MUSIC/SP

Version 5

Release 1

Internet
Guide

About this Guide

This publication describes all the features pertaining to the Internet for MUSIC/SP (Multi-User System for Interactive Computing / System Product).

The topics included in this guide are:

•   World-Wide Web

•   Electronic Mail (POP Servers)

•   News Reader

•   Gopher

•   FTP (File Transfer Protocol)

•   Telnet

•   Name Server Query

•   IRC (Internet Relay Chat)

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 facility, is all that is needed to get started.

When the term *MUSIC* is used in this publication, it refers to MUSIC/SP (Program number 5750-ACF).

Chapter Outlines

Chapter 1 - Introduction to the Internet

> This chapter introduces several MUSIC programs that provide electronic communications for the Internet.

Chapter 2 - World-Wide Web

> This chapter describes MUSIC's Web Line-Mode Browser and how to prepare HTML documents for MUSIC's Web server.

Chapter 3 - Electronic Mail

> This chapter describes the electronic mail facility called "MAIL". You will also find out about Discussion Lists and how to join them. MUSIC's Pop servers are described in this chapter.

Chapter 4 - News Reader

This chapter describes the news reader program called "RN". This program allows you to join news groups on Usenet.

Chapter 5 - Gopher

This chapter describes the Gopher client on MUSIC. Gopher is a document search and retrieval protocol for Internet sites.

Chapter 6 - FTP

This chapter describes FTP (File Transfer Protocol) for transferring files to/from sites connected to the Internet.

Chapter 7 - Telnet

This MUSIC facility provides a method to log on to other computers connected to the Internet.

Chapter 8 - Name Server Query

This chapter describes the NSQUERY command for queries to the DNS (Domain Name Service).

Chapter 9 - Internet Relat Chat (IRC)

This chapter describes the IRC program for interactive discussions on the Internet.

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.

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Chapter 1. Introduction to the Internet

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Using MUSIC to Access the Internet

There are several ways to communicate with other computers from around the world. You can use MUSIC to access the Internet (WEB, MAIL, TELNET, FTP, FINGER, PING, GOPHER, RN) and BITNET (MAIL, LISTSERV).

What is the Internet?

Since the 70's the Internet 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). The name is irrelevant, but what matters is that each site you wish to contact must be connected via TCP/IP to the Internet. Currently, most communications to other sites is done over the Internet.

Many users have a Web browser (client) to access WWW (World-Wide Web) sites on the Internet. MUSIC provides a line-mode Web browser and a Web server.

What is BITNET?

BITNET (Because It's Time NETwork) links many computers together that run the NJE protocol. MUSIC makes use of BITNET's automatic system for maintaining discussion lists called LISTSERV.

MUSIC Programs for the Internet

The following programs are used to access the Internet for communicating with remote sites.

MAIL   Electronic Mail:
         The MAIL program is used to send and receive messages. These messages can originate from your MUSIC system or from anywhere in the world. Your site needs to be connected to an international computer network, either Internet or BITNET for external communications. See *Chapter 3 - Electronic Mail*.

LM   List Manager:
         Through electronic mail you can join discussion lists on the Internet. The List Manager program can help you maintain your subscriptions to these lists. See *Chapter 3 - Electronic Mail*.

WEB   Web Line-Mode Browser: Users connected to MUSIC with a personal computer or a terminal can use this line-mode browser. This browser shows WWW documents in text only. See *Chapter 2 - World-Wide Web*.

IRC   Internet Relay Chat:
         This program allows you to set up an interactive conference with computer users at other sites. It is similar to CHAT except it is for external communications. For more information see the help topic "IRC".

RN   News Reader:
         The MUSIC command "RN" (Read News) provides access to Usenet. Through this 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. See *Chapter 4 - News Reader*.

GOPHER   Document Search and Retrieval:
The Internet Gopher Protocol is a distributed document search and retrieval system. It was developed at the University of Minnesota. Documents reside on many autonomous servers on the Internet. MUSIC's Gopher client allows you to make use of this facility for accessing documents world-wide. See *Chapter 5 - Gopher*.

FTP   File Transfer Protocol:
FTP stands for "File Transfer Protocol" and is the name of the MUSIC interface for transferring files to and from computers connected to the Internet. Many sites allow "anonymous" FTP where you can have access to certain areas of their system - basically, files that the site wishes to make publicly available. These files can be programs or documents. See the topic *Introduction to FTP and TELNET* below.

TELNET   Logging on Other Computers:
You can use the TELNET command of MUSIC to connect to any machine on the Internet. Once you are connected to the remote computer, you usually have to login by entering a userid and a password. Some sites allow you to login with a special userid or guest account. See the topic *Introduction to FTP and TELNET* below.

Introduction to World-Wide Web

As most of us know, 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.

See *Chapter 2 - World-Wide Web* for complete information about creating Web documents.

Web Server

MUSIC's Web server provides a platform for making your Web documents available on the Internet. It is described in the *MUSIC/SP Administrator's Reference*.

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,

Introduction to FTP and TELNET

FTP and TELNET are network communication programs running directly under MUSIC. TELNET allows you to establish sessions with computers on the TCP/IP (Transmission Control Protocol/Internet Protocol) Internet. FTP (File Transfer Protocol) allows you to transfer files. Many computers on the network maintain libraries of public files that you can access through FTP. These files include public domain software, graphics and games. Check with your installation to see if this facility is available at your site.

The following is a brief description on how to use FTP and TELNET. For complete details about FTP see *Chapter 6 - FTP*. For complete details about TELNET see *Chapter 7 - TELNET*.

Connecting to the Internet

Each computer in the network is assigned a name which is used on the FTP or TELNET command to establish a connection. For example, the command:

```
     TELNET VM1.MCGILL.CA
```

will create a session on the VM1 system at McGill. The command:

```
     FTP VM1.MCGILL.CA
```

will create a file transfer connection.

The NET command is useful in locating the names of computers connected on the Internet. This displays a list of computers that offer various services such as FTP access to public files. You can browse through the list and locate specific items. An FTP, GOPHER, or TELNET connection can be established directly from NET by typing an F, G, or T in the margin beside the particular entry.

There are two MUSIC commands that can help you check the connection between you and the remote site. They are:

FINGER   The FINGER command allows you to send a one-line query to a remote Internet site, and receive back information on who is logged into that remote site.

PING   The PING (Packet Internet Groper) command measures round-trip-times to internet sites. It does this by sending an ICMP/IP echo request to the remote site, which IP is obliged to respond to if it receives the packet.

For more information about FINGER and PING, type "HELP FINGER" or "HELP PING" in *Go mode.

Login on the Internet

Once you are connected to the remote computer you usually have to login by entering a userid and a password. Many FTP sites accept the special userid of "ANONYMOUS", allowing you to connect and access their public file library without having a userid assigned on their system. A standard requirement is that you enter your e-mail address as your password.

For more information about FTP and TELNET see *Chapter 6 - FTP* and *Chapter 7 - TELNET*.

Other Forms of Communication

There are other ways to communicate through MUSIC that are not covered in this guide. In particular, a CWIS (Campus-Wide Information System) is an ideal way to use central resources for providing online distribution of information to a large audience. This MUSIC facility is described in the *MUSIC/SP Campus-Wide Information Systems* (*CWIS*) *Guide*. This publication also describes online help, Ads facilities, and full-text searching.

To communicate information about the MUSIC system, MUSIC provides online help for each program. Also, MUSIC manuals are available online using full-text searching. Use the command "MAN" to access these publications.

MUSIC supports many simultaneous users. These users can communicate with each other using the following programs:

CONF   Electronic Conferencing:
        An electronic conference allows a group of users to discuss topics of mutual interest at a time convenient to everyone. To invoke this program, type "CONF" in command mode. See the *MUSIC/SP Mail and Conferencing Guide*.

MAIL   Electronic Mail:
        MUSIC provides the MAIL program for sending and receiving electronic mail. To invoke this program, type "MAIL" in command mode. See *Chapter 3 - Electronic Mail*.

CHAT   Interactive Conferencing:
        The CHAT command accesses interactive conferencing. As each user participating in the conference enters text, the text is recorded on the screen. This written conversation is different from the CONF program as it is designed for immediate response by the participants. For more information see the help topic "CHAT".

TELL   Single Line Messages:
        The TELL command is used to send a single line message to another user signed on to the system. The message text is immediately displayed on the receiver's screen. For more information see the help topic "TELL".

Chapter 2. World-Wide Web

Chapter 2. World-Wide Web

Web Support on MUSIC/SP

MUSIC/SP has proven to be very efficient in handling Web pages for the masses. MUSIC's strengths have always been in supporting thousands of userids and files in a central location, while providing a secure environment. Individuals have complete access and control of their own files (Web pages), while MUSIC provides a WEB server that is reliable and available 24 hours a day (at most sites).

Typically, Web pages (html files, gif files, etc.) are created at your PC and uploaded to your MUSIC account. Any files stored on MUSIC in your http directory (path) are available on the Web. (Of course, your files can only be changed by you with your userid and password.)

In addition to the information below you can find out about how Web documents are created on MUSIC by visiting our Web site (http://musicm.mcgill.ca).

World-Wide Web Terms

The following are some terms that you should be familiar with when using the World-Wide Web.

WWW   World-Wide Web is an information service on the Internet that is based on accessing hypertext documents. It is similar to Gopher - it's menu-based and helps you access different resources. However, as a hypertext service, it allows cross-references (links), graphics, and sound.

Web Browser Your Workstation needs a Browser (or Web client) to access the Web (connect to Web servers). Some examples of Web browsers include: Mosaic, Netscape, and Microsoft Internet Explorer. MUSIC has a line-mode browser that is accessed by the command "WEB".

Web Server   is a place to store Web documents (MUSIC's Web server is described in the *MUSIC/SP Administrator's Reference*.) Web servers usually include an entry point (Home Page) into the Web. Some servers include personal home pages. These documents typically contain information about a person and may contain links to their favorite Web information. MUSIC's home page is at the URL address "HTTP://MUSICM.MCGILL.CA".

HTTP   Hypertext Transfer Protocol is needed to communicate between Web browsers and servers. It is unlikely that you will need to know details about this protocol.

HTTPD   is the program name on MUSIC for the Web server.

HTML   Hypertext Markup Language. HTML is used to format, to provide graphics in a document, and to provide links to other documents on the Web. You can type in the instructions yourself with any PC editor or Word Processor, or you can use a Hypertext Editor.

ITS   ITS is short for Index Text Searching.

URL   The Web uses URLs (Uniform Resource Locators) to specify the location of files on Web servers. See the topic "Storing Web Documents on MUSIC" for details about URLs.

Home Page   Many institutions provide a Home Page on the Web that is the starting point for all other

documents (links) they provide. Individuals may also have personal home pages if they have access to a Web server. These home pages are like a main menu to the information that the author feels is relevant.

MCS   MUSIC/SP Client/Server (MCS) uses a graphical (Windows) interface to do common tasks on your PC. These tasks include e-mail, editing PC or MUSIC files, spell checking, saving files on the PC or MUSIC.

Web Line-Mode Browser

The MUSIC command "WEB" invokes the line-mode browser for accessing Web sites. You can explore the latest news from IBM, Microsoft, McGill, and view most of the estimated 10 million documents available on the World-Wide Web. You can do it from just about any MUSIC supported workstation without having to get any special software.

Supported Features

• Shows Web documents on any MUSIC terminal that is connected as a 3270 or VT100 terminal. This includes 3270 and VT100 emulated terminals on PCs, Macs or Unix machines.

• Just type "WEB" to start the browser. It works from MUSIC command prompts in the editor, view etc., to allow you to immediately look at Web sites mentioned in the text. With TCP3270 you can use your mouse to hightlight URLs in mail messages and click to invoke the Web browser.

• The browser can also be started by the command "WEB HTTP://xxxx" to immediately fetch the referenced document. This allows it to be included in menus such as FSI and CI. So teachers can prepare HTTP documents that students can view without them having to get and install Web Browser software on their PCs.

• Online help includes some Web sites to get you started. (The help file itself is written using HTML tags.)

• Can display documents in HTML format that are stored on MUSIC without having to make them available to external users.

• Supports the TAB function to allow users to quickly jump to the linked document names.

• Allows users to save the location of a document they are viewing for later use. This is done by pressing a key that saves a pointer to the document in a MUSIC file along with a description of the document. This information is stored under the file name of @WEBKEPT. When the Web browser is started again, it will start by showing this document.

• Information in the @WEBKEPT file is stored in HTML format and users can add information to this file by using the editor. The user can also use this file to collect a list of URLs to be included in a home page or other HTML document.

Creating Web Documents

HTML documents are Web documents in ASCII text format and include your text and HTML markup tags. These tags define the components of your HTML document. HTML documents can be stored on MUSIC and accessed through MUSIC's Web server. Any text editor can be used to create your document. Refer to the topic "Basic HTML Tags" later in this chapter.

Storing Documents on MUSIC

Once you have created a document on your PC you can transfer the file(s) to MUSIC using TCP3270 (or equivalent). If you are using the MCS editor, you can choose the "save as" option from the file menu and save your file directly to MUSIC. You do not have to make any changes to your files, but you will have to follow a naming convention as described below.

The Web uses Uniform Resource Locators (URLs) to specify the location of files on servers. The URL specifies the type of resource, the address of the server, and the file name. If the file name is omitted then a default home page for the site is displayed.

A file name on MUSIC includes the userid (with preceding "~" symbol), a directory path that includes the letters "http", and a file type included at the end of the name. The first step in storing Web documents is to create a subdirectory on MUSIC called "HTTP" (this step meets the requirement of "http" being part of each Web document name). This can be done by issuing the command:

```
md \http
```

The following is the syntax of a URL for a Web document on MUSIC.

```
http://server_address/~userid/http/filename.type
```

MUSIC's Web server supports many types of Web documents, including html, image, text, pictures, audio, video, forms, and application files. Here is a list of some of the accepted types:

```
Type        MIME Types              Suffixes

text        text/plain              txt text etext
binary      text/plain              atext atxt
text        text/html               html htm ITS
binary      text/html               ahtml ahtm
binary      image/gif               gif
binary      image/jpeg              jpg jpe jpeg
binary      audio/wav               wav wave
binary      audio/au                au
binary      audio/x-midi            mid
binary      image/x-tiff            tif tiff
binary      video/mpeg              mpg mpe mpeg
binary      video/quicktime         mov
binary      video/avi               avi
binary      application/postscript  ps eps ai
binary      application/x-rtf       wri
binary      application/octet-stream EXE bin class
```

Your site can add any new file types. Contact your systems administrator if you experience problems.

Examples of URLs

URLs on your system must include the server address (MUSIC domain name). For example, to see the MUSIC Product Group's home page the folowing URL is specified:

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

If no file name is given then the default home page for your system is displayed. (The default home page for MUSIC is stored in $000:\HTTP\HOME.HTML - see the topic "HTTPD Server" for information about system configuration.)

An individual's home page must include the whole address (URL). For example, a specific home page at the MUSIC Product Group can be accessed by specifying:

```
http://musicm.mcgill.ca/~roy/http/home.html
```

Basic HTML Tags

HTML (HyperText Markup Language) is constantly changing and the most up-to-date information can be found at the MUSIC Web site:

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

HTML is a markup language based on SGML, which is widely used in the publishing industry. HTML tags define elements of a document such as

- Headings (H1, H2, .. H6)
- Lists (bulleted, numbered, definition)
- Links (hyperlinks)
- Images
- Word emphasis and usage (bold, italics, citations)
- Spacing

For example,

```
<TITLE>This is the title of your document</TITLE>
```

Carriage returns are ignored in HTML documents unless they are a part of a special preformatted (<PRE>) section. Use <P> to put in blank lines and <BR> to force a line break without a blank line. Multiple blanks are also ignored in most cases.

Your Web Browser decides how to present documents on the screen. Different browsers may interpret the tags in a slightly different manner. Viewers of your documents have control over the size of fonts. They may want to enlarge fonts to see your document better or for projection in front of an audience. Line mode browsers such as MUSIC's Web browser called "WEB" or Lynx will show only text lines and no graphics, but will work on just about any terminal.

Sample HTML Document

```
<HTML>
<HEAD>
<TITLE>This is the title of my document</TITLE>
</HEAD>

<BODY>
<H1>This is a Major Heading</H1>
This is a sample sentence to show how the formatting works.
The fact that this is on a new line does not matter in HTML.
<P>
The above "P" tag forced a blank line in between the paragraphs.
This line has some <B>bold</B> text
in it as well as some in <I>italics</I>.

<H2>Another heading but not so major as H1</H2>
This one has a link to another place
<A HREF="http://MUSICM.MCGILL.CA/">Click here for MUSIC's Web menu</A>
<P>
Now we will show an image.
<IMG SRC="//www.mcgill.ca/mcgill/mcgill-coa.gif" ALT="Coat of Arms">
</BODY>
</HTML>
```

Special Keywords

You can enhance your html documents with useful information that the MUSIC Web server automatically provides. If you place, in your html document, one of the special keywords below, your Web browser will display the corresponding information.

&&time	time of day format: hh:mm:ss
&&date1	date in format: WED MAR 06, 1995
&&date2	USA date format: mm/dd/yy
&&date3	date format: 06MAR95
&&date4	European date format: dd/mm/yy
&&dayi	day of the month as an integer
&&daya	name of the day of the week
&&monthi	month of the year as an integer
&&montha	name of the month
&&year	year
&&count	number of times your document is seen
&&created	creation date in format: WED MAR 06, 1995
&&read	last read date in format: WED MAR 06, 1995
&&updated:	last update in format: WED MAR 06, 1995

Style Tips

• Best to have standard formats for your departmental documents to project a consistent interface. This can be done with a "template" that is simply an HTML document with words such as "insert your list of published papers here".

• "Sign" your document with your e-mail address and date last modified so that people can contact you if they have feedback on your information.

- Keep the document current.

- Keep the document legal. Do not use copyrighted cartoon characters, etc. Point (insert a link) to other people's documents rather than copy their contents. URLs can change for the links in your document, make sure that you check these links from time to time.

- Pictures, sound, and video are nice features of WWW, but a lot of viewers prefer to have an option to download these files. Make use of links that say, for example, "Click here to see an aerial view of the campus".

- Watch your humor. Remember that there are millions of potential viewers around the world from different cultures that may not appreciate or understand your humor.

HTML Forms Document

HTML documents can be used to either gather information or to control and guide what a user is offered next. This is done through the use of "forms" support where an application "behind" the document is used to respond the user's interactions.

Forms-based documents are created in three basic steps.

1. Design the input form and write the corresponding HTML document.

2. Write the application program that interprets the data from the input fields of the form.

3. Design the document(s) generated by the program as a reply to the user.

HTML form documents have the following basic features:

```
<HTML>
<HEAD>...text...</HEAD>
<FORM METHOD="POST" ACTION="/~userid/HTTPEXEC/prog">
last name<INPUT="TEXT" NAME="last name" SIZE=30>
<INPUT TYPE="SUBMIT" NAME="Send Form">
</FORM>
</HTML>
```

In the above example, *userid* is a valid MUSIC userid, and *prog* is the valid file name for the MUSIC program.

The METHOD attribute defines the method for the data to be received by the server. The POST method is recommended. This returns a string in the form "name=value&name=value&....", where *name* is the name of the data-entry field and *value* is the associated data.

The form document can contain six types of data-entry fields.

text	text entry field - this is the default
password	text entry field - entered characters are represented as * (asterisk)
checkbox	a single toggle button - on or off
radio	similar to checkbox
submit	a pushbutton that causes the current form content to be sent. Note: You must have an input field of the type "submit" so that the form can be submitted, otherwise, no action can be taken.
reset	a pushbutton to return fields to default values

Sample HTML forms document

This is a sample HTML document form. It is a registration form for a mythical course called "WEB for Dummies" It has sveral fields for entering information about the user and which sessions he would like to attend. After the user has filled in the form, he can press the "SUBMIT" button. This complete document is stored on MUSIC in the public file $WWS:HTTP\REG_WEB.HTML. Following this is a sample program that processes the user's entries.

```
<HTML>
<HEAD>
```

```
<TITLE>WEB for Dummies</TITLE>
</HEAD>
<h1>WEB for Dummies</h1>
<h2>Seminar registration for 1996</h2>
<h6>This seminar is given Monday, Wednesday, and Friday every 2nd
month starting in February.  On each day
two sessions are given at
10:00am-12:00pm and at 2:00-4:00pm.
</h6>
Please fill in the appropriate information and someone will verify
your registration via email.

<FORM METHOD="POST" ACTION="/~$WWS/HTTPEXEC/REG_WEB">

<pre>
 Last Name: <INPUT TYPE="text" name="last name" size=50><br>
First Name: <INPUT TYPE="text" name="first name" size=50><br>
Department: <INPUT TYPE="text" name="department" size=50><br>
E-Mail    : <INPUT TYPE="text" name="email" size=30><br>
Telephone : <INPUT TYPE="text" name="phone" size=12>
</pre>

<h3>Select Seminar Time:</h3>

Month: <select name="month">
<option> February 95
<option selected> April 95
<option> June 95
<option> August 95
<option> October 95
<option> December 95
</select>
Day: <select name="day">
<option selected> Monday
<option> Wednesday
<option> Friday
</select>
Session: <select name="time">
<option selected> 10:00-12:00 am
<option> 2:00-4:00 pm
</select>

<h3>Optional Info:</h3>
<dl>
 <dd> <input type="radio" name="experienced" value="Y" >
    Check if you are experienced using the Internet.
 <dl>
  <dd> If so please check any of the following if true.
  <dd> <input type="checkbox" name="used gopher" value="Y">
      I use Gopher.
  <dd> <input type="checkbox" name="used web" value="Y">
      I use a WEB browser.
  <dd> <input type="checkbox" name="created web" value="Y">
      I have created some documents on the WEB.
  </dl>
  <dd> <input type="radio" name="full seminar" value="Y">
```

```
     Check if you would like a full seminar schedule mailed to you.
  <dd> <input type="radio" name="buy guide" value="Y">
     Check if you want to purchase the <i>WEB for Dummies Guide.</i>
 </dl>
<INPUT TYPE="submit" VALUE="Send Form"><INPUT TYPE="reset" VALUE="Clear
</FORM><HR>
</HTML>
```

Sample REXX program to process sample HTML form

The following is a REXX program that processes the HTML document form in the previous section. This program uses GTFORM to fetch the fields from the client (user). It stores the string in a REXX variable called STRING with an expected length of 8000. This is an arbitrary number that you choose based on the number and size of the fields. The maximum is 32000 characters.

The string is made up of pairs of name/value string seperated by "&". We require that the user types in his last name at least. So the program through the use of RDFORM verifies this. If it is not found, it will send a complaint back to the user via the ADLINE routine.

If the last name is present, it will continue to get each name/value pair. It then constructs a mail message to be sent to the course coordinator.

If all goes well via the ADLINE routine we tell the user that he will be contacted about his registration.

After all processing is complete the RSPOND routine is called to hand the HTTPD (WEB) server control and terminate our program.

This complete program is stored in the public file $WWS:HTTPEXEC\REG_WEB.

```
/inc rex

CALL GTFORM "RETCOD","STRING",8000,"DUMMY",4
IF (retcod<>0) then call dead_meat

/* if the last name is missing, reject the form */

keyword='last name'
   CALL RDFORM 'RETCOD','STRING',8000,'KEYWORD',LENGTH(KEYWORD),,
               'INPUT', 50,'VALUE'
   if retcod<=0 then do
     error=1
     call answer
     end

/* get the number of name/value pairs that were returned by the client*

CALL RDINFO 'RETCOD','STRING',8000,'TOTVAR','MAX_KEYLEN','MAX_VALLEN'

/* use the queue to build up a file to be mailed to the seminar
   coordinator.  */

queue ' WEB for Dummies seminar registration'
queue ' '

/* get each pair of keyword and associated value and format them into
```

```
    the queue for later.  TOTVAR was returned in the call to RDINFO */

do i=1 to totvar
   input=''
   CALL RDNUM 'RETCOD','STRING',8000,'KEYWORD','KEYLEN',,
              'INPUT', 512,'VALUE','I'
   queue left(keyword,max_keylen,' ')||':'||input
end
call mail_it
error=0
call answer
exit

/**********************************************************************
mail_it: /* send mail to seminar organizer */

/* use musio to write the queue content to a file */
   'MUSIO WRITE @TEMP ALL'

/* use sendmail (sm) to sent the file to the seminar coordinator */
   'SM TO(CCFP cckw) SUBJECT(WEB Seminar Registration) file(@temp)'
   'purge @temp'
return

/*********************************************************************/
answer: /* respond to the request */

   txt.1='<head>'
   txt.2='<title> Registration for WEB Seminar </title>'
   txt.3='</head>'
   txt.4='<body>'
   txt.5='<h1>WEB for Dummies Seminar</h1>'
   txt.6='</body>'

/* put the first 6 lines of our HTML file in the queue */
   DO I=1 to 5
      CALL ADLINE "RETCOD","TXT.I",LENGTH(TXT.I)
      IF (retcod<>0) then call dead_meat
   end

   if error=1 then do
     errtxt.1='You must fill in the name and email portion of the form.
     errtxt.2='Otherwise we will not be able to accept you registration
     errtxt.3='<p>'
     errtxt.4='Please re-submit.'

/* if we are handling an error put the error text in the queue */
      DO I=1 to 4
         CALL ADLINE "RETCOD","ERRTXT.I",LENGTH(ERRTXT.I)
         IF (retcod<>0) then call dead_meat
       end
   end
   else do
     OKtxt.1='Thank you for your interest.'
     OKtxt.2='You will be contacted via email to confirm.'
```

```
/* if we are okay with returned data put the "okay" text in the queue *
    DO I=1 to 2
        CALL ADLINE "RETCOD","OKTXT.I",LENGTH(OKTXT.I)
        IF (retcod<>0) then call dead_meat
    end
end

/* write out the last line to close the HTML file  */
    CALL ADLINE "RETCOD","TXT.6",LENGTH(TXT.6)
    IF (retcod<>0) then call dead_meat

/* now pass the info to the httpd server to be given to the client */
    CALL RSPOND "RC",0
    exit

dead_meat:
/* everything turned to ____ so respond to the server
   with an error code */
    CALL RSPOND "RC",-1
    exit
```

Sample Email message produced by REXX program

```
Message-Id:  <24MAY95.15180575.0085.MUSIC@MUSICM.MCGILL.CA>
Date:        Wed, 24 May 1995 14:03:21 EDT
From:        Frank Pettinicchio <CCFP@MUSICM.MCGILL.CA>
To:          Frank Pettinicchio <CCFP@MUSICM.MCGILL.CA>,
             Kathy Wilmot <CCKW@MUSICM.MCGILL.CA>
Subject: WEB Seminar Registration
X-Mailer: MUSIC/SP V4.1.0

 WEB for Dummies seminar registration

last name :FFF
first name:
department:
email     :
phone     :
month     :April 95
day       :Monday
time      :10:00-12:00 am
buy guide :Y
```

Testing HTML Forms

The ECHOER program can be used to test any HTML document form. simply place /echoer as the parameter for the ACTION key word. For example <FORM METHOD="POST" ACTION="/echoer">

The complete source of the echoer program is stored in the public file $WWS:\HTTPEXEC\ECHOER. It is a sample HTML document forms processor written in fortran.

The General Flow of HTML Forms Document Programs

1. Call to GTFORM to fetch the response string from the client. The string will have a series of name/ value pairs seperated by ampersands (&). The following is a sample from the example presented later in this section:

```
last name=&first name=&department=&email=<phone>=&
month=April%2095&day=Monday&time=10%3A00-12%3A00%20am
```

Note that special characters are transmitted as %xx, where xx is a hexidecimal number representing an ASCII character. The RDFOM and RDNUM routines automatically convert these for you.

2. Calls to RDINFO and either RDFORM or RDNUM will retrieve the name/value pairs. Please see the REXX sample program to help you understand the technique.

3. The program performs what ever process is necessary.

4. Calls to ADLINE are used either during or after processing to construct a response to the user.

5. Call to RSPOND is used to signal to the HTTPD server that processing is complete and that a response is available for transmittal to the client.

Subroutines for Processing HTML Forms

Programs written to handle html forms will use some or all of the following routines (details of each routine can be found below). These routines can be used in any programming language including REXX.

GTFORM   get the client's returned string of variable names/ values from what the user filled in.

RDFORM   given a variable name return its value.

RDNUM   get the name/value strings of the ith pair.

RDINFO   tells you how many name/value pairs there are, as well as the maximum lengths of the name strings and value strings.

RDPOS   returns the positions and lengths of the name/value pairs.

ADLINE   add a line to the response to the client

RSPOND   used to tell HTTPD server that program has completed. The text passed back by adline will be transmitted to the client as a response to the user.

RDRSET   resets all pointers, variables etc.

Descriptions of HTML Subroutines

Parameter Descriptions

The following parameters are used in the subroutines below.

RC   returns the length of prmstr, if KWORD is not found, -1 is returned as the value.

KWORD   A 1 to 32 character keyword to be searched for

KLEN   length of KWORD

STRING   The string from the client with the forms response.

STRLEN   The length of string.

PRMSTR   The character string associated with KWORD.

PRMLEN   The maximum length of PRMSTR.

VALUE   Integer value of PRMSTR (where applicable)

VARNUM   ITH variable in the form

TOTVAR   total number of variable/value pairs in the form.

MXVARL   the length of the longest variable name.

MXVALL   the length of the longest value string.

VARPOS   position of the ith variable.

VARLN   length of the ith variable

VALPOS   position of the ith value string

VALLN   length of the ith value string

GTFORM

This subroutine reads from the file a string returned from the client with the variable/value pairs. Calling sequence:

```
    CALL GTFORM(RC,STR1,STRL1,STR2,STRL2)
```

Arguments:

RC   mfio return code in case of error.

STR1   1-32760 text string to be retrieved from the file (line 1). this is in the form
            keyword1=text1&keyword2=text2

STRL1   MAXIMUM length of STR1

STR2   1-256 text string to be retrieved from the file (line 2) this is in no particular form.

STRL2   MAXIMUM length of STR2

RDFORM

This subroutine is used to get the value of a known variable name. Given KWORD, PRMSTR is returned as the value of KWORD. Calling Sequence:

```
        CALL RDFORM(RC,STR1,STRL1,KWORD,KLEN,PRMSTR,PRMLEN,VALUE)
```

Some special characters are encoded with a preceding % (per cent). For example an astersik (*) will come to us as an encoded %2A, where 2A is the ascii hex value. We will convert "%2A" to "*".

Example:

STRING contains the following, and is of length 64
password=secret&fromemail=me@here&title=Duh..%20title&message=Text

```
        CALL RDFORM(RC,'password',8,STRING,80,PRMSTR,80,VALUE)

        returns: RC      6       (length of prmstr)
                 PRMSTR secret  (character string associated with password)
                 VALUE  0       ('secret' is not an integer)
```

Note that the keyword must be in the same case as was used in the HTML document form.

RDNUM

This subroutine is used to get the variable name and its value from the string. VARNUM is used to point to the ith pair. Calling sequence:

```
        CALL RDNUM(RC,STR1,STRL1,KWORD,KLEN,PRMSTR,PRMLEN,VALUE,VARNUM)
```

RDINFO

This subroutine is used to return the number of variable/value pairs and the length of the longest variable name and the longest value string. Calling sequence:

```
        CALL RDINFO(RC,STR1,STRL1,TOTVAR,MXVARL,MXVALL)
```

You must call one of RDINIT, RDFORM, or RDNUM before you call RDINFO.

RDPOS

This subroutine is used to return the character positions of the variable/ value pair pointed to by VARNUM. Calling sequence:

```
        CALL RDPOS(RC,STR1,STRL1,VARNUM,VARPOS,VARLN,VALPOS,VALLN)
```

ADLINE

Adds line of text to a file. If the file is not open the file will be opened fro the caller. Calling sequence:

```
        CALL ADLINE(RC,TEXT,TXTLEN)
```

Arguments:

RC   mfio return code in case of error.

TEXT   1-256 CHARACTER text string to be written to the file.

TXTLEN   length of TEXT.

RSPOND

This routine is used to signal the HTTPD server that processing is complete and take the text lines provided by ADLINE, and respond to the user. Calling sequence:

```
CALL RSPOND(RC,GEN)
```

Arguments:

GEN   =0 means that we pass the contents added via ADLINE routine back to HTTPD
       =999 means that we will use a generic "Everything is ok" file.
       =888 means that we will use a generic "Something is wrong" file.

RDRSET

This subroutine is used to zero all counters and pointers into string. Calling sequence:

```
CALL RDRSET
```

Making Clickable Images

Often information is best offered by presenting an image. Images can be very useful as a source or guide to other information. Different information can be associated with specific parts of the image. For example geographical maps can be used in place of a list or menu to point to and select a specific region or country. Another example, might be to present an image of a *virtual shopping mall*, where clicking on a store fetches particular information about that store.

Such images are called *clickable images*. Clickable images are created by defining areas on the image such as squares, circles and polygons. Each clickable area must be defined as one of these three shapes. These areas are arbitrarily selected by you. The shape need not actually appear in the GIF image. You simply select points on the image that define the area you want. Often an approximation will suffice. Each area should be sufficiently apart or separated from one another. This will help users in making their selection and reduce accidental selections.

The coordinates of these areas are associated with a URL in a file called an imagemap Each clickable image has its own imagemap file.

Creating a Clickable Image

Create the HTML document that is to contain the clickable image.

The image must be a GIF file. GIF files can be created or converted from other formats such as BMP, JPG, and TIF using a variety of PC tools.

For this example, let us suppose the image is called campus.gif. A simple HTML document that would display this image, as a clickable image, is the following:

```
<head>
<title> campus </title>
</head>
<body>
<a href=http://your.system//userid/http/campus.map>
<img src=´campus.gif´ ismap>
</a>
<h5>Select a structure to obtain more information about it.</h5>
<p>
</body>
```

Where *your.system* is the domain name of your MUSIC system, and userid is your MUSIC userid or account.

The diagram of the campus map (campus.gif) contains a variety of shapes. To see a sample of a campus map point your browser to:

```
http://musicm.mcgill.ca//msi/http/campus.gif
```

The shapes of rectangles, circles and polygons are superimposed on the GIF image. At times, to aid the user in the selection, you may set outlines in the actual shapes that you defined. An obvious example of this

would be a geographical map. However, the shapes you choose to define as selectable areas, need not appear as such on the GIF image.

Creating the Image Map

You must define in a file called the *imagemap* (campus.map, for example) a series of shapes and their locations on the GIF image. These areas are then associated to URLs.

- Lines beginning with # are comment lines.
- Blank lines are ignored.
- All other lines must be in the form:

Shape URL list-of-coordinates

```
rect    http://your.system//userid/http/gym.html 150 100 200 100
```

The shape can be one of rectangle, circle or polygon. The list of coordinates are x,y pairs. The number of coordinates depends on the shape. The following is an example of an imagemap file called "campus.map":

```
# simple campus map

# provide general info on campus
default http://your.system//userid/http/general.html
# Sir Arthur Currie Gym
rect    http://your.system//userid/http/gym.html 148,108 177,189
# Leacock Bldg
rect    http://your.system//userid/http/Leacock.html 6,61 55,104
# McIntyre Medical Bldg
circle  http://your.system//userid/http/medical.html 162,45 188,32
# Lower Campus plazapoly
poly    http://your.system//userid/http/plaza.html -
26,119 67,123 96,145 96,189 69,215 35,213 10,177 10,141
```

The imagemap specifications are taken in the order given. So that embedded shapes should be placed before the larger shape in which they occur. For this example the MUSIC file name is userid:http\campus.map.

Allowed Shapes

Default   (abbreviated to DEF) The URL specified here will be passed to the client if the image is clicked on but not on an area we specified. No coordinates are given.

Rectangle   (abbreviated as RECT) A rectangle is defined by the upper-left and lower-right points.

Circle   (abbreviated to CIRC) A circle is defined as the center point and any point on the circle.

Polygon   (abbreviated to POLY) A polygon is defined as the points or vertices. Each vertex must be entered in the correct order. The maximum number of vertices is 100, that is a 100 sided polygon.

Getting Coordinates of Defined Areas

Some WWW browsers display the coordinates of the cursor position as the mouse pointer is moved across a GIF defined as a clickable image. See the example in section Creating a Clickable Image. If your browser does not provide such a feature you can use the ECHOER program to echo the coordinates as you outline the areas of your GIF. The example below is identical to the example provided in the section Creating a Clickable Image, except that the ECHOER program is specified in place of the imagemap file.

```
<head>
<title> campus </title>
</head>
<body>
<a href=http://your.system/ECHOER>
<img src=´campus.gif´ ismap>
</a>
<p>
</body>
```

If the above were stored in the file userid:http\campus.html, it could be used to report to you the x,y values of any point on the GIF image. The URL for this MUSIC file is http://your.system//userid/http.campus.html While your Web browser is displaying your GIF image, place the mouse pointer on the GIF and click. The MUSIC HTTPD (Web) server will echo back the x,y coordinates for the point you clicked on. By pressing on the back or previous button you will return to the GIF image. In this way you can obtain the x,y coordinates required for any area using one of the three basic shapes.

Notes:

1. The MUSIC HTTPD server requires that all files to be served must be in a subdirectory of HTTP or in a subdirectory that has the characters HTTP in its name.

2. The imagemap name must end in ¯.map´. For example, the campus GIF would have an imagemap of userid:http\campus.map.

3. If the HTML file or other document is on the same MUSIC system as the server, you need not specify the entire URL. The following illustrates this.

```
    circle  http://your.system//userid/http/medical.html 450 500 450 500

  could be specified as follows:

    circle  //userid/http/medical.html 450 500 450 500
```

4. It will, at times, be inconvenient to have long list of coordinates strung out on one line. You can continue lines by placing a minus sign (-) at the end of a line. You can simply resume with the next coordinate on the next line. The figure below illustrates this. This is strictly a MUSIC extension.

```
    circle  http://your.system//userid/http/medical.html 450,500 450,500

  could be specified as follows

    circle  http://your.system//userid/http/medical.html 450,500 -
        450,500
```

Detecting Errors

The HTTP server on MUSIC will assist you in debugging the map statements by reporting errors via the browser. It will report an invalid number of coordinates for the following reasons:

- for a rectangle with not exactly two pairs of coordinates found.
- for a circle with not exactly two pairs of coordinates found.
- for a polygon with less than three pairs of coordinates found.
- for any shape that has unmatched pairs of coordinates.

The server will also report invalid numeric entries as well as invalid shape names. To assist you, all errors reported bear a line number pointing to the error in the map file.

Index Text Search (ITS) and HTTP

Web pages for Index Text Search (ITS) applications can be easily created using the information from an ITS MUSIC application. See *Chapter 4 - Index Text Searching* for information on how to prepare and create ITS applications on MUSIC.

For example, the file $MAN:MAN.GNU contains all the information necessary to provide indexed text searching for the *MUSIC/SP Guide for New Users*. When $MAN:MAN.GNU is invoked on MUSIC native mode, a screen with input fields is presented allowing a user to enter text for searching.

You can set up a Web version of the indexed text by using the format below.

```
TYPE text_type
INDEX index_file_name
TEXTFILE text_file_name
TITLE title
HTML
... appropriate html text providing description and instruction
```

INDex
IDX   Specifies the name of the MUSIC file that contains the index data for the text file.

TExtfile
TXT   Specifies the name of the MUSIC file that contains the actual text.

TITle   This is a title to be used in the HTML file.

TYPE   Specifies the data type of the actual data. It usually is in plain text. Currently the data types can be either HTML or TEXT.

HTMl   This is used as a marker. Any text after this is treated as HTML for the purpose of describing the ITS application and for providing instructions.

Example of an ITS document for Web

The following is the contents of the file $MAN:MAN.GNU (used to provide indexed text searching for the MUSIC/SP Guide for New Users online manual on MUSIC, BBS, and GOPHER.

```
/inc itsret
IDX=$MAN:GNU.WIDX
TXT=$MAN:GNU.TOTAL
COPYOK HDR=$MAN:HDRTXT
ORDER WEIGHT
SEND *
COPY *
PCCOPY *
RDCONT
S1T=MUSIC/SP V5.1 Guide for New Users - 22APR96
s1m:
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
====
end
```

The contents of $MAN:\HTTP\GNU.ITS provides index text search for the GNU manual via an HTML Web page. The example below is the complete information required for a Web version of the GNU manual as an ITS application in plain text.

```
TYPE TEXT
INDEX $MAN:GNU.WIDX
TEXTFILE $MAN:GNU.TOTAL
TITLE Guide for New Users
HTML
<H6>MUSIC/SP V5.1 Guide for New Users - 22APR96
</H6>
<P>
<EM>Sample search patterns:</EM><BR>

<STRONG>manage</STRONG>
Look for only the word "manage"<BR>
<STRONG>manage*</STRONG>
Look for words starting with "manage" such as "management"<BR>
<STRONG>mail email</STRONG>
Look for entries that contain both words<BR>
<STRONG>mail or email</STRONG>
Look for entries that contain either word<BR>
<p>
<DL>
<DT><em>Table of contents</em><dd>
<strong>=cs </strong> Use this search word to show contents summary<BR>
<strong>=c </strong> Use this search word to show full contents
</DL>
```

Example of ITS document with HTML Tags

The previous example shows how to create a Web document for plain text files. Text searching is also supported for Web documents with HTML tags.

When you create your ITS document specify "<H" as the identifier (heading indicator) of each new section. The following shows the lines that need to replace the first 3 lines of the example above.

```
TYPE HTML
INDEX $MAN:GNU.WIDX
TEXTFILE $MAN:GNU.HTML
```

Further Information

For more details about creating a html ITS document refer to the *MUSIC/SP Campus-Wide Information* (*CWIS*) *Guide*.

Chapter 3. Electronic Mail

Overview of Electronic Mail

The Mail program on MUSIC is used to send electronic messages to your colleagues. These messages can be sent internally to another person at your institution, or externally to another country. Full documentation on MAIL can be found in the *MUSIC/SP Mail and Conferencing Guide* or by typing "MAN" and viewing the guide online. Also, help is available once the MAIL program is invoked by pressing F1.

How to Use the Mail Facility

The Mail Facility is invoked by choosing item 8 (Mail) on the FSI main selection screen or by entering "MAIL" in *Go mode. The following diagram illustrates the main menu of Mail.

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

Enter an option from the list below or a command, then 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
------------------------------------------------------------- 09.03.41
F1:Help  F3:End  F12:Retrieve
```

Figure 3.1 - Main Menu of Mail

Description of Main Menu of Mail

The following describes the fields on the screen in figure 3.1.

Command =>   This is the command area. Enter an option code from the list on the screen (1 - 9, A and X).

Mail For =>   Your name or userid appears here. To add your name to your mail profile choose item 5
                  (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   The following selection codes are available from the main menu.

            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:
               This facility allows you to view a list of public nicknames maintained at your site.

            7 - Mailbook Facility
               This facility allows you to view an existing mailbook file.

            8 - List Manager
               This facility allows you manager your discussion lists on BITNET and the Internet.
               See the topic "Discussion Lists" later.

            9 - What is new in the Mail Facility
               This selection describes the new features of the Mail facility since the last version.

            A - Frequently Asked Questions (FAQ)
               This selection provides answers to frequently asked questions about electronic mail.

            X - Exit:
               Type "x" in the command area or press F3 to exit mail.

Counts   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.

Function Keys for Mail

Throughout this facility, the following keys are valid:

PA1: Exit Mail   cancels the current request and exits the Mail program.

F1: Help   provides help for the current screen display.

F3: End   returns to the previous function. If you are viewing the main menu screen, then you exit from the Mail program.

F12: Retrieve   displays the previous command in the command area. Up to 5 commands can be recalled.

Entering Commands

Mail commands and MUSIC commands are allowed in the command area. However, most tasks for Mail are done with function keys and select codes. You can type "HELP COMMANDS" if you wish information on Mail commands. MUSIC commands can be entered with a "/" in front to distinguish them from Mail commands. Unless you need to leave the Mail environment for another task, MUSIC commands are not necessary for Mail.

The "=" command is very useful to skip from one screen to another. Enter "=n" where *n* is the selection code from the main menu. For example, from the VIEW INCOMING MAIL screen, enter "=2" to bypass the main menu and go directly to the CREATE AND SEND MAIL screen.

Incoming Mail

Beside each mail item is a space for you to type in a select code to take some action on each piece of mail. Figure 3.2 shows an example of the screen display. The first column under the heading "From" is the userid or nickname of the sender(s). The "Date Sent" column lists the date the mail was sent to you. One of the following appears in the "Type" column:

New   - mail item has not been read yet
Old   - some kind of action has been taken on this mail item
Reply   - answer to one of your outgoing mail items

The last column of the incoming mail list displays 40 characters of the subject.

Example of Viewing Mail

The VIEW INCOMING MAIL screen (figure 3.2) shows a list of all your incoming mail items. By default the list is displayed in ascending order by date received.

After selecting "1" from the main menu of mail, the list of incoming mail items is presented. In figure 3.2 three mail items have been chosen for viewing.

```
------------------------- View Incoming Mail -------------------- Rec 1/5
Command ===>


Mail For ==> Janice Brown                                    (ID/nickname)


Select Codes => A-Answer B-ReplyFrm C-Copy D-Delete F-Forward G-Get L-Listd
                P-Print R-Refuse T-Transfer U-Undel V-View X-Xlogdel Z-Zoom


   From              Date Sent Type  Subject
v  CCDO@MUSICA.MCGI  23AUG90   Old   final call
v  MUG@MARIST        23AUG90   Old   Too much mail.
v  CCRMMUS@MCGILLM   24AUG90   New   change to user guide
_  CCMS000@MCGILLM   25AUG90   New   New Pcws ... Again
_  CCMS000@MCGILLM   27AUG90   New   New Pcws




------------------------------------------------------------------------ 09.07.34
A1:Exit Mail F1:Help      F3:End         F7:Prev  F8:Next  F9:Loc
F10:Refresh F11:Outgoing  F12:Retrieve
```

Figure 3.2 - Selecting Mail Items for Viewing

When the ENTER key is pressed, the first mail item is displayed for viewing. After each item, you can press F3 to go to the next.

Figure 3.3 below shows the third file from the list above.

```
  ------- VIEW MAIL FILE -------          L 80    C 1-80        Rec 1/16
 COMMAND ===>                                           SCROLL ===> PAGE
 *** TOP OF FILE *** ----------------------------------------VC/TEXTLC/IGNORE
Message-Id:  <23AUG90.12875572.0021.MUSIC@MCGILLM>
Date:        Thu, 23 Aug 90 11:55:18 EDT
From:        Roy Miller <CCRMMUS@MCGILLM>
To:          Janice Brown <CCJB@MCGILLM>
Subject: change to user guide

I have a change to the users ref guide.
It is in the profile section.
Add the following text under AUTOPROG:


        The autoprog file can be a REXX file that can run
        several programs when you sign on.


 *** BOTTOM OF FILE ***

F1:Help    F2:Answer  F3:End       F4:Forward   F5:Center   F6:Delete/Undelete
F7:Up      F8:Down    F9:Locate    F10:Previous F11:Next    F12:Retrieve
```

Figure 3.3 - Reading a Mail Item

In figure 3.3 the header information at the top of the screen includes the date and time the mail was sent, who it is from, who it was sent to, and the subject. The text of the mail item follows. At the bottom of the screen the following keys are listed:

F2 Answer	allows you to answer the mail item immediately.
F4 Forward	allows you to forward the mail.
F6 Delete	allows you to delete the mail and its entry from your incoming mail list.
F10 Prev	allows you to view the previous mail item from the incoming mail list.
F11 Next	allows you to view the next mail item from the incoming mail list.
F3 End	returns to the VIEW INCOMING MAIL screen.

External Mail

It is possible to send mail outside of your MUSIC system to another system on your mainframe computer or to another computer anywhere in the world. Check with your installation to see what is supported.

Many institutions are members of BITNET or the Internet. These international networks provide access to other sites around the world. Many institutions host discussion lists that provide a forum for people to discuss topics of interest. (See "Discussions Lists" below.)

The only difference in sending mail outside your system is the longer mail address needed. (Nicknames come in handy for storing long mail addresses.) Be careful when taking note of someone's electronic mail address, not to miss any characters. Once the mail has left your system, there is no way to keep track of where it goes.

If you wish, try sending a message to the the MUSIC Product Group of McGill University. We would appreciate hearing from you about your experience with this guide. Were you able to learn MUSIC programs easily? Do you have any comments for improving future editions?

Our electronic mail address is:

NEWUSER@MUSICM.MCGILL.CA

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, use the LM (List Manager) program.

List Manager

The List Manager facility is a separate set of programs accessed from the main menu of MAIL. It allows you to manage your subscriptions to BITNET and Internet lists. The basic function is to keep a copy of the lists you have subscribed to.

There are a number of differences between mail lists on BITNET and the Internet. For instance, the LISTSERV program runs on BITNET. It is an mail list manager that automates the subscription and unsubscription process. It also automates the posting and delivery of list mail. Mail list managers on the Internet may not function the same as BITNET's LISTSERV.

This facility tries to automate the function of subscription and unsubscription to a mail list. The following

figure shows the screen display for the List Manager.

```
------------------- Managing your Mail List Subscriptions -------------------

Command =>

Enter a Select Option, then press ENTER to process the request.

 1  List titles of all mail list discussion groups
 2  Keyword search of mail list discussion groups
 3  Subscribe to a mail list discussion group
 4  Unsubscribe from a mail list discussion group
 5  List your mail list subscriptions (made with this program)
 6  Temporarily suspend your BITNET Listserv mail
 7  Resume temporarily suspended BITNET Listserv mail






                                                                      15:14:28
 F1:Help    F3/A1:End    F12:Retrieve
```

Figure 3.4 - Screen Display for the List Manager

Help is available by pressing F1 (Help) once this facility is invoked.

POP Servers (POP3 and POPPASS)

MUSIC users have a choice of how they view their mail. You can use the traditional way of connecting to MUSIC via a tn3270 client or a direct connection and view your mail interactively with the MUSIC MAIL program. Alternatively, you can use a TCP/IP POP3 client on your own computer, download mail from MUSIC via the new MUSIC POP3 server and view mail on your computer.

The MUSIC POP3 (Post Office Protocol version 3) server is a TCP/IP server that allows a user using a POP3 client to download their mail from MUSIC. You can connect to MUSIC with a POP3 mail client such as WinPMail or Eudora on a PC, or Eudora on a MAC and fetch your mail from MUSIC. Once you have fetched your mail, you can read it offline. The POP3 clients allow the creation of mail to be sent offline and you have the ability to send it immediately or at a later time. Use of a POP3 client reduces the connect time to MUSIC when you compare it to the connect time for you to sign on to MUSIC via tn3270 and read your mail interactively.

Mail attachments and MIME support are available to you via the MUSIC POP3 server as these features are a function of the POP3 client. Most POP3 clients include support to allow the attachment of any file(s) from the local environment to the message being sent. So, you can send WordPerfect, Microsoft Word, or spreadsheet files via mail to another person. Also, most POP3 clients support MIME, Multipurpose Internet Mail Extensions. MIME provides facilities to include multiple objects of any type in a single message. For example, a mail message can contain a text object, an image object, and an audio object. When the POP3 client receives a MIME message, usually you can choose which object to "view" in the message.

The POPPASS server is a TCP/IP server that allows you to change the the password for your POP3 userid. On MUSIC, you change your signon password as the POP userid is your signon password. This server supports the Eudora POP client "Change Password" requests. The Eudora products for various platforms are available from QUALCOMM Incorporated.

POP Server Usage Notes

1. You cannot use the MAIL program from a MUSIC session and try to connect to your mailbox via the POP3 client at the same time. You are allowed to access your mailbox from one process at a time.

2. The POP concept is limited in that you download your mail to another machine where it may be stored and delete the mail from the server. If you access a number of machines to read your mail, for example at the office and at home, the mail is not available in both environments. POP3 clients work around this functionality issue with a feature that allows you to read your mail from any number of machines, but then the mail must not be deleted from the server. This issue puts the reliance on the system to manage the mail on the server.

    Most POP3 clients allow the user to set an option that will leave the mail on the server, and not delete it once it is downloaded. For example, Eudora's option "Leave mail on server" is found in the Special item under Switches. Note that once mail is read on the server, the client usually decides not to download "old" mail. It only downloads new (ie unread) mail.

    MUSIC offers an ideal solution to the "mail must be deleted from the server" issue. With the combination of default expiry dates for user mail, the POP3 server's expired mail removal feature, and the mail cleanup program, the mail is managed on the server, MUSIC.

3. The MUSIC POP3 server supports the RFC1460 POP3 LAST command between sessions. This is a more efficient way for the client to locate the first unread message in the mailbox on the server. This means that any mail previously read will not be downloaded to the client when the client has been told to use the POP LAST command. For example, Eudora supports the LAST command with the UsePOPLAST=1 entry in the (Switches) section of the file EUDORA.INI.

4. The MUSIC POP3 server uses the non-standard RFC822 header Status: R to flag old mail. Some POP3 clients use this information and do not download the "old" mail, only new mail. The POP3 server works hand in hand with these clients.

5. The MUSIC POP3 server creates RFC822 headers for SENDFILE items before they are downloaded to the client. By putting RFC822 headers on the SENDFILE mail item and thus "converting" it to a regular mail item, clients can now display the item's subject, sender, and send date.

6. Your client software may support the send operation by connecting either to the defined SMTP server and using the SMTP protocol, or by using the POP3 server using the POP3 XTND XMIT feature. The commercial version of the Eudora mail client supports the POP3 XTND XMIT feature. For Eudora, under the tools options menu, sending mail category, the field "SMTP server" determines whether mail is sent via SMTP or POP3 XTND XMIT. Defining the SMTP server address sends mail via SMTP. When this address is left blank, Eudora sends the mail via POP3 XTND XMIT. Earlier versions of the commercial version of Eudora supported XTND XMIT when the line UsePOPSend=1 was found in the file EUDORA.INI in the [Switches] section. UsePOPSend=0 sent mail via SMTP. XTND XMIT mail sending is the faster method.

Note: Systems Administrators should refer to the *MUSIC/SP Administrator's Reference* for information about installing MUSIC's POP3 and POPPASS servers.

Chapter 4. News Reader

Chapter 4. News Reader

Overview of the 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.

The RN command invokes the MUSIC interface to USENET. Through this interface you can read incoming news from a variety of newsgroups, 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 newsgroup called "SCI.EDU".

```
-------------------------- MUSIC/SP News Reader ----------------------------
Command ===>

Use the tab key to position yourself on the Article of your choice and press.
the ENTER key to view the content of the article.

Group: sci.edu--------------------------------------------- 1 to 5 of 9
*0000001 Tierra V3.12: Evolution of Digital Organisms
         Thomas Way <way@chopin.umel.edu>

00000002 International Conference  of Computers and Learning
         Leonardi <5Z2028e@wagon.acadia.ca>

00000003 Re: Half-life question
         Billy - Palman <Snoopy@cup.mortal.com>

00000004 Re: Half-life question
         Cheri A Brown <calabri@cheshir.oxy.ed>

00000005 Re: Half-life question
         Billy - Palman <Snoopy@cup.mortal.com>


--------------------------------------------------- Tue May 26, 1992 13.54.46
F1=Help  F2=Reply  F3=End  F4=Flip  F5=Post  F6=Followup  F7=Up F8=Dn  F12=Retr
```

Figure 4.1 - Screen Display for the News Reader

RN Command Syntax

```
RN <newsgroup -l newsgrouplist>
```

Parameters:

newsgroup   The name of the newsgroup that you wish to see. If this is omitted a list of news-
                      groups is presented.

-L newsgrouplist   is the name of a file with a list of newsgroups to used rather than the default list of
                      newsgroups. You can create your own list by editing $tcp:news.groups, after you
                      have edited the list, simple file it under a name of your choice and use it when you
                      start RN.

                      For example, if you filed the list as rn.list, you would type

                          rn -l rn.list

                      to see your version of the newsgroups list.

RN Function Key Definitions

F1   Displays this help text.

F3   Exit RN.

F5   Enter the post screen. If the cursor points to a newsgroup then the name of that newsgroup will be
         automatically placed the newsgroup fields to which the article will be submitted.

F7   Up one page in the newsgroup list.

F8   Down one page in the newsgroup list.

F9   Repeat the last locate command.

F12   Retrieve the last command(s) entered.

How to use RN

The RN main selection menu provides a list of accessible newsgroups. The groups are listed alphabetically.

Locate the newsgroup that you are interested in by paging up and down (F7 and F8) or by using the
LOCATE command.

To view the most recent articles in a particular group, position the cursor on the group name and press the
ENTER key. This will position you at the last article you read in that group. You can go directly to a partic-
ular group using the GROUP command.

You post to a group by pointing to it and pressing F5 or using the POST command. You can also post to a
group once you have selected it for viewing.

Chapter 5. Gopher

Chapter 5. Gopher

What is Gopher?

Definition:
gopher n. 1. Any of various short tailed, burrowing mammals of the family Geomyidae, of North America. 2. (Amer. colloq.) Native or inhabitant of Minnesota: the Gopher State. 3. (Amer. colloq.) One who runs errands, does odd-jobs, fetches or delivers documents for office staff. **4. (computertech.) software following a simple protocol for burrowing through a TCP/IP Internet.**

Gopher is an Internet protocol for distributed document search and retrieval. It was developed at the University of Minnesota.

Gopher can be taken to mean several things. Most immediately, Gopher is a program (a *client* program) running on MUSIC. This program allows you to connect to other computers attached to the Internet, including both mainframes and PCs. At these remote machines, there is typically information stored on a wide range of topics. Gopher allows you to step through this information, read it, and in the case of binary data, transfer it to MUSIC.

The Gopher client presents you with a hierarchy of items and directories that resemble a file system. The net effect is that you see what looks like a big networked information system containing primarily document items, directory items, search items, and other resources. (Search items allow searches across subsets of the information base which is the Internet.)

On another level, Gopher is something referred to as a protocol. What this means is that it is an agreed upon mechanism for communication, and as such makes a wide range of computers able to talk to each other in a very simple fashion (from your point of view). The Gopher program (the client) that you are using now talks to another Gopher program (a server) on some other machine in order to obtain and display the menus and files that you see.

Sometimes those remote machines are not communicating - perhaps because of problems or perhaps because they are powered down, etc. In these cases Gopher on MUSIC will not be able to make a connection with them. You can only wait and try again later, or try to get the information from some other site.

Gopher does not retain a continuous connection with these remote servers. As a consequence, you access a site successfully at one point and subsequently are not able to access it a short time later (for the reasons mentioned above). Usually these are temporary conditions, lasting anywhere from a few minutes to, in some cases, a few days. Sometimes the addresses have been changed, and this change has not been updated in the server that the Gopher client is contacting.

Navigating Gopher Client Screens

On MUSIC, the Gopher client is implemented via a series of menus which offer 1 line descriptions of either a subsequent sub-menu, a file, or some other internet resource. Each line is numbered, and you can select the item of interest by tabbing down to it and pressing ENTER, or by entering the line number in the command area at the top of the screen.

The Gopher screen display provides you with information about the state of your gopher client - where you "are", in the Internet, so to speak. As well, it displays selectable menu items that you can select to descend further into the Internet hierarchy.

Starting Gopher

To access a Gopher server, use the GOPHER command in *Go mode. When Gopher is started, you can specify optional startup parameters.

```
gopher [gopher-server-addr] [-t][-o][-r][-d][-l][-h][-g][-tm][-gp][-gpt][-hm]
```

-t   trace mode requested (also generates TCP/IP traces)

-o   output text to file @GOPHER.OUTPUT

-r   clears the local menu

-d   defalut gopher server in name,port format
           (example: -dgopher.micor.umn.edu,70)

-l   request line mode (as opposed to 3270 mode)

-h   request a connection to the "home" of gopher (currently, this is gopher.micro.umn.edu)

-g   turn off access to local and system-wide gopher menus

-tm   set timeout value in seconds (eg. -tm 90) for reads

-gp   initial gopher selector string (for sub-hierarchy) eg.
           -gp selector-string-x -otherparms

-gpt   initial gopher selector string (for text file). Note that only the file is displayed and no gopher screens are displayed.

-hm   flag to enable hi-lit line type labels

If you use the GOPHER command without a server address you will receive your own local menu (if available) or a default server address assigned by your MUSIC administrator.

The following is an example of accessing the gopher server at the University of Minnesota.

```
gopher gopher.micro.umn.edu
```

Figure 5.1 shows the screen display for the gopher menu at that site.

```
Gopher Site: gopher.micro.umn.edu (128.101.62.12) ------- Line: 1 of 12
Command ==>                                        BookMark ==> <none>
enter selection  (0:Previous Menu or Exit, Q:Quit)      Menu Depth: 1
--------------------------------------------------------------------------
    1 - Information About Gopher <menu>
    2 - Computer Information <menu>
    3 - Discussion Groups <menu>
    4 - Fun & Games <menu>
    5 - Internet file server (ftp) sites <menu>
    6 - Libraries <menu>
    7 - News <menu>
    8 - Other Gopher and Information Servers <menu>
    9 - Phone Books <menu>
   10 - Search Gopher Titles at the University of Minnesota <Index-Search>
   11 - Search lots of places at the University of Minnesota  <Index-Search>
   12 - University of Minnesota Campus Information <menu>




 MUSIC/SP Gopher---------------------------------------- 27 May 1994 15:22:49
 1:Help 3:End 4:Edit Menu 5:Copy 7:Up 8:Dn 9:Loc 10:Store 11:add Item PA1: Exit
```

Figure 5.1 - Gopher Menu at University of Minnesota

The top of the Gopher screen has the following components as described below:

Gopher Site   This is the Internet address of the site that you last connected to. This is just for your
                  own information - you don't need to do anything with it. You have the ability to create
                  your own tailored menu; in this case, the line would read: Local Gopher Menu. (See the
                  topic "Managing Your Local Menu" later.)

Command   This field is where you can enter a numbered selection from the list displayed below, or a
                  a MUSIC command (preceded by a '/' eg. /FSI). The selectable items are numbered from
                  1 to the maximum number for this place on on the Internet. '0' means return to the previ-
                  ous menu.

Line n of m   This simply informs you how many lines are in this menu, and where you are currently
                  situated.

Menu Depth   This number tells you how many menus deep you are in the Internet hierarchy.

BookMark   A bookmark allows you to do two things: first, you can descend to any level in the Inter-
                  net hierarchy, and then return to the bookmarked menu by issuing the GO command with
                  the bookmark listed after it (eg. assume GOODMENU was entered in the bookmark
                  field. Subsequently, at a deeper level of the hierarchy, you could say GO GOODMENU
                  in the command area, and you would skip back up to the GOODMENU.)

                  Secondly, when you enter a bookmark, Gopher enters this in your local gopher menu file.
                  (See below for more on this.)

Gopher Menus

Menus look like the following:

```
          1 - Information About Gopher <menu>
          2 - Computer Information <menu>
          3 - Discussion Groups <menu>
          4 - Fun & Games <menu>
```

In this menu, the numbers can be entered directly in the command area to select that topic or file. Another way of selecting them is to position your cursor on that line (either via the mouse or by the TAB key) and press ENTER.

The indicators next to the text (eg. <menu>) indicate what you can expect by selecting that entry. <menu> will present you with another menu, while <text> will transfer and display a file, and <binary> will transfer a binary file (it will not be displayed). <telnet> indicates that by selecting that item, you will be placed into a telnet session to connect to another machine.

The following object types are recognized:

<text>	- text file (displayed)
<menu>	- directory (displayed)
<CSO server>	- not currently supported
<error>	- not expected, an error
<binhexed>	- Mac file format (transferred in binary)
<dos-archive>	- PC file format (transferred in binary)
<uuencoded>	- UNIX ASCII file format (transferred in binary)
<Index-Search>	- keyword search
<telnet>	- invokes a telnet session
<binary>	- binary file (transferred)
<gif>	- GIF graphics file (transferred in binary)
<unknown xxxx>	- an error - an unrecognized type

Gopher Function Keys

Figure 5.1 shows the screen display when using gopher and the keys at the bottom of the screen are defined as follows:

F1:Help   This brings up the help facility for Gopher.

F3:End   This exits the current menu. If this is the topmost menu, then this exits Gopher.

F4:Edit Menu   When you have created your own local Gopher menu by using a BookMark or adding a
               menu with F11, the F4 key invokes an editor for the Gopher menu that allows you to move
               or delete items.

    Note: To save confusion, do not use this key unless you have already created your own
               local menu. The file is called @GOPHER.MENU under your userid. See the topic
               "Managing Your Local Menu" later.

F5:Copy   This allows you to copy a file on the Internet to a local file on MUSIC. Normally, selecting
               a binary file will transfer that file to MUSIC using the same name, and selecting a text file

will transfer it to a temporary file for viewing. F5 allows you to specify the file name and to avoid the necessity of viewing the file.

F7:Up   Moves you up within the menu, if it spans more than one screen full of entries.

F8:Down Moves you down within the menu, if it spans more than one screen full of entries.

F9:Loc   This repeats the LOCATE from a previous locate command. If the string is found, then that entry is positioned as as the first entry on the screen.

F10:Store This causes the contents of the current screen to be appended to the file 'GOPHER.LOG'. This allows you to keep a quick record of interesting topics, etc., in a in a file for later reference.

F11:Add Item This adds a menu to your local menu. Note that you do not add items on the menu; rather, you add the entire menu. Thus, if you press F11 at your first menu, and then exit Gopher and restart, it will look as though nothing happened. However, Gopher has created a file called '@GOPHER.MENU' and stored the item 'GOPHER HOME MENU' within it. Duplicate entries are not added, and when there is only 1 entry, Gopher initiates the connection with the server immediately. If you add a a menu at some point other than the 1st menu, Gopher automatically adds your first menu to the list.

Managing Your Local Menu

Your own Local Menu is created or extended whenever you press F11 (as described above) at a gopher menu display (except for the first menu). Also, you can add items with the BookMark feature of Gopher. When you use either of these methods you are creating and maintaining a file on your userid called @GOPHER.MENU. Pressing F4 allows you to edit your local menu for Gopher.

Once you have pressed F4 to edit your menu, you can do one of the following main operations: moving a line or block to a new desired position; deleting entries and/or getting information about menu entries.

Throughout the edit interface the following standard function key definitions are used.

F1   Help

F3   Save the current changes in the file and return to Gopher program.

F4   Mark line or block to be moved.

F5   Move a line or a group of lines marked previously from one part of the menu to another indicated by the user.

F6   Delete the current line from the file.

F7   Display the previous page of menu, if there is one.

F8   Display the next page of menu, if there is one.

F10   Zoom: display internal information about this menu entry, as follows:

    Site   name of the site to be connected
    Address   Internet address of the site
    Port #   number of TCP/IP port to be connected
    Type   specifies the entry type - "menu" means another list of selections, for example, while

"text" means that a file will be displayed. Other types include Telnet, Dos-Archive, Binary, UUencoded, etc.

Selector   This is the string that is sent to the remote Gopher server to obtain the resource/info at this level of the hierarchy.

F12   Exit the program without saving the changes.

Other Gopher Commands

To enter a command, type the command string in the area labeled "Command" and press the ENTER key. MUSIC commands must start with a "/" (slash).

The following commands are processed internally by Gopher Edit:

```
HELP            - same as PF1
QUIT            - same as PF3
TOP             - Go to top of menu options
BOTTOM          - Go to bottom of menu options
LOCATE          - Locate a string in the file selection list
UNMARK          - Unmark line/block marked
```

Gopher Server - GOPHERD

MUSIC includes a Gopher server. Typically the set up and maintenance of the Gopher server is done by site administrators.

Refer to the *MUSIC/SP Administrator's Reference* for more information.

Chapter 6. File Transfer Protocol - FTP

Chapter 6. File Transfer Protocol - FTP

This chapter describes FTP (File Transfer Protocol) for transferring files from other computers connected to the Internet. The following topics are covered in this chapter:

*   Tutorial Descriptions

    - File Transfer, the Internet, and anonymous FTP
    - Getting Started: How to use FTP to Transfer Files
    - Navigating the FTP Screen: Using "Point and Shoot"

*   Reference Information

    - Starting FTP: the Command Line Parameters
    - Description of FTP Commands
    - QFTP (Quick FTP) - If you know what you want

File Transfer, the Internet, and anonymous FTP

What is the 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). The name is irrelevant, but what matters is that a site that you wish to contact must be connected via TCP/IP to the Internet.

You connect to remote sites from MUSIC by using FTP or Telnet. When you use either, you must login to the remote site by providing a userid and password, unless you are using anonymous FTP When you do this, you are sending commands to the remote host. via the network (the Internet). Sometimes response is slow due to network traffic, and sometimes the connection fails, or times out due to problems with the network or at the remote site. For example, if the remote site's operating system crashes, it obviously cannot continue to talk with you.

What is File Transfer?

File transfer is what FTP is all about. It allows to send files to and from a remote host, over the Internet. You do this interactively, or you can submit a job to MUSIC batch to do you for you.

FTP knows how to convert between your file format and the format of files stored on remote systems. All of this is handled for you. You specify the name of the remote file (the file on the remote host computer, not MUSIC) and the name of the local file (the file on MUSIC) and whether you wish to GET (download the file from the remote host to MUSIC) or PUT (upload the file from MUSIC to the remote host).

File transfer using FTP can be very fast, and sometimes, depending on the remote site, the speed of the data lines through which you are connected, the time of day, etc., it can be very slow. For example, transfers to and from Europe are limited by the speed of the link across the Atlantic (currently, not very fast).

Where Can I Transfer Files From?

You can transfer files from any computer that is connected to the Internet and is running a program called an "FTP server". Note that the FTP program that you run on MUSIC is called an FTP client. Clients connect and talk to servers on remote systems. Therefore, if the system that you wish to transfer files to or from does not run an FTP server, then you cannot use MUSIC FTP to perform your transfer.

However, if you can Telnet into that site, then you can use that site's FTP client program to FTP into MUSIC, and use the MUSIC FTP server to perform the file transfer.

If you do not have an account on a remote site, FTP is still a useful tool. Most sites allow something called "anonymous FTP", which is described below.

What About "anonymous" FTP?

"anonymous" FTP is a privilege that certain remote sites offer to users of the Internet. It allows you to login using the userid of anonymous with your e-mail address as your password. You have access to certain areas of the remote system - basically, files that the site wishes to make publicly available. You are usually allowed to download these public files. Depending on the site, you may be allowed to upload files to certain sub-directories.

In order to see which files are present at the remote site, you may wish to use the DIR command of FTP in line mode. In the normal full-screen mode of operation, FTP automatically displays the contents of the current sub-directory.

Note that anonymous FTP is a privilege not a right. You should login to remote sites during THEIR off-peak hours (outside 9-5). You should also be aware that traffic can be monitored on the Internet and certain types of files are not permitted over the US NSFNet.

What Is An "archive server"?

Some sites make extensive collections of software available for anonymous FTP. A notable example is the U.S. Army site in White Sands, whose collections of software for the IBM-PC are "mirrored" (repeated) at other sites around the world. "archive server" is not a technical term in the strict sense. Rather, it merely describes an FTP site which provides storage of software as a service for the collective good of the Internet community. This is different from a site running an FTP server as a convenience for its users and their remote collaborators, where the intent is not to maintain archives for everyone.

What is the "PC" Connection

As mentioned above, there are some archive sites on the Internet that store an amazing amount of software for the IBM-PC. These may be executable modules only, or sometimes executables and source, or sometimes only source. Most of this software is copyrighted but available as "shareware", meaning that you can download it and try it out. If you continue using it you are expected to pay for it (or do whatever the author requested - one fellow asked for payment or that you go out and buy his book!). There are several archive formats used at archive sites to store these files. Popular ones are .ZIP, .ARC, .LZH. and more recently .ARJ file types; each of these refers to a particular form of data compression. Decompressors for these are available usually at the same site where you obtained files of this type. You need binary file transfer for these file types. Using FTP, you can download these files to MUSIC, and from there download them to your PC.

What Are Binary and ASCII Transfer Modes?

Binary transfer mode copies the file intact, without respect to records, new line characters, internal file structure, etc. Basically, you could upload any file in binary mode, and then download it again and see no difference. The files are identical byte for byte. This is important for things such as PC .EXE or .COM files, or archive files such as .ZIP or .ARC or .LZH, or graphic files such as .PIC or .GIF; those files must be maintained without any alteration. ASCII file transfer, on the other hand, is intended to transfer printable text. Translation of characters can occur, as well as rearrangement of records and insertion of CR/LF sequences (carriage return/line feed characters). The intent is that the files look like text files on the respective systems. IBM mainframes use an encoding scheme called EBCDIC which is different than the ASCII encoding scheme used by Unix systems and other machines, including PCs. The text has to be translated between these different character encodings during file transfer - it is NOT suitable for binary files. See the TYPE command for information on how to switch FTP from ASCII to BINARY modes.

Getting Started: How to Use FTP to Transfer Files

The following describes the steps that you need to follow in order to use FTP to transfer a file to or from a remote system. It assumes that you know the name of the system (it's "address") - if you do not, you must find this out, either through your site administrator or from someone at that remote site.

```
     1 - Connect to the remote site, and login.

     2 - Locate where the file is, or should be placed

     3 - Move to that file area via the CD command

     4 - Select ASCII (default), EBCDIC, or IMAGE transfer mode

     5 - Point to the file and press F6 for GET or use the PUT
         command.
```

Connect to the remote site, and login

The very first thing to do is to start FTP. You should be aware that there are various startup options and parameters that can speed up the startup process for you; these are documented in the topic "Starting FTP: the Command Line Parameters".

The following screen appears when the FTP command is entered without any parameters:

```
 Xtype: ASCII  Remote Host: ------not connected------   Address: ------n/a------
 --------------------------------Messages------------------------------------
 MUSIC/SP TCP/IP FTP Version 1.0




 +----------------- File Transfer Protocol: Connect/Login ------------------+
 |                                                                          |
 |     To view a list of remote hosts that allow anonymous FTP, press F4.   |
 |                                                                          |
 | Remote Host ==>                                 (name or numeric address) |
 |    User Id ==>                                  (valid user id or anonymous) |
 |   Password ==>                                  (password if required)    |
 |                                                                          |
 |    Fill in the required fields and press ENTER to Connect/Login.         |
 |    Anonymous FTP uses your E-mail address as the default password.       |
 +--------------------------------------------------------------------------+



 +--------------------------------------------------------------------------+
 1:Help 3:Exit  4:Display List of Remote Sites    10:Close Connect/Login Window
```

Figure 6.1 - FTP Main Screen

The easiest way to connect to the remote site is to fill in the Login Window: Remote Site, Userid, and Password. Press ENTER to initiate the connection to the remote site. Once connected, FTP will log you in and request a directory listing of the home directory for that account (for the file area that you are initially placed into by the FTP server). On some systems (notably VM systems) an additional level of file access exists, and you are prompted for another password via the ACCT command. FTP will prompt you for this if it is necessary. Note that on sites where anonymous access is allowed, you should try a password of your e-mail address or "guest" for this command, if it is requested.

Locate where the file is, or should be placed

If you are downloading ("get": retrieving a file from the remote system), then you need to know where is is on that system. If you are uploading ("put": sending a file to the remote system), then you need to know where you can put it.

Generally, sub-directories are allocated on most systems for various types of files. If you are uploading a file, you might want to ask the owner of the system where to put the file, unless you are uploading anonymously. For anonymous downloads, generally there is a /pub sub-directory where sites keep their publicly available files. In any case, the messages and directory listings tend to point you to the files that are available.

A good file to look at is any file called READ.ME or README or README.FIRST, etc. Usually sites place information that describes where various files can be found on their system in these files.

Move to that file area via the CD command

Once you know where the file or files are that you wish to access, then you have to move into that file area. You do this via the 'CD' or 'CWD' command - this changes your "working" or current sub-directory to the

one that you specify in the command. (In FTP full screen mode, just put your cursor on the sub-directory name on the screen and press ENTER.)

On some systems (for example VM or MVS systems) instead of sub-directories you have other file area concepts, such as accounts or mini-disks. In these cases, you likely do not have to use the CD command at all. At any rate, follow the instructions that the remote site has posted.

Select ASCII (default), EBCDIC, or IMAGE transfer mode

Assuming that you can now see the file name on the screen (for downloading) or at least that you are in the correct file area (sub-directory, mini-disk, etc.) for uploading, you are almost ready to proceed with your file transfer.

First, though, you must decide whether to transfer the file in ASCII or IMAGE (binary) mode. This depends on what the file is. For example if it is simply a text file, then you should probably use ASCII mode (the default). On the other hand, if it is an executable program, binary/image mode is what is required. For any file destined for a personal computer, a binary file transfer is essential for preserving the original bytes.

If you are doing a MUSIC-MUSIC file transfer, you can use the BINARY command. This is a special transfer mode between MUSIC systems that preserves file information. (Usually, this will have been set automatically during the login process.)

Point to the file and press F6 for GET or use the PUT command

For downloading, in full screen mode, simply place your cursor on the file name and press F6. You should see a confirmation window pop up, before the file transfer starts, in order to verify that you will be transferring the correct file. Simply press enter and the file will be transferred. (For some remote systems, FTP might not be able to determine the file name; in this case, you should use the DIRINFO command to tell FTP to use NLST instead of LIST, or simply issue the NLST command yourself. Another possibility is simply to issue a GET command.)

For uploading, you must issue a PUT command. FTP will then proceed with the file transfer.

FTP may not recognize the format of the directory listings for some systems. In some cases, a screen will automatically be displayed asking you to point to where the file name starts in a sample output line. This is the case where FTP cannot determine the remote system type, even though it may be perfectly obvious to you. In other cases, FTP will choose the wrong string for the file name. In this case, even though FTP knows the remote system type, the format of the directory listing is different. Simply move the cursor down to a line in the directory listing containing a file name or sub-directory name, and press F5. A screen will be presented asking you to indicate the starting position of file names.

Navigating the FTP Screen: Using "Point-and-Shoot"

The following box shows the initial Login Window that FTP presents to you at startup.

```
    ----------- File Transfer Protocol: Connect/Login --------------

 To view a list of remote hosts that allow anonymous FTP, press F4

 Remote Host ==>                              (name or numeric address
    User Id ==>                               (valid user id or anonymous
   Password ==>                               (password if required)

  Fill in the required fields and press ENTER to Connect/Login.
  Anonymous FTP uses your E-mail address as the default password.
```

Remote Host: This is the symbolic or numeric remote host address. Pressing F4 will show you a list of sites that allow anonymous FTP.

Userid: This is your userid on the remote system. Note that this is NOT your MUSIC userid.

Password: This is the password associated with your remote userid.

The following box shows the FTP screen when the Login Window is closed. This screen is shown with no established connection to a remote site.

```
Status- >   Xtype: ASCII  Remote Host: --not connected- Address: -n/a-
        ------------------------- Messages -----------------------
Message      MUSIC/SP TCP/IP FTP Version 1.0
Log -- >     *** Enter OPEN command to connect to a remote site

Command
Area-- >     Command ===>
        -------------------- Directory ----------- Line -n/a- of --
Current-- > Current Dir:
Directory

Dir Log-- >
        ----------------------------------------------------------

 Note that there are 5 areas (each discussed in turn):
Status Line Message Log Command Line Current Directory Directory Log
```

Status line for FTP

```
 Xtype: ASCII   Remote Host: quiche.cs.mcgill.ca   Address: 132.206.2.3
 -----------|------------ Messages ---|---------------------------|--
            |                         |                           |
current     |            symbolic     |            numeric         |
transfer <--+            address  < ---+           address  < -----+
mode (ASCII or           of remote site           of remote site
IMAGE)
```

When you are connected with a remote site, the "Remote Host" and "Address" fields are filled in. The "Address" is the numeric equivalent of the host name. Note that the transfer mode field is a "hot spot"; you can put your cursor on and cause something to happen. In this case, the transfer mode is changed. For example, if you put your cursor on ASCII and press ENTER results in:

```
                Xtype: ASCII.
    changes to
                Xtype: IMAGE
```

Messages Log

The Messages Log shows you the various messages that occur when performing file transfer. When FTP has something to say to you (eg.file transfer completed) then it will put this message into the Messages Log. It also displays the text messages sent to and received from the remote host, as well as your input.

```
 ----------------------- Messages ---------------------------------
 dir
 *** Obtaining directory listing (press PA1 to cancel)
 >>> port 132,206,120,2,7,242
 200 PORT command successful.
 >>> list
 150 ASCII data connection for /bin/ls (132.206.120.2,2034) (0 bytes).
Command ===>
```

There are 4 types of messages displayed by FTP:

1. your input, displayed as you typed it in (eg. 'dir')
2. FTP transmitted commands, preceded by '>>>', (eq. '>>> port 132, ...   ')
3. FTP message, preceded with '***' (eg. 'Obtained directory ...')
4. remote messages, preceded by a 3 digit number (eg. '200 PORT ...')

Directory Line

The Current Directory line is an unprotected field, which means that you can use the TAB key to reach it.

```
--------------------- Directory --------------- Line 00001 of 00017
 Current Dir:  /home /guests /x123456
```

By placing the cursor on one of the fields within the line (in this example, either "/home" or "/guests" or "/x123456") and pressing ENTER, you instruct FTP to perform a CD to that sub-directory. For example, by placing the cursor on "/guest" and pressing ENTER, you request FTP to issue the command:

```
    CD /home/guests
```

Directory Log

Usually, FTP will automatically query the remote site in order to display the files within the current working directory. (FTP can be told not to do this.) Here, if you put your cursor on a sub-directory entry and press Enter, FTP will change to that sub-directory. If you put your cursor on a file and press F6, FTP will start to download that file. The following box shows an example of a Directory Log.

```
 Command ===>                                             cursor here
 ------------------ Directory ----------- Line 00001 of 00005  + F6 starts
 Current Dir: /                                           download
 total 1235                                                   |
 -rw-r--r-- 1 0        daemon       4210 Feb  6 16:18 README  < ----+
 dr-xr-xr-x  2 ftp     daemon        512 Mar 19  1991 bin
 dr-xr-xr-x  2 ftp     daemon        512 Mar 20  1991 etc     < ----+
 dr-xr-xr-x  3 ftp     daemon        512 Sep 18 16:23 pub        |
 dr-xr-xr-x  3 ftp     daemon        512 Mar 19  1991 usr    cursor here
                                                              + ENTER

You can control whether filenames                        changes to this
and information (as shown here) or                         sub-directory
only filenames are displayed.
```

File Transfer Monitor

The File Transfer Monitor panel is displayed while file transfer is in progress. The rates and byte numbers are updated to show you the status of the file transfer. Before it starts, you can exit with F3. Also, you can step through the different file transfer types (ASCII,IMAGE,EBCDIC) using F11. "View after Xfer" automatically views the file after transfer if Y (Yes). "Replace Existing File" will not prompt you if Y (Yes) and the file exists. (Note that if N (No) and the file exists, you will be given the chance to replace it.) Once a file transfer is in progress, you can interrupt it by pressing ENTER. (You can terminate it before it starts by pressing F3.)

```
 ------------------- File Transfer Monitor ----------------------
 Remote File:    README
 Local File ===> README
 Type  of Transfer:    ASCII    STREAM              % Transferred: -
 Bytes to Transfer:    -                            % Remaining: -
 Bytes Transferred:    -                            K-Bytes/Second: -
 View After Xfer ===> N (Y or N) Replace Existing File ===> N (Y or N
 Message: Starting file transfer - press ENTER to continue            ø
```

Starting FTP: the Command Line Parameters

Start FTP by simply typing FTP in command mode. The general form of the FTP command is as follows:

```
    ftp site-name remote-userid remote-password other-parms
```

Note: The "site-name", "userid", and "password" are order-dependant. Other parameters can follow in any
          order.

The other parameters on the command line all start with a '-' and are listed below:

-p#   TCP/IP port number (default: FTP 21)

-l   line mode

-f   full screen mode (if your default is line mode)

-a   autodir off: no automatic directory query when changing directories see the AUTODIR command

-d   specifies a sub-directory name. When automatically logging into the remote system, FTP will change
        to this sub-directory.

-di   switch for DIRINFO command - this tells FTP to use NLST rather than LIST for DIR commands.
        Some FTP servers may produce a file list that FTP cannot parse, and thus the F6 key for GET and
        the Enter key for CD will not work unless this option is used.

-lm   turn on message logging (see the LOGLIST command)

-ld   turn on directory logging (see the LOGDIR command)

-t   turn on trace mode - primarily for debugging but will allow you to see the sequence of records being
        received or being written by FTP, as well as lots of other stuff

-s   silent mode: do not write out any messages at all, including error messages. This may be useful for
        REXX execs.

-su   sunique switch: this tells FTP not to issue STOU commands even when a PUT command without a
        -R is used. This may necessary with some FTP servers that do not recognize the STOU command.

FTP also looks for a startup file called @FTPPARMS, in which you can store these parameters. Only the
first line of the file is read.

As well, you can have FTP read commands in a file. For example, the following would automatically ftp into a site, retrieve a file, and quit.

```
/PARM -l
/INC FTP
open a.b.c.d
user anonymous guest
cd pub/goodstuff
type i
get goodstuff.all.of.it -r
quit
```

@FTPPARMS Parameter File

At startup, FTP will look for this file. In it, you can place a line of frequently used command-line options, and thus avoid having to specify them each time. For example, suppose that you wished to use line mode, and also that if you switch into full screen mode you don't want FTP to automatically display the files in your current sub-directory (at the remote site - see the AutoDir command). Then you could place the following line in a file call @FTPPARMS, and FTP would start up in the mode that you wish:

```
-a   -l
```

FTP Command Reference

The following is a list of commands that are available with FTP:

!   The "!" character lets you enter commands directly to the FTP server at the remote site. In case commands must be issued which MUSIC/FTP is not familiar with, then use this character in front of that remote command to instruct MUSIC/FTP not to check for a valid FTP command, but rather to pass on the string directly to the remote FTP server.

              Keep in mind that for some commands (such as GET and PUT), the local FTP client (this program) must know about the command. Thus

```
!get myfile
```

              will not function correctly.

           Note: This command differs slightly from the SITE command. The Site command is used to pass only site specific commands to the remote server. ! can be used to pass any command, even a valid FTP command.

?   The ? command displays the status of most of the internal settings of FTP. Most of these you can set before or during or after startup. Some aren't easily modifiable and are site settings.

Acct   The Acct command allows you to enter the another password for your data access authorization. In practice, this is essentially a command for CMS systems, to allow you to enter either the READ or the WRITE minidisk password.

              When FTP prompts you for a password, you can just enter the password. FTP will append the password to the ACCT command and transmit it. Note that FTP blanks out your password when typed in interactively.

See also User, Pass, Open.

ALLO   The ALLO command is site dependant. It exists to allow a remote host to let you send infor-
                mation about file size, for uploading files. The standard arguments are:

                        allo file-size max-record/page-size

                where "file-size" is in bytes and "max-record" or "page-size"is in bytes.

                Consult the remote HELP for more information on this command.

ASCII   This is a synonym for "TYPE ASCII"; it switches to ASCII file transfer mode. In this mode,
                characters and lines are preserved from system to system. Lines are delimited by the CR/LF
                (carriage return/line feed) sequence (in hexadecimal: x'0D0A'). Note that characters other
                than just printable characters are translated to meaningful equivalents, and that the printable
                characters are replicated after decimal 128 (x'80') since ASCII is a 7-bit code. This may be
                inappropriate for PC files which may used so-called "extended" ASCII. In this case, you
                might want to try using type Binary.

                Use the ASCII command when you are transferring text files. For binary files, see Binary or
                Type. See also EBCDIC.

AutoDir   The AutoDir command controls whether FTP automatically displays the files in the current
                sub-directory that you are in or not. The default mode for full-screen displays is that the files
                will be displayed. This command changes that, and allows you to display the files only when
                you wish to, by issuing a DIR command. Your site may alter the default operating mode to
                avoid the automatic display of sub-directories. You can override this personally by

                        1. setting up an @FTPPARMS file
                  or
                        2. by using the -a options when you are starting FTP

BINARY   This command allows you to instruct a remote MUSIC system to send/receive files in
                binary, unconverted format. This can significantly speed up transfer rates and guarantees
                that files are transferred correctly regardless of their file attributes, peculiarities, or special
                binary data that they may contain. (During transfer, a special 94 byte header is prefixed to
                the data.) Syntax:

                        BINARY BLOCK [ON/OFF]

                If ON or OFF is not specified, ON is assumed. Note that the remote server must agree to this
                mode of transfer. The type will be set to IMAGE mode, but this is not true IMAGE mode -
                this cannot be used between MUSIC and a non-MUSIC remote host, such as a UNIX
                system.

                See also ASCII, EBCDIC, Type, and Mode.

CD   The CD (Change Directory) command is a synonym for the CWD command. It changes
                your current working directory to the one that you specify. If you don't specify any directory
                name, then a PWD (Print Working Directory) command is issued, which displays the name
                of the current working directory. In full screen mode, the current working directory is the
                directory that is displayed on the screen (if one is). In line mode, CD without a parameter or
                PWD is a convenient way to recall which directory is current.

Close   The CLOSE command requests the remote server to terminate the connection. Normally,
                you do this when you wish to remain in FTP and Open another remote connection. If you

wish to exit FTP completely, then issue Quit.

See also Open and Quit.

CWD   The CWD (Change Working Directory) command is a synonym for the CD command (described above).

DELE   The DELE command deletes a file on the remote system, if you have write or delete privileges there. A message indicating the status of the request is returned from the remote FTP server. Note that the directory listing will not be automatically updated in this case. In order to refresh the directory listing, issue the DIR command.

See also the Rename, MkD, and RmD commands.

DELIM   The DELIM command allows you to change the defalut delimiter for text lines from CRLF (carriage return followed by line feed) to carriage return only, line feed only, or the EBCDIC newline (NL) character only.

DIR   The DIR command displays the files in the current sub-directory or file area (some systems don't have sub-directories, and a general term for where the files are kept is "file area").

FTP will automatically issue a DIR command for you whenever you change to another sub-directory. (This can be disabled; see AutoDir.) When you change back to a sub-directory that was previously displayed, FTP will remember the previous directory listing and will not query the remote system again, thus saving you time.

You can subset the files displayed by using wildcard characters in the DIR command. For example, to see all of the .EXE files in a sub-directory you can say:

```
dir *.exe
```

and only those file will be displayed. Because you can also display other sub-directories using this mechanism, you should be aware that you can confuse FTP in some cases. The files displayed in the directory listing might be for some other sub-directory and not for the current working directory. In this case, attempts to retrieve a file will result in the message No such file or directory : this means in the current working directory, not the directory that you have displayed.

How much information will be displayed is controlled by whether you have used the DirInfo command switch or the -di startup parameter. By default, DIR uses the LIST command, which displays all of the file information available from the remote system. Using DirInfo causes DIR to use the NLST command when obtaining a directory listing.

See also CWD, MkD, and RmD commands.

DirInfo   The DirInfo command alters the way in which the Dir command obtains a directory listing. DIR normally issues a PORT command followed by a LIST command. This LIST command requests that the FTP server provide extra information about each file. DirInfo causes the DIR command to switch between using the LIST command and the NLST command, which only displays the filenames. Issuing DirInfo again switches DIR back to LIST.

EBCDIC   This is a synonym for "TYPE EBCDIC"; it switches to EBCDIC file transfer mode. This is used when transferring data between IBM machines, in order to avoid the translation to and from ASCII. Note that many FTP servers on non-IBM machines do not recognize this parameter, and will say so. Normally, this parameter only makes sense when transferring files with another IBM host.

Records are delimited by the EBCDIC character NewLine (x'15') in Streammode In Block mode, no record delimiter is required.

Use the EBCDIC command when you are transferring text or binary EBCDIC files. Often the best transfer strategy for EBCDIC machines is to use type EBCIDC, mode BLOCK, especially for objects such as object modules or load modules.

See also Type, Mode, Binary, and ASCII commands.

Extent   The Extent command allows you to specify secondary space for files that FTP is creating for you during the operation of a GET command. Normally, the default should be adequate: this is the current amount of space + 50%. Specifying a positive number X will provide additional space extents of X%; specifying a negative number -X will provide additional extents of current space + X%.

See also Space, RECFM, and LRECL commands.

FilePos   This command allows you to specify the starting position of a file name or sub-directory within a directory listing. Sometimes, FTP cannot determine the type of remote system it is dealing with, or sometimes, even when FTP can make this determination, the format of the directory listing is not what FTP expects. In the first case, FTP will automatically display a screen asking you for the starting position of the file names. In the second case, you have to initiate this yourself, using the FILEPOS command. It is usually most convenient to use the function key for this (F5). Simply position your cursor on a line in the directory listing containing a file name, and press F5. When the prompt screen is displayed, that line will be included. Place an "X" (or any non-blank character) to mark the start of the file name, and press ENTER.

Get   The GET command initiates the download of the remote file specified in the GET command. The contents of the remote file may be placed unchanged into a MUSIC file, or translations may be applied to it. A simple stream of bytes may be transmitted, or record boundaries may be preserved. All of these options are obtained via other FTP commands that must be issued prior to the GET command. See Type, Mode, Space, Extent, RecFm, LRECL commands.

The format of the GET command:

```
    get remote-file-name local-file-name -R
  or
    get remote-file-name -R        (remote file name is
                                    used for local name)
```

"-R" stands for REPLACE: FTP will delete and recreate your file if it already exists. Note that in this case, your original file will be gone even if the file transfer fails, as the deletion occurs early in the transfer process. If omitted, FTP will prompt you to replace the local file in full screen mode, and fail the transfer request in line mode.

The remote file is placed into a MUSIC file with the file attributes set according to the previous settings that you have made with commands such as Type, Mode, Space, Extent, RecFm, or LRECL. If you have not specified any of these commands then the following defaults apply:

```
    Transfer Type:        ASCII (CR/LF delimited,
                          translated from ASCII)
    Transfer Mode:        Stream (record structure
                          not preserved)
```

```
                          Primary Space:        Site determined, initially 100K
                          Secondary Extent:     Current space + 50%
                          Record Format:        ASCII/EBCDIC files: Variable
                                                Compressed, Binary files: Fixed
                          Record Size (LRECL):  ASCII/EBCDIC files: 0 (for VC
                                                RecFm default)
                                                Binary files: 512 bytes
                          Access Attributes:    Private
```

Help   The HELP command is transmitted to the remote host for interpretation. The remote host
            will return information that pertains to its implementation of the set of FTP commands.
            (Recall that most FTP commands have both the client - this application - and the server - the
            remote host - sides involved in fulfilling commands. If the remote server has not imple-
            mented a particular FTP command, then that command will not work, regardless of its status
            on MUSIC.

            To get to this help facility, press F1 while in FTP, or use the LocHelp command.

Image   This is a synonym for "TYPE IMAGE"; it switches to IMAGE file transfer mode. In this
            mode, bytes are preserved unchanged and unaltered from system to system. In particular, for
            example, PC executable programs can be uploaded or downloaded without destroying them.

            Use the IMAGE command when you are transferring binary files. For ASCII files, see
            ASCII or Type. See also EBCDIC.

List   The LIST command issues a LIST command to the remote server, regardless the status of
            DirInfo. This causes the remote server to send a directory listing with descriptive informa-
            tion about each file. In full screen mode this is displayed in the directory window, and in
            line mode this information is listed on your terminal. If you have directory logging turned
            on, then this information is captured in the directory log.

            See also Dir, NLST, and LogDir commands.

LoadTran   The LOADTRAN command allows you to replace one of FTP's default translate tables with
            your own table, as specified in a file. (See below for format details). Syntax:

                 loadtran type filename

            where "type" is one of the following:

            E2A   EBCDIC to ASCII translate table
            A2E   ASCII to EBCDIC translate table
            E2A   EBCDIC to EBCDIC translate table
                   (to control what characters are displayed)

            and "filename" points to a file containing data as described in the format below.

            See ASCII, EBCDIC, and TYPE commands.

            A translate table is formatted into 6 lines of 4 groups, 8 hex digits per group. For example:

                 FAFAFAFA FAFAFAFA BBBBBBBB BBBBBBBB this is a comment
                 CCCCCCCC CCCCCCCC DDDDDDDD DDDDDDDD

Log   The Log command is a short-cut to specifying LogDir and LogMsg However, no dataset
            names can be used; the default log files

```
              FTP.DIRLIST
       and    FTP.MSGLIST
```

are used.

LogDir   The LogDir command starts a log of all directory listings to a MUSIC file. If you do not
          specify a filename, then the default log file is:

```
    FTP.DIRLIST
```

You can terminate directory logging by issuing the command

```
     logdir off
```

LogMsg   The LogMsg command starts a log of messages (both remote and local) to MUSIC file. If
          you do not specify a filename, then the default log file is:

```
    FTP.MSGLIST
```

You can terminate message logging by issuing the command

```
     logmsg off
```

LogRec   The LogRec command is used primarily for debugging. It dumps inbound data (from a GET
          request) into the file @FTPDATA. This can be useful when you are not sure exactly what
          the remote server is transmitting. The data is placed into the file by raw data blocks as they
          are received from TCP/IP; there is no real significance to the lengths of records in this log
          file, other than network traffic and similar variables.

          To disable record logging, simply issue the LogRec command again.

LRECL   The LRECL command allows you to enter a value for the record size or Logical Record
          Length of the local files that are created for you when downloading files from a remote site.
          A maximum value of 31744 is allowed.

MGET   The MGET command retrieves files matching a wildcard file specification (valid at the
          remote site) to MUSIC

MkD   The MKD command allows you to create a sub-directory on the remote host, if you are
          allowed to by the remote host's access controls and if the remote host's file system supports
          the concept of sub-directories.

Mode   The Mode command specifies the data transfer MODE: either Stream or Block.

          In Stream mode, records come as a CR/LF (or NewLine -EBCDIC) stream of bytes. For
          textual data this is sufficient. However, when the data to be transmitted is binary, and may
          contain CR/LF sequences or NewLine characters, you must either choose Type, Image, or
          Block Mode.

          In Block mode, records are transmitted with a length value. Thus even binary data can retain
          its record structure. For certain types of binary files, this is important.

MPUT   The MPUT command sends files matching a wildcard file specification from MUSIC to the
          remote site

NLST   The NLST command issues a NLST command to the remote server, regardless the status of

DirInfo. This causes the remote server to send a directory listing consisting only of remote filenames to MUSIC. In full screen mode this is displayed in the directory window, and in line mode this information is listed on your terminal. If you have directory logging turned on, then this information is captured in the directory log.

See also Dir, LIST, and LogDir commands.

NOOP   This command is transmitted to the remote server. It does nothing, but will indicate if the remote server is still communicating with you. It should issue a 200-level message, indicating successful completion of the NOOP command.

NoTran   NoTran is primarily a debugging command. It disables the translation of incoming ASCII data from ASCII to EBCDIC, but still allows the use of CR/LF sequences to delimit lines. Thus if you suspect that the ASCII translation is not what you require, then specifying NoTran will allow you to look at the raw ASCII data, delimited by CR/LF sequences into lines.

Open   The OPEN command initiates a connection to a remote server. You must identify the server by supplying an Internet address, which may be either symbolic or numeric. For instance, a symbolic address would be something like "mynode.mycollege.edu", whereas a numeric address would be something like "1.2.3.4"

              If you use a symbolic address, then FTP must query a remote nameserver for the numeric value of the address, only after which can it start the remote connection attempt. The messages being displayed will indicate when the nameserver has been successfully contacted and when the actual remote connection is attempted.

              In full screen mode, if you fill in the LOGIN window, then the OPEN command is issued for you automatically when you start the automatic login sequence. The messages will show you the commands being issued. To see a list of the available FTP sites for anonymous access, press F4 (or Enter if all fields are blank) in the LOGIN window.

              See also User, Pass, Acct, Close, and Quit commands.

Pass   The PASS command allows you to enter your remote password, which should correspond to your remote userid. Note that this is NOT your MUSIC password but must be authorized at the remote site. If you do not have a remote userid there, you may wish to contact that site, or you may wish to try the generally accepted "anonymous/e-mail-address" combination. When FTP prompts you for a password, you can just enter the password. FTP will append the password to the PASS command and transmit it. Note that FTP blanks out your password when typed in interactively.

              See also User, Acct, and Open commands.

Priv   The PRIV command sets the file access attributes of any file that you download to Private. Note that this is the default, and in fact to use other attributes you may be required to be specially authorized by your site administrator.

              See also PUBL and SHR commands.

Publ   The PUBL command sets the file access attributes of any file that you download to Public. This means that any user can read your file simply by using the filename without having to attach your userid to the file name.

              Note that this may not be allowed at your site by default, and in order to use it you may require special authorization from your site administrator.

See also PRIV and SHR commands.

Put   The PUT command stores a MUSIC file onto a remote site, using the various settings for transfer type and mode that either are default or that you have previously set. The contents of the local file may be placed unchanged into remote file, or translations may be applied to it. A simple stream of bytes may be transmitted, or record boundaries may be preserved.

When transmitting files, you may have to be concerned with the file attributes on the remote system. Normally, for text files simple ASCII type with Stream Mode is sufficient. For binary data, Binary type with Stream mode may be sufficient. However, when the binary file is to be actually used on MUSIC or the remote system (as opposed to simply storing it there) then STREAM mode may not be appropriate. As well, if you are dealing with an IBM system, you may need to specify TYPE EBCDIC. The remote site may have various file specification requirements, also. You specify these with the Site command (see Help).

The format of the PUT command:

```
   put local-file-name remote-file-name -R
or
   put local-file-name -R          (local file name is
                                    used for remote name)
```

"-R" stands for REPLACE: FTP will use the STOR command when you specify this option. At the remote site, STOR results in an existing file of the same name being replaced without prompting. Without "-R", FTP will use the STOU (Store Unique) command. This command will not replace a file, but rather will generate another name for the file if it exists, and advise you of this with a message. The SUNIQUE command disables this and causes FTP to always issue the STOR command; your site may have set this as the default.

See also Get, MkD, CD, RmD, Dele, Ren, Type, Mode, and Site commands.

PWD   The PWD command (Print Working Directory) causes the remote server to issue a message containing the name of the current working directory. In line mode, this may be useful to remind yourself of where you are in the sub-directory hierarchy. In full screen mode, FTP automatically maintains a display of the current working directory in the middle of the display screen.

See also Dir, List, Nlst, CD, MkD, and RmD commands.

Quit   The QUIT command causes FTP to close down the current connection and to exit back to MUSIC.

See also Open and Close commands.

RecFm   The RecFm command (Record Format) determines which of the following record formats will be assigned to a file created with a GET command:

U   Undefined record format
F   Fixed record format (records are of fixed length)
FC   Fixed Compressed record format (records are logically of fixed length but internally compressed)
V   Variable length record format
VC   Variable Compressed record format (records are not only of variable length but are also internally compressed)

Use one of the above codes to specify the record format of the MUSIC file.

Rename	The Ren command (Rename) issues the RNFR and RNTO sequences for you automatically. The format is:

        ren   old-remote-file-name   new-remote-file-name

If either RNFR (Rename From) or RNTO (Rename To) fail, then the Rename command fails. Note that the directory is not automatically refreshed, nor is it updated to reflect the change.

RmD	The RmD (Remove Directory) command deletes the directory that you specified as an parameter. Note that if this directory appears on the full screen directory display it will not be removed. You must refresh the directory listing to get an up-to-date listing by issuing the Dir command.

See also MkDir, CD, DirInfo, List, and Nlst commands.

RSize	The RSize command allows you to enter a value for the record size or Logical Record Length of the local files that are created for you when downloading files from a remote site. A maximum value of 31744 is allowed.

Shr	The SHR command sets the file access attributes of any file that you download to Share. This means that your file will be readable by others if they put your ownership id in front of the file name. For example, if DATA was created with SHR, and your userid was AA00, then others could read (but not alter) DATA by referring to it as:

        AA00:DATA

See also PUBL and PRIV commands.

Site	This command is used by the server to provide services specific to its system that are essential to file transfer but not sufficiently universal to be included as commands in the protocol. The nature of these services and the specification of their syntax can be stated in a reply to the HELP SITE command.

Note that this command is differs slightly from the ! command. ! simply passes the uninterpreted string onto the remote server - that string can be any command. SITE is passed as a command to the remote server, and what the server expects within the command of course limits what you can put there.

Space	The Space command allows the user to set the amount of primary file space that FTP requests when trying to create a file. You may wish to alter the default value due to restrictions on the amount of file space that your userid is allowed to have. The site can globally set a default value for the amount of primary file space requested.

FTP will attempt to recover from insufficient space errors. However, you should be aware that this involves extra processing overhead, and at a minimum involves copying the file several times. A more efficient approach is to estimate the file size yourself for exceptionally large files and set the value using SPACE accordingly.

You specify a number which is the amount of file space in K bytes that you wish allocated. When the file is closed, unused space is released.

SUnique	The SUnique command flips between allowing FTP to use the STOU command under certain circumstances and requiring that FTP always use the STOR command. Some servers do not understand the STOU command, and thus this toggle allows you to control what FTP does.

Normally, FTP uses STOU (STore Unique) unless you specify a -R (for replace) on the PUT command. This guarantees that you will not accidentally destroy a file by storing on top of it.

Syst   The Syst command asks the remote server to identify the Operating System that it is running under.

Trace   The Trace command is used primarily for debugging. You can specify Trace On or Trace Off as well as Trace Sockets (This last form causes the TCP/IP socket calls to be traced and places them in a file called @TCPIP.LOG Also, the raw data from the network is dumped into a file called @TCPIP.BUFFERS)

             The output from trace is written to the screen in line mode, or place into the message log in full-screen mode. An easy way to retain a copy of the trace listing is to specify the LogMsg command, and log the trace messages to the message log file.

Type   The Type command allows you to specify to FTP and to the remote server whether the data transfers should be in ASCII, BINARY, or EBCDIC.

             ASCII   Data is translated from/to ASCII to/from EBCDIC for inbound/outbound data. Lines are delimited with a CR/LF (carriage return/line feed x'0D0A') sequence. This is the default.
             BINARY   No translation of the data is performed, and the data is transferred as one continuous byte stream.
             EBCDIC   No translation of the data is performed, but lines are delimited by the EBCDIC NewLine character (x'15 '). Note that Type EBCDIC and Mode Block is what you would specify to transfer binary EBCDIC records.

User   The USER command allows you to enter your remote userid. Note that this NOT your MUSIC userid but must be authorized at the remote site. If you do do not have a remote userid you may wish to contact that site, or you may wish to try the generally accepted "anonymous/e-mail-address" combination.

             When FTP prompts you for a userid, you can just enter the userid. You can also add your remote password corresponding to that userid - FTP will use that value for a subsequent PASS command.

             See also, Pass, Acct, and Open commands.

QFTP (Quick FTP) - If You Know What You Want

Enter "QFTP" in *Go mode and the following screen appears:

```
----------------------------- Quick FTP -----------------------------------
Command ===>
Enter the required information and press ENTER for file transfer

 Remote Site ===>
     User ID ===>
    Password ===>

  Target Dir ===>
 Remote File ===>
  Local File ===>
Up/Down Load ===> DOWN   (Up or Down: direction of file transfer)
   Xfer Type ===> ASCII  (Binary or Ascii: transfer type)

Local File Attributes: (Optional)
    Primary File Space ===>      k
  Secondary File Space ===>      k
          Record Format ===> VC       (V, VC, F, FC, U: Variable/Fixed)
 Logical Record Length ===>      bytes

 Remain connected when finished N  (Yes: don't QUIT when finished  No: Quit)


-------------------------------------------------------------------------------
F1:Help      F3:Exit      Enter:Start File Transfer
```

Figure 6.2 - Quick FTP Screen Display

The QFTP Command in *Go mode allows you to Get or Put a file by simply filling in the menu on the left, and pressing ENTER. The file transfer is performed automatically and you have the option of disconnecting at the end, or remaining connected. QFTP is a simple REXX exec that issues FTP commands in line mode; you can write your own similar scripts for frequent transfers.

FTP Server - FTPD

MUSIC can also operate as a FTP server. Typically the set up and maintenance of the FTP server is done by site administrators. System support personnel can maintain public accounts for anonymous access.

Refer to the *MUSIC/SP Administrator's Reference* for more information.

Chapter 7. TELNET

Overview of TELNET - Logging on Other Computers

The TELNET command establishes a terminal connection with a remote computer through the TCP/IP 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" without any parameters.

```
---------------------------- MUSIC TELNET --------------------------------

 Fill in the following and press ENTER. Pressing F4 will give you a
 list of hosts.




 Host Address ==>

  Port Number ==>

   Parameters ==>






  F1:Help        F3:Exit       F4:List Host Addresses       ENTER:Process
```

Figure 7.1 - Using TELNET to Access Other Computers

Help is provided when the program is invoked by pressing F1.

TELNET Syntax

```
TELNET remote-host [port-number] [-l] [filename]
                                 [-a] [filename]
                                 [-m]
                                 [-c] [filename]
                                 [-t] [time]
                                 [-b]
                                 [-ba]
                                 [-x]
                                 [-vf]
                                 [-d]
                                 [-r] [-rcrlf] [-rcr] [-rlf]
```

TELNET Example

```
telnet vm1.mcgill.ca
```

TELNET Parameters

remote-host	The network address of the computer that you want to connect to. This can be specified as the domain name of the host you wish to connect to or its dotted decimal internet address.
port-number	The port number of the program you wish to connect to on the remote host. For TELNET this defaults to 23.
-l filename	Learn a connection script and place it into the specified file. The commands you use to connect and login to the remote host are automatically saved. These can be replayed later using the "-a" option, allowing you to automate the login process.
-a filename	Automatically connect to a remote host using the script previously saved by the "-l" option. See the section on "Automated Connections" for more details.
-m	Forces a manual connection despite the existence of an auto-connect file.
-c filename	Capture the session dialog into the specified file.
-t secs	This sets the time in seconds that the auto-connect processor will wait between commands. The default is 3 seconds.
-b	Used with "-a" to run the automatic connection in the background. You do not see the connection dialog on the workstation screen. This is intended for sessions that run without user intervention.
-ba	Background, no screen i/o, only until autoconnect sequence ends - can be used to hide initial screens for users.
-x	This is intended for debugging sessions that would normally run in the background. The session executes to completion, without user intervention, but the dialog is displayed on the screen.
-v	Negotiate VT100 mode only.
-vf	Force VT100 mode
-t nnn	Time auto for auto connect scripts.
-d	Force DUMB (NVT) mode
-r	Type of default line return affixed where the r can be followed by one of: CRLF, CR, LF, or blank (none), eg. -rcrlf, -rcr, -rlf, -r.
-p	allows privileged users to telnet to ports that are restricted by the RESTRICT_TELNET_PORTS option.

Automated Connections

When you login to a remote host, you usually always issue the same sequence of commands. If you specify the learn option "-l", TELNET will save these commands in a file. Later this file is used to do the login automatically.

Simple Example of TELNET:

1. Connect to the system specifying the "-l" option on the command.

            telnet vm1.mcgill.ca -l

2. Login to the system.

3. Terminate LEARN mode by entering the "%end" command. This causes TELNET to create the auto-connection file.

4. When you next connect to that system TELNET will automatically login.

Auto-Connect Files

The default name used in learn and auto-connect mode is the dotted decimal internet address of the remote host prefixed with "A.". The example on the last screen would have created a file:

            A.132.207.27.2

If TELNET finds such a file it will automatically go into auto-connect mode when connecting to that address. If this is not desired you can use the "-m" option to force a manual connection.

Often you wish to access a computer for a number of different purposes and would like to have different auto connection scripts for each one. In these cases you can specify your own filename.

TELNET Example: Specifying a File Name

The following example show the use of the file name in setting up an automatic connection to the local library system.

1. Telnet in to the host in learn mode.

            telnet mvs.mcgill.ca -l lib

2. Login and type in the commands to get to the library application.

3. Type "%end" to terminate learn mode and write the connection file which in this case is called LIB.

    To subsequently connect to the library application simple type:

            telnet mvs.mcgill.ca -a lib

Advanced Features

It is possible to automate entire sessions with remote hosts using the auto-connection facility. These sessions can be run in the background under program control to login at specific times, perform special functions and capture data.

TELNET Example: Automated Session

1. Connect to the remote host in learn mode

    ```
    telnet vm1.mcgill.ca -l auto1
    ```

2. Login and perform whatever command you want to automate. This could involve using TELNET's screen capture facility to retrieve data or status from the remote host.

3. Logoff. This will automatically terminate learn mode and save the connection script in the file.

TELNET Example: Testing an Automated Session

Use the "-x" option to test the automated session. This runs the session automatically while displaying the dialog on your screen.

```
telnet vm1.mcgill.ca -a auto1 -x
```

TELNET Example: Using an Automated Session

The following REXX program shows how the session above can be done every hour. The background option "-b" is used to prevent the dialog being shown on the screen.

```
/INC REXX
  Do forever
    'telnet vm1.mcgill.ca -a auto1 -b'   /* connect to system */
    call DELAY 360                       /* wait one hour     */
  end
```

The TIMEOUT parameter

The auto-connect facility sends commands to the remote hosts and waits for a specific response before sending the next one. Periodically an unexpected response halts this process. So a time out feature is built in. If the expected response does not arrive within the specified time limit, the next command is sent anyway. The default of 3 seconds seems to work quite well.

In some circumstances commands sent too soon get discarded and this 3 second time out may be too short. The "-t nnn" option can be used to set this to the number of seconds you want.

Also, if an auto-connection script gets stuck, you can always give it a little push by pressing the ENTER key. This will send the next command in the script.

Network Trace

To assist in debugging network or protocol problems TELNET will keep a log of all network interactions in the file TELNET.TRACE if one exists. To activate the trace, simply create a RECFM=V or RECFM=VC file with this name.

The information stored in the file is the raw TELNET data and commands that are passed over the network. The ASCII and HEX options of the VIEW program are useful in decoding this data.

TELNET Interface

Once connected to a remote site TELNET automatically selects one of four modes of operation depending on the type of remote system that you are connected to.

3270   This is used to communicate with IBM mainframe computers. The workstation functions as a regular IBM 3270 terminal connected directly the the remote computer.

VT100   This is used when communicating with systems that use VT100 type workstations. ANSI escape sequences from the remote computer are used to position the cursor and the input area, control scrolling and manage the screen. Since it is not possible to emulate all VT100 operations, some applications may not work exactly as they would on a real VT100 terminal.

In particular, the difference between local and remote cursor movement is important. When you move your cursor locally, this does not translate into a new cursor position at the remote computer. In order to do this an escape sequence must be sent. In VT100 mode, you can press PA1 in order to alter the meaning of some of your function keys. F11 and F12 can be used to implement remote cursor movements.

LRUP   This allows F5/F6/F7/F8 to act as Left/Right/Up/Down for VT100s.

Line   Line mode or NVT mode (network virtual terminal) is used when communicating with systems that can't handle 3270 or VT100 mode. In this mode data is displayed at the top of the screen and the command area is at the bottom.

Function Keys

In 3270 mode all function keys are passed to the remote computer unchanged. In VT100 F1-F4 are passed to the remote computer. In these cases the % character can be used to issue the appropriate command.

F1:Help   Asks for help.

F3:Exit   Terminates the connection and exits TELNET.

F5:IP   This sends the Interrupt_Process signal to the remote host. This is usually used to cancel the application that is currently running.

F6:AO   This send the Abort_Output to the remote computer to cancel any output from the current application.

F7:AYT   This sends an Are_You_There signal to the remote host. It usually respond in some positive way if it is still connected.

F8:Down   This speeds up scrolling in VT100 mode by clearing the screen before sending the signal to

transmit the next page. For example when using the Unix MORE filter it is much faster to press F8 to go to the next page than to press ENTER.

F10:Cap   Capture workstation output to a file. (Details follow)

F11:TAB   Transmits a TAB character to the remote host.

F12:Send   Transmits data without the CR/LF ending sequence.

ENTER   Transmits data followed by a CF/LF sequence.

PA1   Brings up a window which allows you to select new assignments for your function keys. The following sets of definitions for F1 to F12 are possible:

```
KeyPad:
 F1-F9,F10:  keypad digits 1 to 9, 0; F11:Up, F12:Down
KeyPad:
 F1-F9,F10:  keypad digits 1 to 9, 0; F11:Left, F12:Right
Function Keys:
 F1-F4 VT100 keys F1 to F4, F5: IP, F6: AO, F7: AYT,
 F9: Inp, F10: Cap, F11: Remote TAB, F12: Send (No Cr/LF)
```

"Keypad" refers to the numeric keypad on the VT100 keyboard. Switching into this mode sends escape sequences for these keys, as well as allowing you to send remote cursor movements with F11 and F12.

```
------------------- Set Function Key Definitions -------------------

 PF-Keys:  1-4

 Press ENTER to toggle function key assignments

 PF-Keys: F1-F4  F5:IP F6:AO F7:AYT F9:Inp F10:Cap F11:TAB F12:Send
  KeyPad: Either numeric digits or are as defined by application

 F3:Exit  ENTER:Toggle PFkeys 1-4/1-12  PA1:Exit Without Changes
```

Figure 7.2 - VT-100 Set Function Key Definitions Display

Capturing Output

Pressing F10 brings you to the output capture window. This allows you to specify which file to use, to turn capturing on and off and to view what has been captured so far.

When capturing is first activated the output is written to the beginning of the file. Subsequent output is appended to the file until a new file name is specified or the TELNET session is terminated.

The captured output does not always look exactly the way it appears on the workstation screen. The output is captured in the order it arrives not based on its position on the screen. Often status messages and screen formatting functions like drawing boxes will be interspersed with the captured data. This is particularly true in VT100 and 3270 modes.

TELNET Commands

Any commands prefixed by a percent sign (%) are given special treatment. These are particularly useful in 3270 or VT100 mode when the function keys have no local effect.

%help   Asks for help.

%exit   Terminates the connection and exits TELNET.

%ip   This sends the Interrupt_Process signal to the remote host. This is usually used to cancel the application that is currently running.

%ao   This send the Abort_Output to the remote computer to cancel any output from the current application.

%ayt   This sends an Are_You_There signal to the remote host. It usually respond in some positive way if it is still connected.

%cap   This allows you to capture the workstation output into a file. (Details follow).

%end   This terminates LEARN mode.

Any other command prefixed by the percent sign is passed directly to MUSIC for execution.

Control Characters

Some applications require ASCII control characters as input. The open apostrophe or the cent sign can be used as an escape key to send the ASCII control characters. For example, to transmit "ctrl-a" to the remote computer:

1. Press the open apostrophe.

2. Press the character "a".

3. Press ENTER.

Note: To transmit a real open apostrophe press it twice. There is no ASCII equivalent of the cent sign.

Chapter 8. Name Server Query

Chapter 8. Name Server Query

NSQUERY Command

This program allows the user to query DNS (Domain Name Service) servers for various types of RRs (resource records). Resource record   s are used to provide various forms of information about Internet host s The returned answers are interpreted and displayed by the program. Inverse queries can be performed (use a numeric address as an argument and the program will return symbolic hostname(s) that are mapped to that address.

Using the '-i' flag at startup causes the program to enter an interactive query mode. See below for a description of the keywords that can be used interactively.

Syntax

```
NSQUERY domain    <qtype qclass -d -q -v -t -h -i <-s server> >
```

Parameters:

domain   full or partial domain name specification

qtype   resource record type for the query - one of:

A	host names
NS	name server
CNAME	canonical name
SOA	start of authority
WKS	well known services (Internet)
TXT	text
RP	responsible person
PTR	pointer
HINFO	host info
MINFO	mail info
MX	mail exchange
*	any, including all of the above

qclass   resource record class for the the query - one of:

IN	internet
*	any, including all of the above

-d   dumps UDP block received from nameserver

-t   enables -d and also additional tracing info

-v   verbose mode - more information is produced

-q   quiet mode - less output is produced

-h   display header info toggle

-s   nameserver address; otherwise, the default nameserver in $TCP:TCPIP.CONFIG will be used

-i   start up in interactive mode; parameters that can be changed are:

            DOMAIN=   query address (IP or hostname)
            TYPE=   type name
            CLASS=   class name
            NAMESERVER=   name server address

Each keyword must be separated from another one by a comma. A blank line exists the program. If a keyword is not changed, then the previous value is used.

Chapter 9. Internet Relay Chat (IRC)

Chapter 9. Internet Relay Chat (IRC)

Introduction to IRC

IRC is a multi-user, multi-channel chatting network. It allows people all over the Internet to talk to one another in real-time. Each IRC user has a nickname. All communication with other users is either by nick-name or by the channel that they, or you, are on.

Users Behavior on the Internet Relay Chat System

The Internet Relay Network (IRC) is a system for communicating with other people.

IRC is a free speech system. Users may exchange viewpoints with other users. To protect people from abuse, there are certain rules that the user MUST respect. See the IRC help topic "ETIQUETTE". If a USER doesn't respect the guidelines/rules stated. then the IRC-ADMIN may suspend or reduce the availability for the USER.

How to Start IRC?

First choose the nickname you want to use on IRC. Suppose the choosen nickname is "MyNick", from *Go type:

```
/IRC MyNick
```

Now, if the connection can be etablished, you are in IRC. You will see on the Command line: /Nick MyNick, you have to press ENTER again. If there are no Nickname conflicts (the nickname must be unique in the entire Internet IRC network) you can execute IRC commands, otherwise, you will have to re-issue a /nick command to choose another nickname.

The first thing to do after succesfull connection is usually to use the LIST command to obtain the list of available channels. A channel always starts with the character '#'. When your choice of channel is done, use the CHANNEL or the JOIN command to enter this channel. The PART or the LEAVE command must be used to leave a channel.

IRC is a multi-user, multi-channel chatting network. It allows people all over the Internet to talk to one another in real-time.

Each IRC user has a nickname. All communication with other users is either by nickname or by the channel that they, or you, are on. All IRC commands begin with a / character.

Anything that does not begin with a / is assumed to be a message that is to be sent to everyone on your chan-nel. Here is a list of basic commands to help you get started:

/LIST   Lists all current IRC channels, number of users, and topic.

/NAMES   Shows the nicknames of all users on each channel

/JOIN <channel>   Join the named channel. All non-commands you type will now go to every-one on that channel

/MSG <nick> <msg>	Sends a private message to the specified person. Only the specified nickname will see this message.
/NICK	Change your nickname
/QUIT [message]	Exits IRC.
/HELP <topic>	Gets help on all or specific IRC commands.
/WHO <channel>	Shows who is on a given channel, including nickname, user name and host, and realname.
/WHOIS <nick>	Shows the "true" indentity of someone

These commands should get you started on IRC. Use the /HELP IRC command to find out more about IRC.

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You may use this form to communicate your comments about this publication, its organization, or subject matter, with the understanding that the MUSIC Product Group may use or distribute whatever information you supply in any way it believes appropriate without inccurring any obligation to you.

Possible topics for comments are:

Clarity   Accuracy   Completeness   Organization   Coding   Retrieval   Legibility

If you wish a reply, give your name, institution, mailing address and date:

    _____

    _____

    _____

    _____

What is your occupation?_____

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MUSIC/SP Internet Guide (April 1996)

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