MOBILE RADIO

PHOENIX-S
PHOENIX-SX
PSX-200

PROGRAMMING INSTRUCTIONS FOR USING TQ2310 PROGRAMMER

LBI-31262C

GENERAL ELECTRIC

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1.0 INTRODUCTION

This document describes operating instructions and procedures for programming the PHOENIX-S/SX (PHOENIX) Mobile radio with the Universal Radio Programmer. The Universal Radio Programmer is a suitcase containing a standard Panasonic 8K Hand Held Computer, Panasonic I/O Adapter, Panasonic Mini Printer, a General Electric Program Storage Module, a General Electric Data I/O Module, and a special cable adapter for connection to the PHOENIX radio. The Program Storage Module has eight sockets for up to eight programs (4K, 8K, or 16K EPROMS) each of which may be for a different type radio. The Data I/O module has a cable connector for direct connection to the radio and an EEPROM socket for out-of-the-radio EEPROM programming.

The PSX-200 model radio uses a serial load EEPROM which is programmed differently than the parallel load PROM used in the Phoenix models.

The serial load PROM can not be programmed outside of the radio in the I/O module like the parallel load PROM.

The programming software continues to allow writing the program to a prom in the I/O module but it must be a parallel address PROM. While the parallel PROM cannot be used in the radio it does store the program to be read back into the programmer for retrieval at a later date should it become necessary to do so.

Refer to the Panasonic Manuals and to the General Electric "Maintenance Manual Universal Radio Programmer", TQ2310 (19B234413G1) for general system instructions.

The Universal Radio Programmer uses a series of multiple choice, menu prompts to guide the user through a programming session. Selection of an item causes a new menu to be displayed until the operation to be performed has been defined.

When the operation has been defined, the Programmer switches from multiple choice menu prompts to fill-in-the-blanks type prompts guiding the user through the programming session.

The user may "freeze" (i.e. temporarily suspend) the current operation at any time by depressing the "STP/SPD" (stop/speed) key a second time. Action may be resumed by depressing the "STP/SPD" key a second time.

The user may change the speed of display operations by depressing the "STP/SPD" key and typing a number from 1 thru 9 (1 is slowest). Typing this number also resumes the operation in progress.

The user may abort the current operation at any time by depressing the CLEAR key.

2.0 PROGRAMMER I/O OPTIONS

The Universal Radio Programmer provides the capability to store and access PHOENIX radio program data in three media: The radio (actually an EEPROM in the radio), an EEPROM external to the radio, and a data file internal in the Programmer's battery sustained RAM memory. PHOENIX radio program-data may be retrieved (i.e. READ), modified or created, and stored (i.e. WRITTEN) back to any of the three media. COPY utility operations enable data transfer among these media.

Access to these media are via:

1. EEPROM Socket on the GE I/O module.
2. PHOENIX radio (via special cable to the Data I/O module).
3. PHOENIX File in the system's computer memory.

The programmer asks the operator for the INPUT device (i.e. READ FROM") and OUTPUT device (i.e. "WRITE TO") at appropriate stages in the various programming functions.

2.1 Direct Radio Programming

The usual sequence for field programming the PHOENIX radio is via direct connection to the radio. If the radio has been previously programmed, the normal sequence is to READ the current contents from the PHOENIX radio, PROGRAM/REVIEW the data, then WRITE the updated data back into the radio. If a radio has not been previously programmed the normal sequence is to program all new data, then write it to the radio. (See Section 10 for instructions for cabling and power connections to the radio).

2.2 EEPROM Socket

The user may elect to program EEPROMS using the EEPROM SOCKET on the Data I/O module. Programmed EEPROMS then could be installed in PHOENIX radios, or they may be

copied via the COPY operations into the radio, or saved for future use/ reference. EEPROM may be read and previewed, printed, reprogrammed, etc., in the EEPROM SOCKET the same as EEPROMS in the PHOENIX radios. (See Section 10 for EEPROM socket installation).

2.3 PHOENIX File

The Programmer file system can store a single copy of a PHOENIX radio's data in an internal file that remains intact as long as the Hand Held Computer batteries are not completely discharged, the unit is not powered off with the slightly hidden "all-off" switch in the back of the unit, or until the file data is modified or "overwritten". The Programmer file system can simultaneously store single copies of program data for each different radio: PHOENIX, DELTA, etc.

Data may be read and reviewed, printed, reprogrammed, etc., in the PHOENIX File the same as EEPROMs in the PHOENIX radios. Data may be copied from the File to PHOENIX radios or to EEPROMs in the external EEPROM SOCKET, and vice versa.

While the PHOENIX MOBILE program always reads from and writes to the file named: "PHOENIX MOBILE', the file name can be changed by the user if desired. Renaming the file prevents data from being overwritten and allows the file name to identify the customer, e.g. ACE PLUMBING. See Appendix B of this manual for additional information.

As described in Section 11 an optional Panasonic Programmable Memory (RAM) Peripheral can be added to increase file storage capacity.

3.0 GETTING STARTED

Refer to the Panasonic literature describing the Hand Held Computer system and system operations. These manuals provide excellent descriptions of the standard units, including the keyboard keys and display, and the "Primary Menu".

As indicated above, the system is "menu driven" where the user selects operations and options from menu items displayed on the LCD display. When the unit is initially powered "on", the PRIMARY menu usually will be displayed one line at a time, such as:

```
[ 1 = Calculator      ]
```

```
[ 2 = Clock/Controller ]
```

```
[ 3 = File System     ]
```

```
[ 4 = Run Snap Programs ]
```

```
[ 5 = PHOENIX-MOBILE  ]
```

```
[ 6 = DELTA-MOBILE    ]
```

```
[ 7 = SELF TEST       ]
```

```
[ 8 = (and so on ...) ]
```

If a menu other than the PRIMARY menu is being displayed, depressing the "CLEAR" key two times should result in the PRIMARY menu.

NOTE

A word of CAUTION is in order concerning the CLEAR key. The system is designed to be powered on/off without losing the "state" prior to power off. The unit further powers itself off after about a 10 minute period of no operator action. Therefore, DO NOT indiscrimately depress CLEAR a few times every time you power on the system as you may wipe out some of your work from an incomplete session.

"PHOENIX-MOBILE" is the selection for programming PHOENIX mobile radios. Entry into the PHOENIX-MOBILE program is via depressing the number (or letter) key displayed in front of the menu item: "PHOENIX-MOBILE". (Such as the number "5" key in the above example menu).

3.1 Data Entry

The Programmer in-so-far-as-possible uses multiple choice menu entries to minimize operator input errors. When a menu is displayed (one line at a time) the user must select only the number or letter shown at the start of the line before the "=". Any other key will cause the unit to "beep" and continue cycling thru the menu. (An exception is the CLEAR key that will terminate that selection.)

Normally, data entry other than menu selection consists of:

1. Typing a number (e.g. 163.300) followed by the "ENTER" key.
2. Typing a "Y" (for yes) or "N" (for no or none) to respond to "? (Y/N)" prompts.
3. Typing codes such as "NONE" or 2:30 etc.

The LEFT and RIGHT Arrow keys on the system keyboard move the flashing cursor indicator on the display to assist with data entry. The system will restrict cursor movements to the specified or implied field positions. While entering purely numeric entries, such as frequency data, the system allows only the numerals 0...9 and the decimal point. (If a decimal point already exists, the system further prohibits another. In the unlikely event that the decimal point is in the wrong place, type a number, such as "0" over the existing decimal point, then move the cursor to the desired position and retype the decimal point).

Many of the special keys and functions described in the Panasonic literature are not applicable while programming a radio.

DO NOT attempt to use the "HELP" key as described in the Panasonic literature during execution of the PHOENIX-MOBILE program. The "HELP" key for use in defining the function keys f1, f2, f3 (if desired) should be done prior to selecting the PHOENIX-MOBILE program.

The control keys C1, C2, C3, C4 are not defined for this application.

The ROTATE key has no definition during execution of the PHOENIX-MOBILE program.

4.0 SELECTING TYPE OF PHOENIX-MOBILE

When the user selects the PHOENIX-MOBILE program via the PRIMARY system menu the following message is briefly displayed requesting the user to choose one of models of the PHOENIX mobile radios:

```
┌ - - - - - - - - - - - - - - - ┐
  SELECT PHOENIX  RADIO TYPE
└ - - - - - - - - - - - - - - - ┘
```

followed by cycling a new menu:

```
┌ - - - - - - - - - - - - - - - ┐
  1 = PHOENIX - NO SCAN
└ - - - - - - - - - - - - - - - ┘

┌ - - - - - - - - - - - - - - - ┐
  2 = PHOENIX WITH SCAN
└ - - - - - - - - - - - - - - - ┘
```

Selecting PHOENIX - NO SCAN may cause another menu to be displayed to select among the types without SCAN via the cycling menu:

```
┌ - - - - - - - - - - - - - - - ┐
  1 = STANDARD - NO SCAN
└ - - - - - - - - - - - - - - - ┘
```

4.1 The STANDARD - NO SCAN is the standard PHOENIX mobile radio with two modes (A-Mode and B-Mode) with eight channels per mode.

4.2 The PHOENIX WITH SCAN is the Dual Priority Scan model with up to 16 channels. Selecting SCAN model via the above menu (i.e. typing "2") causes the message "COMPUTING" to be displayed on the LCD for about five or six seconds while the system initializes the channel data space.

5.0 PHOENIX-MOBILE FUNCTIONS DESCRIPTIONS

After the user selects the type of PHOENIX radio, the following message is briefly displayed requesting the user to select one of the several programmer functions:

```
┌ - - - - - - - - - - - - - - - ┐
  SELECT DESIRED OPERATION
└ - - - - - - - - - - - - - - - ┘
```

followed by cycling a new menu:

```
┌ - - - - - - - - - - - - - - - ┐
  1 = PRIMARY MENU
└ - - - - - - - - - - - - - - - ┘

┌ - - - - - - - - - - - - - - - ┐
  2 = PROGRAM/REVIEW
└ - - - - - - - - - - - - - - - ┘

┌ - - - - - - - - - - - - - - - ┐
  3 = PRINTOUT
└ - - - - - - - - - - - - - - - ┘

┌ - - - - - - - - - - - - - - - ┐
  4 = COPY - SINGLE
└ - - - - - - - - - - - - - - - ┘

┌ - - - - - - - - - - - - - - - ┐
  5 = COPY - MULTIPLE
└ - - - - - - - - - - - - - - - ┘

┌ - - - - - - - - - - - - - - - ┐
  6 = CONFIGURE:
└ - - - - - - - - - - - - - - - ┘
```

These are all of the operational functions of the Universal Radio Programmer associated with programming the PHOENIX mobile radio.

5.1 PRIMARY Menu

Typing key #1 returns the system to the PRIMARY menu discussed above. (This should be the last functional operation after completing a PROGRAM/REVIEW session.)

5.2 PROGRAM/REVIEW

PROGRAM/REVIEW is the operation for programming, modifying, and/or reviewing the various data required in the PHOENIX Radio including frequency selection, Channel Guard, CCT, etc. Section 6.0 of this document will describe the PROGRAM/REVIEW operations.

5.3 PRINTOUT

The PRINTOUT function enables the user to make a hard copy listing of the data stored in the Radio, the EEPROM Socket, or the PHOENIX-FILE. Whenever PRINTOUT is selected a "READ FROM" prompt asks the operator for the INPUT device via cycling the following menu:

```
READ FROM: 1 = EEPROM SOCKET
```

```
READ FROM: 2 = PHOENIX RADIO
```

```
READ FROM: 3 = PHOENIX FILE
```

Selecting, for example, the EEPROM socket (key #1) results in a display of

```
READ FROM: EEPROM SOCKET
```

5.3.1 If the A/B Mode type of radio was selected the system displays a message:

```
  --READING
```

5.3.2 If an I/O error of any type occurs in the "READ FROM" procedure, the entire sequence is repeated. Of course, the error (or normal) sequence may be stopped by depressing the CLEAR key (one time).

5.3.3 If the user selects either the EEPROM SOCKET or the PHOENIX RADIO, the system will request frequency range information necessary to compute the correct frequencies from the radio formatted data.

The system will briefly display the message:

```
SELECT FREQ. RANGE
```

and present a selection menu of the possible options:

```
SELECT 1 = HIGH BAND
```

```
SELECT 2 = UHF
```

After selecting the Range, and if the STANDARD A/B type was selected, the user is prompted to select the band via the prompt.

```
SELECT NARROW OR WIDE BAND
```

This is followed by a cycling menu of:

```
SELECT 1 = NARROW
```

```
SELECT 2 = WIDE
```

5.3.4.1 If the user selected HIGH BAND a further range specification is required.

5.3.4.1.1 If HIGH-BAND NARROW-BAND was selected, the systems ask for high-split or low-split via the following cycling menu:

```
1 = 150-162 MHz SPLIT
```

```
2 = 162-174 MHz SPLIT
```

5.3.4.1.2 If HIGH-BAND WIDE-BAND was selected, the systems ask for high-split or low-split by THE CYCLING MENU:

```
1 = 136-153 MHz SPLIT
```

```
2 = 150-174 MHz SPLIT
```

5.3.5 The system next prompts for reference oscillator frequency via the prompt:

```
STD. 13.2 MHz OSC ? (Y/N)
```

The normal response is "Y" for YES. If however, the radio has the alternate 13.8 MHz oscillator, the user would respond with "N".

V09 STANDARD A/B MODE PHOENIX
UHF-WIDE BAND
FRI 10:07:03 & NOV 18 1983

A	TX-FREQ	TX-CG	CCT	RX-FREQ	RX-CG
1	451.8450	NONE	NONE	456.7500	NONE
2	OPEN	NONE	NONE	456.8400	NONE
3	OPEN	NONE	NONE	456.9300	NONE
4	OPEN	NONE	NONE	457.1100	NONE
5	465.3900	NONE	NONE	465.3900	NONE
6	465.4200	NONE	NONE	465.4200	NONE
7	465.4500	NONE	NONE	465.4500	NONE
8	465.4800	NONE	NONE	465.4800	NONE

B	TX-FREQ	TX-CG	CCT	RX-FREQ	RX-CG
1	OPEN	NONE	NONE	457.1400	NONE
2	OPEN	NONE	NONE	457.1700	NONE
3	452.2000	NONE	NONE	OPEN	NONE
4	462.1500	NONE	NONE	466.0800	NONE
5	462.1800	NONE	NONE	466.1100	NONE
6	462.2100	NONE	NONE	466.1400	NONE
7	OPEN	NONE	NONE	OPEN	NONE
8	OPEN	NONE	NONE	OPEN	NONE

*S INDICATES STE ENABLED

V09 PHOENIX WITH SCAN
UHF-WIDE BAND
FRI 11:01:22 & NOV 18 1983

#	TX-FREQ	TX-CG	CCT	RX-FREQ	RX-CG
1	466.6000	97.40	2:30	466.6000	97.40
2	467.0000	67.00*S	2:30	467.0000	NONE
3	468.0000	NONE	2:30	468.0000	97.40*S
4	OPEN	NONE	NONE	466.6000	97.40
5	OPEN	NONE	NONE	OPEN	NONE
6	OPEN	NONE	NONE	OPEN	NONE
7	OPEN	NONE	NONE	OPEN	NONE
8	OPEN	NONE	NONE	OPEN	NONE
	CHANNELS 9-16				
9	OPEN	NONE	NONE	OPEN	NONE
0	OPEN	NONE	NONE	OPEN	NONE
1	OPEN	NONE	NONE	OPEN	NONE
2	OPEN	NONE	NONE	OPEN	NONE
3	OPEN	NONE	NONE	OPEN	NONE
4	OPEN	NONE	NONE	OPEN	NONE
5	OPEN	NONE	NONE	OPEN	NONE
6	OPEN	NONE	NONE	OPEN	NONE

PRIORITY 1 = FIXED PRIORITY CHAN 1
*S INDICATES STE ENABLED

EEPROM HEX

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	A	9	0	0	B	0	0	0	8	F	F	F	F	0	0
1	0	0	2	F	8	3	0	0	0	D	F	F	F	F	0	0
2	0	A	5	0	A	2	0	0	0	A	5	0	4	8	0	0
3	0	0	B	E	B	2	0	0	0	8	F	F	F	F	0	0
4	0	A	5	0	0	3	0	0	0	A	5	0	6	8	0	0
5	0	8	F	F	F	F	0	0	0	8	F	F	F	F	0	0
6	0	A	5	0	6	3	0	0	0	9	F	F	F	F	0	0
7	0	8	F	F	F	F	0	0	0	8	A	1	0	9	0	0
8	0	A	5	0	2	8	0	0	0	A	A	0	8	1	0	0
9	0	8	F	F	F	F	0	0	0	0	0	F	A	9	0	0
A	0	A	9	0	A	A	0	0	0	A	A	0	A	1	0	0
B	0	0	2	F	2	3	0	0	0	0	0	F	C	9	0	0
C	0	A	9	0	C	A	0	0	0	A	A	0	C	1	0	0
D	0	0	2	F	4	3	0	0	0	0	0	F	E	9	0	0
E	0	9	F	3	4	0	0	0	0	8	F	F	F	F	0	0
F	0	F	2	2	4	B	0	0	0	8	F	F	F	F	0	0

EEPROM HEX

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	8	F	F	F	F	0	0	0	8	F	F	F	F	0	0
1	0	9	F	3	0	A	1	2	0	C	3	2	0	9	1	2
2	0	9	0	4	0	0	0	8	0	C	3	2	0	B	1	0
3	0	9	0	4	0	9	1	A	0	C	4	2	0	8	0	0
4	0	9	F	3	0	A	1	2	0	8	F	F	F	F	0	0
5	0	8	F	F	F	F	0	0	0	8	F	F	F	F	0	0
6	0	8	F	F	F	F	0	0	0	8	F	F	F	F	0	0
7	0	8	F	F	F	F	0	0	0	8	F	F	F	F	0	0
8	3	8	F	F	F	F	0	0	0	8	F	F	F	F	0	0
9	0	8	F	F	F	F	0	0	0	8	F	F	F	F	0	0
A	0	8	F	F	F	F	0	0	0	8	F	F	F	F	0	0
B	0	8	F	F	F	F	0	0	0	8	F	F	F	F	0	0
C	0	8	F	F	F	F	0	0	0	8	F	F	F	F	0	0
D	0	8	F	F	F	F	0	0	0	8	F	F	F	F	0	0
E	0	8	F	F	F	F	0	0	0	8	F	F	F	F	0	0
F	0	8	F	F	F	F	0	0	4	8	F	F	F	F	0	0

5.3.6 If the user selects the PHOENIX-FILE as input, the Range information may have already been stored with the file, hence the system would not prompt for it. (The PHOENIX FILE input may require Range selection if not previously edited. The system knows when to prompt for these data.)

5.3.7 Printout Descriptions

The first line identifies the PHOENIX programmer software version number and the type of PHOENIX mobile radio.

The second line shows the range and band information.

The third line shows the current time and date.

> **NOTE**
>
> If the DATE/TIME data are incorrect, see the Panasonic instructions and follow the routine in "CLOCK/CONTROLLER" (menu item 2 in the PRIMARY menu) to reset the date and time.

A header identifies the fields in the listing.

Channel Number is along left side under the "A" or "B" mode designators for the "A/B MODE" radio type.

TX-FREQ = transmit frequency (in MHz)

TX-CG = the transmit Channel Guard digital code or tone frequency. Tone Channel Guard codes may be followed by "*S" indicating that "STE" is enabled for this channel. (The "*S" will appear on both TX and RX tone Channel Guard entries even through STE is enabled/disabled only on a per channel basis).

CCT = the Carrier Control Timer for that channel (min:secs)

RX-FREQ = Receive frequency (in MHz)

RX-CG = Receive Channel Guard digital code or tone frequency. Tone Channel Guard codes may be followed by "*S" indicating that "STE" is enabled for this channel. (A discussion of the format of Channel Guard is presented later in the PROGRAM/REVIEW Section 6.0 of this document.)

If any frequency on any channel is not programmed, the printout shows this as "OPEN". If any other entry is absent (i.e. not programmed) the printout shows "NONE".

Note that due to printer width limitations, channels 9 thru 16 of the SCAN and 16 Channel types are shown as 9 thru 6 after the line: "CHANNELS 9 - 16".

At the completion of the above described printout the user may obtain a HEX dump of the data by typing "Y" to the prompt:

```
HEX DUMP ? (Y/N)
```

5.4 COPY-Single

This is a utility function providing the capability to copy radio formatted data among the above mentioned media (including "from" and "to" the same device).

Selecting the COPY-SINGLE key (key #4) prompts the operator to select an input or COPY-FROM device via the following cycling menu:

```
READ FROM: 1 = EEPROM SOCKET
```

```
READ FROM: 2 = PHOENIX RADIO
```

```
READ FROM: 3 = PHOENIX FILE
```

Selecting for example, the EEPROM socket (key #1) results in a display of

```
READ FROM: EEPROM SOCKET
```

5.4.1 If the STANDARD A/B Mode type of radio was selected the system displays a message:

```
READING
```

5.4.2 If an I/O error of any type occurs in the "READ FROM" procedure, the entire sequence is repeated. Of course, the error (or normal) sequence may be stopped by depressing the CLEAR key (one time).

5.4.3 Following a successful "READ-FROM" operation the system prompts the operator for a copy-TO device with:

```
┌ - - - - - - - - - - - - - - - - ┐
| WRITE TO: 1 = EEPROM SOCKET     |
└ - - - - - - - - - - - - - - - - ┘

┌ - - - - - - - - - - - - - - - - ┐
| WRITE TO: 2 = PHOENIX RADIO     |
└ - - - - - - - - - - - - - - - - ┘

┌ - - - - - - - - - - - - - - - - ┐
| WRITE TO: 3 = PHOENIX FILE      |
└ - - - - - - - - - - - - - - - - ┘
```

Selecting for example the PHOENIX RADIO (key #2) results in a display of one of the following:

5.4.3.1 If the STANDARD A/B type of radio was selected the system displays a message:

```
┌ - - - - - - - - - - - - - - - - ┐
| WRITING                         |
└ - - - - - - - - - - - - - - - - ┘
```

Followed by the message:

```
┌ - - - - - - - - - - - - - - - - ┐
| VERIFY READING                  |
└ - - - - - - - - - - - - - - - - ┘
```

5.4.3.2 If an I/O error of any type occurs in the "WRITE TO" procedure, the entire sequence is repeated. Of course, the error (or normal) sequence may be stopped by depressing the CLEAR key (one time).

5.5 COPY-Multiple

Copy-Multiple is much like copy-single except the WRITE operation is repeated as many times as the operator responds "Y" to the prompt:

```
┌ - - - - - - - - - - - - - - - - ┐
| AGAIN ? (Y/N)                   |
└ - - - - - - - - - - - - - - - - ┘
```

5.6 CONFIGURE

CONFIGURE is used to select MULTI-MODE PHOENIX radio type. Selecting CONFIGURE (key #6) prompts you to enter a configuration code; enter ":M:M:P.C" (use '2ND SHIFT' key for :) the screen should now look like this:

```
┌ - - - - - - - - - - - - - - - - ┐
| CONFIGURE CODE::M:M:P.C         |
└ - - - - - - - - - - - - - - - - ┘
```

Then press the 'ENTER' key. You may now go to PROGRAM REVIEW to program the radio.

5.6.1 NOTES ON MULTI-MODE PROGRAMMING

When configured for MULTI-MODE, you are asked for the number of MODES desired (see section 6.4.1); each mode is programmed in the same manner as a single mode radio.

When writing to RADIO the radio must contain as many EEPROMS as the number of MODES selected.

When writing to EEPROM, you will be prompted for each EEPROM as it is required.

6.0 PROGRAM/REVIEW

PROGRAM/REVIEW is the "editor" that allows the user to program or review the various options in a PHOENIX mobile radio. The user may review/modify data already existing in either of the three "devices" discussed previously, or select totally new data for a radio that is fresh from the factory and has never been programmed.

The PROGRAM/REVIEW function may be thought of as a fixed sequence of:

1. Selecting OLD data (existing in the FILE, EEPROM, or RADIO) or NEW data (that does not exist in any of the "devices").
   a. Selecting the READ FROM device if OLD data is specified.
2. Selecting the range for the target radio. (If not already implied by the data in an existing file.)
3. Selecting the setup options: Channel Guard, CCT, STE, and Specials.
4. Reviewing and/or entering desired data.
5. Selecting a WRITE TO device.

This sequence cannot be altered by the user except by depressing the CLEAR key which aborts the PROGRAM/REVIEW function and returns to the "SELECT OPERATIONS" menu. However, extreme caution should be used with the CLEAR key as it could destroy all the data of your edit session. Prior to actually entering the data, the CLEAR key is safe to use at your option. Likewise if you only review data the CLEAR key is safe. If you determine that you selected undesired options as per step #3 above, the CLEAR key is the only way to restart.

Several keys have special meanings for the PROGRAM/REVIEW operations.

1. The "UP" arrow is the same as the "ENTER" key except when selecting a channel number, where the current number is decremented by 1 and entered.
2. The "DOWN" arrow is:
   1. Same as the "ENTER" key, except in channel selection where the current channel is incremented by 1 and entered.
   2. The same as typing "Y" for yes.

      Thus the "DOWN" arrow may be used for all entries after setup for reviewing existing data.
   3. As previously described "Y" is for yes to a "(Y/N)" prompt.
   4. Also as already discussed "N" is for no for a "(Y/N)" prompt. "N" also may be used as an abreviation for "NONE" for entering (no) Channel Guard or selecting "no Radio CCT".

6.1 Select Old/New

The first choice is to elect to read OLD data from one of the three "devices", or to start from scratch and create all NEW data. The following menu is displayed as soon as PROGRAM/REVIEW is selected.

```
┌ - - - - - - - - - - - - - - - ┐
  1 = OLD DATA
└ - - - - - - - - - - - - - - - ┘

┌ - - - - - - - - - - - - - - - ┐
  2 = NEW DATA
└ - - - - - - - - - - - - - - - ┘
```

If NEW DATA are selected the system data buffer is zeroed and initialized.

If OLD DATA is selected, the system prompts for the user to select a READ FROM device via the following menu sequence:

```
┌ - - - - - - - - - - - - - - - - - - ┐
  READ FROM: 1 = EEPROM SOCKET
└ - - - - - - - - - - - - - - - - - - ┘

┌ - - - - - - - - - - - - - - - - - - ┐
  READ FROM: 2 = PHOENIX RADIO
└ - - - - - - - - - - - - - - - - - - ┘

┌ - - - - - - - - - - - - - - - - - - ┐
  READ FROM: 3 = PHOENIX FILE
└ - - - - - - - - - - - - - - - - - - ┘
```

Selecting for example the EEPROM socket (key #1) results in a display of

```
┌ - - - - - - - - - - - - - - - - - - ┐
  READ FROM: EEPROM SOCKET
└ - - - - - - - - - - - - - - - - - - ┘
```

6.1.1 If the STANDARD A/B Mode type of radio was selected the system displays a message:

```
┌ - - - - - - - - - - - - - - - - - - ┐
  --READING
└ - - - - - - - - - - - - - - - - - - ┘
```

6.1.2 If an I/O error of any type occurs in the "Read From" procedure, the entire sequence is repeated. Of course, the error (or normal) sequence may be stopped by depressing the CLEAR key (one time).

6.1.3 The system will repeat the READ-FROM sequence until data are read without errors from "some" selected device.

6.2 Select Frequency Range

If the user has selected either the EEPROM SOCKET or the PHOENIX RADIO the system will request frequency range information necessary to compute the correct frequencies from the radio formatted data.

The system will briefly display the message:

```
┌ - - - - - - - - - - - - - - - - - - ┐
  SELECT FREQ. RANGE
└ - - - - - - - - - - - - - - - - - - ┘
```

and present a selection menu of the possible options:

```
┌ - - - - - - - - - - - - - - - - - - ┐
  SELECT 1 = HIGH BAND
└ - - - - - - - - - - - - - - - - - - ┘

┌ - - - - - - - - - - - - - - - - - - ┐
  SELECT 2 = UHF
└ - - - - - - - - - - - - - - - - - - ┘
```

After selecting the range the user is prompted to select the band via the prompt:

```
┌ - - - - - - - - - - - - - - - - - - ┐
  SELECT NARROW OR WIDE BAND
└ - - - - - - - - - - - - - - - - - - ┘
```

This is followed by a cycling menu of:

```
┌ - - - - - - - - - - - - - - - - - - ┐
  SELECT 1 = NARROW
└ - - - - - - - - - - - - - - - - - - ┘

┌ - - - - - - - - - - - - - - - - - - ┐
  SELECT 2 = WIDE
└ - - - - - - - - - - - - - - - - - - ┘
```

6.2.1 If the user selected HIGH BAND a further range specification is required.

6.2.1.1 If HIGH BAND NARROW BAND was selected, the systems ask for high-split or low-split via the following cycling menu:

```
[ 1 = 150-162 MHz SPLIT ]
```

```
[ 2 = 162-174 MHz SPLIT ]
```

6.2.1.2 If HIGH BAND WIDE BAND was selected, the systems ask for high-split or low-split by THE CYCLING MENU:

```
[ 1 = 136-153 MHz SPLIT ]
```

```
[ 2 = 150-174 MHz SPLIT ]
```

6.3 If the user selects the PHOENIX-FILE as input, the range information may have already been stored with the file hence the system would not prompt for it. (The PHOENIX FILE input may require range selection if not previously edited. The system knows when to prompt for these data).

6.4 After range and band have been selected, and if OLD DATA was selected, the user has the option of selecting a printout via the prompt:

```
[ PRINTOUT ? (Y/N) ]
```

If selected, the radio data will be printed as per the format described in section 5.3 above for the PRINTOUT menu item.

If the operator is not really sure of the range information he should request a PRINTOUT to verify reasonable looking RX-Freq. (The TX-Freq will most likely be OK. However, the RX-Freq. data will be out of range and incorrect if the incorrect Range information are input by the operator.)

6.4.1 The following question appears only if CONFIGURED for MULTI-MODE

```
[ ENTER #MODES IN RADIO=x ]
```

Where 'x' is the number of modes desired (each mode contains 16 channels.

6.5 Select PROGRAM/REVIEW Options

The user is presented with a number of options prior to data review/entry processes. These selections are extremely useful and should be done with care as will be described below. (Careless options selection also can be extremely costly in user programming time).

6.5.1 Channel Guard Option

The following prompt enables/disables the Channel Guard option.

```
[ CHANNEL GUARD DESIRED (Y/N) ]
```

Responding with "N" (for NO) will:

1. Cause the system to automatically scan thru all channels and delete all existing Channel Guard codes (tone and digital) and STE enable codes.
2. Block the option (during this session) to insert Channel Guard codes.
3. Prevent unwanted CHANNEL GUARD prompts later in the PROGRAM/REVIEW session.

A "Y" (for yes) will:

1. Allow user to select Channel Guard (tone) for each Tx and Rx frequency during the remainder of the session.
2. Promotes a further prompt for Digital CG if the STANDARD A/B MODE PHOENIX was selected:

```
[ DIGITAL CG ? (Y/N) ]
```

A "N" (for NO) in response to the DIGITAL CG prompt will:

1. Cause the system to automatically scan thru all channels and delete all existing Digital Channel Guard codes.
2. Prevent the user from entering any type Digital Channel Guard during the edit/programming session.
3. Block the option of selecting Inverted Digital Channel Guard and Unique Digital Channel Guard.

A "Y" (for YES) in response to the Digital CG prompt allows:

1. The user to enter Digital Channel Guard during the edit/programming session.
2. The user the option to select Inverted Digital Channel Guard option.
3. The user the option to select Unique Digital Channel Guard option.

NOTE

Digital Channel Guard is available only on the STANDARD A/B MODE PHOENIX model.

3. Cause the system to prompt for the desired STE (SQUELCH TAIL ELIMINATION) option by briefly displaying the following message:

```
SELECT STE OPTION
```

followed by the cycling menu:

```
1 = DISABLE STE-ALL CHAN'S
```

```
2 = ENABLE STE-ALL CHAN'S
```

```
3 = SELECT STE FOR EACH CHAN
```

1. Selecting "1" disables all STE on all programmed channels and does not allow the user the option to enable STE during the current session.
2. Selecting "2" enables all STE on all programmed channels and does not allow the user the option to disable STE during the current session.
3. Selecting "3" leaves existing STE as is, and requires the user to enable/disable STE on each channel processed during PROGRAM/REVIEW.

6.6 Special Options

WARNING

ANSWER THE NEXT PROMPT WITH CARE.

After the Channel Guard selection options, (and STE if applicable) the following prompts for more or less restricted or unusual options:

```
NORMAL OPTIONS ? (Y/N)
```

The usual answer is "Y" (for yes) which prevents the user from:

1. Inputting Inverted Digital Channel Guard.
2. Inputting Unique Digital Channel Guard codes (See Table 1 Channel Guard codes with "*").
3. Having the option of selecting the alternate oscillator (See special warning below).

A "N" (for NO) further prompts the user to individually select those options prevented by a "Y" response.

6.6.1 Inverted Digital Channel Guard

NOTE

Radios using the 19D901205G1-3 board must use Inverted Digital Channel Guard.

Inverted Digital Channel Guard option is selected by the prompt:

```
INVERTED DCG ? (Y/N)
```

(Note that Inverted Digital Channel Guard is available only on the STANDARD A/B MODE PHOENIX.)

6.6.2 Unique Digital Channel Guard

Unique Digital Channel Guard is selected by the prompt:

```
RESTRICTED DCG ? (Y/N)
```

Unique codes are marked with "*" in the Table 1 CG codes.

(Note that Unique Digital Channel Guard is available only on the STANDARD A/B MODE PHOENIX.)

6.6.3. 3.125 kHz Reference (Minimum Channel Separation)

```
ALLOW 3.125 kHz REF ? (Y/N)
```

The normal response is NO because using this 3.125 kHz may cause problems with the PHOENIX radio and should be avoided if possible.

A YES allows the system to use a reference divisor of 3.125 kHz in determining the validity of an input frequency. Normally the 3.125 kHz will not be used even if allowed because the standard references will be tried first.

If allowed, every time the system does use this reference, the system will beep and allow the user to reselect another frequency.

6.6.4 Alternate 13.8 MHz Reference Oscillator

(The final non-normal option.)

```
┌ - - - - - - - - - - - - - - - - ┐
  STD. 13.2 MHz OSC ? (Y/N)
└ - - - - - - - - - - - - - - - - ┘
```

SHOULD ALWAYS BE ANSWERED YES

except in the unlikely situation that GE has built for you a special PHOENIX radio with the 13.8 MHz reference oscillator because of very unusual interference conditions that causes the NORMAL 13.2 MHz reference oscillator to be unusable.

NOTE

The alternate oscillator is a hardware crystal change, not a simple option selection.

6.7 Select Carrier Control Timer (CCT)

The PHOENIX radio has the option for selecting a CCT for the radio and enabling this CCT on any channel on a channel by channel basis.

The following prompt allows the user to allow/disallow CCT:

```
┌ - - - - - - - - - - - - - - - - ┐
  ENTER CCT FOR RADIO = nnnn
└ - - - - - - - - - - - - - - - - ┘
```

where "nnnn" may be "NONE", "N", 0:30, 1:00 ...4:00. The system displays the current value of CCT during this prompt, or "NONE" if new data.

If the user enters "NONE" or "N" the system deletes all CCT on all channels and does not allow the user the option of enabling CCT on any channel during the current edit session.

If any valid time is entered the system responds with the prompt

```
┌ - - - - - - - - - - - - - - - - ┐
  ENABLE ALL CCT' ? (Y/N)
└ - - - - - - - - - - - - - - - - ┘
```

A "Y" will enable the CCT for all previously programmed channels and enable CCT automatically on all channels programmed during this session without further interaction with the user.

A "N" requires the user to selectively enable/disable CCT on each channel PROGRAMMED/REVIEWED during this session. Any channel not reviewed will not be effected.

6.8 Main Data Entry/Review Loop

Following selection of the setup options, the system begins the main loop sequence of:

1. Channel Number selection, then for each channel:
    1. Transmit Frequency.
    2. Transmit Channel Guard (if enabled).
    3. Tx Carrier Control Timer (CCT) (if enabled) and not automatically set as selected above).
    4. Receive Frequency.
    5. Receive Channel Guard (if enabled).
    6. STE Selection (If either Tx or Rx has Tone Channel Guard, and if STE is not automatically set as selected above).
2. The option to stop here (More ? (Y/N)).
3. Select the SCAN option for this mode if PHOENIX WITH SCAN was selected.

6.8.1 Selecting Channel Number

The user is prompted to input the channel number via:

```
┌ - - - - - - - - - - - - - - - - ┐
  ENTER CHANNEL NUMBER:
└ - - - - - - - - - - - - - - - - ┘
```

with the BLINKING CURSOR positioned after the ":" as marked on the diagram above by the " " on the bottom box line. The user has a number of options to enter channel numbers:

1. Type the "ENTER" key to leave the channel number unchanged (e.g. to rework the current channel data). If this is the first time thru the loop typing the "ENTER" key defaults to channel "1".
2. The user may enter any valid channel number by typing in one or two digits in any combination or order followed by the "ENTER" key. Recall that the STANDARD PHOENIX radio has an "A" mode and a "B" mode, each with channels 1 thru 8. Therefore valid entries may be such as:

   A1, 1A, A, B, 7, B4, 3B, etc.

   If the channel number data are not acceptable, the system will repeat the prompt for channel number.
3. The user may type UP arrow key to select the channel previous to the current channel (e.g. moving from A3 to A2, or from B1 to A8, etc).
4. The user may type the DOWN arrow key to move to the next successive channel number (e.g. moving from A4 to A5, or from A8 to B1, etc).

6.8.2 Transmit Frequency Entries

The following is a sample prompt for TX-Freq input:

```
┌ - - - - - - - - - - - - - - - ┐
  C: 1-m TX-FREQ:xxx.xxxxMH
└ - - - - - - - - -↑- - - - - - ┘
```

where:

- "1" shows channel number "1", the "m" is mode. (the "M" will not be shown if MULTIMODE and only one mode was selected).

- "TX-FREQ" indicates transmit frequency.

- "xxx.xxxxxMH" designates current TX frequency (in MHz) for the channel.

The flashing cursor is positioned over the 1st "x" as marked on the above diagram with the "↑" on the bottom box line.

The user has a number of input options. He may:

1. Type the "ENTER" or DOWN ARROW key to leave the entry unchanged.
2. Use RIGHT and LEFT arrows to position the cursor to modify any digit shown and then type "ENTER" or DOWN arrow key.
3. Retype the entire xxx.xxxxx frequency followed by the "ENTER" or DOWN arrow key.
4. Type "000.00000" to blank (i.e. "unprogram") this Tx frequency on this channel.

> **NOTE**
>
> A blank channel frequency always shows up on the LCD as "000.00000MH".

The system checks all entries, even those already apparently programmed, for range violations and invalid frequencies.

6.8.2.1 If the entry is out of range for the specified radio Range the system will "BEEP" and the specified Range is briefly displayed, such as:

```
┌ - - - - - - - - - - - - - - - ┐
  RANGE: 450.000-470.000
└ - - - - - - - - - - - - - - - ┘
```

Then, the input entry (containing the out-of-range value) will be repeated. (See also the section on "Special Frequency Input Features").

6.8.2.2 If the entry is an invalid frequency (i.e. does not convert to an integer when divided by a reference code, etc.), the system "BEEPS" and briefly displays the following message:

```
┌ - - - - - - - - - - - - - - - ┐
  INVALID FREQUENCY
└ - - - - - - - - - - - - - - - ┘
```

and the input entry display (with the "invalid" data) is repeated.

> **WARNING**
>
> The programmer system's rules for invalid frequencies may not agree at all with the FCC or other regulatory agency rules for invalid or illegal frequencies. FREQUENCY SELECTION IS THE USERS RESPONSIBILITY.

6.8.2.3 Transmit Channel Guard Entry

Following entry of the TX Frequency (if nonblank) and if the

Channel Guard option was selected, a prompt similiar to the following is displayed showing the current Channel Guard for this TX channel:

```
C: 1-m TX-CG:xxxxx
```

where "xxxxx" is symbolic of the current CG and may be:

1. "NONE" = currently no TX CG.
2. Tone CG such as 67.0 210.7, etc.
3. Digital CG code such as 023, 703, etc.
4. If INVERTED Digital Channel Guard was enabled during setup (option selections), the display for Digital CG also always shows the corresponding Inverted Digital CG equivalent code to the right of the "/" in the display. Note that for every normal Digital Channel Guard input code there exists a corresponding Inverted Digital CG input code. The Hex codes are identical in the programmer and in the PHOENIX Radio. The following is a sample display with Inverted Digital CG enabled:

```
C: 1-m TX-CG:023   / 047
```

where "023" is the normal DCG and "047" is the corresponding Inverted DCG equivalent.

The flashing cursor is initially pointing to the first digit of the code. Note that the "current" value always disappears when the user types anything.

The user has several data entry options:

1. To leave the entry unchanged, type the ENTER or DOWN arrow key.
2. To select a tone CG, type the tone frequency followed by the ENTER or DOWN arrow key. A sample input might be 67.0, 210.7, etc.
3. To enter a normal Digital CG, type the three digit code, such as 023, 654, etc. followed by the ENTER or DOWN arrow key.
4. To enter an INVERTED Digital CG code, precede the code with an "I", such as "I023", "I047", "I172", etc. followed by ENTER or DOWN arrow key.
5. The unique codes are entered the same as other Digital CG codes. Note that the system "BEEPS" and briefly issues the following WARNING message on every entry of Unique DCG. However, the data are accepted by the system after this warning sequence.

```
RESTRICTED
```

If the user types a code unknown to the system (i.e. not in Table 1) or if the user attempts to enter a type code not selected during setup (option selections) the system "beeps" and briefly displays the message:

```
BAD CODE
```

then repeats the initial CG prompt with the INITIAL (old) data.

6.8.2.4 Carrier Control Timer (CCT) Entry

The current value of the CCT for the current channel is displayed in the following prompt.

```
C: 1-m TX-CCT=x:xx OK?(Y/N)
```

where x:xx is "NONE" or the CCT selected above. A "Y" will leave the CCT flag as is. A "N" will enable CCT if disabled, and vice-versa.

6.8.2.5 Receive Frequency Entry

Receive Frequency data entry follows the same rules/procedures as for Transmit Frequency. The prompts are almost the same except "RX" replaces "TX" as shown in a sample below:

```
C: 1-m RX-FREQ:xxx.xxxxxMH
```

6.8.2.6 Receive Channel Guard Entry

Receive CG data entry follows the same rules/procedures as for Transmit CG. The prompts are almost the same except "RX" replaces "TX" as shown in a sample below:

```
C: 1-m RX-CG:xxxxx
```

6.8.2.7 Select STE for this Channel

If STE not automatically enabled or disabled by the system (as selected during options selection) and if either the TX or RX has Tone Channel Guard then enable/disable as desired via:

```
C: n-m STE DISABLED OK?(Y/N)
```

OR

```
C: n-m STE ENABLED OK?(Y/N)
```

6.8.3 Stop Option (within each mode)

After processing both TX and RX options, the system prompts the operator to COMPLETE this mode, or to continue with another channel via the prompt:

```
MORE ? (Y/N)
```

A "Y" or DOWN arrow response causes the system to repeat the loop beginning with the ENTER CHANNEL NUMBER prompt described above.

A "N" (for NO) ends the session.

6.8.4 If PHOENIX WITH SCAN is the subject type, the system prompts for the PRIORITY 1 option selection via briefly displaying the message:

```
SELECT PSLM PRIORITY MODE
```

followed by the following cycling menu:

```
1 = FRONT PROGRAMMABLE
```

```
2 = FIXED PRIORITY
```

```
3 = SELECTED CHANNEL
```

6.8.4.1 If the user selects "2" for Fixed Priority, the system prompts for the fixed priority channel number via:

```
ENTER CHANNEL NUMBER:
```

6.8.9 Post Edit Printout Option

Following the interactive Editing session the system allows a post edit printout via the prompt:

```
PRINTOUT ? (Y/N)
```

If "Y" or DOWN arrow key is typed the system prints the channel data as discussed in the PRINTOUT, Section 4 above.

6.10 Finally the user ends the PROGRAM/REVIEW operation by selecting the output media via the following cycling menu:

```
WRITE TO: 1 = EEPROM SOCKET
```

```
WRITE TO: 2 = PHOENIX RADIO
```

```
WRITE TO: 3 = PHOENIX FILE
```

Selecting for example the PHOENIX File (key #3) results in a display of

```
WRITE TO: PHOENIX FILE
```

Note that system will not exit this loop until the data has been WRITTEN without errors. If an error occurs the system will prompt for the "WRITE TO" device again and again.

NOTE

DO NOT depress the CLEAR key at this point in the PROGRAM/REVIEW session to clear an error condition else you will loose all the input just completed. Of course, if you were only REVIEWING the data, the CLEAR key will do no harm.

The File should always be an option for an error free WRITE TO device, but recall that previous file data will be overwritten.

(See Section 11 for renaming a file to protect from overwrite).

7.0 SPECIAL FREQUENCY INPUT FEATURES

In the event the user wishes to stretch the PHOENIX slightly outside of the normal allowable frequency range, the user can force the programmer to accept a VALID frequency of any value by using the "Insert" key in lieu of the ENTER or DOWN arrow keys. The system will still "BEEP" and show you the proper range, but will accept any VALID value. Of course the radio may not operate properly or even at all on any out-of-range frequency so programmed. (A "VALID" frequency is one that does not result in the "INVALID" message during frequency selections).

8.0 ERROR CODES/MESSAGES/CONDITIONS

The Programmer system will display a number of error messages when certain error conditions are encountered.

1. NO SPACE

   This message may occur if somehow there is not enough unused RAM memory to execute this program. This could result from other uses of the Hand Held Computer such as with the FILE system, or perhaps with basic. The PHOENIX MOBILE will not attempt to execute until you provide enough RAM. The ultimate "fix" to a RAM problem (i.e. the last resort) is to turn the "ALL OFF" switch OFF for a few minutes.

2. OPEN FAILED
   ATTACH FAILED
   I/O FAILURE

   These messages result if the GE I/O module is not connected properly into the system. The PHOENIX MOBILE program will continue after "beeps" and error messages. However, you will not be able to WRITE/READ the radio or EEPROM socket until the error condition is fixed.

3. ID ERROR

   ```
   ID ER (XX XX) CONT ?(Y/N)
   ```

   This message occurs only when attempting to READ/WRITE the radio. This may be because:

   1. The Radio Cable is not attached properly to the I/O module or Radio.
   2. The Radio is NOT POWERED ON.
   3. The Radio is not working properly.
   4. Someone is messing with the PTT, channel select, etc. during a programming operation.
   5. The Radio is not compatible with this version of the PHOENIX MOBILE software (e.g. if you are actually connected to some type radio other than a PHOENIX mobile, or perhaps because the radio is an incompatible "special").

   Typing N (for no) terminates the RADIO I/O sequence. (The system will continue prompting for an output device.)

   Typing Y (for yes) instructs the system to attempt to READ/WRITE the radio.

   The user must assume responsibility for over riding the ID check such as READING/WRITING an incompatible radio.

4. VERIFY ERROR

   Indicates a VERIFY was detected, usually indicating that data were not correctly written in the radio or EEPROM.

5. Other computer system I/O errors 64, 80, etc., result from invalid I/O of some sort and will cause the system to repeat the I/O sequences until the error condition is cleared.

6. NO FILE or WRONG TYPE

   NO FILE is not actually an error. If no data has been written to the PHOENIX File, this message results from an attempt to READ the file data. WRONG TYPE indicates that a PHOENIX MOBILE file exists, but is not compatible with current type PHOENIX radio selected. For example, if file were written by STANDARD A/B PHOENIX, the data format, etc. is not compatible with the PHONEIX WITH SCAN.

8.0 HELPFUL SUGGESTIONS

The following perhaps may save the user some frustrations with the Hand Held Computer and PHOENIX Programmer system.

1. Select a display speed not greater than 6 or 7 for most convenient data entry.
2. New PHOENIX radios may contain factory test data for all the possible combinations of High Band, UHF, Low Band options. As such, the RX frequencies will appear incorrect (i.e. out of range). Therefore always assume that fresh-from-the-factory radios need all new data.
3. To set Date/Time in your system you may have to remove the Hand Held Computer from the suitcase.
4. If the PHOENIX MOBILE program does not show up in the Primary menu, try removing the Hand Held Computer from the suitcase; turning it "ON" (with "ON KEY"); type the CLEAR key a few times; turn the unit "OFF" with the normal "OFF KEY"; then re-insert into the suitcase; and try again. If this fails to reveal the PHOENIX Mobile, repeat this procedure again before assuming that your unit is defective.
5. DO NOT Plug/Unplug peripherals when the system is executing an application program. To be sure of the state of the unit depress CLEAR a few times until you see the PRIMARY menu being displayed. Then turn the unit off via the normal "OFF KEY" prior to inserting or removing modules or capsule programs.
6. The Panasonic BASIC Capsule program options (purchase from Panasonic) has special exiting procedures that you should carefully observe otherwise you may have to play the "ALL OFF" game with the ALL OFF switch in the back of the Hand Held Computer.
7. The user may purchase a variety of peripherals and software capsules for the Hand Held Computer from Panasonic. However, the PHOENIX MOBILE was designed for use only with the basic computer, the Panasonic Mini-Printer Model RL P1004, the GE Program Storage Module and GE I/O Module. As such, inclusion of other devices or other Capsule programs may cause problems. If a problem arises, simply unplug the problem Peripheral/Capsule when executing PHOENIX MOBILE.
8. If the user is programming repetitive data such as frequencies, Channel Guard, etc., use of the function keys may facilitate data entry. The function keys f1, f2, f3 may be programmed (PRIOR TO SELECTING PHOENIX MOBILE) by the following for each desired function key.

   1. Depress "HELP" key on keyboard.

      The systems responds with the prompt:

      ```
      [ PRESS KEY FOR DEFINITION ]
      ```

   2. Depress function key (f1, f2, or f3).

      The system briefly displays the message:

      ```
      [ DEFINE FUNCTION          ]
      ```

   3. Following this system directive type the desired data, such as 467.8750 for a frequency, or 100.0 for Channel Guard, etc.
   4. Depress "ENTER" key on keyboard.
   5. Depress "CLEAR" key.

   Thereafter, the user may simply depress the appropriate function key in lieu of typing out the frequency Channel Guard, etc. defined for that function key.

TABLE 1

TONE & DIGITAL CHANNEL GUARD

TONE CG	DIG. CG	DIG. CG	DIG. CG
No CG	023	261	654
67.0	025	263	662
71.9	026	265	664
74.4	031	271	703
77.0	032	306	712
79.7	043	311	723
82.5	047	315	731
85.4	051	331	732
88.5	054	343	734
91.5	065	346	743
94.8	071	351	754
97.4	072	364	036*
100.0	073	365	053*
103.5	074	371	122*
107.2	114	411	145*
110.9	115	412	
114.8	116	413	212*
118.8	125	423	225*
123.0	131	431	246*
127.3	132	432	252*
131.8	134	445	255*
136.5	143	464	266*
141.3	152	465	274*
146.2	155	466	325*
151.4	156	503	332*
156.7	162	506	356*
162.2	165	516	446*
167.9	172	532	452*
173.8	174	546	454*
179.9	205	565	455*
186.2	223	606	462*
192.8	226	612	523*
203.5	243	624	526*
210.7	244	627	
	245	631	
	251	632	

* Codes Unique to General Electric

10.0 EPROM INSTALLATION AND SYSTEM CONNECTIONS

10.1 EPROM INSTALLATION

The TQ2314 EPROM containing PHOENIX software must be installed in the Program Storage Module before programming can be accomplished. This EPROM is provided separately, as ordered, and must be installed by the user. The following installation procedure is suggested (refer to Figure 10-1).

NOTE

The EPROM device can be destroyed by static discharges. Before handling, the installer should be discharged by touching the test bench ground bus. The PW board and EPROM should also be at ground potential. EPROMs should be stored in conductive material.

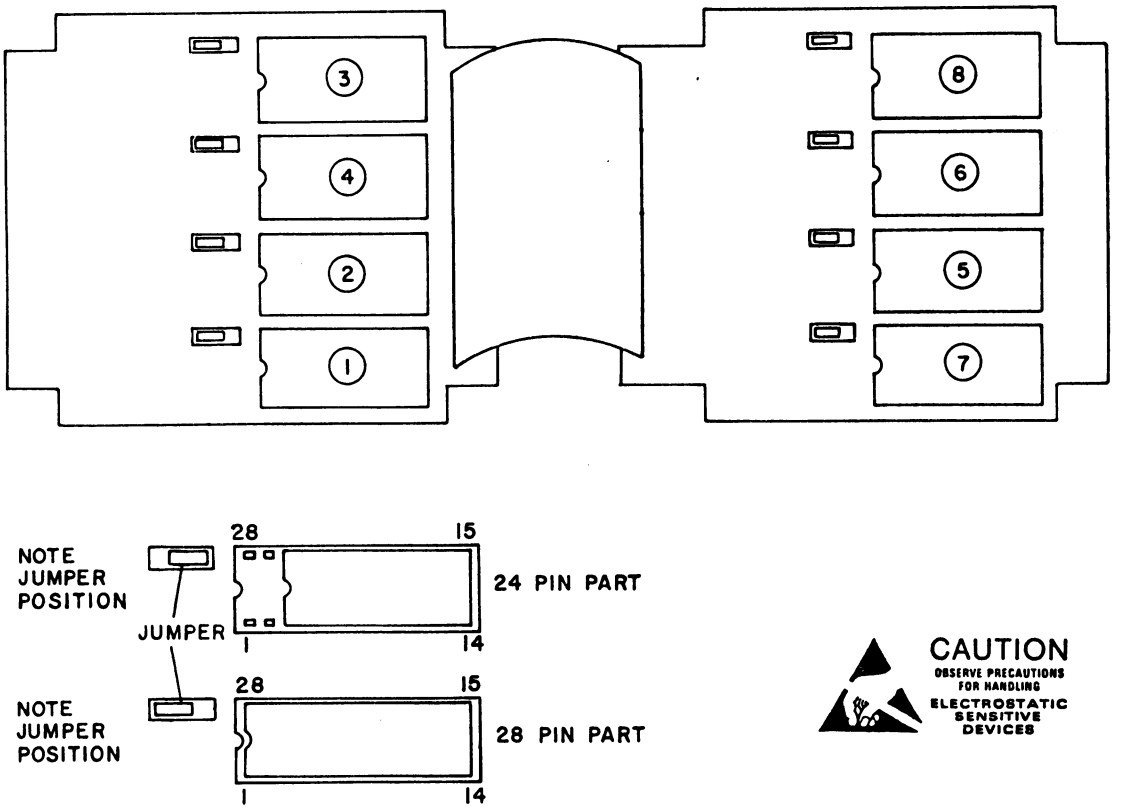


Figure 10-1 - EPROM INSTALLATION

1. Remove the Program Storage Module from the system I/O Adaptor by sliding it to the right approximately two inches.

2. Remove the four screws from bottom cover and open. DO NOT remove boards.

3. Install the EPROM in the lowest-numbered empty socket as shown on the attached figure. (Note socket designations and numerical sequence. Programs will be displayed in the Programmer primary menu according to the socket number.) Check location of the jumper adjacent to the socket.

4. Close the cover and replace the four screws in bottom.

5. Reinstall the Program Storage Module in the programmer.

10.2 PROGRAMMING THE PHOENIX RADIO

The TQ2311 PHOENIX Cable, provided separately as ordered, is used for connecting the PHOENIX radio to the programmer during programming. The following procedure is recommended.

1. Connect the 9-pin connector of the cable to the mating connector of the Programmer's Data I/O Module. Press the locking lever on the cable connector to facilitate installation and removal.

2. Connect the paddle-card end of the cable to the rear of the PHOENIX radio.

3. The radio must be powered by a 13.8 VDC bench supply or vehicle battery during programming. Connect a PHOENIX power cable to the remaining connector of the paddle-card and apply power to the radio.

4. Turn the radio power switch on.

10.3 PROGRAMMING EEPROMS OUTSIDE THE RADIO

EEPROMS can be programmed outside the radio using the TQ2313 Socket Adaptor. Install the socket

adaptor on top of the Data I/O Module, making certain that the connector pins are properly aligned.

The socket adaptor is equipped with a zero insertion force (ZIF) socket. Raise the lever on the socket before installing the EEPROM. Press the lever forward to lock the EEPROM in the socket.

> **NOTE**
>
> Check orientation of the EEPROM. The EEPROM can be damaged if reading or programming is attempted with the part installed backwards.

> **NOTE**
>
> The EEPROM can be damaged by static discharges. Observe handling precautions for electrostatic sensitive devices.

11.0 FILE OPERATIONS

The programmer offers several facilities for managing radio data saved in files, which are summarized in this section. For more detailed information, consult the sections of the Panasonic Hand Held Computer - Instructions for Use titled: "File System" and "Beyond the Primary Unit with the I/O Key". PHOENIX radio data written to (and read from) the PHOENIX FILE is written to (and read from) a file named PHOENIX MOBILE, which is automatically created the first time radio data is written. The file can be deleted, renamed, or copied as required.

11.1 Expanding File Storage with Programmable Memory Peripherals

Optional Panasonic Programmable Memory (RAM) Peripherals can be added to increase file storage capacity. Peripherals are available in several capacities, and one peripheral can be installed in each unused I/O Adaptor slot.

Each Programmable Memory Peripheral, and internal RAM, are separate memory areas. Only one area can be active at a time, and only files stored in that area are available to the PHOENIX MOBILE program, or other programs. To find the current area, or change the current area designation, press the I/O key to enter the I/O menu. Each peripheral, and each memory area is displayed, with the space remaining, and the current area is in reverse image. For example:

```
1=RADIO I/O IN,OFF,SLOT=2
```

```
2=RADIO I/O OUT,OFF,SLOT=2
```

```
3=PRINTER OUT,OFF,SLOT=3
```

```
4=INT RAM, 6520 FREE
```

```
5=EXT RAM, 7542 FREE,SLOT=4
```

> **NOTE**
>
> Underline is used to indicate reverse image in this manual.

Change the current memory by pressing the number displayed with the desired memory area.

11.2 Deleting a File

It may be desirable to delete the PHOENIX MOBILE file if the memory space occupied by it is required for other files.

1. Return to the PRIMARY menu if not already there.
2. Select the file system by pressing "3" (3 = FILE SYSTEM). The computer will display a menu listing all (visible) files. Items 1 and 2 are special functions used to copy and create files.

```
1 = NEW FILE
```

```
2 = COPY FILE
```

for example:

```
┌ - - - - - - - - - - - - - - - - ┐
  3 = DELTA-MOBILE
└ - - - - - - - - - - - - - - - - ┘
```

for example:

```
┌ - - - - - - - - - - - - - - - - ┐
  4 = PHOENIX-MOBILE
└ - - - - - - - - - - - - - - - - ┘

┌ - - - - - - - - - - - - - - - - ┐
  5 = etc.
└ - - - - - - - - - - - - - - - - ┘
```

3. Choose the PHOENIX MOBILE file by pressing the number displayed with it (4 in this example). PHOENIX MOBILE will appear in reverse image.

4. Delete the file by depressing the DELETE and DOWN arrow keys. The programmer will begin displaying the menu of files (less the deleted file).

5. Return to the primary menu by pressing the CLEAR key twice.

11.3 Renaming a File

Any file in the current memory area can be renamed.

1. First make certain that the desired radio data has been written to PHOENIX FILE.

2. Return to the PRIMARY menu if not already there.

3. Select the file system by pressing "3" (3 = FILE SYSTEM). The computer will display a menu listing all (visible) files, as described above.

4. Choose the PHOENIX MOBILE file, or any other desired file, by pressing the number displayed with it (4 in the example). The file name will appear in reverse image and the blinking cursor will be left after the last character of the file name.

```
┌ - - - - - - - - - - - - - - - - ┐
  PHOENIX MOBILE
└ - - - - - - - - - - - - - - - - ┘
```

5. Use the RIGHT ARROW and LEFT ARROW keys to reposition the cursor and type in the new name. The new name can be longer than the original name, up to 24 characters. Delete excess characters by pressing the DELETE key and then the RIGHT ARROW or LEFT ARROW keys, to delete the character at the cursor.

> **NOTE**
>
> It is better to add characters to the file name than to replace the file name. The added characters can simply be deleted if it is necessary to program another radio from the file, and the type of radio is not for gotten.

```
┌ - - - - - - - - - - - - - - - - ┐
  ace plumbing
└ - - - - - - - - - - - - - - - - ┘
```

or

```
┌ - - - - - - - - - - - - - - - - ┐
  PHOENIX MOBILE ace plumbing
└ - - - - - - - - - - - - - - - - ┘
```

6. Press the ENTER key when the name is correct. The programmer will beep, flash "CAN'T EDIT", and begin displaying the file menu again. The modified file name should appear in the menu.

11.4 Restoring the Renamed File

The file must be renamed back to PHOENIX MOBILE (must be uppercase) for the PHOENIX program to use it. Use the renaming procedure described above. Be careful to rename or delete any PHOENIX MOBILE file that already exists, to avoid confusing the computer with two identically-named files.

> **NOTE**
>
> PHOENIX MOBILE is not a text file and cannot be edited by the editing commands described in the Panasonic literature. In addition, the PHOENIX mobile program will reject text files, or files created by other programs, that have been renamed PHOENIX MOBILE. DO NOT name non-PHOENIX files PHOENIX MOBILE.

11.5 Printing the File List

A list of all (visible) files in the current memory can be printed using the following procedure.

1. First make certain the computer is in the PRIMARY

menu. Press CLEAR twice if it is not.

2. Press the I/O key to display the I/O menu. The computer will display a menu of I/O devices and RAM. A typical I/O menu is displayed below:

```
┌ - - - - - - - - - - - - - - - ┐
  1=RADIO I/O IN,OFF,SLOT=2
└ - - - - - - - - - - - - - - - ┘

┌ - - - - - - - - - - - - - - - ┐
  2=RADIO I/O OUT,OFF,SLOT=2
└ - - - - - - - - - - - - - - - ┘

┌ - - - - - - - - - - - - - - - ┐
  3=PRINTER OUT,OFF,SLOT=3
└ - - - - - - - - - - - - - - - ┘

┌ - - - - - - - - - - - - - - - ┐
  4=INT RAM,6860 FREE
└ - - - - - - - - - - - - - - - ┘
```

3. If the printer is off (PRINTER OUT,OFF,SLOT=x), press the number displayed with the printer (3 in the example).
4. Press the I/O key to return to the PRIMARY menu.
5. Press the "3" key to enter the file system. The printer will print everything that appears on the display.
6. When a complete list of files has been printed, press the CLEAR key twice to return to the PRIMARY menu.
7. Press the I/O key to display the I/O menu. Then press the key corresponding to the printer to turn the printer off. Press the I/O key again to return to the PRIMARY menu.

11.6 COPYING A FILE

You may wish to copy a file from one memory area to another or to create a duplicate copy of a file. First make sure that the file to be copied is in the current memory area. If not, change the current memory designation as required, using the I/O menu.

1. If not in the PRIMARY menu, press clear twice to return to the PRIMARY menu.
2. Press the "3" key to enter the file system.
3. Press the "2" key for COPY FILE; this prompt appears:

```
┌ - - - - - - - - - - - - - - - ┐
  SELECT FILE
└ - - - - - - - - - - - - - - - ┘
```

A menu of all the file names in the current memory will be displayed. Press the number of the file to be copied; and the following prompt appears:

```
┌ - - - - - - - - - - - - - - - ┐
  SELECT DESTINATION RAM
└ - - - - - - - - - - - - - - - ┘
```

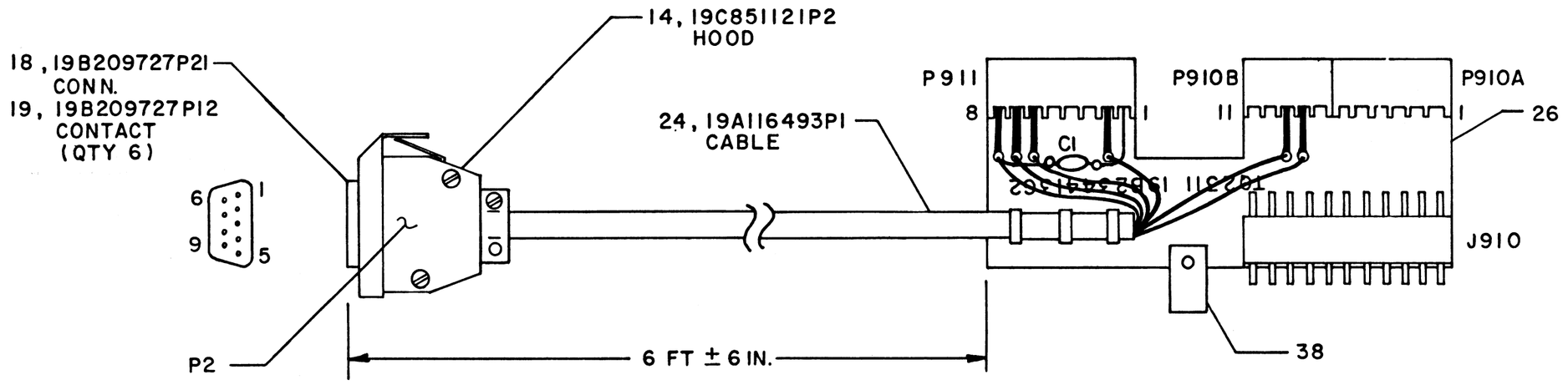
followed by a menu of destination memory areas. The current memory is displayed in reverse image.

For example:

```
┌ - - - - - - - - - - - - - - - ┐
  1=INT RAM, 2625 FREE
└ - - - - - - - - - - - - - - - ┘

┌ - - - - - - - - - - - - - - - ┐
  2=EXT RAM, 6520 FREE,SLOT=4
└ - - - - - - - - - - - - - - - ┘
```

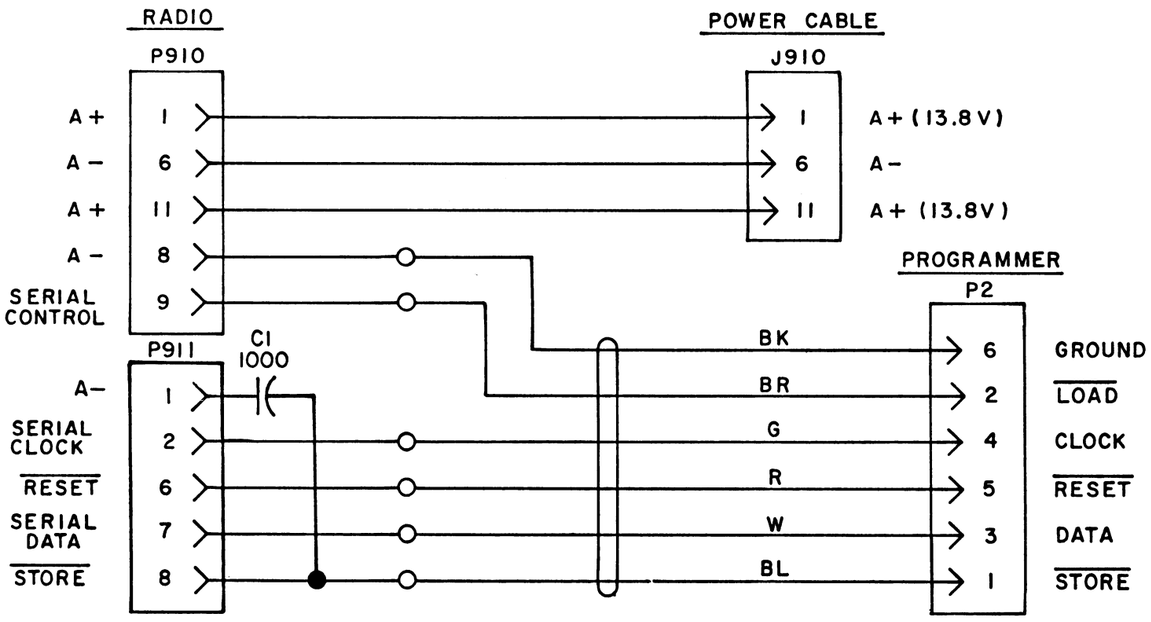
Press the number corresponding to the desired destination memory area. When the copying is complete, the original file system menu will return.



9 PHOENIX CABLE (TQ 2311)

ITEM 24, CABLE, CONNECTION CHART		
WIRE COLOR	FROM	TO
BLUE	P2 - 1	P911 - 8
BROWN	P2 - 2	P910 - 9
WHITE	P2 - 3	P911 - 7
GREEN	P2 - 4	P911 - 2
RED	P2 - 5	P911 - 6
BLACK	P2 - 6	P910 - 8

(19B234413, Sh. 2, Rev. 2)



(19B234422, Rev. 1)

ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG=1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF=MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH=MILLIHENRYS OR H=HENRYS.

SCHEMATIC DIAGRAM

PHOENIX CABLE
19B234413G2

PARTS LIST

PHOENIX CABLE AND PROM KIT
19B234413G2 CABLE KIT TQ2311
19B234413G5 PROM KIT TQ2314
ISSUE 1

SYMBOL	GE PART NO.	DESCRIPTION
		PHOENIX CABLE KIT 19B234413G2
		- - - - - - - - - - - JACKS - - - - - - - - - - -
J910	19A116659P151	Connector, printed wiring: sim to Molex 09-75-1111.
		- - - - - - - - - - - PLUGS - - - - - - - - - - -
P2		Connector. Includes:
	19B209727P21	Shell.
	19B209727P12	Contact. (Quantity 6).
	19C851121P2	Hood.
P910A	19A116659P60	Printed wire, 6 contacts, rated at 5 amps; sim to Molex 09-52-3063.
P910B	19A116659P128	Connector, printed wiring: 5 contacts; sim to Molex 09-52-3051.
P911	19A116659P61	Connector, printed wiring: 8 contacts rated at 5 amps; sim to Molex 09-52-3083.
		PROM KIT 19B234413G5
		- - - - - - - - INTEGRATED CIRCUITS - - - - - - -
U17	19A148241G2	PROM: READ ONLY; sim to D27128.