Radio Shack®

ADDENDUM

Service Manual

26-1101

TRS-80

16K RAM EXPANSION

Catalog Number 26-1101

Converts the
TRS-80 Microcomputer
To
Catalog Number 26-1003/26-1006
Or
TRS-80 Expansion Interface
To
Catalog Number 26-1141/26-1142

When ordering the kit, please specify whether it is to be used for modification of a Microcomputer or an Expansion Interface unit.

CUSTOM MANUFACTURED IN U.S.A. BY RADIO SHACK TC A DIVISION OF TANDY CORPORATION

INTRODUCTION

This 16K RAM Expansion kit is used to perform the following types of modification:

1. to convert a 4K TRS-80 Microcomputer to a 16K Microcomputer.

2. to convert a 0K TRS-80 Expansion Interface to a 16K Expansion Interface.

3. to convert a 16K TRS-80 Expansion Interface to a 32K Expansion Interface.

If you have ordered the mod kit for the Microcomputer, you will receive eight Integrated Circuits (I.C.'s) and two unpunched DIP Shunts. If you ordered the Expansion Interface mod kit, you will receive only the eight I.C.'s.

See the applicable retrofit instructions for installation but, read this entire manual before performing any work — some instructions applicable to all retrofit procedures are not duplicated, i.e., handling of I.C.'s, pin identification, etc.

16K RAM EXPANSION RETROFIT INSTRUCTIONS FOR THE TRS-80 MICROCOMPUTER

1. To disassemble the case, place it upside down on your lap or on a non-scratching surface and remove the six screws.

2. Now place it face up and carefully lift off the top half of the case. Notice that the "ON" LED is attached to it.

3. To remove the LED, slip the black plastic retaining ring (sample enclosed) off of the LED socket. Now pull on the leads while pressing on the LED from the other side. Notice that the base of the LED has a flat side. This indicates the polarity of the leads.

4. Lift the keyboard from the posts. **Do not bend the connecting ribbon cable any more than is necessary.**

5. With the keyboard now free from the posts, lift out the Logic Board. At this point you can read either "TRS-80 1700069A" or "TRS-80 1700069D" on the back of the Logic Board. The "A" and the "D" letter suffixes indicate revision levels and will be referred to later. Also, please note and record the number that is marked on the Logic Board with a felt marker. This is the Board's control number. Lay the P.C. Boards flat, with the integrated circuits and keys facing up.

6. Locate Z13 through Z20. These are the RAM's (see Figure 1).

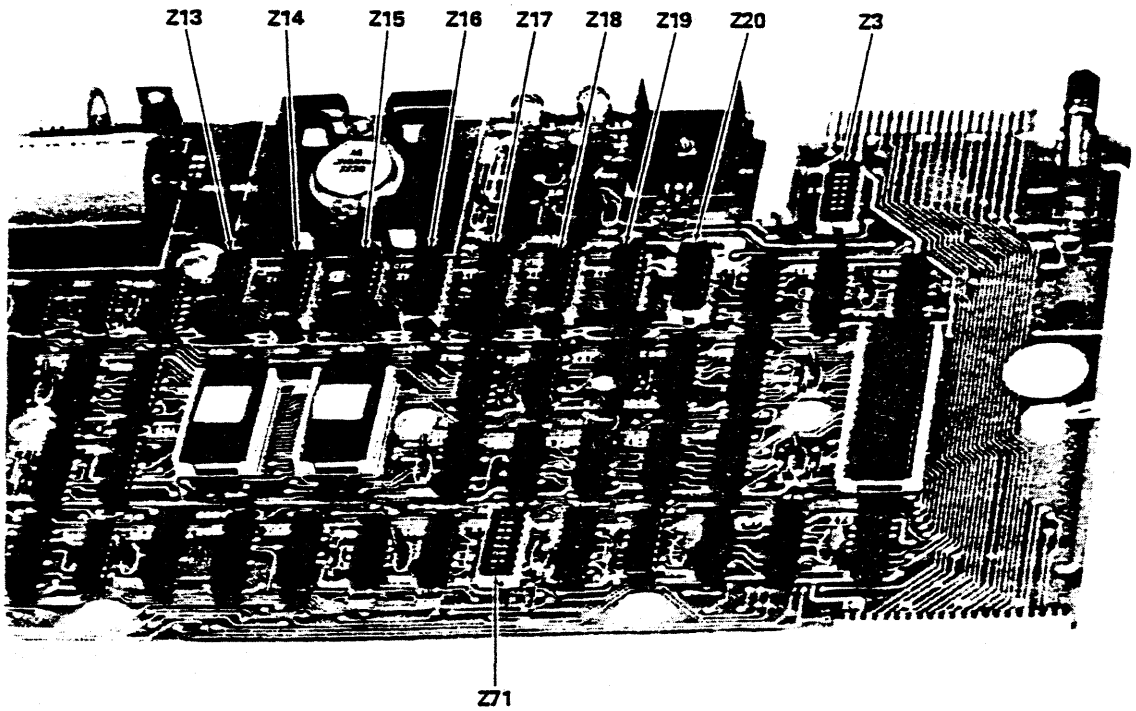


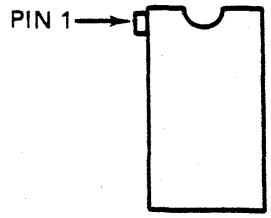
FIGURE 1. RAM LOCATIONS

7. Before pulling out the old RAM's, notice that they have a notch in their cases – all pointing in the same direction. The notches in the new RAM's must also point in the same direction.

NOTE

These are MOS I.C.'s. This means that they can be damaged simply from the discharge of static in the human body. Wear a "static discharge bracelet" if available. If not, temporarily ground yourself to a metal work bench (with all power off, of course) before handling these I.C.'s. Try to avoid making contact with the pins. Also, avoid any unnecessary movement that would cause you to produce a static charge.

8. Remove and replace the RAM's. Use a small screwdriver to gradually pry them loose at both ends. (To preserve the 4K RAM's, place them in the conducting black foam for protection against static).



9. Locate the sockets for Z3 and Z71. (On "A" revision Boards, the Z3 socket will be empty). Remove the jumper circuits (DIP Shunts) from Z3 and Z71 and install the replacement DIP Shunts provided. The punch patterns must match the illustrations shown in Figure 2.

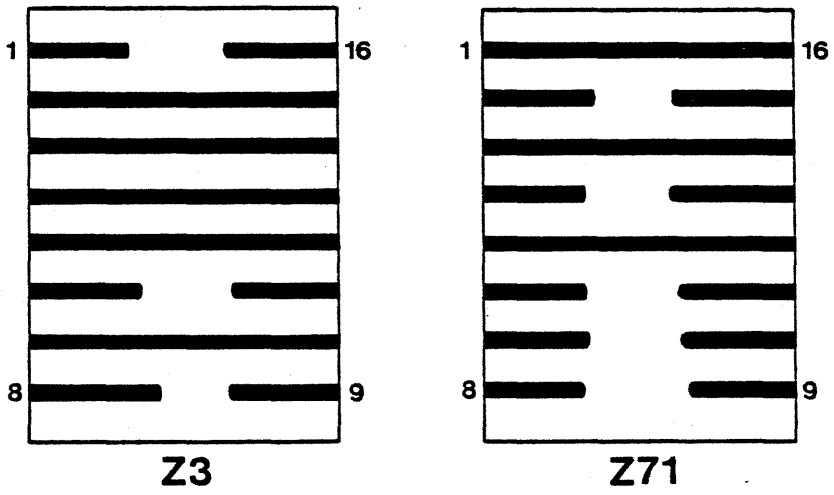


FIGURE 2. DIP SHUNTS FOR TRS-80 MICROCOMPUTER

NOTES

"A" revision Boards have 14-pin sockets and "D" revision Boards have 16-pin sockets. DIP Shunt pins 8 and 9 will hang over the edge of the sockets on the "A" Boards.

Pin 1 on the DIP Shunts should line up like all the other I.C.'s, including the RAM's, as indicated above. Also refer to Figure 2.

10. Now re-assemble the case, making sure that the LED is seated securely (press it in until it snaps into place).

11. Affix the 16K label to the bottom of the case. Oh yes, don't forget to lacquer a screw-head to maintain the warranty.

12. Record the computer serial number and the Board's control number. These numbers and the 4K RAM's should be returned, by the controlling store, to the National Parts Department.

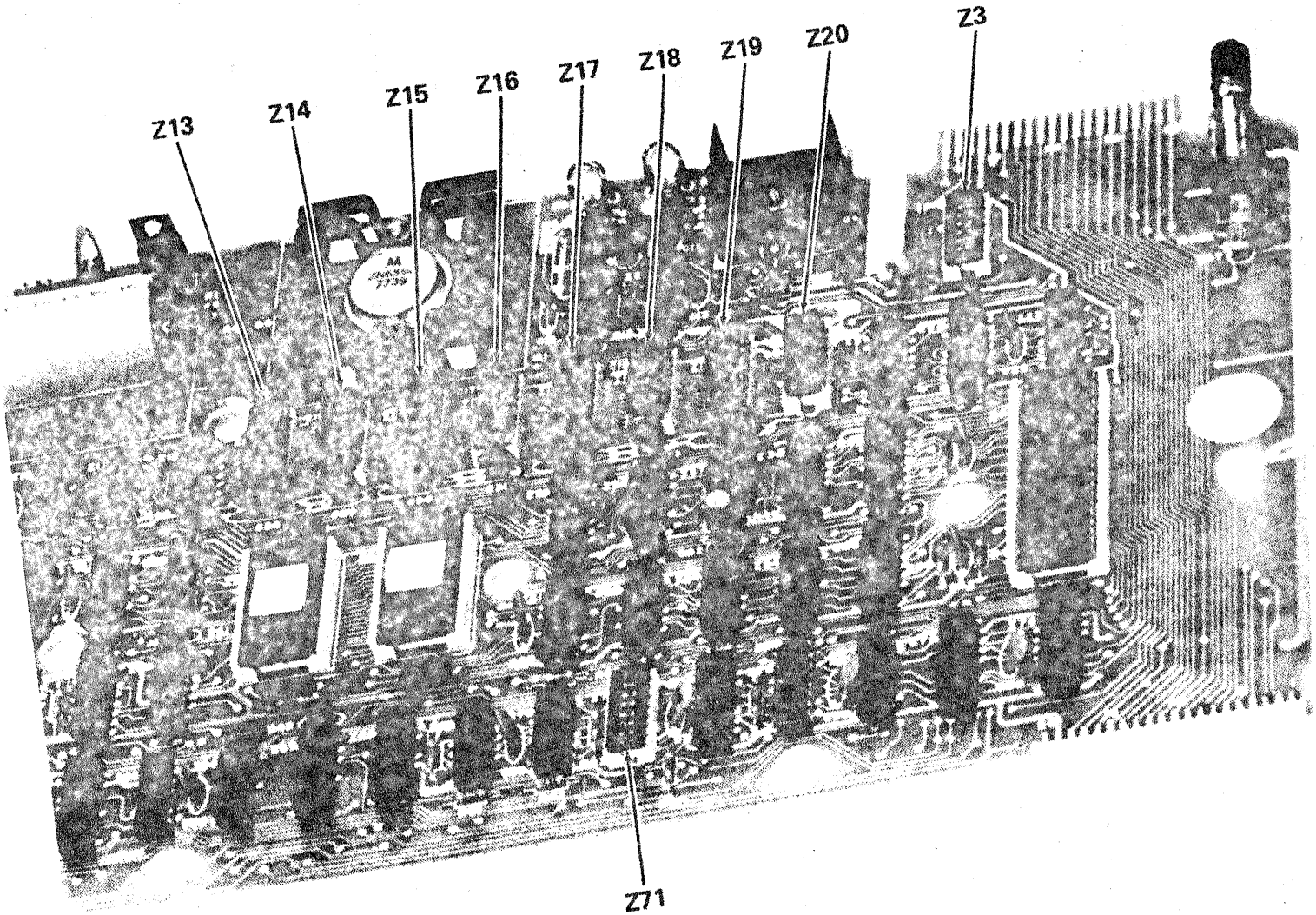
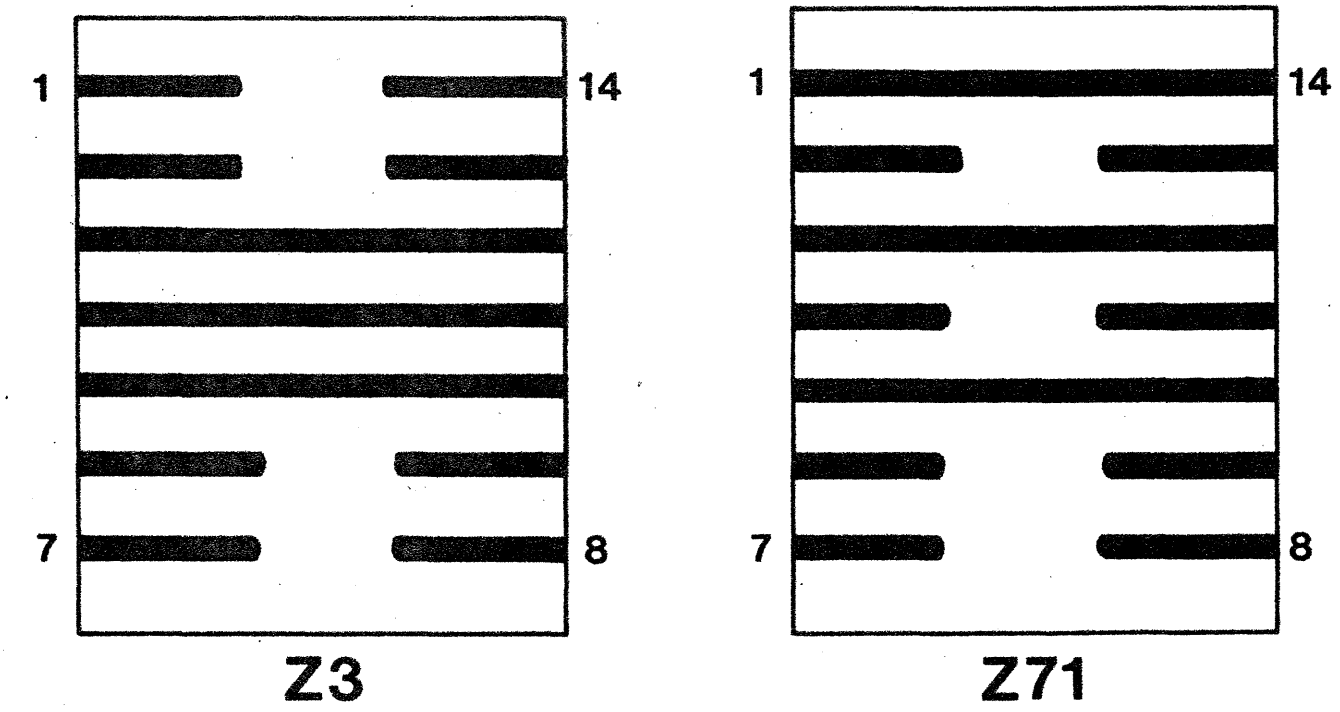


FIGURE 1. RAM LOCATIONS

DIP SHUNTS FOR TRS-80 1700069A BOARDS



DIP SHUNTS FOR TRS-80 1700069D BOARDS

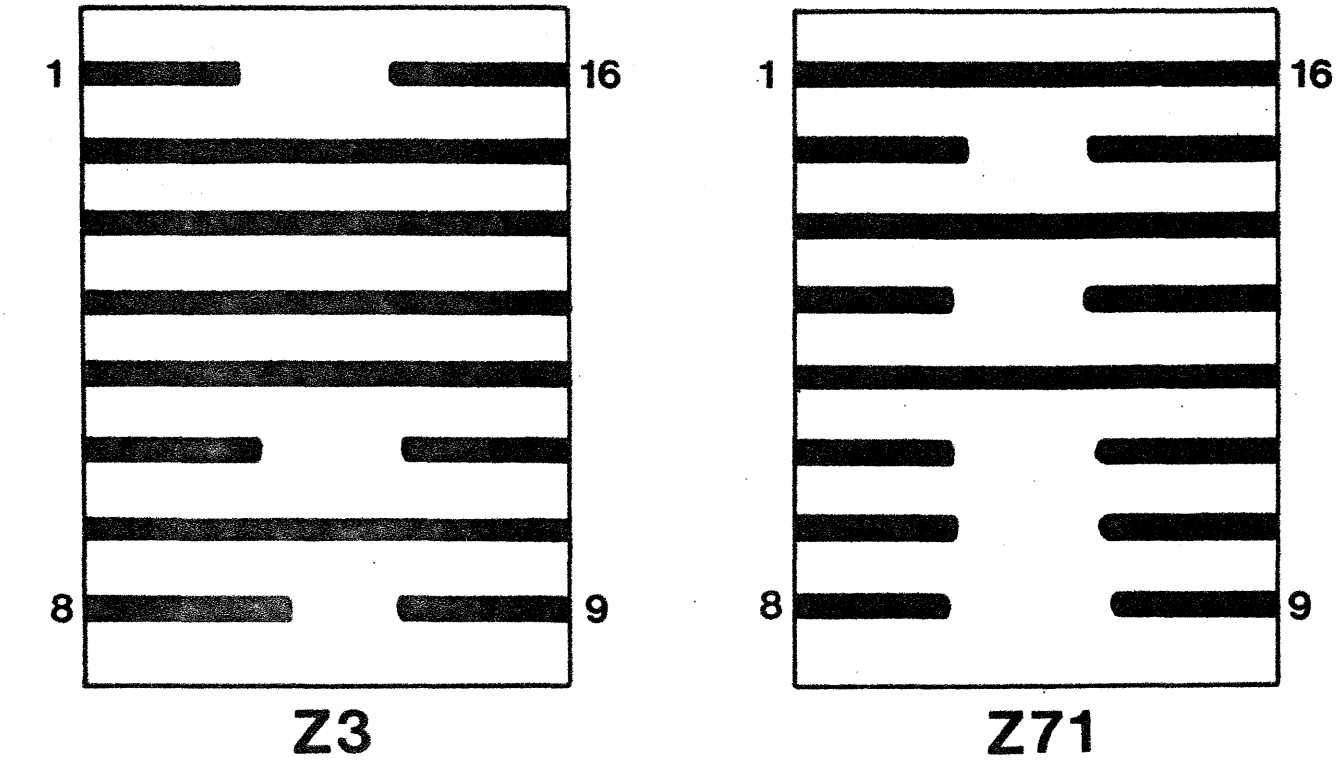


FIGURE 2. DIP SHUNTS

16K RAM EXPANSION RETROFIT INSTRUCTIONS FOR THE EXPANSION INTERFACE

1. To disassemble tht TRS-80 Expansion Interface, place it upside down and remove the six (6) screws on the bottom.

2. Remove the bottom part of the case to expose the component side of the Printed Circuit Board.

CAUTION

See the first NOTE on page 3 before you handle the I.C.'s.

To modify this unit for 16K, locate sockets for IC's Z9 through Z16 and install the eight RAM's you received in the modification kit (see Figure 3).

NOTE

Before you can perform the following modification, the modification to 16K must have been performed.

To modify this unit for 32K, locate sockets for IC's Z1 through Z8 and install the eight RAM's you received in the modification kit (see Figure 4).

Reassemble the case and be sure to lacquer one screw to maintain the warranty.

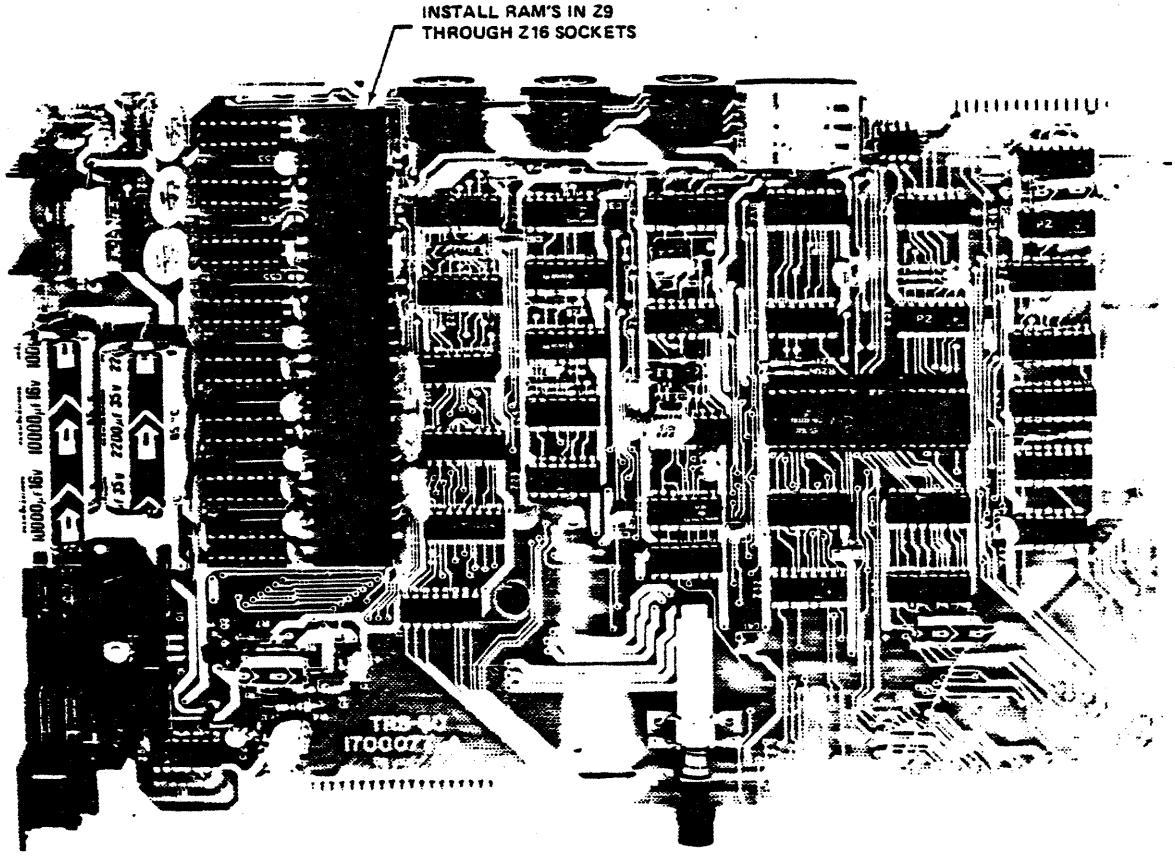


FIGURE 3. TRS-80 EXPANSION INTERFACE (RAM Installation Locator for 16K Retrofit)

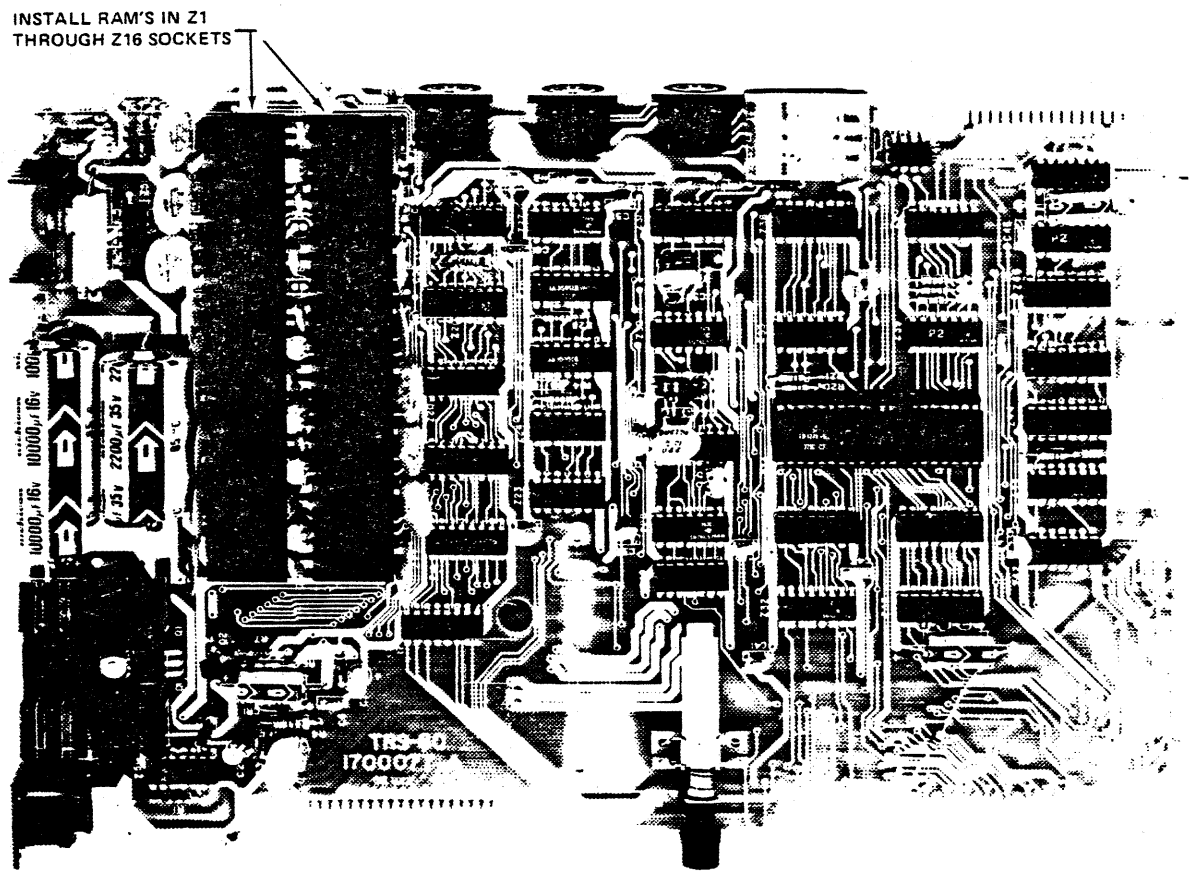


FIGURE 4. TRS-80 EXPANSION INTERFACE
(RAM Installation Locator for 32K Retrofit)

PARTS LIST
(TRS-80 MICROCOMPUTER)

DESCRIPTION	QUANTITY	PART NUMBER
RAM	8	3108009
DIP Shunt	2	2100041

PARTS LIST
(TRS-80 EXPANSION INTERFACE)

DESCRIPTION	QUANTITY	PART NUMBER
RAM	8	3108009

CHECKOUT

Perform the minimum checkout procedure in the applicable step shown on the chart on the following page. The chart lists TRS-80 equipment and combinations of TRS-80 equipment that are affected by this modification. It also provides Power-Up steps and steps to achieve Video Displays of available memory space.

MINIMUM CHECKOUT PROCEDURE

STEP	MODIFIED TRS-80 EQUIPMENT	SPECIAL FEATURES	POWER UP	PROCEDURE	MONITOR SHOULD DISPLAY
1	16K COMPUTER	LEVEL I BASIC	PRESS 'POWER' BUTTON ON REAR OF COMPUTER	——	READY >_
				TYPE 'P.M.' (WITHOUT QUOTES) AND PRESS ENTER KEY	15871
2	16K COMPUTER	LEVEL II BASIC	SAME AS IN STEP 1	——	MEMORY SIZE?
				PRESS ENTER KEY	RADIO SHACK LEVEL II BASIC READY >_
				TYPE 'PRINT MEM' (WITHOUT QUOTES) AND PRESS ENTER KEY	15572
3	16K COMPUTER	LEVEL II BASIC/USED WITH ØK EXPANSION INTERFACE	HOLD BREAK KEY DOWN AND PRESS 'POWER' BUTTON ON REAR OF KEYBOARD AND ON FRONT OF EXPANSION INTERFACE	——	SAME AS IN STEP 2
				SAME AS IN STEP 2	SAME AS IN STEP 2
				SAME AS IN STEP 2	SAME AS IN STEP 2
4	16K EXPANSION INTERFACE	LEVEL II BASIC/USED WITH 16K COMPUTER	SAME AS IN STEP 3	——	SAME AS IN STEP 2
				SAME AS IN STEP 2	SAME AS IN STEP 2
				SAME AS IN STEP 2	31956
5	32K EXPANSION INTERFACE	LEVEL II BASIC/USED WITH 16K COMPUTER	SAME AS IN STEP 3	——	SAME AS IN STEP 2
				SAME AS IN STEP 2	SAME AS IN STEP 2
				SAME AS IN STEP 2	48340

NOTE: NO PROVISION HAS BEEN MADE TO CHECK OUT EXPANSION INTERFACES THAT WILL PROBABLY BE UTILIZED WITH 4K LEVEL II COMPUTERS; THE VALUE DISPLAYED WOULD BE MEANINGLESS.

RADIO SHACK A DIVISION OF TANDY CORPORATION

U.S.A.: FORT WORTH, TEXAS 76102
CANADA: BARRIE, ONTARIO L4M 4W5

TANDY CORPORATION

AUSTRALIA	BELGIUM	U. K.
280-316 VICTORIA ROAD	PARC INDUSTRIEL DE NANINNE	BILSTON ROAD
RYDALMERE, N.S.W. 2116	5140 NANINNE	WEDNESBURY, STAFFS WS10 7JN

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