

## SECTION 8 TAPE LOADER (TAPE LDR)

This section describes the Tape Loader functions. Using the Tape Loader you can load the controller's memory from a data tape, record the PC's memory to a blank tape, or compare the Micro 84 PC's memory with the data tape in the P190.

When the TAPE LDR and PROCEED software label keys are pressed, the following software labels appear on the screen:



These are the main functions of the Tape Loader. Each of these software label keys lead to another set of software labels. Figure 8-1 is a flow diagram of the LOAD PC functions; the RECORD PC functions are contained in Figure 8-2; and Figure 8-3 displays the COMPARE PC software functions.

### NOTE

LOAD PC, RECORD PC and COMPARE PC will prompt you to REMOVE the Micro 84/P190 Programming and Tape Loader tape from the P190's tape drive and to insert either a PC data tape or a write-enabled "scratch" tape. BEFORE leaving the tape loader functions to return to the operations level, REINSERT the Micro 84/P190 Programmer and Tape Loader tape.

TAPE LOADER (TAPE LDR)

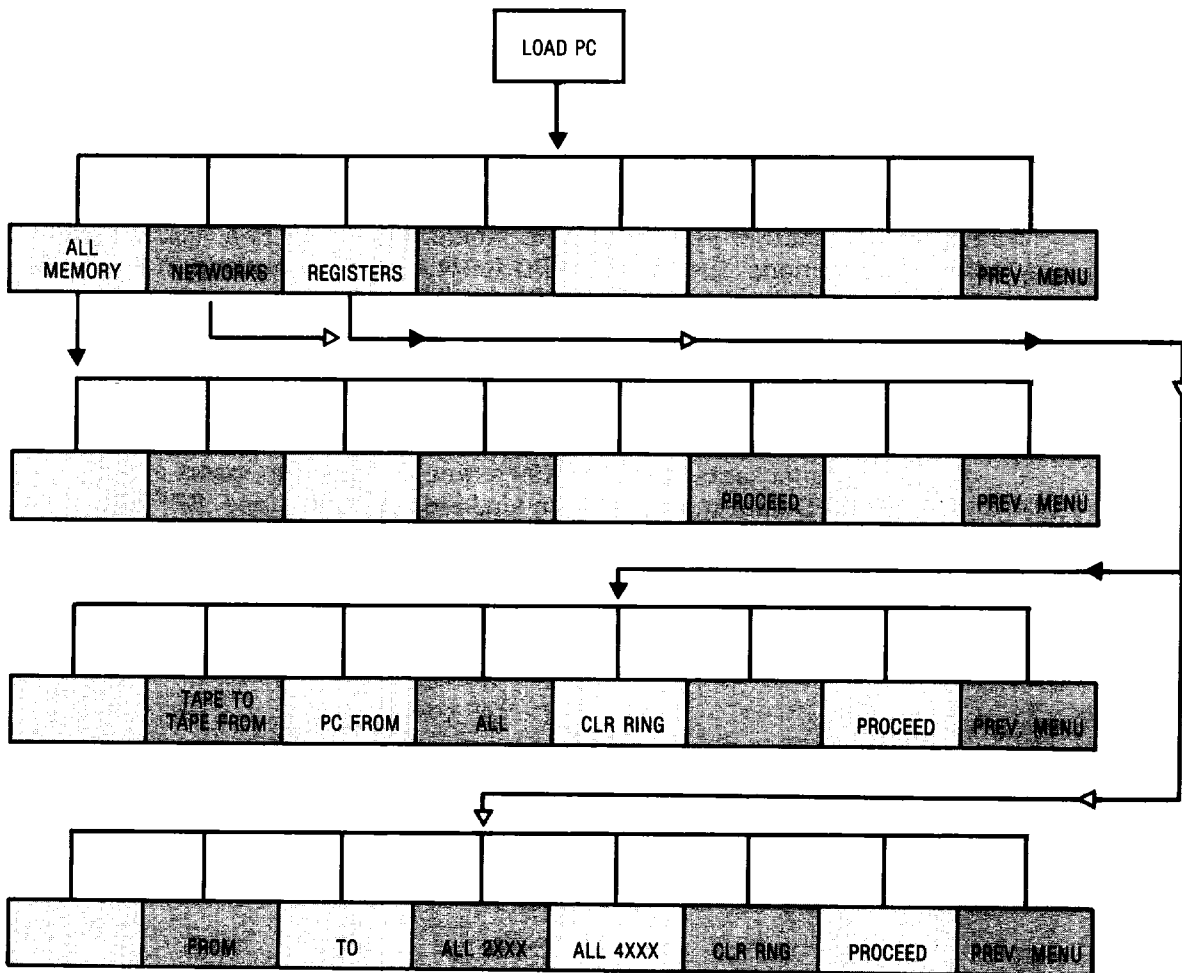


Figure 8-1. LOAD PC Functions

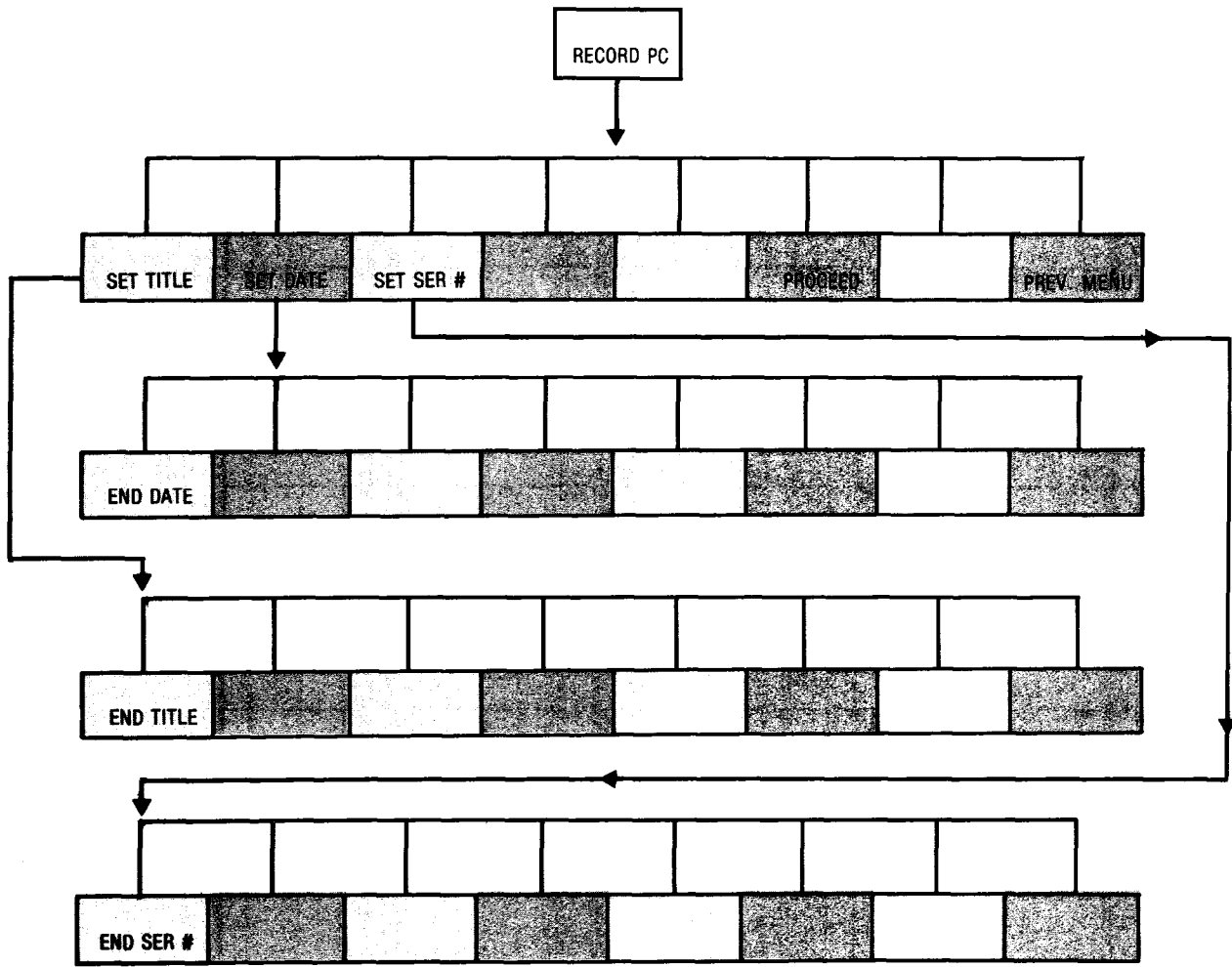


Figure 8-2. RECORD PC Functions

TAPE LOADER (TAPE LDR)

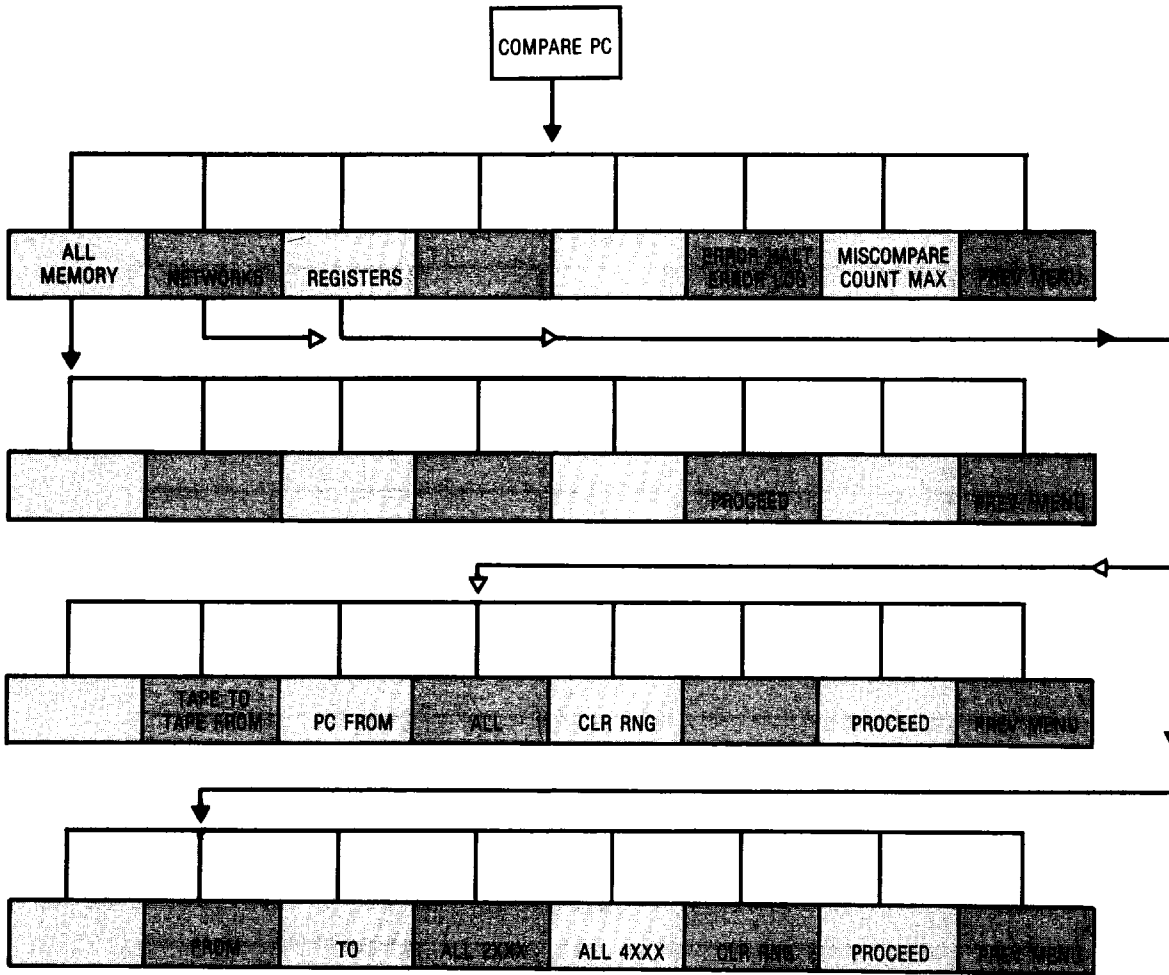


Figure 8-3. COMPARE PC Functions

**NOTE**

Before the load functions can be used, the PC must be stopped.

8.1 LOAD PC

The LOAD PC function is used to write data from a P190 data tape to the Micro 84 PC's memory. Part or all of the data can be loaded into the PC. The Micro 84 PC Memory Protect key must be in the OFF position for all the load functions. To begin the load operation press the LOAD PC software label key. The following software labels appear on the screen:



Decide if all the data or just a portion of it is to be loaded, and press the appropriate software label key.

8.1.1 Load All Memory (ALL MEMORY)

Press this software label key, followed by PROCEED, to load all the tape's data to the PC. This data includes the following:

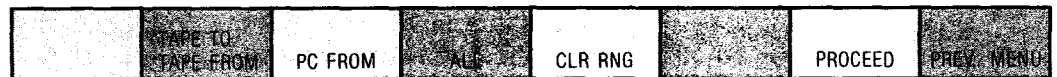
- Networks
- Disabled Discretes
- Registers
- Latching Coils

**NOTE**

Input discretes are always loaded in the OFF state, regardless of whether they are recorded as enabled or disabled.

8.1.2 Load Networks (NETWORKS)

To load all the networks on the P190 data tape, or just a portion of them, to the Micro 84 PC, press the NETWORKS software label key. The following software labels appear on the screen.



Networks loaded from a P190 data tape into a Micro 84 PC, replace (overwrite) the specified networks already in the PC. A caution message appears on the screen and you must press PROCEED or CANCEL before continuing.

To begin loading networks, select a network range using the available software label keys (TAPE FROM, TAPE TO). Then select the first PC network to be replaced (PC FROM). Press the PROCEED software label key.

## TAPE LOADER (TAPE LDR)

Before the load takes place, the controller checks the coil and latch used table. If the data tape contains coils which are already used in the Micro 84 PC, the conflicting data tape references are listed on the screen. These conflicts must be resolved before the load can be performed.

### 8.1.2.1 TAPE TO/TAPE FROM

This software label key is used to set the range of networks to be loaded from the data tape. To set the range:

1. Enter the desired starting network number into the AR.
2. Press the TAPE TO/TAPE FROM software label key.
3. Enter the desired ending network number into the AR.
4. Press the SHIFT key and TAPE TO/TAPE FROM.

If the networks specified are not on the data tape, the error message "LAST NETWORK ON TAPE IS XX" is displayed. Enter a valid network range and press PROCEED.

### 8.1.2.2 PC FROM

This function tells the PC where to place the new networks in its memory. The networks from the data tape can replace existing networks, or be added to existing networks. To set the network location in the PC, enter the PC network number (in the AR) after which the data tape networks are to be inserted. Press the PC FROM software label key.

If the number entered into the AR is larger than the highest network number in the PC, the following error message is displayed: "PC FROM # INVALID, MAXIMUM NETWORK IN PC IS XX". A valid network number must be entered.

### 8.1.2.3 ALL

Pressing this software label key sets the following ranges:

TAPE FROM = 01  
\*TAPE TO = 9999  
PC FROM = 01

- \* The value 9999 is a default value used to ensure that all the networks are loaded; it does not indicate that 9999 networks can be loaded into the Micro 84 PC. The P190 states the highest network number actually read from the tape to the PC.

When the PROCEED software label key is pressed, all the networks on the data tape are loaded to the PC's memory, if the PC's highest network number is greater than or equal to the highest PC data tape network number.

### 8.1.2.4 Clear Range (CLR RNG)

Press the CLR RNG software label key to clear the TAPE FROM/TAPE TO data fields.

8.1.2.5 PROCEED

To begin loading networks from the data tape to the PC once a range has been selected, press the PROCEED software label key.

If the P190 data tape and Micro 84 PC network ranges are valid, all the coils and latches used in the selected networks on the data tape are checked against the coils and latching coils used table in the controller. Any conflict is displayed on the screen along with a prompt to replace the conflicting coil(s) or latching coil(s) with unused coil(s) or latching coil(s). All conflicts MUST be resolved before the load can proceed. A Coil/Latching Coil Conflict Resolution screen appears on the P190 screen. This allows you to assign new coil reference numbers.

The specified FROM/TO range of networks, starting with PC FROM, will be deleted and overwritten by the new networks being read from the P190 data tape.

8.1.3 Load Registers (REGISTERS)

All the registers on the P190 data tape or just a portion of them can be loaded to the Micro 84 PC PC. When the REGISTERS software label key is pressed, the following software labels appear on the screen:



References appear as 40XX. XX can be any number from 00 to 99. Specific limits within the 000 to 999 range do exist and differ for each reference. These limits are shown in the configuration table.

The 'ALL 2XXX' key loads the 40XX registers which serve as sequencer control registers (2100 to 2800 actually load 4001 to 4008). The 'ALL' key loads all 40XX registers.

To load registers, select a register range using the available software label keys then press the PROCEED software label key.

8.1.3.1 FROM and TO

Use these software label keys to set the range of registers to be written from the data tape to the PC. To set the range:

1. Enter the desired starting register reference into the AR.
2. Press the FROM software label key.
3. Enter the desired ending register reference into the AR.
4. Press the TO software label key.

**NOTE**

The FROM and TO fields must contain the same reference type, for example from 4001 to 4005.

8.1.3.2 ALL 2XXX

Press the ALL 2XXX software label key, followed by the PROCEED, to load all the 2XXX sequencers into the PC.

## TAPE LOADER (TAPE LDR)

### 8.1.3.3 ALL 4XXX

Press the ALL 4XXX software label key, followed by PROCEED, to load all the 4XXX holding/output registers into the PC.

### 8.1.3.4 Clear Range (CLR RNG)

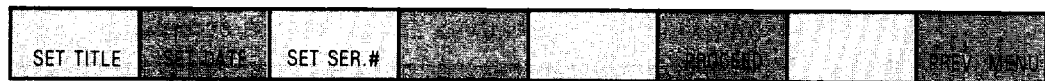
Press the CLR RNG software label key to clear the FROM and TO register data fields.

### 8.1.3.5 PROCEED

When this software label key is pressed, the selected portion of the data tape (ALL 40XX references) is loaded to the PC.

## 8.2 RECORD PC

The RECORD PC function is used to write data from the Micro 84 PC's memory to a blank tape in the P190 Programmer. All the available data is written to the tape. When the RECORD PC software label key is pressed, the following software labels appear on the screen:



The title, date, and serial number are the optional header information which is inserted in the tape. The SHIFT and RUBOUT/BKSP keys are available when setting these parameters. Pressing the SHIFT key and the RUBOUT/BKSP key erases the entire entry; pressing only the RUBOUT/BKSP key erases the last character entered.

### 8.2.1 SET TITLE

To insert a title for the newly created tape:

1. Press the SET TITLE software label key.  
The cursor is positioned beside the word TITLE on the P190 screen.
2. Enter a maximum of 64 characters.
3. Press the END TITLE software label key.

### 8.2.2 SET DATE

To set the date:

1. Press the SET DATE software label key.  
The cursor is positioned beside the word DATE on the P190 screen.
2. Enter up to 20 characters.
3. Press END DATE.

### 8.2.3 Set Serial Number (SET SER.#)

An optional serial number can be entered to help the user identify from which controller the tape is taken. The serial number can be any number from one to six digits in length and is chosen by the user.



To insert a serial number:

1. Press the SET SER.# software label key.
2. Enter the one to six digit serial number.
3. Press the END SER.# software label key.

### 8.2.4 PROCEED

When this software label key is pressed, the PC's memory is recorded onto the write-enabled tape in the P190 Programmer. To write-enable a tape, slide the record tab on the tape to the record position. When the operation is complete the message "RECORD ALL MEMORY COMPLETE" is displayed.

When PROCEED is pressed, the PAUSE software label is available. When PAUSE is pressed, the CONTINUE and ABORT software labels appear.

### 8.3 COMPARE PC

The COMPARE PC function is used to compare the data on the P190 data tape with the data in the PC. Mismatches are identified and displayed on the P190 screen. It is possible to compare all the memory or just part(s) of it. When the COMPARE PC software label key is pressed the following software labels appear on the screen:



#### 8.3.1 Compare All Memory (ALL MEMORY)

Press this software label key then the PROCEED software label key to compare the following data between the data tape and the PC:

- All Memory
- Networks
- Registers

#### 8.3.2 Compare Networks (NETWORKS)

All the networks on the P190 data tape and in the Micro 84 PC's memory or just a portion of them can be compared. When the NETWORKS software label key is pressed the following software labels appear on the screen:



To begin comparing networks, select a network range using the available software label keys then press the PROCEED software label key.

##### 8.3.2.1 TAPE TO/TAPE FROM

This software label key and the SHIFT key are used to set the range of networks to be compared. To set the range:

1. Enter the desired starting network number into the AR.
2. Press the TAPE TO/TAPE FROM software label key.

## TAPE LOADER (TAPE LDR)

3. Enter the desired ending network number into the AR.
4. Press the SHIFT key and TAPE TO/TAPE FROM.

If the networks specified do not exist, the error message "LAST NETWORK ON TAPE IS XX" is displayed. Enter a valid network range and press PROCEED.

If the network range is valid, the networks are compared column by column, one network at a time. If the ERROR HALT function is being used (see Section 7.3.5), the compare stops after a column of a network has been compared and one or more mismatches have been found. The total number of mismatches indicates the number of nodes that mismatched.

### 8.3.2.2 PC FROM

This function instructs the controller where to start the compare. To set the starting network, enter the network number into the AR and press the PC FROM software label key.

### 8.3.2.3 ALL

Pressing this software label key sets the following ranges:

TAPE FROM = 01  
\*TAPE TO = 9999  
PC FROM = 01

- \* The value 9999 is a default value used to ensure that all networks are loaded; it does not indicate that 9999 networks can be loaded into the Micro 84 PC.

When the PROCEED software label key is pressed, all the networks on the data tape and in the PC's memory are compared.

### 8.3.2.4 Clear Range (CLR RNG)

Press the CLR RNG software label key to clear the TAPE FROM/TAPE TO data fields.

### 8.3.2.5 PROCEED

To begin the compare function once a range has been selected, press the PROCEED software label key.

### 8.3.3 Compare Registers (REGISTERS)

All the registers on the P190 data tape and in the PC, or just a portion of them, can be compared. When the REGISTERS software label key is pressed the following software labels appear on the screen:



To begin comparing registers, select a register range using the available software label keys then press PROCEED.

## 8.3.3.1 FROM and TO

Use these software label keys to set the range of registers to be compared. To set the range:

1. Enter the desired starting register reference into the AR.
2. Press the FROM software label key.
3. Enter the desired ending register reference into the AR.
4. Press the TO software label key.

**NOTE**

The FROM and TO fields must contain the same reference type.

## 8.3.3.2 ALL 2XXX

Press the ALL 2XXX software label key, followed by PROCEED, to compare all the 2XXX sequencers on the P190 data tape to those in the PC.

## 8.3.3.3 ALL 4XXX

Press the ALL 4XXX software label key, followed by PROCEED, to compare all the 4XXX holding/output registers on the P190 data tape to those in the PC.

## 8.3.3.4 Clear Range (CLR RNG)

Press the CLR RNG software label key to clear the FROM and TO register data fields.

## 8.3.3.5 PROCEED

When this software label key is pressed, the selected registers (e.g., ALL 4XXX references) are compared between the data tape and the PC.

## 8.3.4 ERROR HALT/ERROR LOG

The ERROR HALT/ERROR LOG function is used to select whether or not the compare will halt when mismatches are found and displayed on the P190 screen. The ERROR HALT mode is assumed when COMPARE PC is pressed.

Press the ERROR HALT/ERROR LOG software label key to select the ERROR LOG mode. This allows the compare function to display mismatches as they are found, and continues the compare without pausing. The total number of mismatches is displayed at the end of the COMPARE process.

To return to the ERROR HALT mode, press the SHIFT key and ERROR HALT/ERROR LOG. This causes the compare to halt. If comparing networks, the compare halts after each mismatched column of network data. The compare halts after each mismatched register reference if comparing registers. To continue the compare function press CONTINUE.

## 8.3.5 Maximum Mismatch Count (MAX MC CNT)

This software label key is used to set a maximum number of mismatches; when this number is reached the operation stops. To set the maximum count, enter a number into the AR and press the MAX MC CNT software label key. The value is displayed on the screen (e.g., MAX MISMATCH COUNT = 0050).

The controller defaults to a maximum mismatch count of 9999.

## TAPE LOADER (TAPE LDR)

### 8.4 PROGRAM PACK

The Micro 84/P371 Program Pack (see Figure 8-4) incorporates a memory that is identical to the user's portion of the controller memory. It is this portion of the controller memory that contains the user-generated logic program. The program pack allows you to dump (store) this logic program for use as a backup to the current system. The program pack also allows a logic program generated on one controller to be transferred (loaded) to another controller with a minimum of effort.

#### NOTES

Only the user-generated logic program is dumped to the program pack. The contents of all holding registers are not transferred.

Be sure that the Program Pack used, matches the controller (i.e., only use the 1K P371-001 with M84A-001 and the 2K P371-002 with M84A-002).

The Micro 84 automatically erases the memory in the program pack before transferring a logic program.

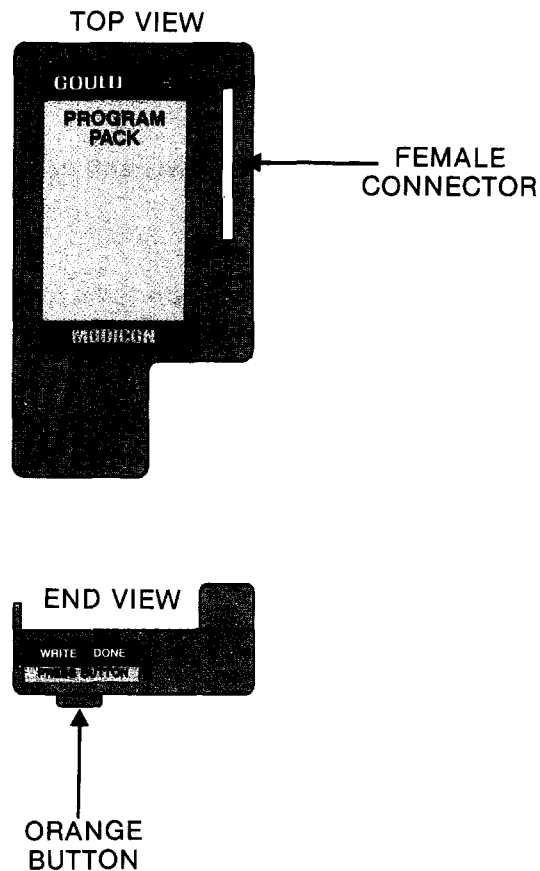


Figure 8-4. Program Pack

#### 8.4.1 P371 Program Pack Insertion

The Program Pack fits onto the board edge in the slot on the bottom of the Micro 84 Controller. Do NOT press the orange button while inserting the Program Pack. Push firmly on the base of the Program Pack to mate securely with the controller. When not actively using the Program Pack, remove it from the controller and store it in a safe place.

#### 8.4.2 Program Pack Dumping (PROG PACK)

Press this software label key to dump the Micro 84's user logic into the P371 Program Pack. As soon as you press PROG PACK the software labels PROCEED and CANCEL are displayed. Press PROCEED to begin the dump-PC-to-pack. This process replaces (overwrites) any prior PC programs already in the program pack.

#### 8.4.3 Program Loading From The P371 Program Pack

The orange button on the bottom of the program pack activates the transfer of program data from the program pack to the controller.

1. Press the button once to cause the following:
  - a. The controller stops and the RUN (red) light on the controller turns off
  - b. The program data transfer begins. When the transfer is completed, the DONE light on the program pack turns on.

If the DONE light does not turn on, it means the load was not successful. Retry loading.

2. Press the button a second time to cause the following:
  - a. The DONE (green) light turns off.
  - b. The controller starts and the RUN light on the controller turns on.
3. If the P190 Programmer was ATTACHED during the loading sequencer, return to the operation selection level and press PROGRAM. This must be done so that the programmer reflects the new controller logic, if any additional programming editing is planned.