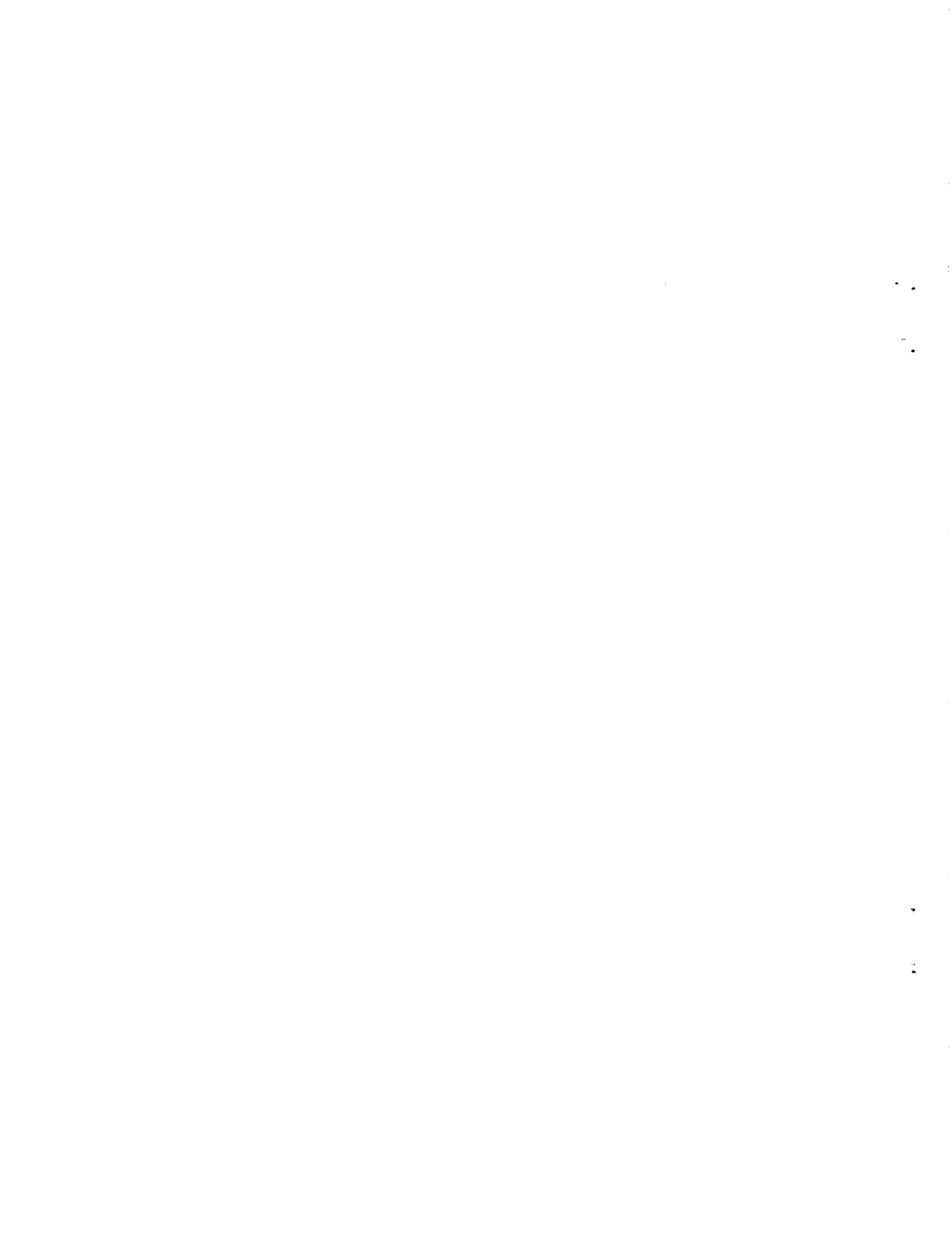


Gould 484 Programmable Controller

PROGRAMMING GUIDE/P190





Gould 484 Programmable Controller

PROGRAMMING GUIDE/P190

SUBJECT: Instructions for using the P190 Programmer with a 484 Programmable Controller and the following three 484/P190 tapes:

AS-T484-001	484 Programmer
AS-T484-002	Utility Package (Ladder Lister)
AS-T190-001	P190 Tape Loader (484 Operations)

SPECIAL INSTRUCTIONS:

This guide supersedes the following publications:

ML-P190-001	484 Programmable Controller Program Tapes/P190
ML-484L-USE	484 Programmable Controller Ladder Lister/P190

June, 1984

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PREFACE

This guide contains instructions for using the 484 PC Programmer, Tape Loader, and Ladder Lister Tapes with a P190 Programmer. Section 1 is an introduction to the P190 Programmer and a description of how it is connected to other devices. Section 2 explains how the program tape is used to create and edit programs. Section 3 describes how the tape loader tape is used to transfer programs between a 484 PC and a tape. The tape loader tape is also used to compare a tape and a 484 PC's memory. Section 4 describes how the ladder lister tape is used to create hard copies of a 484 PC's memory on a printer. Appendix A contains error and information messages which are displayed on a P190 Programmer.

Use the following publications in conjunction with this guide:

ML-C484-000	484 Programmable Controller User's Manual
ML-C484-APL	484 Programmable Controller Applications Manual
ML-P190-USE	P190 Programmer User's Guide
PI-P190-001	P190/484 Reference Guide
PI-J474-001	J474/J475 Interface User's Manual

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SECTION 1

INTRODUCTION TO THE P190 PROGRAMMER

This section covers the basic information needed to use a P190 Programmer with any of the 484 PC tapes.

1.1 THE P190 PROGRAMMING KEYBOARD

The P190 Programmer keyboard has four sections: software label keys, alphabetic keys, function keys, and numeric keys (see Figure 1-1). When using the 484 PC tapes you are most concerned with the software label keys.

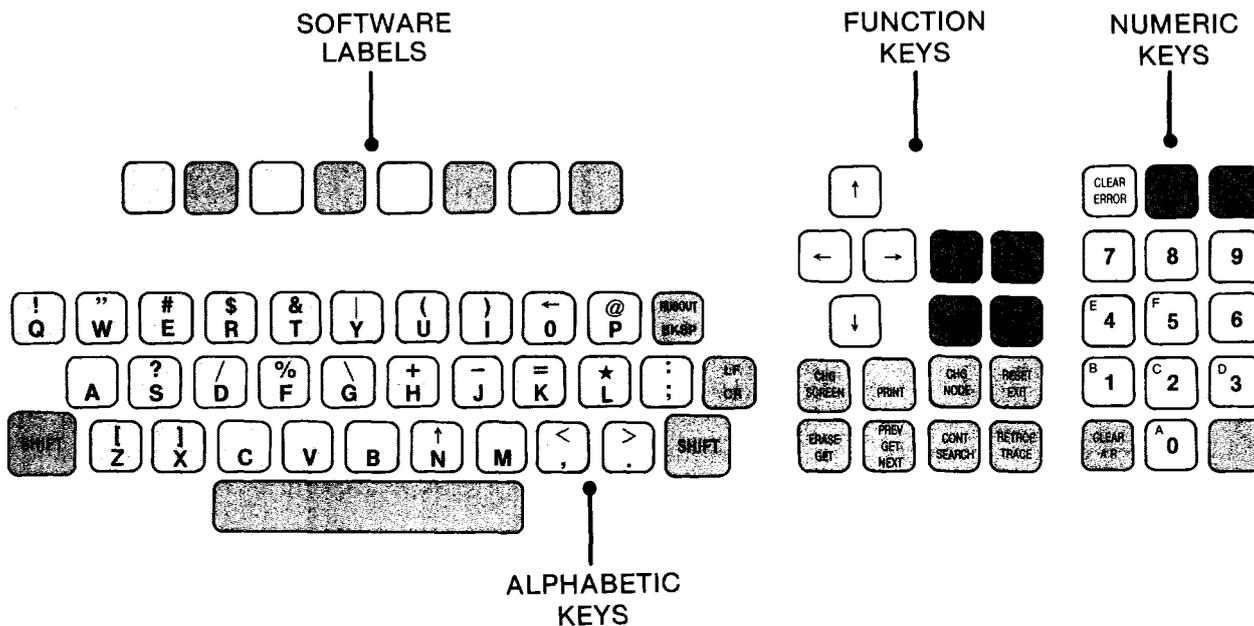


Figure 1-1. P190 Keyboard

1.1.1 Software Label Keys

The software label keys are located at the top of the keyboard in a horizontal row consisting of eight keys which are alternately colored white and grey. The eight software label keys correspond to the eight software labels which appear on the bottom of the CRT screen when a tape is in use. To select a function simply press the corresponding software label key.

1.1.2 Hardware Keys

The following P190 Programmer keys are used with the programmer, tape loader, and ladder lister tapes. Their functions are defined below:



The Change Node (CHG NODE) key is used to access the software labels which allow you to enter new logic or change existing logic.



The Change Screen (CHG SCREEN) key is used to move back and forth between the logic screen and the alternate screen. The P190 retains the information so the CHG SCREEN key can be toggled without losing any data.

INTRODUCTION TO THE P190 PROGRAMMER



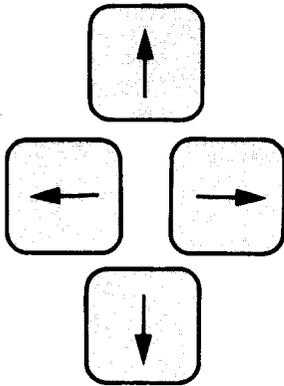
The CLEAR AR key is pressed to clear the value in the assembly register (AR) and replace it with zeros. This key also clears any error messages pertaining to the AR.



The CLEAR ERROR key is used to remove any error message or information message that appears on the error line of the screen.



The Continue Search/Search (CONT/SEARCH) key is used along with the SHIFT key for a comprehensive search procedure. When this key is pressed, search parameters must be entered into the search field in the lower right corner of the P190 screen. The first network containing the search parameters is displayed. To continue the search, press the SHIFT key and the CONT/SEARCH key simultaneously.



A set of four keys control cursor movement. Each key, when pressed, moves the cursor one space in the direction indicated by the arrow on the key (up, down, right, or left). As long as the key is pressed, the cursor continues to move in the direction indicated. When the cursor reaches the last position in any direction, it wraps around and appears in the first position on the opposite end of the screen.



The Delete Network/Delete Node (NTWK DELETE NODE) key and the SHIFT key are used to delete a single node or a whole network. To delete a single node, position the cursor over the node to be deleted and press the NTKW DELETE NODE key. To delete a whole network, position the cursor anywhere in the network to be deleted and press the SHIFT key and the NTKW DELETE NODE key simultaneously.



The ENTER key is used to insert the value or reference number in the Assembly Register (AR) into the area at the cursor on the P190 screen. Before the value or reference number is inserted it is validated; illegal data is not inserted even if the ENTER key has been pressed.



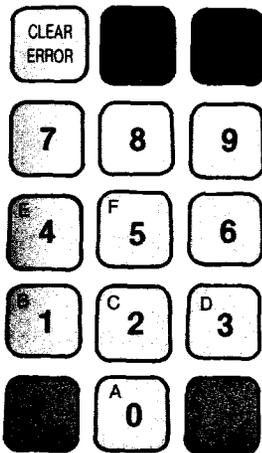
The ERASE/GET key and the SHIFT key are used to call references to the screen or to erase references which are currently displayed on the screen. Press the ERASE/GET key to call up the network, register, or discrete currently referred to in the AR. Press the SHIFT key and the ERASE/GET key simultaneously to erase the reference or network at the cursor position.



The Get Previous/Get Next (PREV GET NEXT) key and the SHIFT key are used to call references or networks to the screen without entering values into the AR. To use this function, the cursor must be positioned over a reference or in a network. To call up the reference or network previous to the one at the cursor position, press the SHIFT key and the PREV GET NEXT key simultaneously. To call up the reference or network following the one at the cursor position, press the PREV GET NEXT key.



The INIT and INIT LOCK keys are the red keys located at the top of the numeric keys section on the panel. These keys are pressed simultaneously to load or reload the tape in the P190 tape drive into the P190's memory. It is not necessary to press these keys immediately after power-up; the first tape is automatically loaded.



The numeric keys are located at the right side of the P190 Keyboard. There are ten keys: A/0, B/1, C/2, D/3, E/4, F/5, 6, 7, 8, and 9. These keys are used to enter decimal or hexadecimal data into the P190 assemble register for use as reference numbers, network numbers, constants, or register contents. To enter a letter, press the appropriate key and the SHIFT key simultaneously.



The PRINT key is used to print the screen display if an RS-232-C compatible device is connected to port 2 on the P190 Programmer.



Press the SHIFT key and the RESET/EXIT key to place the P190 at the RESET Level mode of operation (see Section 2.1). The RESET/EXIT key is used to place the P190 at the EXIT Level (see Section 2.2).

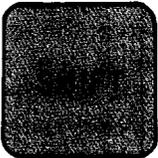


The Retrace/Trace (RETRCE/TRACE) key and the SHIFT key are used to trace relay contacts to a particular network and then return to the network where the trace was performed. Position the cursor over a relay contact which is referenced to a coil and press the RETRCE/TRACE key; the network containing this coil is displayed. To return to the network in which the trace was initiated, press the SHIFT key and the RETRCE/TRACE key simultaneously.

INTRODUCTION TO THE P190 PROGRAMMER



The Rubout/Backspace (RUBOUT/BKSP) and SHIFT keys are used to erase a whole line or a number of characters and reposition the cursor. The RUBOUT/BKSP key is used to backup the cursor position on the screen and erase the character positioned to the left of the cursor. It is active when a TITLE or CONTROLLER NAME is being entered. Press the RUBOUT/BKSP key and the SHIFT key to erase a whole line or entry and reposition the cursor to the start of the line or entry.



The SHIFT keys are located at the lower right and lower left corners of the alphabetic key section. These keys are used to gain access to the upper case functions of all the double function keys on the P190 keyboard. You must press the SHIFT key and the desired function key simultaneously to access the key's upper function.



The START NEXT key is used to start a new network. The new network is inserted after the network currently displayed on the P190 screen or as the first network in the program if no networks exist.

1.2 P190 CONNECTIONS

The P190 must be connected to a J470 Adapter or J474/J475 Interface which in turn is connected to a 484 PC. A J470 Adapter is used for a local, direct connection to a 484 PC. A J474 or J475 Interface is used for remote and Modbus connections. When using a J474 or J475 Interface, a J478 Modem must be used. For more information on the J470 Interface, see a 484 Programmable Controller User's Manual (ML-C484-000). For more information on the J474/J475 Interface, see the J474/J475 Interface User's Manual (PI-J474-001).

Figures 1-2, 1-3, and 1-4 show the various equipment which can be used and the necessary cable connections.

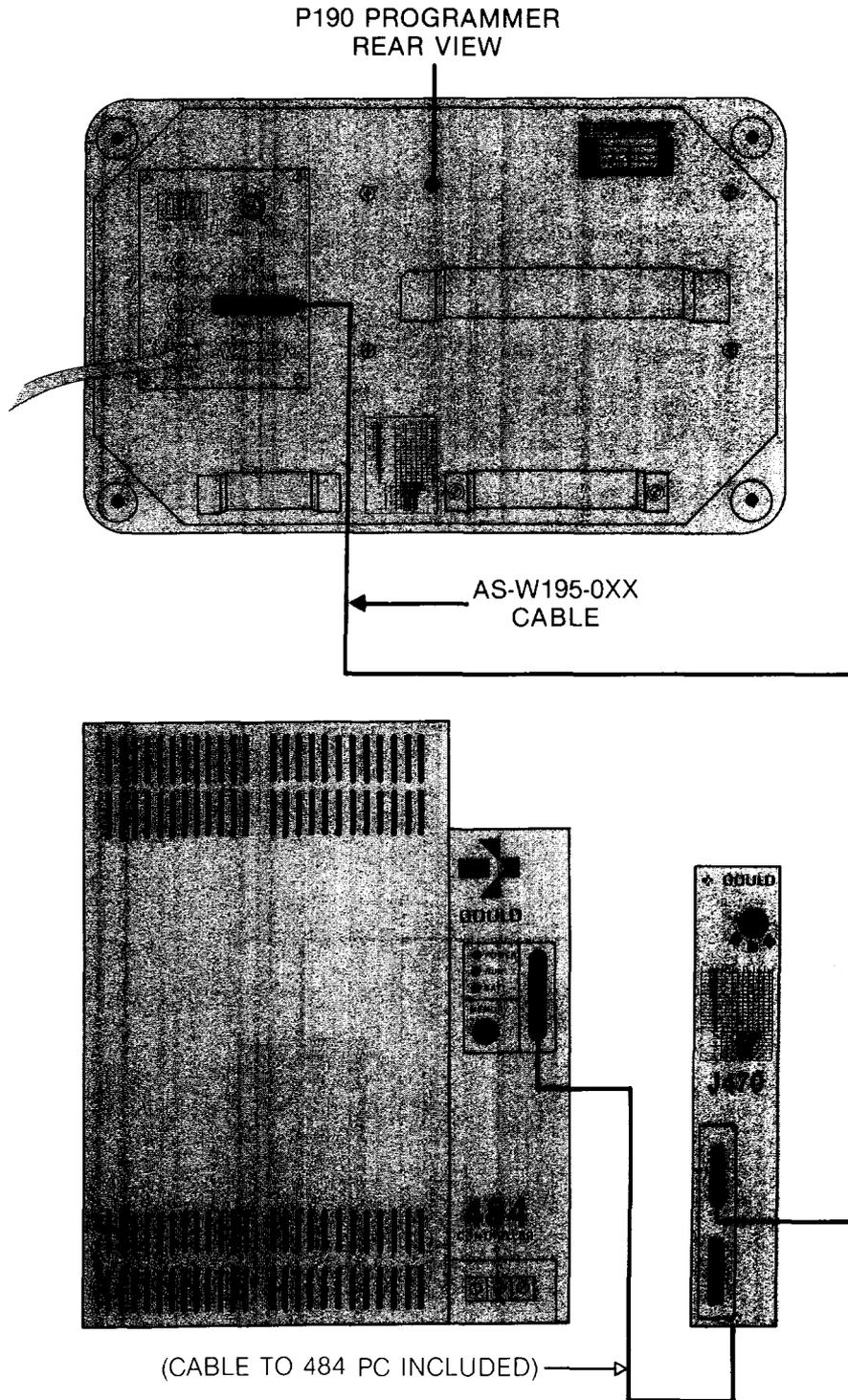


Figure 1-2. Equipment Outline — P190/J470/484

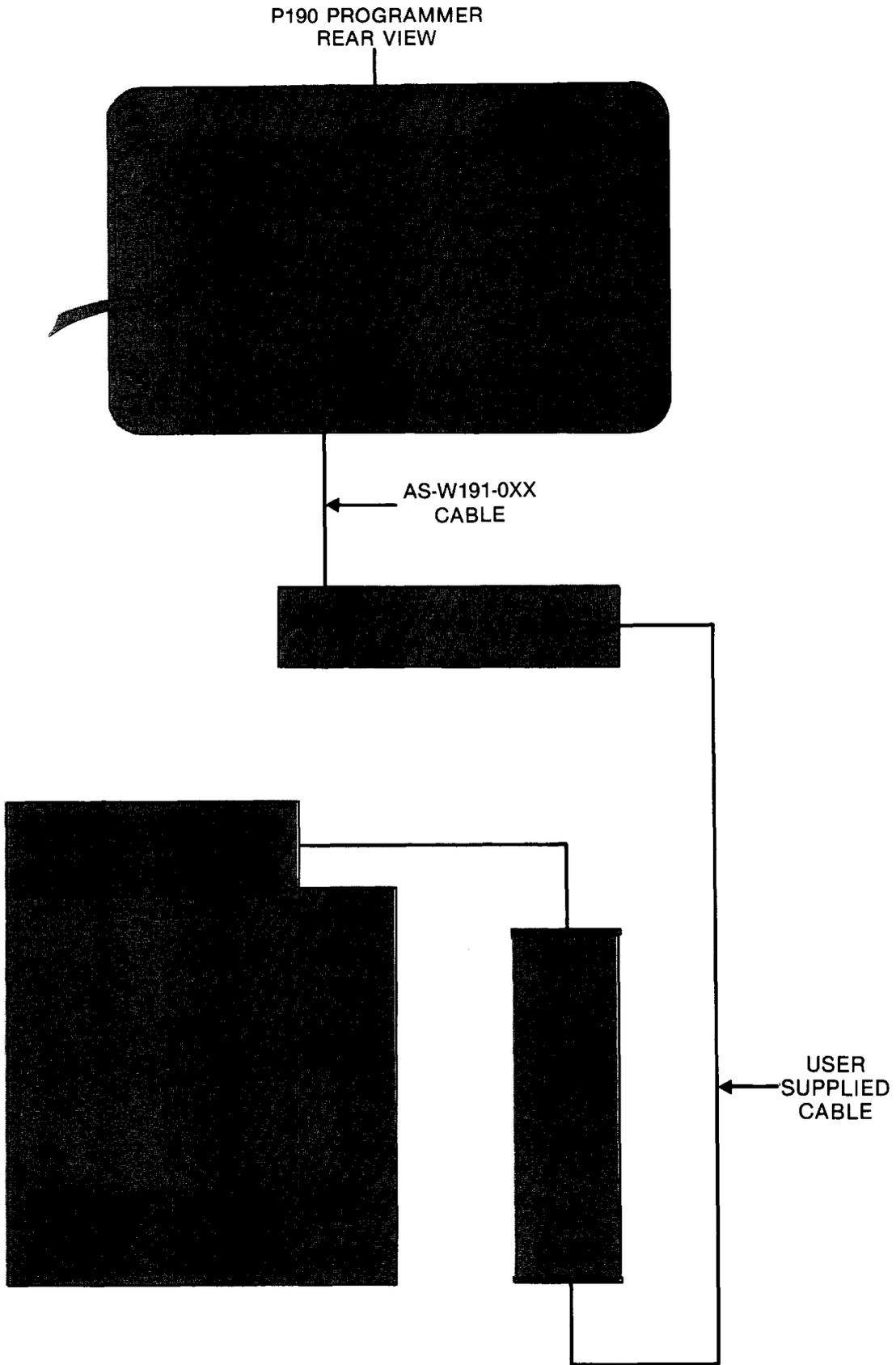


Figure 1-3. Equipment Outline — P190/J478/J474/484

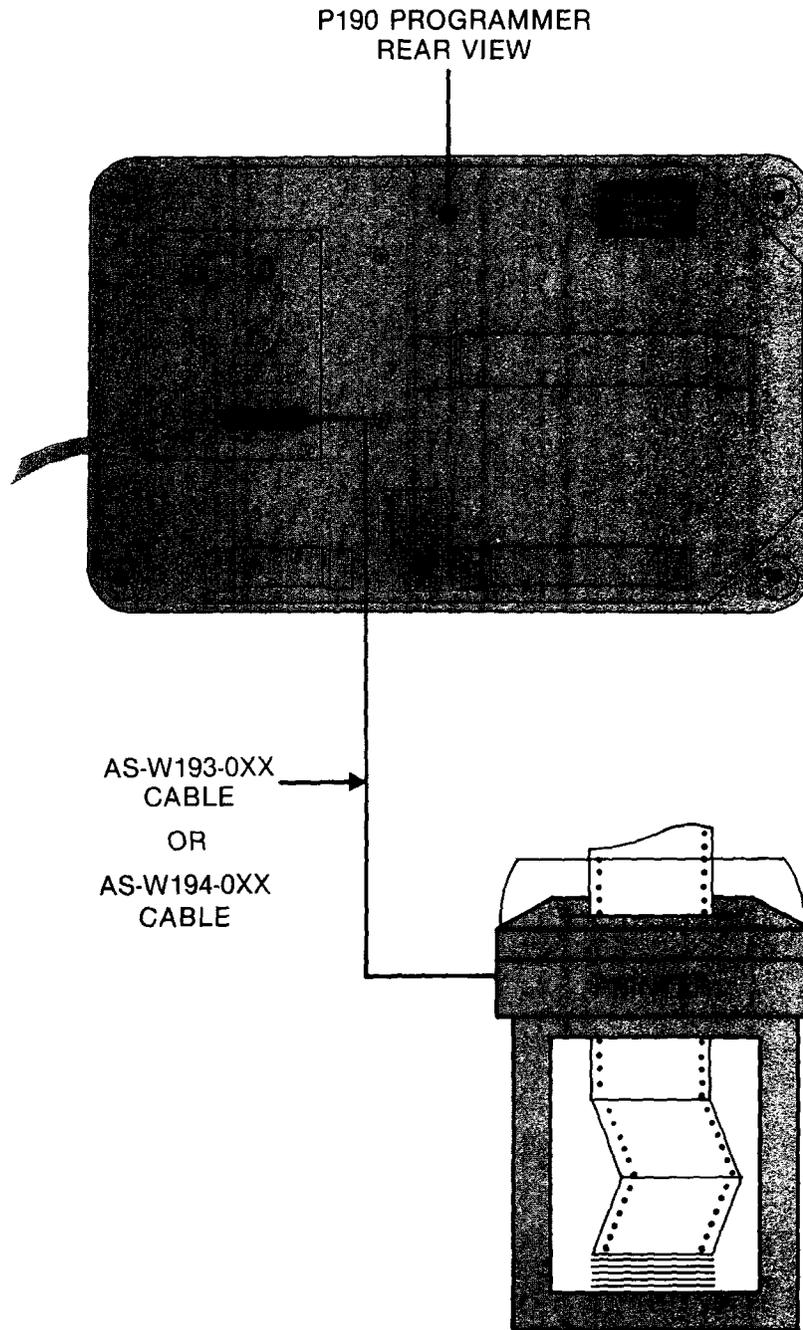


Figure 1-4. Equipment Outline — P190/Printer

INTRODUCTION TO THE P190 PROGRAMMER

Cable pin-outs are found in Figure 1-5.

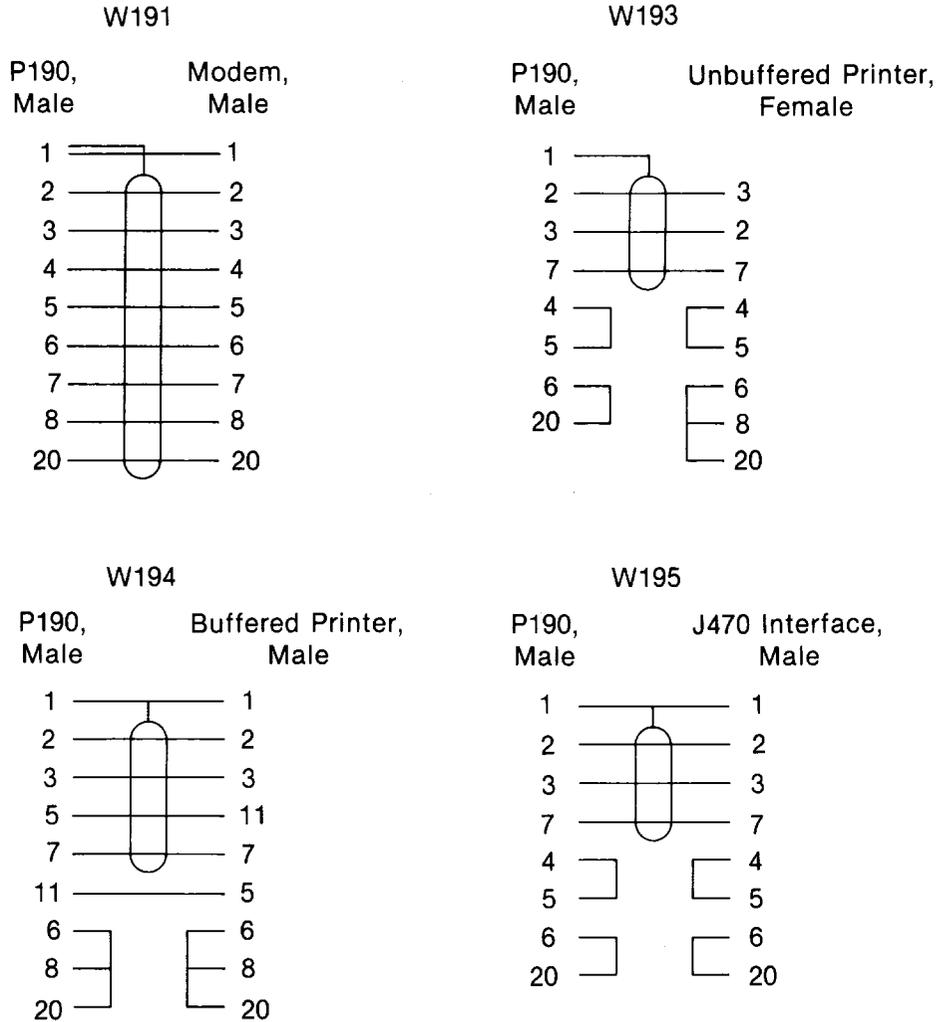


Figure 1-5. Cable Pin-Outs

- 1 — Protective Ground
- 6 — Data Set Ready
- 2 — Transmitted Data
- 7 — Signal Ground
- 3 — Received Data
- 8 — Carrier Detect
- 4 — Request To Send
- *11 — Buffer Full
- 5 — Clear To Send
- 20 — Data Terminal Ready

*Some printers do not use pin 11 as Buffer Full. In this case, appropriate changes must be made to the cable.

The baud rates, parity and start/stop bits on the P190 and J470 or J474/J475 must agree. These P190 parameters are set via DIP switchpacks inside the back of the P190. These switchpacks are located behind the plate to the left of the P190 parameter selection sticker. See Figure 1-2, 1-3, or 1-4 for the P190 rear view. The left switchpack is for the port 1 parameters and the right switchpack is used to set port 2 parameters.

The parameters are set by placing the switches in a combination of up and down positions; up equals 1 or ON, down equals 0 or OFF. The possible switch settings are shown in Figure 1-6 which is a copy of the parameter selection sticker from the back of the P190. For further details on setting P190 port parameters, see the P190 Programmer User's Manual.

BAUD RATE	S1	S2	S3	S4
19,200	1	1	1	1
9,600	1	1	1	0
7,200	1	1	0	1
4,800	1	1	0	0
3,600	1	0	1	1
2,400	1	0	1	0
2,000	1	0	0	1
1,800	1	0	0	0
1,200	0	1	1	1
600	0	1	1	0
300	0	1	0	1
150	0	1	0	0
134.5	0	0	1	1
110	0	0	1	0
75	0	0	0	1
50	0	0	0	0
S5	1	PARITY ENABLE		
	0	PARITY DISABLE		
S6	1	EVEN PARITY		
	0	ODD PARITY		
S7	1	1 STOP BIT		
	0	2 STOP BIT		
S8	1	8 DATA BIT		
	0	7 DATA BIT		

Figure 1-6. P190 Parameter Selection

1.3 INSERTING A TAPE INTO THE TAPE DRIVE

To insert a tape into the P190, open the tape drive door located in the upper right-hand corner of the P190 front panel (see Figure 1-7). Hold the tape so that the metal plate is on the underside and the exposed tape area is toward the tape drive. Insert tape and press firmly until tape clicks into place. Press the INIT and INIT LOCK keys simultaneously to load the tape into the programmer. If it is the first tape inserted after power-up, it loads automatically.

INTRODUCTION TO THE P190 PROGRAMMER

After the tape has been loaded, or when you have finished using the tape, open the tape drive door and push the eject pushbutton to remove the tape; the contents of the tape are in the P190's memory. To clear the P190's memory, press the INIT and INIT LOCK keys as you did to load the tape.

NOTES

The INIT and INIT LOCK keys must be pressed simultaneously in order for the contents of the tape to be entered or the P190's memory to be cleared.

Slide the tape's RECORD tab in the direction opposite that indicated by the arrow on the tab, unless you are using the tape loader tape DUMP 484 function. Doing this prevents the tape from being accidentally written over.

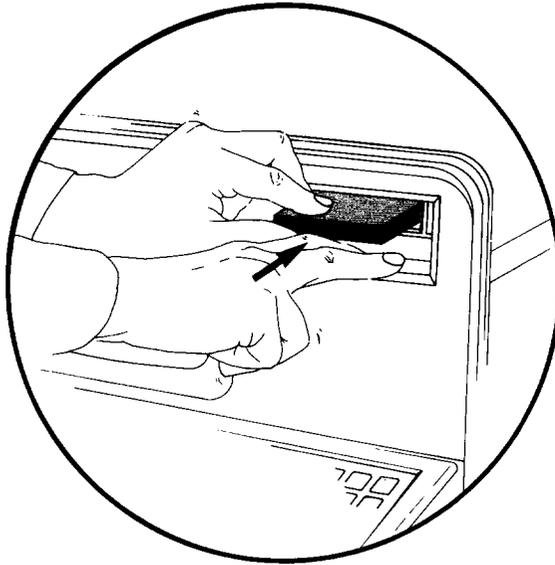


Figure 1-7. Inserting a Tape into the Tape Drive

SECTION 2 484 PROGRAMMER TAPE

This section describes the use of the 484 Programmer Tape. The two main divisions of the tape are the RESET Level (Section 2.1) and the EXIT Level (Section 2.2). These operation levels are reached by pressing the appropriate key(s) on the P190 Keyboard after the tape is loaded into the P190. Press the RESET/EXIT key and the SHIFT key for the RESET Level; press the RESET/EXIT key for the EXIT Level. When the 484 Programmer Tape is loaded, the first software label menu of the Reset Level is displayed.

2.1 RESET LEVEL

The RESET Level contains commands for supervisory actions such as starting, stopping, and clearing memory in the PC. Also included are commands for setting parameters and choosing ON-Line or OFF-Line programming.

Figure 2-1 shows the available software label keys in the RESET Level — ON-Line mode. Figure 2-2 shows the software label key available in the RESET Level — OFF-Line mode.

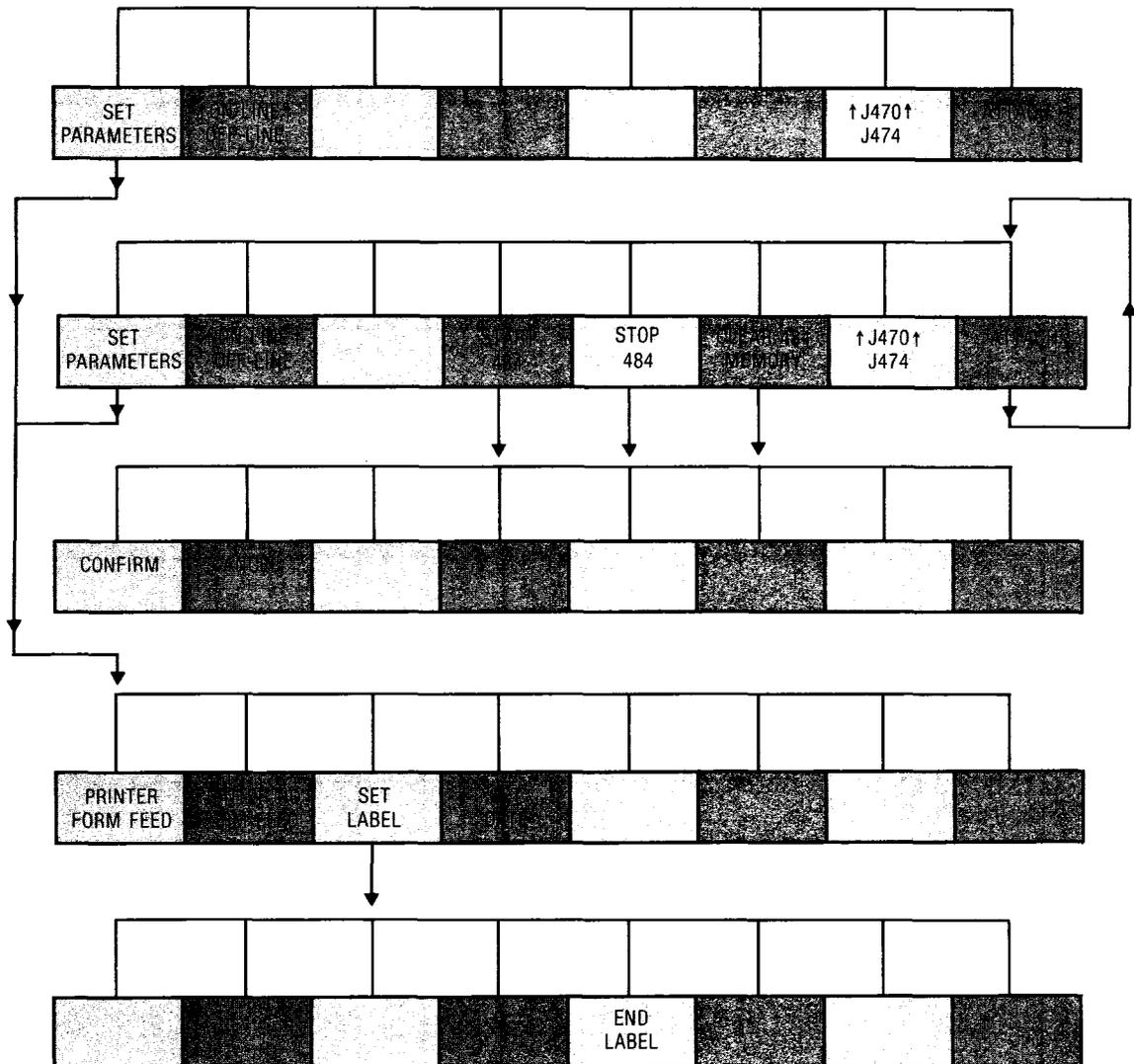


Figure 2-1. RESET Level — ON-Line Mode

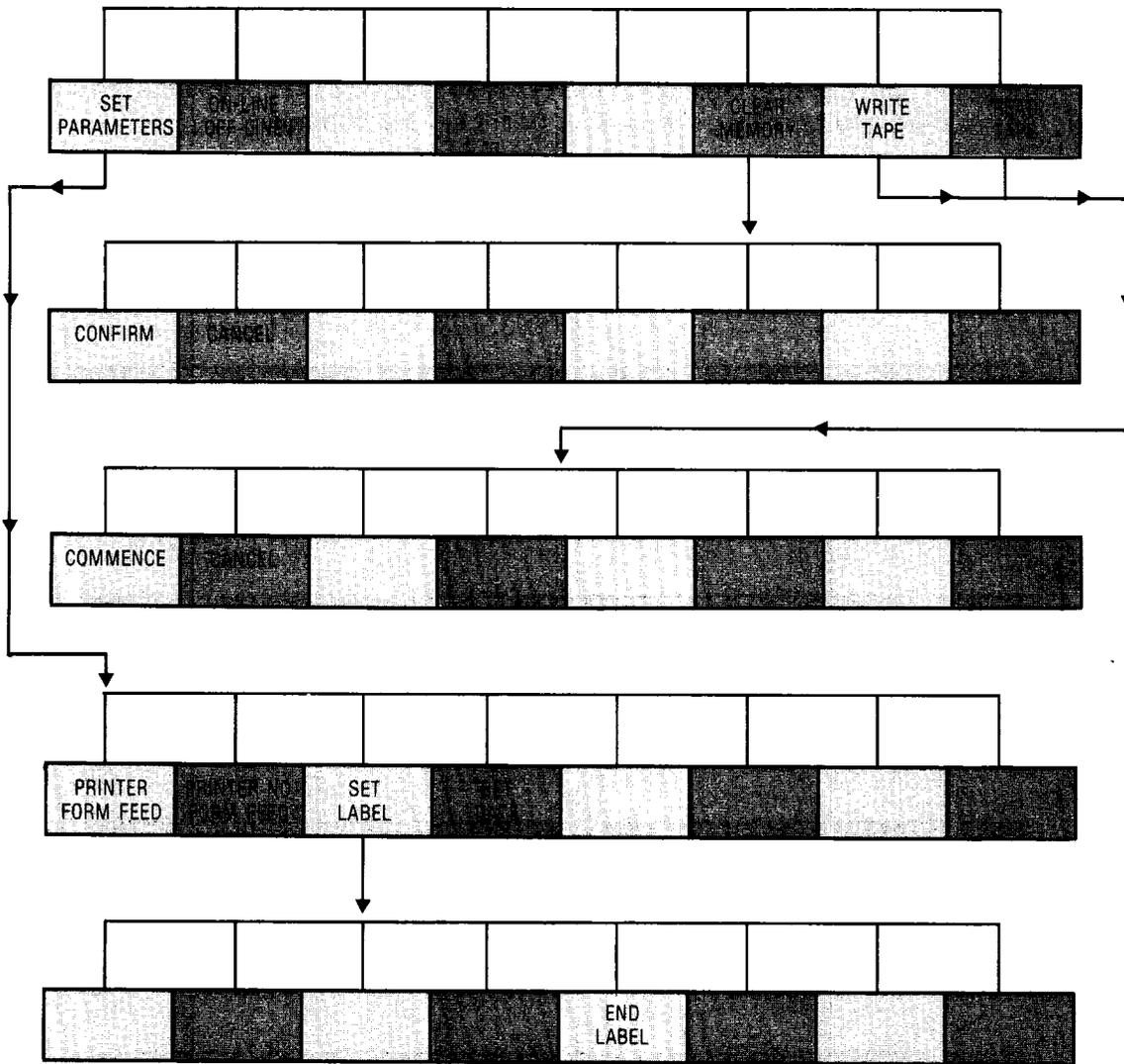


Figure 2-2. RESET Level — OFF-Line Mode

2.1.1 SET PARAMETERS

The functions under SET PARAMETERS are used to indicate the type of printer to be used, if any, and to set labels and dates for use on tapes made OFF-Line. OFF-Line tapes are made using the P190 Programmer with no 484 PC attached.

2.1.1.1 PRINTER FORM FEED and PRINTER NO FORM FEED

The printer attached to Port 2 of the P190 Programmer may or may not support form feed characters. The type of printer must be indicated using the PRINTER FORM FEED and PRINTER NO FORM FEED software label keys.

PRINTER FORM FEED indicates that the attached printer supports form feed characters. An ASCII form feed character is issued before the CRT screen is printed.

PRINTER NO FORM FEED indicates that the printer does not support form feed characters. The P190 Programmer issues the appropriate number of line-feed (LF) characters to bring the printer to the top of the form.

2.1.1.2 SET LABEL and END LABEL

These software label keys are used to enter a tape label or title. This label can be any mix of alphanumeric and special characters with a maximum length of 64.

Press the SET LABEL software label key and enter the label using the P190 keyboard. When complete, press the END LABEL software label key. This enters the label and returns you to the previous set of software labels.

2.1.1.3 SET DATE

Press the SET DATE software label key and enter six date characters. The interpretation of the characters is up to you: month, day, and year, or day, month, and year. For example, April 5, 1984 could be entered as 040584 (month, day, and year), 050484 (day, month, and year), or as 5APR84 (alphanumeric). The date is inserted automatically once six characters are entered via the P190 keyboard.

2.1.2 ON-LINE/OFF-LINE

The P190 Programmer can program a 484 PC in two modes: ON-Line or OFF-Line. ON-Line programming is used when the P190 Programmer is connected to a 484 PC through an RS-232-C interface, either a J470 or a J474/J475. As a program is entered on the P190 it is entered into the 484.

OFF-Line programming requires only a P190 Programmer and a 484 Programmer Tape (AS-T484-001). In OFF-Line programming a 484 PC's memory is simulated within the P190 Programmer. A program can be developed and stored to be loaded into a 484 Controller at a later date.

The following rules apply to OFF-Line programming:

1. OFF-Line programming is always done on a simulated 484 PC with 8K memory, 256 Input/Output (I/O) points, and an Enhanced II Instruction Set. The simulated controller is stopped. The PC that will eventually use the program can be any memory size or instruction set. However, ensure that the amount of memory and type of logic programmed are compatible.

484 PROGRAMMER TAPE

2. When the P190 keylock is unlocked, information can be entered via the keyboard or loaded from tape. Information can also be reviewed, changed, and rewritten to tape.
3. When the P190 keylock is locked, the contents of a tape can be reviewed but not changed.
4. Dump tapes are tapes on which a 484 PC's memory has been recorded. Dump tapes can be duplicated by loading the existing dump tape into the P190's memory, then recording on a blank tape (see Section 3, Tape Loader).
5. Dump tapes produced by the tape loader tape (AS-TI90-001) can be loaded, reviewed and altered by the 484 Programmer Tape (AS-T484-001).

ON-Line or OFF-Line is selected by toggling the ON-LINE/OFF-LINE software label key. Arrows in the software label indicate which function has been selected, up for ON-Line and down for OFF-Line. At power-up, ON-Line is selected automatically, default. When OFF-Line is selected, the following software labels are displayed:

NOTE

All OFF-Line user logic in P190 memory is erased if the key is toggled from OFF-LINE to ON-LINE and back to OFF-LINE. Use the WRITE TAPE function to save OFF-Line programs.

2.1.2.1 CLEAR MEMORY (OFF-Line Only)

This software label only appears when the P190 memory protect key is in the unlocked position and OFF-Line programming is selected. Press the CLEAR MEMORY software label key followed by the CONFIRM software label key to erase all user logic that has been entered into the P190 Programmer. The CANCEL software label key is pressed to cancel the request.

All OFF-Line user logic can also be cleared if the ON-LINE/OFF-LINE software label key is toggled from OFF-LINE to ON-LINE and back to OFF-LINE.

2.1.2.2 WRITE TAPE (OFF-Line Only)

The WRITE TAPE function is used to store OFF-Line programs on tape.

To write a tape:

1. Press the WRITE TAPE software label key.
2. Insert a blank or scratch tape into the tape drive.
3. Press the COMMENCE software label key. (Pressing CANCEL cancels the request.)
4. The message "****DUMPING****" appears on the screen while the tape is being written.

2.1.2.3 READ TAPE(OFF-Line Only)

The READ TAPE function is used to load an existing program from a tape into the P190's OFF-Line memory.

To read a tape:

1. Press the READ TAPE software label key.
2. Insert a previously written dump tape into the tape drive.
3. Press the COMMENCE software label key. (Pressing CANCEL cancels the request.)
4. The message "****LOADING****" appears on the screen along with the tape label and date while the tape is being loaded.

2.1.3 START 484 (ON-Line Only)

When this software label key is pressed the software labels CONFIRM and CANCEL appear on the screen. Press CONFIRM to start the 484. Press CANCEL to cancel the request. The START 484 software label is only displayed when ATTACH is successful and ON-Line programming has been selected.

2.1.4 STOP 484 (ON-Line Only)

When this software label key is pressed the software labels CONFIRM and CANCEL appear on the screen. Press CONFIRM to stop the 484. Press CANCEL to cancel the request. The STOP 484 software label is only displayed when ATTACH is successful and ON-Line programming has been selected.

2.1.5 CLEAR 484 MEMORY (ON-Line Only)

To clear the 484's memory, stop the controller, press the CLEAR 484 MEMORY software label key, and press the CONFIRM software label key. The CANCEL software label key is pressed to cancel the request. The CLEAR 484 MEMORY software label is only displayed when ATTACH is successful and ON-Line programming has been selected.

2.1.6 J470/J474

Toggle the J470/J474 software label key to indicate the interface communicating with the 484 PC. The selected interface type is indicated by two arrows, up for J470 Adapter, down for J474 or J475 Interface. At power-up the arrows are up, indicating J470; this is the default option.

If the interface type indicated and the interface type used do not match, either communications are not established, or an error code is returned from the interface. Toggling this key while attached to a 484 PC detaches the P190 Programmer from the controller.

2.1.7 ATTACH

The ATTACH software label key is used to establish communications between the P190 Programmer and the 484 Controller. The ATTACH software label is only present if the On-Line programming mode has been selected. If using a J474 or J475 Interface, a unit number, indicating the location or address of the 484 PC in the data line communicating with the P190, must be entered into the AR before pressing ATTACH. This value can range from 1 to 247.

If a J470 Interface is being used, simply press the ATTACH software label key to attach the 484 PC to the P190.

2.2 EXIT LEVEL

Logic can be entered at the EXIT Level if the P190 keylock is unlocked. The software labels displayed on the screen depend upon the P190 hardware keys pressed and on the position of the cursor. The EXIT Level functions are shown in Figures 2-3 and 2-4 with instructions for reaching the appropriate software labels.

To reach the EXIT Level, press the RESET/EXIT key. At this point there are a number of options open to you. If in the monitor mode, one of three things can be done. If the cursor is on a register reference, either in the reference area or on the alternate screen, the register contents can be displayed in decimal or binary form. However, these values cannot be altered. To display the next programmed network, press the PREV GET NEXT key. A specific network can be displayed by pressing the ERASE/GET key. (See Figure 2-3.)

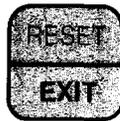
There are more options available if in the program mode, P190 keylock unlocked. After reaching the EXIT Level, pressing either the PREV GET NEXT key or the START NEXT key displays a network on the screen. At this point, register and discrete references can be called to the screen by moving the cursor to the reference area or going to the alternate screen, entering a reference number into the AR, and pressing the ERASE/GET key.

If the cursor is on a register reference, the contents of the register can either be altered or displayed in decimal or binary form. If the cursor is on a discrete reference, or coil in the logic area, the discrete can be enabled, disabled, or forced on or off. Also when the cursor is in the logic area of a displayed network, pressing the RESET/EXIT key brings up a set of editing software labels. Since programming is done at the EXIT Level, when the cursor is in a network, or in the search area, the programming software labels are available. (See Figure 2-4.)

EXIT LEVEL OPERATIONS

THE VARIOUS OPTIONS AVAILABLE WHILE AT THE EXIT LEVEL OF OPERATIONS ARE OUTLINED IN FIGURES 2-3 AND 2-4. FIGURE 2-3 CONTAINS THE OPTIONS AVAILABLE IN THE MONITOR MODE WHILE FIGURE 2-4 CONTAINS THE PROGRAM MODE OPTIONS AND THE AVAILABLE SOFTWARE LABELS.

PRESS



P190 KEYLOCK LOCKED MONITOR MODE

CURSOR ON REGISTER REFERENCE. EITHER ON REFERENCE OR ALTERNATE SCREEN



OR

PRESS



DISPLAYS NEXT PROGRAMMED NETWORK

OR

ENTER NETWORK NUMBER

PRESS



DISPLAYS SELECTED NETWORK

Figure 2-3. EXIT Level — Monitor Mode

PRESS



P190 KEYLOCK UNLOCKED, PROGRAM MODE

PRESS



OR



CURSOR ON REGISTER REFERENCE, EITHER ON REFERENCE OR ALTERNATE SCREEN



OR

CURSOR ON DISCRETE REFERENCE, EITHER ON REFERENCE OR ALTERNATE SCREEN, OR AT COIL ON LOGIC SCREEN



OR

NETWORK DISPLAYED, CURSOR IN LOGIC AREA,

PRESS



OR

CURSOR IN NETWORK OR AT SEARCH AREA

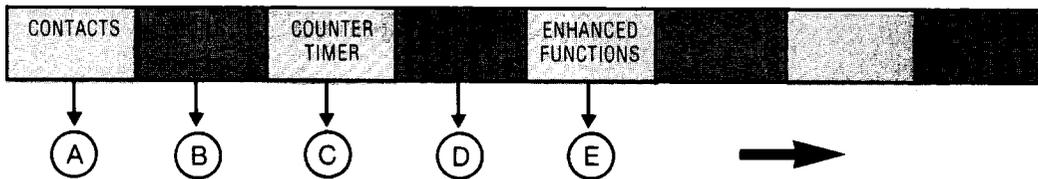


Figure 2-4. EXIT Level — Program Mode

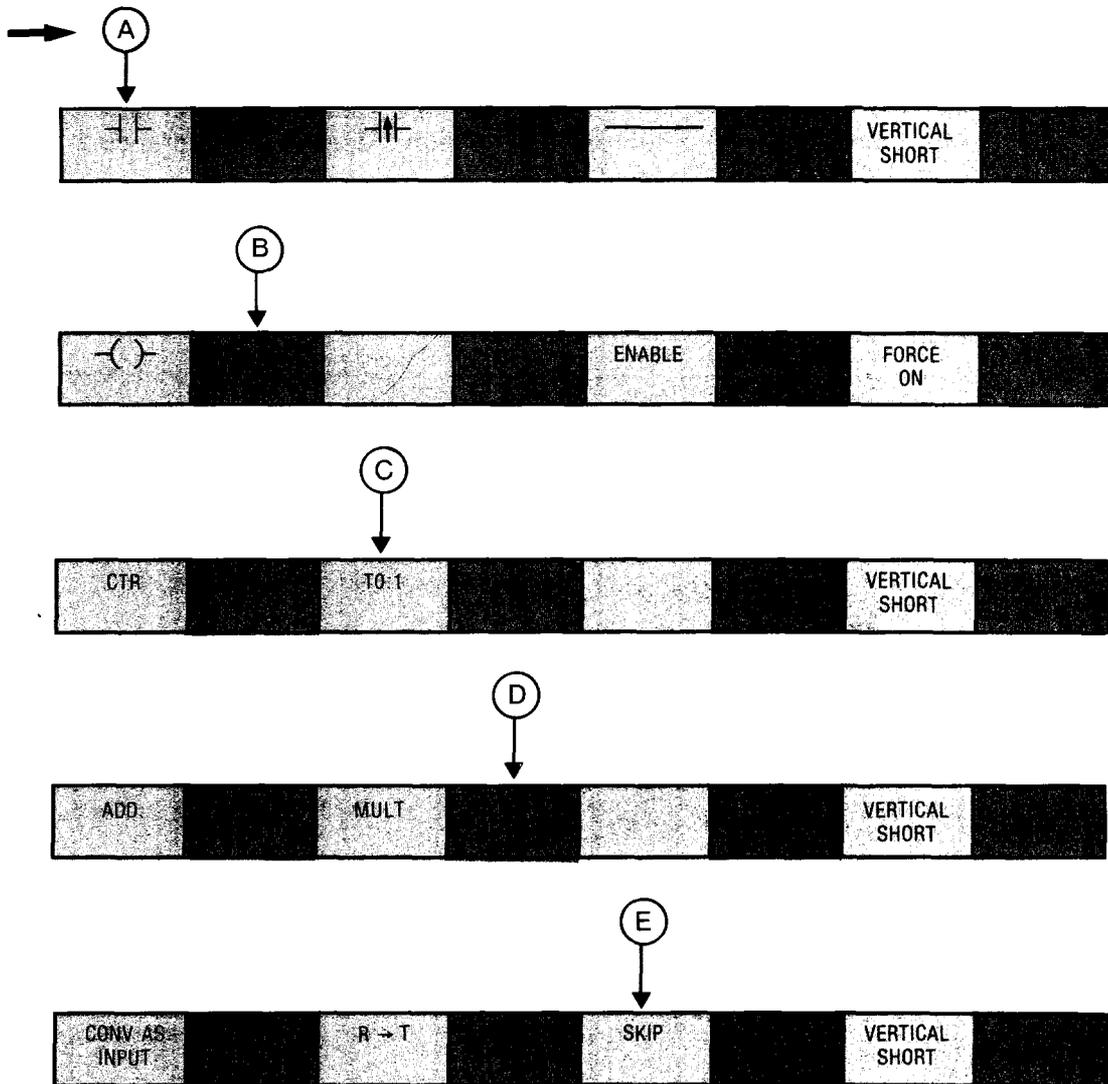


Figure 2-4. EXIT Level — Program Mode (cont.)

2.2.1 Reference Area and Alternate Screen

The reference area is between the logic screen and the status area toward the bottom of the P190 screen and the logic area if on the alternate screen. A total of nine references, three columns of three references each, can be displayed and altered in this area when on the logic screen. To enter the reference area, use the cursor control keys. (See Figure 2-5.)

The alternate screen is an enlarged reference area which replaces the logic screen. The alternate screen is reached from the logic screen by pressing the CHG SCREEN key. A total of 51 references, three columns of 17 references each, can be displayed and altered in this area.

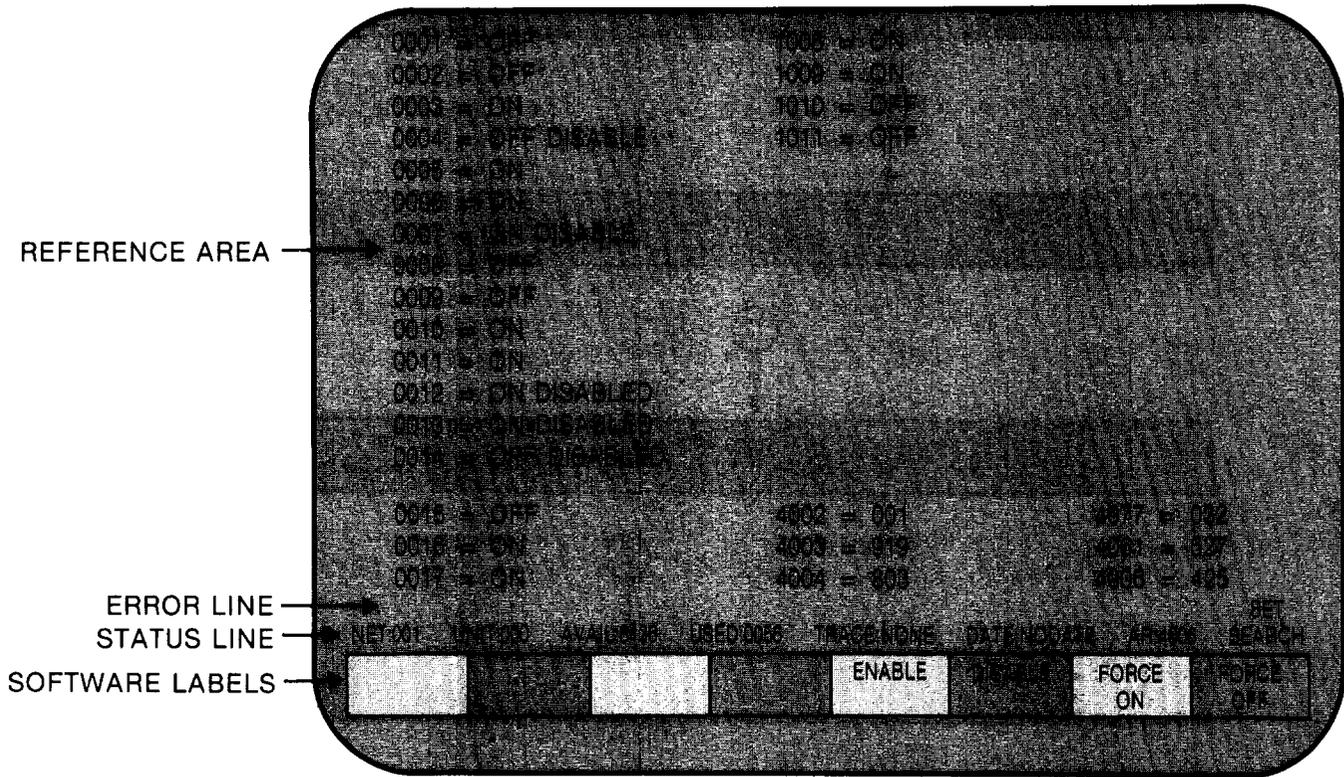


Figure 2-5. Alternate Screen

2.2.1.1 Register Functions

To display a 3XXX input register or a 4XXX output/holding register:

1. Move the cursor to the reference area or press the CHG SCREEN key for the alternate screen.
2. Enter the desired register number into the AR.
3. Press the ERASE/GET key.

The reference number and the register's contents appear in decimal form.

To display in binary form, press the DISPLAY BINARY software label key. To return back to decimal form, press the DISPLAY DECIMAL software label key.

To change the content of a 4XXX register:

1. Position the cursor over the reference.
2. Enter the new value into the AR.
3. Press the ENTER key.

NOTE

If the cursor is not moved to an empty slot before pressing the PREV GET NEXT key, the new reference takes the place of the other.

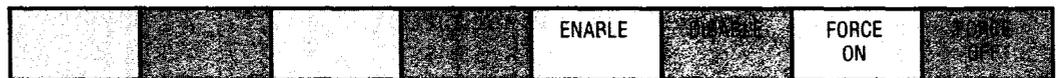
2.2.1.2 Discrete Functions

To display a coil (0XXX), discrete input (1XXX), or sequencer step (2XXX):

1. Move the cursor to the reference area or press the CHG SCREEN key for the alternate screen.
2. Enter the desired discrete number into the AR.
3. Press the ERASE/GET key.

The discrete reference number and its state are displayed.

The following software labels are available when the cursor is positioned over a discrete reference:



Before a discrete can be forced ON or OFF, it must be disabled. To do this, position the cursor over the desired discrete and press the DISABLE software label key. (A coil, 0XXX, must be programmed into 484 memory before it can be disabled.)

Once a discrete is disabled, the FORCE ON and FORCE OFF software label keys can be used to change the discrete's state. Press the ENABLE software label key to re-enable a discrete.

NOTE

If the cursor is not moved to an empty slot before pressing the PREV GET NEXT key, the new reference takes the place of the previous reference.

2.2.2 Programming Elements

Press the CHG NODE key on the P190 Programmer keyboard to reach logic screen operations — programming element software labels. There are six types of programming elements which can be entered on the logic screen: contacts, coils, counters, timers, calculates, and enhanced functions.

2.2.2.1 CONTACTS

Press the CONTACTS software label key to reach the various contact software labels. The following list contains each contact type along with its associated software label symbol:

Normally Open Contact 

Normally Closed Contact 

Transitional Contact (OFF to ON) 

Transitional Contact (ON to OFF) 

Horizontal Short 

Vertical Short (No symbol)

Vertical Open (No symbol)

2.2.2.2 COILS

The following are the available coils and coil function software labels reached by pressing the COILS software label key:



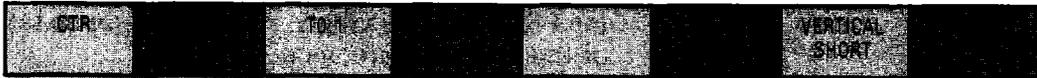
The first two software labels represent coils. The first, $-()-$, is a normal coil and the second, $-(L)-$, is a latched coil which retains its previous state when power is removed and later restored.

When coils are entered in a program, the P190 places them in the eleventh or far right column of the network.

To use any of the coil functions — DISABLE, ENABLE, FORCE ON, and FORCE OFF — position the cursor over the desired coil and then press the appropriate software label key. The FORCE ON and FORCE OFF functions can only be used on disabled coils.

2.2.2.3 COUNTER/TIMERS

The following software labels appear on the screen when the COUNTER/TIMERS software label key is pressed:



COUNTER

The format of a counter is shown in Figure 2-6.

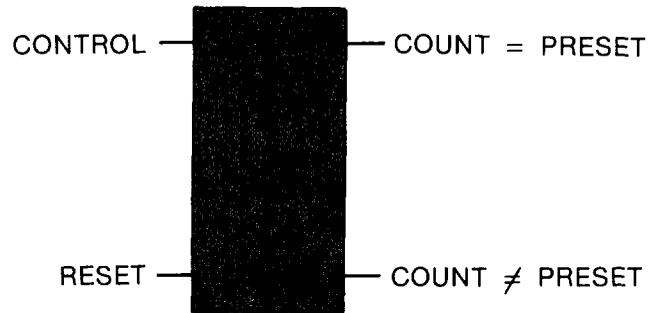


Figure 2-6. Counter

To construct a counter:

1. Enter the maximum desired number of counts, preset value, into the AR if using a fixed numerical value such as 0102 counts, or enter a 3XXX input register reference or a 4XXX holding register reference.

2. Press the CTR software label key.

The cursor is automatically positioned in the top node of the counter, the preset area.

3. Move the cursor down one position.
4. Enter a 4XXX holding register reference into the AR.
5. Press the ENTER key.

This 4XXX register holds the accumulated count value.

TIMER

The format of a timer is shown in Figure 2-7.

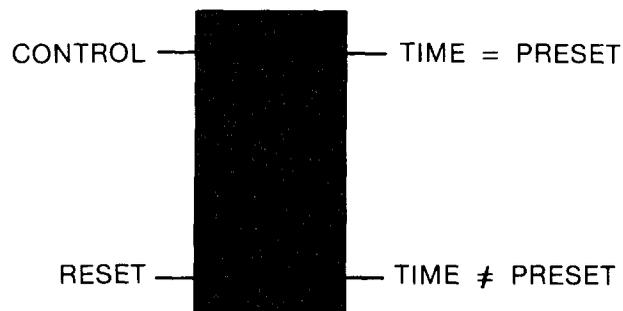


Figure 2-7. Timer

To construct a timer:

1. Enter the maximum desired time, preset value, into the AR if using a fixed numerical value such as 0093 seconds, or enter a 3XXX input register reference or a 4XXX holding register reference.
2. Press one of the timer software label keys: T1.0, T0.1, or T.01.

T1.0 represents seconds where 999 equals 999 seconds; T0.1 represents tenths of seconds where 999 equals 99.9 seconds; and T.01 represents hundredths of seconds where 999 equals 9.99 seconds.

The cursor is automatically positioned in the top node of the timer, the preset area.

3. Move the cursor down one position.
4. Enter a 4XXX holding register reference into the AR.
5. Press the ENTER key.

This 4XXX register holds the accumulated time.

2.2.2.4 CALCULATES

Calculates are the arithmetic functions: addition, subtraction, multiplication, and division. All arithmetic functions have the same structure:

- each occupies three nodes of space in a network.
- each has one input.
- each has two values used to perform the operation and a result.
- each places the result in the bottom node of the function block.

The formats for the arithmetic functions are shown in Figure 2-8.

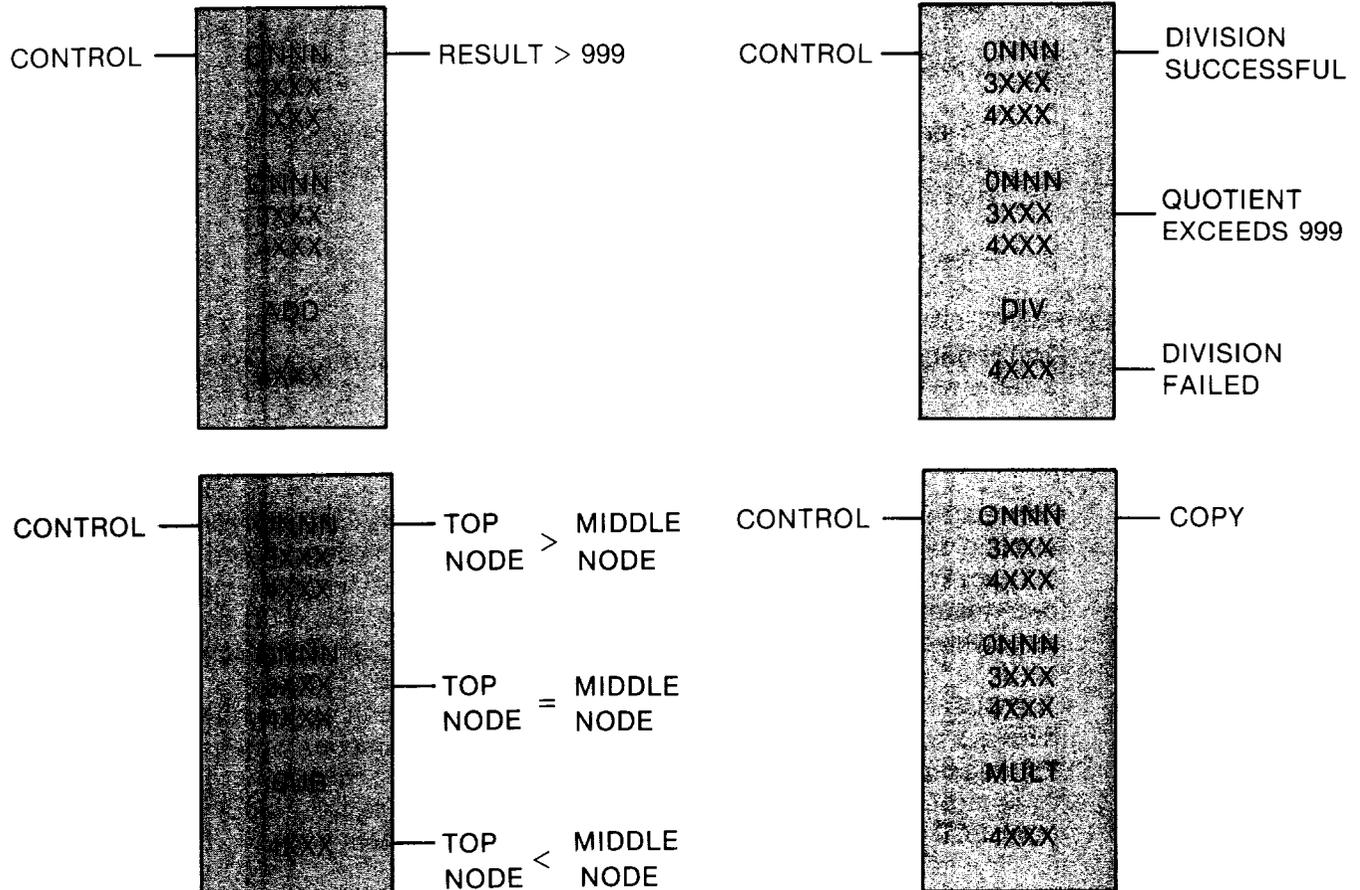


Figure 2-8. Arithmetic Functions

In the ADD block the top and middle values are added together. In the SUB block the middle value is subtracted from the top value. In the MULT block the top and middle values are multiplied by each other. In the DIV block the top value is divided by the middle value.

To construct an arithmetic function block:

1. Enter the top value into the AR. This value can be a fixed numerical value such as 0123, a 3XXX input register reference, or a 4XXX holding register reference. (In the divide function block, the next input or holding register, 3XXX + 1 or 4XXX + 1, is implied; it holds the low order portion of the divisor.)
2. Press the software label key desired: ADD, SUB, MULT, or DIV.

The cursor is automatically positioned in the top node of the block.

3. Move the cursor down one position to enter the middle value. This value can be a fixed numerical value such as 0345, a 3XXX input register reference, or a 4XXX holding register reference.
4. Enter the value into the AR.

5. Press the ENTER key.
6. Move the cursor down one position.
7. Enter the reference for the 4XXX holding register which holds the result. (In the multiply function block, the next holding register, 4XXX + 1, is implied; it holds the low order portion of the result.)
8. Press the ENTER key.

2.2.2.5 ENHANCED FUNCTIONS

The enhanced functions include BCD and binary converts, a register-to-table move, a table-to-register move, and a skip function.

CONVERTS

There are two types of convert functions, BCD (binary coded decimal) and binary. Keep in mind that the type of convert, BCD or binary, is determined by whether one or two inputs are used. Also, the reference types inserted into the function determine whether the convert is an input or output. The BCD convert functions use twelve discrete references; the binary converts use ten discrete references.

The BCD convert functions allow register devices such as thumbwheels and LED displays to be connected to discrete I/O modules. Numerical values are taken from holding registers, converted from binary to BCD, and sent out via logic output coils to control output devices. A BCD convert can also handle input data, convert it from BCD to binary, and place it in a holding register.

The binary convert function converts individual discrete inputs to a binary value and places the binary value in a holding register in the controller. A binary convert can also convert a binary value, taken from a holding register, to individual discrete outputs which are sent out to control an output device. A binary convert is only performed if both the top and bottom inputs on the function block are receiving power.

Each convert function, BCD and binary, can input data or output data. To handle input data, the top value in the convert function block must be a 1XXX discrete input reference and the bottom value must be a 4XXX holding register reference. To handle output data, the top value in the function block must be a 4XXX holding register reference and the bottom value must be a 0XXX discrete output reference.

The convert function block has two inputs and one output. When the top input only receives power, a BCD convert is performed. When the top input and the bottom input are receiving power, a binary convert is performed. The top output passes power when the conversion is done.

The structure of the convert function blocks is shown in Figure 2-9.

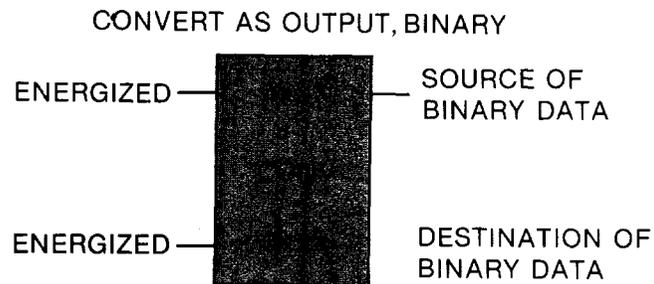
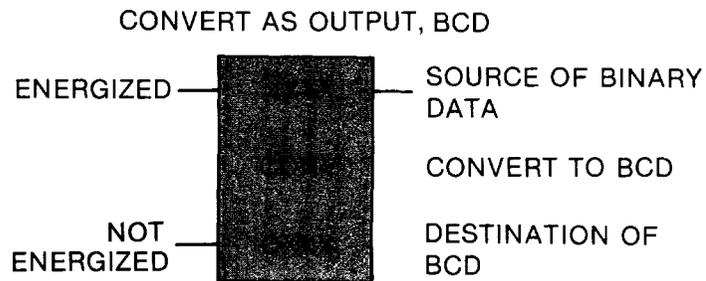
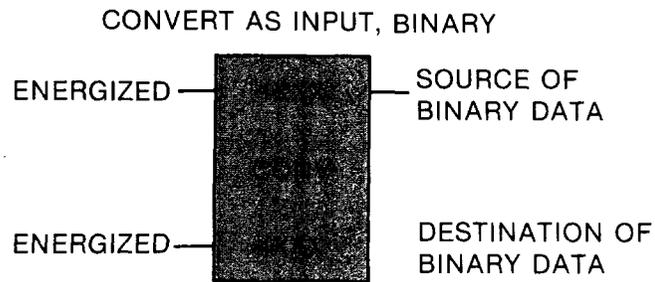
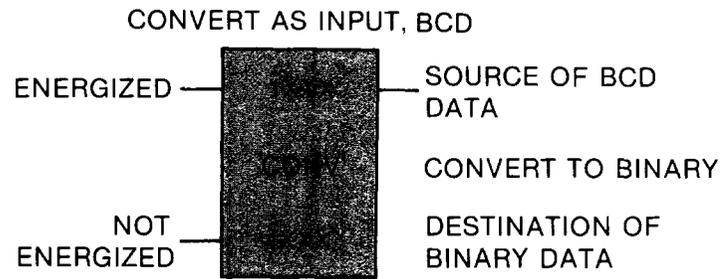


Figure 2-9. Convert Function Blocks

To construct a convert to input data:

1. Enter a 1XXX discrete input reference into the AR.
2. Press the CONV AS INPUT software label key.

The cursor is automatically positioned in the top node of the convert block.

3. Move the cursor down one position.
4. Enter a 4XXX holding register reference into the AR.
5. Press the ENTER key.

To construct a convert to output data:

1. Enter a 4XXX holding register reference into the AR.
2. Press the CONV AS OUTPUT software label key.

The cursor is automatically positioned in the top node of the convert function block.

3. Move the cursor down one position.
4. Enter a 0XXX discrete output reference into the AR.
5. Press the ENTER key.

MOVES

There are two types of move functions: register-to-table (R→T) and table-to-register (T→R). The register-to-table move takes a value from a register and places it in a specified register location in a table. The table-to-register move takes a value from a specified register in a table and places it in another register. The structure of the move function blocks is shown in Figure 2-10.

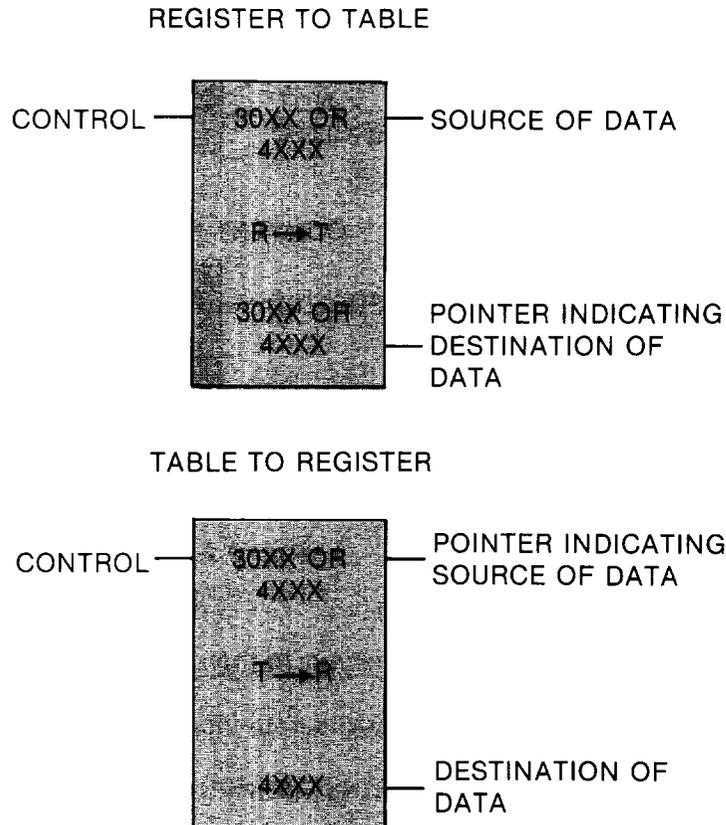


Figure 2-10. Move Function Blocks

To construct a move:

1. Enter a 3XXX input register reference or a 4XXX output/holding register reference into the AR.
2. Press either the R→T or the T→R software label key.
3. Move the cursor down one position.
4. For a register-to-table move enter either a 3XXX or a 4XXX reference. For a table-to-register move, enter a 4XXX reference.
5. Press the ENTER key.

SKIP

A skip function block occupies only one node of space in a network. It uses one input and no output.

To construct a skip:

1. Enter into the AR a fixed numerical value such as 0007, a 3XXX input register reference, or a 4XXX holding register reference.

This value indicates the number of networks to be skipped starting with the remainder of the current network. A zero indicates that all remaining networks are to be skipped.

2. Press the SKIP software label key.

2.2.3 Editing Logic Area (RESET/EXIT)

When the cursor is in the logic area of the screen and the P190 keylock is unlocked, network editing functions can be reached by pressing the RESET/EXIT key on the P190 keyboard.

The following are the available editing function software labels:

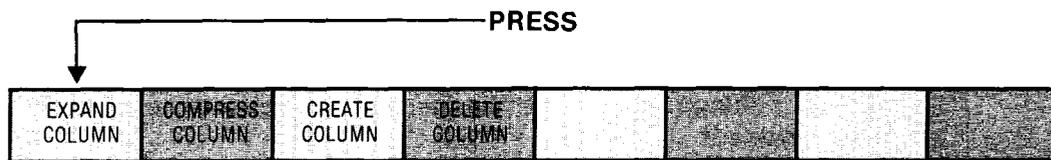
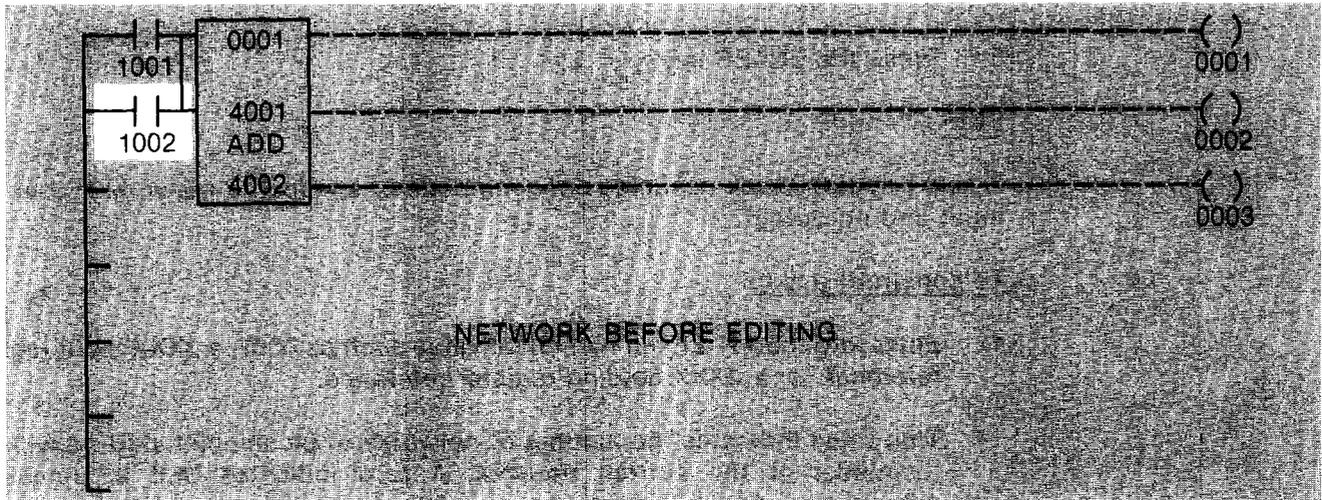
EXPAND COLUMN	COMPRESS COLUMN	CREATE COLUMN	DELETE COLUMN				
------------------	--------------------	------------------	------------------	--	--	--	--

2.2.3.1 EXPAND COLUMN

This function is used to move elements in a column down. Only the elements at and below the cursor in the selected column are moved (see Figure 2-11).

TO EXPAND A COLUMN

POSITION CURSOR OVER THE TOP ELEMENT TO BE MOVED DOWN



TO MOVE DOWN MORE THAN ONE ROW, HOLD THE KEY DOWN

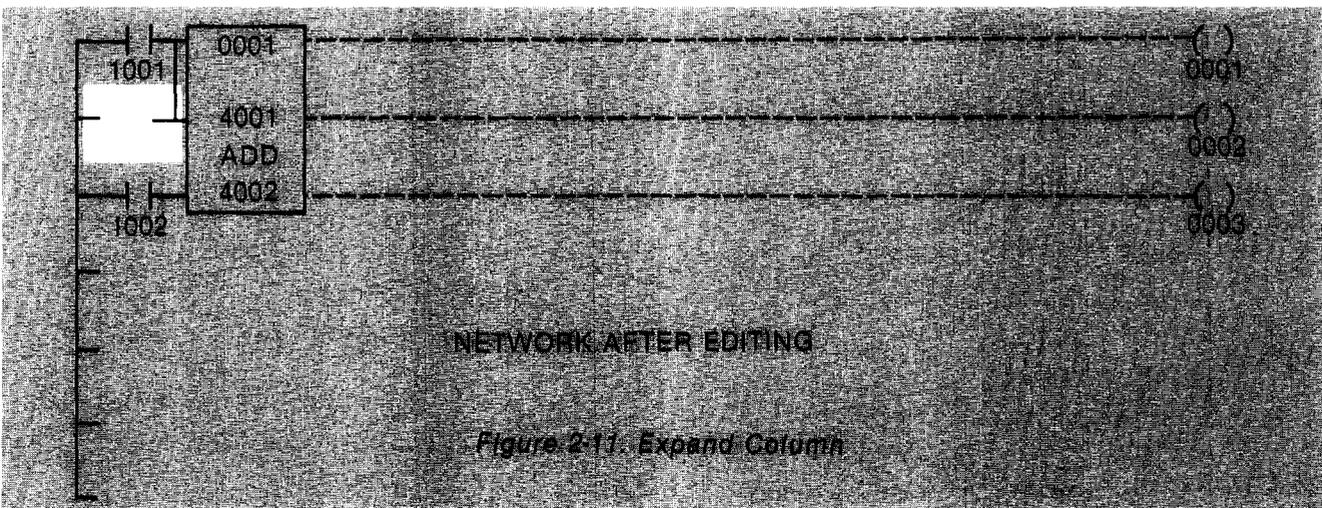


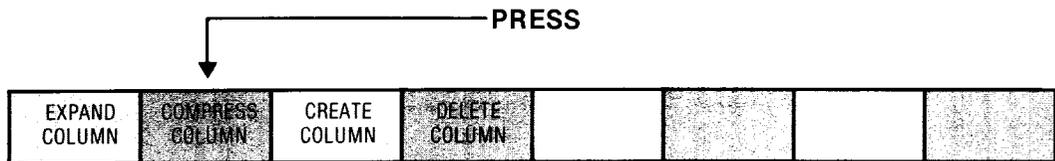
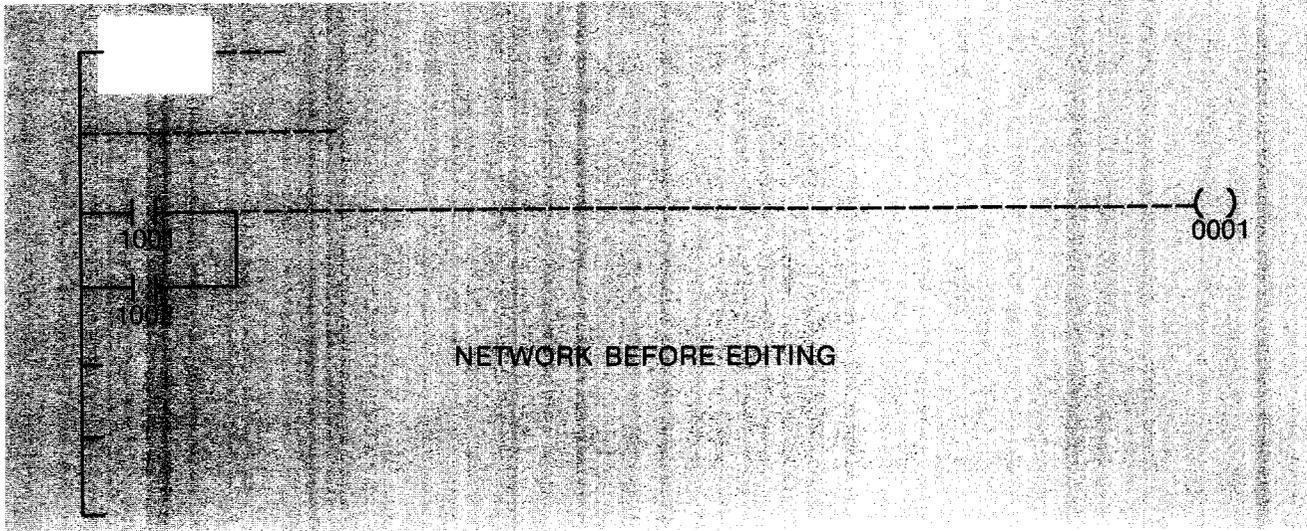
Figure 2-11. Expand Column

2.2.3.2 COMPRESS COLUMN

This function is used to move elements in a column up. Only elements below the cursor in the selected column are moved (see Figure 2-12).

TO COMPRESS A COLUMN

POSITION CURSOR OVER THE SPACE THAT TOP ELEMENT IS TO BE MOVED TO



TO MOVE UP MORE THAN ONE ROW, HOLD THE KEY DOWN

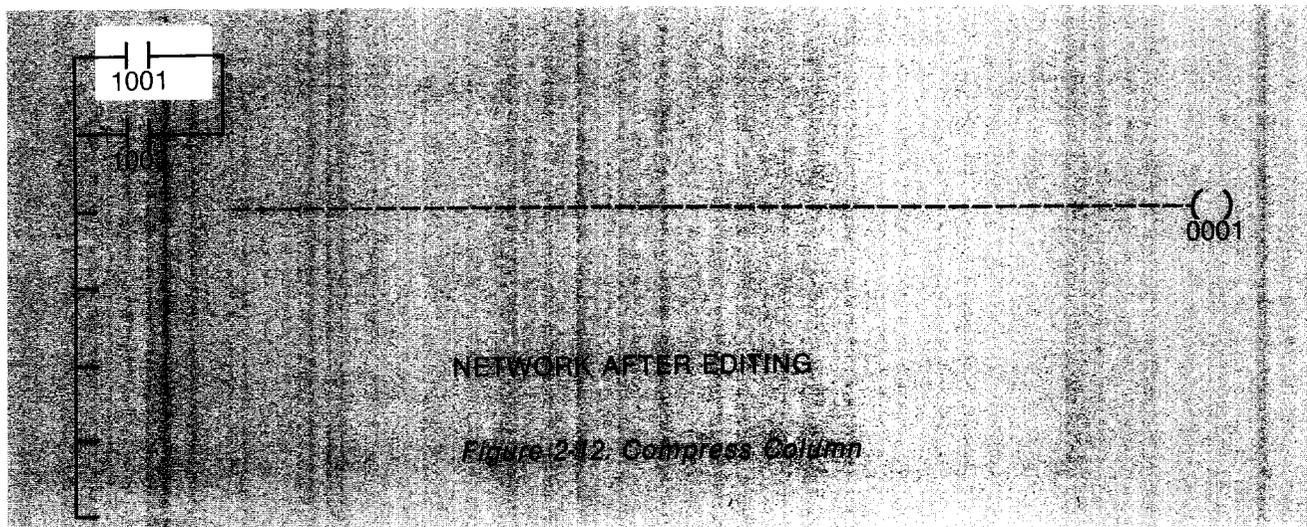


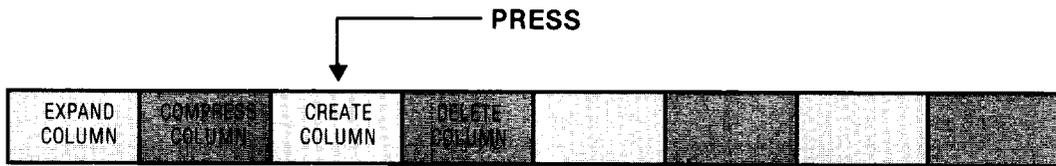
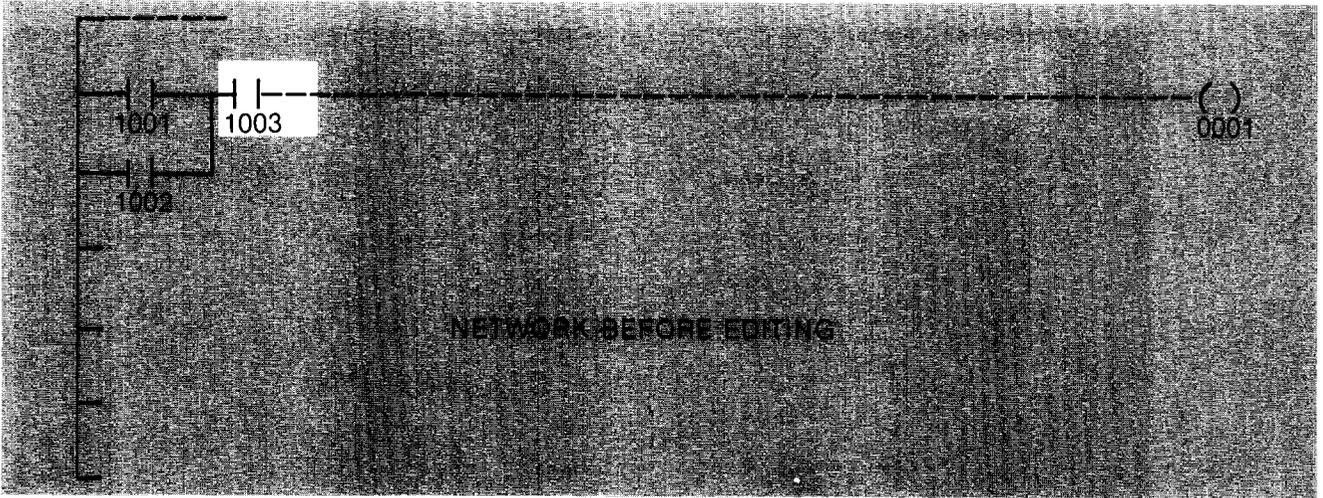
Figure 2-12. Compress Column

2.2.3.3 CREATE COLUMN

This function allows a new, blank, column to be inserted into a network. All logic in the selected column and to the right of the cursor is moved to the right (see Figure 2-13).

TO CREATE A COLUMN

POSITION CURSOR IN AN EXISTING COLUMN, ANY ROW



TO CREATE MORE THAN ONE COLUMN, IF THERE IS ENOUGH ROOM IN THE NETWORK, KEEP THE KEY PRESSED

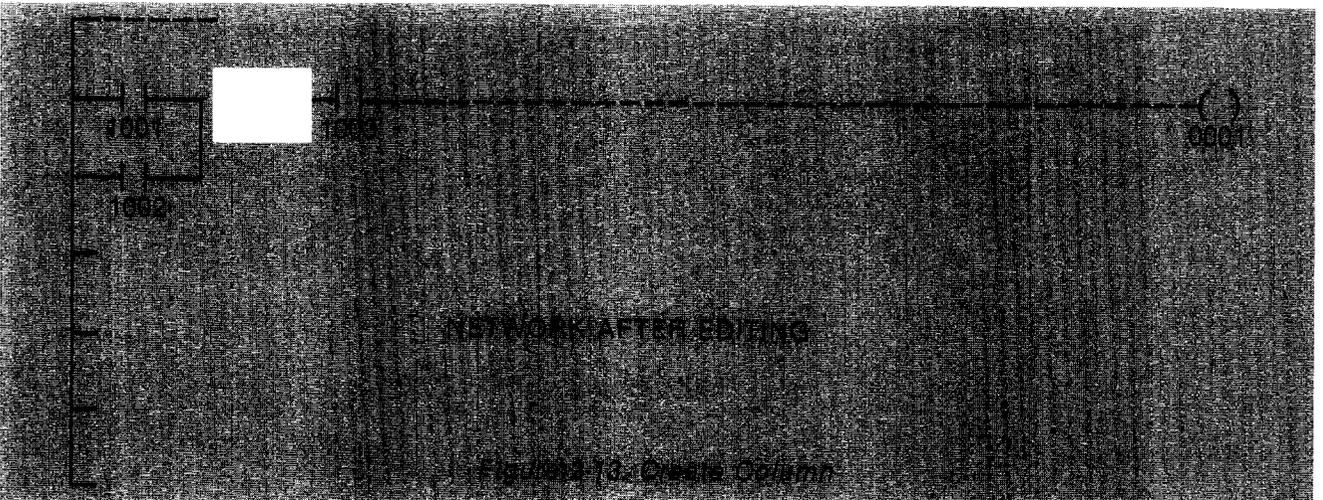


Fig. 2-13. Create Column

2.2.3.4 DELETE COLUMN

This function allows empty columns in a network to be deleted. All the logic to the right of the deleted column is moved to the left (see Figure 2-14).

TO DELETE A COLUMN

POSITION CURSOR IN AN EMPTY COLUMN

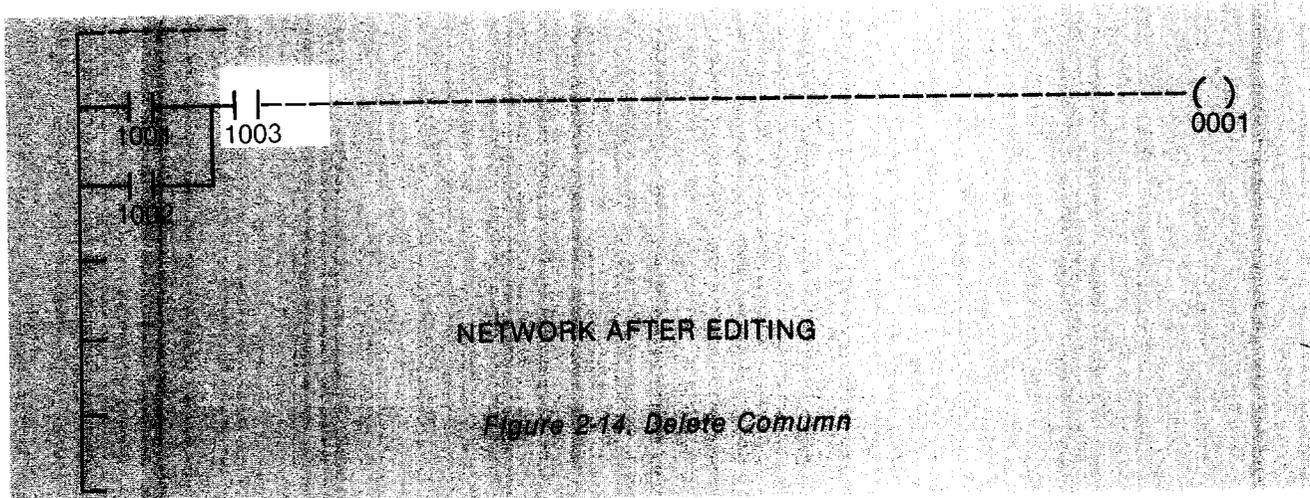
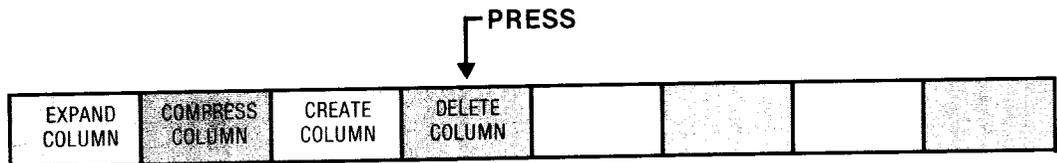
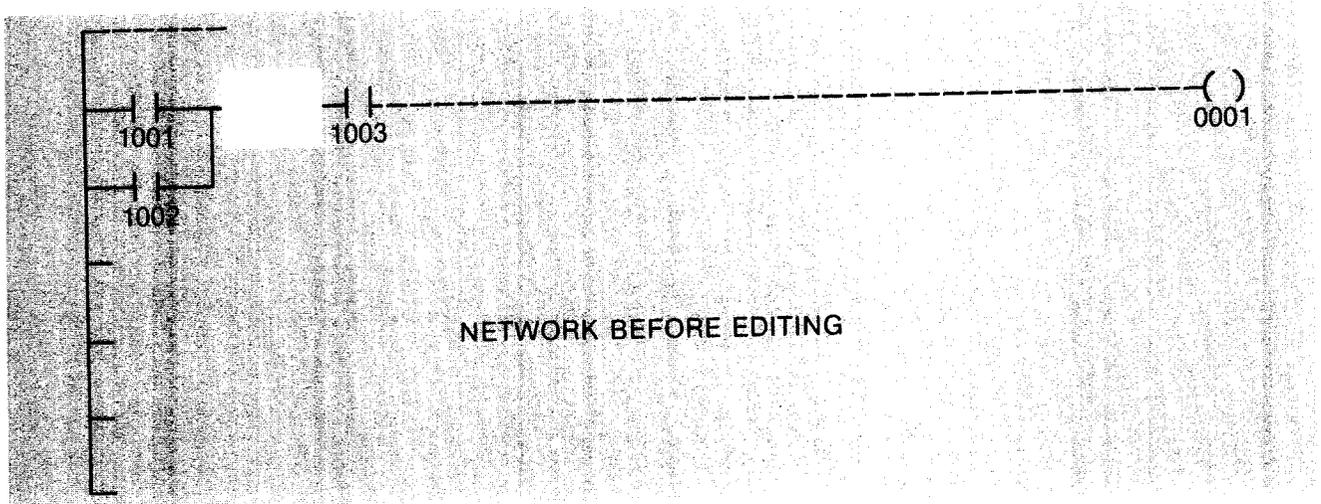


Figure 2-14. Delete Column

SECTION 3 484 TAPE LOADER

The 484 Tape Loader Tape (AS-T190-001) is used to load a PC's memory from the controller to a blank tape in a P190 Programmer, to dump the memory from a data tape in a P190 to a controller, and to compare a data tape in a P190 with a PC's memory. Figure 3-1 shows the software labels associated with the 484 Tape Loader operations.

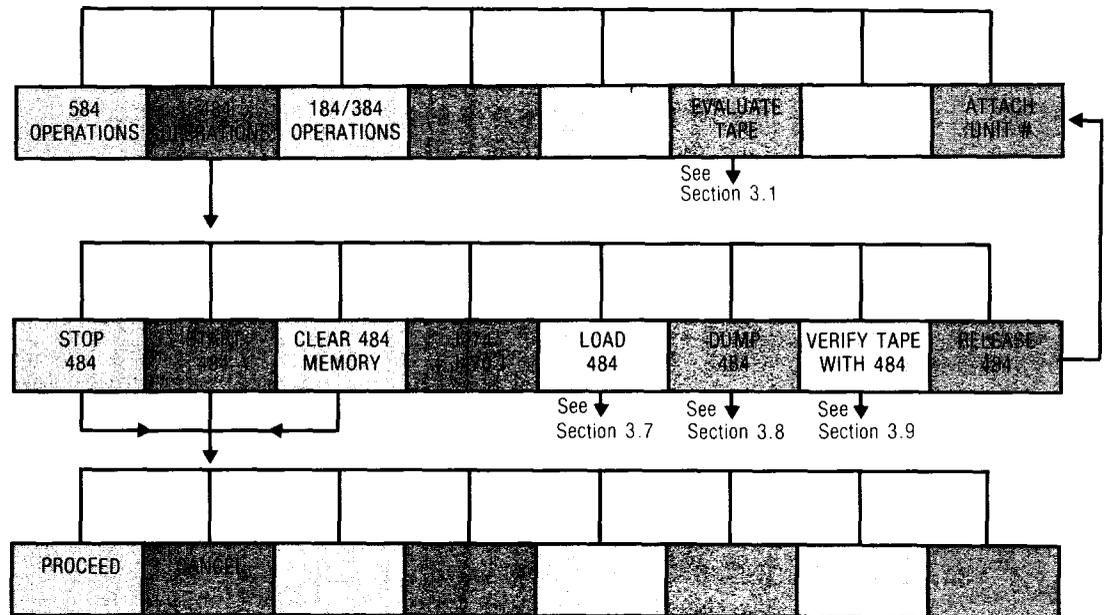


Figure 3-1. 484 Tape Loader Operations

3.1 TAPE EVALUATION

Before a blank tape, new or used, can be made into a working tape it should go through the tape evaluation procedure on the tape loader tape. A working tape is used for actual programming and is made from a Modicon master tape. The evaluation procedure writes and verifies the quality of a blank tape, making two staggered passes so that the entire tape is evaluated; slack caused by temperature changes is eliminated. The evaluation procedure takes about twenty minutes, ten minutes per pass, to complete.

To evaluate a tape:

1. If evaluating a used tape, first erase the tape with a bulk tape eraser. Slide the RECORD tab in the direction indicated by the arrow on the tab, so that the tape is in a write-enabled state.
2. Place the tape loader tape in the tape drive. If this is the first tape inserted after power-up, it will be loaded automatically. If switching from another tape, press the INIT and INIT LOCK keys to load the tape. Loading takes approximately fifty seconds.

484 TAPE LOADER

- When the tape is loaded, the following software labels appear across the bottom of the screen:



- Remove the tape loader tape and insert the tape that is to be evaluated. Press the EVALUATE TAPE software label key. Two new software labels, PROCEED and CANCEL, appear. Press the PROCEED software label key to begin the tape evaluation process.
- If the evaluation is successful, a message appears on the screen indicating such. Next, erase the tape and use it for the creation of a working tape.

If the evaluation is unsuccessful, a message appears on the screen indicating that the tape is not usable. You may want to erase the tape and evaluate it once again before discarding it.

NOTE

The tape must be erased before evaluation takes place. Do not attempt to evaluate a working tape, as this function will erase it. If a working tape is suspect, first make another copy of it from the master tape, then erase the working tape and evaluate it.

3.2 484 PC TAPE LOADER OPERATIONS

To use the tape loader tape with a 484 PC, insert the tape into the P190 tape drive and press the red INIT and INIT LOCK keys. You do not need to press these keys if it is the first tape loaded after power-up. Next, press the ATTACH UNIT # software label key; enter the unit number, 1-247, into the AR; and press the 484 OPERATIONS software label key.

The following are the software labels which appear on the screen, each one representing a basic function of the tape loader tape:



NOTE

For the START 484, STOP 484, and CLEAR 484 MEMORY functions, the P190 keylock must be in the unlocked position.

3.3 STOP 484

To stop the 484, press this software label key then press PROCEED. The CANCEL software label key is used to cancel the request.

3.4 START 484

Press this software label key followed by the PROCEED software label key to start the 484 PC which is connected to the P190. Press CANCEL to cancel the request.

3.5 CLEAR 484 MEMORY

To clear the memory of the connected 484 PC, ensure that the controller is stopped, press the CLEAR 484 MEMORY software label key, then press PROCEED. Press the CANCEL software label key to cancel the request.

3.6 J474/J470

The P190 Programmer communicates with a 484 PC through either a J470 EIA Adapter or a J474/J475 Interface. To select the unit being used, toggle the J474/J470 software label key until the arrows in the software label point to the appropriate interface. If a J474/J475 Interface is used, a unit address must be entered into the AR before toggling the software label key. A unit address indicates the location of the 484 PC in the data line communicating with the P190; this value can range from 1 to 247.

3.7 LOAD 484

With this function, a 484 PC's memory can be loaded into a P190 from a 484 PC data tape inserted in the P190. To load a 484's memory from a data tape:

1. Press the LOAD 484 software label key.
2. Insert a 484 PC data tape into the P190 tape drive.
3. Press the PROCEED software label key. (Press CANCEL to prevent the action.)

The STOP software label appears on the screen. When this software label key is pressed, the software labels PROCEED and ABORT appear. Press PROCEED to continue the operation or ABORT to terminate the operation.

When the operation is complete the message "LOAD COMPLETE" is displayed on the screen.

3.8 DUMP 484

This function allows a 484 PC's memory to be dumped to a blank tape in the P190 Programmer. To dump memory to a blank tape:

1. Press the DUMP 484 software label key.
2. Insert a blank write-enabled tape into the P190 tape drive. To write-enable a tape, push the RECORD tab on the tape in the direction indicated by the arrow on the tab.
3. Press the ENTER TITLE software label key and enter a title of up to 52 alphanumeric characters. When you have finished entering the title, press END TITLE.
4. Press the ENTER DATE software label key. Enter the desired date in six digits. This date usually reflects the date of tape creation or user program revision. When you have entered six digits the date is automatically inserted.
5. Press the PROCEED software label key. (Press CANCEL to prevent the action.)

The STOP software label appears on the screen. When this key is pressed, the software labels PROCEED and ABORT appear. Press PROCEED to continue the operation or ABORT to terminate the operation.

The screen display during the operation is shown in Figure 3-2.

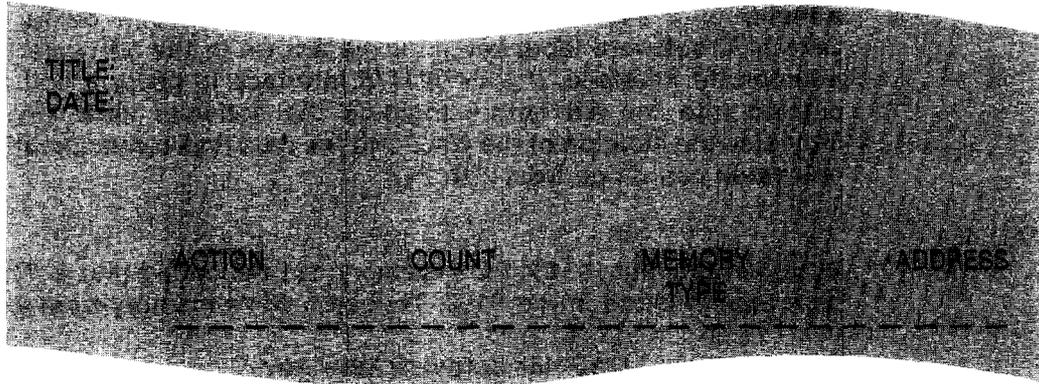


Figure 3-2. Dump Operation Screen Display

When the operation is complete the message "DUMP COMPLETE" is displayed on the screen.

3.9 VERIFY TAPE WITH 484

This function is used to compare a 484 PC's memory with a 484 PC data tape in the P190 Programmer. To do this:

1. Press the VERIFY TAPE WITH 484 software label key.
2. Insert the data tape to be compared into the P190 tape drive.
3. Press the PROCEED software label key. (Press CANCEL to prevent the action.)
4. Toggle the CONTINUE/PAUSE software label key until the arrows are pointing to the desired action.

Selecting CONTINUE causes each miscompare to be shown on the screen but allows the comparison to continue. If PAUSE is selected, the comparison stops when a miscompare is found and displayed. To proceed, toggle the STOP/PROCEED software label key. The comparison can be stopped at any time by pressing the STOP software label key.

The screen display during this operation is shown in Figure 3-3.

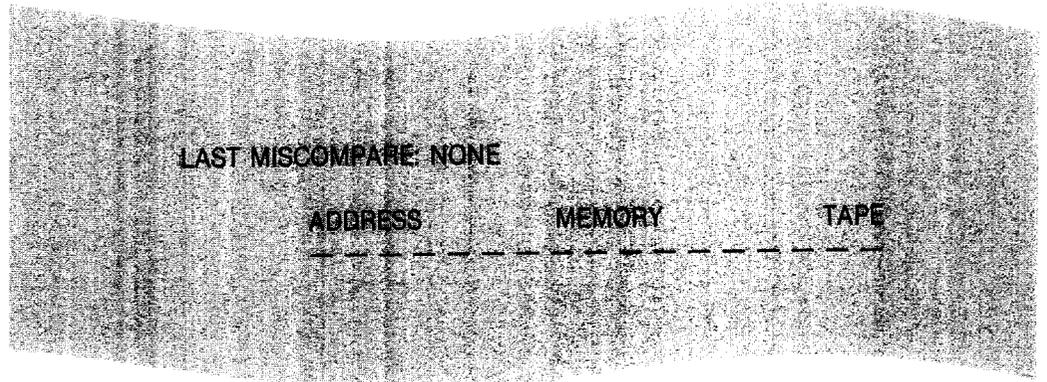


Figure 3-3. Verify Operation Screen Display

When the comparison is complete, either a message stating that the 484 PC memory and the data tape match is displayed, or the total number of mismatches is displayed.

3.10 RELEASE 484

Press the RELEASE 484 software label key to return to the RESET Level. The following software labels are displayed:

584 OPERATIONS	484 OPERATIONS	184/384 OPERATIONS			EVALUATE TAPE		ATTACH UNIT #
-------------------	-------------------	-----------------------	--	--	------------------	--	------------------

SECTION 4 484 LADDER LISTER

The 484 Ladder Lister Tape (AS-T484-002) is used to generate a ladder listing of a user's program obtained from a 484 Programmable Controller. It contains options to print the following information:

- List of all of the networks existing in the 484's memory or just a partial listing. A partial listing can be obtained by specifying the FROM and TO range of networks.
- List of coil usage for discrete inputs, discrete outputs, and internal coils with associated cross references to the type of contact used. The contacts include: normally open, normally closed, positive transitional, and negative transitional. The list includes implied references of coils used, output only, when applicable.
- List of all the sequencer cross references.
- List of registers, input or output, with associated cross references. Implied references (e.g., multiply) are located when applicable.
- Display of register contents in decimal, binary, hexadecimal, and ASCII format.

Software label keys on the P190 keyboard enable the operator to set up the various parameters for a listing. The types of listing information available are summarized in Table 4-1. Figures 4-1, 4-2, and 4-3 show the software labels in the RESET and EXIT Levels of the 484 Ladder Lister.

The P190/484 Ladder Lister also provides an OFF-Line listing capability. Any 484 program logic tape can be listed on the printer without the P190 having to be connected to the 484 PC.

Table 4-1. Available List Options

Ladder Logic Networks	Optional cross reference of coils by contact type and network number
Coil-to-Network Cross Reference	Output coils and internal coils
Coil Disable/Enable Status	Optional cross reference of coils (0XXX) by contact type and network number
Discrete Input Disable/Enable Status	Optional cross reference by contact type and network number
Sequencers	Cross reference of sequencers by contact type and network number
Input Register Contents	Optional cross reference by type and network number
Output/Holding Register Contents	Optional cross reference by type and network number

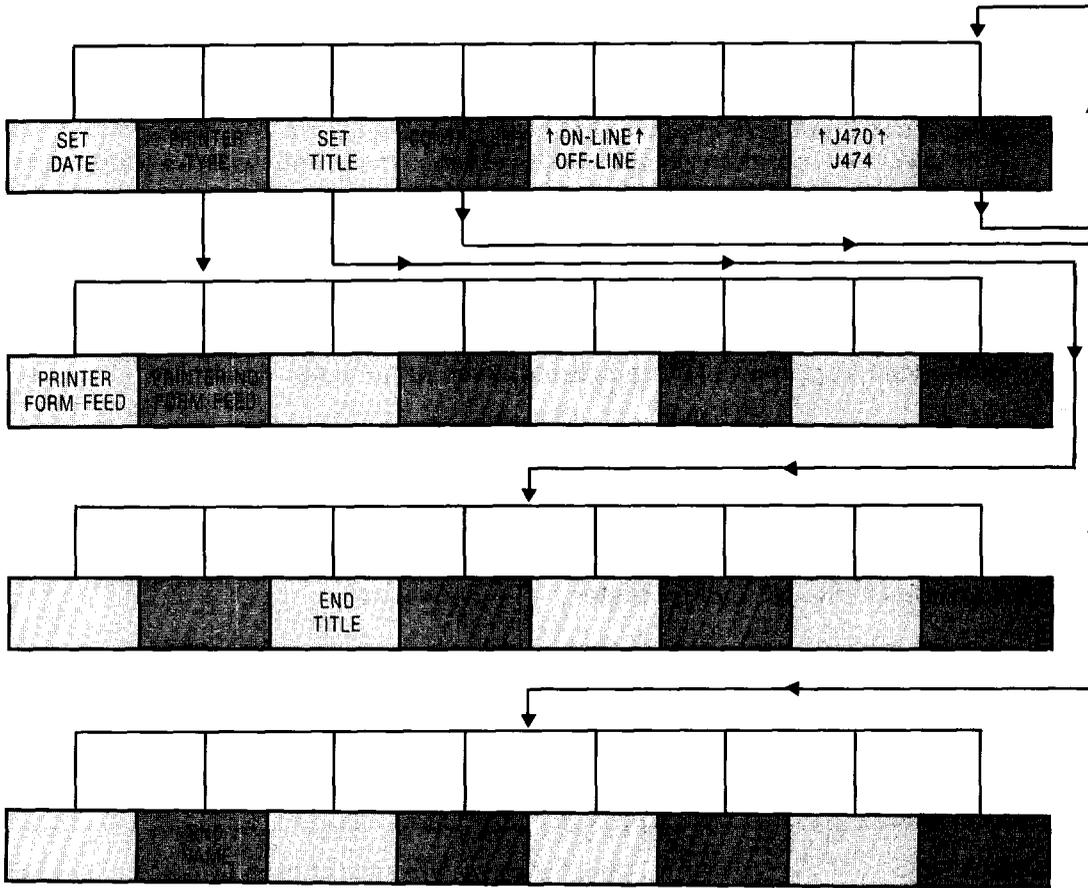


Figure 4-1. RESET Level — ON-Line

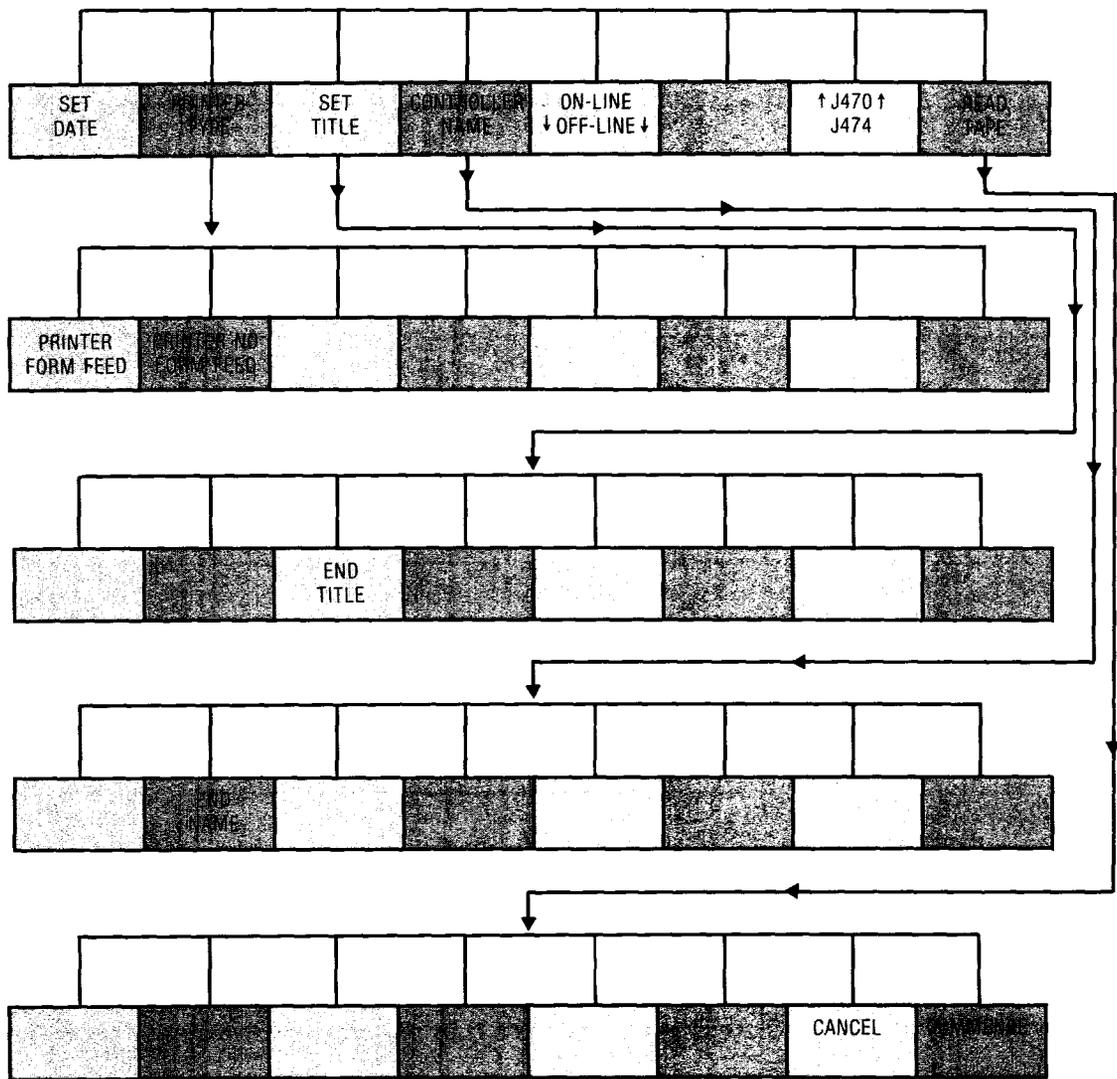


Figure 4-2. RESET Level — OFF-Line

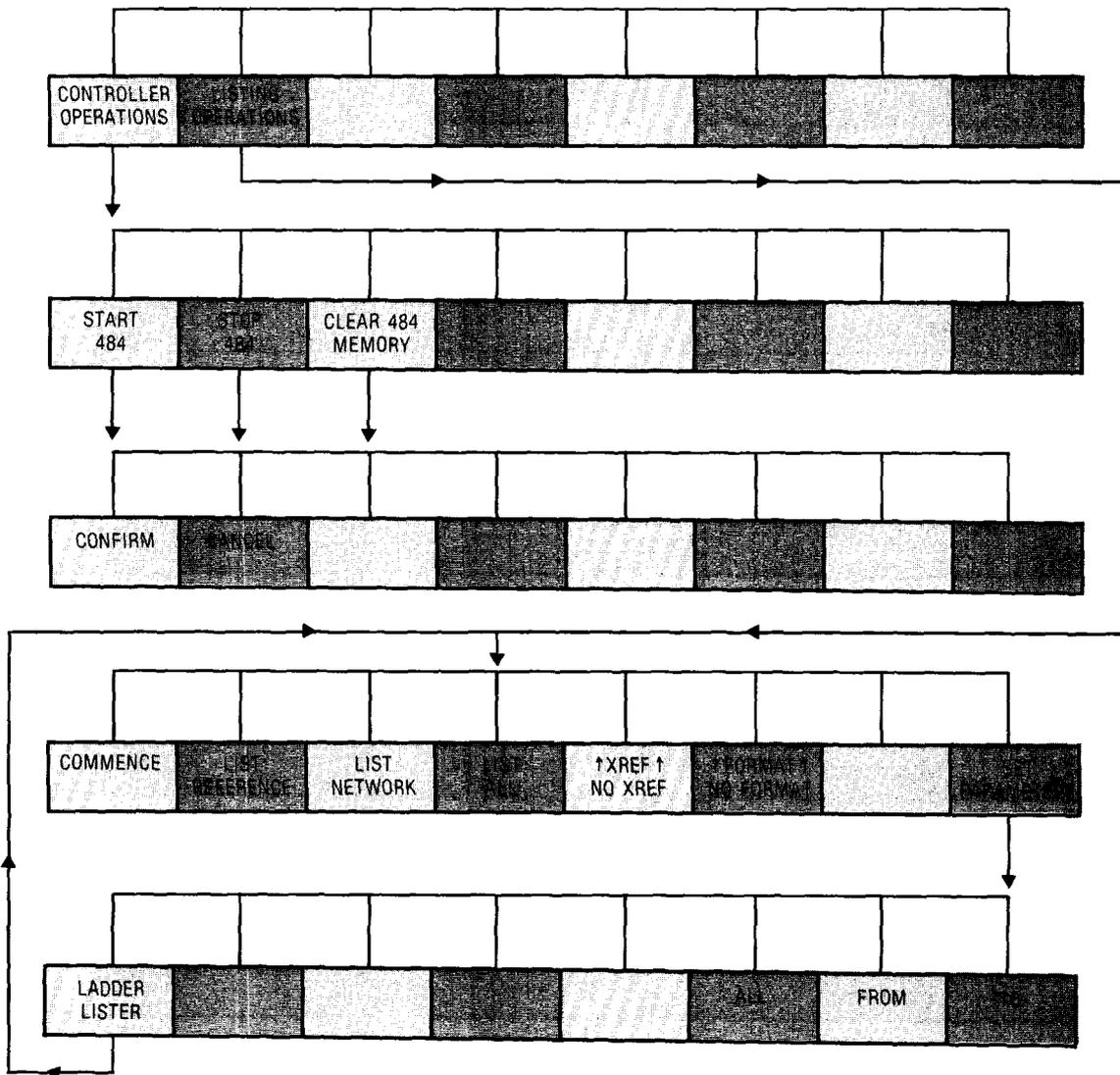


Figure 4-3. EXIT Level

4.1 LIMITATIONS

The P190/484 Ladder Lister does not include a login/logout function. Therefore, the P190 cannot be certain of being the only programmer currently changing a 484 PC's memory. The results of the ladder listing are unpredictable if another device alters the 484 data base while the P190/484 Ladder Lister is functioning.

The two ports on the J470 cannot be used simultaneously.

The ladder lister does not detect implied references in the table-to-register or register-to-table operations. In this case only the specified registers are listed.

4.2 EQUIPMENT REQUIREMENTS

The following is a list of the equipment required to use the P190/484 Ladder Lister Tape:

- A P190 Programmer with 4K or 8K Random Access Memory.
- A BASIC, ENHANCED I, or ENHANCED II 484 Programmable Controller.
- A J470 EIA Adapter or a J474/J475 MODBUS Slave Interface.

NOTE

If a J474 or J475 Interface is used, a J478 modem is required at the P190 Programmer while the J474 or J475 is connected to the 484 PC. The J474 or J475 can only be used with ENHANCED II INSTRUCTION SET of a 484.

- An AS-T484-002 master cassette tape containing the software for the P190/484 Ladder Lister. The master tape is used in the P190 to create working tapes; only the working tapes can be used to run the program. See the P190 Programmer User's Manual for detailed procedures regarding the creation of working tapes.
- A printer/terminal that is RS-232-C compatible operating at one of the following baud rates:

50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, or 19,200.

4.3 RESET LEVEL

After the tape is loaded, the P190 is at the RESET Level. To reach the RESET Level from another level, press the SHIFT key and the RESET/EXIT key simultaneously. At the RESET Level, the following can either be set or selected:

DATE
 PRINTER TYPE
 TITLE
 CONTROLLER NAME or NUMBER
 ON-Line or OFF-Line Mode

When the listing is printed, the heading contains all this information. When at the RESET Level the following software labels are displayed:

SET DATE	PRINTER TYPE	SET TITLE	CONTROLLER NAME	↑ON-LINE↑ OFF-LINE		↑J470↑ J474	ATTACH
-------------	-----------------	--------------	--------------------	-----------------------	--	----------------	--------

At power-up, the unit is in the ON-Line mode and the J470 Interface is selected. The above functions can be set in any order.

4.3.1 SET DATE

When this software label key is pressed, the cursor moves to the top of the screen beside the word DATE. Enter any six alphanumeric characters; the RESET Level software labels are automatically displayed.

When printed, the characters appear in XX/XX/XX format. For example: enter 080384; the printout indicates 08/03/84. The interpretation of this is up to you, mmddy or ddmmy. In this example, mm = month; dd = date; and yy = year. The value set in DATE is preserved until changed. The default value is NO/DATE.

When setting the DATE value, all the alphabetic and numeric keys are valid. The error message "NON-PRINTABLE CHARACTER" or "NO FUNCTION ASSIGNED TO KEY" is displayed if a function key is pressed for DATE. The RUBOUT/BKSP key is not valid in the SET DATE function. If you wish to change the date value simply press the SET DATE software label key. This clears the previous entry and a new date can be entered.

4.3.2 PRINTER TYPE

This software label key is used to choose a particular type of printer device. With each type, six null characters are issued following each carriage return and line feed. When the key is pressed the following software labels are displayed:



4.3.2.1 PRINTER FORM FEED

This software label key is pressed if you are using a printer that allows page eject during a listing. The screen displays the message, "THE FORM FEED OPTION HAS BEEN SELECTED". FORM FEED is the default option.

4.3.2.2 PRINTER NO FORM FEED

This software label key is pressed if you are using a printer that does NOT allow page eject during a listing. The screen displays the message, "THE NO FORM FEED OPTION HAS BEEN SELECTED".

4.3.3 SET TITLE

Pressing this software label key causes the cursor to be positioned at the top of the screen beside the label TITLE. Also, the software label END TITLE appears on the screen. Enter a TITLE of no more than 60 characters using the alphabetic and numeric keys. If more than 60 characters are entered, the error message "END OF TITLE" is displayed.

If any non-printable character is typed in it results in an error and the appropriate error message is displayed on the error line of the screen. The cursor remains in the same position when such an error occurs. If the TITLE is not finished just press the CLEAR ERROR key to resume typing in the TITLE. Pressing the END TITLE software label key terminates the title text; the TITLE is not inserted unless this is done. The TITLE is preserved until changed.

4.3.4 CONTROLLER NAME

When this software label key is pressed the cursor is positioned at the location following the word CONTROLLER on the screen. Enter the name in the same manner as was done for entering a TITLE. A maximum of six characters is allowed.

When the CONTROLLER NAME software label key is pressed the END NAME software label appears on the screen. When the sixth character is entered, the message "END OF CONTROLLER NAME" appears. The END NAME software label key must be pressed, whether or not the name contains six characters, to terminate the CONTROLLER NAME. This inserts the name which is preserved until it is changed.

4.3.5 ON-LINE/OFF-LINE

This is a toggle-type software label key which switches the P190 from one mode of communications to the other. At power-up the P190 is in the ON-Line mode. In the ON-Line mode the P190 is attached to the 484 using the ATTACH software label key, and communication with the 484 PC is allowed.

In the OFF-Line mode, communications are with a 484 dump tape in the P190. Setting the switch to OFF-Line clears the data base in the P190. If the OFF-Line mode is selected, the following software labels are displayed:

SET DATE	PRINTER TYPE	SET TITLE	CONTROLLER NAME	ON-LINE ↓OFF-LINE↓			READ TAPE
-------------	-----------------	--------------	--------------------	-----------------------	--	--	--------------

These OFF-Line functions, excluding READ TAPE, are set in the same manner as the ON-Line functions. The READ TAPE software label key is explained in Section 4.3.8.

Figure 4-4 shows the OFF-Line screen display. The only part of this display which will change is the number of networks, as networks are programmed.

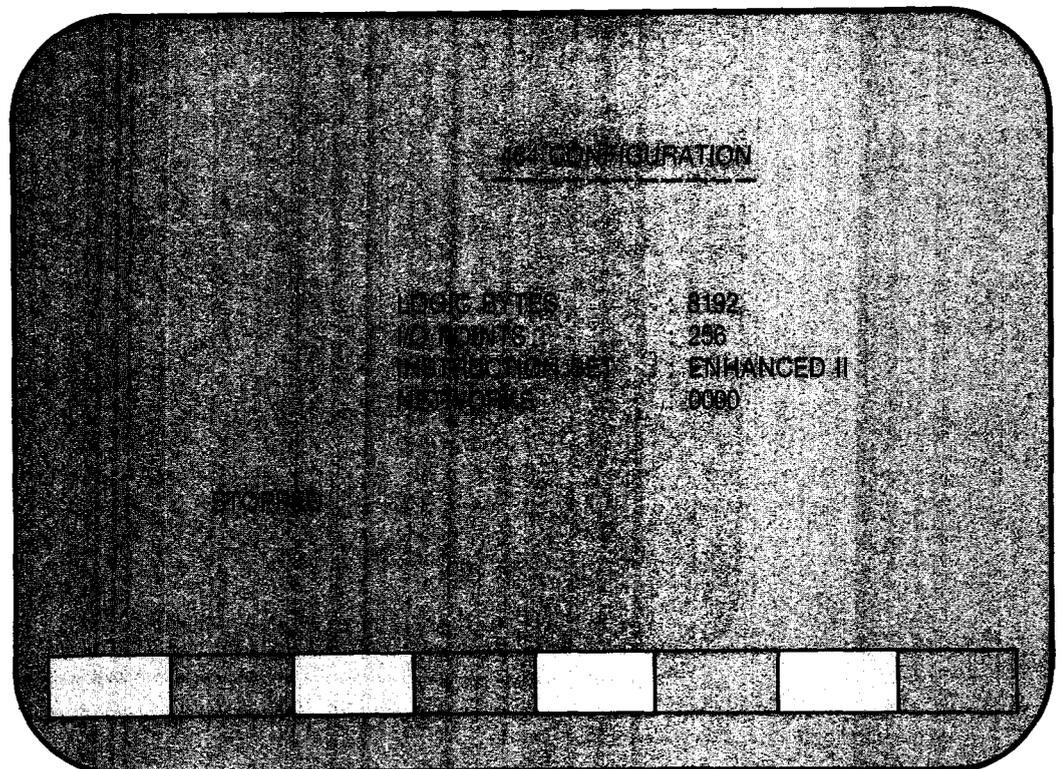


Figure 4-4. OFF-Line Screen Display

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4.3.6 J470/J474 (ON-Line)

This toggle-type software label key enables you to select the communications protocol to match the type of interface used. The P190 ladder lister program communicates with the 484 PC via the J470 Adapter or the J474/J475 Interface only. To ATTACH the P190 to a 484 you must select the communications protocol by toggling the J470/J474 key. J470 is the default state of this option and the UNIT ADDRESS for it is always zero.

If the J474 option is chosen, the J474/J475 must be accompanied by a modem such as the J478 and the J474 or J475's unit address must be specified via the AR. The valid range for the unit address is 1-247; the address is wired onto the connector which is attached to the J474/J475. An error message "INVALID UNIT NUMBER" is displayed in case an invalid unit address is entered, and ATTACH is not possible. The J474 option can only be specified with ENHANCED II INSTRUCTION SET of a 484.

4.3.7 ATTACH

This software label key "attaches" the 484 to the P190 by initiating communications between the two devices.

4.3.7.1 ATTACH (ON-Line)

The P190 is considered attached to a 484 Controller if it has successfully read a controller's configuration while in the ON-Line mode. Note that the EXIT Level can only be reached if an ATTACH was successful. When ATTACH is successful, the information shown in Figure 4-5 is displayed on the P190 screen.

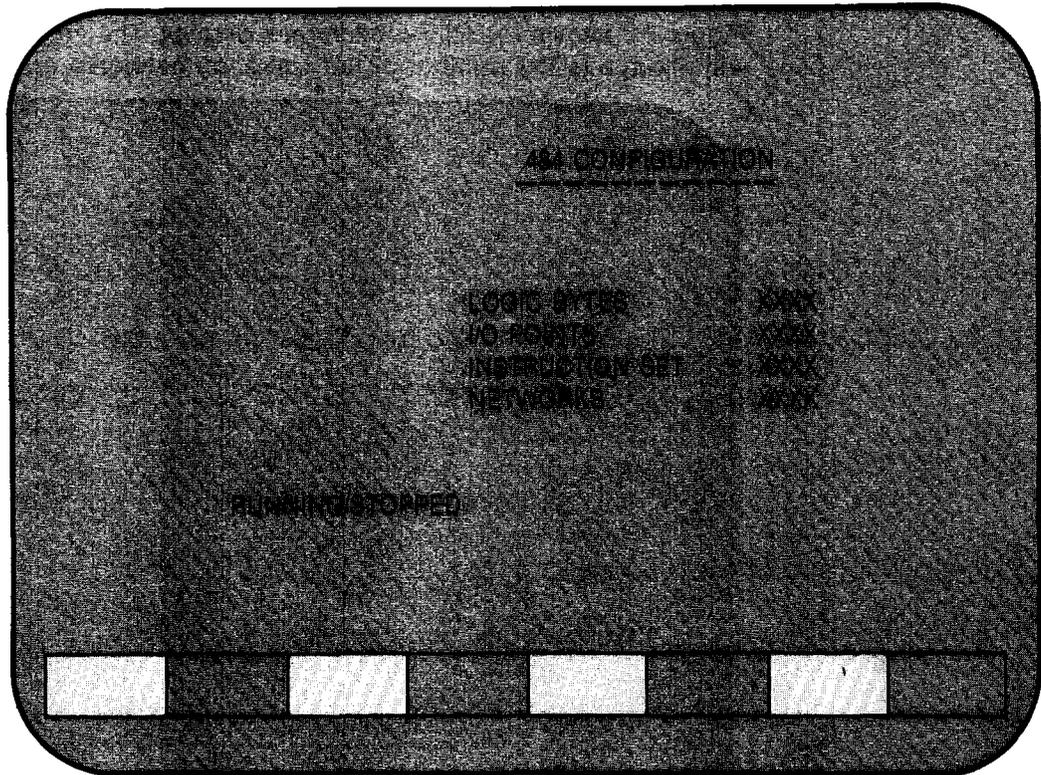


Figure 4-5. ON-Line Screen Display

RUNNING/STOPPED refers to whether or not the controller is running. For logic bytes, I/O points, and networks, XXXX is a decimal value not greater than 9999. The instruction set can be BASIC, ENHANCED I, or ENHANCED II.

NOTE

If the controller is attached and you switch from ON-Line to OFF-Line mode, when you return to the ON-Line mode the controller is released and must be reattached.

4.3.7.2 ATTACH (OFF-Line)

When in the OFF-Line mode, the P190 is always attached. The configuration display is the same as the ON-Line configuration display. The 484 defaults to two channels of I/O, 8K of user logic, and ENHANCED II INSTRUCTION SET.

4.3.8 READ TAPE (OFF-Line)

Pressing this software label key causes the contents of a previously created dump tape, which is currently in the tape drive, to be read into the P190. The dump tape contains a copy of the user program in a 484 PC and can be used to create a ladder listing. See Section 3.8 of this manual for details on how to create a dump tape using the tape loader tape.

When the READ TAPE software label key is pressed, the message "INSERT 484 DUMP TAPE AND PRESS COMMENCE" appears on the screen. When the tape is inserted and COMMENCE is pressed, the message "***LOADING***" appears on the screen.

When the message disappears, the contents of the tape are loaded and you can go to the EXIT Level. If after pressing the READ TAPE software label key you choose not to read the tape, press CANCEL. Pressing CANCEL returns you to the RESET Level.

4.4 EXIT LEVEL

To reach the EXIT Level press the RESET/EXIT key provided the P190 is "attached" to the 484. When this key is pressed it brings up a new level of software labels that enable you to select the next set of 484 operations. The software labels displayed when in the program mode, P190 keylock unlocked, are:



When in the monitor mode, P190 keylock in the locked position, only LISTING OPERATIONS can be performed.

4.4.1 CONTROLLER OPERATIONS

When this software label key is pressed, a new set of software labels is displayed:



Reminder: CONTROLLER OPERATIONS can only be reached in the ON-Line and program modes.

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4.4.1.1 START 484 (Program Mode Only)

This software label key sets up the P190 to issue a START command to the 484. When it is pressed the following software labels are displayed:



The command to start the 484 is issued when the CONFIRM software label key is pressed. If the controller is already running when the key is pressed, a message appears indicating that the controller is running, and the command is ignored. If after pressing START 484 you choose not to start the 484, press CANCEL to escape. Press the RESET/EXIT key to return to the EXIT Level.

4.4.1.2 STOP 484 (Program Mode Only)

This software label key sets up the P190 to issue a STOP command to the 484. The CONFIRM and CANCEL software labels are displayed when this key is pressed. The controller is not stopped until the function is acknowledged by pressing the CONFIRM software label key.

If the controller is already stopped when the key is pressed, an error message is displayed indicating that the controller is stopped and the stop command is ignored. As with the START 484 option, the STOP 484 can be canceled before it is executed. Press the RESET/EXIT key to return to the EXIT Level.

4.4.1.3 CLEAR 484 MEMORY (Program Mode Only)

When this software label key is pressed it sets up the P190 to issue an "initialize memory" command to the 484. Like START 484 and STOP 484, the message is not issued until a confirmation is done by pressing CONFIRM. This option can also be canceled before it is executed. Press the RESET/EXIT key to return to the EXIT Level.

4.4.1.4 CONFIRM (Program Mode Only)

This software label key, as explained previously, initiates a previously selected control operation — START, STOP, or CLEAR MEMORY.

4.4.1.5 CANCEL (Program Mode Only)

This software label key, when pressed, causes the P190 to cancel the previously specified action — START, STOP, or CLEAR MEMORY.

NOTE

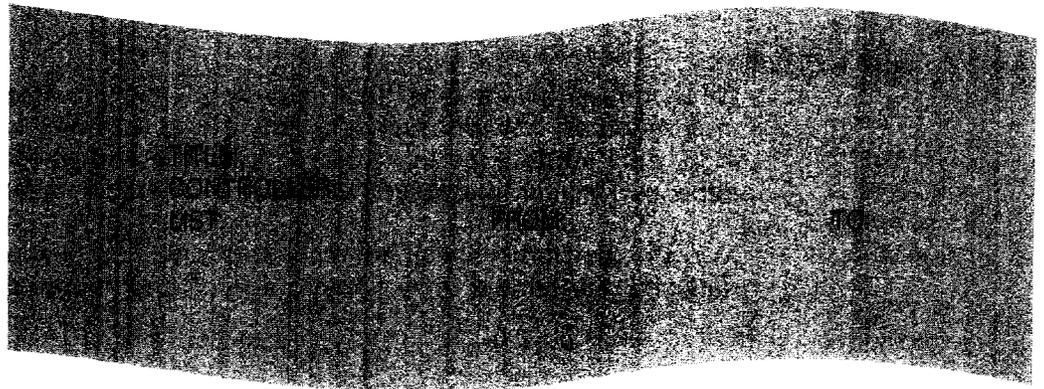
The CANCEL software label key must be pressed before CONFIRM to cancel an operation. Pressing CANCEL has no effect once an option has been confirmed.

4.4.2 LISTING OPERATIONS (Monitor and Program)

When this software label key is pressed the following software labels are displayed:



In addition to this, the screen shows the following fields, beginning at the left-hand edge of the screen:



The spaces are filled with the previously entered values or default values: LIST ALL, FROM 0001, and TO 4254.

LIST ALL is the default value. If neither LIST NETWORK nor LIST REFERENCE is chosen, all the networks and references are printed under the LIST ALL option. The SET PARAMETERS software label does not appear until either LIST REFERENCE or LIST NETWORK is pressed. The SET PARAMETERS software label key must be pressed to set the FROM/TO field.

4.4.2.1 COMMENCE

When this software label key is pressed, the listing is printed. Therefore, the other options should be set before pressing COMMENCE. If COMMENCE is pressed before setting the options, the default options are selected by the program: LIST ALL, XREF, and FORMAT.

The first thing that happens when the COMMENCE software label key is pressed is the validation of the FROM and TO values that you have entered for LIST NETWORK or LIST REFERENCE. If the values are invalid for the listing desired, an error message is displayed. If the FROM and TO values are valid, the ladder lister begins the printing operation.

Once the printing is started there is a way to stop the listing. After COMMENCE is pressed the software label STOP is displayed. To pause the print operation press STOP.

NOTE

Before pausing, the listing continues to print out to the end of the section or network currently being printed.

When the STOP is acknowledged and the printing stops, the software labels CONTINUE and ABORT LISTING are displayed. When the CONTINUE software label key is pressed the printing operation continues from where it was paused.

The ABORT LISTING software label key is pressed to abort a listing in progress. When this software label key is pressed a message appears on the CRT screen and the printer: "ERROR: LISTING ABORTED". Press the CLEAR ERROR key to clear the message and continue at the listing operations level.

4.4.2.2 LIST NETWORK

When this software label key is pressed, the numbers in FROM and TO are interpreted as network numbers. Therefore, if reference numbers (e.g., 3021 or 4115, etc.) are located in FROM and TO, the error message "INVALID RANGE" appears. To clear this, reset the numbers to network numbers within a valid range.

ALL the networks specified are listed and, if chosen, cross referenced. The networks are printed three lines to a node and appear as follows:

```

NETWORK: 0021

+---] [-+---]÷[-----] [-----]÷[---.....-----] ---( )-
I 1001 ! 1002 1003 1004                                0101
I      !
+---] [-+
I 0101
I
    
```

NOTES

If there is sufficient space, more than one network is printed on a page but a network is never split between two pages.

The symbol for a normally closed contact can vary from printer to printer. The one used here is not necessarily a standard.

4.4.2.3 LIST REFERENCE

When this software label key is pressed the numbers entered in FROM and TO, using the SET PARAMETERS function, are interpreted as reference numbers. The numbers must be within the range 0XXX-4XXX. If they are incorrect reference numbers, the error message "INVALID RANGE" is displayed. Enter valid reference numbers to clear the error.

All the references that are within the range of the FROM and TO numbers are printed when COMMENCE is pressed. The listing of 0XXX references includes the network number and disable information. The listing of 1XXX references includes disable information. The listing of 3XXX and 4XXX references gives the register number and its contents.

For 0XXX and 1XXX references, the disable information is indicated by: DN (Disable ON) or DF (Disable OFF). If the coil is not disabled, two dashes (--) are printed. The following is an example of the table:

LISTING OF COIL DISABLE/ENABLE STATUS

COIL#	COIL STATUS									
0001	--	--	--	--	DN	--	--	DF	--	--
0011	--	DF	--	DN	--	DF	--	--	--	--

The registers are printed with their contents shown in four different formats — decimal, binary, hexadecimal, and ASCII — using one line per register as shown in the following example.

LISTING OF INPUT REGISTER CONTENTS

REG #	DEC	BINARY	HEX	ASCII
3001	000	0000 0000 0000 0000	0000	??
3002	000	0000 0000 0000 0000	0000	??

NOTE

The BASIC 484 does not support input registers. The Enhanced I and II controller ladder listings will show input registers with the characters "??" printed in place of non-printable characters.

4.4.2.4 LIST ALL

In the LIST ALL option, the reference range and the network range are based on the configuration of the 484 Controller. The reference range values are entered into FROM and TO for you, by the program. If the LIST ALL option is chosen, all the networks and references present in the controller are listed. If no list function (LIST REFERENCE, LIST NETWORK, or LIST ALL) is specified, LIST ALL is chosen as a default by the program. See Table 4-1 for a list of everything printed under the LIST ALL function, cross references being optional.

4.4.2.5 XREF/NO XREFS

This is a toggle-type software label key which indicates whether or not a cross reference of the networks and/or references is done. The ladder lister defaults to the XREFS option for a listing.

The cross references of 0XXX and 1XXX discrettes are listed on the page after the disable information, while the cross references of 3XXX and 4XXX registers follow the listing of the register values. The cross reference of the coils in a network is listed directly below the printed network.

In a cross reference, the REF TYPEs are:

] [Normally Open	]P[Positive Transitional
]÷[Normally Closed	]N[Negative Transitional

4.4.2.5.1 Network Cross Reference

The network cross reference of coils is by contact type and network number. The following is an example of a cross reference of a network:

COIL#	REF TYPE	X-REF BY NETWORKS
0101	] [	0021
	]P[	0017

4.4.2.5.2 Coil-to-Network Cross Reference

The coil-to-network cross reference table is printed following the listing of networks. It contains the coils and the network in which each coil is turned on. The following is an example of a cross reference table:

X-REF OF COILS TO NETWORK#

OUTPUTS

0001	0003	0003	0004	0000	0022	0000	0000	0022	0005	0005
0011	0000	0022	0000	0022	0000	0022	0000	0000	0000	0000

In the preceding example, column one contains the coil number. The next ten columns contain the network numbers where the coils are turned on; the number of the coil is implied. For example: in line one, 0004 stands for network 4 in which coil 0003 is turned on; coils 0009 and 0010 are each turned on in network 5.

4.4.2.5.3 Coil Cross Reference

The coil cross reference table contains the coil number followed by its contact type and the numbers of the networks it appears in. This cross reference is unlike the coil-to-network cross reference in that the contact types are listed and the networks referenced are all the networks the coil appears in, not just the network it is turned on in. The coil cross reference table looks like the following:

X-REF OF COILS BY CONTACT TYPE AND NETWORK#

COIL#	REF TYPE	X-REF BY NETWORKS
0009	] [	0005
0101	] [	0021
	]P[	0017
0196	]P[	0009
0201	] [	0005, 0009
	]÷[	0005
	]P[	0007-0008

4.4.2.5.4 Discrete Input Cross Reference

In a discrete input cross reference table, the input is printed followed by its reference type and a list of the networks where it is being used. The cross reference table looks like the following:

X-REF OF DISCRETE INPUTS BY CONTACT TYPE & NETWORK#

INP#	REF TYPE	X-REF BY NETWORKS
1001] [0001, 0003, 0006, 0021
]÷[0003-0006
1002]÷[0021
1003] [0021
1004] [0001
]÷[0021
1005]÷[0001

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4.4.2.5.5 Sequencer-to-Network Cross Reference

All 2XXX sequencers used are listed in the left, SEQ #, column followed by contact types and all the networks that the sequencer appears in. A sequencer cross reference listing looks like the following:

```
                X-REF OF SEQUENCERS BY CONTACT TYPE AND NETWORK#  
  
                REF  
SEQ#  TYPE  X-REF BY NETWORKS  
  
2101  ] [   0004  
2503  ] [   0006  
2611  ] [   0006-0008
```

4.4.2.5.6 Input Register Cross Reference

In a 3XXX input register cross reference table, the register number is printed followed by the type of register, INP, and a list of the networks where the register is being used. With a BASIC 484 Instruction Set this option is not available.

The input register cross reference table looks like the following:

```
                X-REF OF INPUT REGISTERS BY NETWORK#  
  
REG #  TYPE  X-REF BY NETWORK #  
  
3001  INP   0004,0007-0008  
3002  INP   0005,0007-0008
```

4.4.2.5.7 Output/Holding Register Cross Reference

The cross reference list of 4XXX registers is separated under the type heading IN or OUT. The IN and OUT lists for each register are completed before going to the next register. With a BASIC 484 Instruction Set this option is not available.

The output/holding register cross reference listing looks like the following:

```

X-REF OF OUTPUT/HOLDING REGISTERS BY TYPE & NETWORK#

REG # TYPE X-REF BY NETWORK #
4001 OUT 0004-0005,0019
4002 OUT 0007
4003 OUT 0008
4101 IN 0017
4102 IN 0017
4102 OUT 0018
4103 IN 0017
4104 IN 0017
4105 IN 0017
4105 OUT 0017

```

In the preceding example, IN indicates that a register is not changed in the reference usage. OUT indicates that the register can be changed by an action of the logic in the reference usage. OUT can also indicate that the register usage can be determined by an actual hardware configuration.

4.4.2.6 FORMAT/NO FORMAT

The options FORMAT or NO FORMAT are chosen by toggling this software label key; the selected option is displayed on the screen.

The ladder lister defaults to the FORMAT option in which the ladder lister starts a new page:

- at the beginning of a listing
- when there is no room on the current page
- when the listing of a series is done

When FORMAT is chosen the page header information appears on every page of the listing.

When the NO FORMAT option is specified, only lines three and four of the page header information are listed on the first page along with the configuration display. The page heading is not contained on any of the pages of the listing. The NO FORMAT option allows you to list one or a few networks at a time, a partial listing, and thereby eliminates the wasteful use of paper.

4.4.2.7 SET PARAMETERS

When this software label key is pressed the following software labels appear:



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4.4.2.7.1 LADDER LISTER

This software label key is used to return to the EXIT Level upon completion of setting the parameters.

4.4.2.7.2 ALL

When this software label key is pressed the listing contains all the networks or 0001-4XXX references found in the controller.

4.4.2.7.3 FROM and TO

When you want only a partial listing of networks or references, use the FROM and TO software label keys. Values for FROM and TO are entered into the AR via the numeric keys section of the keyboard. Once the number you want is in the AR, press the appropriate software label key, TO or FROM, to enter the value.

The FROM number and the TO number must be between 0001 and the highest 4XXX series register for the LIST REFERENCE option. For the LIST NETWORK option this number must be between 1 and the highest permissible network number.

If the TO number is greater than the highest reference number or network number, an error message "INVALID RANGE" is displayed. Correct the number to clear the error.

4.5 THE LISTING

When the LIST NETWORK, LIST REFERENCE, or LIST ALL command is finally entered and the COMMENCE software label key is pressed, the listing is printed. Besides the actual listing of references and/or networks there is a front page display and each page contains a heading unless the NO FORMAT option has been selected.

4.5.1 Front Page Display

The 484 Controller configuration parameters are located at the beginning of each listing. The configuration appears exactly as displayed on the screen at the RESET Level. (Refer to Section 4.3.7.1.)

4.5.2 Page Header

The page heading consists of four lines. The first two lines appear on every page of a listing if the FORMAT option has been selected. The third and fourth lines are printed only on the first page of a listing, FORMAT or NO FORMAT. The following is an example of the page heading format:

(LINE 1)	GOULD MODICON-P190/484	LADDER LISTER	DATE	PAGE: 0XXX
(LINE 2)	(60 CHARACTER TITLE)			
(LINE 3)	CONTROLLER: (6 CHARACTERS)	EXEC: (ENHANCED I, etc.)		
	FROM: XXXX	TO: XXXX		
(LINE 4)	FORM FEED	CROSS REFERENCE	FORMAT	LIST ALL
	or	or	or	or
	NO FORM FEED	NO CROSS REFERENCE	NO FORMAT	LIST NETWORK
				or
				LIST REFERENCE

4.5.3 Notes:

1. The DATE is set at the RESET Level. The PAGE number is controlled by the software of this program.
2. The TITLE is set at the RESET Level. The text for TITLE can be up to 60 alphanumeric characters.
3. The CONTROLLER name is set at the RESET Level. The EXEC is determined by the type of INSTRUCTION SET being used. The values in FROM and TO are taken from your input at the EXIT Level.
4. The options listed (e.g., FORM FEED, NO FORMAT, LIST ALL, etc.) are the options that you chose at the RESET (FORM FEED/NO FORM FEED) and the EXIT Levels, or the default values.

APPENDIX A ERROR AND INFORMATION MESSAGES

The messages shown on the P190 Programmer screen serve two purposes: to provide you with instructions and information, and to alert you to errors in operation and programming. The messages defined in this section are listed alphabetically. Suggested action is given to help you correct error conditions. Most error or information messages are cleared from the screen by the next valid keystroke. Conditions requiring your attention (such as a communications failure) must be handled by pressing CLEAR ERROR, then RESET.

NOTE

Many error responses may be avoided by making sure that communications parameters are set up correctly between the P190 Programmer and the J470 Adapter or J474 Interface.

All messages listed below with an asterisk (*) next to them are information messages rather than error messages.

<u>MESSAGE</u>	<u>DESCRIPTION</u>	<u>SUGGESTED ACTION</u>
ATTEMPT TO XMIT MESSAGE OF BAD LENGTH	Communications error in message from the P190 Programmer.	CLEAR ERROR, RESET, and retry operation.
BAD ADDRESS BOUNDARY	The message received by the 484 PC contained an illegal address.	Reload program into 484 PC using P190 Programmer. If error persists, reload 484 PC from previous dump tape of program.
BAD LENGTH RECEIVED	Communications error in message received by P190 Programmer from 484 PC (via interface).	CLEAR ERROR, RESET, and retry operation.
CANNOT EXPAND NULL COLUMN	Displayed when EXPAND COLUMN is pressed and the cursor is in a column containing no nodes.	
CANNOT TRACE SHORTS, OPENS, CONSTANTS, OR DUMMY REFERENCES	Nodes with numeric values (constants), with undefined elements (dummy references) or without reference numbers (shorts, opens) are not traced.	Move cursor to desired node and/or reference number and retry operation.
*CHECKING FOR USED COIL(S)	User logic is being checked to assure that the requested coil or group of coils has not already been used. This will be followed by the insertion of the coil, or by the message "COIL USED".	

ERROR AND INFORMATION MESSAGES

<u>MESSAGE</u>	<u>DESCRIPTION</u>	<u>SUGGESTED ACTION</u>
CHECKSUM FAILURE	Communications error in message transmitted to the P190 Programmer from the 484 PC via the J474 Interface.	CLEAR ERROR, RESET and retry operation.
CHECKSUM FAILURE AT 484	Communications error detected at 484 PC.	CLEAR ERROR, retry operation.
COIL ABOVE AND TO LEFT OF CURSOR	The insertion of a node cannot be performed because the necessary additions would obstruct the coil extensions.	Move the coil to the right by adding horizontal shorts.
COIL BELOW AND TO LEFT OF THE END OF THIS COLUMN	The column cannot be expanded any further because it would interfere with a coil extension.	Rearrange logic to accommodate coil extension. Expand the columns to the left first, if possible.
COIL BELOW OR TO LEFT IN NEXT ROW	A vertical short cannot be inserted because there is a coil extension below and to the left.	Rearrange logic to accommodate coil extension.
COIL EXTENSIONS WOULD BE BLOCKED BY NODE OR VERTICAL	A column cannot be compressed or expanded if nodes or verticals would interfere with the coil extension.	Rearrange logic to accommodate coil extension. Compress columns from right to left, if possible.
COIL (LATCH) NOT DISABLED	The coil or latch cannot be forced ON or OFF because it has not been disabled.	Disable the coil. It can then be forced ON or OFF.
COIL (LATCH) WITH THIS REF NOT FOUND ON DATABASE	No coil or latch with the selected reference number has been found in user logic by the trace or disable function.	
COIL MAY NOT HAVE VERTICAL	A vertical cannot be placed with a coil or its extension.	
COIL USED	The requested coil has already been programmed and cannot be used again. In the case of a convert function, this coil is one of twelve needed to perform a convert.	Select new coil number.

ERROR AND INFORMATION MESSAGES

<u>MESSAGE</u>	<u>DESCRIPTION</u>	<u>SUGGESTED ACTION</u>
COIL 257 IS BATTERY OK	Coil 257 cannot be programmed in user logic. This coil always indicates the status of the battery backup system.	Select new coil number.
COLUMN FULL	There is not enough room to expand the selected column.	
COLUMN MUST HAVE SOLITARY OPEN	When using the DELETE COLUMN function, the selected column must consist of only a single vertical open at the top of the column	
COLUMN 10 MUST CON- TAIN ONLY COILS AND OPENS	When using the CREATE COLUMN function, the tenth column must be empty, or contain only coils (extended by dotted lines) and opens. If there is a node in column ten, such as a contact, timer, or horizontal short, it will not be permitted in the eleventh column.	
COLUMN 11 NOT EMPTY	The CREATE COLUMN function may not be performed because of lack of room.	
COMMAND TIMEOUT OR ABORT (J474)	No response has been received by the J474 Interface from the 484 PC.	CLEAR ERROR, retry operation. If error persists, examine connections between J474 Interface and 484 PC. (Refer to <u>J474/J475 Interface User's Guide</u>).
CONSTANT TOO LARGE	The decimal value in the AR (assembly register) is too large to be used, as when an attempt is made to place a value greater than 999 into a register.	

ERROR AND INFORMATION MESSAGES

<u>MESSAGE</u>	<u>DESCRIPTION</u>	<u>SUGGESTED ACTION</u>
CONTROLLER RUNNING	The attempted action (e.g., trying to clear the memory) cannot be performed because the controller is running.	Stop controller, then perform action.
*CONTROLLER RUNNING, REG. DATA MAY CHANGE WHILE LISTING	This message is a warning in the ON-Line mode that the status of data can change during the listing because the controller is running.	
CRC FAILURE	Indicates a communications error picked up by the error checking (CRC = cyclical redundancy check).	CLEAR ERROR, RESET and reattempt operation.
*DOING CROSS REFERENCE	This message indicates the status of the listing when it is cross referencing. The message flashes on the screen.	
EMPTY COLUMN	This message occurs when CREATE COLUMN is pressed and the cursor is positioned in an empty column.	Move cursor to the first column to the left which contains logic and retry operation.
*EMPTY NETWORK	This message indicates that there is no logic contained in a specific network.	
*END OF CONTROLLER NAME	Occurs in ladder list function to indicate that the user has filled the space available for the CONTROLLER NAME (6 characters).	
*END OF LISTING	This message indicates that the listing is complete and the program is ready to begin another listing.	

ERROR AND INFORMATION MESSAGES

<u>MESSAGE</u>	<u>DESCRIPTION</u>	<u>SUGGESTED ACTION</u>
END OF LOGIC	There are no more networks started or programmed into logic memory.	If another network is desired, press START NETWORK.
END OF TAPE ENCOUNTERED	This message is a warning that the end of tape has been reached before it should have appeared.	Remove tape, reload P190 program, and retry operation. If error reoccurs, select new tape.
END OF TAPE FAULT	The tape has run out past the allowable point. This message may follow "END OF TAPE ENCOUNTERED".	Remove tape, and retry operation with a new tape.
*END OF TITLE	Occurs in ladder list function to indicate that the user has filled the space available for TITLE (60 characters).	
*ERROR:	This appears on the error line of the screen preceding each error message.	
FATAL ERROR - MUST INITIATE RESET	Communications error message has been cleared from screen. RESET must be pressed to be able to reinitiate communications.	RESET, and reattempt operation.
FUNCTION NOT ALLOWED	The requested function cannot be performed at this time. This may be due to cursor position, type of screen displayed, etc.	Review the necessary conditions for performing a function and make sure they are all satisfied.
*HIGHEST NETWORK FOUND: XXXX	This message appears when an attempt is made to get a network, and the network number in the AR is greater than the highest network number in the controller. The message gives the number of the last network.	

ERROR AND INFORMATION MESSAGES

<u>MESSAGE</u>	<u>DESCRIPTION</u>	<u>SUGGESTED ACTION</u>
ILLEGAL ADDRESS (J474)	The message received by the J474 Interface contained an illegal address.	CLEAR ERROR, retry operation. Reload program into P190 from 484. If error persists, reload 484 PC from previous dump tape of program.
ILLEGAL FUNCTION (J474)	Communications error. The MODBUS system function code was not recognized.	CLEAR ERROR, retry operation. See Modicon Modbus System User's Manual for system diagnostics.
ILLEGAL REPLACE	This message is displayed if the user attempts to replace one type of node with a dissimilar type of node, such as trying to replace a contact with a timer.	Select appropriate node or reference and retry operation. Delete previous node and replace with desired node.
*INSERT 484 DUMP TAPE AND PRESS COMMENCE	After pressing the READ TAPE software label key, this instruction message appears.	Insert 484 Dump Tape. Software labels COMMENCE and CANCEL appear. Press COMMENCE to start dumping the tape into the P190's memory.
INSUFFICIENT ROOM	There is not enough room remaining in the column for a multinode element. For example, a calculate cannot be placed in the next to last or last row.	Rearrange logic to accommodate a multinode element.
INTERACTION BY OTHER PROGRAMMER	Occurs when using GET PREV or GET NEXT. The network length has been altered; nodes have been added or deleted by another programmer.	CLEAR ERROR, RESET, and retrieve network to update display.
INVALID ADDRESS	Communications error. Message not received correctly due to invalid field.	CLEAR ERROR, RESET, and reattempt operation.
INVALID COMMAND		
INVALID DATA (J474)	Communications error detected by J474 Interface.	CLEAR ERROR, RESET, and retry operation.
INVALID MESSAGE LENGTH AT 484	Communications error detected by 484 PC.	CLEAR ERROR, RESET, and retry operation.

ERROR AND INFORMATION MESSAGES

<u>MESSAGE</u>	<u>DESCRIPTION</u>	<u>SUGGESTED ACTION</u>
INVALID NETWORK #	The network number in the AR is not a legal network number.	Select a valid network number and retry operation.
INVALID NODE	Communications error. Message not received correctly due to invalid field.	CLEAR ERROR and reattempt operation. If the error persists, reload the P190 program.
INVALID RANGE	This message indicates that the parameters (FROM/TO) for the beginning and the end of the list are invalid.	Enter valid parameters.
INVALID REFERENCE NUMBER	The reference number (e.g., 1XXX) is not valid for the type of node or operation used (e.g., trying to place a 1XXX reference in the bottom of a timer).	Enter valid reference number and retry operation.
INVALID TAPE RECORD TYPE	The data on the tape is not the right kind to be used in the selected operation. For example, trying to read a P190 program tape instead of a 484 dump tape using the OFF-Line READ TAPE function.	Check the tape to assure that it is the right type. Retry operation. If the tape is the right kind, and the error persists, retry the operation with a new tape.
INVALID UNIT NUMBER	The J474 Interface unit number is not in the valid range, 1 through 247.	Enter a valid unit number and retry ATTACH.
*LISTING ABORTED	This message occurs during ladder listing to inform you that the ladder listing has been aborted, as directed by you.	
LOADER ENCOUNTERED BAD ADDRESS BOUNDARY	This message can occur in OFF-Line programming during the READ TAPE function. The tape may be damaged.	CLEAR ERROR, try to reload tape. Inspect tape for damage. If error persists, use a back-up tape.

ERROR AND INFORMATION MESSAGES

<u>MESSAGE</u>	<u>DESCRIPTION</u>	<u>SUGGESTED ACTION</u>
*LOADING	After inserting a 484 dump tape into the P190, this message appears indicating that the tape is being loaded or dumped into the P190's memory.	
MEMORY FULL	No more user logic can be entered. All words of memory have been used. The label "AVAIL:" on the state line should show all zeros.	Review program for best use of memory.
MEMORY PROTECT ON	The desired action cannot be performed because the 484 PC keylock is locked.	Unlock the Memory protect keylock to perform desired action.
MUST BE A COIL OR A LATCH	The selected action cannot be performed because the cursor is on a node that is not a coil or latch. For example, a 4XXX reference cannot be enabled, disabled, or forced.	Position cursor on desired coil or latch and retry.
MUST BE OPEN WITHOUT VERTICAL IN THE INTERIOR OF A COLUMN	In order to compress a column, the cursor must be positioned on a horizontal open with no vertical above the logic to be moved.	Reposition cursor, if possible, to compress column as needed.
MUST BE 4XXX REGISTER	Values can only be entered into holding registers.	
*NODATE	This message appears as the DATE value if no value has been entered for DATE. It is expressed as NO/DA/TE.	
NODE IN ROW TO RIGHT OF CURSOR	A coil cannot be entered at this point because it would be blocked by a node to the right of the cursor.	Rearrange logic to allow for clear path to column 11.

ERROR AND INFORMATION MESSAGES

<u>MESSAGE</u>	<u>DESCRIPTION</u>	<u>SUGGESTED ACTION</u>
NO ELEMENT AT CURSOR	To perform the requested operation, the cursor must be placed on an element.	Place cursor on appropriate element and perform operation.
NO END OF LOGIC DETECTED - CLEAR 484 MEMORY	The EXIT Level cannot be entered because no end of logic node has been found in the 484 PC memory. The PC memory may have been put out of logical order due to loss of power without battery backup.	Press CLEAR 484 MEMORY then press CONFIRM. Reload 484 PC memory from dump tape, if necessary.
NO FUNCTION ASSIGNED TO KEY	The selected key has no function at this stage of operation (e.g., pressing a key with no software label).	Select appropriate key.
NO NETWORK IN CONTROLLER	The controller has no networks programmed into user logic.	
NO NETWORK IN P190	The P190 Programmer is not holding or displaying a network.	Get an existing network, or press START NEXT to create a new network.
NON-PRINTABLE CHARACTER	This message indicates that the key pressed is for a character which cannot be printed on a ladder list, such as Carriage Return or Line Feed.	
NO (OTHER) DISABLED INPUT	This message appears when the search and continue search functions have located all disabled inputs.	
NO REFERENCE AT CURSOR	On the alternate screen or reference area, no operations can be performed unless the cursor is placed on a reference number.	Place cursor on selected reference number and retry operation.

ERROR AND INFORMATION MESSAGES

<u>MESSAGE</u>	<u>DESCRIPTION</u>	<u>SUGGESTED ACTION</u>
NO ROOM IN REFERENCE	The trace, other than that of a contact referenced to a coil, cannot be performed because there is no room in the reference field to display the value or status.	Erase entries in reference field, or move needed data to alternate screen.
NO SEARCH PARAMETERS	A search cannot be performed unless parameters, node type and/or reference number, are entered into the set search area.	Set search parameters.
NOT ALLOWED IN COLUMN 11	The CREATE COLUMN function cannot be used when the cursor is in column 11.	
NOT ATTACHED TO CONTROLLER	The selected operation cannot be performed because the P190 Programmer is not attached to the controller.	Attach to the controller, and retry the operation.
NOT IN PROGRAM MODE	The selected function or key (e.g., DELETE, or ENTER) is only operative when the P190 keylock is unlocked.	Unlock the P190 keylock and perform operation.
NOT TOP ROW OF ELEMENT	To perform the expand column function when the cursor is on a multinode element, the cursor must be in the top row of the element.	Place cursor on top row of element and retry operation.
NO VERTICAL IN ROW SEVEN	A vertical cannot be placed in row seven.	Rearrange logic to allow for insertion of vertical.
ONLY DECIMAL CHARACTERS ALLOWED IN AR	Only decimal numbers (0-9) are allowed in the AR (assembly register). Letters (A-Z) and special characters (?,;, etc.) are not valid.	Re-enter valid data.

ERROR AND INFORMATION MESSAGES

<u>MESSAGE</u>	<u>DESCRIPTION</u>	<u>SUGGESTED ACTION</u>
OVERRUN ERROR AT 484	Communications error detected at 484 PC. The runlight may be out on the 484 PC.	CLEAR ERROR, start 484 PC if necessary, and retry operation. If error persists check P190 Programmer and 484 PC baud rates.
PARAMETER SET-UP NOT COMPLETE	This message indicates that not all the necessary parameters have been set.	Set remaining parameters and perform operation.
PARITY FAILURE AT 484	Communications error detected at 484 PC.	CLEAR ERROR, retry operation. If error persists check parity settings on P190 Programmer and on interface.
PORT EMPTY OR UNCONNECTED	Communication is not possible because there is no connection to a	Check to assure that the correct cable is used. Check connections at P190 Programmer and at interface.
PORT 2 NOT CONNECTED	Peripheral port 2 (used for connection to printers, etc.) is not connected; communications are not possible.	Check to assure that correct cable is used. Check connections at P190 Programmer and at peripheral device.
PORT 2) RECEIVE) TIMEOUT)	Message occurs during print operations. Indicates that communications have been interrupted.	Check to make sure correct cable has been used. Check Port 2 parameters. CLEAR ERROR and retry operation.
PORT 2) TRANSMIT) TIMEOUT)		
PORT 2 USART STATUS ERROR	Communications error.	CLEAR ERROR, retry operation.
P190 USART STATUS ERROR	Communications error.	CLEAR ERROR, RESET.
REFERENCE FOUND ON ALTERNATE SCREEN	The traced reference is already held on the alternate screen. This message appears only if the reference area below the logic area is full.	Change screen to display alternate screen containing reference.

ERROR AND INFORMATION MESSAGES

<u>MESSAGE</u>	<u>DESCRIPTION</u>	<u>SUGGESTED ACTION</u>
REFERENCE NUMBER NOT REQUIRED	No reference number is needed to complete this type of node, (e.g., a horizontal short).	
SEARCH FAILED	No node and/or reference number as set in the search parameters was found in user logic.	
TAPE CHECKSUM FAILURE	A bad piece of information has been detected on the tape being loaded.	CLEAR ERROR, reload tape. If error persists use back-up tape.
TAPE DRIVE NOT READY	No tape has been inserted into the tape transport, or the tape is not correctly in place.	Insert tape, or make sure that tape is properly inserted.
TAPE DRIVE TIMEOUT	Tape transport or tape error.	Remove tape and inspect for damage. Reinsert tape and retry operation. If error reoccurs, try new tape.
TAPE NOT READ IN	Error in the OFF-Line mode if the READ TAPE function was unsuccessful.	CLEAR ERROR, retry READ TAPE.
TAPE RECORDS OUT OF SEQUENCE	This message occurs during load operations if the information on the tape is out of sequence, or the tape is not being read correctly.	Retry operation. If error reoccurs, try new tape.
TAPE USART STATUS ERROR	This tape error occurs during load tape operations if the tape has been magnetically damaged.	Retry operation. If error reoccurs, try new tape.
TAPE VERIFICATION ERROR	This message occurs during a dump operation if the information on the tape has been written incorrectly.	Retry operation. If error reoccurs, try new tape.

ERROR AND INFORMATION MESSAGES

<u>MESSAGE</u>	<u>DESCRIPTION</u>	<u>SUGGESTED ACTION</u>
TAPE WRITE PROTECTED	The tape cannot be written over because the record tab is in the write protect position. This is usually done to a tape that is to be saved.	Make sure that the tape is to be written over. Locate the record tab in the upper left-hand corner of the tape. Slide tab all the way to the left. Insert into tape transport and retry operation.
TIMEOUT ERROR - COMMUNICATIONS DOWN	The P190 Programmer has not received a response in the allotted amount of time.	CLEAR ERROR, RESET, and retry operation. Check to make sure that the correct cable is used, and that the port parameters are correct.
TOO MANY CHARACTERS RECEIVED ON PORT 2	Communications error.	CLEAR ERROR, retry operation.
TRACE STACK EMPTY	Each successive network traced is put in a trace stack, up to 16 networks. This stack is emptied by using the retrace function. This message is displayed when a retrace is attempted but no networks are in the stack.	
UNDEFINED) ERROR CODE) FROM 484)) UNDEFINED) ERROR) (J474)	An error code was received from the 484 PC or from the J474 Interface; the P190 Programmer did not recognize the code.	CLEAR ERROR, retry operation.
VERTICAL ABOVE AND TO RIGHT IN PREVIOUS ROW	A coil cannot be inserted here because the vertical above and to the right would interfere with the coil extension.	Rearrange logic to allow for clear path of coil to column eleven.
VERTICAL IN ROW 6	EXPAND COLUMN cannot be performed because that would place a vertical in row seven. No verticals are allowed in the last row of logic.	

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PROGRAMMABLE CONTROL DIVISION

PUBLICATIONS COMMENT FORM

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Are there any terms or concepts that are not defined clearly? Y N
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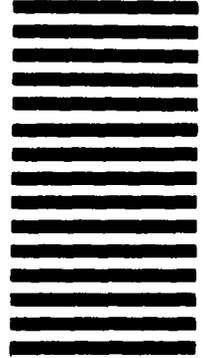
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