



ProTrack® Prober

Model IIc, IIIc

USER'S MANUAL

P/N 21-1357
Rev. 3, Feb 2007

Copyright © 2005 Huntron, Inc. All rights reserved.

Huntron, Tracker, ProTrack, Sig Assist and Huntron Access are registered trademarks of Huntron, Inc. All other names are trademarks or registered trademarks of their respective companies.

This document may not be copied in whole or in part, or otherwise reproduced except as specifically permitted under U.S. copyright law, without the prior written consent of Huntron, Inc., 15720 Main Street, Suite#100, Mill Creek, WA, 98012, USA.

Thank you for purchasing a Huntron ProTrack Prober!

Contacting Huntron

To obtain information about service, accessories and other products, contact:

Huntron Inc.
15720 Main Street, Suite#100
Mill Creek, WA 98012
USA

In North America, call 800-426-9265 or 425-743-3171.

Huntron is also accessible by:

- ◆ FAX: 425-743-1360
- ◆ Internet E-mail: info@huntron.com
- ◆ Internet Home Page: www.huntron.com

HUNTRON, INC. LIMITED WARRANTY

Huntron, Inc. believes in the quality of its products. Accordingly, Huntron provides the following non-transferable warranties for the benefit of the original end-use purchaser of the Huntron ProTrack Prober instrument.

Huntron warrants that the Huntron ProTrack Prober hardware shall be free from defects in material and workmanship for one (1) year from the date of purchase.

Huntron warrants that the diskette(s) containing the Huntron Workstation for Windows software shall be free from defects in material and workmanship for one (1) year from the date of purchase. Huntron further warrants that the software will perform in substantial conformance with the system specifications of the Huntron ProTrack Prober at the time of purchase and for the period of one (1) year thereafter.

The above warranties are in lieu of all other warranties, express or implied, including all warranties of merchantability and/or fitness for a particular purpose. Huntron's liability under these warranties, including any damages sustained by the customer through malfunction or failure of the Huntron software, shall not exceed the amount of the purchase price of the Huntron ProTrack Prober, regardless of the extent of any such damage, including any special, consequential, or incidental damages of any kind.

These warranties shall only apply to products in ordinary use. Huntron shall have no obligation under these warranties with respect to damage caused by accident, transportation, neglect, misuse, unauthorized alterations or repair, improper installation, or operating conditions.

Products purchased in the United States are to be returned to Huntron, Inc. at its factory, transportation prepaid. Products purchased outside the United States are to be returned to the source of purchase for Warranty repair.

Written notice of, and an explanation of the circumstances of, any defect believed to be covered by this agreement shall be provided promptly to Huntron by the customer following discovery of the defect. In satisfaction of its warranty liability, Huntron agrees to take reasonable and prompt action to correct the defect, either by repair or replacement, at its option.

LICENSE

Huntron hereby grants the customer a non-transferable, non-exclusive license to use the Huntron Workstation for Windows software provided with the Huntron ProTrack Prober instrument. The license is perpetual as long as the customer abides by the terms and conditions of this agreement. The purchase price of the Huntron ProTrack Prober instrument includes the fee for the license set forth herein.

The Huntron software may be used only with one particular Huntron ProTrack Prober instrument which it accompanies at the time of purchase and may not be used with any other Huntron ProTrack Prober instrument, without the written permission of Huntron. The customer shall not, without the specific written consent of Huntron, copy, in whole or in part, the Huntron software for any purpose, except to make one copy for backup purposes.

The customer shall not remove or obscure any copyright notice or notices included on or as part of the Huntron software.

The customer shall not recompile, decompile, disassemble or modify the Huntron software in any way, nor produce any derivative work thereof.

TABLE OF CONTENTS

Section 1 INTRODUCTION

1-1	WHAT IS A ROBOTIC PROBER?	1-1
1-2	HOW DOES IT WORK?.....	1-1
1-3	HARDWARE FEATURES	1-2
1-4	SPECIFICATIONS OF THE PROBER IIc, IIIc.....	1-3
1-5	SAFETY INFORMATION.....	1-6
1-6	WEEE AND ROHS STATUS	1-7

Section 2 THEORY OF OPERATION

2-1	INTRODUCTION.....	2-1
2-2	FUNCTIONAL OVERVIEW	2-1
2-3	STEPPER MOTOR CONTROLLER	2-1
2-4	STEPPER MOTOR DRIVERS	2-2
2-5	VISION SYSTEM FOR PROBER IIc AND IIIc.....	2-2
2-6	HIGHER Z FOR PROBER IIc AND IIIc	2-2

Section 3 INSTALLATION

3-1	PC REQUIREMENTS.....	3-1
3-2	INSTALLING THE HUNTRON WORKSTATION SOFTWARE.....	3-2
3-3	INSTALLING THE HARDWARE	3-3
3-4	INSTALLING THE PCI FRAME GRABBER CARD	3-4
3-5	CONNECTING THE PROTRACK TO THE PROBER.....	3-4
3-6	CONNECTING THE PCI FRAME GRABBER CARD TO THE PROBER.....	3-5
3-7	CONNECTING THE PROBER SERIAL INTERFACE TO THE COMPUTER.....	3-6
3-8	INSTALLING THE PCI CAMERA CARD DRIVERS (MONOCHROME) ..	3-7
3-9	STARTING AND ACTIVATING THE SOFTWARE.	3-7
3-10	HUNTRON WORKSTATION SOFTWARE TUTORIAL	3-8

Section 4 GENERAL HARDWARE MAINTENANCE

4-1	RAIL LUBRICATION.....	4-1
4-2	SPRING CONTACT TEST PROBES	4-2
4-3	REPLACING THE PROBE.....	4-2
4-4	REPLACING BROKEN PROBE TIPS.....	4-3
4-5	PROBE STYLES	4-4
4-6	SPECIFICATIONS FOR THE PROBE RECEPTACLE	4-6
4-7	MANUFACTURERS OF CONTACT SPRING PROBES	4-6
4-8	USING THE BURN-IN/OFFSET BOARD TO CHECK FOR PROPER HARDWARE FUNCTIONS	4-7
4-9	FOCUS AND APERTURE ADJUSTMENTS ON PROBER MODELS IIc, IIIc.....	4-8

Section 5 PROBER TEST BOARD SUPPORT ACCESSORIES

5-1	BOARD SPACERS	5-1
5-2	CROSSBAR.....	5-2
5-3	SLIDE BAR	5-3
5-4	SLIDE BAR EXTENSION.....	5-3
5-5	EXTENDED SLIDE BAR.....	5-4
5-6	SUPPORT KIT FOR LARGE BOARDS	5-6
5-7	AUXILIARY PROBE ACCESSORY KIT.....	5-7

Section 6 APPLICATION NOTES

6-1	HOW TO USE THE FRONT PANEL COMMONS.....	6-1
6-2	USING THE COMMON CLIP CABLE WITH THE FERRITE NOISE SUPPRESSER	6-2
6-3	USING EXTERNAL TESTERS WITH THE ROBOTIC PROBER	6-2
6-4	HARDWARE HANDSHAKING.....	6-3
6-5	PROBER TRIGGER IN/OUT SIGNALS.....	6-3
6-6	TIME DELAY DURATION.....	6-3
6-7	EXAMPLE OF A CONCEPTUAL EXTERNAL TESTER.....	6-4

Section 7 CUSTOM APPLICATIONS

7-1	HINTS & TECHNIQUES FOR PROBING SURFACE MOUNT COMPONENTS.....	7-1
7-2	PROBING BOARDS WITH COMPONENTS THAT ARE MORE THAN 3” HIGH	7-2

SECTION 1

INTRODUCTION

1-1 What is a Robotic Prober?

A Huntron Robotic Prober is a universal test fixture for accessing test points on printed circuit boards without the need for test clips and cables. When connected to the Huntron ProTrack I model 20 (hereafter referred to simply as ProTrack), the Prober allows fully automatic power off testing of surface mount, pin-grid-array, discreet through-hole components, DIPS, SIPS, QPFs, SOICs, and edge connectors on printed circuit boards. This provides a complete personal troubleshooting workstation for automatic testing of unpowered fine pitched and through hole devices on printed circuit boards.

The Robotic Prober can also be connected to external troubleshooting instruments, such as a digitizing multi-meter. The TEST terminal from the multi-meter can be connected to a BNC connector at the Prober's back panel. This connector is internally wired to the test probe.

1-2 How does it work?

The Robotic Prober basically consists of three axis which moves a test probe along an XY plane. Once the probe reaches an XY co-ordinate, an up or down Z movement is automatically initiated so that the test probe makes contact with a test point on the target printed circuit board. Each X, Y and Z stage is stepper motor driven. A vision system mounted on the Z axis allows the operator to "teach" the appropriate test points by targeting a PC mouse or trackball pointer over the center of the image of the test point visible on the PC monitor. The software makes it easy to teach test points of DIPS, SIPS, Pin-Grid-Arrays, SOICs, Quad packages, etc. The user does not necessarily have to teach every test point one at a time for these device types. In this way any PCB with accessible test points can be setup for automatic probing. The Z axis, up and down profiles, can be setup for all the components on the board at one time.

Once the test points are setup, the user can choose the appropriate test ranges and then scan the board. This causes the prober to automatically move the test probe to the appropriate test nodes, apply the test signal and record the response on the PC. In this way the entire board can be scanned and the test data can then be stored on the PC hard disk.

When testing a suspect board, the stored data is automatically compared with the suspect data and a report is produced with the most significant difference listed as a priority. The user can apply additional troubleshooting techniques to decide which component is causing the problem. Huntron Robotic Probers come in various configurations allowing you to test tiny boards as small as 2 inches (5.08 cm) square or larger boards of 22" by 23" (55.88 cm by 58.42 cm) in size. No matter which Prober you use, the ProTrack is still used as the primary test signal source.

1-3 HARDWARE FEATURES

A complete troubleshooting workstation consists of a PC, Robotic Prober and a ProTrack.

The Prober Hardware features are discussed below.

- The XYZ stages are stainless steel linear raceways providing an accurate means of moving a light load.
- The linear stages use fine pitched toothed timing belts which are driven by three stepper motors.
- A versatile clamping system provides an easy means of clamping the Printed Circuit Assembly so that the moving probe can access either the solder or component side without the need for additional fixturing.
- Connection to the ProTrack or any external tester is via two BNC connectors mounted at the back of the Prober. One BNC connector is for the Signal from ProTrack or external tester, and the other is for Common to the ProTrack or external tester. This common line is then connected to a signal reference point on the board-under test.
- The Signal BNC connector is routed to the test probe via a flexible low impedance co-axial cable.
- A miniature camera mounted on the Z axis produces a digitized image of an area of the Printed Circuit Assembly on the PC monitor.
- A PC mouse or trackball allows the positioning of it's pointer over the image of the test point displayed on the PC monitor for recording the X and Y co-ordinates.
- The light source for the camera consists of super-bright LEDs.
- Magnetic proximity limit switches are used to define the "home" position. The software allows two reference points from the Printed Circuit Assembly to be digitized relative to the home position. All test point co-ordinates are then automatically referenced and adjusted for boards that may not be in the same position as the golden board from which the test point coordinates were originally setup.
- The test probe tip mounted on the Z axis is removable, allowing standard "bed-of-nails" type spring loaded probe tips to be used. Different probe tips are supplied covering conformal coating applications to fine pitched crown pointed tips.
- All flexible cables are shielded.

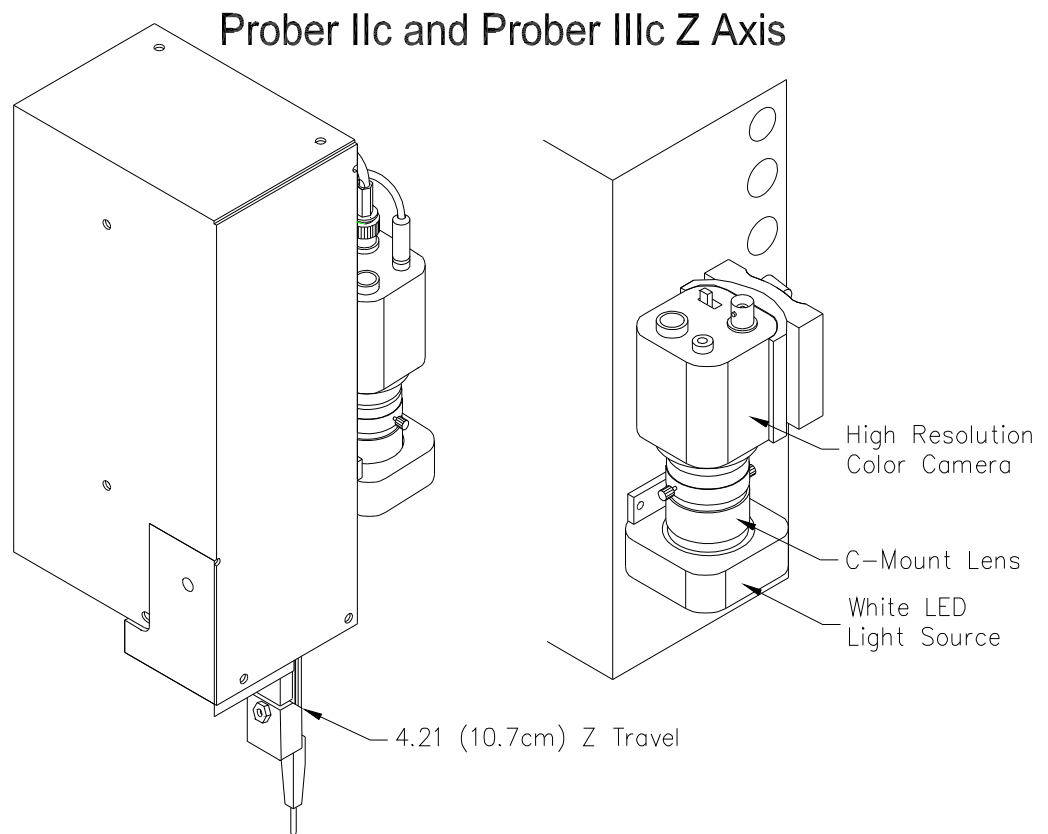
- An emergency STOP switch allows immediate suspension of Prober operation.
- There are 5 Common connectors accessible at the front panel which allows connection to the Printed Circuit Assembly signal reference points.

The rear or side panel provides Trig-In and Trig-Out connectors for providing hardware handshaking with external test instruments other than the ProTrack.

1-4 SPECIFICATIONS OF THE PROBER IIc AND IIIc

Prober IIc and Prober IIIc models are different from the Prober II and Prober III. New features are listed below:

- 1) Color camera with color PCI frame grabber card.
- 2) White LED light source with adjustable intensity
- 3) New Z axis assembly with 4.2”(107mm) Z travel for Prober IIIc
- 4) Prober IIIc has an extra Printed Circuit Assembly slot



Specifications for the Huntron Prober IIc

Specification	Prober IIc	Comments
Physical Dimensions	20" W, 24" D, 14" H. (50.8 cm W, 60.96 cm D, 35.56 cm H)	
Maximum board-under-test size	14.5" W by 14" D (36.83 cm W by 35.56 cm D)	Max thickness is 100 mils (2.54mm)
Maximum board probing area	10.5" W by 12.9" D (26.67 cm by 32.77 cm)	Area of the board that the probe can reach without re-adjusting the position of the board.
Maximum allowable component height	2.375" H (6.03 cm H)	Measured from the lowest slot
# of pcb guide slots	3	
Max Z Travel	2.21" (5.61cm)	Maximum allowable up/down movement
Linear speed	4 inches/sec (10.16 cm/sec)	Speed in the X or Y direction
Minimum resolution	0.001" (25.4 microns)	Minimum allowable movement in the X or Y direction
Probing Accuracy	+/- 0.004" (+/- 101.6 microns)	Measured over a travel distance of 10" (25.4 cm)
Vision system	CCD 811(H) x 508 (V) Color	
Light Source	White LED array w/adjustable Intensity	
Lens system	25mm Focal Length C mount with adjustable focus and aperture	
Frame Grabber	Color, PCI Bus with 754 x 480 Pixels (NTSC, RS-170) max resolution	Requires full height free PCI slot in computer.
Weight	50 lbs (22.68 kg)	Unit only
Mechanical Drive System	3.175 mm wide Kevlar reinforced timing belt. Steel linear raceways.	
Power requirements	115VAC or 230VAC,50Hz or 60HZ ,100W Max	
Computer interfaces	RS232 and PCI camera interface	PCI interface is part of Frame Grabber
Operating temperature	59 degrees F to 86 degrees F (+15 degrees C to +30 degrees C)	
Storage temperature	-58 degrees F to 140 degrees F (-50 degrees C to +60 degrees C)	
Humidity	0 to 50% R.H.	
Safety considerations	Front panel STOP switch for emergency stop	

Specification for the Huntron Prober IIIc.

Specification	Prober IIIc	Comments
Physical Dimensions	36" W, 29" D, 15.7" H (91.44 cm W, 73.66 cm D, 39.88 cm H)	
Max. board-under-test size	22" W by 23" D (55.88 cm W by 58.42 cm D)	Max thickness is 100 mils (2.54mm)
Max board probing area	18.6" W by 22.4" D (47.24 cm W x 56.90 cm D)	Area of the board that the probe can reach without re-adjusting the position of the board.
Max allowable component height	4" H (10.16 cm H)	Measured from the lowest slot
# of pcb guide slots	4	
Max Z Travel	4.21" (10.7cm)	Maximum allowable up/down movement
Linear speed	4 inches/sec (10.16 cm/sec)	Speed in the X or Y direction
Minimum resolution	0.002" (50.8 microns)	Minimum allowable movement in the X or Y direction
Probing Accuracy	+/- 0.004" (+/- 101.6 microns)	Measured over a travel distance of 10 cm)
Vision system	CCD 811(H) X 508 (V) Color	
Light Source	White LED array w/adjustable Intensity	
Lens system	25mm Focal Length C mount with adjustable focus and aperture	
Frame Grabber	Color, PCI Bus with 754 x 480 Pixels (NTSC, RS-170) max resolution	Requires full height free PCI slot in computer.
Weight	140 lbs (63.64 kg)	Unit only
Mechanical Drive System	3.175 mm wide Kevlar reinforced timing belt. Steel raceways.	
Power requirements	115VAC or 230VAC,50Hz or 60HZ, 100W Max	
Computer interfaces	RS232 and PCI camera interface	PCI interface is part of Frame Grabber
Operating temperature	59 degrees F to 86 degrees F (+15 degrees C to +30 degrees C)	
Storage temperature	-58 degrees F to 140 degrees F (-50 degrees C to +60 degrees C)	
Humidity	0 to 50% R.H.	
Safety considerations	Front panel STOP switch for emergency stop	

1-5 SAFETY INFORMATION

Symbols: The following symbols are used either in this manual or on the unit:



CAUTION
Refer to Manual

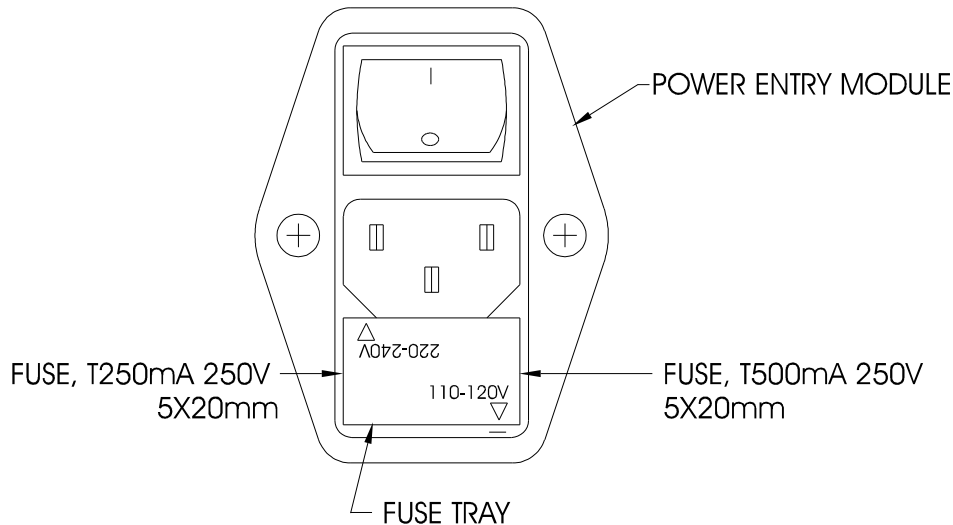


Protective Ground
(Earth) Terminal



Line Fuse Replacement:

Voltage Select/Line Fuse tray: The power entry module on all Probers includes the power switch (0 = OFF, 1 = ON), power cord connector, and a removable tray which selects the line voltage and holds the line fuses.



Make sure that replacement fuses are of the type and current rating specified. If necessary, insert the specified fuse (T250mA or T500mA according to IEC 127) that matches the line voltage setting into the fuse tray.

1-7 WEEE and RoHS Status



We, at Huntron are aware of the recycling needs for Waste Electronic and Electrical Equipment (WEEE) and Restriction of certain Hazardous Substances (RoHS) and are co-operating with systems established, worldwide for the collecting and recycling of our products.



Huntron has applied the Wheeled bin recycle mark (EN50419) to our products. At the present time, most European countries are not complete in their compliance with the European WEEE legislation and they do not have collective systems fully operational and registration initiated. Further recycling information will be added to our website www.huntron.com as it becomes available.

Huntron products, being electronic test equipment, are classified as monitoring and control instruments and are presently exempt from the RoHS directives. Huntron is currently using leaded solder in the construction of our products but we are working for total compliance to RoHS to be completed by July 2006.



Recycling is important to all communities, therefore we ask our customers to be responsible in recycling. Please check your local recycling laws for further information.

SECTION 2

THEORY OF OPERATION

2-1 INTRODUCTION

This section describes how various components of the Prober system work. The purpose of this section is to simply explain the functional characteristics of the main components of the Prober system.

2-2 FUNCTIONAL OVERVIEW

The probe connected to the Z axis is directly connected to the BNC Signal connector located at the Prober back or side panel. The purpose of the XYZ stage is to accurately place the probe at a particular location for the ProTrack to perform the test. The vision system displays an image of a small area of the board-under-test on the PC monitor for setting up the XY locations of test points.

2-3 STEPPER MOTOR CONTROLLER

The Stepper Motor Controller receives ASCII commands from the PC. The controller applies direction pulses for clockwise or counter-clockwise rotation and step pulses at different frequencies to the motor driver.

2-4 STEPPER MOTOR DRIVERS

The purpose of the Motor Drivers is to supply sufficient and regulated current to each phase of the motor winding. The motor drivers are Bipolar Chopper type, supplying current in either direction through the same motor phase winding and regulating the current by high speed on-off switching of the DC supply voltage. Bipolar Chopper Drivers are high efficiency Drivers that produce a maximum amount of torque at relatively high stepper speeds.

The Stepper Motor Controller is capable of half stepping. This produces half the rotational distance per step of a full step motor. The Stepper Motor produces 0.9 degrees of rotational movement per full step. In half step mode the motor produces 0.45 degrees of rotational movement. The total number of incremental steps produced by the motor is 800 steps per revolution. Depending on the timing belt pulley pitch diameter, the motor produces 0.002 or 0.001 inches of linear movement.

2-5 VISION SYSTEM FOR PROBER IIc and PROBER IIIc.

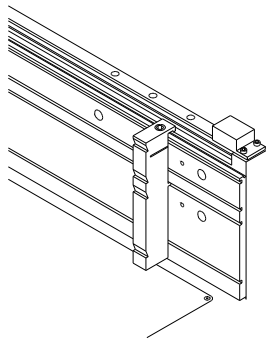
The vision systems consist of a high-resolution color analogue camera mounted on the Z-axis. The color camera is capable of 480 lines of horizontal resolution in the NTSC (rs-170) format. It has automatic background compensation, which allows for digital brightness control on low or highlighting conditions. The camera uses a standard 25 mm C mount lens that has aperture and focus control. The aperture and focus adjustments can be locked into position via setscrews or knobs.

The camera output is available via a co-axial cable with a BNC connector. The output is fed into a PCI bus frame grabber which is installed in a computer. The frame grabber is capable of displaying 60 frames per sec on the PC monitor. Images are in full color.

A new light source with intensity control is mounted in front of the camera. It uses 8 super bright white LEDs which produce diffuse and evenly distributed white light.

2-6 Higher Z for Prober IIc and IIIc.

The Z-axis on these models consists of a longer Z head allowing for probing printed circuit assemblies that contain higher components. This is especially useful in the Prober IIIc model where an extra board slot exists near the bottom. Printed circuit assemblies with large transformers or high heat-sinks can now be mounted in the Prober clamping system.



SECTION 3

INSTALLATION

Installation: Prober IIc or IIIc using Huntron Workstation 4.x software with ProTrack Model 20.

3-1 PC Requirements

The following requirements are provided to assist you in purchasing the correct computer system to use with the Huntron Workstation software. These are the recommended minimum computer requirements:

- PC with Pentium III or equivalent CPU.
- Microsoft Windows™ 2000, XP.
- CDROM drive.
- 512MB RAM
- Hard disk with at least 1 GB free space.
- Windows 16 bit color capable VGA graphics card.
- VGA color monitor.
- 1 free USB 2.0 Port for communication with the Protrack or 1 free parallel printer port for communicating with a Protrack CE version.
- 1 free serial (RS232) port for communicating with the Prober.
- One full height PCI slot for the color camera frame grabber card.

3-2 Installing the Huntron Workstation Software

NOTE: Install the software before installing the PCI Camera frame grabber card.

1. Power up your computer. Insert the software CD into the CDROM drive.
2. If your CD was configured for Auto-run, a menu will be displayed. Click the **Install Workstation** item. If no menu is displayed, run the **Huntron Workstation.exe** program located in the **Setup** folder on the CD.
3. A Huntron License Agreement form is displayed. If you agree, select the **“I accept the license agreement”** option. Click **Next**. The readme.txt file on the CD will be displayed. Click **Next**.
4. Enter your User information if desired. If you are allowing other users to logon and use the software, the default setting allows anyone who logs onto to this computer to use the software with full access. If you select **“Only for me”**, other users who logon to this computer with a different user name will not have access to this software.
5. The default destination folder is **C:\Program Files\Huntron Workstation**. Click **Next** if you do not want to change the default folder.
6. Click **Next** to begin installation.

Click **Finish** when the “Huntron Workstation has been successfully installed” window is displayed

7. **Install the NI Vision for Auto Align software.** Use your Browser’s Back button to return to the main CD menu. Select **Install NI Vision for Auto Align** (or browse the CD, locate the **Vision** folder and execute the file **vison80rte.exe**). Exit the CD software by clicking **Exit**.
8. Run the **NI License Manager** by selecting **Start, Programs, National Instruments, NI License Manager**. Click the **Activate** button on the toolbar. Follow the instructions to enter your NI license serial number. This serial number is printed on the Huntron software CD and/or is located in your NI Certificate of Ownership.

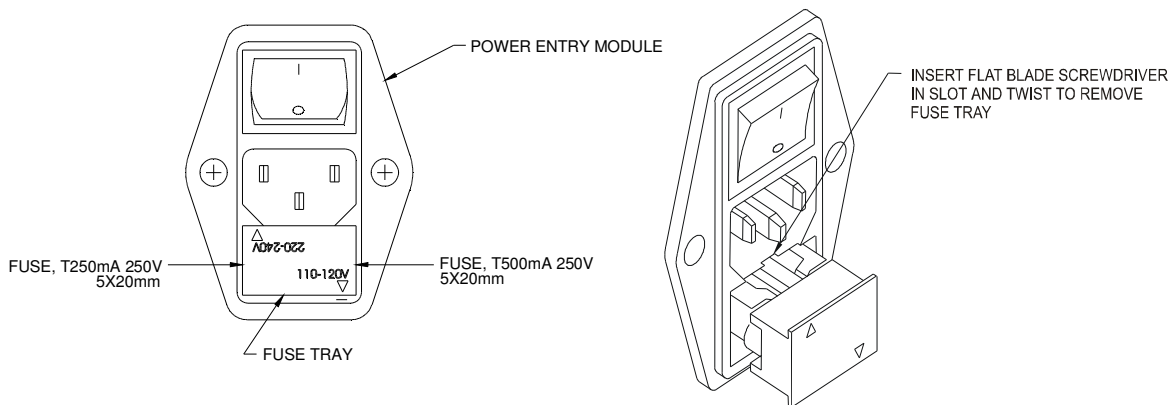
Do not run the software at this point. The hardware must now be installed to complete the installation.

Power off the computer chassis.

3-3 Installing the Hardware

1. Locate the unpacking sheet that was supplied with the Prober.
2. Follow the unpacking steps as outlined in the unpacking sheet.

3. Place the Prober on a stable table or desk. The ProTrack should be positioned on the left side of the Prober. Place the computer monitor on either side of the Prober.
4. Remove the **Red Shipping Stoppers** using the Hex Allen tool supplied in the tool kit. Do not discard these blocks. You will need them again if you transport the Prober to another location. **Also remove the Z locking pin located near the probe tip. Do not discard this pin. You will need this pin for locking the Z probe assembly when transporting the unit.**
5. **Voltage Select/Line Fuse tray:** The power entry module on all Probers includes the power switch (0 = OFF, 1 = ON), power cord connector, and a removable tray which selects the line voltage and holds the line fuses.



220-240VAC Voltage Selection.

NOTE: The above voltage setting indicates **110-120V AC power (arrow pointing towards the — mark.)** If your line voltage is **220–240VAC**, you will need to change the **Voltage Select/Line Fuse Tray setting**. Remove the AC power cord. There is a slot below the AC ground terminal. Insert a flat screw driver into the slot and pull the tray out. Make sure that replacement fuses are of the type and current rating specified. If necessary, insert the specified fuse (T250mA or T500mA according to IEC 127) that matches the line voltage setting into the fuse tray. Insert the tray into the power module so that the 220-240VAC arrow points to the — mark. Insert the AC power cord and connect to a 220-240 Volt AC supply.

3-4 Installing the PCI Frame Grabber card

INSTALL CAMERA FRAME GRABBER BOARD ONLY IN UL LISTED, CSA CERTIFIED, OR TUV/VDE LICENSED PERSONAL COMPUTERS WITH ENCLOSED POWER SUPPLIES WITH SELV NON-ENERGY HAZARDOUS OUTPUTS AND USER INSTRUCTIONS DETAILING THE INSTALLATION OF CARD CAGE ACCESSORIES.

With the computer power turned off, install the card into the computer by positioning it over the PCI slot and pressing it firmly downward. There is no need to set any addresses or interrupts.

Secure the camera card to the computer back panel using the available screw.

3-5 Connecting the ProTrack to the Prober

Unpack the ProTrack as outlined in the unpacking instructions. Install the hardware as outlined in the ProTrack User's Manual. Locate the USB or Parallel IEEE 1284 cable included in the ProTrack package. Protrack CE versions have a parallel interface cable.

Today, most Protracks have a USB port.

For Protrack with USB port: Connect the USB cable from the protrack to the USB port of the computer.

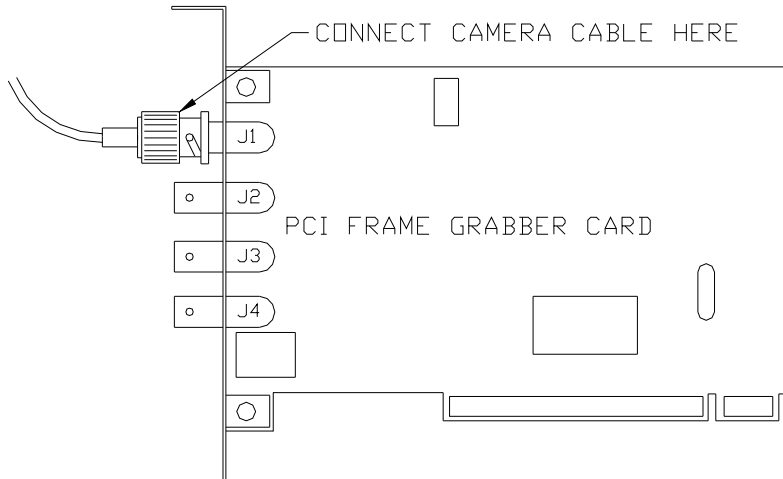
For Protrack CE version with parallel port: Power off the computer and connect the parallel IEEE 1284 cable from the **COMPUTER** connector on the ProTrack to the primary **Printer Port** on the Computer. Refer to the **ProTrack User Manual, Section 9, Remote Mode** for information on using a printer for reporting Protrack data. See diagram on page 4-5.

Connect the BNC cables included in the Prober package to the back panel of the ProTrack. Connect the COMMON terminal on the ProTrack to the COMMON terminal on the Prober. Connect the CHANNEL A terminal on the ProTrack to the SIGNAL terminal on the Prober. See diagram on page 4-5.

Connect the power cords to the ProTrack and the Prober.

3-6 Connecting the PCI Frame Grabber card to the Prober

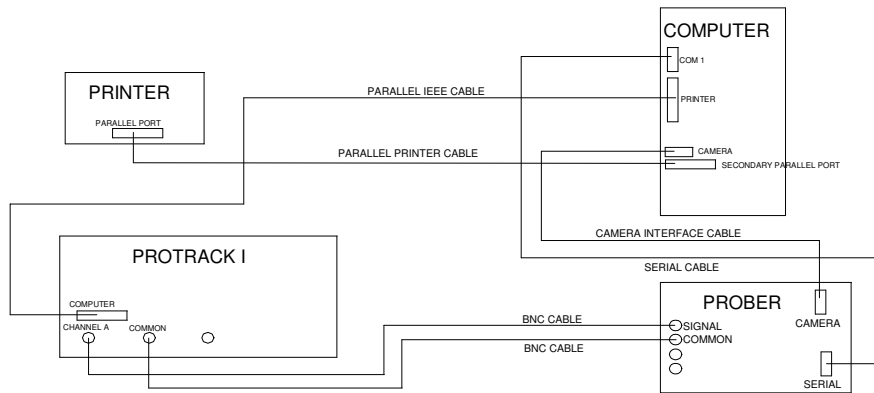
A co-axial cable is supplied with the Prober. The PCI camera card has four BNC connectors allowing up to 4 cameras to be connected. Connect one end of the co-axial cable to the top BNC connector as shown. Connect the other end to the BNC port on the Prober marked “**Camera**”



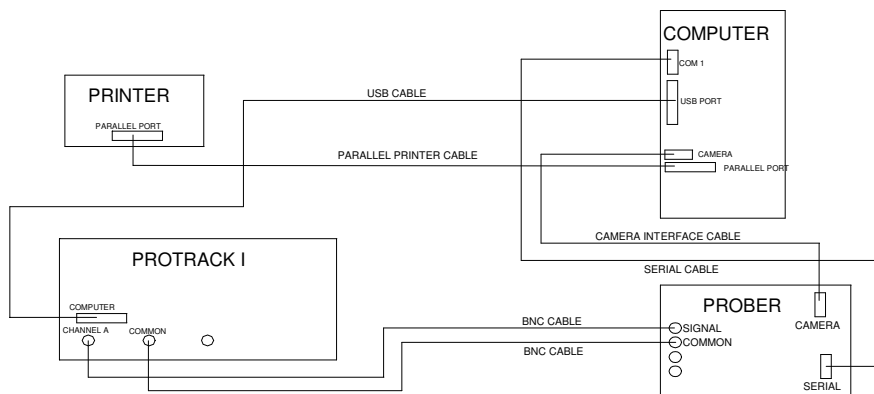
3-7 Connecting the Prober Serial Interface to the Computer

If your computer does not have a mouse port, you will need two serial ports, one for the Prober and the other for a serial mouse or trackball. If you have another type of port (USB) for the mouse, then you will need only 1 serial port for the Prober.

Locate the serial cable and connect the correct end to the Prober Serial port. Connect the other end to the appropriate serial port on the computer (COM1, COM2, COM3 or COM4). Power up the ProTrack and the Prober. The Prober front panel STOP light will switch on and a startup message is displayed on the ProTrack LCD panel.



Cable hookup for computer, Protrack with parallel port and Prober



Cable hookup for Computer, Protrack with USB and Prober

3-8 Installing the PCI drivers for the Color Camera

For Windows 2000/XP


- 1) Ensure that **Huntron Workstation 4.x** CD in your CD drive. If you have installed the Huntron Workstation Software (**Section 4-2**) and then installed the PCI Frame Grabber card (**Section 4-4**), you are now ready to install the drivers.
- 2) Turn on your computer and allow Windows to boot. An **Add New Hardware** wizard prompts you to install a “**Sensoray 611 Frame Grabber**”. Click **Next**.
- 3) If the wizard prompts you to search for drivers, click **Next**. Check the CDROM drive for the search path and **uncheck all the other options**. Click **Next**.
- 4) When a message appears, indicating that the driver has not passed Windows Logo testing, click “**Continue anyway**”. Click **Finish**.
- 5) You will be prompted to install the “**Sensoray X11 Frame Grabber Component**”. Click **Next**. When a message appears indicating that the driver has not passed Windows Logo testing, click “**Continue anyway**”. Click **Finish**. Remove your Huntron Workstation CD. You are now ready to use the software.



CAUTION: DO NOT REMOVE BOARD-UNDER-TEST WHILE THE PROBER IS RUNNING A TEST. THE SPRING LOADED PROBE HAS A SHARP POINT AND MAY CAUSE INJURY IF THIS MACHINE IS IMPROPERLY USED.

3-9 Starting and activating the software.



An icon  will be created on your windows desktop. Double click this icon to start the software.

The Huntron Workstation Activation dialog is displayed. This software is only licensed to be used on one Protrack and Scanner and/or one Prober. The activation codes are generated by Huntron and are specific to the Protrack and Access Prober hardware serial numbers. Activation codes are printed on the software CD. If you do not know the activation codes, call Huntron technical support (425-743 3171) and provide the serial numbers for the Protrack and the Access. Protrack serial numbers start with a **KJ**. Activation codes can be mailed to you. From the e-mail text, copy and paste the activation codes into the correct boxes.

3-10 Huntron Workstation Software Tutorial

A software tutorial (**workstation tutorial.pdf**) is included in the software CD and in the default installed folder (**C:\program files\huntron workstation\documents**).

The tutorial will enable a new user to get acquainted with most of the software features. The help menu in the software will also assist you. Whenever you need detailed information, click **Help** in the appropriate screens. The help feature is context sensitive, so you can click on the green highlighted text to get additional information on related topics.

All **user's manuals** are located in the Manual CD (06-5217) included in your package. Refer to the appropriate manual for the hardware you have.

If you need further assistance, call the Huntron Technical support at

1-(800)-426-9265 or (425) 743 3171

email: info@huntron.com

NOTE: For Prober IIIc only.

NOTE: Using the standard length probe will not allow you to probe boards in the **Base Slot**. Install the **30 Degree Spear Point Probe (P/N 07-2106)** into the **Probe Holder** according to the instructions in the **User Manual Section 4-5**. This is an extended length probe required for probing boards that are mounted in the **Base Slot** (lowest slot).

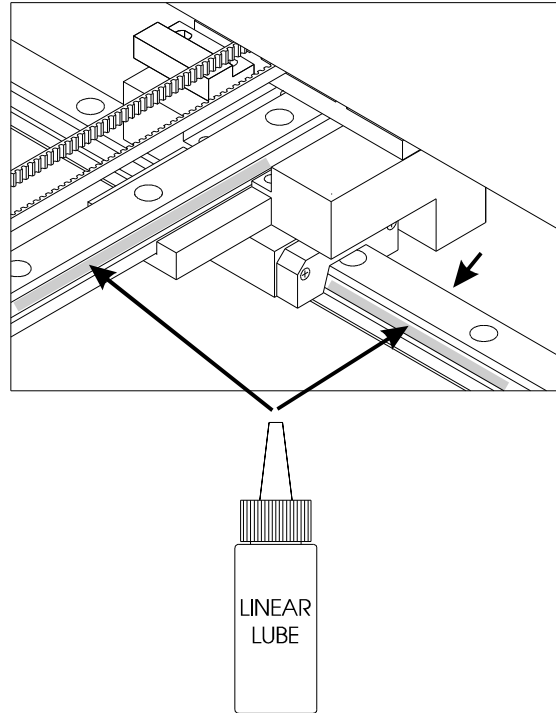
SECTION 4

GENERAL HARDWARE MAINTENANCE

4-1 RAIL LUBRICATION

The linear raceways have to be lubricated using the supplied “linear lube” which is included in your Tool kit. Do not experiment with any other lubricant. Turn the Prober power off. Apply a generous amount of lubricant along each side of the rail as shown below. Manually move the Z axis left and right and then back and forth in order to spread the lubricant along the raceways.

We recommend lubricating the rails at least once a month. You should wipe clean the rail surface with a lint-free cloth if excessive dust is visible prior to lubricating rails.



CAMERA IMAGE ADJUSTMENT FOR PROBER IIc AND PROBER IIIc. Refer to Section 4-9 for details.

NOTE: There are no software adjustments for the camera image for these models. There are Focus and Aperture adjustments on the camera lens that will significantly affect the camera image. Always run the Camera Offset dialog after the Focus and/or Aperture is adjusted.

4-2 SPRING CONTACT TEST PROBES

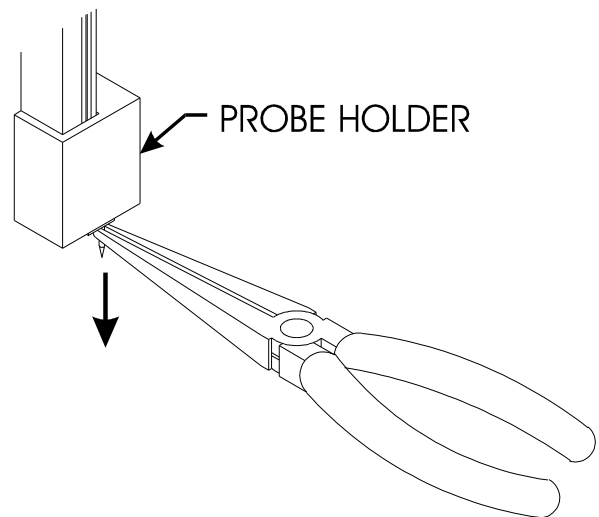
The Prober uses a spring loaded probe for making contact with a test point. Various probe styles are available depending on the type of components tested. These probes are commonly used in bed-of-nails fixtures and are readily available from a large number of manufacturers. Since the probe fits into a specific receptacle, only specific probe sizes can be used. The receptacle is press-fitted into the probe holder. It is a widely used industry standard size, so finding probes that fit into this receptacle should not be a problem. Manufacturers of these probes and the receptacle specifications are listed at the end of this section.

LIFE EXPECTANCY OF SPRING CONTACT PROBES

Generally, quality probes like those from Interconnect Devices Inc. (IDI) are rated at 1,000,000 cycles minimum. The life expectancy depends on proper use and maintenance of the probe. We recommend that you change the test probe once a month.

4-3 REPLACING THE PROBE

Use the needle nose pliers supplied with the Prober tool kit to pull the probe out of the receptacle. **It is not necessary to remove the probe holder to do this.** Simply grip the probe tip with the pliers and pull straight downward. The probe should come out easily.

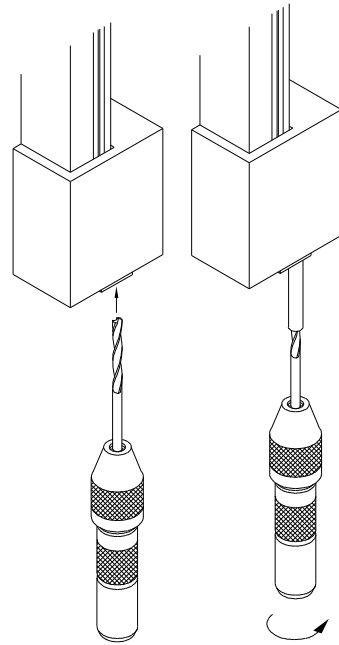


Note: Always run the Camera Offset routine whenever the probe is changed. In fact, if you change to a longer probe and do not run the camera offset, it is likely that your PCB could get scratched by the new tip because the software was not setup for the longer probe tip.

4-4 REPLACING BROKEN PROBE TIPS

It is not necessary to disassemble any parts for this operation. The probe tip may break off from the probe holder in such a way that you are unable to remove the entire part with needle nose pliers.

A small drill bit is provided in the Tool kit. Simply rotate the drill bit a few revolutions and when you feel some resistance, just pull downward. The rest of the broken tip will come out.



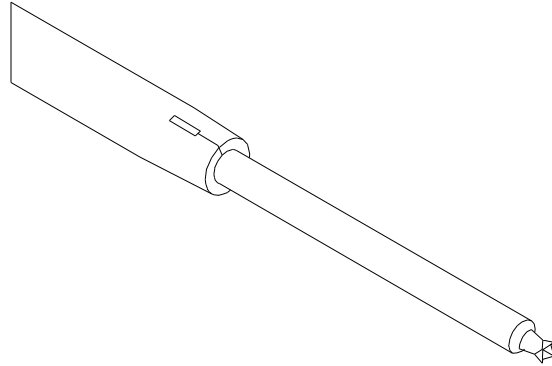
4-5 PROBE STYLES

A probe kit (P/N 98-0126) is supplied with the Prober. 5 of each of the following probes are included in this kit.

ICT, 4 POINT CROWN PROBE

Use this probe for fine pitched devices. (tip diameter = 18 mils) Best pointing accuracy of any probe.

IDI part number: ICT-100-UR-5.5 or
(ICT-S25UR-5.5DGD-S)
(Huntron P/N 07-2112)

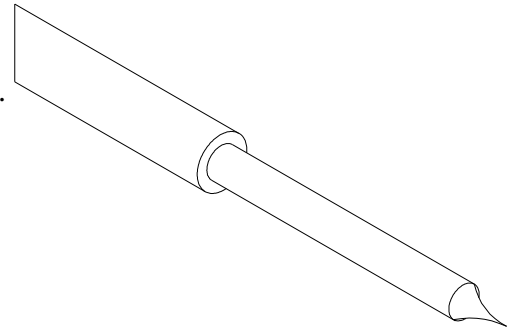


TIP SPEAR PROBE

Used for testing contaminated boards or conformal coatings.

Fine pitch devices can also be tested with this probe.

QA Technology part number: 100-PRN2531U-S
(Huntron P/N 07-2111)



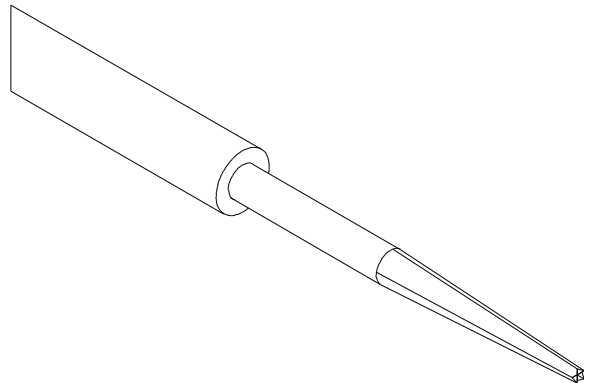
4 POINT TAPERED CROWN PROBE

Used to test leads, land and pads on densely populated boards.

Best for small pad or SMD testing
(tip diameter = 11 mils).

QA Technology Inc. part number:
100-PRP2554S

(Huntron P/N 07-2120)

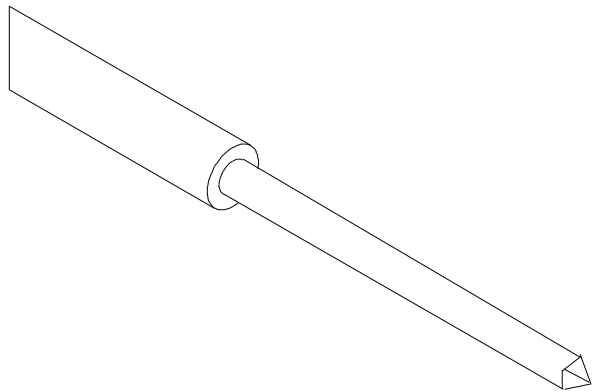


30 DEGREE SPEAR POINT PROBE

Use this probe for testing land pads and plated through holes. The spear point penetrates thin layers of oxides or contaminants.

Extended length for densely packed components.

IDI part number ICTL100-M-5.7-G-S
(or SR25B-6.3D)
(Huntron P/N 07-2106)

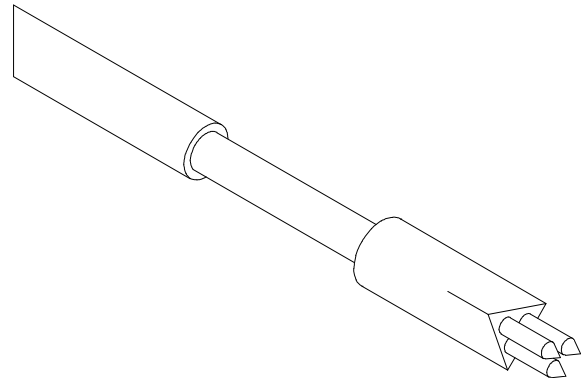


TRI-NEEDLE PROBE

Used to test contaminated boards or pierce conformal coatings.

Best for 100 mils or wider spaced leads or pads.

IDI part number: S100-TN-6.7EN
(or 25TN-6.7EN)
(Huntron P/N 07-2108)

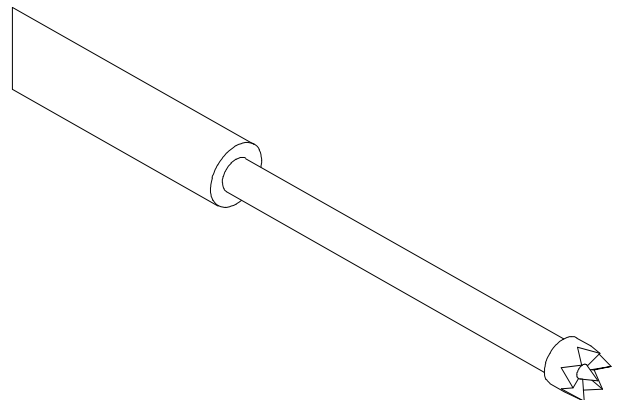


TULIP PROBE

Used to test long leads, terminals and wire wrap posts.

Best for 100 mils or wider spaced leads or pads (tip diameter = 55 mils).

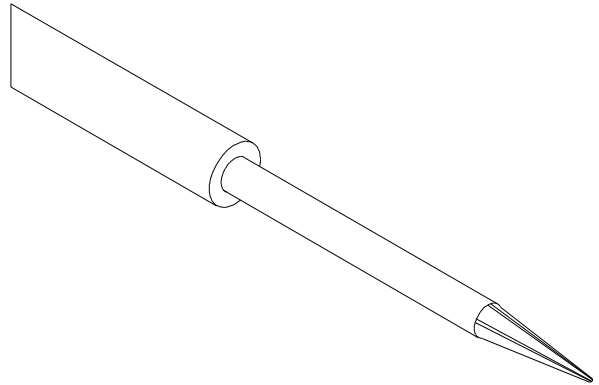
IDI part number ICTL100-VLT-5.7-G-S
(or SR25Y-6.3D)
(Huntron P/N 07-2113)



SINGLE NEEDLE FLUX PENETRATING PROBE

Used for penetrating flux and conformal coated boards.

QA Technology part number: S100-SN-10-GS
(Huntron P/N 07-2136)



4-6 SPECIFICATIONS FOR THE PROBE RECEPTACLE

The general specifications for the probe receptacle, which is press fitted into the Prober probe holder, are as follows:

The IDI part number of this receptacle is R-25-SC or RX-100-SC (Huntron P/N 07-2109).

Receptacle Size:	25
Connection Style:	SC - solder cup
Material:	Nickel/silver, gold plated
Total Length:	1.165 inch (29.59mm)
Overall Outside Diameter:	0.066 inch (1.68mm) outside
Use Spring Probes Size:	0.054 inch (1.37mm)

4-7 MANUFACTURERS OF CONTACT SPRING PROBES

Interconnect Devices, Inc. (IDI)
5101 Richland Avenue
Kansas City, Kansas 66106
Phone: (913) 342-5544 FAX: (913) 342-7043

QA Technology Company, Inc
110 Towle Farm Road,
Hampton, NH 03842, U.S.A
Tel: (603) 926-1193 - Fax: (603) 926-8701

*Probe manufacturer part numbers are subject to change. To order from Huntron, please use the Huntron part number.

4-8 USING THE BURN-IN/OFFSET BOARD TO CHECK FOR PROPER HARDWARE FUNCTIONS

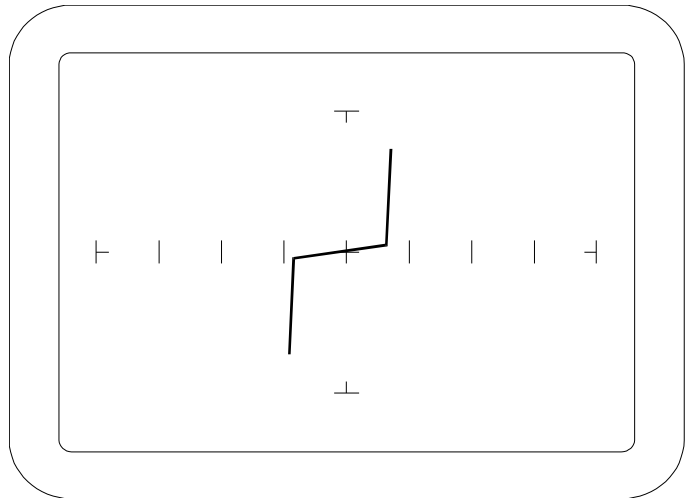
This optional board (p/n 06-3078) can be used for checking the operation of your Prober. **Run the Camera Offset routine on this board.**

Set up all the 50 mils spaced components (U1 to U8) on the Burn-in/offset board. Connect the Common terminal to the node marked “Common” on this board.

Each alternate pin (1,3,5 etc.) is connected to the Cathode of Diode D1. The Anode of D1 is then connected to Common. Pins (2,4,6, etc. are all connected to the Anode of Diode D2. The Cathode of D2 is connected to Common. This simple circuit enables us to find the following failure modes:

If the Prober misses the IC pins, an OPEN Signature will be displayed.

If the Prober Shorts two adjacent pins, a signature of a typical “chair” pattern will be displayed as shown here.



The Prober should complete at least 10 passes on all the pins of the 50 mils spaced components.

If the Prober consistently misses all pins by approximately the same distance, then your Camera offset may not be correctly setup.

If the same pins fail consistently, you may have to check if the original pins were setup correctly.

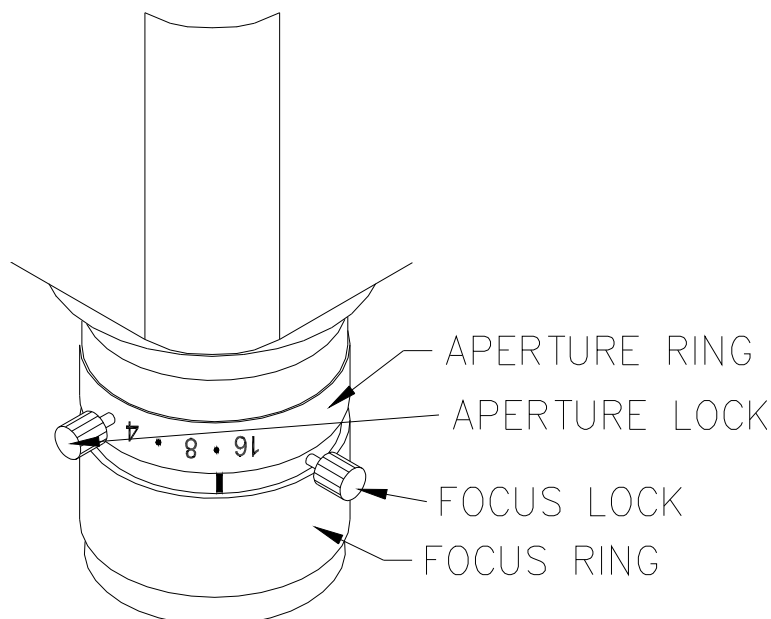
If the Prober misses pins randomly and is unable to make at least 10 passes, then call Huntron Technical Support for more troubleshooting tips.

4-9 Focus and Aperture adjustment on Prober models IIc and IIIc

The camera lens on the color camera have separate Focus and Adjustment rings. These adjustment rings can be locked via locking screws. The aperture setting is factory set to between 8 and 16 and will be locked. The setting is shown below. If the camera image appears dark even with maximum light intensity, it may be necessary to adjust the aperture. By using a larger aperture (decrease in F number), more light will enter the lens but the depth of field will be shorter. Components at various heights will appear unfocused. The best setting is to have the smallest aperture (F 16) and some external bright and evenly distributed light. A small florescent lamp would be sufficient as an additional external light source.

To change the **Aperture size** (F stop) loosen the top screw as shown and rotate to an appropriate setting. Ensure that live camera images are displayed on the PC monitor to check your setting. Tighten the knob when the adjustment is done.

To **focus** the image, simply loosen the bottom screw as shown and rotate until the image is focused. Remember to focus on the actual PCB where the probe will be making contact. If other components at different heights appear unfocused, do not attempt to change settings to get a most desirable setting. It is more important to get a focused image at the PCB level.



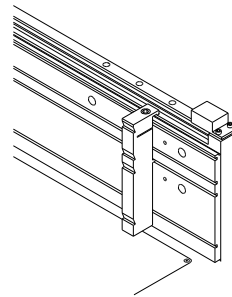
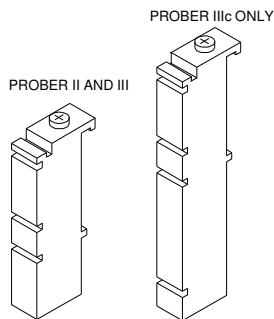
SECTION 5

PROBER TEST BOARD SUPPORT ACCESSORIES

PROBER TEST BOARD SUPPORT ACCESSORIES

This section describes the test board support accessories for use with a Prober I, II, and III. These accessories are used in various combinations to hold different types of boards in the Prober. The description of each accessory includes an illustration and some examples of typical uses. Huntron part numbers are shown at the end of this section.

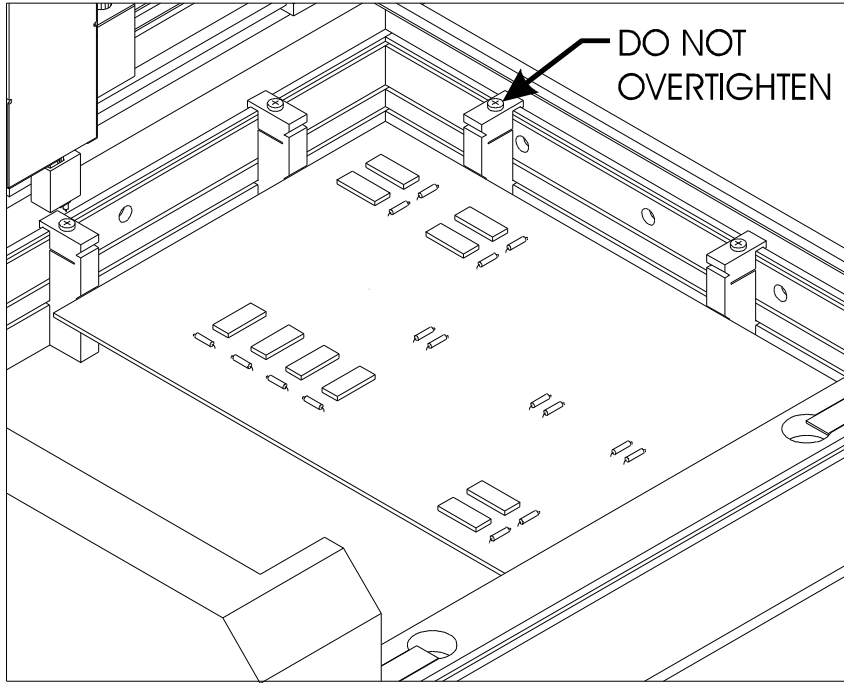
5-1 BOARD SPACERS



Prober IIIc additional slot shown with board spacer.

Board Spacers move the test board away from the slotted walls. The Prober can only probe components that are approximately 0.6" (15mm) away from the slotted walls of the Prober.

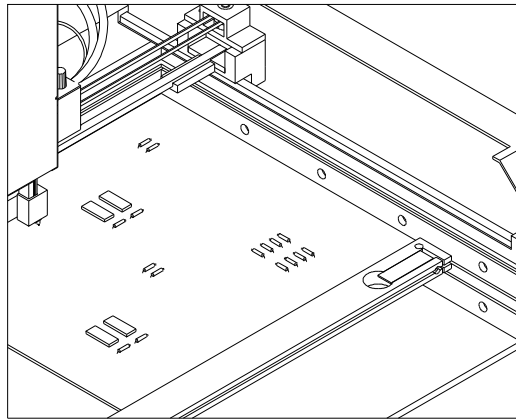
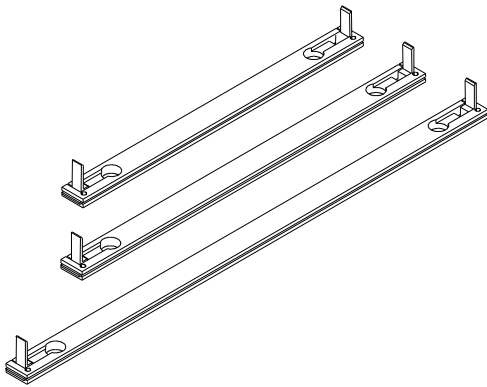
Board Spacers snap onto and slide along the slotted walls. They allow the probing of components on the edge of boards and the supporting of boards with protruding components. (4 board spacers are included in the Prober package)



5-2 CROSSBAR

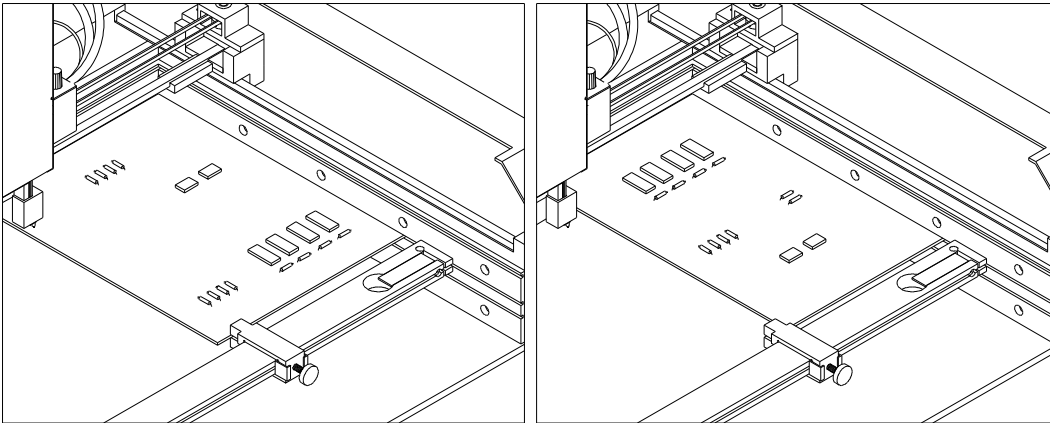
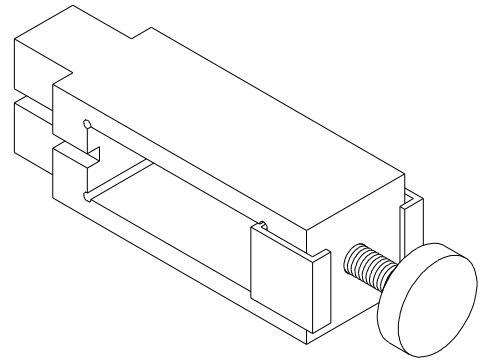
The Crossbar is normally used to hold the front side of the test board.

(1 Crossbar is included in the Prober package)



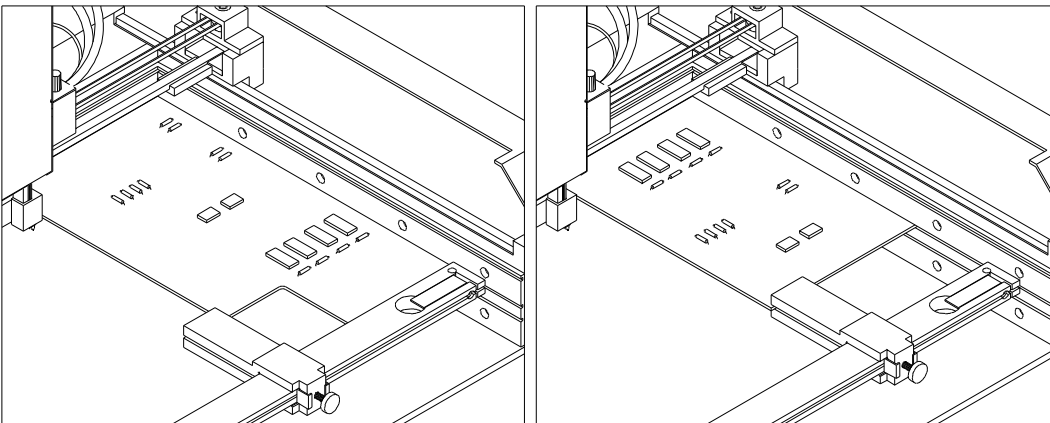
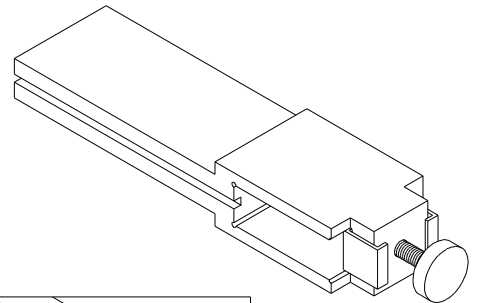
5-3 SLIDE BAR

The Slide Bar mounted on a Crossbar holds the left front corner of the test board. The front of a Slide Bar on a Crossbar can hold the Printed Circuit Assembly away from the Crossbar to allow components on the front edge of the board to be reached by the probe tip. Use a Slide Bar and a Slide Bar Extension mounted on a Crossbar to hold the unsupported side of the test board. (1 Slide Bar is included in the Prober package)



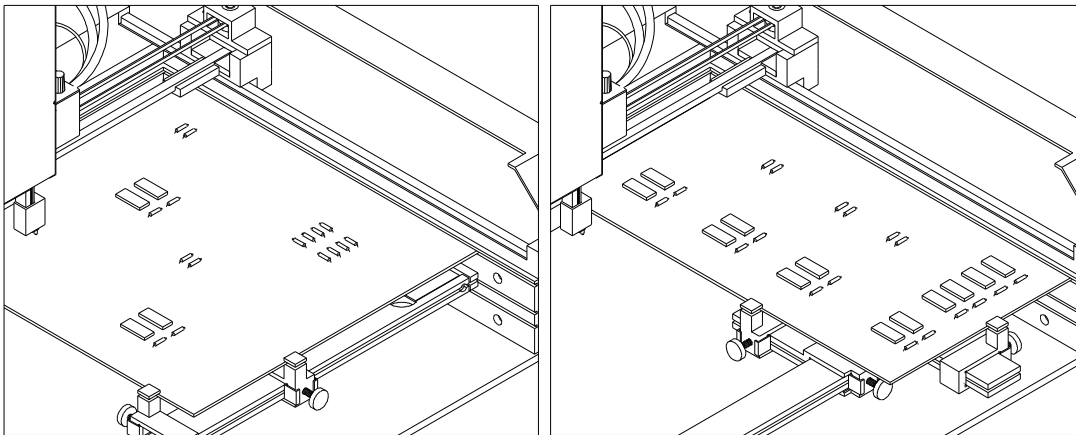
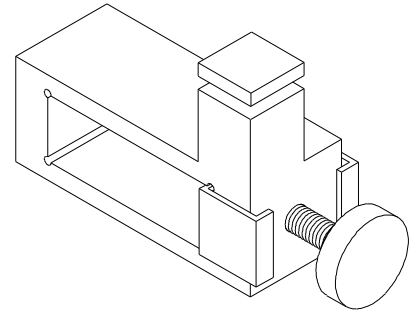
5-4 SLIDE BAR EXTENSION

The Slide Bar Extension mounted on a Crossbar can hold the unsupported side of the test board. The Slide Bar Extension can also be configured with a Slide Bar for additional support of the side of the test board. (1 Slide Bar Extension is included in the Prober package)



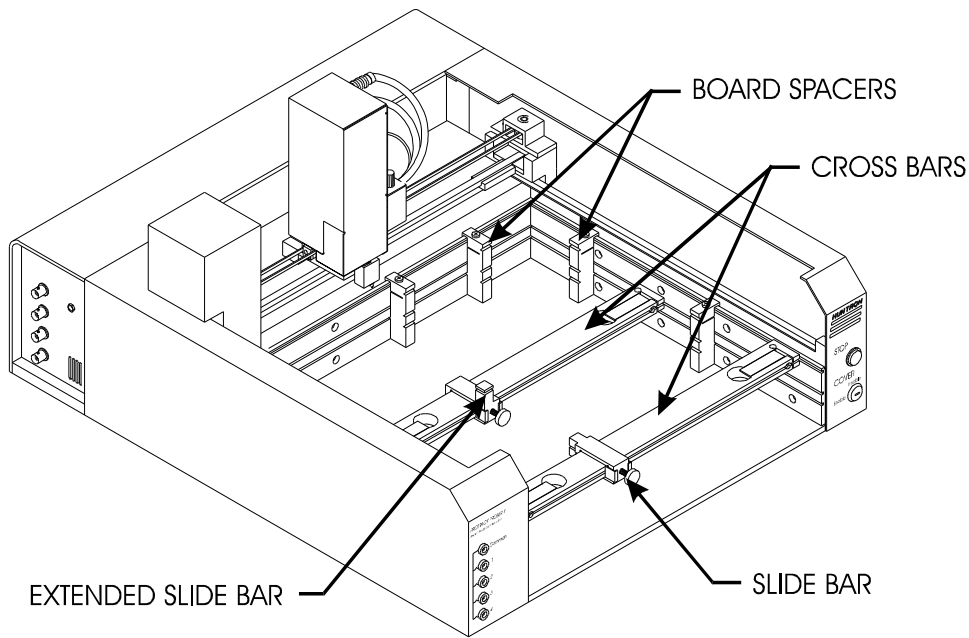
5-5 EXTENDED SLIDE BAR

A Crossbar in the middle slot underneath the test board with an Extended Slide Bar can give support to the unsupported side of the test board. Also, a Crossbar in the middle slot is the main support for holding Printed Circuit Assemblies in the top slot that protrude from the front of the Prober. In this case, use the Crossbar with two Slide Bar Extensions and two Extended Slide Bars. (1 Extended Slide Bar is included in the Prober II and III package)

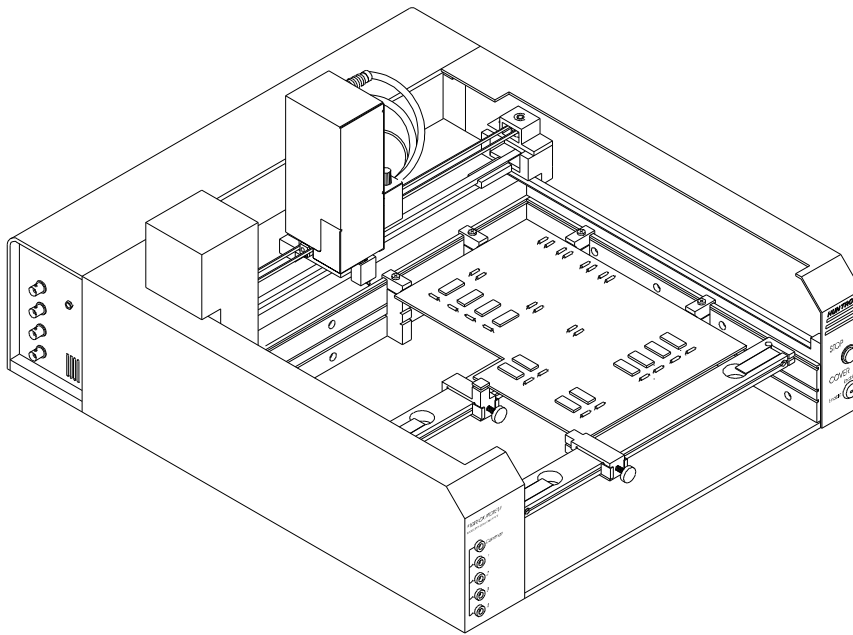


This figure shows how to mount a board that is larger than the normal clamping area. By using Slide Bar Extensions and Extended Slide Bars, the effective clamping area for Prober II grows from 12.5" X 13.5" (31.75 cm by 34.29 cm) to 12.5" X 17.5" (31.75 cm by 44.45 cm). While the clamping area will be increased, the probing area will not change. If you use Board Spacers to allow probing out to the board edge which is next to the back wall of the Prober, the clamping area will only increase to 12.5" X 16.75" (31.75 cm by 42.45 cm). The additional Crossbar and Extended Slide Bar holds the middle of the unsupported edge of the board and prevent the board from flexing while being probed.

When using Extended Slide Bars, the board must be mounted in the top slot of the Prober. The Crossbars (which hold the Slide Bar Extensions and Extended Slide Bars) are then mounted in the middle slot.



This figure shows how to mount either an irregularly shaped board or a long and narrow board. The additional Crossbar and Extended Slide Bar hold the middle of the unsupported edge of the board and prevent the board from flexing while being probed. The Board Spacers allow the Prober to probe components that are mounted within 0.6" (15mm) of the slotted wall edge of the board.



Clamping an Irregularly Shaped Board

When using the Extended Slide Bar, the board must be mounted in the top slot of the Prober. The additional Crossbar (which holds the Extended Slide Bar) is then mounted in the middle slot.

When using the Extended Slide Bar, the board must be mounted

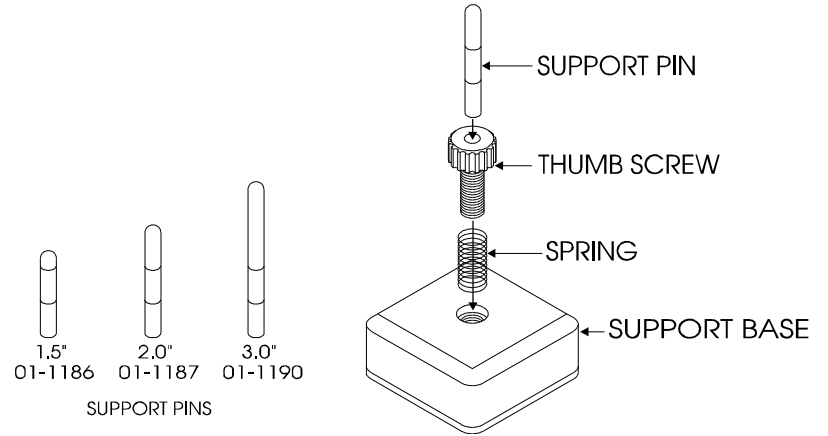
5-6 SUPPORT KIT FOR LARGE BOARDS

Two blocks are included in the Prober III Package. The block can hold three different length pins which are used to prevent large boards from flexing.

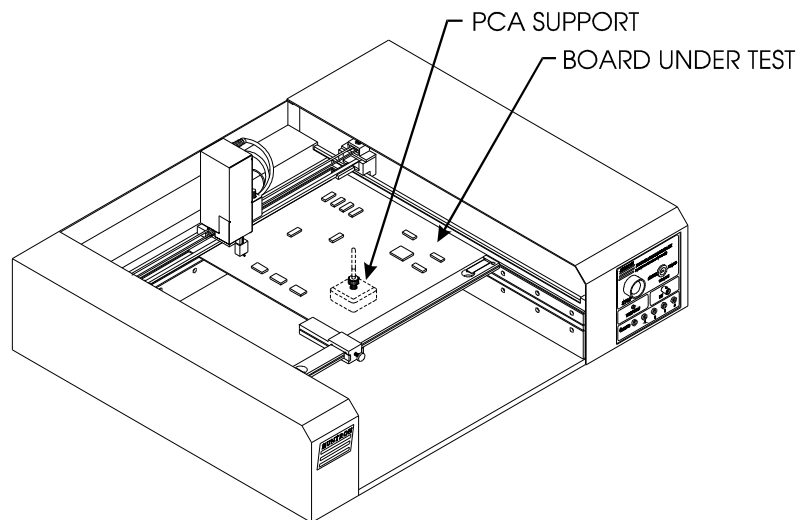
The 3" pin is used for boards mounted in the top slot.

The 2" pin is for the middle slot.

The 1.5" pin is for the bottom slot.



1. Insert pin with spring.
2. Place under board.
3. Rotate thumb screw to adjust pin height.



5-7 AUXILIARY PROBE ACCESSORY KIT

How to use the Auxiliary Probe Accessory kit for connecting an oscilloscope to a Huntron Prober.

Introduction

A Huntron Prober has a spring loaded test probe attached to the Z axis. This probe is directly connected to a flexible coaxial cable which is terminated with a BNC connector at the Prober back panel. An oscilloscope can be directly connected to the BNC connector allowing test signals to be displayed on the oscilloscope CRT. However, due to the length of the coaxial cable and the high cable capacitance, high frequency (above 20Mhz) measurements may not be possible in this configuration. For typical signal analysis using a 100 MHz oscilloscope, it will be necessary to use a 10X oscilloscope probe.

This accessory kit allows the connection of an oscilloscope probe to the spring loaded test probe on the Huntron Prober. The long coaxial cable in the Prober is essentially replaced with your oscilloscope probe cable and a much shorter coaxial cable.

The Auxiliary Probe Accessory P/N 98-0266 kit consists of the following parts:

Description	Huntron P/N
1 Auxiliary Probe Holder	01-1239
1 Coaxial Cable Assembly, F/M	06-4147
1 BNC Adapter	07-1338
2 Screws, 4-40 x 1/2" Philips PH w/washer	07-3085
2 Cable Ties, black, 4"	07-3094
1 Thumb Screw Knob	07-3108
1 Spiral Wrap, 1/2" OD	07-3153
1 Cable Clamp, 1"	07-3207
1 Plastic Bag	20-1027
1 Box	20-1071
1 Auxiliary Probe Instruction Sheet	21-2117
1 Bubble Pack	30-2037

The Auxiliary Probe Holder is used for attaching your oscilloscope probe to the Prober Z axis. The BNC Adapter plugs into the oscilloscope probe tip.

A short coaxial cable is used to connect the BNC Adapter to the Prober's spring loaded probe.

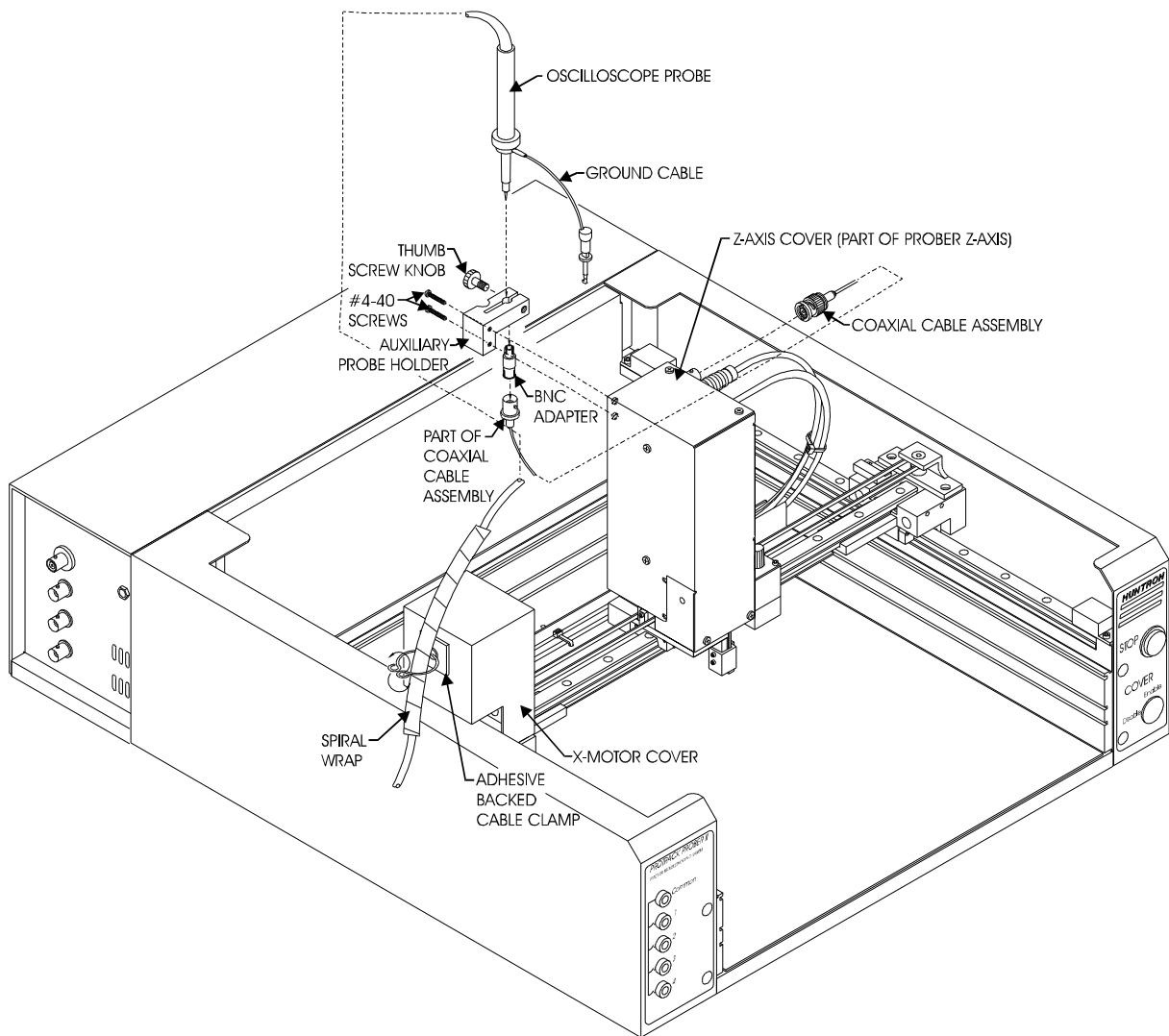


Figure 1. Installation of the Auxiliary Probe Kit on Prober IIc

Installation of the Auxiliary Probe kit. (Refer to Figure 1)

1. Install the Auxiliary Probe Holder using the 2 supplied screws.
2. Insert your oscilloscope probe (not supplied with this kit) into the clamp hole of the Auxiliary Probe Holder and tighten the Thumb Screw Knob. The oscilloscope probe should now be firmly attached to the Prober Z axis.
3. Plug the supplied BNC Adapter into the tip of the oscilloscope probe.
4. Now plug the female end of the supplied Coaxial Cable Assembly into the other end of the BNC Adapter.
5. Disconnect the BNC connector on the right side of the Z axis cover. This cable will not be used for this application. Use a cable tie and attach the unused cable to the wire tray as shown in Figure 3.

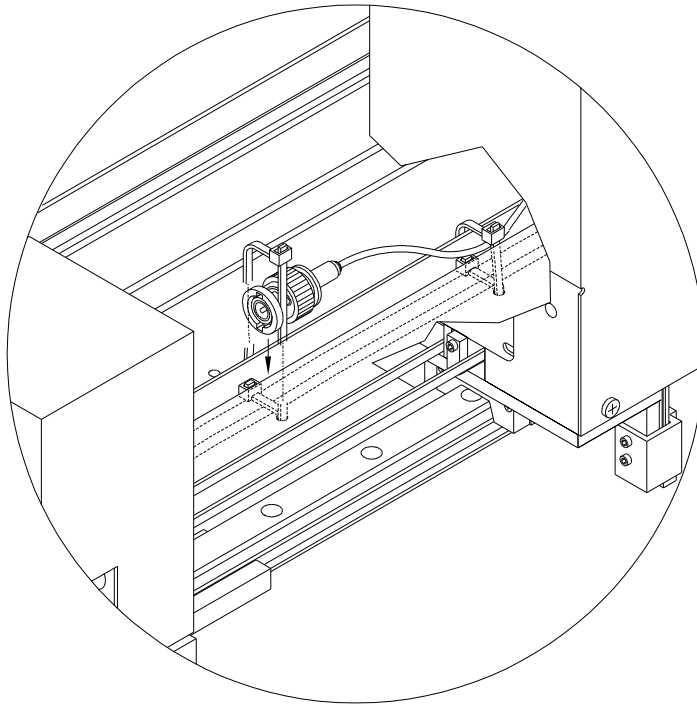


Figure 3. Attaching the unused coaxial cable to the wire tray.

6. Connect the other end of the Coaxial Cable Assembly to the BNC connector on the right side of the Z Axis Cover.
7. Attach the Spiral Wrap to the oscilloscope cable by twisting it so that it wraps around the cable as shown.
8. Install the adhesive backed cable clamp on the left side of the X-Motor Cover as shown. Attach the spiral wrapped oscilloscope cable to the clamp and twist the clamp teeth as shown.
9. Connect the BNC end of the oscilloscope cable to the oscilloscope.
10. Use the ground lead supplied with the oscilloscope to connect to the Ground or reference point of the board-under-test.

You are now ready to use the system.

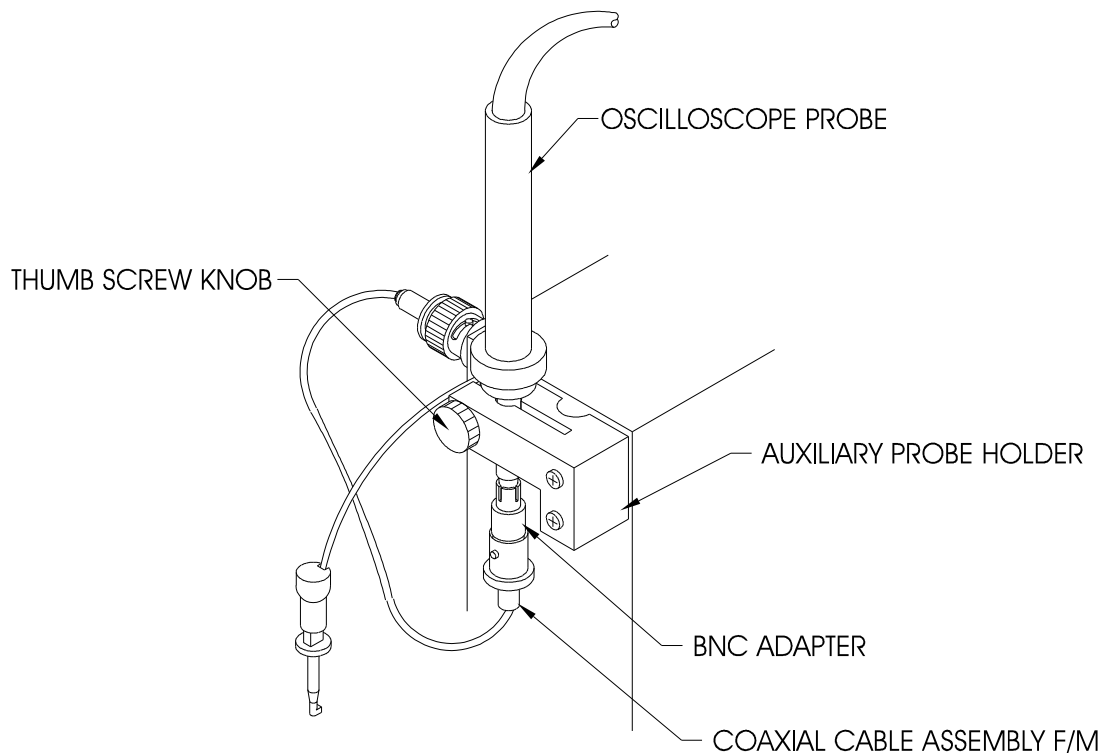


Figure 4. Rear View of assembled parts

Please use these Huntron part numbers for ordering additional accessories.

	Prober I	Prober II and IIc	Prober III	Prober IIIc
Board Spacer	98-0221	98-0111	98-0111	98-0292
Cross Bar w/Locks	98-0222	98-0110	98-0119	98-0019
Slide Bar	98-0109	98-0109	98-0109	98-0109
Slide Bar Extension	98-0132	98-0132	98-0132	98-0132
Extended Slide Bar	98-0133	98-0133	98-0133	98-0133
PCA Support Kit	none	none	98-0167	98-0167
Auxiliary Probe Accessory Kit	98-0266	98-0266	none	none

Notes:

SECTION 6

APPLICATION NOTES

6-1 HOW TO USE THE FRONT PANEL COMMONS

The Prober front panel commons are marked Common, COM1, COM2, COM3 and COM4. These common terminals are used for applications requiring more than one Common connection to the board-under-test. For example, you may want to setup a board so that some components are tested with respect to the Ground terminal and others with respect to Vcc or any other power supply rail. Even though no power source is applied to the board-under-test, signatures may appear significantly different with respect to different Common references.

The main common terminal Common on the Prober front panel is directly connected to the common BNC jack on the Prober side or back panel.

NOTE: Even though 4 Commons are available for physical connection to the board-under-test, only a combination of any 2 of those 4 Commons will get shorted to the main Common terminal. For example, connecting all the Commons to the board can allow the following test conditions:

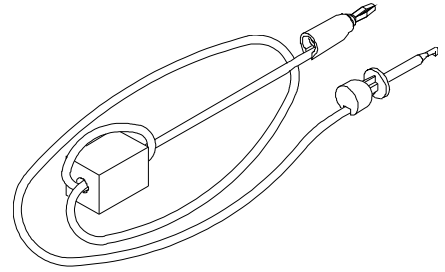
For example, component U1 can be tested relative to COM1 or COM2 or COM3 or COM4. You will have to set up 4 components, each with a different Common if you want to test it relative to all the above Commons.

Component U1 can be tested relative to COM1 and COM2. This will short COM1 and COM2 to the Common terminal. Any combination of **two** Commons can be set up in this way. This feature is useful when you want to short out the power supply rails to the Common circuit.

Component U1 could have been tested relative to COM1, and U2 relative to COM3 and COM4, and U3 relative to COM1 and COM2 etc. In each case, only two Commons are allowed to be shorted to the Common terminal which is wired to the Common terminal of the ProTrack.

6-2 USING THE COMMON CLIP CABLE WITH THE FERRITE NOISE SUPPRESSER

One of the Common cables supplied has a Ferrite suppresser looped around one end of the cable. Use this Common cable if you are testing at low voltages (below 3V). Low voltage testing is sensitive to external noise being coupled into the test system. This high frequency noise can be attenuated by using the ferrite coupled Common cable.



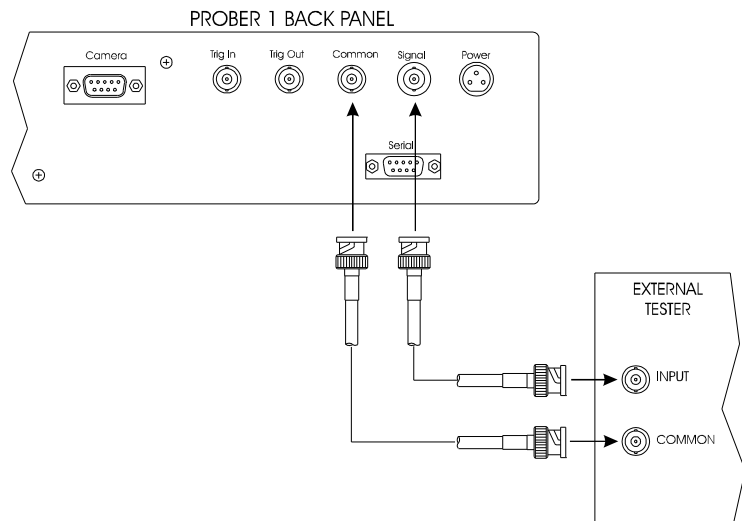
6-3 USING EXTERNAL TESTERS WITH THE ROBOTIC PROBER

The ProTrack can be regarded as an external tester. It provides a test signal to the test probe and records the response in the computer. Similarly, any tester capable of applying or monitoring test signals via the test probe can be connected to the Prober. To accomplish this, some custom software has to be developed in order to make the testing automatic.

The hardware connection to the Prober is via the Signal and Common BNC connectors at the back panel of the Prober. The external tester's signal is connected to the Signal BNC connector and the return or Common connection for a typical 2 wire measurement is connected to the Common BNC connector.

This type of connection automatically routes the external tester's signal to the spring loaded test probe on the Z axis. The board-under-test Common is connected to the tester's Common terminal.

The external tester could be a digitizing Oscilloscope, RCL Meter, Volt Meter, Impedance Meter, Analog to Digital Converter, Fault Simulator, Logic Probe, or even a functional tester with a guided probe.



6-4 HARDWARE HANDSHAKING

The Prober hardware also provides a TTL type output and input for allowing hardware handshaking with external testers. The Prober Trigger-Out and Trigger-In signals are available via BNC connectors at the Prober back panel.

6-5 PROBER TRIG IN/OUT SIGNALS

Prober Trigger-Out signal

The Trigger-Out signal is a 5 volt or 0 volt signal which can be used to indicate to the external tester to execute it's test routine. At this time the Prober test probe is in the down position, and is touching the test point on the board. The tester should now apply it's signal.

Prober Trigger-In signal

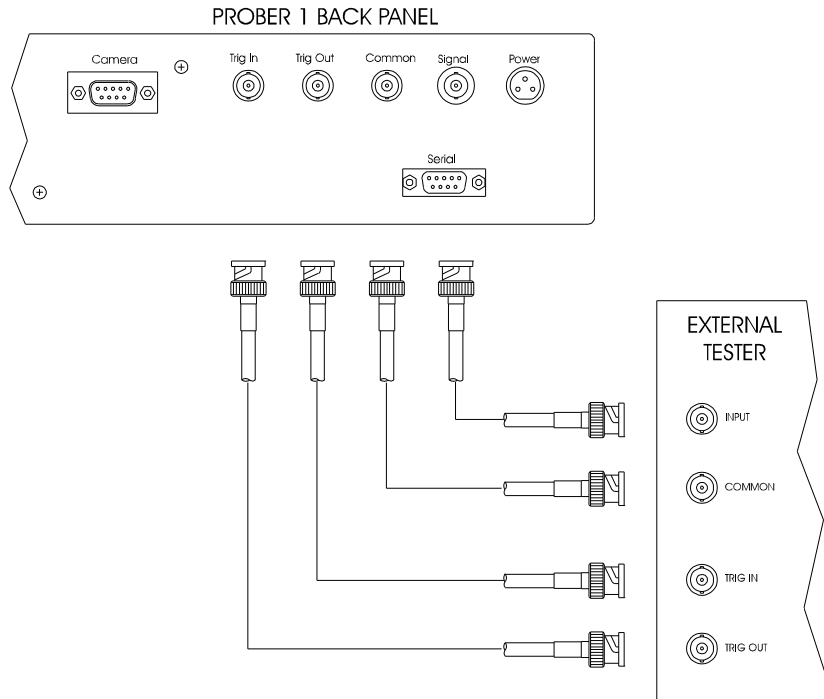
The Prober's Trigger-In signal is normally High. When this line is set to Low by an external tester, the Prober will move the probe up and proceed to the next test point.

6-6 Time Delay Duration

If the external tester has no Trigger In/Out capability, a time delay can be set so that the Probe will wait a specific number of milliseconds in the Down position. While the probe is Down, the tester must execute it's test routine. After the time delay duration expires, the Probe will move up and to the next test point.

6-7 EXAMPLE OF A CONCEPTUAL EXTERNAL TESTER

Let us assume that we have an external voltmeter that is capable of recording 64 readings and has a Trigger Input/Output capability. The voltmeter's Trigger Out line is setup so that it goes LOW whenever a reading is successfully recorded. The voltmeter's Trigger-In line is setup so that whenever a High signal is present, it should take another reading and record it.



Here is an example of the sequence of events for hardware handshaking.

- The XY positions of 64 test pins are set up using the Align, and Teach routines from the Huntron Workstation for Windows software.
- The appropriate parameters in the Settings and External menus are setup. Refer to the Help Menu for specific details on External Settings.
- After clicking Scan Component from the Control menu, the voltmeter is waiting for its Trigger-In to go High so that it can take a reading.
- The probe moves to the first test point and is making contact with the test point on the board-under-test.
- The Prober's Trigger-Out line goes High, indicating to the voltmeter to take the reading.

- The voltmeter, upon detecting this signal, takes the reading and after the value is stored, set it's Trigger-Out to a Low state.
- The Prober detects it's Trigger-In as Low, indicating that the voltmeter is done taking the reading. The probe moves Up and then to the next test point, making contact with it. The Prober's Trigger-Out then goes High indicating to the voltmeter to take the next reading. This cycle is repeated until all 64 test points are accessed.

Setting a time delay Duration with Trigger-Out set to Active High.

In the External menu, set the Duration parameter to 200 ms.

This will allow the probe to wait for 200ms after issuing a High on it's Trigger-Out line while the probe is in the Down position. There is no monitoring of the Trigger-In signal.

Time delay Duration only.

If the time taken for the external tester is a known quantity, the simplest way to synchronize the testing is to set a time delay Duration. Here, there is no need to connect the Trigger lines. The Prober will simply wait for the time to expire while the Probe is in the Down position.

SECTION 7

CUSTOM APPLICATIONS

7-1 HINTS AND TECHNIQUES FOR PROBING SURFACE MOUNTED COMPONENTS

Probing fine pitched devices can be difficult. The pins of these devices are sometimes smaller than the width of the test probe. J-leaded pins bend underneath the component, so no reliable access is available for probing at the pcb level. Some devices have Metric number spacing, thus forcing the software to round off the spacing numbers to the nearest 1/1000 of an inch leading to inaccurate calculations. Some devices are not placed exactly at the same location relative to the “golden board. However, it is still possible to probe these devices with the Prober. The following suggestions serves as a general guide for probing Surface Mount Devices.

1. Be sure all Prober rails are properly lubricated before you begin.
2. Be sure the printed circuit assembly is secure in all directions. Larger boards may need support from below to stop probe bounce. Smaller boards may need a custom support fixture.
3. Focus the camera at the beginning of the Camera Offset procedure and do not touch the focus knob again until the test routine is finished.
4. Perform the Camera Offset routine using the card under test rather than Burn in/Offset Board supplied. Use a magnifying glass to be sure that the probe is exactly on the offset point.
5. Select alignment points that are clearly visible. 90 degree angle foil runs are good examples of alignment points.
6. Program all position coordinates in one sitting. Do not jump in and out of the program making the numerous alignments necessary. Each interruption to the position programming and subsequent realignment increases the margin of error. **Always Align if the probe head returns to the Home position.**
7. Take care to locate cross hairs over the center of pins using the Zoom feature. Try to probe the board/pad rather than the neck of the pins.
8. Be aware that the camera offset is accurate only to the slot level selected. If you are probing test points much higher (more than 200 mils) than the slot level, then the Camera offsets will not be accurate. Try to test points on the pcb itself.
9. To probe devices that are spaced less than 25 mils, a smaller test probe is necessary. The current crown point recommended for SMDs has a tip diameter of 11 mils. This may short out two adjacent pins on certain fine pitched components. A single point version of the tri-needle probe may work

better. For smd probing, use the 4 point tapered crown probe (P/N 07-2120) or the single needle flux penetrating probe (P/N 07-2136)

7-2 PROBING BOARDS WITH COMPONENTS THAT ARE MORE THAN 3 INCHES HIGH

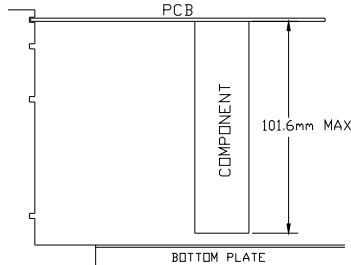
Some boards have components like capacitors, heat sinks, and transformers that are more than 3 inches high. Probing the component side of these boards is difficult due to the limited Z axis up/down travel. These boards have to be probed on the solder side. However, the component may be in the way when you try to clamp it into the board slot.

With Prober III the bottom slot is about 2 inches higher than Prober IIc.

The **Prober IIIc**, has an additional slot that will allow a maximum component height of 4.21 inches (10.7 cm). The printed circuit assembly can then be placed with the solder side up in the top slot with the tall components facing downward. The board can also be placed in the lowest slot with the component side up.

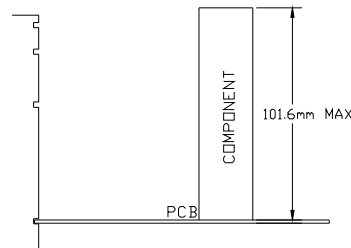
The drawings below show the various methods for installing a board with tall components.

PCB PLACED IN PROBER TOP SLOT WITH LARGE COMPONENT UNDER THE BOARD

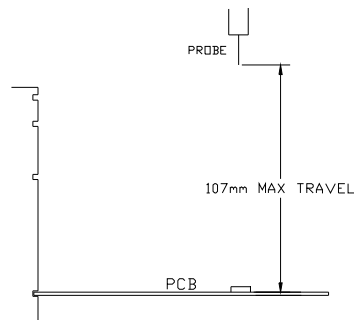


BY REMOVING THE BOTTOM PLATE, THE BASE OPENING BECOMES ACCESSIBLE AND COMPONENTS CAN EXTEND TO THE TABLE TOP ADDING ANOTHER 25mm TO MAX COMPONENT HEIGHT.

PCB PLACED IN PROBER BOTTOM SLOT WITH LARGE COMPONENT ON TOP OF THE BOARD



PCB PLACED IN PROBER BOTTOM SLOT WITH SMALL COMPONENT ON TOP OF THE BOARD



NOTE: To probe boards in the **Base Slot (lowest slot)**, a longer test probe has to be installed. Using the standard length probe will not allow you to probe boards in the **Base Slot**. Install the **30 Degree Spear Point Probe (P/N 07-2106)** into the **Probe Holder** according to the

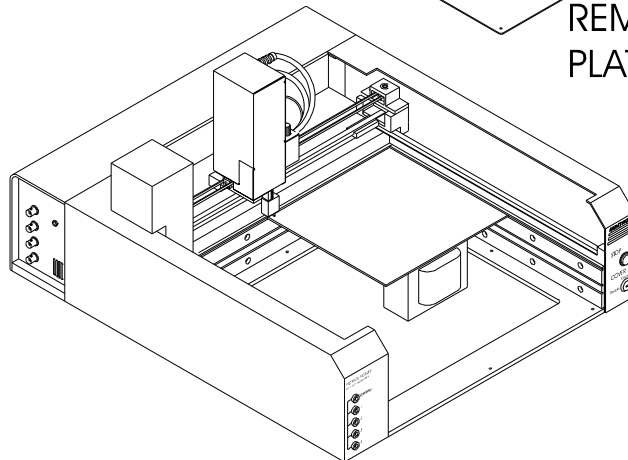
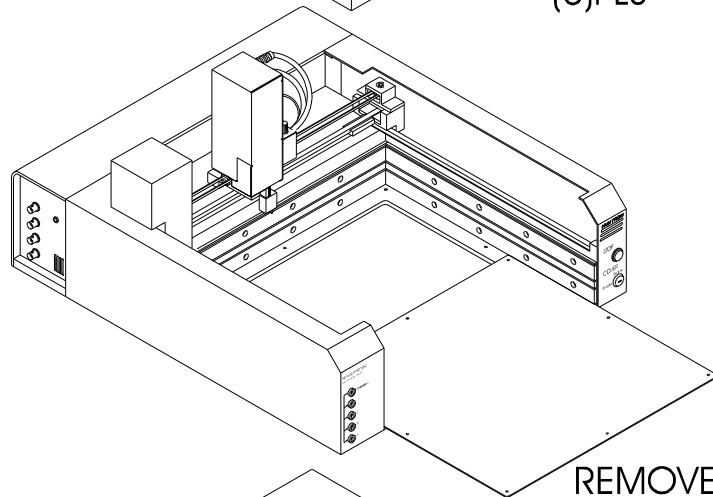
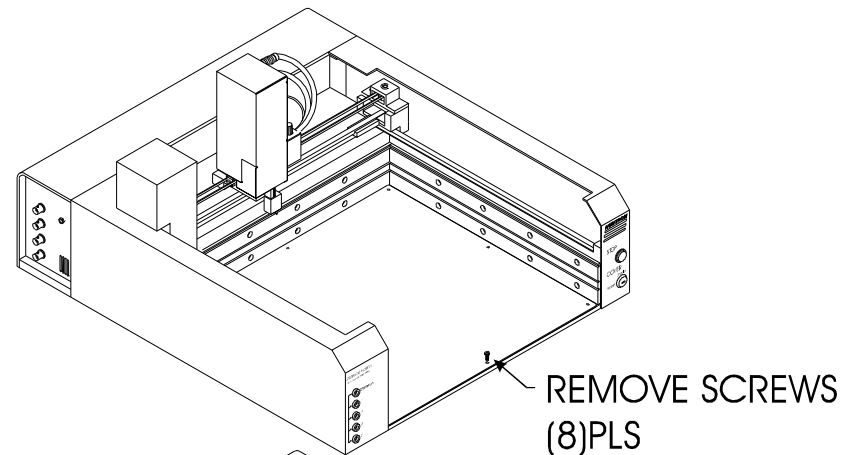
instructions in the **User Manual Section 4-5**. This is an extended length probe required for probing boards that are mounted in the **Base Slot** (lowest slot).

Prober IIc and IIIc has an additional cutout in the base plate. This allows for additional clearance for the large components. Remove the plate as shown below. Mount your board so that the large components are now positioned inside the cutout.

Sometimes, the common connections to the board-under test is difficult. The additional clearance may also make it easier to access the Common connections.

Re-install plate when this feature is not needed.

Prober IIc



End of document