



Service Manual

SureSight™

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Part No.	Rev.	Description	ECN #	Date	Approved
140399	A	SureSight Service Manual	5-41452	5/2000	SH
140399	B	SureSight Service Manual	5-41582	6/2000	SH
140399	C	SureSight Service Manual	D*	D*	D*
140399	D	SureSight Service Manual	D*	D*	D*
140399	E	1. Update working distance on pg. 6, 40/33.4 CM (SSI/SSII) 2. Update crosshair to patient position page 7 40/33.4 CM (SSI/SSII) 3. Update formatting on page 10 4. Remove Parts List, page 25-26. Add reference to Repair BOM's in SAP 5. Clarify Minimum Hardware/Software and Firmware process on page 13 Section 2.4 Step 5-7. 6. Added ATE process step, "Insert Distance Block in position 4 (50cm)" in Step 2.4.5.a on page 19 and Step 2.4.12.b on page 20.	D*	D*	D*
140399	F	1. Updated section 2.4 with additional information in steps 2.4.1.a, 2.4.2.a, 2.4.7.b, and 2.4.8.b	D*	D*	D*

D* SEE SAP DIR FOR CHANGE NUMBER, APPROVER NAME AND DATE OF APPROVAL

Drawings and/or illustrations and/or part numbers contained in this document are for reference purposes only. For current revisions contact Welch Allyn Customer Care at the phone number listed in Section 1.

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SECTION 1 GENERAL INFORMATION

1.1 About the SureSight Vision Screener

SureSight is an objective, accurate, affordable vision test that ensures reliable early detection of refractive error, the primary vision disorder in children. Early detection improves outcomes and reduces treatment duration.

1.2 About the SureSight Autorefractor Model

SureSight is a child friendly, portable, affordable autorefractor that lets you test patients - including young children and adults - anytime, anywhere. Carry it from room to room, to your waiting area, even off-site.

1.3 Technical Help Information

All service and repairs must be performed by fully trained and properly equipped personnel, using genuine replacement parts and correct procedures. Failure to do so will invalidate the product warranty and could compromise instrument safety and performance.

Read and understand all safety warnings and service notes printed in this Service Manual and the Operator's Manuals. If in doubt about any precaution or procedure, for phone help, or to order additional copies of the SureSight Operator's Manuals, contact:

Welch Allyn Customer Care
4341 State Street Road,
Skaneateles Falls, NY 13153 USA
Telephone 1-800-535-6663
www.welchallyn.com

When calling, refer to the model number shown on data label, found on the bottom of the SureSight.

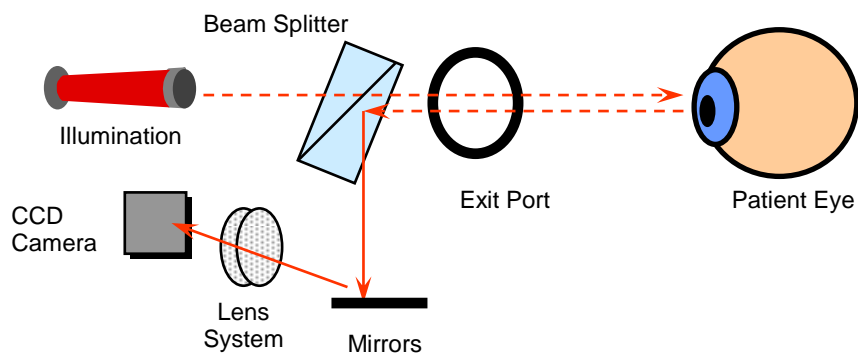
Troubleshooting assistance is contained in Section 3 of this manual.

1.4 Theory of Operation - Details:

Hartmann-Shack Technique Description:

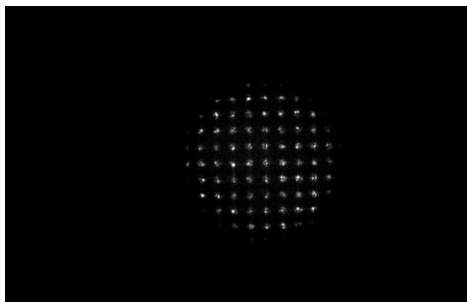
The following is a description of the basic Hartmann-Shack method on which the device is based.

Figure 1

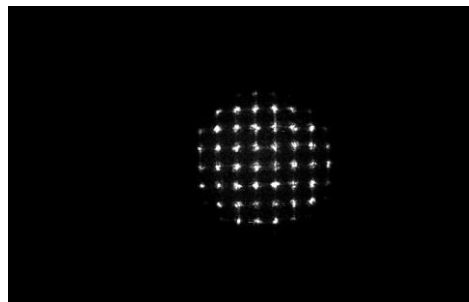


Light is sent from an illumination source inside the SureSight through a beam splitter and focuses on the back of the eye (retina). The retina, in turn, reflects the light back into the device. Inside the unit, the beam travels through a series of mirrors and is received by a micro-lens array, creating an image which is sent to a CCD camera. The spot pattern of light formed is translated into sphere, cylinder, and axis.

Examples of Spot Pattern Received Through CCD Camera



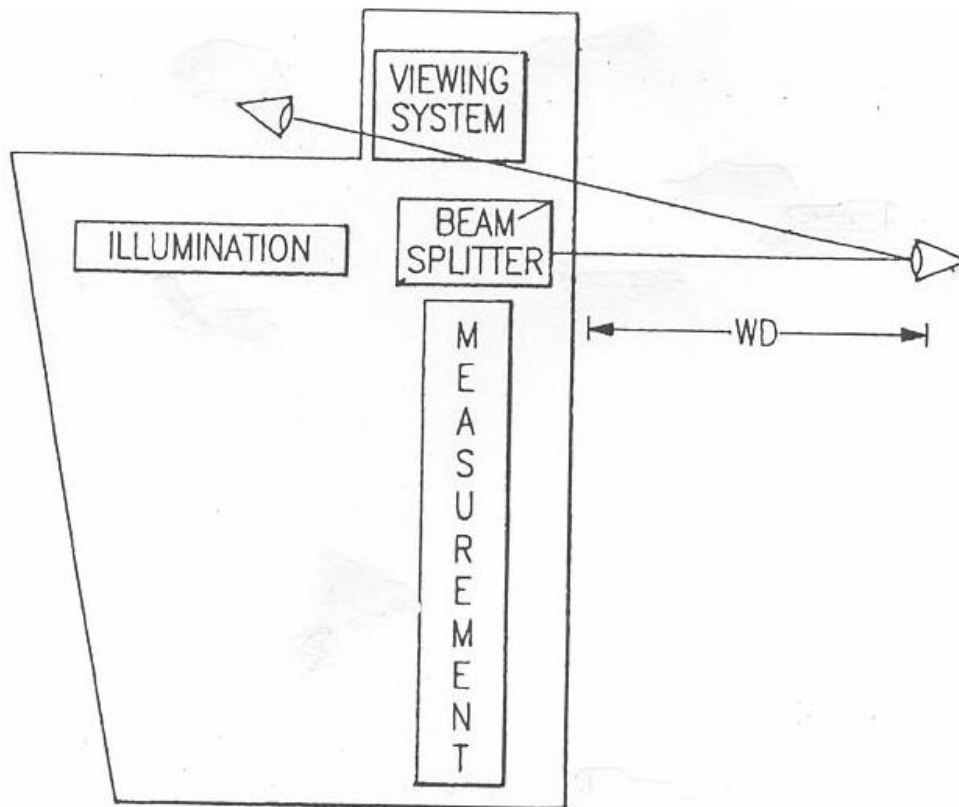
Emmetropic Eye 0.00 Diopters
spot pattern of light is uniform



Hyperopic Eye +4.24 Diopters
spot pattern of light is compacted

VISION SCREENER OPTICAL SYSTEM ARCHITECTURE

The following is a description of the present design architecture. A collimated beam of light is projected out of the patient port by the illumination system. The light is 'focused' by the eye lens and cornea to a small spot on the retina. This blur acts as a point source on the back of the eye which then radiates back through the eye lens and cornea producing a reflected beam which includes information about the lens power and eye aberrations. The resulting return beam is directed by the beam splitter into the measurement path which is detected by the camera at the end of the path. To achieve alignment, the practitioner views the patient eye and the alignment guide pattern through the viewing system. The working distance between the output port of the device and the patient is approximately 40/33.9 centimeters (SSI/SSII). This large working distance provides the opportunity to improve accuracy in children, as well as being less intimidating to them. It also reduces the need for fogging which is used in conventional autorefractors which work at approximately 2cm.



MAJOR SUBSYSTEMS:

Illumination System:

The illumination system generates a laser beam which can be projected into the eye under test. Because this laser beam radiates in the infrared region - it is not visible without an IR goggle or other IR detecting device. For repair and calibration purposes, an ITT night vision scope is recommended for any work which includes the illumination system.

The source of illumination is a 5 mW electrical, 3 mW optical semiconductor laser located on the laser mini board. This board is attached to the illumination tube which houses the optics needed to collect the light emitted by the laser and form it into a beam which is projected from the end opposite the laser. The laser mini board is connected via a 4 position flex cable to the laser drive board which controls the laser output. The drive system monitors the laser output with a photodiode which is physically built into the laser diode. The laser drive system controls the laser output to a particular photodiode level which is set by the DSP board. The DSP controls this setting with a digital pot on the laser drive board according to a calibration performed at the factory. This beam is transmitted through the beam splitter located near the one inch port on the front of the unit.

***SAFETY NOTE:** While the laser is capable of emitting 3 mW of optical power, only a fraction exits the illumination tube. Laser levels are controlled to approximately 18 μ W, which is well within Class I safety limits. However, to prevent improper exposure DO NOT look at the bare laser diode.

A properly functioning illumination system produces an approximately collimated beam of light 2mm in diameter. This beam can be seen using ITT goggles when a piece of white paper is placed in front of an operating illumination tube. The collimated aspect of the beam can be observed by the lack of change in size of the beam (spot) regardless of the distance from the front of the tube.

Measurement System:

The measurement system detects the beam reflected from the patient's eye back toward the unit. This beam enters the product through the one inch port on the front of the unit and is reflected down toward the bottom of the unit by the reflecting side of the beam splitter. This beam passes through a first conjugate lens, to two measurement mirrors which bend the beam across the bottom of the unit and back up toward the top where it passes through a second conjugate lens in to the camera/lenslet assembly. The camera/lenslet assembly consists of the camera board with a lenslet filter mounted to the top of it by a lenslet housing. When the beam passes through this lenslet and IR filter, a group of spots are created which represent the optics of the eye from which the beam came.

The camera image is progressively sent to the DSP board for processing. If a sufficient number and quality of images is detected, the DSP computes and reports a reading of the optical power detected. The exposure, gain and other settings of the camera are controlled by the DSP board through a serial port and a digital pot on the camera board. These settings are also set during the factory calibration.

Viewing System:

The purpose of the viewing system is to create a visible image which can be used to align the product with the patient. Because the laser is invisible, it can't be used for aligning. Instead, the viewing system produces a visible crosshair target which is aligned so as to be in the same position as the invisible laser beam at the in-range working distance. In this way, when the practitioner aligns the crosshair with the patient's eye, they are also aligning the laser which is required to make the measurement. It is critical that the viewing crosshair be aligned to the laser beam at the proper working distance.

The source of illumination for the viewing system is an LED located on the LED mini board. This is a traditional LED used to backlight a crosshair which is cut into a cup mounted over the LED. This mini board and cup assembly is mounted to one end of the viewing tube which contains optics required to magnify and project the crosshair to the patient's position 40/33.4 cm (SSI/SSII) away. The LED mini board is connected to the laser drive board through a 4 position flex cable. The actual drive for the LED is on the laser board and is turned on and off by the DSP using a single control line.

PC BOARD ASSEMBLIES:

DSP Board:

The DSP board includes the microprocessor which controls the operation of the product. It also contains the software in a flash EEPROM, external RAM, a real time clock with battery, and the decoding circuitry for the user button presses. In addition, the DSP board “passes” both power and control signals between boards. All boards are connected to the DSP and all signals and power are redistributed as needed. In other words - any connections which must be made between boards do so through the DSP board.

Power Board:

The power board includes two switching systems to generate all voltages required to operate the product. It includes the charging control circuitry, the low battery circuitry, the distance measurement circuitry, and the speaker/tone generation circuitry.

Fixation Board:

The fixation board includes the fixation LED array which is flashed to attract the patient's attention. It also includes the jacks for USB/RS232 connection, and the charging port. The drive circuitry for the RS232 and USB is located on this board, as well as the IRDA sensor which communicates with the printer. In the central section of this board, the ultrasonic sensor is mounted. However, the ultrasonic sensor circuitry is actually on the power board, it only sits on the fixation board to match the output port of the housing.

One important note: the fixation board must be present for the system to power up. If the power board does not sense the presence of the charging jack with no plug present (i.e.: not charging), it will not power up.

Laser Board:

The laser board provides the drive for both the viewing crosshair LED and the laser. The LED is controlled with a simple on/off control at a set output current. The laser is controlled to a target level depending on the setting of the digital pot on this board. The pot is settable by the DSP during each startup of the device. In addition, the laser has an on/off control which is used in addition to the digital pot to insure that the laser is off when not required for measurement.

Camera Board:

The camera board contains a full chipset for the black and white imager which detects the return beam for measurement. The camera exposure control is accomplished via a serial port on the board, and the gain is controlled by a digital pot which is settable by the DSP. The camera gain is subject to calibration at the factory.

LCD:

The LCD is a custom assembly of glass and printed circuit board. In addition to a series of seven segment displays to present the reading results, and various indicators to indicate other conditions, this board includes the button inputs, and the dip switch inputs. These inputs are passed to the DSP for detection and decoding.

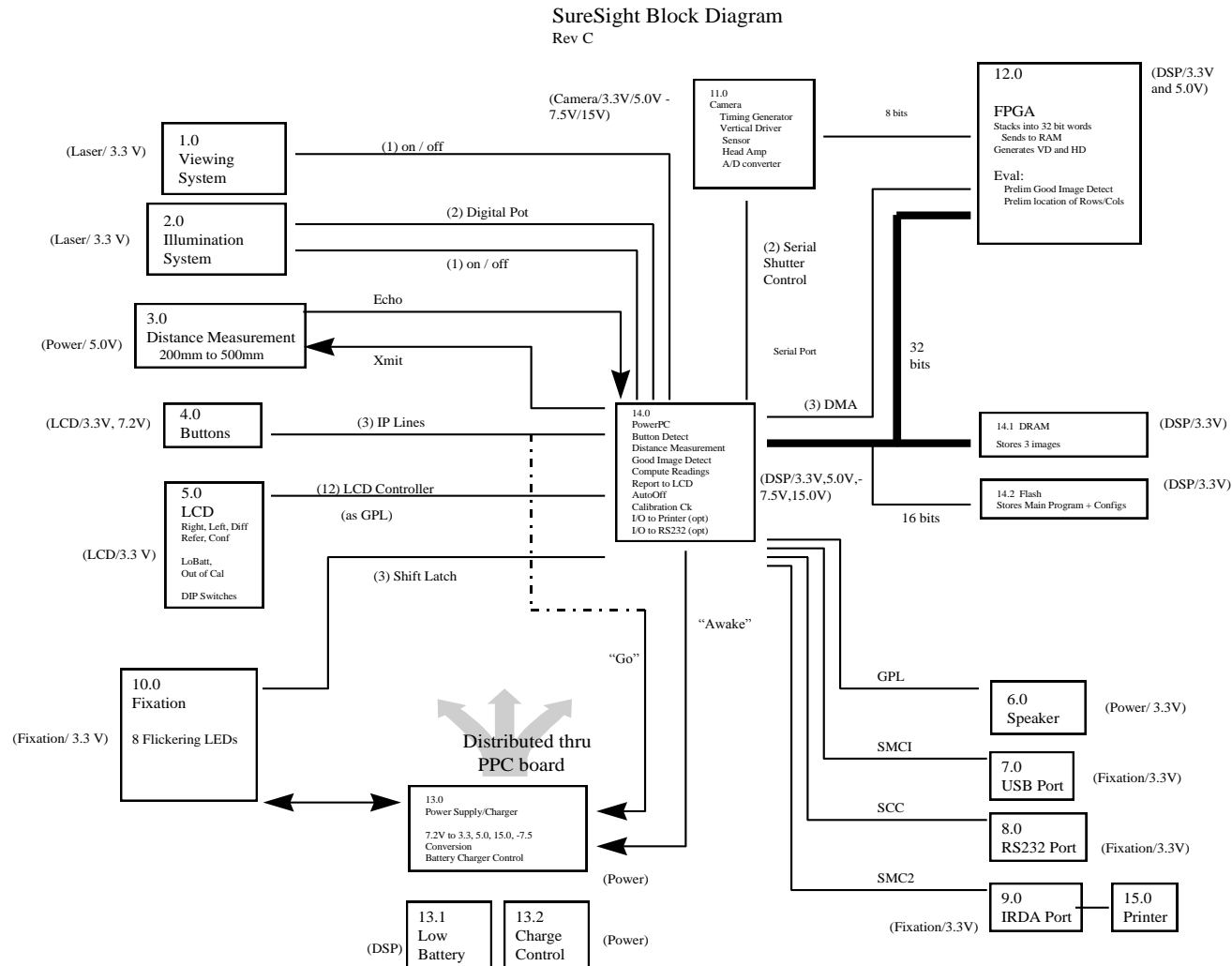
Laser Mini:

The laser mini is a board which is primarily a mechanical mount. The board includes only the laser diode and a flex connector which mates it to the laser drive board via a flex cable.

LED Mini:

The LED mini is a board which is primarily a mechanical mount. The board includes only the LED and a flex connector which mates it to the laser drive board via a flex cable.

1.5 Block Diagram



1.6 Tooling

20020011 TOOL SS2 SERVICE FIXTURE

- 70026354 TOOL SURE SIGHT II SERVICE TOOL SCHEM
 - SURE SIGHT II ST Schematic
 - SS2 SERVICE TOOL BOM Electrical
- 70025981 TOOL SS2 SERVICE TOOL FIXTURE
 - SSII SERVICE FIXTURE Assembly drawing

20018761 SureSight II Alignment Station ATE


- 70024421 TOOL SURE SIGHT II ALIGNMENT FIXTURE
 - Alignment Station Fixture Assembly Drawing
 - SS2 SERVICE TOOL BOM Electrical
- 70024576 MPS HOW2 SURESIGHT II (Refer to Alignment Station section, starting on page 42)

NOTE: For Step 30 and 31, record the Date, Start and Stop time of gluing on the SRF (20010616).

- 70024955 ATE Routine Maint_SureSight II
- 70024374 MFG_ATE Software_SureSight II
- 20010605 SRP Model 14 SureSight Service & Repair Procedure
- 20010616 SRF SureSight Service Report Form / SureSight Loaner Service Report form

1.7 Warnings



ATTENTION: Refer to the operating instructions. This symbol () is intended to advise the user of the presence of important operating or maintenance instructions in the documents accompanying the instrument.



Service or Repair to be performed by qualified and authorized personnel only. There are no user serviceable parts inside the instrument. Opening this device can expose the user to harmful invisible laser radiation.



Use only Welch Allyn 710 series chargers.



Replacement parts and accessories - Use only approved replacement parts and accessories specified in this manual. Refer to the repair parts section of this manual.



Do not sterilize the instrument or any of its components.



Use only with IEC 60601-1 approved printers, or keep printer out of patient vicinity.



Battery replacement: Replace with Welch Allyn model # 72420 Lithium Ion battery only.



Do not attempt to disassemble or modify the battery pack. There are no user serviceable parts inside the pack.



Do not attempt to directly solder the battery pack.



Do not attempt to connect the positive and negative battery terminals to each other, nor to any other device.



"Caution" - use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.



Do not operate, charge, leave or discard battery pack in any environment where it may exceed 0°C to 40°C.



Do not immerse the battery pack in water.



Do not attempt to open or pierce the battery pack.



Do not throw or strike the battery pack.



Do not use a battery pack which appears to be deformed, leaking, corroded or is otherwise irregular.



If electrolyte leaking from battery contacts your skin or eyes, rinse with running water and immediately seek medical attention.



IPX0: Not protected against the ingress of water.



Not for use in the presence of flammable anesthetics.



ITT Nightscope can't leave Welch Allyn repair facility due to import/export regulations. It is considered a military device.



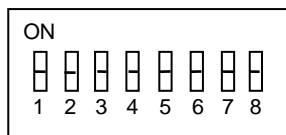
When the device is opened, laser emission above the acceptable exposure limit (AEL) may be present. Care must be taken not to look into the beam or project the beam into another person's eye.

SECTION 2: SERVICE / CALIBRATION

2.1 Incoming Inspection and Checklist:

When a SureSight Unit is Returned, Check:

1. Physical Condition of Package and Unit
2. Record the following observations:
 - Model # _____
 - S/N found on inside of battery door _____
 - Record Dip Switch Position:



- Does Instrument Power Up? Yes No
 - Cal Settings as received? Adult Child
 - S/W version as received? _____
 - Distance function check: Pass Fail
 - Gross Alignment Check - Fake eye
 - Cal light symbol: ON OFF
 - Cross Hair Quality: Good Poor
 - Requested SW Upgrade: Yes No
3. Refer to Section 3 - The Customer Complaint and Troubleshooting Guide to localize the problem.

2.2 Required Upgrades:

Component to Upgrade	When to Upgrade	SS I	SSII
Battery Compartment (see section 4.9)	<ul style="list-style-type: none"> Always replace when the anti-reverse tabs are absent Replace compartment if retainer is too tight or too loose 	X	N/A
Patient Window	<ul style="list-style-type: none"> Replace as needed if scratched Always replace if before serial #9900594 for 14001 and before serial #9920228 for 14011 	X	N/A
O-Ring (see section 4.6)	<ul style="list-style-type: none"> Always remove 	X	N/A
Power PCB Charger	<ul style="list-style-type: none"> Domestically - Change when there is a customer complaint about charge rate in units before 9900480 for 14001 and 9920086 for 14011. Internationally - N/A 	X	N/A
Cross Tubes / Windows	<ul style="list-style-type: none"> Always replace if before serial #0000018 for 14001 and before serial #0020093 for 14011 	X	N/A
Software (see section 2.4)	<ul style="list-style-type: none"> Always upgrade the software to most recent version 	X	N/A

2.3 Tools Required for Service, Calibration and Software Loading

Tier 1: Unit Check Out - Yearly Calibration verification

This Tool is:

- The minimum required to equip a site to perform yearly calibration verification check.
- Does not require the opening of the unit,
- Verifies the product performance.
- Software upgrades are feasible with this tool,
- No internal repairs are allowed.
- Will work to support both SS I and SS II products

Tier 2: Unit Repairs - Major Systems

This tool is:

- Required to equip a site to perform internal repairs.
- Repairs are limited to major subsystems. Component level repair is not available for this product.
- Baseplate realignment performed @ Welch Allyn US only.

TIER	Material Number	DESCRIPTION	Locations
I	T18037	SURESIGHT QUICK CALIBRATION CK	If applicable would be used by a Distributor, Service Center, ASP, etc....
II	20020011	TOOL SS2 SERVICE FIXTURE	Welch Allyn - US, China, Tilburg Major Systems replacement
II	20018761	SURESIGHT II ALIGNMENT STATION ATE	WELCH ALLYN - US ONLY (BASEPLATE REALIGNMENT)
II	20010605	14 Series SureSight Service & Repair Procedure	Welch Allyn - US, China, Tilburg Major Systems replacement, if applicable
II	20010616	SureSight Service Report Form	Welch Allyn - US, China, Tilburg Major Systems replacement, if applicable

Table 2.3-1 Service Tool Table

NOTE: **PROPER TORQUE IS CRITICAL TO FUNCTION.**
 Do Not HAND TIGHTEN WITHOUT TORQUE METER OR DRIVER.

2.4 Calibration and Verification Check:

Preparing the ATE for testing:

1. Remove the 0.3 ND filter,
2. Remove the distance Block,
3. Move the Fake eye to the rear position.
4. Make sure the Fake eye bracket is in the right model position:
 - a. SureSight I = Left position; LED on,
 - b. SureSight II = Right position, LED on.
5. If a customer requests an update to a newer version of software, the following steps should be performed using the tables below to determine the SW/FW and Hardware needed to update and the procedure:

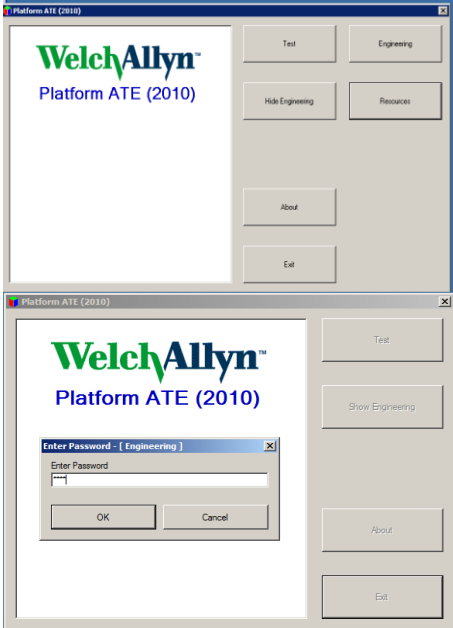
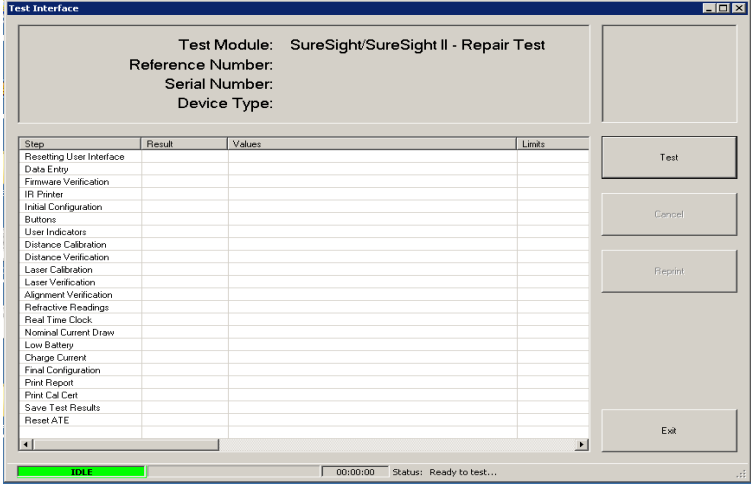
Example: Customer unit received: 14001
 Current Software: 2.20
 Customer wants to update to: 2.25
6. From the table below, you would see the last item is a 14001A and has 2.25 as the minimum. When you get to step 2.4.6 or 2.5.6, instead of entering in 14001, you would enter in 14001A.
7. In step 2.4.9 or 2.5.8 select "Yes" to Load new firmware and re-calibrate.

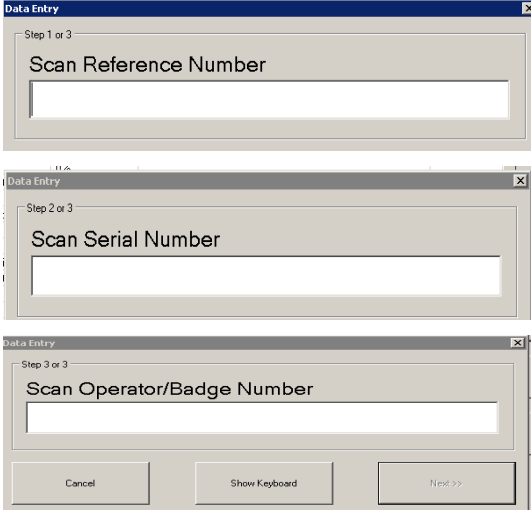
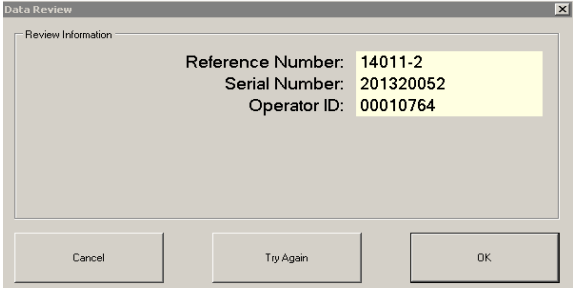
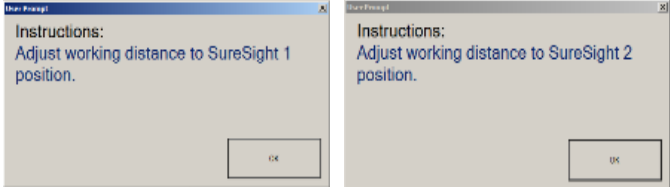
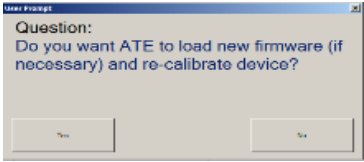
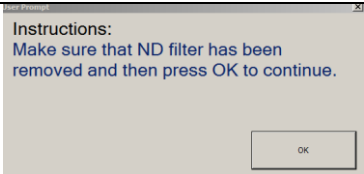
Device Type	Model number	Description	Minimum Acceptable Version of SW	Firmware Version
SS	14001	SURESIGHT, VISION SCREENER	2.20	2.20
SS	14011	SURESIGHT, AUTOREFRACTOR	2.25	2.25
SSII	14001-2	SURESIGHT II VISION SCREENER (CHINA)	10.01	10.01
SSII	14011-2	SURESIGHT II AUTOREFRACTOR (CHINA)	10.01	10.01
SS	14001C	SURESIGHT, VISION SCREENER CHINA	2.20	2.20
SS	14011C	SURESIGHT, AUTOREFRACTOR CHINA	2.20	2.20
SS	14021	SURESIGHT, VISION SCREENER CHINA	2.20	2.20
SS	14031	SURESIGHT, VISION SCREENER, AR, CHINA	2.20	2.20
SS	14001A	SURESIGHT, VISION SCREENER	2.25	2.25

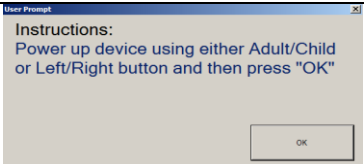
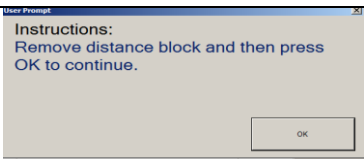
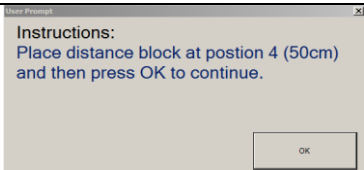



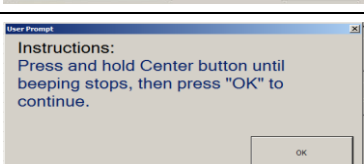

Hardware	
SW Version	Power PCB
2.24 and below	140280-504
2.24 and below	408806
2.25 and above	409726
10.01	409726

NOTE: To reset Calibration timer you must perform a Calibration with the ATE


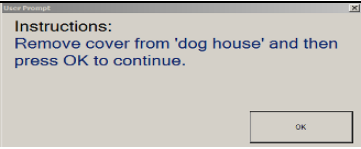
2.4.1	Before starting the software make sure all dip switches are in the off position.
2.4.2	Start up 20020011 ATE software (showing Engineering mode) NOTE: The screen shot below shows the ATE with the Engineering Mode displayed. This can be hidden by pressing the Hide Engineering button. The Password to enter the Engineering mode is bart .
2.4.3	Select "Test".

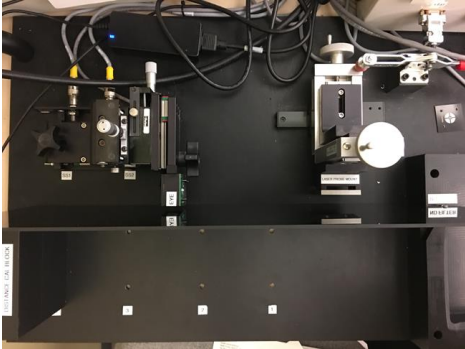

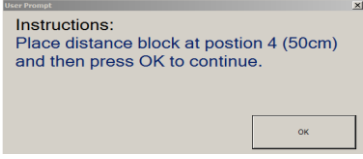
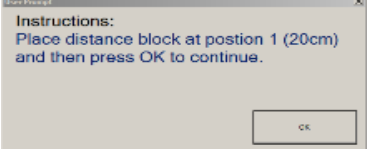
	
2.4.4	<p>In the screen shot below you will notice at the bottom of the screen there are 3 sections.</p> <ul style="list-style-type: none"> ▪ The left most section will indicate what the ATE is doing (idle, testing, etc.); ▪ Time (00:00:00). At the beginning of each device test this will start and keep track of how long the test takes; ▪ Status – At what stage is the current test.
2.4.5	<p>Select “TEST”</p> 
2.4.6	<p>Follow instructions on the screen.</p> <p>NOTE: The Reference (model) number, Serial number and Operator badge number may be scanned or manually entered from the PC connected keyboard or the on screen keyboard (to show select the Show Keyboard button). If you use the scanner the screens will automatically advance.</p> <ul style="list-style-type: none"> ▪ Scan the Reference number (part number on inside of the Battery door), ▪ Scan the Serial Number, ▪ Scan Operator/Badge Number,

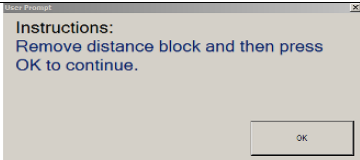
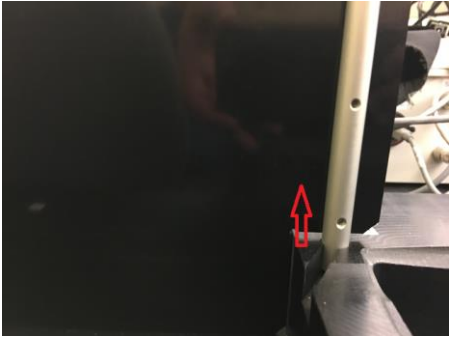
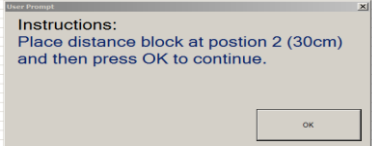
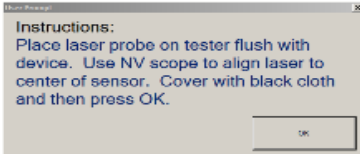
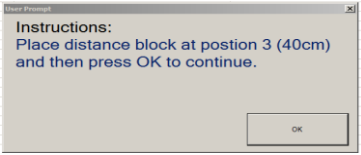
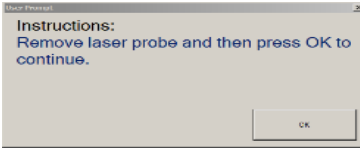
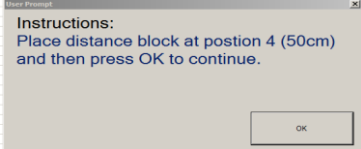
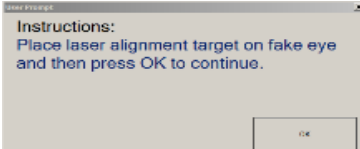
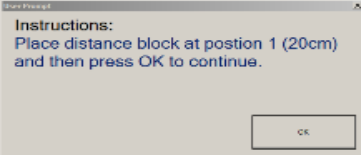
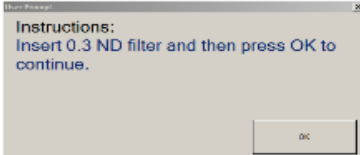
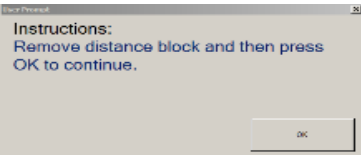
	
2.4.7	<p>Review the data below and make sure it is correct. If it is correct select OK.</p> <p>NOTE: If not correct select “Try Again”, but understand you will need to reenter all of the information again.</p> 
2.4.8	
2.4.9	<p>When the screen below appears:</p> <ol style="list-style-type: none"> If you want to perform an Operational Verification test select “No” and follow the on screen prompts. If you want to re-calibrate or upload firmware select “Yes” and follow the on screen prompts. 
2.4.10	

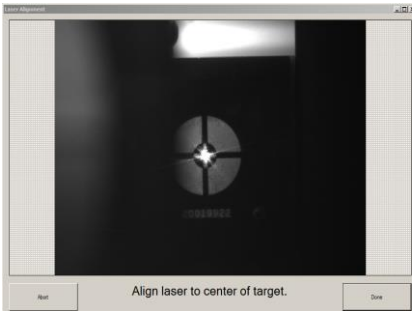
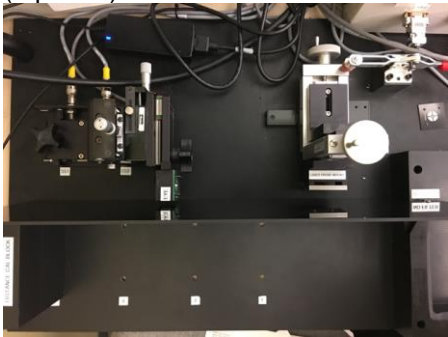
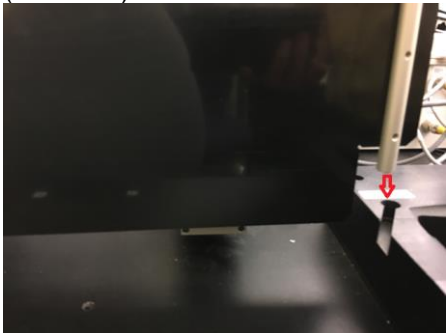
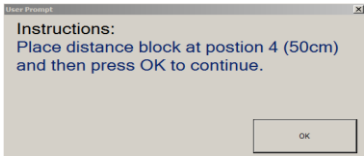
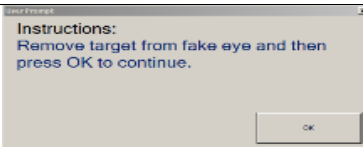
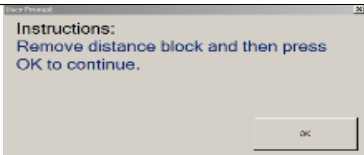

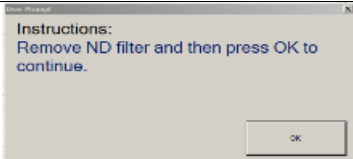
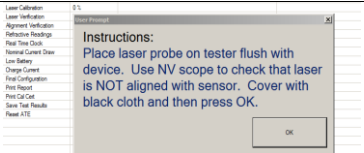
2.4.11	 <p>User Prompt</p> <p>Instructions: Power up device using either Adult/Child or Left/Right button and then press "OK"</p> <p>OK</p>
2.4.12	 <p>User Prompt</p> <p>Instructions: Remove distance block and then press OK to continue.</p> <p>OK</p>
2.4.13	 <p>User Prompt</p> <p>Instructions: Place distance block at position 4 (50cm) and then press OK to continue.</p> <p>OK</p>
2.4.14	 <p>Button Test</p> <p>Instructions: Press Adult/Child button</p> <p>Cancel</p>
2.4.15	 <p>Button Test</p> <p>Instructions: Press Left/Right button</p> <p>Cancel</p>
2.4.16	 <p>Button Test</p> <p>Instructions: Press Center button</p> <p>Cancel</p>
2.4.17	 <p>User Prompt</p> <p>Instructions: Press and hold Center button until beeping stops, then press "OK" to continue.</p> <p>OK</p>
2.4.18	<p>Are all 8 fixation LED's flashing?</p>  <p>Fixation LED Test</p> <p>Are all 8 fixation LEDs flashing?</p> <p>Yes No</p>
2.4.19	<p>Are the fixation LED's off?</p>

	 <p>Fixation LED Test</p> <p>Are fixation LEDs off?</p> <p>Yes No</p>
2.4.20	<p>Are the LCD elements on?</p>  <p>LCD Test</p> <p>Are all LCD elements on?</p> <p>Yes No</p>
2.4.21	<p>Are all LCD elements off?</p>  <p>LCD Test</p> <p>Are all LCD elements off?</p> <p>Yes No</p>
2.4.22	 <p>Cover Removed</p> <p>Instructions: Cover 'dog house' with black cloth and then press OK to continue.</p> <p>OK</p>
2.4.23	<p>Is crosshair on?</p>  <p>Crosshair Test</p> <p>Is crosshair on?</p> <p>Yes No</p>
2.4.24	<p>Is crosshair off?</p>

	
2.4.25	

Use this side of the table to perform an Operational Verification only without calibration or firmware upgrade and follow the on screen prompts.		Use this side of the table to perform a calibration and/or firmware upgrade and follow the on screen prompts.	
2.4.26.a	<p>Install the shield. (top view)</p>  <p>(side view)</p>  <p>Follow ATE instruction prompts.</p> 	2.4.26.b	

2.4.27.a	 <p>Remove the shield from the ATE.</p> 	2.4.27.b	
2.4.28.a		2.4.28.b	
2.4.29.a		2.4.29.b	
2.24.30.a	<p>Insert Distance Block in position 4 (50cm) then</p> 	2.4.30.b	
2.4.31.a		2.4.31.b	

2.4.32.a		<p>2.4.32.b</p> <p>Install the shield. (top view)</p>  <p>(side view)</p>  <p>Follow ATE instruction prompts.</p> 
2.4.33.a		<p>2.4.33.b</p>  <p>Remove the shield from the ATE.</p> 
2.4.34.a		<p>2.4.34.b</p> 

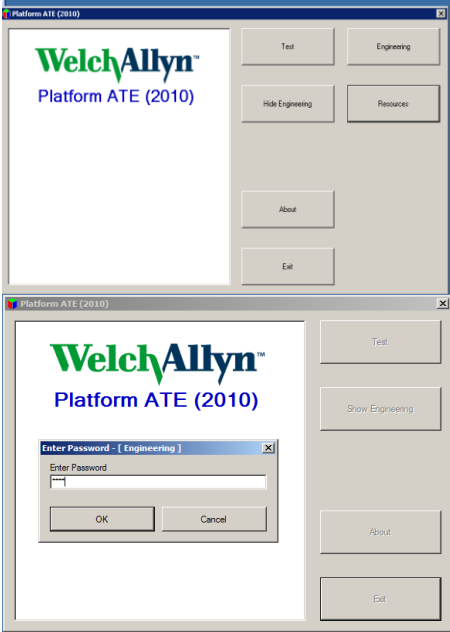
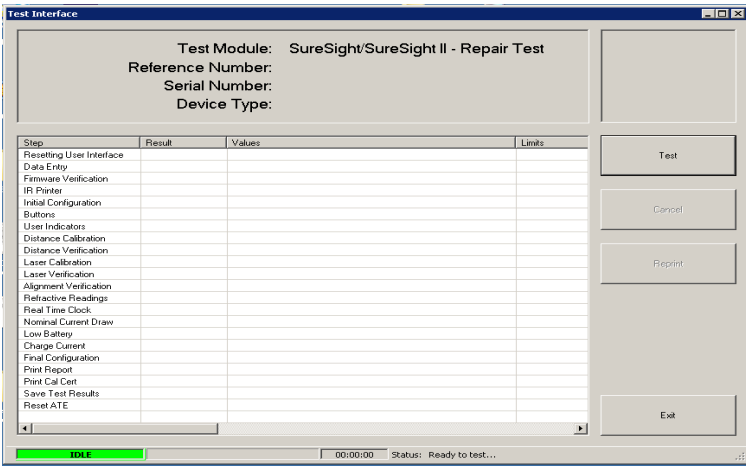
2.4.35.a		2.4.35.b	
2.4.36.a		2.4.36.b	
2.4.37.a		2.4.37.b	Insert Distance Block in position 4 (50cm) then 
2.4.38.a		2.4.38.b	
2.4.39.a		2.4.39.b	
24.40.a		2.4.40.b	
2.4.41.a	 Dip Switch config - OK	2.4.41.b	
2.4.42.a	Install Battery connection - OK	2.4.42.b	

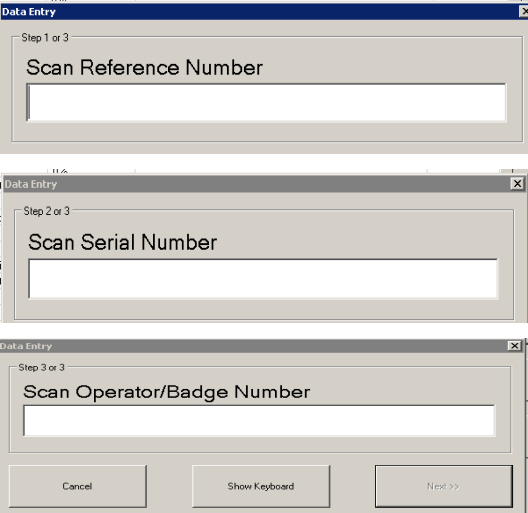
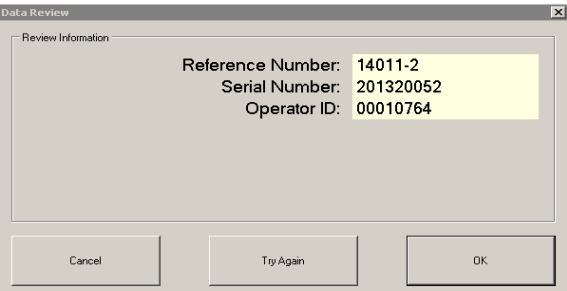
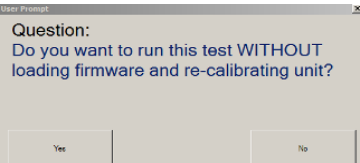
2.4.43.a		2.4.43.b	
		2.4.44.b	
		2.4.45.b	
		2.4.46.b	
		2.4.47.b	
		2.4.48.b	
		2.4.49.b	Install Battery connection - OK
		2.4.50.b	

This is the end of the Automated Test

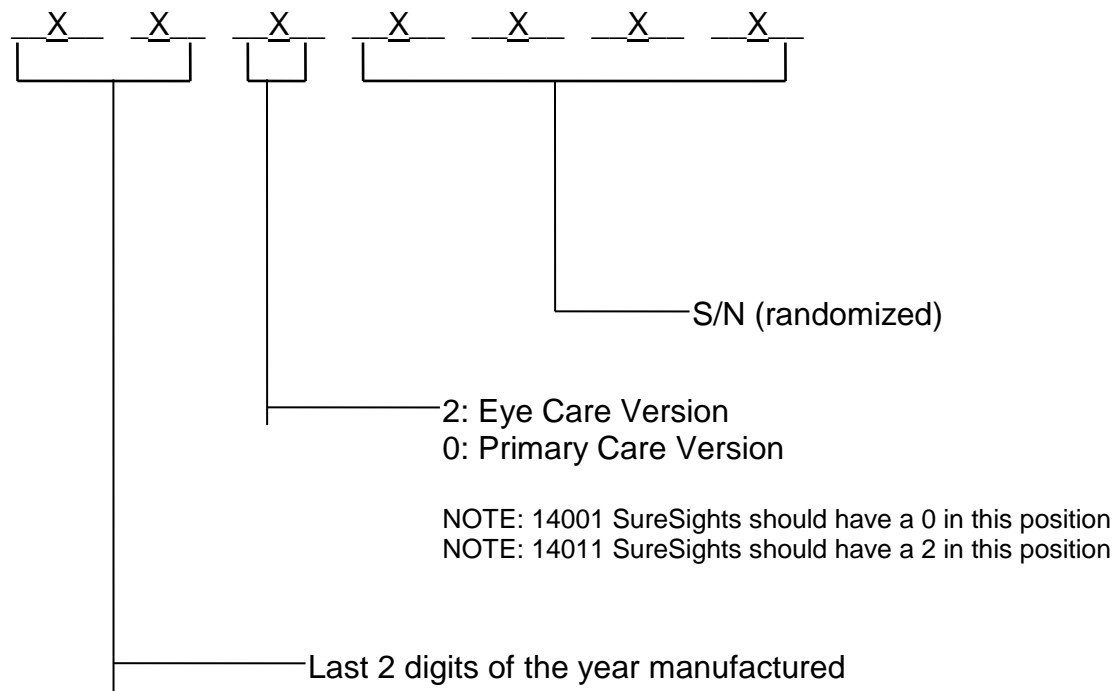
Check for aesthetics. If there are any fingerprints on housings or windows, properly clean them off.

2.5 Software Upgrade

2.5.1	Before starting the software make sure all dip switches are in the off position.
2.5.2	<p>Start up 20020011 ATE software (showing Engineering mode)</p> <p>NOTE: The screen shot below shows the ATE with the Engineering Mode displayed. This can be hidden by pressing the Hide Engineering button.</p> <p>The Password to enter the Engineering mode is bart.</p>
2.5.3	<p>Select "Test".</p> 
2.5.4	<p>In the screen shot below you will notice at the bottom of the screen there are 3 sections.</p> <ul style="list-style-type: none"> ▪ The left most section will indicate what the ATE is doing (idle, testing, etc.); ▪ Time (00:00:00). At the beginning of each device test this will start and keep track of how long the test takes; ▪ Status – At what stage is the current test.
2.5.5	<p>Select "TEST"</p> 

2.5.6	<p>Follow instructions on the screen.</p> <p>NOTE: The Reference (model) number, Serial number and Operator badge number may be scanned or manually entered from the PC connected keyboard or the on screen keyboard (to show select the Show Keyboard button). If you use the scanner the screens will automatically advance.</p> <ul style="list-style-type: none"> ▪ Scan the Reference number (part number on inside of the Battery door), ▪ Scan the Serial Number, ▪ Scan Operator/Badge Number, 
2.5.7	<p>Review the data below and make sure it is correct. If it is correct select OK.</p> <p>NOTE: If not correct select “Try Again”, but understand you will need to reenter all of the information again.</p> 
2.5.8	<p>When the screen below appears:</p> <ol style="list-style-type: none"> If you want to perform an Operational Verification test select “Yes” and follow the on screen prompts. If you want to re-calibrate or upload firmware select “No” and follow the on screen prompts. 

2.6 Product Numbering Structure/ Serial Numbering Structure



2.7 Repair Parts

For an up to date list of Repair Parts for:

- SureSight I refer to 14001/14011
- SureSight II refer to SURESIGHTII_RBOM

Section 3: SureSight Troubleshooting Guide

This guide should be used for phone personnel as well as by repair technicians to facilitate quick diagnosis of problems

Chief Complaint	Cause	Look For	Customer Corrective Action	Repair Technician Corrective Action
Does Not Power up	Battery not charged	a) Verify battery is installed correctly (orientation) in device and battery retainer is latched over battery. See label and arrow on battery indicating direction of proper insertion. Early versions do not have the battery rib to prevent mis-insertion. b) Check for constant or blinking battery symbol on the LCD. Constant = no charge. Blinking = ~10 to 15 minutes of charge left.	a) Install battery correctly per label. b) Charge battery overnight in stand with 71040. c) Return unit for repair.	a) Verify the Charge Current b) Check to see if flexes are connected, connect if not. c) Replace LCD Assembly and/or flex. d) Replace battery compartment. e) Replace Power Board. f) Replace DSP Board.
No LCD Display	No Data stored in memory	a) Ensure that test was taken within last 5 minutes, otherwise data is not stored.	a) Retake test b) Note version 1.09 software and higher. If it is a lower version send unit in to repair to upgrade. c) Return Unit for repair	a) Check to see if flexes are connected, connect if not. b) Replace LCD Assembly and/or flex
No LCD Display	Defective LCD	a) Ensure that test was taken within last 5 minutes, otherwise data is not stored.	a) Retake test b) Note version 1.09 software and higher. If it is a lower version send unit in to repair to upgrade. c) Return Unit for repair	c) Check to see if flexes are connected, connect if not. a) Replace LCD Assembly and/or flex

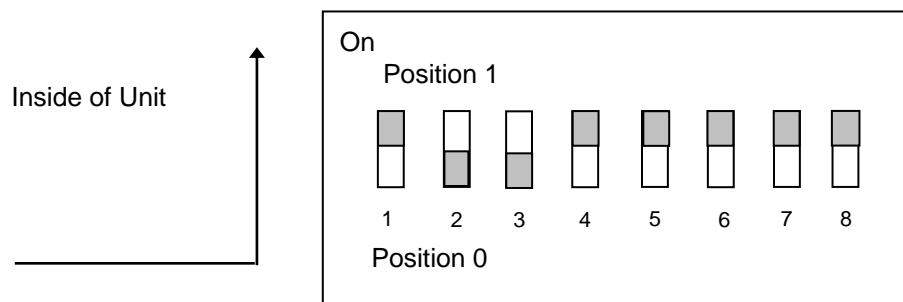
Chief Complaint	Cause	Look For	Customer Corrective Action	Repair Technician Corrective Action
Does Not Print	Printing too far	a) Ensure printer is turned on. b) Ensure that the print button is held until the “ta-da” is heard c) Ensure the unit is aimed at the front of the printer. d) Try printing within 3 feet of printer	a) Retry printing b) Replace batteries in printer c) Return unit for repair	a) Check to see if flexes are connected, connect if not. b) Replace Front Insert Assembly. NOTE: Wire Harness must be replaced if Front Insert Assembly is replaced.
Does Not Print	Printer has gone to “sleep”	a) Check to see if red LED is lit in the front.	a) Press feed (right most button) to wake printer up. b) Return unit for repair.	a) Check to see if flexes are connected, connect if not. b) Replace Front Insert Assembly. NOTE: Wire Harness must be replaced if Front Insert Assembly is replaced.
Prints too light	Print darkness setting is set too light	a) Try sliding the center contrast switch to the right. b) Try self-test on printer to see if the batteries are low; refer to printer manual pg. 14	a) Reset to roughly center of range. Printer can be used at higher or lower settings if customer desires. b) Replace batteries c) Return unit to Hewlett Packard for repair.	
No Cross-Hair	Defective LED Mini board or electrical failure	a) Ensure battery is charged. b) Ensure battery is installed and turned on. c) Look through peephole and identify Crosshair.	d) Return unit for repair.	a) Check to see if flexes are connected, connect if not. b) Inspect to see if green LED lights c) Replace Tubes with PC Sub-Assembly - WA In-House Only d) Replace baseplate assembly

Chief Complaint	Cause	Look For	Customer Corrective Action	Repair Technician Corrective Action
Unit is not aligned	Unit dropped or Impacted beyond shock level provided	a) Crosshair is in patients pupil and in range distance is constant but no images are being taken b) Search around eye for "sweet spot" c) Ensure that doctor and patient are at same height, squared and level with each other.	a) Return unit for repair.	a) Check Tube with PC Assembly. May need to shake to see if there is aperture movement. If there is replace tubes with PC Assembly. WA In-House Only b) Replace Aligned Base-plate Assembly.
No Reading	Incorrect Distance	a) Adjust distance until constant tone b) If unit cannot obtain constant tone, send in for repair.	a) Return unit for repair	a) If O-ring exists, remove it. b) Replace Front Insert Assembly NOTE: Wire Harness must be replaced if Front Insert is replaced c) Replace Power board.
No Reading	Unit misaligned	Refer to Unit is not aligned		
Low Reading	Unit misaligned	a) Ensure level test with patient b) Ensure unit is on proper calibration (adult / child) c) Verify room lighting / not direct lighting d) Verify confidence readings are 6 or higher e) Verify that readings are within .5 D typ.	a) Retest patient level with unit b) Turn down room lights c) verify adult / child calibration d) Verify S/W version e) Return unit for repair	Refer to Unit is not aligned
High Reading	Unit misaligned	a) Ensure level test with patient b) Ensure unit is on proper calibration (adult / child) c) Verify room lighting / not direct lighting d) Verify confidence readings are 6 or higher e) Verify that readings are within .5 D typ.	a) Retest patient level with unit b) Turn down room lights c) verify adult / child calibration d) Verify S/W version e) Return unit for repair	Refer to Unit is not aligned
Buttons not	Electrical or	a) Verify button press performs correct function	a) Return unit for repair	a) Replace LCD Assembly

Chief Complaint	Cause	Look For	Customer Corrective Action	Repair Technician Corrective Action
functioning	Mechanical failure	b) Ensure battery symbol is not lit.		
Unit not giving referral criteria - *'s	Wrong calibration	a) Ensure unit is on proper calibration (adult / child). SureSight will only refer on child calibration.	a) Change calibration as appropriate b) Return unit for repair.	a) Calibrate unit
Crosshair not visible	Flex connector loose	a) Ensure battery in installed and turned on. b) Press Go button c) Verify no Crosshair	a) Return for repair	a) Check to see if flexes are connected, connect if not.
Red LED not visible	Flex connector loose	a) Ensure battery in installed and turned on. b) Press Go button c) Verify no LED	b) Return for repair	a) Check to see if flexes are connected, connect if not.
Unit has low speaker	Foam over speaker on power board	d) Foam is placed directly over speaker in production	a) Return unit for repair	a) Place foam in proper position.
Unit does not charge	Power problem	a) Verify battery is inserted in proper orientation b) Verify battery was not inserted in reversed orientation in that the battery would crush the contacts down thus allowing intermittent contact. c) Verify battery contact has sufficient tension on the battery. Determined by letting the battery retainer freely rotate by gravity alone, when properly engaged over a battery. Retainer should not move when a battery is in place.	a) Bend contacts up to normal position with dental pick. b) Return unit for repair of the battery compartment sub assembly.	a) Replace power Board Assembly b) Replace Front Insert Assembly. NOTE: Wire Harness must be replaced if Front Insert Assembly is replaced.
Eye Care Unit does not Show Axis	Dip switches are at the wrong settings	a) Make sure the dip switches are set correctly: Refer to the Device configuration table below	a) Set dip switches to the correct setting. b) Send Unit in for repair.	a) Replace the LCD Assembly b) Replace the DSP Board

DEVICE CONFIGURATION TABLE:

SureSight performance is controlled by the type of instrument (Primary Care Unit or Eye Care Unit), the dip switches accessible through the battery compartment, located underneath the battery compartment on the LCD board (see figure below) and the Adult Child Mode button (located on the LCD Display). The following table and diagrams show the combinations of settings and the corresponding performance it determines.



There are a total of 8 dip switches, but only the first 3 are used. Each is labeled with their corresponding number.

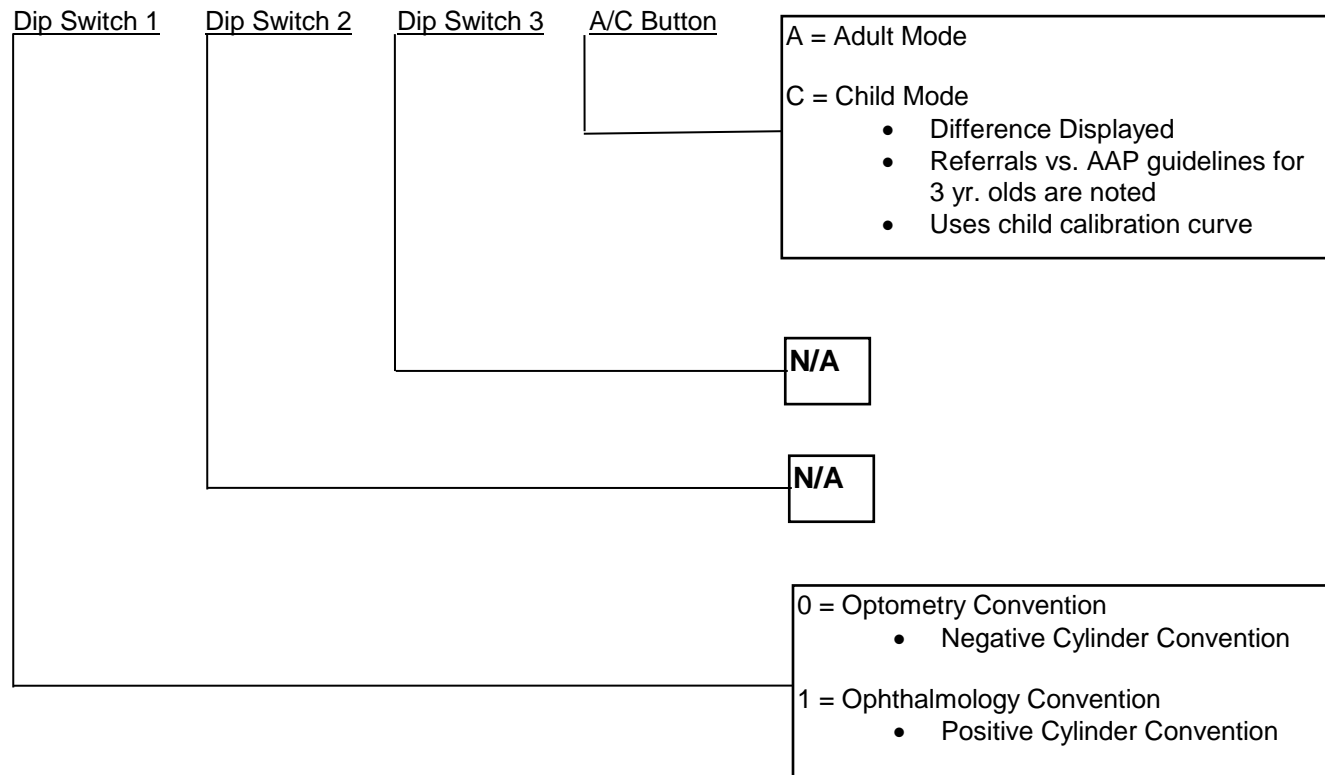
Push in to switch to Position 1 and Pull out to switch to Position 0.

Unit Type	Dip Sw 1 Setting	Dip Sw 2 Setting	Dip Sw 3 Setting	A/C Button Setting	Resolution of Reading Displayed	Axis Displayed	Cylinder Convention	Difference Displayed	Range (min. Sphere)	Referrals Marked with *	Resolution of Reading Computed
Primary Care	0 = Opt	N/A	N/A	Adult	10	No	Negative	No	-4.5	No	1/4
		N/A	N/A	Child	10	No	Negative	Yes	-4.5	Yes	1/4
	1 = Oph	N/A	N/A	Adult	10	No	Positive	No	-4.5	No	1/4
		N/A	N/A	Child	10	No	Positive	Yes	-4.5	Yes	1/4
Eye Care	0 = Opt	0 = Std	0 = 1/4	Adult	100	Yes	Negative	No	-5	No	1/4
			1 = 1/8	Adult	100	Yes	Negative	No	-5	No	1/8
			0 = 1/4	Child	100	Yes	Negative	No	-5	No	1/4
			1 = 1/8	Child	100	Yes	Negative	No	-5	No	1/8
		1 = Scr	N/A	Adult	10	No	Negative	No	-5	No	1/4
			N/A	Child	10	No	Negative	Yes	-5	Yes	1/4
	1 = Oph	0 = Std	0 = 1/4	Adult	100	Yes	Positive	No	-5	No	1/4
			1 = 1/8	Adult	100	Yes	Positive	No	-5	No	1/8
			0 = 1/4	Child	100	Yes	Positive	No	-5	No	1/4
			1 = 1/8	Child	100	Yes	Positive	No	-5	No	1/8
		1 = Scr	N/A	Adult	10	No	Positive	No	-5	No	1/4
			N/A	Child	10	No	Positive	Yes	-5	Yes	1/4

PRIMARY CARE DEVICE CONFIGURATION:

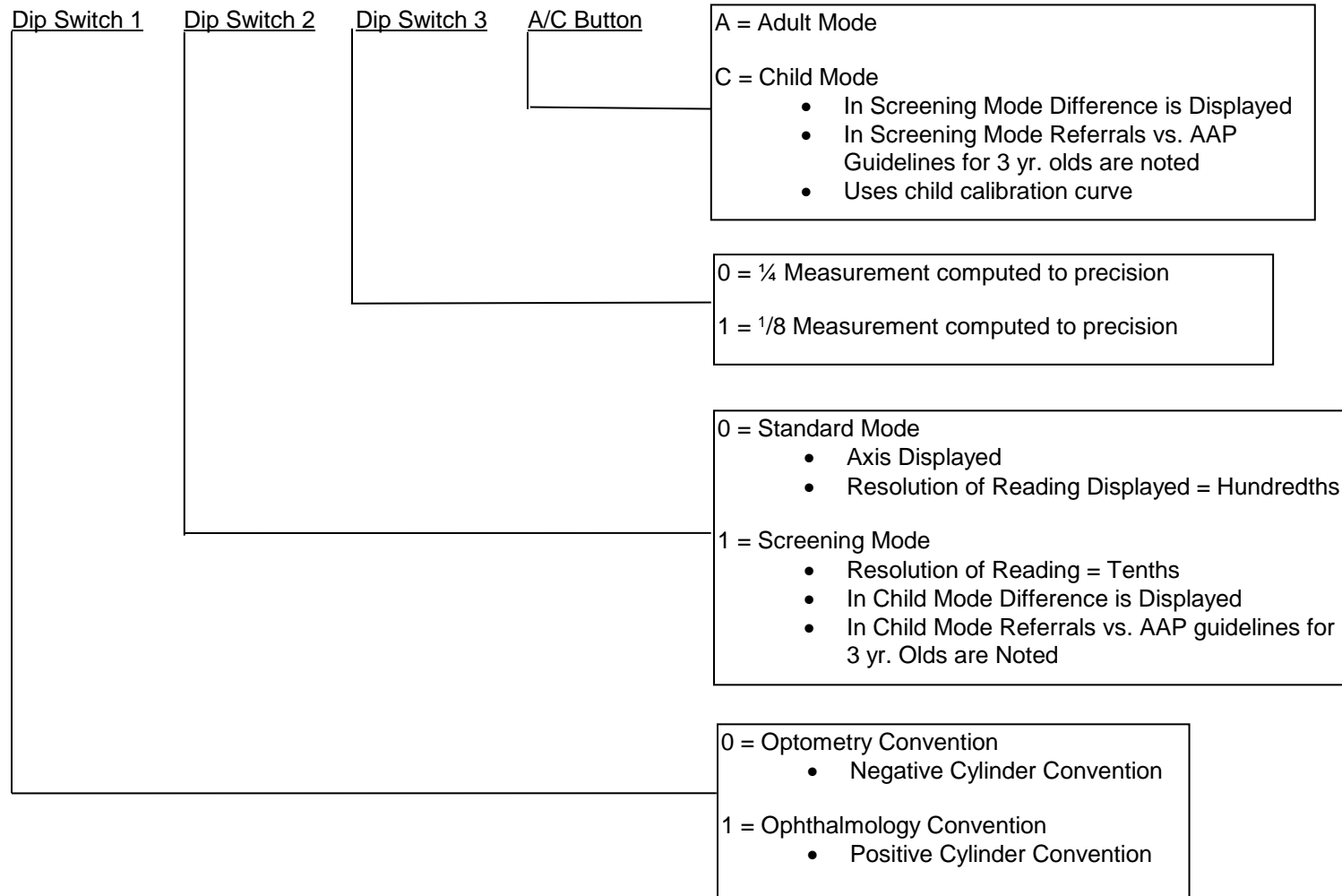
* Resolution of Reading Displayed = Tenths

* Measurement Range = -4.5D to +5D



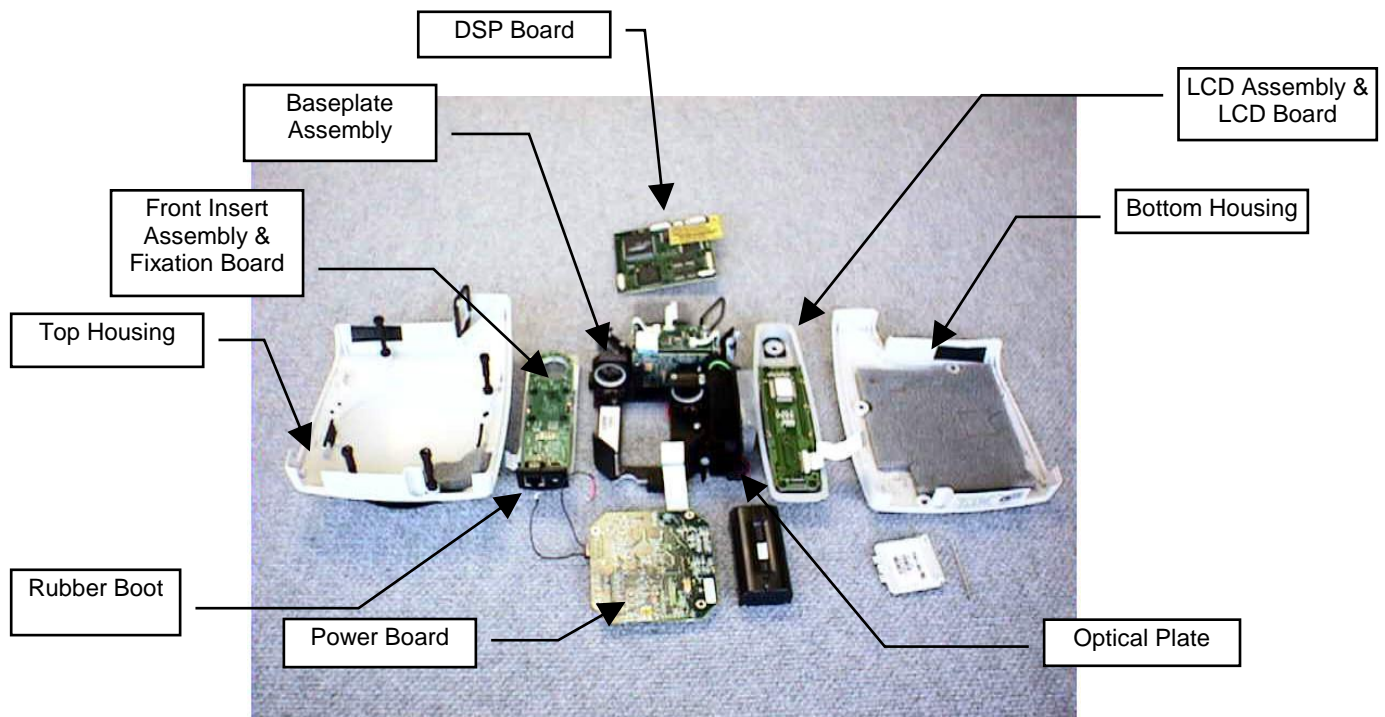
EYE CARE DEVICE CONFIGURATION

* Measurement Range = -5D to +5D



SECTION 4: SureSight Repair instructions

***NOTE:** ALL REPAIR PROCEDURES MUST BE FOLLOWED BY A **CALIBRATION CHECK** (SEE SECTION 2.2), WITH THE EXCEPTION OF SECTIONS 4.12, 4.14 (IF UNIT IS NOT OPENED), 4.15, AND 4.16.



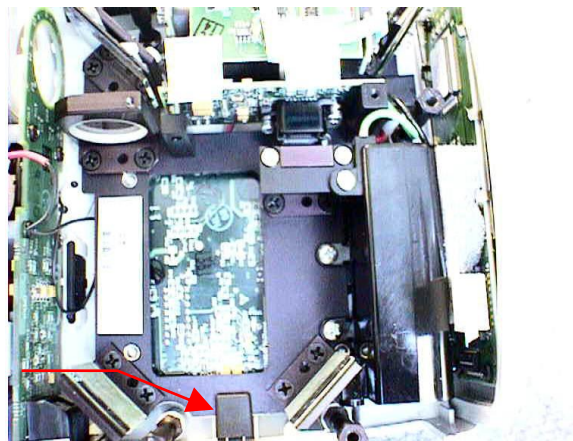
4.1. REPLACEMENT OF BOTTOM HOUSING

- 4.1.1. Place unit in nest T16556, with bottom housing facing up.
- 4.1.2. Remove the 4 T-20 torx screws from bottom housing.



- 4.1.3. Gently remove housing. It may be necessary to hold the front insert down as the housing is removed.
 - 4.1.3.1. Prior to replacement verify the black tape is visible and in its proper location.
 - 4.1.3.2. Ensure that the bumpers are seated correctly, down and completely in their cut out areas, in the top housing.

One of the
three bumpers
seated in cut
out area

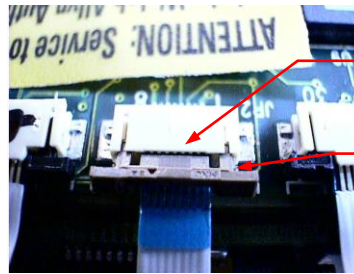
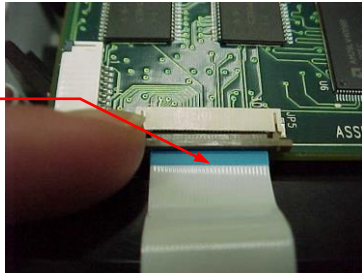


- 4.1.3.3. Replace housing by aligning the front insert and LCD assembly with the guides on the bottom housing.
- 4.1.3.4. Ensure the housing aligns with the battery door and patient window.
- 4.1.3.5. Re-torque to 5.5 - 7.5 in-lb., using torque driver T1562-12. (See drawing 140000 - Appendix D)
- 4.1.3.6. Verify no flexes are caught in between the housings.

4.2. REPLACEMENT OF FLEX

- 4.2.1. Place unit in nest T16556, with bottom housing facing up.
- 4.2.2. Remove bottom housing. (See Section 4.1)
- 4.2.3. Remove glue or kapton tape, if it exists, from the flex.
- 4.2.4. Locate the tabs bar, of the flex insert, toward the flex.
- 4.2.5. Pull out the tab bar away from the flex connector body to loosen the connection, which will allow the flex to slide out. Make sure both sides of the tab are unlatched.

Glue or Kapton Tape will be on this flex.



Connector body

Tab Bar.
Pull bar out to loosen.

- 4.2.6. Replace the flex by holding the tab bar out and sliding the flex back into the connection:
 - 4.2.6.1. Note the flex has an insulated side and a side with connectors.
 - 4.2.6.2. Place the connector side, of the flex, toward the connector side of the flex insert. This is always the opposite side from where the tab bar is.

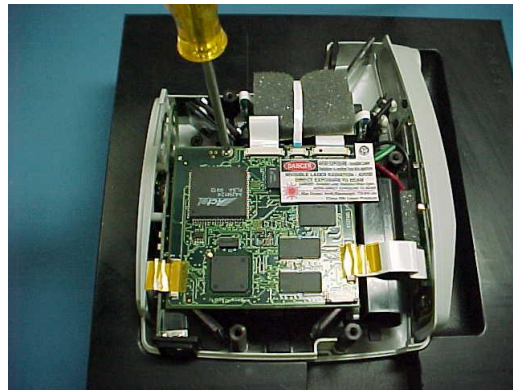


Slide the tab bar in to tighten.

- 4.2.6.3. Once the flex is slid into the flex insert, slide the tab bar back into place. Make sure that the flex is straight, or connections will not be properly made.
- 4.2.6.4. If the flex, that had been removed had either glue or kapton tape on it, replace with kapton tape only.

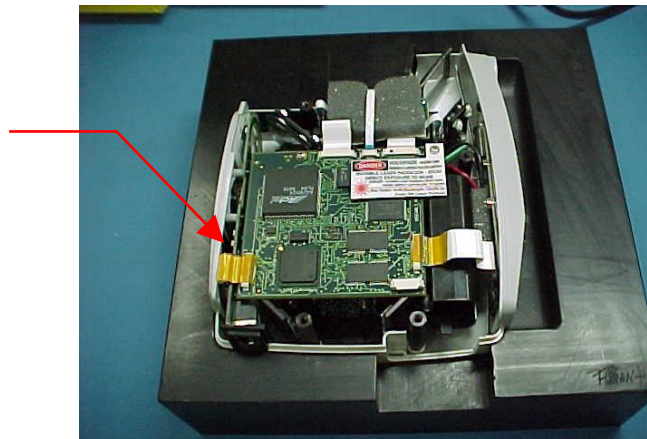
4.3. REPLACEMENT OF DSP BOARD

- 4.3.1. Place unit in nest T16556, with bottom housing facing up.
- 4.3.2. Remove bottom housing (See Section 4.1).
- 4.3.3. Disconnect the flexes, located on the DSP board that connect from the LCD board, fixation board, laser board, power board and the camera board. (See Section 4.2).
 - 4.3.3.1. Note that the fixation and LCD flex may have glue or Kapton tape over them, to keep them secure.
 - 4.3.3.2. Remove glue or kapton tape from the connector. To prevent damage, peel the hardened glue or kapton tape in the direction of the flex, NOT toward the connector, or the connector may be damaged or peel off.
- 4.3.4. Once flexes are clear, remove the 2 screws from the DSP board and carefully lift it out of the unit.



- 4.3.5. Replace the new DSP board, battery side down, onto the aligned plate assembly, aligning holes in board with mounting holes.
 - 4.3.5.1. Replace the laser tag on the right screw, then fasten the DSP board with the 2 screws. Torque screws to 1.5 - 2.0 in-lb., using torque driver T1562-23. (See Drawing 140000 - Appendix D)
 - 4.3.5.2. Reconnect the removed flexes to the proper positions, (See Section 4.2), then using Kapton tape only, tape together the flex and the connector.

Kapton Tape on
the flex and
connector



- 4.3.6. Replace the bottom housing and fasten together. (See Section 4.1) Once the unit is reassembled, download the software (See Section 2.7)

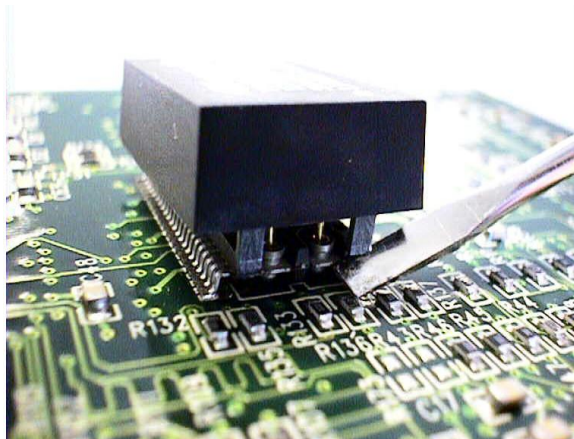
4.4. REPLACEMENT OF RTC BATTERY

NOTE: The RTC battery should last 10 years from its initial placement.

4.4.1. Remove the DSP Board. (*See Section 4.3*)

4.4.2. Disconnect RTC battery from bottom of DSP board:

4.4.2.1. Being very careful not to break the legs of the RTC battery or damage the pins of the IC chip off of the pad, pry the four outer legs of RTC battery away from the board.



4.4.3. Place the new RTC battery onto the DSP board:

4.4.3.1. Align the 4 pins and the alignment tab, of the RTC battery, to the 4 holes and slot on the IC chip.

4.4.3.2. Press the RTC battery down to securely clip onto the IC chip.

NOTE: RTC battery is keyed - DO NOT force it down - make sure its tabs align with RTC chip slots.

4.4.4. Once the unit is reassembled, download software. (*See Section 2.7*)

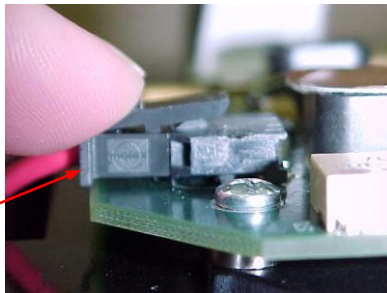
4.5. REPLACEMENT OF FRONT INSERT ASSEMBLY

- 4.5.1. Place unit in nest T16556, with bottom housing facing up.
- 4.5.2. Remove the bottom housing (*See Section 4.1*).
- 4.5.3. Lift the baseplate sub-assembly, with front insert and LCD assembly out of the top housing and disconnect the distance wire assembly from the power board, as well as the front insert flex to the DSP board.
- 4.5.4. Remove the Front Insert Assembly by sliding it up.

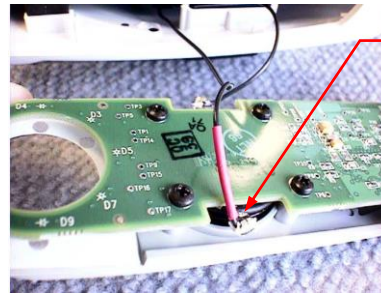


NOTE: You MUST replace the distance wire assembly whenever it is removed from the sensor contacts. It is a single use spring clip only.

Disconnect
the wire
harness from
the power
board



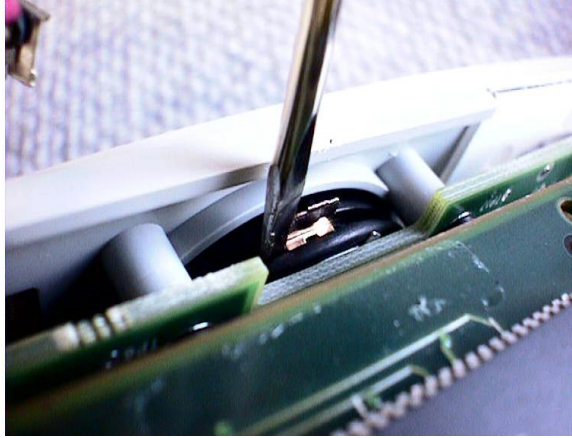
Disconnect
the wire
harness from
the ultrasonic
sensor



- 4.5.5. Replace the front insert assembly and the distance wire assembly:
 - 4.5.5.1. Clip the new distance wire assembly on to the power board.
 - 4.5.5.1.1. Connect the black wire onto the silver tab of the sensor.
 - 4.5.5.1.2. Connect the red wire to the copper tab of the sensor.
 - 4.5.5.2. Replace the entire assembly back into the top housing. Align the bumpers and seat correctly in the guides, on the top housing.
 - 4.5.5.2.1. Slide the front assembly into the unit so that the rubber boot fits into the opening and the tabs of the front insert align with the guides on the bottom housing. Check to make sure there are no wires caught in between the front insert and the bottom housing.
 - 4.5.5.2.2. Reconnect the flex to the DSP board, then using kapton tape, tape together the flex and the connector. (*See Section 4.2*)
 - 4.5.5.2.3. Ensure the bumpers are seated correctly, down and completely in their cut out areas.
 - 4.5.5.2.4. Place the bottom housing back on to the unit. (*See Section 4.1*)
- 4.5.6. Once the unit is reassembled, download software (*See Section 2.7*)

4.6. REMOVAL OF O-RING

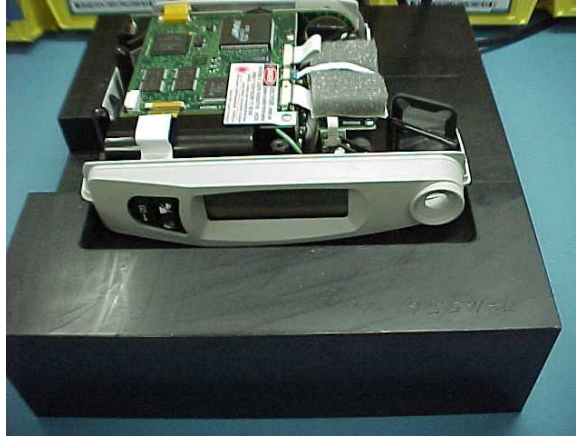
- 4.6.1. Place unit in nest T16556, with bottom housing facing up.
- 4.6.2. Remove bottom housing (*See Section 4.1*).
- 4.6.3. Locate o-ring on the ultrasonic sensor and wire harness assembly.



- 4.6.4. Lift the o-ring away from any wires and clip with a small pair of cutters. Be careful not to damage anything around the o-ring, especially the gold contact and wire assembly.
- 4.6.5. Remove o-ring with tweezers. As much as possible, pull o-ring away from gold contact.
- 4.6.6. Replace bottom housing. (*See Section 4.1*)

4.7. REPLACEMENT OF THE LCD ASSEMBLY

- 4.7.1. Place unit in nest T16556, with bottom housing facing up.
- 4.7.2. Remove the bottom housing. (See *Section 4.1*)
- 4.7.3. Remove glue or kapton tape on LCD flex and disconnect the flex from the DSP board (See *Section 4.2*).
- 4.7.4. Slide the LCD assembly out of the unit.

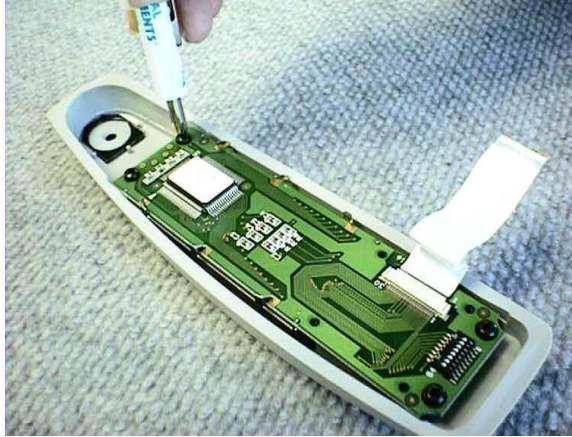


- 4.7.5. Make sure to copy over the dip switch settings from the old LCD.
- 4.7.6. Replace the LCD Assembly by sliding it back into its original place.
 - 4.7.6.1. Slide the assembly back into place by lining it up with the guides on the top housing.
- 4.7.7. Reconnect the LCD flex to the DSP board, then using kapton tape only, tape together the flex and the connector.
- 4.7.8. Replace bottom housing. (See *Section 4.1*)
- 4.7.9. Once the unit is reassembled, download software. (See *Section 2.7*)

4.8. REPLACEMENT OF LCD BOARD

4.8.1. Remove LCD Assembly (*See Section 4.7*).

4.8.2. Remove the 4 screws.



4.8.3. Remove the LCD board and replace. Make sure to transfer buttons to new assembly. Also, copy dip switch settings from old LCD board.

4.8.4. Reattach the board with the screws. Torque screws to 2.75 - 3.75 in-lb., using torque driver T1562-12. (*See Drawing 140000 - Appendix D*)

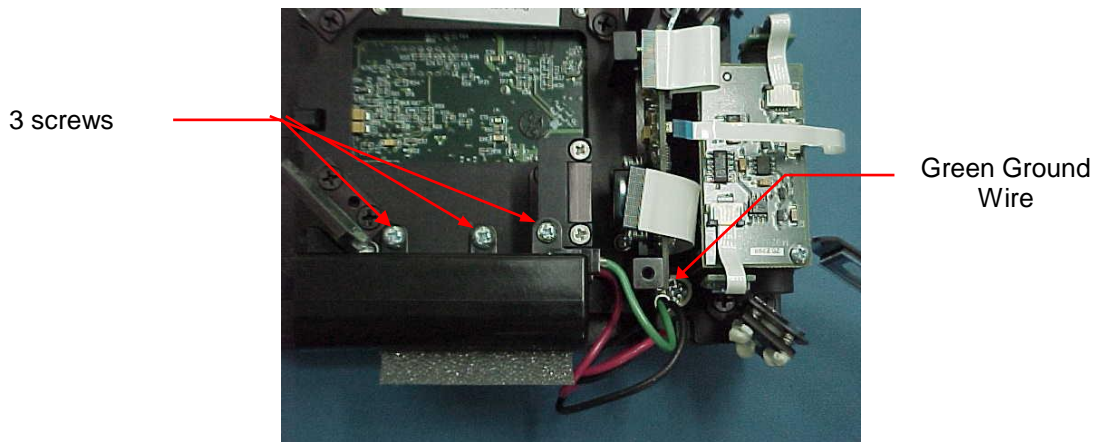
4.8.5. Replace LCD assembly (*See Section 4.7*).

4.8.6. Replace the bottom housing. (*See Section 4.1*)

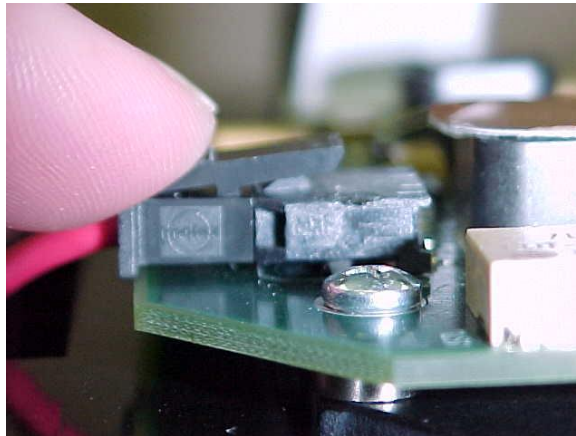
4.8.7. Once the unit is reassembled, download software. (*See Section 2.7*)

4.9. REPLACEMENT OF BATTERY COMPARTMENT ASSEMBLY

- 4.9.1. Place unit in nest T16556, with bottom housing facing up.
- 4.9.2. Remove bottom housing (See Section 4.1).
- 4.9.3. Lift baseplate assembly, with LCD assembly and front insert assembly, out of the top housing. Make sure to disconnect front insert distance wire assembly from connection on the power board and disconnect the LCD flex and the front insert flex from the DSP board. Remove bumpers and place on baseplate support fixture T16541.
- 4.9.4. Disconnect the DSP board. (See Section 4.3)
- 4.9.5. Remove 3 screws from battery retainer unit.
- 4.9.6. Remove the 1 screw from the green ground wire.



- 4.9.7. Remove the black and red wire clip from bottom of the power board:
 - 4.9.7.1. Squeeze the clip down on the side of the wires and slide out.

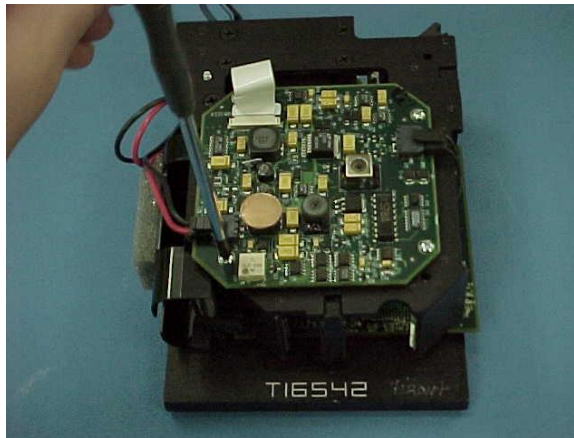


- 4.9.8. Before installing battery compartment assembly, verify wires are in correct slots. With compartment opening facing you, slot side down, the red wire should be on the bottom side and the green wire should be on the top side. The black wire should be connected with the green wire at the contact and then connected with the red wire at the clip. **DO NOT USE ANY BATTERY COMPARTMENT THAT IS NOT CORRECTLY WIRED.**
- 4.9.9. Replace the battery compartment assembly:
 - 4.9.9.1. Connect the black and red wire to the bottom of the power board by sliding the clip on.

- 4.9.9.2. Attach the battery compartment to the baseplate assembly with the three screws. Torque to 1.5 - 2.0 in-lb., using torque driver T1562-23. (*See Drawing 140000 - Appendix D*)
- 4.9.9.3. Ensuring that the wires are close to the camera and out of the way of the standoff, secure the green ground wire, with one screw, to the baseplate. Torque to 3.5 - 4.5 in-lb., using torque driver T1562-12. (*See Drawing 140000 - Appendix D*) If needed bend the contact at a 90° angle to place wires out of the way of the standoff.
- 4.9.9.4. Place a new piece of foam on the side of the battery compartment. The foam should be placed between the end of the cut out, on the side of the compartment, and the closed end on the compartment.
- 4.9.10. Replace the DSP board (*See Section 4.3*).
 - 4.9.10.1. Place the entire assembly back into the top housing by lining up the bumpers into guides, in the top housing. Make sure they are down and fully in their cut out area.
- 4.9.11. Replace bottom housing. (*See Section 4.1*)
- 4.9.12. Once the unit is reassembled, download software. (*See Section 2.7*)

4.10. REPLACEMENT OF POWER BOARD

- 4.10.1. Place the unit in nest T16556, with bottom housing facing up.
- 4.10.2. Remove the bottom housing (*See Section 4.1*), front insert assembly (*See Section 4.5*), and LCD assembly (*See Section 4.7*)
- 4.10.3. Remove the baseplate assembly, along with the LCD assembly and the front insert assembly, from the top housing.
- 4.10.4. Turn baseplate assembly over.
- 4.10.5. Disconnect the battery compartment assembly wire connection and fixation wire assembly from the power board.
- 4.10.6. Place the assembly on the base plate support fixture T16542.
- 4.10.7. Disconnect power flex from the power board.
- 4.10.8. Remove the 4 screws from the power board.



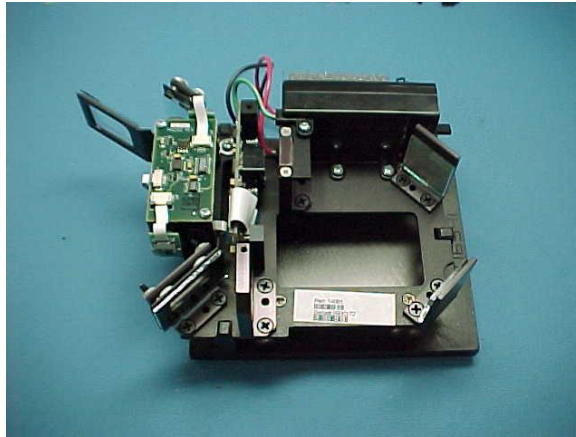
- 4.10.9. Replace the power board:
 - 4.10.9.1. Attach the new power board, so that the battery retainer clip is closest to the battery retainer side and the flex insert is closest to the open slot of the alignment plate. Torque to 1.5 - 2.0 in-lb., using torque driver T1562-23. (*See Drawing 140000 - Appendix D*)
 - 4.10.9.2. Reconnect the battery compartment wire assembly to the proper connection on the power board.
 - 4.10.9.3. Reconnect the power flex to the new power board.
 - 4.10.9.4. Reconnect the new wire harness assembly to the proper connection on the power board.

NOTE: You MUST replace the wire harness whenever it is removed from the sensor contacts. It is a single use spring clip only.

- 4.10.9.5. Place the assembly back into the top housing by lining up the bumpers in the guides on the top housing. Ensuring that the battery compartment assembly wires are tucked underneath and that the ultrasonic sensor wires are free and out of the optical pathway.
- 4.10.10. Replace LCD assembly (*See Section 4.7*) and bottom housing (*See Section 4.1*).
- 4.10.11. Once the unit is reassembled, download software. (*See Section 2.7*)

4.11. REPLACEMENT OF THE ALIGNED BASEPLATE ASSEMBLY

- 4.11.1. Place the unit in nest T16556, with bottom housing facing up.
- 4.11.2. Remove the bottom housing (*See Section 4.1*), DSP Board (*See Section 4.3*), front insert assembly (*See Section 4.5*), LCD Assembly (*See Section 4.9*) and Power board (*See Section 4.11*)
- 4.11.3. Remove the rest of the baseplate assembly.



- 4.11.4. Remove the 4 bumpers from the old aligned baseplate assembly.
- 4.11.5. Place the new baseplate assembly on baseplate support fixture T16542.
- 4.11.6. Write the Product Serial number (located on the battery compartment door) on the new baseplate (next to the baseplate serial number). Then write the new baseplate number on the label on the inside of the door of the battery compartment.
- 4.11.7. Replace the power board to the new aligned baseplate assembly (*See Section 4.11*)
- 4.11.8. Connect the battery compartment wire assembly to the power board.
- 4.11.9. Turn the baseplate assembly over and place on baseplate support fixture T16541.
- 4.11.10. Replace the DSP board (*See Section 4.3*). Attach the LCD assembly (*See Section 4.7*) and the front insert assembly (*See Section 4.5*) to the DSP board.
- 4.11.11. Connect the distance wire assembly clip to the power board.

NOTE: You MUST replace the wire harness whenever it is removed from the sensor contacts. It is a single use spring clip only.

- 4.11.12. Replace the 4 bumpers on the new aligned baseplate assembly.
- 4.11.13. Place the top housing in nest T16556.
- 4.11.14. Place the assembly into the top housing by lining up the bumpers in the guides, on the bottom housing.
- 4.11.15. Replace the bottom housing. (*See Section 4.1*).
- 4.11.16. Once the unit is reassembled, download software. (*See Section 2.7*)

4.12. REPLACEMENT OF HAND STRAP

- 4.12.1. Position the unit so that the hand strap is facing up and the battery door compartment is toward you.
- 4.12.2. Push the hand strap forward until the square notches beneath it are visible; hold the strap in this position with one hand.



- 4.12.3. Insert the tool provided into one of the notches and press outward until the fastener is released.
- 4.12.4. Repeat step 4.12.3 on the other fastener.
- 4.12.5. Insert the fasteners of the new strap into the appropriate slots, so that "Welch Allyn" can be read.
- 4.12.6. Pull on the strap to ensure that it is seated properly.

4.13. REPLACEMENT OF THE TOP HOUSING

- 4.13.1. Place unit in nest T16556, with bottom housing facing up.
- 4.13.2. Remove bottom housing (*See Section 4.1*), the front insert assembly (*See Section 4.5*), the LCD assembly (*See Section 4.7*) and the patient window.
- 4.13.3. Remove the remaining assembly from the top housing.
- 4.13.4. Remove the hand strap. (*See Section 4.12*)
- 4.13.5. Prior to installing the top housing, ensure the black Kapton tape is present.
- 4.13.6. Place the new top housing into nest T16556.
- 4.13.7. Replace the baseplate assembly (*See Section 4.11*), front insert assembly (*See Section 4.5*) and LCD assembly (*See Section 4.7*)
- 4.13.8. Replace the patient window:
 - 4.13.8.1. Ensure the window is clean before replacing. (*See Section 4.14*)
 - 4.13.8.1.1. Ensure that the gasket is wrapped around the window correctly.



- 4.13.8.1.2. Slide the window, with the unconnected seam side of the gasket down, into the guides on the top housing.
 - 4.13.8.2. Place the bottom housing back onto the top housing; ensure that the LCD assembly, front insert assembly, patient window and battery door are aligned in the proper places.
 - 4.13.8.3. Reinsert screws. Torque to 5.5 - 7.5 in-lb., using torque driver T1652-12. (*See drawing 140000-Appendix D*)
 - 4.13.8.4. Replace Hand Strap (*See Section 4.12*)

4.14. CLEANING OF THE WINDOWS

- 4.14.1. All windows on the Sure Sight may be cleaned with a soft window (scratch resistant) cloth moistened with 70% Isopropyl Alcohol or any standard window cleaner.
- 4.14.2. Be sure not to leave streaks to ensure proper function.
- 4.14.3. On older units the patient window may have excess scratches. Replace with new (harder coated) window. (*See S/N Revision Log*)

4.15. HEWLETT PACKARD PRINTER CHECK

- 4.15.1. Make sure there is paper in unit. Install 536000 if needed.
- 4.15.2. While holding down the paper advance button , turn unit on then release paper advance button.
- 4.15.3. Printer should print out a self-test. Make sure everything is clear and readable.
- 4.15.4. The battery reading on the bottom of self-test should be 3,4 or 5. Replace the batteries if reading is 0 or 1.
- 4.15.5. Down load information from a unit.
- 4.15.6. Turn unit off.
- 4.15.7. Place printer back with customer order.
- 4.15.8. Use PRT as a work unit code with an inspect time of 10 minutes.

Note: If unit is from a warranty replacement and there is not paper in it and batteries are in the Styrofoam insert - unit was never used - OK to send back to stock as new without running self-test. Make sure there is a roll of paper, manual and card in box.

4.16. DIP SWITCH CHANGES

- 4.16.1. Open the battery compartment door and locate dip switches underneath the battery compartment, on the LCD board.
- 4.16.2. Using the tool provided, pull or push the dip switch to the On or OFF Position. (See *diagram below*)

When the dip switch is in the UP position, the Dip switch is ON

When the dip switch is in the DOWN position, the Dip switch is OFF

