

IRM-517

INSTALLATION GUIDE

for the

HEATH/ZENITH 88, 89 AND 90 DIGITAL COMPUTERS

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KRES Engineering
P.O. Box 17328
Irvine, CA. 92713

LIMITED 90 DAY WARRANTY

KRES Engineering warrants this product to be free from defects in materials and/or workmanship for a period of 90 days.

In the event of a malfunction or other indication of failure attributable directly to faulty workmanship and/or material, KRES will, at its option, repair or replace the defective part or parts to restore this product to proper operating condition. Return of this product is subject to the issuance of a RETURN MERCHANDISE AUTHORIZATION NUMBER by KRES Engineering. This RMA number must be clearly marked on the outside of the package. Return the product postage paid to KRES Engineering at P.O. Box 17328, Irvine, California 92713 "Attention Warranty Claims Department". All repairs and/or replacements shall be rendered by KRES without charge for parts or labor when the product is returned within the specified period of the date of purchase. This warranty applies only to the original purchaser.

This warranty will not cover the failure of KRES products which at the discretion of KRES, shall have resulted from accident, abuse, negligence, alteration, or misapplication of the product. While every effort has been made to provide clear and accurate technical information on the application of KRES products, KRES assumes no liability in any events which may arise from the use of said technical information.

Our warranty does not cover and we are not responsible for damage caused by misuse or fire or unauthorized modifications to or uses of our products for purposes other than advertised. Our warranty does not include reimbursement for customer assembly, disassembly, set-up time, or unauthorized repairs.

This warranty is in lieu of all other warranties, expressed or implied, including warranties of mercantability and fitness for use. It is not extended to allied equipment or components used in conjunction with these products. IN NO EVENT WILL KRES ENGINEERING BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING FROM OR IN ANY WAY CONNECTED WITH THE USE OF ITS PRODUCTS. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

IMPORTANT: Proof of purchase necessary for products returned for repair under warranty. Before returning any product please call our customer service department for a return authorization number.

INTRODUCTION

The IRM-517 (IC Replacement Module) is a 1 inch by 1 inch printed circuit module designed to plug into IC socket number 517 on a Heath/Zenith 89-90 series of computers. When installed, the cable and module will route the upper three most address lines (A13, A14 and A15) as well as memory request (MREQ) up to the KRES Expansion (EXP-700). For a more detailed explanation of uses for these signals see the EXP-700 users guide.

It is the assumption of this manual that this module is only being installed in systems already containing a KRES Expansion (EXP-700).

IRM-517 INSTALLATION INSTRUCTIONS

BEFORE PROCEEDING MAKE SURE THAT YOU HAVE REMOVED THE LINE CORD FROM THE AC OUTLET TO PREVENT HAZARD OF ELECTRICAL SHOCK

CABINET REMOVAL

() Disconnect the computer line cord from the AC outlet.

Refer to Pictorial 1 and 1A to remove the cabinet shell from the rest of the computer.

() Insert the blade of a small screwdriver in the latch plate, and slide as shown in the inset drawing.

() Repeat this for the latch plate on the other side.

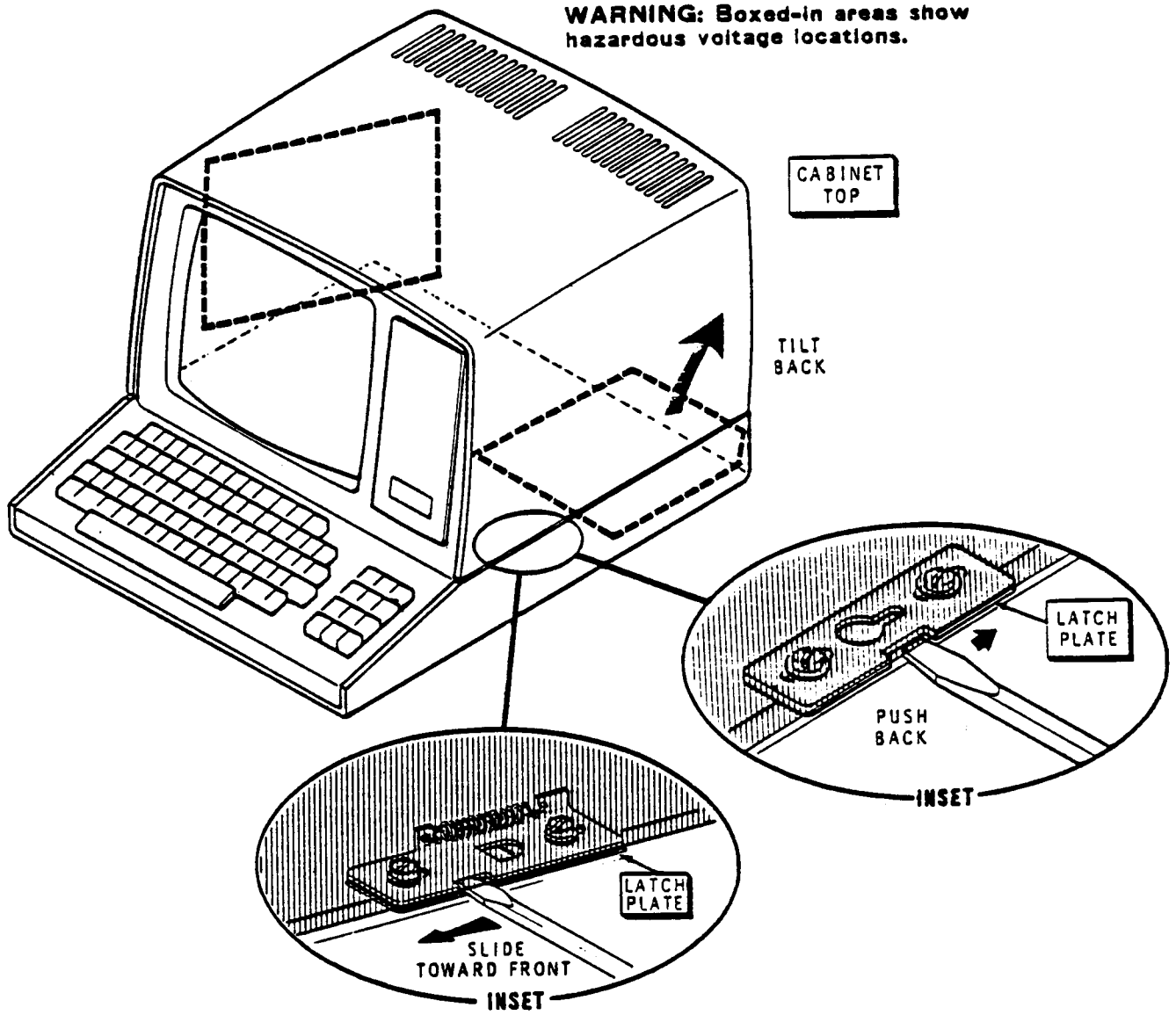
() Carefully tilt the cabinet back.

() Unplug the fan. Your new fan will plug into this cable later.

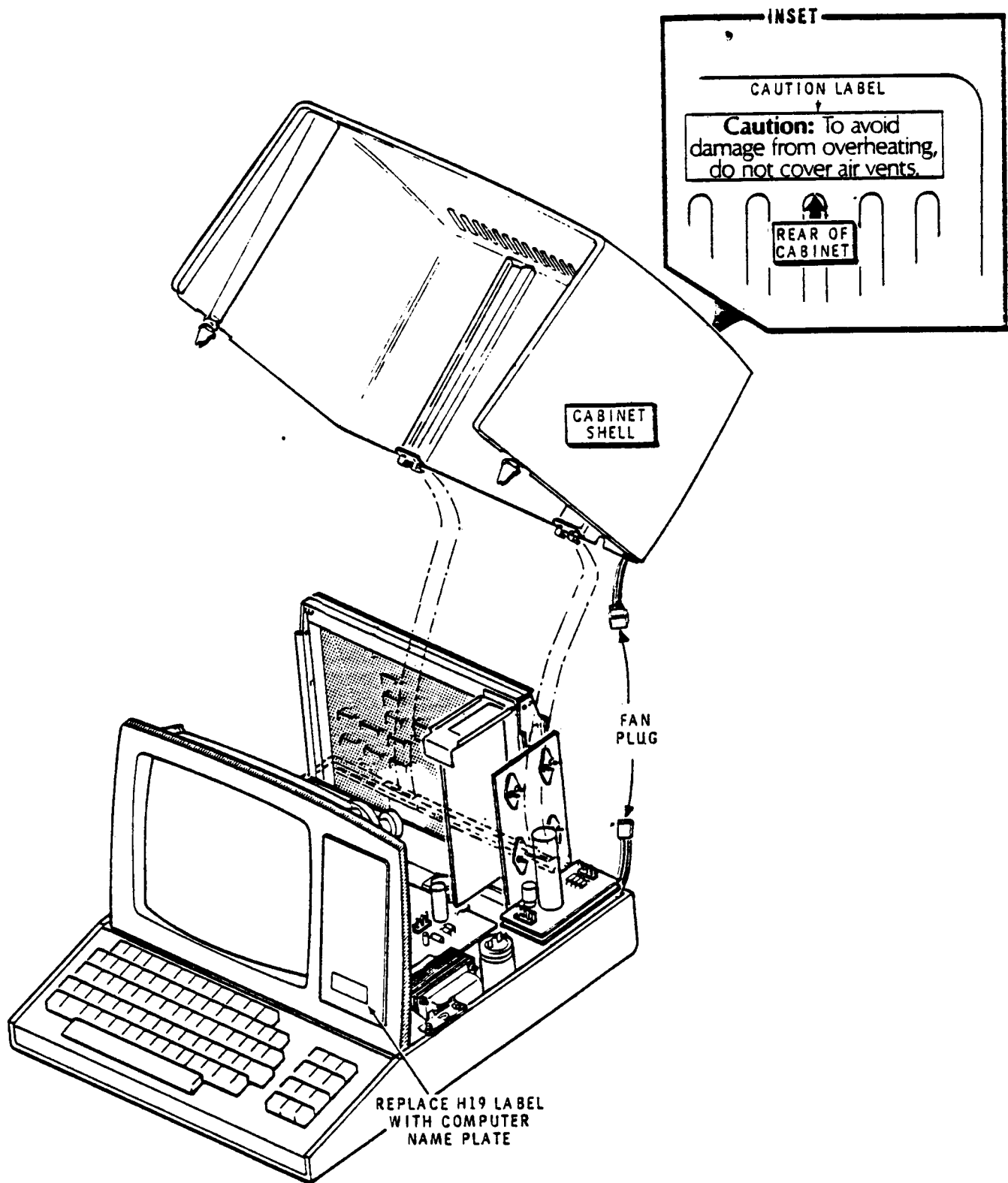
() Remove the lid.

() Set the cabinet shell aside.

WARNING: Boxed-in areas show hazardous voltage locations.



PICTORIAL 1



PICTORIAL 1A

CPU CARD REMOVAL

BEFORE PROCEEDING MAKE SURE THAT YOU HAVE REMOVED THE LINE CORD FROM THE AC OUTLET TO PREVENT HAZARD OF ELECTRICAL SHOCK

Refer to Pictorial 2 to remove the CPU card from the computer in the following steps.

() Remove all the accessory cards from the computer and set them aside. Be sure to mark all connecting cables for easy reinstallation.

() Remove the two screws that hold the CPU card in place and set them aside.

BE SURE TO MARK ORIENTATION AND LOCATION OF ANY PLUGS YOU MUST REMOVE FROM THE CPU CARD OR ACCESSORY BOARDS SO YOU MAY REINSTALL THEM PROPERLY LATER. MANY OF THE CABLES LOOK ALIKE. BE CERTAIN TO MARK WHERE THEY BELONG AS WELL AS THEIR PROPER ORIENTATION. (USUALLY NOTING THE COLOR OF THE WIRE ON ONE END OF THE CABLE AND ITS PLACEMENT ON THE CONNECTOR IS SUFFICIENT TO REORIENT THE CABLES PROPERLY).

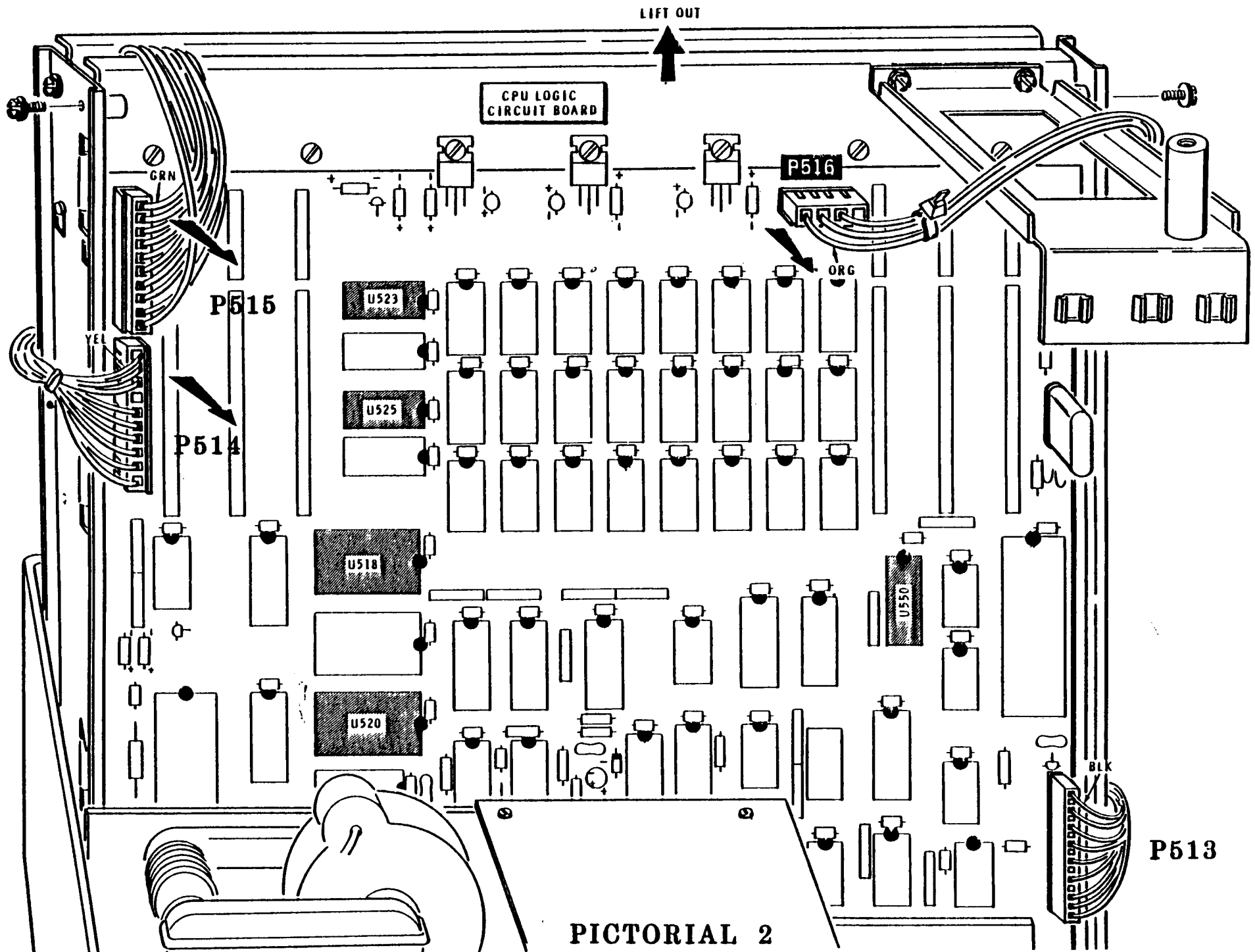
() Unplug P514 and P515 located at along the left edge of your CPU card.

() Unplug P516 along the top edge of your CPU card.

() Slide the CPU card up and out of it's guides.

() Remove P513 along the lower right edge of your CPU.

The CPU card should now be completely removed. Set it flat on a work area.



I. C. HANDLING

CAUTION:

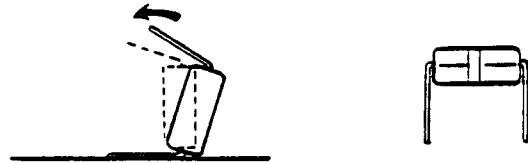
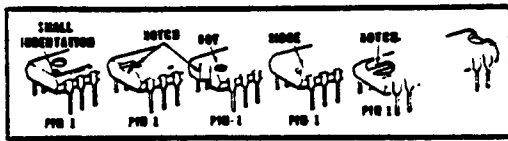
In the following steps you will need to remove and install ICs. To remove an I.C. slip the tip of a small screwdriver under one end of the I.C. and gently pull up. Make sure that all of the pins disengage simultaneously or some of the pins may be bent. If an I.C. removal tool is available, simply grasp the I.C. at each end, squeeze and pull up as shown in pictorial 3 (Inset #1).

To install an IC a few precautions must be taken. The pins on many IC's are bent out at an angle and will not align with a socket. Trying to install an IC without first bending the pins in may damage the IC pins or the socket. To straighten pins on an IC, lay it down on its side and very carefully roll it towards the pins as shown in pictorial 3 to bend the lower pins into place. Turn the IC over and similarly bend the pins on the other side. Before installing the IC in its socket, make sure the pin 1 end of the IC is over the index mark on the CPU board. Make sure all pins are started into the socket, then press firmly. CAUTION: an IC pin can become bent under the IC yet will appear as though it is installed correctly. Pictorial 3 also illustrates the proper installation of an I.C. in its socket.

Some of the I.C.s that you will be handling are sensitive to static electricity. Care should be exercised when handling these parts. Once you are holding one of these parts do not set it down. If you do, then before retouching it place one hand on the workbench first, then pick up the I.C.. This will equalize the static electricity. You will be told when a part to be handled is statically sensitive.

STEP-BY-STEP INSTRUCTIONS

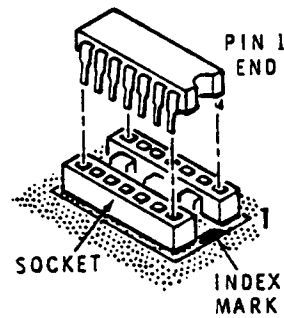
Before you install an IC, lay it down on its side as shown below and very carefully roll it toward the pins to bend the lower pins into line. Then turn the IC over and bend the pins on the other side in the same manner.



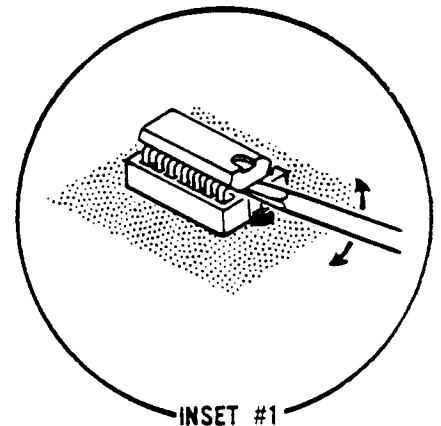
CAUTION: Integrated circuits (IC's) are complex electronic devices that perform many complicated functions in the circuit. These devices can be damaged during installation. Read all of the following information before you install the IC's.

The pins on the IC's may be bent out at an angle, so they do not line up with the holes in the IC socket. **DO NOT** try to install an IC without first bending the pins as described below. To do so may damage the IC pins or the socket, causing intermittent contact.

Make sure that the pin 1 end of the IC is positioned over the index mark on the circuit board (see the detail at the top of this page). Also make sure that all of the pins are started into the socket. Then press the IC firmly into the socket. **NOTE:** An IC pin can become bent under the IC and it will appear as though it is correctly installed in the socket.



PICTORIAL 3



ACTUAL INSTALLATION STARTS HERE

Refer to Pictorial 4 for the next steps.

() Orient the CPU card on the work surface with the metal heat sink away from the table edge.

() Locate IC 517 on the CPU card. It is near the bottom of the card in the center.

() Remove this IC. It should have a white label and be numbered (444-XX).

() Install this IC in the socket on the IRM-517 module. Be sure to properly orient the IC such that the dot or notch on it is next to the label **U517** on the module. **NOTE:** If this IC is installed upside down damage may occur to the computer when power is turned on.

() On the back of the IRM-517 module there is a 20 pin plug. These pins will plug into the now empty socket (U517) on the CPU card. Install the module into this socket with the 8 pin plug on the top of the module pointed to the left.

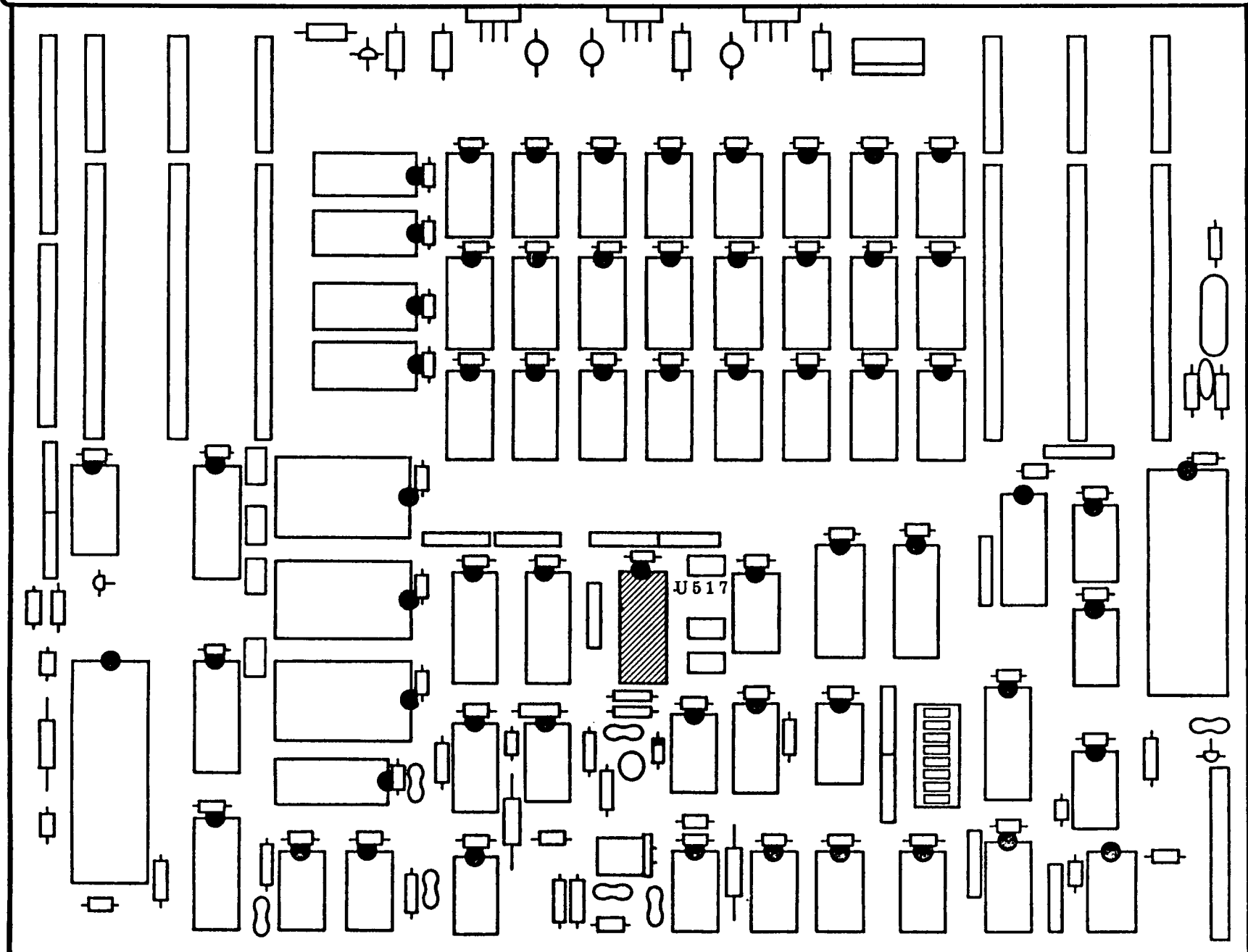
() Locate the cable supplied with the module and plug the large end into the 8 pin plug on the IRM-517 board. There is only one way to orient this plug. This cable may already be installed.

() The small end of the cable should plug onto (P4) on the KRES Expansion (EXP-700). P4 is located along the bottom left edge of the expansion just below U29. There is also only one way to orient this plug.

This completes the installation of the IRM-517 module onto the CPU card.

NOTE: If you have purchased the "KRES Monitor ROM" part number (KMR-100) then now is the best time to install it. Refer to the installation guide supplied with the monitor ROM for instructions. When you have finished installing it, return to this manual and continue with the REINSTALLATION OF THE CPU CARD section on page 9.

PICTORIAL 4



REINSTALLATION OF CPU CARD

You are now ready to reassemble your computer. In the following steps, be certain to reinstall all cables to their original locations with exactly the same orientation as when you removed them.

() Reinstall your CPU card referring back to pictorial 2 if necessary.

() Reinstall P513 along the lower right edge of your CPU. Be sure the black wire is up.

() Begin to slide the CPU card into the plastic guides located on the metal brackets on either side of the machine. (On the non "A" model machines - the H/Z89 or 90 rather than the H/Z89A or 90A - these card guides are not continuous so extra care must be taken to assure that the CPU card does not miss one or more of these supports.

() As you continue to slide the CPU card down into the guides, properly reinstall all connectors to the accessory boards.

() Reinstall the two screws that hold the CPU card in place.

() Reconnect P514 (yellow wire up) and P515 (green wire up) along the left edge of your CPU card.

() Reconnect P516 (orange wire to the left)

Your IRM-517 (IC Replacement Module is now completely installed in your computer and you are now ready to do a final check out and test.

FINAL CHECK OUT AND TESTING

() Verify that all cables and jumpers are connected and configured as stated in the installation section.

() Connect your computer to an AC outlet and turn the power on. It should beep just as before (most units beep twice) followed by the H: prompt on the screen. (NOTE: If you have installed the KRES Monitor ROM (KMR-XXX) then your prompt should read "2 MHz reset" followed by "KE:"). If not, go back and recheck your installation to be certain all steps have been followed properly. Most failures at this stage can be traced to bent under pins, connectors improperly reinstalled or inadvertently pulled loose.

() Disconnect the power cord and perform the remaining steps.

() Reinstall all accessory cards.

() Make one last check of all connectors to be certain they are properly installed and none have been omitted or have pulled loose.

() Refer to Pictorials (1,1A) and reverse the procedure to reinstall the cabinet shell. Do not forget to reconnect the fan cable.

If all of the above steps have been completed then your IRM-517 module is now fully installed in the computer. For details on the uses for the module see the operators guide in the EXP-700 manual.