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# MicroGPIPER User's Manual

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The total cost of corrosion at Army facilities is a significant percentage of maintenance repair budgets. Corrosion of underground steel pipelines used to transport and distribute natural gas often leads to property and environmental damage, and loss of valuable resources. When corrosion problems occur, facility managers must decide whether to repair or replace pipes. Often these decisions consider only current needs and are made with limited knowledge of the network corrosion status.

This report describes MicroGPIPER, a maintenance management system for underground gas distribution networks. MicroGPIPER helps facility managers to determine the corrosion status of a gas piping network and to schedule sections of the network for maintenance and repair. MicroGPIPER considers current and future needs in determining the best maintenance strategy, and stores information concerning the pipe network. The MicroGPIPER system and methods of collecting data for system input are detailed in the *MicroGPIPER Implementation Guide* (USACERL TR FM-92/04). This user's manual explains the operation of the MicroGPIPER software package.

Minimum requirements to run MicroGPIPER are: an IBM-compatible personal computer with 640 kilobytes of conventional memory, MS- or PC-DOS, and a fixed disk drive with a 20-megabyte capacity.

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# MicroGPIPER USER'S MANUAL

## 1 INTRODUCTION

### Background

The total cost of corrosion at Army facilities is a significant percentage of maintenance and repair budgets. Underground steel pipelines are commonly used to collect, transport, and distribute natural gas and petroleum products. Pipe leaks and failures must be minimized in such systems to prevent property and environmental damage, and loss of valuable resources. The most common type of failure in buried pipe is caused by soil-side corrosion. When such failures occur, facility engineers must decide whether to continue repairing leaks as they occur, to install cathodic protection, or to replace failed pipe with new steel or plastic pipe.

MicroGPIPER is a tool that can assist in this decisionmaking process by helping to prioritize the allocation of limited maintenance and repair dollars for underground gas distribution networks. This computerized maintenance management system helps schedule pipes for repair, and analyzes maintenance alternatives based on predicted corrosion rates and life cycle cost analysis. MicroGPIPER also predicts corrosion rates based on soil chemistry data and other physical properties of the piping network.

MicroGPIPER provides the engineer with a data management system and procedures for practical decisionmaking to identify cost-effective maintenance and repair alternatives for underground gas piping systems. Some of its important capabilities include:

- Data storage and retrieval
- Pipe condition rating
- Flexible data reporting
- System customization
- Report output to disk file, printer, or terminal
- User interface similar to other EMS programs.

### Objective

The objectives of this user's manual are: (1) to help the user install and configure MicroGPIPER on an IBM or IBM-compatible personal computer (PC) and (2) to provide step-by-step guidance for the database entry and modification, and report-generating capabilities of MicroGPIPER.

### Approach

A pipe corrosion rate prediction methodology and a numerical corrosion status index (CSI), along with concepts for a corrosion management system, were incorporated into MicroGPIPER. This computerized system was developed to provide a user-friendly database format that combines management

concepts, corrosion prediction models, and life cycle cost analysis methods in a system that predicts corrosion rates, prioritizes pipes for repair, and analyzes various maintenance alternatives.

### **Mode of Technology Transfer**

It is anticipated that the distribution, support, and maintenance of the MicroGPIPER program will be transferred to the U.S. Army Engineering and Housing Support Center (USAEHSC), Fort Belvoir, VA.

### **The MicroGPIPER Process**

There are six steps to using MicroGPIPER:

- First, it is necessary to collect data for MicroGPIPER to process.
- Second, the collected data is entered into the MicroGPIPER database.
- Third, reports can be generated in various selected formats.
- Fourth, economic analysis reports of various replacement and repair alternatives may be generated.
- Fifth, DOS type database maintenance functions may be performed.
- Sixth, the system can be customized to meet the needs of different users.

### **Using This Manual**

The following conventions are used throughout this manual:

- In the text, user-required or entered data will be in bold print and underlined. If a return is required, a left-pointing arrow similar to that usually shown on the ENTER key will be included in the text.

### **Using MicroGPIPER**

The following conventions are used within the MicroGPIPER program:

- During data entry, pop-up screens display information about the field.
- Data not required by the system as noted in the pop-up screens need not be entered if not known.
- Use of keyboard keys is standardized among all Engineered Management Systems (EMS).

- All single key inputs, as in answering a Yes/No prompt or in response to a menu, do not require an **ENTER**. All multiple character inputs and all field entries on a full-screen edit require a concluding **ENTER**.
- Data entry field size is indicated by the size of the field highlight. Monochrome display machines may not display highlights well.
- All numeric fields will be automatically right justified by the program. All alphanumeric fields will be left justified by the program.
- Dates are in standard military format. The year is first, month second, and day last. All dates in the system must be entered this way (YYYY.MM.DD).

### **Product and Trademark Acknowledgements**

IBM is a trademark of International Business Machines, Inc., Armonk, NY.

MS-DOS is a trademark of Microsoft Corporation, Redmond, WA.

PC-DOS is a trademark of International Business Machines, Inc.

dBase III is a trademark of Ashton-Tate, Inc., Torrence, CA.

CLIPPER is a trademark of Nantucket Corporation, Los Angeles, CA.

## 2 GETTING READY TO USE MicroGPIPER

This chapter explains how to install the program onto the fixed disk drive of the computer.

### Hardware Requirements

MicroGPIPER was developed for operation on an IBM-compatible PC that runs MS-DOS or PC-DOS. A fixed disk drive is required; 20 megabytes or larger is recommended. System memory of not less than 640 kilobytes (kb) of conventional memory is required. Expanded memory will improve the program's performance. The computer should be an AT-compatible machine for best program performance. The program system will run on an XT-compatible computer, but will run slowly because of the size and sophistication of the program. A color monitor is recommended but not required.

### Setting Up the DOS Configuration

The DOS CONFIG.SYS files must be changed to include the following command lines:

```
DEVICE = ANSI.SYS  
BUFFERS = 8  
FILES = 19
```

If you do not have a CONFIG.SYS file, use a text editor to create one containing at least the above three lines. The CONFIG.SYS files must be in the ROOT directory. The ANSI.SYS file does not have to reside in the ROOT directory; however, if it does not, the ANSI.SYS must have the path specified.

After editing or creating the CONFIG.SYS file, reboot the computer by pressing (CTRL-ALT-DEL).

Ensure that 640 kilobytes of memory are installed in the system by typing the following:

```
C:>CHKDSK ↵
```

A status report of the system will be listed. The next to last line of the status display should report 655,360 total bytes of system memory.

For further information on these commands, consult your DOS manual.

### Copying MicroGPIPER Onto a Fixed Disk

When you receive the MicroGPIPER program, it will be stored on a floppy diskette. This diskette is not copy-protected, but does require the DOS DISKCOPY program and blank diskettes of the same type to make a backup. Make a backup disk before doing anything else.

**IMPORTANT:** In the installation procedure that follows:

**A:** refers to the letter designation of the floppy disk drive from which you are installing the program.

**C:** refers to the letter designation of the hard drive on which you are installing the program.

Your disk drives may or may not be designated by the letters A: and C:. If not, substitute the appropriate letters for A: and C:.

To install GPIPER on a hard disk, place the backup disk into the floppy disk drive of your computer. You will see the DOS prompt "C:>" to which you will enter the following command "A:". The DOS prompt will now read "A:>" to which you will respond "INSTGPI A: C:". Your screen should show:

```
C:> A:  
A:> INSTGPI A: C:
```

(Note: the C:> and A:> portions of the commands are DOS prompts and are not user-entered.) The "INSTGPI" program creates a directory names GPIPER on the hard disk and copies all the files needed to run to the GPIPER directory. After the "INSTGPI" program has finished, the system is ready to use. Remember to store the distribution and back-up disks in a safe place.

### **Files in the MicroGPIPER Package**

#### *Program Files*

GPIPER.EXE, GPDBA.OVL, GPECON.OVL, GPINT.OVL, GPMOD.OVL, and GPRPT.OVL.

#### *Startup Batchfile*

GOGPIPER.BAT

#### *System Database & Indices*

GS1.DGP, DATABAS.DGP, DATABAS.NGP, DATADIR.NGP, QUERY.DGP, BCC\_MP.DGP & BCC\_MP.NGP.

### 3 USING MicroGPIPER

This chapter explains how to begin MicroGPIPER and how to use the menus.

#### The MicroGPIPER Process

Now that the files have been stored on the fixed disk, you may run the program. You must run the program from the MicroGPIPER subdirectory. The following steps will start the MicroGPIPER program:

1. Access the MicroGPIPER subdirectory by typing `C:>CD \GPIPER` ↵
2. Type `C:\GPIPER>GOGPIPER` ↵

If the program does not start, verify that all procedures in Chapter 1 (Getting Ready to Use MicroGPIPER) were performed. If DOS reports "Not Enough Memory," the system operator should check the CONFIG.SYS file and the AUTOEXEC.BAT file for commands, programs, and device drivers that consume memory and make the appropriate changes as necessary.

#### Sign-On

When the program starts, the following Sign-On screen (Figure 1) appears.

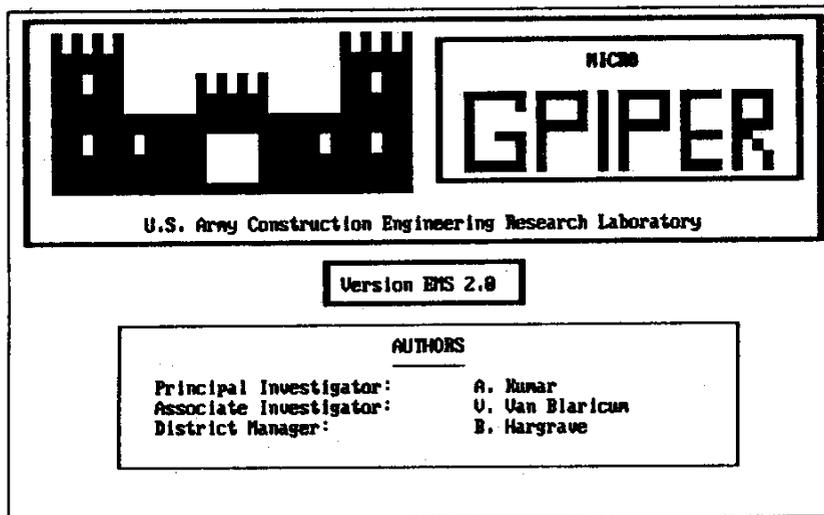


Figure 1. Sign-on screen.

The screen will display until a key is pressed. It may take a few seconds for the next screen to appear because the program is initializing while checking the keyboard for input. Next appears the Disclaimer screen (Figure 2).

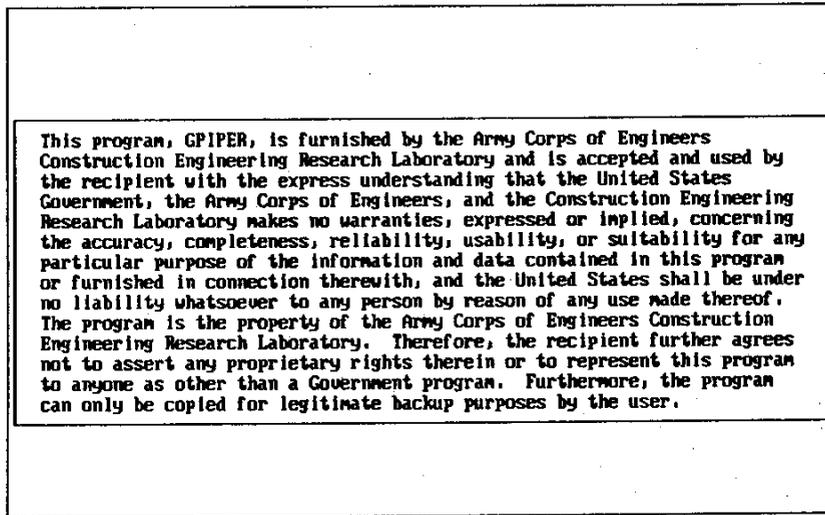


Figure 2. Disclaimer Screen.

The next screen, a Corps of Engineers LOGO screen (Figure 3), only appears if initialization is not yet complete.

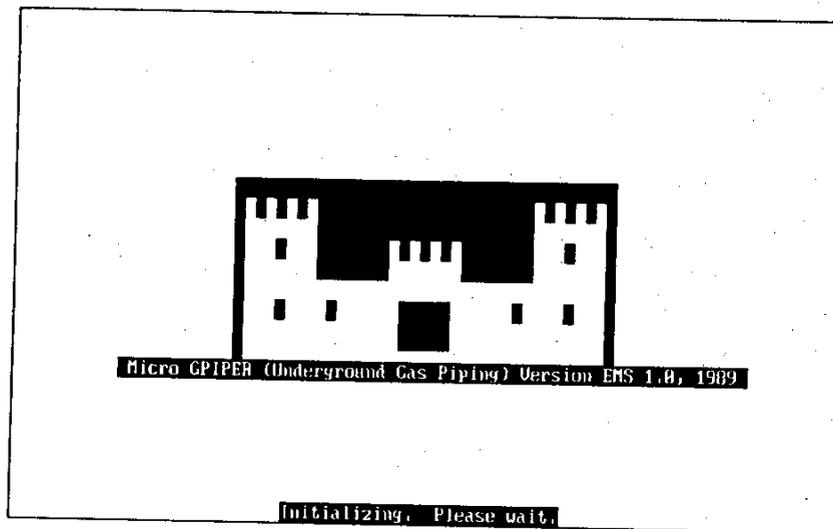


Figure 3. COE logo screen.

## MicroGPIPER Version 2.0 Note

The changes involved in the transition from MicroGPIPER Version 1.0 to 2.0 are in the calculation of the Corrosion Status Index, and thus do not affect the user interface. The screens shown in this manual reflect Version 2.0 of the MicroGPIPER program although most of them show "Version 1.0" in the program screen header.

### Error Detection During Initialization

The program can detect a variety of possible errors by automatic checking. If any of the system databases are missing, a message is printed and the program terminates. If a system index file is missing, a warning is issued and the index file is created.

The program checks available memory to determine if there is enough to run the program's memory-intensive operations. If not, a screen is displayed informing the user about possible remedies and the program requests to be terminated. The user should exit from the program and remedy the situation.

If less than a megabyte of storage space is left on the fixed disk, a warning message is displayed. The system operator should clean up the disk to increase storage space.

The currently selected database set is checked. If any of the databases of the current set are missing, a message advises the user and allows the option to terminate to DOS. If any index files are missing, you will be informed and may answer **[Y]** to have the system create them. Note that the program will not access a database without the associated index file.

If any of the passwords have not been set, a screen warns that this is the case. See "General System Information" (Chapter 8) for information on setting passwords. It is recommended that you set passwords to prevent unauthorized persons from making changes to the GPIPER databases or accidentally deleting files or records.

### Using MicroGPIPER for the First Time

When MicroGPIPER is used for the first time, it does not contain or recognize any pipe section databases. At least one database must be created or at least one existing database must be registered with the program before any other parts of the program can be used. Select "Database Administration" from the main menu, then select "Create/Register a Database" from the Database Administration menu. See "Create/Register a Database" (Chapter 7) for complete instructions on how to do this.

Finally, you must select a database to work with. During normal program operation, the database used when the program was last exited will be automatically selected when the program is restarted. However, no database is selected when the program is run for the first time. If you attempt to select MAIN MENU option [1] or [2] before a database is selected, an error message will appear. To select a database for use, see "Select a Database" in Chapter 7.

After these steps are performed, the program is ready for use. You may wish to begin entering pipe section data into the program. This is covered under "Data Entry and Modifications" (Chapter 4). If a

complete, existing database was registered with the system, you may wish to generate reports. This is covered under "Database Related Reports" (Chapter 5).

## MAIN MENU

The headers for all screens appear the same except that messages appear where MAIN MENU appears to give useful information about the operation underway. The Main Menu is shown in Figure 4.

Database Online: SDIEGO 1989.01.01	Underground Gas Piping MAIN MENU San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989 01:00:00
--	--	---

[1] Data Entry & Modifications  
[2] Database Related Reports  
[3] Data Analysis Programs  
[4] Database Administration  
[5] System Utility  
[E] Exit GPIPER.

OPTION █

Select a menu item.  
Enter the menu ID at the menu prompt or  
select a menu item with the arrow keys and press ENTER.

F1 F2 F3 F4 F5 F6 F7 F8 F9 F10

Figure 4. Opening MAIN MENU.

## Menu User Interface

The program uses a standard menu/user interface. You can select a menu item by either of two methods:

1. The first method is to press the number of the corresponding menu item. (There is no need to press **[ENTER]** after the number.)

2. An alternative method is to use the bounce bar method to select items. The bounce bar is activated by pressing any of the **cursor keys** or **space bar**. Move the highlight to the menu item desired and press **[ENTER]**. The **space bar** will move the bounce bar in a downward direction, recycling to the top from the bottom.

If you select menu items [1] or [2] before a database is selected for use, the following screen (Figure 5) is presented, informing you that a database must be selected before data may be added or modified and before reports may be generated. In order to use the program, you must first select a database. See "Select A Database" (Chapter 7). If no databases exist, see "Create A Database" (Chapter 7).

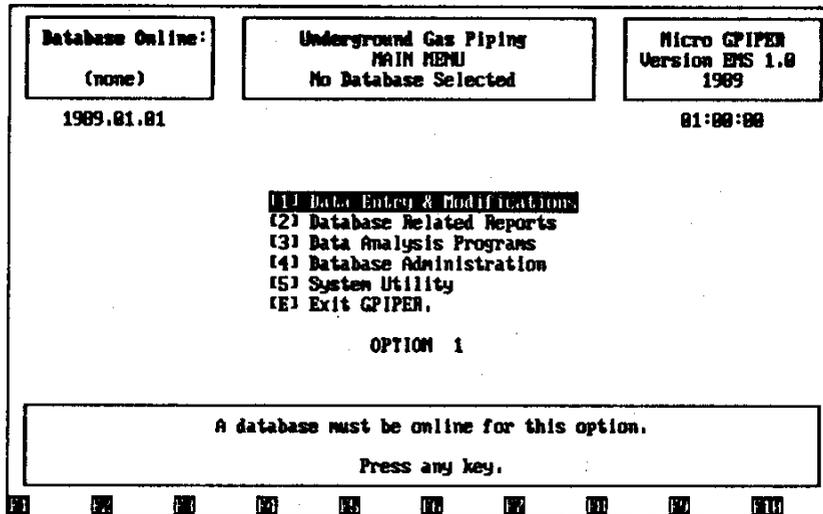


Figure 5. Database not selected error.

### Explanation of Keys

There are five types of keys available for use throughout MicroGPIPER:

- Editing Keys
- Scrolling Keys
- Cursor Movement Keys
- Function Keys
- Alternate Keys

The key descriptions are discussed below.

#### *Editing Keys*

Editing keys are used for editing input fields:

<u>Key Name</u>	<u>Symbol</u>	<u>Key</u>	<u>Description</u>
Backspace key	BkSp		Backspaces and deletes a character
Delete key	Del		Deletes character at cursor
Insert key	Ins		Toggles insert/overwrite
Escape key	Esc		Erases the input field and returns to beginning of field.

### *Scrolling Keys*

Scrolling keys are used to position the cursor on a page in a scrolling region. The following keys are used as scrolling keys:

<u>Key Name Symbol</u>	<u>Key</u>	<u>Description</u>
Page Down key	PgDn	Displays next page
Page Up key	PgUp	Displays previous page
Down Arrow key	On pad	Scrolls down through page
Up Arrow key	On pad	Scrolls up through page

### *Cursor Movement Keys*

Cursor movement keys are used to move within an input field or between input fields. The following keys are used as cursor movement keys:

<u>Key Name Symbol</u>	<u>Key</u>	<u>Description</u>
Left Arrow key	On pad	Backspace nondestructive
Right Arrow key	On pad	Forward space nondestructive
Home key	On pad	Moves cursor to start of field
End key	On pad	Moves cursor to end of field
Ctrl Left Arrow	CTRL LEFT	Moves cursor to previous word
Ctrl Right Arrow	CTRL RIGHT	Moves cursor to next word
Return key	[ENTER]	Moves cursor to next field. If the cursor was on the last field, the edit concludes
Tab key	TAB	Moves cursor to next field
Down Arrow key	On pad	Moves cursor to next field
Shift Tab key	SHIFT TAB	Moves cursor to previous field
Up Arrow key	On pad	Moves cursor to previous field
Ctrl Home key	CTRL HOME	Moves cursor to first field
Ctrl End key	CTRL END	Moves cursor to last field.

### *Function Keys*

The function keys have various usages as shown by the function key line on the screen at various times. The function key usages stay the same from operation to operation.

<u>Key Name Symbol</u>	<u>Key</u>	<u>Description</u>
Help	F1	Show context-sensitive help
Keys	F2	Show available key usage
Add	F3	
Delete	F4	
Edit	F5, F6	
Sort	F7	Sort records in System Utility editor
Compute	F8	Transfer calculator value to field

List	F9	Bring up list of values and select
Done	F10	Exit screen/Prompt

While in reports menu, the following additional key usage is applicable.

In QUERY selection [1]

Edit	F5	Selects a field's condition for inclusion in the report
Sort	F3	Adds a query sort option

In SPECIFY selection [2]

Add	F3	Adds a specify field, specify index field
Delete	F4	Deletes a specify field, specify index field

*Alternate Keys*

<u>Key Name Symbol</u>	<u>Key</u>	<u>Description</u>
Activate	ALT-I	Activates Specify's "Set Index Order"

In addition to the preceding keys, many WordStar control key combinations may be substituted. Press **[F2]** (when "Keys" is displayed in the function key row) to display a list of available keystrokes.

## 4 DATA ENTRY AND MODIFICATIONS

This chapter explains the procedures for entering data into, modifying data in, and deleting data from the database. There are three databases that contain data about an underground gas piping system. One is the pipe database which contains the pipe data. The second is the valve database containing valve data keyed to the pipe data. The third database is the repair database and it is also keyed to the pipe database.

Data Entry and Modification is accessed by selecting option **[1]** from the MAIN MENU. The DATA ENTRY & MODIFICATIONS menu (Figure 6) will appear.

Database Online: SDIEGO 1989.01.01	Underground Gas Piping DATA ENTRY & MODIFICATIONS San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989 01:00:00
--	---	---

**[1] Update Pipe Section Data**  
**[E] Exit to Main Menu.**

OPTION **[1]**

Select a menu item.  
Enter the menu ID at the menu prompt or  
select a menu item with the arrow keys and press ENTER.

F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 Done

Figure 6. DATA ENTRY & MODIFICATIONS menu.

### [1] Update Pipe Section Data

This selection provides the ability to ADD records, MODIFY (edit) records, and DELETE records from one selection. All actions are password protected, so you must know the correct passwords to perform these functions. ADD/MODIFY actions are described first. DELETE actions are described next.

#### Add/Modify

Option **[1]**, Update Pipe Section Data, is password-protected. Pressing **[1]** will display a pop-up screen asking for the system password (Figure 7). Entry of the first system password will allow the user to add or edit data only. Entry of the second system password will allow you to add, modify or delete data. Entry of an erroneous password will return you to the DATA ENTRY & MODIFICATIONS menu.

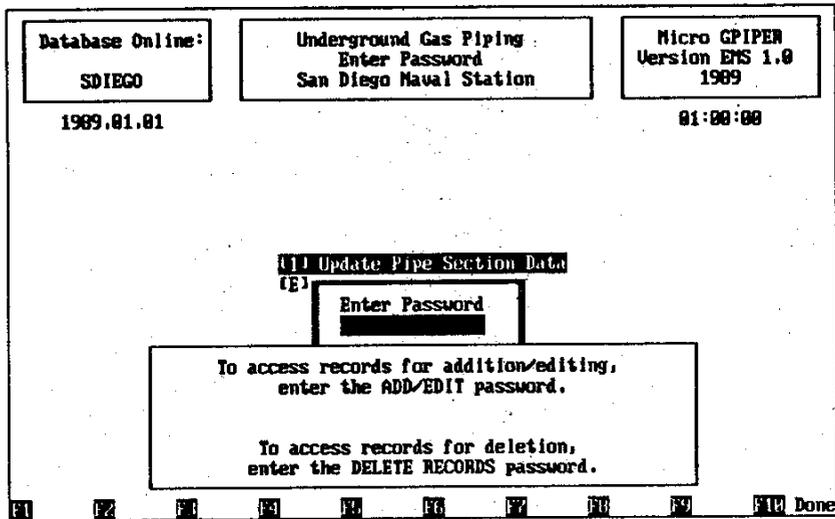


Figure 7. Data entry and modifications password pop-up screen.

When the correct password is entered, the screen requesting a PIPE ID and a SECTION ID for Modification or Purging of Pipe/Soil/Valve/Repair data will appear (Figure 8). The screen that appears next is the SELECT PIPE SECTION ID screen. This screen shows two blank fields that contain the ID used to retrieve records from the database.

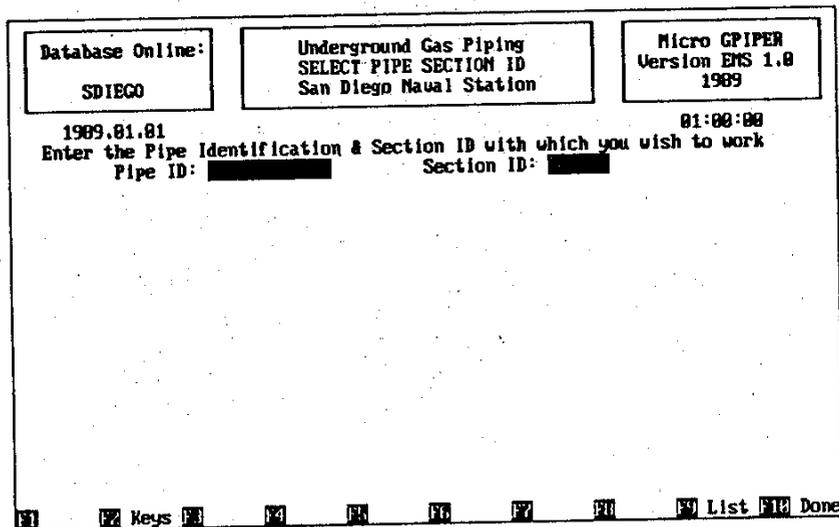


Figure 8. Pipe section ID selection.

The PIPE SECTION ID consists of two parts, the pipe ID and the SECTION ID designations. The pipe ID designation is usually assigned to a specific or length of pipe (see the *MicroGPIPER*

Implementation Guide<sup>1</sup>), e.g., AREA 5. AREA 5 could contain many different sections of pipe, each designated by a different Section ID. The first section would be called PIPE ID AREA 5 Section ID 01. Take a copy of the system pipe network and mark it with the different PIPE ID and Section ID designations. This will help make the assignment of the PIPE ID and Section ID designations logical and retrieval of records easier.

A function key menu is displayed at the bottom of the screen. Three function keys are available for use.

Pressing [F2] will display a Help screen indicating the use of the Function and Editing keys.

Pressing [F9] will cause a pop-up window to appear below the ID entry fields (Figure 9). The last line of this pop-up shows the number of ID entries and the beginning and ending entry ID for the displayed page. When [F9] is pressed again, the bounce bar appears and you may move the bounce bar to highlight the IDs. After highlighting the desired ID, you may press [ENTER] to select it. Press [F10] to return to typing into the entry fields.

Pressing [F10] before invoking or after returning from the pop-up window will exit from the screen without selecting an ID.

Database Online: SDIEGO	Underground Gas Piping SELECT PIPE SECTION ID San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
1989.01.01		01:00:00
Enter the Pipe Identification & Section ID with which you wish to work		
Pipe ID: <input type="text"/>	Section ID: <input type="text"/>	
Pipe Section Identifications		
AREA 5 01	AREA 5 13	
AREA 5 02	AREA 5 14	
AREA 5 03	AREA 5 15	
AREA 5 04	AREA 5 16	
AREA 5 05	AREA 5 17	
AREA 5 06	AREA 5 18	
AREA 5 07	AREA 5 19	
AREA 5 08		
AREA 5 09		
AREA 5 10		
AREA 5 11		
AREA 5 12		
Entries 1 to 19 of 19		
[F1]	[F2] Keys [F3]	[F4] [F5] [F6] [F7] [F8] [F9] Select [F10] Done

Figure 9. Pipe section ID selection with pop-up list.

Figure 10 shows the [F2] key usage help screen.

<sup>1</sup> Richard C. Guglomo, Vicki L. Van Blaricum, C. David Page, Jr., and Ashok Kumar, *MicroGPIPER Implementation Guide*, Technical Report (TR) FM 92/04 (U.S. Army Construction Engineering Research Laboratory [USACERL], July 1992).



If the pipe section already exists, the UPDATE PIPE DATA MENU (Figure 12) is displayed.

Database Online: SDIEGO	Underground Gas Piping UPDATE PIPE DATA MENU San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
Pipe Identification _____ AREA 5	Building Category _____ 0	
Section Identification _____ 01	Mission Priority (1 - 9) _____ 0	
Section Length (ft.) _____ 100.00	Outside Diameter (in.) _____ 4.0000	
Pipe Use _____ GAS	Wall Thickness (in.) _____ 0.2500	
From _____ EDGE OF AREA 5 (D5)	Operating Pressure (psi) _____ 15.00	
To _____ SECTION B2 VALVE 2/4	Depth of Burial (ft.) _____ 2.00	
Pipe Material _____ BLACK STEEL	pH of Soil _____ 7.00	
Coating Material _____ TAPE/TAR	Chlorides of Soil (mg/kg) _____ 0.0	
Type of Joints _____	Sulfides of Soil (mg/kg) _____ 0.0	
Installation Name _____ US NAVY - SAN DIEGO	Resistivity of Soil (Ω-cm) _____ 10000	
Date Installed _____ 1974.01.01	Moisture of Soil (%) _____ 0.0	
Date Rehabilitated _____	Cathodic Protection (Y/N) _____ F	
<b>OPTION</b>	[1] Update PIPE/SOIL/LEAK data (above)	3
<b>[E]</b>	[2] Update VALVE data for this Pipe ID & Section ID	values
	[3] Update REPAIR data for this Pipe ID & Section ID	8
	[E] Enter a new Pipe ID & Section ID.	repairs
F1	F2	F3
F4	F5	F6
F7	F8	F9
F10	F11	Done

Figure 12. UPDATE PIPE DATA MENU.

From the UPDATE PIPE DATA MENU, you may select:

- [1] Update PIPE/SOIL/LEAK Data
- [2] Update VALVE data for this Pipe ID & Section ID
- [3] Update REPAIR data for this Pipe ID & Section ID
- [E] Enter a new Pipe ID & Section ID.

Note that the number of valves and repairs attached to the Pipe ID & Section ID chosen are listed on the right side of this menu.

[1] Update PIPE/SOIL/LEAK Data.

Typing [1] displays a screen which asks if you wish to Modify, Purge, or Quit (Figure 13). Pressing [M] allows you to proceed to the full record edit screen to modify the data. Pressing [P] allows you to purge (delete) the record. Pressing [Q] returns you to the UPDATE PIPE DATA MENU.

<b>[Q]</b>	[M] Modify,	[P] Purge,	<b>[Q] Quit</b>
------------	-------------	------------	-----------------

Figure 13. Modify, purge or quit menu.

If you choose to modify a record, the MODIFY PIPE DATA screen appears (Figure 14). If the record is new, some fields are filled in with data from a previously edited record. This only occurs after a record has been entered or previously selected, and will not happen on first entry to this screen. To eliminate some errors in computations, such as dividing by zero, some fields must be filled before this screen may be exited. This maintains the integrity of the database and ensures that database-wide computations can proceed without computational errors caused by missing data. A small window stating **REQUIRED FIELD** will be displayed adjacent to these fields.

Database Online: SDIEGO	Underground Gas Piping MODIFY PIPE DATA San Diego Naval Station	Micro GPIPEP Version EMS 1.8 1989
Pipe Identification _____ 0800.5	Building Category _____ 0	
Section Identification _____ 01	Mission Priority (1 - 9) _____ 0	
Section Length (ft.) _____ 100.00	Outside Diameter (in.) _____ 0.0000	
Pipe Use _____ GAS	Wall Thickness (in.) _____ 0.2500	
From _____ EDGE OF AREA 5 (05)	Operating Pressure (psi) _____ 15.00	
To _____ SECTION 02 VALVE 2/4	Depth of Burial (ft.) _____ 2.00	
Pipe Material _____ BLACK STEEL	pH of Soil _____ 7.00	
Coating Material _____ TAPE/TAR	Chlorides of Soil (mg/kg) _____ 0.0	
Type of Joints _____	Sulfides of Soil (mg/kg) _____ 0.0	
Installation Name _____ US NAVY - SAN DIEGO	Resistivity of Soil (Ω-cm) _____ 10000	
Date Installed _____ 1974.01.01	Moisture of Soil (%) _____ 0.0	
Date Rehabilitated _____	Cathodic Protection (Y/N) _____ F	
Date of First Leak _____ 2050.01.01	Pipe to Soil Potential _____ 0.000	
Type of First Leak _____	As-Built Records (Y/N) _____ F	
Location First Leak _____		
Comment1 _____ ORIGINAL INSTALLED 1942 PER DWG. 4412, CP FOR 5 YEARS		
Comment2 _____		
Date of Comments _____ 1984.06.01		
<input type="button" value="F1"/> <input type="button" value="F2"/> <input type="button" value="F3"/> <input type="button" value="F4"/> <input type="button" value="F5"/> <input type="button" value="F6"/> <input type="button" value="F7"/> <input type="button" value="F8"/> <input type="button" value="F9"/> <input type="button" value="F10"/> Done		

Figure 14. MODIFY PIPE DATA - full screen edit.

You may use the CURSOR MOVEMENT KEYS to move between fields. The screen has some help pop-ups that appear as fields are scanned using the cursor keys.

Tables 1 to 3 list database fields and descriptions of their contents.

**Table 1**  
**Pipe Database Field List**

Field	Description
Pipe Identification	This field contains the Pipe Identification
Section Identification	This field contains the Section Identification
Section Length (ft)	The length of the Pipe Section in feet*
Pipe Use	A phrase descriptive of the pipe contents
From	A phrase descriptive of the start of the Section
To	A phrase descriptive of the end of the Section
Pipe Material	A word describing the Pipe Material (CI, DI, etc.)
Coating Material†	Blank, "BARE," "NO," or "NONE" indicates NONE. Anything else is a coating.
Type of Joints	A phrase descriptive of the joint type
Installation Name	Name of installation
Date Installed†	YYYY.MM.DD
Date Rehabilitated	YYYY.MM.DD
Date of First Leak	YYYY.MM.DD (blank if no leak)
Type of First Leak	A phrase descriptive of the type of leak
Location First Leak	A phrase descriptive of the location
Building Category	Military Building Category (pop-up help on screen)
Mission Priority†	Military Mission Priority (pop-up help on screen)
Outside Diameter	Outside diameter in inches
Wall Thickness†	Wall thickness in inches
Operating Pressure†	Operating pressure in PSI
Depth of Burial	Depth of burial in feet
pH of Soil†	pH in the range 0 thru 14
Chlorides of Soil	Soil chloride concentration in mg/kg
Sulfides of Soil†	Soil sulfide concentration in mg/kg
Resistivity of Soil†	Soil resistivity in ohm-centimeters
Moisture of Soil†	Soil moisture in percentage
Cathodic Protection†	T if pipe has CP; F if it does not
Pipe-to-Soil Potential†	Measured potential at the test station (volts)
As-Built Records	T/F to indicate if as-built drawings exist
Comment1	A special comment by the user about this Pipe Section.
Comment2	Second special comment.
Date of Comment	YYYY.MM.DD

\*1 ft = 0.305 m; 1 in. = 25.4 mm; 1 psi = 6.89 kPa.

†Required field

**Table 2**

**Valve Database Field List**

---

<b>Field</b>	<b>Description</b>
Pipe Identification	(Same as in the Pipe Database, not entered on Valve screen)
Section Identification	(Same as in the Pipe Database, not entered on Valve screen)
Valve ID	Identification of the valve
Type	Type of valve
Location	Location of valve

---

**Table 3**

**Repair Database Field List**

---

<b>Field</b>	<b>Description</b>
Pipe Identification	(Same as in the Pipe Database, not entered on Repair screen)
Section Identification	(Same as in the Pipe Database, not entered on Repair screen)
Repair Date	Date repair was made
Repair ID	Identification of repair made on repair date
Cost	Cost of repair in dollars
Type	Type of repair (brief description)
Location	Location of repair

---

If the cursor is on the Building Category Code or Mission Priority field, a pop-up window (Figure 15) appears.

Database Online: SDIEGO		Underground Gas Piping MODIFY PIPE DATA San Diego Naval Station		Micro GPIPER Version EMS 1.8 1989	
Pipe Identification		AREA 5	Building Category		650
Section Identification		01	Mission Priority (1 - 9)		0
MISSION PRIORITY: (** Required **)					
Building Category Codes	Description				Mission Priority Code
110 thru 169	Operational Facility				2
170 thru 179	Training Facilities				5
210 thru 452	Technical and Industrial Facilities				6
510 thru 550	Hospital & Related Facilities				3
601 thru 690	Administrative Facilities				0
710 thru 714	Personnel Living Space (AFH)				4
720 thru 725	Personnel Living Space (OMA & OMAR)				4
730 thru 760	Morale & Recreational Facilities				7
810 thru 845	Utilities Plants and Systems				1
880 thru 890	Utilities Plants and Systems				1
900 and above	Other Facilities				9
Entries 1 to 11 of 11					
F2 Keys F4 F5 F6 F7 F8 F9 F10 Done					

Figure 15. Building category code/mission priority pop-up.

If the cursor is on the Mission Priority, the **[F9]** key will activate the SELECT highlight bar in the pop-up. The SELECT bar is active in Figure 15. The bar may be moved with the cursor keys. Pressing **[ENTER]** transfers the Mission Priority value from the pop-up into the record's field. Pressing **[F10]** returns the cursor to the data entry field without transferring a value. Note that if the cursor is on Building Category Code, the same pop-up is available and you can scroll the list; however, you cannot select Building Category Codes because the codes presented in the list are a range and not a unique value.

This pop-up is built from data contained in the Building Category Code/Mission Priority database. Edit this database through the SYSTEM UTILITY option of the MAIN MENU. (See Chapter 8.)

Pressing **[ENTER]** from the last field or pressing **[F10]** at any time in the full screen edit will invoke ACCEPT EDITED PIPE DATA screen (Figure 16). This screen allows the user one last chance to reconsider before the data is entered into the database.

There are three options at the end of data entry for a record:

1. To accept the edited record with its data for storage in the database. Press **[A]** to accept the record and store it in the database. Each field in the record will be validated. If a field is invalid, a pop-up window will state the problem, then position the cursor at the invalid field. If the PIPE SECTION ID has been altered on an existing record, the user must confirm the change with a Y/N at the prompt.

2. To return to the edit screen to change data that was entered incorrectly. Press **[M]** to go back and modify data.

3. To throw away the edits to the record, without storing the data in the database. Press [Q] to throw away the edits to the record. If this is a newly created record, it will be canceled and the program will return to the SELECT PIPE SECTION ID prompt.

Database Online: SDIEGO	Underground Gas Piping ACCEPT EDITED PIPE DATA San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
Pipe Identification _____ AREA 5	Building Category _____ 8	
Section Identification _____ 01	Mission Priority (1 - 9) _____ 8	
Section Length (ft.) _____ 100.00	Outside Diameter (in.) _____ 4.0000	
Pipe Use _____ GAS	Wall Thickness (in.) _____ 0.2500	
From _____ EDGE OF AREA 5 (D5)	Operating Pressure (psi) _____ 15.00	
To _____ SECTION 02 VALVE 2/4	Depth of Burial (ft.) _____ 2.00	
Pipe Material _____ BLACK STEEL	pH of Soil _____ 7.00	
Coating Material _____ TAPE/TAR	Chlorides of Soil (mg/kg) _____ 0.0	
Type of Joints _____	Sulfides of Soil (mg/kg) _____ 0.0	
Installation Name US NAVY - SAN DIEGO	Resistivity of Soil (Ω-cm) _____ 10000	
Date Installed _____ 1974.01.01	Moisture of Soil (%) _____ 0.0	
Date Rehabilitated _____	Cathodic Protection (Y/N) _____ F	
Date of First Leak _____ 2050.01.01	Pipe to Soil Potential _____ 0.000	
Type of First Leak _____	As-Built Records (Y/N) _____ F	
Location First Leak _____		
EDITED PIPE DATA. <input type="checkbox"/> [A] Accept, <input type="checkbox"/> [M] Modify, <input type="checkbox"/> [Q] Quit		

Figure 16. Accept EDITED PIPE DATA screen.

Options [A] and [Q] (except for a new record) will return you to the UPDATE PIPE DATA menu (Figure 17).

Database Online: SDIEGO	Underground Gas Piping UPDATE PIPE DATA MENU San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989															
Pipe Identification _____ AREA 5	Building Category _____ 8																
Section Identification _____ 02	Mission Priority (1 - 9) _____ 8																
Section Length (ft.) _____ 610.00	Outside Diameter (in.) _____ 4.0000																
Pipe Use _____ GAS	Wall Thickness (in.) _____ 0.2500																
From _____ EDGE OF AREA 5 (D5)	Operating Pressure (psi) _____ 15.00																
To _____ BLDG.89 & BLDG.3137	Depth of Burial (ft.) _____ 2.00																
Pipe Material _____ BLACK STEEL	pH of Soil _____ 7.00																
Coating Material _____ TAPE/TAR	Chlorides of Soil (mg/kg) _____ 0.0																
Type of Joints _____	Sulfides of Soil (mg/kg) _____ 0.0																
Installation Name US NAVY - SAN DIEGO	Resistivity of Soil (Ω-cm) _____ 10000																
Date Installed _____ 1974.01.01	Moisture of Soil (%) _____ 0.0																
Date Rehabilitated _____	Cathodic Protection (Y/N) _____ F																
<table border="1"> <tr> <td>OPTION</td> <td>(1) Update PIPE/SOIL/LEAK data (above)</td> <td>17</td> </tr> <tr> <td></td> <td>(2) Update VALUE data for this Pipe ID &amp; Section ID</td> <td>values</td> </tr> <tr> <td></td> <td>(3) Update REPAIR data for this Pipe ID &amp; Section ID</td> <td></td> </tr> <tr> <td>E</td> <td>DE) Enter a new Pipe ID &amp; Section ID.</td> <td>20</td> </tr> <tr> <td></td> <td></td> <td>repairs</td> </tr> </table>			OPTION	(1) Update PIPE/SOIL/LEAK data (above)	17		(2) Update VALUE data for this Pipe ID & Section ID	values		(3) Update REPAIR data for this Pipe ID & Section ID		E	DE) Enter a new Pipe ID & Section ID.	20			repairs
OPTION	(1) Update PIPE/SOIL/LEAK data (above)	17															
	(2) Update VALUE data for this Pipe ID & Section ID	values															
	(3) Update REPAIR data for this Pipe ID & Section ID																
E	DE) Enter a new Pipe ID & Section ID.	20															
		repairs															

Figure 17. UPDATE PIPE DATA MENU (accepted).

You may now select another menu function.

[2] Update VALVE Data for This Pipe ID and Section ID

Typing [2] invokes the SELECT VALVE ID screen (Figure 18).

Database Online: SDIEGO	Underground Gas Piping SELECT VALVE ID San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989	
Pipe Identification _____	AREA 5	Building Category _____	0
Section Identification _____	01	Mission Priority (1 - 9) _____	0
Section Length (ft.) _____	100.00	Outside Diameter (in.) _____	4.0000
Pipe Use _____	GAS	Wall Thickness (in.) _____	0.2500
From _____	EDGE OF AREA 5 (DS)	Operating Pressure (psi) _____	15.00
To _____	SECTION 02 VALVE 2/4	Depth of Burial (ft.) _____	2.00
Pipe Material _____	BLACK STEEL	pH of Soil _____	7.00
Coating Material _____	TAPE/TAR	Chlorides of Soil (mg/kg) _____	0.0
Type of Joints _____		Sulfides of Soil (mg/kg) _____	0.0
Installation Name _____	US NAVY - SAN DIEGO	Resistivity of Soil (Ω-cm) _____	10000
Date Installed _____	1974.01.01	Moisture of Soil (%) _____	0.0
Date Rehabilitated _____		Cathodic Protection (T/F) _____	F
Enter Valve Identification _____			
Enter a blank to exit to Edit Menu			
[F1]	[F2] Keys	[F3]	[F4] [F5] [F6] [F7] [F8] [F9] List [F10] Done

Figure 18. SELECT VALVE ID screen.

The Enter Valve Identification menu appears at the bottom of the screen. You may type in a Valve ID and press [RETURN] or press [F9] to display the Valve IDs pop-up (Figure 19). This gives a list of the valve records that currently exist for the selected pipe section. Pressing [F9] again will actuate the bounce bar selector in the Valve IDs pop-up. Move to the Valve ID desired using the cursor keys, and press [ENTER] to select this record.

Database Online: SDIEGO	Underground Gas Piping SELECT VALVE ID San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989	
Pipe Identification _____	AREA 5	Building Category _____	0
Section Identification _____	02	Mission Priority (1 - 9) _____	0
Section Length (ft.) _____	610.00	Outside Diameter (in.) _____	4.0000
Pipe Use _____	GAS (DS)	Wall Thickness (in.) _____	0.2500
From _____	6.3137	Operating Pressure (psi) _____	15.00
To _____	STEEL	Depth of Burial (ft.) _____	2.00
Pipe Material _____	STEEL	pH of Soil _____	7.00
Coating Material _____		Chlorides of Soil (mg/kg) _____	0.0
Type of Joints _____		Sulfides of Soil (mg/kg) _____	0.0
Installation Name _____	DIEGO	Resistivity of Soil (Ω-cm) _____	10000
Date Installed _____	1981.01.01	Moisture of Soil (%) _____	0.0
Date Rehabilitated _____		Cathodic Protection (T/F) _____	F
Value IDs			
BU104			
BU105			
BU107			
BU108			
BU109			
BU110			
Entries	7 to 12 of 17		
Enter Valve Identification _____			
Enter a blank to exit to Edit Menu			
[F1]	[F2] Keys	[F3]	[F4] [F5] [F6] [F7] [F8] [F9] Select [F10] Done

Figure 19. SELECT VALVE ID screen with pop-up list.

If you type in a valve ID that does not exist, you will be prompted to create the record (Figure 20).

Database Online: SDIEGO	Underground Gas Piping CONFIRM NEW VALVE CREATION San Diego Naval Station	Micro GPIPE Version EMS 1.0 1989
Pipe Identification _____ AREA 5	Building Category _____ 154	
Section Identification _____ 02	Mission Priority (1 - 9) _____ 2	
Section Length (ft.) _____ 610.00	Outside Diameter (in.) _____ 4.0000	
Pipe Use _____ GAS	Wall Thickness (in.) _____ 0.2500	
From _____ EDGE OF AREA 5 (DG)	Operating Pressure (psi) _____ 15.00	
To _____ BLDG.09 & BLDG.3137	Depth of Burial (ft.) _____ 2.00	
Pipe Material _____ BLACK STEEL	pH of Soil _____ 7.00	
Coating Material _____ TAPE/TAR	Chlorides of Soil (ng/kg) _____ 0.0	
Type of Joints _____	Sulfides of Soil (ng/kg) _____ 0.0	
Installation Name US NAVY - SAN DIEGO	Resistivity of Soil (Ω-cm) _____ 10000	
Date Installed _____ 1974.01.01	Moisture of Soil (%) _____ 0.0	
Date Rehabilitated _____	Cathodic Protection (Y/N) _____ F	
Value PV103 does not exist.		
Create it? (Y/N)		
<input checked="" type="checkbox"/>		

Figure 20. Prompt to create new valve record.

If the ID exists, the record is displayed to the right of the ID screen. You are presented with a menu asking whether to Modify, Purge, or Quit this record (Figure 21).

Database Online: SDIEGO	Underground Gas Piping UPDATE VALVE DATA MENU San Diego Naval Station	Micro GPIPE Version EMS 1.0 1989
Pipe Identification _____ AREA 5	Building Category _____ 0	
Section Identification _____ 02	Mission Priority (1 - 9) _____ 0	
Section Length (ft.) _____ 610.00	Outside Diameter (in.) _____ 4.0000	
Pipe Use _____ GAS	Wall Thickness (in.) _____ 0.2500	
From _____ EDGE OF AREA 5 (DG)	Operating Pressure (psi) _____ 15.00	
To _____ BLDG.09 & BLDG.3137	Depth of Burial (ft.) _____ 2.00	
Pipe Material _____ BLACK STEEL	pH of Soil _____ 7.00	
Coating Material _____ TAPE/TAR	Chlorides of Soil (ng/kg) _____ 0.0	
Type of Joints _____	Sulfides of Soil (ng/kg) _____ 0.0	
Installation Name US NAVY - SAN DIEGO	Resistivity of Soil (Ω-cm) _____ 10000	
Date Installed _____ 1974.01.01	Moisture of Soil (%) _____ 0.0	
Date Rehabilitated _____	Cathodic Protection (Y/N) _____ F	
Value I.D. _____ BU105		
Type of Value _____		
Location of Value _____		
<input checked="" type="checkbox"/> (M) Modify, (P) Purge, <input checked="" type="checkbox"/> (Q) Quit		

Figure 21. Modify, purge, quit selection.

For Valves, the Valve Type and Location are also entered (Figure 22).

Database Online: SDIEGO	Underground Gas Piping MODIFY VALUE DATA San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
Pipe Identification _____ AREA 5	Section Identification _____ 02	Section Length (ft.) _____ 610.00
Pipe Use _____ GAS	From _____ EDGE OF AREA 5 (D5)	To _____ BLDG.09 & BLDG.3137
Pipe Material _____ BLACK STEEL	Coating Material _____ TAPE/TAR	Type of Joints _____
Installation Name US NAVY - SAN DIEGO	Date Installed _____ 1974.01.01	Date Rehabilitated _____
Building Category _____ 0	Mission Priority (1 - 9) _____ 0	Outside Diameter (in.) _____ 4.0000
Wall Thickness (in.) _____ 0.2500	Operating Pressure (psi) _____ 15.00	Depth of Burial (ft.) _____ 2.00
pH of Soil _____ 7.00	Chlorides of Soil (mg/kg) _____ 0.0	Sulfides of Soil (mg/kg) _____ 0.0
Resistivity of Soil (Ω-cm) _____ 10000	Moisture of Soil (%) _____ 0.0	Cathodic Protection (T/F) _____ F
Value I.D. _____ BU105		Type of Value _____
Location of Value _____		
<input type="checkbox"/> F1 <input type="checkbox"/> F2 Keys <input type="checkbox"/> F3 <input type="checkbox"/> F4 <input type="checkbox"/> F5 <input type="checkbox"/> F6 <input type="checkbox"/> F7 <input type="checkbox"/> F8 <input type="checkbox"/> F9 <input type="checkbox"/> F10 Done		

Figure 22. Valve data record edit.

After the data is entered, press **[F10]**. The left side of the Valve pop-up will change to the Accept, Modify, Quit function (Figure 23). Pressing **[A]** accepts the entries displayed in the record fields. Pressing **[M]** return to the fields for more editing. Pressing **[Q]** quits the record with no changes.

Database Online: SDIEGO	Underground Gas Piping ACCEPT EDITED VALUE DATA San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
Pipe Identification _____ AREA 5	Section Identification _____ 02	Section Length (ft.) _____ 610.00
Pipe Use _____ GAS	From _____ EDGE OF AREA 5 (D5)	To _____ BLDG.09 & BLDG.3137
Pipe Material _____ BLACK STEEL	Coating Material _____ TAPE/TAR	Type of Joints _____
Installation Name US NAVY - SAN DIEGO	Date Installed _____ 1974.01.01	Date Rehabilitated _____
Building Category _____ 0	Mission Priority (1 - 9) _____ 0	Outside Diameter (in.) _____ 4.0000
Wall Thickness (in.) _____ 0.2500	Operating Pressure (psi) _____ 15.00	Depth of Burial (ft.) _____ 2.00
pH of Soil _____ 7.00	Chlorides of Soil (mg/kg) _____ 0.0	Sulfides of Soil (mg/kg) _____ 0.0
Resistivity of Soil (Ω-cm) _____ 10000	Moisture of Soil (%) _____ 0.0	Cathodic Protection (T/F) _____ F
<input checked="" type="checkbox"/> [A] Accept, [M] Modify, [Q] Quit		Value I.D. _____ BU105
		Type of Value _____
		Location of Value _____
<input type="checkbox"/> F1 <input type="checkbox"/> F2 <input type="checkbox"/> F3 <input type="checkbox"/> F4 <input type="checkbox"/> F5 <input type="checkbox"/> F6 <input type="checkbox"/> F7 <input type="checkbox"/> F8 <input type="checkbox"/> F9 <input type="checkbox"/> F10		

Figure 23. Accept, modify, quit, valve data.

After entering valve data, the UPDATE PIPE DATA menu is again displayed (Figure 24).

Database Online: SDIEGO	Underground Gas Piping UPDATE PIPE DATA MENU San Diego Naval Station	Micro GPIPE Version EMS 1.0 1989
Pipe Identification _____ AREA 5	Building Category _____ 8	
Section Identification _____ 82	Mission Priority (1 - 9) _____ 8	
Section Length (ft.) _____ 618.00	Outside Diameter (in.) _____ 4.0000	
Pipe Use _____ GAS	Wall Thickness (in.) _____ 0.2500	
From _____ EDGE OF AREA 5 (DS)	Operating Pressure (psi) _____ 15.00	
To _____ BLDG.89 & BLDG.3137	Depth of Burial (ft.) _____ 2.00	
Pipe Material _____ BLACK STEEL	pH of Soil _____ 7.00	
Coating Material _____ TAPE/TAR	Chlorides of Soil (mg/kg) _____ 8.0	
Type of Joints _____	Sulfides of Soil (mg/kg) _____ 8.0	
Installation Name US NAVY - SAN DIEGO	Resistivity of Soil (Ω-cm) _____ 10000	
Date Installed _____ 1974.01.01	Moisture of Soil (%) _____ 8.0	
Date Rehabilitated _____	Cathodic Protection (T/F) _____ F	
OPTION	{1} Update PIPE/SOIL/LEAK data (above)	17 values
E	{2} Update VALVE data for this Pipe ID & Section ID	20 repairs
	{3} Update REPAIR data for this Pipe ID & Section ID	
	{4} Enter a new Pipe ID & Section ID.	

Done

Figure 24. UPDATE PIPE DATA MENU.

[3] Update REPAIR Data for This Pipe ID & Section ID

Entering [3] invokes the SELECT REPAIR ID screen (Figure 25). The Enter Date of Repair menu appears at the bottom of the screen. You may type in a Date and Repair ID and press **[ENTER]**.

Database Online: SDIEGO	Underground Gas Piping SELECT REPAIR ID San Diego Naval Station	Micro GPIPE Version EMS 1.0 1989
Pipe Identification _____ AREA 5	Building Category _____ 8	
Section Identification _____ 82	Mission Priority (1 - 9) _____ 8	
Section Length (ft.) _____ 618.00	Outside Diameter (in.) _____ 4.0000	
Pipe Use _____ GAS	Wall Thickness (in.) _____ 0.2500	
From _____ EDGE OF AREA 5 (DS)	Operating Pressure (psi) _____ 15.00	
To _____ BLDG.89 & BLDG.3137	Depth of Burial (ft.) _____ 2.00	
Pipe Material _____ BLACK STEEL	pH of Soil _____ 7.00	
Coating Material _____ TAPE/TAR	Chlorides of Soil (mg/kg) _____ 8.0	
Type of Joints _____	Sulfides of Soil (mg/kg) _____ 8.0	
Installation Name US NAVY - SAN DIEGO	Resistivity of Soil (Ω-cm) _____ 10000	
Date Installed _____ 1974.01.01	Moisture of Soil (%) _____ 8.0	
Date Rehabilitated _____	Cathodic Protection (T/F) _____ F	
Enter Date of Repair: Enter No.:		
_____	_____	
yyyy.mm.dd		
Enter a blank to exit to Edit Menu		

List  Done

Figure 25. SELECT REPAIR ID screen.

Pressing [F9] while in the SELECT REPAIR ID (Figure 26) menu will display the Repair IDs pop-up. Pressing [F9] again will actuate the bounce bar selector in the Repair IDs pop-up. Move to the Repair ID desired using the cursor keys and press [ENTER] to select the highlighted record.

Database Online: SDIEGO	Underground Gas Piping SELECT REPAIR ID San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
Pipe Identification _____ AREA 5	Building Category _____ 0	Mission Priority (1 - 9) _____ 0
Section Identification _____ 82	Outside Diameter (in.) _____ 4.0000	Wall Thickness (in.) _____ 0.2500
Section Length (ft.) _____ 618.00	Operating Pressure (psi) _____ 15.00	Depth of Burial (ft.) _____ 2.00
Pipe Use _____ GAS	pH of Soil _____ 7.00	Chlorides of Soil (mg/kg) _____ 0.0
From _____ EDGE OF AREA 5 (D5)	Sulfides of Soil (mg/kg) _____ 0.0	Resistivity of Soil (Ω-cm) _____ 10000
To _____ BLDG.09 & BLDG.3137	Moisture of Soil (%) _____ 0.0	Cathodic Protection (T/F) _____ F
Pipe Material _____ BLACK STEEL		
Coating Material _____ TAPE/TAR		
Type of Joints _____		
Installation Name _____ US NAVY - SAN DIEGO		
Date Installed _____ 1974.01.01		
Date Rehabilitated _____		

Repair IDs	
Date	ID #
1974.01.01	1
1980.01.01	4
1982.02.02	1
1982.02.02	2
Entries	1 to 4 of 20

Enter Date of Repair: _____	Enter No.: _____
_____	_____
_____	_____
Enter a blank to exit to Edit Menu	

Figure 26. SELECT REPAIR ID screen with pop-up list.

If you enter an ID that does not exist, you are prompted to create the record (Figure 27).

Database Online: SDIEGO	Underground Gas Piping CONFIRM NEW REPAIR CREATION San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
Pipe Identification _____ AREA 5	Building Category _____ 154	Mission Priority (1 - 9) _____ 2
Section Identification _____ 82	Outside Diameter (in.) _____ 4.0000	Wall Thickness (in.) _____ 0.2500
Section Length (ft.) _____ 618.00	Operating Pressure (psi) _____ 15.00	Depth of Burial (ft.) _____ 2.00
Pipe Use _____ GAS	pH of Soil _____ 7.00	Chlorides of Soil (mg/kg) _____ 0.0
From _____ EDGE OF AREA 5 (D5)	Sulfides of Soil (mg/kg) _____ 0.0	Resistivity of Soil (Ω-cm) _____ 10000
To _____ BLDG.09 & BLDG.3137	Moisture of Soil (%) _____ 0.0	Cathodic Protection (T/F) _____ F
Pipe Material _____ BLACK STEEL		
Coating Material _____ TAPE/TAR		
Type of Joints _____		
Installation Name _____ US NAVY - SAN DIEGO		
Date Installed _____ 1974.01.01		
Date Rehabilitated _____		

Repair 1980.12.12 No. 1 does not exist.
Create it? (Y/N)
N

Figure 27. Prompt to create new repair ID.

If the ID exists, the record is displayed to the right of the ID screen. You are presented with the Modify, Purge, or Quit menu for this record (Figure 28).

Database Online: SDIEGO	Underground Gas Piping UPDATE REPAIR DATA MENU San Diego Naval Station	Micro GPIPEP Version BMS 1.0 1989
Pipe Identification _____ AREA 5	Building Category _____ 8	Mission Priority (1 - 9) _____ 8
Section Identification _____ 82	Outside Diameter (in.) _____ 4.0000	Wall Thickness (in.) _____ 0.2500
Section Length (ft.) _____ 618.00	Operating Pressure (psi) _____ 15.00	Depth of Burial (ft.) _____ 2.00
Pipe Use _____ GAS	pH of Soil _____ 7.00	Chlorides of Soil (mg/kg) _____ 8.8
From _____ EDGE OF AREA 5 (DS)	Sulfides of Soil (mg/kg) _____ 8.8	Resistivity of Soil (Ω-cm) _____ 10000
To _____ BLDG.89 & BLDG.3137	Moisture of Soil (%) _____ 8.8	Cathodic Protection (Y/N) _____ F
Pipe Material _____ BLACK STEEL	Repair Date _____ 1974.01.01	Repair ID _____ 1
Coating Material _____ TAPE/TAR	Cost of Repair _____ 0.00	Type of Repair _____ REPLACED PIPE
Type of Joints _____	Location _____	
Installation Name _____ US NAVY - SAN DIEGO		
Date Installed _____ 1974.01.01		
Date Rehabilitated _____		
Q (M) Modify, (P) Purge, (R) Quit		

Figure 28. Modify, purge, quit repair data.

For REPAIRS, the Repair Date, Repair ID, Cost of Repair, Type of Repair, and Location are entered as shown in Figure 29.

Database Online: SDIEGO	Underground Gas Piping MODIFY REPAIR DATA San Diego Naval Station	Micro GPIPEP Version BMS 1.0 1989
Pipe Identification _____ AREA 5	Building Category _____ 8	Mission Priority (1 - 9) _____ 8
Section Identification _____ 82	Outside Diameter (in.) _____ 4.0000	Wall Thickness (in.) _____ 0.2500
Section Length (ft.) _____ 618.00	Operating Pressure (psi) _____ 15.00	Depth of Burial (ft.) _____ 2.00
Pipe Use _____ GAS	pH of Soil _____ 7.00	Chlorides of Soil (mg/kg) _____ 8.8
From _____ EDGE OF AREA 5 (DS)	Sulfides of Soil (mg/kg) _____ 8.8	Resistivity of Soil (Ω-cm) _____ 10000
To _____ BLDG.89 & BLDG.3137	Moisture of Soil (%) _____ 8.8	Cathodic Protection (Y/N) _____ F
Pipe Material _____ BLACK STEEL	Repair Date _____ 1974.01.01	Repair ID _____ 1
Coating Material _____ TAPE/TAR	Cost of Repair _____ 0.00	Type of Repair _____ REPLACED PIPE
Type of Joints _____	Location _____	
Installation Name _____ US NAVY - SAN DIEGO		
Date Installed _____ 1974.01.01		
Date Rehabilitated _____		

Figure 29. Repair data record edit.

After entering the data, press **[F10]**. The left side of the Repair pop-up will change to the Accept, Modify, Quit function (Figure 30). Pressing **[A]** accepts the entries displayed in the record fields, **[M]** returns to the fields for more editing, or **[Q]** quits the record with no changes.

Database Online: SDIEGO	Underground Gas Piping ACCEPT EDITED REPAIR DATA San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
Pipe Identification _____ AREA 5	Building Category _____ 0	
Section Identification _____ 02	Mission Priority (1 - 9) _____ 0	
Section Length (ft.) _____ 610.00	Outside Diameter (in.) _____ 4.0000	
Pipe Use _____ GAS	Wall Thickness (in.) _____ 0.2500	
From _____ EDGE OF AREA 5 (DS)	Operating Pressure (psi) _____ 15.00	
To _____ BLDG. 89 & BLDG. 3137	Depth of Burial (ft.) _____ 2.00	
Pipe Material _____ BLACK STEEL	pH of Soil _____ 7.00	
Coating Material _____ TAPE/TAR	Chlorides of Soil (mg/kg) _____ 0.0	
Type of Joints _____	Sulfides of Soil (mg/kg) _____ 0.0	
Installation Name US NAVY - SAN DIEGO	Resistivity of Soil (Ω-cm) _____ 10000	
Date Installed _____ 1974.01.01	Moisture of Soil (%) _____ 0.0	
Date Rehabilitated _____	Cathodic Protection (Y/N) _____ F	
[A] Accept, [M] Modify, [Q] Quit		Repair Date _____ 1974.01.01
		Repair ID _____ 1
		Cost of Repair _____ 0.00
		Type of Repair _____ REPLACED PIPE
		Location _____
F1	F2	F3
F4	F5	F6
F7	F8	F9
F10		

Figure 30. Accept, modify, quit repair data.

#### Delete Pipe Section Data

Deleting records from the selected database is performed by selecting PURGE from the MODIFY, PURGE, QUIT menu. (Figure 13)

Figures 31 and 32 show how to delete an entire section of pipe data from the database. Since this also deletes the Valve and Repair data associated with the record, two confirmations are required for this function.

Database Online: SDIEGO	Underground Gas Piping CONFIRM PIPE SECTION DELETION San Diego Naval Station	Micro GPIPE Version EMS 1.0 1989
Pipe Identification _____ AREA 5	Building Category _____ 0	
Section Identification _____ 02	Mission Priority (1 - 9) _____ 0	
Section Length (ft.) _____ 610.00	Outside Diameter (in.) _____ 4.0000	
Pipe Use _____ GAS	Wall Thickness (in.) _____ 0.2500	
From _____ EDGE OF AREA 5 (D5)	Operating Pressure (psi) _____ 15.00	
To _____ BLDG.09 & BLDG.3137	Depth of Burial (ft.) _____ 2.00	
Pipe Material _____ BLACK STEEL	pH of Soil _____ 7.00	
Coating Material _____ TAPE/TAR	Chlorides of Soil (mg/kg) _____ 0.0	
Type of Joints _____	Sulfides of Soil (mg/kg) _____ 0.0	
Installation Name US NAVY - SAN DIEGO	Resistivity of Soil (Ω-cm) _____ 10000	
Date Installed _____ 1974.01.01	Moisture of Soil (%) _____ 0.0	
Date Rehabilitated _____	Cathodic Protection (Y/N) _____ F	
Date of First Leak _____ 2010.01.01	Pipe to Soil Potential _____ 0.000	
Delete Pipe ID AREA 5 Section # 02 <input checked="" type="checkbox"/> Y (Y/N)	This option deletes the Pipe Section from the Pipe database & ALL associated Values & Repairs from the respective databases. Is this what you wish to do?	

Figure 31. First delete pipe section data confirmation.

Figure 32 shows the screen that allows the user to finally confirm deletion of the pipe section and all associated data. Answering [Y] will cause these records to be deleted.

Database Online: SDIEGO	Underground Gas Piping CONFIRM PIPE SECTION DELETION San Diego Naval Station	Micro GPIPE Version EMS 1.0 1989
Pipe Identification _____ AREA 5	Building Category _____ 0	
Section Identification _____ 02	Mission Priority (1 - 9) _____ 0	
Section Length (ft.) _____ 610.00	Outside Diameter (in.) _____ 4.0000	
Pipe Use _____ GAS	Wall Thickness (in.) _____ 0.2500	
From _____ EDGE OF AREA 5 (D5)	Operating Pressure (psi) _____ 15.00	
To _____ BLDG.09 & BLDG.3137	Depth of Burial (ft.) _____ 2.00	
Pipe Material _____ BLACK STEEL	pH of Soil _____ 7.00	
Coating Material _____ TAPE/TAR	Chlorides of Soil (mg/kg) _____ 0.0	
Type of Joints _____	Sulfides of Soil (mg/kg) _____ 0.0	
Installation Name US NAVY - SAN DIEGO	Resistivity of Soil (Ω-cm) _____ 10000	
Date Installed _____ 1974.01.01	Moisture of Soil (%) _____ 0.0	
Date Rehabilitated _____	Cathodic Protection (Y/N) _____ F	
Date of First Leak _____ 2010.01.01	Pipe to Soil Potential _____ 0.000	
Delete Pipe ID AREA 5 Section # 02 <input checked="" type="checkbox"/> Y (Y/N)	This option deletes the Pipe Section from the Pipe database & ALL associated Values & Repairs from the respective databases. Are you absolutely sure?	

Figure 32. Second delete pipe section data confirmation.

The following message (Figure 33) appears when the Pipe Section with Valves and Repairs have been deleted. The program then returns to the Pipe Section ID Selection.

Database Online: SDIEGO	Underground Gas Piping CONFIRM PIPE SECTION DELETION San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989											
Pipe Identification _____ AREA 5	Building Category _____ 0												
Section Identification _____ 02	Mission Priority (1 - 9) _____ 0												
Section Length (ft.) _____ 610.00	Outside Diameter (in.) - 4.0000												
Pipe Use _____ GAS	Wall Thickness (in.) _____ 0.2500												
From _____ EDGE OF AREA 5 (DS)	Operating Pressure (psi) _____ 15.00												
To _____ BLDG.09 & BLDG.3137	Depth of Burial (ft.) _____ 2.00												
Pipe Material _____ BLACK STEEL	pH of Soil _____ 7.00												
Coating Material _____ TAPE/TAR	Chlorides of Soil (mg/kg) _____ 0.0												
Type of Joints _____	Sulfides of Soil (mg/kg) _____ 0.0												
Installation Name US NAVY - SAN DIEGO	Resistivity of Soil (Ω-cm) _____ 10000												
Date Installed _____ 1974.01.01	Moisture of Soil (%) _____ 0.0												
Date Rehabilitated _____	Cathodic Protection (T/F) _____ F												
Date of First Leak _____ 2010.01.01	Pipe to Soil Potential _____ 0.000												
Delete Pipe ID AREA 5 Section # 02 Y (Y/N)	Pipe Section AREA 5 02 deleted. 17 valves deleted. 20 repairs deleted.												
<table border="0"> <tr> <td>F1</td><td>F2</td><td>F3</td><td>F4</td><td>F5</td><td>F6</td><td>F7</td><td>F8</td><td>F9</td><td>F10</td><td>Done</td> </tr> </table>			F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	Done
F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	Done			

Figure 33. Pipe section/valves/repairs deleted message.

Delete Valve Data

Selection of the valve record to delete may be done by entering the valve ID in the input field or by pressing the [F9] key to bring up the ID list. Pressing [F9] again will actuate the bounce bar selector in the ID pop-up (Figure 34).

Database Online: SDIEGO	Underground Gas Piping SELECT VALVE ID San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989												
Pipe Identification _____ AREA 5	Building Category _____ 0													
Section Identification _____ 01	Mission Priority (1 - 9) _____ 0													
Section Length (ft.) _____ 100.00	Outside Diameter (in.) - 4.0000													
Pipe Use _____ S (DS)	Wall Thickness (in.) _____ 0.2500													
From _____ VALVE 2/4	Operating Pressure (psi) _____ 15.00													
To _____ EEL	Depth of Burial (ft.) _____ 2.00													
Pipe Material _____ DIEGO	pH of Soil _____ 7.00													
Date Installed _____ 4.01.01	Chlorides of Soil (mg/kg) _____ 0.0													
Date Rehabilitated _____	Sulfides of Soil (mg/kg) _____ 0.0													
Date of First Leak _____	Resistivity of Soil (Ω-cm) _____ 10000													
	Moisture of Soil (%) _____ 0.0													
	Cathodic Protection (T/F) _____ F													
<table border="1"> <tr> <td colspan="2">Value IDs</td> </tr> <tr> <td>2/4</td> <td></td> </tr> <tr> <td>PU 101</td> <td></td> </tr> <tr> <td>PU 102</td> <td></td> </tr> <tr> <td>Entries 1 to 3 of 3</td> <td></td> </tr> </table>			Value IDs		2/4		PU 101		PU 102		Entries 1 to 3 of 3			
Value IDs														
2/4														
PU 101														
PU 102														
Entries 1 to 3 of 3														
<table border="1"> <tr> <td>Enter Value Identification</td> <td></td> </tr> <tr> <td>Enter a blank to exit to Edit Menu</td> <td></td> </tr> </table>			Enter Value Identification		Enter a blank to exit to Edit Menu									
Enter Value Identification														
Enter a blank to exit to Edit Menu														
<table border="0"> <tr> <td>F1</td><td>F2</td><td>Keys</td><td>F3</td><td>F4</td><td>F5</td><td>F6</td><td>F7</td><td>F8</td><td>F9</td><td>F10</td><td>Done</td> </tr> </table>			F1	F2	Keys	F3	F4	F5	F6	F7	F8	F9	F10	Done
F1	F2	Keys	F3	F4	F5	F6	F7	F8	F9	F10	Done			

Figure 34. Valve record selection for deletion.

The valve data is displayed on the right side of the screen, and an action menu is displayed on the left (Figure 35). You may delete the data by pressing [P].

Database Online: SDIEGO	Underground Gas Piping UPDATE VALUE DATA MENU San Diego Naval Station	Micro GPIPER Version EPS 1.0 1989
Pipe Identification _____ AREA 5	Building Category _____ 0	Mission Priority (1 - 9) _____ 0
Section Identification _____ 02	Outside Diameter (in.) _____ 4.0000	Wall Thickness (in.) _____ 0.2500
Section Length (ft.) _____ 610.00	Operating Pressure (psi) _____ 15.00	Depth of Burial (ft.) _____ 2.00
Pipe Use _____ GAS	pH of Soil _____ 7.00	Chlorides of Soil (mg/kg) _____ 0.0
From _____ EDGE OF AREA 5 (DS)	Sulfides of Soil (mg/kg) _____ 0.0	Resistivity of Soil (Ω-cm) _____ 10000
To _____ BLDG.09 & BLDG.3137	Moisture of Soil (%) _____ 0.0	Cathodic Protection (Y/N) _____ F
Pipe Material _____ BLACK STEEL	Value I.D. _____ BU185	Type of Valve _____
Coating Material _____ TAPE/TAR	Location of Valve _____	
Type of Joints _____		
Installation Name _____ US NAVY - SAN DIEGO		
Date Installed _____ 1974.01.01		
Date Rehabilitated _____		
<input type="checkbox"/> (M) Modify, <input type="checkbox"/> (P) Purge, <input type="checkbox"/> (Q) Quit		

Figure 35. Modify, purge or quit valve data.

Figure 36 shows the valve delete confirmation screen. Note that the valve data is displayed to allow confirmation that the correct record has been selected.

Database Online: SDIEGO	Underground Gas Piping CONFIRM VALUE DELETION San Diego Naval Station	Micro GPIPER Version EPS 1.0 1989
Pipe Identification _____ AREA 5	Building Category _____ 0	Mission Priority (1 - 9) _____ 0
Section Identification _____ 01	Outside Diameter (in.) _____ 4.0000	Wall Thickness (in.) _____ 0.2500
Section Length (ft.) _____ 100.00	Operating Pressure (psi) _____ 15.00	Depth of Burial (ft.) _____ 2.00
Pipe Use _____ GAS	pH of Soil _____ 7.00	Chlorides of Soil (mg/kg) _____ 0.0
From _____ EDGE OF AREA 5 (DS)	Sulfides of Soil (mg/kg) _____ 0.0	Resistivity of Soil (Ω-cm) _____ 10000
To _____ SECTION 02 VALVE 2/4	Moisture of Soil (%) _____ 0.0	Cathodic Protection (Y/N) _____ F
Pipe Material _____ BLACK STEEL	Value I.D. _____ PU 182	Type of Valve _____ PLUG
Coating Material _____ TAPE/TAR	Location of Valve _____	
Type of Joints _____		
Installation Name _____ US NAVY - SAN DIEGO		
Date Installed _____ 1974.01.01		
Date Rehabilitated _____		
Delete Valve PU 182 N (Y/N)		

Figure 36. Valve data delete confirmation.

A message appears on the right side of the delete menu, indicating that the valve has been deleted (Figure 37).

Database Online: SDIEGO	Underground Gas Piping CONFIRM VALVE DELETION San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
Pipe Identification _____ AREA 5	Building Category _____ 0	
Section Identification _____ 01	Mission Priority (1 - 9) _____ 0	
Section Length (ft.) _____ 100.00	Outside Diameter (in.) _____ 4.0000	
Pipe Use _____ GAS	Wall Thickness (in.) _____ 0.2500	
From _____ EDGE OF AREA 5 (DS)	Operating Pressure (psi) _____ 15.00	
To _____ SECTION 02 VALVE 2/4	Depth of Burial (ft.) _____ 2.00	
Pipe Material _____ BLACK STEEL	pH of Soil _____ 7.00	
Coating Material _____ TAPE/TAR	Chlorides of Soil (mg/kg) _____ 0.0	
Type of Joints _____	Sulfides of Soil (mg/kg) _____ 0.0	
Installation Name US NAVY - SAN DIEGO	Resistivity of Soil (Ω-cm) _____ 10000	
Date Installed _____ 1974.01.01	Moisture of Soil (%) _____ 0.0	
Date Rehabilitated _____	Cathodic Protection (T/F) _____ F	
Delete Value PU 181 Y (Y/N)	Value PU 181 deleted.	
F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 Done		

Figure 37. Valve deleted message.

#### Delete Repair Data

Deletion of repair records follows the same steps as the deletion of valve records. Select the repair record to delete and progress through confirmation and acknowledgement.

Figure 38 shows the Repair delete confirmation screen. Note that the repair data is displayed to provide assurance that the correct record has been selected.

Database Online: SDIEGO	Underground Gas Piping CONFIRM REPAIR DELETION San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
Pipe Identification _____ AREA 5	Building Category _____ 0	
Section Identification _____ 02	Mission Priority (1 - 9) _____ 0	
Section Length (ft.) _____ 610.00	Outside Diameter (in.) _____ 4.0000	
Pipe Use _____ GAS	Wall Thickness (in.) _____ 0.2500	
From _____ EDGE OF AREA 5 (DS)	Operating Pressure (psi) _____ 15.00	
To _____ BLDG.09 & BLDG.3137	Depth of Burial (ft.) _____ 2.00	
Pipe Material _____ BLACK STEEL	pH of Soil _____ 7.00	
Coating Material _____ TAPE/TAR	Chlorides of Soil (mg/kg) _____ 0.0	
Type of Joints _____	Sulfides of Soil (mg/kg) _____ 0.0	
Installation Name US NAVY - SAN DIEGO	Resistivity of Soil (Ω-cm) _____ 10000	
Date Installed _____ 1974.01.01	Moisture of Soil (%) _____ 0.0	
Date Rehabilitated _____	Cathodic Protection (T/F) _____ F	
Delete Repair 1974.01.01 No. 1 N (Y/N)	Repair Date _____ 1974.01.01 Repair ID _____ 1 Cost of Repair _____ 0.00 Type of Repair _____ REPLACED PIPE Location _____	
F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 Done		

Figure 38. Repair data delete confirmation.

A message indicates that the Repair record has been deleted (Figure 39).

Database Online: SDIEGO	Underground Gas Piping CONFIRM REPAIR DELETION San Diego Naval Station	Micro GPIPER Version EPS 1.0 1989
Pipe Identification _____ AREA 5	Building Category _____ 0	
Section Identification _____ 02	Mission Priority (1 - 9) _____ 0	
Section Length (ft.) _____ 610.00	Outside Diameter (in.) _____ 4.0000	
Pipe Use _____ GAS	Wall Thickness (in.) _____ 0.2500	
From _____ EDGE OF AREA 5 (D5)	Operating Pressure (psi) _____ 15.00	
To _____ BLDG.09 & BLDG.3137	Depth of Burial (ft.) _____ 2.00	
Pipe Material _____ BLACK STEEL	pH of Soil _____ 7.00	
Coating Material _____ TAPE/TAR	Chlorides of Soil (ng/kg) _____ 0.0	
Type of Joints _____	Sulfides of Soil (ng/kg) _____ 0.0	
Installation Name _____ US NAVY - SAN DIEGO	Resistivity of Soil (Ω-cm) _____ 10000	
Date Installed _____ 1974.01.01	Moisture of Soil (%) _____ 0.0	
Date Rehabilitated _____	Cathodic Protection (Y/N) _____ Y	
Delete Repair 1974.01.01 No. 1 Y (Y/N)		Repair 1974.01.01 No. 1 deleted.

Figure 39. Repair deleted message.

After updating pipe, valve and repair records, the program evaluates if any records have been purged. If so, these records are permanently removed from the database and the proper index files are updated (Figure 40).

Database Online: SDIEGO	Underground Gas Piping PACK GPIPER DATABASE San Diego Naval Station	Micro GPIPER Version EPS 1.0 1989		
1989.01.01		01:00:00		
Records marked for deletion have now been removed from the databases and the associated index files have been updated.				
FILES	# of records before pack	# of records after pack	START TIME	FINISH TIME
SDIEGOP	19	10	19:10:34 Elapsed: 00:00:00	19:10:34 00:00:00
SDIEGOV	30	21	19:10:34 Elapsed: 00:00:01	19:10:35 00:00:01
SDIEGON	24	4	19:10:35 Elapsed: 00:00:00	19:10:35 00:00:00
DONE. Press any key to return to Data Entry & Modifications.				

Figure 40. Reindex operation after deletion of records.

## 5 DATABASE RELATED REPORTS

Database reports are selected by pressing [2] from the Main Menu. Figure 41 shows the Database Related Reports Menu.

Database Online: SDIEGO	Underground Gas Piping DATABASE RELATED REPORTS San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989							
1989.01.01		01:00:00							
[1] Set Database Report Query [2] Data Specification Report [3] Summary Report [4] Corrosion Status Index Prediction [5] Condition Frequency Report [6] Priority Ranking Report [7] Valve Report [8] Repair Report [9] Bad Record Report [E] Exit to Main Menu									
OPTION E									
Select a menu item. Enter the menu ID at the menu prompt or select a menu item with the arrow keys and press ENTER.									
F1	F2	F3	F4	F5	F6	F7	F8	F9	F10 Done

Figure 41. DATABASE RELATED REPORTS menu.

All reports are generated in the same way. Press the number corresponding to the report you wish to print (or use the bounce bar), and the printer control pop-up screen requests information about where you wish to have the report printed.

Note that some reports use the pipe section's Corrosion Status Index (CSI) field (the CONDITION FREQUENCY report, the PRIORITY RANKING report, and if you specify the CSI field, the DATA SPECIFICATION report). If one of these reports is run, the CSI for each pipe section in the database will be calculated and the field updated. This procedure is only done the first time one of these reports is generated.

Samples of all of the reports are included in Appendix A of this manual.

### Report Printer Setup

Just before a report prints, a pop-up printer control screen (Figure 42) appears, allowing three options for printing a report, and a Quit option.

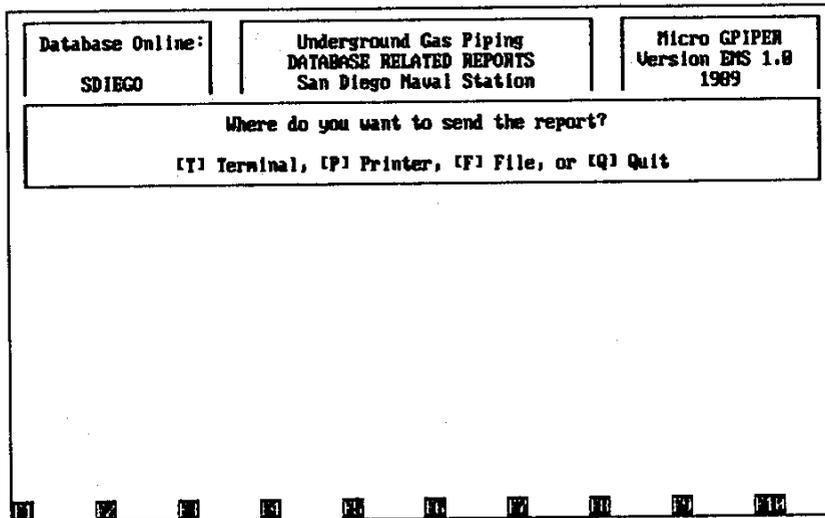


Figure 42. Printer pop-up prompt.

Selecting [T] prints the report on the system monitor. Selecting [P] prints the report on one of two system printers. Selecting [F], prints the report to a disk file. The fourth choice, [Q], allows you to return to the Database Related Reports Menu without printing. When [P] (printer) is selected, a choice of printers is presented. The desired printer may be selected in two ways, by using the cursor keys or the space bar to scroll the menu bar on the printer options, and pressing [ENTER] when the one desired is highlighted, or by pressing [1] or [2] to select the printer (Figure 43).

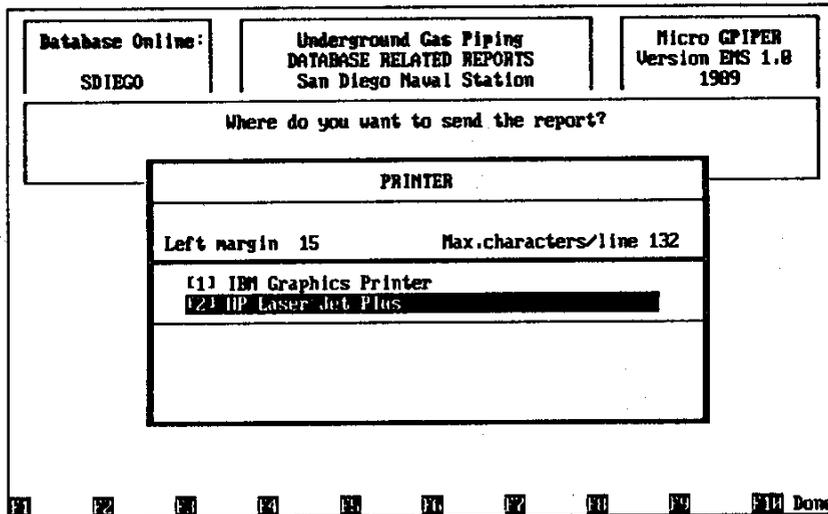


Figure 43. Select Printer selection menu.

After printer selection, you are prompted to choose paper and character format (Figure 44). One of four options of paper size and character pitch may be selected by scrolling the menu bar. Press the spacebar or the cursor keys to highlight the desired paper size. Press **[ENTER]** to select the desired option. The defaults for the printer and page format may be set in General System Information (see Chapter 8).

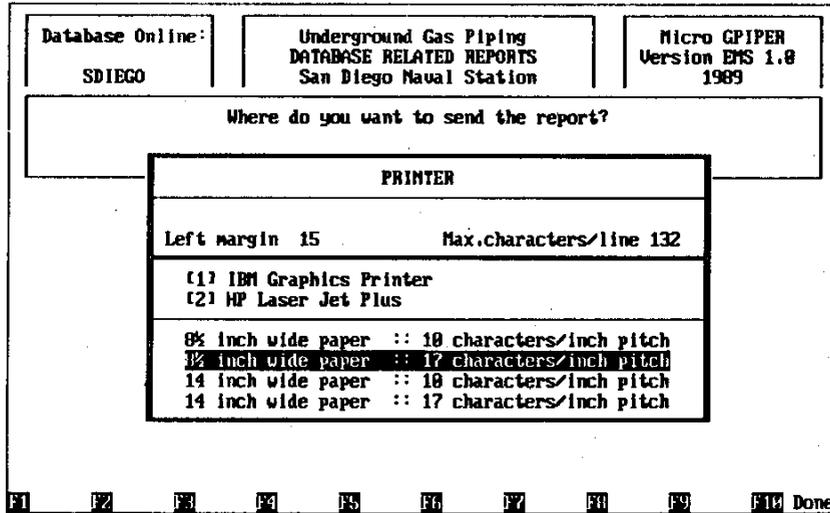


Figure 44. Select paper size, format, and character width.

Finally, the Ready Printer prompt is displayed (Figure 45). Verify that the printer is on, loaded with paper, and positioned at the top of the page. Press **[F10]** or **[ESC]** to exit from this level. Press any other key to print the report.

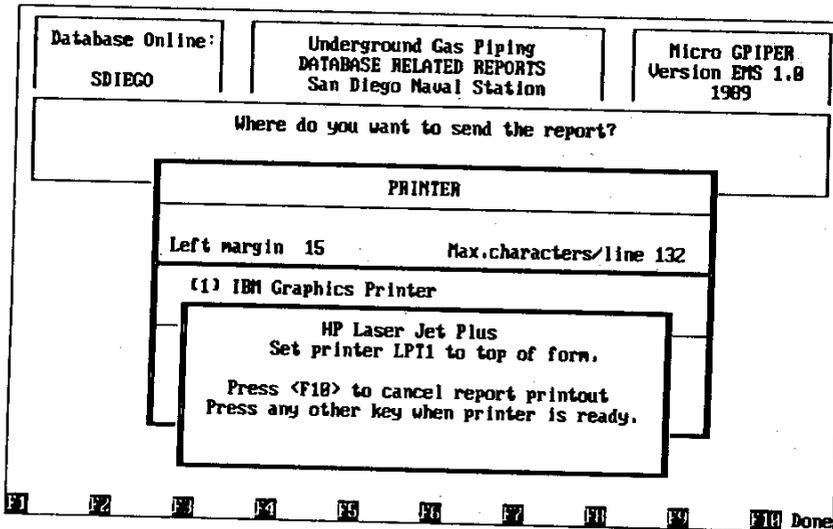


Figure 45. Ready printer prompt.

If the choice was to output the report to a disk file, you are presented with the default filename to which to print the report (Figure 46). If a different file name is desired, you may enter a DOS filename of choice (up to eight characters). The default extension is “.PRN”.

Database Online: SDIEGO	Underground Gas Piping DATABASE RELATED REPORTS San Diego Naval Station	Micro GPIPE Version EMS 1.0 1989
Where do you want to send the report?		
[T] Terminal,	FILENAME	[Q] Quit
	DISK .PRN	
<span>[F1]</span> <span>[F2] Keys</span> <span>[F3]</span> <span>[F4]</span> <span>[F5]</span> <span>[F6]</span> <span>[F7]</span> <span>[F8]</span> <span>[F9]</span> <span>[F10] Done</span>		

Figure 46. Sending a report to a file.

If the disk file selected for report output already exists, you are notified and is given the opportunity to overwrite it (Figure 47).

Database Online: SDIEGO	Underground Gas Piping DATABASE RELATED REPORTS San Diego Naval Station	Micro GPIPE Version EMS 1.0 1989
Where do you want to send the report?		
[T] Terminal,	FILENAME	[Q] Quit
	DISK.PRN	
DISK.PRN This file already exists. Do you wish to overwrite it (y/n)? <b>N</b>		
<span>[F1]</span> <span>[F2] Keys</span> <span>[F3]</span> <span>[F4]</span> <span>[F5]</span> <span>[F6]</span> <span>[F7]</span> <span>[F8]</span> <span>[F9]</span> <span>[F10] Done</span>		

Figure 47. Overwrite file prompt.

## [1] Set Database REPORT Query

This option allows you to qualify the records that appear in the Data Specification and Summary reports. For example, you may wish to generate a summary report for all pipe sections without CP that were installed before 1970. Pressing [1] from the DATABASE RELATED REPORTS menu brings up the screen shown in Figure 48. You are presented with two data boxes. The left box contains a list of fields in the database. The right box displays complete conditional information that you will set. If a field is set conditionally, then only those records meeting the conditions will be printed for the Summary and Specify Reports. This is significant because these reports access the entire database. Other reports are not affected by the conditions for the current report and will be printed regardless of the conditions set.

Database Online: SDIEGO	Underground Gas Piping SET DATABASE QUERY San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989																							
<table border="1"><thead><tr><th>Element</th><th>Criteria</th></tr></thead><tbody><tr><td>PIPE SECTION ID</td><td>All</td></tr><tr><td>LENGTH</td><td>All</td></tr><tr><td>USE</td><td>All</td></tr><tr><td>FROM</td><td>All</td></tr><tr><td>TO</td><td>All</td></tr><tr><td>PIPE MATERIAL</td><td>All</td></tr><tr><td>COATING MATERIAL</td><td>All</td></tr><tr><td>TYPE OF JOINT</td><td>All</td></tr><tr><td>INSTALLATION NAME</td><td>All</td></tr><tr><td>DATE INSTALLED</td><td>All</td></tr><tr><td>DATE REHABILITATED</td><td>All</td></tr></tbody></table>	Element	Criteria	PIPE SECTION ID	All	LENGTH	All	USE	All	FROM	All	TO	All	PIPE MATERIAL	All	COATING MATERIAL	All	TYPE OF JOINT	All	INSTALLATION NAME	All	DATE INSTALLED	All	DATE REHABILITATED	All	PIPE SECTION ID will not affect the number of records for a report.
Element	Criteria																								
PIPE SECTION ID	All																								
LENGTH	All																								
USE	All																								
FROM	All																								
TO	All																								
PIPE MATERIAL	All																								
COATING MATERIAL	All																								
TYPE OF JOINT	All																								
INSTALLATION NAME	All																								
DATE INSTALLED	All																								
DATE REHABILITATED	All																								
Entries 1 to 11 of 31																									
Position to the desired element using the scrolling keys. Select the desired action using the function keys.																									
[F2] Keys [F3] [F4] [F5] Edit [F6] [F7] [F8] [F9] [F10] Done																									

Figure 48. SET DATABASE QUERY.

These conditions remain in force from report to report. They are saved to disk, and need not be reentered the next time the program is run. So if you had previously set some field condition to exclude records, the next time a report was printed, this condition would still be active. You should set the conditions each time reports are printed.

The QUERY SORT ORDER also remains active from report to report. The sort order, however, is not saved to disk; it is abandoned when the program ends.

You may set a condition for each field. Select the field by using the cursor keys. When the field is highlighted, press [F5] (EDIT).

The information box on the right side of the screen will present you with conditional operations to perform (Figure 49). The conditions which can be set are All, List, Range, or Relational. The conditions are exclusive and may not be combined. Pressing [1] thru [4] selects the condition. All (1) selects all records regardless of value in the field. List (2) allows entering a list of eight values for record selection. The field contents must match an item in the list for the record to be printed. Range (3) accepts an

inclusive range of values for which the field will be selected. Relational (4) allows selection by first prompting for the relational operator (>, >=, <, <=), then for the target value.

Database Online: SDIEGO		Underground Gas Piping SET DATABASE QUERY San Diego Naval Station		Micro GPIPE Version EMS 1.0 1989	
Element		Criteria		Choose the criterion: <input type="checkbox"/>	
LENGTH		All		1. All 2. List 3. Range 4. Relational	
Enter the number of the criterion you wish to select.					
<input type="button" value="F1"/> <input type="button" value="F2"/> <input type="button" value="F3"/> <input type="button" value="F4"/> <input type="button" value="F5"/> <input type="button" value="F6"/> <input type="button" value="F7"/> <input type="button" value="F8"/> <input type="button" value="F9"/> <input type="button" value="F10"/> <input type="button" value="Done"/>					

Figure 49. Select query criterion.

For example, in Figure 50, the record must have a date in the range of 1970.01.01 to 1980.01.01 in the DATE INSTALLED field in order to be included in the report. Pipe sections installed before 1970.01.01 or after 1980.01.01 will be excluded.

Database Online: SDIEGO		Underground Gas Piping SET DATABASE QUERY San Diego Naval Station		Micro GPIPE Version EMS 1.0 1989	
Element		Criteria		DATE INSTALLED must be within the following range to be included in a report.	
PIPE SECTION ID		All		From: 1970.01.01	
LENGTH		All		To: 1980.01.01	
USE		All			
FROM		All			
TO		All			
PIPE MATERIAL		All			
COATING MATERIAL		All			
TYPE OF JOINT		All			
INSTALLATION NAME		All			
DATE INSTALLED		Range			
DATE REHABILITATED		All			
Entries 1 to 11 of 31					
Position to the desired element using the scrolling keys. Select the desired action using the function keys.					
<input type="button" value="F1"/> <input type="button" value="F2"/> <input type="button" value="Keys"/> <input type="button" value="F3"/> <input type="button" value="F4"/> <input type="button" value="Edit"/> <input type="button" value="F5"/> <input type="button" value="F6"/> <input type="button" value="F7"/> <input type="button" value="F8"/> <input type="button" value="F9"/> <input type="button" value="F10"/> <input type="button" value="Done"/>					

Figure 50. Range query condition.

Figure 51 shows the setting of a relational query condition. First, the relational operator is selected. Press the number of the operator.

Database Online: SDIEGO	Underground Gas Piping SET DATABASE QUERY San Diego Naval Station	Micro GPIPER Version EMS 1.8 1989
Element	Criteria	Choose an operator: <input type="text" value="0"/>
		1. < 2. <= 3. > 4. >=
DATE INSTALLED	Relational	
Enter the number of the operator you wish to select.		
<input type="button" value="F1"/> <input type="button" value="F2"/> <input type="button" value="F3"/> <input type="button" value="F4"/> <input type="button" value="F5"/> <input type="button" value="F6"/> <input type="button" value="F7"/> <input type="button" value="F8"/> <input type="button" value="F9"/> <input type="button" value="F10"/> Done		

Figure 51. Selecting relational query operator.

Next, the value is entered. The condition set in Figure 52 includes only those pipe sections installed on 1980.01.01 or earlier.

Database Online: SDIEGO	Underground Gas Piping SET DATABASE QUERY San Diego Naval Station	Micro GPIPER Version EMS 1.8 1989
Element	Criteria	DATE INSTALLED must be <= 1980.01.01 to be included in a report.
DATE INSTALLED	Relational	
Date Field		
<input type="button" value="F1"/> <input type="button" value="F2"/> Keys <input type="button" value="F3"/> <input type="button" value="F4"/> <input type="button" value="F5"/> <input type="button" value="F6"/> <input type="button" value="F7"/> <input type="button" value="F8"/> <input type="button" value="F9"/> <input type="button" value="F10"/> Done		

Figure 52. Setting a relational query condition.

After you accept the query conditions, the program proceeds to SET DATABASE QUERY's sort order selection (Figure 53). By default, reports are printed in ascending order of Pipe Section IDs. An alternate order may be set here for the Summary Report. Note that using an alternate order requires the program to generate a temporary index file which lengthens the report output time.

Database Online: SDIEGO	Underground Gas Piping SET DATABASE QUERY San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
SORT ORDER SELECTED		SORT OPTIONS AVAILABLE
		PIPE SECTION ID LENGTH USE FROM TO PIPE MATERIAL COATING MATERIAL TYPE OF JOINT INSTALLATION NAME DATE INSTALLED DATE REHABILITATED Entries 1 to 11 of 31
Position to the desired sort option using the scrolling keys. Select the sort option using the F3 key.		
<input type="checkbox"/> Keys <input type="checkbox"/> Add <input type="checkbox"/> Done		

Figure 53. SET DATABASE QUERY - sort order.

A field is selected by pressing [F3]. You must choose either ascending or descending order for that field. Enter [A] for ascending or [D] for descending. In Figure 54, ascending DATE INSTALLED has already been selected. The report will print the oldest pipe sections through the most recently installed. For those pipe sections with the same installation date, the order will be determined by the Outside Diameter.

Database Online: SDIEGO	Underground Gas Piping SET DATABASE QUERY San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
SORT ORDER SELECTED		SORT OPTIONS AVAILABLE
1. DATE INSTALLED (A)		DATE OF FIRST LEAK TYPE OF FIRST LEAK LOCATION FIRST LEAK BLDG. CAT. CODE MISSION PRIORITY OUTSIDE DIAMETER WALL THICKNESS OPERATING PRESSURE DEPTH OF BURIAL PH (SOIL) CHLORIDES (SOIL) Entries 12 to 22 of 31
Sort in (A) ascending or (D) descending order? <input type="checkbox"/>		
<input type="checkbox"/> Keys <input type="checkbox"/> Add <input type="checkbox"/> Done		

Figure 54. Building a query sort order.

## [2] Data Specification Report

Report 2 will retrieve the information of your choice from the database and display it in a columnar format. The printer pop-up selection screen appears before the report screen, since the type of output and size determines the width of the output. Respond as described at the beginning of this chapter.

A list of pipe section database fields appears. Select the fields to be printed in the order that they should appear in the report. As a field is selected, a number appears to the left of the field name. This number designates the order in which a particular field will be printed from left to right in the report. Add a field to the report by pressing **[F3]** ("Add"), **[+]** (the plus key), or **[Ins]** (Insert). Delete a field from the report by pressing **[F4]** ("Delete"), **[-]** (the minus key), or **[Del]** (Delete). The field numbers will be updated when a field is deleted.

The status area dynamically shows the current report formatting information. The current field width is listed to help you configure the field arrangement. The remaining width is shown, allowing the user to determine which other fields may be included in the report. The report left margin and maximum report width values, as set in General System Information, are also displayed. Refer to Chapter 8 for details about how to change these values.

Figure 55 shows the setup screen.

Database Online: SDIEGO	Underground Gas Piping SPECIFY REPORT San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
1989.01.01		01:00:00
1▶ PIPE SECTION ID	TYPE OF FIRST LEAK	6▶ <b>MOISTURE (SOIL)</b>
2▶ LENGTH	LOCATION FIRST LEAK	CATHODIC PROTECTION
USE	BLDG. CAT. CODE	PIPESOIL POTENTIAL
FROM	MISSION PRIORITY	AS-BUILT RECORDS
TO	OUTSIDE DIAMETER	COMMENT 1
3▶ PIPE MATERIAL	WALL THICKNESS	COMMENT 2
COATING MATERIAL	OPERATING PRESSURE	DATE OF COMMENTS
TYPE OF JOINT	DEPTH OF BURIAL	# OF VALUES
INSTALLATION NAME	pH (SOIL)	# OF REPAIRS
4▶ DATE INSTALLED	5▶ CHLORIDES (SOIL)	CURRENT CSI
DATE REHABILITATED	6▶ SULFIDES (SOIL)	
DATE OF FIRST LEAK	7▶ RESISTIVITY (SOIL)	
Current Field Width = 8 Maximum Report Width = 132 Left Margin = 15		
Remaining Width = 28 Current Report Width = 118 Spaces b/t fields = 2		
<b>[F1]</b> <b>[F2]</b> Keys <b>[F3]</b> Add <b>[F4]</b> Delete <b>[F5]</b> <b>[F6]</b> <b>[F7]</b> <b>[F8]</b> <b>[F9]</b> <b>[F10]</b> Done		

Figure 55. SPECIFY REPORT setup.

The order of records in the Specify Report is (by default) the ascending order of Pipe Section IDs. An alternate order can be set by pressing **[Alt-I]**. The report statistics are removed from the screen and a bar reading **SET INDEX ORDER** is displayed as shown in Figure 56. The selection of fields for building the index key is the same as for field inclusion in Figure 57. Like the Query Sort Order, there is a limit of five fields that one may index. Press **[F10]** to exit **SET INDEX ORDER** and return to field selection.

Database Online: SDIEGO	Underground Gas Piping SPECIFY REPORT - INDEX ORDER San Diego Naval Station	Micro GPIPE Version EMS 1.0 1989
1989.01.01		01:00:00
PIPE SECTION ID LENGTH USE FROM TO PIPE MATERIAL COATING MATERIAL TYPE OF JOINT INSTALLATION NAME DATE INSTALLED DATE REHABILITATED DATE OF FIRST LEAK	TYPE OF FIRST LEAK LOCATION FIRST LEAK BLDG. CAT. CODE MISSION PRIORITY OUTSIDE DIAMETER WALL THICKNESS OPERATING PRESSURE DEPTH OF BURIAL pH (SOIL) CHLORIDES (SOIL) SULFIDES (SOIL) RESISTIVITY (SOIL)	MOISTURE (SOIL) CATHODIC PROTECTION PIPESOIL POTENTIAL AS-BUILT RECORDS COMMENT 1 COMMENT 2 DATE OF COMMENTS # OF VALUES # OF REPAIRS CURRENT CSI
SPECIFY REPORT - SET INDEX ORDER		
<span>[F1]</span> <span>[F2]</span> <span>[F3]</span> <span>[F4]</span> <span>[F5]</span> <span>[F6]</span> <span>[F7]</span> <span>[F8]</span> <span>[F9]</span> <span>[F10]</span> <span>[F11]</span> <span>[F12]</span> <span>[F13]</span> <span>[F14]</span> <span>[F15]</span> <span>[F16]</span> <span>[F17]</span> <span>[F18]</span> <span>[F19]</span> <span>[F20]</span> <span>[F21]</span> <span>[F22]</span> <span>[F23]</span> <span>[F24]</span> <span>[F25]</span> <span>[F26]</span> <span>[F27]</span> <span>[F28]</span> <span>[F29]</span> <span>[F30]</span> <span>[F31]</span> <span>[F32]</span> <span>[F33]</span> <span>[F34]</span> <span>[F35]</span> <span>[F36]</span> <span>[F37]</span> <span>[F38]</span> <span>[F39]</span> <span>[F40]</span> <span>[F41]</span> <span>[F42]</span> <span>[F43]</span> <span>[F44]</span> <span>[F45]</span> <span>[F46]</span> <span>[F47]</span> <span>[F48]</span> <span>[F49]</span> <span>[F50]</span> <span>[F51]</span> <span>[F52]</span> <span>[F53]</span> <span>[F54]</span> <span>[F55]</span> <span>[F56]</span> <span>[F57]</span> <span>[F58]</span> <span>[F59]</span> <span>[F60]</span> <span>[F61]</span> <span>[F62]</span> <span>[F63]</span> <span>[F64]</span> <span>[F65]</span> <span>[F66]</span> <span>[F67]</span> <span>[F68]</span> <span>[F69]</span> <span>[F70]</span> <span>[F71]</span> <span>[F72]</span> <span>[F73]</span> <span>[F74]</span> <span>[F75]</span> <span>[F76]</span> <span>[F77]</span> <span>[F78]</span> <span>[F79]</span> <span>[F80]</span> <span>[F81]</span> <span>[F82]</span> <span>[F83]</span> <span>[F84]</span> <span>[F85]</span> <span>[F86]</span> <span>[F87]</span> <span>[F88]</span> <span>[F89]</span> <span>[F90]</span> <span>[F91]</span> <span>[F92]</span> <span>[F93]</span> <span>[F94]</span> <span>[F95]</span> <span>[F96]</span> <span>[F97]</span> <span>[F98]</span> <span>[F99]</span> <span>[F100]</span>		

Figure 56. Specify order - set index order.

Press **[F10]** from SPECIFY REPORT and the ACCEPT, MODIFY, QUIT prompt will be displayed. If you accept the Specify Report setup, the Printer Ready pop-up will wait for a key to be pressed before the report printing begins (Figure 57).

Database Online: SDIEGO	Underground Gas Piping SPECIFY REPORT San Diego Naval Station	Micro GPIPE Version EMS 1.0 1989
1989.01.01		01:00:00
1> PIPE SECTION ID 2> LENGTH USE FROM TO 3> PIPE MATERIAL COATING MATERIAL TYPE OF JOI INSTALLATIO 4> DATE INSTAL DATE REMABI DATE OF FIR	TYPE OF FIRST LEAK LOCATION FIRST LEAK BLDG. CAT. CODE MISSION PRIORITY OUTSIDE DIAMETER WALL THICKNESS OPERATING PRESSURE	5> MOISTURE (SOIL) CATHODIC PROTECTION PIPESOIL POTENTIAL AS-BUILT RECORDS COMMENT 1 COMMENT 2 DATE OF COMMENTS VALUES REPAIRS NT CSI
HP Laser Jet Plus Set printer LPT1 to top of form. Press <F10> to cancel report printout Press any other key when printer is ready.		
Current Field W Remaining Width		rgin = 15 b/t fields = 2
<span>[F1]</span> <span>[F2]</span> <span>[F3]</span> <span>[F4]</span> <span>[F5]</span> <span>[F6]</span> <span>[F7]</span> <span>[F8]</span> <span>[F9]</span> <span>[F10]</span> <span>[F11]</span> <span>[F12]</span> <span>[F13]</span> <span>[F14]</span> <span>[F15]</span> <span>[F16]</span> <span>[F17]</span> <span>[F18]</span> <span>[F19]</span> <span>[F20]</span> <span>[F21]</span> <span>[F22]</span> <span>[F23]</span> <span>[F24]</span> <span>[F25]</span> <span>[F26]</span> <span>[F27]</span> <span>[F28]</span> <span>[F29]</span> <span>[F30]</span> <span>[F31]</span> <span>[F32]</span> <span>[F33]</span> <span>[F34]</span> <span>[F35]</span> <span>[F36]</span> <span>[F37]</span> <span>[F38]</span> <span>[F39]</span> <span>[F40]</span> <span>[F41]</span> <span>[F42]</span> <span>[F43]</span> <span>[F44]</span> <span>[F45]</span> <span>[F46]</span> <span>[F47]</span> <span>[F48]</span> <span>[F49]</span> <span>[F50]</span> <span>[F51]</span> <span>[F52]</span> <span>[F53]</span> <span>[F54]</span> <span>[F55]</span> <span>[F56]</span> <span>[F57]</span> <span>[F58]</span> <span>[F59]</span> <span>[F60]</span> <span>[F61]</span> <span>[F62]</span> <span>[F63]</span> <span>[F64]</span> <span>[F65]</span> <span>[F66]</span> <span>[F67]</span> <span>[F68]</span> <span>[F69]</span> <span>[F70]</span> <span>[F71]</span> <span>[F72]</span> <span>[F73]</span> <span>[F74]</span> <span>[F75]</span> <span>[F76]</span> <span>[F77]</span> <span>[F78]</span> <span>[F79]</span> <span>[F80]</span> <span>[F81]</span> <span>[F82]</span> <span>[F83]</span> <span>[F84]</span> <span>[F85]</span> <span>[F86]</span> <span>[F87]</span> <span>[F88]</span> <span>[F89]</span> <span>[F90]</span> <span>[F91]</span> <span>[F92]</span> <span>[F93]</span> <span>[F94]</span> <span>[F95]</span> <span>[F96]</span> <span>[F97]</span> <span>[F98]</span> <span>[F99]</span> <span>[F100]</span>		

Figure 57. Printer ready pop-up from specify.

### **[3] Summary Report**

Report 3 will generate a summary report that lists the pipe and section IDs and their locations. The report is generated using the entire database, and Query's conditions and sort parameters. The program pops-up the printer control screen and you respond to the pop-up screen as before.

### **[4] Corrosion Status Index Prediction**

This report plots the Corrosion Status Index (CSI) versus time for a given pipe section along with the predicted year of first leak and number of predicted leaks for each subsequent year. To generate this report, enter a Pipe ID and Section ID of the pipe section for which a CSI plot is desired. A list of available sections may be displayed by pressing **[F9]**. Pressing **[F9]** again allows selection of the desired Pipe ID and Section ID using the scroll bar, the cursor keys, and **[ENTER]**. When the ID is input, the program verifies the ID and pops-up the printer control screen. Respond to the pop-up as described earlier. You will be appraised of the status of the report generation if the report does not go to the terminal.

### **[5] Condition Frequency Report**

The condition frequency report consists of a histogram-type chart which shows the number of sections in a predetermined condition range. It allows you to see the condition of the entire piping system "at a glance." The report is generated using the entire database. The program pops-up the printer control screen and you respond to the pop-up screen as before.

### **[6] Priority Ranking Report**

This report arranges pipe sections in the order in which they should be considered for repair, based on condition, mission priority, and pressure. The report is generated using the entire database. The program pops-up the printer control screen and you respond to the pop-up screen as before.

### **[7] Valve Report**

This report lists all of the valves in the valve database by pipe section. The program pops-up the printer control screen and you respond to the pop-up screen as before.

### **[8] Repair Report**

This report lists all of the repairs in the repair database by pipe section. The program pops-up the printer control screen and you respond to the pop-up screen as before.

## [9] Bad Record Report

This report lists records that have bad or missing data needed to print reports. You should print this report periodically to verify correctness of the database. If bad records are found, they should be edited to contain correct information. The program pops-up the printer control screen and you respond to the pop-up screen as described earlier. If no bad records are found, a message is displayed (Figure 58) and no report is generated.

<b>Database Online:</b> SDIEGO 1988.11.09	<b>Underground Gas Piping DATABASE RELATED REPORTS San Diego Naval Station</b>	<b>Micro GPIPER Version EMS 0.5 1988</b> 09:00:00
---	--	--

[1] Set Database Report Query  
[2] Data Specification Report  
[3] Summary Report  
[4] Corrosion Status Index Prediction  
[5] Condition Frequency Report  
[6] Priority Ranking  
[7] Valve Report  
[8] Repair Report  
**[9] Bad Record Report**  
[E] Exit to Main Menu.

OPTION 9

There are no records in the database meeting the specified criteria.  
Press a key.

F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 Done

Figure 58. Bad records found.

## 6 DATA ANALYSIS PROGRAMS

This chapter will explain the generation of reports which do not access information stored in the databases, but analyzes entered data. This currently includes a life cycle cost analysis program that can be used to analyze maintenance and repair alternatives. The Data Analysis Programs menu, (Figure 59), is selected by choosing option [3] at the MAIN MENU. The user may return to the MAIN MENU or choose to run Advanced Economics Analysis.

Database Online: SDIEGO	Underground Gas Piping DATA ANALYSIS PROGRAMS San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
1989.01.01		01:00:00
[1] Advanced Economic Report for one Alternative [2] Exit to Main Menu.		
OPTION 1		
Select a menu item. Enter the menu ID at the menu prompt or select a menu item with the arrow keys and press ENTER.		
[1]	[2]	[3] Done

Figure 59. DATA ANALYSIS PROGRAMS menu.

A sample report using the data entered in the following screens is presented in Appendix B of this manual. This report computes the cost of an alternative, and then using the length of the pipe in the alternative data, computes the Equivalent Uniform Annual Cost Per Foot (EUAC/ft). This is useful for comparing the per-foot cost of different alternatives.

The initial Advanced Economics Analysis entry screen appears next. The opening screen requires entering the indicated data. When the last screen is filled, the Accept, Modify, Quit pop-up appears (Figure 60). Pressing [A] proceeds to the activity input section. Pressing [M] allows you to return to correct incorrect data. Pressing [Q] allows you to exit this menu option and return to the Data Analysis Programs (a report is not generated).

Database Online: SDIEGO	Underground Gas Piping ADVANCED ECONOMIC ANALYSIS San Diego Naval Station	Micro GPIPER Version EPS 1.0 1989
1989.01.01		01:00:00
ECON I - Economic Analysis Program Description of Alternative INSTALL NEW GAS PIPING Section Identification SECTION 1 AREA 5 Section Length (feet) 1000 Interest Rate (percent) 8.00 Inflation Rate (percent) 4.00 Life of Alternative (years) 20 Fiscal Year to Begin 1989		
[A] Accept,                      [M] Modify,                      [Q] Quit		

Figure 60. Initial input screen with pop-up.

After entering this data, the M&R Activity input screen appears (Figure 61). Help information is displayed below the program header. The left side of the help area contains a short description of the data entries required. The Work/Cost Description is an alphanumeric field which describes the activity. The FY entry is the year. The cost is in dollars. An entry of zero for FY will bring up a prompt for the second M&R activity. A blank entry at the M&R Activity level will result in the request to print a Detail or Summary report (Figure 62).

Database Online: SDIEGO	Underground Gas Piping ADVANCED ECONOMIC ANALYSIS San Diego Naval Station	Micro GPIPER Version EPS 1.0 1989
1989.01.01		01:00:00
For each M&R activity component enter:		
- Work/Cost description?		Life of Alternative (years) 20
- Initial fiscal year?		Fiscal Year to Begin 1989
- Cost?		Interest Rate % 8.00
- Time Spacing (repeat work how often)?		Inflation Rate % 4.00
M&R Activity # 1 Work/Cost Description REMOVE ASPHALT Component 1 FY to begin work 1989 Cost 25000 Timespacing (years) 20 M&R Activity # 2 Work/Cost Description EXCAVATE TRENCH Component 1 FY to begin work 1989 Cost 50000 Timespacing (years) 20 M&R Activity # 3 Work/Cost Description INSTALL PIPE & BACKFILL Component 1 FY to begin work 1989 Cost 45000 Timespacing (years) 20 M&R Activity # 4 Work/Cost Description PAVE TRENCH Component 1 FY to begin work 1989 Cost 15000 Timespacing (years) 20 Component 2 FY to begin work 1990 Cost 15000 Timespacing (years) 20 Enter "0" for FY to conclude Component entry		

Figure 61. M&R Activity input.

An entry of [D] will print a detailed report. An entry of [S] will print a summary report. The printer pop-up, as explained in the beginning of Chapter 5, will appear next.

Database Online: SDIEGO	Underground Gas Piping ADVANCED ECONOMIC ANALYSIS San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
----------------------------	---	---

1989.01.01 01:00:00

For each M&R activity component enter:

- Work/Cost description?
- Initial fiscal year?
- Cost?
- Time Spacing (repeat work how often)?

Life of Alternative (years)	28
Fiscal Year to Begin	1989
Interest Rate %	8.00
Inflation Rate %	4.00

M&R Activity # 1 Work/Cost Description REMOVE ASPHALT  
Component 1 FY to begin work 1989 Cost 25000 Timespacing (years) 20  
M&R Activity # 2 Work/Cost Description EXCAVATE TRENCH  
Component 1 FY to begin work 1989 Cost 50000 Timespacing (years) 20  
M&R Activity # 3 Work/Cost Description INSTALL PIPE & BACKFILL  
Component 1 FY to begin work 1989 Cost 45000 Timespacing (years) 20  
M&R Activity # 4 Work/Cost Description PAVE TRENCH  
Component 1 FY to begin work 1989 Cost 15000 Timespacing (years) 20  
M&R Activity # 5 Work/Cost Description

Detail or Summary Report (D/S)

F10 Done

Figure 62. Detail or Summary Report prompt.

After printing the report, you are prompted to change the interest and/or inflation rate (Figure 63). A **[Y]** will allow changing these values and reprinting the report. An **[N]** will exit this part of the program.

Database Online: SDIEGO	Underground Gas Piping ADVANCED ECONOMIC ANALYSIS San Diego Naval Station	Micro GPIPER Version EMS 0.5 1988
----------------------------	---	---

1988.11.11 15:01:30

For each M&R activity component enter:

- Work/Cost description?
- Initial fiscal year?
- Cost?
- Time Spacing (repeat work how often)?

Life of Alternative (years)	28
Fiscal Year to Begin	1988
Interest Rate %	8.00
Inflation Rate %	5.00

M&R Activity # 1 Work/Cost Description REMOVE ASPHALT  
Component 1 FY to begin work 1988 Cost 25000 Timespacing (years) 20  
M&R Activity # 2 Work/Cost Description EXCAVATE TRENCH  
Component 1 FY to begin work 1988 Cost 50000 Timespacing (years) 20  
M&R Activity # 3 Work/Cost Description INSTALL PIPE & BACKFILL  
Component 1 FY to begin work 1988 Cost 45000 Timespacing (years) 20  
M&R Activity # 4 Work/Cost Description PAVE TRENCH  
Component 1 FY to begin work 1988 Cost 15000 Timespacing (years) 20  
M&R Activity # 5 Work/Cost Description

Repeat this Report with Different Inflation/Interest Rates? N

F10 Done

Figure 63. Repeat report prompt.

## 7 DATABASE ADMINISTRATION

Administrative functions assist in the organization of data and databases. These consist of the following procedures:

- Create a Database
- Delete a Database
- Select a Database
- Index a Database
- Copy a Database
- Change Current Database's Description.

These functions are performed by selecting option [4] at the MAIN MENU. This displays the DATABASE ADMINISTRATION menu (Figure 64).

```
Database Online: SDIEGO 1989.01.01
Underground Gas Piping DATABASE ADMINISTRATION San Diego Naval Station
Micro GPIPE Version EPS 1.0 1989 01:00:00

[1] Create a Database/Register
[2] Delete a Database/Registration
[3] Select a Database
[4] Index a Database
[5] Copy a Database
[6] Change Current Database's Description
[F9] Exit to Main Menu

OPTION [E]

Select a menu item.
Enter the menu ID at the menu prompt or
select a menu item with the arrow keys and press ENTER.

[F1] [F2] [F3] [F4] [F5] [F6] [F7] [F8] [F9] [F10] Done
```

Figure 64. DATABASE ADMINISTRATION menu.

### Entering Directory and Database Names

Selections [1] through [5] of the DATABASE ADMINISTRATION menu require the entry of a path (drive and directory) and a database name. To change the description of the currently selected database, choose option [6]. Figure 65 shows the path and database prompts and entry fields. The title of the menu option will be displayed in the program header where "(example)" is shown. Note that the [F9] description in the function key menu reads LIST and [F10] reads DONE.

Database Online: SDIEGO	Underground Gas Piping (example) San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
----------------------------	--	---

1989.01.01 01:00:00

Enter the drive/directory with the databases -> \_\_\_\_\_  
Enter the name of the database -> \_\_\_\_\_

[F1] [F2] Keys [F3] [F4] [F5] [F6] [F7] [F8] [F9] List [F10] Done

Figure 65. Directory and database prompts.

If the [F10] key is pressed at this point, regardless of the contents of the entry fields, you are returned to the DATABASE ADMINISTRATION menu. If the [F9] key is pressed, the program flashes the message "Please Wait," then supplies a list of paths containing databases registered in the program's internal tables (Figure 66). Note that the [F9] description has been changed to SELECT.

Database Online: SDIEGO	Underground Gas Piping (example) San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
----------------------------	--	---

1989.01.01 01:00:00

Enter the drive/directory with the databases -> \_\_\_\_\_  
Enter the name of the database -> \_\_\_\_\_

Database Directories		
Drive/ Directory	Description	# of databases
H:\GPIPER\SDIEGO		1

Entries 1 to 1 of 1

[F1] [F2] Keys [F3] [F4] [F5] [F6] [F7] [F8] [F9] Select [F10] Done

Figure 66. List of directories.

You may continue to type into the directory entry field, using the list as a reference. If more Database Directories exist than fit in the pop-up window, press the [PgUp] and [PgDn] keys to display a different page of the list. Pressing [F10] at this point will remove the window from the screen. With

the windowed list of directories displayed, press **[F9]** to activate the SELECT highlight bar in the list (Figure 67).

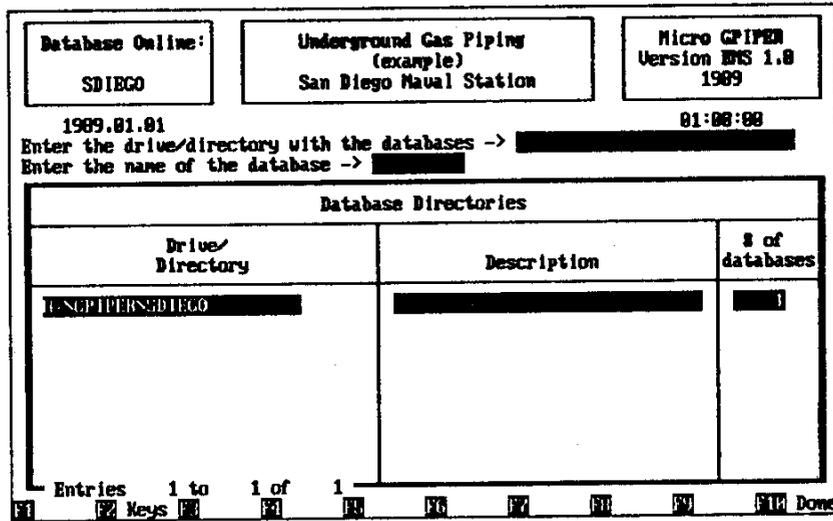


Figure 67. Directory list with selection bar.

The cursor keys and space bar can be used to move the highlight bar, and pressing **[ENTER]** will copy the highlighted path into the entry field. The path is evaluated in the same manner as a path is evaluated by DOS. If you type "SDIEGO" into the path and "C:\COE" is the current subdirectory, then the path will become "C:\COE\SDIEGO" when you press **[enter]**. DOS's "." (current directory) and ".." (parent directory) equivalencies are supported. In addition, if you press **[ENTER]** on a blank directory entry field, the program will select the current directory. The cursor will be placed on the database name entry field (Figure 68).

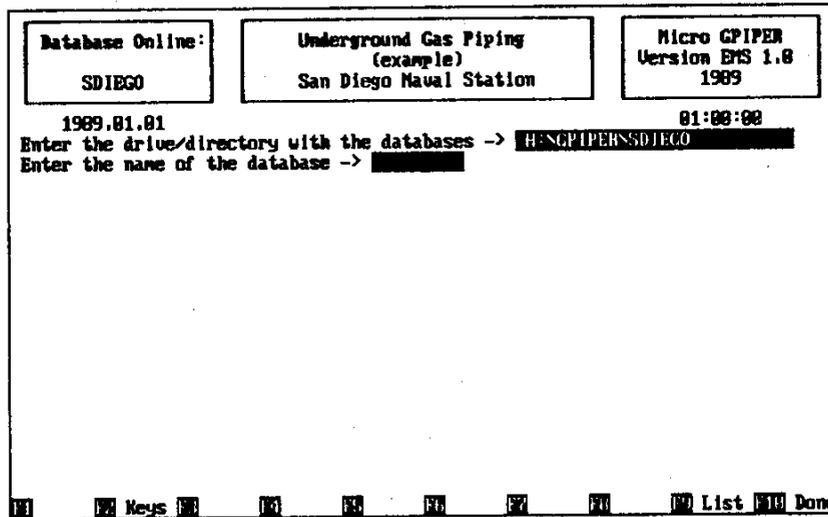


Figure 68. Database prompt – path chosen.

The program only allows the use of seven characters in the filename because the last letter is used to differentiate among the files in a group. Press **[F9]** to display a list of databases in the selected directory (Figure 69).

Database Online: SDIEGO	Underground Gas Piping (example) San Diego Naval Station	Micro GPIPEX Version EMS 1.0 1989	
1989.01.01	Free Space on Drive H: 4,898,816	01:00:00	
Enter the drive/directory with the databases -> H:\GPIPEX\SDIEGO			
Enter the name of the database -> [REDACTED]			
Databases			
Name	Description	Approx. Size	Last Access Date Time
SDIEGO	San Diego Naval Station	20070	1988.12.07 00:00:00
Entries 1 to 1 of 1			
[F1]	[F2] Keys [F3]	[F4]	[F5] [F6] [F7] [F8] [F9] [F10] Done

Figure 69. List of databases.

Pressing **[F9]** again activates the SELECT highlight bar in the database list window (Figure 70). Pressing **[ENTER]** will select the highlighted database.

Database Online: SDIEGO	Underground Gas Piping (example) San Diego Naval Station	Micro GPIPEX Version EMS 1.0 1989	
1989.01.01	Free Space on Drive H: 4,898,816	01:00:00	
Enter the drive/directory with the databases -> H:\GPIPEX\SDIEGO			
Enter the name of the database -> [REDACTED]			
Databases			
Name	Description	Approx. Size	Last Access Date Time
<b>SDIEGO</b>	<b>San Diego Naval Station</b>	<b>20070</b>	<b>1988.12.07 00:00:00</b>
Entries 1 to 1 of 1			
[F1]	[F2] Keys [F3]	[F4]	[F5] [F6] [F7] [F8] [F9] [F10] Done

Figure 70. Database list with selection bar.

If the database name is typed into the entry field or selected with the highlight bar, the directory and database entry is concluded. The program determines if the files exist and proceeds to the action

determined by the DATABASE ADMINISTRATION menu option. Note that some menu options preclude the availability of the SELECT highlight bar for entering the name of the database. For example, CREATE A DATABASE requires that the database name be typed into the entry field.

## Help Screens

Help screens are available from all screens requesting a directory or database name by pressing the [F2] function key. Pressing [F2] while in the Help Screen will return to the calling screen. The screen shown will depend upon whether the list of directories/databases is displayed and whether the SELECT bar is active. Figure 71 shows an example help screen.

<b>OPTIONS:</b> You may type into the entry field. <b>[F2]</b> List. Display a list of available choices for the current entry field. You may continue to type into the entry field.	
<b>[F10]</b> Done. No entry. Cancel.	
<b>[F11]</b> (if on last field) Concludes data entry.	
Cursor movement - b/t fields	<b>[TAB]</b> <b>Ctrl-X</b> <b>[←]</b> next field <b>[←]</b> <b>Shift-TAB</b> <b>Ctrl-E</b> previous field
Cursor movement within a field	<b>[←]</b> <b>[→]</b> one character <b>[Home]</b> beginning of field <b>[End]</b> end of field
Deletion & Insertion	<b>[Del]</b> or <b>Ctrl-C</b> character under cursor <b>[Backspace]</b> character left of cursor <b>[Esc]</b> clear input field(s) <b>Ctrl-→</b> word right of cursor <b>Ctrl-↵</b> everything right of cursor <b>[Ins]</b> or <b>Ctrl-U</b> toggles b/t Insert & Overwrite (initial)
F2 to return to selection entry.	

Figure 71. Help screen example.

### [1] Create a Database

Before any file operations may be performed, a database must be selected for use. If no databases exist, as when MicroGPIPER is first installed on a hard disk, one must be created. This is done by pressing [1] from the DATABASE ADMINISTRATION menu. The CREATE A DATABASE MENU appears (Figure 72). This menu gives you the option of creating a new database or registering an existing database with the program.

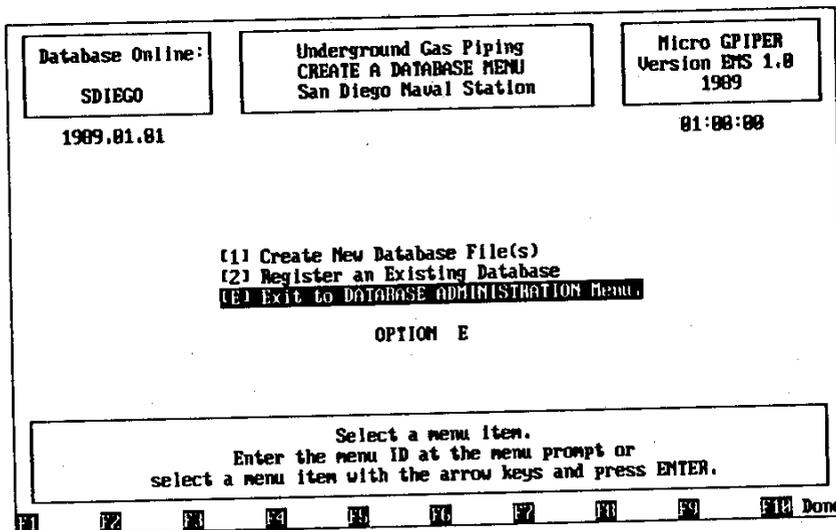


Figure 72. Create a database menu.

*Create New Database File(s)*

This suboption allows you to create a new database for use. Press **[1]** from the CREATE A DATABASE MENU.

Creating a new database requires two input fields: the DOS path where the files are to be created and the filename for the file group. If you have forgotten the subdirectories that have been made for the various files, press **[F9]** to bring up a list of the paths as shown in Figure 73. Note also that the

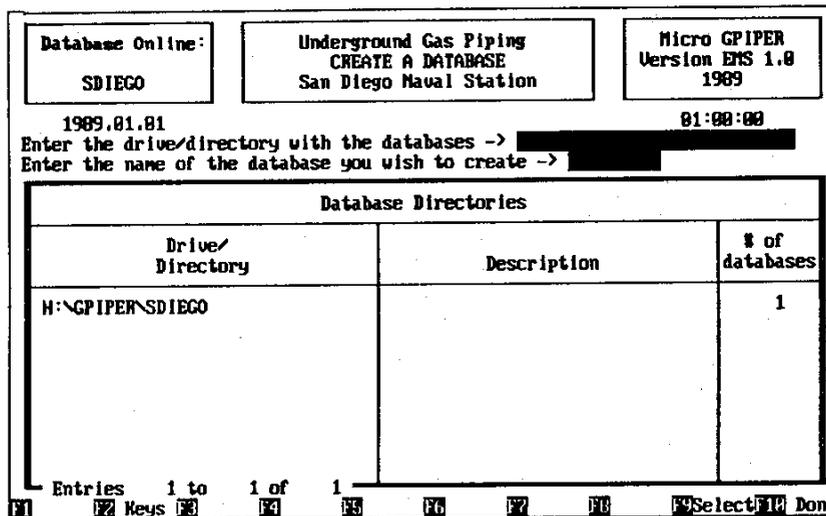


Figure 73. Creating a new database.

screen indicates how many databases are in each subdirectory. Pressing [F9] again allows you to use the cursor to highlight a path, as described at the beginning of the chapter. If [F9] is pressed, a screen appears showing the names of the databases in the selected path (Figure 74). Enter a new database name at the prompt. You will then be asked to enter a brief description of the database. The Accept/Modify/Quit screen will be displayed. If you choose [A], the program will create the database (Figure 75). If you choose [M], you will be allowed to modify the database description. If you choose [Q], you will be returned to the menu and the database will not be created.

Database Online: SDIEGO		Underground Gas Piping CREATE A DATABASE San Diego Naval Station		Micro GPIPER Version EMS 1.0 1989	
1989.01.01		Free Space on Drive H: 5,185,536		01:00:00	
Enter the drive/directory with the databases -> H:\GPIPER\SDIEGO					
Enter the name of the database you wish to create -> FTORD					
Databases					
Name	Description	Approx. Size	Last Access Date Time		
SDIEGO	San Diego Naval Station	28870	1988.12.07	00:00:00	
Entries 1 to 1 of 1					
Keys Done					

Figure 74. Display of existing database names in path.

Database Online: SDIEGO		Underground Gas Piping CREATE GPIPER DATABASES San Diego Naval Station		Micro GPIPER Version EMS 1.0 1989	
1989.01.01				01:00:00	
<p>Created PIPE database H:\GPIPER\SDIEGO\FTORDP.DCP          Created PIPE index H:\GPIPER\SDIEGO\FTORDP.NGP          Created VALUE database H:\GPIPER\SDIEGO\FTORDU.DCP          Created VALUE index H:\GPIPER\SDIEGO\FTORDU.NGP          Created REPAIR database H:\GPIPER\SDIEGO\FTORDR.DCP          Created REPAIR index H:\GPIPER\SDIEGO\FTORDR.NGP</p> <p>Do you wish to create another database (Y/N) ? N</p>					

Figure 75. File creation process.

You may enter a **[Y]** at the prompt shown in Figure 75 to create another database. Pressing **[N]** or **[ENTER]** will return to the CREATE A DATABASE MENU.

### Register an Existing Database

This option allows previously existing MicroGPIPER database files to be accessed by the program. For example, files created on a second computer or with a different version of MicroGPIPER must be registered before they can be used. Note that when a database is created as described above, it is automatically registered with the program. The files must be copied onto the hard disk at the DOS level. Upon entering this section of the program, a screen similar to the CREATE A DATABASE screen (Figure 74) will appear. You enter the path where the database resides into the first field. After entering the path and pressing **[ENTER]**, the cursor moves to the filename field. Then enter the filename and database description and the database is registered and available for use in the program.

### [2] Delete a DATABASE

This option operates similar to the Create A Database option. Select option **[2]** from the DATABASE ADMINISTRATION menu. This option requires the entry of the DELETE password. The password entry pop-up is displayed just below the option **[2]** (Figure 76).

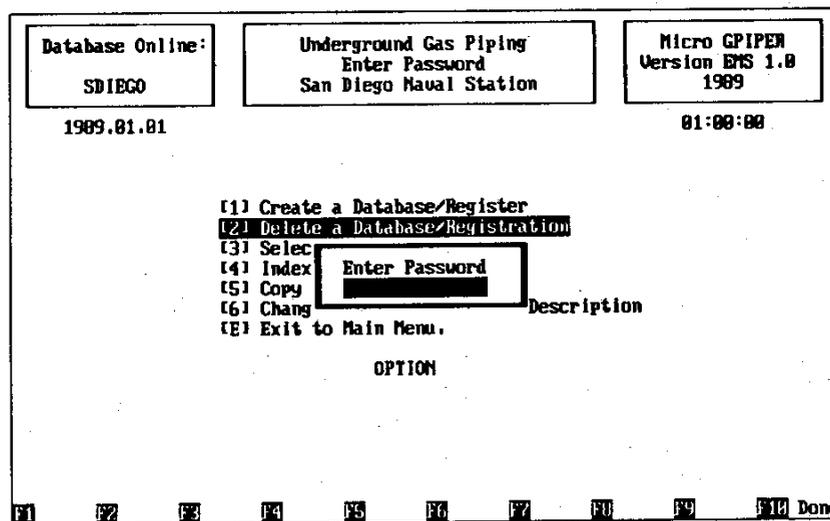


Figure 76. Password entry to delete a database.

After the correct password is entered, the DELETE A DATABASE MENU (Figure 77) will appear. There are two options available: to delete a database from the disk, or to remove the database's registration. Deletion destroys the data. (Do not use this option unless the data is no longer needed or a backup copy has been made.) The removal of a registration from the database will not allow access to the data but does not destroy the data. The data will still be stored on the hard drive, and the database may be registered with the program at any time.

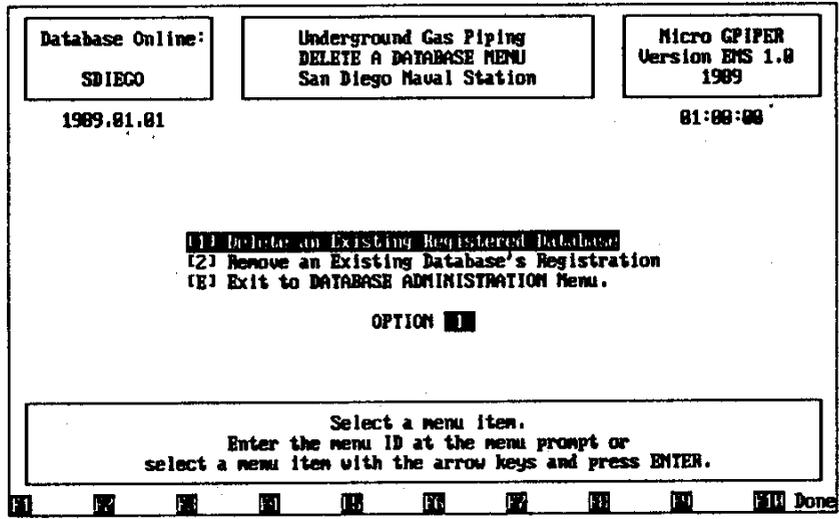


Figure 77. DELETE A DATABASE MENU.

*Delete an Existing Registered Database*

When you press [1], the program prompts for the directory and database name. Select this as described previously. Figure 78 shows the screen with the list of registered paths with the SELECT bar activated.

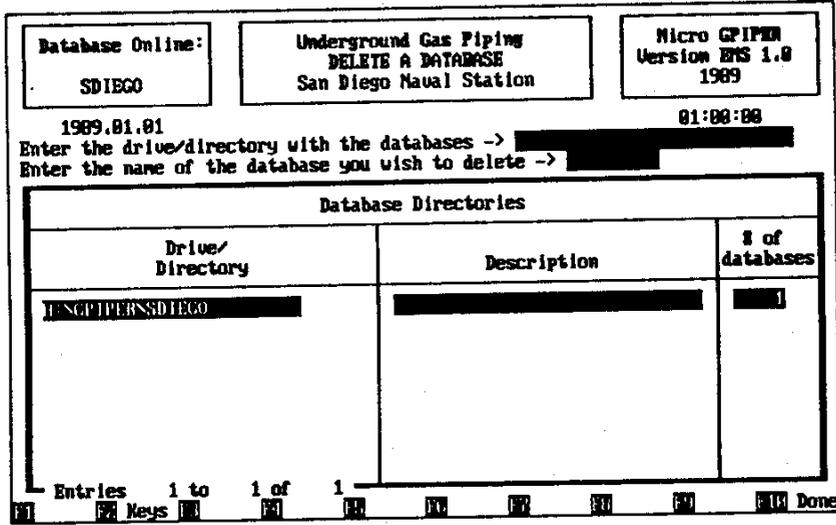


Figure 78. DELETE A DATABASE path list.

You are given two chances to abort this deletion. Figures 79 and 80 show this confirmation process. Respond **[Y]** to both prompts to delete the selected files.

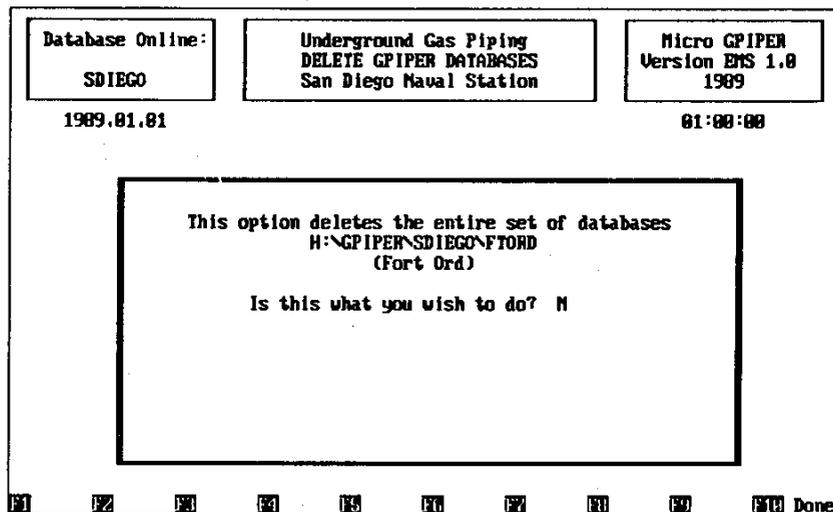


Figure 79. First confirmation to delete a database.

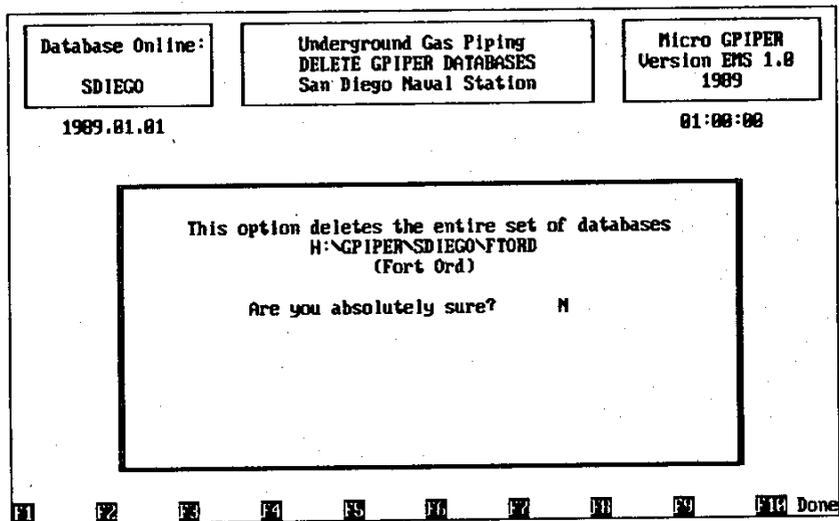


Figure 80. Second confirmation to delete a database.

Figure 81 shows the screen display as files are deleted from the disk. To delete more files, press **[Y]**. Pressing **[N]** or **[ENTER]** will return to the Delete Menu.

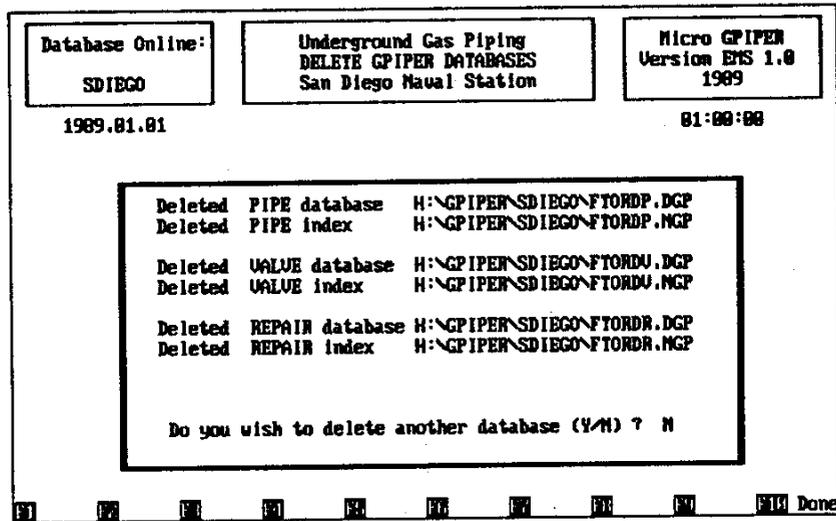


Figure 81. Deletion progress.

#### Remove an Existing Database's Registration

This option allows removing a database's listing from the program's internal tables. It does not erase the database from the disk. This option requires user confirmation (Figure 82). The database can later be registered with the program again by using the "Register an Existing Database" option of the CREATE A DATABASE menu.

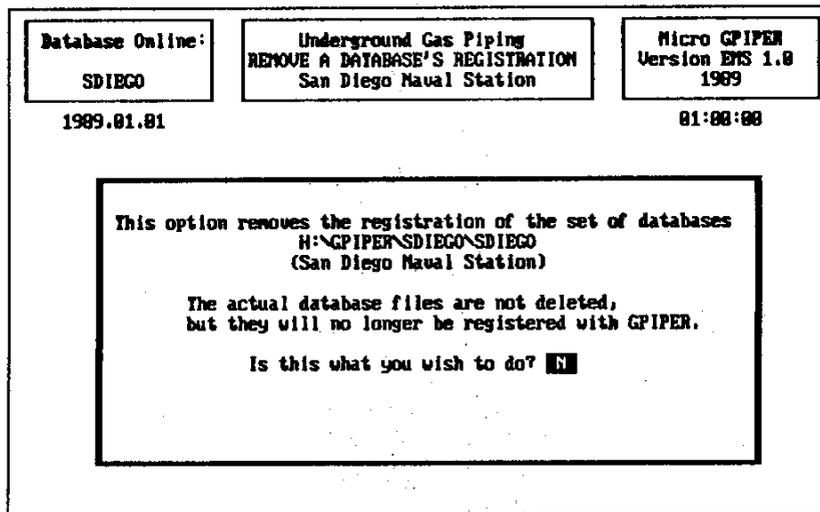


Figure 82. REMOVE A DATABASE'S REGISTRATION prompt.

[3] Select a Database

Before any file operations (such as editing data or printing reports) may be performed, a database must be selected for use. This option allows selection of the active file. Enter [3] at the DATABASE ADMINISTRATION menu. The directory and database prompts will appear; select these as described previously. Figures 83 and 84 show the directory and database windowed lists with the SELECT bar activated, as described at the beginning of the chapter.

Database Online: SDIEGO	Underground Gas Piping SELECT A DATABASE San Diego Naval Station	Micro GPIPER Version EPS 1.0 1989
----------------------------	--	---

1989.01.01 01:00:00  
 Enter the drive/directory with the databases ->  
 Enter the name of the database with which you wish to work ->

Database Directories		
Drive/Directory	Description	# of databases
H:\GPIPER\SDIEGO		2

Entries 1 to 1 of 1  
 F1 F2 Keys F3 F4 F5 F6 F7 F8 F9 F10 Done

Figure 83. SELECT A DATABASE directory list.

Database Online: SDIEGO	Underground Gas Piping SELECT A DATABASE San Diego Naval Station	Micro GPIPER Version EPS 1.0 1989
----------------------------	--	---

1989.01.01 01:00:00  
 Free Space on Drive H: 4,743,168  
 Enter the drive/directory with the databases -> H:\GPIPER\SDIEGO  
 Enter the name of the database with which you wish to work ->

Databases			
Name	Description	Approx. Size	Last Access Date Time
F:\ORD SDIEGO	Ft. Ord San Diego Naval Station	7721 28878	1989.05.15 19:45:12 1989.05.15 19:15:54

Entries 1 to 2 of 2  
 F1 F2 Keys F3 F4 F5 F6 F7 F8 F9 F10 Done

Figure 84. SELECT A DATABASE filename list.

The selected database is now ready for use. Other program functions, such as editing data and generating reports, may now be performed.

#### [4] Index a Database

At some time during the use of MicroGPIPER, errors may occur in index files that will stop the program from working. This option allows you to re-create all of the index files used by the selected database.

Select option [4] at the DATABASE ADMINISTRATION menu, and then select the database to index. The current (online) database will be supplied by the program as the default. Next the program asks if you wish to create the index files for the files indicated. If you do not wish to re-create the index files, an [N] will return you to the DATABASE ADMINISTRATION menu. A [Y] will cause the system to create all of the index files.

Figure 85 shows the progress screen during indexing. This is done because the process can take a long time if the files are extremely large.

Database Online: SDIEGO  
1989.01.01

Underground Gas Piping  
CREATE DATABASE INDICES  
San Diego Naval Station

Micro GPIPER  
Version EMS 1.0  
1989  
01:00:00

H:\GPIPER\SDIEGO\SDIEGO

The necessary index files have been created.

FILES	# of records to be indexed	START TIME	FINISH TIME
SDIEGOP	19	19:48:13 Elapsed:	19:48:14 00:00:01
SDIEGOU	38	19:48:14 Elapsed:	19:48:14 00:00:00
SDIEGOR	24	19:48:14 Elapsed:	19:48:14 00:00:00

DONE. Do you wish to index another database (Y/N) ? N

Figure 85. Indexing progress screen.

After indexing, you may press [N] or [ENTER] to return to the DATABASE ADMINISTRATION menu. Pressing [Y] will prompt for the name of another database to index.

#### [5] Copy a Database

This option allows copying a database to a diskette or to another hard drive and subdirectory. You must assure that the destination of the copied database has sufficient space to hold the files. Databases may be copied to either 5-1/4 or 3-1/2-in. diskettes. It is your responsibility to ensure that the chosen diskette is large enough to hold the files to be copied. It is unlikely that a subdirectory of a hard disk would not have sufficient space to hold the database files, but it should still be checked. Refer to your DOS manual for information on these issues.

Select option [5] from the Database Administration menu. A screen will appear asking for the SOURCE of the databases to copy. You may use the [F9] key to select the Path and Filename as in other options (Figure 86). The program then continues to select the destination Path and Filename (Figure 87).

Database Online: SDIEGO	Underground Gas Piping COPY A DATABASE San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
----------------------------	--	---

1989.01.01      Free Space on Drive H: 5,054,464      01:00:00

Enter the drive/directory with the databases -> H:\GPIPER\SDIEGO

Enter the name of the database to copy from (SOURCE) -> SDIEGO

Databases			
Name	Description	Approx. Size	Last Access Date Time
SDIEGO	San Diego Naval Station	20870	1988.12.07 00:00:00

Entries 1 to 1 of 1

F1 F2 Keys F3 F4 F5 F6 F7 F8 F9 Select F10 Done

Figure 86. Obtain source path and filename.

Database Online: SDIEGO	Underground Gas Piping COPY A DATABASE San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
----------------------------	--	---

1989.01.01      Free Space on Drive H: 4,743,168      01:00:00

SOURCE Database: H:\GPIPER\SDIEGO\SDIEGO

Enter the drive/directory with the databases -> H:\GPIPER\SDIEGO

Enter the name of the database to copy to (DESTINATION) -> SD2

F1 F2 Keys F3 F4 F5 F6 F7 F8 F9 List F10 Done

Figure 87. Obtain destination path and filename.

The program displays the fully qualified source and destination database names and prompts for confirmation to perform the COPY operation (Figure 88).

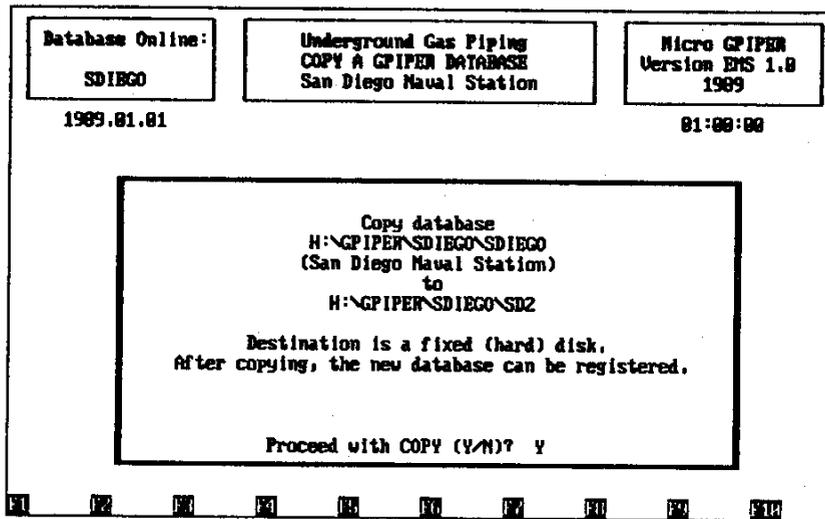


Figure 88. Request to proceed with copy.

When a database is copied, you are prompted to register the database for use by the system (Figure 89). This is only necessary when the object file is being copied to the hard disk. The program makes no attempt to automatically decide if registration is necessary. You must decide to register.

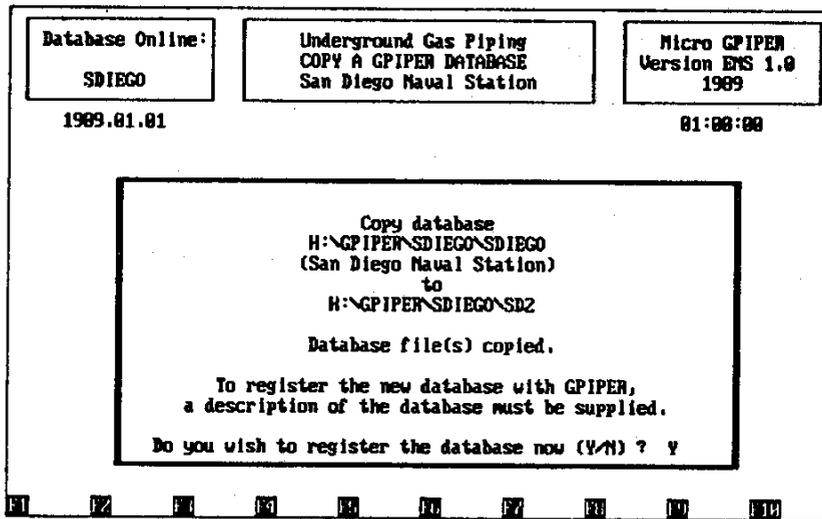


Figure 89. Request to proceed with registration.

After registration of the newly copied database, you are prompted to index it (Figure 90). The database must be indexed before it can be selected for use.

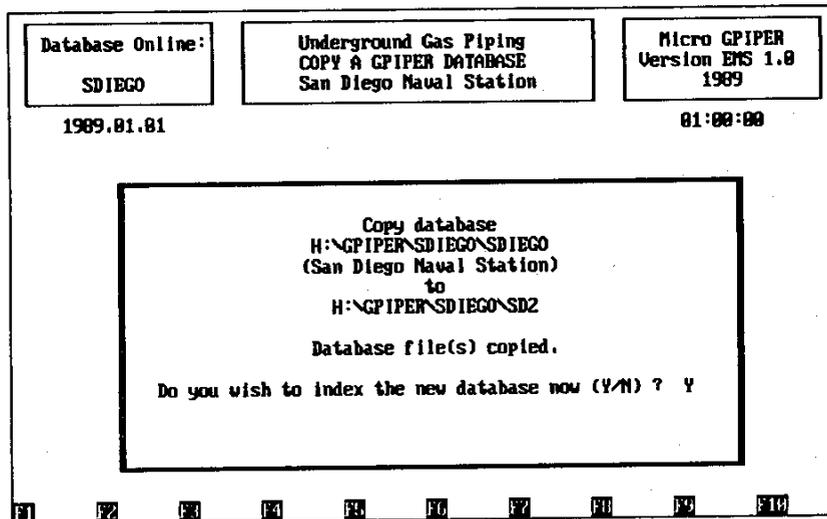


Figure 90. Request to index the copied database.

If you answered **[Y]** to the indexing request, the database files will be indexed. Figure 91 shows the screen display during this process.

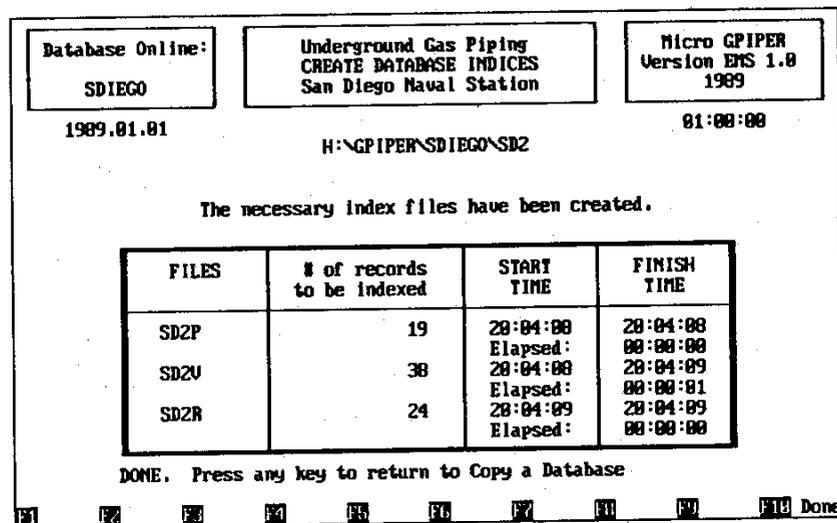


Figure 91. Indexing the copied database file.

#### [6] Change Current Database's Description

This option allows changing the description of the currently selected database. Select option **[6]** from the Database Administration menu. Select a file as described previously. The screen shown in Figure 92 allows you to change the description.

Database Online: SDIEGO 1989.81.81	Underground Gas Piping CHANGE DATABASE DESCRIPTION San Diego Naval Station	Micro GPIPER Version BPS 1.0 1989 01:00:00
<div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 80%;"> San Diego Naval Station Description of database H:\GPIPER\SDIEGO\SDIEGO </div>		
<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: 90%;"> Enter the description of the database. </div>		
F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 Done		

Figure 92. Changing a database's description.

After changing the description, you have three options (Figure 93). Pressing **[A]** accepts the new description. Pressing **[M]** allows you to go back to make corrections. Pressing **[Q]** allows you to exit this operation without making any changes to the description.

Database Online: SDIEGO 1989.81.81	Underground Gas Piping CHANGE DATABASE DESCRIPTION San Diego Naval Station	Micro GPIPER Version BPS 1.0 1989 01:00:00
<div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 80%;"> San Diego Naval Station Description of database H:\GPIPER\SDIEGO\SDIEGO </div>		
<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: 90%;"> [A] Accept,                      [M] Modify,                      [Q] Quit </div>		
F1 F2 F3 F4 F5 F6 F7 F8 F9 F10		

Figure 93. Accept, modify, quit - CHANGE DATABASE DESCRIPTION.

## 8 SYSTEM UTILITY

System utility functions allow you to perform a number of operations to configure MicroGPIPER for your particular hardware configuration. Some of the pop-up tables can be edited to customize MicroGPIPER to the specific installation. The following screen (Figure 94) shows the SYSTEM UTILITY MENU.

Database Online: SDIEGO 1989.01.01	Underground Gas Piping SYSTEM UTILITY MENU San Diego Naval Station	Micro GPIPER Version EMS 1.8 1989 01:00:00
--	--	---

(1) General System Information  
 (2) Building Category Code/Mission Priority Editor  
 (E) Exit to main menu

OPTION E

Select a menu item.  
 Enter the menu ID at the menu prompt or  
 select a menu item with the arrow keys and press ENTER.

F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 Done

Figure 94. SYSTEM UTILITY MENU.

Pressing [F2] will display the available keys for the System Utility database editor. The first of these screens is shown in Figure 95.

OPTIONS:	
[F10] Done. Editing is complete. Prompt to Accept, Modify or Quit.	
Movement among records and fields	
[Home]	first field in record
[End]	last field in record
[→] [Tab]	[Ctrl-D] [Space] [←] next field
[←] [Shift-Tab]	[Ctrl-S] [Backspace] previous field
[↓]	[Ctrl-X] next record
[↑]	[Ctrl-E] previous record
Paging through list	
[PgUp]	previous page
[PgDn]	next page
[Ctrl-PgUp]	first page
[Ctrl-PgDn]	last page
More. Press PgDn	
F2 to return to selection entry.	

Figure 95. Help screen.

Since this program option allows access to all program features and allows you to change passwords, you must enter the appropriate password to gain entry to the screens. At the prompt (Figure 98), enter the password.

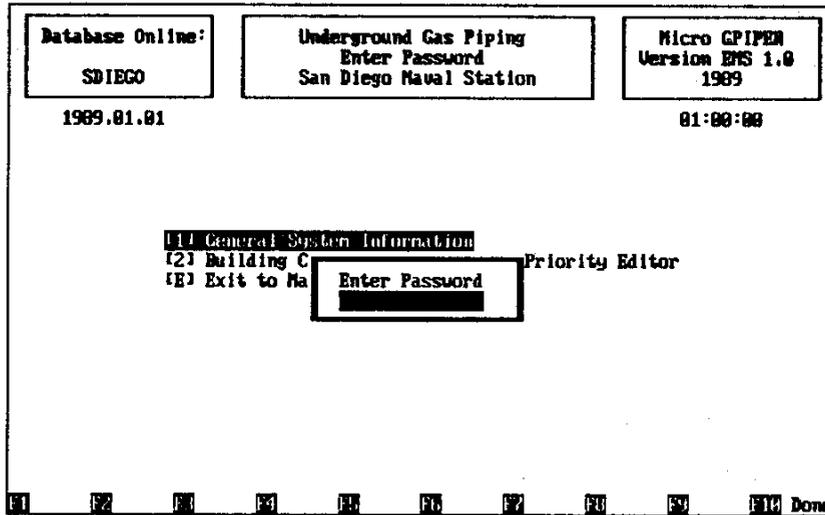


Figure 96. System utility prompt.

[1] General System Information

This selection allows customization of the program system for its hardware environment with five screens of user-definable options. Figure 97 shows the first display. Monitor type, passwords, and the default printer are set here. Printer, disk file, and system console characteristics for report output are set on subsequent screens. You may move among the screens by pressing the [PgUp] and [PgDn] keys. The screen available for each key is noted in a box at the base of the screen. Press the [F10] key to return directly to the SYSTEM UTILITY menu from any screen.

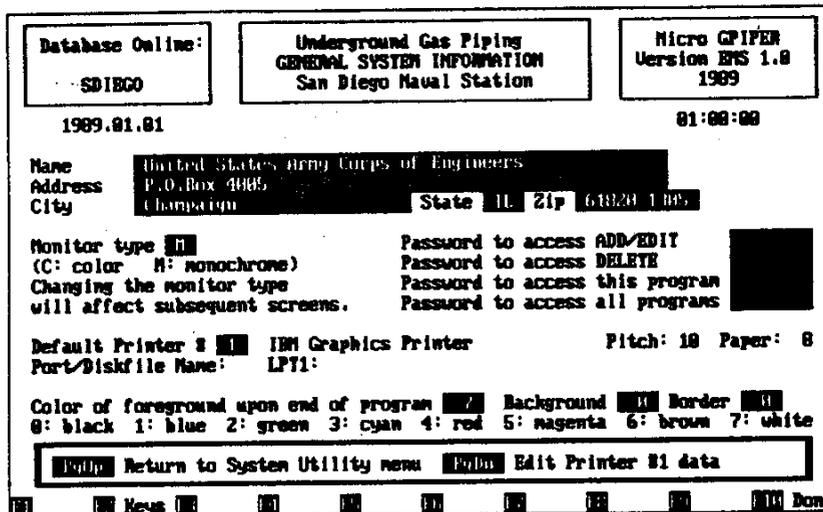


Figure 97. GENERAL SYSTEM INFORMATION.

### *User Name and Address*

You may type your name, organization, and address in this section. This is not critical to the program's operation, but merely serves as a record.

### *Monitor Type*

Initial setting = M (monochrome)

Enter **[C]** (color) if the computer is equipped with a color video adapter and monitor. This will provide the best visual differentiation of displayed information.

Though it is possible for the program to detect the type of video adapter, it is not possible to determine the type of monitor to which the adapter is connected. In particular, many laptop portables have an EGA (enhanced graphics adapter) with a monochrome monitor. Strange character attributes may occur in this situation. To provide a more compatible viewing screen, you should set this configuration to **[M]** (monochrome).

If the monitor type is changed, the screen attributes will be saved upon exit from this screen.

### *Passwords*

No passwords are set initially.

You should select passwords required to access certain program operations and enter them here. It is recommended that the passwords be changed regularly.

The first password controls access to the Add/Edit operations of DATA ENTRY & MODIFICATIONS. New records may be added and data in existing records may be modified by the user after this password is entered at the password pop-up prompt.

The second password controls access to the Delete operations. Deletion of records from a database or deletion of an entire database (or its registration with the program) require the entry of this password.

The third password controls access to General System Information and any System Utility editor (e.g., Building Category Code/Mission Priority). Therefore, if this password is forgotten, one cannot gain access to this screen to reveal it.

The fourth password, if entered at any password prompt, allows access to all of the program's operations.

1. Once a specific password is entered correctly, the program will no longer prompt for it.
2. The entry of the "DELETE" password at the password pop-up prompt will also allow access to the Add/Edit operations.
3. If any of the passwords are left blank, a warning message will be displayed both at program initialization and whenever the General System Information screens are exited.

### Default Printer #

Initial setting = 1

Enter [1] or [2] to select which of the two possible system printers is to be the default. This printer will be highlighted in the Printer Prompt at report time.

The name of the default printer, its default pitch, default paper size, and port are displayed next to the printer #. Each printer has a separate setup screen where these options and other printer data may be entered.

### Colors Upon the End of the Program

Initial setting = 7 (white foreground)  
0 (black background)  
0 (black border)

If the monitor type (see above) is set to "C" (color), the program will set the screen border on a color monitor to blue. This option allows the setting of the border to black (or another color) at program completion. Foreground and background color settings are included as a convenience.

### Printer Information Screens

There are four printer information screens. The first two screens contain printer settings. The third contains disk file specifications for report output. The last contains the system console characteristics, also for report output.

Printers are the most difficult hardware item to interface with programs. This is because the set of print features and the control code sequences needed to activate those features vary greatly from printer to printer. Note also that the exact pitch (characters per inch, cpi) used for compressed printing also varies. The program uses no printer-specific features other than compressed print.

Printers #1 and #2. Initial settings for printers #1 and #2 are shown in Figures 98 and 99. The entry fields are the same for both setups.

Database Online: SDIEGO	Underground Gas Piping PRINTER SET-UP INFORMATION San Diego Naval Station	Micro GPIPER Version EPS 1.0 1989
1989.01.01		01:00:00
Printer # 1	Name: IBM Graphics Printer	Default Paper Size 8
	Port: LPT1: Default pitch 10 (10 or 17)	Default Paper Size 8 (8 or 14)
	Left Margin	Max.chars/line
	8%	14
10 cpi	0	132
17 cpi	14	214
	Set-up Strings (Enter codes in DECIMAL)	
10 cpi	10	0 0 0 0 0 0 0 0 0 0
17 cpi	15	0 0 0 0 0 0 0 0 0 0
	↑↑↑ Edit General System data	↑↑↑ Edit Printer #2 data
	↑↑ Keys	↑↑ Done

Figure 98. Printer #1 setup.

Database Online: SDIEGO	Underground Gas Piping PRINTER SET-UP INFORMATION San Diego Naval Station	Micro GPIPER Version EMS 1.8 1989
1989.01.01		01:00:00
Printer # 2	Name: HP Laser Jet Plus	Default Paper Size 8
	Port: LPT2: Default pitch 10 (18 or 17)	(8 or 14)
	Left Margin	Max.chars/line
	18 cpl 8	88
	17 cpl 15	132
	Set-up Strings (Enter codes in DECIMAL)	
18 cpl	27 69 0 0 0 0 0 0 0 0	
17 cpl	27 69 27 30 107 50 03 0 0 0	
	PgUp Edit Printer #1 data	PgDn Edit Disk File data
F1	F2 Keys	F3 F4 F5 F6 F7 F8 F9 F10 Done

Figure 99. Printer #2 setup.

*Printer Name.* The name entered here will display in the Printer Prompt pop-up at report time.

Initial setting = IBM Graphics Printer

*Port.* This is the DOS device name for the parallel port to which the printer is connected. Values may be set from "LPT1:" to "LPT4:".

Initial setting = LPT1:

Note that serial printers may also be used, but the system operator must configure DOS accordingly and provide the device name here. See the MODE command in the DOS manual and consult the printer's technical reference manual.

*Default Pitch.* This value tells the program which print pitch to use. The appropriate setup string (defined below) will be sent to the printer when the report begins. The pitch setting also determines the left margin and, along with paper size, determines the maximum characters per line.

Initial setting = 10  
Available settings: 10 or 17.

*Default Paper Size.* This value informs the program of the size of paper in use by the printer.

Initial setting = 8  
Available settings: 8 (8-1/2 in. x 11 in.) or 14 (14 in. x 11 in.)

NOTE: This printer setup screen allows for storing of data for four combinations of pitch and paper size. The desired combination may be selected from the Printer pop-up at report time. Setting the default pitch and default paper size will designate the desired combination as the default.

*Left Margin and Maximum Characters/Line.* The left margin and maximum characters per line for both regular and wide paper are set here. All units are in characters for the pitch selected. For example, a left margin of 8 for 10 cpi yields a 0.8-in. left margin. For a 1-in. left margin, set this value to 10.

Since compressed print pitch varies from about 16 to 18 characters per inch depending on the printer, adjust the values for 17 cpi accordingly.

Initial settings are shown in Figure 100.

*Setup Strings.* Consult the technical reference section of your printer's manual to obtain the decimal ASCII set-up strings for 10 characters-per-in. and 17 characters-per-in. print. Enter the decimal ASCII values for each character in the appropriate (compressed) set-up string. Up to 10 values may be entered to accommodate laser printers' long setup strings. Values of zero are ignored by the program.

Initial settings are shown in Figure 100.

*Disk File (Printer #3).* Output may be directed to a file on the hard drive instead of to a printer. Following are the settings for this option.

*Default Filename.* This filename is the default when [F] (file) is selected from the Printer pop-up prompt at report time. Another name may be entered at that time. The extension is always fixed at ".PRN"

Initial setting = DISK.PRN

*Other Settings.* These may be set accordingly if the system operator wishes to copy the disk file to the printer at a later time.

Initial settings are shown in Figure 100.

Database Online: SDIEGO 1989.01.01	Underground Gas Piping PRINTER SET-UP INFORMATION San Diego Naval Station	Micro GPIPE Version ERS 1.0 1989 01:00:00
Printer # 3	Name: Diskfile	Default Filename: DISK.PRN
	Default pitch: 10 (10 or 17)	Default Paper Size: 14 (8 or 14)
	Left Margin	Max.chars/line
18 cpi	8	14
17 cpi	15	214
Set-up Strings (Enter codes in DECIMAL)		
18 cpi	0 0 0 0 0 0 0 0 0 0	
17 cpi	0 0 0 0 0 0 0 0 0 0	
PgUp Edit Printer #2 data		PgDn Edit System Console data
F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 Done		

Figure 100. Printer #3 setup.

*Console (Printer #4).* Output may also be directed to the monitor. Following are the settings for this option:

*Port.* This is the DOS device name for the system console.

Initial Setting = CON:

*Other Settings.* These may be changed to take advantage of certain monitors' abilities to display more than 80 characters per line.

Initial settings are shown in Figure 101.

Database Online: SDIEGO	Underground Gas Piping PRINTER SET-UP INFORMATION San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
1989.01.01		01:00:00
Printer # 4	Name: Console	
	Port: CON	Default pitch 10 (10 or 17)
		Default Paper Size 8 (8 or 14)
	Left Margin	Max.chars/line 8%
	10 cpi 0	14 00
	17 cpi 0	00 00
	Set-up Strings (Enter codes in DECIMAL)	
10 cpi	0	0 0 0 0 0 0 0 0 0 0
17 cpi	0	0 0 0 0 0 0 0 0 0 0
PgUp Edit Disk File data		PgDn Return to System Utility menu
F1	F2 Keys	F3 F4 F5 F6 F7 F8 F9 F10 Done

Figure 101. Printer #4 setup.

## [2] Building Category Code/Mission Priority Editor

Selecting [2] from the SYSTEM UTILITY MENU allows you to edit the data in the Building Category Code/Mission Priority database. This allows you to customize it to your individual needs. This is the information displayed on the Building Category Code/Mission priority pop-up help table that appears during the add/edit pipe data routine. This option is password-protected. Enter the third system password. The active editor is shown in Figure 102.

Database Online: SDIEGO	Underground Gas Piping BCC/MP System Database Editor San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
1989.01.01	Record 1 of 11	01:00:00
Building Category Code	Description	Mission Priority
110 thru 169	Operational Facility	2
170 thru 179	Training Facilities	5
210 thru 452	Technical and Industrial Facilities	6
510 thru 550	Hospital & Related Facilities	3
601 thru 690	Administrative Facilities	8
710 thru 714	Personnel Living Space (AFM)	4
720 thru 725	Personnel Living Space (OMA & OMAR)	4
730 thru 760	Morale & Recreational Facilities	7
810 thru 845	Utilities Plants and Systems	1
880 thru 890	Utilities Plants and Systems	1
900 and above	Other Facilities	9

Keys Add Delete Edit Sort Done

Figure 102. Building category code/mission priority editor.

Pressing [F3] appends a new record to the end of the database, thereby adding a new entry to the table. Note that "<New Record>" is displayed between the date and the time (Figure 103). This record will be automatically positioned at the proper location when the edited database is saved to disk.

Database Online: SDIEGO	Underground Gas Piping BCC/MP System Database Editor San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
1989.01.01	< New Record > Record of 11	01:00:00
Building Category Code	Description	Mission Priority
110 thru 169	Operational Facility	2
170 thru 179	Training Facilities	5
210 thru 452	Technical and Industrial Facilities	6
510 thru 550	Hospital & Related Facilities	3
601 thru 690	Administrative Facilities	8
710 thru 714	Personnel Living Space (AFM)	4
720 thru 725	Personnel Living Space (OMA & OMAR)	4
730 thru 760	Morale & Recreational Facilities	7
810 thru 845	Utilities Plants and Systems	1
880 thru 890	Utilities Plants and Systems	1
900 and above	Other Facilities	9
		8

Keys Done

Figure 103. Adding a new record.

If the Building Category Code is left blank, an error window (Figure 104) is displayed.

Database Online: SDIEGO	Underground Gas Piping BCC/MP System Database Editor San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
1989.01.01	< New Record >	01:00:00
Record of 11		
Building Category Code	Description	Mission Priority
110 thru 169	Operational Facility	2
170 thru 179	Training Facilities	5
210 thru 452	Technical and Industrial Facilities	6
510 thru 550	Hospital & Related Facilities	3
601 thru 690	Administrative Facilities	8
710 thru 714	Personnel Living Space (AFH)	4
720 thru 725	Personnel Living Space (OMA & OMAR)	4
Building Category Code cannot be blank. Records with invalid data will automatically be deleted. Press a key.		
		0
[F1] [F2] Keys [F3] [F4] [F5] [F6] [F7] [F8] [F9] [F10] Done		

Figure 104. Error window for building category code.

Pressing [F4] deletes the current entry. Note that "<Deleted Record>" is displayed between the date and the time (Figure 105). This notation will be displayed whenever the record pointer is positioned on a deleted record. A deleted record can be retrieved by pressing [F4] again.

Database Online: SDIEGO	Underground Gas Piping BCC/MP System Database Editor San Diego Naval Station	Micro GPIPER Version EMS 1.0 1989
1989.01.01	< Deleted Record >	01:00:00
Record 1 of 11		
Building Category Code	Description	Mission Priority
110 thru 169	Operational Facility	2
170 thru 179	Training Facilities	5
210 thru 452	Technical and Industrial Facilities	6
510 thru 550	Hospital & Related Facilities	3
601 thru 690	Administrative Facilities	8
710 thru 714	Personnel Living Space (AFH)	4
720 thru 725	Personnel Living Space (OMA & OMAR)	4
730 thru 768	Morale & Recreational Facilities	7
810 thru 845	Utilities Plants and Systems	1
880 thru 890	Utilities Plants and Systems	1
900 and above	Other Facilities	9
[F1] [F2] Keys [F3] Add [F4] Delete [F5] Edit [F6] [F7] Sort [F8] [F9] [F10] Done		

Figure 105. Deleted record notation.

Pressing [F5] allows you to edit the entry at the selection bar.

Pressing [F7] displays the screen shown in Figure 106. If you answer "Y", records marked "<Deleted Record>" or containing invalid data are permanently removed from the database. The remaining records are then sorted by Building Category Code. This process is performed automatically

when the edited database is saved to disk, but you may want to use this option to organize the data while editing.

Database Online: SDIBCO		Underground Gas Piping BCC/MP System Database Editor San Diego Naval Station		Micro GPIPER Version EMS 1.0 1989	
1989.01.01		Record 1 of 11		01:00:00	
Building Category Code	Description			Mission Priority	
110 170 210 510 601 710 720 730 thru 760 810 thru 845 800 thru 890 900 and above	<p>This option removes all records marked &lt; Deleted &gt; and sorts the database by Building Category Code.</p> <p>Proceed (Y/N) ? Y</p>				
	Morale & Recreational Facilities			7	
	Utilities Plants and Systems			1	
	Utilities Plants and Systems			1	
	Other Facilities			9	

Figure 106. Sort option.

Press **[F10]** to conclude editing. The menu shown in Figure 107 will appear. Pressing **[A]** accepts the edits and writes the database to disk. Pressing **[M]** returns to editing. Pressing **[Q]** quits the editor and abandons the edits.

Database Online: SDIBCO		Underground Gas Piping BCC/MP System Database Editor San Diego Naval Station		Micro GPIPER Version EMS 1.0 1989	
1989.01.01		Record 1 of 11		01:00:00	
Building Category Code	Description			Mission Priority	
110 thru 169 170 thru 179 210 thru 452 510 thru 550 601 thru 690 710 thru 714 720 thru 725 730 thru 760 810 thru 845 800 thru 890 900 and above	Operational Facility Training Facilities Technical and Industrial Facilities Hospital & Related Facilities Administrative Facilities Personnel Living Space (AFW) Personnel Living Space (OMA & OMAN) Morale & Recreational Facilities Utilities Plants and Systems Utilities Plants and Systems Other Facilities			2 5 6 3 8 4 4 7 1 1 9	
N		[A] Accept,		[M] Modify,	
				[Q] Quit	

Figure 107. Accept, modify, quit - System Database Editor.

## APPENDIX A: Database-Related Reports

For the first example of the SPECIFY REPORT, the Date of First Leak, Type of First Leak, and Location of First Leak have been selected. No QUERY conditions or special index order has been set. All records will be printed in the order of the Pipe Section ID.

Page 1

SPECIFY REPORT  
Filename: H:\GPIPER\SDIEGO\SDIEGO  
REPORT DATE: 1989.01.01 01:00:00  
GPIPER (v. EMS 2.0)

PIPE SECTION ID	DATE OF FIRST LEAK	TYPE OF FIRST LEAK	LOCATION FIRST LEAK
AREA 5 01	1988.03.02	BREAK	10' WEST OF 2/4
AREA 5 02	1986.04.04	BREAK	AT BLDG. 89
AREA 5 03	1980.01.01	EARTH- QUAKE	50' WEST GATE 6
AREA 5 04	.		
AREA 5 05	1968.01.01		
AREA 5 06	1987.03.06	CORROSION	OUTSIDE BLDG.35
AREA 5 07	.		
AREA 5 08	1950.01.01	CORROSION	BOILER RM. WALL
AREA 5 09	1980.01.01	CORROSION	OUTSIDE BLDG.22
AREA 5 10	1960.01.01	VALVE SEAT	VALVE 8/4
AREA 5 11	1975.01.01	CORROSION	BLDG. 3000
AREA 5 12	1984.01.01	CORROSION	BLDG. 126
AREA 5 13	1980.01.01	BREAK	20' WEST 5/3
AREA 5 14	1980.01.01	BREAK	DRY DOCK 341
AREA 5 15	1954.01.01	CORROSION	OUTSIDE BLDG.24
AREA 5 16	1965.01.01	VALVE SEAT	VALVE 5/2
AREA 5 17	.		
AREA 5 18	1987.02.02	VALVE SEAT	VALVE 5/10
AREA 5 19	.		

This SPECIFY REPORT includes the fields shown in the report below.

SPECIFY REPORT  
 Filename: H:\GPIPER\SDIEGO\SDIEGO  
 REPORT DATE: 1989.01.01 01:00:00  
 GPIPER (v. EMS 2.0)

PIPE SECTION ID	OUTSIDE DIAMETER	WALL THICKNESS	OPERATING PRESSURE	LENGTH	PIPE MATERIAL	# OF VALVES
AREA 5 01	4.00	0.2500	15.00	100.00	BLACK STEEL	3
AREA 5 02	4.00	0.2500	15.00	610.00	BLACK STEEL	17
AREA 5 03	4.00	0.2500	15.00	640.00	BLACK STEEL	2
AREA 5 04	4.00	0.2500	15.00	520.00	BLACK STEEL	2
AREA 5 05	1.50	0.2500	15.00	175.00	BLACK STEEL	1
AREA 5 06	4.00	0.2500	15.00	80.00	BLACK STEEL	0
AREA 5 07	1.00	0.2500	15.00	60.00	BLACK STEEL	0
AREA 5 08	4.00	0.2500	15.00	40.00	BLACK STEEL	0
AREA 5 09	4.00	0.2500	15.00	550.00	BLACK STEEL	3
AREA 5 10	1.00	0.2500	15.00	120.00	BLACK STEEL	1
AREA 5 11	4.00	0.2500	15.00	470.00	BLACK STEEL	2
AREA 5 12	2.00	0.2500	15.00	40.00	BLACK STEEL	0
AREA 5 13	1.25	0.1000	15.00	200.00	BLACK STEEL	1
AREA 5 14	1.25	0.1000	15.00	210.00	BLACK STEEL	1
AREA 5 15	4.00	0.2500	15.00	260.00	BLACK STEEL	1
AREA 5 16	4.00	0.2500	15.00	530.00	BLACK STEEL	1
AREA 5 17	4.00	0.2500	15.00	460.00	BLACK STEEL	1
AREA 5 18	4.00	0.2500	15.00	440.00	BLACK STEEL	2
AREA 5 19	1.00	0.1000	15.00	50.00	BLACK STEEL	0

This SPECIFY REPORT includes the same fields as the previous example. The QUERY condition has been set to include only those records with Outside Diameters  $\geq$  2 inches and Pipe Lengths  $\geq$  200 feet. These conditions are noted under the report heading. In addition, this report is printed in order of Pipe Length, set by SPECIFY's SET INDEX ORDER.

SPECIFY REPORT  
 Filename: H:\GPIPER\SDIEGO\SDIEGO  
 REPORT DATE: 1989.01.01 01:00:00  
 GPIPER (v. EMS 2.0)

PIPE SECTION ID	OUTSIDE DIAMETER	WALL THICKNESS	OPERATING PRESSURE	LENGTH	PIPE MATERIAL	# OF VALVES
AREA 5 15	4.00	0.2500	15.00	260.00	BLACK STEEL	1
AREA 5 18	4.00	0.2500	15.00	440.00	BLACK STEEL	2
AREA 5 17	4.00	0.2500	15.00	460.00	BLACK STEEL	1
AREA 5 11	4.00	0.2500	15.00	470.00	BLACK STEEL	2
AREA 5 04	1.50	0.2500	15.00	520.00	BLACK STEEL	2
AREA 5 16	4.00	0.2500	15.00	530.00	BLACK STEEL	1
AREA 5 09	1.00	0.2500	15.00	550.00	BLACK STEEL	3
AREA 5 02	4.00	0.2500	15.00	610.00	BLACK STEEL	17
AREA 5 03	4.00	0.2500	15.00	640.00	BLACK STEEL	2

The SUMMARY REPORT is shown below. This example uses no QUERY conditions, but uses QUERY's SORT ORDER to print the records sorted by the contents of the TO field.

Page 1

SUMMARY REPORT  
 Filename: H:\GPIPER\SDIEGO\SDIEGO  
 REPORT DATE: 1989.01.01 01:00:00  
 GPIPER (v. EMS 2.0)

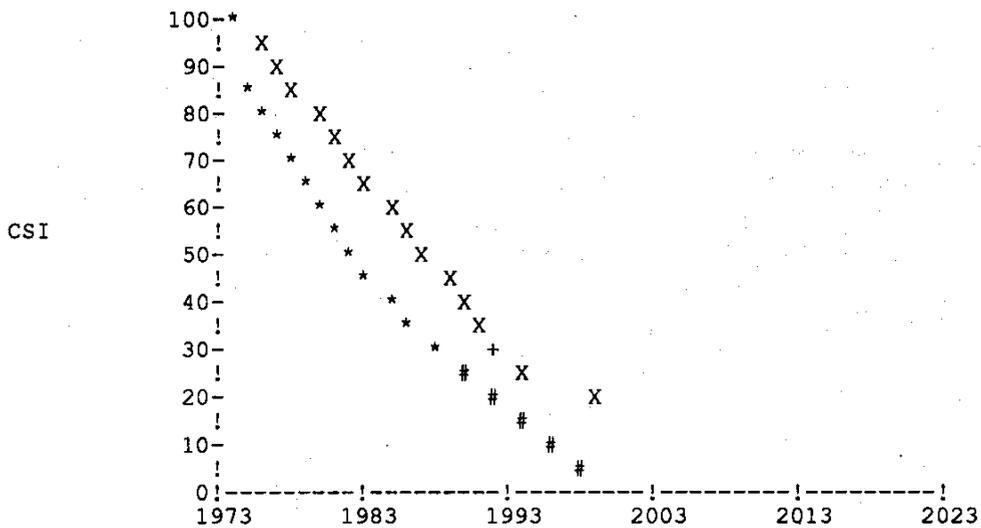
PIPE SECTION ID	USE	TO	FROM
AREA 5 07	GAS	BLDG. 1134 & 277	SECTION 04
AREA 5 12	GAS	BLDG. 126	SECTION 11
AREA 5 09	GAS	BLDG. 16	BLDG. 26
AREA 5 08	GAS	BLDG. 21	SECTION 04
AREA 5 11	GAS	BLDG. 3040	BLDG. 16
AREA 5 06	GAS	BLDG. 42	BLDG. 29
AREA 5 10	GAS	BLDG. 75	SECTION 09 VALVE 8/4
AREA 5 15	GAS	BLDG.24 VALVE 5/1	SECTION 13 VALVE 5/3
AREA 5 04	GAS	BLDG.26 & KALBFUS	GATE #6
AREA 5 05	GAS	BLDG.29	VALVE 3/1 & GATE #6
AREA 5 16	GAS	BLDG.3052	BLDG.24 VALVE 5/2
AREA 5 02	GAS	BLDG.89 & BLDG.3137	EDGE OF AREA 5 (D5)
AREA 5 13	GAS	DRY DOCK 341	BLDG.3040 VALVE 5/3
AREA 5 14	GAS	DRY DOCK 341	SECTION 13
AREA 5 03	GAS	GATE #6	BLDG. 89
AREA 5 01	GAS	SECTION 02 VALVE 2/4	EDGE OF AREA 5 (D5)
AREA 5 19	GAS	SECTION 19	SECTION 18
AREA 5 18	GAS	VALVE 5/10	VALVE 5/5
AREA 5 17	GAS	VALVE 5/5	BLDG.3052

The first example of GPIPER's CSI Prediction Report shows a 4-in. diameter section of pipe with a 0.25-in. wall thickness. Using the corrosion model, it was predicted to leak in 1992. The actual first leak occurred in 1988. The graph below shows both curves. Note the legend at the bottom of the page. The Graph Table that follows is for predicted leaks.

CSI PREDICTION REPORT  
 Filename: SDIEGO  
 REPORT DATE: 1989.01.01 02:00:00  
 GPIPER (v. EMS 2.0)

PIPE IDENTIFICATION	: AREA 5	SECTION NUMBER:	01
SOIL RESISTIVITY	: 10000.00	SOIL pH	: 7.00
COATING MATERIAL	: TAPE/TAR	WALL THICKNESS:	0.2500
YEAR INSTALLED	: 1974	PIPE SIZE (OD):	4.0
PREDICTED FIRST LEAK (CSI<=30):	1992	ACTUAL FIRST LEAK:	1988.03.02

Adjusted Formula : Max.Pit Depth = 0.0541 \* (time ^ 0.58)  
 Pit Depth (in inches) & Time (in years)



X Prediction  
 + Predicted First Leak (CSI=30)  
 \* Actual  
 # Extrapolation

CSI PREDICTION REPORT  
 Filename: SDIEGO  
 REPORT DATE: 1989.01.01 02:00:00  
 GPIPER (v. EMS 2.0)

PIPE IDENTIFICATION : AREA 5

SECTION NUMBER: 01

## GRAPH TABLE

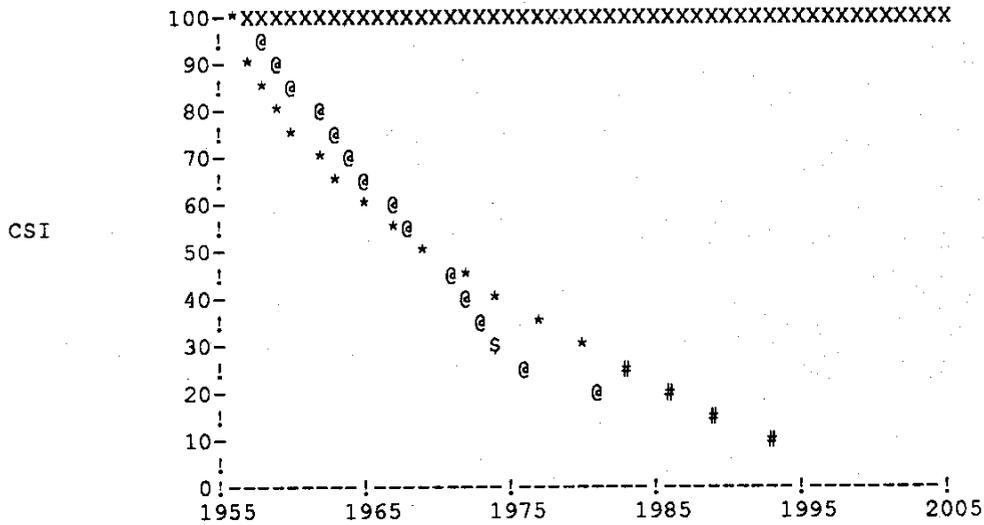
CSI YEAR	CALCULATED CSI	NUMBER OF LEAKS	TOTAL # LEAKS
1974	100	0	0
1975	96	0	0
1976	92	0	0
1977	88	0	0
1978	84	0	0
1979	81	0	0
1980	77	0	0
1981	73	0	0
1982	69	0	0
1983	65	0	0
1984	61	0	0
1985	57	0	0
1986	53	0	0
1987	49	0	0
1988	46	0	0
1989	42	0	0
1990	38	0	0
1991	34	0	0
1992	30	1	1
1993	26	1	2
1994	25	1	3
1995	23	1	4
1996	23	1	5
1997	22	1	6
1998	21	1	7
1999	20	1	8
2000	20	1	9
2001	20	1	10
2002	19	1	11
2003	19	1	12
2004	18	1	13
2005	18	1	14
2006	18	1	15
2007	17	1	16
2008	17	1	17
2009	17	1	18
2010	17	1	19
2011	16	1	20
2012	16	1	21

This example shows a cathodically protected pipe section with an actual first leak recorded in 1980. GPIPER version EMS 2.0 calculates a predicted CSI for the both the event of successful cathodic protection and its failure. Note the three curves on the graph.

CSI PREDICTION REPORT  
 Filename: SDIEGO  
 REPORT DATE: 1989.01.01 02:00:00  
 GPIPER (v. EMS 2.0)

PIPE IDENTIFICATION : AREA 5 SECTION NUMBER: 08  
 SOIL RESISTIVITY : 10000.00 SOIL pH : 7.00  
 COATING MATERIAL : TAPE/TAR WALL THICKNESS: 0.2500  
 YEAR INSTALLED : 1956 PIPE SIZE (OD): 4.0  
 PREDICTED FIRST LEAK (CSI<=30): 1974 ACTUAL FIRST LEAK: 1980.01.01  
 CATHODIC PROTECTION w/ PIPE-to-SOIL POTENTIAL <= -0.85 VOLTS

Adjusted Formula : Max.Pit Depth = 0.0396 \* (time ^ 0.58)  
 Pit Depth (in inches) & Time (in years)



X Prediction  
 @ Prediction (in event of Cathodic Protection Failure)  
 \$ Predicted First Leak (CSI=30, in event of Cathodic Protection Failure)  
 \* Actual  
 # Extrapolation

CSI PREDICTION REPORT  
 Filename: SDIEGO  
 REPORT DATE: 1989.01.01 02:00:00  
 GPIPER (v. EMS 2.0)

PIPE IDENTIFICATION : AREA 5

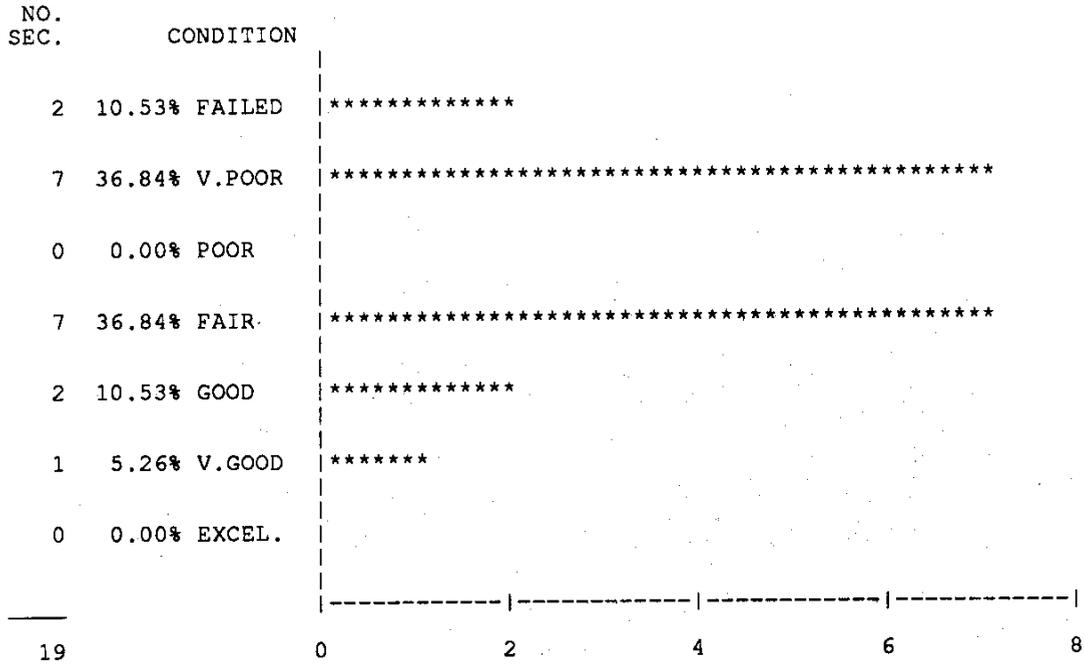
SECTION NUMBER: 08

GRAPH TABLE  
 (EVENT OF CATHODIC PROTECTION FAILURE)

CSI YEAR	CALCULATED CSI	NUMBER OF LEAKS	TOTAL # LEAKS
1956	100	0	0
1957	96	0	0
1958	92	0	0
1959	88	0	0
1960	84	0	0
1961	81	0	0
1962	77	0	0
1963	73	0	0
1964	69	0	0
1965	65	0	0
1966	61	0	0
1967	57	0	0
1968	53	0	0
1969	49	0	0
1970	46	0	0
1971	42	0	0
1972	38	0	0
1973	34	0	0
1974	30	1	1
1975	26	1	2
1976	25	1	3
1977	23	1	4
1978	23	1	5
1979	22	1	6
1980	21	1	7
1981	20	1	8
1982	20	1	9
1983	20	1	10
1984	19	1	11
1985	19	1	12
1986	18	1	13
1987	18	1	14
1988	18	1	15
1989	17	1	16
1990	17	1	17
1991	17	1	18
1992	17	1	19
1993	16	1	20
1994	16	1	21

The CONDITION FREQUENCY REPORT gives an overall assessment of the piping system. It assigns a condition category to each pipe section from FAILED to EXCELLENT, then tabulates the number of pipe sections per category.

CONDITION FREQUENCY REPORT  
 Filename: SDIEGO  
 REPORT DATE: 1989.01.01 01:00:00  
 GPIPER (v. EMS 2.0)



The PRIORITY RANKING REPORT lists pipe sections in the order of urgency for maintenance. The rank is determined by a low CSI (high probability to leak because of corrosion) coupled with a high operating pressure. Finally, if this ranking factor is equal for two pipe sections, then the section with the higher Mission Priority is ranked first.

Page 1

PRIORITY RANKING REPORT  
 Filename: SDIEGO  
 REPORT DATE: 1989.01.01 01:00:00  
 GPIPER (v. EMS 2.0)

RANK	PIPE ID	SEC. #	CSI	OPER. PRES.	MISSION PRIORITY
1	AREA 5	08	15	15.000	1
2	AREA 5	15	15	15.000	1
3	AREA 5	05	20	15.000	2
4	AREA 5	11	20	15.000	5
5	AREA 5	10	20	15.000	6
6	AREA 5	12	20	15.000	6
7	AREA 5	06	20	15.000	7
8	AREA 5	09	20	15.000	8
9	AREA 5	16	21	15.000	2
10	AREA 5	18	41	15.000	1
11	AREA 5	07	48	15.000	1
12	AREA 5	13	53	15.000	2
13	AREA 5	14	53	15.000	2
14	AREA 5	19	57	15.000	4
15	AREA 5	01	59	15.000	2
16	AREA 5	02	59	15.000	2
17	AREA 5	03	61	15.000	9
18	AREA 5	04	62	15.000	9
19	AREA 5	17	76	15.000	2

The VALVE REPORT lists all valve data in the selected database.

Page 1

VALVE REPORT  
 Filename: H:\GPIPER\SDIEGO\SDIEGO  
 REPORT DATE: 1989.01.01 01:00:00  
 GPIPER (v. EMS 2.0)

PIPE SECTION ID	VALVE I.D.	VALVE TYPE	VALVE LOCATION
AREA 5 01	2/4		B/T SEC. 01,02
AREA 5 01	PV 101	plug	
AREA 5 01	PV 102	plug	
AREA 5 02	2/4		B/T SEC.01,02
AREA 5 02	?		B/T SEC.02,03
AREA 5 02	BV06		
AREA 5 02	BV101		
AREA 5 02	BV102		
AREA 5 02	BV103		
AREA 5 02	BV104		
AREA 5 02	BV105		
AREA 5 02	BV107		
AREA 5 02	BV108		
AREA 5 02	BV109		
AREA 5 02	BV110		
AREA 5 02	BV111		
AREA 5 02	BV112		
AREA 5 02	BV113		
AREA 5 02	BV114		
AREA 5 02	BV115		
AREA 5 03	3/1		GATE #6
AREA 5 03	?		BLDG. 86
AREA 5 04	3/1		GATE #6
AREA 5 04	4/1		BLDG.26 & KALBF
AREA 5 05	3/1		GATE #6
AREA 5 09	4/1		BLDG. 26
AREA 5 09	4/4		BLDG.16
AREA 5 09	4/7		BLDG.16
AREA 5 10	8/4		BLDG. 75
AREA 5 11	4/7		BLDG. 16
AREA 5 11	5/3		BLDG. 3040
AREA 5 13	5/3		B/T SEC.11,13
AREA 5 14	2/4		B/T SEC.01,SE
AREA 5 15	5/1		BLDG. 26
AREA 5 16	5/2		BLDG. 24
AREA 5 17	5/5		
AREA 5 18	5/10		
AREA 5 18	5/5		

The REPAIR REPORT lists all repair data in the selected database.

REPAIR REPORT  
 Filename: H:\GPIPER\SDIEGO\SDIEGO  
 REPORT DATE: 1989.01.01 01:00:00  
 GPIPER (v. EMS 2.0)

PIPE SECTION ID	REPAIR DATE	REPAIR ID	REPAIR COST	REPAIR TYPE	REPAIR LOCATION
AREA 5	02	1974.01.01	1	0.00	REPLACED PIPE
AREA 5	02	1980.01.01	4	0.00	
AREA 5	02	1982.02.02	1	0.00	
AREA 5	02	1982.02.02	2	0.00	
AREA 5	02	1982.02.02	3	0.00	
AREA 5	02	1982.02.02	4	0.00	
AREA 5	02	1982.02.02	5	0.00	
AREA 5	02	1982.02.02	6	0.00	
AREA 5	02	1982.02.02	7	0.00	
AREA 5	02	1982.02.02	8	0.00	
AREA 5	02	1982.02.02	9	0.00	
AREA 5	02	1982.02.02	10	0.00	
AREA 5	02	1983.06.30	1	0.00	
AREA 5	02	1983.06.30	2	0.00	
AREA 5	02	1983.06.30	3	0.00	
AREA 5	02	1983.06.30	4	0.00	
AREA 5	02	1983.06.30	5	0.00	
AREA 5	02	1983.06.30	7	0.00	
AREA 5	02	1983.06.30	8	0.00	
AREA 5	02	1983.06.30	9	0.00	
AREA 5	03	1975.10.04	1	0.00	REPLACED PIPE
AREA 5	04	1976.01.01	1	0.00	PIPE REPLACED
AREA 5	07	1966.01.01	1	0.00	REPLACEMENT
AREA 5	09	1944.11.01	1	0.00	REPLACED

The BAD RECORD REPORT will list any records having missing data for required fields in the PIPE DATABASE. The required fields are those that are needed to calculate a value in a report, e.g., the CSI of a pipe section.

BAD RECORD REPORT  
Filename: H:\GPIPER\SDIEGO\SDIEGO  
REPORT DATE: 1989.01.01 01:00:00  
GPIPER (v. EMS 2.0)

Report Conditions:  
Bad values in Date Installed, Wall Thickness,  
Operating Pressure, pH, or Resistivity.

PIPE SECTION ID	DATE INSTALLED	WALL THICKNESS	OPERATING PRESSURE	pH (SOIL)	RESISTIVITY (SOIL)
AREA 5 20	1988.06.01	0.1500	15.00	6.40	0

## APPENDIX B: Economic Analysis Reports

These sample reports use the data entered in the example in Chapter 5, DATA ANALYSIS PROGRAMS. This report computes the cost of an alternative, and then using the length of the pipe in the alternative data, computes the Equivalent Uniform Annual Cost Per Foot (EUAC/ft). This is useful for comparing the per-foot cost of different alternatives.

The Detail data analysis report lists the Present Value for each of the components.

ECON1 REPORT  
REPORT DATE: 1989.01.01 01:00:00

### PROJECTED COST ANALYSIS (DETAIL)

```

Section ID           :SECTION 1 AREA 5

Section Length      :   1000 feet
Interest Rate       :   8.00 %      Inflation Rate   :   4.00 %

Alternative         :  INSTALL NEW GAS PIPING
Life of Alternative :  20
M&R ACTIVITY        YEAR      COST($)      PRESENT VALUE($)

REMOVE ASPHALT      1989      25000.00      25000.00
EXCAVATE TRENCH     1989      50000.00      50000.00
INSTALL PIPE & BACKFILL 1989      45000.00      45000.00
PAVE TRENCH         1989      15000.00      15000.00
Total:              135000.00      135000.00

Initial Cost ($)    :              135000.00
Present Value ($)   :              135000.00
Equivalent Uniform Annual Cost (EUAC) :              13750.05
EUAC per Linear Foot :              13.75
    
```

The Summary data analysis report is for the same input as the Detail.

ECON1 REPORT  
REPORT DATE: 1989.01.01

01:00:00

PROJECTED COST ANALYSIS

(SUMMARY)

Section ID : SECTION 1 AREA 5  
Section Length : 1000 feet  
Interest Rate : 8.00 % Inflation Rate : 4.00 %  
Alternative : INSTALL NEW GAS PIPING  
Life of Alternative : 20  
Initial Cost (\$) : 135000.00  
Present Value (\$) : 135000.00  
Equivalent Uniform Annual Cost (EUAC) : 13750.05  
EUAC per Linear Foot : 13.75

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ATTN: DEH

ROK/US Combined Forces Command 96205  
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ATTN: Facilities Engineer 96343  
ATTN: DEH-Okinawa 96331

416th Engineer Command 60623  
ATTN: Facilities Engineer

US Military Academy 10996  
ATTN: Facilities Engineer

AMC - Dir., Inst., & Svcs.  
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FORSCOM Engineer, ATTN: Spt Det. 15071

HSC  
Walter Reed AMC 20307  
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Ft. Belvoir, VA 22060  
ATTN: Engr & Hsg Div  
Vint Hill Farms Station 22186  
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