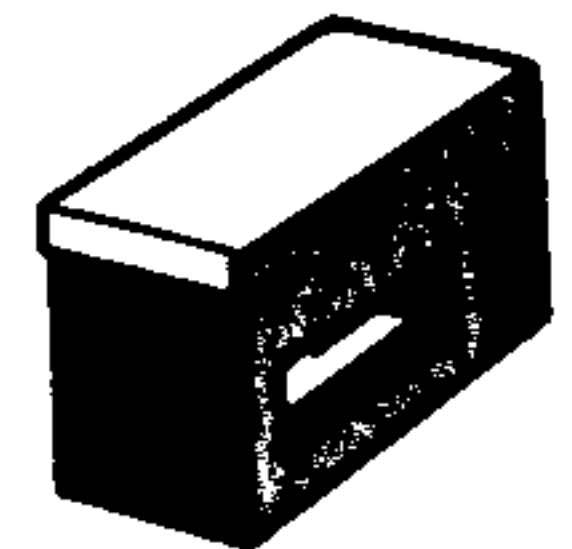


Expansion Memory Module



INTRODUCTION

The Ultracomp Systems Memory Expansion Module allows the TI 99/4A Home Computer User to fully expand the memory capability of their system. Software packages such as TI Extended BASIC*, TI LOGO*, Editor/Assembler*, Disk Based Software, and numerous other Software Cartridges can be run to make effective use of their enhanced programming capabilities. Many Third Party Software packages exist which also require the expanded memory. The Ultracomp Memory Module adds 32K bytes of Random Access Memory (RAM) to the TI 99/4A computer, and has been designed to operate without the need for an external power supply or wall transformer. The unit assures full system expansion capability by allowing connection of the Speech Synthesizer Module*, stand-alone RS-232, PERCOM Disk System, and other peripherals via the Daisey Chain Expansion Connector.

NOTE: The BASIC language which is built into the computer cannot make use of the additional memory without a software cartridge that indicates its ability to use the expanded memory.

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INSTALLATION

To install your Expansion Memory Module please refer to Figure 1.

CAREFULLY READ and FOLLOW these next steps.

CAUTION: The electronic components in the module can be damaged by **STATIC ELECTRICITY**. To avoid the possibility of such damage **AVOID TOUCHING** the connector contacts on either side of the unit.

- Turn **OFF** the main computer console and any devices that may be attached.
- The memory module should be placed next to the main console. **NOTE:** The memory unit **MUST** be to the **LEFT** of the Speech Module for proper operation.
- An optional strip of Velcro is included if you feel that the normal force of the connector contact will not hold the unit in more rugged environments. To attach the Velcro simply pull the two strips apart and peel the backing off of the "loop" side. This strip should go on the main console just above the door. The other strip, the "hook" side should be attached in the same manner to the memory unit above the extending connector.
- Align the module's connector with the console's expansion connector (make sure the console's door is up, exposing the expansion connector inside).
- Firmly but carefully push the module toward the console until the connectors are firmly joined. Initially it may help to angle the memory module slightly. The module should be flush with the computer console. If any obstruction is encountered before the module is fully inserted; pull the two units apart and visually inspect both the console and module connectors to ensure there are no mechanical obstructions in the connectors' path.
- After the module is in place any additional peripherals may be connected in a similar manner or per their appropriate instructions.
- When the system is configured, power-up should be performed according to the instructions in the console's and peripheral's manuals. The memory unit will power-up with the console.

REMOVING THE EXPANSION MEMORY MODULE

To remove your Expansion Memory Module **CAREFULLY READ and FOLLOW** these next steps.

CAUTION: The electronic components in the module can be damaged by **STATIC ELECTRICITY**. To avoid the possibility of such damage **AVOID TOUCHING** the connector contacts on either side of the unit.

- Turn the power **OFF** to all the devices connected in the system including the main console according to their power-down instructions. The expansion memory will power-down with the console.
- Disconnect any expansion units or peripherals to the right of the memory module.
- Carefully remove the memory unit by using a slight rocking motion as you pull the module away from the console.
- If desired the other peripherals may be re-added to re-configure the system.

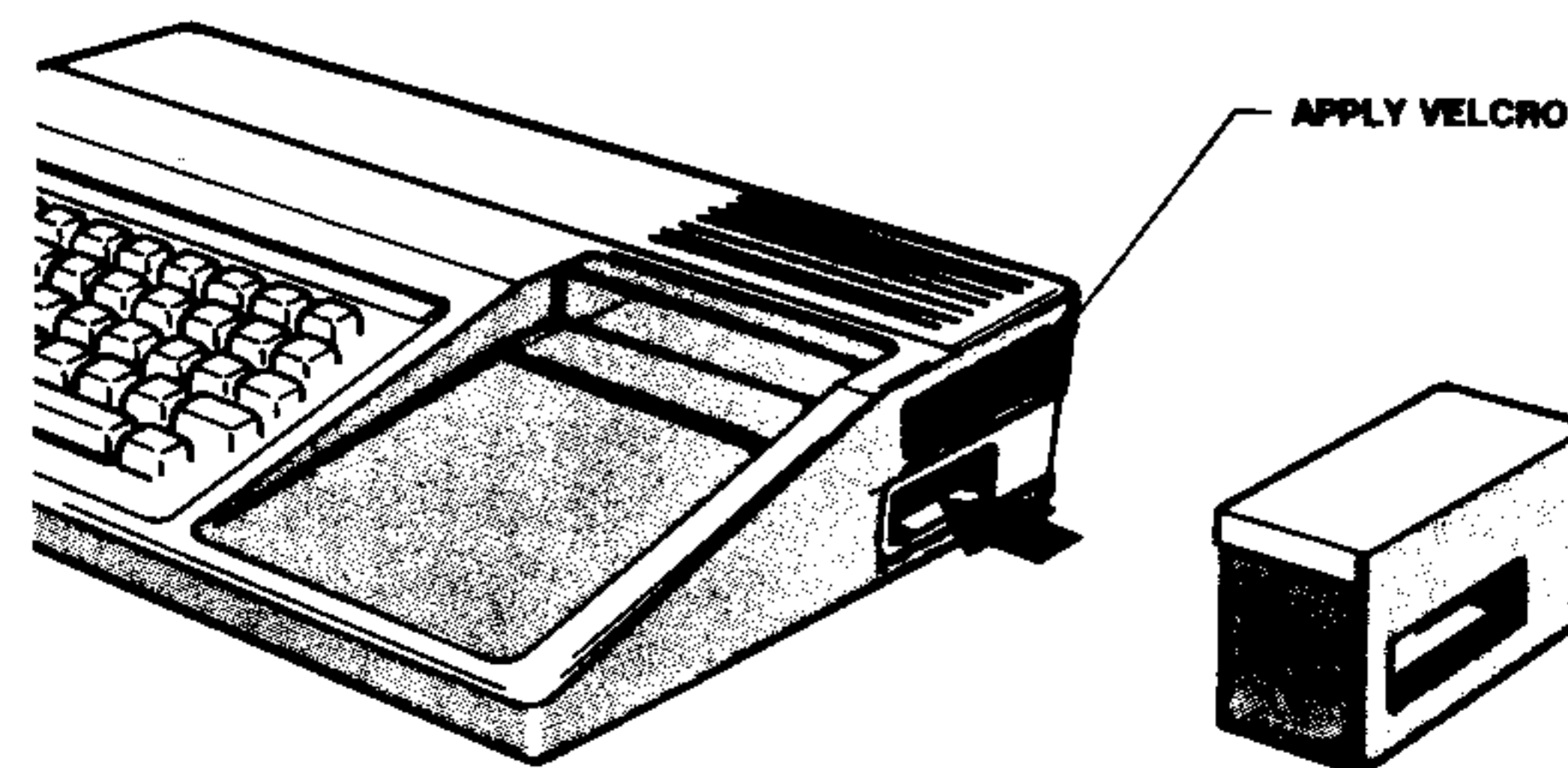


Figure 1

TESTING AND VERIFICATION OF PROPER OPERATION

Your Expansion Memory Module has been pre-tested for proper operation before shipment. Operation can be verified to certain limits depending on the types of program cartridges available. Three of these TI LOGO*, TI Extended BASIC*, and the MINI-Memory Module* are briefly discussed in this section.

MINI-Memory Module*:

The most complete testing can be done with this module. The user can either write a short assembly language program to read and write various patterns to each memory location, or use the DEBUG commands to inspect and modify various locations and then verify the contents. Further instructions on using these commands can be found in the manual for the MINI-Memory Module*.

TI Extended BASIC*:

After Extended BASIC is booted up or even after writing a program the "SIZE" command can be used to indicate the amount of memory available. Just type in "SIZE" after the ">" prompt and press "ENTER".

WITHOUT >SIZE (enter)
MEMORY EXPANSION: 13928 BYTES OF STACK FREE

WITH >SIZE (enter)
MEMORY EXPANSION: 13928 BYTES OF STACK FREE
24511 BYTES OF PROGRAM SPACE FREE

NOTE: TI Extended BASIC* does not include the 8K segment of memory located at 2000 thru 3FFF as this area is normally used for assembly language programs and the like. Hence the response of 24511 BYTES OF PROGRAM SPACE FREE.

TI LOGO* (I & II):

TI LOGO* will not normally boot up unless all 32K of memory is present. After selecting TI LOGO* it will take about five seconds before the heading "WELCOME TO TI LOGO" appears along with a "?" prompt. Otherwise, the response may be "CHECK SYSTEM" or various garbled LOGO terms and notation, which indicate insufficient memory is available or present in the system.

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IN CASE OF DIFFICULTY

If the Expansion Memory Module does not appear to be operating properly, please check the following items:

- VERIFY Home Computer operation without unit connected.
- CHECK all connections to insure that cables and connections are properly connected and seated.
- INSURE that the memory module is to the LEFT of the Speech Synthesizer.

If none of the above corrections work refer to the Warranty and Service sections of this manual.

SERVICE/REPAIR AVAILABILITY

If your unit should develop a problem after the 90 day warranty period, Ultracomp Systems will repair or replace the suspected unit upon your authorization to service the unit. Due to the nature of the product, there is a \$15 minimum service charge*. If additional parts are required you will be notified if the total cost of repair exceeds \$30. There is a maximum charge of \$100* for repair which essentially gives you a new or rebuilt unit. All postage and shipping costs are also assumed by the owner. Normal service lead times are five working days after receipt of unit. Send inquiries or unit to address listed under the warranty section of this manual.

* Prices subject to change