

# MRV11-D UNIVERSAL PROM MODULE CONFIGURATION GUIDE

The MRV11-D Universal PROM module is a flexible, high density PROM module for the 16-, 18-, or 22-bit Q-bus systems including the 11/02, 11/03, 11/21, 11/23A, and 11/23B. The module contains 16 28-pin sockets which can accept static RAM and a variety of user-supplied PROMs, such as fusible link PROMs, UVPROMs (ultraviolet erasable), and masked PROMs. It accepts several densities of PROMs up to and including 32K by 8. With all 32K devices, memory capacity is 512K bytes.

## CONFIGURATION

The MRV11-D contains 41 jumper posts, two switch banks, and 16 ROM chip sockets. The user can configure the features he needs by connecting the jumper posts with 14 jumper clips which are supplied with the module. The module is shipped from the factory with all jumper clips installed.

The following features can be configured by means of the jumper clips or by the two switch banks on the module.

- Window/direct mode addressing
- Location of page control register
- Bootstrap
- Use of multiple MRV11-D boards
- Normal/high performance timing
- Switch-selectable starting address
- DATO bus cycle inhibit
- Small system/large system
- Static RAMs

Figure 1 locates the chip set sockets (XE36-XE51) and the jumpers. Figure 2 is a flow diagram for configuring the module. Figures 3 through 13 are guides for configuring the system.

The jumper posts are drawn as they appear, component side up with handles facing away from you. The numbers preceded by J represent the jumper posts on the module whereas the push-on connectors which connect the jumpers are designated W3 through W16. W1 and W2 are 0-ohm shunts for battery backup. W1 or W2 should be installed, but not both. Since the module does not contain jumper numbers it is important to have the module properly oriented when referring to the jumper designations.

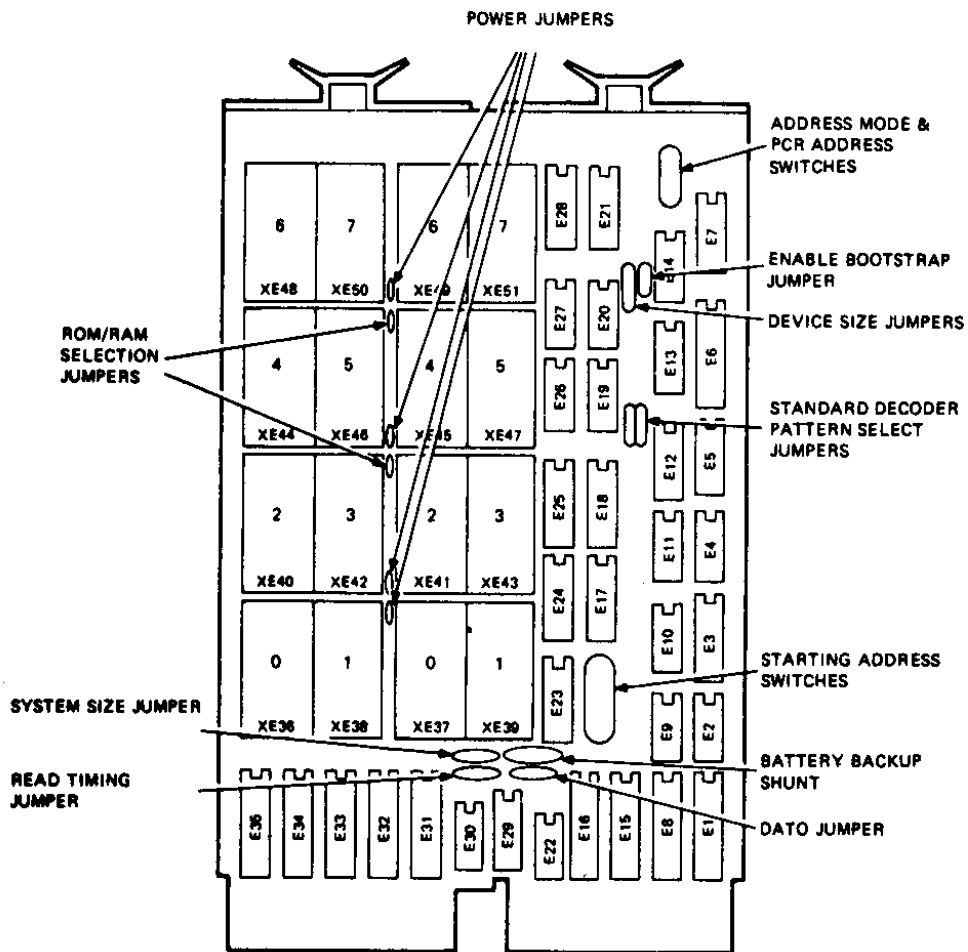
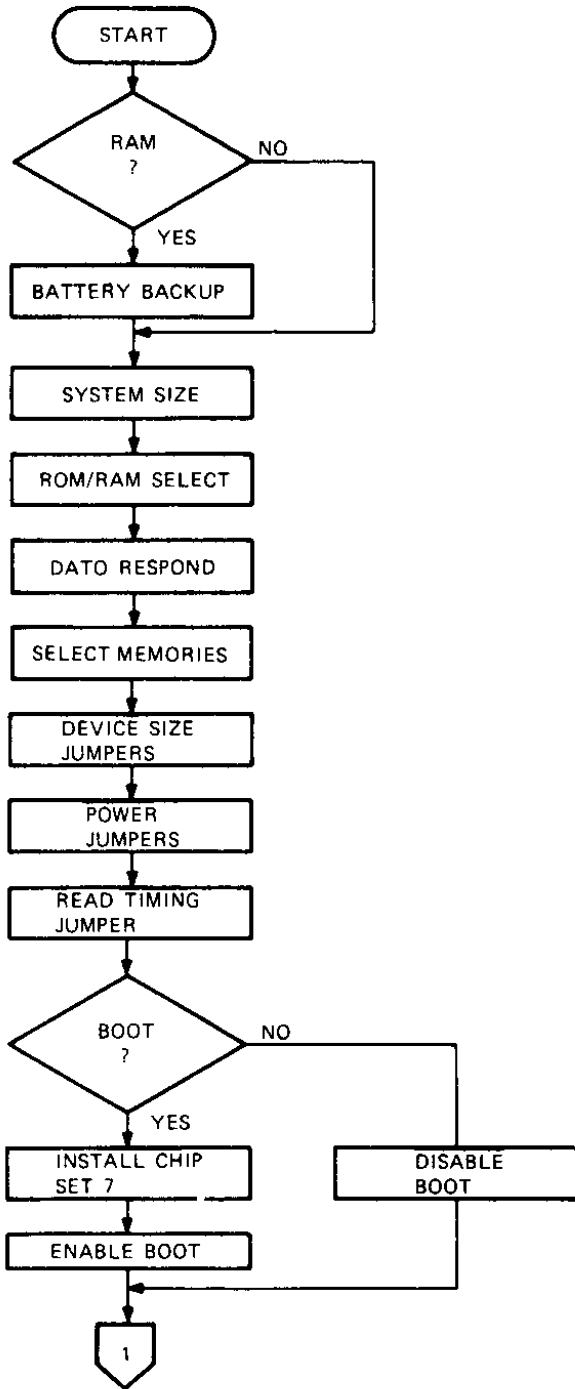
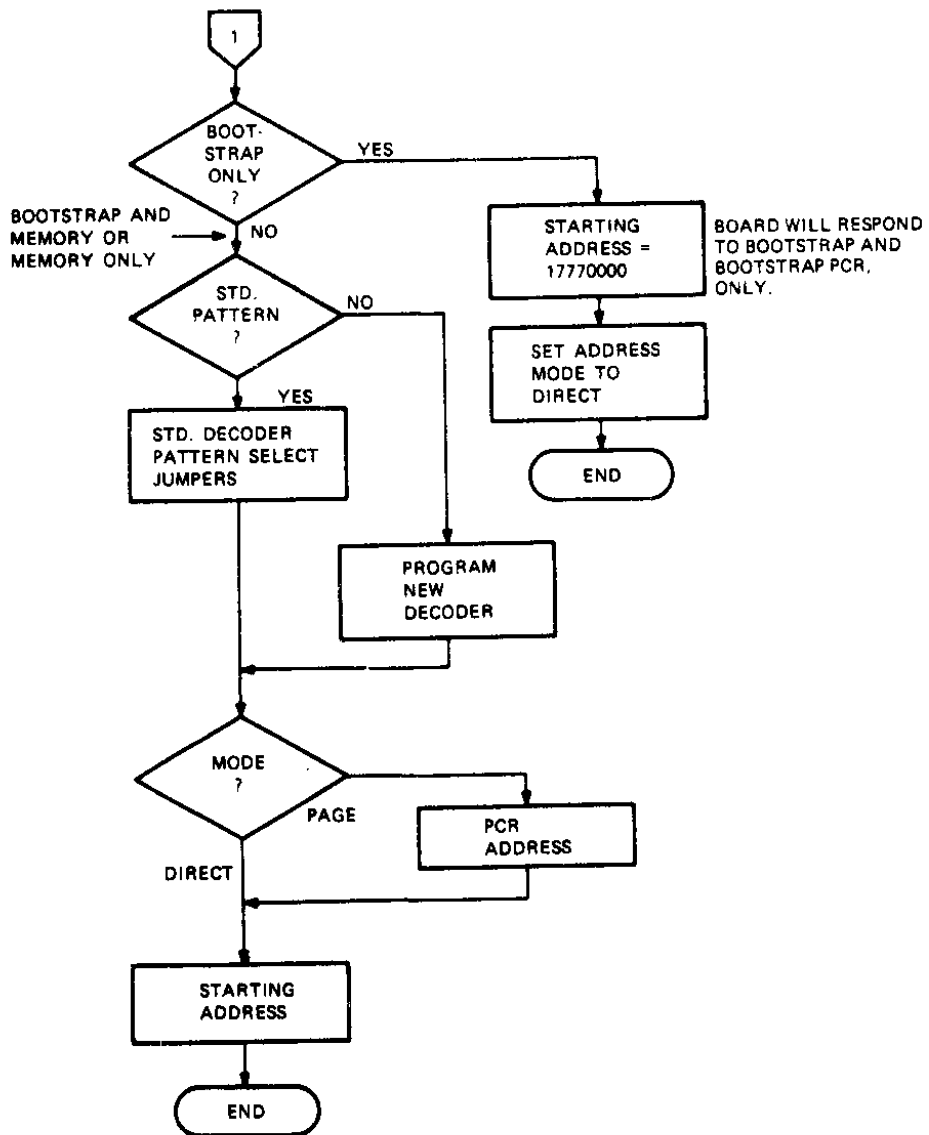


Figure 1 Jumper and Switch Locations



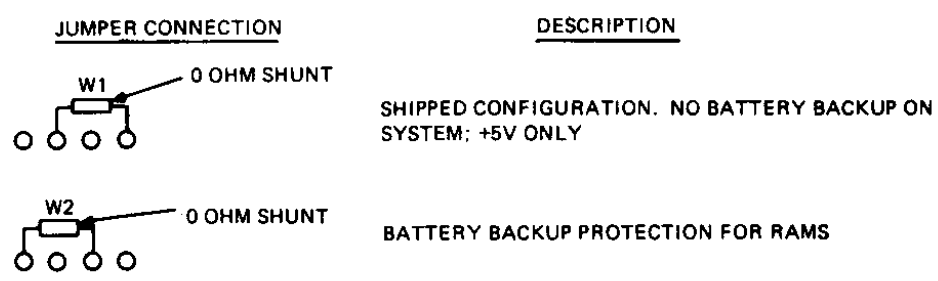
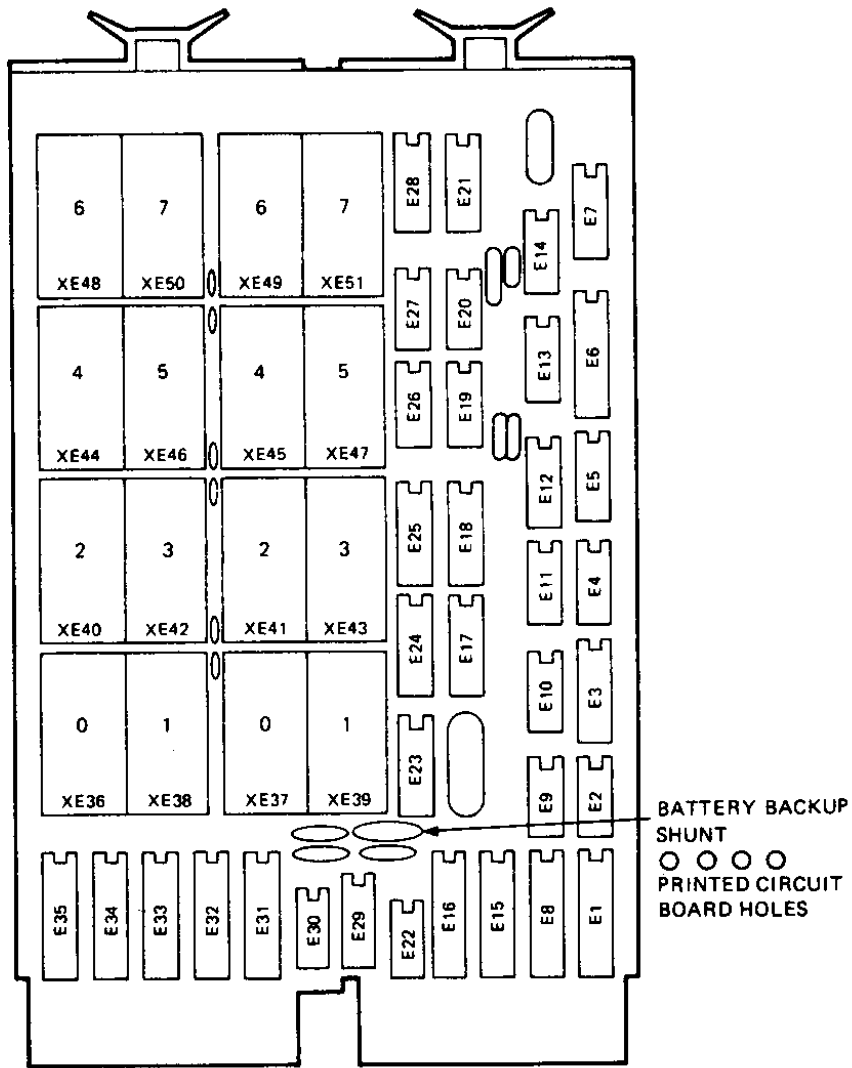
MA-0168-83

Figure 2 Jumper Configuration Flowchart (Part 1)



MA-0176-83

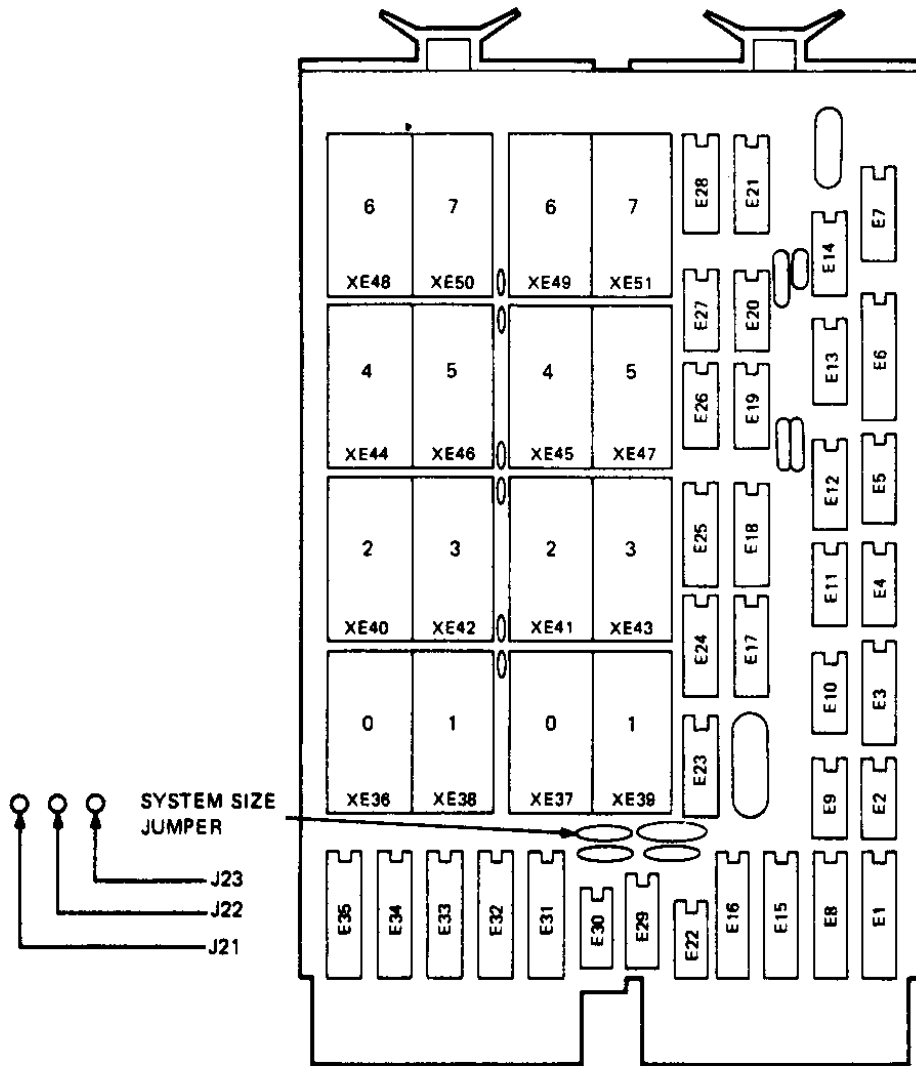
Figure 2 Jumper Configuration Flowchart (Part 2)



NOTE  
 INSTALL W1 OR W2 BUT NOT BOTH.

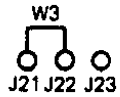
MA-0194-83

Figure 3 Battery Backup Shunt (W1, W2)

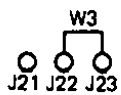


JUMPER CONNECTION

DESCRIPTION



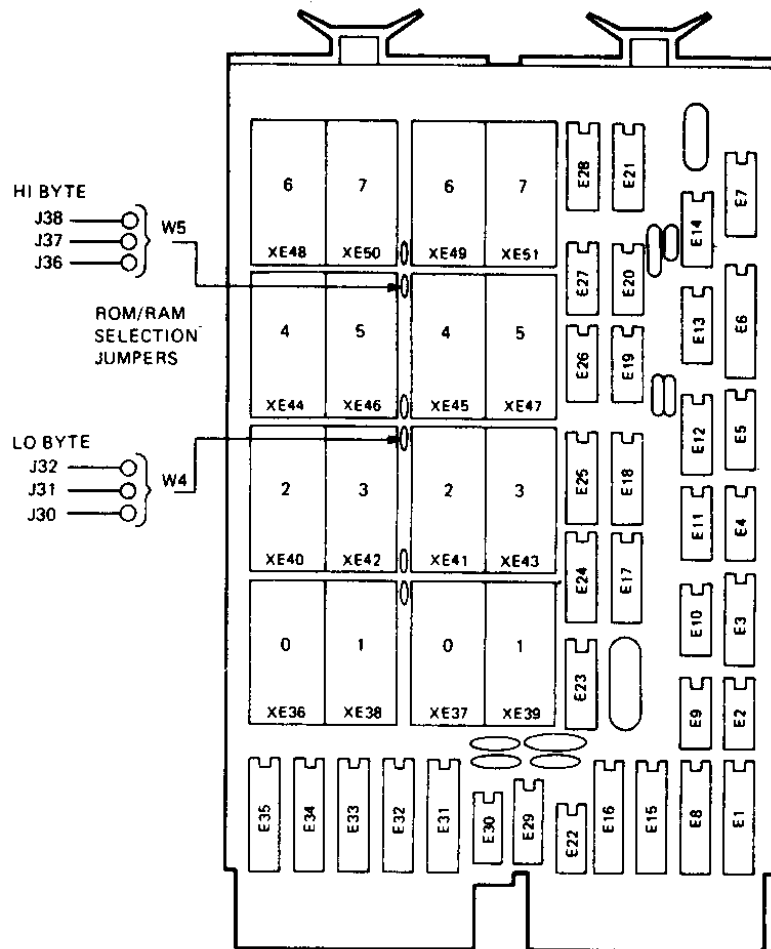
SPECIFIES 16-BIT OR 18-BIT SYSTEM.



SPECIFIES 22-BIT SYSTEM.

MA-0184-83

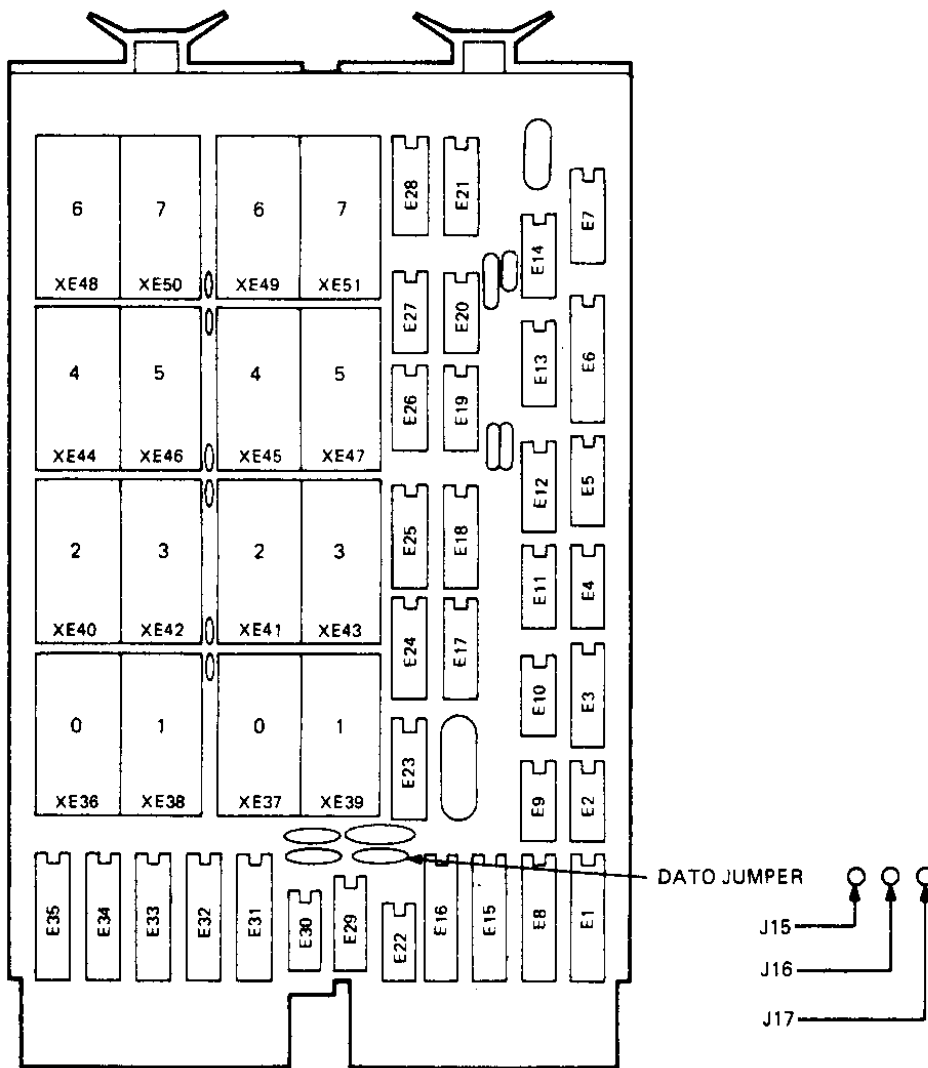
**Figure 4 System Size Jumpers (W3)**



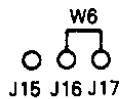
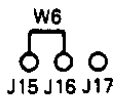
JUMPER CONNECTION	DESCRIPTION
HI BYTE W5 } J38 } J37 } J36  LO BYTE W4 } J32 } J31 } J30	THIS CONFIGURATION IS USED FOR ALL ROM MEMORY (NO RAM). BOTH JUMPER CLIPS (W4 AND W5) MUST BE INSERTED IN THE UPPERMOST PINS.
HI BYTE W5 } J38 } J37 } J36  LO BYTE W4 } J32 } J31 } J30	THIS CONFIGURATION IS FOR ROM/RAM MEMORY. RAM IS INSTALLED IN CHIP SETS 0 THROUGH 3 (BOTTOM HALF OF ARRAY). WHEN RAM IS INSERTED, BOTH JUMPER CLIPS MUST BE INSTALLED IN THE LOWER PINS.

MA-0182-83

Figure 5 ROM/RAM Selection Jumpers (W4, W5)



JUMPER CONNECTION



DESCRIPTION

CAUSES BUS TIMEOUT WHEN ACCESSED BY DATO CYCLE. NOT USED WHEN RAM IS INSTALLED.

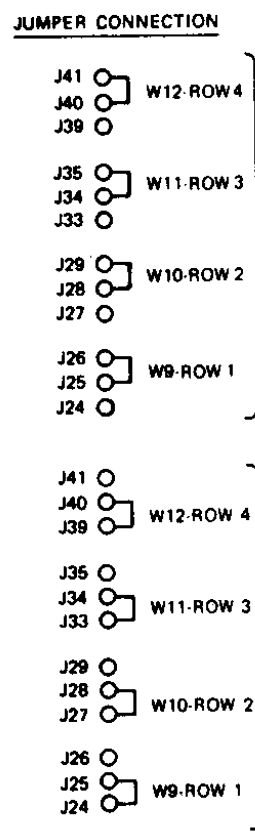
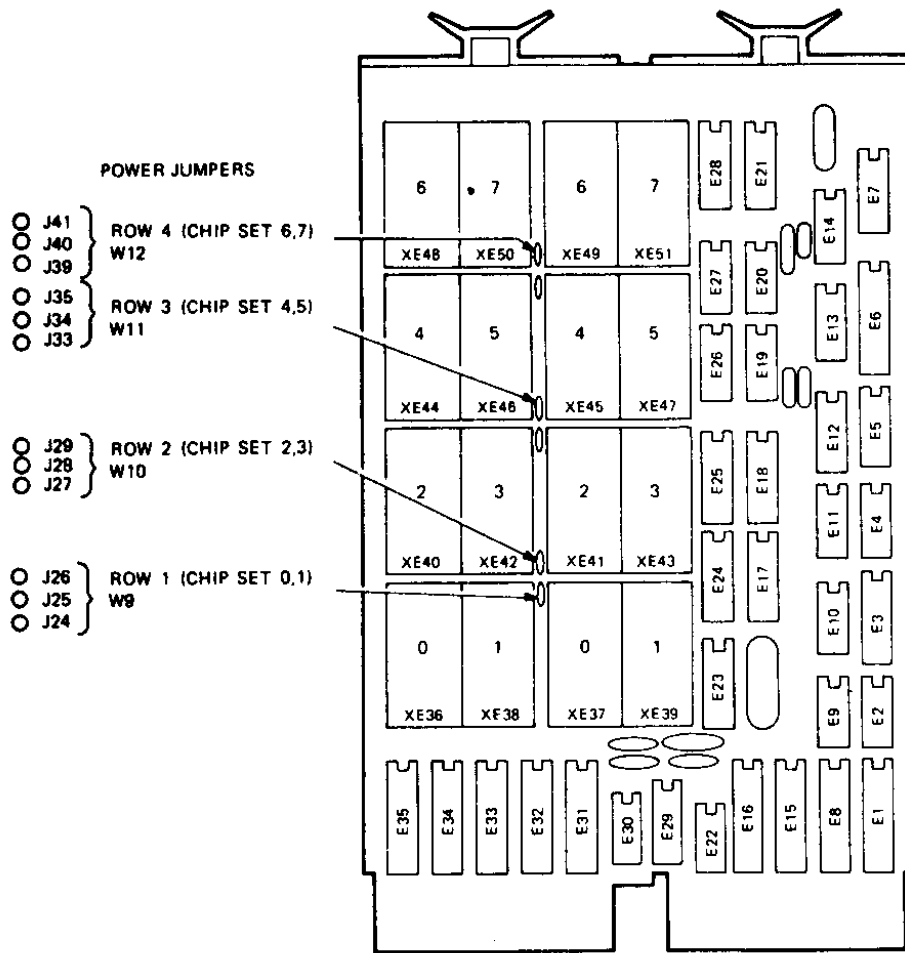
WITH RAM INSTALLED, USE THIS CONFIGURATION WHICH WILL RESPOND TO DATO CYCLES.

NOTE  
THE PCR OR THE BOOTSTRAP PCR WILL NOT TIMEOUT IN EITHER CONFIGURATION WHEN ACCESSED BY DATO CYCLES. EITHER JUMPER CONNECTION MAY BE USED, BUT THE CLIP MUST BE INSTALLED TO ALLOW ANY DATO CYCLE ON THE MODULE.

MA-0185-83

Figure 6 DATO Jumper Connection (W6)





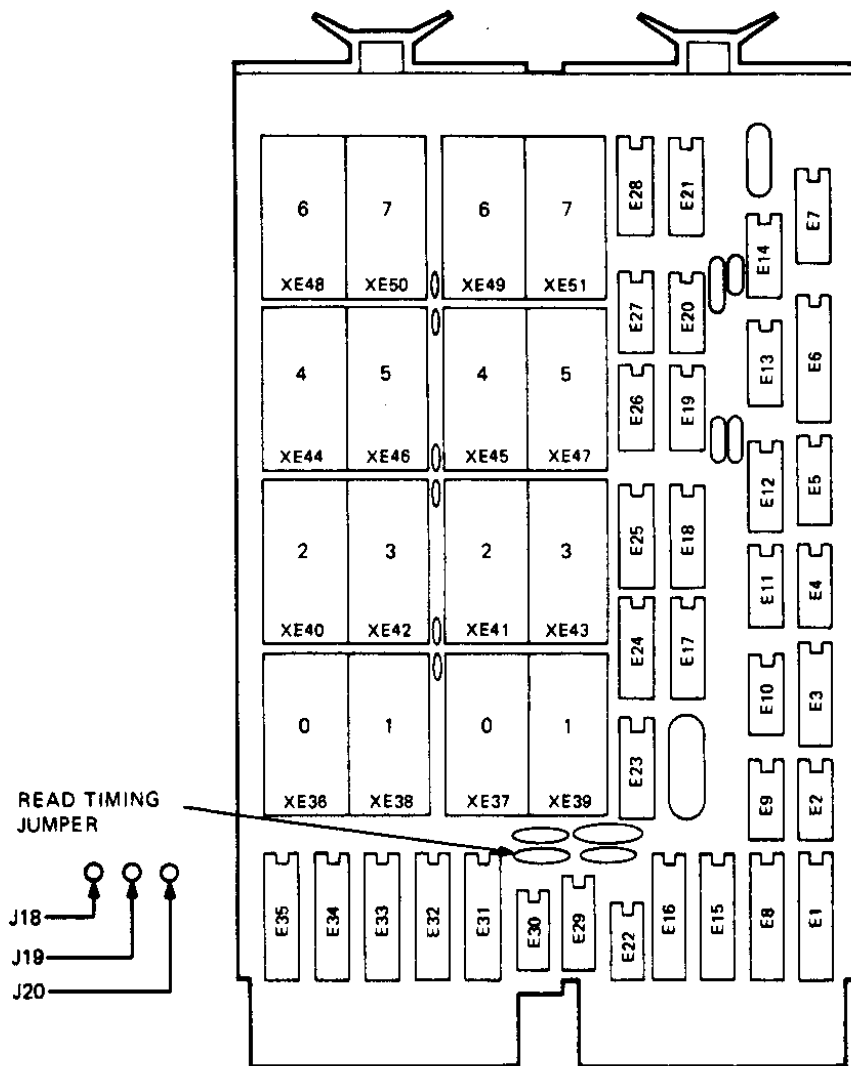
**DESCRIPTION**

THIS CONFIGURATION IS FOR 2K BY 8 AND 4K BY 8 ROMS AND 8K BY 8 STATIC RAM. THE POWER JUMPER MAY BE IN EITHER POSITION FOR THE 8K BY 8 ROM. THE POSITION SHOWN PROVIDES +5V POWER TO PIN 26. THE CONFIGURING IS DONE ON A ROW BY ROW BASIS. FOR EXAMPLE, IF 4K BY 8 ROMS ARE INSTALLED IN ROWS 1, 2, 3 AND 16K BY 8 ROMS ARE INSTALLED IN ROW 4, THE ROW 4 JUMPER WOULD BE CONNECTED BETWEEN THE TWO LOWER PINS WHILE ALL THE OTHER JUMPERS ARE CONNECTED AS SHOWN.

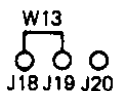
FOR 16K BY 8 OR 32K BY 8 DEVICES, THE POWER JUMPER MUST BE IN THIS POSITION. IN THIS POSITION, PIN 26 IS CONNECTED BY AN ADDRESS LINE.

MA 0187 B3

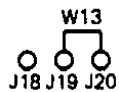
**Figure 8 Power Jumper Connections (W9, W10, W11, and W12)**



JUMPER CONNECTION



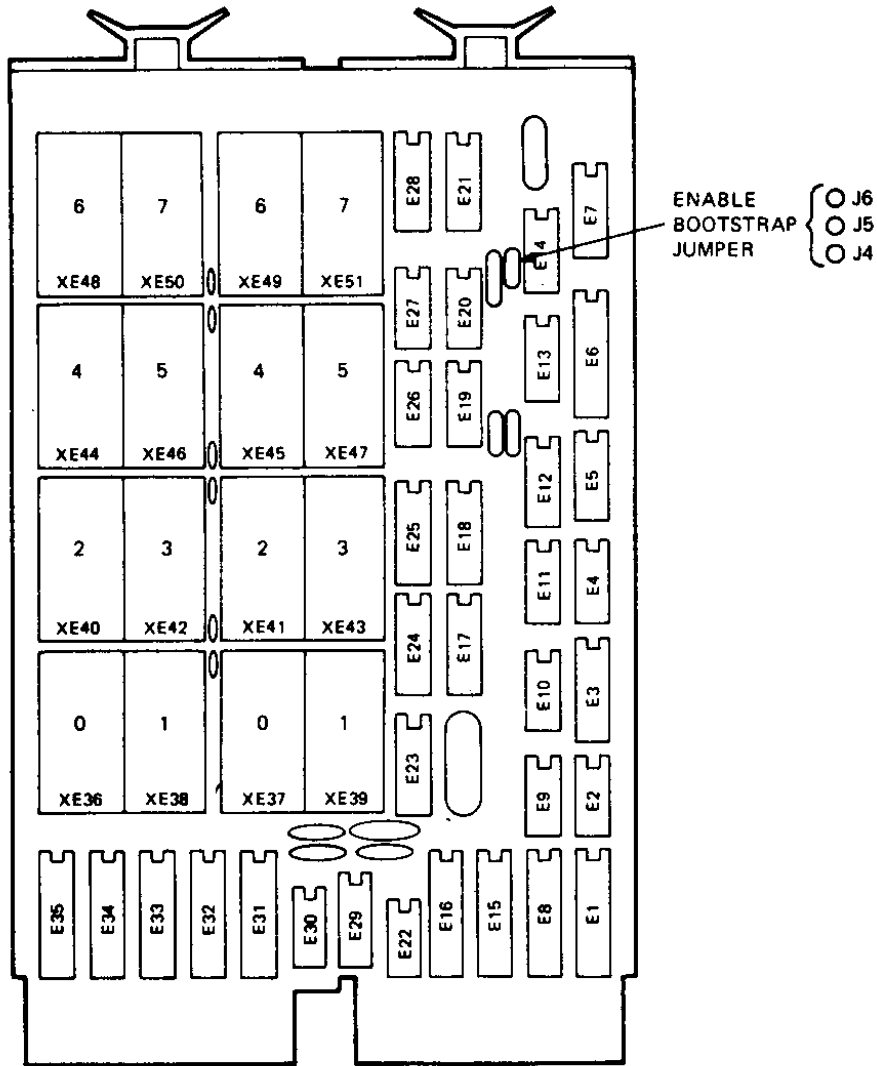
450 ns READ TIME (NORMAL).



200 ns READ TIME (FAST). IN THIS CONFIGURATION, SPEED ADVANTAGE IS OBTAINED BUT THE SLOWEST DEVICE INSTALLED ON THE BOARD MUST MEET THE 200 ns ACCESS TIME REQUIREMENT.

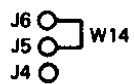
MA-0189-83

Figure 9 Read Timing Jumper (W13)

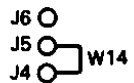


JUMPER CONNECTION

DESCRIPTION



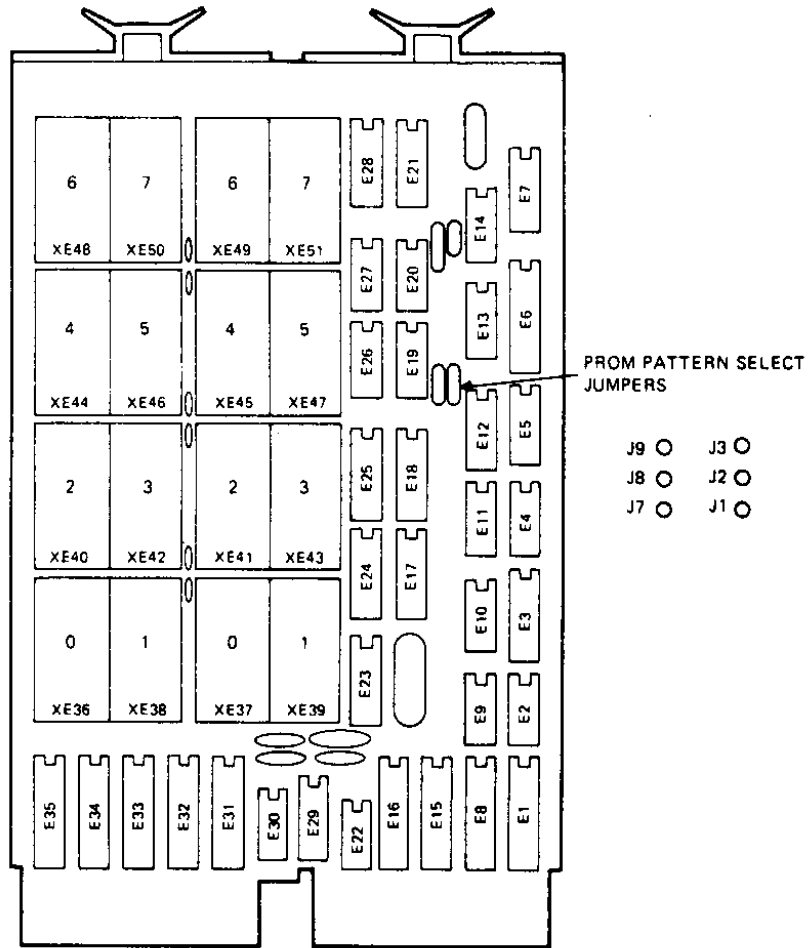
ENABLES BOOTSTRAP. ALLOWS 512 BYTES AT 17773000 (WINDOW 0), AND 512 BYTES AT 17765000 (WINDOW 1) TO BE USED AS BOOTSTRAP. BOOTSTRAP PCR ADDRESS IS 17777520.



DISABLES BOOTSTRAP ON MRV11-D. NONE OF THE ABOVE LOCATIONS RESPOND.

MA-0173-83

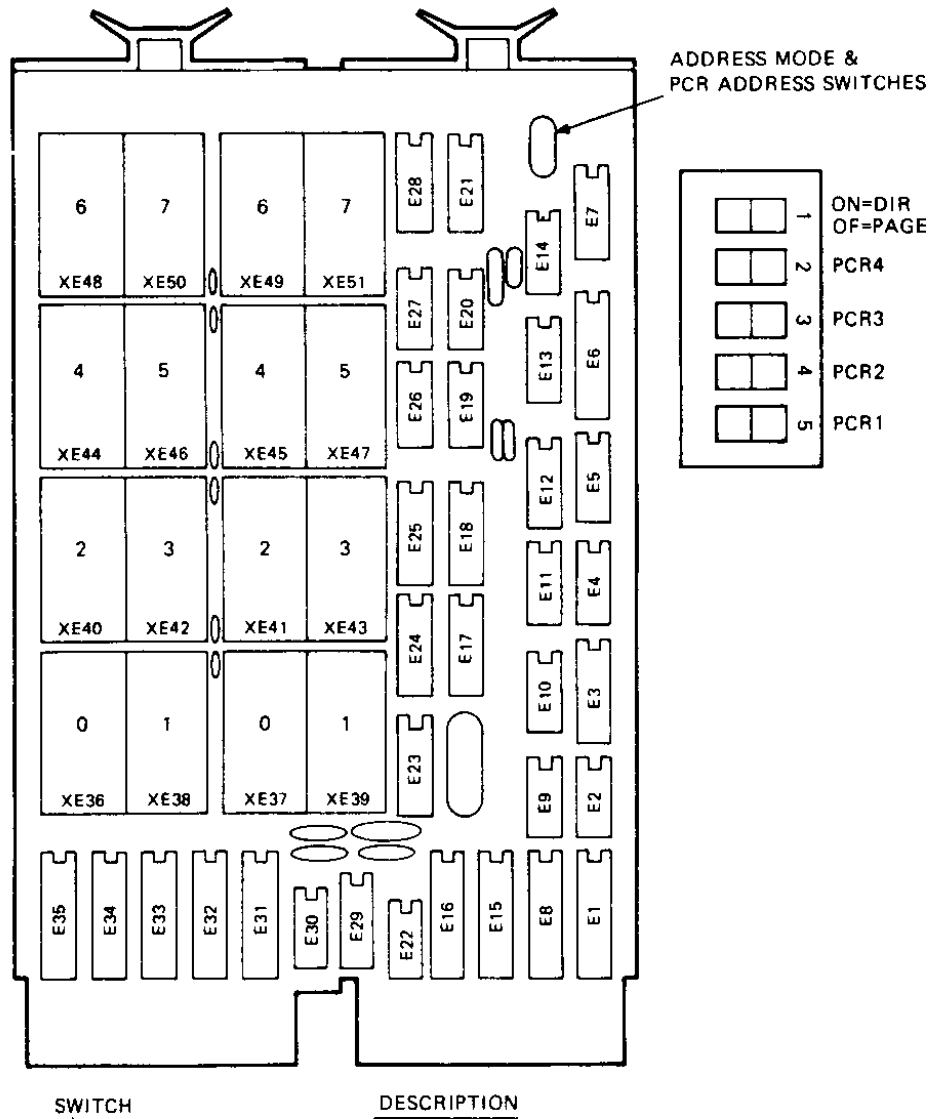
Figure 10 Enable Bootstrap Jumper (W14)



JUMPER CONNECTION		DESCRIPTION
J9 ○	J3 ○	2K BY 8 ROMS, 1/2 POPULATED
J8 ○	J2 ○	
J7 ○	J1 ○	
		2K BY 8 ROMS, FULLY POPULATED
J9 ○	J3 ○	
J8 ○	J2 ○	
		4K BY 8 ROMS, FULLY POPULATED
J9 ○	J3 ○	
J8 ○	J2 ○	
		8K BY 8 ROMS, FULLY POPULATED
J9 ○	J3 ○	
J8 ○	J2 ○	

MA-0193-83

**Figure 11 Standard Decoder Pattern Select Jumpers (W15, W16)**



**NOTE**

ORIENT MODULE WITH HANDLES FACING AWAY AND FINGERS TOWARD YOU.

**DIRECT/PAGE** TO SELECT DIRECT MODE ADDRESSING, PUSH RIGHT SIDE OF ROCKER SWITCH DOWN (SWITCH ON). TO SELECT PAGE MODE ADDRESSING, PUSH LEFT SIDE OF ROCKER SWITCH DOWN (SWITCH OFF).

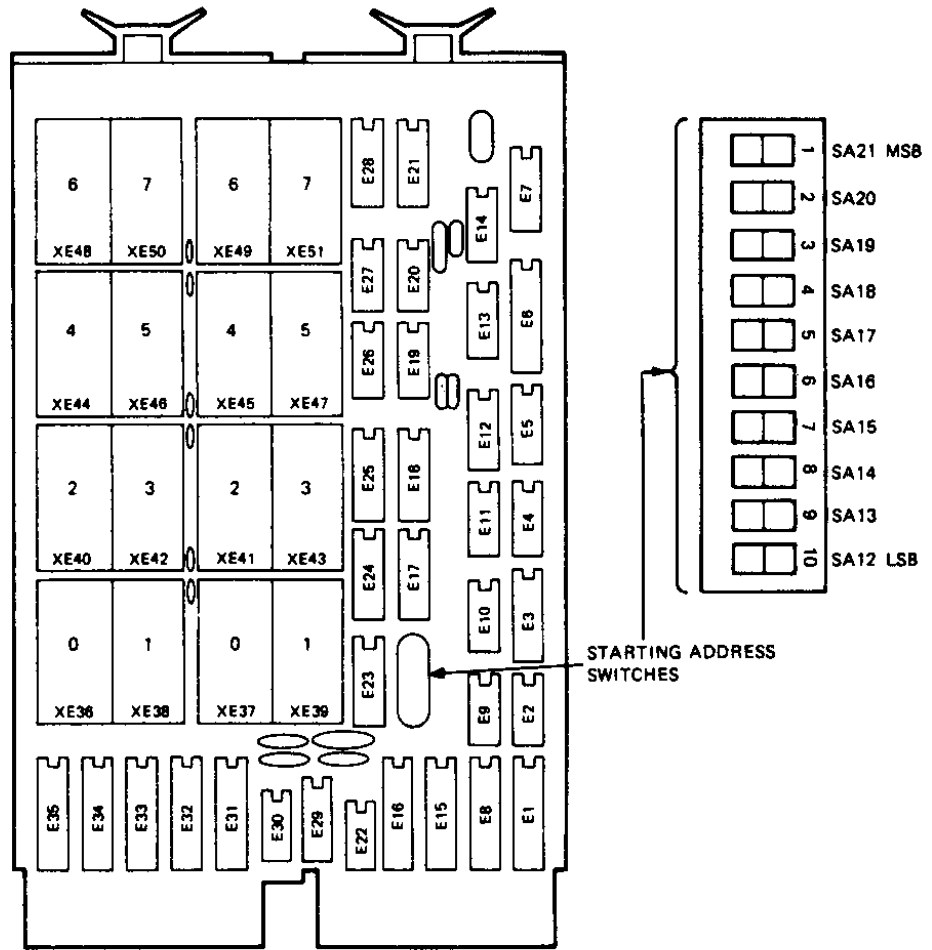
**PCR4, PCR3, PCR2, PCR1** THESE SWITCHES CONTROL THE ADDRESS OF THE PAGE CONTROL REGISTER. THE SWITCHES ALLOW ANY ADDRESS FROM 17777000 TO 17777036 TO BE SELECTED ON EVEN WORD BOUNDARIES.

PUSHING DOWN THE RIGHT SIDE OF THE ROCKER SWITCH PRODUCES A LOGICAL 0 (SWITCH ON). PUSHING DOWN THE LEFT SIDE PRODUCES A LOGICAL 1 (SWITCH OFF).

Default: 17777036<sub>g</sub>

MA-0183-83

**Figure 12 PCR Address Switches**



SWITCH	DESCRIPTION
SA1--SA10	ROCKER SWITCHES. PUSHING THE RIGHT SIDE OF THE SWITCH DOWN TURNS THE SWITCH ON (LOGIC 1). PUSHING THE LEFT SIDE OF THE SWITCH DOWN TURNS THE SWITCH OFF (LOGIC 0).
SA11--SA21	SETS UP STARTING ADDRESS OF THE MODULE. PERMITS ANY STARTING ADDRESS FROM 0 TO 17770000 ON 4K BYTE BOUNDARIES.

**NOTE**  
 MODULE IS ORIENTED WITH HANDLES FACING AWAY AND FINGERS TOWARD YOU.

MA-0100-03

**Figure 13 Starting Address Switches**

