SERIES 90, PM9053A OPERATING INSTRUCTIONS (2708/TMS 2716 PERSONALITY MODULE)

2708 and TMS 2716 PROMs require a specialized programming sequence. This sequence causes the PM9053A Personality Module to operate in a manner different than other Personality Modules. The programming characteristics of the 2708 require that when any location is to be programmed, all other locations within the same block must be programmed to prevent data loss.

MULTI-PASS PROGRAMMING

The 2708 PROM consists of an 8 x 16 x 64 matrix and the TMS 2716 consists of an 8 x 16 x 128 matrix. That is, there are 64 or 128 blocks which consists of 16 bytes of programmable memory cells. The programming technique for either specifies a fixed number of passes through all addresses to guarantee programming of worst-case devices. Using the multi-pass technique the Series 90 performs 100 programming passes through all user selected blocks. The required multi-pass programming is accomplished in the PM9053A Personality Module by buffering all data in an on-board RAM memory of 2K x 8 capacity.

LAST ADDRESS may be user selected if a partial PROM is to be programmed; otherwise it is 3FF for the 2708 or 7FF for the TMS 2716. It is important to note that, should the user designate a part of the PROM by redefining FIRST and LAST ADDRESS, the defined field must include all blocks of interest.

MANUAL OPERATION

LIST and VERIFY modes are not affected by the multi-pass programming requirement. In LIST, data is listed directly from the COPY ROM. In VERIFY the COPY ROM is verified against the MASTER ROM or other input device data.

PROGRAM and DUPLICATE operate as described in the operating procedure except that data from the Input device (Keyboard, MASTER socket, Paper Tape, TTY) is collected in a RAM memory until the LAST ADDRESS condition occurs. When the LAST ADDRESS is detected the Series 90 begins the required multi-pass programming sequence, transferring data from the RAM to the 2708/TMS 2716.

As the programming operation proceeds in either the PROGRAM or DUPLICATE mode the Hexadecimal display will indicate the pass count in decimal. At the end of pass 99 a read pass compares the RAM and PROM. If any address does not compare the read pass halts and displays the faulty address and RAM data in the hexadecimal display, and the PROM data in the binary indicators. The read-check operation will continue when the ENTER key is depressed.

When the read-check operation is complete, an "F" will appear in the display indicating the operation is finished.

OPERATION WITH SERIES 90 OPTIONS

All Series 90 options are designed to work unbuffered operation on one location at a time. Since the PM9053A requires buffered operation to do the multi-pass programming it operates with the Series 90 options in a different manner than the unbuffered Personality Module.

Operation With The 9101 Paper Tape Reader Option

The 9101 VERIFY paper tape function operates normally. The 9101 DUPLICATE paper tape function proceeds normally but data is collected in RAM buffer instead of programming until the LAST ADDRESS is reached, when the module begins programming.

Operation With 9102 Teletype Option

The LIST and VERIFY teletype-functions operate normally.

The PROGRAM and DUPLICATE teletype functions proceed normally but data is collected in the RAM buffer until the LAST ADDRESS is reached, when control is transferred to the PM9053A Personality Module. The programming operation proceeds as defined for the manual operation. If programming errors occur the error information appears in the Hex display as in the keyboard operation.

Operation With 9104 Parallel Interface Option

The 9104 LIST mode operates normally with the PM9053A.

The 9104 PROGRAM mode proceeds normally but data is collected in the RAM instead of programming until the LAST ADDRESS is reached, when control is transferred to the Personality Module for programming. The RESPONSE for the last data transfer will be delayed until the multi-pass programming is complete as defined below.

The programming operation proceeds as in the manual operation. When the programming and read-check operations are complete, control returns to the 9104 remote option. Successful programming is indicated by a normal RESONSE signal. Unsuccessful programming is indicated by the RESPONSE-ERROR signal combination. If programming is unsuccessful it is necessary to LIST and compare to determine which locations failed to program.

Operation With 9105 RS232 Option

The 9105 List mode operates normally with the PM9053A.

The 9105 PROGRAM mode proceeds normally but data is collected in the RAM instead of programming until the LAST ADDRESS is reached, when control automatically transfers to the Personality Module. The acknowledgement for the last data transfer will be delayed until the multi-pass programming is complete as defined below.

The programming operation proceeds as in the manual operation. When the programming and read-check operations are complete, control returns to the 9105 remote option. Successful programming is indicated by a normal ACK control character. Unsuccessful programming is indicated by NAK control character. If programming is unsuccessful it is necessary to LIST and compare to determine whch locations failed to program.

SAMPLE PROGRAMMING SEQUENCE FOR 2708

Operation	Display
1. Push RESET	
2. Push PROG. The display shows FIRST and LAST addres	0 0 0 3 F F
3. Define address field to be programmed using keyboard (EX: 010 03F	0 1 0 0 3 F
4. Push ENTER. Display shows START address	0 1 0
5. Key in data desired. (EX: 73)	0 1 0 7 3
6. Push ENTER. The contents of the first block of the COPY PROM is transferred to the RAM buffer. The new data (73) is stored at its address (010) in the RAM. The address is automatically incremented and displayed for next entry.	0 1 1
7. When LAST address in the defined field appears key in desired data	0 3 F 8 4
8. Push ENTER. The 100 pass programming automatically proceeds. The display indicates the pass count in decimal from 00 to 99.	0 0
9. When pass 99 is complete, an automatic read-check is made on all locations comparing the RAM buffer and the COPY PROM data. If the read-check is successful an "F" appears in the display.	F