

1. Using the Single 5 Volt 2716's in the ROM Arrays

To use the single 5 volt type 2716, you must configure one of the ROM arrays to accept 2K ROMs. This may be done following the directions given in the manual for using TMS-2716's. Next you should make adapters which will plug into the ROM sockets on the K-1012 board and will accept a single 5 volt 2716. This can be done using a 24 pin header and a 24 pin socket. These should be connected together as follows.

1. Connect all pins on the socket to the corresponding pins of the header, except for pins 19, 20, and 21.
2. Connect pin 19 of the socket to pin 20 of the header.
3. Connect pin 20 of the socket to pin 18 of the socket or header.
4. Connect pin 21 of the socket to pin 24 of the socket or header.

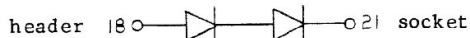
2. Programming Single 5 Volt 2716's with the K-1012 Prom I/O Board

To program single 5 volt 2716's, you must first make the following hardware modifications. The modifications given in the manual for TMS-2716's should be disregarded.

1. Cut jumper trace J4 and install jumper J5.
2. Install a wire to short out capacitor C30.

Next you must build an adapter which will plug into the programming socket on the K-1012 board and accept a single 5 volt 2716. This may also be done with a 24 pin header and a 24 pin socket. These should be connected together as follows.

1. Connect all pins of the socket to the corresponding pins on the header except for pins 18, 19, 20, and 21.
2. Connect pin 19 of the socket to pin 20 of the header.
3. Use two silicon diodes in series to connect pin 21 of the socket to pin 18 of the header as shown. (This is to drop the programming voltage from 26 volts to 25 volts.)



4. Install the adapter in the programming socket.
5. Connect pin 18 of the socket to pin 14 of U43.
6. Connect pin 20 of the socket to pin 15 of U43.

Now you must make the following changes and additions to the programming software. You should ignore the changes given in the software for TMS-2716s.

Changes

| | | | | |
|----------|-----|---------------|-------------|------------------------------|
| LINE 95 | 215 | A9 01 | LDA #1 | ;ONE TIME THROUGH |
| LINE 100 | 21F | 09 21 | ORA #H'21 | ;SET OE HIGH AND TURN VPP ON |
| LINE 107 | 231 | 29 DE | AND #H'DE | ;SET OE LOW AND TURN VPP OFF |
| LINE 190 | 2C8 | 09 10 | ORA #H'10 | ;SET CE HIGH |
| LINE 195 | 2D0 | 20 60 03 | JSR DELAY50 | ;WAIT 50MS |
| LINE 197 | 2D6 | 29 EF | AND #H'EF | ;SET CE LOW |
| LINE 210 | 2E5 | 4C 6B 06 LOAD | JMP NEWLOAD | ;NEW READ BYTE CODE |
| LINE 246 | 31F | 69 08 | ADC #H'08 | ;PROGRAM 2K BYTES |
| LINE 265 | 33D | 09 3F | ORA #H'3F | ;SET BITS 0-5 TO OUTPUTS |
| LINE 270 | 34A | 29 E0 | AND #H'E0 | ;SET CE LOW, ETC. |
| LINE 271 | 24C | 09 20 | ORA #H'20 | ;SET OE HIGH |

ADDITIONAL CODE

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360 A0 32      DELAY50: LDY #50      ;50MS
362 A2 C8      DLY1MS: LDX #200     ;1MS
364 CA        LOOP:    DEX
365 D0 FD      BNE LOOP
367 88         DEY
368 D0 F8      BNE DLY1MS
36A 60         RTS
36B AD 0A FE   NEWLOAD: LDA PORTBD
36E 29 DF      AND #H'DF    ;SET OE LOW
370 09 01      ORA #H'01    ;TURN ON VPP
372 8D 0A FE   STA PORTBD
375 AD 08 FE   LDA PORTAD ;READ THE BYTE
378 48         PHA
379 AD 0A FE   LDA PORTBD
37C 29 FE      AND #H'FE    ;TURN OFF VPP
37E 8D 0A FE   STA PORTBD
381 68         PLA
382 60         RTS

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Once you have saved a copy of the software, you should use the following procedure to bring up your system to perform the programming. The 2716 to be programmed should be inserted in the adapter while the system power is off. Make sure the programming voltage switch is off, i.e. away from the programming socket. This will prevent accidental programming of the 2716 on power up. Now turn the system power on. Load in the programming software and execute the NEWPRM routine once, which will initialize the software. Finally, flip the programming voltage switch on, i.e. toward the programming socket, and proceed according to steps 5, 7, 9, and 10 of the programming procedure in the manual (page 14). The programming voltage must be on in order to read as well as program the 2716's.

We can't recommend inserting and removing the 2716's with the power on. But, if you wish to do so, make sure the programming voltage is off and that pin 12 (GND) is inserted before and removed after pin 24 (+5 volts).