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Bulletin 1300 Enhanced Programming Terminal Operation Manual

Price $25.00

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- Tell what causes the trouble.
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Chapter

1

What You Should Know Before Using The Terminal

GENERAL

This manual provides the information needed to operate the Bulletin 1300 Enhanced Programming Terminal. The Programming Terminal can be supplied in either of two packages. The remote Handheld Terminal (DHT) is packaged for portable use and the Door Mounted Terminal (DMT) is packaged for mounting in a system cabinet door. A basic understanding of the Programming Terminal will allow you to:

- Set and view parameters
- Alter the Drive configuration
- Monitor Drive functions
- Check for faults
- Troubleshoot the Drive.
- Enable Local control of the Drive.

The Programming Terminal (Figure 1-1) features a 64 character Liquid Crystal Display which can display 4 lines of 16 alpha numeric characters each. A programmable password guards against use of the terminal for unauthorized access to the Drive.

IMPORTANT: The Bulletin 1300 Enhanced Programming Terminal is not intended to replace or be considered a suitable alternative for the operator control station for all applications. Refer to codes and standards applicable to your particular system for specific requirements and additional information.

BASIC FUNCTIONS

The Programming Terminal is a menu driven device which provides operator access or control to the following Drive functions:

PASSWORD - A user programmable feature that guards against unauthorized access to the Drive.

MONITOR - Allows the viewing of a select group of multiple parameters on one screen, in engineering or per unit values.

PARAMETER - Allows the setting or viewing of single system parameters. a 16 character text display is provided for every parameter. Values can be displayed in engineering units, hexadecimal, or signed/unsigned decimal. The Minimum and Maximum values are displayed .

EEPROM - Allows the transfer of data between Drive system RAM, default ROM, and storage EEPROM.

TERM SETUP - Allows the user to setup the desired terminal features available in the limited access mode.

DRIVE SETUP - Allows the user to configure the Drive for use with adapter cards. Linking of source and sink type parameters will achieve the desired Drive operation.

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FAULTS - Allows fault reporting, fault clearing and Drive reset functions to occur. Fault/Warning buffers containing up to 16 faults are maintained in the Drive. Each fault or warning is displayed as up to 32 character of English text for simplified analysis.

LOGOUT - Provides a mechanism to return to limited access from the unlimited access mode.

LOCAL CONTROL - Allows the user to select Remote or Local control. Local Control allows the Drive/machine to be controlled from the Programming Terminal.

KEYPAD LAYOUT

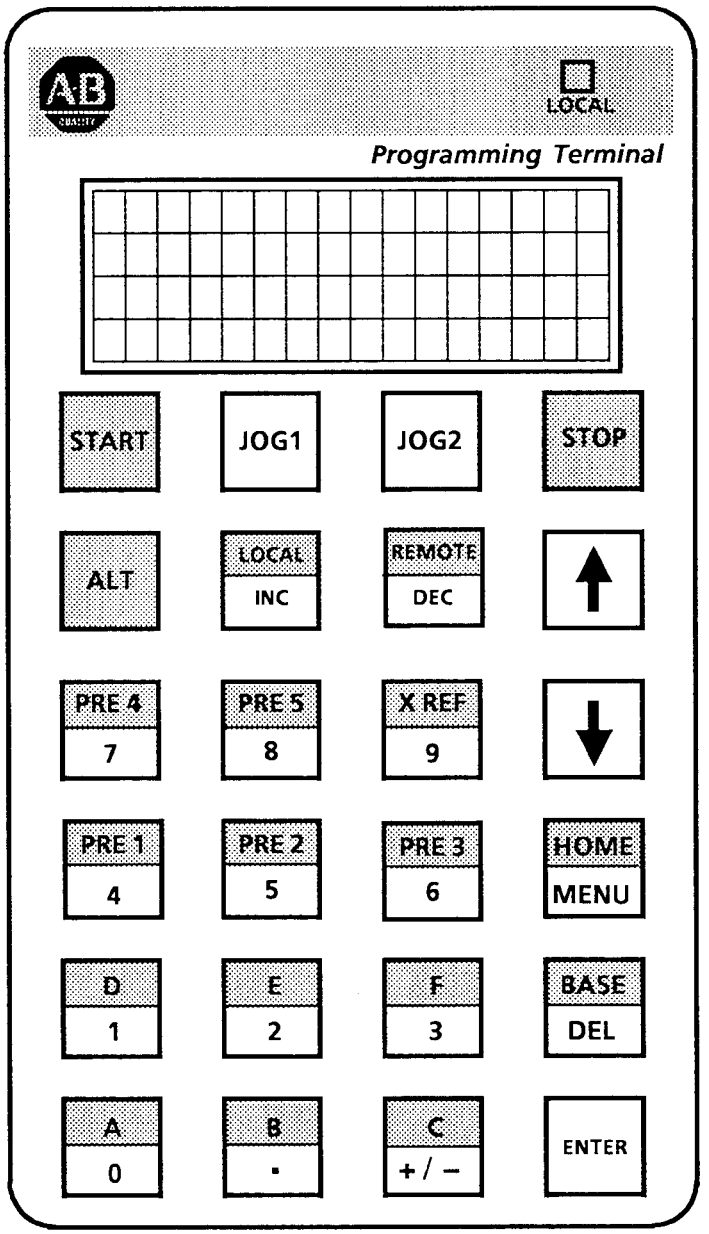


Figure 1-1. Enhanced ProgrammingTerminal

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CONTROL OPTIONS

The Enhanced Programming Terminal can be run in either the Local or Remote mode. In the Local mode, local control is enabled and the Drive can be started or stopped and preset speeds & references entered or altered while the Drive is running, by using the Programming Terminal. An amber LED in the upper right hand corner of the Programming Terminal (Fig. 1-1) indicates that Local control is enabled when it is illuminated. When the Remote mode is in effect, the drive receives control commands from adapter boards (The Stop button on the Programming Terminal is always active), and any changes to Drive variables can only be carried out when the drive is stopped.

WARNING: The Start/Stop control circuitry in this Drive is composed of solid state components. If hazards due to accidental contact with moving machine components or unintentional flow of liquid, gas or solids exist, NEMA standards require that a hard wired, **Maintained** operator Emergency Stop circuit be used with the Drive. The Emergency Stop device must be mounted so it is within reach of the operator when using this Bulletin 1300 Programming Terminal.

If the drive is operating in the Local Mode, and a Drive reset is attempted, Local Control is immediately released.

CURSOR POSITION

The cursor on the Programming Terminal is used to select functions, make menu selections, and enter values. The cursor appears in two different ways, depending on the function being performed. In most cases, the cursor appears as a set of right and left arrow brackets as shown in Figure 1-2.

```
SELECT MODE 1 - 8
<  1 - PASSWORD  >
   2 - MONITOR
   3 - PARAMETER
```

Figure 1-2. Cursor Type 1

In some cases, the cursor appears as an arrow in the margin as shown in Figure 1-3.

```
PRE1          0   RPM <
TORQ          0   %
ARMI          0   AMP
FLDI          0   AMP
```

Figure 1-3. Cursor Type 2

The specific cursor type used will be explained for each of the Programming Terminal functions.

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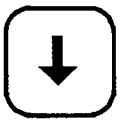
The cursor may be positioned by either using the  or , or by pressing the Numeric key corresponding to the number of the item on the menu screen. For example, the cursor could be moved to the 3- Parameter by either pressing the  twice, or by pressing the  key.

BASIC KEY OPERATIONS

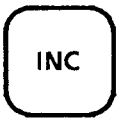
Several of the keys will perform the same function regardless of the specific menu option which is being performed. These keys and their functions are defined below:



Moves the cursor upward. If there are only two choices for the cursor position, this key will toggle between the two choices each time it is pressed. If more than two choices are available, the cursor will wrap from top to bottom.



Moves the cursor downward. If there are only two choices for the cursor position, this key will toggle between the two choices each time it is pressed. If more than two choices are available, the cursor will wrap from bottom to top.



Increments the value of the information which is presently selected by the cursor position.



Decrements the value of the information which is presently selected by the cursor position.



Causes the Programming Terminal to return to the next higher level Menu Screen. In some cases, before returning to the next higher level Menu Screen, the Programming Terminal will prompt you with a question. This is particularly true in the case where the function just executed has changed Drive setup or system information.

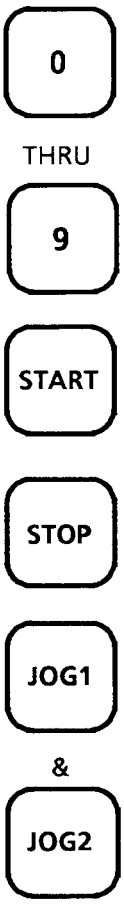


Causes the Programming Terminal function, Menu selection, or value to be entered. When used to select a Programming Terminal function, the function on which the cursor is located will be selected. When used to enter a numeric value, the value appearing between the cursor brackets will be entered.



Causes the last character entered to be deleted. If no characters are displayed and this key is depressed, the previous number is redisplayed.

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Causes the numeric value on the key to be entered.

Starts the Drive in the Local Mode only.

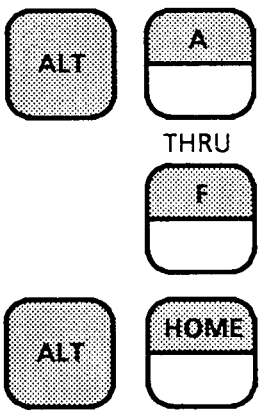
Causes the Drive to perform a normal stop in both the Local and Remote Modes.

Allows the motor to be operated at internal Jog rates when the terminal is in the Local mode .

ALT KEY OPERATIONS

When the ALT key is pressed, an alternate key symbol appears at the lower left of the terminal display as shown at the lower left of the display in Figure 1-4. While the symbol is displayed, the keys with secondary functions (blue) become active. Pressing the ALT key a second time, or pressing any other key disables the alternate function(s). The ALT functions are two separate keypress operations, and not simultaneous presses (With the exception of contrast control).

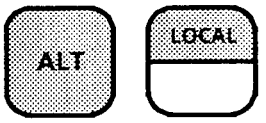
Key Usage:



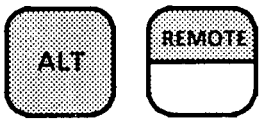
ALT - A-F : Hex numbers used to modify parameter values displayed in hex.

ALT - HOME : Resets the terminal to the power on state.

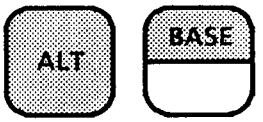
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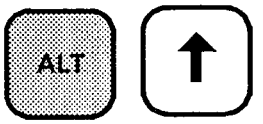
ALT - LOCAL: Enables Local control.



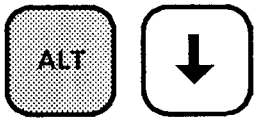
ALT - REMOTE : Disables Local control.



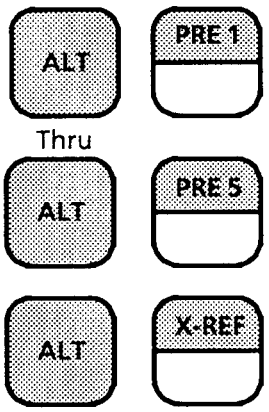
ALT - BASE : Changes the number base for the parameter display values. Number bases change between engineering units, hex and decimal.



ALT - UP : Holding both of these keys simultaneously causes the contrast or viewing angle of the LCD to be increased.



ALT - DOWN : Holding both of these keys simultaneously causes the contrast or viewing angle of the LCD to be decreased.



ALT - PRE1 through PRE5 : When the terminal is in the Local mode these display the selected Preset Speed, which can then be enabled or altered.

ALT - X REF : Displays the external reference value when the terminal is in the Local mode.

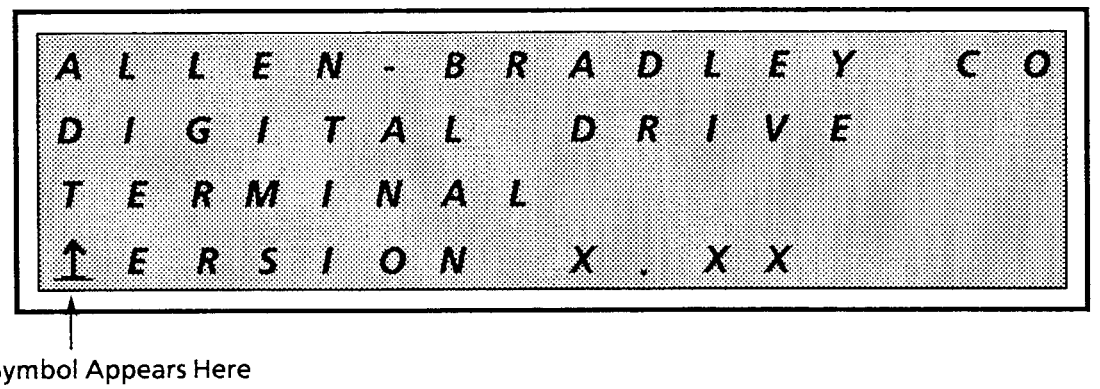


Figure 1-4. ALT Key Functions

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POWER UP

Programming Terminal & Communications Initialization- The first screen to appear upon power up is shown in Figure 1-5. This screen is used, during power up or terminal reset, for product identification with software revision. While this screen is displayed, all power up diagnostics are attempted. The letter I in DRIVE will drop down to graphically display a moving pendulum. This pendulum swings once for each communication request from the terminal. These requests contain all the initialization information needed by the terminal to operate correctly.

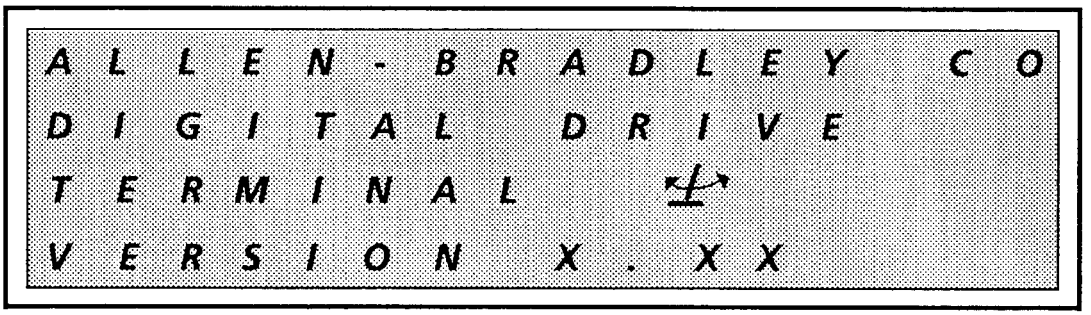


Figure 1-5. Programming Terminal Initialization

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Chapter

2

Installing the Terminal

GENERAL

The Programming Terminal is connected to the Drive thru the use of a 9 conductor cable with a D-type female connector. A 9 pin male D-Type connector is mounted on the end of terminal TB3 at the bottom of the Drive cabinet as shown in Figure 2-1. Communication between the Main Control Board and the Programming Terminal is accomplished using RS 422 serial communication.

WARNING: The Start/Stop control circuitry in this Drive is composed of solid state components. If hazards due to accidental contact with moving machine components or unintentional flow of liquid, gas or solids exist, NEMA standards require that a hard wired, **Maintained** operator Emergency Stop circuit be used with this Drive. The emergency stop device must be mounted so it is within reach of the operator when using this Bulletin1300 Programming Terminal.

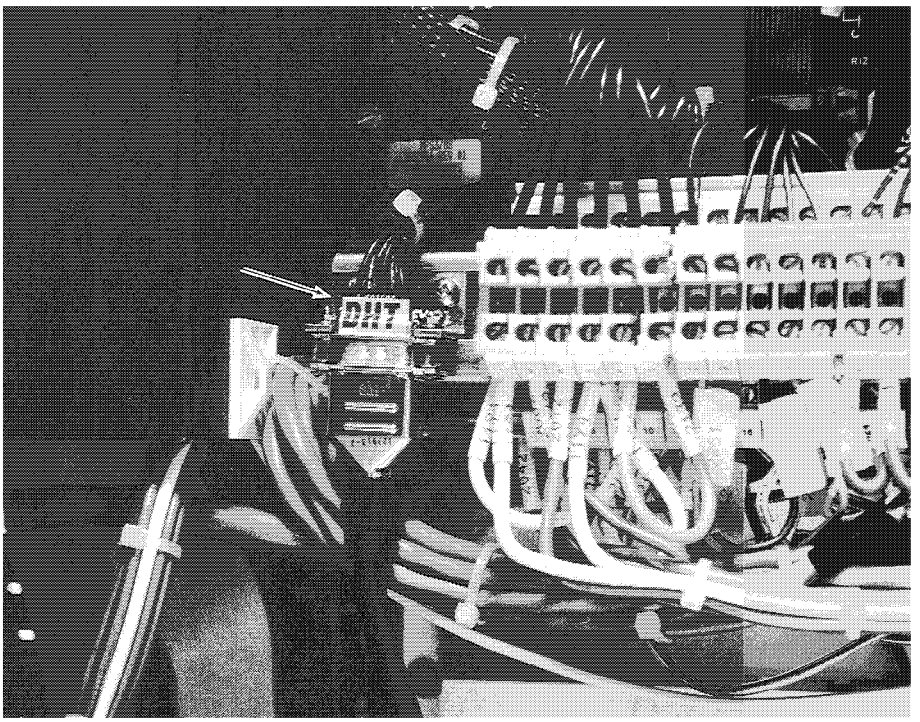


Figure 2-1. Programming Terminal Cable Connection Location

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CONNECTION

Connection of the Programming Terminal cable to the male connector in the drive may be made or broken while the Drive is running provided Local control is not active through the Programming Terminal.



WARNING: If Local control is active and the programming terminal connection is broken, a controlled stop occurs. The Programming Terminal readout will indicate a Loc Mode Serial Timeout, and the system must be reset. The potential use of Local control must be taken into account if the possibility of injury or process and equipment damage exists during a controlled stop.



WARNING: Extreme care must be used when making or breaking the Programming connection on Bulletin 1395 Drives in system cabinets, to guard against shock hazard due to accidental contact with other live components.

Wiring from the male connector to the 1395 Main Control Board is provided as standard within the Drive and is detailed in the Bulletin 1395 Installation & Maintenance Manual 5.6.

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Chapter

3

Setting Up The Terminal

TERMINAL SETUP MODE

Terminal Setup Menu Screen - The Terminal Setup Mode allows you to enable several functions for use in the limited access mode. The Term Setup mode can only be entered after the correct password has been entered using the Password mode selected from the Main Menu. When the Term Setup Mode has been selected, the Terminal Setup screen shown in Figure 3-1 will appear. The two options are defined as follows:

- Modes - Allows you to individually enable or disable each of the three different Programming Terminal functions for use with the limited access mode. The Main Menu screen in the limited access mode will vary depending on which function (s) has been enabled. Refer to Chapter 4 for limited access mode Main Menu screens.
- Limited Access - Allows you to select up to ten Drive parameters which may be modified using the Parameter mode while in limited access. NOTE: Selection of parameters for the limited access mode does not limit the access to any parameters while in Unlimited Access .

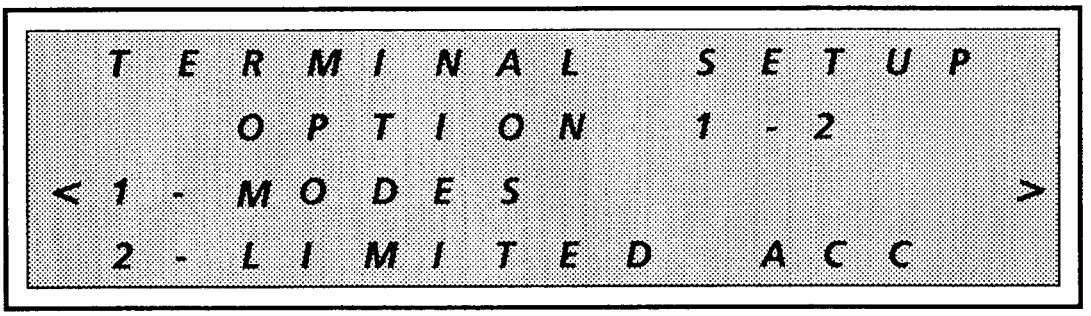


Figure 3-1. Terminal Setup Menu Screen

Press ↓ or ↑

or

Press 0 – 9 to move the cursor.

Press ENTER to execute the option shown by the cursor position.

Press MENU to return to the Main Menu.

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Modes Function - When the Modes function from the Term Setup Menu screen is selected, the screen shown in Figure 3-2 will appear. The screen is used to select and enable the following functions:

- Disp Mode - When this function is set to ON, the Monitor Mode appears immediately after all power up checks have been performed. If this function is set to OFF, the Programming Terminal will display one of the Main Menu screens after the power-up checks are performed.
- Param Mode - When this function is set to ON, the Parameter mode in the limited access mode is enabled. When enabled, you may view all parameters and modify up to ten parameters in the limited access Parameter mode. The ten parameters which may be changed are selected using the Limited Acc function selected from the Terminal Setup Menu shown in Figure 3-1. When this function is disabled, by setting the function to OFF, No Parameter can be viewed or changed in the limited access mode.
- Run Mode - When this function is set to ON, several keys on the Programming Terminal are enabled for Drive control functions.

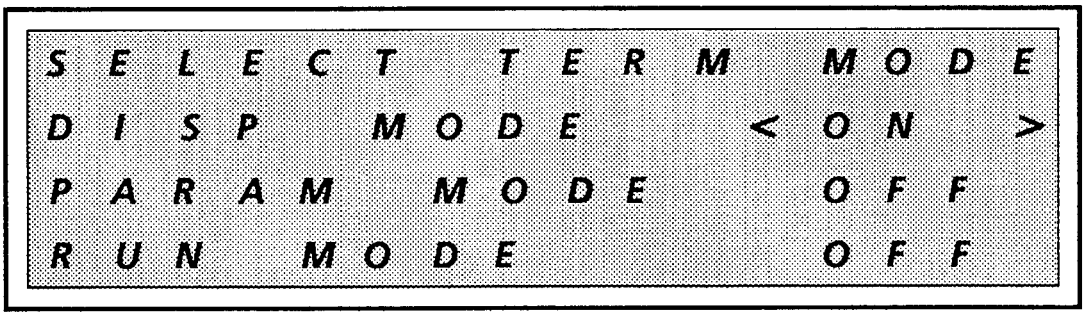
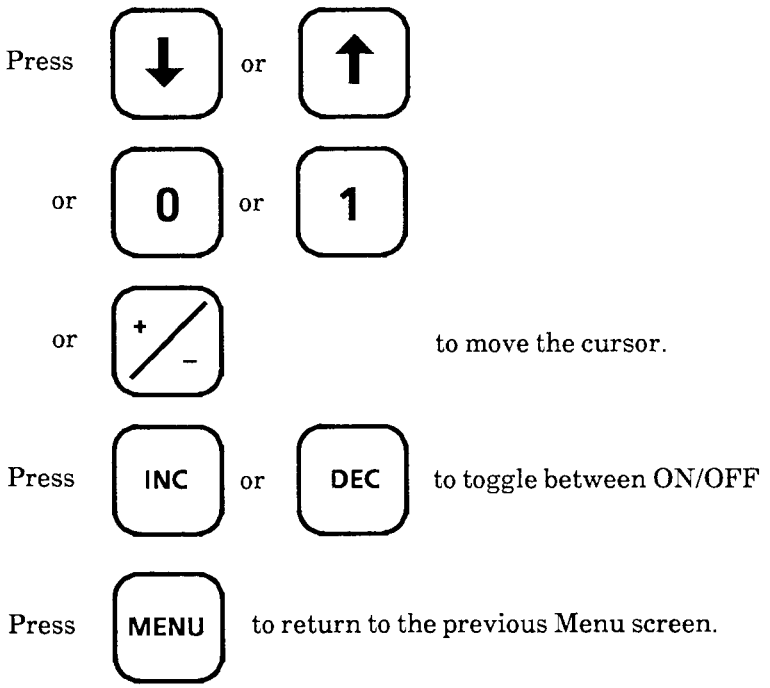


Figure 3-2. Selecting The Terminal Mode



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Limited Access Parameter Selection - When the Limited Access function is selected from the Terminal Setup Menu, one of the two screens shown in Figure 3-3 will appear. The Limited Access Parameter Selection function allows you to select up to ten parameters which can be modified thru the limited access Parameter mode. The ten parameters are stored in a table by entry number as shown on line two of the screens shown on Figure 3-3. If no parameter is entered in the the table location, OFF will appear in the left and right arrow brackets. The Up and Down keys are used to increment thru the table. Once a table entry number has been selected, the parameter number is entered by using the numeric keys followed by the ENTER key. If a parameter number of 0 is entered, the particular table entry is not used and will indicate OFF on the screen.

IMPORTANT: The parameters accessable in the limited access mode are only enabled when the Param Mode function has been set to ON using the Terminal Mode Selection screen (Figure 3-2). None of the functions available in the Term Setup mode are available unless you have properly entered the password to enter the unlimited access mode of operation.

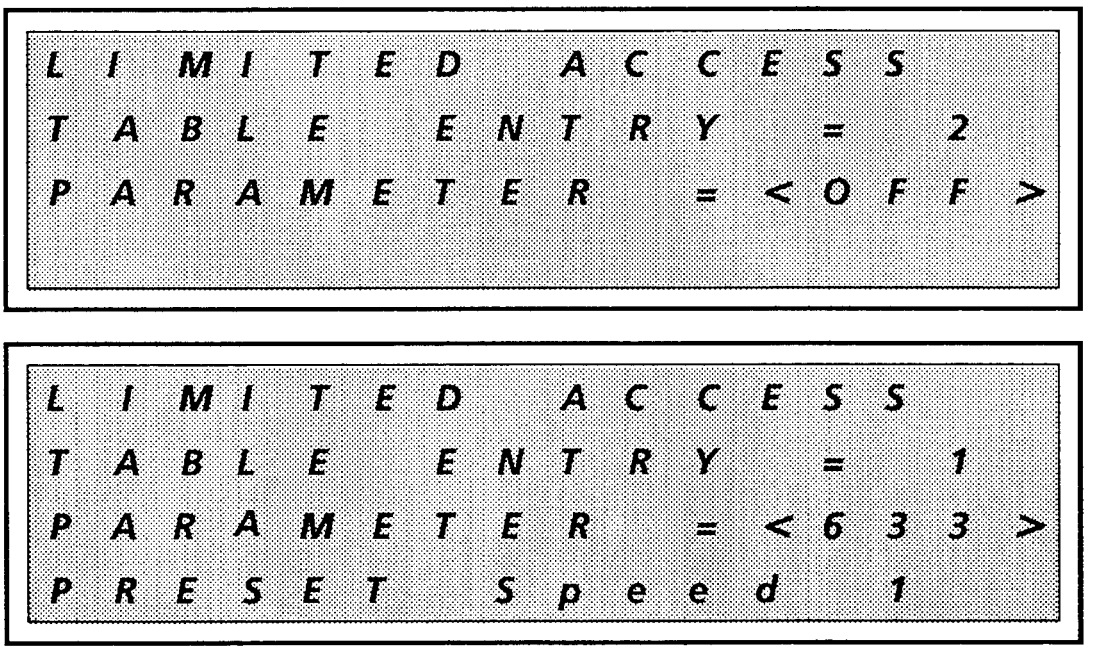


Figure 3-3. Limited Access Parameter Selections

Press ↓ or ↑ to increment thru the parameter access table.

Press INC or DEC to increment or decrement the value of the parameter for the table entry.

Press 0 – 9 to enter the parameter number directly.

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Press ENTER to enter the parameter number just entered with the 0-9 keys into the table.

Press MENU to return to the previous Menu screen.

Whenever a parameter number is entered for a table entry, the fourth line of the display will show the name of the parameter as shown in the bottom screen in Figure 3-3.

If changes have been made, the Programming Terminal will ask if new values are to be backed up to the Drive EEPROM before returning to the Main Menu .

DRIVE SETUP MODE

Drive Setup Menu Screen - The Term Setup mode allows you to perform the Drive configuration function which links Sink parameters to Source parameters. For a description of Drive configuration refer to the Drive Installation and Maintenance Manual.

When the Drive Setup mode has been selected, the Drive Setup Menu screen shown in Figure 3-4 will appear. The two options are defined as follows:

- Read/Edit - Results in the present Drive configuration being read from the Drive RAM into the Programming Terminal. Once in the Programming Terminal, the linking of sink to source parameters may be changed.
- Clear/Edit - Results in an empty configuration table being initialized for use by the Programming Terminal to set up a new Drive configuration table. In this case, no previous links have been made.

Note: Two links are fixed and are not changeable. These are the links from Parameter 152 (Logic Command 3) to Parameter 200 (DHT IN 1) and Parameter 250 (DHT OUT 1) to Parameter 100 (Logic Status).

The cursor for the Term Setup Menu Screen appears as a set of left and right arrow brackets.

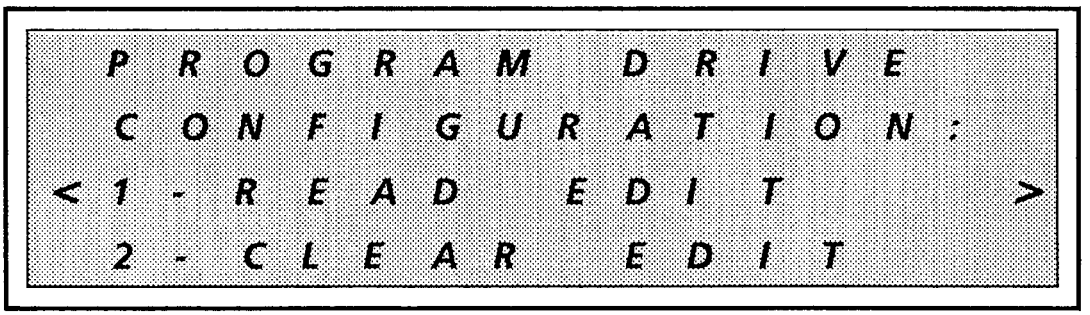


Figure 3-4. Drive Setup Menu Screen

Press ↓ or ↑

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or Press [0] - [9] to move the cursor.

Press [ENTER] to select the function shown by the cursor position.

Press [MENU] to return to the Main Menu screen.

If the Read/Edit function has been selected, the display will appear as shown in Figure 3-5 while the Programming Terminal is reading the Drive configuration information from the Drive RAM.

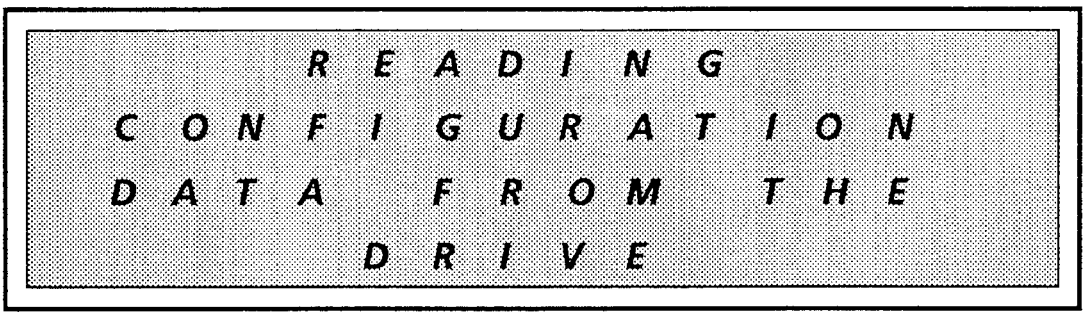


Figure 3-5. Reading Configuration Files from Drive

Changing Drive Configuration - After selecting one of the available functions from the Drive Setup screen, a display similar to Figure 3-6 will appear. The information displayed is:

- **Line 1:** Name of sink parameter linked.
- **Line 2:** "Linked to" statement.
- **Line 3:** Name of source parameter being linked to sink parameter specified on line 1.
- **Line 4:** Left number indicates parameter number of sink parameter whose name is listed on line 1. Middle number indicates parameter number of source number listed on line 3. Right number indicates how many links are remaining.

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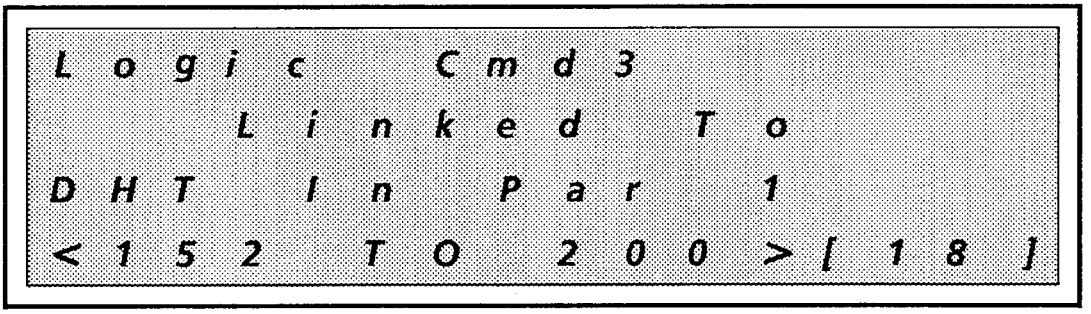


Figure 3-6. Configuration Screen

Press ↓ or ↑ to scroll through sink parameters

or Press 0 – 9 to change source parameter# (see Table 3-1 for valid #s)

Note: Changing a source parameter changes the link connected to the displayed sink.

Press 0 – 9 to enter new sink parameter# (See Table 3-2 for valid #s)

Note: Changing the sink moves the Cursor to the sink parameter and displays its current link source.

Press INC & DEC to increment or decrement through the source parameter list.

Press ENTER to terminate numeric entry or to scroll through configured parameter sinks

Press MENU to return to the Main Menu screen.

The configuration function allows you to make up to 20 links between source and sink parameters (2 are fixed). Table 3-1 lists all of the valid source parameters, and Table 3-2 lists all the valid sink parameters. Refer to the Drive Installation and Maintenance manual for parameter descriptions.

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Table 3-1. Bulletin 1395 Source Parameters

NUMBER	FUNCTION
1 - 19	Not Used
100 - 119	Control Configuration Inputs
200 - 219	Programming Terminal Control Inputs
300 - 319	Adapter Board Port B configuration inputs
400 - 419	Adapter Board Port A configuration inputs

Table 3-2. Bulletin 1395 Sink Parameters

NUMBER	FUNCTION
10 - 14	Constant Source Parameter Values
150 - 169	Control Configuration Outputs
250 - 269	Programming Terminal Configuration Outputs
350 - 369	Adapter Board Port B Configuration Outputs.
450 - 469	Adapter Board Port A Configuration Outputs.

To create a new link, use the numeric keys to enter the number of the sink parameter. The display will then appear as shown in Figure 3-7 where the sink parameter number is entered, but the source parameter number is zero. To create a link, use the INC or DEC keys to increment one-by-one through the possible source parameters, or use the numeric keys to enter the the number directly. If a sink parameter number which has been previously linked is entered, the screen will display the link information for that parameter. Each sink parameter may only be linked to a single source parameter, however, a source parameter may be linked to several sink parameters. For this reason the sink parameter is entered first and the link is defined by the sink parameter being linked to a source parameter.

The ENTER key may be used to increment through the existing table of links. Every time the ENTER key is pressed, the next link is displayed. Once an existing link is displayed, the source parameter may be changed using either the INC or DEC keys or by entering a different source parameter number using the numeric keys.

If a parameter number which is not a valid configuration parameter is entered, the warning screen shown in Figure 3-8 will be displayed. The screen will remain for 5 sec., or until any key is pressed, and then the display will return to the previous screen.

Enter a zero value for a source parameter in order to clear a link.

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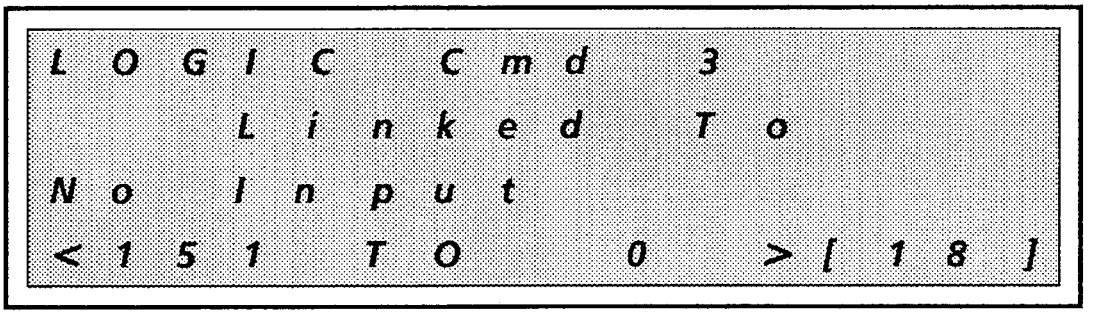


Figure 3-7. Entering New Sink

Press ↓ or ↑ to change sink parameter#

Press INC & DEC to change source parameter.

or Press 0 - 9 to change source/sink parameter# (see Table 3-1 for valid #s)

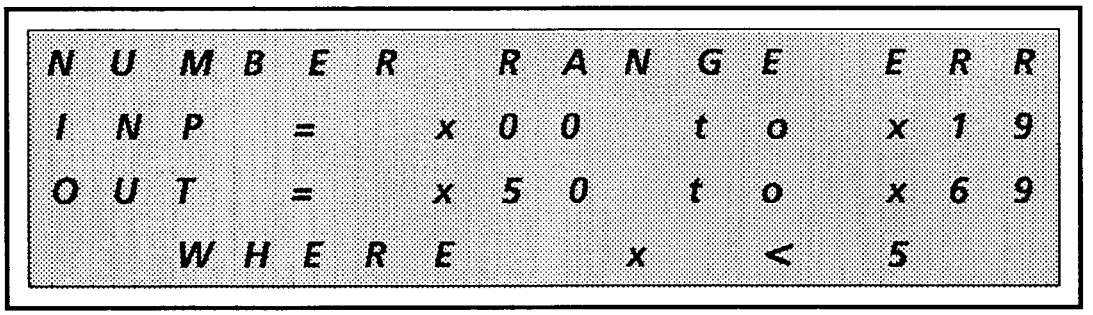


Figure 3-8. Configuration Warning

Saving Drive Configuration Table - When the MENU key is pressed after link changes have been made, the screen shown in Figure 3-9 will be displayed. The functions are defined as follows:

- No, Quit. New configuration information is not sent to the Drive, and the Programming Terminal display returns to the Main Menu screen.
- Yes, Config. New configuration information is sent to the Drive RAM and the Display Message shown in Figure 3-10 appears.
- More Changes. No changes are made to the Drive configuration and the Programming Terminal returns to the Configuration screen shown in Figure 3-6.

If changes to the parameter values have been made, the Programming Terminal will ask if new values are to be backed up to the Drive EEPROM before returning to the Main Menu.

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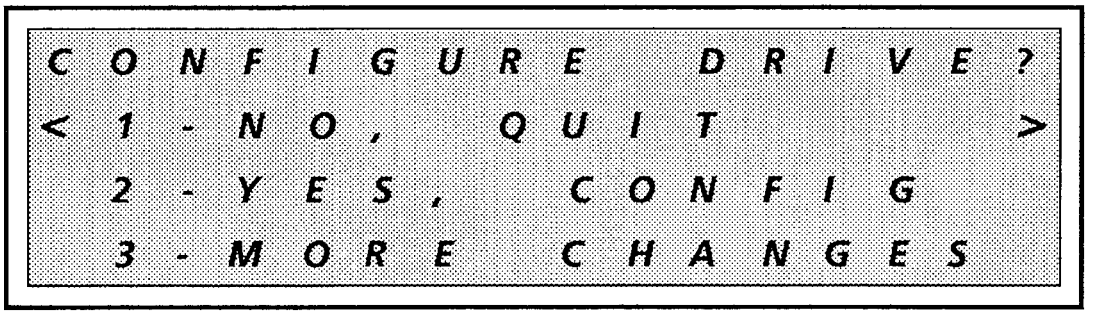


Figure 3-9. Saving Configuration Request

Press ↓ or ↑

or 0 – 9 to move the cursor.

Press ENTER to execute function.

Press MENU to return to the Main Menu screen.

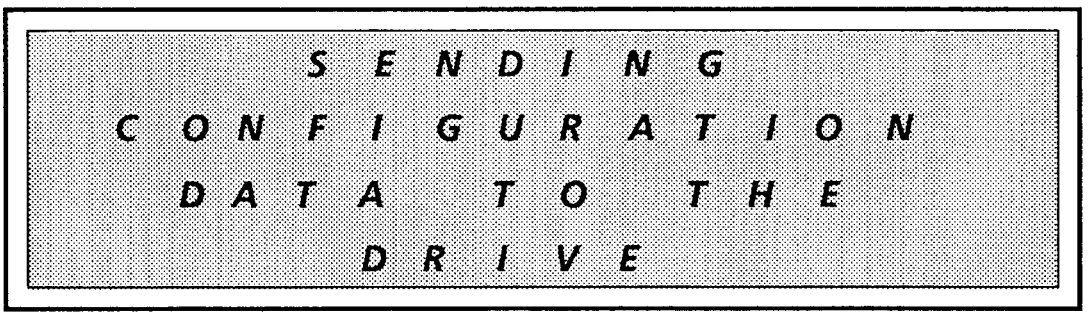


Figure 3-10. Updating Drive Parameter Table

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If the Drive cannot accept the new configuration data (Drive may be running an EEPROM Save), then the message in Figure 3-11 appears.

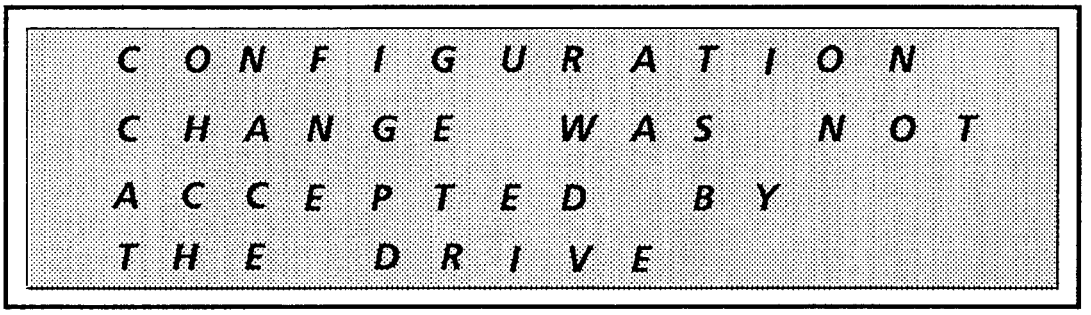


Figure 3-11. Configuration Non - Acceptable

After approximately 5 seconds, the screen will return to the Save Configuration Request screen shown in Figure 3-9.

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Chapter 4

Using The Basic Terminal

INTRODUCTION

The Bulletin 1300 Enhanced Programming Terminal provides two levels of access to the various functions. The available functions are controlled through the use of a password. When the proper password has been entered or the password feature is not active, the full functionality of the Programming Terminal is available. This is referred to as the Unlimited or Programming mode.

PASSWORD SECURITY

Through the use of the Terminal Setup mode, the Programming Terminal can be configured to provide one of four levels of user security. Once programmed, the Terminal Setup can be stored in the Drive. This permits the operator to use one Programming Terminal for numerous Drives without compromising the security of individual Drives.

The highest level of security requires the operator to enter the correct password before proceeding further. The operator is not allowed to look at or modify any Drive features without first entering the correct password. This provides the most secure system. Refer to Password Mode for details.

The next level provides the operator read only access to any parameter in the drive. No modifications to the parameters can be made. Refer to Terminal Setup Mode for details.

The third access level provides the operator with parameter read access and the ability to modify up to ten preselected parameters. The parameters that can be modified are specified in the Terminal Setup Mode description.

The final access level is the Programming Mode. The operator has complete access to all programming and monitoring features of the terminal. The specific access level available to the operator is selected while in this mode.

FAULT SCREENS

If any diagnostic test or communications request incurs a problem during power up, a fault message may appear on the screen. If a fault message appears, refer to Chapter 8, Troubleshooting, for further explanation and the steps that must be taken to re-establish communications.

MODE SELECTION

Unlimited Main Menu Screen - The Unlimited Main Menu screen appears when the password is zero, or the user has correctly entered the password using the Password Mode. This screen (Figure 4-1) allows selection of the Programming Terminal function (labeled MODE on the screen) that is desired. The Programming Terminal screen only has room to display 3 of the possible modes at one time. Figure 4-1 lists all of the available modes showing the initial position of the cursor when the main menu is first entered. The cursor appears as a set of right and left arrow brackets. The mode name shown within the cursor brackets will flash indicating that the cursor is on that mode.

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IMPORTANT: The 1395 Drive module ships from the factory with the password set to zero. This will place the program terminal in the unlimited access mode when it is connected the first time. To activate password security, you must set the password to a non-zero value.

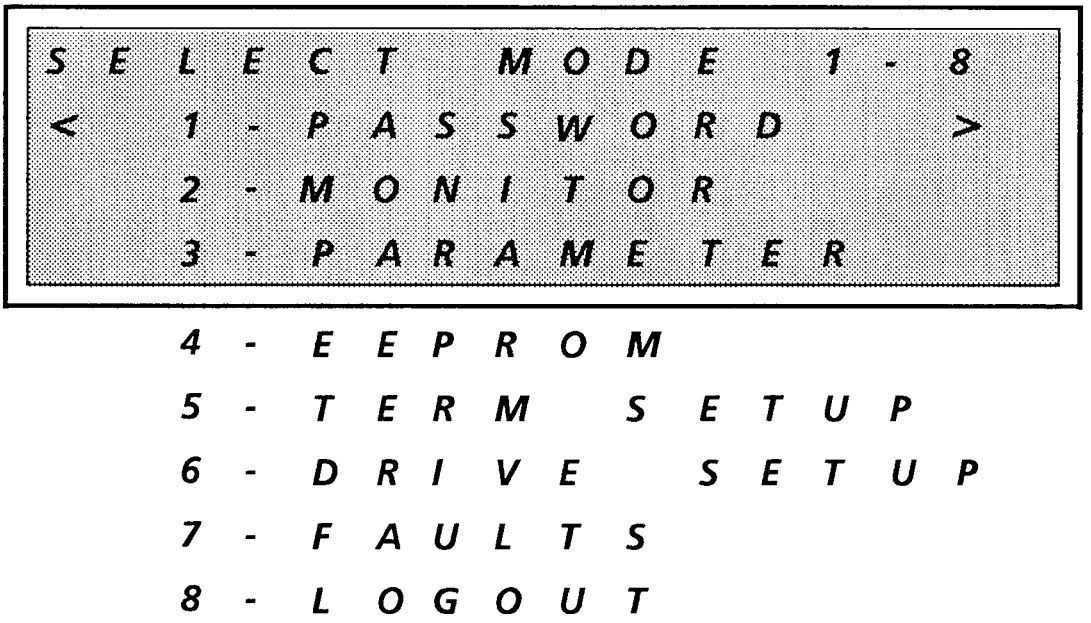


Figure 4-1. Unlimited Main Menu Screen with Password ≠ 0

Press ↓ or ↑

or 0 thru 9 to move the cursor directly to a menu selection.

Press ENTER to enter the mode selected by the cursor position.

After you press the ENTER key is pressed, the first screen associated with the mode selected will appear.

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If the password for the Programming Terminal is zero, the Main Menu screen will only display modes 1-7 as shown in Figure 4-2. Mode 8, Logout, will only appear when a password other than zero is used.

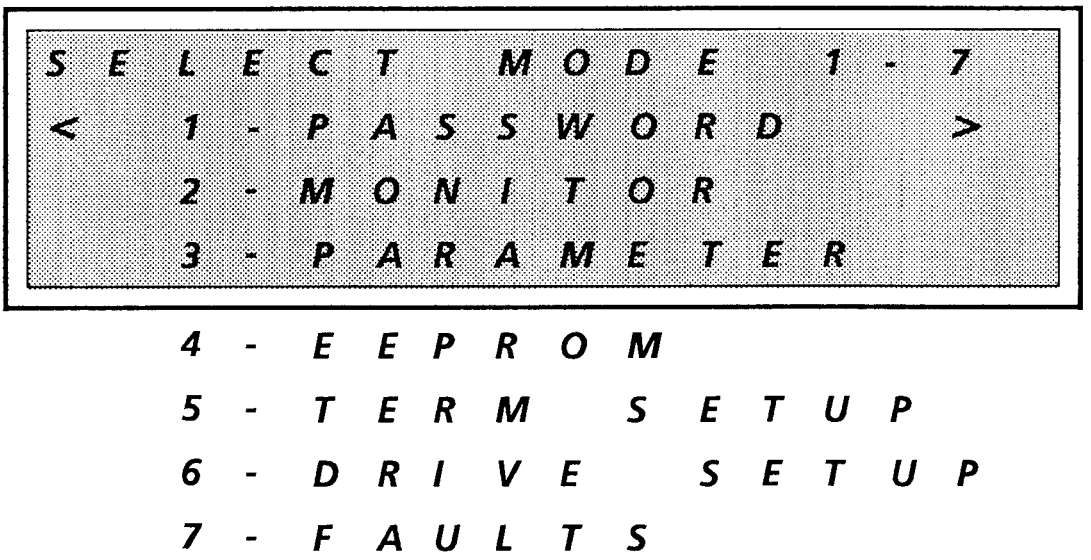


Figure 4-2. Unlimited Main Menu Screen with Password = 0

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Limited Main Menu Screen - The limited access mode is available to users who have not entered the password. There are three possible Main Menu screens which may appear in the limited access mode, depending on whether the parameter mode has been enabled. The Parameter mode in limited access will allow the user to change the values of up to 10 Drive set-up parameters. The parameters which may be accessed are determined using the Term Setup mode and can only be changed by entering the unlimited access mode which requires correctly entering the password. Figure 4-3 shows the limited access Main Menu screen when the Parameter mode has been enabled, and Figure 4-4 shows the Main Menu screen when the parameter mode has been disabled.

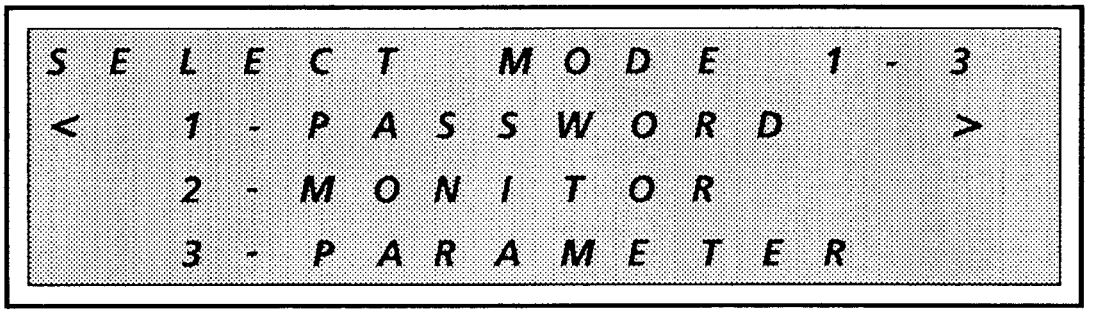


Figure 4-3. Limited Main Menu Screen with Parameter Mode Enabled

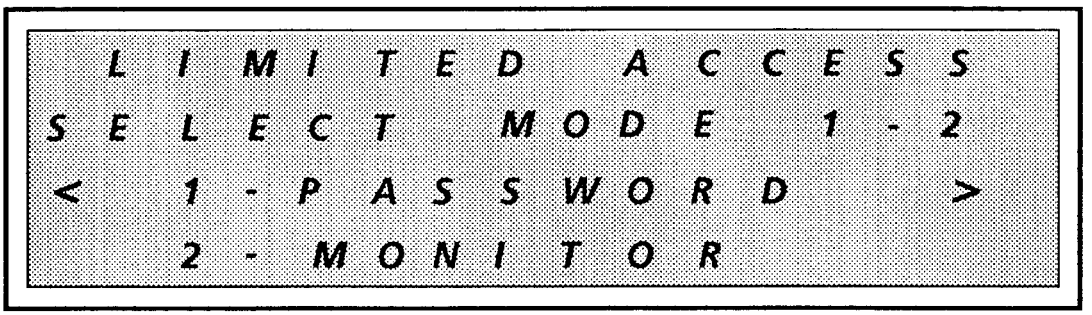


Figure 4-4. Limited Main Menu Screen with Parameter Mode Disabled

Press ↓ or ↑

or 0 thru 9 to move the cursor

Press ENTER to enter the mode selected by the cursor position.

After the ENTER key is pressed, the first screen associated with the mode selected will appear.

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PASSWORD MODE

Entering the Password - The Password mode, selected using the Main Menu screen (or if Parameter and Display modes are both off), is used to enter the password. Entering the correct password will enable unlimited access to all Programming Terminal functions. The Password screen used to enter the password is shown in Figure 4-5. This screen will appear the first time the Password mode is entered as long as a correct password has not been entered previously. The password is entered as a number ranging from 1 to 65535 using the numeric keys. The number will appear within the right and left arrow brackets.

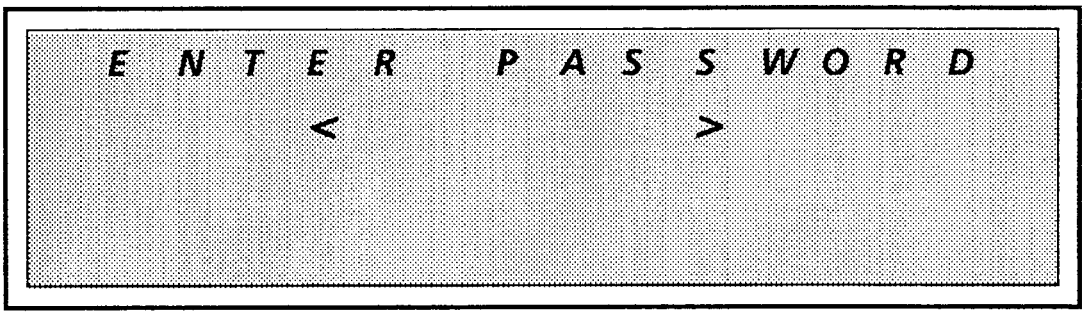


Figure 4-5. Password Entry

Press [0] — [9] to enter password 1 to 65535

Press [ENTER] to initiate a password read of the value on the screen by the Programming Terminal.

If the password is correctly entered, the Programming Terminal will automatically return to the Main Menu screen which will now appear as an Unlimited Main Menu screen (Fig. 4-1). If the password entered is not correct, the screen will appear as shown in Figure 4-6 for approximately 2 to 3 seconds. It will then return to the Limited Main Menu screen (Fig. 4-3 or 4-4) and remain in the limited access mode. If Display and Parameter Modes are both off, it re-requests the Password Entry in Figure 4-5.

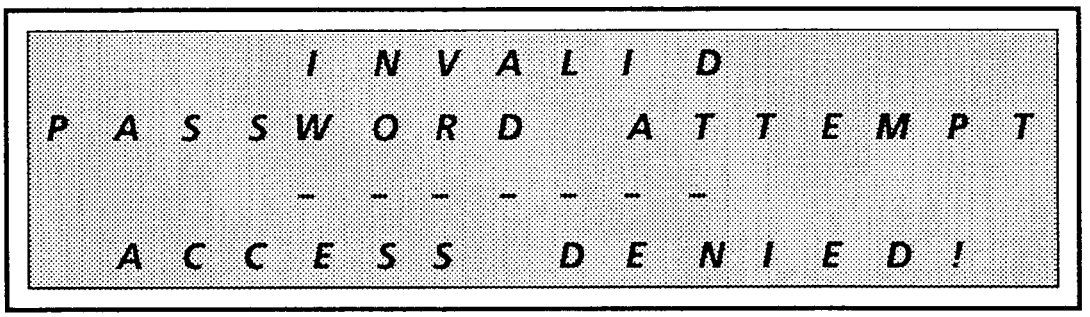


Figure 4-6. Invalid Password Entered

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Changing the Password - Once the unlimited access mode has been enabled by entering the correct password, the password may be changed by again selecting the Password mode on the Main Menu screen. In this case, the first screen will appear as shown in Figure 4-7. At this point, the old password (the password presently being used), must be entered. The password is entered as a number ranging from 0 to 65535 using the numeric keys. This number will appear to the right of the word OLD within the brackets.

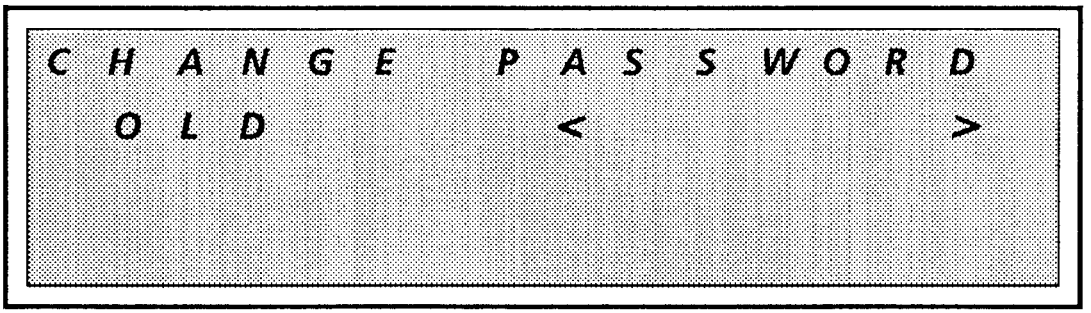


Figure 4-7. Password Change - Entering OLD Password

Press [0] – [9] to enter the password presently being used (0 to 65535).

Press [ENTER] to terminate the numeric entry and verify old password.

If the password entered is incorrect, the screen will appear as shown in Figure 4-6 for approximately 2-3 seconds. The Programming Terminal will then return to the Unlimited Main Menu screen, and the present password won't be changed.

If the password is correctly entered, the Programming Terminal will display the next line as shown in Figure 4-8. At this point, the new password is entered using the numeric keys.

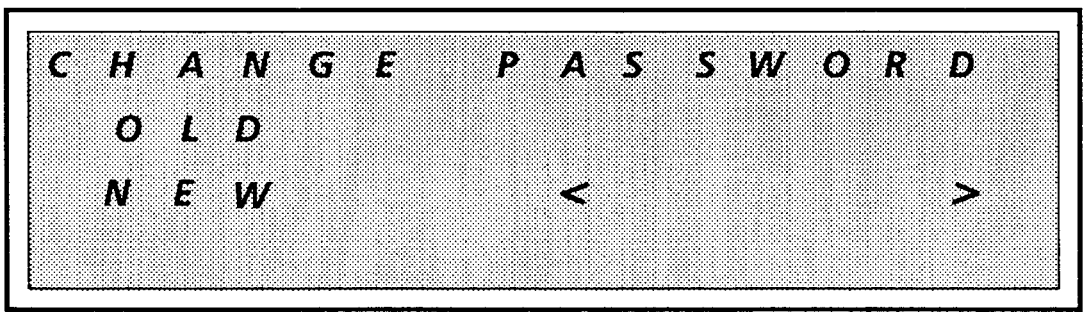


Figure 4-8. Password Change - Entering New Password

Press [0] – [9] to enter the new password (0 to 65535).

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Press [ENTER] to terminate the numeric entry and accept the new password.

Once the ENTER key has been pressed, the next line as shown in Figure 4-9 will be displayed. At this point, the new password which was entered on the previous line, must be entered again. This step is included to verify correct entry of the new password.

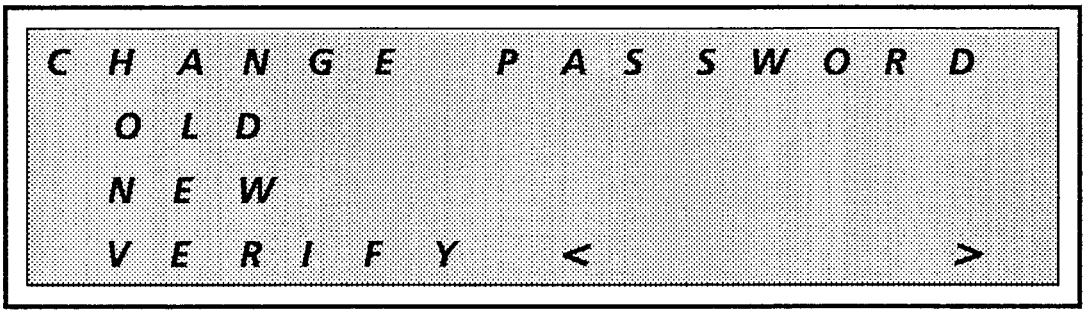


Figure 4-9. Password Change - Verify New Password

Press [0] — [9] to enter the new password a second time.

Press [ENTER] to terminate the numeric entry and to verify the new password.

If the password entered on the NEW line does not match the password entered on the VERIFY line, the screen will appear as shown in Figure 4-10 for 2-3 seconds. The Programming Terminal will then return to the Limited Main Menu and the password is not changed.

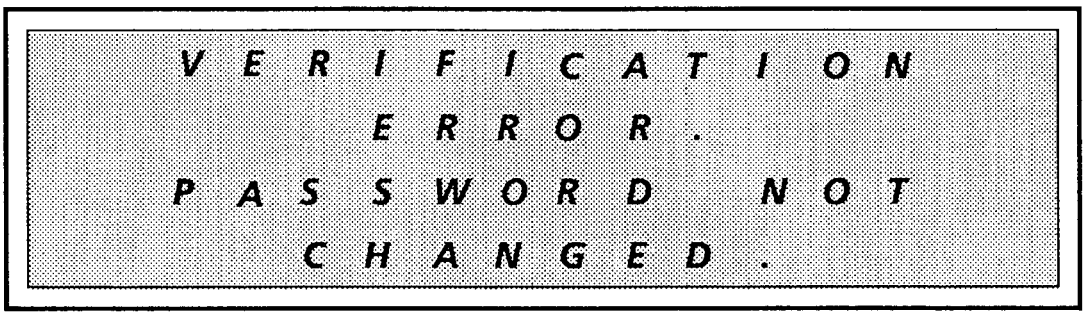


Figure 4-10. Password Verification Error

IMPORTANT: The password value 0 is used by the program terminal to access the unlimited mode. Setting the password to zero will cause the terminal to power up in the unlimited access mode. To enable password protection, use a non-zero password.

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Backup of New Password - The password is stored in the RAM memory of the Drive. When a change in password is made, the change will only be valid as long as power remains applied to the Drive control. The screen shown in Figure 4-11 is used to store the new password to EEPROM in the Drive. Option 1 causes the new password to remain in the RAM memory, but does not write the new value to EEPROM. In this case, the new password is only valid as long as power remains applied to the Drive. Option 2 results in the password being stored in the Drive EEPROM.

WARNING: When Option 2 is chosen to store the Password to EEPROM, all changed parameter values currently in the RAM memory will also be stored to EEPROM. Caution must be used when selecting Option 2. Undesired value changes inadvertently entered in EEPROM may cause erractic Drive operation and potential injury to personnel.

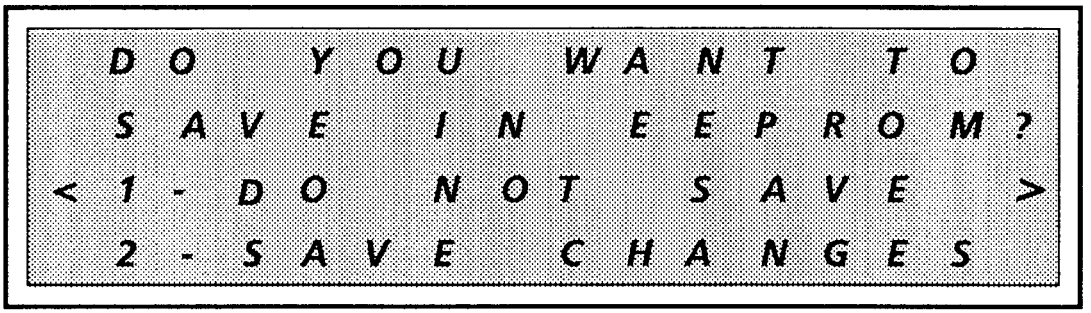


Figure 4-11. Save New Password

Press ↓ or ↑ to move the cursor

or

Press 1 for Option 1

Press 2 for Option 2

Press MENU for "Do Not Save" function

Press ENTER to execute the option shown by the cursor position.

Once the selected option has been executed, the screen will return to the Unlimited Main Menu.

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MONITOR MODE

Unlimited Access Monitor Mode - When the monitor mode on the unlimited Main Menu screen has been selected, a screen similar to that shown in Figure 4-12 will appear on the display. This screen allows you to select up to four different drive parameters to be displayed simultaneously on the Programming Terminal on a On Line basis. Each line of the display may be set up to display any one of the parameters listed in Table 4-1.

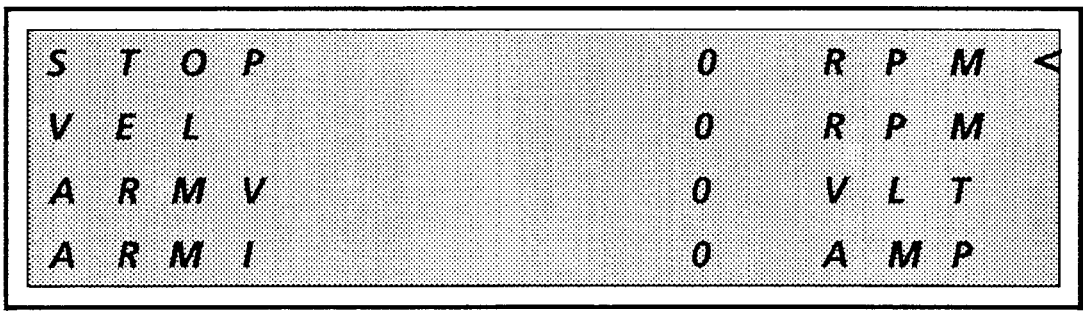


Figure 4-12. Unlimited Access Monitor Mode (Default Values)

Press ↓ or ↑ to move the cursor into the active, or through the screen.

Press INC or DEC to select the parameter to be monitored (as listed in Table 4-1)

Press MENU to return to the Unlimited Main Menu.

Table 4-1. Monitor Mode Display Parameters

Programming Terminal Display		Actual Parameter Name
VEL	RPM or %	Velocity Feedback
TORQ	%	Torque
ARMV	VLT or %	Armature Voltage
ARMI	AMP or %	Armature Current
FLDI	AMP or %	Field Current

Selection of the desired parameter to be displayed for each line is accomplished by placing the cursor, which appears as a left arrow on the right margin of the display, on the line to be modified using the up/down arrow keys. The INC and DEC keys are then used to cycle through the parameters listed in Table 4-1. Several parameters may be displayed in two different units. Each unit is a separate item. Each of the four lines is selected independently. Therefore the same information may be monitored on more than one line. A blank line can also be selected if desired.

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In addition to the parameters listed in Table 4-1, the first line of the Monitor display may be setup to display the speed reference currently being used by the drive. When this function is selected, the first line will display one of the lines listed in Table 4-2 depending on which speed reference input is presently being used by the Drive.

Table 4-2. Speed Reference Display Parameters

Programming Terminal Display		Actual Parameter Name
STOP	RPM or %	
XREF	RPM or %	External Velocity Reference
PRE1	RPM or %	Preset 1 Velocity Reference
PRE2	RPM or %	Preset 2 Velocity Reference
PRE3	RPM or %	Preset 3 Velocity Reference
PRE4	RPM or %	Preset 4 Velocity Reference
PRE5	RPM or %	Preset 5 Velocity Reference
JOG1	RPM or %	Jog 1 Velocity Reference
JOG2	RPM or %	Jog 2 Velocity Reference
MOPF	RPM or %	MOP Forward Velocity Reference
MOPR	RPM or %	MOP Reverse Velocity Reference

If changes to the Monitor function have been made, the Programming Terminal will ask if setup information is to be backed up to the drive EEPROM before returning to the Main Menu.

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Backup of Monitor Mode Parameters - The parameter monitoring information entered using the Unlimited Monitor Mode functions is stored in RAM memory of the Drive, and will remain in memory only as long as power remains applied to the Drive control. The screen shown in Figure 4-13 is used to store the new Monitor setup information to EEPROM in the Drive. Option 1 keeps the new setup in RAM memory, but doesn't write it to EEPROM. In this case, the new setup is only valid as long as power remains applied to the Drive. Option 2 results in the setup being stored in the Drive EEPROM.

WARNING: When Option 2 is chosen , all changed parameter values currently in the RAM memory will be stored to EEPROM. Caution must be used when selecting Option 2. Undesired value changes inadvertently entered in EEPROM may cause erractic Drive operation and potential injury to personnel.

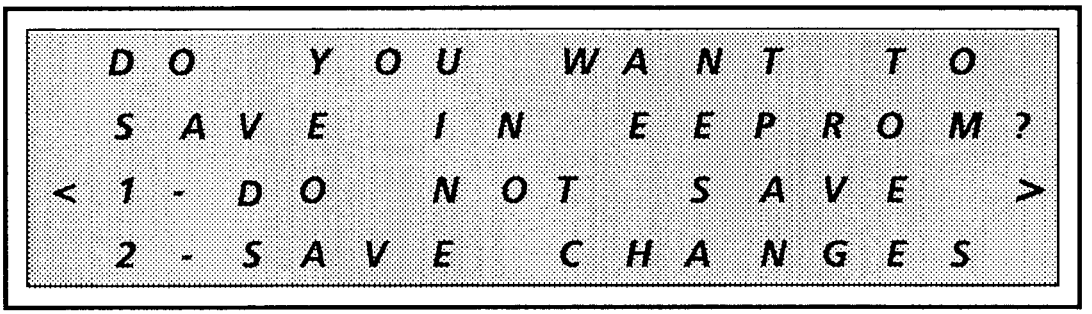


Figure 4-13. Saving New Monitor Mode Parameters

Press ↓ or ↑ to move the cursor

or

Press 1 for Option 1

Press 2 for Option 2

Press MENU for "Do Not Save" function

Press ENTER to execute the option shown by the cursor position.

Once the selected option has been executed, the screen will return to the Unlimited Main Menu.

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Limited Access Monitor Mode - When the Monitor mode on the Limited Main Menu screen has been selected, the screen shown in Figure 4-14 will appear on the display. This screen allows you to monitor four different drive parameters simultaneously on the Programming Terminal on a real time basis. The choice of parameters to be monitored cannot be changed in the Limited Access Monitor mode.

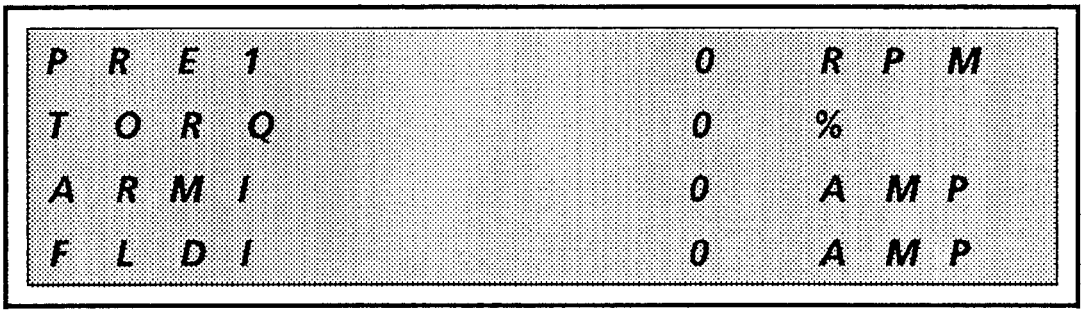


Figure 4-14. Limited Access Monitor Mode

Press MENU to return to the Limited Main Menu

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Monitor Mode Screens - If the Monitor mode is selected from the Limited Main Menu, and the Monitor mode has not been set up to monitor any parameters, the notification screen shown in Figure 4-15 will appear for 2-3 seconds before the display returns to the Limited Main Menu screen. If this is the case, then no monitoring of parameter information is possible in the limited access mode.

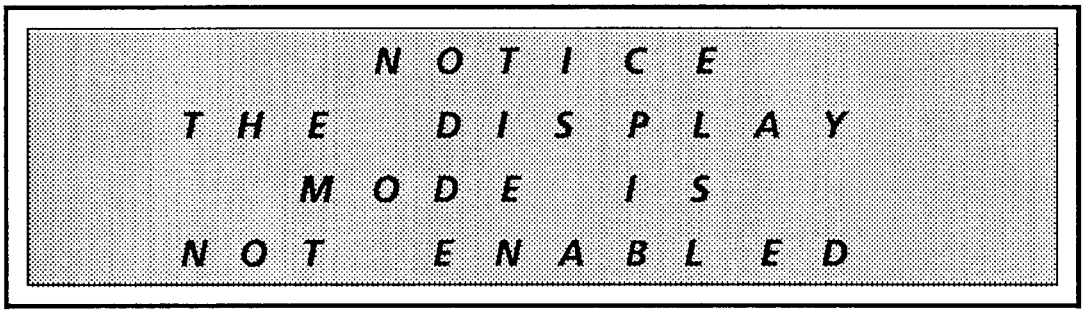


Figure 4-15. Display Mode Off Notification

If the Monitor mode is selected in the Unlimited Access Mode, and the Monitor mode has not been set up to monitor any parameters, the warning screen shown in Figure 4-16 will appear for 2-3 seconds. The Display will then show the Unlimited Monitor mode screen (Similar to Figure 4-12 with all lines blank).

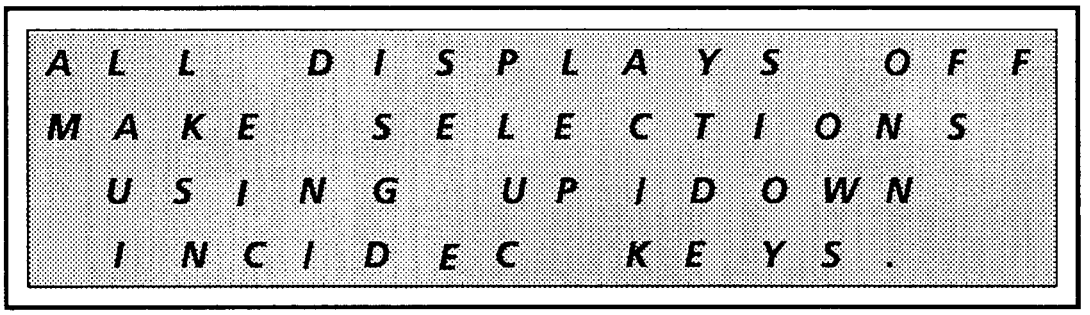


Figure 4-16. Display Mode Not Setup Notification

If all lines are blank and you are in limited access mode, then message is displayed in Figure 4-17 appears..

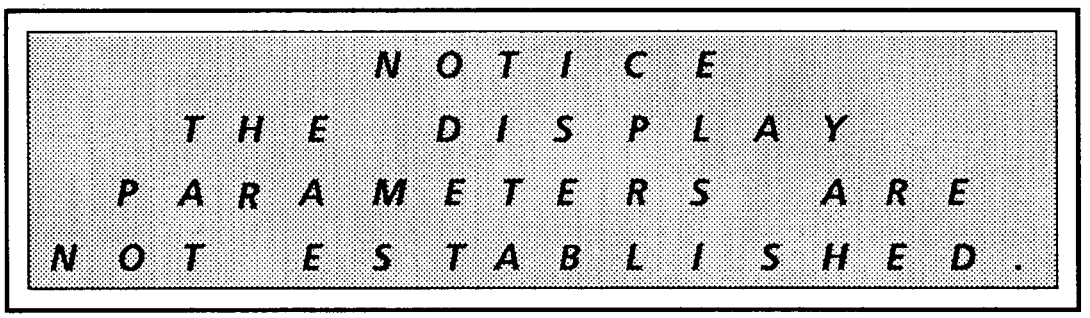


Figure 4-17. Parameters Not Established Notification

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Chapter 5

Programming The Drive

PARAMETER MODE

Initial Parameter Entry - If a parameter has not been previously accessed using the Programming Terminal, the screen shown in Figure 5-1 will appear when the Parameter mode is selected from the Main Menu. The cursor will appear as right and left flashing arrow brackets. The desired parameter number from 0 - 999, is entered using the numeric keys. The number will appear within the right and left arrow brackets.

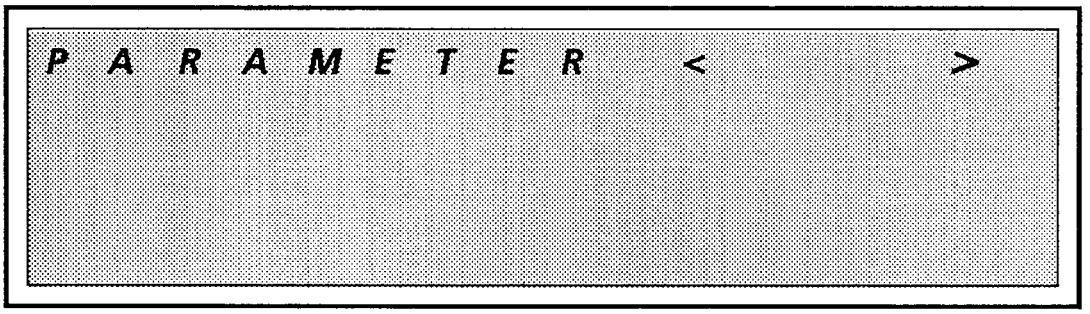


Figure 5-1. Entering an Initial Parameter

Press [0] — [9] to enter parameter number (1 - 999).

Press [ENTER] to display parameter information

Press [MENU] to go back to MAIN MENU

Parameter Screens - Figure 5-2 illustrates the parameter screen display used for parameters with numeric values. The information on this screen is defined as:

- Line 1 - Indicates the parameter number whose data is being displayed.
- Line 2 - Parameter name in ASCII text.
- Line 3 - Present value of parameter and units if applicable. The number system used for the value display is selectable using the ALT - BASE function.
- Line 4 - Value Limits of parameter displayed using the same number system as line 3.

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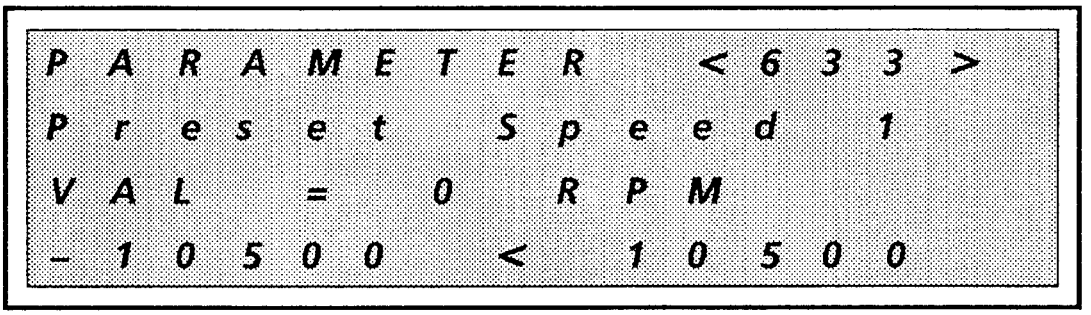


Figure 5-2. Numeric Parameter Screen

Press [INC] or [DEC] to increment or decrement thru the parameter table or parameter value one at a time.

Press [↓] or [↑] to move the cursor between the parameter number field and parameter value field.

or Press [0] - [9] to enter the parameter number directly.

and Press [ENTER] to display the entered new parameter screen.

or Press [ENTER] to toggle between present parameter and a previously entered parameter.

or Press [MENU] to return to Main Menu.

In addition to parameters with numeric values, there are several parameters that use different data types. Selection of parameters with these other data types, is identical to parameters using numeric data. The normal parameter display for each of the other data types differs slightly from numeric valued parameters. Bit coded parameters appear as shown in Figure 5-6. On/Off selectable parameters are illustrated in Figure 5-8.

If no parameters had been previously accessed, the appropriate parameter screen will appear after entering a parameter number in the initial parameter entry screen as shown in Figure 5-1. If a parameter had been previously accessed, the appropriate parameter screen will appear immediately upon selection of the parameter mode in the Main Menu as in Figure 5-2.

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Changing Parameter Numbers - The cursor on the normal parameter screen appears as left and right arrow brackets and can be moved between the parameter line and the value line to allow the user to change either the parameter number, or the value of the parameter selected. When the cursor is on the parameter line of the normal parameter screen as shown in Figure 5-2, the parameter number may be changed by using either the INC or DEC keys or by using the numeric keys to enter the parameter number directly.

Using the INC and DEC keys causes the new parameter number to be entered immediately, and the display updated.

When the numeric keys are used, the parameter number selected appears within the cursor brackets and the brackets will flash. The information for the new parameter is not displayed until the ENTER key is pressed.

Entry of a new parameter number changes the normal parameter screen for that new parameter number. Pressing the ENTER key without changing the parameter number causes the display to toggle between a previous parameter and the current parameter being displayed.

Changing Numeric Parameter Values - The cursor on the parameter screen appears as right and left arrow brackets and can be moved between the parameter line and the value line to allow the user to change either the parameter number, or the value of the parameter selected. When the cursor is on the Value line of the parameter screen as shown in Figure 5-3, the parameter value may be changed by using either the INC or DEC keys or by using the numeric keys to enter the value directly.

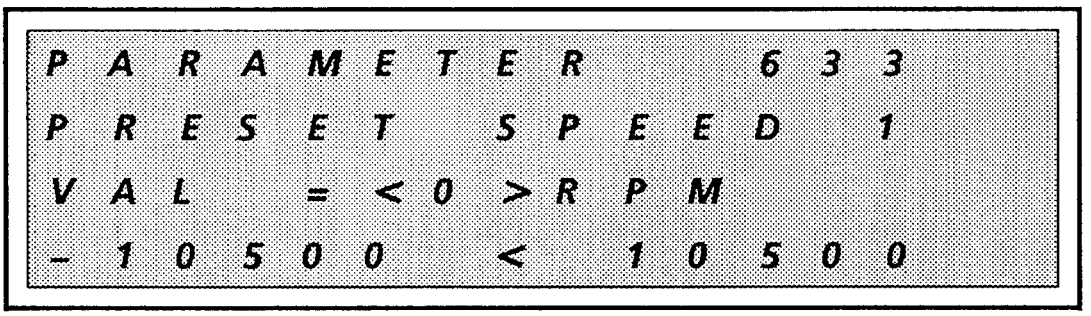


Figure 5-3. Parameter Value Displayed in Engineering Units.

Press INC or DEC to increment or decrement the parameter

Press ↓ or ↑ to move the cursor from the parameter number to change bit definitions.

or Press 1 – 9, +/-, . to enter the parameter value directly.

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and Press **ENTER** to enter the new parameter value.

Pressing **ENTER** again will cause the display to toggle between the present parameter and a previously entered parameter.

or Press **MENU** to return to Main Menu.

Using the INC and DEC keys enters the new parameter value immediately, and the parameter display for the new parameter value appears on the screen.

When the numeric keys are used, the parameter value selected appears within the cursor brackets and the brackets flash. The data for the new parameter is not sent to the Drive until the ENTER key is pressed.

If changes to parameter values have been made, the Programming Terminal will ask if new values are to be backed up to the Drive EEPROM before returning to the Main Menu.

Changing Parameter Value Display Base - The ALT key used with the BASE key allows changing of the parameter value display base. This function requires two keystrokes.

Press **ALT** to enable the alternate key function.

then **BASE** to change the parameter value display base.

Each time the function is performed, the number system used to display the parameter value will cycle to the next base. Figures 5-3 through 5-5 illustrate the available number bases. The parameter value range shown on line 4 of the display is scaled automatically for the new number system.

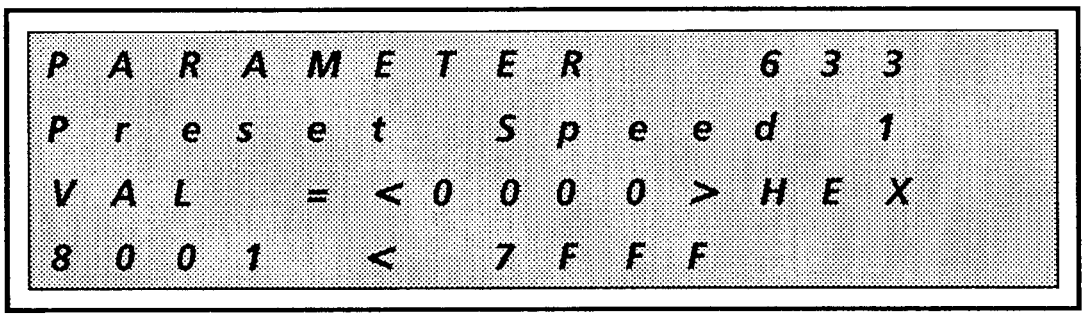


Figure 5-4. Parameter Value Displayed in Hexidecimal

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When the Hexidecimal system is chosen, the letters A-F are also enabled for use in entering parameter values. These letters are entered via two keystrokes using the ALT key and the alternate letter keys.

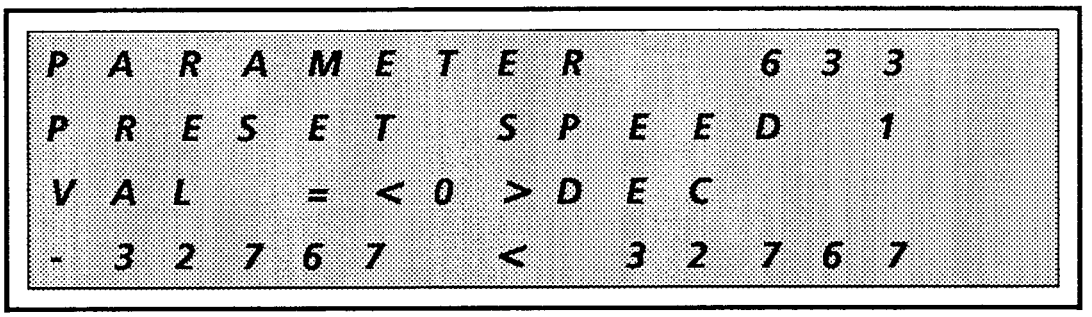


Figure 5-5. Parameter Value Displayed in Decimal

Changing Bit Coded Parameter Values - Several parameters in the Drive are programmed as bit coded words consisting of 16 bits. Each of these bits has been given a definition. Parameter 627, Flux Mode Select, is an example of this type of parameter. Figure 5-6 illustrates the normal parameter displayed when a bit coded parameter has been selected using the Parameter mode. The selection of parameter numbers for bit coded parameters is exactly the same as parameter selection for numeric parameters. The major difference is that line 3 displays a 16 bit binary word. Line 4, instead of displaying the range of values for the parameter, displays the words BIT ADJUSTABLE. This indicates that the parameter is a bit coded word.

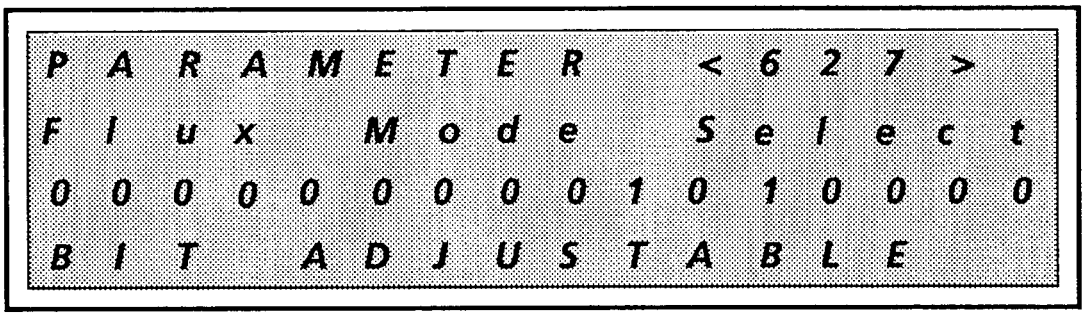
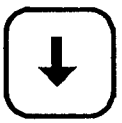


Figure 5-6. Parameter Displayed as Bits

Press  or  to move the cursor from the parameter number to change bit definitions.

When the cursor is moved off the parameter number, the display will appear as shown in Figure 5-7. In this case, the cursor appears as an up arrow on the bottom line of the screen.

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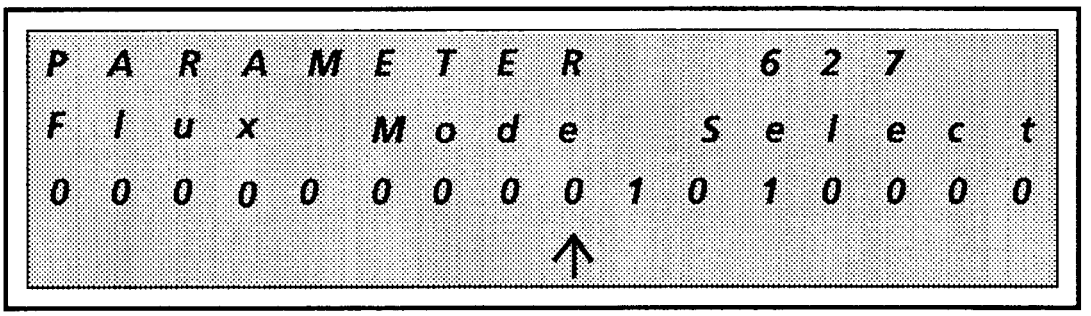


Figure 5-7. Changing Bit Coded Parameters

Press [INC] or [DEC] to select the bit to be changed.

Press [0] or [1] to reset or set the bit value, respectively.

Press [↓] or [↑] to return to the parameter line.

Press [+/-] to toggle bit value 1 to 0 or 0 to 1.

Press [MENU] to return to the Main Menu.

If changes to the parameter values have been made, the Programming Terminal will ask if new values are to be backed up to the Drive EEPROM before returning to the Main Menu (refer to Fig. 5-10).

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Changing Selectable Parameter Values - Several parameters in the Drive are programmed to be selectable as to function. Parameter 626, Jog Ramp Enable is an example of this type of parameter. Figure 5-8 illustrates the normal parameter screen displayed when an ON/OFF selectable parameter has been selected using the Parameter mode.

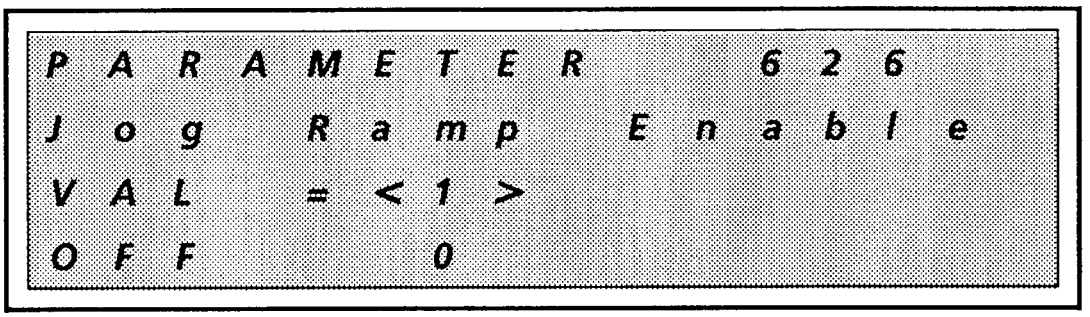


Figure 5-8. Changing Selectable Parameters

Press ↓ or ↑ to move the cursor from the parameter number to the value line.

Press 0 to change the value to 0.

Press 1 to change the value to 1.

Press +/- , INC , DEC to toggle value 0 - 1 or 1 - 0.

Press ↓ or ↑ to return to the parameter line.

Press MENU to return to the Main Menu.

If changes to the parameter values have been made, the Programming Terminal will ask if new values are to be backed up to the Drive EEPROM before returning to the Main Menu. Refer to Fig. 5-10 for EEPROM back-up.

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Non-Changeable Parameter Screen - All parameters below 500 and above 950 in the Drive are non-changeable since their values are continuously updated by the normal execution of the Drive . Several of these parameters are Source parameters used to transfer information from the Drive to external devices. Figure 5-9 illustrates the Non-Changeable Parameter Display screen.

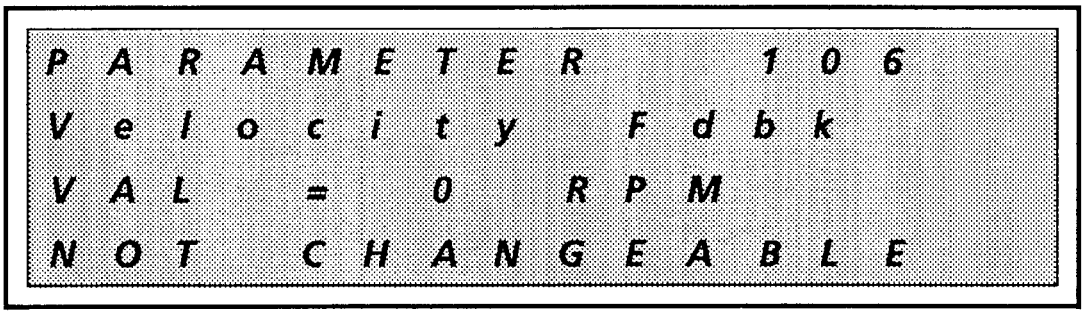


Figure 5-9. Non-Changeable Parameters

Backup of Parameter Values - The parameter values entered using the Parameter mode are stored in RAM memory of the Drive, and will remain in memory as long as power remains applied to the Drive control. The screen shown in Figure 5-10 is used to store the new parameter values to EEPROM in the Drive. The new values remain in RAM memory, but are not written to EEPROM under Option 1. In this case, the new parameter values are only valid as long as power remains applied to the Drive. The new parameter values are stored in the Drive EEPROM with Option 2.



WARNING: When Option 2 is chosen , all changed parameter values currently in the RAM memory will also be stored to EEPROM. Caution must be used when selecting Option 2. Undesired value changes inadvertently entered in EEPROM may cause erratic Drive operation and potential injury to personnel.

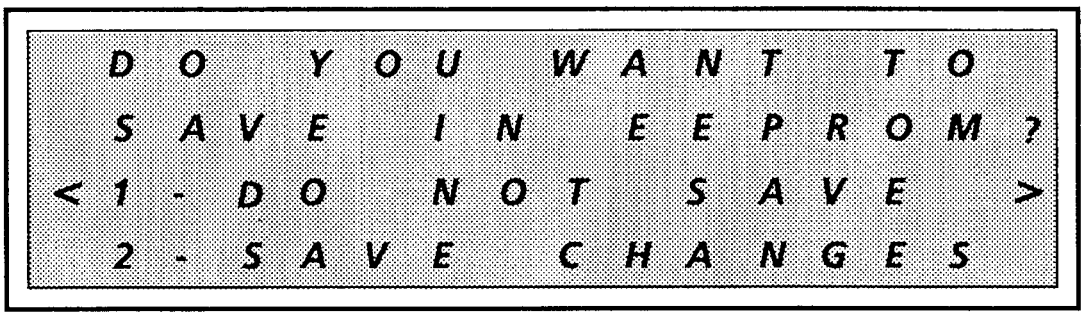
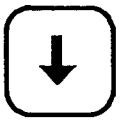


Figure 5-10. Saving Parameter Values to Drive EEPROM

Press  or  to move the cursor.

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Press [0] – [9] to select option.

Press [MENU] as the default "Do Not Save Change" exit.

Press [ENTER] to execute the option shown by the cursor position.

Illegal Parameter Changes - If an attempt to send an illegal parameter number or an out of range parameter value to the Drive is made, the screen in Figure 5-11 will appear. When a parameter value is out of range, the screen in Figure 5-12 will appear .

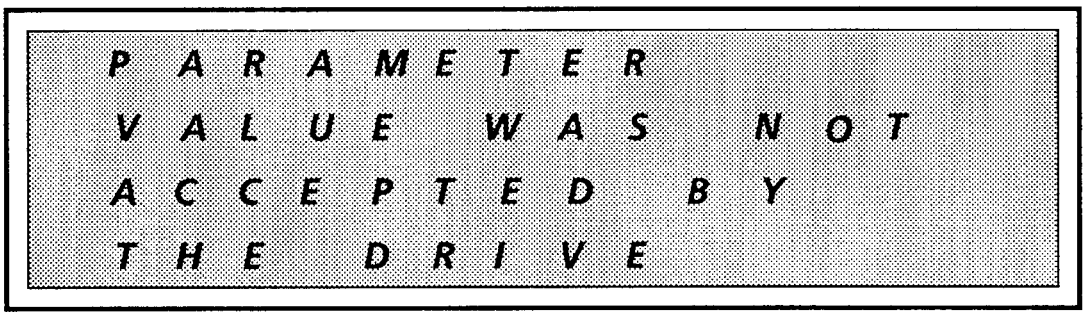


Figure 5-11. Illegal Parameter Request

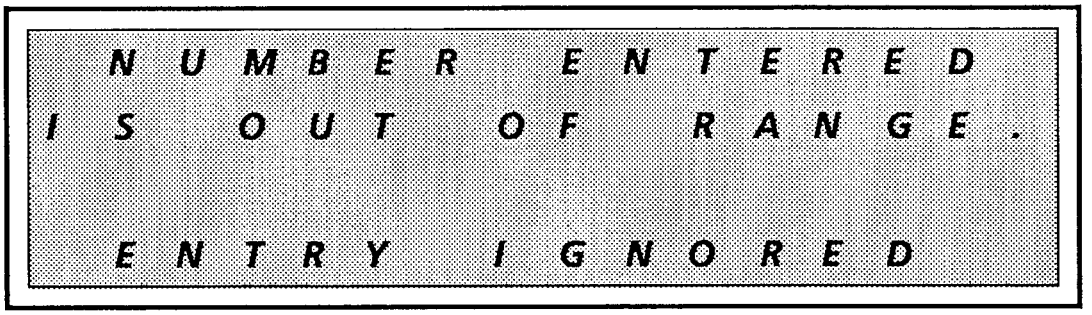


Figure 5-12. Number Range Error

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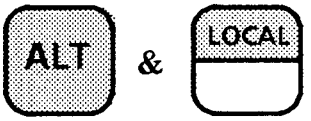
Chapter

6

Operating The Drive From The Terminal

LOCAL MODE

Local Control Access - To access Local control press :



consecutively.

If the Drive was already under LOCAL control, the keypresses will be ignored. If the Terminal Run Mode was not activated when these keypresses were made, the Warning Screen Display in Figure 6-1 will appear for a short period of time to notify you the Terminal is not in Run Mode. See Terminal Set-Up Mode to activate Run Mode.

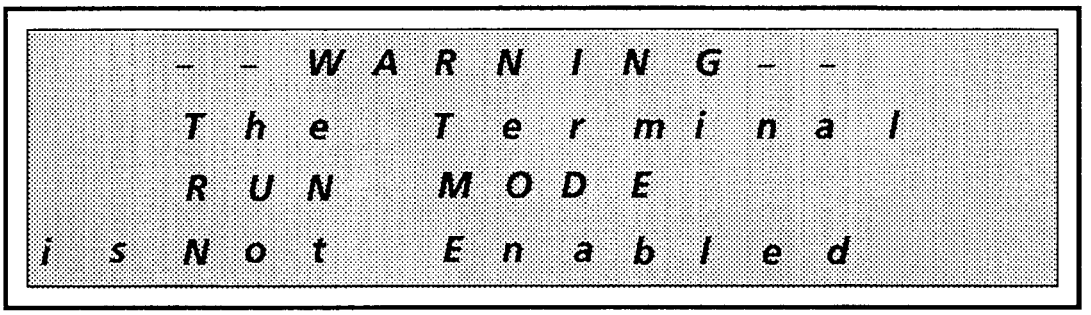


Figure 6-1. Terminal Run Mode Disabled Screen

If the Drive is faulted when an attempt is made to access Local Control, the Warning screen in Figure 6-2 will appear for a short period of time.

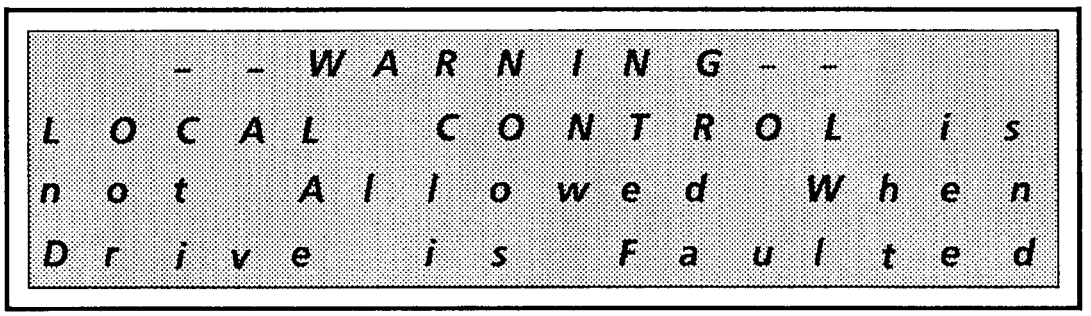


Figure 6-2. Drive Faulted Warning Screen

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If the Drive is running when an attempt to access Local Control is made, the Warning screen in Figure 6-3 will be shown for a short period of time.

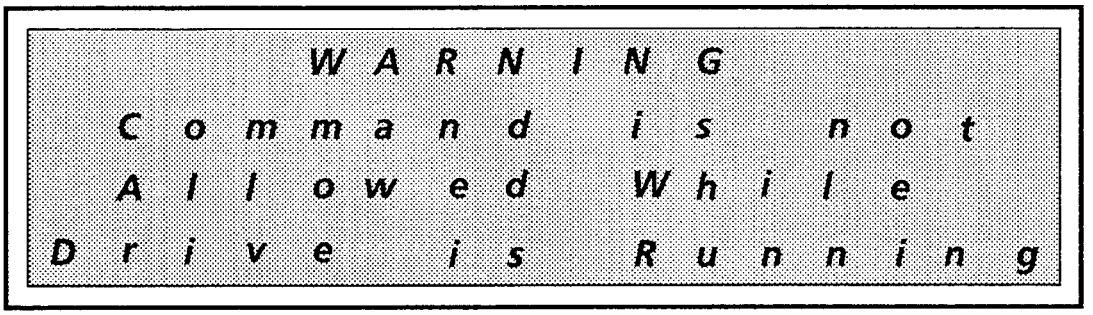


Figure 6-3. Drive Running Warning Screen

If none of the conditions described in Figures 6-1 through 6-3 are present, the display screen in Figure 6-4 will appear.

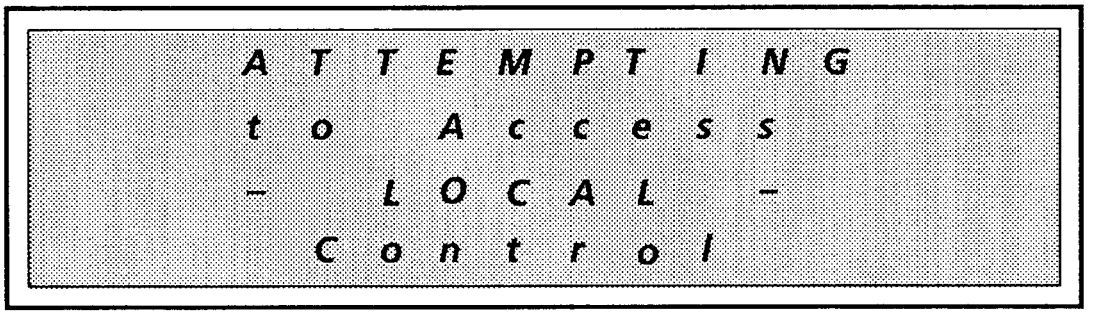
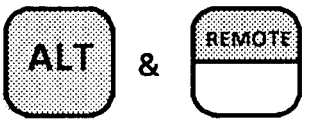


Figure 6-4. Attempting to Access Local Control

LOCAL Control is achieved when the LOCAL LED on the Programming Terminal is illuminated.

Local Control Release - To terminate Local Control and return to Remote Control press :



consecutively.

If the Terminal Run Mode was disabled when these keypresses were made, the Warning Screen Display in Figure 6-5 will appear for a short period of time.

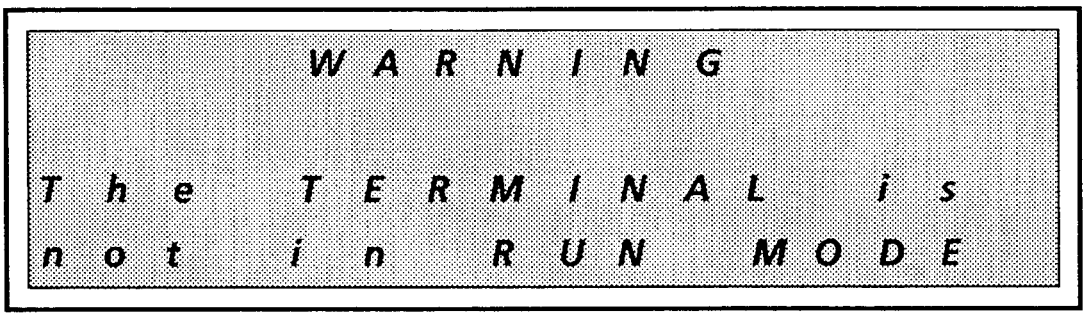


Figure 6-5. Terminal Run Mode Disabled Screen

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If LOCAL control had been previously removed , the display in Figure 6-6 will appear for a short period of time.

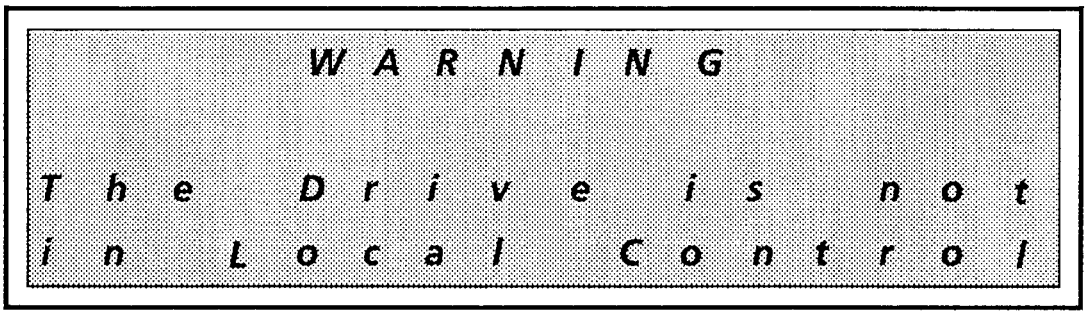


Figure 6-6. Local Control Disabled Screen

If the Drive is running when an attempt to release Local Control is made the Terminal will respond with the Warning Display shown in Figure 6-7 for a short period of time.

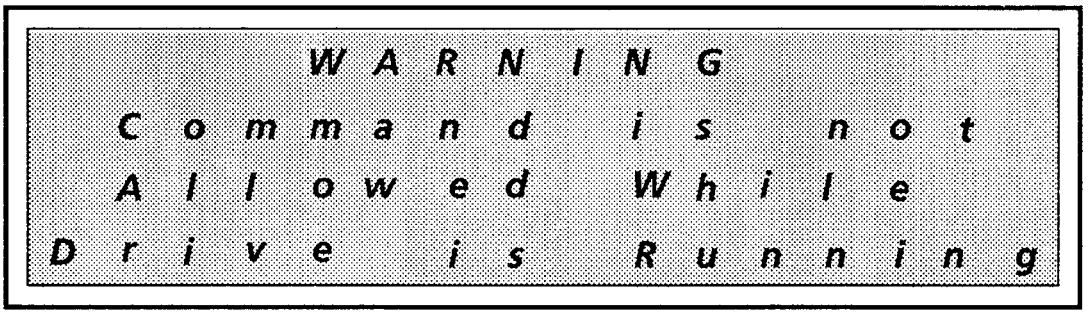


Figure 6-7. Drive Running Warning Screen

If none of the conditions described in Figures 6-5 through 6-7 are present, the display screen in Figure 6-8 will appear.

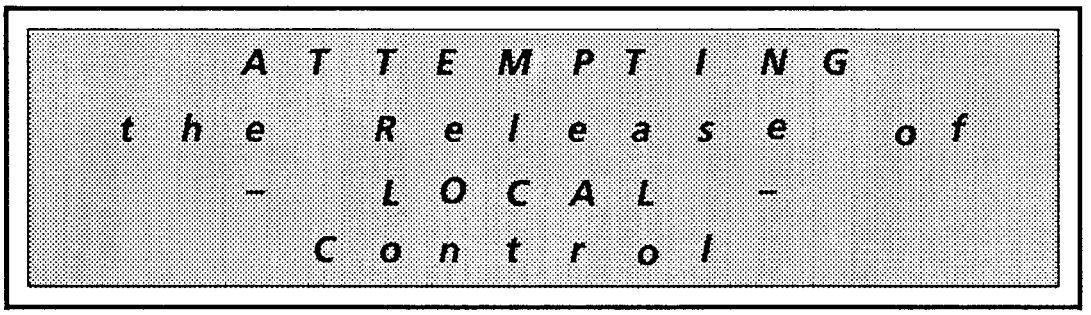


Figure 6-8. Attempting to Release Local Control

LOCAL Control is released when the LOCAL LED on the Programming Terminal is no longer illuminated.

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USING THE JOG FUNCTION

Jog Enable - The preset Jog functions can be enabled by pressing the:

JOG1 or JOG2 keys

If the Terminal Run Mode is not active when either of the Jog keys are activated, the Warning message in Figure 6-9 will appear on the terminal display for a short period of time.

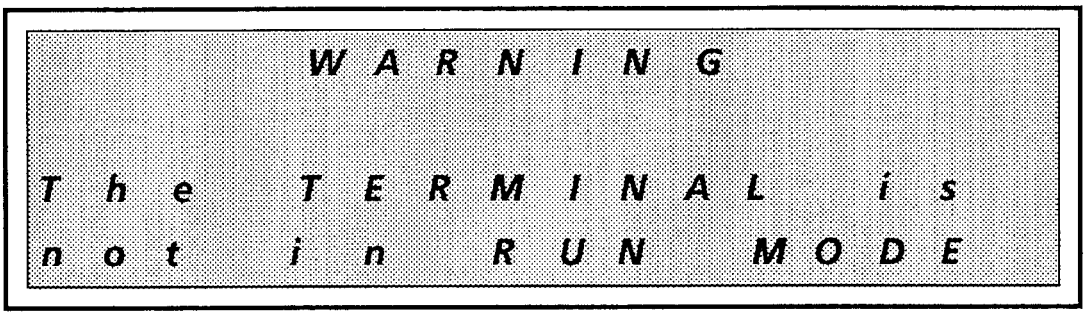


Figure 6-9. Terminal Run Mode Disabled Screen

If the Drive is not in local control when an attempt to Jog is made, the warning in Figure 6-10 is displayed for a short period of time.

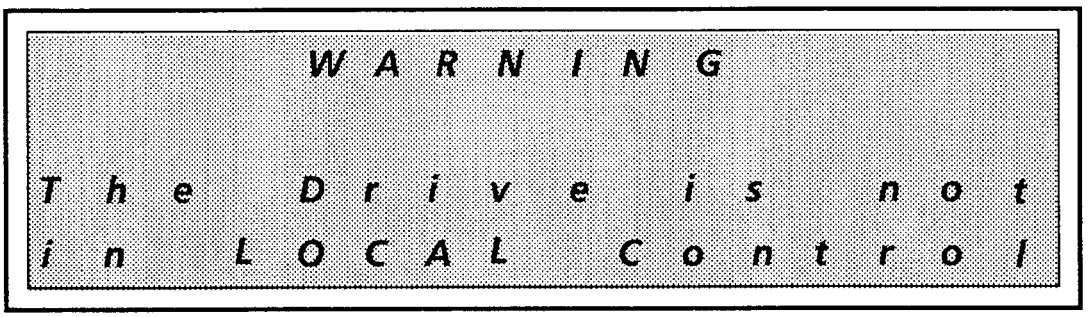


Figure 6-10. Local Control Disabled Screen

If any stop is enabled and an attempt to Jog is made, the screen in Figure 6-11 is displayed.

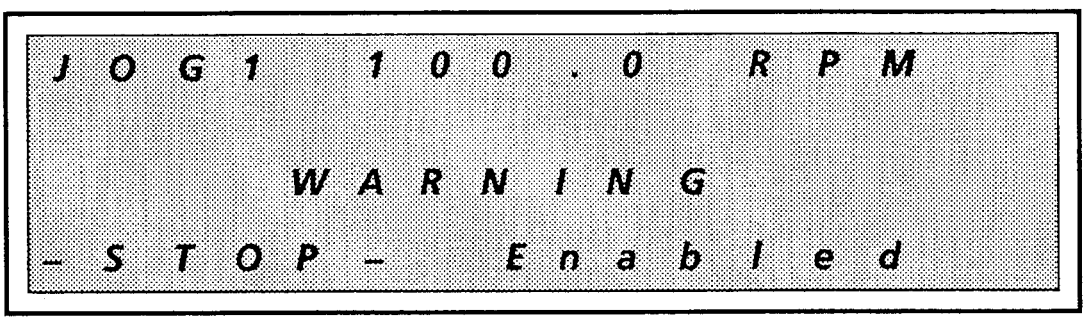


Figure 6-11. Stop Enabled Notification Screen

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If the Drive is already running at another reference when an attempt to Jog is made, the screen in Figure 6-12 is displayed.

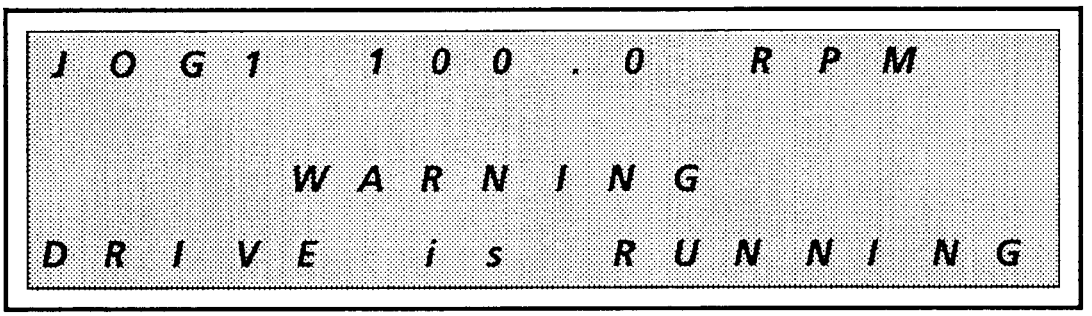


Figure 6-12. Drive Running Notification Screen

If the conditions in Figures 6-9 through 6-12 aren't present, the first time you press a Jog key the screen shown in Figure 6-13 will appear.

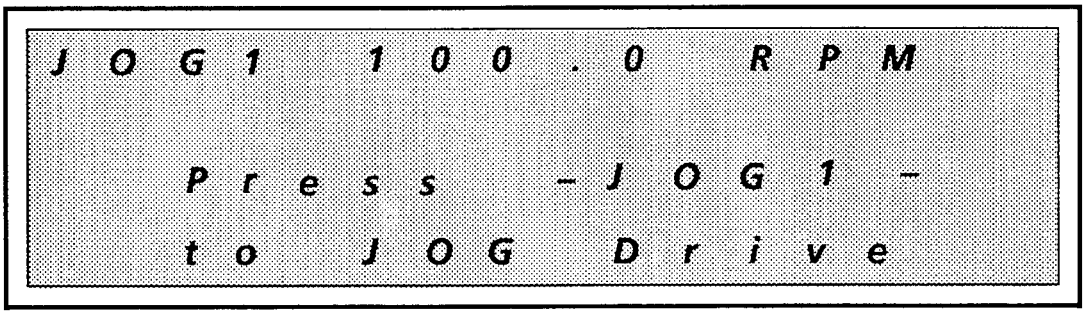


Figure 6-13. Jog Screen

Jogging - To Jog the motor, press either:

the JOG1 or JOG2 keys, until the display in Figure 6-14 appears.

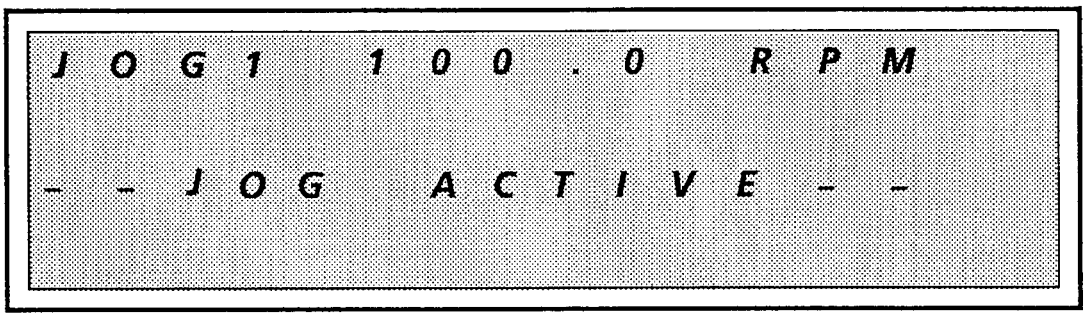


Figure 6-14. Jog Running Screen

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Jog Modify - If the user has Unlimited access to the Drive, the Jog Speed can be changed by using the following keys:

the [A / 0] thru [X-REF / 9] keys or,

the [B / .] key, or

the [C / ±] key.

The display will then show a modified JOG Speed reference like the example in Figure 6-15.

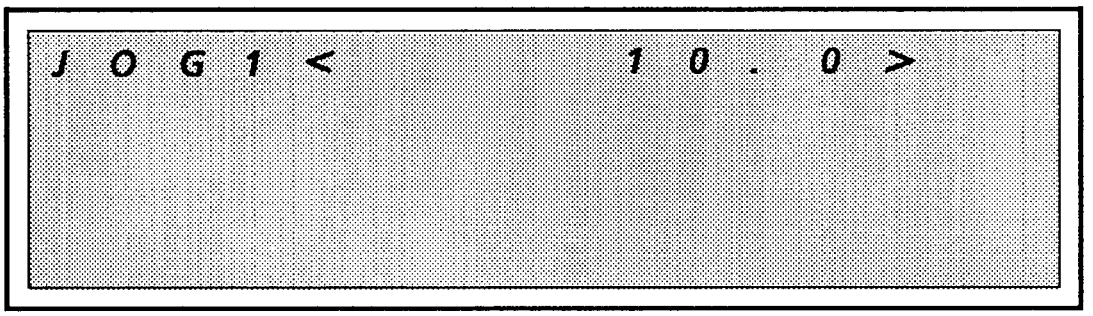


Figure 6-15. Changing Jog Reference

The Jog Speed Reference will be stored in the RAM memory and will stay there only as long as there is power to the Drive.

Jog Exit - To exit the JOG screens press the :

[DEL] or [MENU] keys.

The terminal will return to the Main Menu or a previous Monitor or Parameter screen.

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USING THE PRESET & X-REF FUNCTIONS

Selecting the Desired Speed-Ref Source - With the START already enabled, now press:

the ALT key, and

the PRE 1 thru PRE 5 keys, or

the X REF key.

If the Terminal Run Mode is disabled , the Notification message in Figure 6-16 will appear on the terminal display for a short period of time.

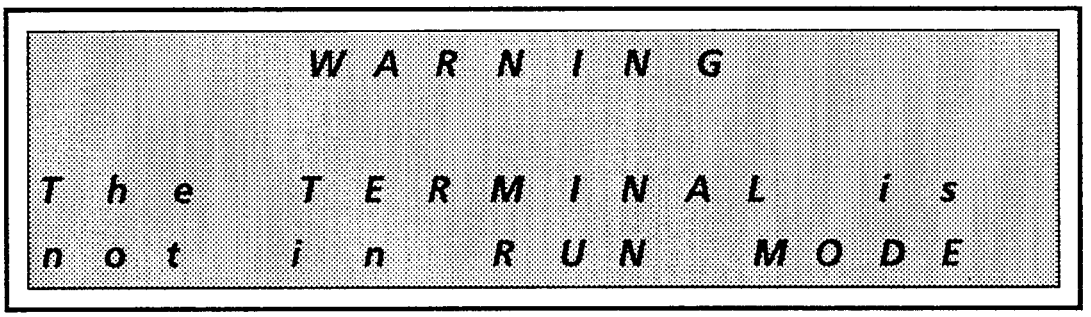


Figure 6-16. Terminal Run Mode Disabled Screen

If the Drive is not in local control , the message in Figure 6-17 will be displayed for a short period of time.

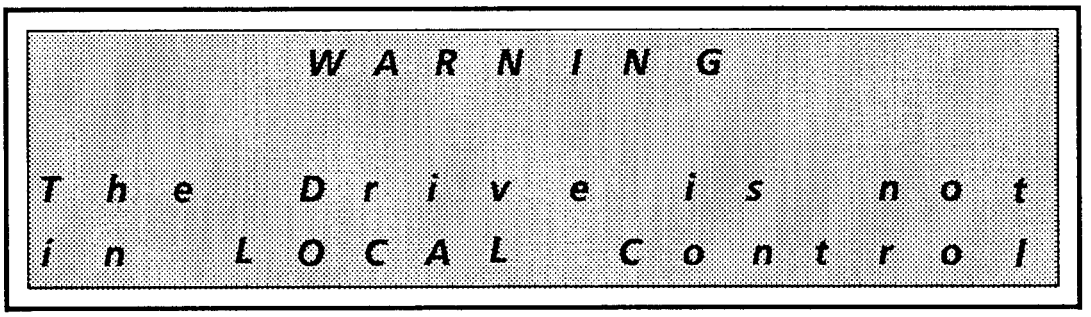


Figure 6-17. Local Control Disabled Screen

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If the Drive is not ready, the message in Figure 6-18 will be displayed for a short period of time.

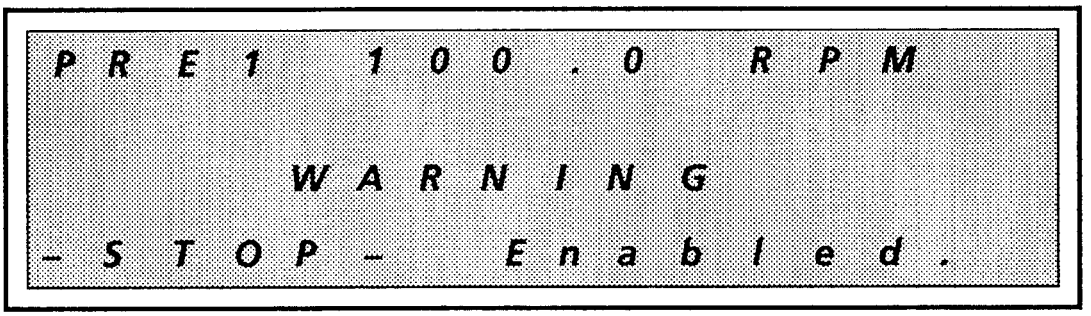


Figure 6-18. Stop Enabled Warning Screen

Note: If the Drive is already running at the requested command, the display screen in Figure 6-19 will appear for a short period of time.

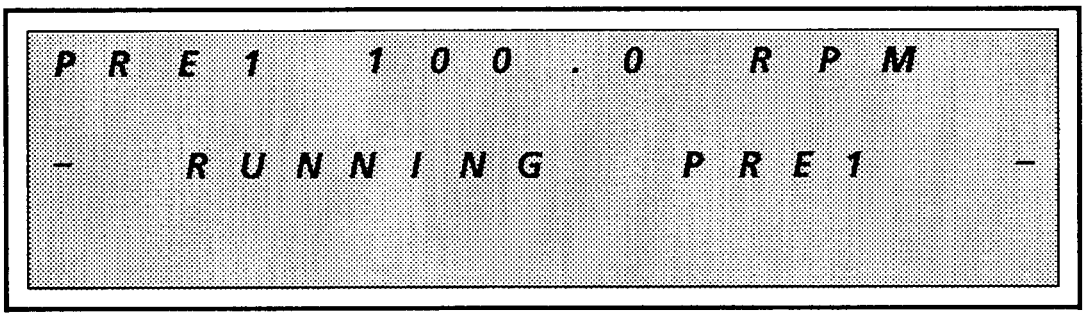


Figure 6-19. Running at Requested Command Screen

If none of the conditions in Figures 6-16 through 6-19 are in effect, then the display screen shown in Figure 6-20 will appear.

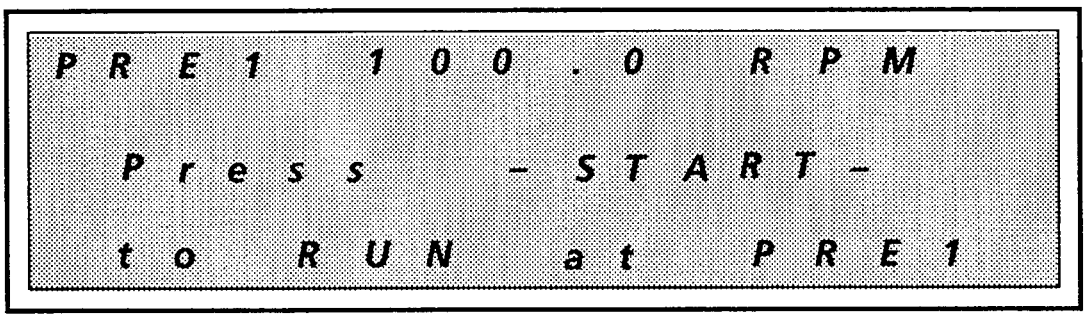


Figure 6-20. Drive Start Screen

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Start The Drive - If the Start is Enabled, pressing the



key, will cause the Drive to run at the Preset as shown in Figure 6-21 .

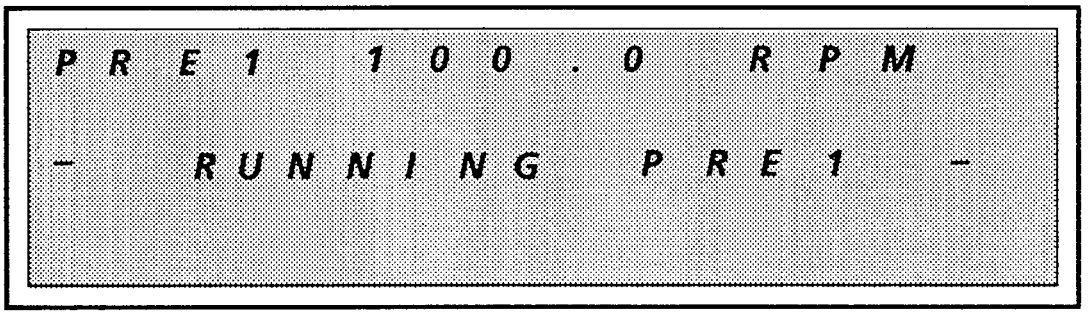
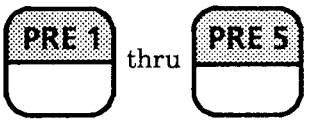
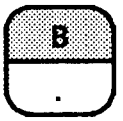


Figure 6-21. Drive Running Screen

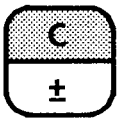
Modifying the Run Reference - If the user has Unlimited Access , the PRE 1 through PRE 5 speeds can be changed by using keys:



or



or



NOTE: The terminal does not have the ability to change the X-Ref.

When the Preset speed has been modified, the new figure will appear on the display as shown in Figure 6-22.

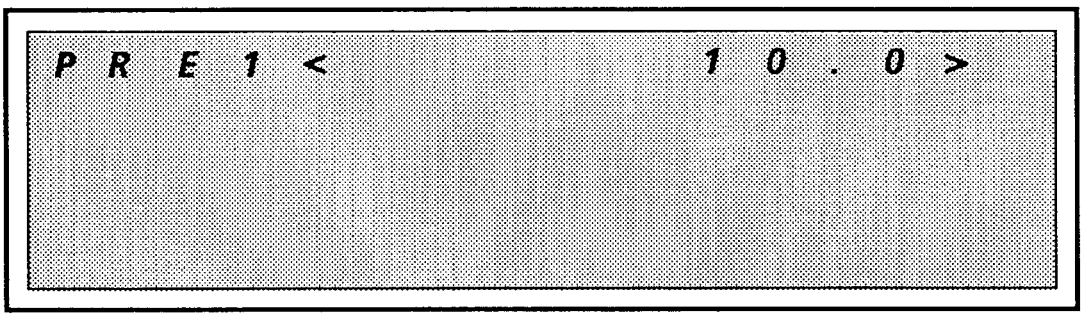
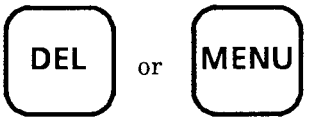


Figure 6-22. Preset Speed Modification Screen

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Exiting the Drive Run Function - Pressing the :



keys will initiate an exit from the Pre 1 thru Pre 5 or the XRef Screens.

The terminal then returns to the Main Menu or a Previous Monitor or Parameter screen.

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Chapter 7

Saving Parameters

EEPROM MODE

EEPROM Menu Screen (Fig. 7-1) - Parameter values, Drive setup information, and Programming Terminal information are all stored in the RAM memory of the Drive upon initial entry of data. Whenever data is changed using one of the Programming Terminal functions, you will be asked if the new information should be backed up. If you do not backup the information at this point, the data will only be stored in the RAM memory , and will only remain there as long as power is applied to the Drive. If, after making several changes, you now wish to back up ALL of the changed data to the Drive EEPROM, the EEPROM mode may be used. The EEPROM mode is only available on the Unlimited Main Menu screen.

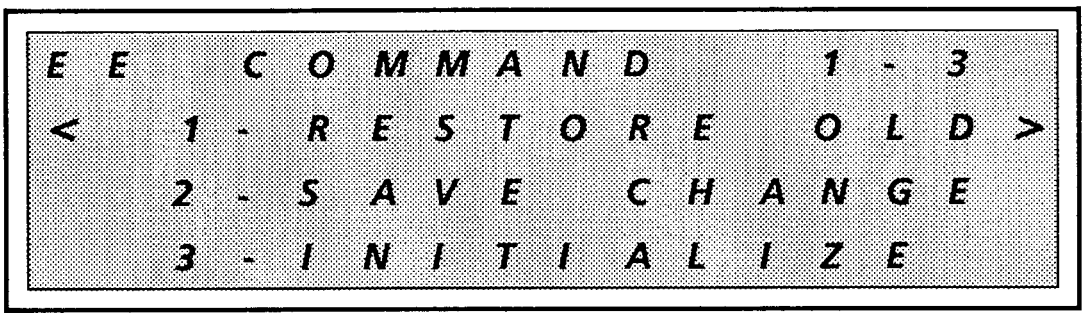


Figure 7-1. EEPROM Menu Screen

Press ↓ or ↑

or

Press 0 – 9 to move the cursor.

Press ENTER to execute the option shown by the cursor position.

Press MENU to return to the Main Menu

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- RESTORE OLD. This option will read the existing parameter values and setup information presently in the Drive EEPROM memory and move them to the Drive RAM memory.
- SAVE CHANGE. This option will cause all parameter values and setup information presently stored in the Drive RAM memory to be written to the Drive EEPROM. This will save all changes made since the last write to EEPROM.
- INITIALIZE. This option reads a set of initial parameter values from the drive internal memory, and moves them to Drive RAM and EEPROM.

IMPORTANT: When INITIALIZE is selected, all data presently in the drive RAM memory will be erased and the Drive will be set to a generic initial condition. In this case, all Drive setup data specific to the application which may have been entered previously will be lost. This is an initial setup function, and should NOT be used on Drives that are already setup.

IMPORTANT: When RESTORE OLD is selected, all data presently in the Drive RAM memory will be erased and the Drive will return to the conditions setup by the previous write to EEPROM command. This means that any new data entered , if not previously saved to EEPROM, will be lost.

Restore Old Function - When the RESTORE OLD Function from the EEPROM Menu screen is selected, the screen shown in Figure 7-2 will appear. This screen is used to verify that the RESTORE OLD function has been requested. Option 1 allows you to return to the EEPROM Menu screen without performing the function. Option 2 executes the RESTORE OLD function and the screen shown in Figure 7-3 will appear on the display until the function is completed.

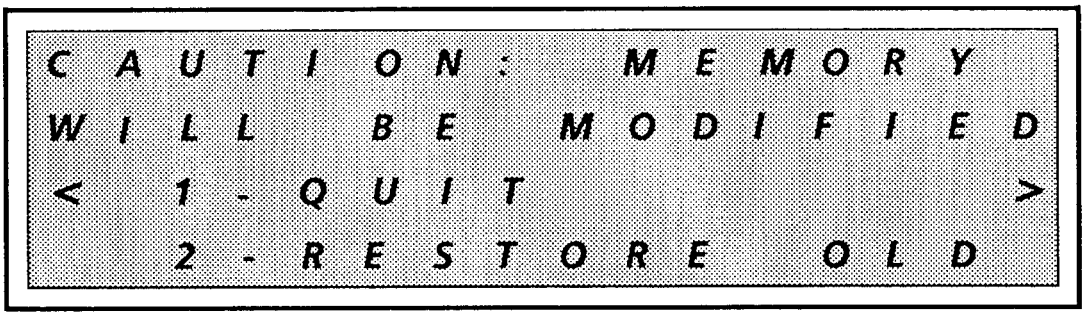


Figure 7-2. Restore Verify

Press ↓ or ↑

or

Press 0 – 9 to move the cursor.

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Press ENTER to execute the option shown by the cursor position.

Press MENU to return to the EE Command Menu (Fig. 7-1).

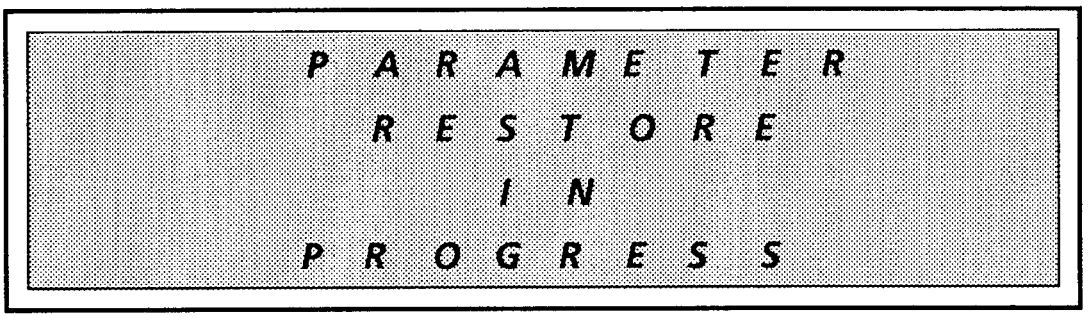


Figure 7-3. Restoring Parameters from EEPROM

After the RESTORE OLD function has been completed, the Programming Terminal will automatically read pertinent setup information from the Drive and the screen shown in Figure 7-8 will appear. Once the function has been successfully completed, the screen shown in Figure 7-9 will appear for 2-3 seconds, before the display returns to the Main Menu screen.

Save Change Function - When the SAVE CHANGE function from the EEPROM Menu screen is selected, the screen shown in Figure 7-4 will appear. This screen is used to verify that the save change function has been requested. Option 1 allows you to return to the EEPROM Menu screen without performing the function. Option 2 executes the Save Change function and the screen shown in Figure 7-5 will appear on the display until the function is completed. Once the function has been successfully completed, the screen shown in Figure 7-9 will appear for 2-3 seconds before returning to the Main Menu screen.

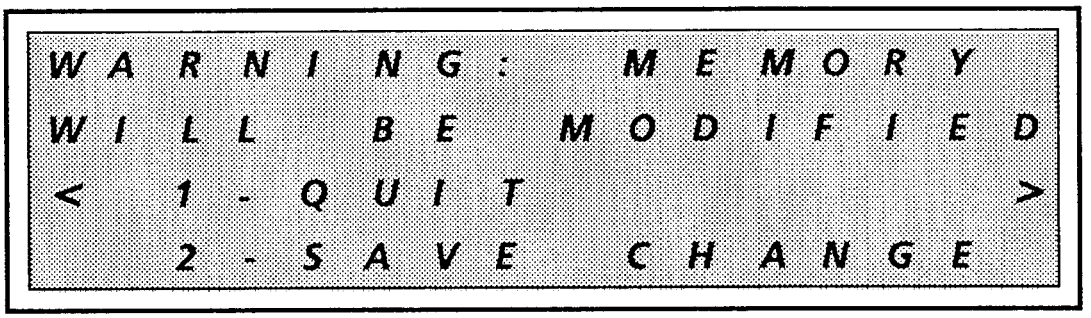


Figure 7-4. Save Verify

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Press ↓ or ↑

or

Press 0 – 9 to move the cursor.

Press ENTER to execute the option shown by the cursor position.

Press MENU to return to the EE Command Menu.

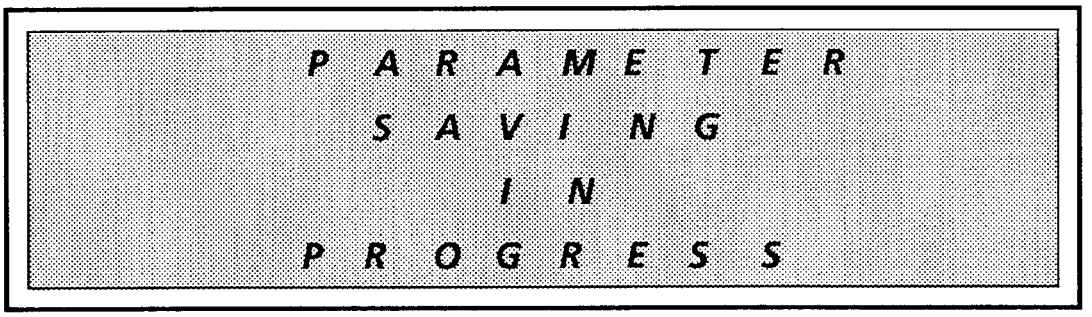


Figure 7-5. Saving in EEPROM

Initalize Function - When the Initialize function from the EEPROM Menu screen is selected, the screen shown in Figure 7-6 will appear. The screen is used for verification of the Initilization function request. Option 1 allows you to return to the EEPROM Menu screen without performing the function. Option 2 executes the Initialization function and the screen shown in Figure 7-7 will appear on the display until the function is completed.

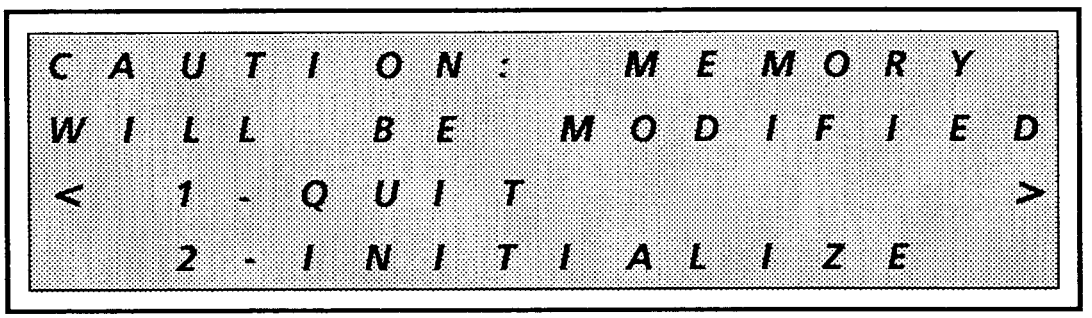


Figure 7-6. Re-Initialization Verify

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Press ↓ or ↑

or

Press 0 – 9 to move the cursor.

Press ENTER to execute the option shown by the cursor position.

Press MENU to return to the previous Menu screen.

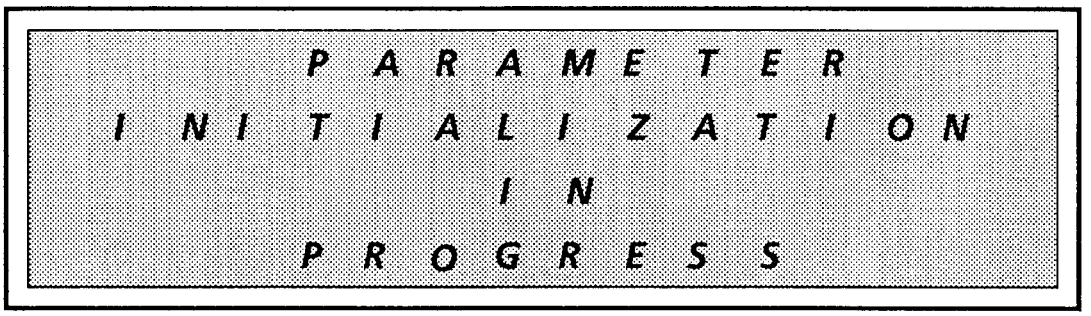


Figure 7-7. Initializing Drive

After the Initialize function has been completed. the Programming Terminal will automatically read pertinent setup information from the Drive and the screen shown in Figure 7-8 will appear. Once the function has been successfully completed, the screen in Figure 7-9 will appear for 2-3 seconds before the display returns to the EEPROM Menu Screen.

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Status and Warning Screens - When either the RESTORE OLD, or INITIALIZE functions are executed, the Programming Terminal will read setup information from the Drive before returning to the Menu, and the screen shown in Figure 7-8 will appear. When any of the three EEPROM options have been successfully completed, the screen shown in Figure 7-9 will appear.

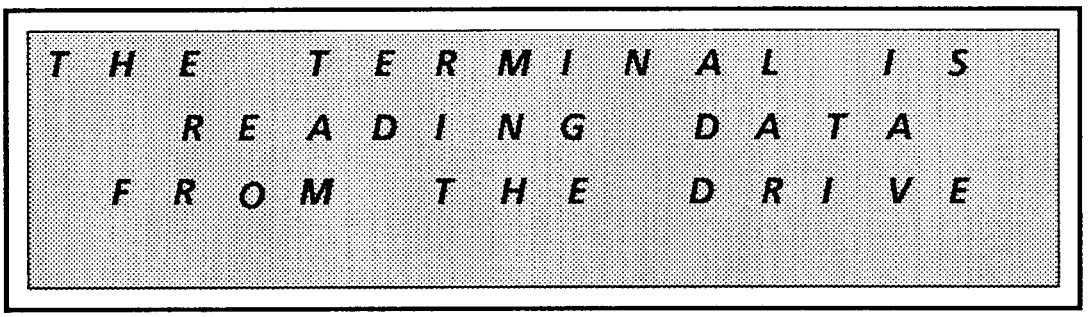


Figure 7-8. Reading New Drive Data

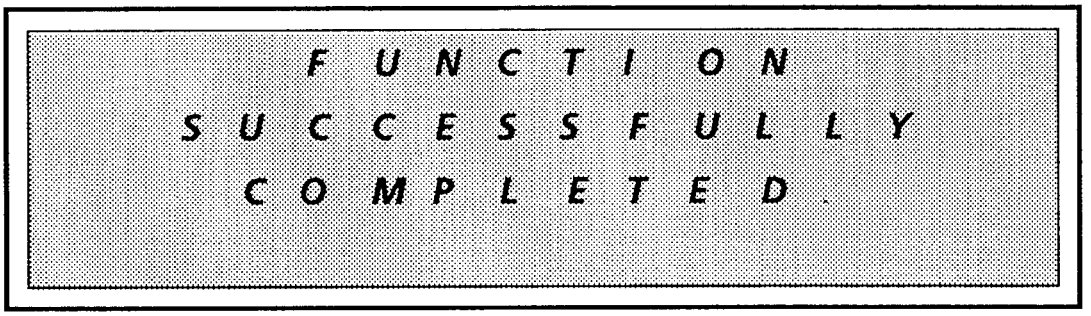


Figure 7-9. Function Completed

In some Drive operating conditions, reading or writing to EEPROM is not permitted. If an access of EEPROM is attempted in one of these Drive modes, the screen shown in Figure 7-10 appears for 2-3 seconds before the Programming Terminal returns to the Main Menu screen.

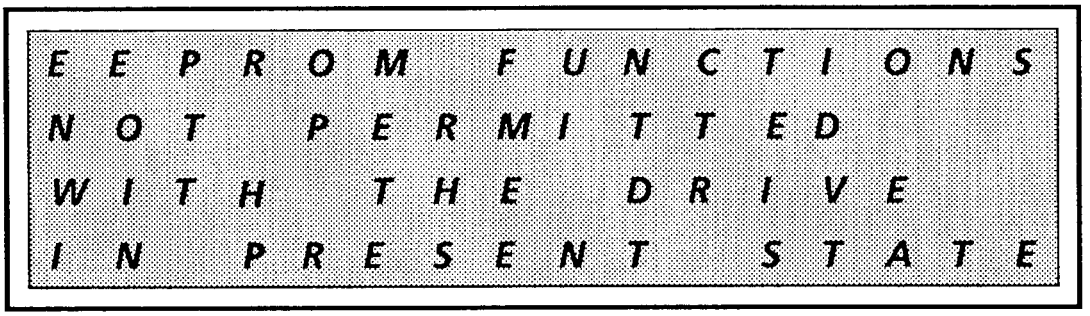


Figure 7-10. Illegal EEPROM Function

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Chapter 8

Troubleshooting With The Terminal

DRIVE FAULT SCREENS

Immediate Drive Fault Display - Whenever a Hard or Soft Fault occurs in the Drive, a fault display similar to those shown in Figure 8-1 will immediately appear on the Programming Terminal display no matter what function was being performed at the time the fault occurred. Information contained in these displays includes:

- Line 1. Indicates whether the fault was a Hard or Soft fault.
- Line 2. Indicates the fault code number of the fault.
- Line 3 & 4. Text message describing the fault.

The Hard/Soft fault displays shown in Figure 8-1 will appear whether the Programming Terminal is in the limited or unlimited access mode. Refer to Drive Installation and Maintenance Manual for a description of the fault types and code numbers.

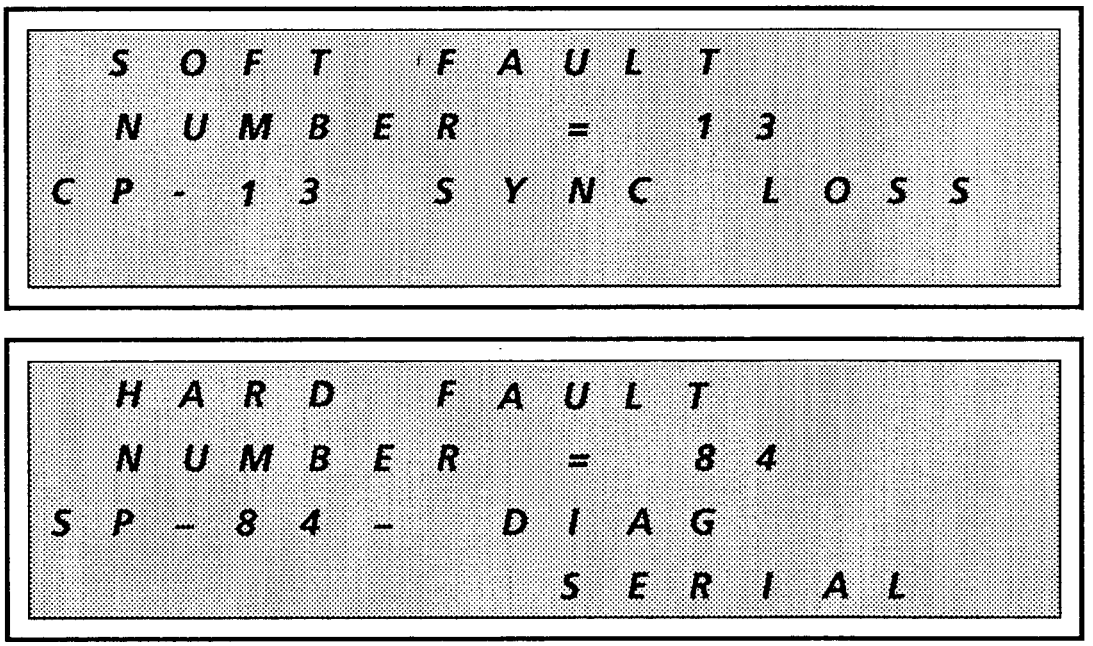


Figure 8-1. Immediate Fault Display

Press MENU to enter the Fault Menu screen.

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Drive Fault Menu Screens - The Drive Fault Menu Screens shown in Figures 8-2 and 8-3 can be accessed from the Main Menu by selecting the Fault Mode, or it will be displayed after a Hard or Soft fault display by pressing any key.

There are two Fault Menu screens. The screen shown in Figure 8-2 will appear when the Programming Terminal is in the unlimited access mode. The options are defined as follows:

- View Faults. Allows you to scroll through the Drive fault buffer.
- Clear Faults. Clears the Drive fault buffer as long as no additional faults are detected.
- System Reset. Attempts to clear the Drive fault buffer and reset the Drive.

IMPORTANT: Selecting a System Reset causes the Drive to perform a complete system reboot. All data presently in RAM memory will be erased and the Drive will return to the conditions setup by the last write to the EEPROM memory. This means that any new data entered, if not previously saved to EEPROM, will be lost.

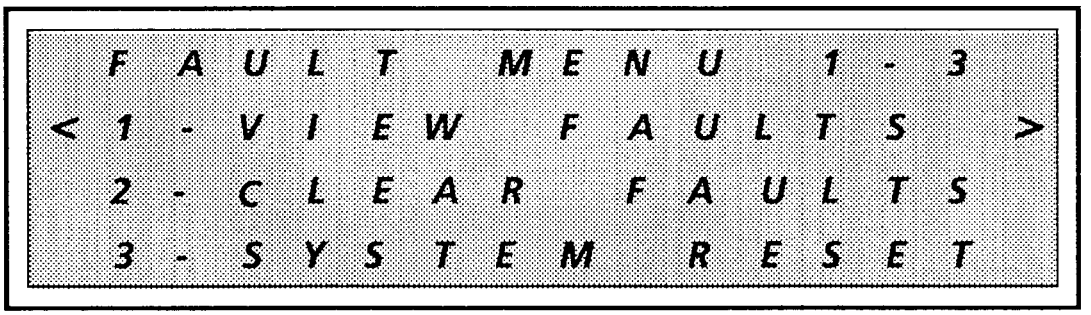


Figure 8-2. Unlimited Fault Menu

Press ↓ or ↑

or 0 – 9 to move the cursor

Press ENTER to select the function shown by the cursor position.

Press MENU to return to the Main Menu.

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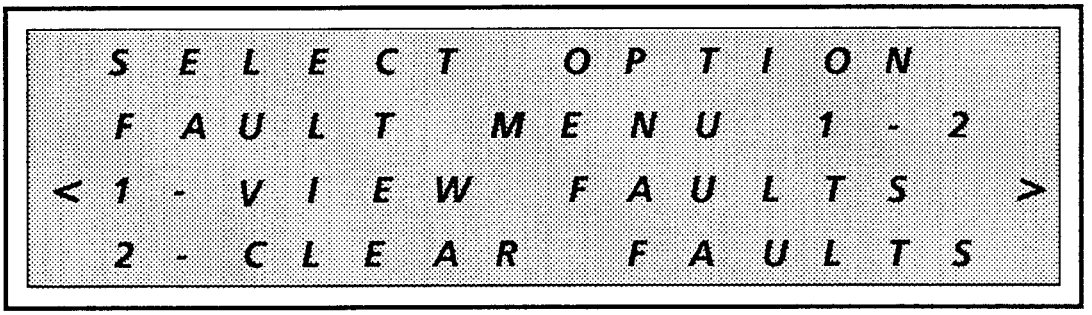


Figure 8-3. Limited Fault Menu

Viewing Drive Faults - If the View Faults function is selected from the Fault Menu screen, a screen similar to Figure 8-4 will appear. The screen in Figure 8-4 displays the following information:

- Line 1. Fault number indicating the order of occurrence of the fault
- Line 2. Fault code number of the fault being displayed.
- Line 3 & 4. Text describing fault.

If no faults are present, the screen shown in Figure 8-5 will appear for approximately 5 seconds and then return to the Fault Menu in Figure 8-2.

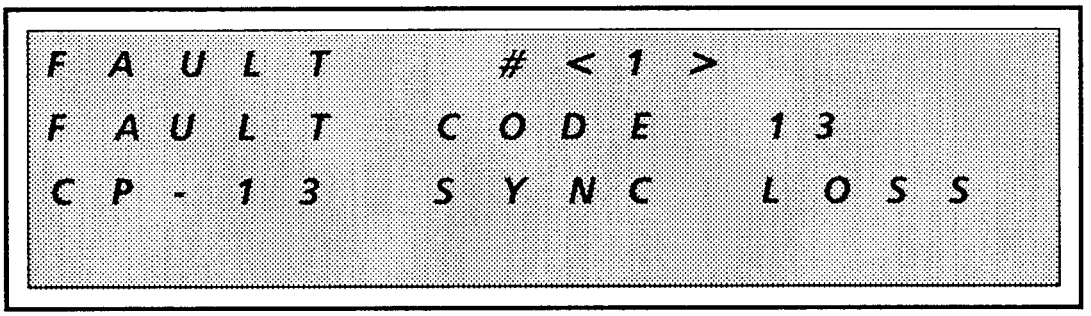


Figure 8-4. View Faults Screen

Press ↓ or ↑

or INC & DEC to move through the Fault Queue

Press MENU to return to the Fault Menu

Press ENTER to request a Fault Queue reset.

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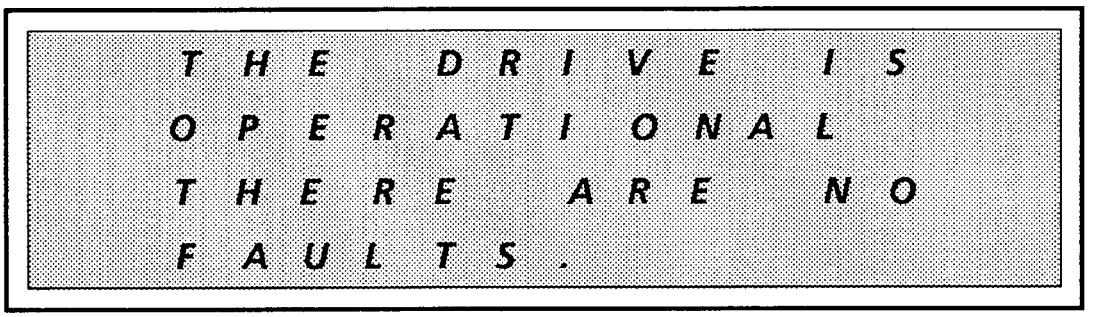


Figure 8-5. No Faults to Report

Clear Faults Function - If the Clear Fault function is selected from the Fault Menu, the Programming Terminal will attempt to clear all fault buffers in the Drive.

Press MENU to return to the Fault Menu

Press ↓ or ↑

or INC & DEC to move the cursor

Press ENTER to enter a Clear Faults request

Upon successful completion, the screen shown in Figure 8-6 will appear for 2 to 3 seconds, and then the display will return to the Fault Menu screen.

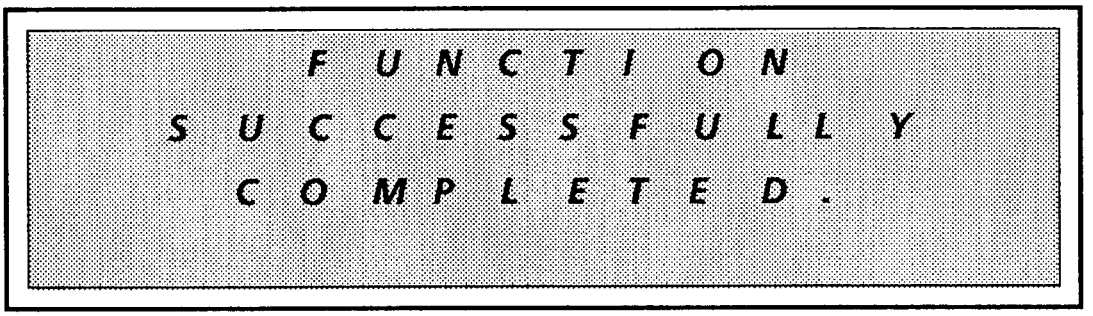


Figure 8-6. Clear Faults

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System Reset Function - If the System Reset function is selected from the Fault Menu, the Programming Terminal will attempt to reset the Drive and the Programming Terminal. While the Reset function is being performed, the screen shown in Figure 8-7 will be displayed. Upon successful completion, the Programming Terminal will go through a standard power up routine and return you to the Main Menu screen.

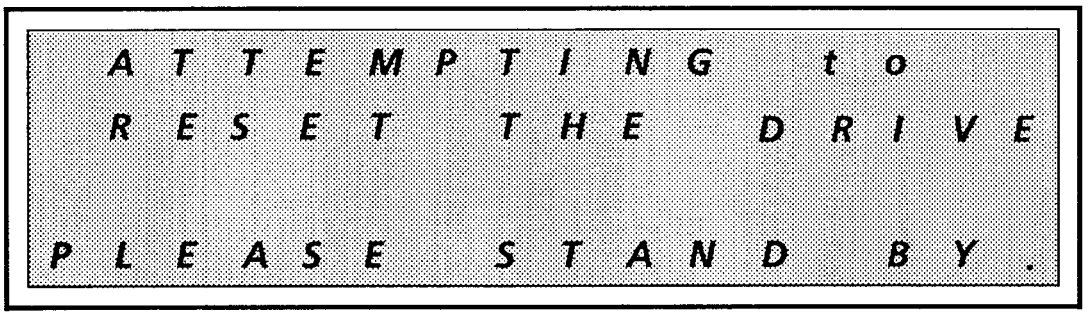


Figure 8-7. Attempting System Reset

Unsuccessful Clear Faults or System Reset Attempt - If the Clear Faults or System Reset function cannot be successfully completed, the screen shown in Figure 8-8 will appear on the display for approximately 5 seconds before returning you to the Fault Menu Screen shown in Figure 8-2.

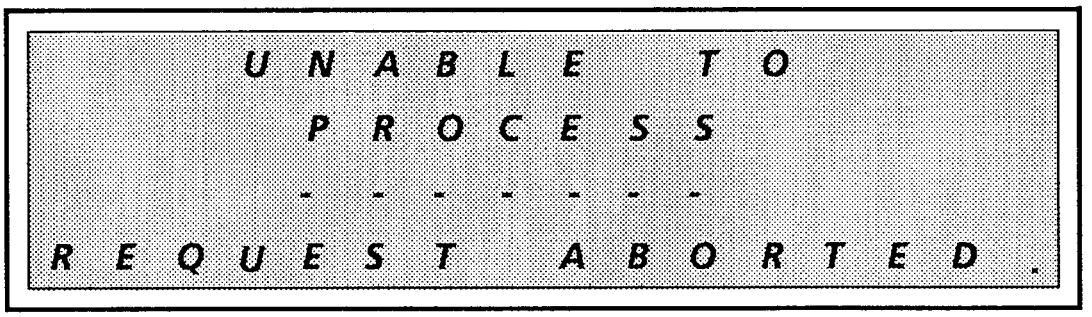


Figure 8-8. Request Not Allowed

If a Hard fault was experienced and an attempt to clear the fault was made, the screen in Figure 8-9 will appear.

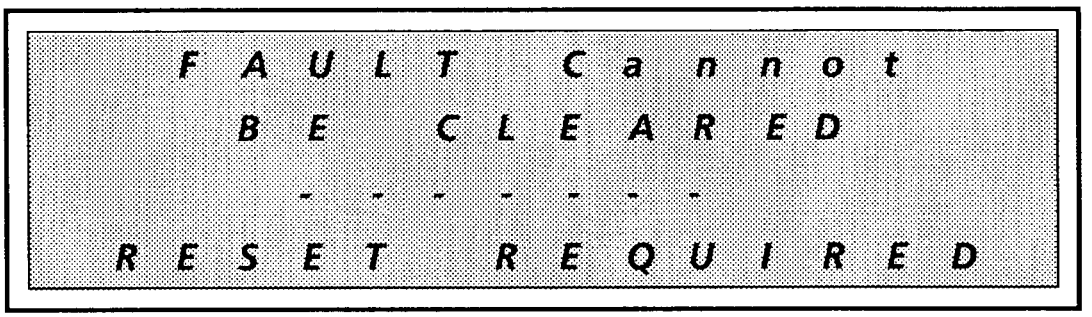


Figure 8-9. Cannot Clear Hard Faults

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PROGRAMMING TERMINAL TEST FUNCTION

If on power up of the Programming Terminal, one of the internal diagnostics test fails, then the display will appear as shown in Figure 8-10. If one or more of the tests indicate Failed, the Programming Terminal is now unusable and must be replaced.

Tests include:

- RAM - Internal memory has shorted address/data lines or stuck bits.
- ROM - Program checksum in terminal was incorrect.
- LCD - Terminal display circuitry is not functioning correctly.
- SER - Serial Communications problem.

Key Usage: Not Active

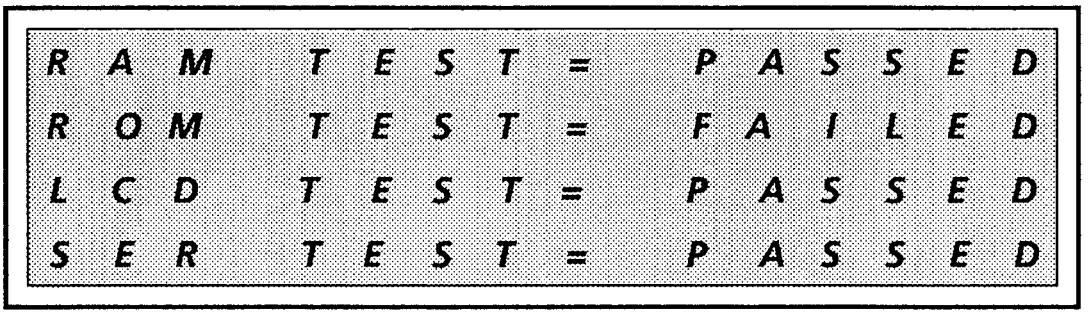


Figure 8-10. Programming Terminal Test Function

KEYBOARD TEST FUNCTION

If, on power up, any key(s) is shorted or pressed, the keyboard test function is activated. The location of the key is displayed on the screen by row and column number as shown in Figure 8-11. If a key is shorted, its row/col is displayed after the equal signs. If multiple keys are shorted, the row/col will continue to display '?' no matter which key is pressed. Open keys can be tested on power up by holding a key down and then pressing the appropriate key(s) to test.

The Keyboard Test Function is exited by pressing the ENTER key.

If you use the ENTER key to access test, then you must press one other key before the ENTER key will allow you to exit. This allows testing of the ENTER key for a possible shorted condition.

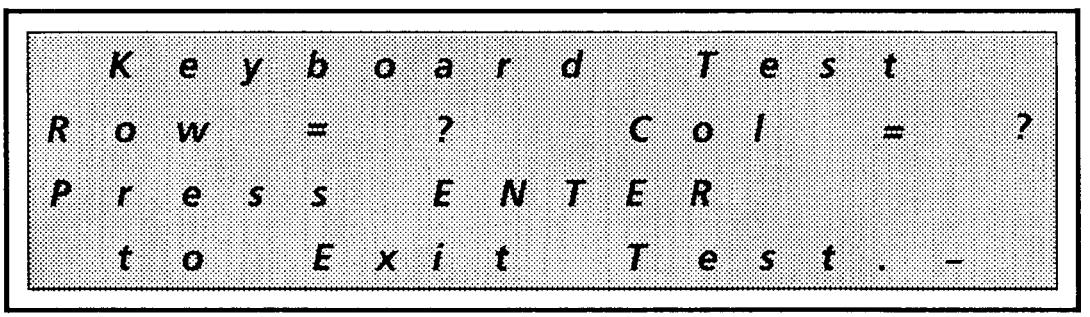


Figure 8-11. Keyboard Test Function

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ALERT SCREENS

Alert screen # 1 (Figure 8-12) appears after two attempts at a communication request have occurred without acknowledgment from the Drive. If, communications are re-established within two more attempts, the terminal will return to the previous display. Otherwise, a communications fault is displayed as in Figure 8-10.

Key Usage: None

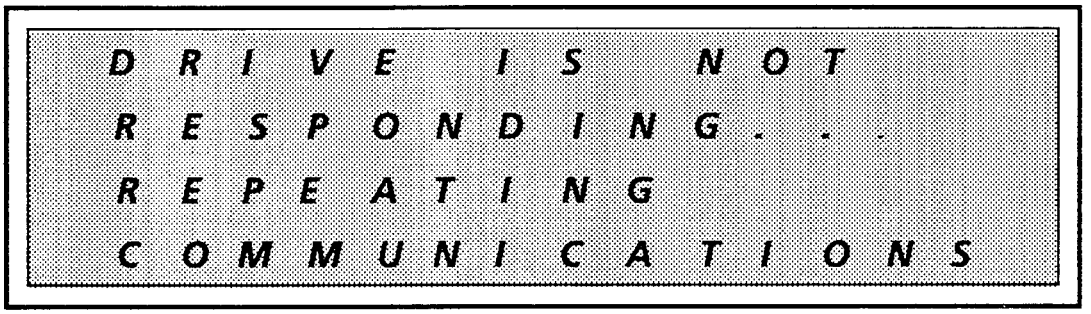


Figure 8-12. Screen #1 (Communications Warning)

If the Drive is operating under Local Control when a Communications Request failure occurs, Local Control is released and the Alert in Figure 8-12 occurs.

If your system request (through the terminal) cannot be processed by the drive, the message in screen #2 (Figure 8-13) is displayed.

Key Usage: Any keypress you make is considered an acknowledgment of the condition. You are then returned to the previous display.

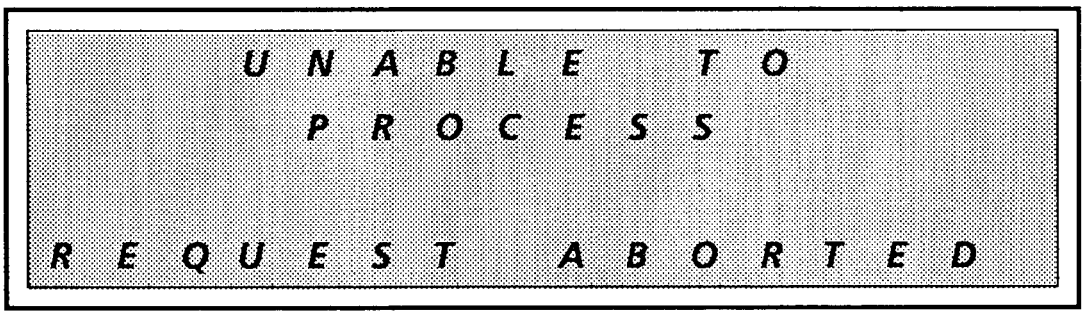


Figure 8-13. Screen #2 (Request Not Allowed)

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If you attempt an EEPROM function during a period when the Drive cannot accept it, the message shown in Alert screen #3 (Figure 8-14) is displayed. This may be due to the the fact the Drive is running, an EEPROM function is already in progress, etc. The screen will time out in approximately 5 seconds, and return you to the previous screen.

Key Usage: None

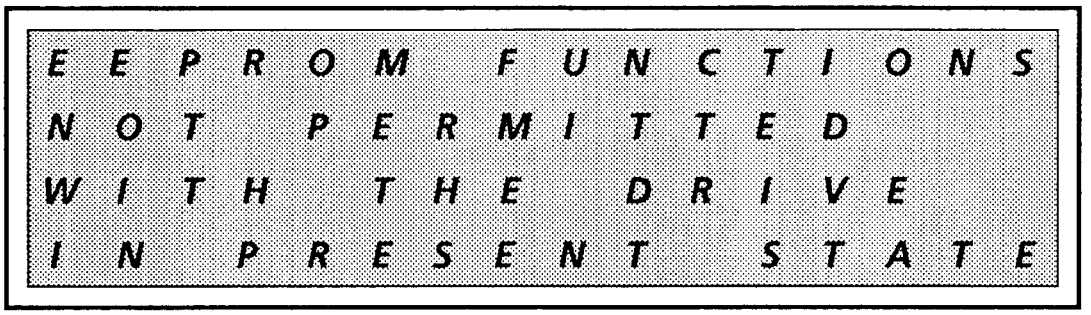


Figure 8-14. Screen #3 (Illegal EEPROM Function)

If you request a Drive configuration change (linkage) and the Drive does not accept it, Alert screen #4 (Figure 8-15) is displayed. This is usually due to the the fact the Drive is running, The screen will time out in approximately 5 seconds, and return you to the previous screen.

Key Usage: None

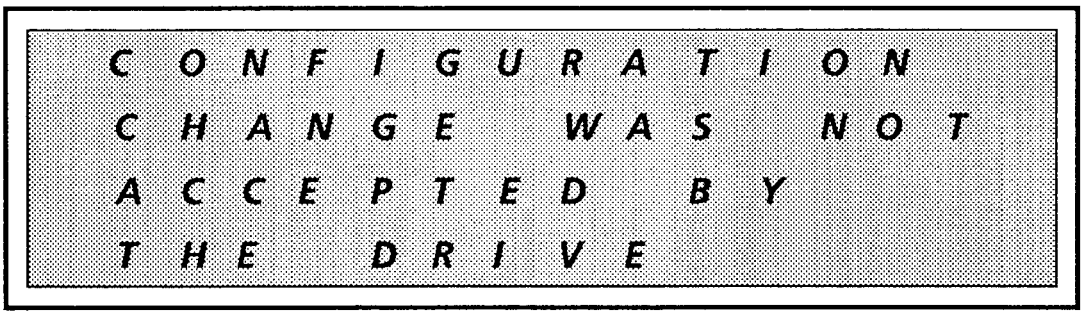


Figure 8-15. Screen #4 (Illegal Configuration Request)

Alert screen # 5 (Figure 8-16) is displayed whenever a parameter value is not accepted by the Drive. Non-acceptance of a parameter may be due to the fact it is out of range, an illegal parameter number etc. The screen will time out in approximately 5 seconds, and return you to the previous screen.

Key Usage: None

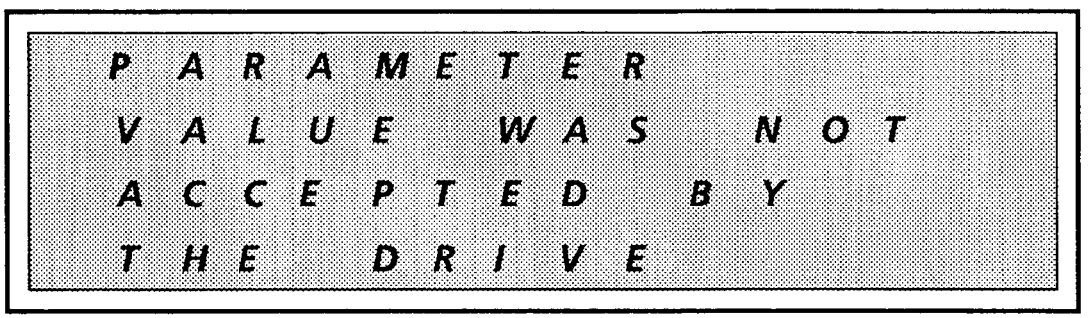


Figure 8-16. Screen #5 (Illegal Parameter Request)

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Alert screen # 6 (Figure 8-17) is displayed whenever a parameter value is entered that is less than the minimum or greater than the maximum value allowed for that parameter. This is a terminal range check, and not a Drive range check. The screen will time out in approximately 5 seconds, and return to the previous screen.

Key Usage: Any keypress you make is considered an acknowledgment of the condition. You are then returned to the previous display.

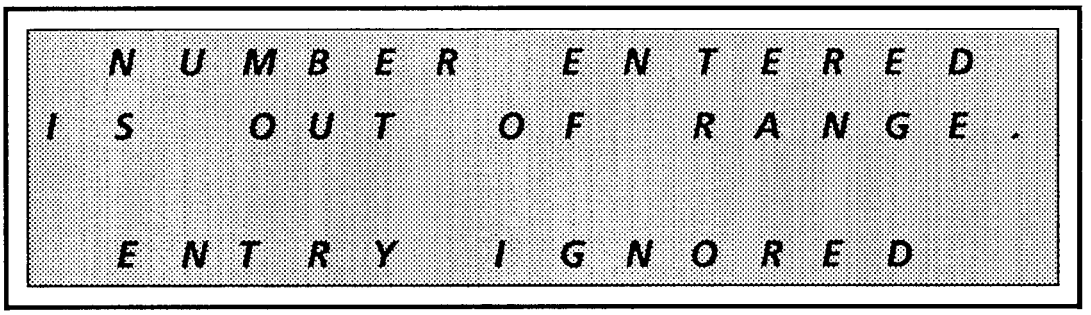


Figure 8-17. Screen #6 (Number Range Error)

Alert screen # 7 (Figure 8-18) is displayed whenever you attempt to enter an invalid password. This display remains for 3 seconds or until you press another key on the terminal. The screen will time out in approximately 5 seconds, and return to the previous screen.

Key Usage: Any keypress you make is considered an acknowledgment of the condition. You are then returned to the previous display.

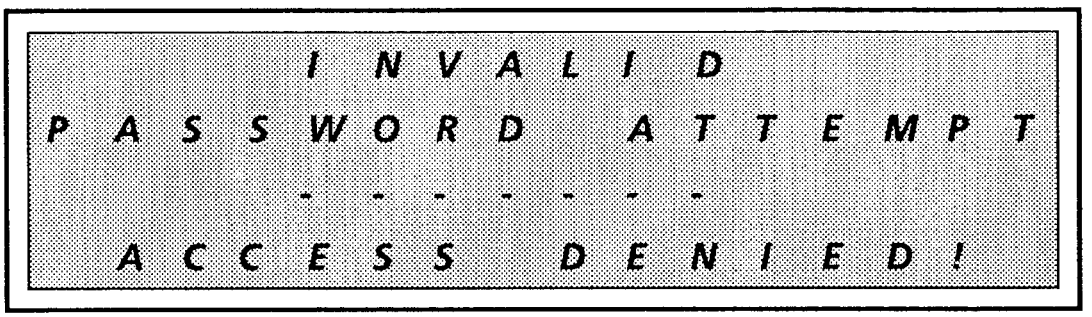


Figure 8-18. Screen #7 (Invalid Password Attempted)

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Alert screen # 8 (Figure 8-19) appears during the verification sequence of changing the password, if the verification value does not equal the original value you entered. The screen will time out in approximately 5 seconds, and return to the previous screen.

Key Usage: None.

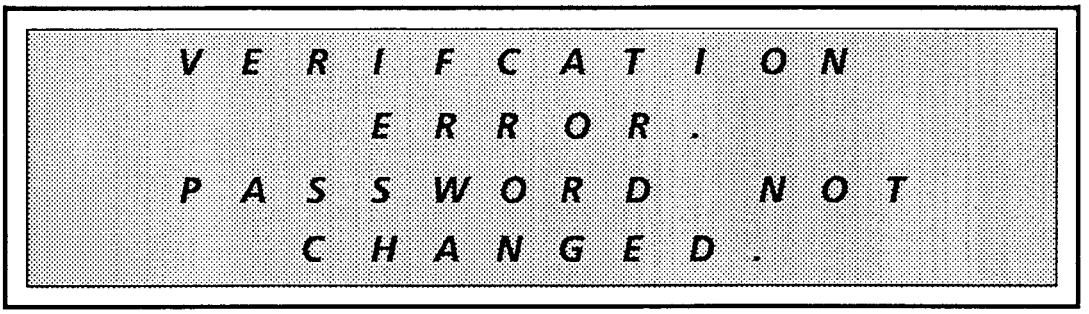


Figure 8-19. Screen #8 (Invalid Verification of New Password)

If the user selects the MONITOR mode from the terminal in limited access, and the terminal display mode is off, Alert screen # 9 (Figure 8-20) appears.

Key Usage: None

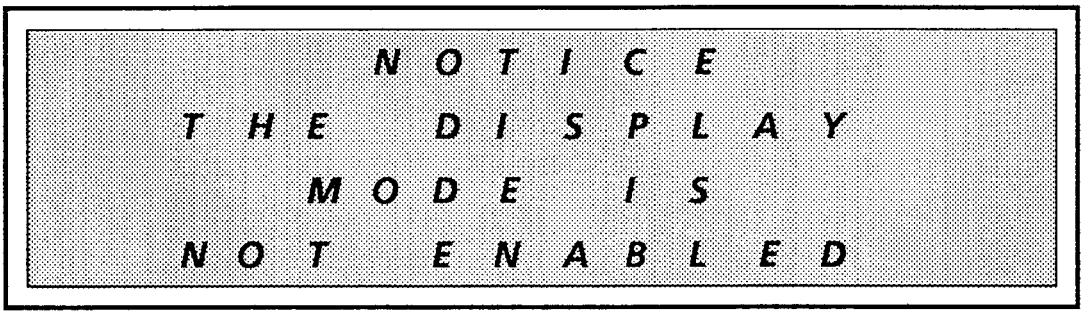


Figure 8-20. Screen #9 (Display Mode Off)

If no faults are present when you request to view faults, Alert Screen #10 (Figure 8-21) is displayed for 5 seconds before returning you to the fault menu.

Key Usage: Not Applicable

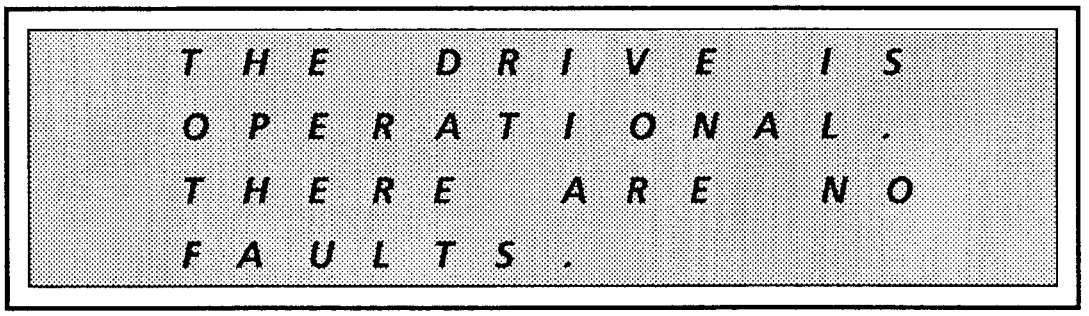


Figure 8-21. Screen #10 (No Faults to Report)

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If you attempt to disable the Terminal RUN MODE while under Local Control, the alert in screen #11 (Figure 8-22) will be displayed for 5 seconds before returning you to the previous screen.

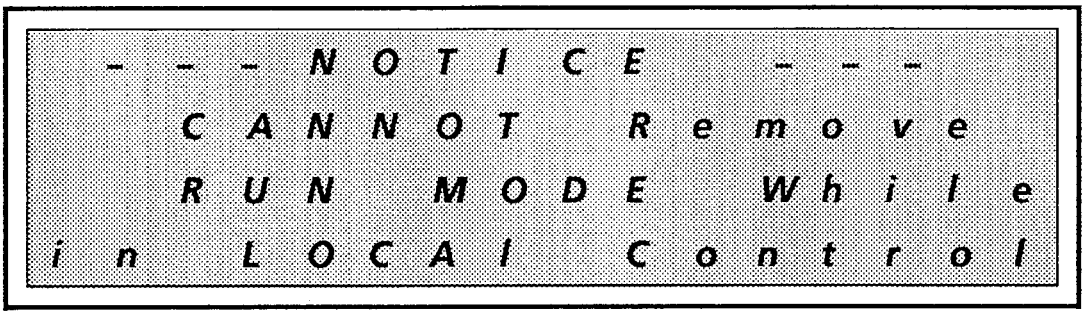


Figure 8-22. Screen #11 (Cannot Disable in Local)

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LATIN AMERICA HEADQUARTERS
1201 South Second Street
Milwaukee, WI 53204 USA
Tel: (414) 382-2000
Telex: 43 11 016
FAX: (414) 382-2400

Motion Control Division
4300 West Brown Deer Road
Brown Deer, WI 53223

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