the Editor. The Editor is used to create and revise files. These files can contain programs, data, documents, etc.. In this full-screen environment, Program Function keys are used to issue commands. These key definitions are listed at the bottom of the screen. Most programs on MUSIC are full-screen applications and have function key definitions or option codes listed on the screen.

4. **Help:** The F1 key or the HELP command is used for getting help. The HELP command can be used in the command area of any MUSIC application. A topic name can be included with the command. For example, while in the Editor program, you can type the following to get help for the Editor MOVE command.

   ```
   HELP MOVE
   ```

   MUSIC commands can also be entered in the command area of the Editor and many other programs on MUSIC. It is a good idea to use the slash (/) character in front of the MUSIC command to distinguish it from commands for the current program. If you enter "/HELP" the Editor executes a MUSIC command. In this case, you would receive MUSIC's General Help facility.

   For example, you may want information about MUSIC subroutines while editing a program. Enter:

   ```
   /HELP SUBROUTINES
   ```

Foil 4 - Files on MUSIC

1. **Files are stored on disk attached to the mainframe**

2. **Files are stored privately under your userid in your "library"**

3. **Files can be shared (SHR file attribute)**

4. **Files can be transferred to/from a PC (PCWS)**

5. **Files can be stored on a flat file system or a tree-structured system**

FLAT (*LIB cmd*)

```
@ELOG.000
ACCT.PAPER1
ACCT.PAPER2
CV
HIST.NOTES
HIST.PAPER
LETTER92JAN
LETTER92FEB
```

TREE (*DIR cmd*)

```
@ELOG.000
ACCT\
ACCT\PAPER1
ACCT\PAPER2
CV
HIST\
HIST\NOTES
HIST\PAPER
LETTERS\92JAN
LETTERS\92FEB
```

TREE (*TREE cmd*)

```
AB01\--+-ACCT
       |
       +-HIST
       |
       +-LETTERS
```

Foil 4 - Files on MUSIC

1. **Disk:** Large disks are attached to the mainframe computer to store your data. Your userid may have storage limits, so purge files that you don't need.

2. **Library:** The group of files that you own is referred to as your *library*. File ownership is determined by the userid excluding the subcode (if any). Each file in your library has a unique name. The FLIB program is invoked by FSI (selection 4 on FSI's main menu). This program lists the files in your library.

   There are other programs on MUSIC that can help you manage your files. For example, the LIBRARY command displays different information from FLIB and it can save the list in a file. Type "/HELP LIBRARY" for more information.

3. **File Attributes:** In addition to your own library, you can access files in the public library and shared files in other user's libraries. By default, your files are saved with the PRIV (private) attribute. This means that only you can access your files when signed on to MUSIC with your userid. No one else has access to the files in your library unless you create files with the SHR (share) attribute. To give a file the SHR attribute use the FILE command in the Editor as follows:
   `FILE filename SHR`
   Use the MAKSHR command for files that already exist.

   When files have the share attribute, other MUSIC users can access them. The other user needs to know your userid (not the password) and the name of the file. For example, if your userid was ABCD and the file was called XYZ the other user would supply the name "ABCD:XYZ". They would not be able to change your file, but they would be able to view or copy it.

4. **PCWS:** MUSIC includes software for your PC called PCWS (Personal Computer WorkStation) that allows you to access the mainframe. You can toggle back and forth between a PC and MUSIC session. By using the XTPC and XTMUS commands on MUSIC you can transfer files to and from the PC. Type "/HELP PC" for more information or refer to the *MUSIC/SP Personal Computer WorkStation* (*PCWS*) *guide*.

5. Your files can be stored in your library under one directory (flat file system) or several directories (hierarchical tree-structured file system). The commands to use a tree-structured system are the same as DOS commands (MD, CD, RD, DIR).

   Box 1: shows the list of files when there are no directories. All the files are stored "at the root". Files can be grouped together by choosing names with the same prefix.

   Box 2: shows the results of the DIR command. All files are shown, along with directories.

   Box 3: shows the user's library when the TREE command is used. Only the directories are shown here. You can see the files by placing the cursor on a directory name and pressing F12 to invoke the FLIB program. FLIB is the program that is used by FSI as a File Management option.

Note: The @ELOG.000 file is created automatically by the Editor. This log file is necessary for the Editor to recover data due to system failure. "@" files are generated by MUSIC programs.

Foil 5 - Important Keys to Remember

TAB	**Skips from one field to another**
ENTER	**Transmits a screen or line of information to MUSIC**
INS	**Inserts characters on a line**
DEL	**Deletes characters on a line**
Fn	**Program Function keys (F1 - F12 or PF1 - PF24) You can define your own keys**

Foil 5 - Important Keys to Remember

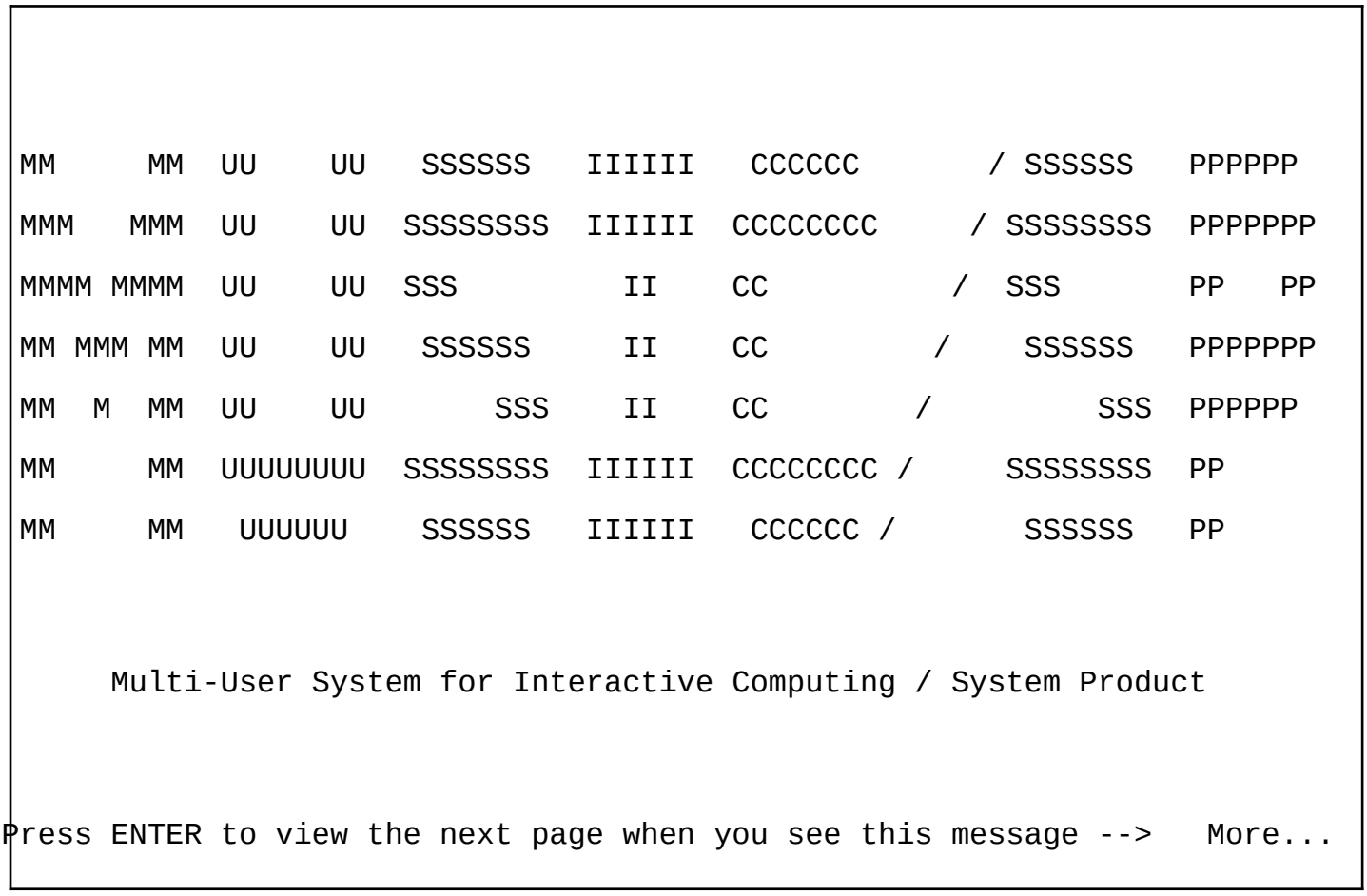
TAB	This key is used to skip to each input field on the screen. Some workstations have a NEW LINE key (an arrow that points down and to the left) that also skips to input fields.
ENTER	The ENTER key is needed to transmit data to the computer one line or one screen of information at a time.
INS	The INSERT key is a local editing key used to insert characters on the current line.
DEL	The DELETE key is a local editing key used to delete characters on the current line.
Fn	Function (F or PF) keys are used extensively on MUSIC. Some workstations have 24 function keys, but 12 keys are sufficient for MUSIC programs. The term PF key and function key (F key) mean the same thing. Use F1 to access help and F3 to exit the current screen or program. The definitions of the other keys depend on the program you are using at the time. There are command equivalents for every function key if your workstation does not have these keys, but it easier to work with function keys.

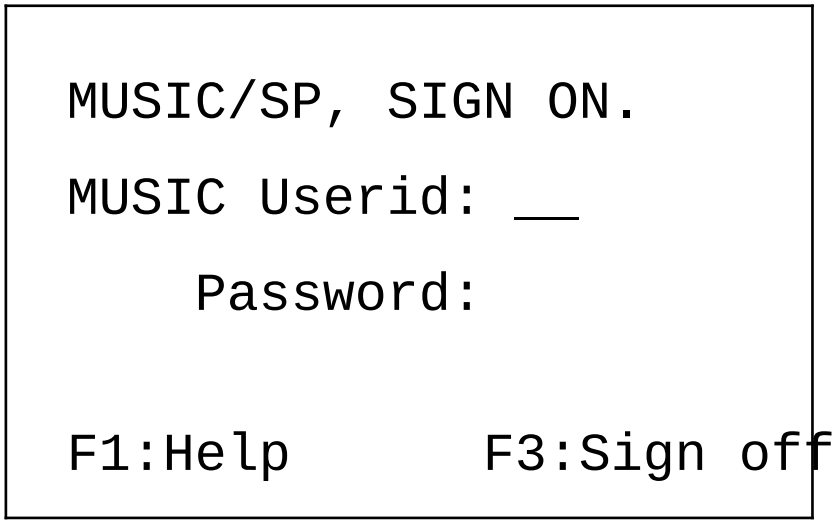
Defining your own Keys

MUSIC allows you to define your own function keys for *Go mode. Type "/HELP DEFINE" for information. The Editor also allows your own definitions. For information, type "HELP DEFINE" during an edit session.

The topic "Programming with REXX" in Chapter 7 has a sample of defining keys.

Foil 6 - Signing On





Foil 6 - Signing On

MUSIC Logo

Before you can sign on to MUSIC you must power on your workstation and follow certain steps until MUSIC displays the MUSIC logo. The steps for making the connection to MUSIC involve certain commands that you type or keys that you press. For example, some users may need to type "dial music" to connect to MUSIC. Since there are many types of workstations and several ways to connect to the mainframe, these steps cannot be described here. Check with someone at your installation for the correct procedure.

Once connected, MUSIC displays a 3270 full screen image on most types of workstations, including Personal Computers.

Sign On Screen

Once you have made the connection to MUSIC and you see the logo, Press ENTER to see the sign-on screen.

Notice that the cursor (__) is automatically where it should be for you to enter your userid. Follow these steps to sign on:

1. Type in your userid, press the TAB key to put your cursor in the password field.

2. Type in your password (it does not show as you type), press the ENTER key.

MUSIC responds with information on when your userid was last used, the date and time of this sign-on, and your workstation port number. The first time you use MUSIC you may be prompted to enter your name. Lastly, MUSIC displays the working environment that is set up for your userid. This, most probably, will be either *Go mode or FSI.

Foil 7 - *Go Mode

- **MUSIC commands are entered in this mode**

  Getting Help:

HELP	**- MUSIC's General Help facility**
MAN	**- Online manuals**

  Menu Facilities:

FSI	**- Full Screen Interface**
CI	**- Course Information**
MAIL	**- Electronic Mail program**
TODO	**- Time, Office, and Documentation Organizer facility**
TUT	**- Tutorials for REXX and Fortran**

  Working with Files:

EDIT	**VIEW**	**PURGE**
COPY	**RENAME**	**PRINT**
FINDTEXT	**FLIB**	**and more...**

- **There are about 100 MUSIC commands available.**

  HELP COMMANDS

Foil 7 - *Go Mode

Some users will see the *Go message each time they sign on. Other users will see the *Go message when they press F3 to exit from the current program.

MUSIC commands can be entered from *Go mode or from the command area of programs (some programs require a preceding slash (/)). For example, while in the Editor you can enter the EDIT command to edit a second file. When you finish the second file, you are returned to the first edit session.

The following commands are used often on MUSIC:

Getting Help:

HELP	Invokes the HELP facility which provides information about the MUSIC system. A wide range of topics are covered including: MUSIC commands, subroutines, utilities, etc.
MAN	Invokes the text search facility for displaying MUSIC manuals.

Menu Facilities:

FSI	Invokes the Full Screen Interface program. FSI allows you to access various components of the MUSIC system through a series of selection menus. Help is provided once FSI is invoked.
CI	Invokes the Course Information facility for students. This menu program works in conjunction with CM (Course Management facility) for teachers. Help is available once the program is invoked.
MAIL	Invokes the electronic mail facility. Your mail is received and created through this menu facility.
TODO	Invokes the TODO (Time, Office, and Documentation Organizer) facility. This facility provides menu items for such things as schedules, mail, spell check, etc. Help is provided once TODO is invoked.
TUT	Invokes the TUTORIALS facility for learning about REXX and Fortran.

Working with Files:

EDIT	Invokes the Editor.
VIEW	Invokes the VIEW program for full-screen viewing of files of any record length, type, or size.
COPY, RENAME, PURGE, PRINT	Copies, renames, purges, or prints a file in your library.
FINDTEXT	Finds a file that has certain text in it. This is handy if you forget a file name.
FLIB	Invokes the library management program for selecting groups of files. From this screen, you can: edit, browse, copy, rename, and delete files by typing the appropriate option code beside the file name.

Note: Many of these commands are available by choosing the appropriate item from a menu. For example, PRINT is a file management option of FSI. As FLIB above indicates, option codes are available on many screens to invoke program commands or MUSIC commands.

Other Commands

There are approximately 100 MUSIC commands available. Type "HELP COMMANDS" to find out more about them.

Foil 8 - FSI

```
Help   End    Up    Down   Top   Bottom Main  Scan   Find   Topic  Quit
-----------------Full Screen Interface for MUSIC-------------- Page 1/1
Command ===>
   13 *NEW* mail items and    5 replies waiting
 Place the cursor on an item and press ENTER or RETURN.

 MUSIC tools:
   Mail           Electronic mail facility
   Programming    Compilers, processors, tutorials, etc
   CI             Course Information
   Internet       Internet access, news reader, gopher, etc
   More           Other general MUSIC tools
 MUSIC files:
   FLIB *         Full Library Screen for current directory
   FLIB           Filespec => _____________________________ < pattern
   FUTIL          Other file related utilities
 MUSIC environment:
   Help           General help and online documentation
   New Password   Change your password
   Defaults       FSI customization
   Profile        Profile utility and options
   Disconnect     Terminate your session and disconnect from MUSIC
   Suggest        Make a suggestion or send a comment to support staff

F1=Help      F2=Suggest     F3=End         F9=Find         F12=Retrieve
```

Foil 8 - FSI

The following list briefly describes the items you can select from the main selection screen of FSI.

To select an item on the menu, place your cursor on a highlighted topic and press ENTER, or type the first 4 letters of the topic name in the command area and press ENTER. You can press F1 (Help) for complete information once an item is selected. Also, each item below is described in detail in the *MUSIC/SP Guide for New Users*.

MUSIC Tools:

Mail	invokes the MAIL facility for sending and receiving electronic mail.
Programming	displays the "Programming Languages" screen for information and tutorials about compilers and processors available at your site.
CI	invokes the Course Information menu for students.
Internet	displays the "Internet" menu to provide access to all programs available for using the Internet.
More	displays a "Tools" menu with many common MUSIC programs.

MUSIC files:

FLIB	invokes the FLIB facility for managing MUSIC files. Type a pattern specification in the *Filespec* area on the screen to indicate which set of files you wish to work with (use "*" to see all your files). From this facility you see a list of files to view, edit, delete, etc.
FUTIL	displays the "File Utilities" screen with many common MUSIC programs for working with files.

MUSIC environment:

Help	provides access to the General Help Facility of MUSIC and a list of online manuals that you can access with Index Text Searching.
NewPassword	displays the "New Password" for changing your sign-on password. It is important to choose your password carefully and to change it periodically to maintain maximum security for your userid and files.
Defaults	displays the "FSI Defaults" screen for tailoring your FSI working environment.
Profile	displays the FSI "Profile" screen which gives access to the PROFILE program for tailoring your MUSIC working environment. The more common PROFILE options are presented on this screen.
Disconnect	ends your MUSIC session by quitting FSI and signing off MUSIC. Press F3 (End) if you wish to leave the FSI menu but remain signed on to MUSIC.
Suggest	allows you to type in a message and send it to support staff through e-mail.

Foil 9 - Defaults

```
Help   End    Up    Down   Top   Bottom Main   Scan   Find  Topic  Quit
----------------------------FSI Defaults----------------------- Page 1/1
Command ===>
 Date: 20May94 10:01:47                            Updated: 16May94 15:03
 Make the necessary updates and press F3 to save the fields and exit.

   Editor name        =>              < personal editor file name

   Browse name        =>              < personal browse file name



   FLIB display info  =>Y  < Y-yes, N-no

   FLIB columns info  =>1  < 1-one column mode, 2-two columns mode

   File system        =>T  <  F-flat, T-tree structured




F1=Help F2=Ask F3=End F7=Up F8=Dn F9=Fnd F10=Tp F11=Bt F12=Ret PA1=Quit
```

Foil 9 - Defaults

Defaults

This facility is used to set operating defaults of FSI and FLIB facilities. Make any changes and press the ENTER to effect the change.

Editor name	If the editor that you are using has a different name from the system editor, its name should be specified in this field.
Browse name	If the browse program that you are using is different from the system default, its name should be specified in this field.
FLIB display info	Specify Y in this field to request additional information on each of the files in the group such as the space required, record format, record length, access dates, and access control. Locating this information adds overhead to the library scanning routine.
FLIB columns info	Specify 1 to display the file names in one column. Specify 2 to display file names in two columns with sequence numbers.
File system	MUSIC offers a flat or tree structured file system. With a flat system, all your files are stored in one directory. A tree structured system allows you to make different directories for each group of files.

Foil 10 - Profile

```
Help   End   Up   Down   Top    Bottom Main   Scan   Find   Topic  Quit
------------------------------Profile------------------------- Page 1/1
Command ===>
 Date: 20May94 10:02:13                          Updated: 17May94 16:16
 Place the cursor on an item and press ENTER or RETURN.

   Profile Util  Invoke Profile utility

   Help Profile  Help to the profile options

 Fast path:
   Show          Display your complete profile

   Brief         Display your name and id number (if assigned)

 Enter the required parameters and press ENTER to process:
   Autoprog  => _____________________________ < fill in the program na       me

   Batch pw  => ________ < fill in the new password

   Language  => ____ < SP-spanish, FR-french, PO-portuguese,
                       EN-english, KAN-kanji

F1=Help F2=Ask F3=End F7=Up F8=Dn F9=Fnd F10=Tp F11=Bt F12=Ret PA1=Quit
```

Foil 10 - Profile

Profile Options

This interface is used to access the Profile utility, and in particular, the most common functions.

Profile Util	accesses the PROFILE program for changing attributes of your userid (in other words, your MUSIC working environment).
Help Profile	accesses the help text for the PROFILE program.
Fast Path	simply invokes the Profile utility with "SHOW" or "BRIEF" as the parameter. These parameters list the attributes of your userid.
Autoprog	gives the file name of a program that will automatically be executed each time you sign on.
Batch pw	defines a new batch password (1 to 8 characters). This password may be required when you run a batch job.
Language	specifies the national language you prefer for messages, etc. The change will take effect the next time you sign on. Not all applications support all languages. If an application does not support the language you request, it uses English.

Foil 11 - CI

```
Help   End   Up    Down   Top   Bottom Main   Scan   Find   Topic  Quit
-----------------------Course Information---------------------- Page 1/1
Command ===> REG
 Date: 20May94 14:41:30                          Updated: 19May94 16:14

 General Information:
 MAIL           Receive and send electronic messages
 OUTLINE        Read course outline
 NOTES          The course notes
 ASSIGNMENTS    The assignments
 DOCS           Online documentation
 FSI            Access to the MUSIC menu interface (from *GO)


   +-------------------------------------------------------------+
   |  Currently, you do not have any course material available. |
   |                Contact your instructor.                     |
   |              **Press  F3  to leave  CI.**                   |
   +-------------------------------------------------------------+




F1=Help F2=Ask F3=End F7=Up F8=Dn F9=Fnd F10=Tp F11=Bt F12=Ret PA1=Quit
```

Foil 11 - CI

The Course Information Facility (CI) allows you to access course notes and assignments and send electronic mail to fellow class members and your teacher. To start this program, enter:

```
CI
```

This facility works in conjunction with the CM facility for teachers. You are automatically registered to use CI when all the students in the course and the teacher have special course userids. This means that all the userids start with the same 2 characters. If you do not have a course userid, use the REG command (explained below). You will need to have your userid included with the course list in order to use CI.

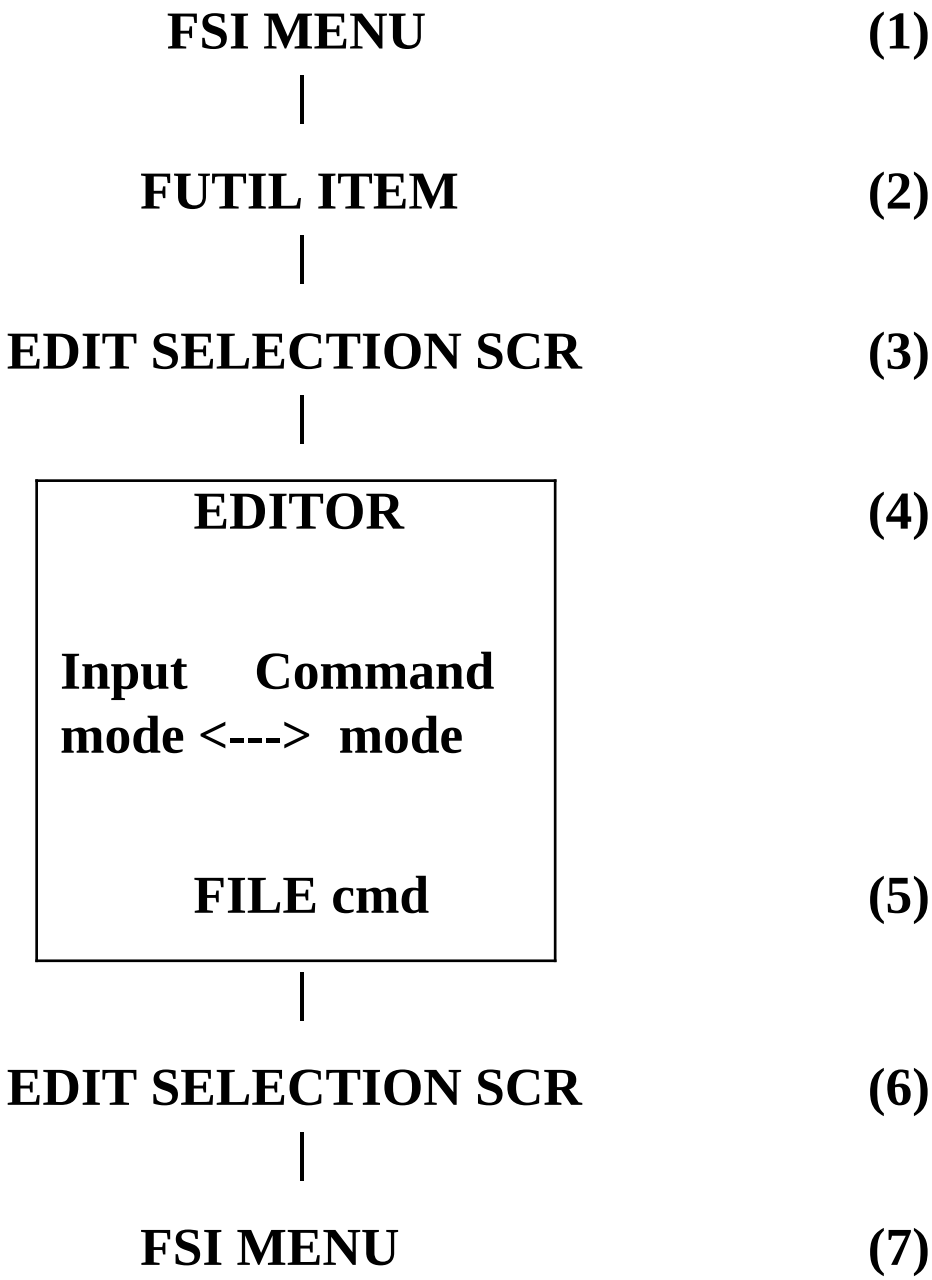
Once the Course Information Facility is started, you can select an item. To select an item, type the number of the item in the command area and press the ENTER key. Help on the various items is available by pressing F1 after the item is selected.

Your teacher may choose to use only a subset of the items available. Perhaps there are no online course notes for your course. In this case you will get the message "No Information Available".

REG Command

The REG command invokes the Course Registration screen. This programs allows you to register your userid in a class list and access course information using the CI program. Before registering you must know the class identification word and the userid of the teacher who owns the course information files. This information is furnished by your teacher.

Foil 12 - The Editor



Foil 12 - The Editor

For most users, the FSI screen is displayed when you first sign on. If you are in *Go mode, then you can issue the "FSI" command to start FSI, or you can issue the EDIT command to go directly to the editor (See EDIT command below).

To create or edit a file through FSI, follow these steps below:

1. Start with the main menu of FSI.

2. Choose the FUTIL item on the menu.

3. Fill in the appropriate fields on the EDIT SELECTION screen and press ENTER.

4. For new files you will go directly to input mode of the Editor. For existing files you will go directly to command mode. It's easy to go back and forth from input to command mode by using function keys.

   In input mode you need to use the TAB key or NEW LINE key to go to the next line. When you have filled the screen, press ENTER to open up more space. If you press ENTER twice or use a function key, then you leave input mode. Press F11 (Input) to return to input mode.

5. When you are finished, press F12 to go to command area and enter the FILE command to save your data.

6. You will return to the EDIT SELECTION screen.

7. Press F3 to return to FSI menu.

EDIT Command

The EDIT command can be used in *Go mode to invoke the Editor. Also, this command can be entered in the command area of any full screen program, including the Editor to start a 2nd edit session. By using the EDIT command you will bypass the EDIT SELECTION screen of FSI. The EDIT SELECTION screen allows you to pass some parameters to the Editor program before starting the edit session. You can also add these parameters to the EDIT command. For more information, enter "/HELP EDIT".

Editor Commands

The Editor has about 150 commands (some are macros) available for your use. The most common commands are issued by using function keys. If you wish to learn more about Editor commands, type "HELP COMMANDS" during an edit session.

Foil 13 - The Editor (Cont'd)

```
userid:TRY.EX                                    L 80   W 1 72     Rec 1/8
    *Top of file
--> Using the Editor

    The Editor is used to create and revise files.
    The proper way to type in lines of text is to use the
    TAB key to end each line.
    Use the ENTER key when you have filled the screen.
    After you have typed in your text, press F12 and type the
    "FILE" command to save your file and end the edit session.
    *End of file




    ----+-T--1---+----2---+----3---+----4---+----5---+----6----+----7--
Command:_
** File has lower case characters or is new-assuming TEXT LC    Reading
Default PFs: 1:Help  2:Split    3:Quit   4:Mark     5:Center 6:Del line
  *EDIT*    7:Uppage 8:Downpage 9:Locate 10:Ins line 11:Inp  12:Command
```

Foil 13 - The Editor (Cont'd)

In the diagram, a sample file called TRY.EX is displayed on the screen for editing. The following describes the Editor screen display.

TRY.EX	The name of the file is shown in the upper left hand corner.
L 80	The logical record length (L) is the maximum number of characters allowed per line. The default is 80 characters for MUSIC files. The maximum is 8192 characters (or bytes).
W 1 72	Columns 1 to 72 are shown on the screen (window). In most cases this is sufficient room to type your data. (The WINDOW FLIP command changes the window to show columns 9 to 80.)
Rec 1/8	The current number of records (lines) in this file is displayed in the upper right hand corner. This file has 8 lines (records) and it shows you are on line 1 of 8 (Rec 1/8).
-->	This line pointer indicates your current position in the file. The line number shows at the top of the screen (Rec 1/8).
1----+----2 etc.	This line of numbers and dashes near the bottom of the screen is a scale line showing the column numbers.
** File has lower...	This message warns you that lower case characters are preserved. Use the editor command TEXT UC if you wish to have the editor automatically convert characters to upper case as text is entered.
Reading	This message appears in the bottom right hand corner on MUSIC whenever it is waiting for instructions.
Function Keys	The Editor default definitions for function keys are displayed at the bottom of the screen.
__	This symbol is the cursor. In figure 3.4 above, it is positioned on the first line of your empty file. The information printed on the top of the screen remains the same for input or command mode of the Editor. Other messages on the screen include:
*Top of File	This line appears when you are at the top of your file.
*End of File	This line indicates that you are at the bottom of your file.
Command:	This is the command area of the Editor. You can type Editor commands in this field. To get the cursor to this area use the F12 or TAB key. (MUSIC commands can be typed in this area too.)
* Input Mode *	If you were in input mode, this message displays at the bottom of screen. In this mode use the TAB key to end each input line and the ENTER key to transmit several lines.

Note: The PREFIX editor command changes the screen display by including a 4-character modifiable area beside each line. (This area has ==== showing in the left margin.) You may prefer to use the editor this way.

Foil 14 - Mail

```
--------------------------- Mail Facility ----------------------------
Command ===>

Enter an option from the list below or a command, press ENTER to
process the request.
Mail For ===> Janice Brown                                (ID/nickname)

 1  Read Incoming Mail
 2  Create and Send Mail
 3  Outgoing Mail (Acks and Unrec'd)
 4  Mail Directory
 5  Mail Profile
 6  Public Directory
 7  Mailbook Facility
 8  List Manager
 9  What is new in the Mail Facility
 A  Frequently Asked Questions (FAQ)
 X  Exit                                  COUNTS:
                                              1 Incoming New Mail
                                              4 Incoming Old Mail
                                              3 Acknowledgements Waiting
                                              1 Unreceived Outgoing Mail
------------------------------------------------------------------------
F1=Help  F3=End  F12=Retrieve
```

Foil 14 - Mail

The following describes the screen display for the MAIL facility.

Command => This is the command area. Enter an option code from the list on the screen (number or X).

Mail For => Your name or userid appears here. The procedure for adding your name to your mail profile is described in the section "Mail Profile". It is important to add your name so it will be included with your return address for all your outgoing mail.

Selection Codes Type a selection number or "x" in the command area on the screen. Help is available for each item after it is selected.

1 Read Incoming Mail:
view list of all incoming mail items.
2 Create and Send Mail:
for typing and sending your messages.
3 Outgoing Mail (acks and unrec'd):
view list of your outgoing mail items. You can check to see if someone has read your message.
4 Mail Directory:
You can assign names to an individual or a group of userids to make it easier to remember mail addresses.
5 Mail Profile:
This facility allows you to tailor the mail facility to your needs. For example, you have a choice of how the incoming and outgoing mail is sorted in the list.
6 Public Directory
Similar to item 4 except this is not your private directory.
7 Mailbook Facility
Allows you to view mail that has been logged into your mailbook.
8 List Manager
Invokes the List Manager facility for joining BITNET or Internet discussion lists.
9 What is new in the Mail Facility
Displays a brief description of recent modifications to MAIL.
A Frequently Asked Questions (FAQ)
Displays a list of questions and answers about MAIL.
X Exit:
Type "x" in the command area or press F3 to exit mail.

The number of incoming and outgoing mail items is displayed in the bottom right-hand corner of the screen.

Incoming New Mail:
is the number of incoming mail items that you have not read (no action has been taken).
Incoming Old Mail:
is the number of incoming mail items that you have looked at but have not deleted.
Acknowledgements Waiting:
is the number of your outgoing mail items that have been received (the receiver has read the mail you sent or taken some other action).
Unreceived Outgoing Mail:
is a combination of the number of your outgoing mail items that have NOT been received (no action has been taken by the receiver on the mail you sent) and suspended mail items.

Foil 15 - Signing Off

From FSI:

Choose the DISCONNECT item on main menu

From *Go:

Type "OFF"

Foil 15 - Signing Off

It is important to sign off from MUSIC when you are finished for accounting purposes.

Also, if you leave your workstation unattended, someone could use your userid and files.

Chapter 7. Teaching Programming

Teaching Programming

This chapter presents some of the more common processors for teaching programming. These processors were chosen because they are easy to learn and teach, have structured programming aids, and are widely used in educational and commercial environments. These languages are industry standards and learning them can provide students with marketable job skills.

Compilers and Processors

MUSIC supports a wide variety of compilers and processors and they are listed in *Chapter 2 - Facilities* of this guide. This chapter introduces you to the programming interfaces for the more common processors. VS Fortran is necessary to run many MUSIC applications, and is therefore, available for your use. Other processors are optional products and may not be available at your institution.

- VS FORTRAN
- IBM BASIC
- VS PASCAL
- VS COBOL
- C/370

REXX Language Interpreter

The REXX Language Interpreter is highly recommended for teaching structured programming. This processor is included with the MUSIC system and is used extensively for many MUSIC applications. The last section in this chapter, "Programming with REXX" explains this simple, yet powerful language.

Using FSI Language Interfaces

Through the FSI Language Interface facility your students can create and run programs. If you wish to know about running programs without FSI, refer to the *MUSIC/SP User's Reference Guide*.

FSI provides menu driven interfaces to high level language compilers and processors. Students don't need to know complex Job Control Language (JCL) or cryptic commands to use the compilers. Default compiler options are pre-set. The programs are compiled and linked in a single step, eliminating the need to handle object programs and load modules. Program compilation and output can be stored in a file and optionally printed when needed.

Note: The REXX language requires no JCL and therefore does not have an interface.

The language compilers and processors that are available on your system are listed on the "Compilers/Processors Menu" (PROGRAMMING item, FSI main menu). Figure 7.1 is an example of this menu. To make a selection, type a selection number and press ENTER. The system interface for the selected item will then start.

The following figure shows an example of the Compilers/Processors menu.

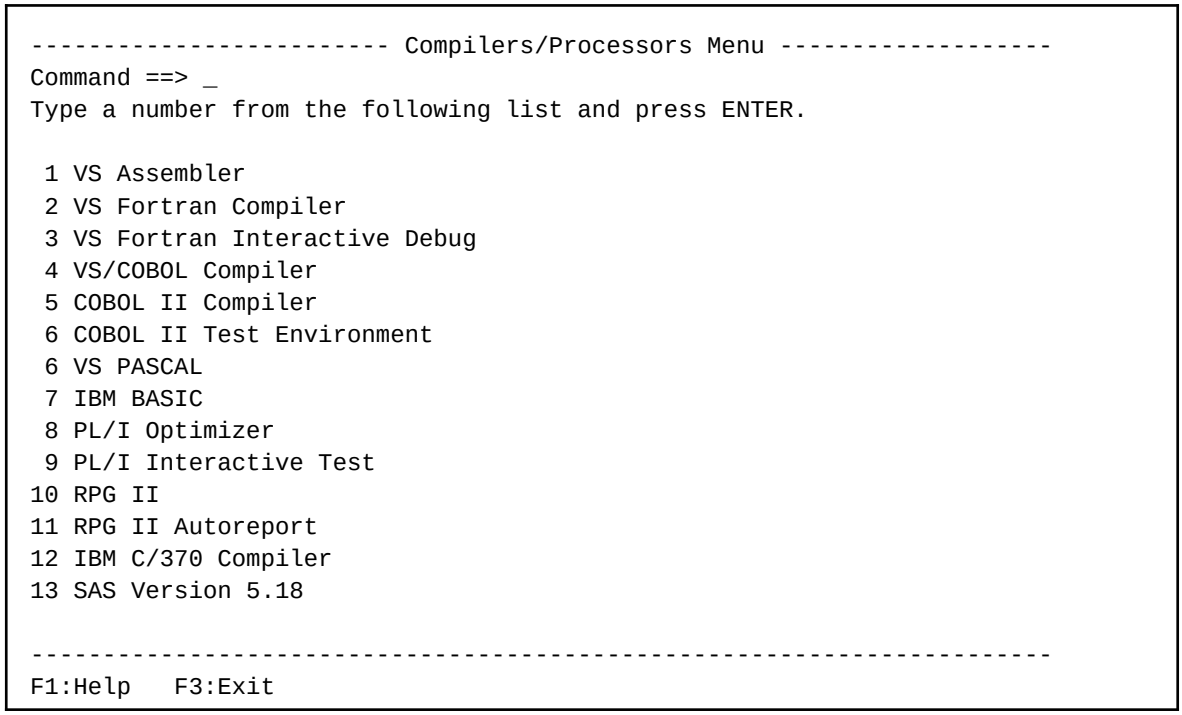


Figure 7.1 - Compilers/Processors Menu

FSI provides interfaces for most programming languages (unless the language has its own interface). For example, selection 2 from figure 7.1 provides an interface for VS Fortran. This interface allows you to edit a program, compile and execute it, review, and print the results. Figure 7.2 is an example of the VS Fortran FSI interface.

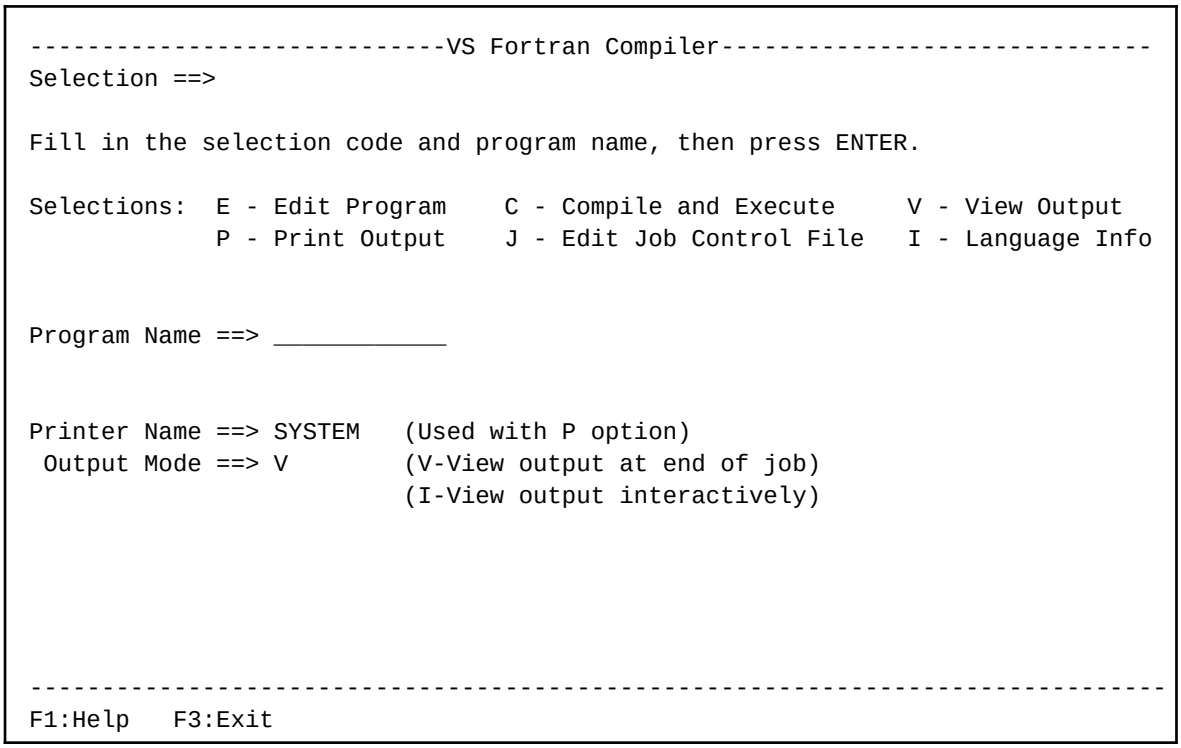


Figure 7.2 - FSI Interface for VS Fortran

Your cursor is automatically positioned in the selection field at the top of the screen. To use this interface, type the selection code indicating the function you want, then type the program name in the space available and press ENTER.

FSI Interface Selection Codes:

E - This option is used to edit the program source file. This file contains your program. If you are writing a new program and this file does not already exist, selecting E will allow you to create one.

C - The program is compiled, and if no errors are detected, it is executed. An output file is automatically created that can be viewed or printed later. In addition an object file may also be created.

V - This option is used to view the current output file.

P - This option prints the current output file on a specified printer.

J - This option allows you to edit a special file containing the MUSIC control statements to compile and execute your program. You can:

- Change the region size
- Add /FILE statements if required
- Change the compiler options (/OPT statement)
- Change the run-time options (/PARM statement)
- Change the Loader options (/JOB statement)
- Add SYSIN data after the /DATA statement

I - This option gives information specific to the language you are using. It lists details on compiler options, run-time options, /FILE statement requirements, and information about using that particular language on MUSIC.

Program File Names

Each language interface creates a number of files on your behalf based on the program name. For example, if PROGRAM1 is the name used in the "Program Name" field, the following files are created:

PROGRAM1.S — is the file containing the actual program source statements and is the one you access when you specify the EDIT option.

PROGRAM1.OBJ — is the object program created by the compiler. This may not always be created, depending on the language you are using.

PROGRAM1.LIST — contains the output of the latest run. This file can be viewed at any time by using the V option and can be printed using the P option. It is also accessible while editing the source file by pressing F2.

PROGRAM1.xxx — contains the MUSIC control statements required to compile and execute your program. The J option is used to edit this file for changing default options that are specified on the control statements. More information can be obtained about language specific control statements by selection option I. The value of "xxx" depends on the language you are using. For example, if VS/FORTRAN is being used the name would be:

PROGRAM1.VSF

Note: There is no file created that is actually called PROGRAM1 - all files have a suffix of ".S", ".OBJ", etc. The files created by the interface remain in your library until you delete them.

Printer Name

A default route destination is displayed in this field. Check with your installation about available printers.

Output Mode

If "V" is specified, the program output is saved in a file that you view after the program has completed.

If your program is interactive, that is, it writes messages to the screen and reads input from the keyboard, it is important to see the program output as it is being produced. In this case, use the "I" option.

Summary of using the FSI Programming Interface

The following describes the typical usage of this interface and indicates what happens at each stage.

1. Select the E option, type in a new program name and press ENTER. The interface notices that the program does not already exist and asks you if you want to create a new one. If you respond positively, a new control file is created and you are given a new source file to edit. Once you have finished entering your new program you terminate the edit using the FILE command. You are now returned to the selection screen. You can use the J option to edit the control file for the program to change the default file definitions or compiler options.

2. Select the C option. This compiles the program and executes it if there are no errors. Usually there are some errors the first time. The program output is automatically displayed and you are returned to the selection screen when you have finished looking at it.

3. If there are errors to correct select option E and make the appropriate changes to the program source statements. You can switch back and forth between editing the program and looking at the output file by pressing F2. As in (1), finish the edit using the FILE command. This returns you to the selection screen where you can re-compile using the C option. This process is repeated until you are satisfied that the program works properly.

4. The P option can now be used to print the finished program at the printer of your choice.

Further Information

There is an exercise in Chapter 4 of the *MUSIC/SP Guide for New Users* that includes the steps to create a Fortran program through FSI. For your convenience, this exercise has been extracted from the online manual and is stored in a file called "PROG.EXER".

Common Processors for Teaching Programming

Some of the more common processors for teaching programming are summarized in this section. (REXX is presented in the next section under the heading "Programming with REXX".)

Tutorials for REXX and FORTRAN Languages

This tool was developed to provide students with an easier way to learn REXX and FORTRAN programming languages. TUTORIALS is a menu-driven facility created with MUSIC's IDP program (Information Display Program). Students should find it very easy to use since most are familiar with CWIS or BBS facilities at their sites. TUTORIALS works in the same way.

TUTORIALS can be invoked using the PROGRAMMING item on the FSI main menu or from *GO mode by entering the "TUTORIALS" command (TUT for short).

The following two screens show the main menu for the REXX and FORTRAN tutorials.

```
Help   End    Up     Down   Top    Bottom Main   Scan   Find   Topic  Quit
---------------------------- REXX  Tutorial ------------------------- Page 1/1
Command ===>

 TAB (or use arrow keys) to move cursor to a topic name and press ENTER key

  CONCEPT         Concept, Main Features and Applications for REXX

  INVOKING REXX   Invoking REXX interpreter
  EXAMPLES        Simple programs in REXX

  INSTRUCTIONS    Common Instructions
  BUILTIN         Built-in Functions

  STACK           I/O Commands

  INTERNETR       REXX Newsgroup (when Internet is available)
  QUESTIONS       Frequently Asked Questions (FAQ)
  REFERENCER      Publications about REXX

F1=Help  F2=Ask F3=End F7=Up F8=Dn F9=Find  F10=Top  F11=Bot F12=Cur PA1=Quit
```

Figure 7.3 - Main Menu for the REXX Tutorial

```
Help   End    Up     Down   Top    Bottom Main   Scan   Find   Topic  Quit
------------------------ VS FORTRAN Tutorial ---------------------- Page 1/1
Command ===>

 TAB (or use arrow keys) to move cursor to a topic name and press ENTER key

  INTRODUCTION    Article from MUSIC NEWS: VS FORTRAN Version 2

  INVOKING FORT   Invoking VS FORTRAN Compiler

  VS FORTRAN      Information from MUSIC/SP manuals

  EXAMPLESF       Simple programs in VS FORTRAN

  DEBUGGER        FORTRAN Debugger

  INTERNETF       FORTRAN Newsgroup (when Internet is available)

  REFERENCEF      Publications about VS FORTRAN

F1=Help  F2=Ask F3=End F7=Up F8=Dn F9=Find  F10=Top  F11=Bot F12=Cur PA1=Quit
```

Figure 7.4 - Main Menu for FORTRAN Tutorial

Programming Examples

For each programming language there is an item called EXAMPLES.

Learning through examples is one of the easiest ways of get started in a programming language.

For each example, students can view the program, execute it, copy it to their library or, make changes in the program. Using this option, students can change the examples and dynamically see the results of how the examples execute with their changes.

The following figure shows the menu of EXAMPLES on the REXX tutorial:

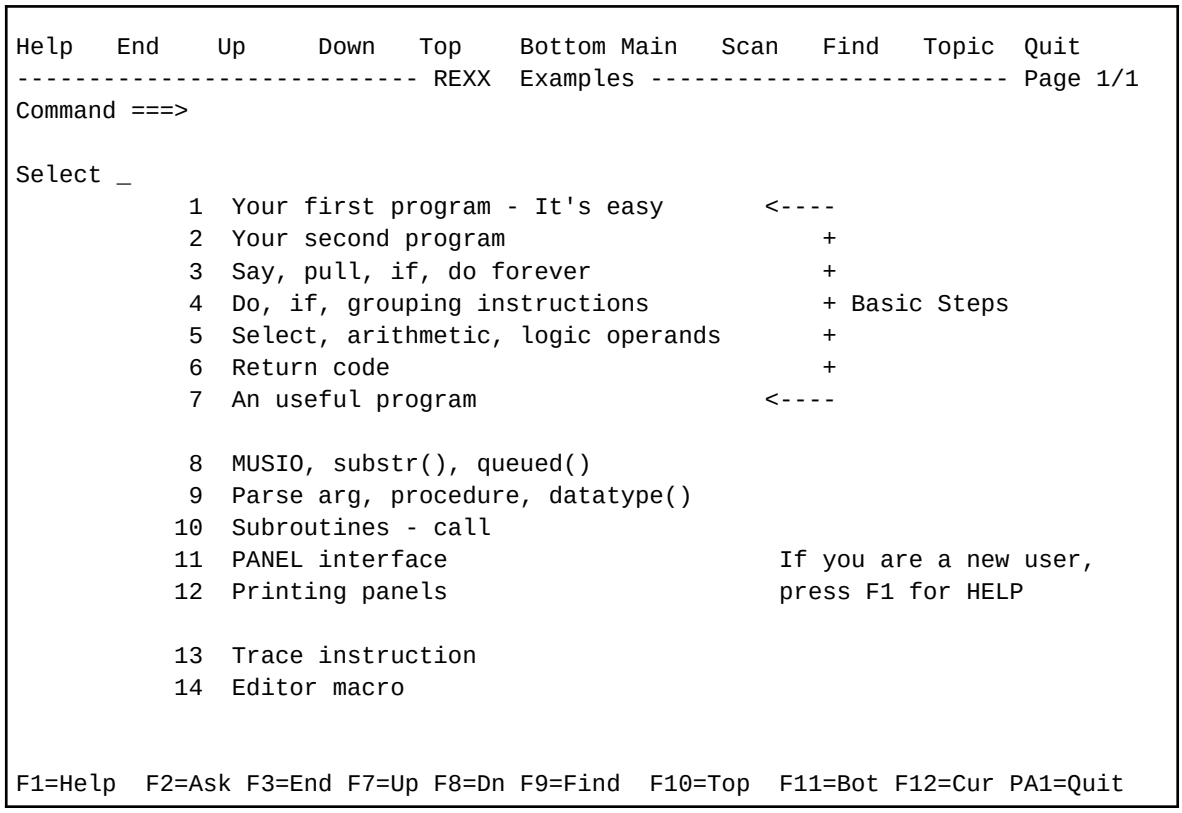


Figure 7.5 - EXAMPLES main menu on the REXX tutorial

To give you an idea of how the examples are, the next figure shows example number 2, called "Your second program":

```
Help   End    Up     Down   Top    Bottom Main   Scan   Find   Topic  Quit
Opt:2  -------------------- REXX  Examples ------------------------ Page 1/1
Command ===>


 View Ex2        Exec Ex2        Change Ex2         Copy Ex2

 The second example explores the PULL and IF instructions.

 The "PULL" instruction reads the response entered from the keyboard
 and puts it into MUSIC's memory (in this case, variable "who").

 To tell the interpreter to select from one of two possible
 instructions, use "IF-THEN-ELSE".

          say " Welcome to REXX and MUSIC, what is your name?"

          pull who             <-------ask for the user's name
          if who = ""
             then say "Hello Stranger!"
             else say "Hello" who
          exit

F1=Help  F2=Ask F3=End F7=Up F8=Dn F9=Find  F10=Top  F11=Bot F12=Cur PA1=Quit
```

Figure 7.6 - Example 2 on the REXX tutorial

All examples were created on MUSIC. However, you can copy all them to other operating systems where the compilers/interpreters to those languages are available. Small changes might be necessary.

For example, you can transfer through PCWS, NET3270 or other file transfer software all the samples from the REXX Tutorial to run under the OS/2 operating system. The option INVOKING in both tutorials describes how to invoke the programs in other environments, such as OS/2 and CMS.

VS FORTRAN

Programs written in Fortran can be compiled and run using the IBM VS Fortran Compiler and Library. VS Fortran supports both the Fortran 77 and Fortran 66 language standards. Fortran 77, the newer standard, is the default. To request Fortran 66, you must specify the compiler option LANGLVL(66).

Available Versions

Each MUSIC system provides either of two versions of VS Fortran (but not both): (1) VS Fortran Version 1 (Release 4) Compiler and Library, program number 5748-FO3, or (2) VS Fortran Version 2 Compiler, Library and Interactive Debug, program number 5668-806. Which version is present is an installation option and varies from site to site. Both versions are invoked by the /LOAD VSFORT control statement.

To see which version is available on your system, run the following job and examine the first digit of the level number in the heading line of the output:

```
/LOAD VSFORT
/JOB NOEDIT
```

```
      STOP
      END
```

Version 2 is compatible with Version 1, in that it can run all object modules and load modules produced by Version 1. Version 2 accepts Fortran source prepared for Version 1, but the reverse is not true.

VS Fortran Version 2 provides the following enhancements: 31-character variable names, language keywords in mixed upper and lower case (it is not case sensitive), an Intercompilation Analyzer (ICA), graphic relational operators (combinations of "<", ">" and "="), a source level Interactive Debug Facility (IAD), and other features not present in Version 1.

Interactive Debug

With VS Fortran Version 2, MUSIC users can debug and test their programs at the source language level using either IBM's Interactive Debug (IAD) in line mode or MUSIC's full-screen VS Fortran Interactive Debug (TESTF).

Interlanguage Communication

It is sometimes desirable to invoke subprograms written in other programming languages. A VS FORTRAN main program may call subroutines written in Assembler, PL/I, VS/PASCAL, COBOL, and VS FORTRAN.

You may also invoke VS FORTRAN subroutines from Assembler, COBOL, PL/I, and VS/PASCAL. When calling VS FORTRAN subroutines from other languages (where the main program is NOT VS FORTRAN), you must call a subroutine VSFINT before any calls to VS FORTRAN routines. This routine (VSFINT) performs library initialization for the VS FORTRAN environment. For more information type "/HELP FORTRAN".

Sample Program for VS Fortran

The following is a sample program that is stored in the file PROGSAMP.FOR1.

```
/SYS REGION=512
/LOAD VSFORT
C  VS FORTRAN SAMPLE PROGRAM.
C  CALCULATES RADIUS, CIRCUMFERENCE, AND AREA OF A CIRCLE,
C  GIVEN THE DIAMETER.
C  ANSWERS CAN BE REQUESTED IN HIGH OR LOW PRECISION.
C  INPUT IS BY MUSIC NAMELIST.
      REAL*8 DIAM,RADIUS,CIRCUM,AREA
      LOGICAL LOW,HIGH
      NAMELIST /DATAIN/ DIAM,LOW,HIGH
100   WRITE(6,*) 'Enter: DIAM=value,LOW  OR  DIAM=value,HIGH'
      LOW=.FALSE.
      HIGH=.FALSE.
      READ(9,DATAIN,END=200)
      IF(.NOT.(LOW.OR.HIGH)) LOW=.TRUE.
      CALL CALC(DIAM,RADIUS,CIRCUM,AREA)
      IF(LOW) WRITE(6,10) DIAM,RADIUS,CIRCUM,AREA
10    FORMAT(' DIAMETER=     ',F9.4,3X,'RADIUS=    ',F9.4/
     *       ' CIRCUMFERENCE=',F9.4,3X,'AREA=      ',F9.4)
      IF(HIGH) WRITE(6,20) DIAM,RADIUS,CIRCUM,AREA
20    FORMAT(' DIAMETER=     ',F12.6,3X,'RADIUS=    ',F12.6/
```

```
     *       ' CIRCUMFERENCE=',F12.6,3X,'AREA=      ',F12.6)
      GO TO 100
200   STOP
      END
      SUBROUTINE CALC(X,R,C,A)
      REAL*8 X,R,C,A,PI/3.14159265/
      R=X/2
      C=X*PI
      A=R**2*PI
      RETURN
      END
/INCLUDE MUSNL.OBJ
```

Further Information

For more information choose "I" for Language Information on the VS Fortran interface screen; or type "/HELP FORTRAN"; or refer to the *MUSIC/SP User's Reference Guide*.

The TUTORIALS facility, as mentioned earlier, provides help and examples for Fortran.

Manuals for VS Fortran Version 1

VS Fortran Language and Library Reference, SC26-4119.

VS Fortran Programming Guide, SC26-4118.

Manuals for VS Fortran Version 2

VS Fortran Version 2 Language and Library Reference, SC26-4221.

VS Fortran Version 2 Programming Guide, SC26-4222.

VS Fortran Version 2 Interactive Debug Guide and Reference, SC26-4223.

VS Fortran Version 2 Master Index and Glossary, SC26-4603.

VS Fortran Version 2 Reference Summary, SX26-3751 (booklet).

VS COBOL Compiler

MUSIC supports the OS/VS COBOL (Program Product 5740-CB1). The COBOL processor invokes the compiler, and then the loader (unless /JOB NOGO is specified). After loading, the program is automatically executed with the OS/MUSIC interface. The COBOL compiler is invoked by the use of a /LOAD COBOL statement. This statement can be followed by a /OPT statement specifying options for the Assembler and by a /JOB statement specifying parameters for the loading step.

VS COBOL Examples

1. A COBOL job with compiler and loader options. /FILE statements for GO step (execution time) ddnames are also defined.

```
/FILE GO.CARDIN RDR
/FILE GO.PRINTOUT PRT
/LOAD COBOL
/OPT DECK
/JOB MAP
      COBOL Source Program
/OPT
      COBOL Source Subprogram
/DATA
      Data
```

2. A COBOL program which reads data from SYSIN (data following /DATA), writes them on SYSPRINT (printed output), SYSPUNCH (terminal holding file), and FILE01 (a temporary UDS file). At end-of-file on SYSIN, additional data is read conversationally from CONSOLE (terminal input) until the user signals end-of-file on the terminal by typing /EOF. Then the disk data set FILE01 is read back in and listed. (The following example is stored in a file called PROGSAMP.COB1.)

```
/FILE FILE01 UDS(&&TEMP) NREC(100)
/LOAD COBOL
       ID DIVISION.
       PROGRAM-ID. COBOL-IO-TEST.
       ENVIRONMENT DIVISION.
       INPUT-OUTPUT SECTION.
       FILE-CONTROL.
           SELECT CARD-FILE ASSIGN TO UR-S-SYSIN.
           SELECT DISK-FILE ASSIGN TO DA-S-FILE01.
           SELECT CON-FILE ASSIGN TO UT-S-CONSOLE.
           SELECT PRINT-FILE ASSIGN TO UR-S-SYSPRINT.
           SELECT PUNCH-FILE ASSIGN TO UR-S-SYSPUNCH.
       DATA DIVISION.
       FILE SECTION.
       FD  DISK-FILE
           LABEL RECORDS ARE STANDARD
           RECORDING MODE IS F.
       01  DISK-REC  PIC X(80).
       FD  CON-FILE
           LABEL RECORDS ARE OMITTED.
       01  CON-REC  PIC  X(80).
       FD  CARD-FILE
           LABEL RECORDS ARE OMITTED.
       01  CARD-REC  PIC X(80).
       FD  PRINT-FILE
           LABEL RECORDS ARE OMITTED.
       01  PRINT-REC.
          05  CC    PIC  X.
          05  PRINT-LINE   PIC  X(132).
       FD  PUNCH-FILE
           LABEL RECORDS ARE OMITTED.
       01  PUNCH-REC  PIC  X(80).
       WORKING-STORAGE SECTION.
       77  HOLD1  PIC  9(4)  VALUE ZERO  COMP-3.
```

```
        PROCEDURE DIVISION.
            OPEN INPUT CARD-FILE OUTPUT PRINT-FILE, PUNCH-FILE
            DISK-FILE.
        START-HERE.
            READ CARD-FILE AT END GO TO EOF.
            MOVE CARD-REC TO PRINT-LINE.
            WRITE PRINT-REC AFTER POSITIONING 2 LINES.
            WRITE PUNCH-REC FROM CARD-REC.
            WRITE DISK-REC FROM CARD-REC.
            GO TO START-HERE.
        EOF.  DISPLAY ' THIS IS THE END NOW TRY INPUT FROM CONSOLE'.
            CLOSE CARD-FILE PRINT-FILE PUNCH-FILE.
              OPEN INPUT CON-FILE.
        CON-SECT.
            READ CON-FILE AT END GO TO VERY-END.
            DISPLAY 'FROM CONSOLE ' CON-REC.
            GO TO CON-SECT.
        VERY-END.
            CLOSE CON-FILE DISK-FILE. DISPLAY 'CONV END'.
            OPEN INPUT DISK-FILE.
            DISPLAY ' THE FOLLOWING RECORDS ARE FROM DISK FILE'.
        DISK-READ.
            READ DISK-FILE AT END GO TO FINAL-EXIT.
            DISPLAY ' RECORD FROM DISK ' DISK-REC.
            GO TO DISK-READ.
        FINAL-EXIT.
            CLOSE DISK-FILE. DISPLAY ' THATS ALL FOLKS..'.
            STOP RUN.
/DATA
FIRST DATA CARD
SECOND DATA CARD
THIRD DATA CARD
LAST DATA CARD
```

Further Information

For more information choose "I" for Language Information on the VS COBOL interface screen; or type "/HELP COBOL"; or refer to the *MUSIC/SP User's Reference Guide*.

The following reference manuals are available:

IBM VS COBOL for OS/VS (GC26-3857)

OS/VS COBOL Programmer's Guide (SC28-6483)

VS PASCAL

Pascal was designed as a high-level programming language by professor Niklaus Wirth of the Technical University of Zurich, Switzerland (1968 -1970). It was named after Blaise Pascal, the seventeenth-century philosopher and mathematician. It was designed to teach the benefits of structured programming.

FSI Programming Interface

This compiler uses the default FSI Programming Interface (the same as VS Fortran in figure 7.2). After Selecting Compilers and Processors, and choosing the VS PASCAL Compiler, access the VS PASCAL Interface screen.

VS PASCAL Debugger

The VS PASCAL interactive debugger is available under the MUSIC system. In order to use the debugger, program modules require the DEBUG option. For more information type "/HELP PASCAL".

Examples of PASCAL Programs

The following examples are available to copy to your own userid:

PROGSAMP.PAS1 is a simple program that shows the use of built-in procedures (DATETIME).

PROGSAMP.PAS2 uses TERMIN and TERMOUT procedures.

Further Information

For more information choose "I" for Language Information on the VS PASCAL interface screen; or type "/HELP PASCAL"; or refer to the *MUSIC/SP User's Reference Guide*.

The following reference manuals are available:

VS PASCAL Application Programming Guide, (SC26-4319).

VS PASCAL Language Reference, (SC26-4320).

VS PASCAL Reference Summary, (SX26-3760).

IBM BASIC

BASIC is an easy-to-use language for introducing students to programming. BASIC (Beginners' All-purpose Symbolic Instruction Code) has features to help novice programmers. BASIC statements are more similar to English than statements of other languages. Statements like READ, PRINT and SELECT make sense to new programmers. Syntax is simple and easy to remember.

The IBM BASIC compiler has features that help students learn programming:

- Structured Programming Aids
- Full-Screen Editing
- Debugging Commands and Statements
- Online Help for all Commands and Statements
- Line-by-Line Syntax Checking
- Supports VSAM (Virtual Storage Access Method) VSAM files can be organized as sequential, relative, keyed, or stream.
- BASIC automatically appends a qualifier to the end of file names. The BASIC qualifiers are:

  .BASDATA data files

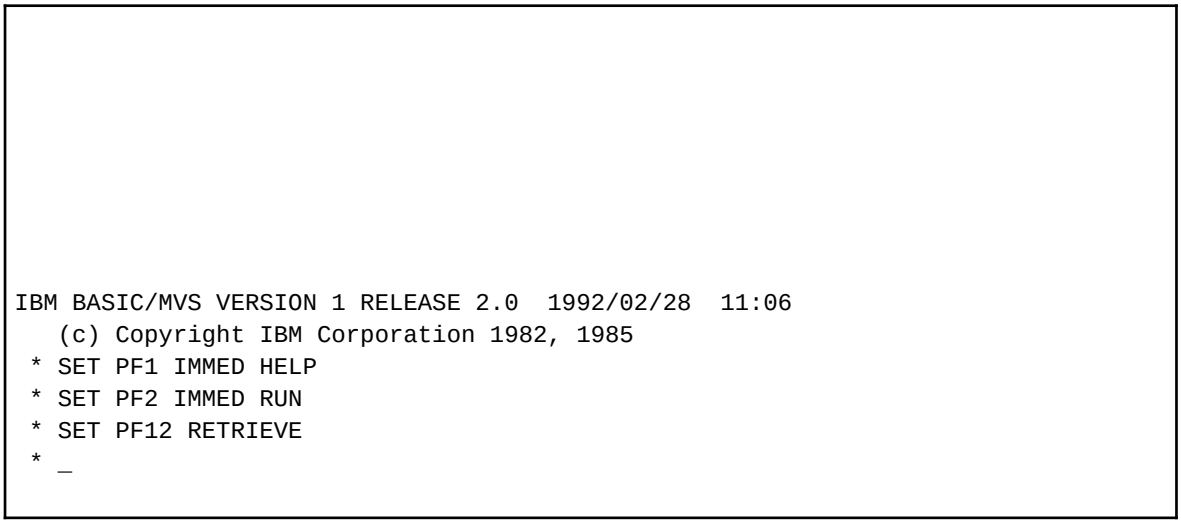
.BASIC	source files
.BASLOG	log files
.BASOBJ	workspace files
.PROFILE	profile files
.LIST	list files
.OBJ	object files

The file IBMBASIC.PROFILE is used at start up time to control the environment. The user can edit this file and save a modified copy under their own userid. For example:

```
! ******* MY PROFILE ********
SET PROFILE TERM
SET PF1 IMMED HELP
SET PF2 IMMED RUN
SET PF3 QUIT
SET PF5 IMMED PRINT PAGE
SET PF6 IMMED LIST
SET PF7 SAVE
SET PF8 RENUMBER
SET PF9 AUTO
SET PF10 LOAD
SET PF11 INITIALIZE
SET PF12 RETRIEVE
```

How to Use IBM BASIC

To invoke IBM BASIC type "IBMBASIC" from *Go mode or select the item from the FSI Compilers/Processors menu. The following figure shows the screen display for the IBM BASIC interface.



Sample IBM BASIC Programs

The following examples can be copied to your userid:

PROGSAMP.BAS1	presents some of the most common commands of a BASIC program: rem, let, print, if.

PROGSAMP.BAS2 presents SELECT/CASE blocks. The SELECT block is more versatile as a structuring device than the IF block. SELECT allows you many alternative paths of control.

PROGSAMP.BAS3 shows different kinds of loop structures for BASIC programs and how to create and run a load module. In this example, the object module for the BASIC program resides in the file PROGSAMP.OBJ. It is created when COMPILE command is issued.

PROGSAMP.LKED generates PROGSAMP.LMOD based on the object module. When the user enters "progsamp.loop" MUSIC executes the program without a new compilation. Thereby, providing better performance while running the program.

PROGSAMP.BAS4 shows DIM and OPTION statements for defining arrays An array can have 1 - 7 dimensions. Array subscripts can begin with 0 or 1.

PROGSAMP.BAS5 accesses an Internal Sequential File. It creates/rewrite: INTEREST.BASDATA file.

PROGSAMP.BAS6 accesses a Native Sequential File. It creates/rewrite: INTERES2.BASDATA file.

PROGSAMP.BAS7 reads the data file created by PROGSAMP.BAS5 program (INTEREST.BASDATA) and writes the data both to your screen and to a file. The file (DISP.BASDATA) is formatted as a report.

Further Information

For more information type "/HELP BASIC" or refer to the *MUSIC/SP User's Reference Guide*.

The following reference manuals are available:

B is for BASIC (GS26-4102)
IBM BASIC General Information (GC26-4023)
IBM BASIC Language Reference Summary (SX26-3736)
IBM BASIC Language Reference (GS26-4026)
IBM BASIC Programming Guide (SC26-4027)
IBM BASIC/MVS Systems Services (SC26-4106)

IBM C/370 Compiler

Programs written in the C language can be compiled and run using one of two IBM C compilers: IBM C/370 compiler (Program Product 5688-040) or the IBM C/370 Compiler Version 2 (5688-187) and IBM C/370 Compiler Version 2 Library (5688-188).

The C processor invokes the compiler, and then the loader (unless /JOB NOGO is specified). After loading, the program is automatically executed.

The C/370 Compiler is invoked by the use of a /LOAD C370 statement. This processor invokes the C/370 Compiler first, and then the loader, upon successful completion of the compilation process. After loading, the compiled program is automatically executed using the OS/MUSIC interface (unless /JOB NOGO is used or the compiler return code is 12 or more). The /OPT and /JOB control statements may be used with this processor. C/370 object modules can optionally be produced and saved, intermixed with source. The object modules are identical with those produced on OS.

C/370 Example

This famous program writes a message to the terminal.

```
/LOAD C370

  /* This is a sample C/370 Program */

#include <stdio.h>
main ()
{
  printf("Hello, World\n");
}
```

Further Information

For more information choose "I" for Language Information on the IBM C/370 interface screen; or type "/HELP C370"; or refer to the *MUSIC/SP User's Reference Guide*.

The following reference manuals are available:

IBM C/370 User's Guide, (SC09-1264).
Systems Application Architecture Common Programming Interface C Reference - Level 2, (SC09-1308).
IBM C Reference Summary, (SX09-1088). *IBM C/370 Diagnosis Guide and Reference V2*, (LY09-1804).

Programming with REXX

Basic Concepts of REXX

REXX (Restructured Extended Executor) was conceived, designed and developed by Michael Cowlishaw of IBM's United Kingdom Scientific Center in Winchester, England in 1979. It has gained much popularity and is also available for Personal Computers.

The REXX programming language has been designed to make programming easier. REXX can be used to introduce students to modern programming concepts. This is because it uses the structured format common to modern programming languages and it is particularly good at handling character strings.

REXX can also be used extensively as a front-end to other programs. It is often used by professional programmers to step users through a complex sequence of program steps without the end user needing to be aware of the details.

REXX allows the execution of MUSIC commands and programs from directly within the REXX program itself, and thus, enables the programmer to chain together sequences of MUSIC commands under program control. The language constructs offered by REXX lend themselves well to structured programming and the powerful functions for command parsing, character handling, and data conversion, make it an excellent tool in the interactive environment.

Structured Language

A structured language has three structured programming constructs: sequence, selection and repetition.

When programs are written with the aim of using only three control structures, the result will be a structured program. The benefit of structured programming is that the program is more reliable and easier to understand than an unstructured program.

This is important for teaching purposes because it can provide a clear understanding of complex problems and their solution. This also helps the student during debugging by making it easier to locate problem areas within the program.

Moving from REXX to more traditional programming languages like PASCAL or C is an easy step.

Typeless Variables

One of the concepts that makes REXX such an easy-to-use language is that its data are essentially typeless; a variable can have any value. There are no rules for data conversion to learn. REXX provides no mechanism for declaring variables.

Interpreted Language

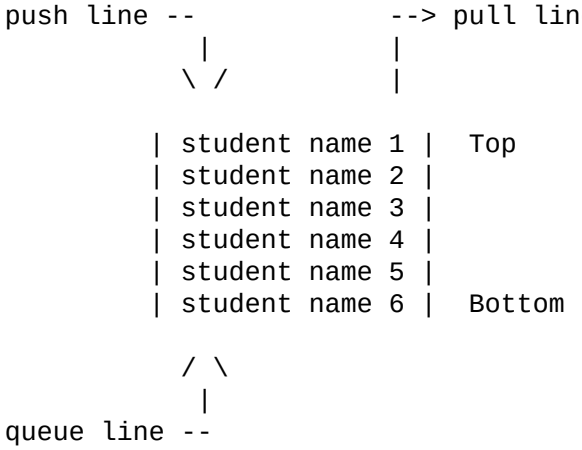
It is an interpreted language, when a REXX program is executed, each statement is translated into codes the computer can directly execute,and then these codes are immediately executed by the computer. To execute a program written in REXX, all you have to do is type the name of the program.

Debugging Facilities

REXX has tracing facilities and tools to find program errors while your program is running. The TRACE ON statement can be included without modifying the program.

Data Manipulation

REXX maintains an internal stack which is accessed by the PUSH, QUEUE and PULL instructions. All REXX programs in a particular program chain have access to the same stack so data can be passed from one REXX program to another via the stack. Basically, with these three commands (push, queue and pull) you will be able to exchange data between your program and other programs or files. There are special commands and built-in functions to help you do that. For example:



Applications for REXX

REXX is a general purpose language and teachers have found applications in a variety of areas. This interpretive language is excellent for applications that interact with users, and applications that process other programs. Avoid applications that are highly computational in nature or are CPU intensive. Non-interpretive languages, such as Fortran, Pascal, or C, are best suited for these types of applications.

Many people have found that REXX is an effective language in which to write programs for their own personal use. It is comparable in power and application to the BASIC language but with the benefits of modern control structures and other advanced facilities.

Command Procedures

Creating command procedures is one area that REXX excels in. Command procedures (or EXECs) combine operating system commands with logic to create new commands for individual needs. REXX passes commands directly to MUSIC without any special procedures.

Editor Macros

This is another major application area for REXX. The command set supplied by an editor can be greatly extended by writing new tailor-made commands (macros).

PANEL Interface

An interface to MUSIC's full screen PANEL facility is available through a special PANEL command in REXX. The screens are created as usual via the PANEL facility and stored as object files. When REXX encounters a PANEL command it dynamically loads the appropriate object files for the screen images. Modifiable fields are then filled from the specified REXX variables and the panel service routine is invoked to perform the I/O. When this is complete, the data from any modified field is then returned via the REXX variables.

For more information on this interface, refer to *MUSIC/SP User's Reference Guide* (SC38-8102).

MUSIC Applications Written in REXX

There are many applications on MUSIC that use REXX. Below is a list of a few of them.

- Macros and Prefix Area for the Editor
- FSI (Full Screen Interface)
- CM and CI (teacher and student interfaces)
- TREE (for displaying files and directories)
- AMS (Full screen interface to Access Method Services)
- TCP/IP support (FTP and Telnet)
- FindText (search for text in a group of files)
- IDP (Information Display Program for CWIS)
- DEBUG (program for debugging)

Invoking REXX

The file containing a REXX program should contain the following control statements.

```
/INCLUDE REXX
  . . . .
  REXX program statements
  . . . .
```

The program can be executed from MUSIC command mode by typing the name of the file containing the program followed by an optional parameter string. For example, if a REXX program was contained in the file REX1, typing:

```
REX1 ABCD
```

would execute the program. The parameter string ABCD would be available to the program via the PARSE ARG instruction or the *ARG* function.

If you find it necessary to use a larger region size for a REXX program, you must create a private file called REXX, containing:

```
/SYS NOPRINT,REGION=nnnn
/LOAD REXX
```

For example, a larger region would be needed for FSI file management if a very large number of files is involved. The default (and minimum) region size for /LOAD REXX is 1024K.

REXX Examples

Example 1:

This example shows how simple REXX is to use. If you wish to test REXX, store these lines in a MUSIC file. Execute the file by entering the file name.

```
/INCLUDE REXX
say "Hello, World"
exit
```

Example 2:

This program prompts the user for commands and executes them. Note the "say" statements can use both kinds of quotes.

```
/INCLUDE REXX

say " Welcome to REXX, what is your name?"

/* ask for the user's name */
pull name

say ' ' name ', when asked to enter a command, type in a MUSIC'
say " command of your choice and I'll see it gets done. If you"
say ' have trouble with the syntax of a particular command just'
say ' enter "HELP cmd" where cmd is the command name.'
say ' '
say ' Command "OFF HOLD" ends your session.'

/* main prompt loop */
do forever
   say ' Go ahead' name
   pull cmd   /*get command*/
   cmd        /*execute it */
end
```

Example 3:

This is an example of a program that could be set as your AUTOPROG option in the PROFILE program. It will be executed each time you sign on to your userid. This program lists a file called DONT.FORGET that has some notes about things that you want to remember. It defines your program function keys for *Go mode and starts the MAIL program. Note the use of the return code (rc) and the direct execution of MUSIC commands.

```
/INCLUDE REXX

'LIST DONT.FORGET'
if rc¬=0
   then do
          say ' '
          say ' '
          say 'Nothing to remember today! Great!'
        end
 say 1
 'PFS'
 'MAIL'
 exit
```

The following is the contents of a file called "PFS" that is executed by the above program.

```
/INCLUDE DEFINE
/DEF PF1 =MYEDIT
/DEF PF3 OFF HOLD
/DEF PF6 =CD\
/DEF PF10 FSI
/DEF PF11 CM
/DEF PF12 RETRIEVE
```

Example 4:

This program reads the file MARKS.EL101 and writes the final mark in the file FINAL.EL101. Note the use of SUBSTR, QUEUED and MUSIO functions/commands. Also notice the PUSH, QUEUE and PULL commands.

The content of MARKS.EL101 is:

```
columns 1-30       32-35    37-40    42-45
student's name     mark1    mark2    mark3

Amy Wright         10.0      7.0      6.50
H.G. Wells          6.5      3.0      5.75
John Doe            2.0     10.0      8.0
John Smith          6.0      8.0      5.0
Kathleen Logan      4.0      9.0      2.0
Mary Brown          3.75     5.0      3.5
Slim Pickens        5.0      8.0      6.75
Sue Jones           7.0      8.0      9.0
Zaphod Beeblebrock 10.0      5.0      6.0
```

The program file is as follows:

```
/INCLUDE REXX

'MUSIO READ MARKS.EL101 ALL'

nrec = queued()  /* number of records in the file */

if nrec = 0
   then do
```

```
          say 'File not found'
          exit
        end
i=1             /* controls the temporary array */
do nrec
   pull line     /* gets a line of stacks top */
   mark1 = substr(line,32,4) /*gets the students mark1 */
   mark2 = substr(line,37,4) /*gets the students mark2 */
   mark3 = substr(line,42,4) /*gets the students mark3 */
   temp.i= substr(line,1,31)||(mark1+mark2+mark3)/3
   i = i + 1
end

err=queued() /*it is to certify that stack is empty */
if err¬=0
   then do
          say '**** Error ****' err ' register(s) in the stack'
          exit
        end
i=1
do nrec
   queue temp.i
   i = i + 1
end

push 'Student name                    Final Mark'
push ' '
push date()
push '-------------------------------------'
push 'Final Marks of English Literature 101'
push '-------------------------------------'

'MUSIO WRITE FINAL.EL101 ALL'
'MUSIO CLOSE FINAL.EL101'
say '******* List of FINAL.EL101 File *********'
'LIST FINAL.EL101'
exit
```

Example 5:

This example calculates the factorial. Note the recursive nature of the REXX language.

```
/INC REXX
/* calculate factorial */
parse arg num rest
if datatype(num,'w') ¬= 1 then do
    say 'I can only calculate the factorial of whole numbers.'
    exit
end
say 'The factorial of' num 'is' fact(num)
exit

fact: procedure
   arg num
   if num = 1 then return 1
```

```
   temp = fact(num-1)
   return num * temp
```

Example 6:

This example archives all files whose names end in ".S". Note the use of the functions USERID, DATE and TIME.

```
/INC REXX

    code=substr(userid(),1,4)  /*get code*/
    '/LIB *:.S'                /*get list of names*/

/* edit the file, delete all except those ending in .S,
   add the userid for mfarc2 and put in the control
   statements */

    queue '/PARM @LIB'
    queue '/INC EDITOR'
    queue 'TOP;DEL 9999,(NOT/.S /)'
    queue 'TOP;C//' || code || ':/*'
    queue 'TOP'
    queue 'I /FILE 1 TAPE VOL(ARCTAP) LRECL(80) BLK(8000)'
    queue 'I /INC MFARC2'
    queue 'I '
    queue 'FILE ARCJOB'
    'EXEC'

/* submit the job to batch */

    'SUB ARCJOB R(MUSIC) CL(TA) MSG(PLS MOUNT ARCTAP)'

    say ' '
    say ' Archive submitted at' time() 'on' date()||'.'
    exit
```

Example 7:

This example shows REXX using the PANEL program. A panel called ENTDAT has 5 unprotected fields to be filled in.

```
/INCLUDE REXX
   /* This is an example of a data entry program.
      Fields from a panel are written to a file.
      The panel is called ENTDAT and the file DATFIL. */

   do forever

     /* Display the panel and get the data. Stop if
        PF3 is pressed */

      'PANEL ENTDAT NAME ADDR.1 ADDR.2 ADDR.3 PHONE '
      if rc¬=0 then do;say ' Error in ENTDAT panel'; exit; end;
      if aid=3 then leave
```

```
        /* write the data to the file */

         queue name || addr.1 || addr.2 || addr.3 || phone
         MUSIO WRITE DATFIL 1
       end
```

Note: The PANEL command line must be in upper case characters.

Example 8:

This program shows you the REXX Editor Macro Facility. Note that '/INC REXX' is not used because this program will be used as an EDITOR command. For a complete explanation about REXX Editor Macros type "HELP REXX" while using the Editor.

```
/* This macro saves the current file & gets a new file for editing.
   Usage:    get filename
*/
PARSE ARG FNAME REST
if FNAME="" then do
    say " A file name must be specified on GET"
    exit
  end
if REST /= "" then do
    say " Invalid operand on GET"
    exit
  end
'EXTRACT /ACTION/'
if action.1 = on then do
   say ' File has unsaved changes. Do you wish to save them?'
   pull resp
   if substr(resp,1,1) = "Y" then "SAVE"
end
"NAME" FNAME
"TOP"
"MSGS OFF"
"DEL 9999999"
"MSGS ON"
"MERGE" FNAME
"NOCHANGE"
"MSG  File got"
"TOP"
```

Further Information

For more information about REXX, type "/HELP REXX" or refer to the *MUSIC/SP User's Reference Guide*.

The TUTORIALS facility, as mentioned earlier, provides help and examples for REXX.

Publications

The following IBM publications describe REXX:

VM/SP System Product Interpreter User's Guide (SC24-5238)
This guide is more suitable for beginners, and programmers who have not used a structured language before. It contains various examples, problems, and solutions. It also describes programming styles and techniques to help you design your REXX programs.

VM/SP System Product Interpreter Reference (SC24-5239)
This publication is more suitable for experienced programmers. However, all users should have this reference manual. It describes the syntax of all commands and functions, debug aids, errors numbers and messages, reserved keywords and special variables.

VM/SP System Product Interpreter Reference Summary (SX24-5126)
This is a booklet contains the syntax of commands and functions. It is useful as a quick reference.

Note: The sections of these publications that describe the usage of REXX in the CMS environment do not generally apply to MUSIC. The *MUSIC/SP User's Reference Guide* describes the usage of REXX in the MUSIC environment.

The following two books are useful for learning and teaching REXX:

A Practical Approach to Programming,
by M. F. Cowlishaw, Second Edition, Prentice Hall, 1990. It contains the language definition, syntax diagrams, error numbers, and messages.

Modern Programming Using REXX,
by Robert P. O'Hara and David Roos Gomberg, Prentice Hall, 1985. This is a useful book for teaching the benefits of structured programming. It includes many examples, questions, and solutions.

Chapter 8. Electronic Mark Submission (EMS)

Introduction to EMS

EMS (Electronic Mark Submission) was designed to allow teachers to submit marks electronically. EMS will need to be configured for your site (see the topic "EMS Configuration" later in this chapter for more information). EMS is being used at McGill to submit marks for approval before they are exported to an off-system mark database. This chapter describes the EMS system as it is setup for this particular site. For example, marks are submitted as follows:

```
  destination:    teacher --> faculty --> registrar --> mark database
       userid:    AA01        XX01        ZZ01
```

Mark Submission

The typical submission process starts with the teacher entering the marks or importing the marks to the class-roll. The marks are validated; when correct, the teacher submits them. The classroll with marks is then sent to the faculty for approval and email is sent to inform the faculty.

The first step is for the teacher to select the appropriate course. After entering the MUSIC command "EMS", the following screen appears:

```
---------------------- Electronic Marks Submission --------------------------
Command  ==>

Tab to the course you wish to select, type S, and press the ENTER key.

------------------------------------------------------------- Page 1/1
_  * 1XX-XXXAG01     Beginners Czech II
_    1XX-XXXAN01     Beginners Czech II
_  * 1YY-YYYAG01     YYY Course - Grad students
_  * 1YY-YYYAN01     YYY Course - Non grad
_    1ZZ-ZZZAG01     Anthropology ZZZ-G
_    1ZZ-ZZZAN01     Anthropology ZZZ-N









------------------------------------------------------------- MUSIC/SP 19:27:36
F1=Help   F3=Exit    F7=PgUp    F8=PgDown     F9=Locate     ENTER=Process
```

Figure 8.1 - Selecting a Course for Marking

Once the course is selected, the teacher is presented with the classroll for that course.

Classrolls

Data entry and validation is based on a classroll (marks are not accepted for students not on the classroll). In the example above, classrolls are stored under the userid YY01. Classrolls are owned by the Registrar and are delivered to the teacher. Access to classrolls is controlled by a centralized "authorization table" (see the topic "EMS Configuration"). Marks can be entered student by student, or imported from a text file.

The following screen shows a classroll after the teacher has entered the marks.

```
--------------------------- 1XX-XXXAG01 -------------------------------------
Command  ==>

Press F1 to see the list of valid marks and grades.

Stud.#-----+Mrk+---Stud.Name-------------------------------- Page 1/1
5241897     010    *AA01-HDHMSKS/JHKUB/MR
5425799     095    *AA01-HDDEH/DSLFEN/MS
6545754     086    *AA01-HHMED/FLSRENCE VSCTSRSH/MR
5428455     075    *AA01-BECKETT/SHRHH THHNE/MS
5442789     056    *AA01-BENNETT/NSCSLE/MS
5427494     000    *AA01-BLSSMBERG/RSCHHRD DHVSD/MR









------------------------------------------- **Comments ** - MUSIC/SP 19:28:07
F1=Help  F2=Conv.  F3=EXIT(NoSave)  F5=Edit/Add comments  F6=View Comments
F7=PgUp    F8=PgDn    F9=Save    F10=Submit    F12=Command  ENTER=Validation
```

Figure 8.2 - Marking a Course for Submission

Valid marks and grades:

The following is an example of the help file associated with the screen above (figure 8.2). It shows the valid marks for this particular course.

```
A 85-100; A- 80-84; B+ 75-79; B 70-74; B- 65-69; C+ 60-64;
C 55-59; D 50-54; F 0-49

J  = Absent
F  = FAILED
K  = INCOMPLETE     ***PLEASE FOLLOW FACULTY GUIDELINES
P  = PASS
S  = SATISFACTORY
U  = UNSATISFACTORY
&& = GRADE NOT YET AVAILABLE
CR = CREDIT GRANTED BASED ON EQUIVALENT QUALIFICATIONS (CE ONLY)
EX = EXEMPTION BASED ON EQUIVALENT QUALIFICATION (CE ONLY)
FN = FAILURE, MAY NOT WRITE SUPPLEMENTAL EXAMINATION (CE ONLY)
HH = To be continued  Graduate Faculty only
IP = In progress      Graduate Faculty (Master's thesis programs only)
```

```
Grades of K*, KK, KF, L, L*, N, NC, NE, R, W, WF, WL must be
processed separately by the faculty.
```

Instructions to enter the marks are also included in the help for this screen (figure 8.2) as follows:

1. **To Enter Marks:**
   <Tab> to the MARK field, type in a mark and <tab> to the next line to continue entering marks. When you get to the bottom of the screen press F8 to get to the next page (F7 will bring you back to the previous page). You may press <enter> at any point to check for invalid marks. Marks which are invalid must be changed before any marks can be "submitted"; however, once marks have been submitted none can be changed using EMS. If you just want to enter a few marks (without submitting them) you may do so; press <enter> then save and exit (F3). You can return to the mark list later.

   See your system administrator for information about importing marks. The help file does include these instructions, but they are based on NET3270 and requirements at McGill.

2. **To Add Comments:**
   If you wish to attach notes concerning particular students (e.g. to add a student who is missing from the mark list, to indicate that a student never attended class, etc.) you may do so by selecting the attach comments file [Add/Edit comments file (F5)]. To add comments either individually by student (make sure cursor is on the same line), as a general comment or to add a missing student (make sure cursor is at the command line) press F5. Comments are saved and attached each time marks are submitted. If you require more lines while in the comments file press F10. When finished typing comments press F9, then press <enter> to save the file. When the screen shows "replaced" at top left corner press <enter> to return to the mark list.

3. **To Submit Marks:**
   When you are ready to send marks to the faculty office, press F10 (Submit). Incomplete lists will not be accepted. Therefore, a grade of "J" must be entered even if you have added an explanation in the comment file.

   If you wish to have an unencrypted copy for proof reading before submission, type the command "EXPORT" on the command line (see EMS commands below).

4. **After Marks are Submitted:**
   After you have pressed F10 (submit), a message will appear on the screen with details concerning your course (number of marks submitted, etc). When "More..." appears on the bottom right of your screen press <enter>. Information concerning e-mail messages will appear. Again, press <enter> to return to the mark list. Your MUSIC userid will appear on the mark list beside each mark which you have submitted.

   Press F3 to exit.

EMS Commands

The following commands are available with EMS. Press F12 to get to the command line.

IMPORT Type

```
IMPORT filename
```

to import your text file into the EMS class roll. Any discrepancies will be noted as well as "extra" students in your text file will automatically be added to the "comments" file.

EXPORT If you wish to create a copy to proof read before submission you may do so by typing

```
EXPORT
```

at the command line. This will create an unencrypted file (file beginning with the letter "E" and the extention ".txt", e.g. EBASB01.txt) which you may download to your workstation.

Note: An ExxxB01.txt file is automatically generated when you submit (F10) your marks. You may downlaod this file to keep for your reference (or to give a to your department).

POST This command creates a file called PxxxB01.txt which is suitable for posting as it will contain only student numbers (in numerical order) and marks.

Top This command positions you at the top of the file.

Bottom This command positions you at the bottom of the file.

Locate This command locates records via a search for the string "text". For example,

```
L Smith
```

will position you at the line containing "Smith".

EMS Configuration

Centralized Authorization

The authorization file defines which userids can access which classrolls, and which userids can submit marks for which courses. Information such as: the teacher's userid, the target userid, the course number, and an email address for notification are included in this file.

Approval Process

Marks are entered by the teacher, and submitted to the target userid within the authorization file. Each level can amend the marks; such changes are tagged with the userid. Any number of submission levels may be defined. For example: teacher, department, faculty, registrar.

EMS Rules File

EMS must be customized; otherwise defaults used at McGill will apply. The EMS rules file ($EMS:EMS.RULES) contains REXX statements that define the local parameters (for example, mark ranges, userids, etc.). Also, the authorization file must be created as this defines the flow of data within the system (see the topic "Authorization File" below).

The following is the file $EMS:EMS.RULES:

```
/* --------------------------- EMS RULES ---------------------------- */
/* ---                Electronic Marks Submission                --- */
/* ---                 SITE DEPENDENT PARAMETERS                -----  */
/* ------------------------------------------------------------------- */

/* -------------------------- parameters -------------------------- */
/* ---                        general variables                -----  */
/* ------------------------------------------------------------------- */

ctlfile='$EMS:EMS.AUTH' /* id & file name for the authorization table */
pw_chgmrks='FACULTY'    /* password to allow user to change a mark    */
cr_userid='YY01'        /* id where class roll files are stored       */

/* ---------------------- marks & letter grades --------------------- */
/* ---     Igrades=instructor's grades  F=Faculty's grades       ---  */
/* ------------------------------------------------------------------- */

minmrk=0   /* minimum valid value for the mark */
maxmrk=100 /* maximum valid value for the mark */

Igrades='A,A-,B+,B,B-,C+,C,D,F,J,CR,EX,F,FN,HH,IP,K,P,S,U'
Fgrades='A,A-,B+,B,B-,C+,C,D,F,J,CR,EX,F,FN,HH,IP,K,K*,KF,L,L*'
Fgrades=Fgrades||',P,S,U,&&,W,WL,WF,--'

/* -------------------------- parameters -------------------------- */
```

```
/* ---                          marks file                        ----- */
/* ------------------------------------------------------------------- */

cst#=1    /* column of student number */
lst#=7    /* length of student number */
cmrk=9    /* column of mark or grade  */
lmrk=3    /* length of mark or grade  */
cstn=14   /* column of student name   */
lstn=32   /* length of    "    name   */

/* --------------------------- parameters --------------------------- */
/* ---                        Class roll file                       ----- */
/* ------------------------------------------------------------------- */

rcst#=1  /* column of student number */
rlst#=7  /* length of student number */
rcstn=9  /* column of student name   */
rlstn=30 /* length of    "    name   */

/* --------------------------- withdrawal --------------------------- */

rcwdt=64 /* column of withdrawal date             */
rlwdt=4  /* length of withdrawal date             */
rcw=79   /* column of withdrawal letter (W or --) */
rlw=2    /* length of withdrawal letter           */

/* --------------------------- external ----------------------------- */
/* ---       Other parameters related to EDI records            ----- */
/* ---          EDI = Electronic Data Interchange               ----- */
/* ------------------------------------------------------------------- */

term='95H'
trans='72'
```

EMS Authorization File

Use the MUSIC command EMS.UPDATE to update the authorization file ($EMS:EMS.AUTH). The following screen appears:

```
 -----------------EMS Authorization file Update Facility------------- Page 1/1
 Command ===>
DATE: 27Jun95 20:02:30                                  UPDATED: 31Mar95 15:44


 Select UPDATE to insert, delete, and edit authorization records

Update         Run the EMS Authorization File Update Program


 Select the following to sort the Authorization File as indicated

Course         Sort the Authorization File by Course Number

Name           Sort the Authorization File by Course Name

Read           Sort the Authorization File by Reader Id

Submit         Sort the Authorization File by Submiter Id

Target         Sort the Authorization File by Target Id

 F1=Help F2=AskF3=End  F7=Up  F8:Dn  F9=Find F10=Top F11=Bot F12=Ret PA1=Quit
```

Figure 8.3 - EMS Update Program

Miscellaneous Notes for EMS

1. Data files are encrypted using CRYPTIO within the REXX function package.
2. A central userid is used to define the password for encryption: $EMA.
3. There are two different modes of operation; complete submission only or partial submissions allowed.
4. Export of the marks file from the Registrar's userid uses FTP to transfer data.

Glossary

Glossary

ASCII terminal. Stands for American National Standard Code for Information Interchange. MUSIC is used in line mode for ASCII terminals, unless the terminal has a video display and passes through a protocol converter.

character string. A character string is a consecutive set of letters, numbers, symbols, or blank spaces.

code. The word code can have many meanings. For example, programming code or access code. The word code is sometimes used to refer to a userid. Sign-on code and userid are the same thing on MUSIC.

command. A command is an instruction you give to MUSIC or a MUSIC program to have it perform a task for you.

command area. Most programs have a command field at the top of the screen. In this area, you can type commands for the current program or for MUSIC.

command language. MUSIC command language consists of a variety of commands that perform a function or invoke a program. MUSIC commands can be entered in *Go mode or in the command area of a program screen.

compiler. A compiler translates a program into a object program or into machine language.

current line. It is the line that is currently being modified during an edit session. On some workstations, the current line is highlighted by being brighter or a different color.

cursor. The cursor is a moveable mark that indicates where you are on the screen. The character the cursor is on will be the one that you can change by typing over it. The cursor is moved around on the screen with the TAB key or with one of the directional arrow keys.

default. A default is a value or condition that has been preset by MUSIC. For instance, the function keys have been assigned default definitions by MUSIC.

disk storage. A magnetic disk unit for online storage of files.

discussion list. Many users join a discussion list through LISTSERV software on a topic of their choice. The discussion takes place through electronic mail.

download. Transferring data from MUSIC to a personal computer.

edit. You can edit a file by: correcting mistakes; adding or deleting information; and moving sections of the file to another part of the file. Files are edited using Editor commands, function keys, and local editing keys.

Editor. The name of the program on MUSIC that is used to create and modify files.

Editor command. An Editor command is, typically, a one-word instruction that is used to modify files. It can usually be abbreviated. Editor commands are typed into the command area of the screen.

facilities. The word facilities and programs are used interchangeably. A facility is usually a large program that accesses other programs. For example, FSI.

file. A file on MUSIC can contain your source program, data, SCRIPT document, etc.. A collection of files is built up under a userid, and is called a user's *library*.

FILE. File is an Editor Command to record any changes you have made to a file and end the edit session. (See also SAVE.)

file attributes. Each file on MUSIC has different characteristics or attributes. For example, the PRIV attribute means your file is private and only you have access; the SHR attribute means files can be shared. Also, the size, record length, read-write access, etc. are all attributes.

file management. A program to help you maintain your files. With FSI, you can access, create, edit, copy, and rename your library of files.

file selection list. When working with your files (file management) you can select a certain group of files to work with. These files may have a common prefix or suffix.

file specification (filespec). With FSI, you need to specify which files you want to work with by filling the 'filespec' field on certain screens.

FSI. Stands for Full Screen Interface. It is a facility that provides the user with menu screens for choosing different programs on MUSIC.

FTP. Stands for File Transfer Protocol. It is used to transfer files from remote Internet sites.

full screen mode. The entire screen is displayed and transmitted at once. This mode is used for filling in the blank input fields on the screen. The opposite of full screen mode is line mode - input is entered one line at a time, rather that a screen at a time.

function keys They are used by a variety of programs to perform predetermined functions. They provide the convenience of one-key-stroke entry of common or complicated command strings.

The Editor is a program that makes extensive use of function keys. Each function key has been pre-defined to perform specific Editor commands. Function keys are action keys, because they signal the computer to start processing something.

***Go.** After you sign on to MUSIC, you are in *Go mode (also called MUSIC command mode). (Many new users go directly to the FSI, bypassing *Go mode.) This working environment is where you start after signing on, and to where you return after using a MUSIC program, in order to give MUSIC its next instruction.

input field (area). Many programs display fill-in-the-blank areas on the screen for you to enter your data. These areas are called input fields.

insert mode. When you use the local insert key, the workstation is in insert mode. You can insert characters in the middle of lines.

interactive. An interactive operating system is conversational. It accepts input from the user and responds directly to the workstation.

interface. A program that links the user to another program. Often this is a full screen panel asking you to fill in the appropriate input fields for the target program.

Internet. The Internet evolved from a small experimental network in the early 1970's. Since then, it has evolved to encompass a large number of heterogeneous sites world-wide, and allows you to reach around the world and contact other computer sites. Each site acquires this connectivity by using something called TCP/IP (Transmission Control Protocol/ Internet Protocol).

job control language (JCL). Identifies and describes a batch job to the MUSIC operating system.

/JOB statement. A job control statement which specifies run-time options for the Loader.

library. The collection of files for each userid is called a library. It is similar to the term directory.

line pointer. Line pointer is the name given to the arrow that points at the current line in the Editor.

local editing keys. These are the keys that do not transmit information to the computer. For example, the insert, delete, and arrow keys.

magnetic tape. A storage medium for large amounts of data. Reels of magnetic tape are stored off line for archival purposes or transport.

MAIL. On MUSIC, the program for sending electronic mail is called MAIL.

mail directory. The DIRECT program for mail allows you to create nicknames to represent electronic mail addresses.

mail profile. The MPROF program for mail allows you to change default parameters for MAIL.

menu. They are provided with many full screen programs on MUSIC. Selections for different programs are listed on the screen for you to choose from. FSI is a menu-driven program.

mode. A state in which MUSIC is ready to accept and process information. There are several modes, for example: *Go - MUSIC command mode; Command mode of the Editor; and Input mode of the Editor.

It is also a mode of operation such as insert mode, replace mode, or full screen mode.

multi-sessions. You can have more that one MUSIC session per workstation. MUSIC programs make use of this feature to call in other programs.

MUSIC/SP. Multi-User System for Interactive Computing/System Product. MUSIC/SP, or MUSIC for short, is an operating system. Operating systems run and manage the computer and other hardware, like the disk and tape drives, and the workstations. An interactive computer system, like MUSIC, allows many people to use the computer concurrently to perform a variety of tasks. It will seem to each person, however, that they are the only one using the system.

offline storage. Data is kept separate from the computer on magnetic tape or cartridges. Data that is stored offline needs to be read into the computer and put online before it can be processed.

online storage. Data is kept on magnetic disk attached to the computer. It can be accessed at anytime.

operating system. Acts as a middleman between you and the computer. It allocates the computer's resources between users.

password. Each userid has a password associated with it. The maximum length allowed for a password is eight characters. Passwords protect the privacy of the userid. You can change your password using the PROFILE facility. Do this regularly to maintain security.

PCWS. Personal Computer WorkStation program. A personal computer can use MUSIC without a protocol converter by using this software for the PC.

processor. A program that interprets and executes computer languages.

program function keys (PF keys). See function keys.

protocol converter. For MUSIC, it is a device to allow ASCII workstations to act as 3270-type terminals.

public library. MUSIC stores all of its public programs in the public library. Everyone can access these files by name (most are read or execute only files). If you have a file by the same name as a public file then you will always get your file.

record length. Is the number of characters per line in a MUSIC file. The default length is 80 characters across. The Editor can handle line lengths of up to 512.

SAVE. Save is an Editor Command. It will record any changes you have made while editing a file, and continue the edit session. (See: FILE.)

SCRIPT. Is the name of the word processing program on MUSIC. Control words imbedded in your text control the formatting of the documents.

software. All the programs on the computer are called software. All the computer equipment is called hardware.

SPELL. Is the name of the program on MUSIC that is used for checking the spelling in your files.

TCP/IP. Stands for TCP/IP (Transmission Control Protocol/ Internet Protocol). See Internet.

TELNET. Is a MUSIC command that invokes the TELNET interface for connecting to remote Internet sites.

terminal. A device that transmits and receives data to a computer. It usually has a keyboard and a video display. It may have a direct connection to the computer, or pass through a protocol converter, or use telephone lines (modem).

TODO. Stands for Time, Office, and Documentation Organizer. It is a menu program for office applications.

upload. Transferring data from a personal computer to MUSIC.

userid. Is a sign-on code that identifies you to MUSIC.

utilities. Is another term for programs. Often this class of programs is used for maintenance of files.

Web. Web refers to the World-Wide Web (WWW) on the Internet. The command "WEB" invokes the line-mode browser for accessing WWW sites.

working environment. When you sign on to MUSIC you have a choice of using *Go mode or a menu facility as your "base of operations". After branching out to different programs on MUSIC, this is the place where you return to.

workstation. A device used to communicate with the mainframe computer. It can be either a terminal or a personal computer.

3270 emulation. Personal computers or non-3270 terminals can use a program or a protocol converter to operate as if they were IBM 3270 terminals.

3270-type terminal. Is a terminal that has 3270 architecture or connects to the computer with a protocol converter to emulate a 3270 terminal. An IBM terminal of the 3270 series is a real 3270.

Appendix A - MUSIC as a Web Server for Course Material

Example of Web Usage at McGill University

The availability of a Web Server on MUSIC provides another opportunity for teachers to provide course information electronically and reliably.

The course 280-331A - Introduction to Management Systems involves four instructors, nine sections and over 1,000 students each academic year. The students are Faculty of Management undergraduates and from Continuing Education programs. Our experience with using a Web server for distributing course material has been good, but as with most attempts to make improvements it has required considerable effort. In our case, moving to a Web Server coincided with a change in text book and switching to new software (Windows, Excel and Access).

The computer assignments are now more realistic, in addition to obtaining the requirements for an assignment students can download an Excel template containing data for use in an Excel problem or data files for incorporation in an Access database.

Students can obtain copies of some past examinations and solutions.

The following is provided for the benefit of instructors who opt to use MUSIC as a Web Server and whose primary use of computers is through IBM-compatible PCs.

Active Web pages on MUSIC must be stored in subdirectory HTTP and/or its subdirectories. Subdirectories of the HTTP subdirectory can be used to store last semester's pages or the pages being prepared for the next semester.

Most commands for manipulating files are compatible between DOS and MUSIC, but there are some significant differences particularly in the use of wildcards (* and ?).

The file transfer facilities in TCP3270 are recommended for uploading to MUSIC. Care must be exercised to ensure that the correct options are used. For an HTML document specify TSO/MUSIC, ASCII, CRLF, Record Format as Variable and LRECL=400. Also you will probably want to change the extension HTM used with DOS to HTML. Specify the HTML subdirectory on MUSIC where the file is to be stored (e.g. change to the correct subdirectory before selecting Transfer)

To upload a .EXE (executable) file specify TSO/MUSIC only (no ASCII or CRLF).

For an assignment that requires several files, e.g. a Word document and one or more Excel files, make use of software such as PKZIP. This allows you to combine the PC files into one self-extracting PC file which is then uploaded. The student then downloads one file to the PC and then executes the downloaded file to produce two or more files. For downloading to disk most Web browsers recognize a .EXE file, they will not recognize .XLS or .WK or .DOC files correctly.

If you wish to count the number of accesses to a HTML file then after uploading you should use the revised CHMOD command:

```
CHMOD \http\crspage.html shr,cnt
```

to turn on counting. The new command COUNT displays file counts and creation dates e.g. COUNT CRSPAGE.HTML A new command ZEROCNT resets the file count to 0. For example:

```
ZEROCNT \HTTP\CRSPAGE.HTML
```

Uploading a revised file to replace the version currently on MUSIC does not reset the count.

It is very strongly recommended that you verify any changes to your Web pages, in particular download any .EXE files and ensure that they are correct. Students access Web pages at times when the instructor is not available, and they expect them to work. Spelling mistakes and formatting problems they will tolerate. A missing link will return a NOT FOUND message, and there is no software support in MUSIC to identify a missing link when setting up Web pages.

Compatibility and Incompatibility Between MUSIC and DOS

```
CD (Change Directory)
    CD REPORTS
    CD \REPORTS
    CD \REPORTS\1995      1995 not acceptable as filename or
                          subdirectory on MUSIC
    CD \REPORTS\YR1996
    CD ..\YR1994
    CD ..
    CD \

MD (Make Directory)
    MD REPORTS
    MD \REPORTS

RD (Remove Directory)
    RD REPORTS          - Directories must be empty on both
                          MUSIC and DOS
    RD \REPORTS
    RD \REPORTS\YR1996

TREE (Display names of all subdirectories)
    TREE

COPY
    COPY MONDAY TUESDAY
    COPY HOME.HTML \HTTP\HOME.HTML
                        - DOS extensions limited to 3 characters

RENAME
    RENAME MONDAY TUESDAY
    RENAME HOME.HTML  \HTTP\HOME.HTML
                        - Not valid in DOS - useful in MUSIC

DEL                     - DELETE acceptable in MUSIC but not in DOS
    DEL MONDAY
    DEL \HTTP\JUNK.HTML

DIR
    DIR
    DIR \HTTP.HTML
    DIR *.HTML SUB      - Use DIR *.HTM /S in DOS to include
                          subdirectories
    DIR /W

COMP
    COMP FILE1 FILE2
```

Wildcards (Global File Name Characters)

?	A single character can occupy that space.
*	any character can occupy that space and all following character spaces in the filename or extension.
A*P*.TXT	matches A.TXT, APPLE.TXT and ASPIRIN.TXT (P is not required)
MUSIC - A*P*.TXT	matches ASPIRIN.TXT, APPLE.TXT and APRICOT.TXT but not A.TXT (P is required in filename

There are other differences in the use of wildcards in commands such as COPY and RENAME. For example:

```
COPY FOILS \FALL95\*                    - not accepted
COPY FOILS \FALL95\FOILS                - accepted
```

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