Service & Repair Procedure:

14 Series SureSight Service & Repair Procedure

**DRAWN:** Steve Correll  **DATE:** February 13, 2006
**APPROVED:** Cathy Marshall  **DATE:** February 13, 2006
**RELEASED:** John Janke  **DATE:** February 13, 2006

<table>
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<tr>
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<td>1006943</td>
<td>SAC</td>
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<td>CM</td>
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<td>SAC</td>
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<td>MLM</td>
<td>9/25/06</td>
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<td>Updated 2.f.IV to add version table, deleted section 2.f.V.</td>
<td>1009322</td>
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- Combined 2 SRF documents into 1 (Loaner version will be obsoleted. Removed references to the Loaner version SRF (20010616)
- Revised the whole procedure in consideration of the newer model ATE steps.

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FORM DIR 80010684 VER D
Purpose:
1) This Work Instruction details how to perform evaluation and repairs of SureSight units.
2) It is supplemented by the Service Manual PN 140399.

Scope:
1) The procedures in this work instruction apply to SureSights only.

Responsibilities:
1) Product Service management shall ensure that the requirements of this document are communicated and implemented.
2) Personnel performing evaluation and repair of 14001/14011 series product are responsible for following the instructions contained within this work instruction.

Definitions:
1) Data Entry: A team who performs various repair-related SAP transactions such as entering repair information into SAP to stage product for repair or prepare it for billing.
2) MPD WI-PS-0025: Repair Paperwork & SAP Traveler Instructions is a work instruction in QSI.
3) QSI – Database used by Welch Allyn to manage & control Quality Records.
4) RAI: Abbreviation for Return As Is recorded on the traveler by bench personnel so Data Entry processes the order accordingly in SAP.
5) Repair Order: SAP repair order (type ZRA) - is an SAP document used:
   a) As a cost collector.
   b) To generate a quote for the customer.
   c) To generate the subsequent invoice document if applicable.
   d) Its number format is sequential with no defined 1st number.
6) Service Report Form: Hard copy form used to record test & inspection data.
7) Traveler: Hard copy output generated in SAP for repair personnel to record repairs performed and technical findings.

Procedure:
1) Incoming Product:
   a) Review all reason for return (allegation) information.
   b) Check for any special instructions: rush, warranty, etc.
   c) Confirm item matches traveler per MPD WI-PS-0025.
   d) Label box if needed.
   e) Add loaner paperwork if needed.
2) **Initial paperwork and inspection:**
   
a) **Incoming paperwork**
   
i) Research history if needed.
   
ii) Obtain a Service Report Form.
   
   (1) Record model number and serial number.
   
   (2) Record repair order number and receive date.
   
   (3) Record accessories that came in with unit on check sheet.
   
   (4) Test accessories per their own tests.
   
   (5) **Notes:**
   
   (a) If printer is dead due to batteries - replace them.
   
   (b) If a low reading is present - make an external note to customer that new batteries will be needed soon.
   
   iii) Label customer battery with unit serial number.
   
 b) **Incoming inspection**
   
i) Tilt unit to look at position of black tape on inside of housings:
   
   (1) Should not see large gap - record results.
   
   ii) Open battery door - it should open easily - record results.
   
   iii) With battery door open - observe dip switches - record results.
   
   iv) View inside of battery compartment:
   
   (1) There should be a “wedge” or "lip" in the middle of far end - record results
   
   v) Place customer battery, test battery if needed, into unit.
   
   vi) Press any button to power up unit - record results.
   
   vii) Test battery if needed on T18046 per A04639.
   
   viii) **Battery Capacity Check and replacement guidelines:**
   
   (1) All (in or out of warranty) Batteries will be tested as follows:
   
   (2) Test all that will not power up when received.
   
   (3) Test all that have a reason for return that refers to any type of battery or charging problem.
   
   (4) **Out of warranty batteries should not be replaced unless they fail any of the above tests.**
   
   (5) Record comment #64 on traveler for all out of warranty batteries that are NOT replaced.
   
   (6) Record comment # 20 on traveler for all batteries that are replaced.
   
   ix) With unit powered up, observe LCD.
   
   (1) Check to see if unit is in Adult or Child mode - record results.
   
   (2) Record on service report form if the CAL symbol is on or not
   
   (a) If symbol is on, has it been 18 months since its last calibration - record results.
x) With unit still on, view cross hair & check for:
   (1) Fatter, brighter style.
   (2) Should be clear and not tilted.
   (3) If in doubt on rev of cross hair, refer to serial numbers in update section.

xi) With unit still on, press the **GO** button.
   (1) Unit should start making beeping sounds.
   (2) Move unit to and from a flat surface:
      (a) **Check for all three tones – too far, in range and too close.**

xii) With unit still on attempt reading of fake eye:
     (1) If in doubt, perform an alignment check on the ATE:
        (a)
     (2) Record results of alignment test (eye or tester).

xiii) Check physical condition - record results.

xiv) Check charging current per service manual.
    (1) **Note:** Units before 9900480/9920086 will read on the lower end of spec.

xv) With unit still on, transfer info to printer:
    (1) Make sure print is complete.
    (2) Record software rev on service report form.
       (a) Do not forget to note the P or E suffix.

xvi) For Software Requirements see service manual:
    (1) Circle appropriate answers on the service report form. If unit came in with software older than 2.00, place software information sheet with order.

xvii) After the initial testing is complete, initial section on service report form.
c) **Updates:**
   
i) Take a look at incoming tests.
   
ii) The following updates need to be done **under warranty:**
   
   (1) Anything with the older style cross hair (before 0000018/0020091) needs to have the newer tube assembly installed.
   
   (a) If the beam splitter and viewing mirror have longer screws, automatically replace these as well.
   
   (b) External comment #71 needs to be recorded in the external comments when this update is done.
   
   iii) Any unit that does not have “wedge” in battery compartment (before 9900481/9920086) needs to have the battery compartment replaced.
   
   iv) Any unit with the older charge current that has a charging allegation needs to have the power PCB replaced.
   
   v) Any unit that is opened with serial number less than 0000442/0020351
   
   (1) Needs to have a jumper install between pins 1 and 6 of U1 on the DSP PCB.
   
   (2) EMO 5-3292 needs to be noted on internal comments when this update is done.
   
   (3) **Note:** -503RWK and higher revs do not need this update.
   
   vi) Any unit before 9900450 that has not been in previously, needs to have o-ring removed.
   
   vii) Any unit requiring a new DSP PCB, that has a camera board version 140220-503:
   
   (1) Should have the DSP PCB replaced with a 140250-506.
   
   (a) If stock of the 140250-506 is no longer available, the following changes will be required:
   
   (i) The DSP PCB will need to be replaced with a 401444.
   
   (ii) The camera board will need to be replaced with a 401443.
   
   (iii) The software will need to be upgraded to version 2.20 or higher.
   
   1. See software Requirements section in the service manual.
   
   (iv) A flat, bead ferrite added to the camera flex cable with the longer Kapton tape to affix the ferrite.
   
   (v) See Image 9 below.
viii) Any unit requiring a new camera PCB that has a DSP board version 140250-506:

1. Will need the DSP board upgraded to a 40144.
2. Software upgraded to version 2.20 or higher.
   a. See Software Requirements section in the service manual.
3. A flat, bead ferrite added to the camera flex cable with the longer Kapton tape to affix the ferrite.
   a. See Image 9 below.
4. Remove the DSP board from the SureSight assembly and Rework as follows:
   a. Suggested Tools:
      i. Solder (WA #: M31408)
      ii. Soldering iron (PACE tempwise TW100)
         1. Temp = 700 deg. F
         2. Blade style tip (PACE Model No. 1124-0502-P1)
      iii. De-soldering tweezers (PACE Model No. MT-100)
      iv. Fine Tip Permanent Marker

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<th>Part number to be added</th>
<th>Reference Designator</th>
<th>Part number being replaced/removed</th>
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<tr>
<td>705192</td>
<td>U3</td>
<td>D236819-480000</td>
</tr>
<tr>
<td>N/A</td>
<td>R176</td>
<td>D236803-1002</td>
</tr>
<tr>
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<td>U9</td>
<td>D236815</td>
</tr>
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<td>D236803-0000</td>
<td>R39</td>
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<td>R41</td>
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<tr>
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<td>R58</td>
<td>N/A</td>
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<td>R71</td>
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<tr>
<td>N/A</td>
<td>R73</td>
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(b) The picture, image 1, below references the front of the 140250-506 board.
(c) Image 1 – Front of 140250-506:
(d) With the board oriented as shown in the image 1 above, locate and remove U9.
   (i) Image 2 – U9 locator

(e) Next, locate U3.
   (i) Image 3 – U3 locator.
(ii) Using a set of de-soldering tweezers, remove U3:

1. Replace it with **part number 705192** (spread spectrum oscillator).
2. The oscillator must be oriented such that pin 1 is located in the top right hand corner of the footprint.
3. You will notice that an asterisk denotes the pin 1 location on the board (asterisk circled in yellow in image 3).
4. Pin 1 on **part number 705192** is identified by the shape of the lead on the bottom or the chip.
5. Turn the chip over to display the underside as shown in image 4.
6. You will notice that the lead shown in the top left of image 4 has rounded corners.
   a. When the chip is turned back over for soldering, pin 1 should line up with the top right corner of the footprint.
7. Image 4 – Oscillator pin locator:

   ![Bottom of chip](image)

   ![Pin 1](image)

   ![Top of chip](image)
(iii) Flip the board over to show the backside as shown in image 5.

(iv) Image 5 – back of board:

(v) With the board oriented as shown in the image 5, locate and remove R71, R72, R73.

(vi) Image 6 – R71 thru R73:
(vii) Next, locate reference designators R39, R41, R58, and R176.
(viii) Image 7 – R39, R41, R58, & R176:

(ix) Remove the resistor at location R176 and leave unpopulated.
(x) Populate R39 and R41 with **Part number D236803-0000** (zero ohm jumper).
(xi) Populate R58 with **Part number D236803-51R1** (51.1 ohm resistor).
(xii) Using a permanent felt tip marker, mark the front of the board with:
1. New DSP board number & Rev.
2. Date.
3. Operator’s initials.
4. Strikeout the old assembly number.
5. Strikeout the old board number.
6. Image 8 – Marking the Board.
(xiii) Visually verify that the following parts were removed:
1. Visual verification should be completed by an operator different from the one that performed the modification.
   a. D236819-480000 U3
   b. D236803-1002 R176
   c. D236815 U9
   d. D236803-1001 R71
   e. D236803-1001 R72
   f. D236803-1001 R73

(xiv) Visually verify that the following parts were added:
1. Visual verification should be completed by an operator different from the one that performed the modification.
   a. 705192 U3
   b. D236803-0000 R39
   c. D236803-0000 R41
   d. D236803-51R1 R58

(5) Record who performed & verified the visual check, the date that this procedure was performed, and update the service report form.

(6) While assembling the upgraded board back into the unit, add a flat, bead ferrite to the camera flex cable, and affix the ferrite with a piece of the longer Kapton tape as shown.
(a) Image 9 – ferrite attachment.

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**Image 9 – ferrite attachment.**

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**Ferrite location**

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d) **Repair of unit:**

i) Most trouble shooting and repairs are covered in the repair manual and productions troubleshooting sheet.

ii) The following repairs are not:

1. **Tube assembly replacement Clean, Clean, Clean all parts.**
   - (a) Remove top cover.
   - (b) Carefully disconnect long flex from Laser Driver PCB.
   - (c) Carefully lift insides out of bottom housing.
   - (d) Place unit on T16542 so power PCB is facing upwards.
   - (e) Remove 4 screws that hold Tube assembly onto the base plate.
   - (f) Carefully remove old PCB's from old assembly.
   - (g) Discard of cross hair cup if it is the older, skinnier one.
   - (h) Obtain new one.
   - (i) Place cross hair cup and PCB's onto new assembly
     
     (i) **Note:** There is not a torque for the small screws on the mini PCB's – hand tightened them.
   - (j) Secure tube assembly onto base plate with screws.
   - (k) Flip unit over onto T16541 and reinsert flex.

iii) **Notes:**

1. **Whenever the unit is powered on without the housing - disconnect the mini laser flex!!!!!!**
2. Record all work & repairs performed on the Service Report Form.
3. May also write on traveler at this time or at end of repair.
4. Before replacing a PCB or PCB assembly, please have technician review unit.
5. **Notes:** Any unit that fails alignment:
   - (6) Make sure that unit has black tape on viewing window bracket and correct tubes.
   - (7) If unit has gray tape and shorter illumination tube, but appears to have newer cross hair, only the viewing window and illumination tube needs to be replaced.
   - (8) **Always align unit according to A04062.**
e) **Final tester:**
   i) **Notes:**
      (1) Unit may need software downgrading, review the service report form.
         (a) If software downgrade is required:
            (i) Follow Service manual instructions for detailed software loading instructions.
      ii) Run on final tester as per manual.
         (1) If unit fails for alignment, check on alignment station prior to changing parts.
      iii) After unit passes tester, initial section of service report form.
   f) **Final check:**
      i) Place customer battery in unit.
         (1) Use test battery if unit did not come with battery.
      ii) Perform charging current check as per manual.
      iii) Perform final check as listed on the service report form.
      iv) If the unit has any other software version other than 2.20 see the software version table in the service manual to ensure that the unit is loaded with the proper version.
         (1) Follow Service manual instructions for detailed software loading instructions.
         (2) With unit still on, transfer info to printer:
            (a) Make sure print is complete
            (b) Attach print out to the back of the paperwork.
         (3) Record the software version that was loaded on the service report form.
   v) Remove battery from unit.
      (1) **Reminder:** All units are to be shipped without the battery installed in the unit.
   vi) For customer units – set switches back to those recorded on sheet or to the default if new software was installed.

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**Packaging:**

i) Place helpful hint card underneath handle strap.
ii) Place unit into a plastic bag.