

**RAVE 99**

*"99/4A Products to Rave About"*

**99XT KEYBOARD**

**INTERFACE CARD**

**INSTALLATION AND OPERATING MANUAL**



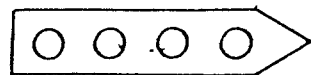
HAZARDOUS VOLTAGES ARE EXPOSED INSIDE CONSOLE WHEN ENERGIZED. TURN OFF SYSTEM AND REMOVE POWER SUPPLY CORD BEFORE BEGINNING.

NOTE

Optional LOAD/RESET features should not be installed until after the RAVE 99 keyboard interface has been installed using the procedure below and operationally tested.

NOTE

According to TEXAS INSTRUMENTS, some of the older 99/4A consoles have a "keyed connector" in the power cable between the power supply board and the main board. If your computer has this type of connectors, you will need an adapter kit to connect the interface board to your computer. RAVE 99 will supply this adapter kit FREE OF CHARGE. RAVE 99 will send the kit promptly upon notification of need.



"KEYED CONNECTOR"

- 1) On black consoles, remove the ON/OFF switch by gently prying it away from the console.
- 2) Place the console "bottom up" and remove the phillips head screws (1 thru 7) from the bottom cover. See FIG 1. Place the screws aside for reinstallation. Remove the bottom cover and set aside.

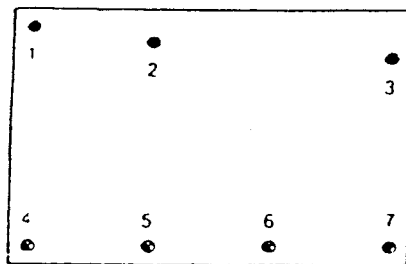


Figure 1  
BOTTOM VIEW

- 3) Remove and save screws securing power supply board. Disconnect the cable going to the main board and set power supply board aside. See FIG 2.
- 4) Remove screws (1,2, and 3 only) securing main shielded circuit board (motherboard) and screws securing keyboard and set aside. See FIG 2. The main board and keyboard should remain in place.

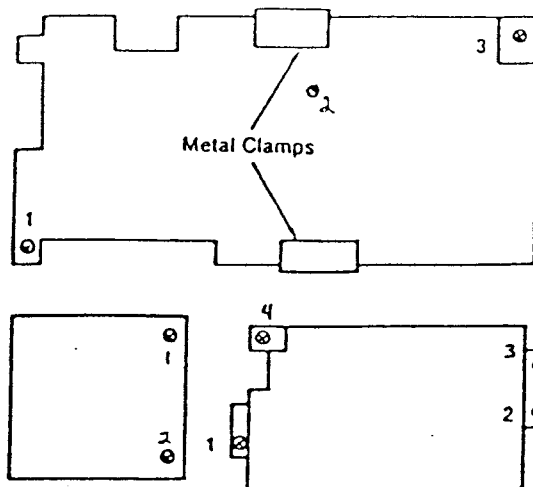


Figure 2  
BOTTOM VIEW

- 5) Place console bottom cover back to its original position. Grasp both top and bottom covers of the computer and place console such that the top cover is up. Remove the console top cover and set aside.

NOTE: If installing the optional console cover, the cover posts should be installed per kit instructions prior to this next step.

- 6) Unplug the 15 pin connector between the TI keyboard and main board, then remove the TI keyboard. Place the RAVE 99 Interface card in the same position as the original TI keyboard and plug the 15 pin connector onto the main board.
- 7) Plug the four wire power cable connector from the main board to the connector on the RAVE 99 interface card marked JC3. Route any excess cable length over the main board shield. See FIG. 3.

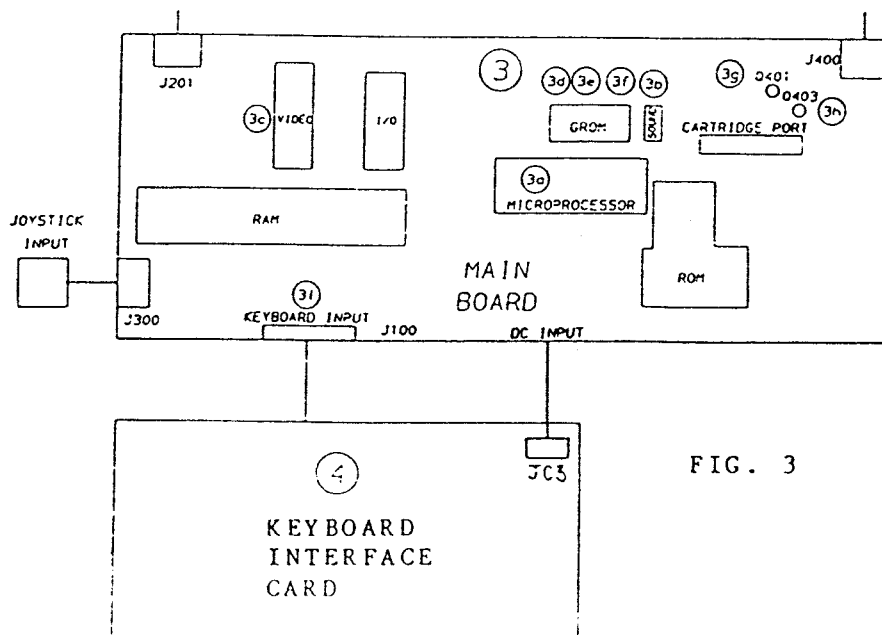
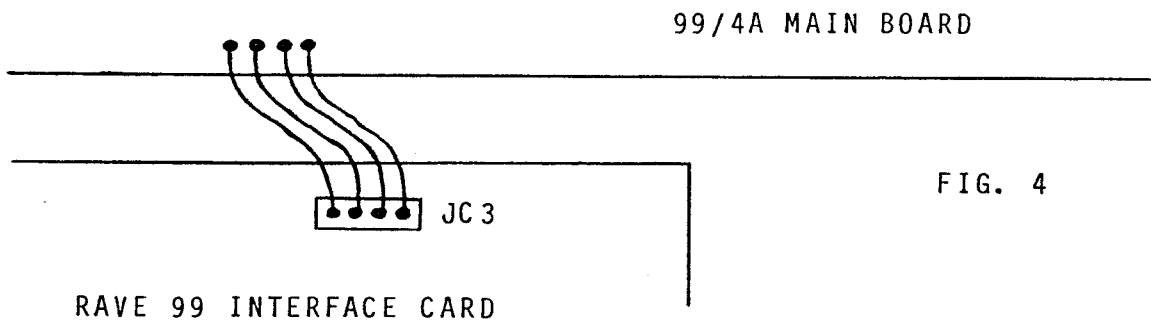


FIG. 3

WHEN CONNECTED CORRECTLY, THE RIGHT HAND WIRE ON THE CONNECTOR ATTACHED TO THE KEYBOARD INTERFACE SHOULD ALSO BE THE RIGHT MOST WIRE ON THE MAIN BOARD. SEE FIG. 4.

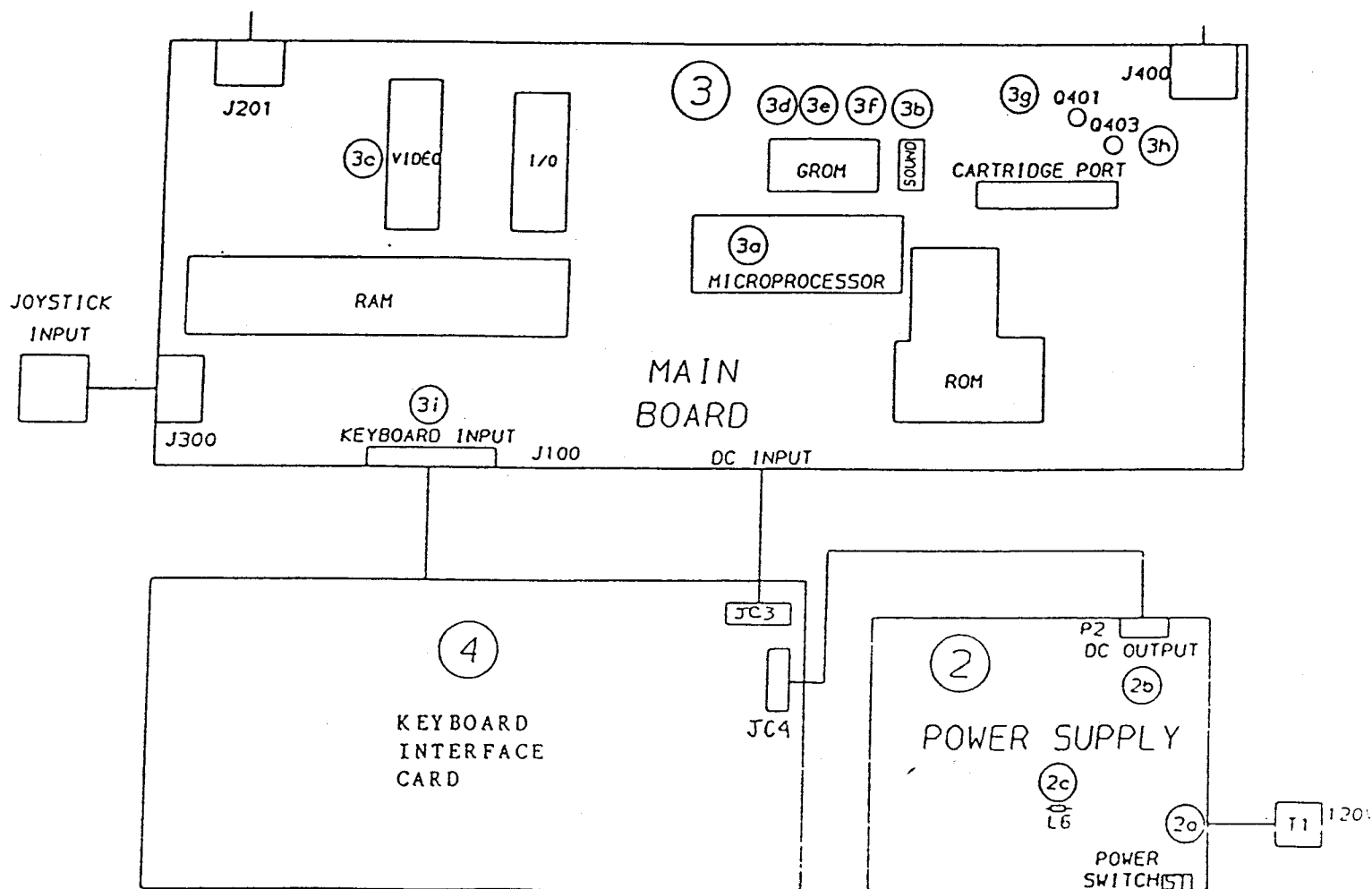


- 8) Place the console top cover in place and again place the console "bottom side" up. Remove the console bottom cover and secure the motherboard and RAVE 99 Keyboard interface card using the screws removed earlier.
- 9) Plug the free end of the RAVE 99 power cable to the POWER SUPPLY board.

- 10) Secure power supply board in console with screws removed earlier. Ensure the ON/OFF switch adapter is properly engaged with the switch.
- 11) Reassemble console bottom cover with the top cover and secure with the remaining screws. On black consoles insert the ON/OFF switch operator. AT THIS POINT, THE ONLY PART OF THE ORIGINAL CONSOLE LEFT SHOULD BE THE TI KEYBOARD.

At this point, your wiring should be the same as shown in FIG. 4.

FIG. 4 FINAL CONNECTION DIAGRAM



- 12) To prevent possible damage to other equipment if a wiring error has been made, it is suggested that the computer be energized without peripherals attached for the first time.

\*\*\*\*\*  
KEYBOARD LAYOUT  
\*\*\*\*\*

This section describes how to use a PC/XT compatible keyboard with your 99/4A computer. It is easy to do after taking a few minutes to read the descriptions of the differences between a PC/XT type keyboard and the standard 99/4A listed below.

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ALT - This key performs the same function as the 99/4A FCTN key when used with letters, numbers, and punctuation symbols found on that keyboard. The numbers on the number pad portion of the key board may be used with the ALT key.

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CLRL - This key works the same as on the 99/4A keyboard. The number pad keys may also be used with the CTRL key.

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CAPS LOCK - This key works the same as the ALPHA LOCK key except that it does not interfere with joystick operation when engaged. The indicator light (if provided) is on when the interface card is in the CAPS LOCK mode. You can obtain lower case letters without leaving the CAPS LOCK mode by pressing the SHIFT key and the desired letter. In addition to shifting all letters to upper case, the 99XT also places the often used double quote (") into the unshifted key position for convenience in the command mode. The single quote (') becomes the SHIFTED character in this case.

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NUM LOCK - This key determines the operating mode of the keys on the keyboard cursor control/number pad. When the NUM LOCK is off (indicator light off if provided) the keys perform their cursor control functions as follows:

ARROW KEYS(2,4,6,8)	CURSOR DIRECTION(FCTN+S,D,E,X)
HOME(7)	TI WRITER"HOME"(CTRL+L)
PG UP(9)	TI WRITER"ROLL UP"(FCTN+6)
PG DN(3)	TI WRITER"ROLL DOWN"(FCTN+4)
INS(0)	INS CHAR(FCTN+2)
DEL(.)	DEL CHAR(FCTN+1)

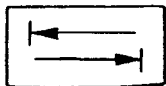
When the NUM LOCK is on, the keys act as a number pad.

The NUM LOCK mode may be temporarily reversed without operating the NUM LOCK key by using the SHIFT key. For example, with NUM LOCK ON, the cursor may be moved left by pressing SHIFT and the number pad "4" key (left arrow).

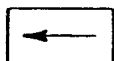
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SCROLL LOCK - Ignore the word "lock". This key scrolls the screen to the right or "windows" (FCTN+5) when using TI WRITER.

PRT SC - (PRINT SCREEN) This key returns a Print Catalog command (FCTN+P) when used with the MYARC disk controller and software. To print press SHIFT and PRT SC. To abort(FCTN+4), press PRT SC.



TAB/BACK TAB - This key returns a TAB(FCTN+7) when pressed and a BACK TAB(CTRL T) when pressed with SHIFT when using TI WRITER, EDITOR/ASSEMBLER or compatible software.



BACKSPACE - This key returns a FCTN+S to move the cursor to the left.

FUNCTION KEYS (F1 through F10) These provide the following functions:

\* One key entry of 99/4A FCTN+1 through FCTN+0 commands. For example, F5 is the same as FCTN+5 on the 99/4A

\*When SHIFTed, inputs 99/4A CTRL+1 through CTRL+0 commands. Pressing SHIFT and F4 returns CTRL+4.

\*When used with the CTRL key returns the following special inputs:

CTRL + F1	RESERVED
CTRL + F2	FCTN+SHIFT+P (FAST TERM)
CTRL + F3	FCTN+SHIFT+T (FAST TERM)
CTRL + F4	FCTN+SHIFT+X (FAST TERM)
CTRL + F9	MISSING KEY #1
CTRL + F10	MISSING KEY #2

See the MISSING KEYS portion of the manual for explanation of missing key codes.

\*When used with the ALT key provides the following functions when optional user installed wiring is attached:

ALT + F1	LOAD INTERRUPT
ALT + F9	COMPUTER RESET

```
*****
*
* CAUTION - USE OF THE LOAD INTERRUPT WITHOUT PROPER SOFTWARE
*           CAN CAUSE THE COMPTER TO LOCK UP. THE COMPUTER RESET
*           WILL OCCUR AT ANY TIME THE ALT AND F10 KEYS ARE
*           PRESSED. POSSIBLE LOSS OF DATA MAY OCCUR.
*
*****
```

\*\*\*\*\*  
99XT INTERFACE OPERATION  
\*\*\*\*\*

1) Select a convenient location for the computer console which will still be used for all other non-keyboard functions. Connect your system up in the normal manner.

2) Provide an IBM PC/XT compatible keyboard for use with the 99XT interface. The keyboard must have a 5 pin "DIN" connector on the cord to plug into JC2 on the card. The modular (phone type) connector found on the portable version of the PC will not work without modification. Information on pinout of these connectors is widely available.

3) Though not mandatory for operation, it is recommended that a keyboard with status indicators ( LED, etc.) for the CAPS LOCK and NUM LOCK keys be used.

4) The keyboard cable is connected to the interface card at connector JC2. If the optional console cover is being used, the keyboard cord connector can be plugged into JC2 directly through the large hole in the cover.

\*\* Care should be taken to prevent the keyboard cable from being pulled hard while connected to the interface card. Damage to the card may result.

5) When first turning on your computer, press the ESCape key at the prompt to press any key. Now normal keyboard procedures may be followed.

\*\*\*\*\*  
\*  
\* IT IS IMPORTANT TO PRESS THE ESC KEY AFTER POWER UP TO ENSURE \*  
\* PROPER OPERATION OF THE INTERFACE CARD. \*  
\*  
\*\*\*\*\*



## Missing Keys

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The original TI keyboard had more key code capacity than they had actual keys. The RAVE 99 keyboard takes advantage of these unused MISSING keys by returning their key codes for your use. You can be confident that these keys are truly unused key codes that have never been used in a program up to now. We have called these keys MISSING Key 1 and MISSING key 2.

These keys are generated by the following:

MISSING KEY 1 - Ctrl + F9

MISSING KEY 2 - Ctrl + F10

## DETECTION OF MISSING KEYS

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### BASIC or X BASIC programs

Only MISSING key 1 is available in these programs and is detected by a -1 in the "return variable" when using the CALL KEY subprogram.

### ASSEMBLY LANGUAGE programs

In this language both MISSING keys are available for use.

Below is a segment of ASSEMBLY code to detect each of the missing keys.

NOTE! THIS IS NOT A COMPLETE PROGRAM, ONLY AN EXAMPLE.

```
MIS1      EQU 6          DISPLACEMENT FOR MISSING KEY 1
MIS2      EQU 10         DISPLACEMENT FOR MISSING KEY 2
```

```
MSG1      TEXT 'MISSING KEY 1'
CLRLN     TEXT '      '
```

```
CHECK1    CLR R12        POINT TO KEYBOARD
          TB MIS1        TEST FOR MISSING KEY 1.
          JEQ BLANK      BRANCH IF NOT PRESSED.
          LI R0,32+2     SETUP SCREEN POSITION.
          LI R1,MSG1     GET MSG ADR.
          LI R2,9        MSG LENGTH.
          BLWP @@VMBW    DISPLAY IT.
          JMP CHECK1     REPEAT.
```

```
BLANK     LI R0,32+2     SETUP SCREEN POSITION
          LI R1,CLRLN    GET THE "BLANK" LINE ADR.
          LI R2,9        MSG LENGTH.
          BLWP @@VMBW    BLANK THE SCREEN.
          JMP CHECK1     REPEAT.
```

## USER INSTALLED OPTIONS

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NOTICE: THE INFORMATION BELOW PROVIDES THE USER WITH THE TECHNICAL INFORMATION NECESSARY TO INSTALL KEYBOARD CONTROLLED LOAD INTERRUPT AND COMPUTER RESET CAPABILITIES. RAVE 99 MAKES NO CLAIM AS TO THE USERS ABILITY TO SUCCESSFULLY INSTALL THESE FEATURES OR TO THEIR SUITABILITY FOR ANY INTENDED USE.

RAVE 99 WARRANTS ONLY THAT THE FEATURES OPERATE AS INTENDED BY RAVE 99 WHEN CORRECTLY INSTALLED. THE USER ASSUMES ALL RISK ASSOCIATED WITH MAKING PHYSICAL ALTERATION OF THE MAIN COMPUTER BOARD.

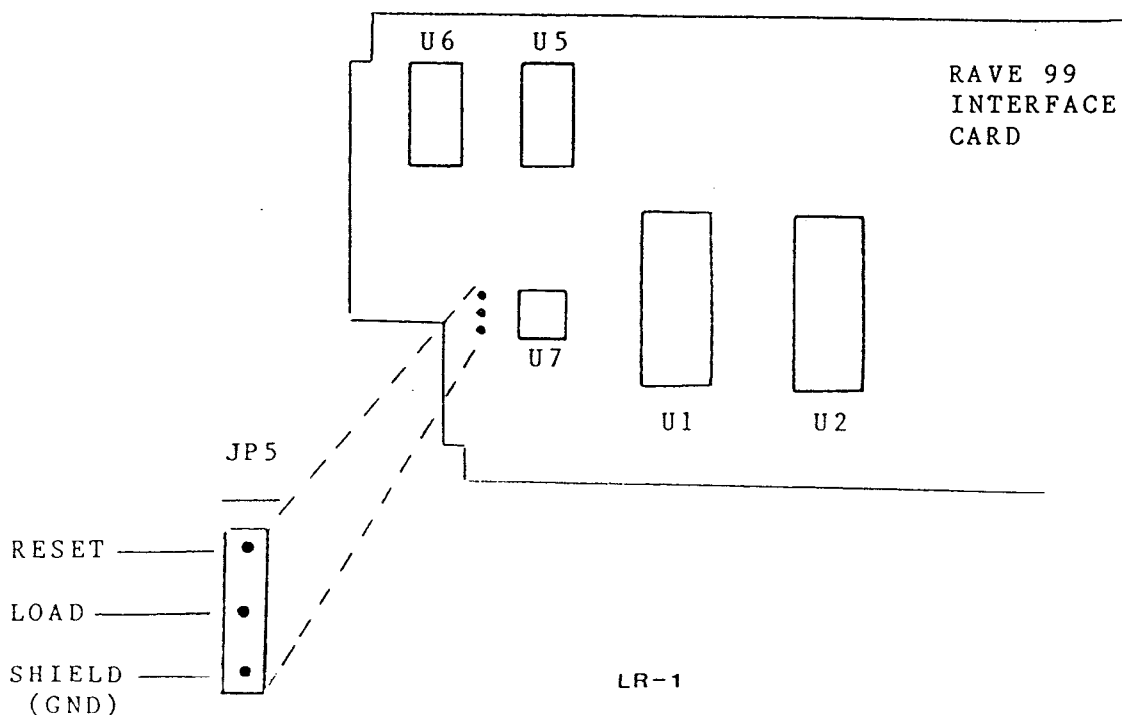
The diagrams below show the correct circuit points for connection of the LOAD and RESET features. Also provided are suggested physical connection points that have been tested by RAVE 99. For information on use of these features, see the ALT key description in the LAYOUT section of the manual.

\*\* An installation kit is available from RAVE 99 which includes a connector for the interface card connected to a ready to solder harness of proper length. The LOAD/RESET KIT can be obtained directly from RAVE 99.

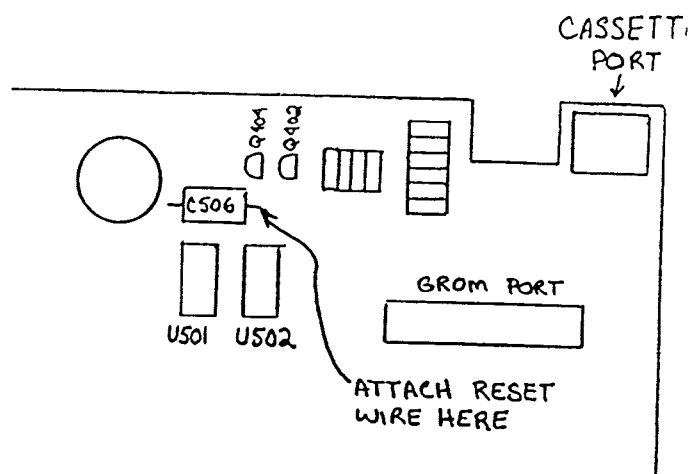
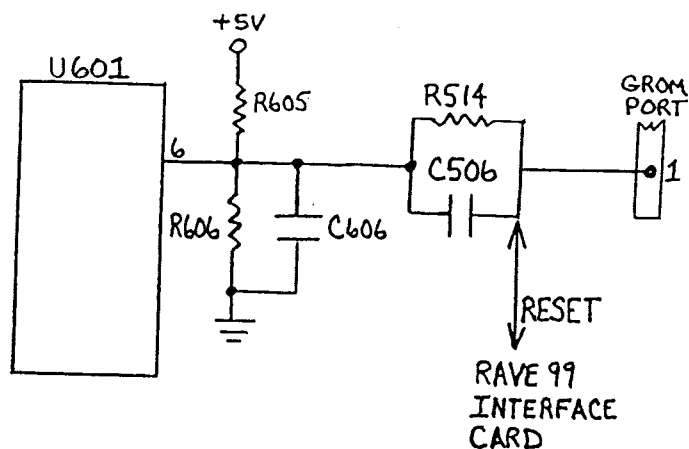
NOTE: installation of the RESET feature disables the automatic RESET that normally occurs when inserting a module with the computer energized. It may be necessary, depending on application, to perform a RESET from the keyboard after inserting a module.

### INTERFACE CARD CONNECTION

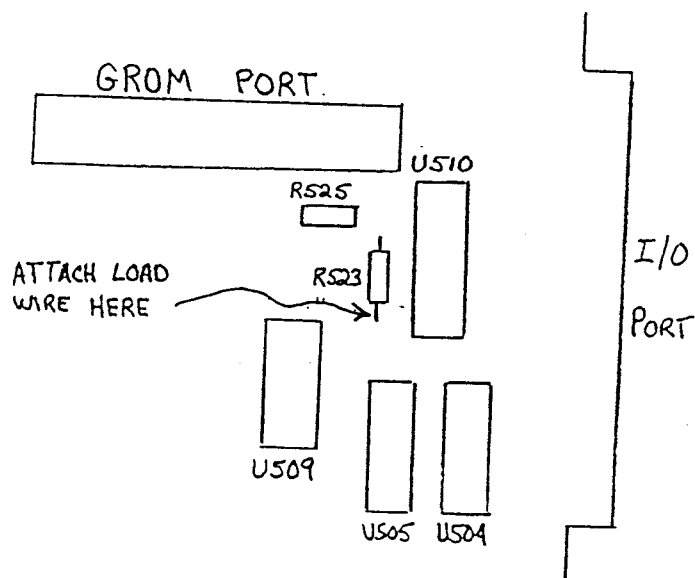
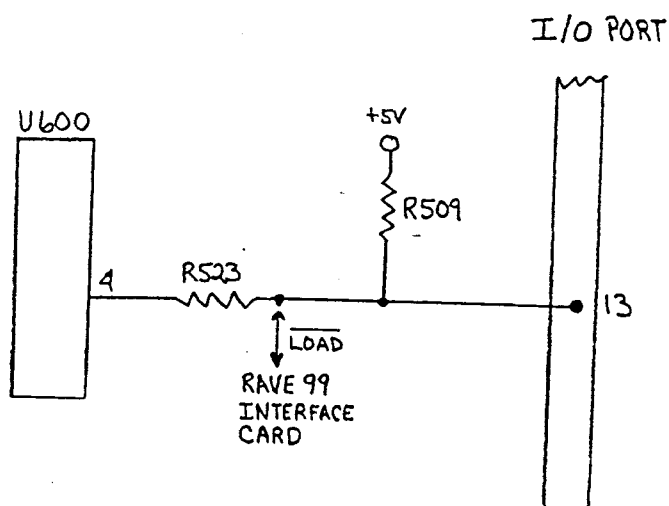
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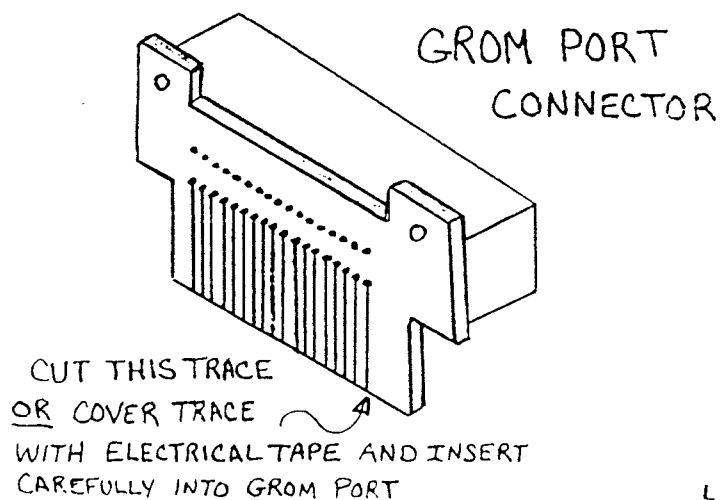
## RESET CONNECTION



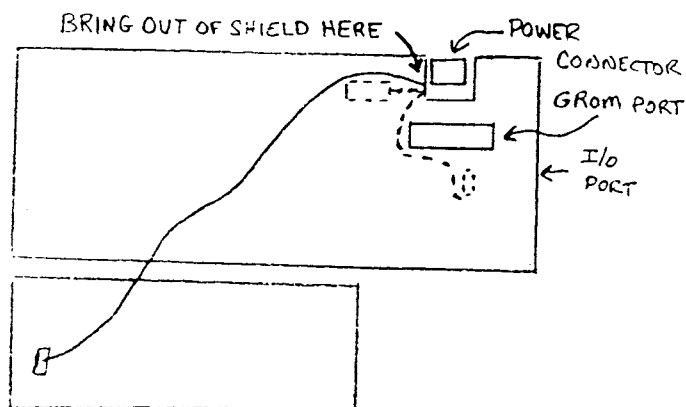
## LOAD INTERRUPT CONNECTION



## GROM PORT CONNECTOR MODIFICATION



## CABLE ROUTING



### THREE-MONTH LIMITED WARRANTY

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This RAVE 99 KEYBOARD ENHANCEMENT Warranty Extends To The Original Consumer Purchaser of the Accessory.

### WARRANTY DURATION

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This KEYBOARD ENHANCEMENT is Warranted for a period of three(3) months from the date of the original purchase by the consumer.

### WARRANTY COVERAGE

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This KEYBOARD ENHANCEMENT is Warranted against defective materials or workmanship. THIS WARRANTY IS VOID IF THE ACCESSORY HAS BEEN DAMAGED BY ACCIDENT, UNREASONABLE USE, NEGLIGENCE, IMPROPER SERVICE OR OTHER CAUSES NOT ARISING OUT OF DEFECTS IN MATERIALS OR WORKMANSHIP.

### WARRANTY DISCLAIMERS

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ANY IMPLIED WARRANTIES ARISING OUT OF THIS SALE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE ABOVE THREE-MONTH PERIOD. RAVE 99 SHALL NOT BE LIABLE FOR LOSS OF USE OF THE HARDWARE OR OTHER INCIDENTAL OR CONSEQUENTIAL COSTS, EXPENSES, OR DAMAGES INCURRED BY THE CONSUMER OR ANY OTHER USER.

Some states do not allow the exclusion or limitation of implied warranties or consequential damages, so the limitations or exclusions may not apply to you in these states.

### LEGAL REMEDIES

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This warranty gives you specific legal rights, and you may have other rights that vary from state to state.

### WARRANTY PERFORMANCE

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During the above three month period, your Keyboard Enhancement will be repaired or replaced with a new or recoditioned unit of the same or equivalent model(at RAVE 99's option) when the unit is returned by prepaid shipment to RAVE 99 at the address below. The repaired or replacement unit will be warranted for three months from the date of repair or replacement. Other than the postage requirement, no charge will made for repair or replacement of in-warranty units.

RAVE 99 strongly recommends that you insure the unit for value prior to shipping.

SHIP TO :

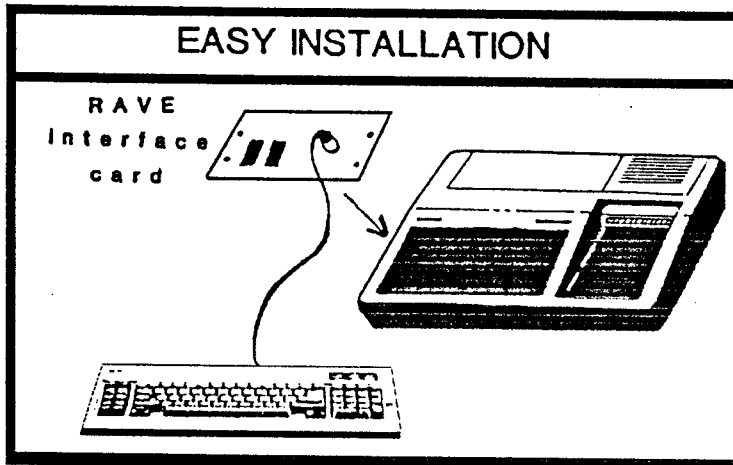
RAVE 99 CO.  
112 RAMBLING ROAD  
VERNON, CT. 06066

## RAVE 99 CO. PRODUCT INFORMATION

## IBM Style Keyboard Interface Card 99XT

### PC Keyboard Interface

Our Model 99XT Interface Card installs in the 99/4A console in place of the old keyboard. Only a screw driver is the only tool needed for installation. Comes with clear step by step instructions. NO Soldering required.



The Model 99XT Interface Card allows use of any IBM PC/XT compatible keyboards with your 99/4A. The Interface Card supports all 83 standard PC/XT key codes. Keyboards that "Auto" select between an XT and AT compatible computers will not work. A switch selectable XT/AT keyboard is compatible.

#### Key Assignments

##### Function Keys

The Model 99XT Interface Card provides single key-press operation for the TI 2-key press combination "FCTN-0" through "FCTN-9".

##### Cursor Keys

The Model 99XT provides single key press operation for the TI-2 key press combination "FCTN-E", "FCTN-S", "FCTN-D", and "FCTN-X"

##### Page Keys

The Model 99XT provides single key press operations for the following TI 2 key press combination:

PAGE - UP (FCTN-6), Page-Down (FCTN-4)

Home (CTRL-L)

#### Other Keys

The Model 99XT provides single key press operation for the following TI 2 Key press Combinations:

[ (FCTN-R) ] (FCTN-T) ' (FCTN-O) \ (FCTN-Z) ' (FCTN-C)

TAB (FCTN-7) BACK TAB (CTRL-T) BACK-SPACE (FCTN-S)

Optional user installed Computer Reset and Load Interrupt capability from the keyboard. Complete instructions included.

### Model 99XT Available in KIT form

Same features as above but you save by building it yourself. Kit includes printed circuit board, complete instruction manual, and RAVE 99 custom chips. Hard to find parts such as connectors and cables are also included. Requires only assembly and between \$10.00 to \$15.00 in easy to find components to complete.

### Keyboard Options

#### Custom Cover Kit

This option covers the opening left by removing the old keyboard. Protects interface electronics from damage and also gives a finished look to your console.

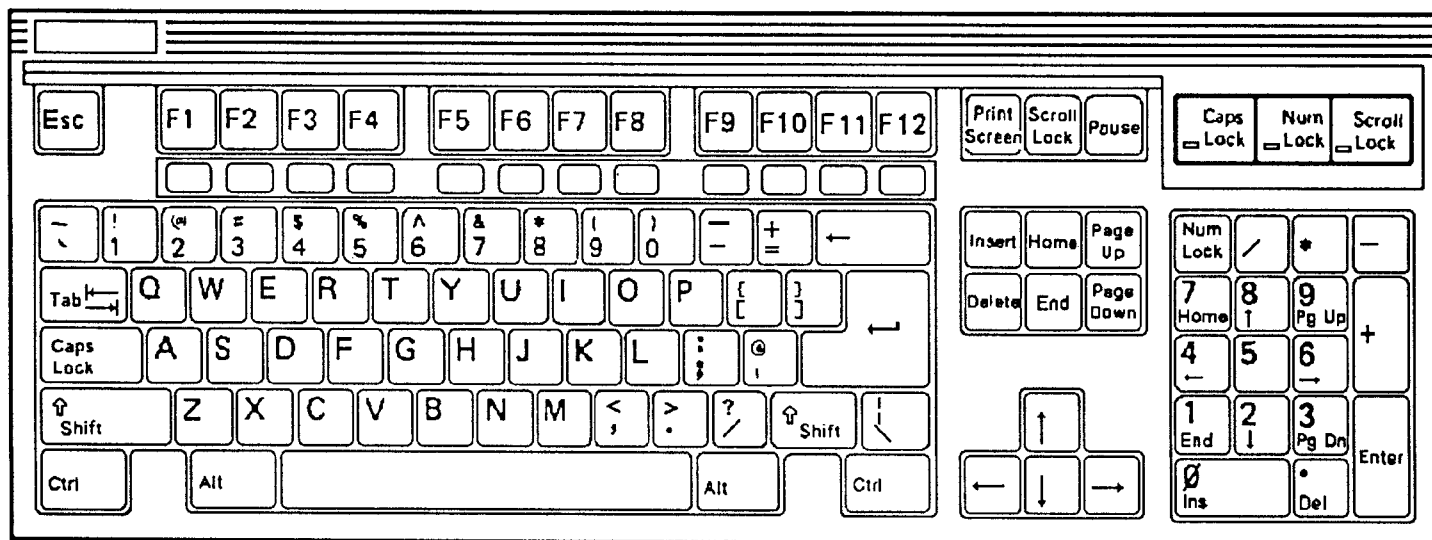
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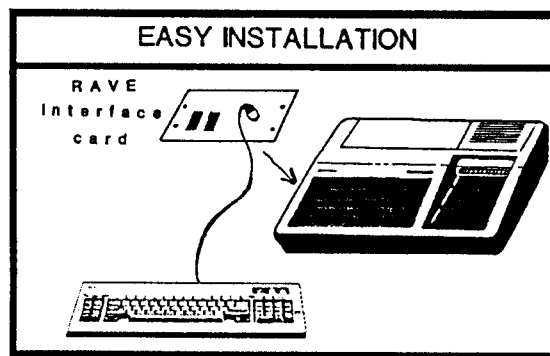
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## IBM Style Keyboard Enhancement XT/101

The New RAVE 99 Keyboard Enhancement allows you to connect an IBM style keyboard to your TI-99/4A! The full size keyboard eliminates the awful contortions required when using the original keyboard. This system includes both the Interface Card and our Model XT/101 Keyboard shown below. Get full-featured key layout with 101 keys and dedicated numeric keypad with numeric operators PLUS these additional great features:



- 1) Interface Logic Card Installs easily in console without soldering. A screwdriver is all that is required.
- 2) 101Key IBM Style Enhanced Keyboard with 12 function keys across the top. Same as the TI-99/4A.
- 3) Supports single key entry of most TI-Writer, Multiplan, and Editor/Assembler commands.
- 4) Attractive low profile keyboard with adjustable tilt angle, Mechanical Tactile/Click Key Swithes, Double Injected Key Caps, and 5 ft. cord.
- 5) Dedicated numeric keypad with numeric operators.
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- 9) Keyboard comes with a hinged Dust-Proof Cover which also serves as a paper holder. It is also removable.
- 10) Keyboard is XT/AT switchable which allows operation with the TI-99/4A (XT mode) or with an IBM style computer system (AT mode).
- 11) CAPS LOCK, NUM LOCK & Scroll Lock LED Indicators provide immediate keyboard status.
- 12) A Caps Lock key which does not interfere with joystick operations. Makes running games and graphics programs much friendlier.
- 13) Optional User installed Computer RESET and LOAD INTERRUPT capability from the keyboard. Avoids turning your computer OFF & ON each time a program decides to hang. This feature prolongs the life of your system by avoiding damaging power cycling of your computer equipment.
- 14) Detailed Installation and Operating Instruction Manuals included.
- 15) 90 Day Warranty

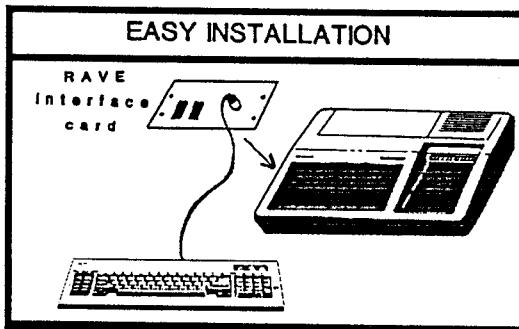


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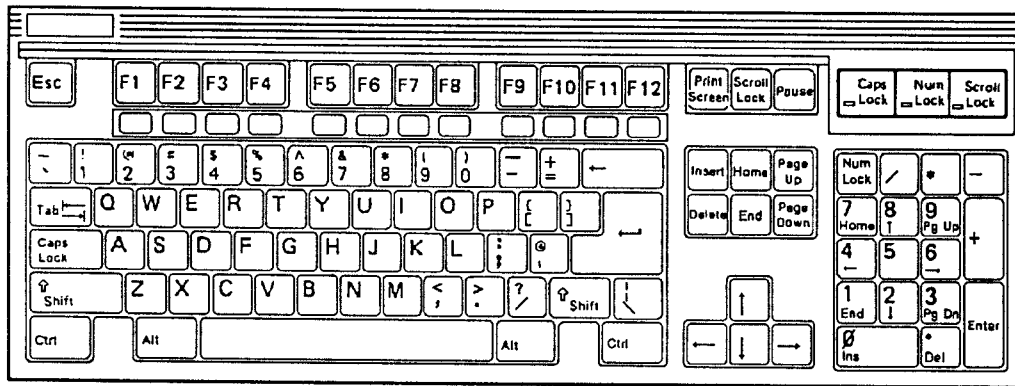
112 Rambling Road, Vernon CT 06066  
With RAVE, the Future is now!

(203) 871-7824

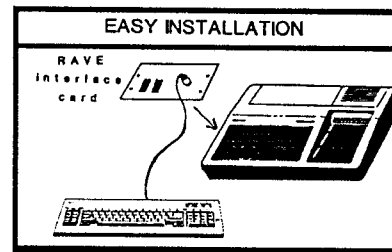
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With RAVE, the Future is now!

(203) 871-7824



# RAVE 99

112 RAMBLING ROAD  
VERNON, CT 06066

RAVE 99 LOAD/RESET CABLE

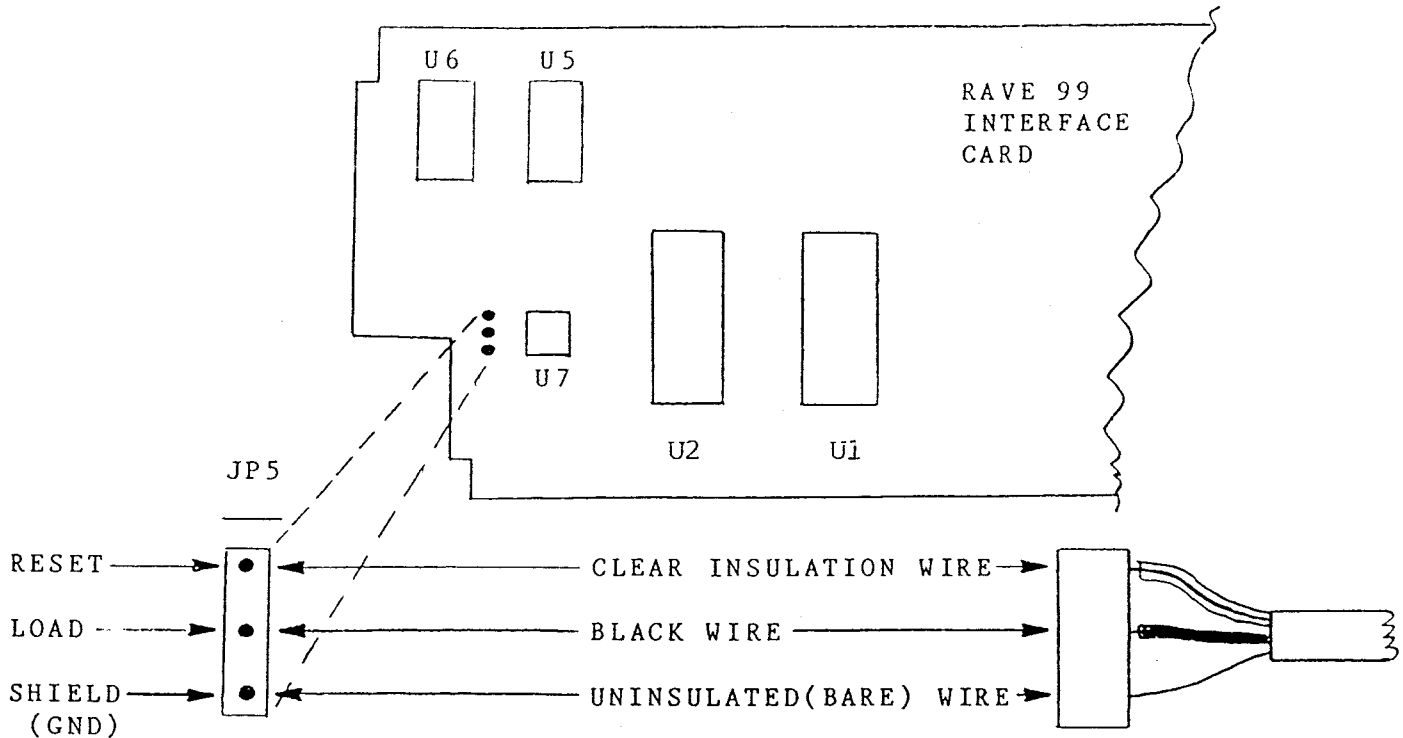
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INCLUDES: ONE PREASSEMBLED CABLE  
CUT TO LENGTH, WITH CONNECTOR  
AND INSTALLATION INSTRUCTIONS.

## RAVE 99 LOAD/RESET CABLE INSTALLATION

Refer to the RAVE 99 Keyboard Enhancement Manual for details on connecting the free ends of the cable to the computer console. THE USER ACCEPTS ALL RESPONSIBILITY FOR MODIFICATIONS TO THE MAIN CIRCUIT BOARD. RAVE 99 claims only that the circuit will work as intended when correctly installed.

### INTERFACE CARD CONNECTION



## INFORMATION TO USERS

**WARNING:** This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of part 15 of FCC Rules. Only computer and peripherals (computer Input/Output devices, terminals, printers, etc.) certified to comply with the class B limits may be attached to this keyboard. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient the receiving antenna
2. Relocate the computer with respect to the receiver
3. Move the computer away from the receiver
4. Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the FCC helpful:

"How to Identify and Resolve Radio-TV Interference Problems"

This Booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402-Stock No. 004-000-00345-4.

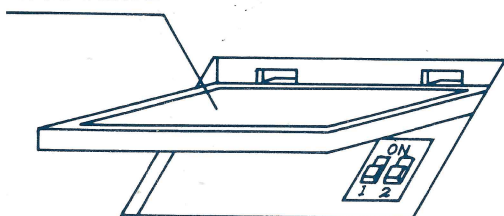
**NOTICE:** In order to insure continued compliance to the FCC emission limits for this keyboard, it is necessary to use computer and I/O cables which are shielded. The shield must be terminated to the metallic cabinet at both ends to guarantee adequate suppression of undesirable emissions.

# FK-2001/2 KEYBOARD

## Quick-Reference Card

## SETTING DIP SWITCH

LOGO PLATE



The dip switch is located under the logopad. This switch allows you to set the keyboard for the following options.

\*If your computer is a PC/XT or 100% PC/XT compatible, or a European version of the PC/XT, set both "1" and "2" on ON.



\*If your computer is a PC/EXT or 100% PC/EXT compatible, or an american version of the PC/EXT, set "1" on ON and "2" on OFF.



\*If your computer is an AT or 100% AT compatible, set "1" on OFF and "2" on ON.

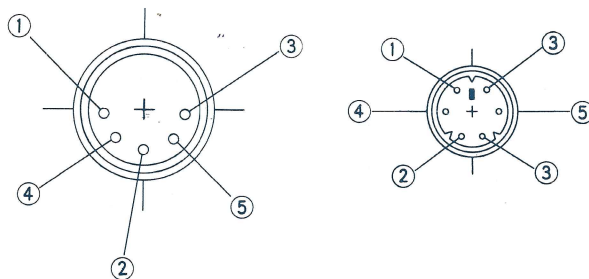


\*If your computer is an EAT, PS/2 or 100% compatible, set both "1" and "2" on OFF.



## PLUG PIN CONNECTION DIAGRAM

The keyboard cable connects to the system board through a 5 pin DIN plug or 6 pin MINI DIN plug. The following figure lists the connector-pins and their signals:



## POWER SOURCE

Pin No.	Signal Name	Pin No.	Signal Name
1	Clock	4	Gnd
2	Data	5	+5V
3	Spare		

## ASSIGNMENT

Voltage	Current
+5V $\pm$ 5%	500mA (max)

## ONE YEAR WARRANTY

We shall offer service for our products one year from date of delivery. Also we will be glad to supply parts for replace by yourself if necessary.