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**Advanced Radio Coordination
(ARC)
Workstation
User's Guide**

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1. Introduction

1.1 What Can the Workstation Do? An Overview

The Advanced Radio Coordination (ARC) Workstation is modular in design and allows you to add to your basic personal computer (PC) workstation platform only those modules you need. Instructions for installing both the workstation platform and the modules are included in the software package.^[1] The modules you can choose to install on your ARC Workstation are

- MRSELS-II Activities
- PCN/PN Activities
- Radio Engineering Activities
- Report Activities
- Graphics Activities
- General Communications.

Using the Microwave Radio and Satellite Engineering and Licensing System II (**MRSELS-II**) activities, you can upload and download files, and automatically log on to MRSELS-II.

The Prior Coordination Notice/Public Notice (**PCN/PN**) activities give you an automated method for logging and tracking PCNs on your PC. FCC PN data is used to provide information on missing PCNs that may affect microwave radio paths.

The **radio engineering** activities provide various PC-based programs for engineering, designing, and studying microwave and UHF radio routes.

The **report** activities enable you to produce and manipulate a variety of ASCII reports.

The **graphics** and **plotting** activities allow you to perform propagation studies over irregular terrain and generate the plots. You can also generate plot output files on MRSELS-II and download them to the ARC Workstation. Once you have downloaded the files, you can display them on your PC's screen and plot them using a plotter attached to one of your PC's serial ports, or a graphics printer attached to your PC's parallel port.

Using the **general communications** option, you can access software communications programs that have not been integrated into the workstation environment. It provides a gateway for accessing other systems (for example, the UNIX® system) from the ARC Workstation.

UNIX is a registered trademark of UNIX System Laboratories, Inc.

1.2 How to Use This Document

This user guide consists of several sections that tell you how to use the workstation in general, several sections that tell you how to use specific programs, and several tutorials that take you through hands-on exercises. We suggest that you read the general sections (Sections 1 to 7) before you try to use the program sections or tutorials.

- **Section 1, Introduction**, introduces you to the software and this document.
- **Section 2, Getting Started**, tells you how to set up your PC and access the workstation.
- **Section 3, Understanding the Screens**, gives you a guided tour of the workstation's screens so you can tell them apart and use them properly.
- **Section 4, Moving Around, Selecting Activities, and Selecting Commands**, tells you how to move among screens, select activities, and select commands.
- **Section 5, General Workstation Functions**, describes several general workstation functions: working with briefcases, updating the ARC password, assigning a function to a key, updating the communications configuration, and backing up the workstation.
- **Section 6, How to Use the Calendar Activities**, tells you how to use a reminder feature for upcoming activities and manage the scheduling of robotic events.
- **Section 7, The Main Menu – Selecting an Activity**, briefly describes the items on the main menu and where they take you.
- **Section 8, How to Use the MRSELS-II Activities**, tells you how to use the various MRSELS-II activities.
- **Section 9, How to Use the PCN/PN Activities**, tells you how to use the workstation to log and track Prior Coordination Notices.
- **Section 10, How to Use the Radio Engineering Activities**, tells you how to use the workstation's various radio engineering programs.
- **Section 11, Graphics, Reports, and General Communications**, briefly describes the graphics, reports, plotting, and general communications programs.
- **Appendix A, How to Do a Transhorizon Loss (OHLOSS) Study**, gives you a sample problem and step-by-step instructions.
- **Appendix B, How to Use the PLOTPATH Task Set**, gives you a sample problem and step-by-step instructions.
- **Appendix C, An Introduction to the PCN Log Activities**, gives you step-by-step instructions for the various PCN Log activities.

- **Appendix D, How to Use Public Notices With the PCN Log**, gives you step-by-step instructions for the various PN activities.
- **Appendix E, FM Diversity Channel Plans**, contains tables for use with the FM Diversity program.

1.3 Syntax Used in This Document

This document uses <> around key names to show when you should press a key (for example, <Tab> tells you to press the Tab key).

Your keyboard may not name the keys the same way they are named in this document. For example, this document will refer to the Enter key, which some keyboards may call the Return key. The ARC Workstation uses the Enter key to continue or complete a process.

The cursor keys, <Cursor Up>, <Cursor Down>, <Cursor Left>, and <Cursor Right>, may be known as up arrow key (↑), down arrow key (↓), left arrow key (←), and right arrow key (→).

The Escape <Esc> key is used to terminate a process. This function is available for most activities of the ARC Workstation.

The Tab (<Tab>) and Back Tab (<Shift> + <Tab>) keys are used to move from field to field.

1.4 Getting Help!

If you need help with the ARC Workstation, you can call the hotline on (201) 829-2580. The workstation also offers on-line help, and Section 3.5 tells you how to access it.

2. Getting Started

2.1 Setting Up Your PC

The ARC Workstation requires the following hardware, software, and communications considerations.

2.1.1 The Hardware You Need

- An IBM PC AT® computer (or a compatible computer) class system with 640 kB of RAM
- Hard disk with a minimum of 7.5 MB available before installation, 1 MB after installation

NOTE: You will need 7.5 MB for just the basic workstation platform. Depending on the optional modules you install, you may need even more storage space.

- One 1.44-MB or 1.2-MB floppy disk drive
- Color graphics adapter or its equivalent required for graphics and/or color capability.

2.1.2 The Software You Need

The software requirements include

- Equivalent of IBM PC DOS 3.X
- 580 kB of free memory
- No conflicting resident programs
- No conflicting menu system.

2.1.3 Communications Requirements

The communications requirements include

- Ability to communicate with COM1, COM2, COM3, or COM4
- Internal or external modem or internal company network
- Direct Distance Dialing
- Ability to transmit all ASCII characters
- Ability to transmit with no echo (half duplex mode).

AT is a registered trademark of International Business Machines Corporation.

2.1.4 How DOS Should Be Set Up

- DOS in its own subdirectory, one level below the root directory
- DOS subdirectory included in the PATH.

2.2 Installing the Software

Instructions for installing your ARC Workstation software are included in the software package (Bellcore Software Package SP-NWT-000093).

2.3 Accessing the Workstation

The workstation programs are stored on the PC's hard disk and are accessed by substituting the pseudo "I" drive for the actual drive. To activate the workstation, you must enter the name of a predetermined batch file. This batch file is "arc30.bat." So, to access the workstation, type *arc30.bat* (or the name of the batch file that will activate your particular workstation) and press *<Enter>*.

When the workstation starts, you'll see a logon screen (see Figure 2-1).

To complete this screen and gain access to the ARC Workstation Main Menu

1. Type your predefined logon ID.
2. Press *<Tab>* to move to the password field.
3. Type your predefined password. For security, the password does not print on the screen.
4. Press *<Enter>*.

The workstation verifies the entered logon ID and password. If either entry is incorrect, the workstation will redisplay the logon screen and ask you to try again. Enter the correct logon ID and password.

While the workstation is processing this information you'll see the word "Busy" flashing in the upper right corner of the screen. (You'll see "Busy" flashing any time the workstation is processing information.)

When the workstation has verified your logon and password, you'll see the Main Menu.

2.3.1 How to Exit the Workstation

To exit the workstation from any menu and return to DOS on your PC, type *qtdos* and press *<Enter>*.

You can also select the "Quit and Return to DOS" option from the MAIN MENU. To do so, use the plus key, *<+>*, to move the prompter bar down to the "Quit and Return to DOS" option and then press *<Enter>*.

To exit the workstation from any list activity and return to DOS, type *q*, press *<Enter>*, and then press *<Enter>* again when a screen telling you you're about to quit appears. You can also select "Quit" from the command prompter and press *<Enter>* twice.

2.3.2 The Workstation's Timeout Feature

The workstation has an automatic timeout feature. This feature lets you leave the workstation idle while securing it against tampering. You can access the timeout screen from any workstation menu screen by typing *out* and pressing <Enter>.

If you leave your workstation idle at a menu screen for 30 minutes, the workstation will automatically display the timeout screen (see Figure 2-2).

To return to the workstation, press <Enter> and then use <Tab> to position the cursor on the password field, enter the password, and press <Enter>. The workstation returns to the menu it was displaying before the timeout.

You can change the message displayed on the timeout screen by typing a new message and pressing <Enter>.

You can also use the finder to change the timeout screen's message (see Section 4.5) and to change the default timeout interval.

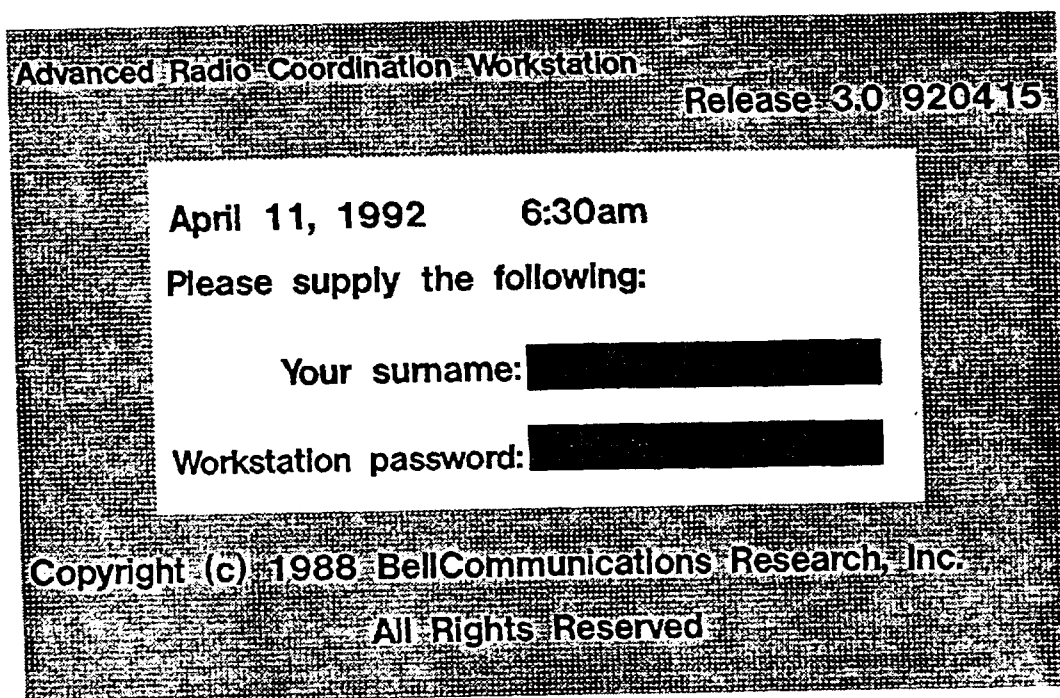


Figure 2-1. Workstation Logon Screen

ARC Workstation Menus


Saturday 11 Apr 92 6:47pm

Selection Functions  marked M2Act

*** END OF INDEX **

1 of 1: Commands
Advanced Radio Coordination Main Menu

MRSELS-II Activities (M2Act)

Leaving the office
Enter a short message for visitors:
I am out Press  to continue, Esc to quit

General Communications (gencom)

Quit and Return to DOS (QTDOS)

Figure 2-2. Workstation Timeout Screen

3. Understanding the Screens

A first step in getting acquainted with the ARC Workstation is understanding the types of screens you'll be seeing.

- Menu screens
- Object input screens
- Workspace screens.
- Help screens
- Program work screens

This section describes and shows an example of each type of screen.

3.1 General Screen Layout

All screens consist of three areas: header, body, and footer (see Figure 3-1).

- The **header** contains such information as the screen name, date/time, fast-path code, and status messages.
- The **body** contains such information as the programs/activities, options, input forms, and help screens.
- The **footer** usually contains prompts.

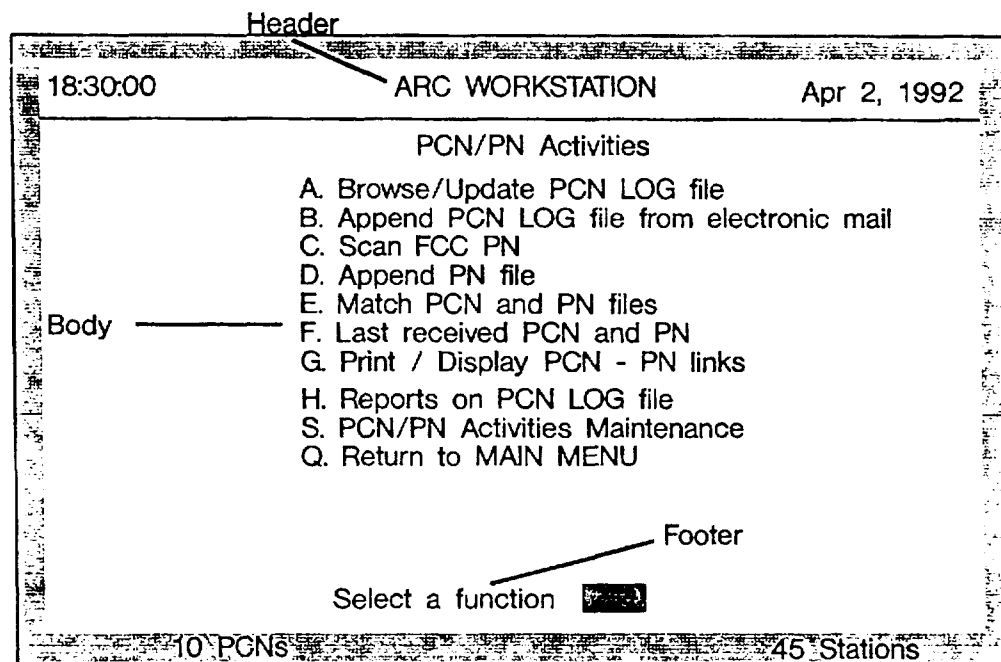


Figure 3-1. Screen Layout

3.2 Menu Screens

Menu screens offer you a list of programs or activities from which to choose. To select a program or activity, use the plus <+> and minus <-> keys to move the prompter bar to the one you want and press <Enter>, or enter an alphanumeric character, depending on the menu. (See Figures 3-2 and 3-3.) (See Section 4.1 for more information on how to use the prompter bar.)

The workstation has a Main Menu, submenus, and access mode menus.

The Main Menu

The Main Menu appears when you first access the ARC Workstation or whenever it is accessed from one of the submenus. It also appears when you use the *arcmenu* command. It allows you to select one of the six activities that currently make up the workstation.

Submenu

After you select an item from the Main Menu, you'll see a submenu. Depending on the item you select, the submenu might contain options for accessing data base/file functions, object input/work screens, or reports.

Access Mode Menu

An access mode menu appears when you select certain options from the submenus. This type of menu gives you access to the PCN Log file.

ARC Workstation Menus

Saturday 11 Apr 92 6:47pm

Selection Functions marked M2Act

*** END OF INDEX **

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| | Reports Activities (RptAct) |
| | Graphics & Plotting Activities (PltAct) |
| | General Communications (gencom) |
| | Quit and Return to DOS (QTDOS) |

Figure 3-2. Menu Screen — Prompter Bar Access

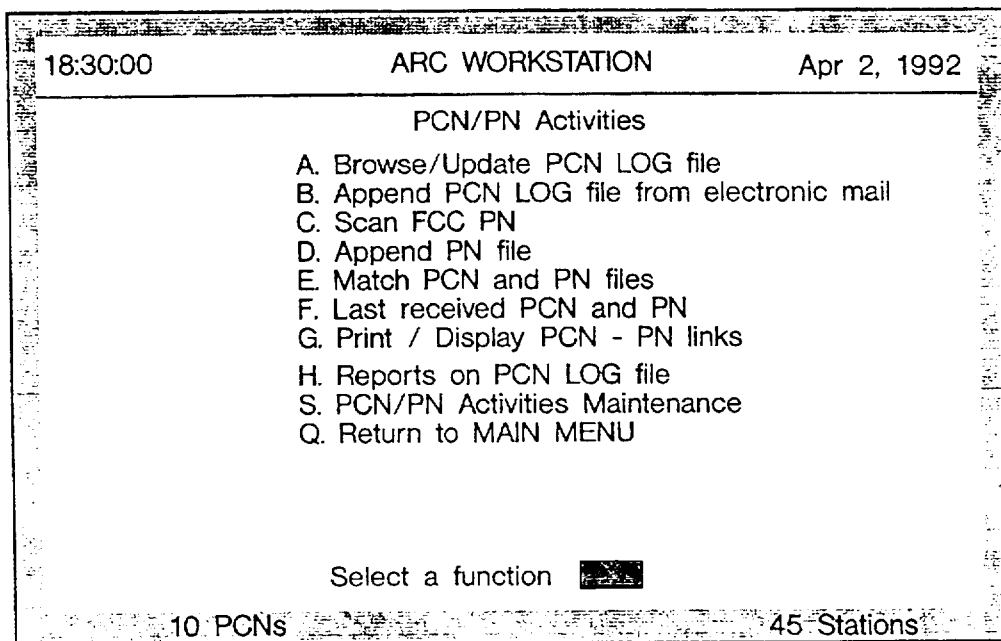


Figure 3-3. Menu Screen — Alpha Character Access

3.3 Object Input Screens

Object input screens provide a form on which you can either create a new object (file) or update the details of an existing object (see Figure 3-4).

ARC Workstation Menu Saturday 1:1 Apr 92 6:47pm

Creating OHLOSS file 0 items marked M2Act

Selection Functions

Create New Item
Please supply the following details for the new OHLOSS file:

Name: _____

Author: Heinrich Hertz

Comments: _____

File in: _____

Logging: (Y/N) Backup every: (D/W/M)

Press: ← to continue, Esc to quit

Figure 3-4. Object Input Screen

3.4 Workspace Screens

Workspace screens contain a list of datasets or data-entry screens recognized by the workstation (see Figure 3-5). For example, this screen appears when you access the Work w/Database Files or Work w/Data Entry Screens submenu. Workspace screens allow you to work with files (for example, create, copy, edit, print) and the list itself (for example, search, sort, print). Files are stored in

- **Folders** - which hold groups of related files
- **Drawers** - which hold frequently accessed folders and files
- **Credenzas** - which hold infrequently accessed folders and files.

You can even discard files in the "wastebasket," which is a place that holds unwanted files until you finally erase them (you can restore them, too, if you've changed your mind).

The workstation's "desktop" is a general workspace screen that you can access from anywhere on the workstation. To access the desktop, press <F4> or <Alternate> + <D>. To return to the Main Menu, type *arcmenu* <Enter>.

Saturday 11 Apr 92 6:47pm

0 items

marked M2Act

| # | Type | Name | Location | File In |
|----|--------------|----------------------------|-------------------|---------|
| 1. | Path Profile | Ft. Stockton to Chancellor | Desktop | engrng |
| 2. | Path Profile | Halandri to the Acropolis | Desktop | |
| 3. | Path Profile | Sunset C. O. to Moon Bay | engrng | |
| 4. | Path Profile | Morristown to Sparta | folder1 | |
| 5. | Path Profile | St. Louis CO to Airport | 1 of 4: Plotter | |
| 6. | Path Profile | Alamo to Ft. Sam Houston | Common Operations | |

Display
 Open
 Print
 Delete
 Mark for Transfer
 Copy
 Create

Figure 3-5. Workspace Screen

3.5 Help Screens

Help screens provide both program and data base information (see Figures 3-6 and 3-7). You can get on-line help in the following ways.

- From menus
- From fields on on-line forms
- Using the finder.

3.5.1 Help from a Menu

Help from menus provides program information.

To access help from the Main Menu and submenus

1. Use the plus (+) and minus (-) keys to position the prompter bar on the chosen activity.
2. Press `<Ctrl> + <Enter>` and a help screen for that activity will appear.

If no help is available for the activity or program, the workstation beeps when you press `<Ctrl> + <Enter>`.

To exit from a help screen, press any key.

3.5.2 Help from a Field

Help is available from many input forms.

To access help from a PCN/PN screen, position the cursor on the field, enter a question mark (?), and press `<Enter>`. You'll see a help screen.

To access help from *interactive* screens, position the cursor on the field and press `<Ctrl> + <Enter>`. You'll see a help screen.

To exit from a help screen, press any key.

3.5.3 Using the Finder

Section 4.5 tells you how to do this.

3.6 Data Entry Screens

Data entry screens provide you with a convenient method for inputting data to a program. The data entry screens perform syntactic and cross-field checks to reduce data input errors.

ARC Workstation Menus

Saturday 11 Apr 92 6:47pm

Selection Functions 0 items marked M2Act

*** END OF INDEX **

1 of 1: Commands
Advanced Radio Coordination Main Menu

| | |
|---|---|
| <p>General Communications (gencom)</p> <p>Executes the command to allow users to run a communications program not resident in the workstation. To update the parameters, use the command "updgncom"</p> | <p>Activities (M2Act) Activities (PCNAct) Meeting Activities (REAct) Activities (RptAct) Plotting Activities (PltAct) Communications (gencom) (QTDOS)</p> |
|---|---|

Figure 3-6. Program Help Screen

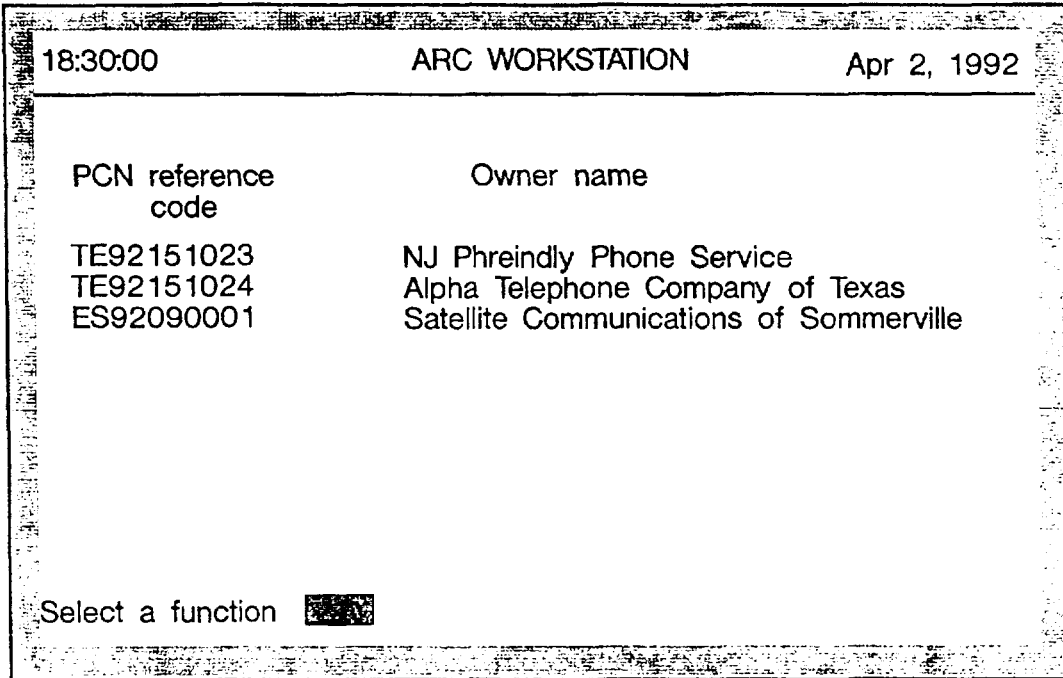


Figure 3-7. Database Help Screen

4. Moving Around, Selecting Activities, and Selecting Commands

The ARC Workstation operates through the use of menus, submenus, and input forms in all program activities/functions. You can move from one screen (menu, submenu, form, program) to another in the following ways:

- Using menus to access screens by selecting options with the prompter bar or by entering alpha characters
- Fast pathing
- Finder access.

The ARC Workstation also operates through the use of "Common Operations" commands (accessed by using the prompter and selector bars — see Section 4.6) and commands accessed by function keys (see Section 4.10).

4.1 What Is a Prompter Bar and How Do I Use It?

The prompter bar highlights an activity from a menu or a command from the list of "Common Operations" commands. It appears as a long, thin, solid rectangle that spans a menu or command box and can move up and down. You can use it to mark an option or task. To use the prompter bar

1. Use the plus <+> and minus <-> keys to position the prompter bar at the menu option or command you want.
2. Press <Enter> to start the activity or function.

4.2 What Is a Selector Bar and How Do I Use It?

The selector bar highlights items on the Finder Access screen (see Section 4.5) and items in a list on a workspace screen (see Section 3.4). To move it, you use the cursor up <↑> and cursor down <↓> keys. On a workspace screen, the selector bar is used with the prompter bar to act upon items. That is, you use the selector bar to select the item you want to work on and the prompter bar to choose the command you want to use on the item.

For example, to delete an item from your workspace screen:

1. Use the cursor up <↑> and cursor down <↓> keys to position the selector bar on the item you want to delete.
2. Use the plus <+> and minus <-> keys to move the prompter bar to the command "Delete."
3. Press <Enter>.

4.3 What is Marking and How Do I Mark Items?

Marking is a way to select a group of items that you want to act upon. Unless you mark items, when you execute a command using the prompter bar it will only act upon the single item highlighted by the selector bar.

You can mark items with the F7 and F8 keys. The F7 key marks items individually. The F8 key marks all the items in the list. Both keys are toggle keys, which means that if you press the key once, it marks the item and if you press it again it unmarks the item. If an item is already marked, pressing the key will unmark it. Marked items will appear highlighted.

4.4 How to Use Fast Pathing

As you become familiar with the ARC Workstation, you might want to use "fast pathing" to help you work more quickly. Fast pathing lets you move between screens (that is, from one menu to the next) or start an activity, using typed commands.

To fast path, enter the command/abbreviation (in upper/lowercase as shown) for the screen you want. The command appears along the bottom of your screen as you type it. Press *<Enter>*. The workstation accesses the screen you want.

NOTE: You can't fast path when running a program (such as a PCN or radio engineering program). The workstation must be ready to receive a command.

The following list gives you all fast-path screens and the fast-path access code as it appears on the screen.

- MRSELS-II Activities -- *M2Act*
 - MRSELS-II Logon -- *login*
 - Upload Misc. Files -- *filxfr*
- PCN/PN Activities -- *PCNAct*
- Radio Engineering Activities -- *REAct*
 - Digital Radio Diversity Analysis -- *drdiv*
 - Reflection Calculation and Analysis -- *reflet*
 - Map Intersection Calculations -- *mapint*
 - Azimuth Calculations -- *azimuth*
 - 30-Second Database Program -- *30sped*
 - Transhorizon Program -- *ohloss*
 - Height Above Average Terrain -- *haat*
 - Transhorizon Loss - Near Field Calculations -- *shield*

- Tower Height Calculations -- *towrht*
- Antenna Height Calculations -- *ratop*
- 3 Second Terrain Profiler -- *3sterp*
- Obstruction Fading Program -- *obsfad*
- Terrestrial Path Design Tasks -- *path*
- Radial Map Intersection Program -- *radpgm*
- VH Coordinate Programs -- *vh1*
- Fresnel Zones Calculations -- *fresnel*
- Terrestrial Elevation Angle -- *angmod*
- Earth Station-Satellite Program -- *view*
- 6 Ghz SSB Noise Program -- *noise*
- Radio Channel Performance -- *nslidi*
- Obstruction Clearance Task -- *obsi*
- Geostationary Satellite Interference -- *orbcalti*
- Receive Levels 4 Path w/Passives -- *prepasti*
- AM Radio Diversity -- *amdiv*
- FM Radio Diversity -- *fmdiv*
- TD Radio Diversity -- *tddiv*
- Intermodulation Calculations -- *intermod*
- Co-Channel Interference Calculation -- *cochin*
- Height Above Average Terrain -- *uhfhaat*
- Reports Activities -- *RptAct*
- Plotting Activities -- *PltAct*
- General Communications -- *gencom*

NOTE: The fast-path code for the ARC Main Menu is *arcmenu*.

The fast-path code for creating OHLOSS files or data entry screens is *create*. You can enter this fast-path code from any menu. To use this fast-path code, type *create* followed by a space and the appropriate selection (for example, *sat*), and press <Enter>. The appropriate screen will appear.

4.5 How to Use the Finder

The finder feature can help you understand the workstation by providing complete operational and program information. You can access the finder from any menu by pressing <F1>.

The finder display screen is divided into three panels; the first one functions much like a main menu, and the other two sections like submenus (see Figure 4-1).

To use the finder display screen to get information

1. Use the cursor (arrow) keys to position the selector bar on an item in a screen area that corresponds to the information you need.
2. Press <Ctrl> + <Enter>.

To cancel the finder display screen (that is, exit from the finder and return to the menu), press <Esc>.

ARC Workstation Menus
ARCWS FINDER

Wednesday 1 Apr 92 11:10 pm

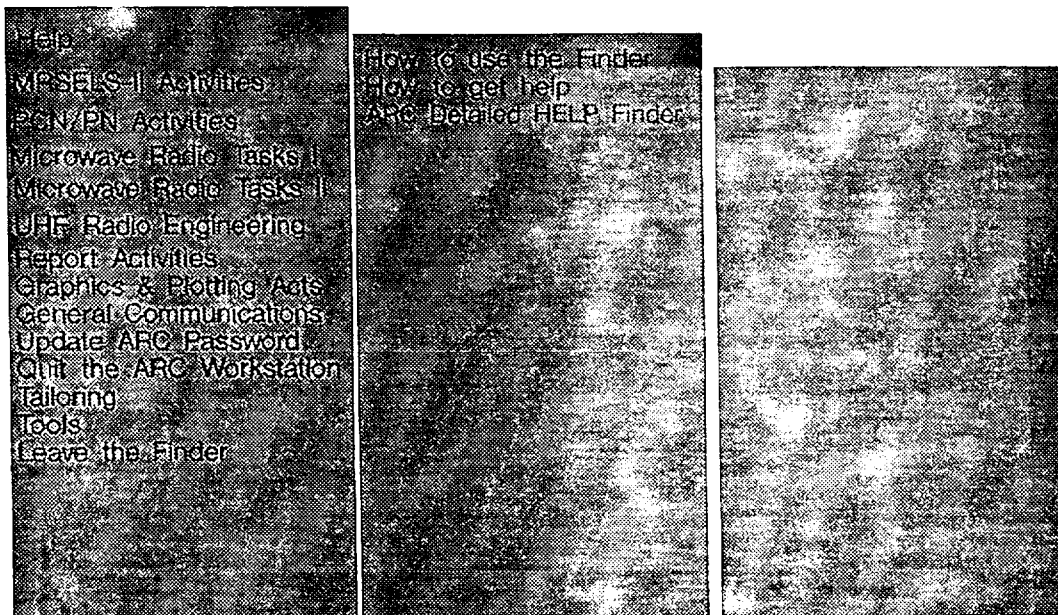


Figure 4-1. Finder Display Screen

4.6 How to Use the Common Operations Commands

The following lists the commands alphabetically that appear in the small command box in the lower right-hand corner of your screen whenever you access a workspace screen. These commands are accessed by using the prompter bar (<+> and <-> move the bar). Because all the commands won't fit in the box at the same time, you have to scroll down or up (keep pressing <+> or <->) to see the commands that are not visible.

Several of the commands access other sets or boxes of commands. For example, the Mail command accesses a set of commands for working with electronic mail on the workstation.

You can get a comprehensive explanation of each function by positioning the prompter bar on the item and pressing <Ctrl> + <Enter>.

| | |
|-------------------|---|
| Add Reminder | Schedule a reminder to be issued. |
| Area Specific | Toggle between the standard prompters and a prompter specific to an area. |
| Bring Forward | Bring forward postdated items. |
| Copy to Clipboard | Add the named item, marked items, or item under the selector bar. |
| Create | Create a new object or area of the type specified. |
| Delete | Move the named item, marked items, or item under the selector bar to the wastebasket or destroy the item(s). |
| Display | Display the data contents of the named item, marked items, or item under the selector bar. |
| File | Move a file(s) or item under the selector bar to a different file location. |
| Filing | Replace the current prompter with the Filing prompter, which allows you to see file areas, move to the desktop, move into a file, put an item into a folder, refile, and file into drawer/folder, cabinet, briefcase, or credenza. |
| List Operations | Replace the current prompter with the List Operations prompter, which allows you to print the list, sort the list, find the next item, find all the items, close an area, clear item messages, hide marked items, show marked items, and move marked items. |

| | |
|----------------------|---|
| Mail | Replace the current prompter with the Mail prompter, which allows you to mail a copy, send a message, send a short message, display the mailbox, display the outbox, see the last message, and see the network log. |
| Make a Copy | Make a duplicate of the named item or item under the selector bar. |
| Object Details | Replace the current prompter with the Object Details prompter, which allows you to make annotations, see annotations, delete annotations, change details, see details, see the object log, delete the object log, encrypt, and decrypt. |
| Open | Change the named item's content or replace the list with an area's content. |
| Personal Management | Replace the current prompter with the Personal Management prompter, which contains a calendar, reminder, last-message information, post-date items, and bring-forward information. |
| Post Date | Schedule marked item(s) under the bar that should be brought forward at a later date. |
| Print | Print the contents of the named item, marked items, or item under the selector bar. |
| Refile | Return the marked item(s) under the selector bar to the file location. |
| Search and Clipboard | Replace the current prompter with the Search and Clipboard prompter, which allows you to use canned searches, make lists, define searches, execute searches, add searches to the clipboard, display the clipboard, copy to the clipboard, remove items from the clipboard, and clear the clipboard. |
| Search Workstation | Search for objects and areas. |
| See Last Message | Redisplay the most recently displayed network or reminder message. |

4.7 The "dirlist" Command

The "dirlist" command, or DOS Directory Manager, is a very useful command because it provides access to the DOS directories that make up your workstation and to all the directories and files on your hard drive and floppy drives. It is a DOS file manager and, as such, is quite powerful. The easiest way to understand the basics of using the "dirlist" command is to try it out.

1. To activate the DOS Directory Manager, type *dirlist* and press <Enter>.
2. You should see a listing of the first 21 directories that make up the workstation and a command prompt. (There are three pages of command prompts.)
3. Press <Ctrl> + <Enter> to browse through the help screens on the available commands.
4. Using the "Display File/Dir" command, display the ASCII directory. Note that the files are listed in a window that also tells you the number of files in the directory.
5. Press <Esc> to end the ASCII directory display.
6. Using the down arrow key, move to the WMSWORK Directory (it's located at about line number 25).
7. Using the "Expand Directory" command, expand this directory.
8. There should be several files in this directory. Try displaying their contents. The workstation uses the WMSWORK directory as a scratch directory, and it holds the images you've been viewing.
9. Move to the "Close Directory" command (use the gray <+> key) and press <Enter>. You should be back on your Directory List.
10. Move to the "New Directory" command and press <Enter>.
11. A window appears in which you can specify a directory outside your workstation. Type *[drive]:\DOS* (for example, *c:\dos*) and press <Enter>. Your DOS directory is now displayed.
12. Close this directory. This moves you to your root directory.
13. Now type *Q* or select the "Quit" command and press <Enter>. You should be back where you started.

Be cautioned that you can delete files via this manager, and you should be careful.

4.8 The "Object Details" Commands

The "cdetails" command (or Change Details) allows you to change or edit the details of a workstation file.

1. If you're on an ARC menu, press <F2>.
2. Display your desktop.
3. Select an OHLOSS file.
4. Move to page 3 of your prompter.
5. Move to the OBJECT DETAILS prompter selection and press <Enter>.
6. Move to page 1 of the OBJECT DETAILS prompter.
7. Select an OHLOSS file and then, using the "Change Details" command, view the details of this file. This command allows you to edit the details of the information associated with the OHLOSS file. Press <Enter> when you're done. You can also change the short name. However, for now just press <Enter>.
8. If you press <F9>, a window appears on the bottom third of the screen. This window displays the details of the OHLOSS file.
9. Using your up and down arrow keys, move from item to item. Observe what happens in the details window.
10. To remove this window, press <F9>.

4.9 Using Memory Programs

Three memory programs that are part of the workstation are available for your use. All of these programs are found in I:\PROGS.

The three programs are

| Name | Function |
|------------|----------------------------|
| memmap.exe | Display the map of memory |
| membrk.exe | Mark the memory (RAM only) |
| memrls.exe | Release the marked memory. |

4.9.1 Checking the Amount of Available Memory

There are times when the amount of available random access memory (RAM) is critical for the correct functioning of a program. You can check the amount of free memory by using the memmap.exe program.

1. Type *dos memmap* and press <Enter>.
2. The program displays your current usage of the 640 KB of RAM and some information about your hardware.

After you've logged off your workstation and are at a DOS prompt, try typing `{drive}:\wms\progs\memmap` and pressing `<Enter>`. A memory map should appear. Note that the amount should be larger than when you tried from your workstation.

4.9.2 Memory Management Programs

Whenever you run a terminate-and-stay-resident (TSR) program, a small kernel of the program usually remains in memory. The kernel allows the program to come back to life at a moment's notice. The ARC Workstation has several TSRs that, if allowed, would use up valuable memory. To release this memory back for use after you quit from ARC, you can use a memory-releasing program in the ARC30.BAT file. Before running any TSRs, mark the memory. When the programs have been terminated, release the memory.

For example, you can activate a mouse driver program this way. You could use the following code:

```
mouser.bat
c:\wms30\progs\membrk mickey
mouse driver start up
c:\wms30\progs\memrls mickey
"eof"
```

The name "mickey" is used to mark the memory so that when you run the memrls program, all the TSRs installed by the mouser.bat file are released.

4.10 Function Keys and What They Do

On the ARC Workstation, many keys are assigned a command or task. When you log on to MRSELS-II, many keys take on special meanings. This section lists both "regular" workstation keys and MRSELS-II keys, by function. Keys that apply to MRSELS-II are marked with an asterisk (*).

| The Key's Function | The Key |
|---|----------------|
| BROWSE | |
| PC file | ALTERNATE B* |
| CLEAR | |
| Field | CONTROL END* |
| Screen | CONTROL HOME* |
| COPY | |
| PC file | ALTERNATE C* |
| CREATE | |
| New line | CONTROL ENTER* |
| DISCONNECT | |
| Communications line and hang up the modem | ALTERNATE G* |
| DISPLAY | |
| All active tasks | F6 |
| ARC Workstation variables | CONTROL F5 |
| HELP, if available, on the current item, command, or field | CONTROL ENTER |
| Key definitions | ALTERNATE F5 |

| The Key's Function | The Key |
|-----------------------------|-------------------|
| ERASE/DELETE/REMOVE | |
| Character | DELETE* |
| DOS file | ALTERNATE R* |
| Input | CONTROL F10* |
| PC file | ALTERNATE E* |
| EXECUTE/ENTER | |
| Current command | ENTER |
| GO TO | |
| ARC Workstation Desktop | F4 or ALTERNATE D |
| ARC Workstation Finder | F1 |
| ARC Workstation Wastebasket | ALTERNATE W |
| Briefcase task | ALTERNATE B |
| Calendar task | ALTERNATE C |
| File Areas List | F2 |
| first field on screen | HOME* |
| last field on screen | END* |
| Search task | ALTERNATE S |
| INSERT | |
| Data, text | INSERT* |
| LIST | |
| Key definitions | ALTERNATE K* |
| PC directory or file | ALTERNATE L* |

| The Key's Function | The Key |
|--|---|
| HELP | |
| HELP, if available, on the current item, command, or field | CONTROL ENTER |
| HELP on MRSELS-II | ALTERNATE H* |
| MARK/UNMARK | |
| All items in the list | F8 |
| Current list item (highlighted by the selector bar) | F7 |
| MOVE | |
| To the bottom of the list | END |
| Down | CURSOR DOWN* (down arrow ↓) |
| To the left | CURSOR LEFT* (left arrow ←) or BACKSPACE |
| To the left (quickly) | CONTROL LEFT* |
| To the next field | TAB* |
| To the previous field | SHIFT TAB* |
| The prompter bar down one | gray + |
| The prompter bar up one | gray - |
| To the right | CURSOR RIGHT* (right arrow →) |
| To the right (quickly) | CONTROL RIGHT* |
| To the top of the list | HOME |
| Up | CURSOR UP* (up arrow ↑) |

| The Key's Function | The Key |
|--|----------------|
| OPEN/CLOSE | |
| Command line window | F10 |
| Details window on the current item | F9 |
| QUERY | |
| Error detection | ALTERNATE F4* |
| QUIT/LEAVE | |
| Current command or finder | ESCAPE |
| Current task (In some cases, this causes an exit to DOS.) | F5 |
| RESUME | |
| Error detection | ALTERNATE F2* |
| RETURN | |
| To the ARC Workstation without dropping the communications line | ALTERNATE Q* |
| To the ARC Workstation, disconnect the communication line, and hang up the modem | ALTERNATE G* |
| SELECT | |
| Cursor | CONTROL F8* |

| The Key's Function | The Key |
|------------------------|---------------|
| SEND | |
| Attention message | ALTERNATE 1* |
| Device cancel message | ALTERNATE 2* |
| Dup message | ALTERNATE F6* |
| Field mark message | ALTERNATE F7* |
| ID message | ALTERNATE 3* |
| Print message | ALTERNATE 4* |
| System request message | ALTERNATE 5* |
| Test message | ALTERNATE 6* |
| TOGGLE | |
| Binary mode | ALTERNATE F5* |
| Buffered display | ALTERNATE Z* |
| Insert mode | INSERT |
| Monitor mode | ALTERNATE M* |
| Prompter window | F3 |
| Trace mode | ALTERNATE F3* |
| TURN ON/OFF | |
| Duplex | ALTERNATE F9* |
| Error detection (off) | ALTERNATE F1* |
| Modem display | ALTERNATE V* |
| Printer | ALTERNATE P* |
| UPLOAD | |
| Marked files | ALTERNATE U* |

5. General Workstation Functions

The functions described in this section are called "general" because they are not tied to a specific ARC Workstation program. They include the following topics:

- Working with briefcases
- Refiling
- Updating configurations
- Updating passwords
- Adding and updating users
- Assigning functions to keys
- Workstation directory structure and backup.

5.1 How to Work with Briefcases

Using "briefcases," you can easily move information between ARC Workstations. An ARC Workstation briefcase is a formatted floppy disk on which information from the ARC Workstation has been written. All new items, fixes, enhancements, and upgrades are distributed on briefcases.

5.1.1 How to Copy from the Workstation to a Briefcase

1. Insert a formatted floppy disk in your PC's floppy drive. (Use the drive you selected when you installed the workstation.)
2. Move the selector bar to the item in the list (for example, report list) to be copied.
3. Move the prompter bar (which is in the box on the right side of your screen) to the command "File into: Briefcase."
4. Press <Enter> and the workstation copies the information.

To copy several items in a multi-item list

1. Use the <F7> key to mark each item to be copied.
2. Execute the "File into: Briefcase" command (follow steps 3 and 4 above).

You can copy all the items in a list by marking the entire list with the <F8> key. Proceed with steps 3 and 4 above. If the size of the files in bytes exceeds the capacity of the floppy disk, the workstation tells you that an item cannot be copied to the briefcase and asks you to use another formatted floppy disk.

5.1.2 How to Copy from a Briefcase to the Workstation

1. Press <Alt> + .
2. The workstation prompts you to insert a floppy disk (that is, the source briefcase) into the floppy disk drive.

3. After you insert the floppy disk, press *<Enter>* and the workstation lists the items on the briefcase. Also, a new prompter (the "briefcase" prompter) appears.

NOTE: If you insert the briefcase before pressing *<Alt> + *, the workstation verifies that the inserted floppy disk is a briefcase. If it is, it activates the briefcase activity without prompting you about the disk drive.

4. **To copy a single item** from the briefcase

- Move the selector bar to that item and move the prompter bar to the command "Copy from Briefcase."
- Press *<Enter>* and the workstation copies the item from the briefcase to the desktop.

If that item already exists in the workstation, the workstation tells you whether the item in the workstation is "older," "younger," or "identical" in age to the item on the briefcase. Generally, you should direct the workstation to delete the existing item and copy the "new" item from the briefcase.

To copy several items from the briefcase

- Mark them using the *<F7>* key.
- Move the prompter bar to the command "Copy from Briefcase."
- Press *<Enter>* and the workstation copies the items from the briefcase to the desktop.

To copy all items from the briefcase

- Use the *<F8>* key to mark them all.
- Move the prompter bar to the command "Copy from Briefcase."
- Press *<Enter>* and the workstation copies the items from the briefcase to the desktop.

5.1.3 How to Change the Briefcase Drive

To change the briefcase drive from "A" to "B," or vice versa

1. Press *<F2>* to display the list of the workstation's "File Areas."
2. Move the selector bar to the System Credenza and display the contents of the Credenza.
3. Move the selector bar to the item whose type is "User List" and name is "Workstation Users."
4. Move the prompter bar to the "Open" command and press *<Enter>*.
5. A window appears from which you can choose to Add, Delete, or Update the "User List." The window contains the default value of U (Update). Press *<Enter>* and a

window appears displaying the various defaults used by the workstation.

6. Using `<Tab>`, move the cursor to the third item in the second row. This is the briefcase drive definition. If it is an "A," you can change it to a "B," or vice versa.
7. Press `<Enter>` and the briefcase drive definition is changed.
8. To activate the renamed drive, log off the workstation and log on again.

5.2 What is Refiling and When Should I Refile an Item?

When you open an item that is not currently on the "desktop," the workstation automatically moves the item to the desktop for easy access. After you finish updating the item, you should refile it using the "refile" command.

For example, to refile the "User List" accessed in the Section 5.1.3 example, move the selector bar to the "User List," type *refile*, and press `<Enter>`.

5.3 How to Update the Communications Configurations

Three update (*upd*) commands are used to configure the workstation to MRSELS-II communications parameters. If you don't know the valid contents of a field on an update input screen, press `<Ctrl> + <Enter>`. Help information for the field in which the cursor is positioned will appear.

5.3.1 How to Change the Screen Colors

You can use the update color command (*updcolor*) to change your screen's colors while the workstation is connected to MRSELS-II. To update the screen colors

1. Type *updcolor* and press `<Enter>`. A screen listing the various field types appears.
2. Enter the color you want for each field using `<Tab>` to move from one field to the next.
3. Press `<Enter>` to save your color choices.

5.3.2 How to Update the Network Parameters

You can use the update network command (*updnet*) to initialize or change the network configuration parameters. Using *updnet*, you can update the baud rate, com port, network type, and modem type. To update the network configuration

1. Type *updnet* and press `<Enter>`. A screen listing the configuration parameters appears.
2. Enter the configuration you want in each field using `<Tab>` to move from one field to the next.
3. Press `<Enter>` to start the network configuration choices. To get a listing of the available parameters for each field entry, press `<Ctrl> + <Enter>`.

5.3.3 How to Update IDs and Passwords

You can use the update ID command (*updid*) to initialize or change IDs and passwords for the network, micom, and MRSELS-II. You can also use it to change the network telephone number. You can use the *updid* command to update the MRSELS-II/micom logon ID, the network user ID (*none* must be entered if no network user ID is needed), the network password (*none* must be entered if no network password is needed), and network number (this includes a direct dialing number). To update one of these parameters

1. Type *updid* and press <Enter>. A screen listing the parameters appears.
2. Select the parameter(s) you want to change and follow the displayed prompts to complete the procedure.

If you have established passwords with this procedure, they will be used when a log-on procedure is selected. The passwords will not be displayed on the screen.

5.4 How to Update the ARC Workstation Password

1. Log on to the workstation.
2. Type *updpassw* and press <Enter>. A window appears asking you to enter the current password.
3. Enter the current password. A window appears with two side-by-side entry fields.
4. Type the new password into the two adjacent entry fields. If the two entries are not identical, the workstation won't update the password.

5.5 How to Add and Update Users

5.5.1 Adding Users

You can add user IDs to your workstation by using the add user command (*adduser*).

1. Type *adduser* and press <Enter>.
2. Fill in the fields on the *adduser* data screen.
3. When you're finished, press <Enter>.

Do not use a user ID or password that already exists on your workstation.

5.5.2 Updating Users

You can update your ARC Workstation profile by using the update program command (*updpro*).

1. Type *updpro* and press <Enter>.
2. Change the appropriate profile line(s).
3. Press <Enter> and your profile is updated.

5.6 How to Assign a Function to a Key

Assigning a function to a key involves three basic steps:

- Accessing your Key List (each workstation user must have his or her own Key List defined)
- Opening your Key List
- Adding the new key definition.

NOTE: Before you add a new definition to a key, make sure that a previously defined key isn't being used for the same function.

An Example: Assigning the <Shift> + <F10> keys to the "qtdos" Command

The following instructions tell you how to assign the <Shift> + <F10> keys to the function of executing the quit DOS command (*qtdos*).

1. Press the <F2> key to display the workstation "File Areas".
2. Move the cursor to the System Credenza and display its contents.
3. Move the selector bar to your Key List. (It is probably identified by your user name. For example, if your logon id is "arc100", then the Key List's name is "Keys for arc100".)
4. Type the command *open* and press <Enter>. The list of currently defined keys is displayed along with a special prompter.
5. Move the prompter to the command, "Add a Key Assignment", and press <Enter>. A window appears in which to enter a description of the key's function. In this case, enter *Quit and Return to DOS*.
6. <Tab> to the *Enter the command word(s)...* field, type *qtdos*, and press <Enter>. A key selection window appears.
7. Press <Shift> + <F10> and the key is assigned the function of "qtdos."
8. Move the prompter bar to the Return Updated Keys command and press <Enter>.

Now when you press <Shift> + <F10> on any ARC Workstation menu, the "qtdos" command will be executed. Once you complete this task, refile the Key List by moving the selector so it highlights the Key List and typing *refile* <Enter>.

5.7 Workstation Directory Structure and How to Back Up the Workstation

We designed the ARC Workstation so that users wouldn't need an in-depth knowledge of DOS. However, we've provided a brief discussion of the subdirectory structure to help you understand it.

The ARC Workstation is usually installed in the subdirectory WMS30. This subdirectory contains only subdirectories and is made to be the pseudoroot directory via the DOS

SUBST command. When you install the workstation, three empty subdirectories are created. The workstation uses them as working directories and they usually do not contain files (i.e., they are empty directories). If you back up the workstation, the three empty directories are not copied to the backup medium because most backup programs do not copy empty directories. When you restore the workstation, the three subdirectories will be missing and the workstation will not function.

The three working directories are DOSDIR, PROCCOMP, and WMSWORK.

To re-create the three subdirectories, change directory (cd) to the WMS subdirectory and use the make directory (md) command to create them (for example, *md dosdir*).

We recommend that just before you back up the workstation you make a list of the directories. To do this, change directories to the WMS directory and type *dir*. /w* and press <Enter>. A subdirectory listing will appear on your screen. To print it, press <Print Screen>.

When the workstation is restored, compare the list you printed out with the current subdirectory list to make sure all the subdirectories are still there.

6. How to Use the Calendar Activities

The Calendar Activities feature allows you to set reminders and manage the scheduling of robotic events. To access the Calendar Activities from any menu, press **<Alt> + <C>**. If you are on a list-related activity, you can either press **<Alt> + <C>** or choose the Personal Management prompt. Then select the Calendar command and press **<Enter>**. You can also type *calendar* and press **<Enter>** to activate this activity.

6.1 Using the Calendar Activities

When you initiate the calendar activities, the screen shows the current month's calendar on the right half of the screen, and a label indicating today's date. The left half shows a vertical listing of times beginning at 8 a.m. and extending to 5 p.m. A label above the time list corresponds to the cursor position in the calendar.

To move from month to month, use the **<Page Up>** and **<Page Down>** keys. **<Page Up>** moves back in time and **<Page Down>** moves forward in time. The arrow keys move from day to day.

To use the calendar, first select the appropriate month, day, and, if necessary, year, and then press **<Enter>**. The right half changes into a command prompter (a command **cannot** be entered via the keyboard). Note that the 8 a.m. time slot is selected. Use the up and down arrows to move through the time slot list. The time slot list has a half-hour granularity. It starts at 12 midnight and ends at 11:30 p.m.

To quit from the calendar activities, use the **<Esc>** key.

6.2 Using the Reminders Feature

This feature allows you to "set," "see," and "drop" reminders of events. For example, this is how you might set a reminder for an important meeting you need to attend two days from the current date.

1. First, move the calendar cursor two days in the future and press **<Enter>**.
2. Using the gray **<+>** key, move to the Set Reminder command.
3. Using the down arrow key, move to 1:30 p.m. (that's when the meeting starts). The 1:30 time slot is not labeled as such, but the time slot selector lies between 1 p.m. and 2 p.m.
4. Press **<Enter>**.
5. An Add a Reminder data entry screen appears. On this screen, type *important meetings — get up and go!* The time and date fields will be prefilled with your time and date selections.
6. If all the information is the way you want it, press **<Enter>**. Notice that an "R" appears next to the selected time slot.

To browse the reminder, you can use the gray <-> key to move to the See Reminders command. If you press <Enter>, the reminder you just set appears across the top of the screen. Pressing any key removes it from the screen.

If you don't think you need the reminder any more, select the Drop Reminder command and press <Enter>. The reminder will be shown across the top of the screen and a Dropping Reminder screen will appear. Press <Enter> to delete it because the default answer is Y (yes). The "R" will disappear and so will the reminder. If you set a reminder, it will continue to appear even after the event. So once a reminder has lost its meaning, drop it from the calendar.

6.3 Using Robotic Events

Robotic events (also called "robots") are commands that you can activate or deactivate to do a particular routine task at a regularly scheduled time.

When you installed the platform, a profile was built for you that includes the number of seconds of idle time allowed before any scheduled event can "spring to life". You can use the update program command (*updpro*) to access your profile. The first line is the number of seconds of idle time before any robot can spring to life. Robots can be scheduled to function hourly, daily, weekly, or monthly.

If a scheduled robot misses a scheduled time, however, its priority to run increases. This sometimes leads to the occurrence of "wild robots". Also, a small bug in the platform causes the "robot" flag to continue to be displayed long after the robot has run. To remove this flag, you can either type the command *norobflg* or *refresh* and press <Enter>. Either command gets rid of the annoying flag.

One robot is already active when you install your workstation. You may also want to activate the new antiviral robot. This robot searches through your hard drive seeking out viruses.

But, first, let's discuss the currently active robot and how to manage it.

6.3.1 Active Robots

When you install the release 3.0 version of the ARC workstation, only the robot that periodically checks on the amount of hard disk space available to the workstation is functional. This is the "ChkSpace" robot and was originally scheduled at the 20th day of the month at 0200 hours. However, it's scheduled to be a daily event, and it will attempt to run every day to check your disk space.

6.3.2 The Antiviral Robot

The ARC Workstation platform comes with an antivirus program. This program is capable of checking your entire hard drive for the presence of a virus. If a virus exists, the program will report that fact to you.

To help you install the antivirus program's robot command, an install command has been created. Once you've loaded the ARC Workstation platform and logged onto the

workstation, you simply type the command *avgard* and press *<Enter>*.

This program detects and reports on the following viruses:

- Jerusalem virus, strains A, B, B2(C), D, and E
- DATACRIME virus, strains 1280, "(C) II", and 1168
- Icelandic virus.

6.3.3 Managing Robotic Events

Now let's learn how to view a scheduled event.

1. Activate the calendar activity.
2. Move the day cursor to the 20th day of the previous month and press *<Enter>*.
3. Using the up arrow key, move the time selector bar back in time to 2 a.m.
4. There should be an "E" to the left of 2 a.m.
5. Move the command prompt to the command "See Scheduled Event" and press *<Enter>*.
6. A "See an Event" window should appear.

The fields displayed show the robot to be executed, the type of command, the scheduled time, the currently scheduled date, and the scheduled time interval. This is the time slot for the chkspace robot. To quit, press *<Enter>*.

7. The Main Menu — Selecting an Activity

The first menu you see after logging on is the Main Menu. You can also access it from submenus. The Main Menu is the place where you select the ARC Workstation activity you want. This section briefly describes each of the Main Menu options. The fast-path code for the Main Menu is *arcmenu*.*

| | |
|---|---|
| MRSELS-II Activities | The options on this submenu enable you to create and edit data base input files, build data-entry screens for input into special studies programs, log on to MRSELS-II, and upload miscellaneous files. |
| PCN/PN Activities | The options on this submenu enable you to log and track Prior Coordination Notices (PCNs). You can also use FCC Public Notices to report information on missing PCNs that may affect microwave radio paths. |
| Radio Engineering Activities | This submenu gives you access to a variety of radio engineering programs that you can execute on your PC without having to interact with a mainframe. |
| Reports Activities | This activity provides a special workspace task for working with reports. |
| Graphics & Plotting Activities | This activity provides a special workspace task for working with graphics files and programs. |
| General Communications | This option allows you to access communications software that is unknown to the ARC Workstation. |
| Quit and Return to DOS | This option returns the workstation to the DOS operating environment. |

* For information on using fast-path codes, see Section 4.4.

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Selection Functions  marked M2Act

*** END OF INDEX **

| | |
|---|---------------------------------------|
| 1 of 1: Commands | Advanced Radio Coordination Main Menu |
| MRSELS-II Activities (M2Act) | |
| PCN/PN Activities (PCNAct) | |
| Radio Engineering Activities (REAct) | |
| Reports Activities (RptAct) | |
| Graphics & Plotting Activities (PltAct) | |
| General Communications (gencom) | |
| Quit and Return to DOS (QTDOS) | |

Figure 7-1. ARC Workstation Main Menu

8. How to Use the MRSELS-II Activities

This section gives you a general description of the MRSELS-II activities.

When you select "MRSELS-II Activities" from the MAIN MENU, you will get the MRSELS-II Activities menu.* The fast-path code for this option is *M2Act*.†

8.1 What You Can Do: An Overview

You can choose the following options from the MRSELS-II Activities menu:

- **MRSELS-II Logon** - Using this option, you can log on to MRSELS-II.
- **Upload Misc. Files** - Using this option, you can upload miscellaneous DOS files.

ARC Workstation Menus

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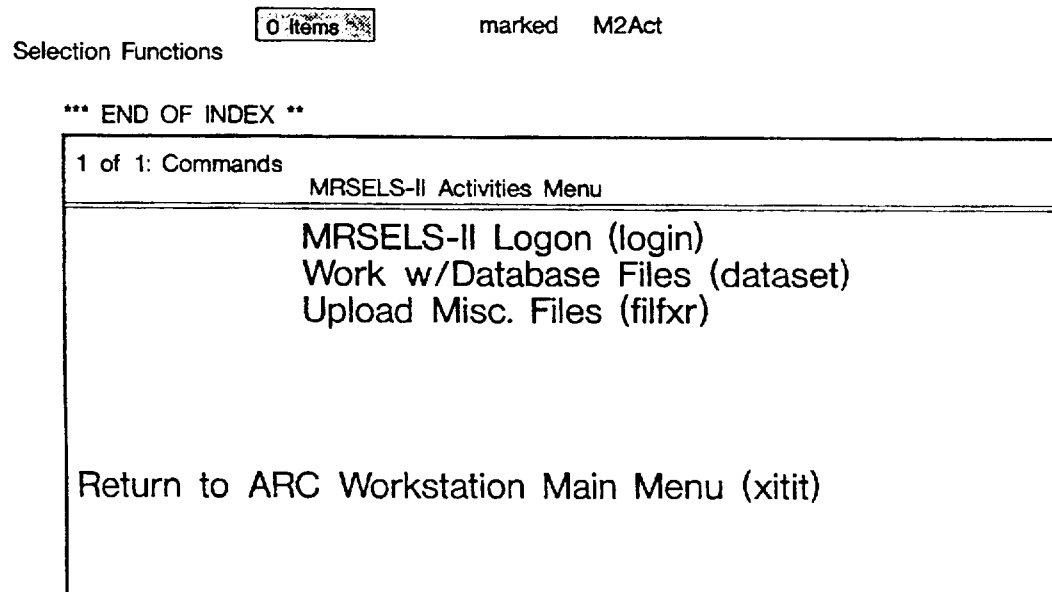


Figure 8-1. MRSELS-II Activities Menu

* If you don't know how to select an option from a menu, see Section 3.2.

† For instructions on how to use fast-path codes, see Section 4.4.

8.2 How to Log on to MRSELS-II

To log on to MRSELS-II, choose the "MRSELS-II Logon" option from the MRSELS-II Activities menu.

The fast-path code for this option is *login*.

When you choose the "MRSELS-II Logon" option, a screen appears that has fields in which you must enter information. The table below tells you how to fill out these fields.

| Field Name | What to Enter |
|----------------------------------|---|
| MRSELS-II Password: | Type your current password. The password does not print on your screen. |
| MICOM Password: | Type your current password. The password does not print on your screen. |
| MRSELS-II/MICOM Logon ID: | Overtyping the predefined logon ID, if necessary. |
| Network ID: | Overtyping the network ID, if necessary. |
| Network Password: | Overtyping the predefined network password, if necessary. The password does not print on your screen. |
| Network Number: | Overtyping the network number, if necessary. |

On the logon screen, you will see the following prompt:

Press <Enter> to continue, <Esc> to quit

This prompt tells you to press <Enter> after you finish entering information in each field. It also tells you that if you want to stop logging on, you can press <Esc> to quit and go back to the MRSELS-II Activities menu.

8.2.1 How to Make the Logon Process Go Faster

Using the update ID (*updid*) command (see Section 5.3.3), you can define all the logon fields, except the MRSELS-II Password field, as defaults.

NOTE: All the fields that can be predefined cannot be left blank. If you don't use a Network ID or Network Password, you **MUST** predefine both fields with the word *none*.

8.2.2 How to Reconnect the Previous Logon Session

After the first logon, the first screen that you'll see is a Logon Option screen. Type *l* for an initial log on to MRSELS-II, or type *r* if the MRSELS-II link had been previously logged on to (i.e., the link is still active and the session is being continued). The reconnect option is available for as long as the line is open (connected) and is only valid during a current workstation session.

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Selection Functions marked M2Act

*** END OF INDEX **

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MRSELS-II

MRSELS-II Password:

MICOM Password:

MRSELS-II/MICOM Logon ID:

 Network ID:

 Network Password:

Q Network Number:

Figure 8-2. MRSELS-II Logon Screen

8.3 How to Upload a File to MRSELS-II

After you create a file and populate it with data, you can upload it to MRSELS-II.

1. To upload a file, move the selector bar to the file's name and move the prompter bar to the command "Mark for Transfer."
2. Press <Enter> and a VM File Description screen appears.
3. Type the VM filename (up to eight alphanumeric characters), the VM filetype (up to eight alphanumeric characters), and press <Enter>.
4. Return to the ARC menus by pressing <Tab> and logging on to MRSELS-II (see Section 8.2).
5. When you're logged onto MRSELS-II, type *x* and press <Enter> to escape from the MRSELS-II menu structure.
6. When the "ready" prompt appears, press <Alt> + <U> and all files that you have marked for transfer are uploaded to MRSELS-II.

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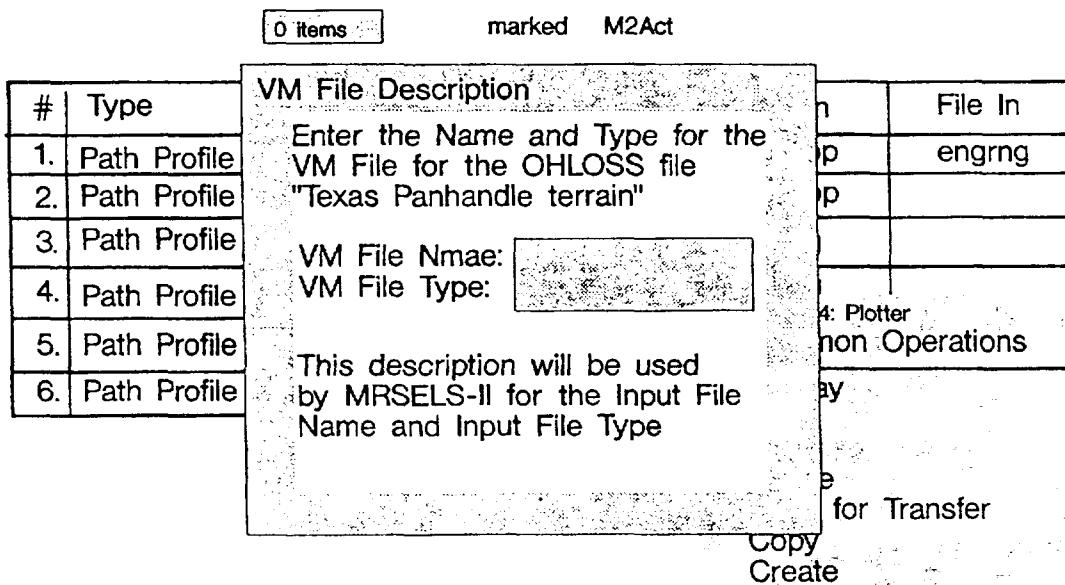


Figure 8-3. VM File Description Screen (File Transfer)

9. How to Use the PCN/PN Activities

This section gives you a general description of how to use the PCN/PN activities. For more detailed instructions, see Appendices C and D, which are tutorials.

When you select "PCN/PN Activities" from the Main Menu, you will get the PCN/PN Activities menu.* The fast-path code for this option is *PCNAct*.†

9.1 What You Can Do: An Overview

Using this option, you can log and track Prior Coordination Notices (PCNs). You also can use FCC Public Notices (PNs) to provide information on missing PCNs that may affect microwave radio paths.

The following list briefly describes each of the PCN/PN activities.

| | |
|---|---|
| Browse/Update PCN LOG file | Allows you to browse through the contents of the PCN Log file and add new entries. This selection gives you a submenu of options for accessing the PCN Log file. |
| Append PCN LOG file from electronic mail | Allows you to append (add) a PCN file via electronic mail. |
| Scan FCC PN | Allows you to scan PNs. The PN file contains data for pending license applications as filed with the FCC. You can use this data to determine whether PCNs that may affect microwave radio paths have been received. |
| Append PN file | Allows you to append (add) only new data to an existing PN file. |
| Match PCN and PN files | Allows you to match the PCN with the PN file. |

* If you don't know how to select an option from a menu, see Section 3.2.

† For instructions on how to use fast-path codes, see Section 4.4.

| | |
|--------------------------------------|--|
| Last received PCN and PN | Allows you to display a summary of the last-received PCNs and the date of the last time PNs were entered. |
| Print/Display PCN - PN links | Allows you to print or display PCN - PN links. |
| Reports on PCN LOG file | Allows you to review specific PCNs, pending PCNs, or PCNs by date. This selection gives you a submenu of options for accessing and summarizing PCN Log data. |
| PCN/PN Activities Maintenance | Allows you to set the initial values of the PCN Log reference code, add new printer characteristics, archive the PCN Log, or restore the PCN Log from a backup copy. |
| Return to Main Menu | Returns you to the Main Menu. |

The prompt you'll see:

Select a function:

This prompt asks you to choose one of the above options by entering the letter that corresponds to it.

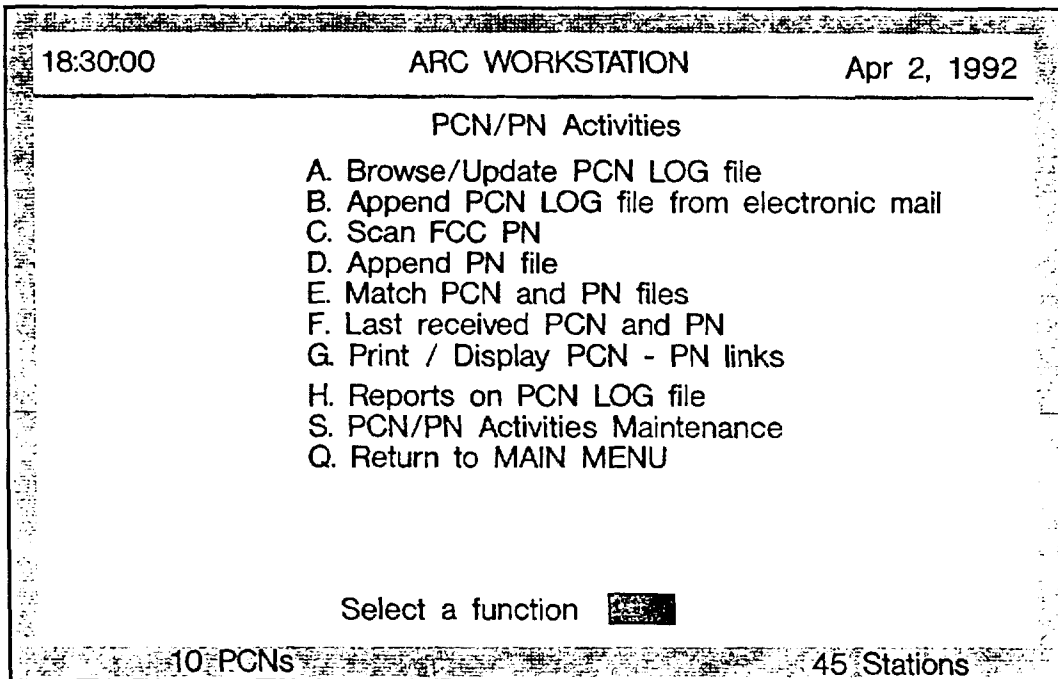


Figure 9-1. PCN/PN Activities Menu

9.2 How to View or Update the PCN Log File

The PCN Log file contains detailed information on PCNs that have been entered into the PCN Log. PCNs can be entered into the Log manually or via electronic mail.

When you select the "Browse/Update PCN Log File" from the PCN/PN Activities menu, you will get a new menu that offers you various ways to access the PCN Log file. The list below briefly describes these options.

| | |
|---|--|
| Frequency Coordinator Company Code | Allows you to access the PCN Log data by the frequency coordinator company code. |
| Log reference code | Allows you to access the PCN Log data by the Log reference code. |
| FCC owner code | Allows you to access the PCN Log data by the FCC owner code. |
| Owner/Licensee name | Allows you to access the PCN Log data by the owner/licensee name. |
| Station name | Allows you to access the PCN Log data by the station name. |
| Station CALL SIGN | Allows you to access the PCN Log data by the station call sign. |
| New Data | Allows you to add new PCN Log records. |
| Return to PCN/PN menu | Returns you to the PCN/PN Activities menu. |

The prompt you'll see:

Select the case:

This prompt asks you to choose one of the above options by entering the letter that corresponds to it.

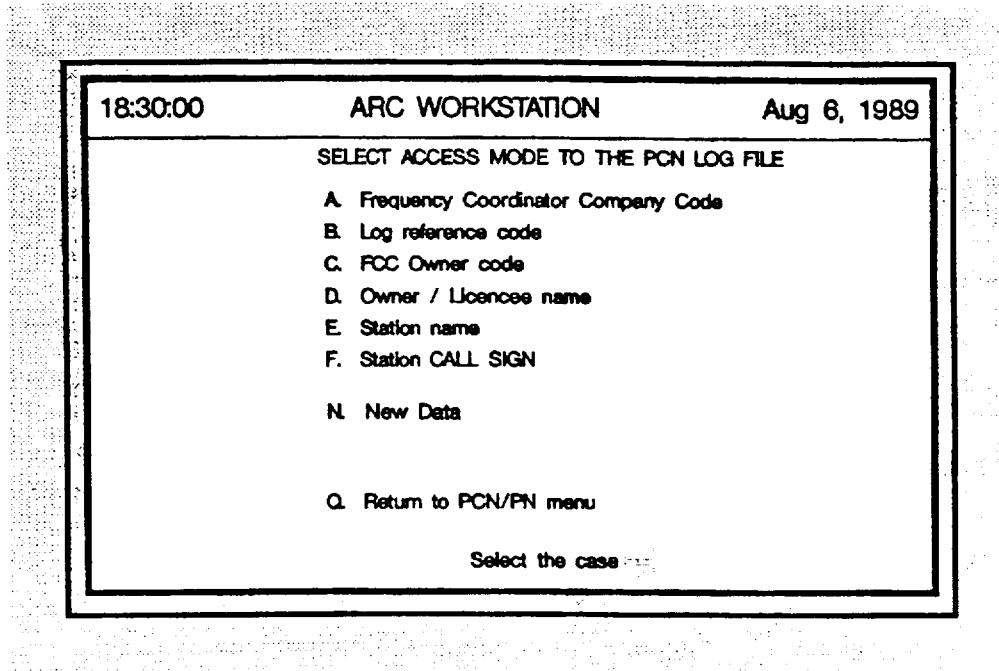


Figure 9-2. Browse/Update PCN Log File Access Mode Menu

9.2.1 Accessing a PCN Log File by Its Frequency Coordinator Company Code

Using this selection, you can access the PCN Log data file by the frequency coordinator company code.

Fields: The cursor is positioned in the *Frequency Coord. Company Code* field. Section 9.2.7. tells you what you can enter in this field and Figure 9-3 shows you what the screen looks like.

The prompt you'll see:

Menu, Next/Previous/Delete PCN, Select station, Other CODE or Edit?

This prompt gives you the following choices:

- M = return to the **menu** and store the data in the data base
- N = go to the **next** PCN
- P = go to the **previous** PCN
- D = **delete** the currently displayed PCN
- S = **select** a station
- O = clear the screen and enter **another** code
- E = **edit** the current screen.

Type the letter that corresponds to your choice.

If you type a "?" and press <Enter>, you will get a display that shows the entry key being used (for example, PCN reference code) and the Owner Name, except when the entry key is the Owner Name.

| ARC WORKSTATION | | Aug 6, 1989 | |
|---|----------------------|----------------------|----------------------|
| PCN LOG file accessed by Frequency Coordinator Company Code | | | |
| Frequency Coord. Company Code: | <input type="text"/> | | |
| PCN LOG/Preference Code: | <input type="text"/> | | |
| Date PCN issued: | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Date PCN received: | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| FCC Owner Code: | <input type="text"/> | | |
| Owner or Licensee Name: | <input type="text"/> | | |
| PCN Path or Route Description: | <input type="text"/> | | |
| PCN Modification Code: | <input type="text"/> | | |
| Date of Prior PCN: | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Requested Reply Date: | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Actual reply date: | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Objection: | <input type="text"/> | | |
| Remark: | <input type="text"/> | | |
| Station name: | <input type="text"/> | Call Sign: | <input type="text"/> |
| T/E Station: | <input type="text"/> | Other PCN: | <input type="text"/> |
| Transmit freq.: | <input type="text"/> | | |
| Constr. permit number/Licence: | <input type="text"/> | | |
| Latitude: | <input type="text"/> | Longitude: | <input type="text"/> |
| Menu, Next/Previous/Delete PCN, Select station, Other CODE or Edit? | | | |

Figure 9-3. PCN Log File Accessed by Frequency Coordinator Company Code

9.2.2 Accessing the PCN Log File by LOG Reference Code

Using this selection, you can access the PCN Log data file by the LOG reference code.

Fields: The cursor is positioned in the *PCN Log/Reference Code* field. Section 9.2.7. tells you what you can enter in this field and Figure 9-3 shows you what the screen looks like.

The prompt you'll see:

Menu, Next/Previous/Delete PCN, Select station, Other CODE or Edit?

See Section 9.2.1 for an explanation of these options. Type the letter that corresponds to your choice.

9.2.3 Accessing the PCN Log File by FCC Owner Code

Using this selection, you can access the PCN Log data file by the FCC owner code.

Fields: The cursor is positioned in the *FCC Owner Code* field. Section 9.2.7. tells you what you can enter in this field and Figure 9-3 shows you what the screen looks like.

The prompt you'll see:

Menu, Next/Previous/Delete PCN, Select station, Other CODE or Edit?

See Section 9.2.1 for an explanation of these options. Type the letter that corresponds to your choice.

9.2.4 Accessing the PCN Log File by Owner/Licensee Name

Using this selection, you can access the PCN Log data file by the owner/licensee name.

Fields: The cursor is positioned in the *Owner or Licensee Name* field. Section 9.2.7. tells you what you can enter in this field and Figure 9-3 shows you what the screen looks like.

The prompt you'll see:

Menu, Next/Previous/Delete PCN, Select station, Other CODE or Edit?

See Section 9.2.1 for an explanation of these options. Type the letter that corresponds to your choice.

9.2.5 Accessing the PCN Log File by Station Name

Using this selection, you can access the PCN Log data file by the station name.

Fields: The cursor is positioned in the *Station Name* field. Section 9.2.7. tells you what you can enter in this field and Figure 9-3 shows you what the screen looks like.

The prompt you'll see:

Menu, Next/Previous/Delete PCN, Select station, Other CODE or Edit?

See Section 9.2.1 for an explanation of these options. Type the letter that corresponds to your choice.

9.2.6 Accessing the PCN Log File by Station CALL SIGN

Using this selection, you can access the PCN Log data file by the station call sign.

Fields: The cursor is positioned in the *Station Call Sign* field. Section 9.2.7. tells you what you can enter in this field and Figure 9-3 shows you what the screen looks like.

The prompt you'll see:

Menu, Next/Previous/Delete PCN, Select station, Other CODE or Edit?

See Section 9.2.1 for an explanation of these options. Type the letter that corresponds to your choice.

9.2.7 Adding New Data to the PCN Log File

Using this selection, you can add new PCN Log records to the data base.

Fields: The list below tells you what to enter in each field on your screen.

NOTE: Where the maximum number of characters for a given field is shown, the number includes spaces. Alphanumeric characters are alpha, numeric, and any other accessible characters on the keyboard. Numeric characters are only the number keys on the keyboard.

If you don't enter the maximum number of characters in each field, press <Enter> to move to the next field.

| Field Name | What to Enter |
|---|---|
| Frequency Coord. Company Code: | Enter up to 6 alphanumeric characters for the frequency coordinator company code. This field is optional. |
| PCN LOG/Reference Code: | Enter up to 9 alphanumeric characters for the PCN Log/reference code. A suggested format for the code is SSYYDDDNN, where SS is either ES or TE, YY is the year, DDD is the Julian day (for example, March 15th is usually the 074th day), and NN is from 00 to 99. |
| Date PCN Issued: | Enter 6 numeric characters for the PCN issuance date. |
| Date PCN received: | Enter 6 numeric characters for the date on which the PCN was received. |
| FCC Owner Code: | Enter up to 8 alphanumeric characters for the FCC owner code. |
| Owner or Licensee Name: | Enter up to 40 alphanumeric characters for the owner or licensee name. |
| PCN Path or Route Description: | Enter up to 78 alphanumeric characters for the PCN path or route description. |

| | |
|---------------------------------------|---|
| PCN Modification Code: | Enter 1 alphanumeric character for the PCN modification code. |
| Date of Prior PCN: | Enter 6 numeric characters for the date of the prior PCN. |
| Requested Reply Date: | Enter 6 numeric characters for the requested reply date. |
| Actual reply Date: | Enter 6 numeric characters for the actual reply date. |
| Objection: | Enter 3 alphanumeric characters for the objection. |
| Remarks: | Enter up to 44 alphanumeric characters for any remarks. |
| Station name: | Enter up to 11 alphanumeric characters for the station name. |
| Call Sign: | Enter up to 6 alphanumeric characters for the call sign. |
| T/E Station: | Enter up to 2 alphanumeric characters for the terrestrial or earth station. |
| Other PCN: | This field is automatically established by the PCN/PN activity programs. If there is more than one PCN for the station, an "M" appears as the field entry. If the PCN is singular, the field is left blank. |
| Transmit freqs: | Enter up to 44 alphanumeric characters for the transmit frequencies. |
| Constr. permit number/License: | Enter up to 16 alphanumeric characters for the construction permit number/license. |
| Latitude: | Enter up to 9 numeric characters for the latitude. |

Longitude:

Enter up to 10 numeric characters for the longitude. The range is between 64 and 124.

The prompt you'll see:

Menu, add new Station, add new PCN or more Edit?

This prompt asks you to choose whether to return to the menu, add a new station, add a new PCN, or edit the current screen. The following mnemonics are used for each prompt:

- M = Menu
- S = Station
- N = PCN
- E = Edit.

Type the letter that corresponds to your choice.

ARC WORKSTATION Aug 6, 1989

New Data

Frequency Coord. Company Code: []
PCN LOG/Reference Code: []
Date PCN issued: [] / [] / []
Date PCN received: 08/08/89
FCC Owner Code: []
Owner or Licensee Name: []
PCN Path or Route Description: []

PCN Modification Code: []
Date of Prior PCN: [] / [] / []
Requested Reply Date: [] / [] / []
Actual reply date: [] / [] / []
Remarks: [] Objection: []

Station name: [] Cell Sign: []
T/E Station: [] Other PCN: []
Transmit freq.: []
Constr. permit number/Licence: []
Latitude: [] Longitude: []

Menu, add new Station, add new PCN or more Edit?

Figure 9-4. New Data Input Screen

9.3 How to Append the PCN Log File From Electronic Mail or a Floppy Disk

Using this selection, you can receive PCN information electronically via an electronic mail system (for example, the UNIX system) or from a floppy disk. The data must meet the specifications defined by the National Spectrum Managers Association (NSMA).^{[2] [3]}

Fields: The list below tells you what to enter on your screen.

| Field Name | What to Enter |
|------------------|--|
| EMAIL file name: | Enter the name of the file that is to be automatically logged into the PCN Log file. |

9.4 How to Scan FCC PNs for Missing PCNs

Using this selection, you can scan PNs to discover missing PCNs. The PN data is stored on MRSELS-II. The program scans the PN text and saves only the PN data for the specified state(s). When the program is scanning data, the screen is divided into three sections. The top section displays the input text while the bottom section displays the output text. The middle section displays text that may be in error. The program stops to allow you to correct errors (see Appendix D for more detail). You can ignore or correct the errors it finds. You can also save the data if you wish.

Fields: The list below tells you what to enter on your screen.

| Field Name | What to Enter |
|----------------|--|
| FCC file name: | Enter the name of the file that you want to scan. The name of the file should include a unique number that appears on the printed FCC Public Notice. |

9.5 How to Append a PN File

Using this selection, you can append a scanned PN file to an ARC Workstation PN match file. The program then automatically matches the file with the PCN Log to determine if there are any missing PCNs. Only unique records are added to the PN match file.

9.6 How to Match PCN and PN Files

Using this selection, you can determine missing PCNs and generate reports. The program matches the PCN Log file against the PN file and records all matches, all unmatched PCNs, and all unmatched PNs.

9.7 How to Summarize the Last Received PCN and PN

Using this selection, you can generate a summary of the last PCN received from each Frequency Coordination Company and the date of the last time PN data was entered. The summary uses the current date and scans the PCN Log file for the latest PCN received for each unique Frequency Coordination Company Code entered into the PCN Log.

9.8 How to Print or Display PCN - PN Links

Using this selection, you can

- Print or display reports on unmatched PCNs for more than six months
- Display matched PCNs
- Display partially matched PCNs (for example, one or more stations associated with the PCN are missing, but at least one station has matched the PN data file)
- Display all unmatched PCNs (that is, no stations in the PCN match the PN data)
- Display all matched PNs.

9.9 How to View and Print Reports on the PCN Log File

Using this selection, you can review specific PCNs, view a summary of only pending PCNs, or view the PCN Log as a function of a past date. This selection displays a submenu that offers you various ways to access and summarize the PCN Log data. The list below briefly describes these options.

| | |
|---|--|
| Frequency Coordinator Company Code | Allows you to access the PCN Log data by the frequency coordinator company code. |
| LOG reference code | Allows you to access the PCN Log data by the Log reference code. |
| FCC owner code | Allows you to access the PCN Log data by the FCC owner code. |
| Owner/Licensee name | Allows you to access the PCN Log data by the owner/licensee name. |
| Station name | Allows you to access the PCN Log data by station name. |
| Station CALL SIGN | Allows you to access the PCN Log data by the station call sign. |
| Summary on pending PCN Log | Allows you to access the PCN Log records and provides a summary of pending PCNs. |
| PCN Log summary | Allows you to access the PCN Log records and provides a comprehensive summary of PCNs. |
| Special Reports | Allows you to access the PCN Log records by the PCN Issue date and the Owner Code, or the PCN Issue date and the Owner Name. |
| Select another printer | Allows you to select another printer as the output device. |
| Return to PCN/PN menu | Returns the workstation to the PCN/PN Activities menu. |

The prompt you'll see:

Select the case:

This prompt tells you to choose an option by entering the letter associated with it.

9.9.1 Accessing Reports by Frequency Coordinator Company Code

Using this option, you can access the PCN Log data file by the frequency coordinator company code.

The prompt you'll see:

The Frequency Coordinator Company Code:

When you see this prompt, enter the frequency coordinator company code and press *<Enter>*.

9.9.2 Accessing Reports by LOG Reference Code

Using this option, you can access the PCN Log data file by the LOG reference code.

The prompt you'll see:

First PCN/LOG Reference Code:

At this prompt, enter the PCN Log reference code and press *<Enter>*.

9.9.3 Accessing Reports by FCC Owner Code

Using this option, you can access the PCN Log data file by the FCC owner code.

The prompt you'll see:

The FCC Owner Code:

At this prompt, enter the FCC owner code and press *<Enter>*.

9.9.4 Accessing Reports by Owner/Licensee Name

Using this option, you can access the PCN Log data file by the owner/licensee name.

The prompt you'll see:

The Owner Name:

At this prompt, enter the name of the owner/licensee and press *<Enter>*.

9.9.5 Accessing Reports by Station Name

Using this option, you can access the PCN Log data file by the station name.

The prompt you'll see:

The Station Name:

At this prompt, enter the name of the station and press <Enter>.

9.9.6 Accessing Reports by Station CALL SIGN

Using this option, you can access the PCN Log data file by the station call sign.

The prompt you'll see:

The Station Calling Sign:

At this prompt, enter the station call sign and press <Enter>.

9.9.7 Summarizing Pending PCNs

Using this option, you can access the PCN Log data file and get a summary of pending PCNs.

The prompts you'll see:

Ending date:

At this prompt, either press <Enter> to accept the system date or enter the date you want (using 6 numeric characters) and then press <Enter>. The screen displays the number of pending PCNs.

Do you want to Print, Display or Quit? (P/D/Q)

At this prompt, enter *p* for print, *d* for display, or *q* for quit.

NOTE: You can only display *or* print — you can't do both at the same time.

9.9.8 Generating a PCN Log Summary

Using this option, you can access the PCN Log data file and get a comprehensive summary of PCNs.

The prompts you'll see:

Starting date:

At this prompt, either press <Enter> to accept the system date or enter the desired date (using 6 numeric characters) and press <Enter>. The screen displays the number of PCNs received after the designated date.

Do you want to Print, Display or Quit? (PIDIQ)

At this prompt, either enter *p* for print, *d* for display, or *q* for quit.

NOTE: You can only display *or* print — you can't do both at the same time.

9.9.9 Printing Special Reports

Using this option, you can print detailed reports on individual PCNs by entering the PCN issue date and the FCC owner code, or the PCN issue date and the owner name.

The prompt you'll see:

PCN date:

At this prompt, enter the issue date of the PCN and either the FCC owner code or the owner name. To get a list of current owner codes or owner names, enter a question mark in either of the owner-related fields.

9.9.10 Selecting Another Printer

Using this option, you can select another printer as the output device. The workstation has three predefined printers (IBM color, EPSON LX, RX, FX, and HP ThinkJet). You can add other printers via the PCN/PN Maintenance Activities "add new printer characteristics" option (see Section 9.10). Refer to the documentation supplied with your printer.

The prompt you'll see:

Enter the printer number

At this prompt, enter the number that corresponds to the printer you want.

9.10 How to Use the PCN/PN Maintenance Activities

Using this selection, you can set the initial value of the PCN Log reference code, select the color displays, add new printer characteristics, archive the PCN Log, and restore the PCN Log from a backup copy. You access this selection from the PCN/PN Activities menu.

The following list briefly describes each maintenance activity.

| | |
|--|--|
| Colors Installation | Using this option, you can install the colors for the PCN/PN Activities screens. |
| Add new printer characteristics | Using this option, you can add new printer characteristics. Refer to the documentation supplied with your printer. |
| Save data base on disk | Using this option, you can save the data base on disks. |
| Restore data base from disk | Using this option, you can restore the data base from disks. |
| Recover/Retie after disaster | Using this option, you can recover and retie after a disaster. |

The prompt you'll see:

Select a function

At this prompt, enter the letter associated with the option you want.

9.11 How to Archive/Unarchive the PCN Log

You can easily back up or share your PCN log by using the PCN archiving and unarchiving programs. These programs are **not** accessed from the PCN activities menu, but either from the ARC Workstation finder or by typing the commands used to initiate those programs. The commands are "pcnwrap" and "pcnuwrap", respectively.

The Appendix C tutorial, *An Introduction to the PCN Log Activities* provides a complete discussion of how, why, and when to use this feature.

10. How to Use the Radio Engineering Activities

This section gives you a general description of the radio engineering activities. For more detailed instructions, see Appendix A, which is a tutorial.

When you select "Radio Engineering Activities" from the Main Menu,* you will get the Radio Engineering Activities menu. The fast-path code for this option is *REAct*.†

10.1 What You Can Do: An Overview

This option gives you both microwave radio engineering functions and UHF radio engineering functions. The following briefly describes the options available for each of these categories:

Microwave Radio Engineering Activities:

| | |
|---|---|
| Digital Radio Diversity Analysis (drdiv) | Performs digital radio diversity studies. |
| Reflection Calculation and Analysis (reflet) | Analyzes the effects of ground reflection on an antenna. |
| Map Intersection Calculations (mapint) | Calculates the distance between locations on topographic maps and the points of intersection from the map edges. |
| Azimuth Calculations (azimuth) | Determines either the direct azimuth values or the indirect azimuth values for two different radio stations. It also calculates free-space path loss. |
| 30-Second Database Program (30sped) | Extracts a 30-second terrain profile between two radio stations using a regional 30-second data base. |

* If you don't know how to select an item from a menu, see Section 3.2.

† For instructions on how to use fast-path codes, see Section 4.4.

| | |
|--|---|
| Transhorizon Program (ohloss) | Calculates transhorizon losses using terrain profiles generated by the 30-second data base program. |
| Height Above Average Terrain (haat) | Calculates the height above average terrain profile for a single radio station on either a single azimuth or on eight radials that are spaced 45 degrees apart at a distance of ten miles from the station. |
| Transhorizon Loss - Near Field Calcs (shield) | Determines if an earth station can cause near-field problems for a microwave path. |
| Tower Height Calculations (towrht) | Optimizes the height of a tower. |
| Antenna Height Calculations (ratop) | Optimizes a radio route based on the cost of various antenna heights. |
| 3 Second Terrain Profiler (3step) | Produces a 3-second terrain profile between two specified coordinates. |
| Obstruction Fading Program (obsfad) | Determines the outage time of radio paths due to obstructions under varying conditions of refractivity. |

**Terrestrial Path Design
Tasks (path)**

You can determine for a planned radio path, using a terrain profile (for example, an OHLOSS file), whether antenna placement provides adequate clearance, and if not, where to place the antennas to provide the needed clearance. You can also compute 1) K to meet arbitrary clearance criteria, 2) heights of space diversity antennas, 3) heights of minima for reflective paths, and 4) path grazing data.

**Radial Map Intersection
Program (radpgm)**

You can use this program to determine the map intersection points for 7.5", 15" and 1° x 2° maps, given a central coordinate point.

**VH Coordinate Programs
(vh1)**

You can determine either VH coordinates given latitude and longitude, or determine the airline mileage between VH coordinate pairs, or determine VH coordinates and mileage given a pair of latitude and longitude coordinates.

**Fresnel Zones Calculatlons
(fresnel)**

You can calculate 20 Fresnel Zones for either a given path in miles at a given frequency; or given distances from a start point to a reflection point, and from the reflection point to the end point at a given frequency or wavelength (meters).

**Terrestrial Elevation Angle
(angmod)**

You can calculate the elevation angle of a terrestrial path via this program.

**Earth Station – Satelllte
Program (view)**

You can calculate, using view, satellite positions, elevation angle, and Earth Station azimuth.

| | |
|---|--|
| 6 GHz SSB Noise Program (noise) | You can calculate the anticipated per-hop noise in the top baseband of either an FM-radio system or a 6-GHz single sideband (SSB) system. |
| Radio Channel Performance (nsldl) | This program calculates radio-channel performance based on noise power ratio readings. |
| Obstruction Clearance Task (obsi) | You can determine microwave path blockages using this task. The horizontal and vertical clearances of an obstruction are calculated along the Fresnel radii. |
| Geostationary Satellite Interf. (orbcali) | This task determines if a terrestrial beam points within 2° of the orbit for geostationary satellites. |
| Receive Levels 4 Paths w/Passives (prepastl) | Calculates receive level for a path with billboard passives. |
| AM Radio Diversity (amdly) | This task assists you in designing transmission systems that meet AR-6A transmission objectives for outage and channel misalignments. |
| FM Radio Diversity (fmdly) | This program assists you in designing FM microwave transmission facilities, which include the use of space-diversity antennas. |
| TD Radio Diversity (tdly) | This program determines transmission unavailability for a radio path, using either TD or TH radio. |

UHF Radio Engineering Activities:

**Intermodulation
Calculation and Analysis
(Intermod)**

Calculates intermodulation factors for radio systems below 1 GHz.

**Co-Channel Interference
Calculations (cochin)**

Calculates potential interference for UHF channels that are very close in frequencies.

**Height Above Average
Terrain (uhfhaat)**

Calculates the height above average terrain profile for a single azimuth or eight radials that are spaced 45 degrees apart at a distance of ten miles from the station. If the frequency is in the 152- to 158-MHz, 470- to 512-MHz, or 929- to 932-MHz bands, the effective radiated power (erp) can be calculated when the antenna height exceeds 500 feet. (This is done only when eight radials are calculated.)

10.2 Procedures Common to All the Radio Engineering Activities

Rather than repeating the same instructions in each of the radio engineering activities, we summarize them here. Following sections will briefly give specific details about each program.

When you select any of the radio engineering activities, the following will happen:

1. A copyright notice appears that contains the name and version number of the program being used. To get past the notice immediately, you can press *<Enter>*. If you wait approximately eight seconds, the copyright notice will disappear automatically.*
2. The input screen(s) appears. After you input appropriate data, the program you selected will run.
3. The output is automatically displayed on your screen. To end the display, press *<Esc>*.
4. A screen appears that lets you choose what you want to do with the output. You have the following choices: **
 - **Print Latest Result** (option 1) - prints the results that were previously displayed by using the DOS print command.
 - **Final Report Printout** (option 2) - prints the final report. This option is useful if you're generating a series of related studies.
NOTE: You must use option 3 before you can use this option.
 - **Append Result to Report File** (option 3) - requests the full path and filename to which current output should be appended. After you supply this information, you can make related runs without quitting the program.
 - **Modify Input Data** (option 4) - allows you to change only that portion of the input data necessary to continue with the study.
 - **Start over** (option 5) - gives you a blank input screen and deletes the previous input data.

* For certain programs, a program information screen appears immediately after the copyright screen. Press *<Enter>* to continue.

** For certain programs, not all disposition options are used since some of the options are highly illogical for some programs.

- **Quit and return to ARC** (default option) - if you haven't created a report file yet, this option stops the program and erases all input and output data. If you've created a report file, the program saves it.

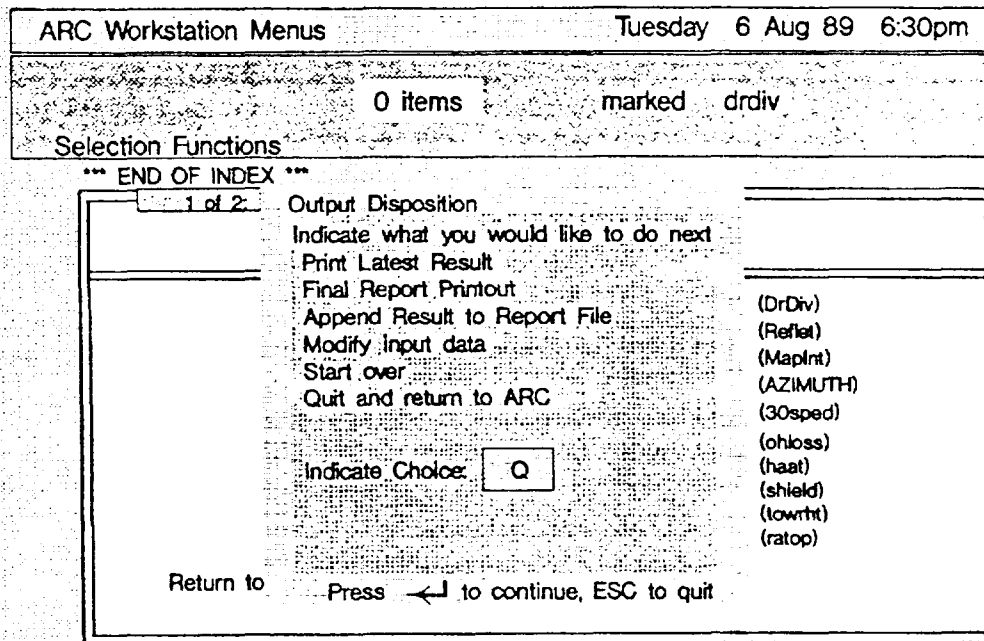


Figure 10-1. Output Disposition Screen

10.3 Microwave Radio Engineering Activities

10.3.1 The Digital Radio Diversity Program

Using this program, you can analyze digital radio diversity. Depending on the options you choose, you will enter data in multiple input screens.

The fast-path code for this program is *drdiv*

10.3.2 The Reflection Calculation and Analysis Program

Using this program, you can analyze ground reflection. You must enter data on one input screen.

The fast-path code for this program is *reflet*

10.3.3 The Map Intersection Calculations Program

Using this program, you can calculate the entry and exit points of standard sizes of US geographical survey maps for a set of radio paths. You must enter data in at least three input screens. When you're finished entering station location data, press <Esc> to run the program.

The fast-path code for this program is *mapint*

10.3.4 The Azimuth Calculations Program

For two non-colocated radio stations, you can calculate either the distance between the two stations given the latitude and longitude of the stations, or the location of the second station given the latitude and longitude of the first station and the azimuth and distance (in units) to the second station. You can calculate the free-space path loss for all the common-carrier microwave radio bands. You must input data on three screens.

The fast-path code for this program is *azimuth*

10.3.5 The 30-Second Database Program

Using this program, you can calculate the terrain profile between two non-colocated radio stations using a regionalized 30-second terrain data base. You must enter data on two input screens. This regional data base is stored on a floppy disk and you can get it by contacting your local company's ARC coordinator.

The fast-path code for this program is *30sped*

NOTE: Terrain profile datasets created on the workstation can be uploaded to MRSELS-II. An executive program on MRSELS-II will automatically make the uploaded datasets compatible with MRSELS-II terrain profile dataset requirements.

10.3.6 The Transhorizon Program

Using this program, you can calculate the over-the-horizon losses between two non-colocated microwave radio stations using a previously generated terrain profile as input. You must enter data on one input screen.

The fast-path code for this program is *ohloss*

10.3.7 The Height Above Average Terrain Program

Using this program, you can calculate the average height above the terrain for a distance of ten miles from a radio station along either an inputted azimuth value or eight radials that are spaced 45 degrees apart and start at zero degrees azimuth (that is, due North). This program uses the regional 30-second data base as input. You must input data on one input screen.

The fast-path code for this program is *haat*

10.3.8 The Transhorizon Loss Program - Near-Field Calculations

Using this program, you can calculate the near field transhorizon loss to an existing radio path from an earth station's shield. You must input data on one screen.

The fast-path code for this program is *shield*

10.3.9 The Tower Height Calculations Program

Using this program, you can calculate the optional height of the towers on a single two-station path. You must input data on three screens.

The fast-path code for this program is *towrht*

10.3.10 The Antenna Height Calculations Program

Using this program, you can calculate the optimal height of antennas based on the costs of materials (that is, the costs of concrete, steel, paint, and lights). You must input data on three screens.

The fast-path code for this program is *ratop*

NOTE: The first screen contains the prices for concrete, steel, paint, and lights. The prices are retained in a file and if the values change they are saved in that file. The date and time of the update are recorded.

10.3.11 The 3 Second Terrain Profiler

Using this program you can generate a terrain profile between two non-colocated radio stations using the appropriate section of the 3 Second data base. You must enter all the required data for the two stations; however, you have the option of writing the terrain profile to either an OHLOSS file or to a DOS file. The 3 Second data base is only available to those companies that also support the Workstation for Advanced Radio Engineering (WARE).

The fast-path code for this program is *3sterp*

10.3.12 Obstruction Fading Program

This program calculates the outage time of radio paths due to obstructions under varying conditions of refractivity. The resulting output is an estimate of the time below level based on antenna center lines. Meteorological data in the form of means and standard deviations of the refractive gradient are used as a statistical platform.

Input Description

Required Inputs:

1. Frequency for the antennas in GHz
2. Primary antenna fade depth

3. Space-diversity antenna fade depth
4. Array of four (4) refractive means
5. Array of four (4) refractive sigmas
6. Units M for metric, S for standard
7. A "Y" for high-noise design, or an "N" for low-noise design

Optional parameters:

8. Additional left centerline value (in feet) to be included in the analysis
9. Additional right centerline value (in feet) to be included in the analysis.

A terrain profile of the path under study must exist prior to executing this program. You can generate it via 1) 3sterp or 2) 30sped. It can also be a DOS file from some other source. If the terrain profile is via a DOS file from some other source, then it **must** conform to the output file structure of the 3sterp and 30sped programs.

The fast path code is *obsfad*

10.3.13 Terrestrial Path Design Tasks

You can use this program to determine for a planned radio path whether antenna placement provides adequate clearance, and if not, where to place the antennas to provide the needed clearance. You can also compute 1) K to meet arbitrary clearance criteria, 2) heights of space-diversity antennas, 3) heights of minima for reflective paths, and 4) path-grazing data.

This program also requires that a terrain profile of the path be available for input. This file can either be an OHLOSS file generated by 3sterp or 30sped, or a DOS file that matches the format of the OHLOSS file.

Input Description

Required Inputs:

1. OHLOSS File (Yes|No) { Y implies OHLOSS File exists; N implies DOS file exists }
2. Frequency (GHz)
3. Units (M = metric|S = standard)
4. Program option (1|2|3|4|5)

Option 1 Inputs:

1. K Factor (to just meet clearance rule)
2. FRESNEL Zone as a decimal of 1

Option 2 Inputs:

1. Fresnel Zone

Option 3 Inputs:

1. Move main antenna (Y|N; default is N)
2. Stationary Antenna (L|R)
3. K Factor
4. Fresnel Zone

Option 4 Inputs:

1. Indicate if Grazing data to be used (N|Y)

Option 4a Inputs (No Grazing data):

1. Distance of reflective point from the left station
2. Reflection Elevation
3. Fix clearance from left or right (L|R)
4. Min Clearance Height
5. Max Clearance Height

Option 4b Inputs (Grazing data):

There are four mutually exclusive suboptions to choose (1|2|3|4):

Suboption 1: Grazing Heights (L|R) and Maximum Height

Suboption 2: No more data required; just press <Enter> to continue.

Suboption 3: Grazing Data (L|R), Maximum Height of L|R for Grazing Height, and Reflection Distance

Suboption 4: Grazing Data (L|R), Reflection Distance

The fast-path code for this program is *path*

10.3.14 Radial Map Intersection Program

You can use this program to determine the map intersection points for 7.5", 15" and 1° x 2° maps given a central coordinate point.

Input Description

All input values require

1. Latitude of Station A (°, ", ')
2. Longitude of Station A (°, ", ')
3. Distance in miles from Station A to Station B (default is 10 miles)
4. Azimuth from Station A to Station B (°, ", ')
5. Number of radials to generate (default is 8)

The fast-path code for this program is *radpgm*

10.3.15 VH Coordinate Programs

You can determine either VH coordinates given latitude and longitude, or the airline mileage between VH coordinate pairs, or VH coordinates and mileage given a pair of latitude and longitude coordinates.

Input Description

Input Screen 1:

Choose either Option A|B|C

Option A: Converts latitude and longitude to VH coordinates

Option B: Given VH coordinate pair, returns mileage between them

Option C: Given a pair of latitudes and longitudes, returns VH coordinates and mileage from A to B

The fast-path code for this program is *vh1*

10.3.16 Fresnel Zones Calculations

You can calculate 20 Fresnel Zones for either a given path in miles and a given frequency; or given the distances from a start point to a reflection point, and from the reflection point to the end point, and a given frequency or wavelength (meters).

Input Description

Option 1:

1. Total path distance (miles)
2. Frequency in MHz

Option 2:

1. Distance from start point to reflection point (miles)
2. Distance from reflection point to end point (miles)
3. Either frequency (MHz) or wavelength (meters)

The fast-path code for this program is *fresnel*

10.3.17 Terrestrial Elevation Angle

You can calculate the elevation angle of a terrestrial path via this program.

Input Description

1. Station A transmitter center line in amsl-feet
2. Station B transmitter center line in amsl-feet
3. Path distance in miles

The fast-path code for this program is *angmod*

10.3.18 Earth Station – Satellite Program

You can calculate, using view, satellite positions, elevation angle and Earth Station azimuth.

Input Description

All inputs are required.

1. Earth Station name
2. Latitude (°, ", ^)
3. Longitude (°, ", ^)
4. Minimum Longitude (°)
5. Maximum Longitude (°)
6. Incremental value from Minimum Longitude to Maximum Longitude

The fast-path code for this program is *view*

10.3.19 6 GHz SSB Noise Program

You can calculate the anticipated per-hop noise in the top baseband of either an FM radio system, or a 6-GHz single sideband (SSB) system.

Input Description

Basic input:

1. Let the program calculate received input level (Y|N)

Option Y (Program calculates received input level):

1. Transmission gain (dB)
2. Receive gain (dB)
3. Transmitter power (watts)
4. Rectangular waveguide (feet)
5. Circular waveguide (feet)
6. Noise figure (dBmco)
7. Frequency (GHz)
8. Path distance (miles)
9. Channel loading

Input frequency ≥ 11 GHz implies input additional data

10. Terrain factor
11. Region factor

Option N (You input received input level):

1. Received input level
2. Frequency (GHz)
3. Noise figure
4. Channel loading

Input frequency ≥ 11 GHz implies input additional data

5. Terrain factor
6. Region factor

The fast-path code for this program is *noise*

10.3.20 Radio Channel Performance

This program calculates radio channel performance based on noise power ratio headings.

Input Description

All inputs are required:

1. Up to 40-character description of the route
2. 11 values of noise levels at the relative drives for the channel being studied
3. The number of hops in route
4. Output format (N=> only listing [default]|Y=> Listing + curve)
5. Objective (41 = TH systems – total sys. noise; 44 = TD systems – total sys. noise)

The fast-path code for this program is *nsldi*

10.3.21 Obstruction Clearance Task

You can determine microwave path blockages using this task. The horizontal and vertical clearances of an obstruction are calculated along the Fresnel radii.

Input Description

All input parameters are required:

1. Station 1 Latitude (°, ", ^)
2. Station 1 Longitude (°, ", ^)
3. Station 1 height (AMSL-ft)
4. Station 2 Latitude (°, ", ^)
5. Station 2 Longitude (°, ", ^)
6. Station 2 height (AMSL-ft)
7. Obstruction Latitude (°, ", ^)
8. Obstruction Longitude (°, ", ^)
9. Obstruction height (AMSL-ft)
10. Frequency (GHz)

The fast-path code for this program is *obsi*

10.3.22 Geostationary Satellite Interference

This task determines if a terrestrial beam points within 2° of the orbit for geostationary satellites.

Input Description

All input parameters are required:

1. Company Number
2. Name of Station A
3. Name of Station B
4. The status of Station A
5. Latitude and Longitude of both stations (°, ", ^)
6. C/L heights (AMSL-feet) of the stations

The fast-path code for this program is *orbcalti*

10.3.23 Receive Levels 4 Path w/Passives

Calculates receive level for a path with billboard passives.

Input Description

All input parameters are required:

1. Frequency (input for first station only)
2. Station or passive name
3. Latitude (°, ", ^)
4. Longitude (°, ", ^)
5. Transmitter power or passive height
6. Antenna diameter or passive width
7. Antenna gain or angle of passive
8. Distance to next station or passive (feet)

The fast-path code for this program is *prepasti*

10.3.24 AM Radio Diversity

This task assists you in designing transmission systems that meet AR-6A transmission objectives for outage and channel misalignments.

Input Description

Basic required input parameters:

1. Hot standby (Y|N)
2. Relative gain of secondary antenna with respect to main antenna
3. Route using space-diversity combining (Y|N)
4. Number of hops in the route (1, 2, 3,...n)
5. Frogging interval (up to 800 miles|0.0 for up to 400 miles)
6. Default route objectives (Y|N)

If a Y for 6., then input

7. Noise objective (# sec/yr noise > 55 dBmco)
8. Deviation of objective (# sec/yr deviation > 2 dB)

Inputs required for each hop (as input in 4.):

1. Hop roughness (ft.)
2. Hop length (miles)
3. Average hop temperature (°F)
4. Climate parameter (0.5|1|2)
5. Max antenna spacing for hop (ft)
6. Diversity antenna below main antenna (Y|N)
7. Hop requires a pre-amp (Y|N)

The fast-path code for this program is *amdiv*

10.3.25 FM Radio Diversity

This program assists you in designing microwave transmission facilities that include the use of space-diversity antennas.

Input Description

Required path data inputs

1. Number of hops (max allowed 20)
2. Total number of channels (includes protection channels)
3. Number of protection channels
4. Path objective (0 => long haul | -1 => short haul | # of seconds)
5. Frogging in use (Y|N)
6. System is single sideband (Y|N)
7. Space diversity (Y|N)
8. 4-6 GHz Cross Banding (Y|N)

A different set of input screens appears, depending on how you answer the required path data questions.

The fast-path code for this program is *fmdiv*

10.3.26 TD Radio Diversity

This program determines transmission unavailability for a radio path.

Input Description

Required path data inputs

1. Name of Station 1
2. Name of Station 2
3. Climate factor (0.5|1|2, where => mountains, average, coastal)
4. Roughness factor (0 => very smooth and >50 => very rough)
5. Path distance (miles)
6. Average annual temperature (°F)
7. Objective (0 => long haul | 1 => short haul | value in seconds)
8. Number of channels
9. Analog protection fade margin (dB)
10. Digital protection fade margin (dB)

Inputs required for number of channels (for example, if you input 4 channels, you are required to input this data four times.)

1. Channel frequency number (enter protection channel freq. number last)

2. Antenna separation (feet)

Inputs required for number of channels minus 1 (for example, if you input 4 channels, you are required to input this data three times.)

1. Regular channel designation (1 => analog | 2 => digital)
2. Regular channel fade margin (dB)

The fast-path code for this program is *tddiv*

10.4 UHF Radio Engineering Activities

10.4.1 The Intermodulation Calculation and Analysis Program

Using this program, you can calculate intermodulation factors for radio systems in the UHF band. You must input data on three screens.

The fast-path code for this program is *intermod*

10.4.2 The Co-Channel Interference Calculation Program

Using this program, you can determine if there is potential interference between two UHF stations. You must input data on one screen.

The fast-path code for this program is *cochin*

10.4.3 The Height Above Average Terrain Program

Using this program, you can calculate the average height above the terrain for a distance of ten miles from a radio station along either a single inputted azimuth value or eight radials that are spaced 45 degrees apart and start at zero degrees azimuth (that is, due North). If the radio station's transmitting frequency is in the 152- to 158-MHz band, the 470- to 512-MHz band or the 929- to 932-MHz band, then the reduced effective radiated power (erp) will also be calculated. This is only done when the antenna height exceeds 500 feet and you select the eight radial option. This program uses the regional 30-second data base as input. You must input data on one screen.

The fast-path code for this program is *uhfhaat*

11. Reports, Graphics, and General Communications

11.1 The Reports Activities Program

Using this program, you can produce and manipulate a variety of reports. The Reports Activities run in a subspace of the ARC workspace.

The fast-path code for this program is *RptAct*

11.2 The Graphics Activities Program

Using this program, you can access Path Profiles, use the Plotpath task set (see next section), define plotter port files, and plot the output from MRSELS-II graphic and plotting programs. You can also use it to define a graphics port and plot the output to a graphics printer.

The fast-path code for this program is *PltAct*

The plotting activities run in a subspace of the ARC workspace. The Appendix B tutorial gives you detailed instructions on how to use them.

11.3 The PLOTPATH Task Set

This task set allows you to determine if there are clearance problems for either proposed or existing radio paths. You can use either the 30-Second Terrain data file or 3-Second Terrain data base as input.

The plot of the clearance study is displayed on your monitor. You can either redo the study by changing the data or inputting new data. You also have the option of producing terrain profile data sets as an output. The interference studies can be plotted on either your graphics printer or a plotter attached to your workstation.

Appendix B is a tutorial explaining how to use the PLOTPATH task set.

11.4 The General Communications Program

This program allows you to interface your PC with nonintegrated workstation communications software.

The fast-path code for this program is *gencom*

When you select this option from the ARC Workstation Main Menu,* a screen appears that contains the default values for the communications program to be executed and a script file, if appropriate. You can create or change the default values by using the command *updgncom*.

NOTE: Because you can use whatever general communications program you want, and because the general communications program is not part of the workstation, we do not recommend or include any specific program. Both the *gencom* and *updgncom* commands can be used from anywhere in the workstation.

* If you don't know how to select an item from a menu, see Section 3.2

Appendix A — How to Do a Transhorizon Loss (OHLOSS) Study

A.1 Introduction

This tutorial tells you how to do a transhorizon loss study on the ARC Workstation. The study is done completely at your workstation. You may wish to read through the *ARC Workstation Self-Paced Training Guide*, BR 940-400-002, Issue 1^[4], to be published in 1992, before proceeding with this tutorial. That guide provides "hands-on" exercises and provides all necessary input data.

A.2 Tutorial Outline

Using a sample problem and sample screens, this tutorial takes you step by step through the following activities:

- Creating a terrain profile input dataset for the transhorizon program
- Executing the transhorizon program
- Managing various files created during a transhorizon study.

A.3 The Sample Problem

You have proposed that an 11-GHz route between the existing Carew Tower, Ohio location and a new location in Florence, Kentucky be built. As part of the required study, you must know what the transhorizon loss is for the proposed path. Figure A-1 contains the data you'll need for this tutorial.

A.4 Solution Synopsis

To do this task, you must first execute one of the Terrain Profile programs (either the 3sterp program or the 3OSPED program). Next, you execute the Transhorizon Loss program (currently the OHLOSS86 program). If you are satisfied with the results, you can terminate the study, print the results, or build a print file and continue with another run by altering the input.

A.5 Before You Begin

Before you begin this tutorial, you should know how to log on to the ARC Workstation. If you don't, see Section 2.3.

Also, this sample problem is solved using the regional 30-second data base for the Ameritech Company. To do a transhorizon study, you must have a copy of the 30-second data base for your region.

A.6 Step-By-Step Instructions

Step 1 - Log On

Log on to your ARC Workstation.

Step 2 - Select the Activity You Want

The ARC Main Menu should appear after you have logged on to your workstation (Figure A-2). Select the Radio Engineering Activities option (use the gray <+> key to move the prompter bar to the activity) and press <Enter>.

Step 3 - Create the OHLOSS File

If you haven't previously created an OHLOSS file, you must create one. To create an OHLOSS file

1. Press <F1> to activate the ARC Workstation finder (Figure A-3).
2. In the left panel, move the selector bar to the Microwave Radio Tasks I option using the cursor up <↑> and cursor down <↓> keys. The ARC function selector menu displays (Figure A-4).
3. Use the cursor right <→> key to move the selector bar to the center panel.
4. Move the selector bar down to the 30-Second Data Base Program.
5. Move the selector bar to the right panel and highlight the function that reads "Create Ohloss File" and press <Enter>.
6. An OHLOSS file creation screen appears asking you to provide a name of up to 35 alphanumeric characters for the file. Type in the name and press <Enter>.
7. A message appears telling you that an OHLOSS file has been created. You then should be returned to the Radio Engineering Activity menu (Figure A-5).

Step 4 - Populate the OHLOSS File

The OHLOSS file you created in Step 3 contains no data and, as such, is useless. To populate the file with data

1. Select the 30-Second Data Base Program on the Radio Engineering Activity menu (Figure A-5) and press <Enter>.
2. If you have created other OHLOSS files, and they have not been deleted from the ARC Workstation, a list of all existing OHLOSS files appears and you must choose the one you wish to use (Figure A-6).
3. Select the file you created in Step 3 and the command "Select this item". Press <Enter> and the 30SPED copyright screen appears. You can get past this screen immediately by pressing <Enter> or just wait eight seconds for the screen to automatically disappear.

A window appears and prompts you to provide data about the two locations of interest or a single location with the distance and azimuth of the second site from the first site (Figure A-7).

4. Choose high, medium, or low resolution. The resolution is used to space out the terrain points. High resolution yields terrain points 0.1 miles apart, and low resolution yields terrain points 0.5 miles apart.

After you have provided the appropriate data (Figure A-1), press <Enter>.

5. The 30SPED program begins to execute. During execution you are prompted for the 30-second data base disks. The 30SPED program uses the same floppy disk drive as the workstation's Briefcase drive (see Section 5.1).

When the program is completed you have the input you need for executing the Transhorizon Loss program.

Step 5 - Execute the OHLOSS Program

1. Select the Transhorizon Program option on the Radio Engineering Activity menu and press <Enter>.
2. The copyright screen appears. You can proceed by pressing <Enter> or waiting for the screen to automatically disappear.
3. A list of the existing OHLOSS files appears. You can either select a file or terminate the process (Figure A-8). If you select a file, a window appears asking you to input values for the following:
 - Surface refractivity
 - Frequency in MHz
 - The climate indicator (either *c* for continental or *m* for maritime)
 - The source of the input data (this field is optional) (Figure A-9).
4. The program digests your input data and produces a report that automatically appears on your monitor. When you have finished looking at the report, press <Esc>.
5. A window appears asking what you want to do with the input and output data (Figure A-10). You have the following choices:
 - **P** = print the current output report
 - **F** = print the final output report (this report is the accumulation of several runs)
 - **A** = append the current output to a file for printing later (usually via the F option)

- **M** = change the current input and rerun the program (this allows you to change the input parameters displayed in Figure A-9 and is normally used with the A and F options)
- **S** = start over the previous input parameters (Figure A-9)
- **Q** = quit and return to the Radio Engineering Activity menu (the input and output files are deleted, but not the OHLOSS files).

Step 6 - Managing OHLOSS Files (Optional)

Over a period of time you will notice that the list of OHLOSS files has grown and you really would like to do some workstation cleanup by deleting unwanted OHLOSS files. To simplify this task

1. Press **<F1>** (you can be at any of the ARC Workstation menus). The ARC Workstation finder should appear (Figure A-3). Choose the appropriate task. The ARC function selector menu appears (Figure A-4).
2. Move the finder to locate and highlight the option in the right panel that says "Display OHLOSS Files". Press **<Enter>**.
3. You should see a list of OHLOSS files. To delete one of these files, highlight (mark) it by moving the selector bar to that file and pressing **<F7>**.
4. Continue highlighting all the files you want to delete.
5. When you're finished marking the files, type the command *delete* and press **<Enter>**. The marked files are all transferred to the workstation wastebasket.
6. To empty the wastebasket, press **<Alt> + <W>**. The contents of the wastebasket are displayed.
7. To delete the files from the wastebasket, mark them, type *delete*, and press **<Enter>**. A message appears warning you that files are about to be erased and asking you if you want to continue.
8. If you wish to continue, type a *y* and press **<Enter>**. The files are shredded (erased).

Otherwise, just press **<Enter>**, which means "no".

You can recover files from the wastebasket before they are shredded by using the Common Operations commands (in the box on the right side of a workspace screen) to file them or move them back to the workstation desktop.

Site A: Carew Tower, OH

Location - Latitude: 38 06" 02'
Longitude: 84 30" 50'
Antenna C/L Height: 587 ft.
Elevation: 554 ft.

Site B: Florence, KY

Location - Latitude: 39 00" 08'
Longitude: 84 37" 44'
Antenna C/L Height: 73 ft.
Elevation: 934 ft.

Figure A-1. Problem Data

ARC Workstation Menus

Saturday 11 Apr 92 6:47pm

Selection Functions  marked M2Act

*** END OF INDEX **

| |
|---|
| 1 of 1: Commands |
| Advanced Radio Coordination Main Menu |
| MRSELS-II Activities (M2Act) |
| PCN/PN Activities (PCNAct) |
| Radio Engineering Activities (REAct) |
| Reports Activities (RptAct) |
| Graphics & Plotting Activities (PltAct) |
| General Communications (gencom) |
| Quit and Return to DOS (QTDOS) |

Figure A-2. ARC Workstation Main Menu

ARC Workstation Menus
ARCWS FINDER

Wednesday 1 Apr 92 11:10 pm

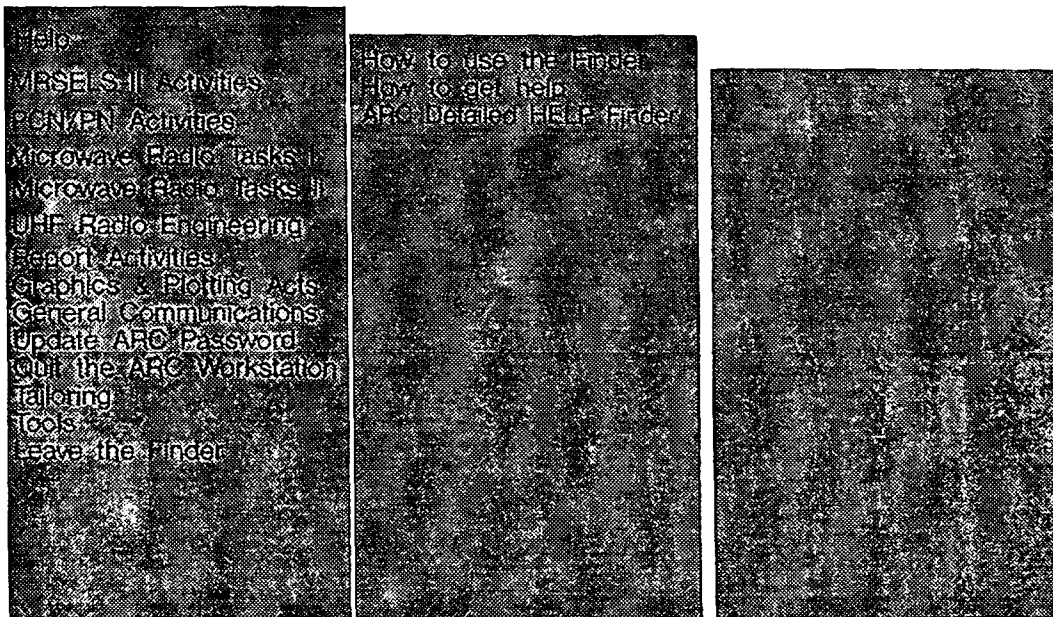


Figure A-3. ARC Workstation Finder

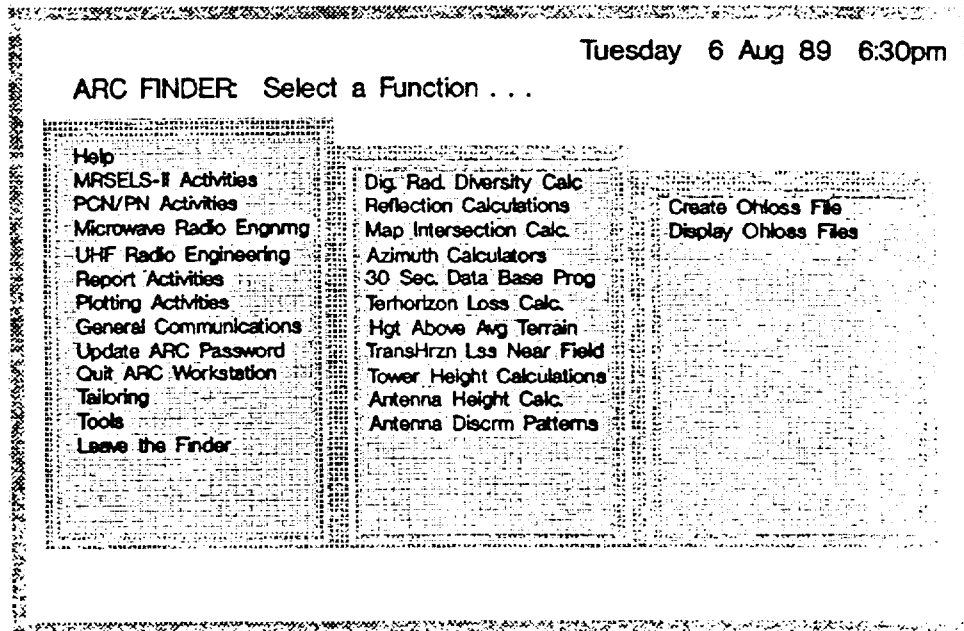


Figure A-4. Creating an OHLOSS File

ARC Workstation Menus Tuesday 6 Aug 89 6:30pm

0 items marked drdiv

Selection Functions

*** END OF INDEX ***

1 of 2: Radio Engineering Activity Menu

Microwave Radio Engineering Activities

| | |
|---|-----------|
| Digital Radio Diversity Analysis | (DrDiv) |
| Reflection Calculation and Analysis | (Reflet) |
| Map Intersection Calculation | (MapInt) |
| Azimuth Calculations | (AZIMUTH) |
| 3D Second Data Base Program | (3Dsped) |
| Transhorizon Program | (ohloss) |
| Height Above Average Terrain | (haat) |
| Transhorizon Loss-Near Field Calcs. | (shield) |
| Tower Height Calculations | (towrht) |
| Antenna Height Calculations | (ratop) |
| Return to ARC Workstation Main Menu (xitit) | |

Figure A-5. Radio Engineering Activity Menu

| ARC Workstation Menu | | Tuesday 6 Aug 89 6:30pm | | |
|------------------------|-------------|----------------------------|----------|---------|
| Select an OHLOSS file | | | | |
| Select the OHLOSS file | | Tuesday 6 Aug 89 6:30pm | | |
| 4 items | | SElect | | |
| # | Type | Name | Location | File In |
| 1. | OHLOSS file | test of pc terrain profile | Desktop | |
| 2. | OHLOSS file | test of the upload | Desktop | |
| 3. | OHLOSS file | Test OHLOSS file | 30SPED | |
| 4. | OHLOSS file | Manage file | 30SPED | |

1 of 2 Select

Select this item

Return Without
Selecting

Figure A-6. List of Existing OHLOSS Files

Select an OHLOSS file Tuesday 6 Aug 89 6:30pm

Enter data for 30SPED

| Disk Drive for Data Base: | | Resolution (H, M, L) | |
|---------------------------|--|--|--|
| Station A | | Station B | |
| Name | <input type="text"/> | <input type="text"/> | |
| Latitude | <input type="text"/> ° <input type="text"/> ' <input type="text"/> " | <input type="text"/> ° <input type="text"/> ' <input type="text"/> " | |
| Longitude | <input type="text"/> ° <input type="text"/> ' <input type="text"/> " | <input type="text"/> ° <input type="text"/> ' <input type="text"/> " | |
| Center Line | <input type="text"/> ft | <input type="text"/> ft | |
| Elevation | <input type="text"/> ft | <input type="text"/> ft | |

Instead of STATION B
Latitude and Longitude,
you may choose to enter ...

Azimuth (0° - 360 °) ° ' "

Distance . Miles

Press to continue, ESC to to quit

Figure A-7. Site Parameters

ARC Workstation Menu Tuesday 6 Aug 89 6:30pm

Select an OHLOSS file

Select the OHLOSS file Tuesday 6 Aug 89 6:30pm

4 Items SELECT

| # | Type | Name | Location | File In |
|----|-------------|----------------------------|----------|---------|
| 1. | OHLOSS file | test of pc terrain profile | Desktop | |
| 2. | OHLOSS file | test of the upload | Desktop | |
| 3. | OHLOSS file | Test OHLOSS file | 30SPED | |
| 4. | OHLOSS file | Manage file | 30SPED | |

1 of 2 Select

Select this item

Return Without Selecting

Figure A-8. Executing OHLOSS with the Selected File

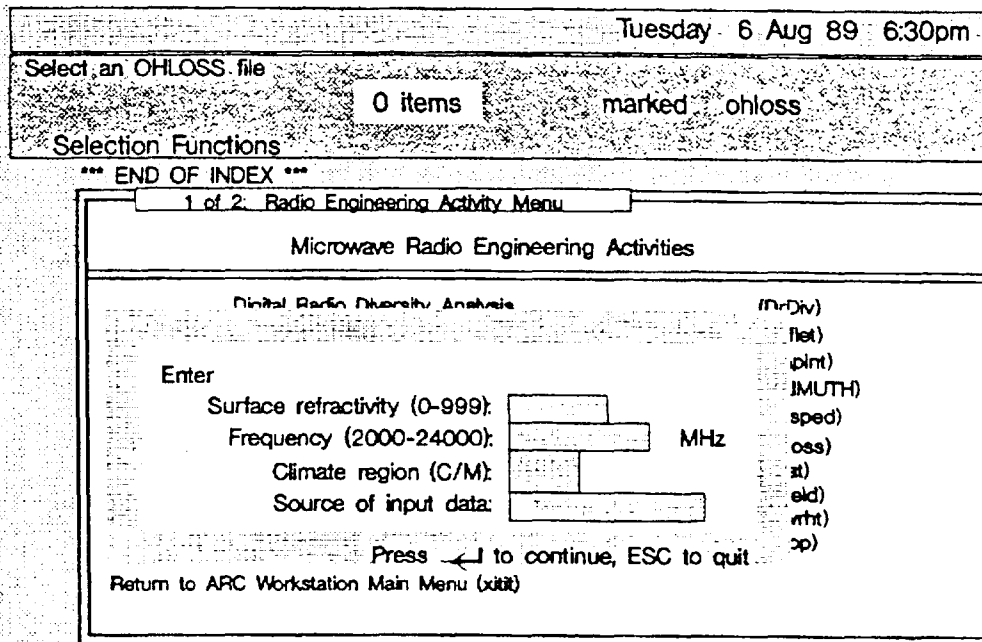


Figure A-9. Study Parameters Input

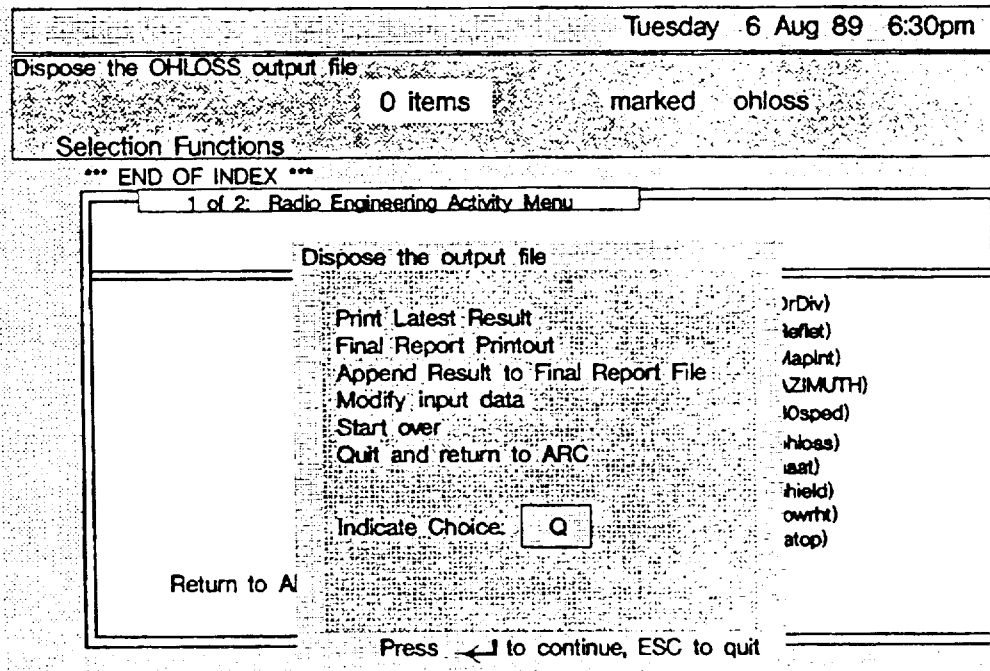


Figure A-10. Disposition of Program Status

Appendix B — How to Use the PLOTPATH Task Set

B.1 Introduction

This tutorial helps you learn how to use the PLOTPATH task set. The PLOTPATH task set is part of the Graphics and Plotting Activities of the ARC Workstation. The PLOTPATH task set allows you to do interference studies and, if required, calculate transhorizon loss. You can use the PLOTPATH task set from your PC.

We assume that you will either do the example problem used in the tutorial or you will pick a problem suitable for your area of the country. We also assume that you have installed this task set on an ARC Workstation that is at least Release 2.5, and you have at hand at least Bellcore's floppy disk version of the 30-Second Data File. If you have installed the Workstation for Advanced Radio Engineering (WARE) Release 1.0 as part of your ARC Workstation, you can use Bellcore's 3-Second Database.

B.2 Tutorial Outline

The tutorial covers the following topics:

- How to create a path profile (interference) study
- How to regenerate a path profile study
- The various optimal outputs from a path profile study
- Other programs that can be optionally executed.

B.3 The Sample Problem

You are studying the possibility of building a 6-GHz path between your existing Carew Tower facility in Cincinnati, OH and a site in Florence, KY. As part of this engineering study, you need to determine if there are any potential interference problems. Figure B-1 contains the detailed data for this problem.

B.4 Solution Synopsis

To do this task, you need to at least execute the PLOTPATH task set. As part of the output, you can generate terrain-profile data sets. These data sets can be used as input to the transhorizon loss analysis program or the path analysis program.

B.5 Before You Begin

Before you begin this tutorial, you must know how to log on to the ARC Workstation and have properly installed the PLOTPATH task set. If you don't know how to log on, read Section 2.3. If you haven't installed the PLOTPATH task set, refer to the *ARC Workstation Installation Guide* (SP-NWT-000093, Issue 3, March 1992) for the necessary briefcases and instructions.

B.6 Logging On

Log onto your ARC Workstation, then select the Graphics and Plotting Activities on the Main Menu and press *<Enter>*.

B.7 Creating a Path Profile

The "path profile" is the file type where the output of a PLOTPATH run is saved. So before you run PLOTPATH, you must first create a path profile. To do so, follow these steps:

1. Type *c path profile* and press *<Enter>*.
2. When the "Create New Item" screen appears, type in an appropriate name (up to 35 characters); for example, *Carew Tower to Florence, KY-Study 1*.
3. You can press *<Tab>* to get to the comments field and type up to four 35-character lines of additional information (this is optional).
4. Press *<Enter>* and a new path profile named "Carew Tower to Florence, KY-Study 1" has been created.
5. Move the selector bar to the new path profile, or simply press the *<End>* key and the selector bar will move to it.

NOTE: To skip over a field, use the *<Tab>* key. If a field is completely filled, the cursor automatically moves to the next field. To move the cursor to the next field from a partially filled field, use the *<Tab>* key.

B.8 Making Sure You Have a Terrain Profile Available

The PLOTPATH program requires as input **either**

- A terrain data base (either the 3-Second Terrain Database or the 30-Second Terrain Data File) **or**
- A pregenerated terrain profile (the terrain profile can be either an OHLOSS file or an external DOS file).

In this tutorial, we'll use a pregenerated OHLOSS file. If you're not sure how to generate an OHLOSS file, read through Appendix A - How to Do a Transhorizon Loss (OHLOSS) Study.

If you don't have an OHLOSS file generated for this PLOTPATH tutorial, generate the OHLOSS file now. Once you've generated the OHLOSS file, start at this point in this tutorial.

B.9 Running PLOTPATH

To run PLOTPATH, follow these steps:

1. Type the command *plotpath* and press *<Enter>*.

2. The Copyright Notice appears and it should read "PLOTPATH Command Version 2.0." To go to the next screen, either press <Enter> or wait eight seconds.
3. The "PLOTPATH Information Screen" appears with a brief explanation of what will follow and what you must input. Press <Enter> to continue.

Terrain Profile Input

The "Terrain Profile Input Source" screen appears. This screen is used to input the source of the terrain profile. Note that there are four options. Also, you can write the terrain profile used by PLOTPATH as a DOS file if you use Option 1 or 2.

1. Using the <Tab> key, move the cursor to the Option 3 field.
2. Type *y* and press <Enter>.
3. Now you must select an OHLOSS file. Move the selector bar to the appropriate file and press <Enter>.

Station Data Input

The "PLOTPATH Station Data Input" screen now appears. You must fill in all the fields on this screen.

1. Note that "Units" is defaulted to an "F" so press <Tab> to move to the next field.
2. Type *H* in this field.
3. For Station A, type *Carew Tower*.
4. For Station A's latitude and longitude, use the data from Figure B-1.
5. For Station A's Antenna Center Line, use *587*. Press <Tab>.
6. Station A's Elevation field is prefilled with *-9999*. This number tells the program to calculate the elevation using the data from the 3-Second or 30-Second Terrain data bases. However, use the elevation value in Figure B-1 (554 feet).
7. Because the elevation field is not completely full, use your space bar to blank out the remaining two 9s.
8. Now use Figure B-1 to fill in the data for Station B. When you're finished, you should be on the Frequency field. Remember to blank out the remaining 9s in the elevation field.
9. Now type *2.0* and press <Enter>.

The K-Factors - Fresnel Zone Input

The next screen to appear is the "PLOTPATH K-Factor - Fresnel Zone Data Input" screen. You MUST input a value for the first K factor and Fresnel zone. For this tutorial, we use the following: $K = 4/3$ and $Fresnel = 1.0$.

1. In the first field, type *1.333*.
2. In the second field, type *1.0*.
3. Press *<Enter>*.

PLOTPATH Comments Input

The "PLOTPATH Comments Input" screen that now appears is an optional screen. You can enter up to seven comments on a plot. Comments 1 to 4 appear on the left side of the picture, and comments 5 to 7 appear on the right side. Each comment holds up to 25 alphanumeric characters. Type some comments into each field and then press *<Enter>*.

Obstruction Data Input

This screen allows you to enter up to 10 obstructions along the terrain profile. The starting point of the obstruction we're using for this tutorial is in miles (or kilometers) from Station A.

1. Type *t* for trees.
2. Type a start distance of *1.0* and press *<Tab>* to go to the End Distance field.
3. Type an end distance of *3.0* and press *<Tab>* to go to the Height field.
4. Type *40* to create a forest of 40-foot high trees that is two miles long. Press *<Tab>* to go to the next line.
5. Type *b* for building.
6. Type a start distance of *3.75* and press *<Tab>* to go to the next field.
7. Type an end distance of *3.8* and press *<Tab>* to go to the next field.
8. Type a height of *70* and press *<Enter>*.

The PLOTPATH output is now displayed to your screen. Press any key to end the display and automatically return to the previous screen and the Program Disposition screen.

Program Disposition Screen

You'll see a list of the following three options:

- **Modify** input and rerun
- **Start over** with new data
- **Quit** PLOTPATH and return to ARC.

The default choice is **Q**, so if you just press *<Enter>*, you'll return to ARC. (For all choices, after eight seconds the screen disappears and whatever you chose is acted upon.)

B.10 Plotting

We can now plot the path profile to either a graphics printer or a plotter. These must be attached to your PC.

NOTE: An example of a completed path profile named "Acropolis to Halandri" has been included with the PLOTPATH task set.

To draw an existing path profile, you can use either the Drawpath or Display command. For this tutorial, we'll use the Display command.

1. Move the selector bar to the path profile named "Acropolis to Halandri".
2. Type *d* and press <Enter>.
3. A Copyright screen appears that displays the statement "Drawpath Command Version 2.0." Press <Enter> to continue.
4. The "Drawpath Information" screen appears. It briefly explains the three options available to you. Note that for Option 2, *Display and Print*, you can scale the size of the plot. Values larger than 1.0 make it larger than the size of the paper. Press <Enter> to continue.
5. For this tutorial, we only want to display the path profile, so enter *X* in Option 1 and press <Enter>. The path profile should display on your screen.
6. When the "Program Disposition" screen appears, press <Enter>.

A Note About Printers

The available printer drivers are for the Epson, IBM Proprinter, and IBM Proprinter XL. If you have some other manufacturer's printer that looks like one of these three printers, you may have to "play" with the printer to see how it plots. If you can attach to an HP LaserJet,® printer, the plots produced by PLOTPATH are of very good quality.

Four plots (Figures B-2 through B-5) have been included as examples of PLOTPATH outputs. Each figure was generated using one of the four terrain input options. Figure B-2 was generated using an external DOS terrain file. Figure B-3 was generated using the 30-Second Data File. Figure B-4 was generated using an OHLOSS file. And Figure B-5 was generated from the 3-Second Terrain Database (it also shows the x-axis resolution for very short paths).

LaserJet is a registered trademark of Hewlett-Packard Corporation.

B.11 Terrain Profile Importation (optional)

To use the optional terrain profile outputs as input to the Transhorizon Program, they must be imported into the workstation. Press <F1> to activate the Finder.

1. Move down to the Microwave Radio Engineering activity and then right to Display OHLOSS Files.
2. Press <Enter>.
3. A list of OHLOSS files is shown. To import a terrain profile, type the command *import* and press <Enter>.
4. A window appears asking you if the import is to the currently selected item (s) or to a new item (n). Type an *n* and press <Enter>.
5. A window appears asking you what you want to create. Respond by typing *ohloss file* and press <Enter>.
6. A data entry screen appears asking you to name the file; for example, *Carew to Florence #1*. After typing up to 35 characters, press <Enter>.
7. A window appears asking for the location and name of the file you want to import; for example, *c:\terr1.dat*.
8. Press <Enter> to import the file.
9. To input the second terrain profile, repeat steps 1 to 8 of this section.

B.12 Transhorizon Loss Study (optional)

To study transhorizon loss, see Appendix A.

Site A: Carew Tower, OH

Location - Latitude: 38 06" 02'

Longitude: 84 30" 50'

Antenna C/L Height: 587 ft.

Elevation: 554 ft.

Site B: Florence, KY

Location - Latitude: 39 00" 08'

Longitude: 84 37" 44'

Antenna C/L Height: 73 ft.

Elevation: 934 ft.

Figure B-1. Problem Data

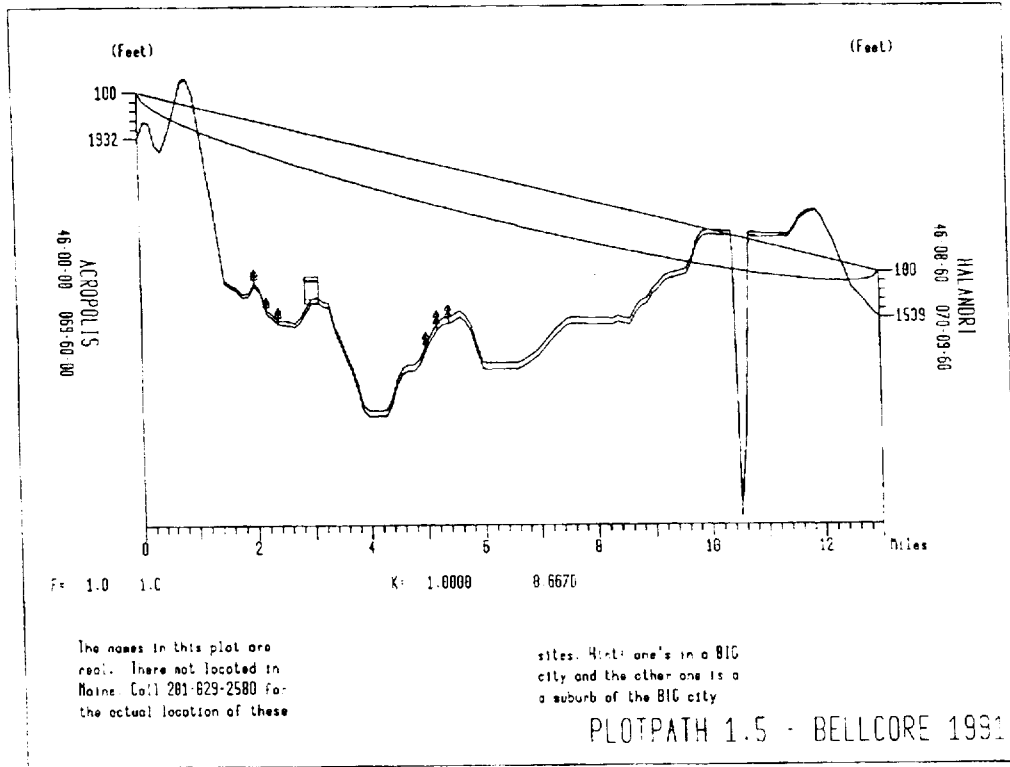


Figure B-2. Plot Using an External DOS Terrain File

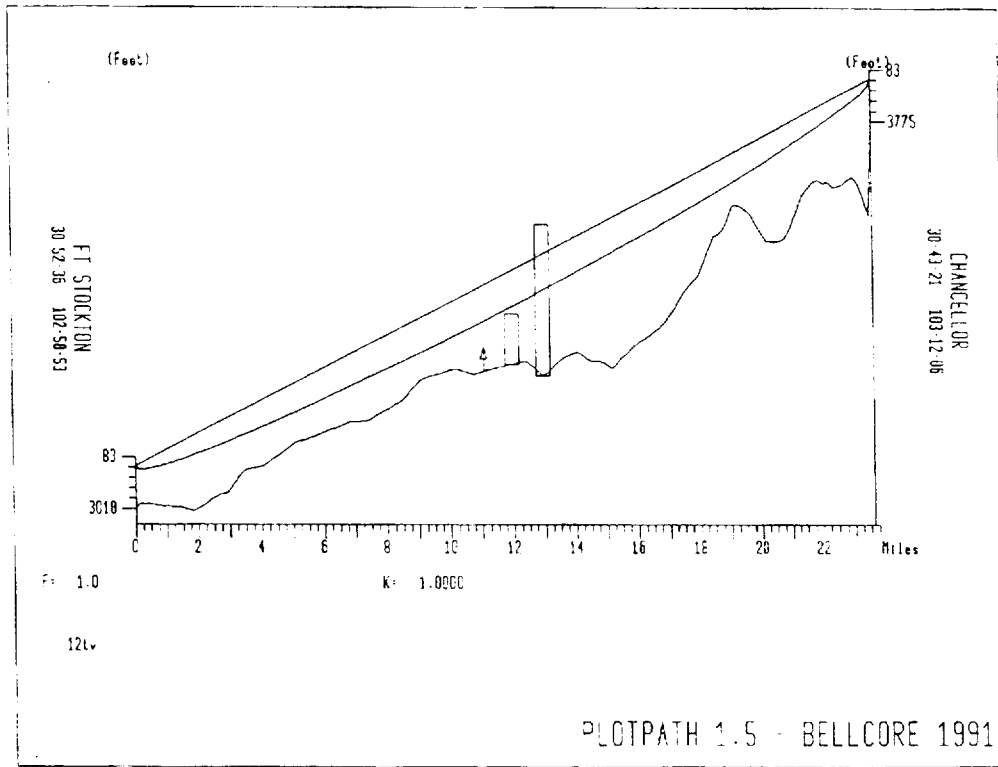


Figure B-3. Plot Using the 30-Second Data File

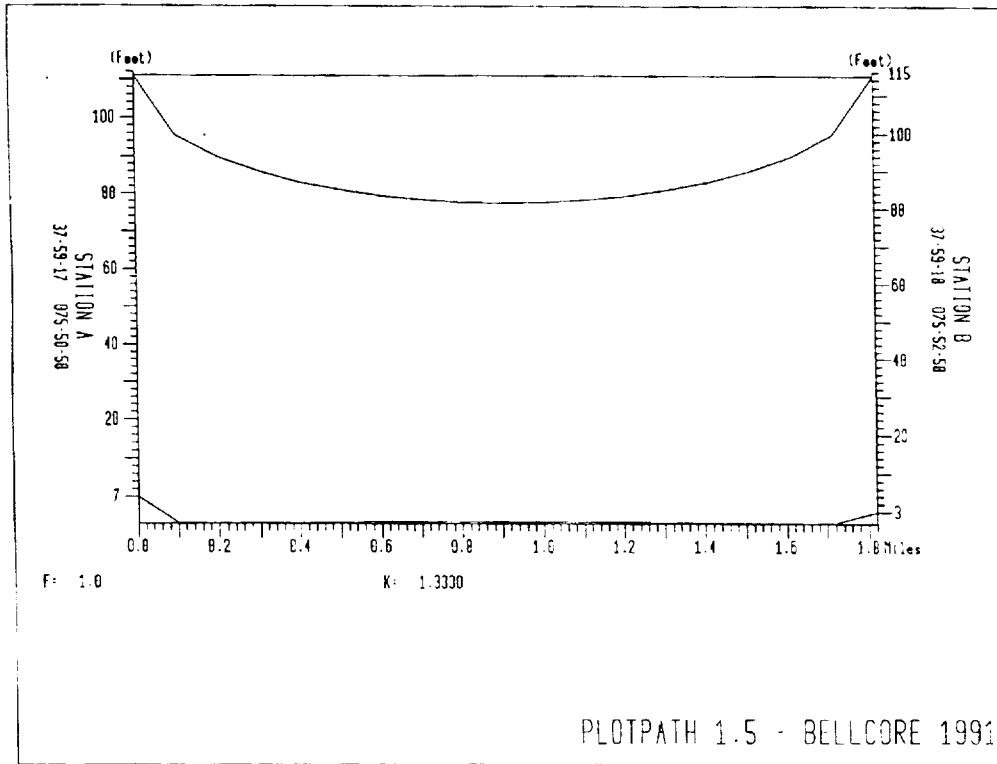


Figure B-4. Plot Using an OHLOSS File

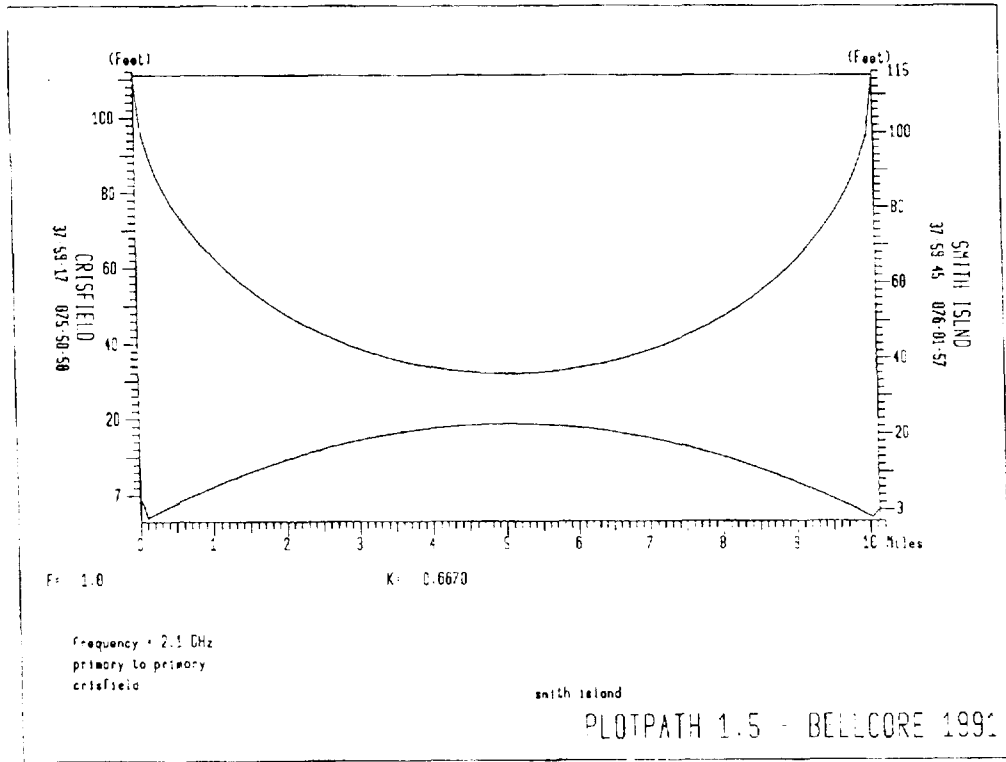


Figure B-5. Plot Using the 3-Second Terrain Database

Appendix C — An Introduction to the PCN Log Activities

C.1 Introduction

This tutorial shows you how to do various PCN Log activities. To get the maximum benefit from this tutorial, you should log onto the ARC Workstation and work through the examples.

C.2 Tutorial Outline

Using a sample problem and sample screens, this tutorial takes you step by step through the following activities:

- Adding a new PCN Log entry
- Editing an existing PCN Log entry
- Accessing the PCN Log reports
- Using the various maintenance activities.

C.3 The Sample Problem

You have received a Prior Coordination Notice (PCN) for a proposed 18-GHz route. The route is from Orono, ME to Black Cap Mountain, ME, and from Farmington, ME to York Hill, ME. Figures C-1 and C-2 contain the detailed PCN information and are used as the example for the first three topics of this tutorial.

C.4 Getting Started

To begin this tutorial, log onto the ARC Workstation. (If you don't know how to log on, see Section 2.3.)

After you log on, select the PCN Activities option on the ARC Workstation Main Menu and press *<Enter>*.

C.5 How to Add a New PCN Log Entry

1. Select Option A on the main PCN/PN Activity Screen by pressing *<A>* (see Figure C-3).
2. Select Option N on the PCN Log File Access Mode Menu by pressing *<N>*. A blank PCN mask should appear and the *Date PCN Received* field should be filled in with the current date. If the date is incorrect, overwrite it.

The cursor should be in the first field (*Frequency Coord. Company Code*).

3. Do not fill in any data in the first field. Press *<Enter>* to move to the next field.

In the PCN Log/Reference Code field, type in what your company uses as its convention. In this example, you can use TE8905801. Notice that the example code value fills the field and the cursor moves to the next field.

(See Figure C-1 for the sample PCN data).

4. The PCN was issued on 2/24/89, so type *02 24 89*. Obviously, the PCN would have been received a few days after its issue date. So type a date of *02 27 89* in the DATE PCN Received field.
5. The owner of this proposed path is Maine Public Broadcasting. Because no FCC Owner Code is given on the PCN, skip the *FCC Owner Code* field by pressing *<Enter>*. (Enter moves you forward only.)
6. In the *Owner or Licensee Name* field, type in the owner's name: *Maine Public Broadcasting*.
7. The PCN Path or Route Description is usually provided in a cover letter to which the PCN is attached. However, in this example the route description is in the Problem Synopsis section. Type *Orono, ME - Blk Cap Mtn, ME*.
8. Because this is a new PCN, skip the *PCN Modification Code* and *Date of Prior PCN* fields to get to the *Date Reply Required* field. Type *03/24/89*. Usually you have 30 days to respond to a PCN.
9. Skip the next two fields because these are filled in after the PCN has been studied.
10. The Remarks field is optional. If you wish, you can type in some remarks. Otherwise, skip this field.
11. Enter the Station Name (use *ORONO*). If there is more than one station located at *ORONO* on this PCN, the stations must be uniquely identified (for example, *ORONO1*, *ORONO2*, etc.). The station name is used as a key when accessing the PCN Log data base and thus must be unique within a PCN.
12. Skip the *Call Sign* field (because this is a proposed path) and type the code *TE* in the *T/E Station* field. This identifies the station as a terrestrial station rather than an Earth Station (ES).
13. Enter the exact transmit frequencies or 18 GHz.
14. Enter the latitude and longitude of the Orono station (see Figure C-1 for the values). After you enter the longitude, press *<Enter>*. Notice that a single character window appears to the right of the word Edit on the bottom line.
15. After you press *<Enter>* and the window is opened, the record is both syntactically and cross-field-checked for errors. If an error has been made, the program won't open the window but instead displays a message in the upper left corner of the screen to alert you to the error. It also positions the cursor in the field containing the error.

If the record is correct, you have the following choices:

- **M** returns you to the menu
- **S** lets you enter more station data associated with this PCN
- **P** allows you to enter data on a new PCN
- **E** allows you to edit what you see on the screen.

For this example, select Option S and add the station data for Black Cap Mountain. Then select Option M. You should be on a PCN menu screen.

C.6 How to Edit an Existing PCN Log Entry

This section discusses both editing an existing PCN Log entry to add another path and editing only existing information.

Adding a New Path to an Existing PCN Log Entry

You may have noticed that the sample PCN contained two paths and in the previous section we only entered the first path. To add another path, select the New Data option by pressing <N>.

1. Move the cursor to the PCN Log/Reference Code field and enter the value of the PCN entry you want to add the path to (the value is TE8905801).
2. Repeatedly press <Enter> until the PCN data and the message "Fill in the STATION Identification" both appear. (Note that the PCN received date will reflect the current date, not the actual date received.)
3. Referring to Figure C-2, enter the appropriate station data for both the Farmington, ME and York Hill, ME stations.
4. After entering the York Hill station data, select Option M, which takes you to a PCN menu screen.

Editing an Existing PCN Log Entry

In the previous task, you entered data on a new path to an existing PCN record. Notice that you did not add the path description in the *PCN Path* field.

1. On the PCN menu, select Option B (the Log Reference Code) as the access key to the log by pressing . Observe that the cursor is positioned in the second field.

If you need help on what reference codes are currently in the log, enter a question mark (?) and press <Enter>. A complete list of PCN Log Reference Codes and their corresponding owners will appear.
2. Press any key to return to the mask screen.
3. Enter the reference code value *TE8905801* and press <Enter>. The screen should contain both the PCN data and the data about the first associated station.

4. The cursor is in the lower right-hand corner. Select Option E (Edit). The cursor moves to the beginning of the first field.
5. Use *<Cursor Down>* to move forward from field to field until the cursor is at the beginning of the *PCN PATH...* field.
6. Press *<End>* and the cursor moves one character past the end of the existing data in that field.
7. Enter the description of the second path as *Farmington, ME - York Hill, ME*.
8. Press *<Esc>*. The cursor returns to the bottom line and the "E" disappears.
9. Press *<M>* to return to the Select Access Mode To The PCN Log File menu screen and select the "Q" (Quit) option. You should be returned to the PCN Log's Main Menu.

C.7 Accessing PCN Log Reports

Select the Reports on PCN Log File option by pressing *<H>*. You should be viewing the Reports on PCN Information menu screen.

You have the following options:

- Options A through F and Option J provide access to detailed reports on individual PCNs.
- Option G provides a summary report on pending PCNs.
- Option H provides a summary report on all PCNs.
- Option P allows you to select the appropriate printer. The type of printer that the program thinks it is interfacing with is displayed at the center bottom of the screen.

Individual PCN Log Entry Detailed Reports

Options A through F and Option J provide detailed reports on individual PCNs. Options A through F access the PCN Log by using a single key value (for example, Option B uses the PCN Log Reference Code as its key to access the log). Option J allows you to access the log by using either the FCC Owner Code and PCN Issue Date or the Owner's Name and PCN Issue Date as the access keys to the log.

To see what a detailed report looks like, work through the following example that uses Option B as the access key to the log.

1. Select Option B, PCN/Log Reference Code, by pressing **. A screen should appear titled "SELECTING PCN BY REFERENCE CODE", and the very bottom line of the screen should read "PCN/LOG REFERENCE CODE". The cursor is in a blank field that is nine characters wide.

If you need help on what reference codes are in the log, type a question mark (?) and press *<Enter>*. A list of all the reference codes should appear. If the list is longer than the screen, use *<Cursor Up/Down>* to move through the list.

2. Enter the reference code value *TE8905801* and press *<Enter>*. A detailed report on the PCN associated with that reference number will print, and the program returns you to the "Reports on PCN Information" screen.

For practice, you should try printing the individual reports by using some of the other access methods.

Pending PCN Log Summary Report

This summary report is date-sensitive and provides a summary report of all PCNs that are due (or past due) by the selected date. This report can be displayed to the screen or printed. The media options are exclusive of each other. That is, you can select the printer or the display, but not both simultaneously.

1. Select Option G, Summary on Pending PCN Log, by pressing *<G>*.
2. The "SUMMARY ON PENDING PCN" screen appears with the default value of the current date. You can overwrite this date with any date you want.
3. Press *<Enter>* and the number of PCNs that are either due or past due appears. You must choose whether you want to Print (P), Display (D), or Quit (Q). (Q means return to the menu screen.)
4. Press *<D>* and the pending summary report appears. This report is wider than 80 columns (wider than your screen). To view the hidden sections of the report use *<Cursor Left/Right>*. Press another key to return to the Reports on PCN Information menu screen.

PCN Log Summary Report

This summary report is also date-sensitive and automatically sets the starting date at 90 days before the current date. However, you can select your own date, and can display or print the report.

1. Select Option H and a "Summary PCN File" screen should appear. The starting date is automatically set to 90 days in the past. If this date is suitable, press *<Enter>*. The number of log entries since the starting date appears. You have the option of displaying, printing, or quitting.
2. Choose the display option and all the PCN Log entries since the entered starting date will appear. Use *<Cursor Left/Right>* to move the report from side to side because it is wider than the viewing window.
3. Return to the main PCN Activities menu.

C.8 PCN/PN Log Maintenance Activities

Select Option S on the main PCN Activities menu and the System Maintenance menu should appear. The maintenance activities are as follows:

- Installing color

- Adding new printer characteristics
- Saving the PCN Log to a disk
- Restoring the PCN Log from a disk
- Recovering the log data base after a disaster.

Color Installation

This maintenance option allows you to change the colors of the PCN Log display.

Add New Printer Characteristics

This maintenance option allows you to define the characteristics of a printer that is different from the three printers currently defined for interface with the log application. The three printers currently defined are the IBM color printer; the Epson LX, RX, or FX printer; and the HP ThinkJet printer. These three printer definitions cover a large majority of the available printers.

Saving the PCN Log Database

This option allows you to save the PCN Log data base on floppy disks. Be sure to have plenty of formatted floppy disks before starting this activity.

Restoring the PCN Log from Floppy Disks

The PCN Log can be restored from floppy disks if you saved it using the previous option. The restore program prompts you for the disks.

Recovering/Retyling the Database

This option restores the log indexes if a problem with them occurs.

C.9 Archiving and Unarchiving PCN Logs

An easier and more convenient way to archive (wrap) and unarchive (unwrap) your PCN log is to use the archive (*pcnwrap*) and unarchive (*pcnuwrap*) commands. These commands are accessed either from the Finder (press <F1) or by fast pathing. You don't access these commands from the PCN Log Activities menu.

Using the Archiving Command

There are several good reasons for using the *pcnwrap* command.

- It lets you save a very large PCN Log (up to 1.4 MB) on a 360kB floppy disk. (It prompts you for more disks, if necessary.)
- It provides you with a method of passing the PCN Log among several independent ARC Workstations.
- It allows you to reduce the size of your PCN Log.

You should get in the habit of archiving your PCN Log at least once a week if you are adding entries daily.

To archive (pack) your PCN log

1. Type *pcnwrap* and press <Enter>.
2. A data window appears asking for the destination of the PCN Log. For example, you would type *a:* and press <Enter>. The PCN Log would then be written, in a compressed format, to the floppy disk in drive A.

Using the Unarchive Command

To restore a PCN Log

1. Type *pcnuwrap* and press <Enter>.
2. A data window appears asking for the source of the PCN Log. If your source was disk drive A, you would type *a:* and press <Enter>. The unwrap task looks at the specified location (drive), decompresses the PCN Log, and restores its indexes.

Maine Public Broadcasting

02/27/89

Microwave Path Data

| | | |
|----------------------------|-------------------------------|-----------------|
| Station Name: | Orono, ME | Blk Cap Mtn, ME |
| Path Status | Proposed or Prior Coordinated | |
| Call Sign | | |
| Latitude (D-M-S) | 44 53 57.0 | 44 45 36.0 |
| Longitude (D-M-S) | 68 40 11.0 | 68 33 59.0 |
| Ground Elev (Ft-AMSL) | 400 | 990 |
| Path Azimuth (Deg) | 152.111 | 332.184 |
| Path Distance (Miles) | | 10.869 |
| (KM) | | 17.492 |
| Antenna | | |
| Primary TX | Milliflect | NA |
| | 255-18-6 | |
| FCC Code | MB0930 | |
| Gain (dBi) | 48.2 | |
| C/L (FT-AGL) | 60 | |
| Primary RX | NA | Milliflect |
| | | 255-18-6 |
| FCC Code | | MB0930 |
| Gain (dBi) | | 48.2 |
| C/L (FT-AGL) | | 75 |
| Equipment | Microwave Associates | Receive |
| | BV88U4MA18CC | Only |
| FCC Code | 2Y5302 | |
| Emission | 20MO F8W | |
| Loading | Video | |
| Stability (%) | 0.003000 | |
| Power (DBM) | 19.0 | |
| Receive Level (DBM) | | -27.4 |
| EIRP (DBM) | 67.2 | |
| Fixed Losses (DB) | 0.0 | 0.0 |
| Free Space Loss (DB) | | 142.0 |
| Transmit Frequencies (MHz) | 17710.000V 17790.000H | |

Figure C-1. Example of PCN Detailed Data

Maine Public Broadcasting

02/27/89

Microwave Path Data

| | | |
|----------------------------|-------------------------------|---------------|
| Station Name: | Farmington, ME | York Hill, ME |
| Path Status | Proposed or Prior Coordinated | |
| Call Sign | | |
| Latitude (D-M-S) | 44 40 0.0 | 44 35 48.0 |
| Longitude (D-M-S) | 70 8 56.0 | 69 58 25.0 |
| Ground Elev (Ft-AMSL) | 400 | 1210 |
| Path Azimuth (Deg) | 119.155 | 299.278 |
| Path Distance (Miles) | 9.902 | |
| (KM) | 15.936 | |
| Antenna | | |
| Primary TX | Milliflect | NA |
| | 255-18-6 | |
| FCC Code | MB0930 | |
| Gain (dBi) | 48.2 | |
| C/L (FT-AGL) | 60 | |
| Primary RX | NA | Milliflect |
| | | 255-18-6 |
| FCC Code | | MB0930 |
| Gain (dBi) | | 48.2 |
| C/L (FT-AGL) | | 150 |
| Equipment | Microwave Associates | Receive |
| | BV88U4MA18CC | Only |
| FCC Code | 2Y5302 | |
| Emission | 20MO F8W | |
| Loading | Video | |
| Stability (%) | 0.003000 | |
| Power (DBM) | 19.0 | |
| Receive Level (DBM) | | -26.6 |
| EIRP (DBM) | 67.2 | |
| Fixed Losses (DB) | 0.0 | 0.0 |
| Free Space Loss (DB) | 142.0 | |
| Transmit Frequencies (MHz) | 17710.000V 17790.000H | |

Figure C-2. Example of PCN Detailed Data (continued)

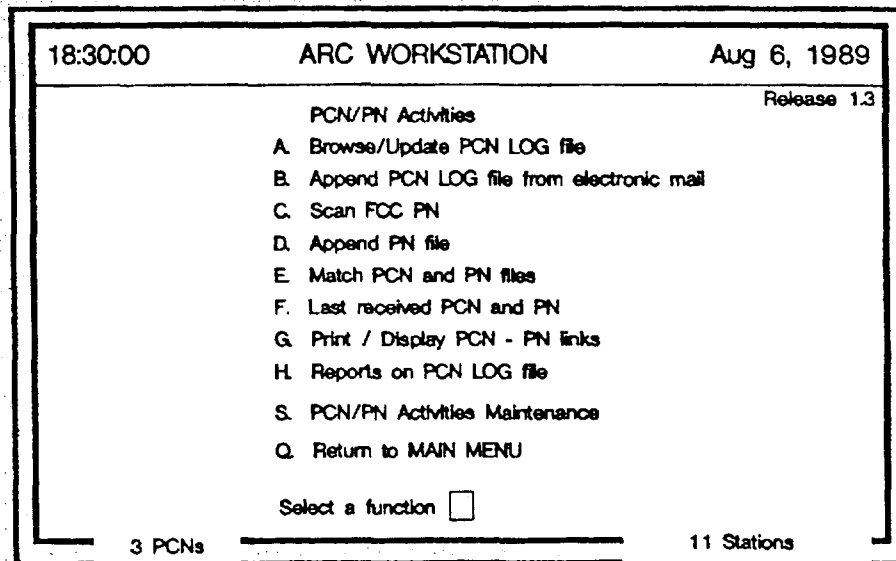


Figure C-3. PCN/PN Activities Screen

Appendix D — How to Use Public Notices with the PCN Log

D.1 Introduction

In conjunction with the PCN Log, Public Notices (PNs) text files contain information about point-to-point microwave radio. This tutorial introduces you to the various PN activities by presenting step-by-step instructions on how to use them.

To get the maximum benefit from this tutorial, you should logon to your ARC Workstation and work through the instructions in each section.

D.2 Tutorial Outline

The tutorial covers the following topics:

- Definition and format of the Public Notice text files
- Viewing and editing the region filter
- Accessing and downloading PNs on MRSELS-II
- Filtering and parsing PNs
- Appending PNs
- Matching PNs and PCNs
- PN- and PCN-related reports.

D.3 The Sample Problem

You want to use the Public Notice text for proposed point-to-point microwave paths to determine if you are missing any critical PCNs.

D.4 Before You Begin

Before you begin this tutorial, you should know how to logon to the ARC Workstation. If you don't, see Section 2.3. You should also have a PCN Log with valid entries, and know how to logon to MRSELS-II. (Appendix C tells you how to add new PCN Log entries and Section 8.2 tells you how to logon to MRSELS-II.)

If you want to store the Public Notice text file(s) on a floppy disk, then have a formatted floppy disk ready before beginning this tutorial. You can format a floppy disk by accessing the "Tools" activity on the ARC Workstation Finder.

D.5 Background Information

Filtering for Errors and Irrelevant Notices

The Public Notices (PNs) used in this tutorial and available on MRSELS-II are for proposed microwave radio paths within the United States, and thus contain notices that are of no interest to some users because their paths are not affected. The PNs have been scanned by an optical scanner that digitizes the data into a format accessible from a

computer terminal. However, this data can contain typographical errors that either existed before it was scanned or were introduced by the scanning process. The PN portion of the PCN/PN Log activities both filters and parses the PNs to remove notices that are not relevant to a particular region, locate syntactic errors, and allow users to correct these errors as required.

Public Notice Text File - Definition

The Public Notice text file as it exists on MRSELS-II consists of some FCC introductory text (called "boiler-plate" text) and a series of PN text records. The PN text records are used in the PCN/PN Activities. The PN text record is analyzed for the following:

- First, the program uses the two-character state code (uppercase) that precedes the text to filter out all unneeded text.
- Then it analyzes the following text for
 - FCC number
 - Company name
 - Station code
 - Location
 - Latitude
 - Longitude
 - Various actions that are in the text
 - Whether it's a reflector
 - Various directions in the text (for example, New York toward Newark)
 - Azimuth.

D.6 How to Use the Region Filter

The region filter excludes all unnecessary PN data and reduces the size of the PN data base used in the PCN Log-matching process. The region filter is usually established when the ARC Workstation is installed and consists of the official United States state postal abbreviations for a particular region. Let's look at the region filter on your ARC Workstation.

1. Press <F2> to activate the File Areas.
2. Press <End> to move the selector bar to the ARC Workstation Objects drawer (the name of this drawer may be different on some workstations).
3. Display the contents of the drawer, which should be many folders.

NOTE: To display the contents of any list item, move the prompter bar to the command "Display," the selector bar to the item to be displayed, and press <Enter>.

4. Move the selector bar to the folder named "PCN Files" and display its contents.
5. Move the selector bar to the item which is a "PCN/PN File" named "States List" and display its contents.

It should contain the states within your region. For example, the NYNEX region consists of CT, MA, ME, NH, NY, RI, and VT.

NOTE: If your region filter doesn't contain the correct set of state codes, you must edit it so it has the correct set.

The following steps tell you how to edit the filter using the "edlin" editor. If your region filter is correct, skip to the next section, *How to Access Public Notices on MRSELS-II*.

- Leaving the selector bar on the PCN/PN File named "States List", move the prompter bar to the Open command, and press <Enter>.
- Edlin displays an End of input file followed by an asterisk (*). At the asterisk, type the letter *L* and press <Enter>.
- A single line numbered 1 should appear. At the asterisk, type the number 1 and press <Enter>.
- The contents of line 1 appear again and immediately below is a line 1 with only an asterisk displayed. On this line, type the state postal abbreviations for your region (they must be separated by either a blank or a comma). Press <Enter>.
- At the asterisk, type the letter *E* (this command ends edlin and saves the file).

D.7 How to Access Public Notices on MRSELS-II

The Public Notices for use with the PCN Log are stored on the MRSELS-II "C" disk. This disk can be accessed from any MRSELS-II ID. The following steps tell you how to access PNs.

1. Log onto MRSELS-II from your ARC Workstation.
2. Type *filel* on the Main Menu and press <Enter>.
3. Press <End>.

4. Type *filel * pubnote c* and press *<Enter>*. A new file screen that lists all the available Public Notice data sets appears.

The PN data sets are named using the following convention "PMMDDYY PUBNOTE". That is, the file name is PMMDDYY and MM is the month, DD is the day, and YY is the year when the FCC issued the Public Notice. For example, P081689 means that this is a Public Notice issued by the FCC on August 16, 1989. And the file type is always PUBNOTE.

5. Type *pc* in the "CMD" column on the line that contains the Public Notices you want to use. You can download several PN data sets by typing = (an equals sign) in the CMD column after you use the *pc* command. The system downloads the data sets to the "I:\REPORTS" directory, assigns them VM data set names, and truncates the data type to the first three characters of "PUBNOTE."

For example, the PN data set on VM is called P081689 PUBNOTE and when it is downloaded it becomes p081689.pub. You can download to a floppy disk by typing either *toa* or *tob* (where *a* means the A drive and *b* means the B drive) instead of *pc*. The names default as described above.

6. After you download to the ARC Workstation all the PN data sets you plan to use, you should log off MRSELS-II and return to the ARC Workstation.

D.8 How to Use PNs with the PCN Log

1. Select the PCN/PN Activities option on the ARC Workstation's Main Menu and press *<Enter>*.
2. You should now be on the PCN/PN Activities menu. Notice that the menu selections that use Public Notices are options C through G. The following list describes these options.

- **Option C: Scan FCC PN** - This program performs two functions.
 - It filters the PN data set to remove the PNs not within the region. (This is done using the region filter discussed in Section D.6.)
 - It syntactically verifies the PNs.

The program displays errors found in the data and gives you the option of accepting the data as it exists, correcting the error, or excluding the data.

The PNs are first filtered and then those PNs that pass through the filter are displayed one at a time on the upper half of your screen. As the program checks the syntax, it writes the PN to the bottom half of the screen. If a PN passes all the checks, the program writes it to a temporary data set. The program displays the PNs with errors in the middle of your screen so you can decide what to do with them.

What the program actually does is compare the text to a set of rules that describe the format of Public Notice text with regard to microwave radio

applications that have been accepted for filing.

- **Option D: Append PN File** - This option appends the results of the output of Option C to a PN data base. The process does not allow duplicate data to be appended to the PN data base, that is, it always verifies that any new data is unique.
 - **Option E: Match PCN and PN Files** - This option matches the PCN Log with the PN data base. The matching process creates a data set that can be queried by using Option G.
 - **Option F: Last Received PCN and PN** - This option shows you when the last PN data set was scanned, appended, and matched with the PCN Log. It also shows the PCNs that are due or past due.
 - **Option G: Print/Display PCN-PN Links** - This option allows users to either print or display six different reports. The reports are
 - PCNs unmatched for more than 6 months
 - Matched PCNs
 - Partially matched PCNs
 - Unmatched PNs
 - Matched PNs
 - Multiple matched PNs.
3. Select Option C by pressing <C>.
 4. A window appears on the bottom left part of the screen. It is prefixed with the statement "FCC file name:". In this window (the cursor is automatically positioned in the window), type the fully qualified path and name of the PN data set to be filtered and parsed (for example, B:p081689.pns, which means the PNs to be worked on are on a floppy in the B drive and the file name is p081689.pns).
 5. If you correctly type in the fully qualified PN data set name, the upper half of the screen becomes the viewing window for the PN data that has successfully passed through the region filter. As the program parses the PN data according to the rules contained in the Rules file, the data to be written to a temporary data set appears in the lower half of the screen (it is difficult to provide examples because the PN data passed through the filter varies by region).

If the data does not match the rules, the program places the data with the error in a separate window in the middle of the screen. You can pass the data through either as is (pressing <F9> passes data to the output file) or you can correct it (again pressing <F9> passes the data to the output file), or the data can be ignored (pressing <F10> makes the program drop the data).

6. When Option C has completed, select Option D. The program appends the temporary PN data file created in Option C to the PN data base. However, it checks all the records in the temporary data set against the PN data base and only appends unique records. This prevents duplicate data records from existing in the PN data base. All the records in the PN data base are unique.
7. When Option D has completed, select Option E to match the PCN Log data base with the PN data base. This creates the report data set you access from Option G.
8. Select Option F to display the last PN run and the PCNs that don't have a response date entry. Notice that the last PN access should be the current date (the PN access information appears in the upper left-hand part of the screen).
9. Select Option G. You can choose to either print or display the reports (you have to print OR display — you can't do both at the same time). You can try displaying (or printing) each of the reports options. However, depending on the contents of your PCN Log, the various resulting reports may vary from containing nothing to containing quite a lot of information.

D.9 How to Interpret the Six PCN - PN Related Reports

PCNs Unmatched for More Than Six Months

Basically, this report means that the Public Notice data base contains PNs that are considerably younger than the PCNs in the log.

Matched PCNs

This report shows all the PCN Log entries that match entries in the PN data base.

Partial Matched PCNs

This report shows whether a PN matches a portion of a PCN's entry. For example, the entry may have had many stations and the PN did not contain all the stations.

Unmatched PNs

This report lists all the regional PN records to which no match could be found in the PCN Log. This is a very important report because it may show you a PCN that could affect your existing paths, and you may not have seen or received this PCN.

Matched PNs

This report lists all the PNs that match PCN Log entries.

Multiple Matched PNs

This report lists all the PCNs that match a PN.

Appendix E — FM Diversity Channel Plans

This section includes channel plans for use with the FM Diversity program. The tables have been abstracted from BR 940-330-110.

| 4L | 4U | 6L | 6U | N11L | N11U | A11L | A11U |
|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 1 3730. | 1 3770. | 10 5925.5 | 20 6177.5 | 1 10755. | 1 11405. | 1 10775. | 1 11385. |
| 2 3810. | 2 3850. | 11 5945.2 | 21 6197.2 | 2 10955. | 2 11685. | 2 10975. | 2 11665. |
| 3 3890. | 3 3930. | 12 5974.8 | 22 6226.9 | 3 10995. | 3 11645. | 3 11015. | 3 11625. |
| 4 3970. | 4 4010. | 13 6004.5 | 23 6256.5 | 4 10715. | 4 11445. | 4 10735. | 4 11425. |
| 5 4050. | 5 4090. | 14 6034.2 | 24 6286.2 | 5 11155. | 5 11325. | 5 11175. | 5 11305. |
| 6 4130. | 6 4170. | 15 6063.8 | 25 6315.9 | 6 10875. | 6 11605. | 6 10895. | 6 11585. |
| 7 3710. | 7 3750. | 16 6093.5 | 26 6345.5 | 7 10915. | 7 11565. | 7 10935. | 7 11545. |
| 8 3790. | 8 3830. | 17 6123.1 | 27 6375.2 | 8 11115. | 8 11365. | 8 11135. | 8 11345. |
| 9 3870. | 9 3910. | 18 6152.8 | 28 6404.8 | 9 11075. | 9 11245. | 9 11095. | 9 11225. |
| 10 3950. | 10 3990. | 19 6172.5 | 29 6424.5 | 10 10795. | 10 11525. | 10 10815. | 10 11505. |
| 11 4030. | 11 4070. | | | 11 10835. | 11 11485. | 11 10855. | 11 11465. |
| 12 4110. | 12 4150. | | | 12 11035. | 12 11285. | 12 11055. | 12 11265. |
| 13 4190. | 13 4198. | | | | | | |

The frequency plans listed are accessed by entering one of the following codes for PLN code when PLN CDE, # OF CHANS, CHAN #s are requested
 NOTE: When 9PLN is used this request is to be read as PLN CDE, # of FREQ, FREQ in MHz

4L Lower 4GHz Plan

4U Upper 4GHz Plan

6L Lower 6GHz Plan

6U Upper 6GHz Plan

N11L Lower 11GHz Normal Plan

N11U Upper 11GHz Normal Plan

A11L Lower 11GHz Alternate Plan

A11U Upper 11GHz Alternate Plan

9PLN to enter frequencies in MHz from the common carrier bands,
 when frogging enter frequencies as frogging pairs

Use the following codes to obtain STD CLIM and TERRAIN factors.

The values provided can be modified by specifying roughness when it is requested.

Enter 0 for roughness if it is unknown or if the STD value applies.

C — Over water and gulf coast

A — Average terrain and climate

M — Mountain and dry climate

E — Use to enter the fade occurrence factor directly.

6 GHz BLOCK FREQUENCY LOADING AND POLARIZATION CODES

| LOW CHANNEL FREQUENCIES: L, S, D (Chans. 10-19) | | | | | | |
|--|---|------------------------------------|-----------------------------------|--|--------------|-----|
| Chans. | CODES | CODES | CODES | CODES | POLARIZATION | |
| | LK, LV, LL, LB, L1, LT, LZ, L5, L7, LD, LE, LY, ST, SP, SR, SO, D1, D3, | LC, LM, LA, LQ, L3, L9, S8, S6, | LU, LH, LF, LJ, L4, L0, S9, S7 | LS, LP, LI, LN, L2, LG, LX, L6, L8, LR, LW, LO, SS, SQ, SR, S5, D2, D4 | (H) | (V) |
| | (MHz) | (MHz) | (MHz) | (MHz) | | |
| 10 | 5925.5 | -- | -- | 5930.4 | H | V |
| 11 | 5945.2 | 5937.8 | 5952.6 | 5960.0 | V | H |
| 12 | 5974.8 | 5967.4 | 5982.3 | 5989.7 | H | V |
| 13 | 6004.5 | 5997.1 | 6011.9 | 6019.3 | V | H |
| 14 | 6034.2 | 6026.7 | 6041.6 | 6049.0 | H | V |
| 15 | 6063.8 | 6056.4 | 6071.2 | 6078.6 | V | H |
| 16 | 6093.5 | 6086.0 | 6100.9 | 6108.3 | H | V |
| 17 | 6123.1 | 6115.7 | 6130.5 | 6137.9 | V | H |
| 18 | 6152.8 | 6145.3 | 6160.2 | 6167.6 | H | V |
| 19 | 6172.5 | -- | -- | -- | V | H |
| HIGH CHANNEL FREQUENCIES: H, T, F (Chans. 20-29) | | | | | | |
| Chans. | CODES | CODES | CODES | CODES | POLARIZATION | |
| | HK, HV, HL, HB, H1, HT, HZ, H5, H7, HD, HE, HY, TT, TP, TR, TO, F1, F3, | HC, HM, HA, HQ, H3, H9, T8, T6, | HU, HH, HF, HJ, H4, H0, T9, T7 | HS, HP, HI, HN, H2, HG, HX, H6, H8, HR, HW, HO, TS, TQ, TR, T5, F2, F4 | (H) | (V) |
| | (MHz) | (MHz) | (MHz) | (MHz) | | |
| 20 | 6177.5 | -- | -- | 6182.4 | H | V |
| 21 | 6197.2 | 6189.8 | 6204.7 | 6212.0 | V | H |
| 22 | 6226.9 | 6219.5 | 6234.3 | 6241.7 | H | V |
| 23 | 6256.5 | 6249.1 | 6264.0 | 6271.4 | V | H |
| 24 | 6286.2 | 6278.8 | 6293.6 | 6301.0 | H | V |
| 25 | 6315.9 | 6308.4 | 6323.3 | 6330.7 | V | H |
| 26 | 6345.5 | 6338.1 | 6352.9 | 6360.3 | H | V |
| 27 | 6375.2 | 6367.7 | 6382.6 | 6390.0 | V | H |
| 28 | 6404.8 | 6397.4 | 6412.2 | 6419.6 | H | V |
| 29 | 6424.5 | -- | -- | -- | V | H |

Code V or H is determined by polarization of even-numbered channels
H = Odd-numbered V, Even-numbered H
V = Odd-numbered H, Even-numbered V.

O = Letter Ø = Zero

| 12 CHANNEL PLANS | | | | | |
|--|-------------|-------------|---|-------------|-------------|
| LOW-REG. CHAN. YQ, YR, YS, YT, YZ, Y1, Y2, Y3 | POL. (H) | POL. (V) | LOW-SPLIT CHAN. ZQ, ZR, ZS, ZT, ZZ, Z1, Z2, Z3 | POL. (H) | POL. (V) |
| (MHz) | | (MHz) | | | |
| 5P-11155 | H | V | 5E-11175 | H | V |
| 8P-11115 | V | H | 8E-11135 | V | H |
| 9P-11075 | H | V | 9E-11095 | H | V |
| 12P-11035 | V | H | 12E-11055 | V | H |
| 3P-10995 | H | V | 3E-11015 | H | V |
| 2P-10955 | V | H | 2E-10975 | V | H |
| 7P-10915 | H | V | 7E-10935 | H | V |
| 6P-10875 | V | H | 6E-10895 | V | H |
| 11P-10835 | H | V | 11E-10855 | H | V |
| 10P-10795 | V | H | 10E-10815 | V | H |
| 1P-10755 | H | V | 1E-10775 | H | V |
| 4P-10715 | V | H | 4E-10735 | V | H |
| HIGH-REG. CHAN. WQ, WR, WS, WT, WZ, W1, W2, W3 | POL. (H) | POL. (V) | HIGH-SPLIT CHAN. XQ, XR, XS, XT, XZ, X1, X2, X3 | POL. (H) | POL. (V) |
| (MHz) | | (MHz) | | | |
| 2J-11685 | H | V | 2D-11665 | H | V |
| 3J-11645 | V | H | 3D-11625 | V | H |
| 6J-11605 | H | V | 6D-11585 | H | V |
| 7J-11565 | V | H | 7D-11545 | V | H |
| 10J-11525 | H | V | 10D-11505 | H | V |
| 11J-11485 | V | H | 11D-11465 | V | H |
| 4J-11445 | H | V | 4D-11425 | H | V |
| 1J-11405 | V | H | 1D-11385 | V | H |
| 8J-11365 | H | V | 8D-11345 | H | V |
| 5J-11325 | V | H | 5D-11305 | V | H |
| 12J-11285 | H | V | 12D-11265 | H | V |
| 9J-11245 | V | H | 9D-11225 | V | H |

Code V or H is determined by polarization of highest channel of Frequency Block.

POLARIZATION CODES

| 4-GHz Channel Polarization Plans – 6- or 12-Channel Operation | | | | | | | | | |
|---|------------|------|------|------|--------------------------|------------|------|------|------|
| A(2,4,5,6,7,P,V,D,E,S,T) | | | CODE | CODE | B(2,4,5,6,7,P,V,D,E,S,T) | | | CODE | CODE |
| SLOTS A | | | (H) | (V) | SLOTS B | | | (H) | (V) |
| CHANNELS | FREQ (kHz) | | | | CHANNELS | FREQ (kHz) | | | |
| 7 | — | 3710 | V | H | 7 | — | 3750 | V | H |
| 8 | — | 3790 | V | H | 8 | — | 3830 | V | H |
| 9 | — | 3870 | V | H | 9 | — | 3910 | V | H |
| 10 | — | 3950 | V | H | 10 | — | 3990 | V | H |
| 11 | — | 4030 | V | H | 11 | — | 4070 | V | H |
| 12 | — | 4110 | V | H | 12 | — | 4150 | V | H |
| REG A | | | | | REG B | | | | |
| 1 | — | 3730 | H | V | 1 | — | 3770 | H | V |
| 2 | — | 3810 | H | V | 2 | — | 3850 | H | V |
| 3 | — | 3890 | H | V | 3 | — | 3930 | H | V |
| 4 | — | 3970 | H | V | 4 | — | 4010 | H | V |
| 5 | — | 4050 | H | V | 5 | — | 4090 | H | V |
| 6 | — | 4130 | H | V | 6 | — | 4170 | H | V |
| C(2,4,5,6,7,P,V,D,E,S,T) | | | CODE | CODE | D(2,4,5,6,7,P,V,D,E,S,T) | | | CODE | CODE |
| REG A | | | (V) | (H) | SLOTS A | | | (H) | (V) |
| CHANNELS | FREQ (kHz) | | | | CHANNELS | FREQ (kHz) | | | |
| 1 | — | 3730 | V | H | 7 | — | 3710 | V | H |
| 2 | — | 3810 | V | H | 8 | — | 3790 | V | H |
| 3 | — | 3890 | V | H | 9 | — | 3870 | V | H |
| 4 | — | 3970 | V | H | 10 | — | 3950 | V | H |
| 5 | — | 4050 | V | H | 11 | — | 4030 | V | H |
| 6 | — | 4130 | V | H | 12 | — | 4110 | V | H |
| SLOTS B | | | | | REG B | | | | |
| 7 | — | 3750 | H | V | 1 | — | 3770 | H | V |
| 8 | — | 3830 | H | V | 2 | — | 3850 | H | V |
| 9 | — | 3910 | H | V | 3 | — | 3930 | H | V |
| 10 | — | 3990 | H | V | 4 | — | 4010 | H | V |
| 11 | — | 4070 | H | V | 5 | — | 4090 | H | V |
| 12 | — | 4150 | H | V | 6 | — | 4170 | H | V |

Code V or H is determined by polarization of channels 1-6 (regulars).

| 11-GHz Channel Polarization Plans – 6-Channel Operation | | | | | |
|---|--------------|-------------|-------------------------------|--------------|-------------|
| LO-REG-ODD | POLARIZATION | | LO-REG-EVEN | POLARIZATION | |
| YA-YB-YC-YD-YE YF-YG-YH-YI | CODE (H) | CODE (V) | YI-YI-YK-YL-YM YN-YO-YP-Y2 | CODE (H) | CODE (V) |
| 5P-11155 | H | V | 8P-11115 | H | V |
| 9P-11075 | V | H | 12P-11035 | V | H |
| 3P-10995 | H | V | 2P-10955 | H | V |
| 7P-10915 | V | H | 6P-10875 | V | H |
| 11P-10835 | H | V | 10P-10795 | H | V |
| 1P-10755 | V | H | 4P-10715 | V | H |
| HI-REG-ODD | POLARIZATION | | HI-REG-EVEN | POLARIZATION | |
| WA-WB-WC-WD-WE WF-WG-WH-WI | CODE (H) | CODE (V) | WI-WJ-WK-WL-WM WN-WO-WP-W2 | CODE (H) | CODE (V) |
| 3J-11654 | H | V | 2J-11685 | H | V |
| 7J-11565 | V | H | 6J-11605 | V | H |
| 11J-11485 | H | V | 10J-11525 | H | V |
| 1J-11405 | V | H | 4J-11445 | V | H |
| 5J-11325 | H | V | 8J-11365 | H | V |
| 9J-11245 | V | H | 12J-11285 | V | H |
| LO-SPLIT-ODD | POLARIZATION | | LO-SPLIT-EVEN | POLARIZATION | |
| ZA-ZB-ZC-ZD-ZE ZF-ZG-ZH-ZI | CODE (H) | CODE (V) | ZI-ZJ-ZK-ZL-ZM ZN-ZO-ZP-Z2 | CODE (H) | CODE (V) |
| 5E-11175 | H | V | 8E-11135 | H | V |
| 9E-11095 | V | H | 12E-11055 | V | H |
| 3E-11015 | H | V | 2E-10975 | H | V |
| 7E-10935 | V | H | 6E-10895 | V | H |
| 11E-10855 | H | V | 10E-10815 | H | V |
| 1E-10775 | V | H | 4E-10735 | V | H |
| HI-SPLIT-ODD | POLARIZATION | | HI-SPLIT-EVEN | POLARIZATION | |
| XA-XB-XC-XD-XE XF-XG-XH-XI | CODE (H) | CODE (V) | XI-XJ-XK-XL-XM XN-XO-XP-X2 | CODE (H) | CODE (V) |
| 3D-11625 | H | V | 2D-11665 | H | V |
| 7D-11545 | V | H | 6D-11585 | V | H |
| 11D-11465 | H | V | 10D-11505 | H | V |
| 1D-11385 | V | H | 4D-11425 | V | H |
| 5D-11305 | H | V | 8D-11345 | H | V |
| 9D-11225 | V | H | 12D-11265 | V | H |

Code V or H is determined by polarization of highest channel frequency of block. When block of channel frequencies is used and is not covered in above, Code V or H is determined by highest channel frequency of block.

| 24-Channel Operation | | | | | |
|-------------------------------|-------------|-------------|-------------------------------|-------------|-------------|
| HI-REG & SPLIT WU-WV-WW-WX | CODE (H) | CODE (V) | LO-REG & SPLIT YU-YV-YW-YX | CODE (H) | CODE (V) |
| 2J-11685 | H | V | 5E-11175 | H | V |
| 2D-11665 | V | H | 5P-11155 | V | H |
| 3J-11645 | H | V | 8E-11135 | H | V |
| 3D-11625 | V | H | 8P-11115 | V | H |
| 6J-11605 | H | V | 9E-11095 | H | V |
| 6D-11585 | V | H | 9P-11075 | V | H |
| 7J-11565 | H | V | 12E-11055 | H | V |
| 7D-11545 | V | H | 12P-11035 | V | H |
| 10J-11525 | H | V | 3E-11015 | H | V |
| 10D-11505 | V | H | 3P-10995 | V | H |
| 11J-11485 | H | V | 2E-10975 | H | V |
| 11D-11465 | V | H | 2P-10955 | V | H |
| 4J-11445 | H | V | 7E-10935 | H | V |
| 4D-11425 | V | H | 7P-10915 | V | H |
| 1J-11405 | H | V | 6E-10895 | H | V |
| 1D-11385 | V | H | 6P-10875 | V | H |
| 8J-11365 | H | V | 11E-10855 | H | V |
| 8D-11345 | V | H | 11P-10835 | V | H |
| 5J-11325 | H | V | 10E-10815 | H | V |
| 5D-11305 | V | H | 10P-10795 | V | H |
| 12J-11285 | H | V | 1E-10775 | H | V |
| 12D-11265 | V | H | 1P-10755 | V | H |
| 9J-11245 | H | V | 4E-10735 | H | V |
| 9D-11225 | V | H | 4P-10715 | V | H |

Code V or H is determined by polarization of highest channel frequency of block.

References

- [1] SP-NWT-000093, *The Advanced Radio Coordination Workstation Installation Guide*, Issue 3, (Bellcore, March 1992).
- [2] *Electronic Transfer of Prior Coordination Notices*, Terrestrial Format, (National Spectrum Managers Association [NSMA], Draft, April 1991).
- [3] *Electronic Transfer of Prior Coordination Notices*, Earth Station Format, (National Spectrum Managers Association [NSMA], Draft, April 1991).
- [4] BR 940-400-002, *ARC Workstation Self-Paced Training Guide*, Issue 1 (Bellcore, to be published).

Glossary

NOTE: Some of the terms included in this glossary are provided as additional reference material.

| | |
|-----------------|---|
| ARC | Advanced Radio Coordination |
| Briefcase | A specially structured floppy disk used for moving information between workstations. |
| Credenza | A storage location for folders and items that are infrequently accessed. |
| Desktop | A workspace screen that allows you to work with files and folders, and access drawers and credenzas. |
| DOS | Disk Operating System; an operating environment commonly used on PCs. |
| Drawer | A storage location for folders and items that are accessed frequently. |
| FCC | Federal Communications Commission |
| Folder | A storage location for a group of related items. |
| Function Key | A key that activates a command, program, etc. when pressed. |
| Megabyte | 1,000,000 bytes |
| MRSELS-II | Microwave Radio and Satellite Engineering and Licensing System II |
| NSMA | National Spectrum Managers Association |
| Optional Module | A module that can be installed at the user's discretion; it isn't required. |
| PC | Personal Computer |
| Platform | The basic workstation environment without any optional modules. |
| PCN | Prior Coordination Notice |
| Prompt | The program asks you to do something via a message that prints on your screen. |
| Prompter Bar | A highlighting bar moved by the grey plus (+) and minus (-) keys that enables you to choose a menu item or a command. |

| | |
|--------------|---|
| PN | Public Notice |
| Selector Bar | A highlighting bar moved by the cursor up <↑> and cursor down <↓> keys that enables you to choose an item to work on. |
| Wastebasket | A place to set aside unwanted items before you actually erase them. |

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