

**PROMlink<sup>TM</sup>**

**DATA I/O**

# PROMlink<sup>TM</sup>

Part No. 326-0009-002

SN 8702863

Version 2.01 MS-DOS 360K DISK

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# USER NOTES

July 26, 1985

984-0005-003

PROMlink(tm) 2.01

## 1. BAUD RATES

Low baud rates: This version of PROMlink has been tailored to run at higher baud rates. The selection of baud rates from within PROMlink has been limited to 2400, 4800, and 9600 baud. Lower rates may be selected by editing the configuration file, but operation of PROMlink at these baud rates is not guaranteed.

Changing baud rates: Changing baud rates in the middle of a PROMlink session will cause spurious characters to be sent which can cause the next operation to fail. Performing a "Select programmer type" operation after changing the baud rate or exiting PROMlink to change the baud rate is recommended.

## 2. TEXAS INSTRUMENTS PROFESSIONAL

Terminal emulator utility: TERM.COM will only work on IBM compatible machines. The stand alone terminal for the TI Professional is named TITERM.COM. TITERM operates at 9600 baud only.

## 3. USER FUNCTIONS

The user function file shown on page 3-106 of the PROMlink manual is for a GANGPAK.

## 4. LABEL PRINTING UTILITY

The .HEX command for the label printing utility does not allow an argument of zero (null character).

## 5. BINARY FORMAT

Model 19: Create file from RAM using the binary format (10) on the Model 19 will not work properly due to the absence of handshaking in this situation. It is suggested that another I/O format be used with this programmer.

Aborting "Load RAM from file" (using control-Z): This operation may result in a "Contact with Programmer Broken" error on the next command. In this case, abort the programmer operation from the front panel and re-enter remote mode. For example on the Model 29 programmer press "SELECT F 1 START START".

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## 6. DISPLAY COLORS

PROMlink checks the display board to determine what colors to set for the display. If a color display card is being used, the colors are set up as defined in the configuration file. If the monochrome card is being used, the color is automatically set to white foreground and black background.

## 7. EXIT REMOTE MODE AUTOMATICALLY

If it is desired that PROMlink always causes the programmer to exit remote mode when PROMlink is exited, this can be done using a batch file like below:

```
pl %1  
echo Z>com1:
```

which, when executed, will cause DOS to send the Z command to the programmer after quitting PROMlink.

## 8. PROMLINK WITH NO PROGRAMMER

It is possible to run PROMlink 2.0 without the computer being connected to a programmer. By pressing F1 when the opening screen is displayed, the main menu will appear. This allows access to functions like setting the serial port parameters and examining files. Once a programmer is connected, it is suggested that a "select programmer type" operation be performed to properly establish contact.

## 9. CHANGING PROGRAMMERS

Any time the programmer connected to PROMlink is changed (even if it is changed to a programmer of the same type) or powered off during a PROMlink session, a "Select programmer type" operation must be performed. Failure to do so may result in incorrect operation of PROMlink or a slowing of PROMlink response.

## 10. LOGIC DEVICE PROGRAMMING

When changing to logic device programming using the load configuration operation, it is necessary to also perform a set programmer type operation. Failure to do so will cause PROMlink to use a file transfer format other than JEDEC.

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## 11. CAUTION

Any changes to device type or operations boundaries, etc. that were not made using a PROMlink menu (i.e. changes made from the programmer front panel, user functions or logic terminal mode) will not be reflected in the PROMlink status block and thus will not be used for any subsequent operations performed within PROMlink.

## 12. MODEL 120/121

Fill RAM: The fill RAM operation on the Model 121 may not work if the Begin RAM address is set within device word limit of the last programmer RAM address.

Error counters: Some Model 120/121 errors are not counted by error logging. These are errors 34, 38, and 22 which cannot be isolated to the offending device and so are not added to the device error counters. Error 36 (bad insertion) errors are counted, however, even though for some kinds of devices, this error cannot be isolated to the offending device. In this case, all devices in the programmer sockets are counted as bad even though all but one may be inserted properly.

## 13. LOGIC TERMINAL MODE

Scrollin on Color display: When operating PROMlink in the Logic Terminal mode using a color monitor card in an IBM compatible computer, using the control-S and control-Q keys to control scrolling can cause the monitor to be blank while the text is halted. The information is not lost and will become visible again once control-Q is pressed. If you have this configuration, it is suggested that you use the terminal emulator utility to view data in the Logic Terminal mode.

## 14. BIOS COMPATIBLE COMPUTERS

The feature described in the manual pertaining to using PROMlink with non-IBM compatible computers that have similar BIOS calls (Basic Input/Output System interrupt calls) has been removed from the product. This allowed a significant increase in performance for true IBM compatible computers.



**PROMlink<sup>TM</sup>**

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# PROMlink™ 2.0

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PC-DOS

MAY 1985

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---

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- Desired method of shipment
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- Shipping and billing address of firm, including zip code
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# INTRODUCTION

A series of approximately ten thin, horizontal white lines of varying lengths, stacked vertically and aligned to the right, creating a decorative underline for the title.

**DATA I/O**

STARTED

FUNCTIONS

UTILITIES

INDEX



This manual describes PROMlink and how to use it.

PROMlink is a menu-driven software interface between Data I/O Corporation's PROM and Programmable Logic Device programmers and a variety of popular personal computers.

PROMlink will run on the following personal computers:

- IBM PC, XT or AT™
- Compaq™ and Compaq plus™
- AT&T 6300™
- Texas Instruments Professional™

Please refer to PROMlink system requirements.

PROMlink supports the following Data I/O programmers and paks:

- Model 19
- Model 29A and 29B
- Model 120/121
- Series/model 22
- Model 60A and 60H
- UniPak™ and UniPak 2™
- MOSPak™
- GangPak™ and Gang Programming Module
- LogicPak™ and P/T Adapters

---

**PROMlink FEATURES****1.1**

PROMlink is designed to be an easy to use, menu-driven program that allows communication between a host computer and Data I/O programmers. Some of the features of PROMlink are:

- PROMlink is completely menu driven.
- Data files are easily transferred back and forth from the personal computer to the programmer.
- Many commonly used functions such as *Set Operation Boundaries* and *Select Device Type* are available from several of PROMlink's menus.

---

**COMPATIBILITY WITH PROMlink 1.0****1.2**

PROMlink 2.0 is significantly different from PROMlink 1.0. The information in this section will be of interest to those who have used previous versions of PROMlink and who may be upgrading PROMlink 1.0 to 2.0. For example, major differences include:

1. Menu operation has been streamlined by the use of function keys to select the options available from the PROMlink menus. On most menus PROMlink will automatically go to the option you have selected without having to press the RETURN key.
2. Many menus have changed from PROMlink 1.0 to 2.0 and the functions may not be accessed in the same way.
3. The format of the initialize file *INIT.CFN* has been changed and the PROMlink 1.0 *INIT.DIO* files will not work for PROMlink 2.0. Instead, you may have several initialize files (now called *Configuration Files*) that may be loaded or saved at any time during a PROMlink session.

The Section called *Statistics* in PROMlink 1.0 has been changed to *Error Logging* to more accurately reflect the content of the section. The format of the *STATS.DOC* file is different in PROMlink 2.0. (Refer to Appendix B.2 for more information.)

### Some New Functions Have Been Added to PROMlink:

- Expanded File Handling Capability:
  - Change Default Directory
  - Delete and Rename Files
  - Display Files
- Enhanced Programmer RAM Edit Functions:
  - Full Screen Editor in Hex or ASCII
  - Split/Shuffle RAM
- Multiple Configuration Files
- Ability to Change Port Configuration From Inside PROMlink
- Logic Device Support (See Section 1.3)
- Set Size and 16 Bit Mode Capability
- Binary I/O Format Capability
- New User Utility Programs
  - Terminal Emulator
  - Label Printer
  - File Delete Protection
- User-Definable Functions
  - This function allows the user to create a custom menu in PROMlink that performs any of the standard computer remote control functions not available from the usual PROMlink menus.

Data files created by PROMlink 1.0 and 2.0 are identical. It is not necessary to change any of your existing data files to accommodate PROMlink 2.0.

**LOGIC DEVICE PROGRAMMING FEATURES****1.3**

PROMlink 2.0 has increased the capability to program logic devices. These new features are:

- Updated Device List  
The *Select Device Type* menu for PROMlink 2.0 now contains all of the logic devices supported by the Data I/O Model 60 and LogicPak.
- Transfer of JEDEC Formatted Data  
When the LogicPak or Model 60 are used with PROMlink, the JEDEC logic data transfer format is automatically selected. The other I/O formats are disabled.
- Terminal Emulator for the Model 60 and LogicPak  
The Logic Terminal mode or *E7* Mode of the LogicPak or Model 60 may be entered from a PROMlink menu. This provides access to most of the logic-specific programmer functions.

**CONTENTS OF THE PROMlink PACKAGE****1.4**

The PROMlink software package contains:

- One disk in a plastic pouch labeled:  
PROMlink
- The PROMlink User's Guide manual
- 25-pin cable for connection between a personal computer's RS-232-C port and the Data I/O programmer

If any of the above items is missing, please contact your Data I/O representative. Table 1-1 shows the files residing on the PROMlink disk.

Table 1-1. Files on the PROMlink Disk

File Name	Description
PL.EXE	Executable PROMlink program
LABL.EXE	Label printing utility
RONLY.EXE	File delete protection
RW.EXE	File delete protection removal utility
TERM.COM	Terminal Emulator
INIT.CFN	PROMlink default configuration file
INITPC.CFN	PROMlink IBM PC, XT, AT default configuration file
INITTI.CFN	PROMlink Texas Instruments Professional default configuration file
INITBIO.CFN	PROMlink default configuration file for other BIOS compatible computers
PLMENU.STR	PROMlink menu text
PLERROR.STR	Error Messages
PLDEVLST.DAT	Device List
LOGIC.UFN	Example User Function File
GANG.UFN	Example User Function File
DISKS.LAB	Example for Label Printer
PROMS.LAB	Example for Label Printer



# GETTING STARTED

A series of approximately 10 thin, horizontal white lines of varying lengths, creating a decorative underline for the title.

**DATA I/O**

2 STARTED

3 FUNCTIONS

4 UTILITIES

5 INDEX

This section is dedicated to minimizing the effort required to learn and work with PROMlink and to maximize your resultant productivity. This manual has been designed to provide you with easy access to the information it contains about PROMlink, to serve as a tutorial for the new user, and to provide an overview of the product for those who want to survey PROMlink features and functions prior to purchase.

If you have used PROMlink before, you may want to go directly to Section 3 MENUS AND FUNCTIONS and begin your programming session. Make sure that you make a backup disk of PROMlink.

The primary goal of this section is to set the foundation from which you can build an understanding of PROMlink, rapidly access this manual as an information resource, and begin working almost immediately with PROMlink.

The first time user can be working productively with PROMlink within fifteen minutes of opening this manual.

Please read the following paragraphs, take care of the necessary system requirements (configuration and installation), and then perform the PROMlink sample session. The sample session is located at the end of this section.




## NOTATION CONVENTIONS

## 2.2

Table 2-1 shows notation conventions used in this manual.

Table 2-1. Notation Conventions

Notation	Usage
<i>italics</i>	Indicates references by name to computer or programmer keyboard keys and items contained in examples, figures, listings and tables. This includes screen titles, field names, and messages that appear on the screen.
quotation marks	Surround items when some ambiguity exists about what is italicized.
UPPERCASE	File names and extensions are referred to in upper-case in the text. In examples, file names and extensions are shown exactly as they would be entered by the user.
lower-case	PC-DOS and MS-DOS recognize upper-case and lower-case as being identical. In general, user input is shown in lower-case, as most users would enter it.
<span style="border: 1px solid black; padding: 2px;">RETURN</span>	This symbol represents the return or enter key on the computer keyboard. This key is represented by the symbol,  , on the IBM PC keyboard and called the enter key in IBM documentation.

An example of italics used in text:

The message, *Operation successfully completed*, appears below the System Status field after the operation is finished.

## MAKING A BACK UP

---

## 2.4

Before you proceed any further, make a backup of the PROMlink disk to protect against accidental erasure of files or damage to the disk. This is very important and will only take a few minutes. Following are the procedures required to create a backup disk for a personal computer with either one or two disk drives, or to put a copy of PROMlink on the fixed disk of a personal computer.

**Backup Procedure for One Floppy Disk Drive****2.4.2**

1. Place a DOS (version 2.0 or later) disk in drive A and turn the power on. (If the computer is turned on and DOS is started, you do not have to perform this step.)
2. Make sure that the prompt on the screen is "A>". If it is not "A>", type *a:* and press the RETURN key.

3. Type:

```
format /s 
```

and follow the directions. Put the blank disk that you want to contain the backup files in drive A when asked.

4. When asked *Format another (Y|N)*, type:

n

5. Remove the DOS formatted disk from drive A.
6. Place the original PROMlink program disk in drive A.
7. Type:

```
copy *.* b: 
```

and when prompted, remove the original PROMlink disk from drive A and insert the backup disk.

8. When the "A>" prompt reappears after the copy is complete, remove both disks and label the backup disk.

You have now created a backup of the PROMlink program disk, and the disk has a copy of the DOS operating system on it. Put the original PROMlink program disk in a safe place and use the backup copy to run PROMlink. If anything should ever happen to make the backup disk unusable, the above procedure can be followed to create another backup disk. Never use the original disk as a working copy.

## Edit AUTOEXEC.BAT

## 2.4.4

The following procedure is intended for users with a hard disk computer system. It permits you to call PROMlink from the DOS prompt without having to specify a path.

1. Return to the root directory by typing "cd \", if you are not already there.

If there is no "AUTOEXEC.BAT" file on your operating system, you will need to make one.

2. Enter into the editor of your choice (for example Edlin).
3. Edit the DOS file "AUTOEXEC.BAT" by adding the following lines to the bottom of the file:

```
path c:\promlink
```

```
set PLMSG=c:\promlink
```

Typing these two lines allows you to start PROMlink from any directory by typing:

```
pl RETURN
```

4. Save the edited "AUTOEXEC.BAT" file.

Placing these lines in autoexec.bat makes it unnecessary to type them in at system power up. The first line tells DOS where to find PROMlink. The second line tells PROMlink where its message and configuration files are located.

*Note: If a path command already exists in the AUTOEXEC.BAT file, you will need to append it by adding:*

```
;c:\promlink
```

Example: If you have the following path at the prompt

```
c:\DOS
```

Typing the ";c:\promlink" after the path will create a new path looking like this:

```
path c:\DOS;c:\promlink
```

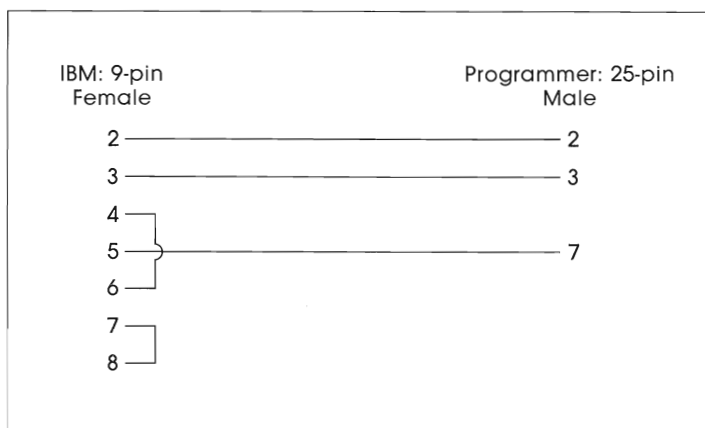


Figure 2-2. Serial Cable for IBM-AT

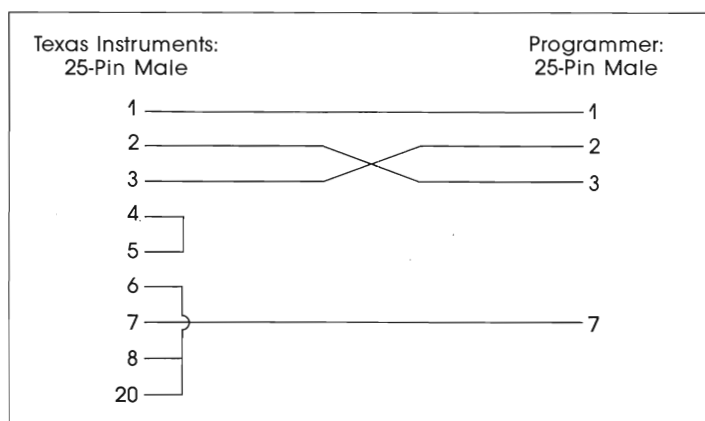


Figure 2-3. Serial Cable for Texas Instruments Professional

3. In order to run PROMlink on your computer, the programmer must be in *Remote Control Mode*. To select the *Remote Control Mode*, on the programmer keyboard press the following keys for these Programmers: System 19, Series 22, and Models 29 and 60:

SELECT F 1 START START

And press these keys for the following Programmers: Models 120 and 121:

SELECT 0 9 START

*Note: Refer to Appendix B.5 for Serial I/O Configuration information.*

5. Put the PROMlink disk in the default drive. The prompt on the screen will be for drives A, B, C, or E (for the TI). When PROMlink starts up, it will expect to be running in an IBM PC, XT or AT. To run on a TI Professional computer, the customer simply copies INITTI.CFN to INIT.CFN. Type:

pl or

pl filename.cfn (configuration file)

RETURN

PROMlink will start, and after approximately 30 seconds the *Opening* or first menu will be displayed. You will see start up messages on your screen before the first menu is displayed.

*Note: The PROMlink program disk must be in the default drive. If you have a hard disk, and PROMlink resides on the hard disk, the current directory must be set to the one containing PROMlink unless you have set the path and the value of PLMSG. See your DOS manual for more information.*

## OPENING MENU

2.8

The *Opening* screen (figure 2-6) displayed after PROMlink is started consists of title and copyright information and also indicates whether proper contact with the programmer has been established. (The programmer must be in *Remote Control* mode and be connected to the serial port of the computer with the correct communications protocols set before PROMlink will communicate.

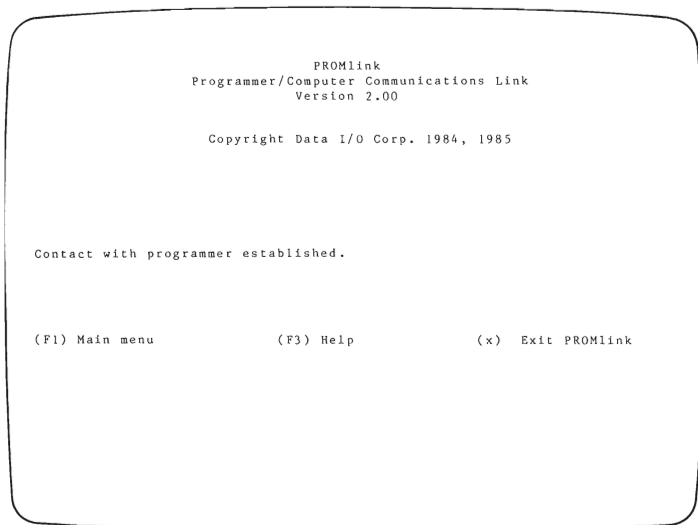


Figure 2-6. Opening Screen

If proper contact has not been established, the message, *cannot contact programmer*, is displayed below the copyright.

Once contact has been made, press the *F1* key on the computer keyboard to go to the *Main* menu.

*Note:* At the bottom of every screen is a reverse video help line with the keys highlighted that will move you from menu to menu (F1 and F2), and to get help for a particular function (F3).

*Note:* The option (X) to exit PROMlink is available only on the opening screen, the MAIN menu screen and the Help Message screen for the MAIN menu.



This section is dedicated to minimizing the effort required to learn and work with PROMlink and to maximize your resultant productivity. This manual has been designed to provide you with easy access to the information it contains about PROMlink, to serve as a tutorial for the new user, and to provide an overview of the product for those who want to survey PROMlink features and functions prior to purchase.

If you have used PROMlink before, you may want to go directly to Section 3 MENUS AND FUNCTIONS and begin your programming session. Make sure that you make a backup disk of PROMlink.

The primary goal of this section is to set the foundation from which you can build an understanding of PROMlink, rapidly access this manual as an information resource, and begin working almost immediately with PROMlink.

The first time user can be working productively with PROMlink within fifteen minutes of opening this manual.

Please read the following paragraphs, take care of the necessary system requirements (configuration and installation), and then perform the PROMlink sample session. The sample session is located at the end of this section.

### HOW TO USE THIS MANUAL

### 2.1

The PROMlink manual is organized to provide you with convenient application and reference information.

Section 1. INTRODUCTION: A basic introduction to PROMlink and its features that provides information about PROMlink's primary functions. It also will direct you to related manuals and gives service and ordering information.

Section 2. GETTING STARTED: If you are a first-time user of PROMlink, you will want to pay particular attention to this section. Here there are:

- Step by step procedures for making a backup disk of PROMlink
- How to make the Data I/O programmer to personal computer cable connections
- How to start PROMlink and become familiar with notation conventions and PROMlink screens and menus
- A sample session that guides you through a typical programming session

Section 3. MENUS AND FUNCTIONS: Provides detailed descriptions of all the PROMlink screens and menus and how to use them. Descriptions are organized in menu groups as they stem off the Main menu. There are ten sub-menus available from the Main menu and each of these may have one or more functions available from it. Each menu lists its functions in frequency-of-use order, not necessarily in the order you would first use the item in a start up session.

Section 3 also includes descriptions of User Support Utilities that are on the PROMlink disk.

Section 4. USER SUPPORT UTILITIES: Provides descriptions of utilities that the user will find useful in the operation of PROMlink.


Section 5. INDEX/APPENDICES: In the Appendices you will find reference and special configuration and compatibility information. The main body of the PROMlink manual will guide you to these appendices. The manual's index is also located in this section.

## NOTATION CONVENTIONS

## 2.2

Table 2-1 shows notation conventions used in this manual.

Table 2-1. Notation Conventions

Notation	Usage
<i>italics</i>	Indicates references by name to computer or programmer keyboard keys and items contained in examples, figures, listings and tables. This includes screen titles, field names, and messages that appear on the screen.
quotation marks	Surround items when some ambiguity exists about what is italicized.
UPPERCASE	File names and extensions are referred to in upper-case in the text. In examples, file names and extensions are shown exactly as they would be entered by the user.
lower-case	PC-DOS and MS-DOS recognize upper-case and lower-case as being identical. In general, user input is shown in lower-case, as most users would enter it.
<span style="border: 1px solid black; padding: 2px;">RETURN</span>	This symbol represents the return or enter key on the computer keyboard. This key is represented by the symbol,  , on the IBM PC keyboard and called the enter key in IBM documentation.

An example of italics used in text:

The message, *Operation successfully completed*, appears below the System Status field after the operation is finished.

### PROMlink SYSTEM REQUIREMENTS

### 2.3

To use PROMlink, you must have:

- An IBM PC, XT or AT, Compaq or AT&T 6300, or Texas Instruments Professional with at least 192K of RAM
- MS-DOS versions 2.0 or later
- One or more double-sided floppy disk drives
- An RS-232-C port. The correct cable is provided with PROMlink. (This cable will not work with the TI or the AT 9-pin port.)
- One of the following Data I/O programmers:
  - Model 22 and Series 22, all revisions
  - Model 29A with CRC and 16K RAM or less, revision C and above
  - Model 29A with CRC and 64K RAM or less, revision B and above
  - Model 29B, all revisions
  - System 1902, revision G and above
  - Models 120 and 121, revision G and above
  - Model 60 or 60H, all revisions

These are the minimum requirements. For ease of use it is suggested that you have two disk drives, one from which to run PROMlink, and another to contain data files.

*Note: The Model 120 and Model 60 programmers do not allow PROMlink to perform the following operations:*

*Display of programmer RAM size*

*Fill RAM with data byte*

*Edit RAM*

*Split RAM*

*Shuffle RAM*

*Set operations boundaries functions*

*Model 120 does permit I/O offset*

*Note: The GangPak and Gang modules do not indicate to PROMlink the number of correctly programmed devices. PROMlink normally keeps a count of correctly programmed devices and errors. These counts will not be updated when a GangPak or Gang module is in use.*

**MAKING A BACK UP****2.4**

Before you proceed any further, make a backup of the PROMlink disk to protect against accidental erasure of files or damage to the disk. This is very important and will only take a few minutes. Following are the procedures required to create a backup disk for a personal computer with either one or two disk drives, or to put a copy of PROMlink on the fixed disk of a personal computer.

### Backup Procedure for Two Floppy Disk Drives

### 2.4.1

1. Place a DOS (version 2.0 or later) disk in drive A (usually the left drive) and turn the power on. (If the computer is already on and DOS is started, you do not have to perform this step.)
2. Make sure that the prompt on the screen is "A>". If it is not "A>", type *a:* and press the RETURN key.

3. Type:

```
format b: /s 
```

and follow the directions. Put the blank disk that you want to contain the backup files in drive B when asked.

4. When asked *Format another (Y|N)*, type:

n

5. Remove the DOS disk from drive A.
6. Place the original PROMlink program disk in drive A.
7. Type:

```
copy *.* b: 
```

8. When the copy is complete, remove both disks and label the backup disk.

You have now created a backup of the PROMlink program disk, and the disk has a copy of the DOS operating system on it. Put the original PROMlink program disk in a safe place and use the backup copy to run PROMlink. If anything should ever happen to make the backup disk unusable, the above procedure can be followed to create another backup disk. Never use the original disk as a working copy.

**Backup Procedure for One Floppy Disk Drive****2.4.2**

1. Place a DOS (version 2.0 or later) disk in drive A and turn the power on. (If the computer is turned on and DOS is started, you do not have to perform this step.)
2. Make sure that the prompt on the screen is "A>". If it is not "A>", type *a:* and press the RETURN key.

3. Type:

```
format /s 
```

and follow the directions. Put the blank disk that you want to contain the backup files in drive A when asked.

4. When asked *Format another (Y|N)*, type:

n

5. Remove the DOS formatted disk from drive A.
6. Place the original PROMlink program disk in drive A.
7. Type:

```
copy *.* b: 
```

and when prompted, remove the original PROMlink disk from drive A and insert the backup disk.

8. When the "A>" prompt reappears after the copy is complete, remove both disks and label the backup disk.

You have now created a backup of the PROMlink program disk, and the disk has a copy of the DOS operating system on it. Put the original PROMlink program disk in a safe place and use the backup copy to run PROMlink. If anything should ever happen to make the backup disk unusable, the above procedure can be followed to create another backup disk. Never use the original disk as a working copy.

### Backup Procedure for a Hard Disk System

### 2.4.3

1. Turn the personal computer on and make sure that DOS is started. How you do this will depend on your system configuration. If you have the DOS operating system on your fixed disk, simply turn the personal computer on, and the system will boot from the fixed disk. If DOS is not on your fixed disk, follow step one of the backup procedure for either the one- or two-drive systems.

*Note: Use drive E if you have the TI Professional.*

2. Determine the directory on the fixed disk in which you want the PROMlink programs to reside. Use the change directory command, `cd`, described below:

TYPE:

`C>cd \` (puts you in the root directory)

`C>mkdir promlink` (makes a new directory for  
PROMlink files)

`C>cd promlink`

*Note: The PROMlink directory is used as an example but you may define another directory.*

3. Place the original PROMlink program disk in drive A.
4. Type:

`copy A:*. * c: [RETURN]`

5. After the files are copied, remove the original PROMlink program disk from drive A.

You have now put a copy of PROMlink on your fixed disk, where it can be used whenever needed. Put the original PROMlink program disk in a safe place. If anything should ever happen to make the copy of PROMlink on the fixed disk unusable, the above procedure can be followed to recopy it. Never use the original disk as your working disk.



## Edit AUTOEXEC.BAT

## 2.4.4

The following procedure is intended for users with a hard disk computer system. It permits you to call PROMlink from the DOS prompt without having to specify a path.

1. Return to the root directory by typing "cd \"", if you are not already there.

If there is no "AUTOEXEC.BAT" file on your operating system, you will need to make one.

2. Enter into the editor of your choice (for example Edlin).
3. Edit the DOS file "AUTOEXEC.BAT" by adding the following lines to the bottom of the file:

```
path c:\promlink
```

```
set PLMSG=c:\promlink
```

Typing these two lines allows you to start PROMlink from any directory by typing:

```
pl RETURN
```

4. Save the edited "AUTOEXEC.BAT" file.

Placing these lines in autoexec.bat makes it unnecessary to type them in at system power up. The first line tells DOS where to find PROMlink. The second line tells PROMlink where its message and configuration files are located.

*Note: If a path command already exists in the AUTOEXEC.BAT file, you will need to append it by adding:*

```
;c:\promlink
```

Example: If you have the following path at the prompt

```
c:\DOS
```

Typing the ";c:\promlink" after the path will create a new path looking like this:

```
path c:\DOS;c:\promlink
```

## PROGRAMMER CONNECTION

## 2.5

An appropriate programmer (System 19, Series 22, and Models 29, 120, 121, 60) must be connected to your personal computer and the correct communications protocols must be set.

The following steps must be followed to achieve this with a Model 29. If you have a programmer model other than the Model 29, refer to the appropriate programmer manual for connection instructions.

1. Connect one end of the supplied cable (25-pin) to the COM1: port of the computer. Connect the other end to the serial port of the programmer. See Figure 2-1. (See Appendix B.1 for information on using the COM2: port.) Figure 2-2 shows the cable connection for the AT and figure 2-3 shows the cable connection for the Texas Instruments Professional (TI).

*Note: Data I/O supplies a 25-pin connector cable which will work except for the following personal computers: IBM AT, and TI Professional. Data I/O does not supply the 9-pin connector, and if you have a computer requiring a 9-pin connector, for example the AT, you can purchase a 9- to 25-pin adapter from your dealer. (The IBM part number for the 9-pin connector is 828-6170.)*

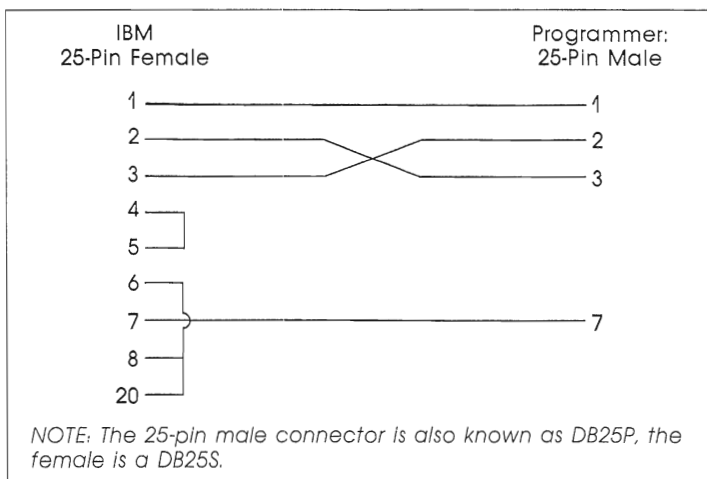


Figure 2-1. Serial Cable for IBM PC/XT

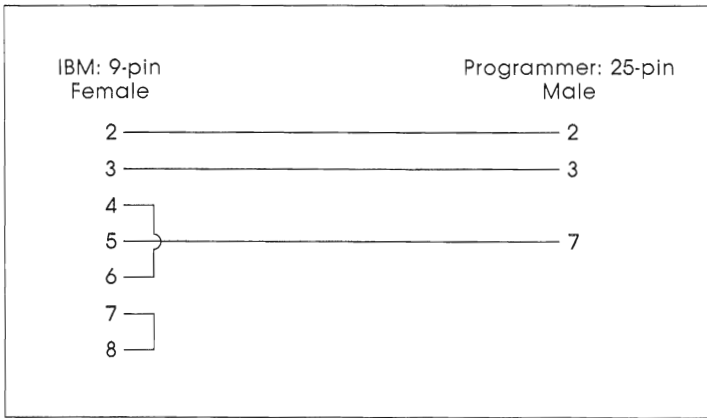


Figure 2-2. Serial Cable for IBM-AT

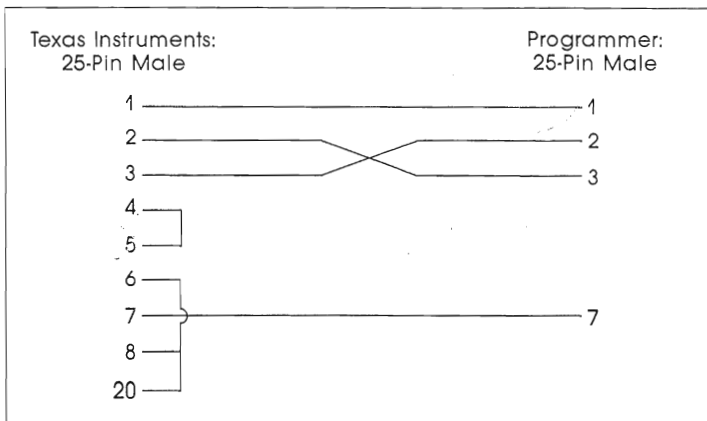


Figure 2-3. Serial Cable for Texas Instruments Professional

2. Set the programmer protocol to 9600 baud, 8 bits, no parity. Figures 2-4 and 2-5 show the switch settings for the Model 29 programmer. Consult your programmer manual or Appendix B.5 to achieve the correct setting for your programmer.

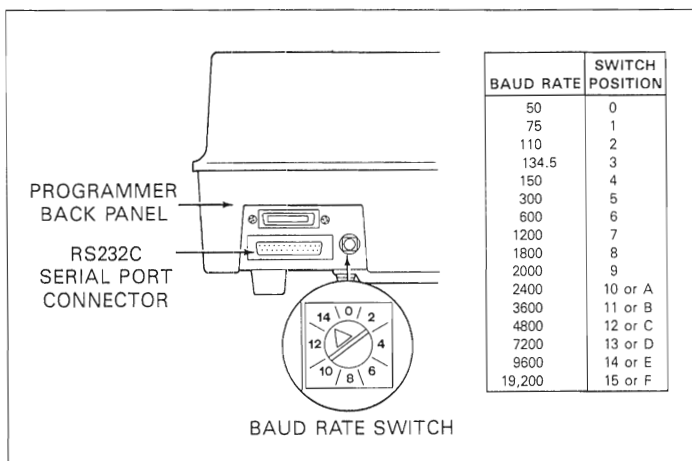


Figure 2-4. Selecting the Baud Rate on the Model 29

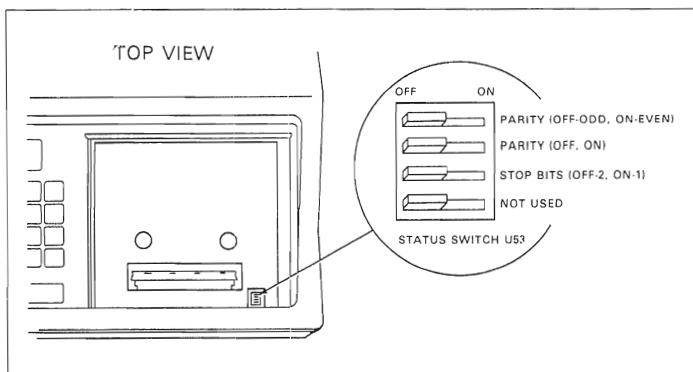


Figure 2-5. Selecting the Parity on the Model 29

3. In order to run PROMlink on your computer, the programmer must be in *Remote Control Mode*. To select the *Remote Control Mode*, on the programmer keyboard press the following keys for these Programmers: System 19, Series 22, and Models 29 and 60:

SELECT F 1 START START

And press these keys for the following Programmers: Models 120 and 121:

SELECT 0 9 START

*Note: Refer to Appendix B.5 for Serial I/O Configuration information.*

## STARTING THE PROGRAM

## 2.6

1. Place a DOS system disk, or your PROMlink disk with DOS on it, in Drive A (usually on the left) and turn the power on. (If you have a personal computer where DOS resides on the hard disk, turn the power on without putting a disk in drive A.)

*Note: The DOS operating system is not included on the PROMlink disk. If you want to have both PROMlink and DOS on the same disk, you can do this when you make the backup disk. Refer to your computer operating system manual for backup procedures. Assure that proper programmer to computer contact is established.*

2. The programmer must be turned on and in *Computer Remote Control* mode. This is selected from the programmer's front panel, as described in the programmer's manual.
3. The correct cable must be connected to the correct port. Use the cable provided with PROMlink and connect it to the COM1: port of the computer.
4. The communication protocol must be set correctly. Set the programmer protocol to 9600 baud, 8 bits, no parity, as described in your programming manual.

5. Put the PROMlink disk in the default drive. The prompt on the screen will be for drives A, B, C, or E (for the TI). When PROMlink starts up, it will expect to be running in an IBM PC, XT or AT. To run on a TI Professional computer, the customer simply copies INITTI.CFN to INIT.CFN. Type:

pl or

pl filename.cfn (configuration file)

RETURN

PROMlink will start, and after approximately 30 seconds the *Opening* or first menu will be displayed. You will see start up messages on your screen before the first menu is displayed.

*Note: The PROMlink program disk must be in the default drive. If you have a hard disk, and PROMlink resides on the hard disk, the current directory must be set to the one containing PROMlink unless you have set the path and the value of PLMSG. See your DOS manual for more information.*



## SELECTING A START UP CONFIGURATION

## 2.7

Unless you have saved a configuration during a previous programming session, PROMlink will start up using the default configuration contained in *INIT.CFN*. (See Appendix B.1 for configuration file format and default configurations.)

You have the option of specifying your own configuration file for PROMlink to use when it is started up. This configuration file must be one you have created earlier by using the *Save Configuration* function from PROMlink or is an edited file that follows the format described in Appendix B.1.

Example:

To enter PROMlink using the file *CONFIG.CFN* that you created earlier, type the following from your command line:

Command Line	Type
C>	pl config.cfn <span style="border: 1px solid black; padding: 2px;">RETURN</span>

You will enter PROMlink with the configuration specified by the file *CONFIG.CFN* already in effect.

The following items show the two possible conditions that occur when you either enter PROMlink by typing *pl* from the prompt or when you enter into a specific configuration file.

1. >pl (no file name)

PROMlink first looks for *INIT.CFN* in the default directory. If *INIT.CFN* is not there, PROMlink looks for *INIT.CFN* in *PLMSG*.

If *INIT.CFN* is in neither location, the configuration is set to the default. No error message will be displayed.

2. >pl file name (file name or entire path name)

The search procedure PROMlink performs is the same as in the first item. You may enter either just a file name or an entire path name. An error message will be displayed if the file or path name are not found.

## OPENING MENU

## 2.8

The *Opening screen* ( figure 2-6) displayed after PROMlink is started consists of title and copyright information and also indicates whether proper contact with the programmer has been established. (The programmer must be in *Remote Control* mode and be connected to the serial port of the computer with the correct communications protocols set before PROMlink will communicate.

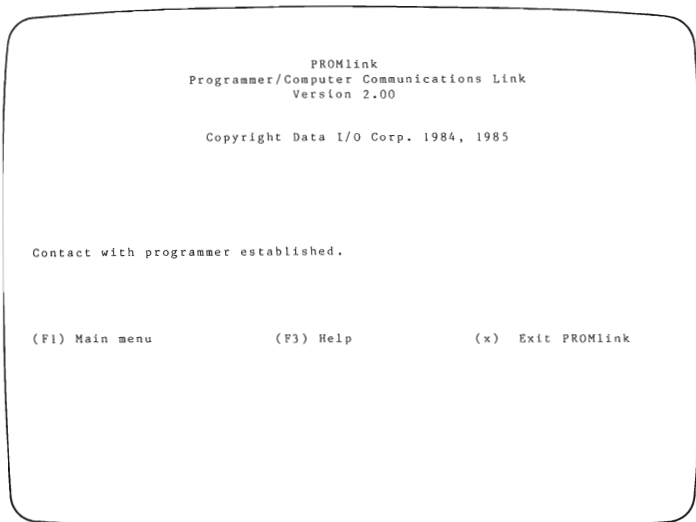


Figure 2-6. Opening Screen

If proper contact has not been established, the message, *cannot contact programmer*, is displayed below the copyright.

Once contact has been made, press the *F1* key on the computer keyboard to go to the *Main* menu.

*Note:* At the bottom of every screen is a reverse video help line with the keys highlighted that will move you from menu to menu (F1 and F2), and to get help for a particular function (F3).

*Note:* The option (X) to exit PROMlink is available only on the opening screen, the MAIN menu screen and the Help Message screen for the MAIN menu.

**Function:** Select a major function  
**Required Input:** Function number  
**Options:** Any of the PROMlink functions  
**Completion Message:** (none)  
  
**Notes:** Exit with X key from the help line.  
 Then press Y in response to the screen prompt

Figure 2-7 shows the *Main* menu. The *Main* menu provides the system status at the top of the screen and the menu of PROMlink's major functions.

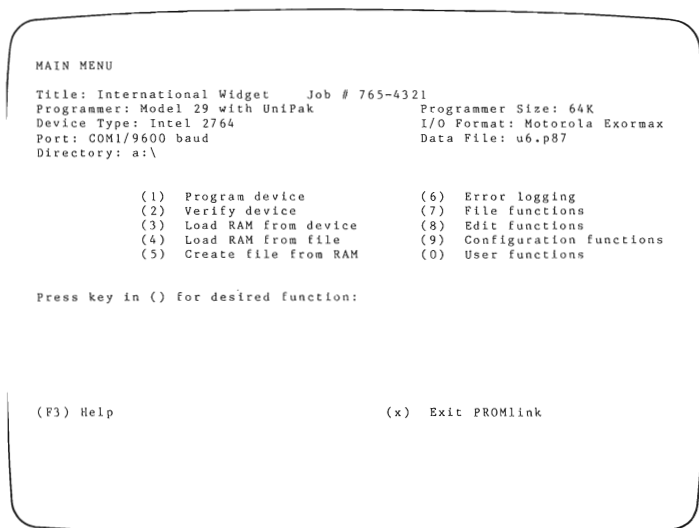


Figure 2-7. Main Menu

The system status area provides information about the current configuration: programmer and device type and I/O Format; programmer to computer connection status; current file data: RAM size and data file title; and the current directory. Select the desired function by typing its number. Each function displayed on the *Main* menu is described in the following subsections.

# SAMPLE SESSION

---

**DATA I/O**

## PROMlink SAMPLE SESSIONS

2.10

The following set of examples are recommended if you are a first time user of PROMlink. Before you proceed with this session, check that you have successfully connected the programmer to your computer, made a backup disk of PROMlink, started PROMlink, and are now looking at the *Main* menu. If everything else has been done and the *Main* menu (figure 2-8) isn't on the screen:

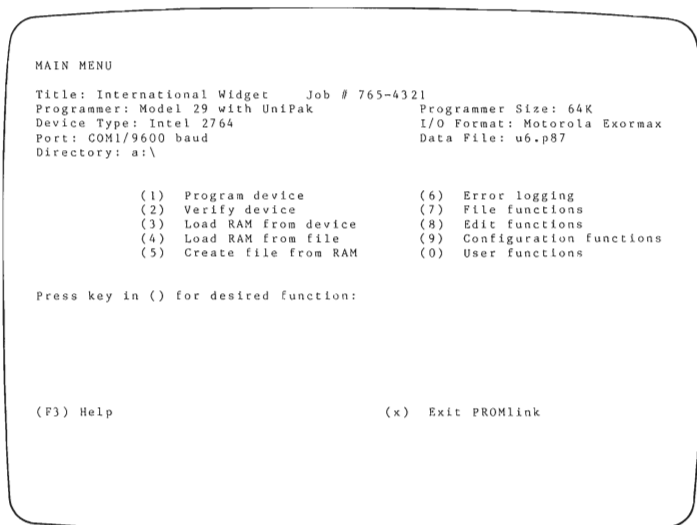


Figure 2-8. Main Menu

Press:

F1

(on your computer keyboard)

*Note: If you are already familiar with PROMlink, you may want to skip the rest of Section 2 and begin a programming session with PROMlink.*

Figure 2-9 is a flow diagram of the procedures covered in the next several exercises. The complete breakdown of the relationship among all of PROMlink's screens and menus is shown in figure 3-1 at the beginning of Section 3.

## SECTION TWO

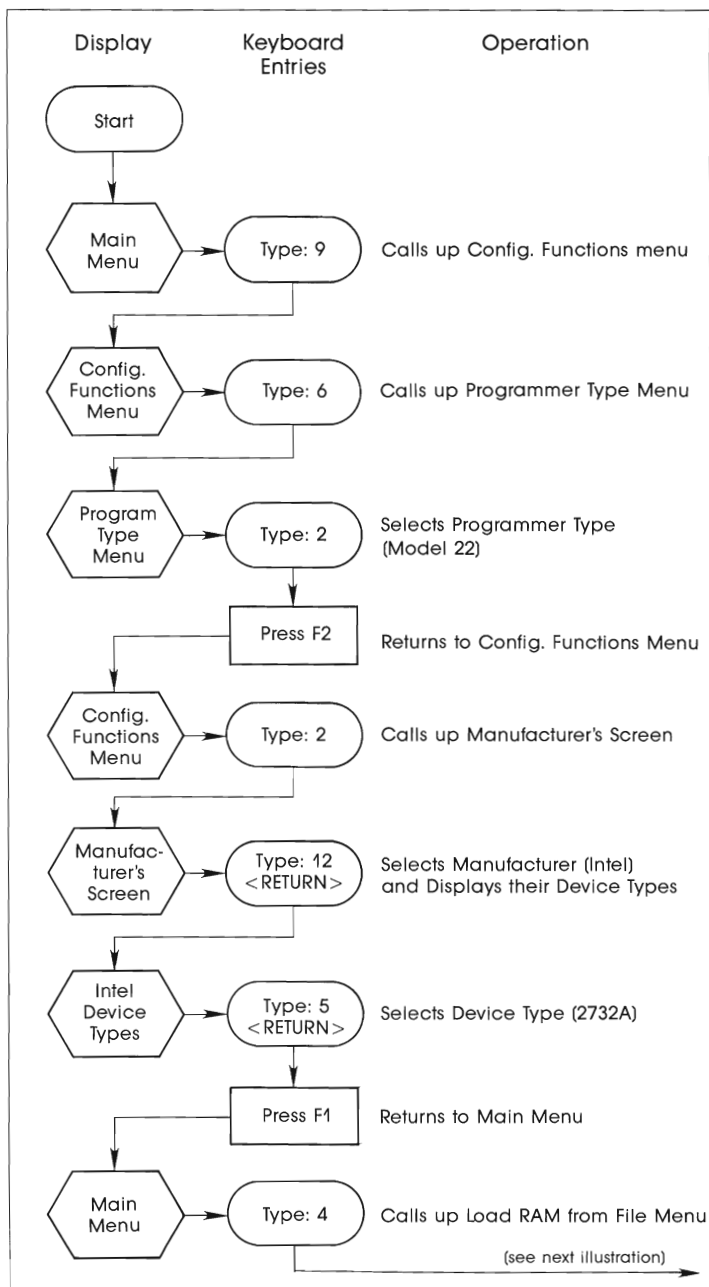


Figure 2-9. Example Session

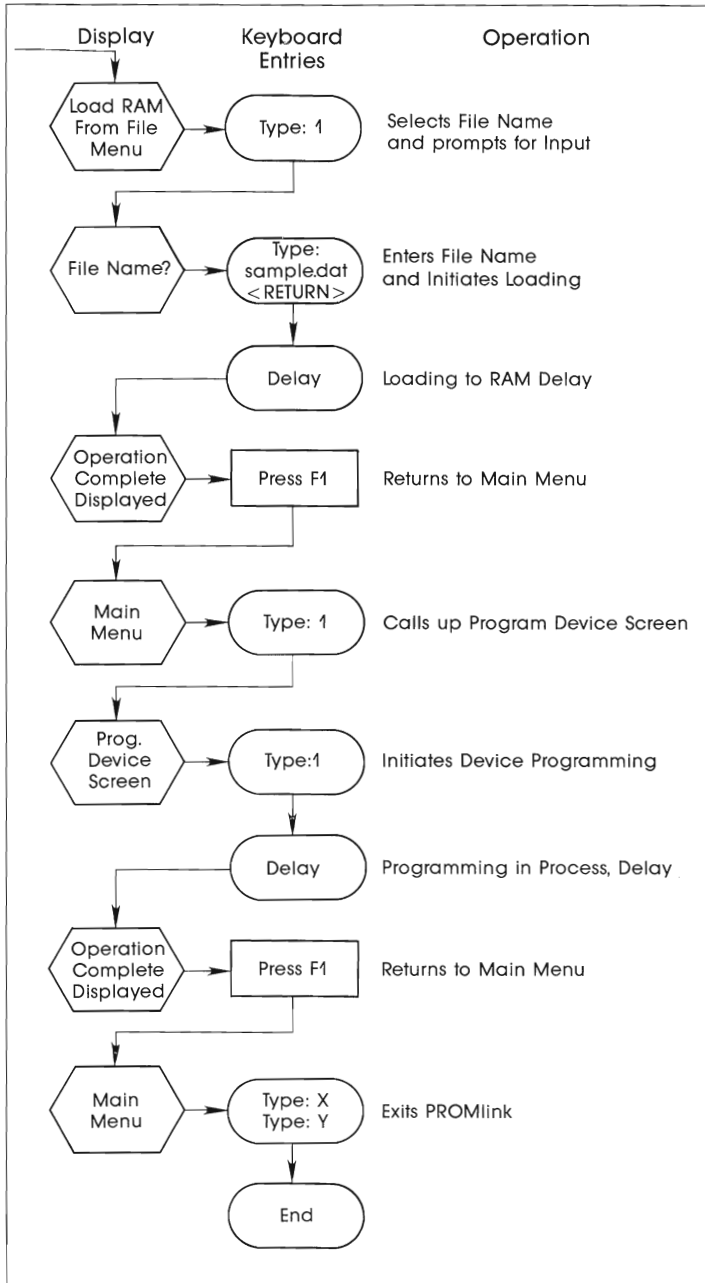


Figure 2-9. Example Session (Continued)

### Introduction

### 2.10.1

Study the *Main* menu displayed on your screen and notice the status area at the top portion of the screen. The information displayed there reflects the configuration parameters for the current programming session.

This menu allows you to select any of the major PROMlink functions. In the following steps you will select and become familiar with functions 9 and 1 from the *Main* menu.

After studying the *Main* menu, you will go directly to the *Configuration Functions* menu and become familiar with its options. Figure 2-10 shows the *Configuration Functions* menu. You will be using functions 6, 2, and 7 from this menu.

At start up, PROMlink will use the default configuration *INIT.CFN* unless you have loaded a configuration created during a previous programming session. This configuration can be modified using the *Configuration Functions* menu.

The information displayed there reflects the configuration parameters for the current programming session.



## Configuration functions

Title: International Widget      Job # 765-4321  
Programmer: Model 29 with UniPak      Programmer Size: 64K  
Device Type: Intel 2764      I/O Format: Motorola Exormax  
Port: COM1/9600 baud      Parity: no parity  
Data bits: 8      Stop Bits: 1  
User function file: logic.fnc      Data File: u6.p87  
Directory: a:\

- |                              |                            |
|------------------------------|----------------------------|
| (1) Enter title              | (6) Select programmer type |
| (2) Select device type       | (7) Select I/O format      |
| (3) Set operation boundaries | (8) Logic terminal mode E1 |
| (4) Configure port           | (9) Load configuration     |
| (5) Load user function       | (0) Save configuration     |

Press key in ( ) for desired function:

(F1) Main menu

(F2) Previous menu

(F3) Help

Figure 2-10. Configuration Functions Menu

### Selecting the Programmer Type

### 2.10.2

The status area of the screen reflects the programmer and pak type (if any) that you are using. If they are not correct, you should change them by:

Selecting the *Configuration Functions* menu by typing:

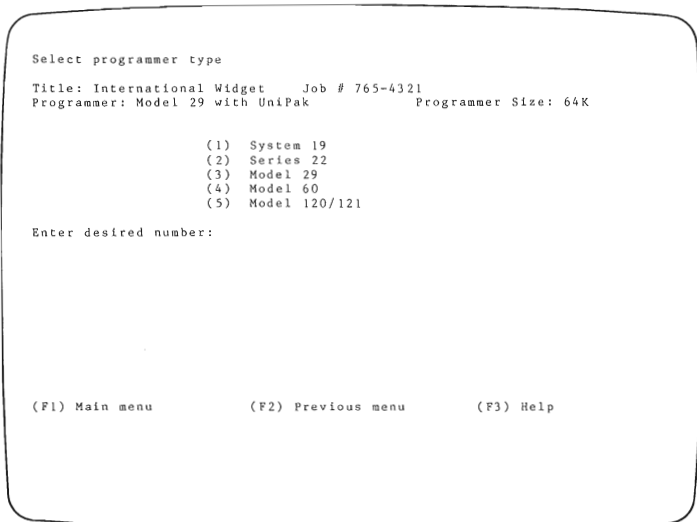
9 (from the *Main* menu)

The *Configuration Functions* menu is displayed as shown in figure 2-10.

Then type:

6

To display the *Programmer Type* menu.



The screenshot shows a terminal window with the following text:

```
Select programmer type

Title: International Widget      Job # 765-4321
Programmer: Model 29 with UniPak      Programmer Size: 64K

      (1) System 19
      (2) Series 22
      (3) Model 29
      (4) Model 60
      (5) Model 120/121

Enter desired number:

(F1) Main menu      (F2) Previous menu      (F3) Help
```

Figure 2-11. Programmer Type Menu

In this sample session the Model 22 will be chosen as the programmer that is connected to the computer running PROMlink. The Model 22 has Computer Remote Mode selected.

Type:

2 to select the Model 22 and after a short delay press:

F2

to return to the *Configurations Functions* menu. Note that the *Programmer Type* field now shows the Model 22 as the current programmer.

*Note: Pressing F2 anytime will return you to the menu you were using prior to the current one displayed on the screen. And pressing F1 will return you to the Main menu.*

### Selecting the Device Type

### 2.10.3

You should be back at the *Configuration Functions* menu. The status area of the screen will indicate the current "Device Type." Once the programmer type has been chosen, the next item to select is the device type. If the device type indicated in the status area is not the one you desire, choose the *Select Device Type (2)* option from the menu.

## SECTION TWO

The first of two *Select Device Type* screens is displayed, as shown in figure 2-12.

```
Select device type

Device Type: Intel 2764

MANUFACTURERS:

(1)  AMD              (12) Intel             (23) Ricoh
(2)  Altera           (13) Intersil          (24) Rockwell
(3)  Cypress          (14) Mitsubishi       (25) SEEQ
(4)  Eurotechnique    (15) MMI logic        (26) SGS-ATES
(5)  Exel             (16) MMI memory       (27) Signetics
(6)  Fairchild        (17) Mostek           (28) TI
(7)  Fujitsu          (18) Motorola         (29) Thomson
(8)  GI               (19) NS                (30) Toshiba
(9)  Harris           (20) NEC               (31) VTI
(10) Hitachi          (21) OKI               (32) Xicor
(11) Hughes           (22) Raytheon

Enter manufacturer number and RETURN:

Press SPACE to enter Data I/O family/pinout code

(F1) Main menu      (F2) Previous menu    (F3) Help
```

Figure 2-12. Select Device Manufacturers Screen

You can choose the device type that you will be using from this menu. Following is an example of the procedure. In this sample session an INTEL 2732A will be chosen.

Type:

12

(or the number corresponding to the manufacturer)

RETURN

to select INTEL as the manufacturer of the device. The second *Select Device Type* screen is displayed, as shown in figure 2-13. This screen allows you to select the correct device from a list of INTEL devices supported by Data I/O products.

```

Select device type

Device Type: Intel 2764

Intel DEVICES:

(1) 2704      (9) 27C64      (17) 2816A      (25) 8749
(2) 2708      (10) 27128      (18) 2817A      (26) 8751
(3) 2716      (11) 27128A      (19) 8741      (27) 8751H
(4) 2732      (12) 27256      (20) 8741A      (28) 8755A
(5) 2732A     (13) 27512      (21) 8742      (29) 87C64
(6) P2732A    (14) 27513      (22) 8744
(7) 2764      (15) 2815      (23) 8748
(8) 2764A     (16) 2816      (24) 8748H

Enter the number of your part number and RETURN:

Press SPACE to view part numbers again


(F1) Main menu      (F2) Previous menu      (F3) Help

```

Figure 2-13. Select Device Type Number Screen

*Note: Because Data I/O is continually updating and revising the Manufacturer's list, the numbers corresponding to the manufacturer may not be the same as they are on the example screen. Look for the manufacturer's name on the list, and enter that number when prompted.*

Select the 2732A by typing:

5

(or the number corresponding to the 2732A)

RETURN

The screen changes to show the selected device, its family and pinout code, and its size. Press the:

F1

key to return to the *Main* menu.

*Note: Devices can be selected using Family/Pinout Codes also.*

When you program a device, you will either be programming the device from files you already have on your data disk, or you will be using PROMlink to make files that you will store on the data disk to program the device later.

*NOTE: The data in any file is always formatted in some way. If you have formatted data files, you must check in the status section of your screen to see if the I/O format is the same as that of the files.*

If it is not, you must go to the *Set I/O Format* option from the *Configuration Functions* menu.

If you have no preference for the format of the data file, the default format (87) is a good one in terms of simplicity, density and error checking. *Binary* format (10) takes up the least disk space and has the quickest transfer but has minimal checking functions.

*Note: Any binary file including MS-DOS .COM files may be transferred to the programmer if the I/O format is set to binary (10). PROMlink will do no interpretation of the file data, however, and the data in programmer RAM will be byte for byte the same as the data in the binary file.*

*MS-DOS .EXE files differ from .COM files in that they must be processed by a loader before they can be executed. It is therefore unlikely that transferring .EXE file data to the programmer would yield useful results.*

## Programming the Device

## 2.10.5

Once you have set the *Programmer Type*, *Device Type*, and *I/O Format*; you are ready to perform a number of operations. The operation that you will be using most frequently, is "Programming the Device."

This session is only an example of how you might use PROMlink to program a device. If you want to follow the session and program a real device, substitute the correct programmer for the one given in step 1 and the correct manufacturer and device for the ones given in steps 3 and 4 of the Sample Session instructions. Also, the file name entered in step 5 should be the name of a real data file stored on disk. If you don't already have a data file stored on disk, one can be created from a master device using the functions *Load RAM from Device* and *Create File from RAM*. The Sample Session proceeds as follows:

*Note: Whenever the menu indicates "RAM", it is referring to the memory in the programmer only. The RAM in the computer is never required.*

## Load RAM from File

## 2.10.6

Select the *Load RAM from File* function by typing:

4

The *Load RAM from file* menu is displayed, as shown in figure 2-14.

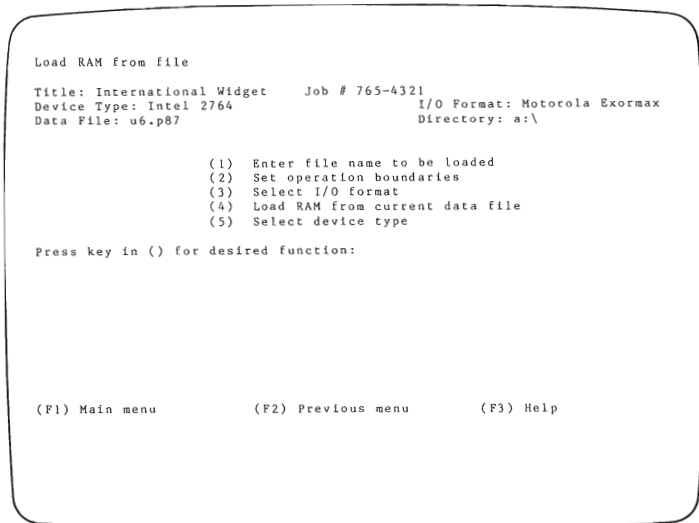


Figure 2-14. Load RAM From File Menu

In this sample session the data file name is *data.p87*

Type:

1

To enter the name of the file to be loaded. Then type:

*data.p87*

RETURN

*Note: If you frequently deal with data files that are in more than one I/O format, we recommend adding a dot extension to your file name that reflects the format of the*



data in the file. For example, for files in the Motorola Exormax format, (format 87) a file name might be "data.p87". This will help to avoid confusion about which format a file has.

A flashing asterisk appears on the screen during the load from disk data file to programmer RAM. When the load is complete, the message, *Operation successfully completed* appears.

Type:

**F1**

to return to *Main* menu.

If you were really programming the 2732A, it would have to be inserted in the textool socket on the programmer.

Select the Program Device function by typing:

1

The *Program Device* screen is displayed, as shown in figure 2-15.

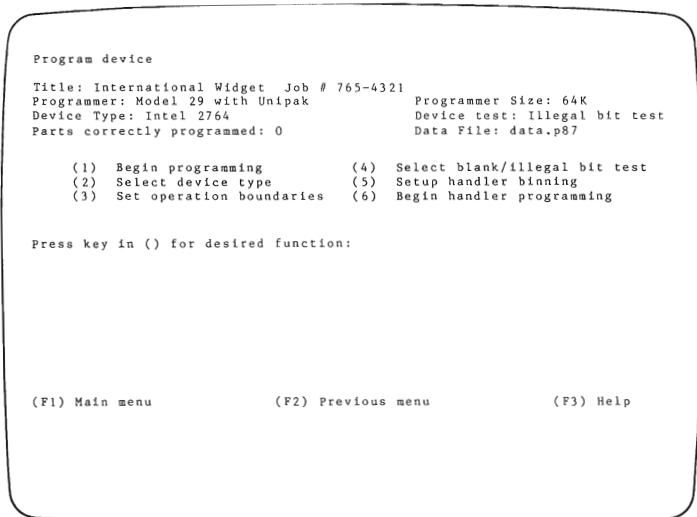


Figure 2-15. Programmer Device Screen

## SECTION TWO

At this point, care should be taken to make sure that all entries in the system status fields are correct. Table 2-2 shows each status field name and what should appear in that field for proper operation of PROMlink and the programmer. If any field contains incorrect data, return to the *Main* menu and redo the step for the instructions indicated in the third column of the table.

**Table 2-2. System Status Fields and Contents for the Sample Session**

Field Name	Required Contents	Instruction
Device Type	Intel 2732A	3
Data File	data.P87	5
Programmer	Series 22	1

If the system status fields are correct, type:

1

to begin the programming operation. A flashing asterisk will appear near the bottom of the screen to indicate that the device is being programmed. When the device is programmed, the message, *Operation successfully completed*, appears.

Press:

F1

to return to the *Main* menu.

**Exit PROMlink****2.10.7**

---

Type:

X

from the help line and

Y

when the screen prompts to exit PROMlink.

This concludes the Sample Session.



# MENUS AND FUNCTIONS

A series of approximately ten thin, horizontal white lines that start from the left edge of the page and extend towards the right, ending just before the 'MENUS AND FUNCTIONS' text. The lines are of varying lengths, creating a sense of motion or a stylized underline.

**DATA I/O**

FUNCTIONS

UTILITIES

INDEX

# MENUS AND FUNCTIONS 3

This section is a reference guide and provides descriptions of all of PROMlink's menus and functions. Organization of the information is in the order each function appears on the *Main* menu.

## MAIN MENU FUNCTIONS AND SECTIONS

3.1

- 3.2 (1) Program Device
- 3.3 (2) Verify Device
- 3.4 (3) Load RAM from Device
- 3.5 (4) Load RAM from File
- 3.6 (5) Create File from RAM
- 3.7 (6) Error Logging
- 3.8 (7) File Functions
- 3.9 (8) Edit Functions
- 3.10 (9) Configuration Functions
- 3.11 (0) User Functions

For any given task, you will proceed through one or more operations to accomplish that task. Figure 3-1 shows the relationship among PROMlink operations and their related screens and menus. Each rectangle represents a PROMlink operation and its screen or menu.

*Note: The term "menu" refers to a PROMlink display offering a choice of menu functions and "screen" refers to a PROMlink display presenting function operation information or requiring a specific user response.*

Many of PROMlink's functions can be reached from several menus and levels and the most direct route is shown in the diagram. Also, there are some sub-level menus not indicated on the menu tree which are less frequently used or used only for special circumstances.

The relationships among the screens and menus are shown as an inverted tree with lines or branches showing the connections between them. Many of the screens and menus can be reached only by proceeding downward through the tree via other screens and branches of the tree. For example, the complete file directory screen is reached from the *File Functions* Menu (7).

## SECTION THREE

However, there are several functions that are accessible from more than one level. For instance, *Select Device Type* can be accessed from the following menus:

- Program Device
- Verify Device
- Load RAM from Device
- Configuration Functions
- Load RAM from File

This is done for your convenience during a programming session. Each menu is described only once and the section that provides that information is indicated in figure 3-1. This number is given directly below the rectangle representing the screen.

Notice in figure 3-1 the *File Functions* menu, the *Edit Functions* menu, and the *Configuration Functions* menu and the several operations and functions available from each. These three functions, which are options from the *Main* menu, provide many of PROMlink's basic operational and parameter functions. In this manual, sub-tabs labeled *File/Edit Functions* and *Configuration Functions* provide quick access to these screens and menus.

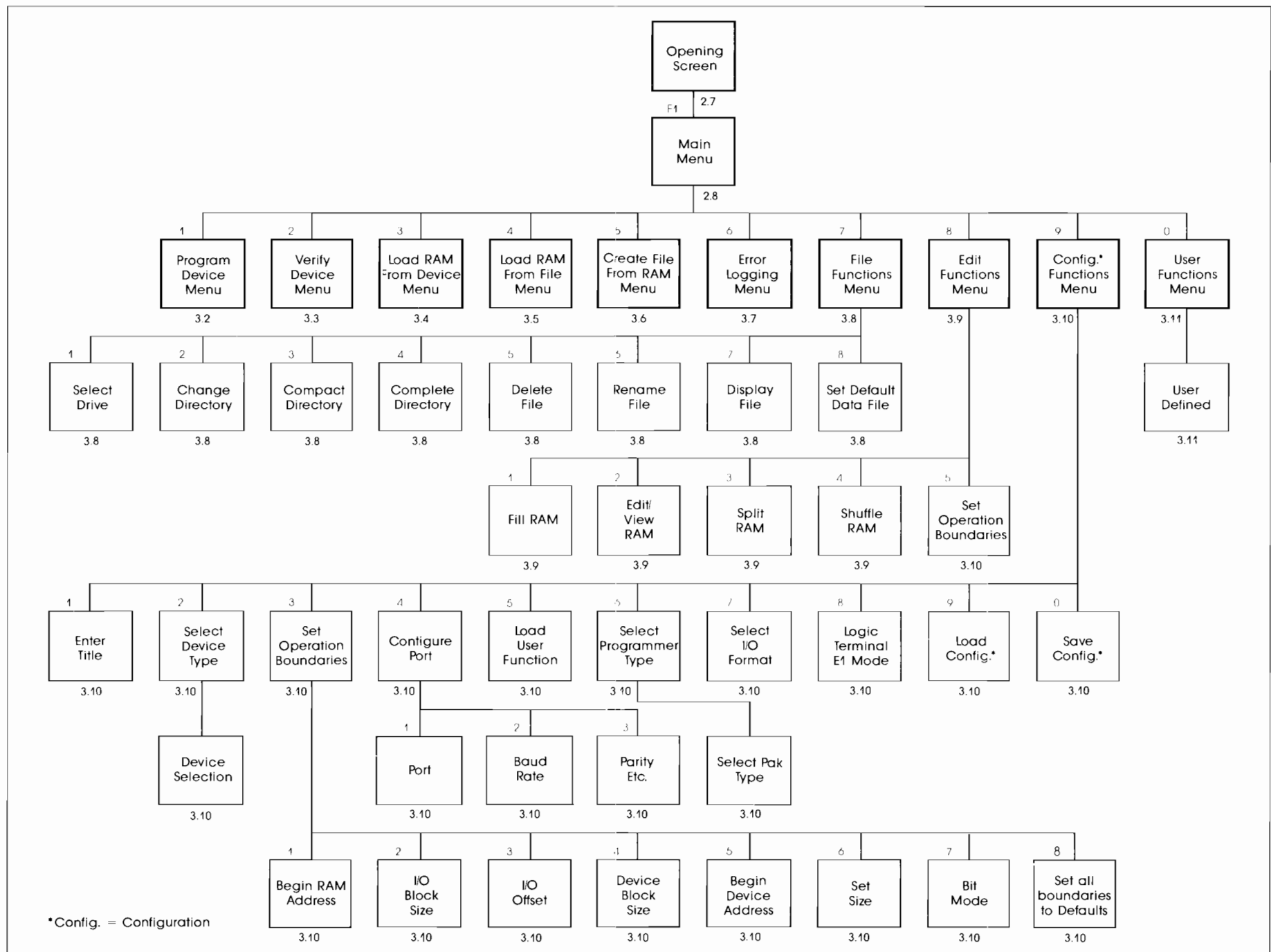


Figure 3-1. Relationship Among PROMlink Screens



## General Operation and Screen Format

## 3.1.1

Most of the PROMlink screens and menus present the system status and a menu. PROMlink prompts you for a response to perform an operation or select another menu. Figure 3-2 shows a sample menu and the components of it. The system status area appears across the top of the display. Messages and prompts appear below the status area of the display.

Most screens and menus prompt you to either enter a value to select a function or to enter specific information which will set a particular parameter. You can return to the *Main* menu anytime by pressing the *F1* key. Pressing the *F2* key will return you to the previous screen or menu. If you are unsure about what to enter, or want more information, press the *F3* key from anywhere in the program. A help screen will be displayed with information about the current operation or error condition displayed on the PROMlink screen.

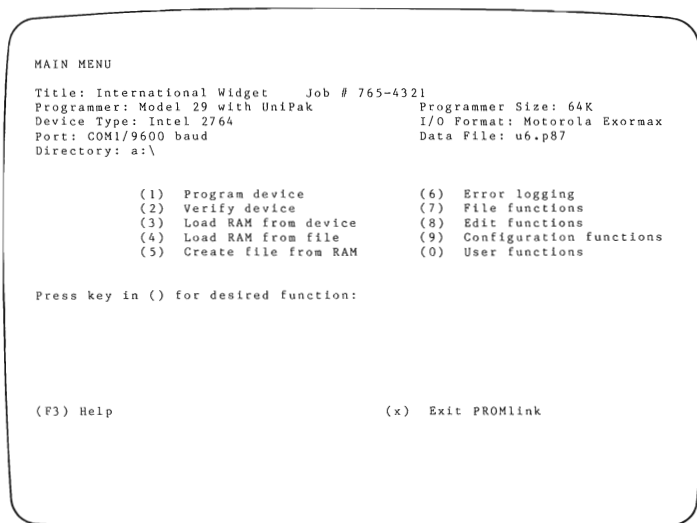


Figure 3-2. Main Menu

## SECTION THREE

To allow quick scanning of menus, the primary identifiers are highlighted in reverse video. These are the menu name, the function key definitions, and the prompt line. (See figure 3-3 for PROMlink Function keys and callouts.)

To make a selection from any of the options presented on the menu, type the number in ( ) representing that option. Some screens and menus require that you press the RETURN key after you have made your numerical selection while others will automatically execute your selection. The highlighted prompt line will explain the status and prompt you for any action required. You can correct a typing error when making your selection by using the backspace key (unless the selection is made automatically).

Many of the screens require you to enter a value in hexadecimal notation. Appendix A contains a table of commonly used hexadecimal numbers and their decimal equivalents.

Holding down the *CTRL* key while pressing the *Z* key during an operation will abort the operation, (except for Split and Shuffle RAM functions). PROMlink will return you to the previous menu.

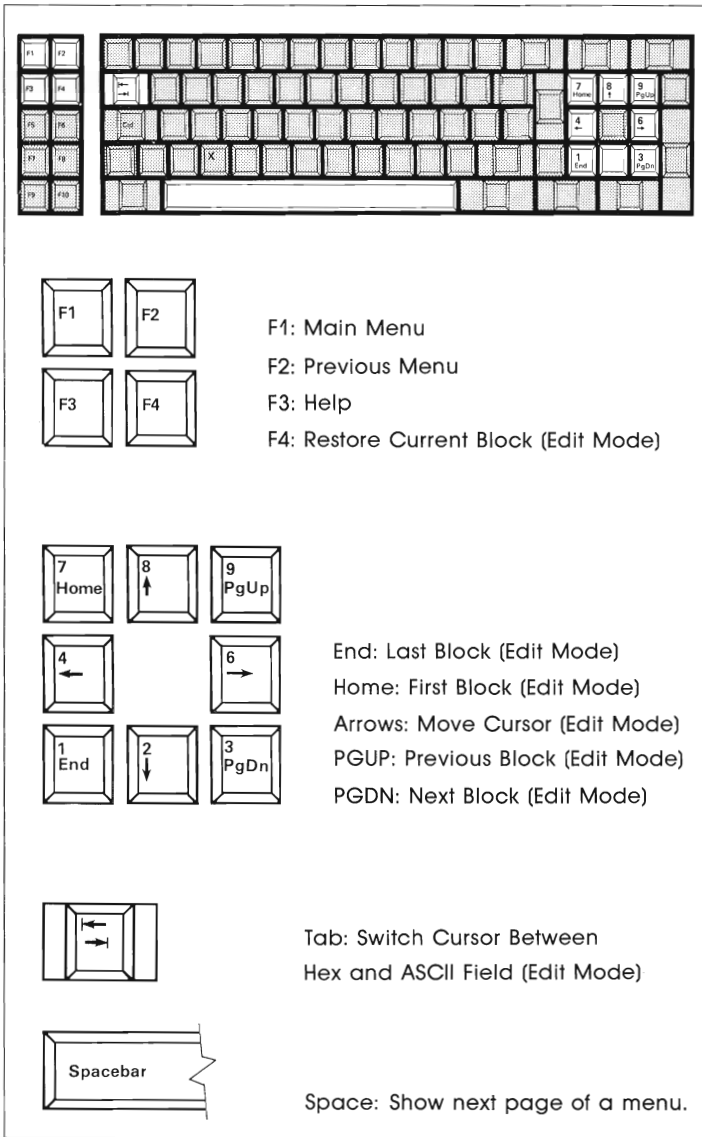


Figure 3-3. PROMlink Function Keys

### Main Menu System Status

### 3.1.2

The *main* menu system status area provides the following information:

- Menu Name
- Configuration Title
- Programmer Type
- Current Device Type
- Programmer and PC Connection
- Current Directory
- RAM size
- Current I/O Format
- Current Data File
- Current User Function File

When you first start PROMlink, the set of internal system status values shown in figure 3-2 is displayed. PROMlink accesses these values from a "Configuration File" called *INIT.CFN* that is on the PROMlink disk. You may create your own configuration file by using the *Save Configuration (0)* command from the *Configuration Functions* menu. The new configuration can then be reloaded at a later time with the *Load Configuration (9)* command from the *Configuration Functions* menu. This allows you to set up programming sessions quickly. If you name your configuration file *INIT.CFN* then PROMlink will automatically load that configuration at start up.

*Note: When PROMlink is started, the system status values are loaded from the disk in the default drive or in PLMSG in a file named: INIT.CFN*

*If this file has been erased or for any other reason does not exist, the PROMlink program uses its own internal set of status values. INIT.CFN default values are shown in figure 3-2. The contents of INIT.CFN and all configuration files are described in appendix B.1.*

*Note: The programmer RAM size is not displayed in the system status area for the Model 120 and Model 60 programmers.*

The following sections describe the PROMlink screens and menus and their functions. The shaded block at the beginning of the menu description provides you with a synopsis of the function, input, and options of that menu or screen.

## PROGRAM DEVICE (1)

## 3.2

**Function:** Program the device in the programmer socket

**Required Input:** Function number

**Options:** Program a device or set up programming configuration

**Notes:** Verify that the correct device type is displayed in Current device type before programming.

The *Program device* menu allows you to begin programming the device (1), select the device type to be programmed (2), set the operation boundaries (3), select the kind of testing to be performed on the device prior to programming (4), set up handler binning (5), and begin handler programming (6). (See figure 3-4.)

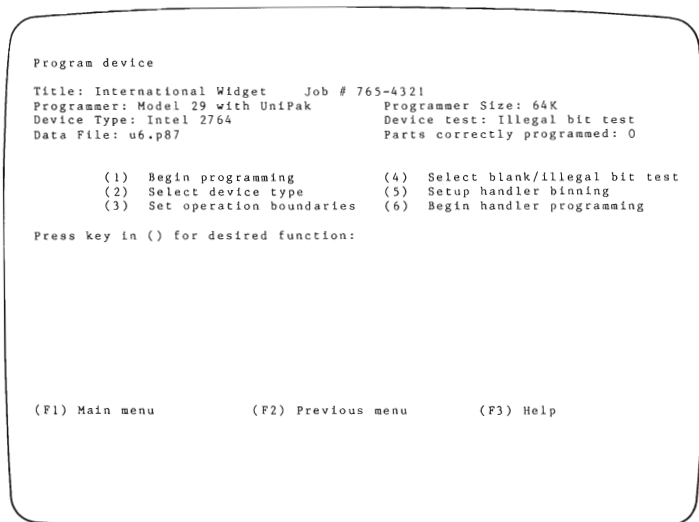


Figure 3-4. Program Device Menu

**Begin Programming (1)****3.2.1**

When the programmer programs a device, it actually performs these operations: testing the device to assure that new information will be accepted by the device, programming the device, and then verifying that the device has accepted the correct RAM information. See figure 3-5 for a flow diagram of the relationship of the data that will be programmed into the device.

During programming, PROMlink will display a message on the screen indicating that the device is being programmed.

The programming operation can take several minutes. When the procedure is complete, PROMlink displays a message indicating successful completion. If there is some difficulty in programming the device, an error message will appear.

Error numbers generated by the programmer are always less than 100. Refer to your programmer manual for listings of these messages. PROMlink errors are numbered 100 or greater.

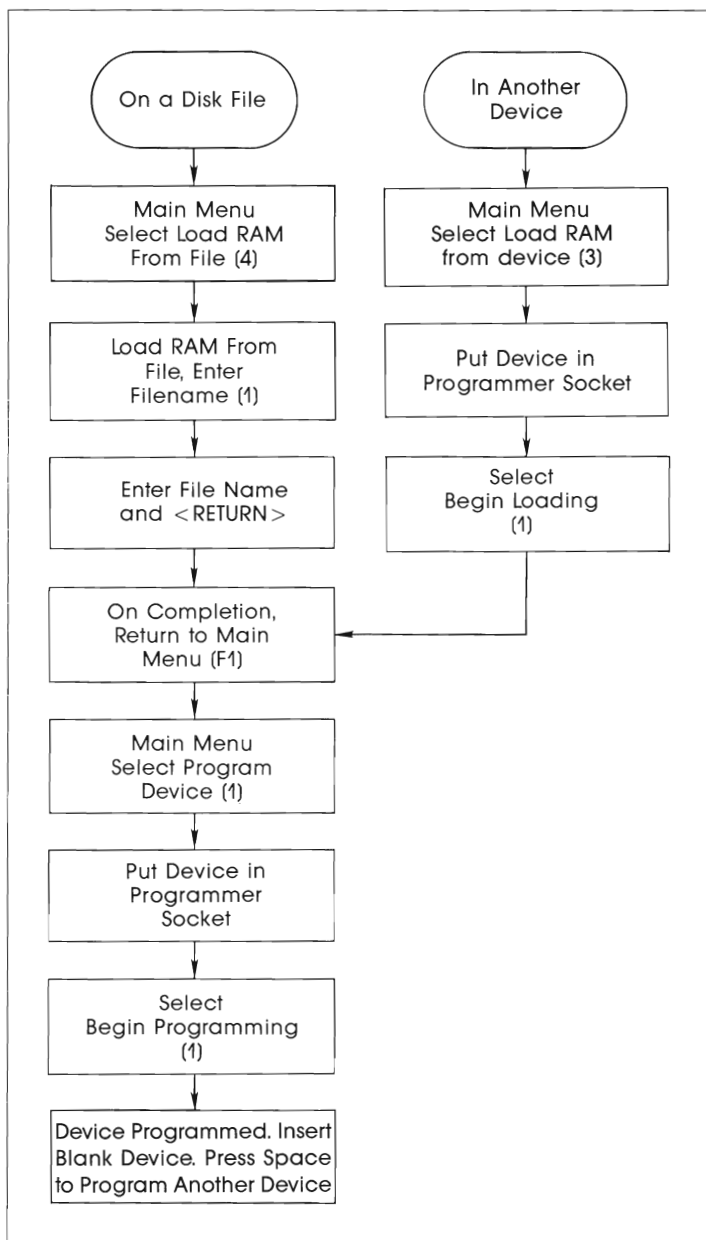


Figure 3-5. Flow Diagram



## Select Device Type (2)

## 3.2.2

The *Select Device Type* function is available from the following menus:

- Configuration Functions
- Verify Device
- Load RAM from Device
- Load RAM from File
- Program Device

## Set Operation Boundaries (3)

## 3.2.3

The *Set Operation Boundaries* function is accessible from the following menus:

- Program Device
- Verify Device
- Load RAM from Device
- Load RAM from File
- Create File from RAM
- Edit Functions
- Configuration Functions

Because there are many parameters you can set from this option, detailed discussion of the functions listed below are in *Configuration Functions*.

- Begin RAM Address
- I/O Block Size
- I/O Offset
- Device Block Size
- Begin Device Address
- Set Size
- Bit Mode
- Set All Boundaries to Defaults

### Select Blank Check/Illegal Bit Test (4)

### 3.2.4

When you select (4) from the Program Device menu, PROMlink will go to the *Blank Check/Illegal Bit Test* menu shown in figure 3-6. From this menu, you can choose the following options:

- (1) Illegal Bit Test
- (2) Blank Check
- (3) None (This allows the user to disable the test before programming.)

These functions refer to the device test that will be automatically performed in a program device operation before the device is actually programmed.

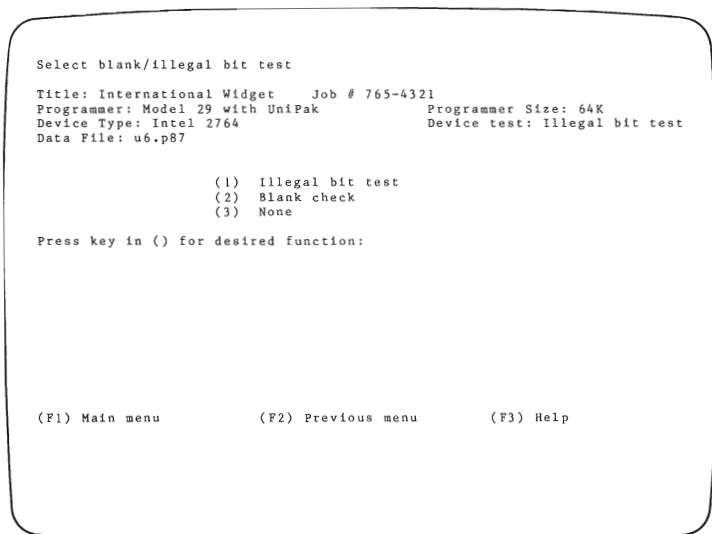


Figure 3-6. Blank Check/Illegal Bit Test

**The Illegal Bit Test****3.2.5**

In some cases it is not necessary that the device be blank to program or add new information. However, for programming to be successful, all the programmed bits (or fuses in logic devices) in the non-blank device must match those in the programmer's RAM (including the new or additional information).

Selecting the *Illegal Bit* Test instructs the programmer to look for programmed bits that appear in the device but are not specified in RAM. If a programmed bit in the device does not match its corresponding bit in RAM, an illegal bit error will be displayed. This is a fatal error, causing the programming session to abort.

**Blank Check (2)****3.2.6**

A Blank Check test is initiated prior to programming to assure that there are no programmed bits in the device to be programmed. If no programmed bits are detected, the device is blank, and programming will continue.

## Set Up Handler Binning (5)

## 3.2.7

**Function:** Allows the user to select which error conditions will correspond to the category signals sent to the Handler

**Required Input:** Category number for each error condition

**Notes:** (None)

The *Handler* is an attachment to the programmer that automatically moves devices through a socket connected to the programmer where they are programmed and then sorted.

Figure 3-7 shows the *Set Up Handler Binning* menu. There are six error conditions displayed on the menu. The numbers on the screen corresponding to the six error conditions are the binning categories. You may enter a number from 1 - 5 (depending on your *Handler*) to select the binning signal given to the *Handler* during *Handler* programming for each of the error conditions.

An example of category selection follows:

Programmed Correctly:	1
Bad Device/Continuity:	4
Illegal Bit/Non-Blank:	2
Programming Error:	2
Data Verify Error:	3
Functional Verify Error:	3

If you entered these category numbers during *Set Up Handler Binning*, the *Handler* would drop all acceptably programmed devices into bin 1, all *Illegal Bit/Non-Blank* and *Programming Errors* into bin 2, all *Data Verify* and *Functional Verify Errors* into bin 3, and *Bad Device/Continuity Errors* into bin 4. Bin 5 would not be used during this session. (See the *Handler* manual for set up instructions.)

### Begin Handler Programming (6)

### 3.2.8

**Function:** Dispense multiple devices for programming

**Required Input:** Number of devices to program

**Completion Message:** Operation successfully completed

**Notes:** (none)

The *Begin Handler Programming* function menu (figure 3-8) is similar to the *Program Device* function and menu except that the *Handler* will automatically load the devices, program them and deposit the devices into the appropriate bin according to the selections made at the *Handler* set up menu, and continue with the procedure until the number of devices you specified at the screen prompt have been correctly programmed. The *Handler* will continue with the programming until either the specified number of devices have been correctly programmed or an unrecoverable error has occurred.

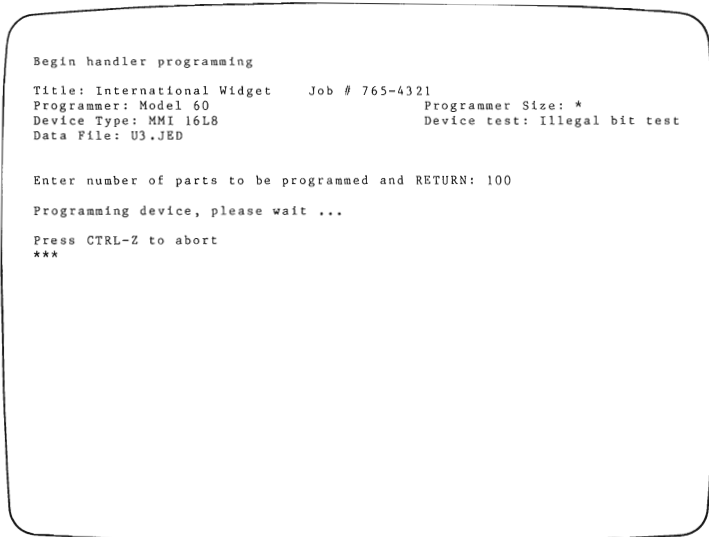


Figure 3-8. Begin Handler Programming Screen

## VERIFY DEVICE (2)

## 3.3

**Function:** Check device data against programmer RAM data

**Required Input:** 1

**Options:** Perform the verification, set up the device verify configuration, or return to the Main menu

**Completion Message:** *(Result of verification)*

**Notes:** The device type shown in the system status area should match that of the device in the socket. Make sure that the correct data is in the programmer RAM.

All data bits in a device are checked for a match with data bits in programmer RAM. (See figure 3-9.) A message stating whether the data matches the RAM data is displayed when the verification is complete. This check is used to verify that a device has been correctly programmed.

During the verification, operation status is *Verifying device with RAM*. The message, *Operation successfully completed*, is displayed below the system status area upon completion of the RAM verify. If any errors occurred during the operation, an error message is displayed in place of the completion message. The RAM verify can be aborted by holding down the *CTRL* key while pressing the *Z* key at any point during the operation.

The following functions are also available from this menu:

- (2) Select Device Type
- (3) Set Operation Boundaries

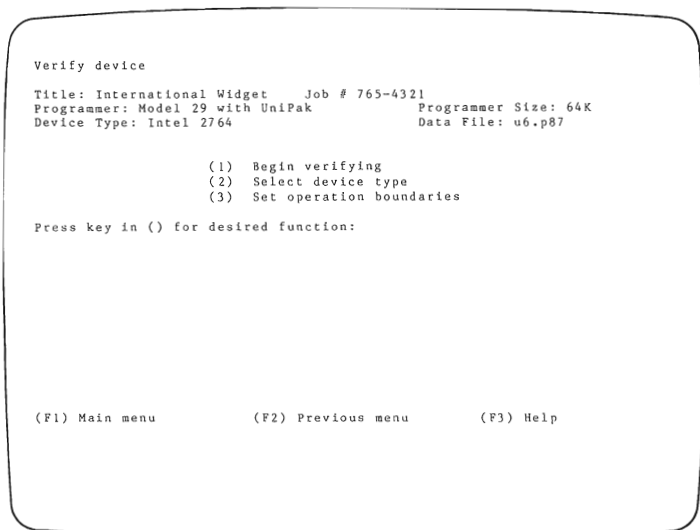
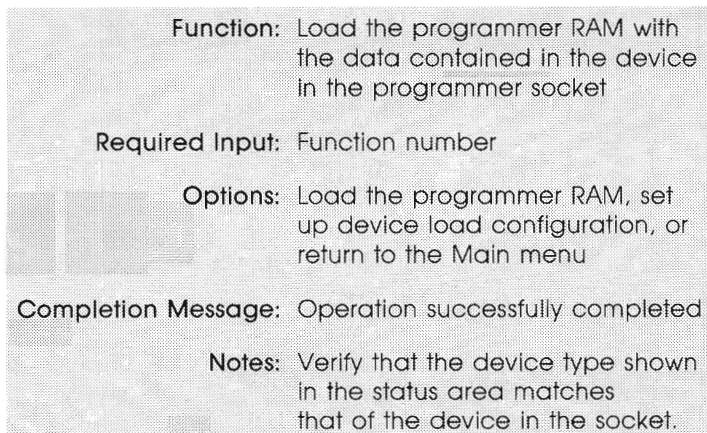


Figure 3-9. Verify Device Menu



## LOAD RAM FROM DEVICE (3)

3.4



The *Load RAM from device* screen (figure 3-10) displays the system status and allows you to load the programmer RAM with the data contained in a device in the programmer socket. Before loading the RAM, verify that the device type displayed in the system status area is the same as that of the device plugged into the socket. Initiate the RAM load by pressing 1. During the load, operation status is Loading RAM from device. The message, *Operation successfully completed*, is displayed below the system status area upon completion of the RAM load. If any errors occurred during the load, an error message is displayed in place of the completion message. The RAM load can be aborted by holding down the CTRL key while pressing the Z key at any point during the load.

Loading the programmer RAM from a device is particularly useful when you want to duplicate a programmed device. The data in the device is loaded into RAM where it can then be used to program other devices of the same type or transferred to a PC disk for storage.

The following functions are also available from this menu:

- (2) Select Device Type
- (3) Set Operation Boundaries

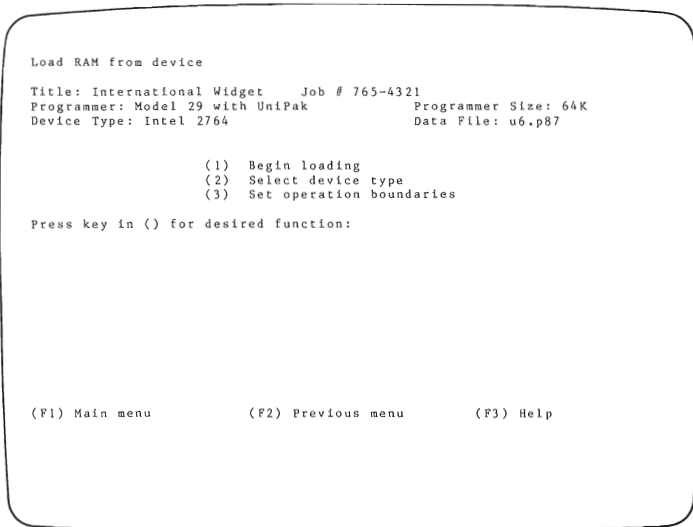


Figure 3-10. Load RAM From Device Menu

## LOAD RAM FROM FILE (4)

3.5

**Function:** Load the programmer RAM with data from a PC file

**Required Input:** Function number

**Options:** Load RAM or set up load configuration

**Notes:** Check for the correct data format in the I/O Format field

The *Load RAM from File* screen (figure 3-11) displays the system status and prompts you to select a menu item. By typing a 1, PROMlink will prompt you to enter the name of a PC file containing the data to be downloaded to the programmer RAM. This data is then transferred to the programmer. The programmer receives the data using the I/O format number you select and places the data in the programmer RAM. Before initiating the load, check the I/O format shown on the screen to see that it matches the format of the file. The I/O format can be changed, if necessary, by pressing 3.

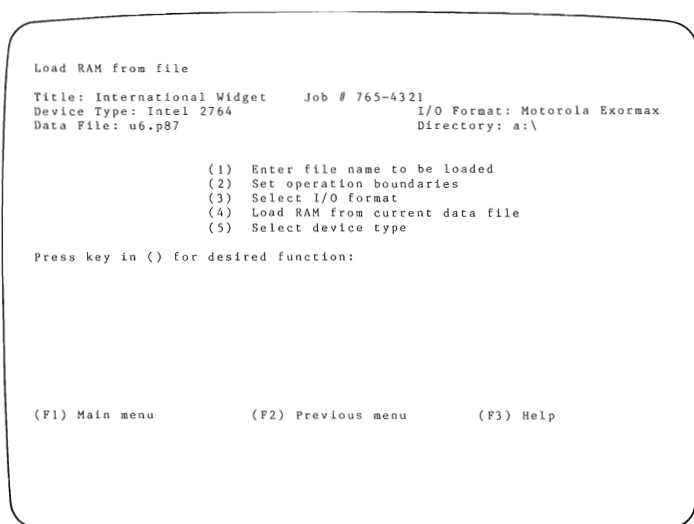


Figure 3-11. Load RAM From File Menu

Press the RETURN key after entering the drive specification and path (if necessary), and file name to initiate the RAM load. PROMlink will display

*Loading RAM from file:*

file name, and a flashing asterisk will flash at the bottom of the screen during the load. You may abort the RAM load by holding down the CTRL key while pressing the Z key which causes the operation to end immediately and displays the message *Operation aborted*. When the RAM load is complete, the message, *Operation successfully completed* is displayed. If any errors occur during the load, an error message is displayed in place of the completion message.

Loading the programmer RAM from a computer file allows you to program devices with data that has been saved on a floppy disk.

The following functions are also available from this menu:

- (2) *Set Operation Boundaries*
- (3) *Select I/O Format*
- (4) *Load RAM from Current Data File*
- (5) *Select Device Type*

## CREATE FILE FROM RAM

## 3.6

**Function:** Create a computer data file containing the contents of the programmer RAM

**Required Input:** Function number

**Options:** Create the file

**Completion Message:** Operation successfully completed

**Notes:** Check for correct data format in the system status area

The *Create File from RAM* menu (figure 3-12) displays the system status and allows you to create a computer data file from data contained in the programmer RAM. This menu allows you to create a file (1), to set operation boundary addresses (2), or to select the I/O format (3). PROMlink will prompt you for the name of a computer data file that will contain the RAM data if you press 1. The file name may contain a drive specification and path in addition to the file name and extension. If you specify a file that already exists, you are given a choice of writing the RAM data on top of the data currently in that file (replacing it) or entering a different file name.

The amount of data stored in the file depends on the I/O block size and current device size. A different I/O block size can be specified with the *Set Operation Boundaries* function (Function 2 of this menu). Before creating the file, verify that the I/O format displayed in system status is the desired one for the file you are creating. If it is not, change it by selecting function (3) from the menu.

The following functions are also available from this menu:

- (2) *Set Operation Boundaries*
- (3) *Select I/O Format*

Create file from RAM

Title: International Widget      Job # 765-4321  
I/O Format: Motorola Exormax      Data File: u6.p87  
Directory: a:\

- (1) Enter file name to be created
- (2) Set operation boundaries
- (3) Select I/O format

Press key in ( ) for desired function:

(F1) Main menu

(F2) Previous menu

(F3) Help

Figure 3-12. Create File From RAM Menu

## ERROR LOGGING

## 3.7

**Function:** Display, save, and clear the programming session error counts

**Required Input:** Option selection

**Options:** Clear the error counts or save and clear the error counts

**Completion Message:** Operation successfully completed

**Notes:** (none)

Error counts are saved to a file named STATS.DOC on the default drive of the computer.

Programming session error counts can be saved to disk or cleared from the *Error Logging* screen (figure 3-13). Session statistics include the number of devices that have been successfully programmed, and the number of illegal bit/non-blank errors, programming errors, verify errors, and bad device/continuity errors detected, since the PROMlink session was started or the error counts were last cleared. The session statistics are updated after every programming operation.

The error counts will be saved to a file called "STATS.DOC" on the default directory. If that file already exists, the current error counts are appended to that file.

The *Error Logging* menu gives you two options: clear the current error counts or save the error counts and then clear them. Clearing the error counts (with or without saving them) resets all the counts to zero. Further programming operations are then recorded in the error counts as usual.

*Operation successfully completed* is displayed after the operation is completed.

*Note: The GangPak and Gang modules cannot indicate to PROMlink the number of correctly programmed devices. Therefore, PROMlink does not update the error counts when a GangPak or Gang module is in use.*

Error logging

Title: International Widget      Job # 765-4321  
Programmer: Model 29 with UniPak      Programmer Size: 64K  
Device Type: Intel 2764      Data File: U6.P82  
Directory: c:\

Parts correctly programmed: 12      Programming errors: 0  
Bad device / continuity: 0      Data verify errors: 0  
Illegal bit / non blank: 1      Functional verify: 0

(1) Clear totals  
(2) Save and clear totals

Press key in ( ) for desired function:

(F1) Main menu      (F2) Previous menu      (F3) Help

Figure 3-13. Error Logging Menu





## FILE/EDIT FUNCTIONS

---

**DATA I/O**

## FILE FUNCTIONS

## 3.8

Section 3.8 describes PROMlink file manipulation and associated directory functions. (See figure 3-14.) The file functions that you can access from the *File Functions* menu are deleting, renaming, displaying, and setting the default data file. You can also select the operating disk drive, view the complete or compact working directory, and change the directory.

The screens and menus defining these functions are presented in the following sections.

```
File functions
Title: International Widget   Job # 765-4321
Data File: u6.p87           Directory: a:\

      (1) Select drive        (5) Delete file
      (2) Change directory    (6) Rename file
      (3) Compact directory    (7) Display file
      (4) Complete directory   (8) Set default data file

Press key in ( ) for desired function:

(F1) Main menu      (F2) Previous menu      (F3) Help
```

Figure 3-14. File Functions Menu

### Select Drive and Change Directory

### 3.8.1

The first two functions on this menu are *Select Drive* (1) and *Change Directory* (2). They provide you with the flexibility to move from one directory to another and to change your disk drive. (See figure 3-15 and 3-16.)

<b>Function</b>	Change working directory or operating disk drive
<b>Required Input:</b>	Type name of new working directory or letter designation of new disk drive
<b>Options:</b>	Remain in current drive/directory
<b>Completion Message:</b>	Current directory: \
<b>Notes:</b>	(none)

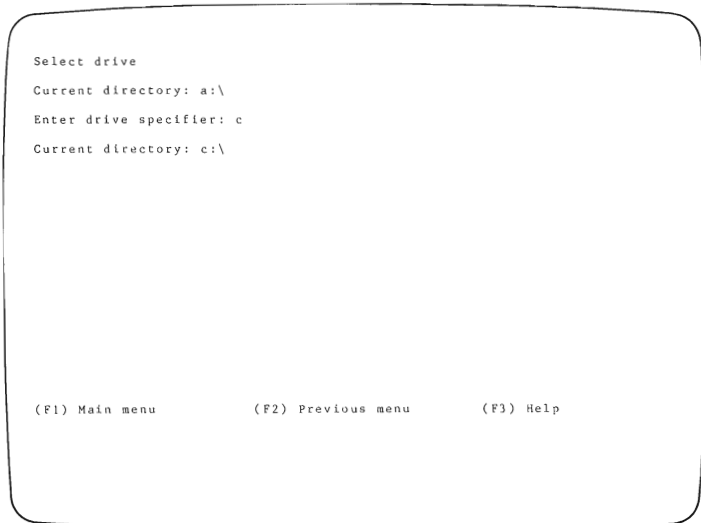


Figure 3-15. Select Drive Screen

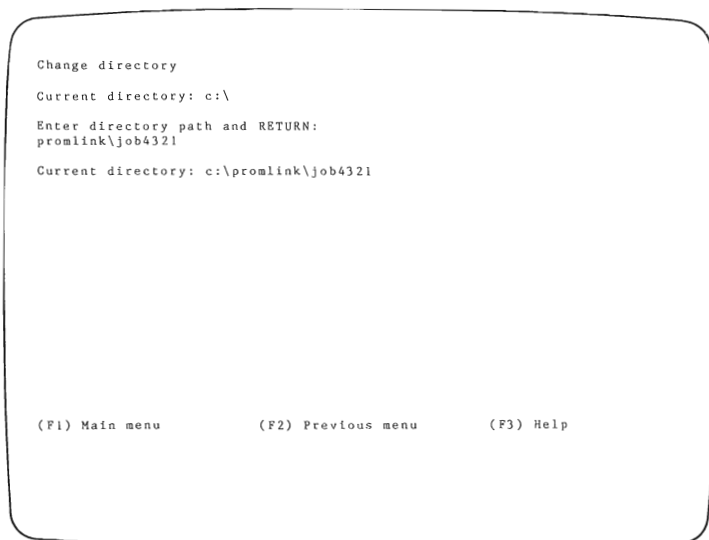


Figure 3-16. Change Directory Screen

### Displaying the Directory

### 3.8.2

PROMlink offers two directory listings. Each provides a list of the data files in the directory specified. The Complete Directory lists, in addition to the file names and amount of free working space, other information. The following two sections explain the contents of each.

<b>Function:</b>	Display listing of directory
<b>Required Input:</b>	Directory path and/or filename and <div>RETURN</div>
<b>Options:</b>	Select (3) for compact directory listing  Select (4) for complete directory listing
<b>Completion Message:</b>	None. Directory is displayed.
<b>Notes:</b>	(none)

### Compact Directory

### 3.8.3

The *Compact Directory* screen (figure 3-17) displays a complete list of files currently in the directory that you specified. You can list the files on your current directory by entering RETURN without having to type the path name.

You can indicate a specific file or group of files to list. To list specific files, enter the search key according to the DOS rules for file specifications and wildcard characters. If no files exist that match the search criteria, a message indicating that PROMlink is unable to display the directory will appear.

For example, the search key *b:\*.xyz*

would display information for all files on drive B that have the extension,

*xyz*.

The default drive is the drive indicated in the system status area as part of the default directory.

If the disk or hard disk in the default drive is divided into subdirectories, information for the files contained in the current directory is displayed. For more information concerning file specifications, default drives, and directories, refer to your DOS manual.

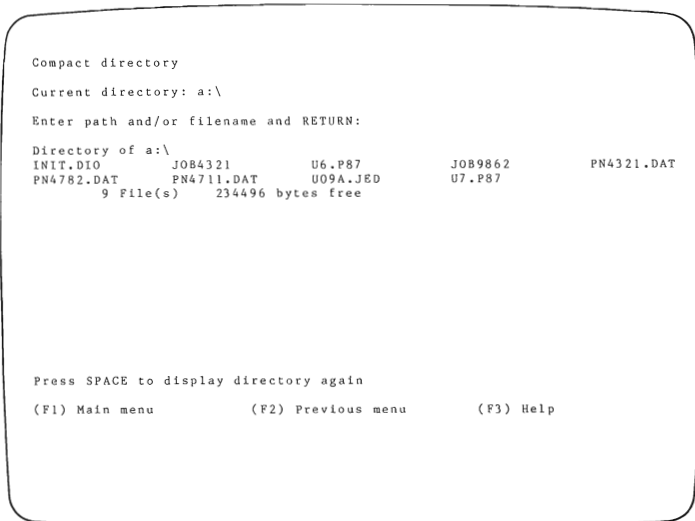


Figure 3-17. Compact Directory Screen

## Complete Directory

## 3.8.4

The *Complete Directory* screen (figure 3-18) displays a complete list of files currently in the directory that you specified. Additional information displayed on the screen is listed below:

- Amount of space (number of bytes) used by each file
- Date and time the file was last edited

The procedures on listing the directories is the same for both directory list functions. Refer to the information in the *Compact Directory* discussion above.

```

Complete directory
Current directory: a:\
Enter path and/or filename and RETURN:

Directory of a:\
INIT      DIO      140    3-04-85 12:02p
JOB4321   DIO      137    2-28-85 10:16a
U6        P87      22570  2-27-85 12:11p
JOB9862   DIO      137    2-27-85 11:40a
PN4321    DAT      11306  2-27-85 11:45a
PN4782    DAT      11306  2-27-85 11:46a
PN4711    DAT      11306  2-27-85 11:47a
U09A      JED      1001   2-27-85 5:00p
U7        P87      22574  2-28-85 11:13a
9 File(s) 234496 bytes free

Press SPACE to display directory again

(F1) Main menu      (F2) Previous menu  (F3) Help

```

Figure 3-18. Complete Directory Screen



## Delete File

3.8.5

**Function:** Deletes a data file from directory

**Required Input:** File name

**Options:** (none)

**Completion Message:** Operation successfully completed

**Notes:** (none)

This function allows you to delete data files from any directory. It is good practice to periodically clear your working directory of configuration files and data files that you no longer use. The *Delete File* screen shown in figure 3-19 lists all of the files currently in the directory. Enter a file name from the list and press the RETURN key. The file you named will be gone.

### CAUTION

*Make sure that you really want to delete the file before pressing the RETURN key; this procedure is not reversible.*

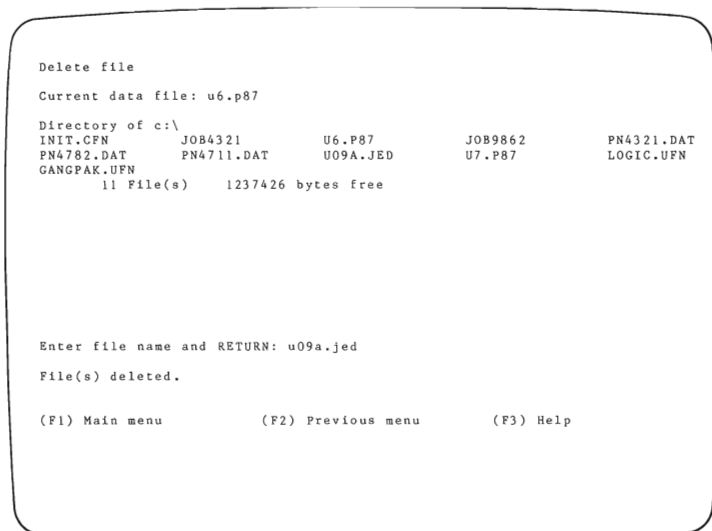


Figure 3-19. Delete File Screen

### Rename File

3.8.6

**Function:** Changes the name of a current file to a different name

**Required Input:** Original-filename new-filename

**Options:** (none)

**Completion Message:** Operation successfully completed

**Notes:** (none)

This function allows you to change the name of a file you have previously stored in a directory. The *Rename File* menu shown in figure 3-20 allows you to change the name of a file within your current working directory. This function is useful for taking a previously named data file and changing the file name to reflect more adequately the contents of the file. Changing the name of a data file does not affect the contents of the file in any way.

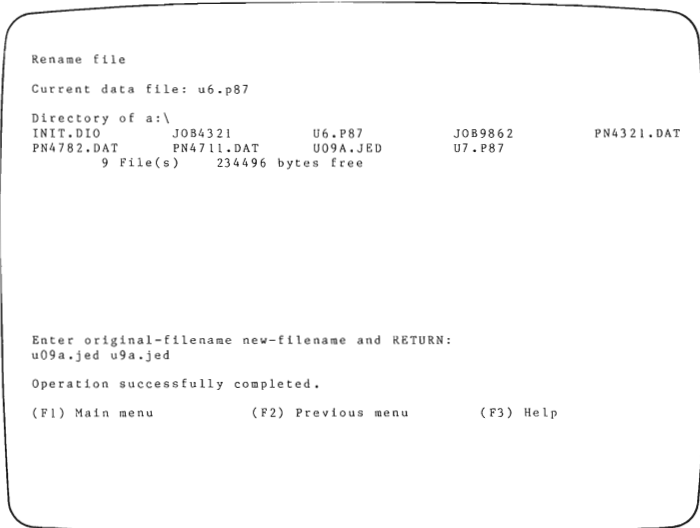


Figure 3-20. Rename File Screen

### Display File

### 3.8.7

**Function:** Shows the contents of the data file

**Required Input:** File name

**Options:** Display file, return to the File Functions menu, or return to the Main menu

**Completion Message:** (none)

**Notes:** (none)

This function allows you to view the contents of the data file. PROMlink will prompt you for the file name you want to view. (See figure 3-21.) After you enter the file name and press the RETURN key, a second display containing the data file you specified appears. Figure 3-22 shows the screen with a sample file displayed on it.

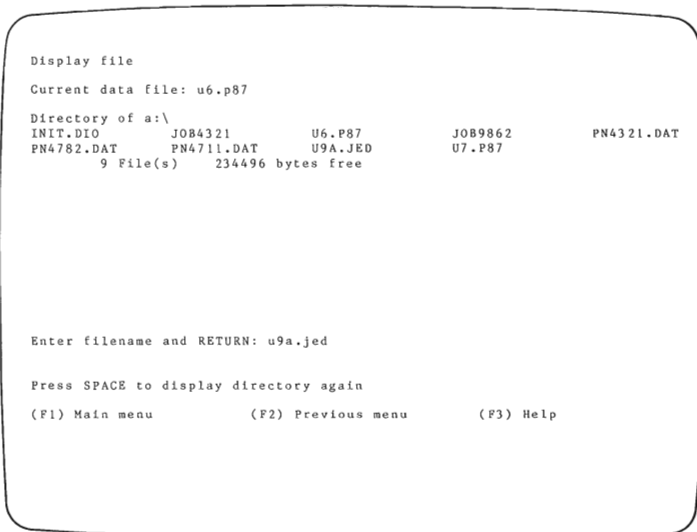


Figure 3-21. Display File Menu

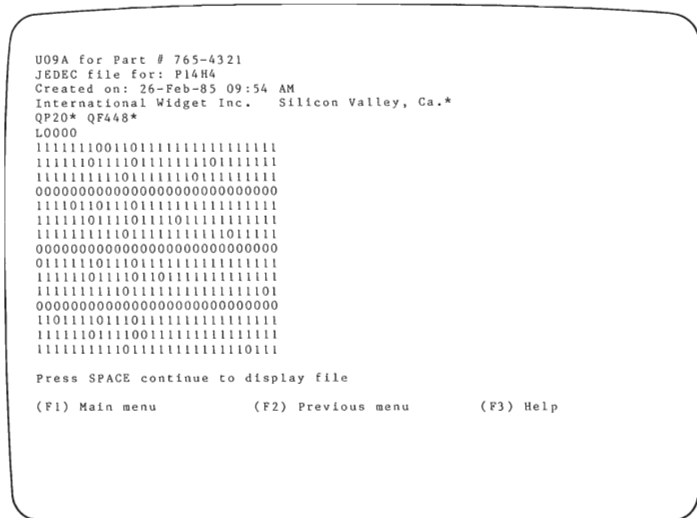


Figure 3-22. Display File Screen

## Set Default Data File

## 3.8.8

**Function:** Selects the name of the data file that will appear in the system status area

**Required Input:** File name

**Options:** (none)

**Completion Message:** Operation successfully completed

**Notes:** (None)

This function allows you to set the file that PROMlink will show in the system status area. By typing the name of the file you want and pressing the RETURN key, (figure 3-23) PROMlink will indicate that name in the system status area. The function is useful for setting up configurations in preparation for saving a configuration. The data file is normally set any time a file is loaded or created.

*Note: This operation does not load the file. If you want to load a file, go to the Load RAM from file (4) from the Main menu.*

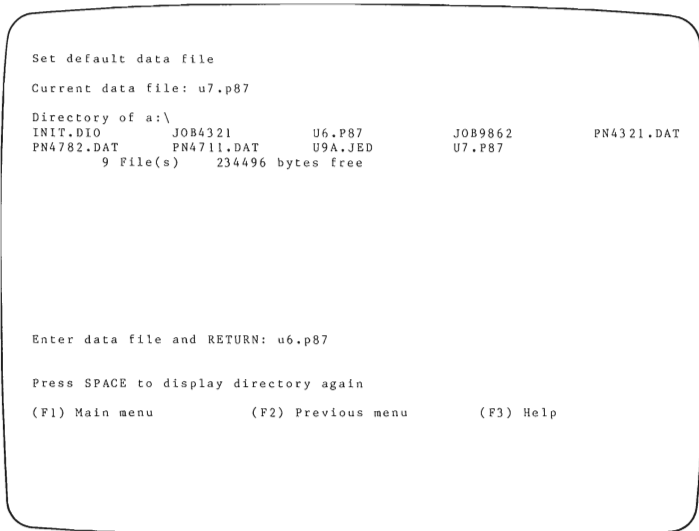


Figure 3-23. Set Default Data File Screen

## EDIT FUNCTIONS

## 3.9

This section describes PROMlink edit functions. (See figure 3-24.) The *Edit RAM* functions allow you to modify the RAM in the programmer. RAM may be filled with an 8-bit hexadecimal pattern or may be edited using the full screen editor. *Split and Shuffle RAM* are two commands used for rearranging RAM data for 16-bit programming. See your programmer manual. (This option is not available for all programmers.)

You can also access *Set Operation Boundaries (5)* from the *Edit Functions* menu.

The screens and menus defining these functions are presented in the following sections.



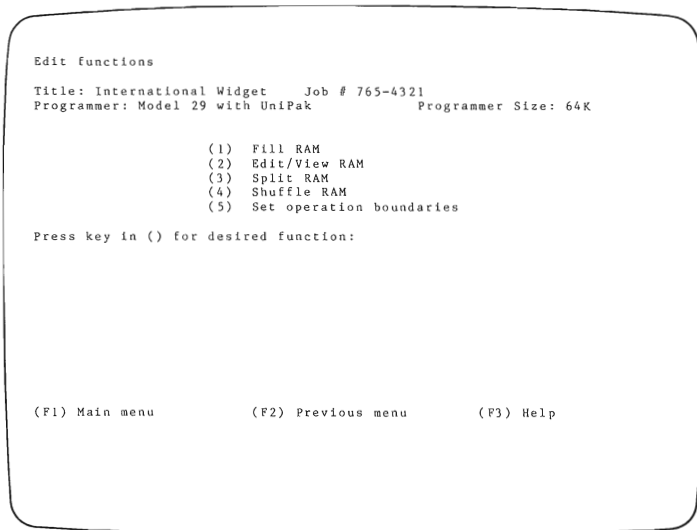


Figure 3-24. Edit Functions Menu

**Function:** Fill the programmer RAM with specified data

**Required Input:** Data to fill RAM, specified as one byte in hexadecimal format

**Options:** Fill the RAM with specified data, return to the *Edit Functions* menu, or return to the *Main* menu

**Completion Message:** Operation successfully completed

**Notes:** This function destroys and replaces the current contents of the programmer RAM.

The programmer RAM can be filled with a specific data byte from the *Fill RAM* screen (figure 3-25). Access is from the *Edit Functions* menu (8) on the *Main* menu. After the fill RAM with data byte operation is complete, all bytes in the programmer RAM contain the specified data byte. Enter the data byte used to fill the RAM in hexadecimal notation. (See appendix A for a table of ASCII characters and their hexadecimal codes.)

#### CAUTION

*This operation destroys and replaces the current contents of the programmer RAM. If you decide not to fill RAM, before you begin the operation, press the F1 key to return to the Main menu. Pressing the F2 key will return you to the Edit Functions menu.*

Fill RAM with 0 can be done in a few seconds with all programmers except the System 19.

This operation takes approximately one minute per 16K of RAM to be filled. You can limit the portion of RAM affected by this operation and the amount of time it takes to complete by setting a different *Begin RAM Address* and *I/O Block Size* (select *Set Operation Boundaries* from this menu). Or, you may find it more useful to perform the Fill RAM operation directly from the programmer front panel.

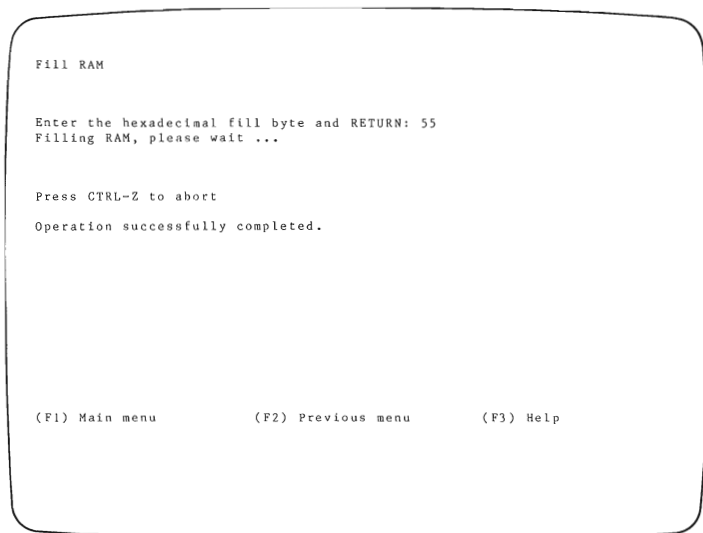


Figure 3-25. Fill RAM Screen

## Edit/View RAM

## 3.9.2

**Function:** Edit the contents of programmer RAM

**Required Input:** RAM address and new data

**Options:** Edit the RAM or return to the *Main* menu

**Completion Message:** (none)

**Notes:** (none)

The *Edit RAM* function is an expanded Edit feature of PROMlink 2.0 and is a powerful tool for manipulating data. The Edit RAM function is a full screen editor that lets you look at and edit the programmer RAM contents in blocks of 256 bytes. (See figure 3-26.)

*Note: The term RAM only refers to the RAM in the programmer, not the RAM in the PC.*

By pressing 2 from the *Edit Functions* menu, you will be prompted for the first address where you want to start your editing session. Enter a hexadecimal address and press the RETURN key. If you do not specify a starting point, pressing the RETURN key will move you to the address 0.

While PROMlink is reading RAM, a message to wait will appear on the screen. After a slight delay, the full screen editor will appear with the cursor placed at the beginning address that you specified.

**Parts of the Full Screen Editor****3.9.3**

1. The top line of the screen is the cursor address. At any point, it shows what address you are editing.
2. The middle and largest portion of the screen is the editing area. This is the 256 byte display of RAM data that begins (upper left-hand corner) with the beginning address you specified. This 256 byte area is the "editing block". To the right of this block is the ASCII equivalent codes column. This column is an ASCII representation of the hexadecimal codes that you are editing. Each time a change is made in an 8-bit address, the ASCII column will change to reflect the new input.

*Note: This function operates in reverse also. If you edit the ASCII column, the corresponding hex address will change. The TAB key toggles between ASCII and Hex areas.*

3. The *edit* menu is directly below the editing block. This area provides instruction on cursor movement within the editing block, going from ASCII to Hex columns, changing blocks, and leaving the editor.
4. Help functions are highlighted in reverse video at the bottom of the screen. In addition to F1 (return to Main menu), F2 (return to previous menu), and F3 (Help), a fourth help function has been added for the Edit RAM session. This function, F4, will restore the current block you are editing to its original state before you started the editing session. If, for instance, you make some changes in your data and decide, before you move to another block, that you want to keep the original data, by pressing F4, the current block will return to its original state.

**CAUTION**

*Once you either move to another block or leave the editor, any changes that were made were saved and the new data replaced the original data in programmer RAM.*

## Editing a Data Block

## 3.9.4

Figure 3-26 shows an editing session starting at the address 35C. You can move around in this block by pressing the ARROW keys on your computer keypad. The cursor will move vertically by one line at a time and horizontally by one nibble at a time. Each time you move to a new 8-bit location, the address will be displayed at the top of the screen. When you change the value of a data byte, the ASCII column to the right of the editing block will be changed to reflect the new data.

The TAB key will toggle you between the ASCII and Hex columns. Changes made in either section will be reflected in the other. All of the changes you make to a block of data will be highlighted in reverse video so you can easily see what modifications have been made before you move to the next block of data or exit the editor.

```

Cursor at location: 0000035C
ADDRESS      HEXADECIMAL      ASCII
00000350    16 08 DF 16 FF E2 00 9C 22 27 0A 31 31 96 3B 36    .....11.;6
00000360    96 3A 36 20 DA CE 20 00 DF 16 39 CE 18 6A 09 26    .6.....9..j.4
00000370    FD 39 86 02 BD DB 1E BD DB 27 D6 44 2B 03 43 20    .9.....D+.C
00000380    03 73 00 38 94 38 94 30 27 04 BD D9 56 12 8D DB    .s.8.0'...V...
00000390    4F 20 1A 86 02 BD DB 1E BD DB 27 96 3C D6 44 2B 0    .....<.D+
000003A0    01 43 94 30 27 04 BD D9 56 13 BD DB 4F 86 80 BD    .C.0'...V...0...
000003B0    DB 1E 86 47 7E DB 1A 96 59 26 03 7E DF 58 86 05    ..G'...Y&..-[.
000003C0    B7 E0 00 86 02 BD DB 1E BD DB 27 86 20 8D E5 86    .....'. ...
000003D0    20 BD DB 1E 96 38 D6 44 2A 01 43 87 E2 02 86 01    .....8*.C.....
000003E0    8D 7B 86 10 8D CE CE 07 00 BD DC 4C 2B 04 BD D9    {. ....L+....
000003F0    56 16 85 10 27 08 09 26 08 96 59 27 5A BD D9 56    V.....&.Y'Z..V
00000400    10 4D 2A E5 86 10 8D 55 96 59 27 4B 86 01 8D A4    .M*....U.Y'K....
00000410    BD DB 4F DE 2A FF E2 00 86 E2 03 85 42 26 0F 7F    ..0*.....B&.
00000420    E2 00 8D 33 86 E2 03 84 40 27 9D 7E DC 3C 85 40    ...3.....@'..<.@
00000430    27 0A 96 42 2B 06 BD DC 58 7E DB C8 BD DC 60 BD    ..B+...X'.....
00000440    D9 50 86 80 8D 17 86 45 8D 1B 20 3F B6 E2 03 85    .P.....E..?....

ARROW's ... cursor control      HOME ... 1st block      END ... last block
PGUP ... previous block      PGDN ... next block
TAB ... switches cursor between HEXADECIMAL and ASCII field

(F1) main menu   (F2) previous menu   (F3) help   (F4) restore current block

```

Figure 3-26. Edit/View RAM Screen

*Note: When you are editing a 256 byte block of data, programmer RAM is not changed until you either:*

*Leave the editor      or  
Go to another 256 byte block of data*

The PGUP and PGDN keys on your keypad will load the next 256 byte block of data. When you press PGUP, PROMlink will go to the previous 256 bytes of data. When you press PGDN, PROMlink will advance to the next 256 byte block of data.

*Note: If you perform a PGUP or PGDN move, be certain that you are ready to move on. Any changes made to the current data block will be recorded in programmer RAM.*

Once the new block has been displayed, using the ARROW keys will again move the cursor vertically by one line at a time and horizontally by one nibble at a time.

The HOME and END keys on your computer keypad move the cursor to address 0 and the last programmer RAM address, respectively. Pressing the HOME key will move you to the first 256 bytes of the programmer RAM. The cursor will be at address 00. Pressing the END key will move you to the last 256 bytes of your programmer RAM. The cursor will be at the top left-hand corner of this block.

To exit the editor, press the F2 key. PROMlink will return to the Edit/View RAM menu.

*Note: Leaving the editor by pressing the F3 key does not cause the changes you have made (if any) to be written in programmer RAM.*

## Split RAM

## 3.9.5

**Function:** Separates a block of 16-bit data in programmer RAM into two blocks of 8-bit data

**Required Input:** Hexadecimal center point (must be an even power of 2)

**Options:** Select a center point or return to the Main menu

**Completion Message:** Operation successfully completed

**Notes:** Unless you specify a center point, PROMlink will choose the RAM center point and this operation could take a long time if you have a lot of RAM.

The *Split RAM* function (figure 3-27) allows you to separate data that you have organized as 16 bits wide into two 8-bit devices. The *Split RAM* screen prompts you to enter a center point and then to press the RETURN key. There will be a delay while PROMlink is separating the odd and even data bytes and loading them into two separate blocks of RAM.

With data beginning as 16 bits wide, all 8-bit bytes occupying even addresses will go to the block of RAM whose addresses are lower than the specified midpoint and the 8-bit bytes occupying odd addresses will go to the block of RAM whose addresses are equal to and higher than the specified midpoint.

*Note: The RAM center point address that you specify must be an even power of two.*

*Note: Split RAM cannot be aborted by pressing control Z.*



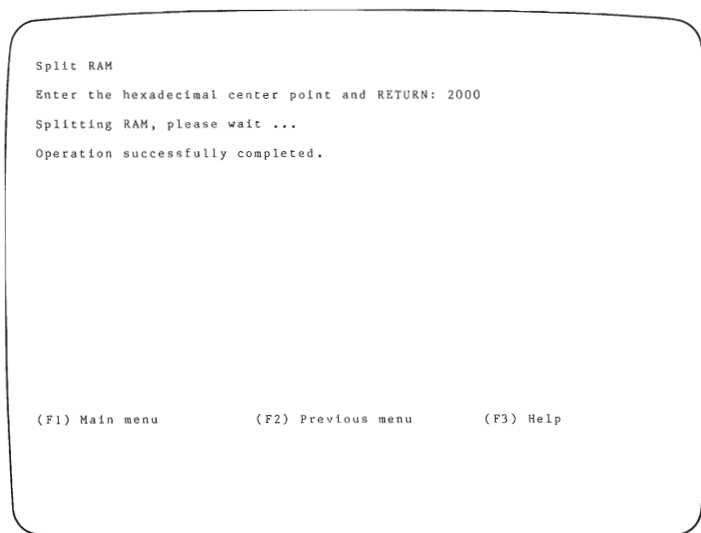


Figure 3-27. Split RAM Screen

## Shuffle RAM

## 3.9.6

**Function:** Interweaves data in two equal sized blocks of 8-bit data back into one block of 16-bit data

**Required Input:** Hexadecimal center point (must be an even power of 2)

**Options:** Select a center point or return to the *Main* menu

**Completion Message:** Operation successfully completed

**Notes:** (none)

The *Shuffle RAM* function is essentially the opposite function of *Split RAM* and allows you to interweave two blocks of 8-bit data back into one block of 16-bit data. The *Shuffle RAM* screen prompts you to enter a center point and then to press the RETURN key. There will be a delay while PROMlink is combining the odd and even data bytes and loading them into one 16-bit block.

One of the 8-bit data blocks contains all of the data at even addresses and the other 8-bit data block contains all of the data at odd addresses. *Shuffle RAM* will take the data from the center point and higher and combine it with data below the center point such that the block of 16-bit data will now have data that was before the center point on even addresses and data that was after the center point on odd addresses.

The *Shuffle RAM* screen is similar to the *Split RAM* screen; the only difference is that the top of the screen will indicate which function is being performed.

*Note: Shuffle RAM cannot be aborted by pressing control Z.*

**Set Operation Boundaries****3.9.7**

The *Set Operations Boundaries* function defines the block of memory currently being worked on. This function is available from the following menus:

- Program Device
- Verify Device
- Load RAM from Device
- Load RAM from File
- Create File from RAM
- Edit Functions
- Configuration Functions

Because there are many parameters you can set from this option, detailed discussion of the functions listed below are in Configuration Functions.

- Begin RAM address
- I/O Block size
- I/O offset
- Device block size
- Begin Device Address
- Set Size
- Bit Mode
- Set All Boundaries to Defaults



## CONFIGURATION FUNCTIONS

## 3.10

The options and functions available from this menu let you set all parameters you will need to define a data file configuration and save it for loading at another time, set all data entry parameters (*Set Operation Boundaries* (3)), and configure the computer serial port. Figure 3-28 shows the *Configuration Functions* menu and the 10 options available from it.

```
Configuration Functions

Title: International Widget      Job # 765-4321
Programmer: Model 29 with UniPak  Programmer Size: 64K
Device Type: Intel 2764          I/O Format: Motorola Exormax
Port: COM1/9600 baud             Parity: no parity
Data bits: 8                     Stop Bits: 1
User function file: logic.fnc     Data File: u6.p87
Directory: a:\

      (1) Enter title              (6) Select programmer type
      (2) Select device type       (7) Select I/O format
      (3) Set operation boundaries  (8) Logic terminal mode E1
      (4) Configure port           (9) Load configuration
      (5) Load user function        (0) Save configuration

Press key in ( ) for desired function:


(F1) Main menu      (F2) Previous menu      (F3) Help
```

Figure 3-28. Configuration Functions Menu

## Enter Title

## 3.10.1

**Function:** Defines the title displayed as the first line of the system status area

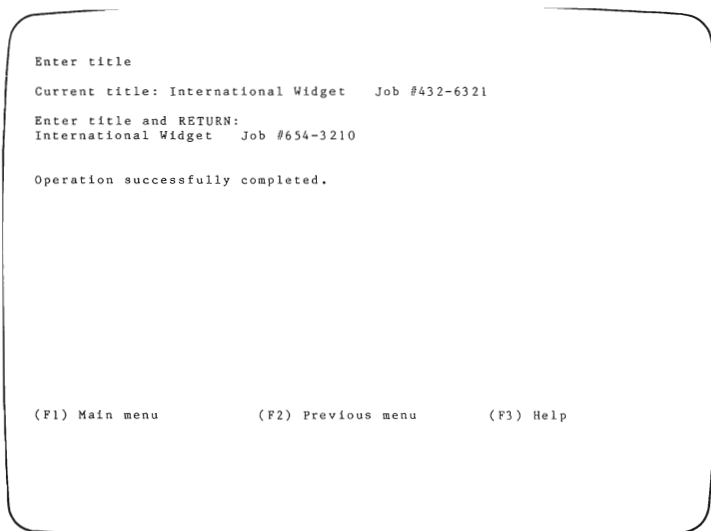
**Required Input:** Descriptive title

**Options:** (None)

**Completion Message:** Operation successfully completed

**Notes:** (none)

This option allows you to assign a unique title to the configuration information. This title will be displayed as the first line of the system status area. (See figure 3-29.)



```
Enter title
Current title: International Widget   Job #432-6321
Enter title and RETURN:
International Widget   Job #654-3210

Operation successfully completed.

(F1) Main menu      (F2) Previous menu      (F3) Help
```

Figure 3-29. Enter Title Screen

## Select Device Type

## 3.10.2

The system status area of the PROMlink screen will indicate the current configuration parameters. If the device type indicated is not the one you want to use, choosing the *Select Device Type* option will let you pick the manufacturer from the *Manufacturer Selection* screen and the device type from the *Select Device Type* screen.

**Function:** Specify the current device type

**Required Input:** Selection of a manufacturer and a device from menus

**Options:** Manufacturers and their devices or Family/pinout code

**Completion Message:** (none)

**Notes:** This resets the *Current device type* field

The device name displayed in the *Device Type* field of the system status is changed by choosing *Select Device Type* from the *Program Device* menu and the following sub-menus:

- Configuration Functions
- Verify Device
- Load RAM from Device
- Load RAM from File
- Program Device

You will use this function often so be sure to check the system status area of the screen to assure the correct device type is indicated. You have a choice of different programmable device manufacturers and the supported devices that each of them offers. Device type selection is performed with the help of two menus, described in the sub-sections following.

## Manufacturer Selection

## 3.10.3

**Function:** Select the manufacturer of the device

**Required Input:** Selection of a manufacturer from the menu, or a Data I/O *Family/Pinout* code

**Options:** Select a manufacturer or return to the *Main* menu

**Completion Message:** (none)

**Notes:** After the manufacturer selection, the device must be specified on the next menu.

The *Manufacturer Selection* screen (figure 3-30) appears first when the *Select Device Type* operation is chosen. This screen provides a list of the PROM, PAL, IFL, EPROM, and EEPROM manufacturers whose devices are supported by Data I/O programmers. You can select a manufacturer by entering the number listed next to its name, or you can enter the *Family/Pinout* code of the device by pressing the space bar.

The *Family/Pinout* code directly specifies both the manufacturer and device. The *Family/Pinout* codes of the devices supported by Data I/O programmers can be found in the programmer manuals.

Choosing a manufacturer by number causes a list of that manufacturer's devices to be displayed on a second screen. This second screen is described in the following sub-section.

If you decide to enter the *Family/Pinout* code of the device, the screen shown in figure 3-31 is displayed. Enter the *Family/Pinout* code and press the RETURN key. A check to see if the device is supported by the selected programmer is performed as described in the next section.



```

Select device type

Device Type: Intel 2764

MANUFACTURERS:

(1)  AMD           (12) Intel           (23) Ricoh
(2)  Altera        (13) Intersil        (24) Rockwell
(3)  Cypress       (14) Mitsubishi    (25) SEEQ
(4)  Eurotechnique (15) MMI logic    (26) SGS-ATES
(5)  Exel          (16) MMI memory   (27) Signetics
(6)  Fairchild     (17) Mostek       (28) TI
(7)  Fujitsu       (18) Motorola     (29) Thomson
(8)  GI            (19) NS           (30) Toshiba
(9)  Harris        (20) NEC           (31) VTI
(10) Hitachi       (21) OKI          (32) Xlcor
(11) Hughes        (22) Raytheon

Enter manufacturer number and RETURN:

Press SPACE to enter Data I/O family/pinout code

(F1) Main menu      (F2) Previous menu  (F3) Help
  
```

Figure 3-30. Manufacturer Selection Screen

```

Select device type

Enter family/pinout code of your device and RETURN: 7933


(F1) Main menu      (F2) Previous menu  (F3) Help
  
```

Figure 3-31. Family /Pinout Code Screen

## Device Selection

## 3.10.4

**Function:** Select a device type

**Required Input:** Selection from a menu of devices available from the specified manufacturer

**Options:** Select a device or return to the *Manufacturer's Selection* menu

**Completion Message:** Device type was accepted by the programmer

**Notes:** For some manufacturers, the devices will span more than one screen; in this case, press the space bar to view more devices

The *Device Selection* screen (figure 3-32) displays the supported devices manufactured by the chosen manufacturer. Choose a specific device from this screen by entering the number listed next to that device and pressing the RETURN key.

```

Select device type

Device Type: Intel 2764

Intel DEVICES:

(1) 2704      (9) 27C64      (17) 2816A      (25) 8749
(2) 2708      (10) 27128      (18) 2817A      (26) 8751
(3) 2716      (11) 27128A      (19) 8741       (27) 8751H
(4) 2732      (12) 27256      (20) 8741A      (28) 8755A
(5) 2732A     (13) 27512      (21) 8742       (29) 87C64
(6) P2732A   (14) 27513      (22) 8744
(7) 2764     (15) 2815      (23) 8748
(8) 2764A    (16) 2816      (24) 8748H

Enter the number of your part number and RETURN:

Press SPACE to view part numbers again


(F1) Main menu      (F2) Previous menu      (F3) Help
  
```

Figure 3-32. Device Selection Screen

Not all Data I/O programmers support all the devices listed. Once a device is selected, the device is checked to see if it is supported by the currently selected programmer. (The type of programmer being used is displayed in the Programmer field of the system status area.)

A message indicating whether the device was accepted is displayed after this check is performed. This message includes the device's Family/Pinout code and the size of the device. If the device was not accepted for the selected programmer, you can return to the *Device Selection* menu by pressing the F2 key, or to the *Main* menu by pressing the F1 key.

*Note: If a device that you know is supported by your programmer does not appear on the device selection screen, you may select that device by entering the Family/Pinout code, rather than by selecting the manufacturer and the device from screens. A list of the Family/Pinout codes is given in your programmer manual.*

*Note: Because Data I/O is continually updating and revising the Manufacturer's list, the numbers corresponding to the manufacturer may not be the same as they are on the example screen. Look for the manufacturer's name on the list, and enter that number when prompted.*

## Set Operation Boundaries

## 3.10.5

**Function:** Specify various boundaries that limit the effect of programmer and device operations

**Required Input:** Selection of the boundary to change from the *Set Operation Boundaries* menu

**Options:** Select a boundary to change, set all boundaries to their default values, or return to the *Main* menu

**Completion Message:** (none)

**Notes:** Not supported for model 60 and LogicPak.

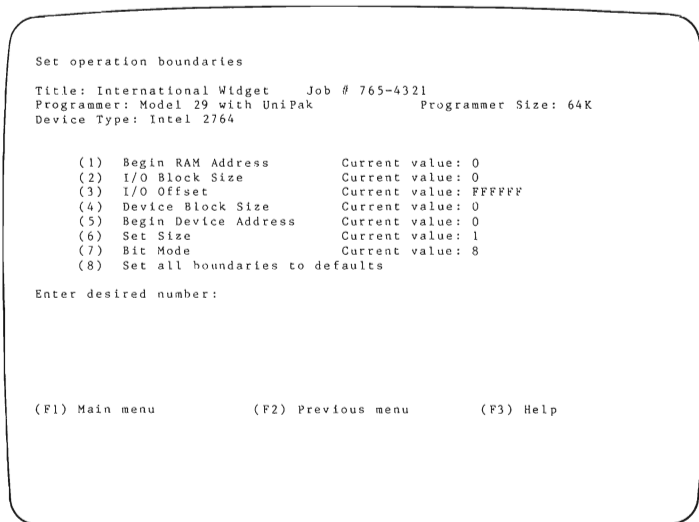


Figure 3-33. Set Operation Boundaries Menu

The *Set Operation Boundaries* menu (figure 3-33) lets you select any of seven operation boundaries to set to a new value. You can also access this menu from the following menus:

- Program Device
- Verify Device
- Load RAM from Device
- ~~Load RAM from File~~
- Create File from RAM
- Edit Functions

The current operations boundaries are displayed on the screen. Operation boundaries are limits on the effect of PROMlink and programmer operations. Select the operation boundary that you want to set by entering the number displayed to the left of the boundary name. Another screen will be displayed that allows you to change the boundary. The seven boundaries that can be set are:

- Begin RAM Address
- I/O Block Size
- I/O Offset
- Device Block Size
- Begin Device Address
- Set Size
- Bit Mode
- Set All Boundaries to Defaults

*Note: Set Size and Bit Mode are options available only if you have the Model 121, or the System 19 or Model 29, with the GangPak.*

Once a boundary has been set to anything other than its default value, it is displayed in the system status area. The boundaries and their associated screens are described in the following sub-sections.

*Note: If your programmer is a model 120 I/O OFFSET is the only parameter allowed to be changed.*

## Begin RAM Address

## 3.10.6

**Function:** Specify a new beginning programmer RAM address. Addresses before this address will not be used in subsequent programmer operations.

**Required Input:** A new address, or the RETURN key

**Options:** Set new beginning address, set beginning address to default value, or return to Set Operation Boundaries menu

**Completion Message:** Begin RAM address has been changed to:

**Notes:** Default beginning address is zero.

The first RAM address that will be affected by programmer operations is specified with the *Begin RAM Address* screen (figure 3-34).

Other than for the *Edit RAM* operation, no PROMlink or programmer operations will affect any address before the beginning RAM address. For example, if the beginning RAM address is set to 100hex and 200hex bytes of data are downloaded from a computer file, those bytes will be written to locations 100 through 2FF in programmer RAM. The default value for the beginning RAM address is 0.

Set a new beginning RAM address by entering it in hexadecimal notation on the *Begin RAM Address* screen. The beginning address can be set to the default value of 0 by pressing the RETURN key. PROMlink will update the value you have selected when you press the return key. Beginning RAM addresses other than 0 are displayed in the system status. The beginning address value remains in effect until it is reset by this function or by loading in a new configuration file, or until PROMlink is restarted.

*Note: This operation cannot be performed from PROMlink for the Model 60 or the LogicPak with either the Model 19 or 29.*

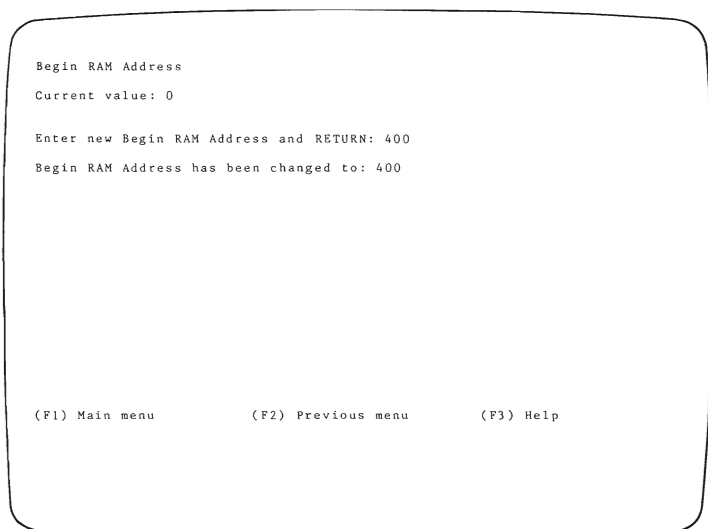


Figure 3-34. Begin RAM Address Screen

**Function:** Specify the input/output block size for transfers from programmer RAM to computer data files

**Required Input:** A new block size, or the RETURN key

**Options:** Set a new block size, set the block size to its default value, or return to the *Set Operation Boundaries* menu.

**Completion Message:** I/O Block Size has been changed to:

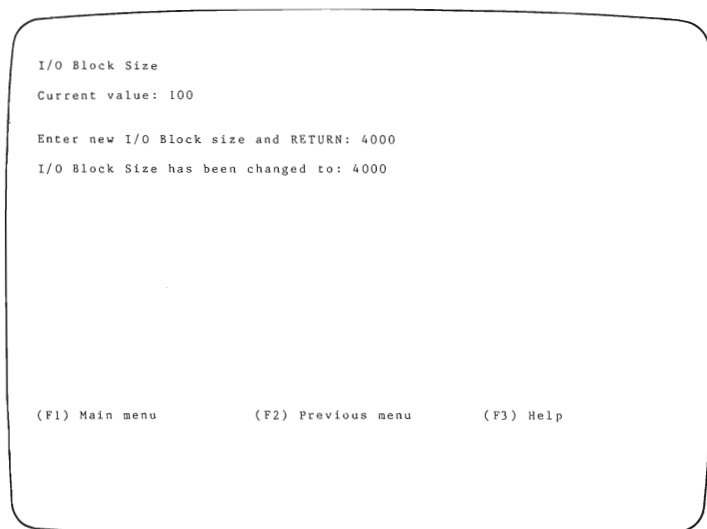
**Notes:** The default block size is zero, which means that the device size determines the amount of data transferred.

The input/output block size is set from the *I/O Block Size* screen (figure 3-35). The block size determines how many bytes of programmer RAM data will be transferred to a personal computer data file during a *Create File From RAM* operation.

Set the *I/O Block Size* by entering the number of bytes to be transferred during creation of computer data files. Set the input/output block size to its default value (0), (the word limit of the device selected) by pressing the RETURN key. Pressing the F2 key returns you to the *Set Operation Boundaries* menu.

The default *I/O Block Size* is 0. This does not mean that 0 bytes are transferred, but that the number of transferred bytes depends on the current device type displayed in the *Device Type* field of the system status. For example, if a 2764 device, which contains 8K data bytes, is selected and a *Create File From RAM* operation is selected, exactly 8K (8192 decimal) data bytes will be transferred from RAM to the computer file.





**Figure 3-35. I/O Block Size Screen**

If you specify a block size other than the default 0, exactly that number of bytes will be transferred. For example, with the same 2764 device, but with an I/O block size of 1000hex, 1000hex data bytes (4K) will be transferred from the programmer RAM to the computer data file.

*Note: This operation cannot be performed from PROMlink for the Model I20 and Model 60 programmers and the LogicPak.*

**Function:** Set the address offset for transfers between the programmer and the computer for either *Load RAM from File*, or *Create File from RAM*

**Required Input:** An address offset or the RETURN key

**Options:** Enter a new address offset, set the offset to its default value, or return to the *Set Operation Boundaries* menu

**Completion Message:** I/O Offset has been changed to:

**Notes:** The default I/O Offset address is FFFFFF.

The *I/O Offset* screen (figure 3-36) lets you set an address offset for transfers between the computer and the programmer. Set a new *I/O offset* by entering the offset value in hexadecimal. Set the *I/O offset* to the default value (FFFFFF) by pressing the RETURN key. Press the F2 key to return to the *Set Operation Boundaries* menu.

*Note: The System 19 does not have a default value for I/O OFFSET, PROMlink sets it to zero when return is pressed.*

When data is saved from programmer RAM to a computer data file, an address is associated with each data byte as shown in figure 3-37. The addresses are used to retain the proper order of the data bytes in programmer RAM; other than this, they have no effect on programmer or PROMlink operations.

*Note: This operation cannot be performed from PROMlink for the Model 60 programmer and the LogicPak because block related operations are not used in programmable logic programming.*

The address offset is applied to addresses during data transfers between the computer data file and the

programmer RAM, affecting the data that is transferred or the address given to that data. Four cases exist in which the I/O offset has effects; these cases are discussed below.

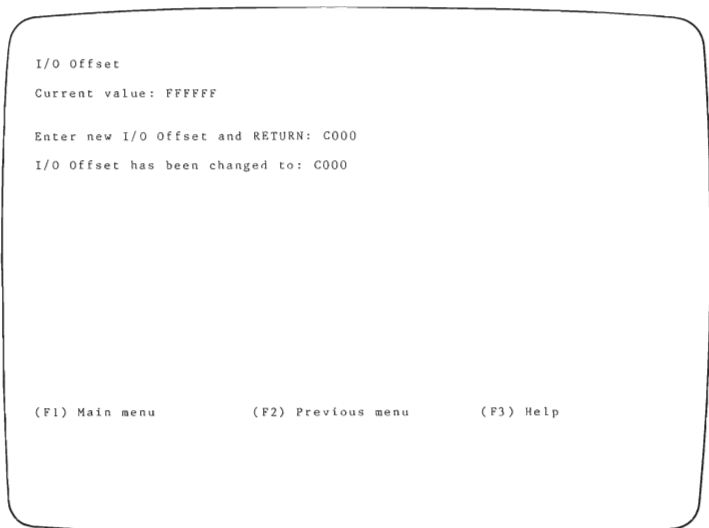


Figure 3-36. I/O Offset Screen

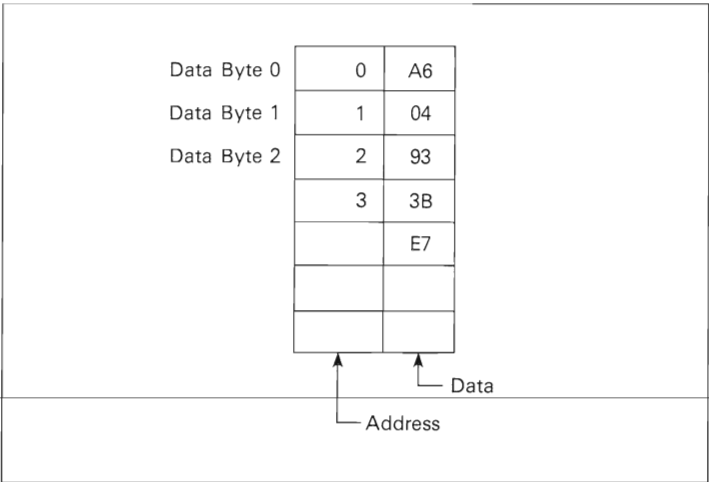


Figure 3-37. PC Data File, Basic Format

### Case 1: RAM to computer Transfer, I/O Offset = A

Data is to be transferred from programmer RAM to a computer data file. In all data transfers from programmer RAM, the first data byte transferred is the one at the address specified by *Begin RAM Address* (BRA). This first data byte is stored as the first byte of the computer data file. The second data byte, read from location BRA + 1 in programmer RAM is written to the second location in the computer data file.

Addresses associated with each data byte in the computer data file are determined according to the following equation:

$$\text{Address} = \text{Data Byte Number} + \text{I/O offset}$$

Thus, if the I/O offset is Ahex, the address associated with the first data byte in the computer file is A, the address associated with the second data byte is A + 1, or Bhex and so on, as shown in figure 3-38.

### Case 2: Computer to RAM Transfer, I/O Offset = A

Data is to be transferred from a computer data file to programmer RAM. In this case the I/O offset determines the first data byte in the computer data file that is transferred to programmer RAM. The first data byte will always be written to location BRA in programmer RAM. Thereafter, consecutive bytes are read from the computer data file and written to consecutive locations in the programmer RAM.

The address at which data is stored in the programmer RAM is determined by the following equation:

$$\begin{aligned} \text{RAM address} &= (\text{Computer file address}) - (\text{I/O offset}) \\ &\quad + (\text{Begin RAM Address}) \end{aligned}$$

Figure 3-39 shows the address and data mapping for a computer to RAM transfer with an offset of Ahex (10 decimal). Note that data bytes 1 and 2 in the computer data file are not transferred; the data transfer starts at the data byte with address Ahex in the data file.

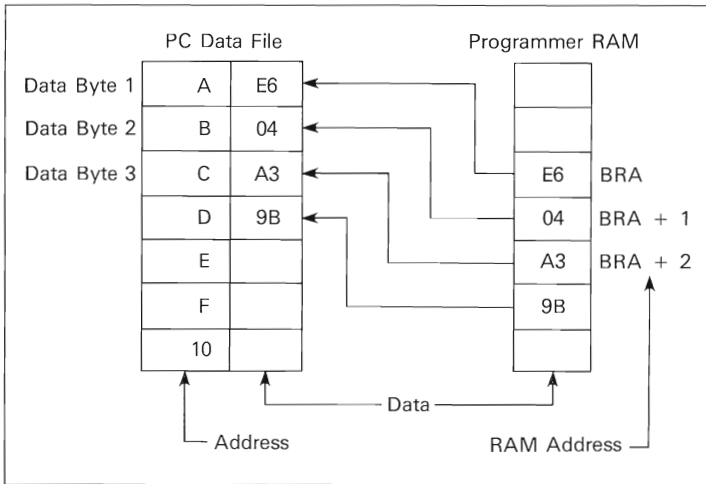


Figure 3-38. Address Correspondence Between a PC Data File and Programmer RAM. I/O Offset = A. RAM to PC transfer.

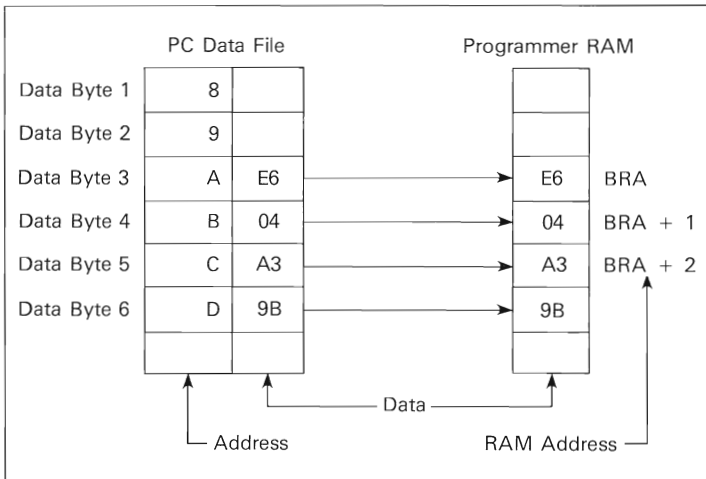


Figure 3-39. Address Correspondence Between a PC Data File and Programmer RAM. I/O Offset = A. PC to RAM transfer.

### **Case 3: RAM to Computer Transfer, I/O Offset** **= FFFFFF<sub>hex</sub>(default)**

When the I/O offset is set to its default value, the data in location BRA of programmer RAM is transferred to the first data byte in the computer data file, data in location BRA + 1 is transferred to the second location in the computer data file, and so on. Addresses associated with the data bytes in the computer file are assigned sequentially, starting at 0 for data byte 1. Figure 3-40 shows the mapping of computer and programmer RAM addresses and data for a RAM to computer transfer with the default I/O offset in effect.

### **Case 4: Computer to RAM Transfer, I/O Offset** **= FFFFFF<sub>hex</sub>(default)**

When the I/O offset is set to its default value, the address associated with the first data byte in the computer data file becomes the I/O offset and data is transferred as in case 2: The first data byte is written to location BRA in the programmer RAM, and consecutive bytes in the computer file are written to locations in programmer RAM according to the following equation:

$$\begin{aligned} \text{RAM address} &= (\text{Computer file address}) - (\text{I/O offset}) \\ &\quad + (\text{Begin RAM Address}) \end{aligned}$$

Figure 3-41 shows the mapping of computer and programmer RAM addresses and data for a RAM to computer transfer with the default I/O offset in effect.

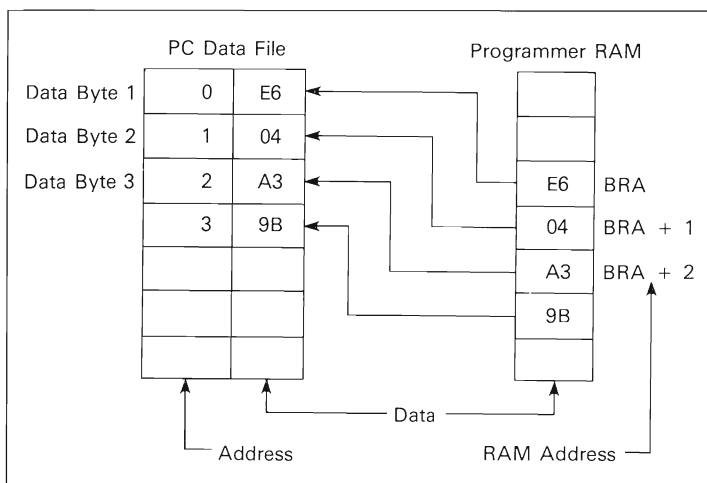


Figure 3-40. Address Correspondence Between a PC Data File and Programmer RAM With Default I/O Offset, RAM to PC Transfer

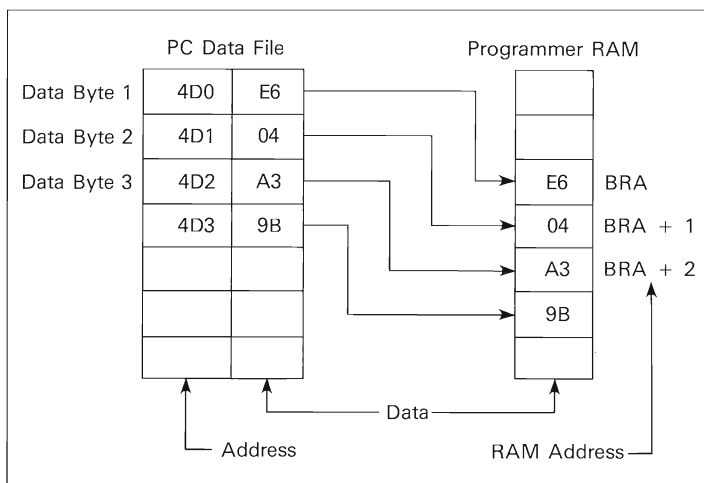


Figure 3-41. Address Correspondence Between a PC Data File and Programmer RAM With Default I/O Offset, PC to RAM Transfer

**Function:** Set the number of bytes in a device that will be affected by programmer operations

**Required Input:** A value for block size or the RETURN key

**Options:** Set a new device block size, set the block size to its default value, or return to the *Operations Boundaries* menu

**Completion Message:** Device Block Size has been changed to:)

**Notes:** The default device block size is 0, which causes all bytes in the device to be affected by programmer operations. The device block size is used in conjunction with *Begin Device Address*.

The *Device Block Size* screen (figure 3-42) lets you define how many data bytes in a device will be affected by PROMlink and programmer operations. Used with *Begin Device Address*, the *Device Block Size* lets you define a small portion of the device on which subsequent operations will have effect.

Define the device block size by entering in hexadecimal the number of bytes to be used for device-related operations. The device block size can be set to its default value (0) by pressing the RETURN key.

*Note: This operation cannot be performed from PROMlink for the Model 120 and Model 60 programmers and the LogicPak.*



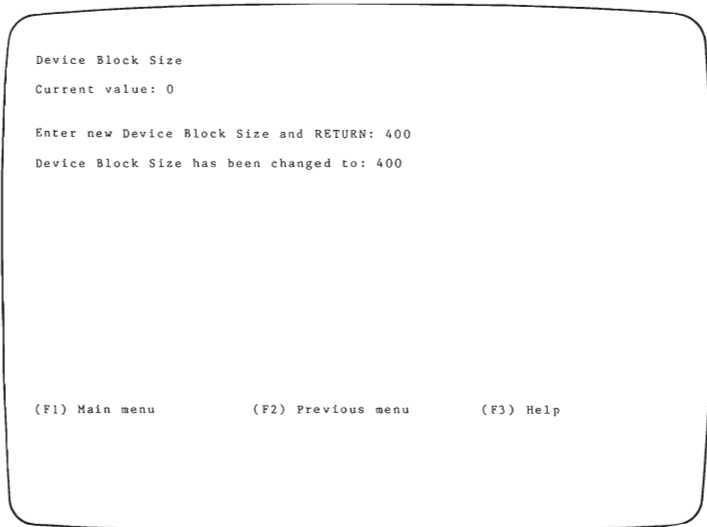


Figure 3-42. Device Block Size Screen

## Begin Device Address

## 3.10.10

**Function:** Set the beginning address in the device for programmer operations. Addresses preceding the beginning address are not affected by programmer operations.

**Required Input:** A new beginning address or the RETURN key

**Options:** Set a new beginning address, set the beginning address to its default value, or return to the *Set Operation Boundaries* menu

**Completion Message:** Begin Device Address has been changed to:

**Notes:** The default beginning device address is 0. If this value is non-zero, Device Block Size must be changed correspondingly

Use the *Begin Device Address* screen (figure 3-43) to specify the first data byte in a device to be used in programmer operations and data transfers. Any bytes in address locations before the *Begin Device Address* are not affected by any operation. Enter the desired beginning address in hexadecimal, or press the RETURN key to set the beginning address to the default value (0). Pressing the F2 key returns you to the *Set Operation Boundaries* menu.

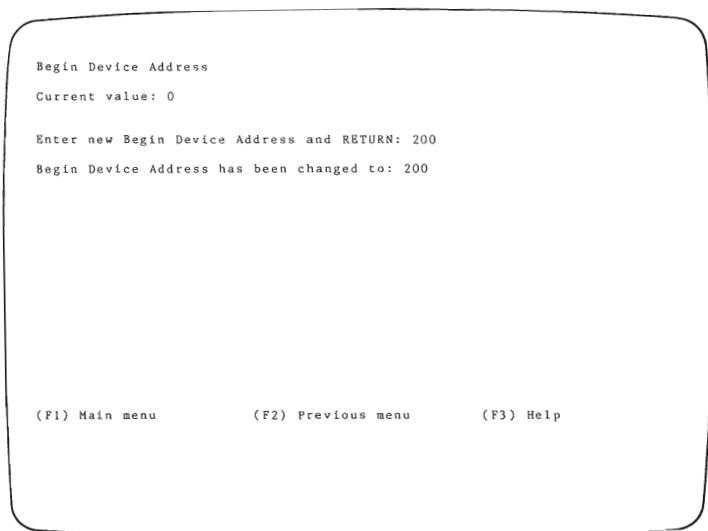


Figure 3-43. Begin Device Address Change

When *Begin Device Address* is set to anything other than the default value, the *Device Block Size* must be set to a value that does not cause addressing beyond the limits of the device. For example, if for a 4K device such as the 2732, you set a beginning device address of C00hex (3K), only one fourth of the device (another 1K) is available for further operations. The device block size must be changed to 400hex (1K) or less to accommodate the change in *Begin Device Address*.

*Note: This operation cannot be performed from PROMlink for the Model 120 and Model 60 programmers, Models 19 or 29 with LogicPak.*

## Set Size

## 3.10.11

**Function:** Allows programming of multiple devices

**Required Input:** Numerical value from 1 to 20

**Options:** Select a new value, keep the default value, or return to the *Set Operation Boundaries* menu.

**Completion Message:** Set size has been changed to: new value

**Notes:** The default *Set Size* is 1, which is standard programming

*Set Size* is used when you want to program more than one device at a time with different patterns. By entering a value from 1 to 20 at the screen prompt (figure 3-44), you choose the number of devices to be programmed with different patterns. The *Set Size* may be changed back to its default value of 1 by pressing the RETURN key. Refer to your programmer manual for details.

*Note: The Set Size option is only available with the following programmers and Pak types:*

*Model 121*

*Model 29 with the GangPak*

*System 19 with the GangPak*

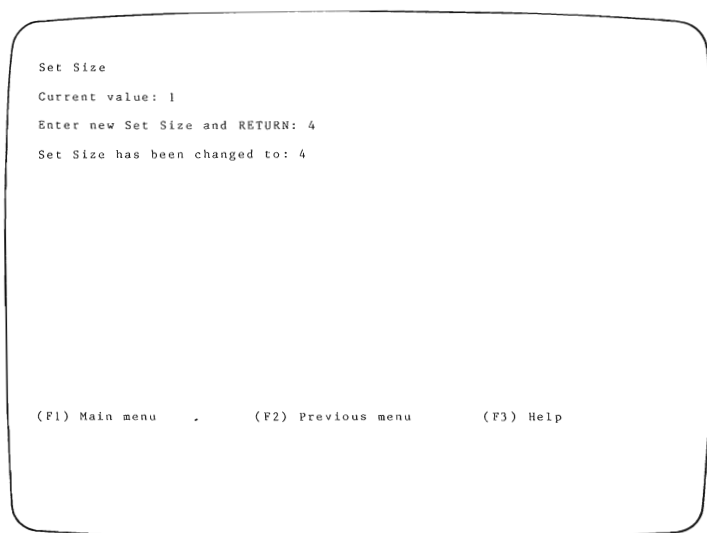


Figure 3-44. Set Size Screen

**Function:** Special case of set programming that allows data organized as 16 or more bit words to be programmed into 8-bit data devices

**Required Input:** Numerical Bit Mode value

**Options:** Set a new value, remain at the default value of 8, or return to the *Set Operation Boundaries* menu

**Completion Message:** Bit Mode has been changed to:

**Notes:** (none)

*Bit Mode* is used when you have data organized in groups of 16 or more bit words that you want to put in more than one 8-bit device. By entering a *Bit Mode* value (multiple of 8) at the screen prompt (figure 3-45), you are choosing the number of devices that the data will be divided into. The Bit Mode may be changed back to its default value of 8 by pressing the RETURN key. Refer to your programmer manual for details.

*Note: The Bit Mode option is only available with the following programmers and Pak types:*

*Model 121 (8 and 16 Bit Mode values only)*

*Model 29 with the GangPak (multiples of 8 up to 64 Bit Mode values)*

*System 19 with the GangPak (multiples of 8 up to 64 Bit Mode values)*

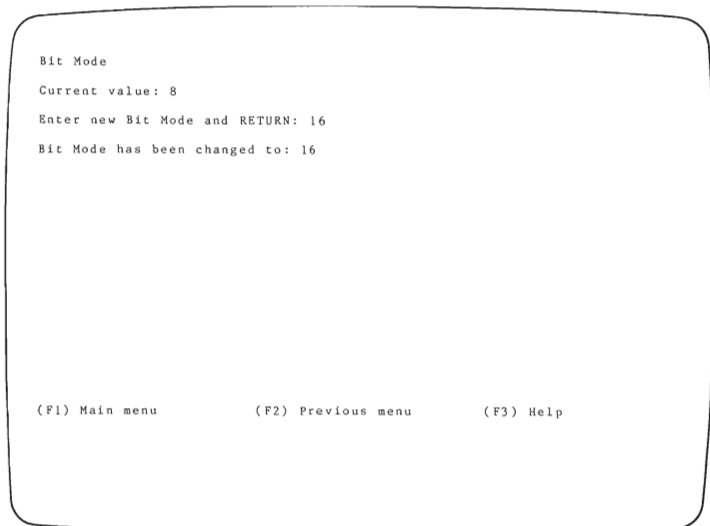


Figure 3-45. Bit Mode Screen

## Set All Boundaries to Defaults

3.10.13

**Function:** Sets all boundary values for the *Set Operation Boundaries* menu to their defaults

**Required Input:** (none)

**Options:** Set all values to defaults

**Completion Message:** Operation successfully completed

**Notes:** (none)

Figure 3-46 shows the PROMlink *Set Operation Boundaries* default parameters. These values will remain unless you change them with the *Set Operation Boundaries* menu or load a new configuration file.

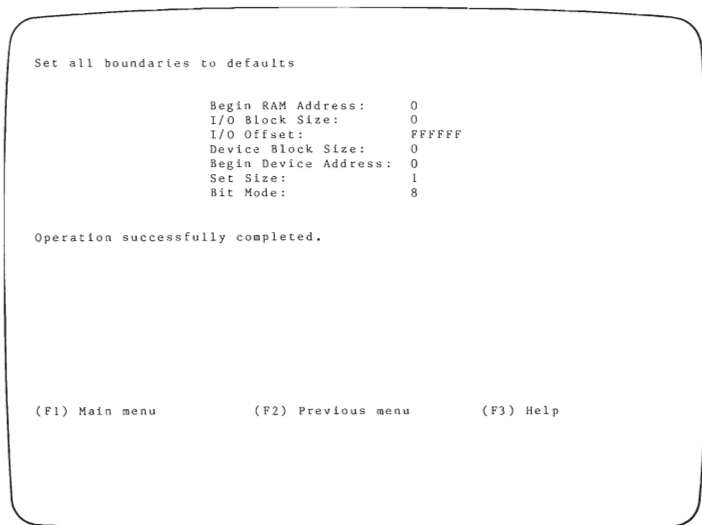


Figure 3-46. Set All Boundaries to Default Screen



## Configure Port

3.10.14

**Function:** Defines port, baud rate, and parity

**Required Input:** Function number

**Options:** Choose a function number, return to the *Configuration Functions* menu, or return to the *Main* menu

**Completion Message:** (none)

**Notes:** (none)

The *Configure Port* menu (figure 3-47) lets you define the programmer to computer connections. See section 2.3 for complete set up procedures for the Model 29 programmer. If you have another model, refer to its operator's manual for complete details.

```

Configure port
Title: International Widget      Job # 765-4321
Port: COM1/9600 baud           Parity: no parity
Data bits: 8                   Stop Bits: 1

      (1) Port
      (2) Baud Rate
      (3) Parity/Data Bits/Stop bits

Press key in ( ) for desired function:

(F1) Main menu      (F2) Previous menu      (F3) Help
    
```

Figure 3-47. Configure Port Menu

**Function:** Set serial port connection

**Required Input:** Port number that your programmer is connected to

**Options:** Change the port or keep the default at Port 1

**Completion Message:** Port has been changed to:

**Notes:** (none)

The PROMlink default port is COM1 (see figure 3-48). You shouldn't need to change the port unless you are using more than one programmer.

*Note: COM1 and COM2 refer to the serial ports for the IBM PC. The TI has up to four COM ports. Consult your computer operator's manual.*

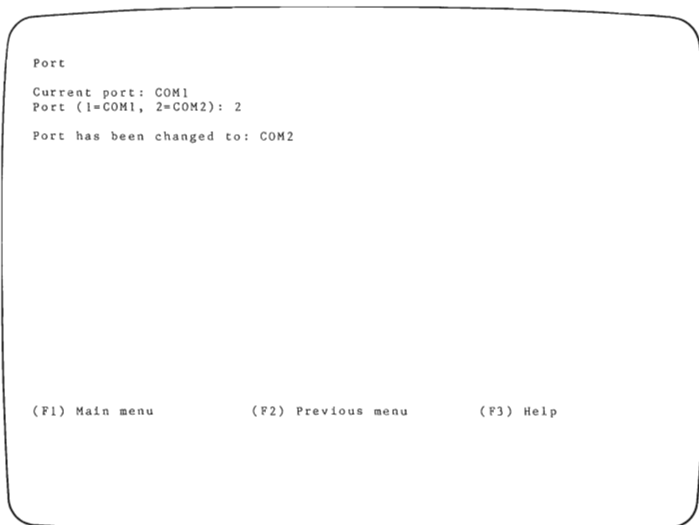


Figure 3-48. Port Screen

## Baud Rate

3.10.16

**Function:** Set baud rate

**Required Input:** Menu number corresponding to the new baud rate

**Options:** Change the baud rate or keep the default set at 9600 baud

**Completion Message:** Baud rate has been changed to: new baud rate

**Notes:** (none)

PROMlink offers eight baud rate settings as shown in figure 3-49. However, the default baud rate of 9600 baud (9600 bits/sec) is the maximum efficiency level for data transmission. Refer to your programmer manual for further information.

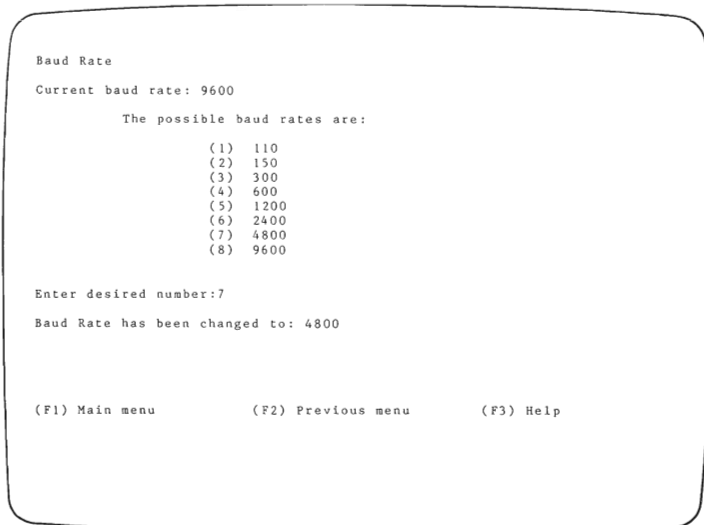


Figure 3-49. Baud Rate Screen

**Parity/Data Bits/Stop Bits****3.10.17**

**Function:** Set parity/data bits/stop bits

**Required Input:** Value or condition of functions

**Options:** Change the functions or keep the default values of no parity, 8 data bits, and 1 stop bit.

**Completion Message:** Parity has been changed to:  
Data Bits has been changed to:  
Stop Bits has been changed to:

**Notes:** (none)

This function, referred to as "protocol" defines the method data is serially transmitted. Figure 3-50 shows the values and conditions that can be changed from this function. For details on *Parity Data Bits* and *Stop Bits*, refer to your programmer manual.

Parity/Data Bits/Stop bits

Current parity: no parity  
Parity (e=even, o=odd, n=no parity): e  
Parity has been changed to: even

Current data bits: 8  
Data bits (7 or 8): 7  
Data bits has been changed to: 7

Current stop bits: 1  
Stop Bits (1 or 2): 1  
Stop Bits has been changed to: 1

(F1) Main menu

(F2) Previous menu

(F3) Help

Figure 3-50. Parity/Data Bits/Stop Bits Screen

## Load User Function

3.10.18

**Function:** Sets up a previously stored user-defined menu

**Required Input:** The file name of the user function file and press RETURN

**Options:** Load a function or return to the *Main* menu

**Completion Message:** Operation successfully completed

**Notes:** (none)

The *load user function* screen (see figure 3-51) allows you to select the file that will be used to define the *user functions* menu. After you have selected the user file you want to load and press the RETURN key, PROMlink will load that file and your user menu will be available from the *User Functions* option from the *Main* menu. Refer to *User Functions* for more information.

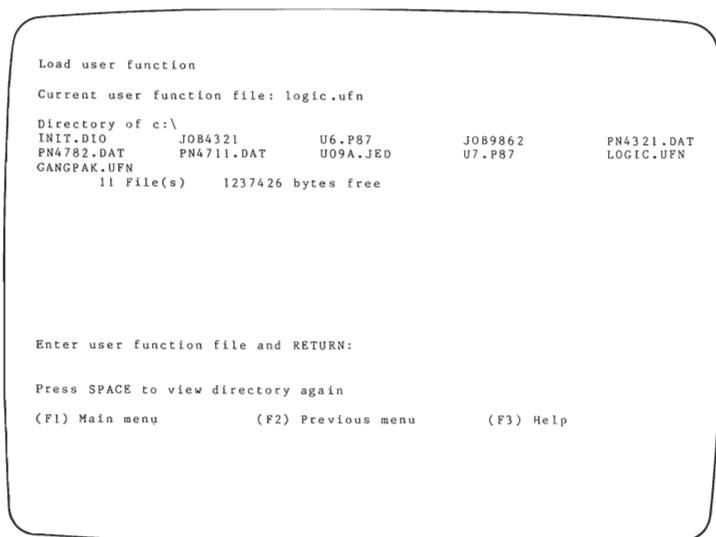


Figure 3-51. Load User Function Menu

## Select Programmer Type

3.10.19

<b>Function:</b>	Specify the type of programmer being used
<b>Required Input:</b>	Selection from menu of programmers
<b>Options:</b>	Select a programmer or return to the <i>Main</i> menu
<b>Completion Message:</b>	Operation successfully completed (unless you choose System 19 or Model 29 then the <i>Select Pak Type</i> menu will become available)
<b>Notes:</b>	This resets the Programmer field in the system status area

The *Select Programmer Type* screen (figure 3-52) displays a list of the Data I/O programmers supported by PROMlink and lets you choose the appropriate programmer. Select the programmer to be used by entering the number that is displayed next to the programmer name. Selecting a new programmer type alters the Programmer and Programmer memory fields in the system status area. Each time you start a session, change programmers, or load a configuration file, make sure the programmer type in the system status area is indicated correctly. Note: The Model 60 and Model 120 do not allow PROMlink to display RAM size.

*Note: PROMlink may operate Data I/O programmers even if the programmer type displayed in the Programmer field does not match the one being used. However, error messages displayed may be incorrect and misleading.*

*Note: If you select the Model 29 or System 19 programmers, a second menu will allow you to select the Pak Type.*

*Note: The JEDEC format is selected automatically if the Model 60 is selected from this menu.*



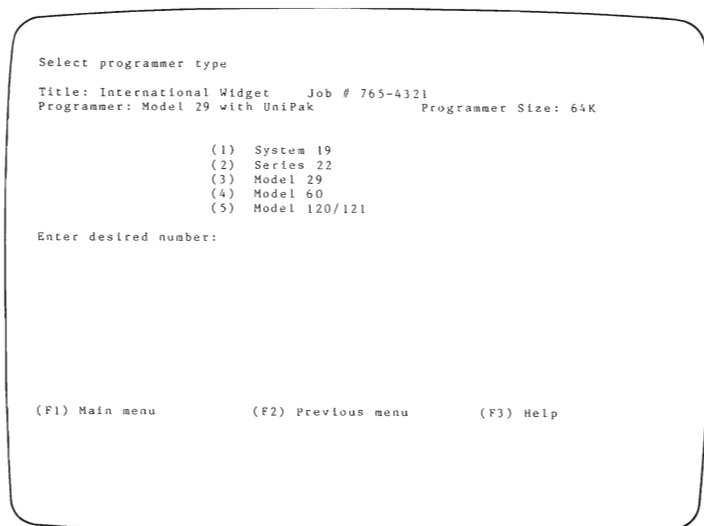


Figure 3-52. Select Programmer Type Menu

### Select Pak Type

3.10.20

**Function:** Specify the pak type

**Required Input:** Selection from menu of pak types

**Options:** Select a pak type or return to the *Main* menu

**Completion Message:** Operation successfully completed

**Notes:** This resets the Programmer and Pak Type indication in the system status area

If you selected the Model 29 or System 19 programmers from the *Select Programmer* menu, a second menu (figure 3-53) will automatically appear to allow you to select the pak type that you are using. Select the pak type by entering the number that is displayed next to the pak type name. The status area will reflect the new programmer and pak type.

*Note: PROMlink will operate if the wrong pak type is chosen, however, error messages displayed may be incorrect or misleading. Make sure that the pak type is the one desired at the start of each session, when equipment is changed, or when a new configuration file is loaded.*

*Note: The JEDEC format is automatically selected if LogicPak is selected from this menu.*

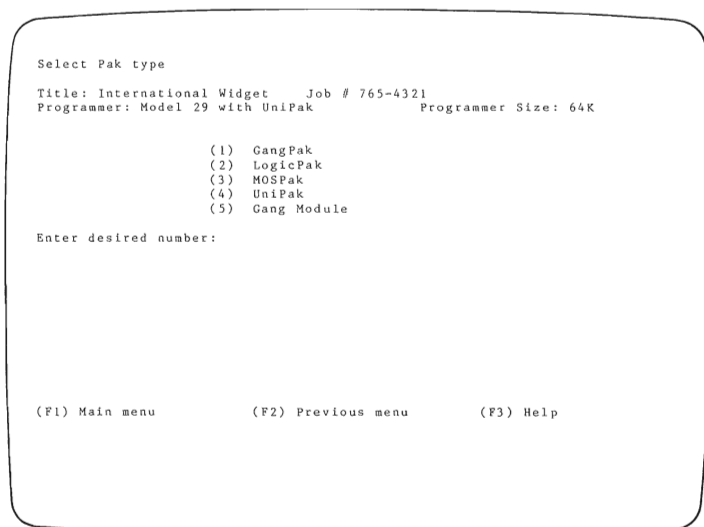


Figure 3-53. Select Pak Type Menu

## Select I/O Format

## 3.10.21

**Function:** Specify an input/output format for data transfers to and from your Data I/O programmer

**Required Input:** A format code selected from menu

**Options:** Select a format or return to the *Main* menu

**Completion Message:** I/O Format has been changed to:

**Notes:** The format chosen must be supported by the programmer. Consult the programmer's manual.

All data transfers between the programmer and the computer are performed according to an input/output (I/O) format or protocol for data being transmitted and received. The format to be used is selected from the *Select I/O Format screen which is accessed from the Configuration Functions (9) on the Main menu (Figure 3-54)*. The menu lists the available formats with a number preceding the name of each format. Select a format by entering its number and pressing the RETURN key.

PROMlink checks to determine whether the format you select is supported by the current programmer. (The current programmer type is displayed in the Programmer field in the system status area.) If the I/O format is accepted by the programmer, the message, *I/O Format has been changed to:* is displayed. If the I/O format is invalid for the current programmer, the message "Unknown I/O format" is displayed.

*Note: PROMlink does not check data being transferred to or from the programmer for the correct I/O format. You must make sure that any data transferred is in the correct format. The selected format is used only to instruct the programmer of the format to use when receiving or transmitting data. For more information concerning I/O formats, see your programmer manual.*

```

Select I/O format

Current I/O format: Motorola Exormax

(07) A-B10F          (03) A-B10F start code    (06) A-BHLF
(02) A-BHLF start code (05) A-BNPF          (01) A-BNPF start co
(52) A-Hex Apostrophe (53) A-Hex comma      (58) A-Hex Comma SOH
(51) A-Hex Percent    (56) A-Hex Percent SOH   (57) A-Hex SMS
(50) A-Hex Space       (55) A-Hex Space SOH   (32) A-Oct Apostroph
(31) A-Oct Percent     (36) A-Oct percent SOH  (37) A-Oct SMS
(30) A-Oct Space       (35) A-Oct Space SOH   (10) Binary
(80) Fairchild Fairbug (83) Int Intellec 8/MDS (88) Int MCS-86 Hex
(81) MOS Technology    (82) Motorola Exorciser  (87) Motorola Exorma
(70) RCA Cosmac        (85) Signetics Abs Obj (13) Spectrum
(12) Spec. start code  (86) Tektronix Hex    (90) TI SDSMAC

Enter desired number and RETURN:

(F1) Main menu      (F2) Previous menu    (F3) Help
  
```

**Figure 3-54. Select I/O Format Menu**

*Note: The Select I/O Format Function is not available for the System 19 or Model 29 programmers with LogicPak or the Model 60. For those programmers and pak types the JEDEC format is automatically selected. Refer to your Model 60 or Logic Pak manual for the JEDEC format information.*

*Note: The Select Programmer I/O Format function is also available from the following menus:*

*Load RAM from File  
Create File from RAM*

## JEDEC FORMAT

The JEDEC format is an ASCII logic format. This format only applies if you are using the Model 60 Logic Programmer or LogicPak. It is automatically selected by PROMlink if you have this model. See your Model 60 programmer or PLDS manual for detailed information.

*Note: The JEDEC format is not an option available from the Select I/O Format menu because it is only used for the logic programmers.*

**Function:** Simulate a terminal

**Required Input:** 8 to choose *Logic Terminal Mode* from the *Configuration Functions* menu

**Options:** Select *Logic Terminal Mode* or remain in the *Configuration Functions* menu

**Completion Message:** (none)

**Notes:** (none)

The *Logic Terminal Mode* function is useful for logic programming and is only available for the Model 60 Logic Programmer and LogicPak. Figure 3-55 shows the *Logic Terminal Mode* menu. Refer to your programmer manual for complete details. This function puts the programmer into *Logic Terminal Mode* (E1) which then allows PROMlink to simulate a terminal while connected to the programmer. To exit *Logic Terminal Mode*, press any of the following keys:

ESC F1 F2

DATA I/O CORP. - Programmable Logic Development System - 303A-V02  
Copyright 1982,1983

- GENERAL COMMANDS -

- 0 - Display menu
- 1 - Enter Family/pinout code
- 5 - Enter reject count option
- 6 - Enter verify option
- 7 - Enter security fuse option
- 8 - Enter functional test data
- F - Configuration number
- G - Select attributes

- I/O COMMANDS -

- B - Receive JEDEC data
- C - Transmit JEDEC data

- DEVICE RELATED COMMANDS -

- 2 - Load device
- 3 - Verify device
- 4 - Program device

- FUSE MAP COMMANDS -

- A - Display fuse pattern
- D - Display fuse sumcheck
- E - Edit fuse pattern

NOTE - Always transmit an "ESC" before removing adapter

Command :

Figure 3-55. Logic Terminal Mode Menu

**Function:** Loads a previously saved configuration

**Required Input:** File name and RETURN

**Options:** Enter a new file name to be loaded or return to the *Configuration Functions* menu

**Completion Message:** Operation successfully completed

**Notes:** (none)

The *Load Configuration* function is a convenient method to quickly recall a particular programming session's configuration. Figure 3-56 shows the *Load Configuration* functions screen. By typing the file name of a previously defined configuration (saved using 0 from the *Configuration Functions* menu) you load a new configuration. The status area of the screen will indicate the current configuration.

*Note: If you have configuration files that you previously saved, you can load them directly at system start up by typing:*

*>pl file name*

from the DOS prompt.



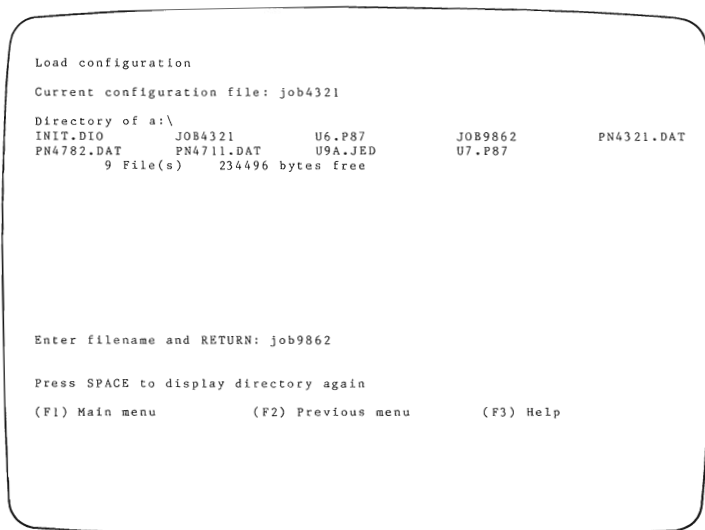


Figure 3-56. Load Configuration Screen

## Save Configuration

3.10.24

**Function:** Stores a defined configuration

**Required Input:** File name and RETURN

**Options:** Enter a new file name or return to the *Configuration Functions* menu

**Completion Message:** Operation successfully completed

**Notes:** (none)

The *Save Configuration* function is an easy way to store a particular programming session's configuration that you want to use later. By entering the file name when prompted from the *Configuration Functions* menu and pressing the RETURN key as shown in figure 3-57, you save the configuration you defined during the programming session and can then *Load* (9) it at a later time.

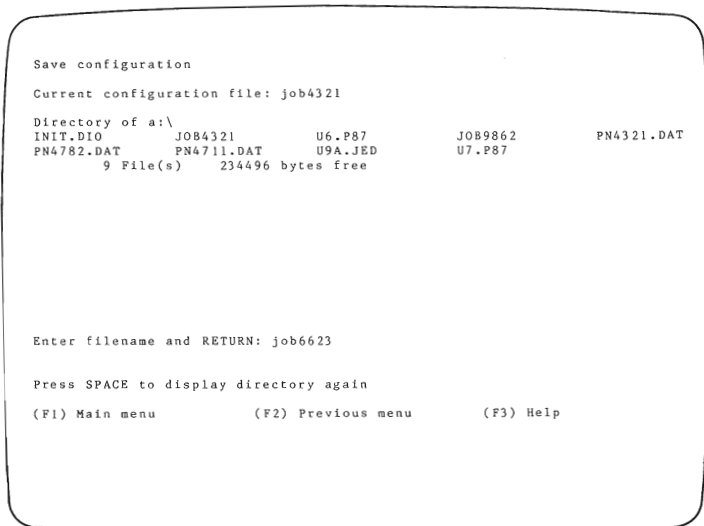


Figure 3-57. Save Configuration Screen

## USER FUNCTIONS

## 3.11

**Function:** User can define unique menu

**Required Input:** Function number

**Options:** Select previously defined menu function or return to the *Main* menu

**Completion Message:** (none)

**Notes:** If no user function file is loaded, there will be no menu and the message "No user function file loaded" will appear.

The *User Function* menu is a menu that is defined by the user. You can add functions or combinations of functions not currently available from the normal PROMlink menus.

To define unique menus, you must first decide which functions you want to use and how to implement them using the programmer's Computer Remote Control commands. A text file must then be created (whose format is described below) which defines this menu and what it does. This file is called the User Function File. Once this file is loaded by PROMlink (by selecting Load User Function (5) from the *Configuration Functions* menu), this new menu is accessed from the *Main* menu by selecting *User Functions* (0).

The User Function file is a user generated text file that defines a menu for PROMlink. The menu is a list of one or more menu items. A menu item consists of a menu item name and a command sequence. A command sequence consists of one or more commands. A command consists of a valid CRC command followed by one of the defined PL commands. No more than 10 menu items will be accepted and no more than 24 characters will be accepted for a menu item name. CRC commands must always be followed by a PL command. CRC commands and PL commands are always placed one per line.

## SECTION THREE

Graphically, these definitions look like this:

MENU:	Made up of 1 to 10 MENU ITEMS
MENU ITEM:	Made up of 1 MENU ITEM NAME followed by a COMMAND SEQUENCE
COMMAND SEQUENCE:	Made up of 1 or more COMMANDS
COMMAND:	Made up of 1 valid CRC COMMAND followed by 1 PL COMMAND
CRC COMMAND:	Standard Computer Remote Control command from the programmer manual. Only one CRC COMMAND per line.
PL COMMAND:	Made up of a 3 character response code. These are defined below. Only one PL COMMAND per line.
MENU ITEM NAME:	Made up of the two characters \" followed by RETURN. Only one MENU ITEM NAME per line.

Notice that the 1 to 24 characters in the MENU ITEM NAME become what is actually printed for the function in the User Function menu. The PL COMMAND is a three letter code that tells PROMlink what to expect from the programmer after the preceding CRC COMMAND is sent.

There are only seven PL COMMANDS. They are listed below with an explanation of what they will cause PROMlink to do.

- `\%>` Will cause PROMlink to wait no more than three seconds for a prompt. If the prompt takes longer, error 100 will be issued. If there was an error, the message will be printed, if not, "Operation Complete" will be displayed.
- `\%*` Will cause PROMlink to wait an indefinite amount of time for a prompt. The standard action symbol will be printed while waiting and the operation may be aborted by pressing CTRL Z. If there was an error, the message will be printed, if not, "Operation Complete" will be displayed.
- `\%P` Will cause PROMlink to accept characters from the programmer and discard them until no characters have been sent for one second.
- `\%R` Will cause PROMlink to accept characters from the programmer and display them. Characters will be displayed until the prompt is received. If an error is received, it will be printed.
- `\%D` Will cause PROMlink to accept characters from the programmer and display them. Characters will be displayed until no characters have been sent for one second.
- `\%E` Will send an ESCape character to the programmer, then wait no more than 3 seconds for a prompt.
- `\%M` Will print the characters following the command until a closing double quote (") is encountered.

## SECTION THREE

If any error is received from the programmer, PROMlink will abort the operation even if there are more COMMANDS in the COMMAND SEQUENCE to be executed. An example User Function File is shown below:

```
\ "Erase EEPROMs"  
E0]  
\%*  
\ "Display all checksums"  
E3]  
\%P  
1  
\%D  
\%M  
"  
2  
\%D  
\%M  
"  
3  
\%D  
\%M  
"  
4  
\%D  
\%M  
"  
5  
\%D  
\%M  
"  
6  
\%D  
\%M  
"  
7  
\%D  
\%M  
"  
8  
\%D  
\%E  
\ "Blank device test"  
B  
\%*
```

This file will produce a *User Function* menu that will have three menu items, which are shown in figure 3-58.

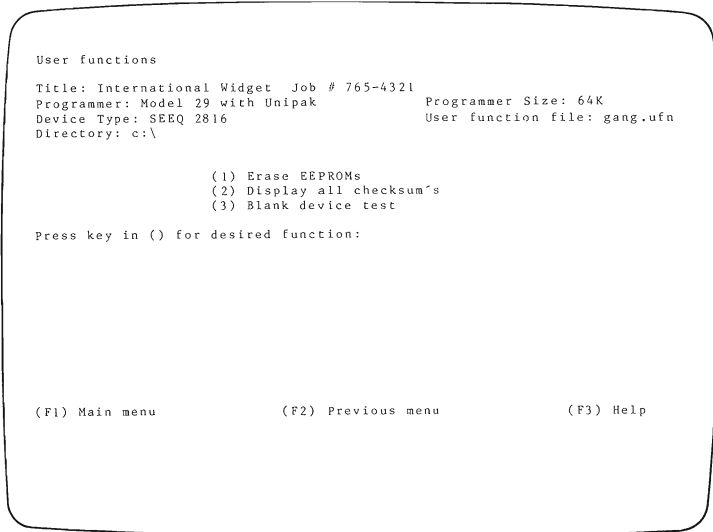


Figure 3-58. User Function Screen



( )

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( )



# USER SUPPORT UTILITIES

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**DATA I/O**

UTILITIES

INDEX

# USER SUPPORT UTILITIES 4

This section describes three handy utilities, which are included on the PROMlink disk for your convenience. These utilities are often useful in an engineering environment, but typically must be purchased as separate packages.

Now, you don't have to justify the purchase of several individual programs that will make your work easier. The following utilities are available when PROMlink is installed in your system simply by calling them from the system prompt.

- Terminal Emulator Utility
- Label Printer Utility
- File Protection Utility

The utilities are described individually, with instructions for their use. Each of the utilities has special features or functions you will want to be familiar with before using.

## TERMINAL EMULATOR UTILITY

4.1

**Function:** Dumb terminal emulator for personal computer disk file transfer from/to mainframe computer or Data I/O programmers or another personal computer, via RS-232-C COM1: port, in full or half duplex

**Required Input:** From DOS, using "MODE", set baud rate (up to 9600); with PROMlink disk or executable files in logged-in drive, enter "TERM" and RETURN; enter F1 key to quit utility

**Options:** Any of TERM's commands

**Completion Message:** (none)

**Notes:** TERM, a simple terminal emulator, is noteworthy because of its small executable file size; it runs on the IBM-compatible personal computers that run PROMlink; it permits file transfer in binary or text mode

Prior to using TERM, connect your other computer, Data I/O programmer to the COM1: port on the host computer. Set the correct parity and baud rate with the *MODE* function in DOS for the equipment you are using. See the example for the IBM PC, which follows:

In this example, you use the DOS *MODE* command to set the serial port configuration:

```
A>mode com1:9600,n,8,1
```

After "MODE" is typed, the first argument specifies the serial port (COM1:), then the baud rate is specified (9600), no (n) parity is required, there will be eight (8) data bits and one (1) stop bit for this configuration.

The COM1: serial port must be configured each time DOS is started. This procedure can be automated by adding *MODE COM1:9600,n,8,1* in the operating system's *AUTOEXEC.BAT* file. This way, every time DOS is started, the COM1: port will automatically be configured to your specification.

To use the terminal emulator utility, install the PROMlink program disk or executable files into the logged-in disk drive and at the system prompt type:

```
A>term RETURN
```

This will run the TERM (Terminal Emulator) program and display the *TERM* program menu shown in figure 4-1. The status field, located at the bottom of the screen, reports your option selection and user-input file names. Commands sent to TERM are entered by using the computer's special function keys. Refer to the list of commands in table 4-1 for a description of their function.

```
A>term
TERM V1.07, Copyright (C) 1984,1985 Data I/O Corp.
(F1) Exit TERM
(F2) Terminate file transfer
(F3) Display help screen
(F4) Create disk file
(F5) Send disk file
(F6) Set file transmission mode
(F7) Set full or half duplex
```

```
{F3} Help    Full  Binary
```

Figure 4-1. TERM (Terminal Emulator) Menu

Table 4-1. TERM Commands and Function

COMMAND	FUNCTION
F1	Closes any open files and then exits to DOS
F2	Stops file I/O transfer and closes any open files
F3	Displays the help screen, which consists of the list of commands and a brief description
F4	Receive file: Permits user to create a file name for a file to be received and saved to disk — files are written to disk exactly as received. Specify a path for the file (if required); type filename (up to eight characters plus dot and three character extension) in status block as requested and press the RETURN key
F5	Transmit file: Permits user to specify a file name for a file to be transmitted from the computer to equipment connected to COM1: port. Specify a path for the file (if required); type filename (up to eight characters plus dot and three-character extension) in status block as requested and press RETURN key
F6	Binary or Text mode of file transmission set by toggling between them; default is Binary mode; Text mode suppresses (strips out) control Z, control C, linefeeds, and nulls from files being sent from computer to COM1: port via transmit file (F5) function—Do NOT use text mode when transmitting JEDEC files to PLDS; See <i>TERM</i> menu status block for current mode
F7	Full or Half duplex transfer mode set for file transmit/receive (F5 and F4) functions; default is Full duplex; See <i>TERM</i> menu status block for current mode

To assist you in using the Terminal Emulator Utility, two examples are provided. Each example shows how to transfer a JEDEC formatted file from your computer to a Data I/O Model 29 programmer (with a LogicPak and P/T adapter, called PLDS Programmable Logic Development System) or vice-versa. Refer to the LogicPak, Model 60 or System/Model 19 programmer manuals for related key entry sequences (select codes) for *Terminal Remote Control (TRC)* mode file transfers.

The following examples assume that the equipment is connected correctly and that the COM1: port is appropriately configured. The PROMlink disk or executable files, with the TERM utility, must be installed in the computer.

## Example 1: JEDEC File Transfer From PLDS To Computer Via TERM

In this example, a JEDEC format device file must be loaded into programmer RAM and be ready for download to the computer.

1. Set Model 29 to *full duplex (echo)* operation by entering the following key sequence from the programmer front panel:

SELECT C E START 0 START

2. Enter the PLDS terminal mode (*TRC*) from the Model 29 programmer front panel by entering:

SELECT E 1 START

3. Run the *TERM* program by typing the following characters from the computer keyboard:

A>term RETURN

Your computer is now a terminal and the *TERM* program menu is displayed on screen.

4. Prepare TERM to receive a file by selecting the *full duplex* mode option from the menu (only if necessary; TERM defaults to *Full duplex* at start-up):

F7 (toggles between *Full* and *Half*)

## SECTION FOUR

5. Select the *Create disk file* function:

filename

to receive the transmitted file. (You can specify a disk drive and path prior to filename if required.)

6. Instruct the PLDS to transmit the JEDEC file by typing (from the computer keyboard):

You should see the device file scroll down the screen as it is being written into the disk file.

7. Using TERM's *Terminate file transfer* function, close the file when transmission is complete by entering:

This example is concluded and the JEDEC file transfer from the PLDS to your computer is complete. There are other step sequences for downloading a file from the programmer to the computer, using TERM. The preceding method is perhaps the most direct, requiring the least number of steps.

### Example 2: JEDEC Transfer From Computer to PLDS Via TERM

In this example, a JEDEC format device file must be created and saved to disk. If you are performing these examples in sequence, you can transfer the same device file from example 1 back to the PLDS. Make sure that the COM1: serial port is correctly configured.

1. Run the TERM program by typing the following characters from the computer keyboard:

A>term

2. Establish that the Model 29 is in *full duplex* mode. If it isn't, enter the following key sequences from the programmer front panel:

3. Enter the PLDS terminal mode from the Model 29 programmer front panel, by entering:

The *PLDS* menu will be displayed, including the *PLDS Command* prompt. Most of this menu will over-write the *TERM* program menu on the screen except for the status block. The *TERM* status block and *PLDS Command* prompt inform you that you can communicate with both the *TERM* program and the *PLDS* equipment through the terminal emulator.

4. At the *PLDS Command* prompt (from the computer) type:

Command:1 xxxx

where 1 is the *PLDS* menu selection which permits specification of device-to-be-programmed family and pinout code. The xxxx represents, and is replaced by, the four-digit device family and pinout code number that you supply.

5. Prepare the *PLDS* to receive a JEDEC file. At the *PLDS Command* prompt (from the computer) type:

Command:B

6. To recall the complete *TERM* menu, enter:

The *TERM* menu will be displayed. (It is not necessary to recall this menu if you can remember the function keys.)

7. Prepare *TERM* to transmit a file by specifying the appropriate transmission mode (use *binary* mode to transmit JEDEC files) from the *TERM* menu:

(toggles between *Binary* and *Text* mode)

(See the status field at the bottom of the screen—*TERM* defaults to *Binary* mode at start-up.)



8. Set TERM for *full duplex* (only if necessary; TERM defaults to *Full duplex* at start-up):

(toggles between *Full* and *Half*)

9. Select the *Send disk file* function from the TERM menu:

filename

to transmit the file. The file being transferred must be for the same device family and pinout code as that entered previously from the PLDS menu. (You can specify a disk drive and path prior to filename if required.)

When file transfer is complete, the PLDS *Command* prompt will be displayed.

10. Using TERM's *Terminate file transfer* function, close the file by entering:

This concludes this example and the JEDEC file transfer from the your computer to the PLDS.

The examples provided in this section describe only two of the possibilities for using TERM. Notice that both examples make use of features or capabilities that originate from PLDS menu option selections and programmer/pak select code functions.

When your programmer is set in *Terminal Remote Control* and TERM has converted your computer into a terminal, all of these programmer/pak features or capabilities are accessible. Consult the programmer and/or LogicPak manuals for more information pertaining to the use of these features and capabilities.

## LABEL PRINTER UTILITY

4.2

**Function:** Prints continuous form device and disk labels in various sizes on any standard printer

**Required Input:** A label text file; with PROMlink disk or executable files in logged-in drive, at system prompt enter "LABL" file name and RETURN; enter number of label rows to be printed and RETURN; enter "Q" to quit utility

**Options:** Directives (dot commands embedded in the text file) create a label template, which enables various utility and printer options

**Completion Message:** (none)

**Notes:** LABL, the label printer utility, is noteworthy because it permits the user to create ASCII text files for labels using standard text editors in their non-document mode; permits the user to specify the text appearance (label template) in either Epson(R) FX-80 control codes and/or hexadecimal codes; permits the user to substitute a character-string (eg. revision number, etc.) for an input variable, specified in the label template, just prior to printing; permits specification of the number of label rows to be printed.

Prior to using LABL, create the label template (which includes the text to be printed). A label template is created by embedding the utility program and printer directives (dot commands and control codes) in the ASCII text file.

## SECTION FOUR

These directives must be appropriate for the label type, the printer being used, and the hard-copy appearance of the text. A LABL text file contains one or more lines of text (in ASCII mode only) that are to be repeatably printed on the number of label rows you specify when prompted by the program.

*NOTE: The dot commands or directives must begin in column one of the text file; that is, the "." (dot) must be in column one. Only the first letter of the dot command is required. You must use text editors in their non-document (standard ASCII or text) mode to suppress any extraneous characters. These characters are added (e.g. word wrap) by most text editors in their document-format mode and will cause problems for the LABL program.*

To use the label printer utility, install the PROMlink disk or executable files (with the LABL program) into the logged-in disk drive or execution command directory and at the system prompt type:

```
A>labl RETURN
```

This will run the LABL (Label Printer) program and display the *LABL help* screen, which is shown in figure 4-2. The *LABL* program *help* screen shows the control directives that can be used to create a label template. Table 4-2 lists and describes each of these directives.

*NOTE: Directives are always entered on the line which precedes the line where the action or function is to take effect.*

```

A>labl
PROMlink Label Printer  Version 1.00  Copyright 1985 Data I/O Corp.
usage:  LABL <filename>

LABL is a printing utility designed for use with continuous form labels.
It uses text from <filename> to print alignment and/or production label sets.

Control directives begin with a dot ('.'): all other lines are text lines.
(Exception: blank lines are ignored. See the '.BLANK' directive below.)
The following control directives (or any abbreviations) may be used:

.*          a comment line -- ignored by LABL
.BLANK      print a blank line
.CPI        <n>      print n cols/inch (Epson FX-80 control codes)
.DISPLAY    <text>   display <text> as label file is loaded
.HEX        <val> <val> ... send up to 16 hexadecimal byte codes to printer
.LPI        <n>      print n lines/inch (Epson FX-80 control codes)
.VARIABLE   <tag> <text> use <text> to prompt for string to replace <tag>

With FX-80-compatible printers, '.CPI' arguments may be 5, 10, 12, or 17, and
'.LPI' arguments may be 6, 8, 10, 12, or 18.

```

Figure 4-2. LABL (Label Printer) Opening Screen

Table 4-2. LABL Directives and Functions

DIRECTIVE	FUNCTION
.*	Indicates a comment line, used to describe a label template's or a directive's purpose; these comments appear in the text file, but are ignored (not printed) by LABL
.B	B(lank) instructs LABL to print a blank line; also creates the vertical spacing between labels (carriage returns/line feeds from the text editor will NOT do this)
.C<n>	C(PI - Columns Per Inch) specifies the character width to the printer; <n> can only be 5, 10, 12, or 17 CPI for Epson FX-80; typically followed by the LPI (Lines Per Inch) specification
.D	D(isplay) instructs LABL to print the text (after .d) to the screen as the file is loaded at run time; display has no effect on the printer
.H<val> ... <val>	H(exadecimal) alerts LABL that the next set of two-digit hex numbers, <val>ues-up to 16 hex bytes, are sent as printer control codes; instructs the printer to perform some special action/function associated with the text; hex printer control codes are printer specific, consult your particular printer's manual
.L<n>	L(PI - Lines Per Inch) specifies the number of lines that are printed per inch of vertical space; <n> can only be 6, 8, 10, 12, or 18 LPI for Epson FX-80; 6, 8, 10 LPI specify standard height characters; little characters are specified by 12 and 18 LPI

Table 4-2. LABL Directives and Functions (continued)

DIRECTIVE	FUNCTION
.V<tag> <text>	V(ariable) permits the specification of a variable <tag> to be substituted for a user-input character-string, which is prompted for (by <text>) just prior to the label file being printed; can be used to input version numbers, which may vary with the printing session

## Label Printer Utility Example Files

## 4.2.1

The label printer utility comes with two example files, which reside in PROMlink's executable files directory. These two files are *DISKS.LAB* and *PROMS.LAB*. You can run LABL and print these files as is or substitute their text and directives for your own by editing them.

*NOTE: Should you elect to substitute label text/directives, make a working copy of the master file. Edit the working file copy only.*

Success with LABL depends to some extent on your willingness to experiment and a knowledge of how your printer operates. The more experience you have creating and printing labels, the easier the label printer utility will be to use.

Figure 4-3 shows what the *DISKS.LAB* ASCII text file, with embedded directives (template), looks like.

```
.* Widgeinit evaluation copy labels
.* Set up for Avery 4014 labels -- 4 in. x 1-7/16 in.

.* Ask for version number
.d      Widgeinit evaluation copy labels
.var    %%% Enter version number (V.VV):

.cpi 5
.lpi 6
WIDGINIT Ver %%%
.b
.cpi 17
.lpi 12
Copyright 1985 International Widget Corp.
.b
This software remains the property of the publisher
and is authorized for use only under written license
agreement. This software contains trade secret and
copyright information of International Widget Corp.
.cpi 10
.lpi 6
.b
.* Set FX-80 underlined italic mode
.hex    1b 34 1b 2d 31

For Evaluation Only

.* Turn off underline, italics
.hex    1b 34 1b 2d 30

.b
.b
.cpi 10
.lpi 6
```

Table 4-3. Disk Label Template with Text (Sample)

Examining figure 4-3, notice the spacing of lines in the file. This is only for readability. The carriage returns that created this spacing are not recognized by LABL, so this spacing has nothing to do with the actual printed label.

Next, notice the *.b(lank)* directives in the first column of the file. These are the instructions for vertical spacing that determine the location of lines of text and blank lines between text. Blank lines between text, created by *.b(lank)*, also specify the amount of space between rows of labels or where the next row of labels begins.

The *.d(isplay)* directive instructs LABL to display all the text which follows it on the screen during run time. Dot commands, including *.*, are not displayed. Notice the *.var(iable)* directive. This directive instructs LABL to look for the variable tag *%%%* and prompts the user with text: *Enter Version number (V.VV)*. For the example, four percent signs (*%%%%*) were used for the tag, however, any characters may be used, as only the number of characters is significant. LABL uses the number of characters specified by the tag as the number of characters to be input and printed when LABL is run.

When the prompt appears, during run time, you input a character-string to replace the variable tag. The character-string is actually substituted, at the second occurrence of the tag, in the line of text.

The line length or number of character-columns determines the horizontal dimensions of the text. The amount of information that will fit on a label line depends on the size of the label and the size of the characters. Experimentation with these parameters will provide the desired text appearance.

The *.cpi*, *.lpi* and the example's *.hex* directives are for the Epson FX-80 printer. They specify the size and special formatting of the text characters. At the end of the file, they turn off the special formatting and initialize the printer's standard character size.

---

*NOTE: If you are going to use a printer other than the FX-80, consult that printer's manual for the correct column-per-inch and line-per-inch control codes to use with the *.hex* directive.*

---



## SECTION FOUR

To print the example label template, make sure there is paper in the printer and it's turned on. If you decide to use the Avery™ 4014 labels, some experimentation for the correct label-form position in the printer carriage may be required. Then type:

```
A>labl disks.lab RETURN
```

You will see the following information displayed:

```
PROMlink Label Printer
Version 1.00
Copyright 1985 Data I/O Corp.

Enter version number (VVV): 2.00
WIDGINIT Ver 2.00
Copyright 1985 International Widget Corp.
```

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*For Evaluation Only*

*Please enter number of rows to print (or 'Q' to quit):*

Notice the user-input prompt to substitute a character-string for the specified variable tag and the prompt for the number of label rows to be printed. Enter the correct information requested by these prompts and RETURN.

After the last prompt and RETURN, the label printer utility will print out the formatted label text shown in figure 4-4.

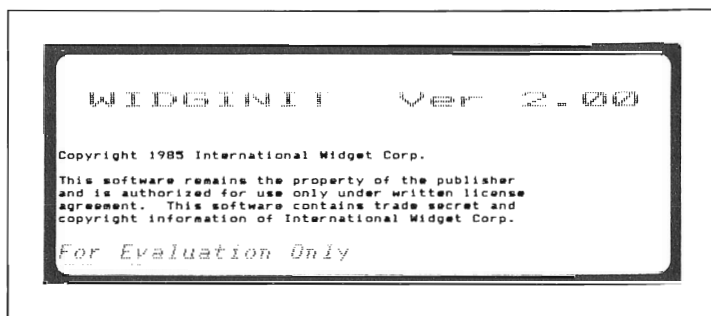


Figure 4-4. Printed Disk Label (Example)

The Label Printer Utility also includes a text file example of a set of six-across device labels. Figure 4-5 shows what the *PROMS.LAB* ASCII text file, with embedded directives (template), looks like.

*NOTE: The PROMS.LAB file shown in figure 4-5 is not exactly as you will see it displayed on screen. There are actually six blocks of label text on the line shown in the figure instead of just three. Unfortunately, the manual page size allows only three blocks of text to be illustrated. If you call up the file and examine it, you will see all six blocks (127 columns) of text on a single line (U1, U2 and U3 repeat). The rest of the file is exactly as shown in the figure.*

```
. * Prom labels for 83-999-001
. * Set up for Brady(tm) 75-196547 labels -- 1-1/8 in. x 1/4 in.

. * Display label id on PC screen

. d Prom labels for 83-999-001 (3 per set)

. * Set up printer for compressed print, 12 lines per inch

. cpi 17
. lpi 12

. * One row of label text

U1      83-999-001      U2      83-999-001      U3      83-999-001
(C) 1985 Int Widget    (C) 1985 Int Widget    (C) 1985 Int Widget

. * Space to next row of labels

. b
. b

. * Reset printer in case this is the last row

. cpi 10
. lpi 6
```

Figure 4-5. Device Label Template With Text (Sample)

## SECTION FOUR

The use of directives in figure 4-5 is very similar to that of figure 4-3. No character-string input is required of the user so no variable (*v* directive) is declared. There is one row of label text. This row of text blocks is repeated continuously, according to the number of rows you select at run time in response to the prompt:

*Please enter number of rows to print (or 'Q' to quit):*

Figure 4-6 shows what the six-across labels look like when printed with the information in the *PROMSLAB* text file.

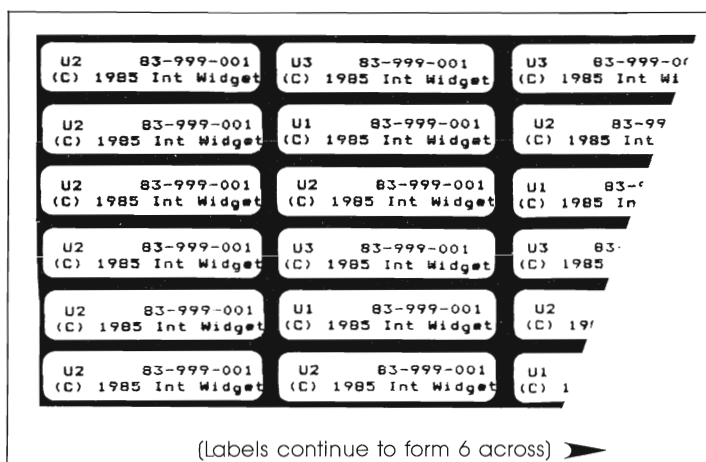


Figure 4-6. Printed Device Labels (Example)

**Label Printer Utility Error Recovery****4.2.2**

If an error in creating the label template is encountered at run time, an error message will be displayed. Program execution will continue until the prompt:

*Please enter number or rows to print (or 'Q' to quit):*

is displayed. To recover, record the error description displayed on screen, then quit LABL. Call up the text file from your editor (in the non-document mode), edit the required information described in the error message and save the edited file. Then run LABL again and try printing your edited label text file.

If this is the first time you have used a label printer utility, you may encounter some difficulties associated with the peculiarities of label size and positioning in the printer carriage. Experimentation will take care of the difficulties and give you the desired label text appearance.

## FILE PROTECTION UTILITY

4.3

**Function:** Permits the user to specify files as "read only" to prevent accidental erasure or modification, also to remove the "read only" restriction and return the file to "read/write" status

**Required Input:** PROMlink disk or executable files installed in the logged-in drive; at system prompt, type the command "RONLY" and the file name of the file to be protected (read only); type the command "RW" and the file name of the file to be returned to "read/write" or normal status

**Options:** Protect the file and unprotect the file

**Completion Message:** (none)

**Notes:** If an over-write or delete operation is attempted on a protected file, the error message is usually "file cannot be found"; the protection, which hides the file, can be removed by typing (from the system prompt) "RW" filename of the protected file

The File Protection Utility, included on the PROMlink disk with the executable files, is actually two separate programs that operate together. The *ronly.exe* program provides the file protection part of the utility, and *rw.exe* provides the file protection removal. Together, they are the File Protection Utility.

You can call the file protection program from the system prompt, when the PROMlink disk or its executable files is in the logged-in drive, by typing:

```
A>ronly [drive:] [path] filename [.ext] 
```

This will place the "read only" restriction on the file named and prevent it from accidental erasure or modification. This "read only" restriction can be removed with the PROMlink utility "RW.EXE" and must be removed prior to writing new information or deleting that file.

To remove the "read only" restriction on protected files, place the PROMlink program disk in the logged-in drive and at the system prompt type:

```
A>rw [drive:] [path] filename [.ext] 
```

*This action will restore the protected file to "read/write" or normal status.*



# APPENDICES/INDEX

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**DATA I/O**

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...



This appendix contains coding charts to help you use PROMlink™. Table A-1 lists commonly used hexadecimal numbers along with their decimal equivalents. Table A-2 lists ASCII characters and their hexadecimal and decimal equivalent codings.

Table A-1. Commonly Used Hexadecimal Numbers

HEX	DECIMAL	HEX	DECIMAL	K
0	0	40	64	
1	1	80	128	
2	2	100	256	
3	3	200	512	
4	4	400	1024	1K
5	5	800	2048	2K
6	6	1000	4096	4K
7	7	2000	8192	8K
8	8	4000	16384	16K
9	9	8000	32768	32K
A	10	10000	65536	64K
B	11	20000	131072	128K
C	12			
D	13			
E	14			
F	15			
10	16			
11	17			
12	18			
13	19			
14	20			
15	21			
16	22			
17	23			
18	24			
19	25			
1A	26			
1B	27			
1C	28			
1D	29			
1E	30			
1F	31			
20	32			

Table A-2. ASCII Coding Chart

Decimal	Hex	Char	Decimal	Hex	Char	Decimal	Hex	Char
0	00	NUL	43	2B	+	86	56	V
1	01	SOH	44	2C	,	87	57	W
2	02	STX	45	2D	-	88	58	X
3	03	ETX	46	2E	.	89	59	Y
4	04	EOT	47	2F	/	90	5A	Z
5	05	ENQ	48	30	0	91	5B	[
6	06	ACK	49	31	1	92	5C	]
7	07	BEL	50	32	2	93	5D	^
8	08	BS	51	33	3	94	5E	_
9	09	HT	52	34	4	95	5F	`
10	0A	LF	53	35	5	96	60	a
11	0B	VT	54	36	6	97	61	b
12	0C	FF	55	37	7	98	62	c
13	0D	CR	56	38	8	99	63	d
14	0E	SO	57	39	9	100	64	e
15	0F	SI	58	3A	:	101	65	f
16	10	DLE	59	3B	;	102	66	g
17	11	DC1	60	3C	<	103	67	h
18	12	DC2	61	3D	=	104	68	i
19	13	DC3	62	3E	>	105	69	j
20	14	DC4	63	3F	?	106	6A	k
21	15	NAK	64	40	@	107	6B	l
22	16	SYN	65	41	A	108	6C	m
23	17	ETB	66	42	B	109	6D	n
24	18	CAN	67	43	C	110	6E	o
25	19	EM	68	44	D	111	6F	p
26	1A	SUB	69	45	E	112	70	q
27	1B	ESC	70	46	F	113	71	r
28	1C	FS	71	47	G	114	72	s
29	1D	GS	72	48	H	115	73	t
30	1E	RS	73	49	I	116	74	u
31	1F	US	74	4A	J	117	75	v
32	20	SP	75	4B	K	118	76	w
33	21	!	76	4C	L	119	77	x
34	22	"	77	4D	M	120	78	y
35	23	#	78	4E	N	121	79	z
36	24	\$	79	4F	O	122	7A	{
37	25	%	80	50	P	123	7B	
38	26	&	81	51	Q	124	7C	}
39	27	'	82	52	R	125	7D	~
40	28	(	83	53	S	126	7E	DEL
41	29	)	84	54	T			
42	2A	*	85	55	U			

# CONFIGURATION FUNCTIONS

---

**DATA I/O**

FUNCTIONS

4 UTILITIES

C INDEX

The PROMlink configuration file is read by PROMlink when it's starting up. This file contains instructions or information that initializes PROMlink's configuration to operate your particular computer and programming equipment. A configuration file can be one of the four default files included with PROMlink, or one of any number of configuration files created by the user.

The four default configuration files included with PROMlink are listed below:

INIT.CFN	PROMlink default configuration file
INITPC.CFN	PROMlink IBM PC, XT, AT, AT&T 6300 and Compaq default configuration file
INITTI.CFN	PROMlink TI Professional default configuration file
INITBIO.CFN	PROMlink BIOS-compatible default configuration file

These default configuration files initialize PROMlink to run on the specific computer you are using. When first starting PROMlink, if you enter:

```
A>pl RETURN
```

the *INIT.CFN* default configuration will be loaded. The *INIT.CFN* file (as supplied by Data I/O) configures the PROMlink program and utilities to run on an IBM PC, XT, AT, AT&T 6300 or Compaq personal computer.

## Default Configuration Files For Computers Other Than IBM

---

### B.1.1

PROMlink also runs on IBM-compatible computers; however, a different configuration file must be used. If you are going to use a computer other than an IBM when you start-up PROMlink, you must enter:

```
A>pl filename 
```

where "filename" represents either *INITTI.CFN* (for the Texas Instruments Professional computer) or *INITBIO.CFN* (for IBM BIOS-compatible computers). The AT&T 6300 and Compaq personal computers will run either *INIT.CFN* or *INITPC.CFN*. More detailed information on PROMlink and computer compatibility is available in Appendix B.4.

If you would like to have PROMlink automatically default to the correct configuration for your computer, you will need to copy the *INITTI.CFN* file or the *INITBIO.CFN* file into *INIT.CFN*. This is done from the operating system, using the *COPY* function. Then you will not need to specify a file name to insure correct PROMlink configuration for your computer.

*NOTE: If you altered the INIT.CFN file to run a computer other than an IBM, and then want to change back to the IBM format, just copy the INITPC.CFN file into INIT.CFN.*

There are other methods of accomplishing the goal of bringing PROMlink up in the correct configuration for your computer. One method is to edit the appropriate three-letter computer configuration code in the default configuration file. There are three of these three-letter codes. They are:

IBM	IBM hardware compatible
TIP	Texas Instruments Professional
BIO	IBM BIOS compatible

Each code tells PROMlink what type of computer it's running on. These codes can be edited in the *INIT.CFN* file by using the operating system editor EDLIN or some other text editor. See the sample configuration file, described later in this appendix, for the location in the file of the three-letter code.

**User Created Configuration Files****B.1.2**

PROMlink can also be indirectly configured for your computer through the *Save configuration* function in the *Configuration functions* menu. After PROMlink is up and running on your computer, the three-letter configuration code that is in use at the time is automatically written into every file you create and save using the *Save configuration* function.

This method also permits the alteration of other configuration parameters, which are described in the paragraphs following the sample configuration file. You can change the default configuration from the *Configuration functions* menu to accommodate a different computer port, programmer, pak or device type.

Whenever you select the *Save configuration* function from the *Configuration functions* menu or exit PROMlink with the *update* option (*INIT.CFN* only), a configuration file is created and listed by name in the file directory. If you want to use this configuration file when starting PROMlink, enter the following:

```
A>pl filename RETURN
```

where "filename" is the name of the configuration file you created and saved. This file contains all the information necessary to configure PROMlink for the computer and programming equipment.

If you want to use a different configuration file when you are in PROMlink, simply go to the *Configuration functions* menu and select the *Load configuration* (9) function and select the file name you saved. PROMlink will load the new file and you will be able to move quickly to another task with new operating parameters and equipment.

## Sample Configuration File

## B.1.3

To help you learn and understand the configuration file format, a sample configuration file is shown below:

```
n
PLV2.0
IBM
International Widget    Job #765-4321
u6.p87
logic.ufn
c:\pl\job4321
COM1,9600,n,8,1
11,Intel,2764
87,8,1,2,0,1
0,0,FFFFFF,0,0
1,2,2,2,2,2
```

**n**

The first line of the file is the update flag, either an *n* or a *u*. The letter *u* (*update* file option) only has significance in the *INIT.CFN* file. When you exit PROMlink, the *INIT.CFN* file is checked to see if the first character is a *u*. If so, the file is updated with the current PROMlink configuration. If the first letter is an *n*, the file is not updated.

The *Save configuration* function always creates files with an *n* as the first character. The start-up default *INIT.CFN* file also has an *n* as the first character.

### PLV2.0

The second line of the configuration file is a version number which PROMlink uses to assure that the file is of the right format.

### IBM

The third line of the configuration file is a three-letter code that describes which personal computer PROMlink is running on. There are three of these three-letter codes. These codes have been described in a previous paragraph and are related in detail in appendix B.4



**International Widget Job #756-4321**

The fourth line of the configuration file is the title that will appear above the status or configuration block at the top of most PROMlink menus. It can be anything as long as it fits on one line.

**u6.p87**

The fifth line of the configuration file is the name of the default *Data File* contained in the menu status blocks. This line can include a path specification if the default data file is not contained in the default directory. The path specification tells PROMlink on what drive and in what directory to find the default data file. If a default data file is not specified, an \* asterisk will be present on line five.

**logic.ufn**

The sixth line of the configuration file states the name of the *User function file*. The *User function* file permits you to design your own unique menu of PROMlink functions. If you select the *User Functions* (0) from the *Main* menu, this text file will be loaded and the menu it contains will be displayed. If a *User function* file is not specified, an \* asterisk will be present on line six.

**c: \PL \ job4321**

The seventh line of the configuration file is the name of the default directory. This is the directory that is displayed when either the *Complete* or *Compact directories* are selected from the *File functions* menu.

**COM1,9600,n,8,1**

The eighth line of the configuration file indicates the serial port parameters. This line consists of five parameters separated by commas.

The first parameter is the name of the port that the programmer is connected to. It may be COM1 or COM2 for the IBM computers and COM1, COM2, COM3, or COM4 for the Texas Instruments computer.

The second parameter is the baud rate. This can be 110, 150, 300, 600, 1200, 2400, 4800, or 9600 baud. PROMlink

defaults to 9600 baud which is the recommended data transmission rate.

The third parameter is the parity. This can be n, e, or o for no parity, even parity or odd parity, respectively.

The fourth parameter is the number of data bits which can be either 7 or 8.

The last parameter is the number of stop bits which can be either 1 or 2.

### 11, Intel, 2764

The ninth line contains three parameters, which consist of programmer equipment indicator, device manufacturer name, and device type number, all separated by commas.

The first parameter is a number indicator representing the Data I/O programmer and pak types. It can be any one of the values listed as follows:

- 0 Series/Model 22
- 1 Model 60A or 60H
- 2 Model 120/121
- 3 System/Model 19 with GangPak
- 4 System/Model 19 with LogicPak
- 5 System/Model 19 with MOSPak
- 6 System/Model 19 with UniPak or UniPak 2
- 7 System/Model 19 with Gang Module
- 8 Model 29 with GangPak
- 9 Model 29 with LogicPak
- 10 Model 29 with MOSPak
- 11 Model 29 with UniPak or UniPak 2
- 12 Model 29 with Gang Module

The second parameter is the default device manufacturer's name: Intel

The third and last parameter is the number of the default device type: 2764

(The device manufacturer's name and device number must appear exactly as they do in the PROMlink menus.)

**87,8,1,2,0,1**

The tenth line of the configuration file consists of six numbers separated by commas.

The first of these six numbers is the I/O format number.

The second is the data-bit mode (8, 16 or any multiple of 8 up to 64 data bits).

The third number determines what sort of test (if any) is done prior to programming devices. A "0" represents no test, a "1" represents the illegal bit test, and a "2" represents the blank device check.

The fourth and fifth numbers represent the computer screen color. Note that these numbers will be ignored for the IBM monochrome displays. The fourth number is the color of the characters (foreground) while the fifth number is the color of the background. For the IBM computers, the colors are listed as follows:

- 0 black
- 1 blue
- 2 green
- 3 cyan
- 4 red
- 5 magenta
- 6 yellow
- 7 white

The default colors for PROMlink are foreground 2 (green) and background 0 (black). The only way to set these colors is by editing the configuration file.

The sixth number on this line of the configuration file is the *Set size*. This number can range from 1 to 20 and tells PROMlink the number of devices to be programmed. This option is only available for Gang programmers (like the Models 120/121 and the GangPak).

0,0,FFFFFF,0,0

The eleventh line of the configuration file contains the five programmer *Operation boundary* values separated by commas. In order, these operation boundaries are:

Begin RAM Address  
I/O Block Size  
I/O Offset  
Device Block Size  
Begin Device Address

1,2,2,2,2,2

The twelfth and last line of the configuration file holds the binning category numbers for the six error conditions. These numbers are separated by commas and are in this order:

Parts correctly programmed  
Bad device / continuity  
Illegal bit / non blank  
Programming errors  
Data verify errors  
Functional verify

Any line and any part of all the lines in the configuration file can be edited to change some part of PROMlink's operation. If any of PROMlink's configuration file parameters are missing or contain an illegal value, an error message will be displayed when the configuration file is loaded.

If PROMlink is not operating and the equipment is connected properly, check the current configuration file format and parameters. These must be correct for the equipment being used and device being programmed.

Editing a configuration file is only advantageous for changing the update option, the computer type, and the display colors. The rest of the configuration file parameters are more easily modified from inside PROMlink through the *Configuration functions* menu selections.

## ERROR LOGGING FILE FORMAT

## B.2

The error logging file *STATS.DOC* is used by PROMlink to save the various error counters that PROMlink updates every time it programs a device. Whenever *Save and clear totals* is selected from the *Error logging* menu, the current states of PROMlink's error counters (as well as other information) are appended to the end of the *STATS.DOC* file. If *STATS.DOC* does not exist, selecting the *Save and clear totals* function will create it automatically.

The *STATS.DOC* file can be cleared of out-of-date information by calling the file up and editing it, or by deleting the entire file. Remember, *STATS.DOC* is automatically created (if it doesn't exist) by selecting the *Save and clear totals* function, which would give you a clean file to begin a new programming session.

The *STATS.DOC* file can be sent to the screen or printer for you to review its contents. The information *STATS.DOC* provides will help you track the results of your device programming session(s) and a hardcopy of the file itself can be used as a programming session(s) error logging report.

**Sample Error Logging STATS.DOC File****B.2.1**

An example of the information content in *STATS.DOC* is shown below. Each line of information in the sample file is explained in the paragraphs which follow the example.

```
-  
International Widget Corp.    Job #765-4321  
26/07/85 10:18  
U09A.JED  
MMI/16L8  
502,0,1,0,3,2
```

The first line of information written to *STATS.DOC* is always a dash character (-). This is to aid you in visually separating different programming session error logging entries. *STATS.DOC* can contain multiple error logging entries. Each new entry is appended to the file at the end of the error logging entry for the last recorded programming session.

**International Widget Corp. Job #765-4321**

The second line contains the title obtained from the *Main* menu status block. The title can be specified by selecting the *Enter title* function from the *Configuration functions* menu.

**26/07/85 10:18**

Line three records the date and time that the error logging entry was appended to the file. This information line begins with the date; a two-digit day, a two-digit month, and a two-digit year separated by slashes ( / ). A space follows the date and then the time is displayed; a two-digit hour and a two-digit minutes, separated by a colon (:).

**U09A.JED**

The fourth line is the name of the default data file in use at the time the error logging entry was appended to the file.

### MMI/16L8

Line five is where the device manufacturer's name and device type number are recorded. This information will be the same as appears in the *Select manufacturer* and *Select device type* menus.

### 502,0,1,0,3,2

The sixth line displays the six PROMlink device counters separated by commas. The counters, from left to right, are listed below with a description of their contents.

Counter one:	502	= Parts correctly programmed
Counter two:	0	= Bad device / continuity
Counter three:	1	= Illegal bit / non blank
Counter four:	0	= Programming errors
Counter five:	3	= Data verify errors
Counter six:	2	= Functional verify

These counters are updated in PROMlink whenever a device is programmed.

**Error Logging Programmer/Pak Error Codes****B.2.2**

The error codes generated by the programmer/pak during the programming session relate to the type of error encountered. In some cases the error codes are different for each programmer/pak.

PROMlink sorts and counts these error codes into the correct bin (device counter) regardless of the programmer/pak-dependent error code. *STATS.DOC* records the result of this error logging binning and counting for each programming session. The following list describes the programmer/pak-dependent error codes (numbers) that are sorted into each error counter bin.

**Parts correctly programmed (bin)**

no error code = correctly programmed device

**Bad device / continuity (bin)**

26 Series/Model 19 and Model 29  
 31 all programmers/paks  
 32 Model 120/121  
 33 Model 120/121  
 34 Model 120/121  
 35 Model 120/121  
 36 Model 120/121  
 38 Model 120/121  
 3B Model 60A/60H

**Illegal bit / non blank (bin)**

20 all programmers/paks  
 21 all programmers/paks  
 39 Model 60A/60H  
 B1 UniPak/UniPak 2 and MOSPak

**Programming errors (bin)**

22 all programmers/paks  
 77 Model 60A/60H and LogicPak

**Data verify errors (bin)**

23 all programmers/paks  
 24 all programmers/paks  
 29 Model 120/121



### Functional verify (bin)

74 Model 60A/60H and Logic Pak

75 Model 60A/60H and Logic Pak

These counters will not be updated for the Gang Programming Module nor GangPak programmer. PROMlink has no way of knowing how many devices they actually programmed correctly. The *Functional verify* counter only works for the Model 60 and LogicPak. More information on these error codes can be obtained by consulting the appropriate programmer/pak manual.

**PROGRAMMER SELECT CODES****B.3**

Extended functions (select codes) are special commands which are programmer/pak specific. Each extended function has a two-digit hexadecimal code associated with it. These functions are accessed by sending the extended function code followed by a right bracket "]" (ASCII character 93-decimal) and a carriage return (CR) to the programmer.

As is the case with regular commands, some extended functions require additional information to be sent to the programmer after the carriage return. Some extended functions respond with information preceding the response character ">".

Because extended functions are programmer specific, you will need to consult your Data I/O programmer or pak manual for the details of each extended function contained in the following list:

**MOSPAK:**

- CE ] CR - Set reject count to default
- CF ] CR - Set single pulse reject count
- EF ] CR - Display MosPak configuration number

**UNIPAK:**

- C3 ] CR - Access specific Family/Pinout options
- CC] CR - Examine Family/Pinout code
- CE ] CR - Set reject count to default
- CF ] CR - Set single pulse reject count
- EF ] CR - Display UniPak configuration number

**UNIPAK 2:**

- BC ] CR - Disable Electronic Identifier test
- BD ] CR - Enable Electronic Identifier test
- C3 ] CR - Access specific Family/Pinout options
- CC] CR - Examine Family/Pinout code
- CD] CR - Display devices Electronic Identifier array
- CE ] CR - Set reject count to default
- CF ] CR - Set single pulse reject count
- EF ] CR - Display UniPak 2 configuration number

### GANGPAK:

- CC] CR - Examine Family/Pinout code
- CD] CR - Display devices Electronic Identifier array
- E0 ] CR - EEPROM erase routine
- E1 ] CR - Select set size (1 - 8)
- E2 ] CR - Select word size (multiple of 8)
- E3 ] CR - Display checksum of desired device
- EF ] CR - Display GangPak configuration number

### LOGICPAK:

- CE ] CR - Set option attributes
- E1 ] CR - Enable terminal mode
- E2 ] CR - Receive PALASM source
- E3 ] CR - Transmit PALASM source
- E4 ] CR - Assemble PALASM source
- E5 ] CR - Enter reject count option
- E6 ] CR - Enter verify option
- E7 ] CR - Enter security fuse option
- E8 ] CR - Set number of logic fingerprint cycles
- E9 ] CR - Enter starting vector and test sum
- EA ] CR - Display fuse pattern
- EB ] CR - Receive JEDEC data
- EC ] CR - Transmit JEDEC data
- ED ] CR - Display sumcheck of fuse data
- EE ] CR - Edit fuse by number
- EF ] CR - Display LogicPak configuration number

### 120A/121A:

- 18 ] CR - Set VCC levels during verify
- 20 ] CR - Performs EEPROM test
- 22 ] CR - Convert to 16 bit programmer
- 23 ] CR - Set number of verify passes
- 25 ] CR - Select Electronic Identifier options
- CC] CR - Electronic Identifier Family/Pinout codes
- CD] CR - Electronic Identifier code inquiry
- DF ] CR - Inquire device status for all 20 sockets

**SERIES 22:**

A4 ] CR - Clear all RAM  
 B2 ] CR - System configuration number  
 B7 ] CR - View select functions  
 B8 ] CR - Display device options  
 B9 ] CR - Display test  
 BC ] CR - Disable Electronic Identifier  
 BD ] CR - Enable Electronic Identifier  
 C1 ] CR - Calibration  
 C3 ] CR - Programming algorithm option selection  
 CC ] CR - Display Family/Pinout code  
 CD ] CR - View Electronic Identifier  
 CE ] CR - Select normal reject count  
 CF ] CR - Set one pulse reject count  
 F4 ] CR - Set nibble mode  
 F5 ] CR - Set binary base  
 F6 ] CR - Set octal base  
 F7 ] CR - Set hexadecimal base  
 F8 ] CR - Disable nibble mode  
 FE ] CR - Power down save

**MODELS 60A and 60H:**

A2 ] CR - Fill fuse map  
 C2 ] CR - Select JEDEC mode  
 C3 ] CR - Define handler error count  
 C4 ] CR - Select display format  
 C5 ] CR - Define handler device counter  
 C8 ] CR - Enable/disable underblow/overblow output  
       format  
 CA ] CR - Select number of test passes  
 CE ] CR - List vectors on/off  
 EA ] CR - Output fuse map  
 E5 ] CR - Reject option  
 E6 ] CR - Testing mode  
 E7 ] CR - Security fuse enable/disable  
 E8 ] CR - Define Logic Fingerprint cycles  
 E9 ] CR - Start/end vector for Logic Fingerprint  
 EB ] CR - Input data in JEDEC format  
 EC ] CR - Output data in JEDEC format  
 FE ] CR - Save parameters in non-volatile RAM

**COMPUTER COMPATIBILITY****B.4**

PROMlink was written to be compatible with personal computers which use MS-DOS. However, in the interests of efficient use of the CRT display and especially the computer's serial port, PROMlink will not run on all MS-DOS compatible systems without some modifications.

The reason for this is that although the operating system for all MS-DOS computers is essentially identical, the hardware may be implemented in different ways or located at different addresses. PROMlink expects particular hardware to be located at specific addresses in the computer. If this is not the case, PROMlink will run improperly on some computers even though they are MS-DOS compatible.

MS-DOS and PROMlink were designed initially to run on an IBM PC without modification. It is possible, however, to run PROMlink on a computer that is not 100 % hardware compatible with the IBM PC. The third line of the PROMlink default configuration file contains a three letter code which tells PROMlink what type of computer it is running on. This three letter code can be any one of the following:

IBM	IBM hardware compatible
TIP	Texas Instruments Professional
BIO	IBM BIOS compatible

If *BIO* is specified, PROMlink will not access any of the computer's hardware directly, but will expect certain IBM PC BIOS calls to work. This is useful if your computer hardware is not compatible with the IBM PC, but permits the use of compatible BIOS or MS-DOS interrupt calls. MS-DOS interrupt calls are used by PROMlink regardless of the three-letter code option.

If the *B/O* option is selected, the following BIOS interrupt calls will be made:

10-hex	Video I/O
14-hex	RS-232-C I/O

If the *IBM* option is selected, the following hardware addresses are accessed:

I/O:3F8 to 3FE	COM1:
I/O:2F8 to 2FE	COM2:
I/O:3B4 to 3BB	Monochrome display ctrl regs
I/O:3D0 to 3DA	Color/graphics display ctrl regs
B0000 to B0FA0	Monochrome display memory
B8000 to B8FA0	Color/graphics display memory

In addition, interrupt 11 (equipment determination) and interrupt 14 (RS-232-C I/O) will be used.

If the *TIP* option is selected, the following hardware addresses are accessed:

I/O:0E4 to 0E7	COM1:
I/O:0EC to 0EF	COM2:
I/O:0F4 to 0F7	COM3:
I/O:0FC to 0FF	COM4:
DF800	Display attribute latch
DF810 to DF813	Display control regs
DE000 to DE7D0	Display character memory

**SETTING PROGRAMMER'S SERIAL PORT PARAMETERS****B.5**

The information contained in this part of appendix B describes briefly the hardware switches or select codes required to set the Data I/O programmers' serial port data transmission parameters. This information is intended for quick reference. So only the switch settings, switch locations, and select codes are provided. If you require further instructions to learn exactly how to perform the procedure required to implement the switch settings or select codes, please refer to the appropriate programmer manual.

The serial port parameters that PROMlink cares about are:

- baud rate
- stop bits
- parity

Each of these parameters will be described for the specific programmer in the following paragraphs and illustrations.

**Model/Series 22 and Model 60 Programmers****B.5.1**

The Model/Series 22 and Model 60 serial port parameters are set from the front panel keyboard, using the following select function codes:

SELECT CODE	SERIAL PORT PARAMETER
DA	Set Baud Rate
DB	Select Parity
DC	Select Stop Bits

The procedure for setting each of these serial port parameters varies somewhat according to the programmer. Consult your programmer manual for further details.

## System/Model 19 and Model 29 Programmers

## B.5.2

The serial port parameters are set for the System 19 and Model 29 programmers from the position of hardware switches located on the back panel (baud rate) or inside of the programmer. Refer to the two illustrations (figure B-1 and B-2) which follow for the location and correct setting of the switch associated with the specific serial port parameter.

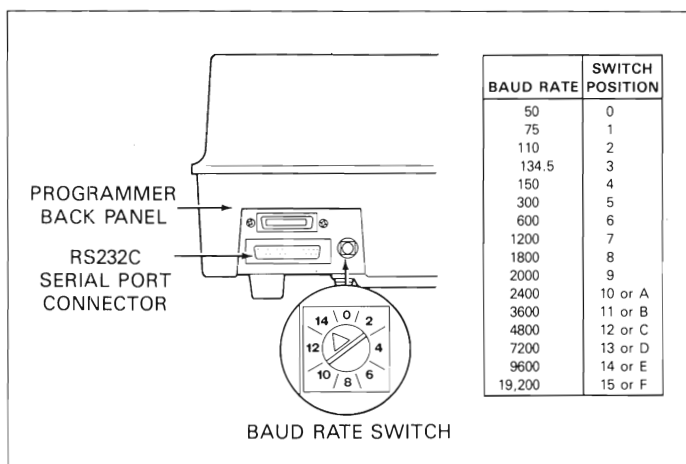


Figure B-1. System 19/Model 29 Baud Rate Switch and Settings

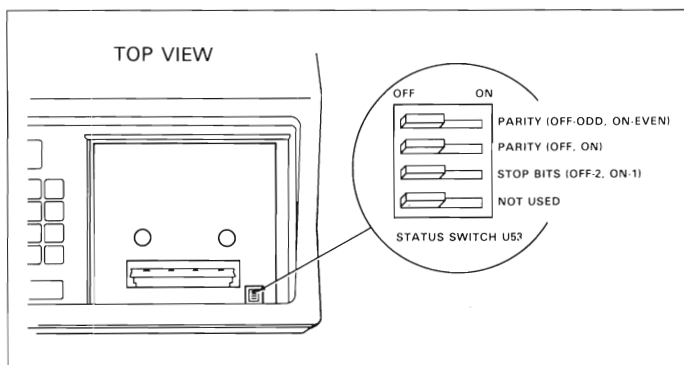


Figure B-2. System 19/Model 29 Parity/Stop Bit Switches and Settings



## Model 120/121 Programmers

## B.5.3

The serial port parameters are set for the Model 120/121 programmers from the position of hardware switches located on the Serial I/O card inside the programmer. There are two types of Serial I/O cards that may be used in the Model 120/121. The card that controls serial port #1, which is the port PROMlink will communicate through, is the Keyboard Display and Serial I/O card (701-1829).

Refer to the illustration (figure B-3) that shows the internal view of the programmer for the location of the 701-1829 Serial I/O card. Pull out this Serial I/O card and set the switches for the desired serial port parameter. Refer to figure B-4 for the location of the switches and the settings for the appropriate serial port parameters.

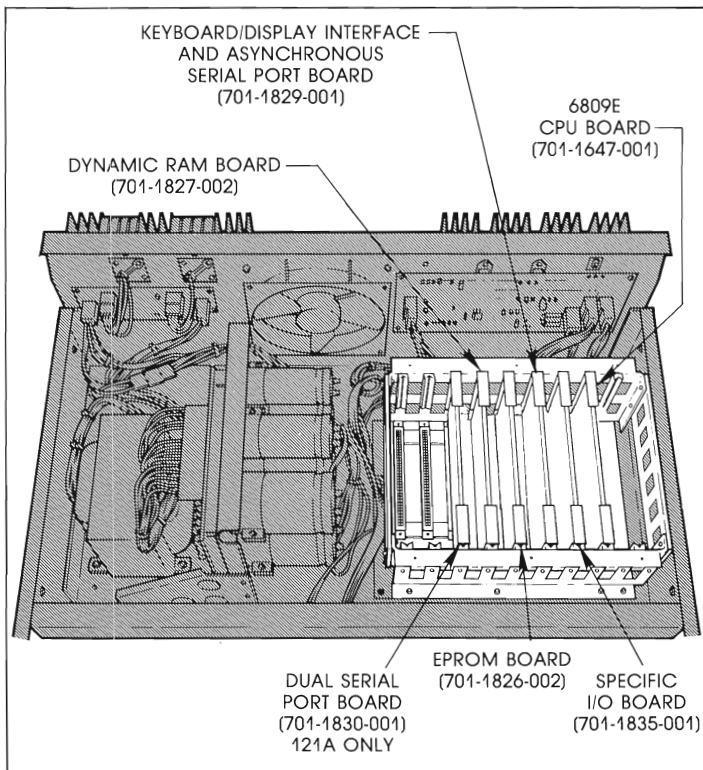


Figure B-3. Model 120/121 Serial I/O Card (701-1829) Location

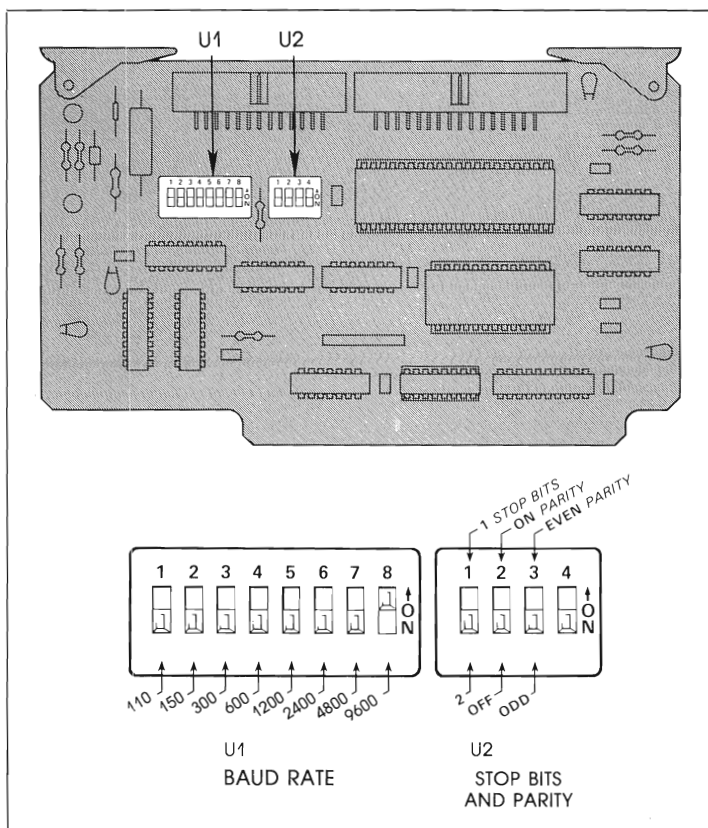


Figure B-4. Model 120/121 Serial I/O Card Switch Settings



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Telex 910-951-1362

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(714) 662-1182  
Telex 755870

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880212 (DORADO CO UD)

**Dorado Company**  
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(1) 7249511 thru 15 or 7210669  
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5-546391  
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Telex 32392 TSEE IL

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(6) 5915551  
Telex 680356 SISTREL I

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Telex K25227

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65 2729412  
Telex RS 37162

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Electronic Building Elements (PTY),  
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Sertek International, Inc.  
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Telex 19162 MULTI IC or  
23756 MULTI IC

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Dynamic Supply Engineering R.O.P.  
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#### TURKEY

Data I/O Europe  
(20) 622866

#### UNITED KINGDOM

Microsystem Services  
High Wycombe  
(494) 41661  
Telex 837187 MICSYS G



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## Software Problem Report

**Problem Description:** Please describe how to reproduce the problem and include the source file and output files (on disk or tape if possible).

(Use reverse side if more room is needed.)

Name \_\_\_\_\_

Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_ Date \_\_\_\_\_

Data I/O Software Product \_\_\_\_\_

Version \_\_\_\_\_ Serial Number \_\_\_\_\_

Other Software Used \_\_\_\_\_

Computer Manufacturer \_\_\_\_\_ Model \_\_\_\_\_

Operating System \_\_\_\_\_ Version \_\_\_\_\_

Peripherals \_\_\_\_\_

Programmer Model \_\_\_\_\_ Revision \_\_\_\_\_

Mail to: Data I/O Corporation  
Customer Support Center  
10525 Willows Road N.E./P.O. Box 97046  
Redmond, WA 98073-9746  
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