

 <b>ABBOTT ADD</b>	<b>INDEX TECHNICAL SERVICE BULLETIN</b>
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<b>PRODUCT:</b> <b>ABBOTT SPECTRUM® (43)</b>	<b>DATE:</b> <b>20-MAR-97</b>
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TSB #	IMPLEMENTATION	SUBJECT	EFFECTIVITY DATE
43-085A	I - S/N All	New Style Pump and Valve / Home Station Interface PCB	01-OCT-96
43-084		CANCELLED	CANCELLED
43-083		CANCELLED	CANCELLED
43-082		CANCELLED	CANCELLED
43-081	F - All Serial Numbers	Welch Allyn® Barcode Reader Board Modification	14-JAN-93
43-080		CANCELLED	CANCELLED
43-079A	O - All Serial Numbers	Fluid Level Sense (Sample Arm) FOR U.S. USE ONLY	28-JAN-94
43-079	F - S/N 1346 & below	Fluid Level Sense (Sample Arm) INTERNATIONAL USE ONLY	18-FEB-93
43-078		CANCELLED	CANCELLED
43-077		CANCELLED	CANCELLED
43-076		CANCELLED	CANCELLED
43-075A	F - All Serial Numbers	New Sample Carousel Grounding Strap	25-MAY-93
43-074A	N - S/N 3463 & below	New Cuvette Carrier Splash Shield	31-AUG-92
43-073		CANCELLED	CANCELLED
43-072A	F - S/N 3596 & below	Rear Panel Controller Upgrade Kit For New Reagent Cooler Installation	14-JUN-93
43-071A	O - S/N at 4.8 Software & below	Grounding Modification	17-AUG-93
43-070	F - S/N 3334 & below	New Cuvette Carrier & Lamp Housing Assembly	15-JAN-92
43-069A		CANCELLED	CANCELLED
43-068		CANCELLED	CANCELLED
43-067		CANCELLED	CANCELLED
43-066	N - S/N 3246 & below	Improved Pump & Valves Board	COMPLETE
43-065	F - S/N 3204 & below	SRAM Lockups	OBSOLETE
43-064	F - S/N 3156 & below	Front-End Board	OBSOLETE
43-063A	O - 4.8 Software Only	Series II Non-linear Math Model	01-APR-92
43-062	I - S/N 2384, 2765, 2766, 2768, 2851, 2860, 1360, & 1184	Series II 4.7 to 4.8 Upgrade	COMPLETE
43-061B	O - All Serial Numbers	5 mL or 7ml Primary Sample Tube Carousel	21-SEP-94
43-060	N - S/N 3043 & below	Fan Spacing Kit	19-MAR-91
43-059E	F - All Product code 43	4.8 and Grounding Modification	27-SEP-94
43-058B	O - All Product code 43	Noise Reduction Upgrade	21-MAY-93
43-057	N - S/N 2978 & below	Improved Sample Carousel Grounding Strap	OBSOLETE
43-056	N - S/N 2904 & below	ISE Septum Alignment	Superseded by ISE Serv. Manual
43-055	F - 2859, 2860, 2861 2878 to 2893, 2895, 2895, 2897 2900 & 2902	Reagent Inner Arm Horizontal Motor Holding Current Increase	OBSOLETE
43-054A	N - S/N 2960 & below	35 Micron Diluent Valve Filter	OBSOLETE
43-053		CANCELLED	CANCELLED
43-052	F - S/N 2798 & below	Mixer Arm Holding Current	26-FEB-90
43-051	N - S/N 2668 & below	Lamp Holder Assembly Replacement	15-SEP-89
43-050	N - S/N 2370 to 2577	Rear Panel, Right Side	26-MAY-89
43-049	N - S/N 2656 & below	Lamp Housing Hole Plug	16-JUN-89
43-048A	N - S/N 2641 & below	New Style Diluent Filter (70 micron)	15-MAY-89
43-047	F - S/N 2441 & below	Lamp Socket Replacement	CANCELLED
43-046B	O - S/N 2641 & below	Semi-Conductor Memory - Upgrade	17-MAY-89
43-045A	F - S/N 2313 & below	ISE Software Change - Version 18.1	11-NOV-88
43-044	F - S/N 2185 & below	Reagent Arm	04-AUG-88
43-043A	F - S/N 2131 & below	Dual Port Ram Board	Superseded by

43-042	O - S/N N/A	EP-3.4 Software Upgrade	ISA 43-062
43-041A	F - S/N 2110 & below	Syringe Heatsink Change	OBSOLETE
43-040	N - S/N 2110 & below	Cuvette Change Panel	20-DEC-89
43-039	N - S/N N/A	CPU & DRAM Jumpers	08-JUL-88
43-038A	F - S/N 2100 & below	Arm Lubrication & Heatsink Change	CANCELLED
43-037A	O - S/N 1990 & below	EP-3.3 Software Upgrade	20-DEC-89
43-036	O - S/N 1835 & below	110 VAC to 220 VAC Conversion	OBSOLETE
43-035B	O - S/N 1954 & below	24 VDC Reagent Cooler Assembly (107)	11-MAR-88
43-034	O - S/N 1934 & below	EP-2.5 Software upgrade (Bi-directional)	OBSOLETE
43-033	O - N/S	Primary Sample Tube Carousel (5ml)	OBSOLETE
43-032	O - S/N 1834 & below	EP-2.4 Software Upgrade	OBSOLETE
43-031	O - S/N 1835 & below	Static Electricity	OBSOLETE
43-030	N - S/N 1685 & below	Lamp Housing & Heatsink Upgrade	10-OCT-87
43-029	N - S/N 1520 & below	Reagent ID Reader Mounting Block	OBSOLETE
43-028C	N - S/N 1660 & below	CRT Controller PCB (PAL Decode Prom)	OBSOLETE
43-027	O - S/N 1654 & below	EP-1.1 Software Upgrade	OBSOLETE
43-026A	N - S/N 1490 & below	Main AC PowerDistribution PCB	OBSOLETE
43-025A	I - S/N 1490 & below	EP-1.0 Software and Hardware Upgrade	OBSOLETE
43-024		----- --OBSOLETE--	OBSOLETE
43-023	N- S/N 1395 & below	Reagent/Sample Arm Z-Motor Wiring	OBSOLETE
43-022B	I - S/N 1410 & below	M-2.2 Software and Hardware Upgrade	OBSOLETE
43-021	O - S/N N/A	M-2.0 Software Upgrade	OBSOLETE
43-020	N - S/N 1320 & below	Side Panel Fuse Holder	OBSOLETE
43-019B	F - S/N 1320 & below	Sample Syringe Current Increase	OBSOLETE
43-018B	F - S/N 1320 & below	Reagent Syringe Current Increase	OBSOLETE
43-017A	F - S/N 1320 & below	Sample Arm Current Increase	OBSOLETE
43-016A	F - S/N 1320 & below	Reagent Arm Current Increase	OBSOLETE
43-015	N - S/N 1320 & below	Fan Guard & Fuse Change	OBSOLETE
43-014	N - S/N 1313 & below	Deck Supports	Superseded by Service manual
43-013	I - S/N 1275 & below	Low Power Holding Current Increase	OBSOLETE
43-012A	I - S/N 1269 & below	Spectrum Hardware Package	OBSOLETE
43-011A	I - S/N 1294 & below	M-1.6 Software Upgrade	OBSOLETE
43-010A	N - S/N 1245 & below	CRT Controller & PROM Change	OBSOLETE
43-009	N - S/N 1235 & below	Sample Carousel Drip Pan Gasket	COMPLETE
43-008A	I - ALL INSTRUMENTS	Reagent Arm Adj. Positioning/Sensitivity	OBSOLETE
43-007	N - S/N 1167 & below	Version M1.1 Software Update	OBSOLETE
43-006	I - S/N 1143 & below	Software Market Release Software	OBSOLETE
43-005	I - S/N 1134 & below	Reagent Arm Improvements	OBSOLETE
43-004	I - S/N 1120 & below	Hardware Reliability Upgrade	OBSOLETE
43-003A	N - S/N 1107 & below	U.S. Marketing Clinical 3.93 Software Upgrade	OBSOLETE
43-002	N - S/N 1103 & below	Improved Reagent ID Motor Torque	OBSOLETE
43-001	N - S/N 1103 & below	Desensitize Reagent Inner Arm Sensor	OBSOLETE

<b>PENDING -</b>	TSB index number has been reserved for a future TSB.
<b>CANCELLED -</b>	TSB index number is cancelled.
<b>INCORPORATED -</b>	TSB was incorporated into another document or manual.
<b>OBSOLETE -</b>	TSB no longer applies.
<b>COMPLETE -</b>	TSB implementation is complete.

END OF DOCUMENT

	<b>ABBOTT ADD</b>	<h1>TECHNICAL SERVICE BULLETIN</h1>
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SUBJECT:  
**New Style Pump and Valve / Home Station Interface PCB**

TSB#: **43-085A**

ORIGINATOR: **Steve Lincoln**  
APPROVED: **Mark Slater 9/16/96**

PRODUCT:  
**ABBOTT SPECTRUM® (43)**

REF. ECN: **P1-9031-031**

**Trademark:** ABBOTT SPECTRUM and EPx are registered trademarks of Abbott Laboratories.  
CCx is a trademark of Abbott Laboratories.

<p>IMPLEMENTATION:</p> <div style="border: 1px solid black; padding: 5px;"> <input checked="" type="radio"/> Immediate  <input type="radio"/> Next Service Call  <input type="radio"/> Next Failure  <input type="radio"/> Optional         </div> <p>Instruments Requiring Modification: <b>ALL</b></p>	<p>TSB Part/Kit #: <b>2-54905-02</b></p> <p>TSB Effectivity/ Part(s) Availability: <b>01-OCT-96</b></p> <p><b>TSB Tracking by Serial # required (IMMEDIATE TSB's ONLY)</b></p> <div style="border: 1px solid black; padding: 5px;"> <input checked="" type="radio"/> YES  <input type="radio"/> NO         </div>	<p>Upgrade Time: <b>2.0 Hrs.</b></p> <p>Validation Time: <b>1.0 Hr.</b></p> <p>Total Mod. Time: <b>3.0 Hrs</b></p> <p><b>**NOTE** The instrument must be at TSB Level <u>n/a</u> prior to performing this TSB.</b></p>
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**NOTE: THIS TSB SUPERSEDES TSB 43-085. REMOVE THAT TSB AND REPLACE WITH TSB 43-085A. REVISIONS TO THIS DOCUMENT ARE NOTED WITH AN → OUT IN THE MARGIN.**

**I. DISTRIBUTION:**  
World wide

**II. PURPOSE:**  
The Pump and Valve PCB and the Homestation Interface PCB have been combined into one PCB that replaces the current Pump and Valve PCB (2-06790-01) and the HomeStation Interface PCB (2-06775-01). The new design incorporates a cover to protect the board from spills and leaks. Fuses for the main sub-assemblies controlled through the Pump and Valve PCB have also been included. To aid in troubleshooting test points have been added to the board.

**III. ADMINISTRATIVE NOTES:**

- This TSB is to be incorporated as an IMMEDIATE upgrade of the Pump and Valve (2-06790-01) and / or the Homestation Interface PCB (2-06775-01).
- It is expected that, in most cases, this modification can be incorporated in the course of normal service.
- **Europe:** For tracking purposes, Customer Service managers are requested to respond to Area Customer Service, Delkenheim, by the 10th of each month, as to the number of systems upgraded and the number of systems remaining to be upgraded.
- **USA and ROW:** For tracking purposes, area managers are requested to respond by fax, (972-518-6153) by the 10th of each month, as to the number of systems upgraded and the number of systems remaining to be upgraded.

**IV. SPECIAL TOOLS:**  
Standard Field Service tool kit.

**V. PARTS:**  
2-54905-02 Pump and Valve / Homestation Interface PCB upgrade kit.

The kit includes:

**\*\*Potential Biohazard & Voltage Hazard. Observe Proper Safety Precautions.\*\***

54905-104	Pump & valve / Homestation Interface PCB
54998-101	Shield
14351-108	Standoff snap/snap .125 x .125 x .25
14351-045	Standoff snap/snap .156 x .187 x .25
14351-107	Standoff foot/snap .125 x .25
14702-037	Standoff Hex male/female 4-40 x .25

**DOMESTIC:**

Parts will be shipped to FSE's/FSR's through the normal weekly parts shipments.

**INTERNATIONAL:**

International Service locations should forecast TSB parts via their regular spare parts channels.

**SERVICE KIT IMPACT:**

Service Kits will be upgraded with the pump and valve upgrade kit 2-54905-02.

**REPLACED PARTS:**

The parts replaced by this modification should be properly disposed of. Do not return any parts to Dallas or any restocking location. Existing boards 2-06790-01 and 2-06775-01 in the FSR kits should be retained until notified by Field Service Admin with disposition instructions.

**COMPATIBILITY:**

This modification is both upward and downward compatible with products 43, 65, 63, 66, and 70.

**VI. PROCEDURE:****MODIFICATION STEPS:**

1. Perform the ISE shut down procedure.
2. Power the system down using the main power switch.
3. Remove the instrument top deck and set it aside.
4. Remove the HomeStation Interface PCB and the Pump and Valve PCB.
5. Remove the standoffs for each of these boards. On some of the older systems it may be necessary to remove the ISE in order to gain access to the screws holding the standoffs in place.

**SAFETY NOTE: All screws must be removed from the ISE shroud. Failure to do so could cause the new PCB to short to ground.**

6. From the drawings in Figure 1 determine the correct standoffs and locations on the ISE shroud to be used for the system that you are working on. This will be dependant on the type of ISE shroud on the system the upgrade is being installed on. There are several different shrouds presently in the field.
7. On the ISE shroud install the correct standoffs as indicated in Figure 1.
8. Ensure that the jumper configuration is correct by comparing the new board to the jumper illustration in Figure 2.
9. Install the new board on the ISE shroud.
10. When installing the plugs to the jacks on the new board note the following:
  - a. There are two jacks marked J491. The one marked J491EP is used for EPx® installations. The jack marked J491S is used for Abbott Spectrum® and CCx™ installations.
  - b. J492S is also marked J665EP. This jack is common to both EPx and Abbott Spectrum analyzers.
  - c. J662 is used only on EPx systems.
  - d. All jacks that do not have an "S" or an "EP" next to the jack number are common to all systems.
11. After connecting all of the plugs to the jacks install the shield over the Pump and Valve / HomeStation PCB as illustrated in Figure 3.
- ➔ 12. Remove the mix arm from the instrument. Allow the mix arm to come to room temperature then using a DVM measure the resistance between the pins of the mix arm. If the resistance is less than 2400 ohms, discard the arm. Replace it utilizing parts from the field service kit.
13. Power the system back up using the main power switch.

**CHECKOUT:**

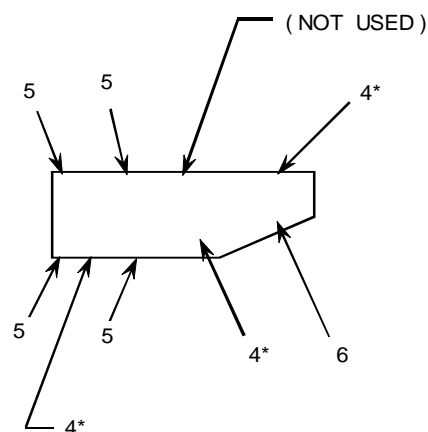
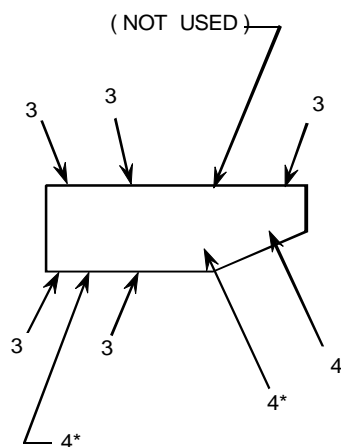
1. Access the **Pumps and Valves** screen. Highlight the appropriate field and check the following functions:
  - a. Ensure water flow in the reagent and mixer wash cups.
  - b. Ensure that the waste pump can be turned off and back on.
  - c. Ensure that water flows for the incubator fill.
  - d. Perform a purge on the diluent system. Check and be sure there is water coming from the sample probe. Perform the diluent flow check.
  - e. Check the diluent level sensor by lifting the diluent bottle off the platform. Home robotics. The instrument should display a diluent level low error and sound the error alarm.
2. Perform the **Barcode Reader Test**.
  - a. Complete 10 scans with no errors.
3. Access the **Mix Arm** screen. Highlight the appropriate field and check the following function:
  - a. Turn the mixer on. Ensure correct mix action.
4. Access the **Sample Arm** screen. Highlight the appropriate field and check the following function:
  - a. Rotate the sample carousel to at least five random positions. Then home robotics.
- ➔ 5. Access the **AD Read** screen.
  - a. Set the screen up to read the voltage output from the optics. Be sure all wave lengths read correctly. No Reads equal Ø for any wavelength.
6. Reinstall the top deck on the system.

**MODIFICATION CONTROL STICKER UPDATE:**

1. Check off the modification control sticker to indicate that TSB 43-085 has been incorporated.

ISE SHROUD P / N	USED IN
06475 - 102	SPECTRUM I
19529 - 101	PRIMARY SAMPLE TUBE KIT
19529 - 201	7ML TUBE KIT

ISE SHROUD P / N	USED IN
19130 - 104	EPX® SPECTRUM II SPECTRUM I CCX™ CCX II



### Hardware

3	Standoff, hex 4-40	P/N 14702-037
4	Foot/snap standoff	P/N 14351-107
5	Snap/snap standoff .156 dia	P/N 14351-045
6	Snap/snap standoff .125 dia	P/N 14351-108

Figure 1

**\* NOTE: THIS STANDOFF INSTALLED AT THE FACTORY.**

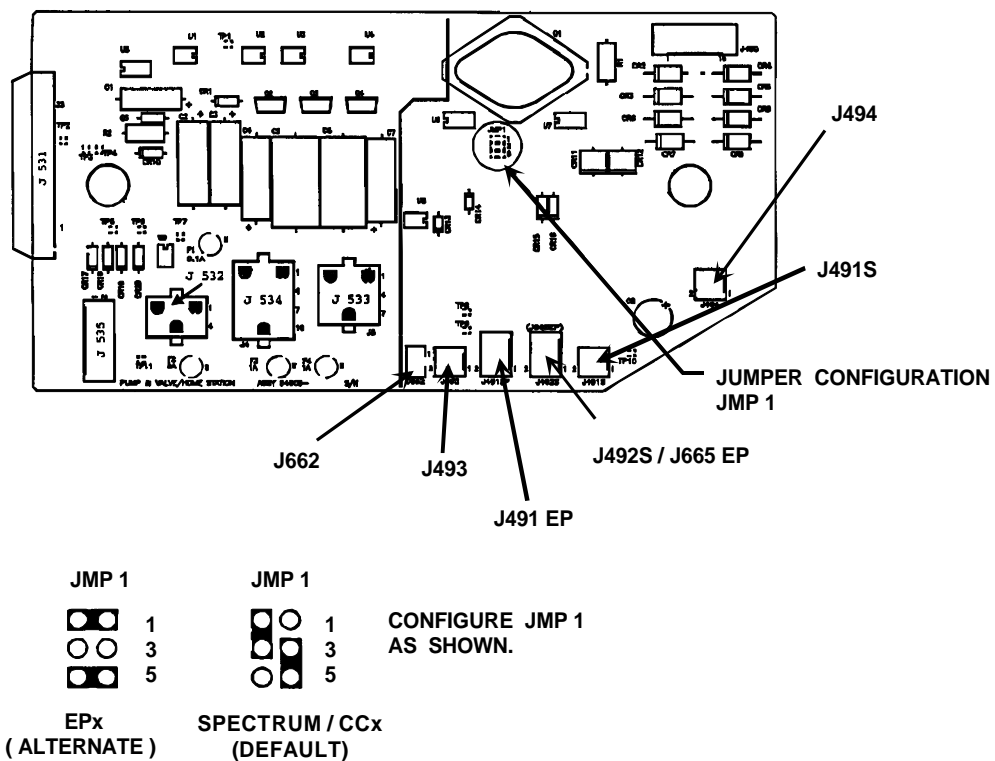


Figure 2

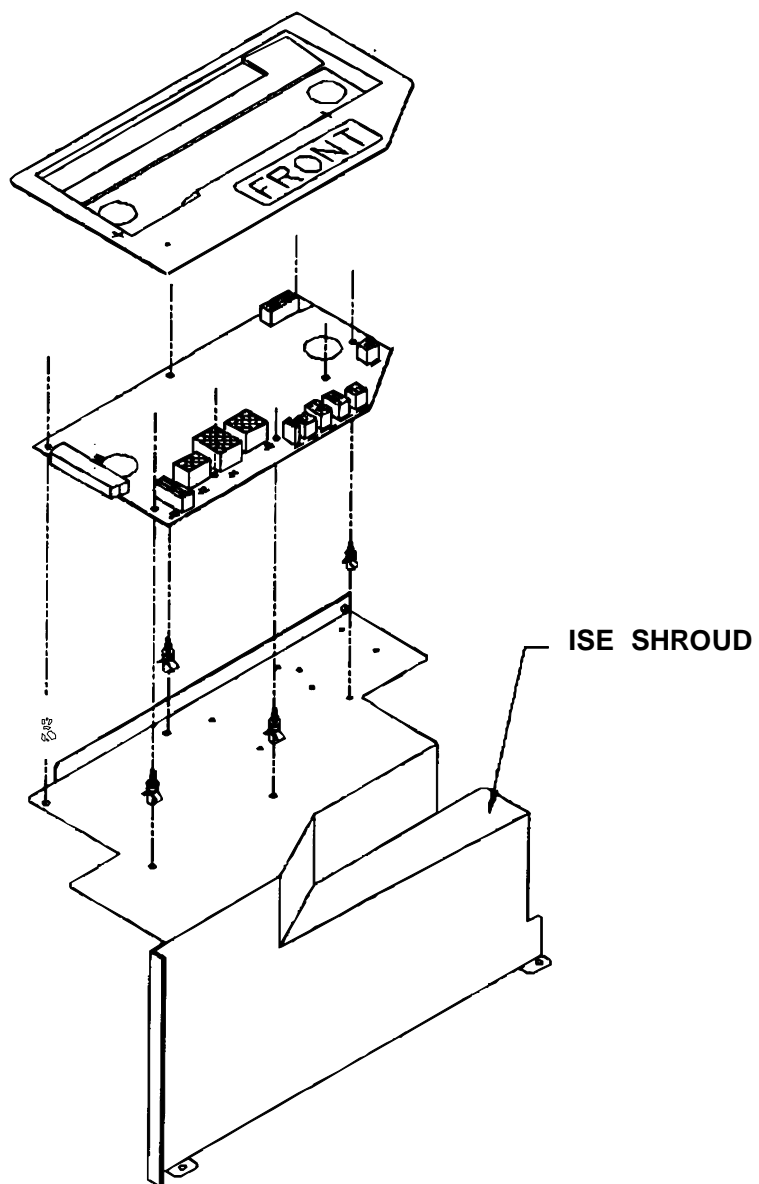


Figure 3



**TEST POINTS**

TP1	Waste Pump
TP2	Mix Coil
TP3	Barcode Reader CW Drive
TP4	Barcode Reader CCW Drive
TP5	Diluent pressure switch High
TP6	Diluent pressure switch Low
TP7	Sample Pump
TP8	Sample Carousel Home Sensor
TP9	Sample Carousel Station Sensor
TP10	Ground for Home Station Section
TP11	Ground for Pump & Valve Section

**FUSES**

F1	Mix Coil	0.2A
F3	Waste Pump	1A
F4	Barcode Reader Motor	1A



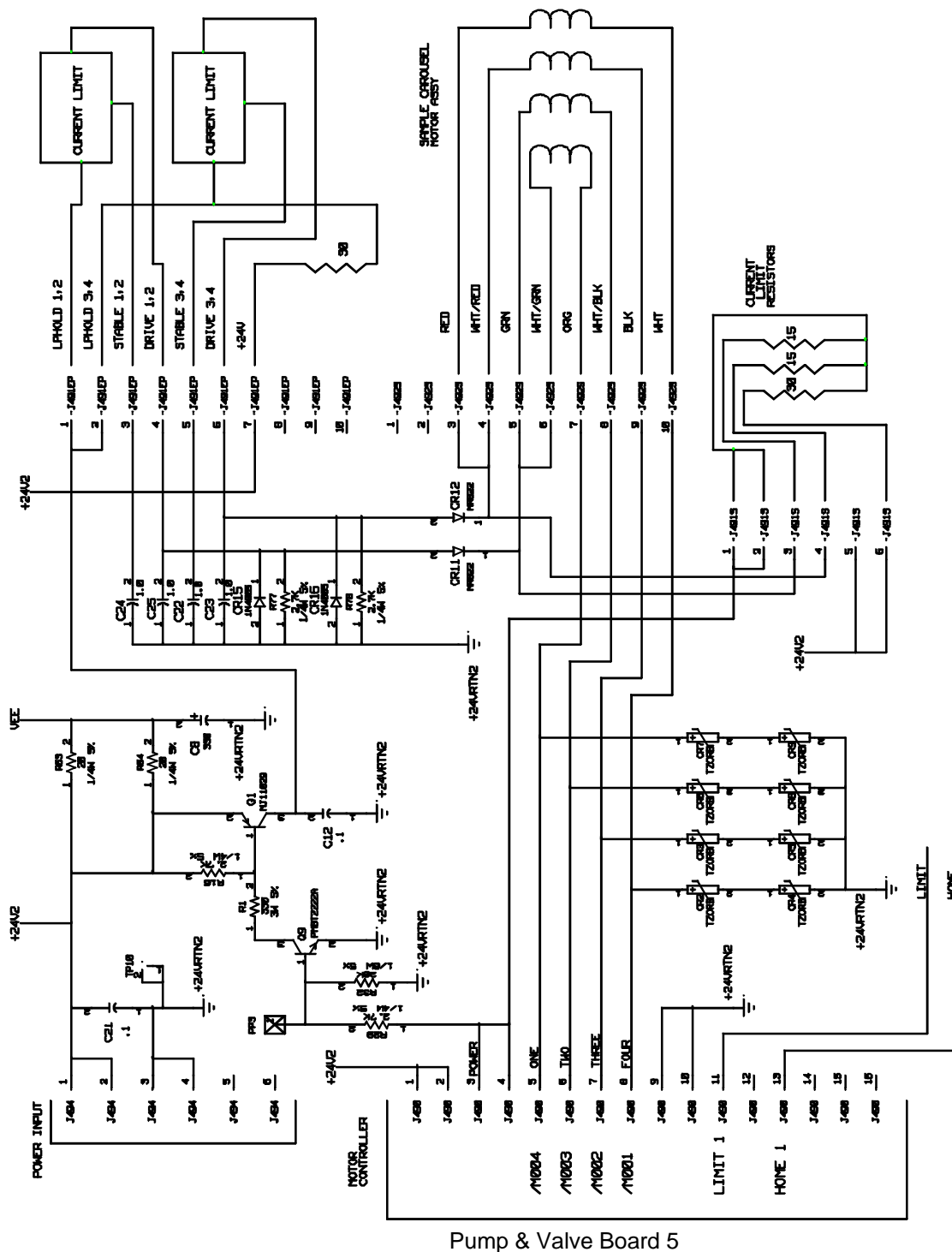
**\*\*Potential Biohazard & Voltage Hazard. Observe Proper Safety Precautions.\*\***



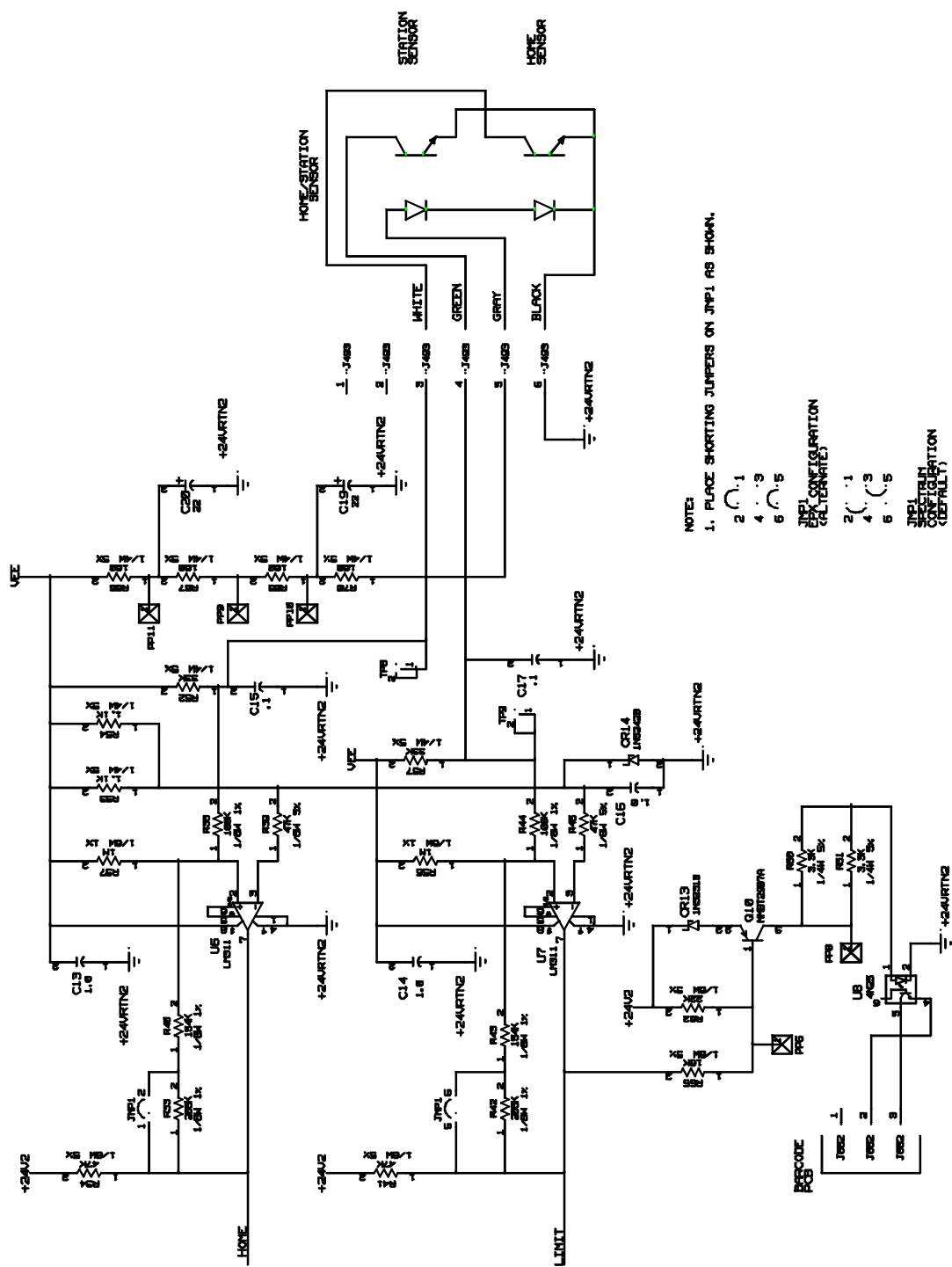
**\*\*Potential Biohazard & Voltage Hazard. Observe Proper Safety Precautions.\*\***



**\*\*Potential Biohazard & Voltage Hazard. Observe Proper Safety Precautions.\*\***



Pump &amp; Valve Board 5



### Pump & Valve Board 6

END OF DOCUMENT

	<b>ABBOTT ADD</b>	<h1>TECHNICAL SERVICE BULLETIN</h1>
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SUBJECT:  
**New Style Pump and Valve / Home Station Interface PCB**

TSB#: **43-085**

ORIGINATOR: **Steve Lincoln**  
APPROVED: **Mark Slater 5/6/96**

PRODUCT:  
**ABBOTT SPECTRUM® (43)**

REF. ECN: **P1-9031-031**

**Trademark:** ABBOTT SPECTRUM and EPx are registered trademarks of Abbott Laboratories.  
CCx is a trademark of Abbott Laboratories.

<p><b>IMPLEMENTATION:</b></p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <input type="radio"/> Immediate  <input type="radio"/> Next Service Call  <input checked="" type="radio"/> Next Failure  <input type="radio"/> Optional         </div> <p>Instruments Requiring Modification: <b>n/a</b></p>	<p>TSB Part/Kit #: <b><u>2-54905-02</u></b></p> <p>TSB Effectivity/ Part(s) Availability: <b><u>03-JUN-96</u></b></p> <p><b>TSB Tracking by Serial # required (IMMEDIATE TSB's ONLY)</b></p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <input type="radio"/> YES  <input checked="" type="radio"/> NO         </div>	<p>Upgrade Time: <b><u>2.0 Hrs.</u></b></p> <p>Validation Time: <b><u>1.0 Hr.</u></b></p> <p>Total Mod. Time: <b><u>3.0 Hrs</u></b></p> <p><b>**NOTE** The instrument must be at TSB Level <u>n/a</u> prior to performing this TSB.</b></p>
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**OBSOLETE. SUPERSEDED BY TSB 43-085A.**

 <b>ABBOTT ADD</b>	<h1>TECHNICAL SERVICE BULLETIN</h1>
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SUBJECT:  
**Rear Panel Controller Upgrade Kit for  
New Reagent Cooler Installation**

TSB#: **43-072A**

ORIGINATOR:  
**Rod Deifbaugh / Jack Hall / Bill Gill**

PRODUCT:  
**ABBOTT SPECTRUM® (43)**

APPROVED: **Michael Manion - June 14, 1993 (signature on file)**

REF. ECN: **P1-7886**

<p>IMPLEMENTATION:</p> <p><input type="checkbox"/> Immediate</p> <p><input type="checkbox"/> Next Service Call</p> <p><input checked="" type="checkbox"/> Next Failure</p> <p><input type="checkbox"/> Optional</p> <p>Instruments Requiring Modification: <b>S/N 3596 &amp; Below</b></p>	<p>TSB Part/Kit #: <b><u>18720-101</u></b></p> <p>TSB Effectivity/ Part(s) Availability: <b><u>14-JUN-93</u></b></p>	<p>Upgrade Time: <b><u>2 hrs.</u></b></p> <p>Validation Time: <b><u>1 hr.</u></b></p> <p>Total Mod. Time: <b><u>3 hrs</u></b></p>
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**\*\*NOTE\*\* The instrument must be at TSB Level n/a prior to performing this TSB.**

ABBOTT SPECTRUM and EPx are registered trademarks of Abbott Laboratories.

CCx and SERIES II are trademarks of Abbott Laboratories.

## I. Distribution:

Total

## II. Purpose:

The following changes have been made to improve the reliability of the Reagent Cooler Assembly. Some of the changes incorporated are listed below. 1) Larger and more efficient Thermal Electric Devices (TED). 2) Improved controller board. 3) Redesigned TED Heatsink.

To incorporate these changes the physical layout of the cooler assembly had to be changed substantially. The new TEDs require more current. For proper cooling of the controller board it has been relocated to the rear of the instrument.

## III. Administrative Notes:

The modification is to be completed on the next failure of the Reagent Cooler Assembly.

**NOTE: This TSB replaces the previously released TSB 43-072 which should be discarded. This TSB adds pictorials for clarity and updates part numbers. No functional procedures have changed.**

**NOTE: This kit only provides the necessary parts for the initial installation of the new cooler assembly. It will be necessary to insure that the correct Reagent Cooler assembly is ordered.**

**NOTE: Reference ISA 43-131 for additional specific information regarding this upgrade.**



#### IV. Special Tools:

No Special Tools will be required to install this modification.

#### V. Parts:

18720-101 Controller and wiring kit for ABBOTT SPECTRUM®, ABBOTT SPECTRUM® CCx™, ABBOTT SPECTRUM® SERIES II™ and ABBOTT SPECTRUM® CCx™ SERIES II™

Consist of the following:

- 18347-102 Cable, Cooler Power
- 18348-101 Cable, Alarm Circuit
- 18346-102 Cable, Cooler Drive
- 18360-103 Controller Assembly
- 18362-102 Rear Panel, Upper Half
- 18361-102 Rear Panel, Lower Half
- 18339-101 RS-232 Cover
- 14494-206 Sim Lock Screws (Four to hold the controller to the rear panel)
- 14414-103 Lock Nuts 6 -32.
- 14370-018 20.5" Tygon Tubing
- 14494-008 Screw, 4-40 x 0.500 PHP, S, CDPL

**NOTE: The Reagent Cooler is not included in the kit. You must order the new cooler prior to installation of the rear panel controller kit.**

Reagent Cooler Part numbers for Reference Only

- 2-18332-02 Reagent Cooler, ABBOTT SPECTRUM CCx I
- 2-18332-03 Reagent Cooler, ABBOTT SPECTRUM EPx and ABBOTT SPECTRUM I
- 2-18332-05 Reagent Cooler, ABBOTT SPECTRUM CCx SERIES II
- 2-18332-08 Reagent Cooler, ABBOTT SPECTRUM SERIES II

#### VI. Procedure:

##### A. System Preparation:

**Note: It will be required to have access to the rear of the instrument. The new controller will be installed on a new rear panel behind the ISE assembly.**

1. Perform the ISE shutdown procedure.
2. Remove the reagents from the cooler and store them properly.
3. Perform ISE shutdown.
4. Power down the instrument.
5. Remove the Top Deck.
6. Remove the Incubator Fan Filter Access Panel.
7. Disconnect the system's incoming water connection.
8. Remove the right Top Deck Stand Off.
9. Remove the two screws holding Reagent Probe Wash Cup bracket to the Dual Sensor Assembly Bracket.
10. Position the Wash cup in a manner that it will not interfere with the cooler removal.

##### B. Reagent Cooler Removal:

1. Remove the connectors to the Reagent Barcode Reader Assembly.  
Reader Head - P575, Dual Sensor P576, Motor P536 and Limit Sensor P537
2. From the left side of the Reagent Cooler Controller Board, remove the +24 VDC connector P580 and Alarm cable P589.
3. From the bottom back left corner of the Reagent Cooler remove the 120 VAC Fan power connector P273.
4. At the front of the cooler assembly base plate, remove the two screws that hold the cooler assembly to the instrument.
5. Remove the Reagent Cooler Assembly.

**C. Wiring Harness Installation:**

1. From the rear of the instrument, remove the panel located behind the ISE. On some instruments there were RS-232 connectors on this panel. If these cables are present, mark and remove the connectors from the old panel.
2. From the Reagent Cooler area, route the Power Cable (18347-102) connector P1023 under the rear of the Incubator Optics assembly. The cable must be routed so that the quick connect connector is extended out the hole opened by the rear panel removal (See Figure 1, Sect VII, Figures).
3. Repeat the above for the Alarm Cable P1020 (18348-101).
4. From the rear of the system, pull a 8" (20.26 cm) service length.
5. Dress the cables under the Incubator Optics assembly in a manner that routes the cables along the existing cable run.
6. Check that the cables do not interfere with the Waste Pump and it's associated tubing.
7. Remove the Keyboard Bezel Cover.
8. Route the Power Cable terminal lugs J303, J304 and ground (J302) through the cable port located at the bottom of the vertical panel located between the processor and the power supply area.
9. Dress the cable to the left of the 24 VDC Power Supply (See Figure 1, Sect VII, Figures).
10. Repeat the above for the Alarm Cable P285 connector.
11. Continue routing the Alarm Cable connectors up the left post to the card cage area.
  - a. Route the P285 to the top connector of the Incubator Servo Board.
  - b. Tie back the old connector P285, by bending the connector back and using a tie wrap to secure it to the cable.
12. Install the interface board part # 18845-102 (Packaged with 2-18332-08 ABBOTT SPECTRUM® Cooler), Reference Table 1 on the next page.

To install the interface board, perform the following procedure while referring to Figure 2 and 3.

  - a. Unplug P574 from J1 of the barcode reader board located in slot 10 of the master card cage.
  - b. Plug J2 of the interface board into J1 of the reader board.
  - c. Plug P574 into J1 of the interface board.
  - d. Secure the interface board to the reader board by inserting nylon support post P/N14351-090 between J1 and J7 of the reader board and into the small round hole of the interface board. Ensure the post latches the interface board.
13. Starting from the card cage area, dress the Alarm cable.
14. Starting in the keyboard/power supply area, dress both the Alarm and Power Supply cables.
15. At the 24 VDC Power Supply, connect the new power cable's J303 (Black) terminal lug.
16. At the 24 VDC Power Supply, connect the new power cable's J304 (White) terminal lug.
17. At the 24 VDC Power Supply, connect the Ground (J302) (Green) terminal lug to the power supplies ground.
18. At the 24 VDC Main Distribution board, disconnect connector P231. Remove the 12A fuse at F1.
19. Tie back the old connector P231.
20. From the Reagent Cooler area, route the Controller Drive Cable (18346-102) connector P1007 under the rear of the Incubator Optics assembly. The cable must be routed so that the quick connect connector is extended out the hole opened by the rear panel removal.
21. From the rear of the system, pull a 8" (20.26 cm) service length.
22. Dress the cables under the Incubator Optics assembly in a manner that routes the cables along the existing cable run.
23. Check that the cables do not interfere with the Waste Pump and it's associated tubing.

**D. Rear Panel Controller Installation**

1. If the instrument has RS-232 connectors on the ISE side, install the connectors to the new upper panel (18362-102) in same position that they were removed from.
2. Install the new upper panel.
3. Remove the vent tube fitting from the old panel and install it on the new one.
4. Disconnect the old vent tube from the waste manifold and install the new tubing P/N14370-018 between the manifold and vent tube fitting.
5. Remove the cover of the Controller Assembly (18360-103). Ensure that jumper JU1 is removed and JU2 is installed on the Controller PCB (See Figure 4, Sect VII, Figures)
6. Mount the controller to the Rear Lower Panel (18360-103) using the four screws (14494-206).
7. Direct the new cables out the rear of the instrument.
8. Install the P1007 (Controller), P1020 (Alarm) and P1023 (Power) cables to the Controller Assembly.

**NOTE: To remove the Controller and Power cables you must squeeze the metal ring to release the lock.**

9. On the rear panel, there are two studs. These studs can be used to hold the lower rear panel and the Controller Assembly in place on the upper rear panel. Using the two (2) nuts (14414-103), secure the assembly to the panel studs.
10. Install remaining screws to hold lower rear panel to chassis.

**E. Reagent Cooler Installation**

1. Check that the Controller Drive and 120 VAC Fan P273 cables are clear of the Reagent Cooler installation area.
2. Lay the controller cables across the Incubator Optics assembly.
3. Check that the Reagent Wash Cup is clear of the installation area.
4. Check that the cooler installation area is clear.
5. Place the New Reagent Cooler into position.
6. Rock the cooler backwards to insure that it is firmly against the rear hold down foot.
7. Install the two (2) screws in the front corners of the cooler. Check for clearance between cold plates and cuvette carousel encoder disk. Move cooler assembly as far to right as possible prior to tightening screws.
8. Connect the P273 Fan Power to the connector at the left rear corner of the cooler's base plate.
9. Route the Controller cable connectors P1008 and P1012 over the top of the cooler's fan Plenum.
10. Route the Controller cable connectors P1010 and P1014 between the Reagent Cooler and Incubator Optics assembly.
11. At the left rear of the Reagent Cooler, loop and wire tie the extra lengths of the Controller Cables.
12. Connect the four connectors. P1010 - Quadrant #1 (Positions 1-5), P1008 - Quadrant #2 (Positions 6-10) P1012 - Quadrant #3 (Positions 11-15) and P1014 - Quadrant #4 (Positions 16-20) (See figure 1, Sect VII, Figures).
13. At the front of the Reagent Cooler, tie back the old cooler power cable connector P580 and the old Alarm Cable P589.
14. Install the connectors to the Reagent Barcode Reader Assembly.  
Reader Head - P575, Dual Sensor P576, Motor P536 and Limit Sensor P537.
15. Reinstall the top deck stand OFF.
16. Install Reagent Probe Wash Cup bracket to the Dual Sensor Assembly Bracket.
17. Check that all tubing connections are secure.
18. Reconnect the system's incoming water connection.
19. Replace the Incubator Filter Access Panel.

**F. CHECK-OUT**

1. Turn on the system power.
2. After the system has fully booted, check that each cooler quadrant is cool to the touch. The ambient section on all instruments will be driven to maintain a temperature between 20 and 28 degrees C.

**NOTE: Only the ABBOTT SPECTRUM® SERIES II™ and ABBOTT SPECTRUM® CCx™ SERIES II™ systems have the software that will monitor the alarm condition for quadrant #1. The three (3) cooled quadrants are not monitored on any ABBOTT SPECTRUM or ABBOTT SPECTRUM® EPx® instruments.**

3. If any quadrant is not being cooled, notify the Technical Service Group immediately.
4. Check that the ABBOTT SPECTRUM, ABBOTT SPECTRUM EPx and non-noise reduced ABBOTT SPECTRUM SERIES II and ABBOTT SPECTRUM CCx Reagent Cooler fan is blowing air out the back of the instrument.

**NOTE: Check that on noise reduced ABBOTT SPECTRUM SERIES II and ABBOTT SPECTRUM CCx instruments that the reagent cooler fan is blowing air out the front of the cooler heatsink.**

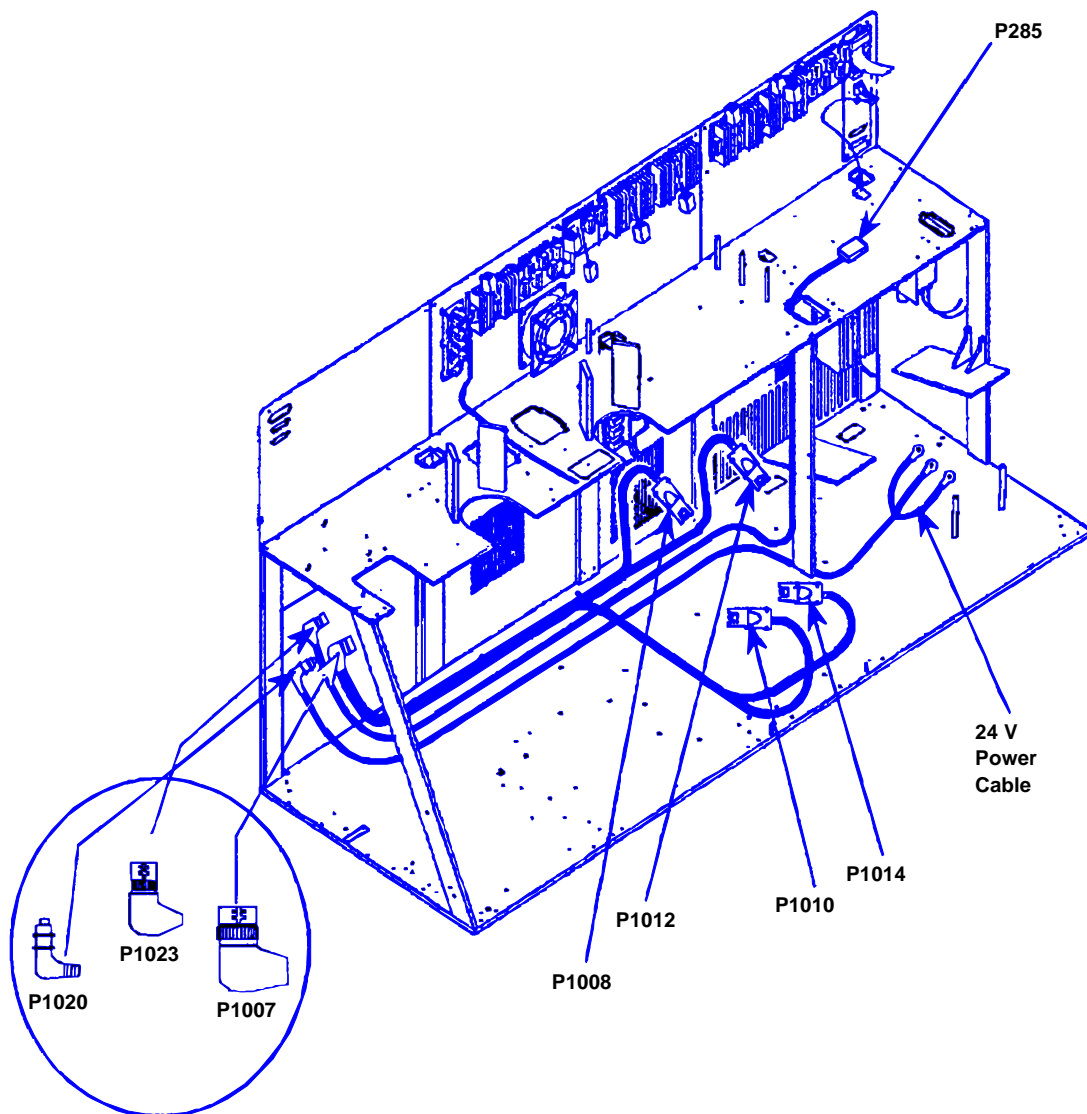
5. Install the Top Deck.
6. After the cooler has come to temperature (approximately 45 mins.) use your temperature meter to measure the two (2) end positions of each quadrant. For the temperature measurement procedure, refer to ISA 43-098.
7. Retrain the Reagent Arm's Reagent Cooler positions and Highest Bottom.
8. Using Configuration - Device Setup - Print out a copy on the Robotic Step Tables. Using the printout update the customers records.
9. Fill the Reagent Cooler with cartridges. Using the Reagent Barcode Reader Test Screen, check that each position is read properly.

**G. VALIDATION**

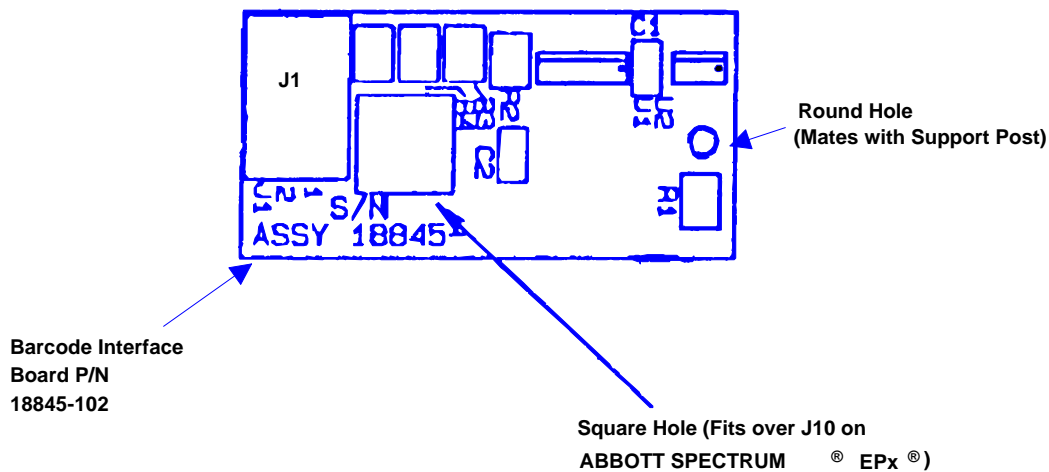
1. Perform a Total Service Call.
2. Mark the Modification Control Label Accordingly.

## VII. Figures

**NOTE:** You may have to scroll down and to the right to view graphic examples.



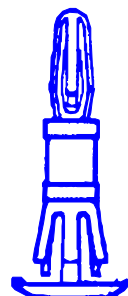
**Figure #1**



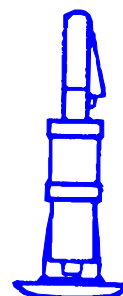
NOTE: Nylon Washer P/N 14687-140 Goes Here



Nylon Mounting Post P/N 14351-090 (Used to mount Interface Board to Intermec Reader Board on all ABBOTT SPECTRUM<sup>®</sup> instruments)



Nylon Mounting Post P/N 14351-094 (Used to mount Interface Board to Intermec Reader Board on all on ABBOTT SPECTRUM EPx)



**Figure #2**  
**Barcode Interface Board P/N 18845-102**  
**and Mounting Hardware**

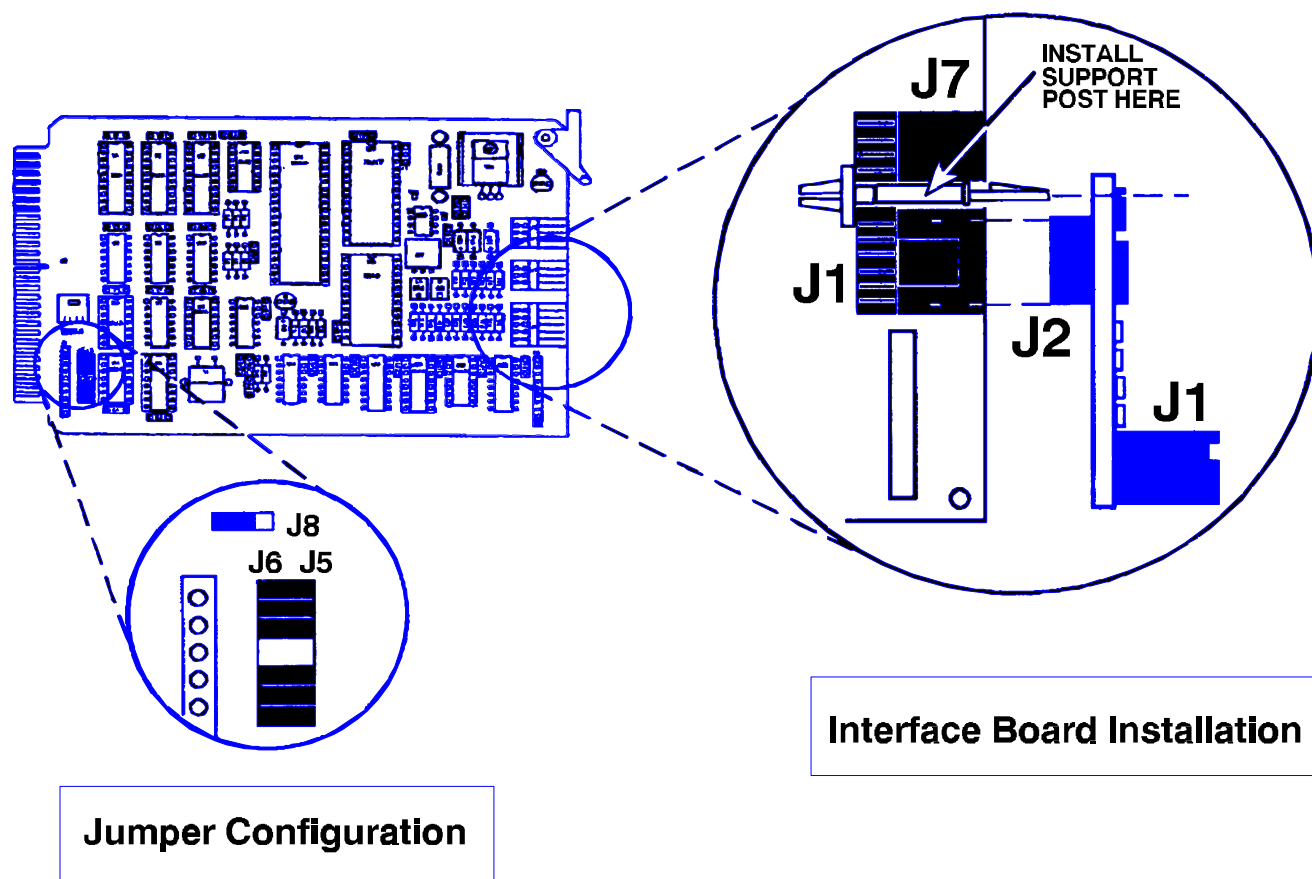
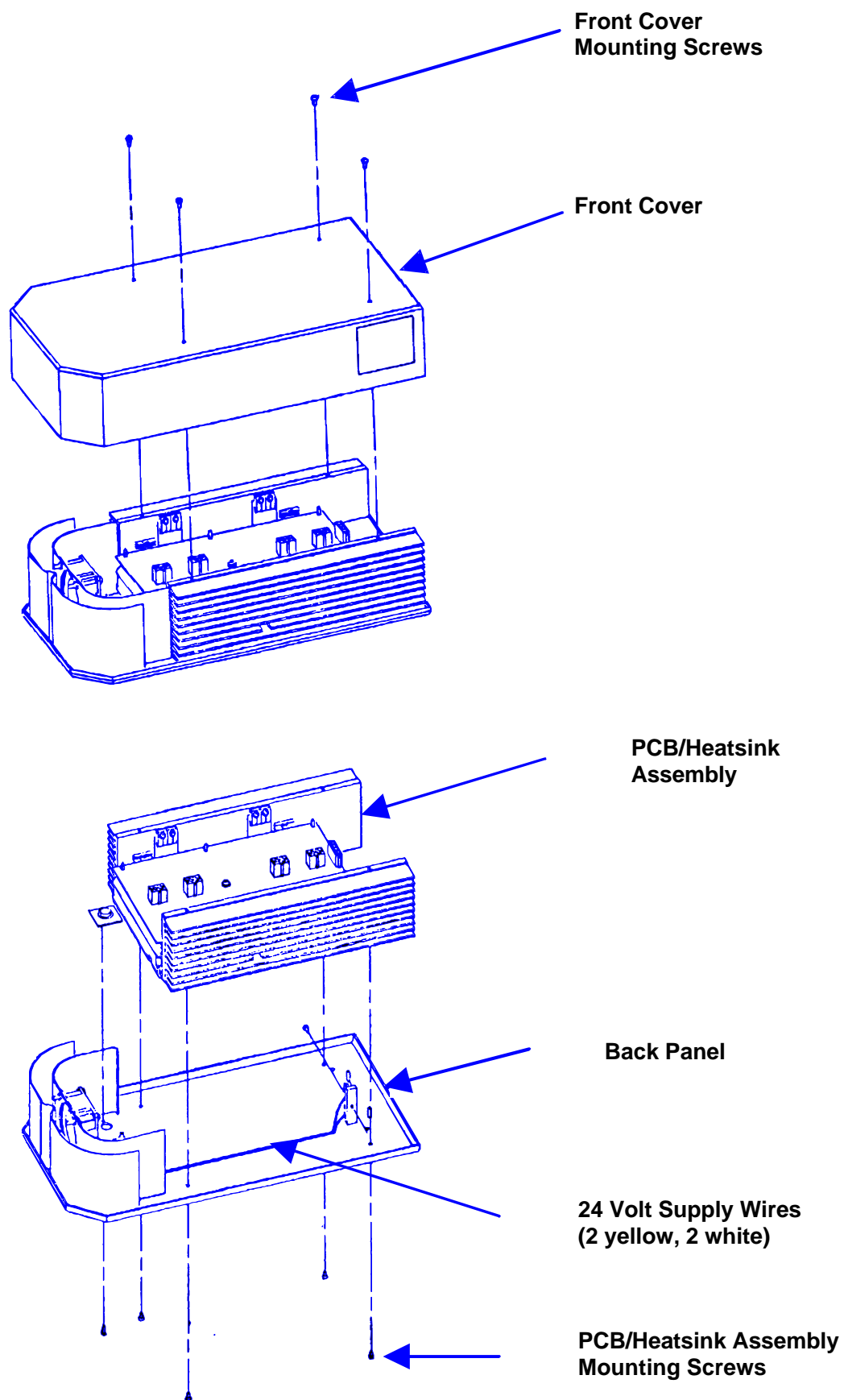


Figure #3

**Figure #4**

**\*\*Potential Biohazard & Voltage Hazard. Observe Proper Safety Precautions.\*\***



**END OF DOCUMENT**

 <b>ABBOTT ADD</b>	<h1>TECHNICAL SERVICE BULLETIN</h1>
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SUBJECT:  
**5 mL or 7 mL PRIMARY SAMPLE TUBE CAROUSEL**

TSB#: **43-061B**

ORIGINATOR: **Jane Hughes**  
APPROVED: **Michael Manion September 21, 1994**

PRODUCT:  
**ABBOTT SPECTRUM® (43)**

REF. ECN: **P1-6154**

Trademark: ABBOTT SPECTRUM is a registered trademark of Abbott Laboratories.

<p><b>IMPLEMENTATION:</b></p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <input type="radio"/> Immediate  <input type="radio"/> Next Service Call  <input type="radio"/> Next Failure  <input checked="" type="radio"/> Optional     </div> <p>Instruments Requiring Modification: <b>n/a</b></p>	<p>TSB Part/Kit #: <b>LN 1367-14</b></p> <p>TSB Effectivity/ Part(s) Availability: <b>21-SEP-94</b></p> <p><b>TSB Tracking by Serial # required (IMMEDIATE TSB's ONLY)</b></p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <input type="radio"/> YES  <input checked="" type="radio"/> NO     </div>	<p>Upgrade Time: <b>5 Hrs.</b></p> <p>Validation Time: <b>4 Hrs.</b></p> <p>Total Mod. Time: <b>9 Hrs.</b></p> <p><b>**NOTE** The instrument must be at TSB Level <i>n/a</i> prior to performing this TSB.</b></p>
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**NOTE:** This document supersedes TSB 43-061A. TSB 43-061A should be removed and this document put in its place. This TSB has been rewritten to update parts lists and clarify information regarding fluid sensitivity for both styles of sample arms. This TSB also OBSOLETEs TSB 43-033.

#### I. DISTRIBUTION:

Complete Distribution.

#### II. ADMINISTRATIVE NOTES:

United States: Scheduling of this modification will be handled by the Marketing Group.

Scheduling should be coordinated with the availability of parts and trained people. Orders should be placed through RZZ Order Entry in N. Chicago.

International: Service Managers should forecast requirements and place their orders through Field Service Logistics.

#### III. GENERAL:

The purpose of this modification is to give the instrument the capability of having 7mL Vacutainer tubes placed directly in the sample carousel thus eliminating excess handling of the specimen.

**NOTE:** The 7 mL (LN: 1367-15) Primary Sample Tube Carousel is not included in this kit and needs to be ordered separately.

**NOTE:** Only 19534-302 Grounded Sample Cup Carousel can be used on this assembly.

**NOTE:** Fluid Sensitivity Limits are:

1. Tube:
  - 2.62 inches in the tube with clot level height checked against gauge shipped with the kit.
2. Primary Sample Tube (PST) Carousel
  - A. Old Style Arm (06200-107 or below): 500 uL in sample cup  
**NOTE:** Samples cups on inner ring only of 5 mL PST carousel
  3. New Style Arm
    - B. Inner Ring: 50 uL in sample cup
    - Outer Ring: 150 uL in sample cup
4. Sample Cup Carousel still allows 50 uL minimum volume.  
**NOTE:** Use grounded sample cup carousel only.

**\*\*Potential Biohazard & Voltage Hazard. Observe Proper Safety Precautions.\*\***

**IV. PARTS REQUIRED:**

7 mL PRIMARY TUBE SAMPLE CAROUSEL KIT (LN 1367-14)

<b><u>PART NUMBER</u></b>	<b><u>DESCRIPTION</u></b>	<b><u>QTY</u></b>
P/N 19528-101	Support Enclosure, DI Weight Sensor	1
P/N 19529-201	Bracket, ISE Shield MTG-PCB	1
P/N 19530-101	Wash Plate (Pump)	1
P/N 19539-203	Primary Tube Drive Assembly	1
P/N 18730-101	Template, 7 mL Primary Tube	1
P/N 06586-201	Heat Sink - Sub Assembly	1
P/N 54771-101	Supplement, Prim Sam Tube	1
P/N 19559-101	Container, Primary Samp Tray	1
P/N 14715-003	Standoff, Hex 4-40 x .250 Nyl	4
P/N 14489-132	Screw, #4-40 x .250, PHP	8
P/N 14537-002	Washer, Flat #r x 0.280 Nyl	8
P/N 14702-034	Standoff, Hex 4-40 x .750 Nyl	4
P/N 19534-302	Carousel Assy, P.S.T. Modified Sample Cup	1
P/N 19516-102	Template, 5 mL, Primary Tube	1

**NOT INCLUDED IN KIT:**

<b><u>PART NUMBER</u></b>	<b><u>DESCRIPTION</u></b>
1367-15	7 mL Primary Sample Tube Carousel
19534-101	5 mL Primary Sample Tube Carousel (use of 5 mL carousel not recommended since sample cups can not be used on this carousel)

**V. MODIFICATION STEPS:****A. SYSTEM SHUTDOWN**

1. Perform the ISE shutdown procedure, reference page 39 in the Operations Manual, under Anticipated Power Loss.
2. Remove the reagents from the reagent cooler and place in an appropriate refrigerator.
3. Remove sample probe, reagent probe, and mixer arm from the instrument.
4. Power the instrument off using the main switch and then unplug the A.C. power cord.
5. Turn off the water to the instrument at the Water Quality Station. Disconnect the inlet water from the system.

**B. HEAT SINK ASSEMBLY (06586-201) Reference Figure 1.**

The resistance value for R9 and R10 were 15 ohms. These two resistors are now 7.5 ohms. This will increase the motor torque by increasing the drive current.

1. Remove the CRT/Keyboard cover.

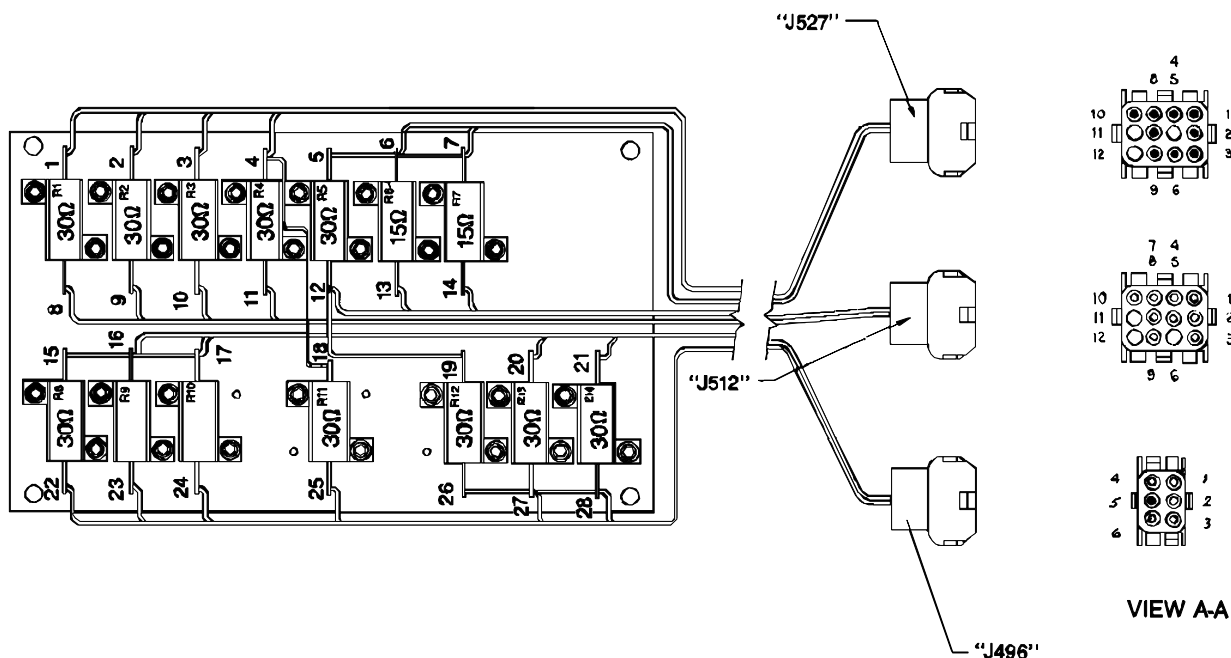


Figure #1

2. Remove the CRT assembly.
3. Disconnect cable connectors J-496, J-512 and J-527 (Heatsink Assembly).
4. Remove the four screws that hold the assembly to the back panel.
5. Install the new Heatsink and perform the previous steps in reverse order.

### C. ISE SHIELD

1. Remove the three hole top deck from the Spectrum.

**NOTE:** During the next step use caution when removing the diluent weight sensor assembly, it is possible to damage the two wires that attach to the sample diluent weight switch.

2. Remove the sample diluent reservoir, and tubing from diluent pump. Remove the three screws holding the sample diluent weight sensor assembly. Detach the two wires on the weight sensor switch and remove from the instrument. (Reference Figure 2).
3. Disconnect P-492 sample carousel motor, P-495 carousel sensor, and the green grounding wire which will be attached to the carousel base plate and the grounding bar. If the sample carousel ID reader is mounted on the sample carousel assembly disconnect P-497 from the PCB.
4. Remove the four corner screws holding the carousel base plate to the four standoffs. Lift the drive assembly up and out of the way (Reference Figure 3).
5. Remove the splash plate between the carousel and the incubator optics and discard this plate.

**NOTE:** If connectors are not already identified do so before removal.

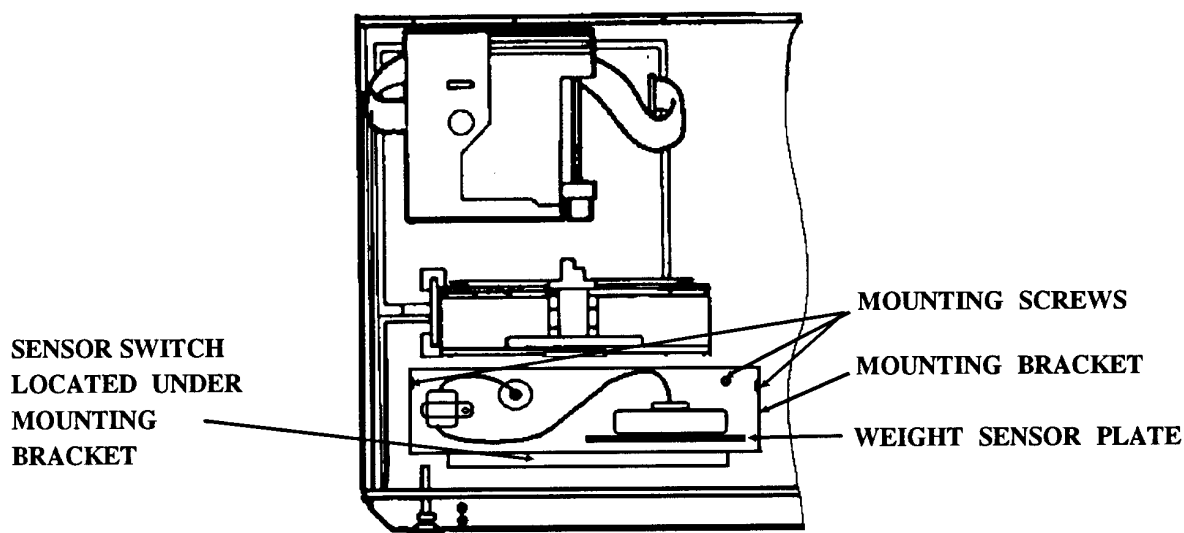


Figure #2  
Front View

6. Disconnect from the pump and valve board P-531 (ribbon cable from motor controller #5), P-532 (lower 24 vdc distribution board), P-535 (high and low pressure sensor and reagent wash manifold), P-533 (reagent ID motor and sensor) and P-534 (115 VAC).
7. Remove the 4 nylon standoffs or the 4 hex screws and standoffs holding the Pump and valve board to the ISE shield. Discard the standoffs or the screws and standoffs. Save this board for installation on the new ISE shield.

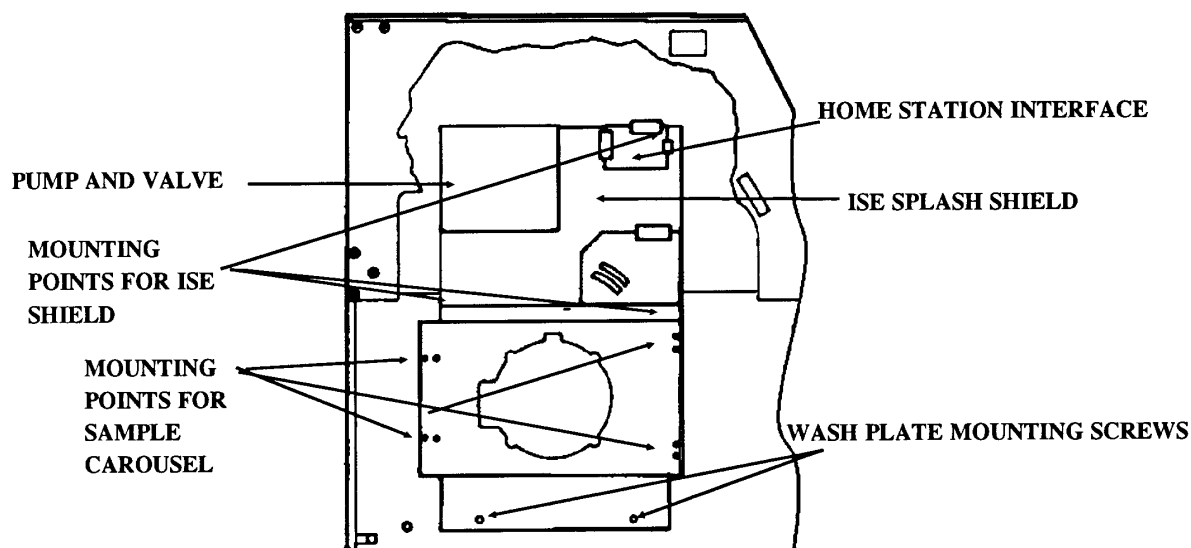


Figure #3  
Top View

8. Disconnect from the Home Station Interface board. P-490 (motor controller #2), P-491 (resistive current limiter), P-493 (carousel home station sensor), and P-494 (24 vdc supply).
9. Remove the 4 nylon standoffs or the 4 hex screws and standoffs holding the Home Station Interface board. Discard the standoffs or screws and standoffs. Save this board for installation on the new ISE shield.
10. Disconnect P-497 from the sample carousel ID reader.
11. Remove the two hex screws (left side inside the ISE door) that hold the ISE control module in place. Remove the ISE control unit from the instrument being careful not to damage any of the cables attached to the module.
12. Remove the left back panel of the Spectrum in order to have better access to the ISE shield assembly.
13. Remove the ISE shield assembly, by removing the two hex screws holding the bottom of the shield to the base of the Spectrum and the one screw that supports the top of the shield to the shelf above it (Reference Figure 3).
14. Slide the old shield out of the instrument and discard along with the ID reader board.
15. Install the pump and valve board and the home station interface board onto the new ISE shield assembly. The screws, standoffs and washers are supplied in the kit. The 1/4 inch standoffs are for the Pump and Valve board and the 3/4 inch standoffs are for the Home Station Interface board.

**NOTE: Failure to use the nylon standoffs and washers will allow 115 VAC to come in contact with the chassis.**

16. Install the new ISE shield in the same place that the old one was. Reinstall the ISE module into its original position in the reverse order that it was taken out.

**D. WASH PLATE**

1. Remove the two hex screws holding down the wash plate (Reference Figure 2).

**NOTE: During the next step do not remove the tubing from the manifolds.**

2. Remove the wash manifold (two screws) and the sample pressure manifold (two screws) and lay the manifolds to the side.
3. Disconnect P-565, from the pump and remove the wash plate assembly from the system. Remove the pump from the wash plate and lay it to the side. Remove the wash plate and discard it.
4. Install the diluent pump onto the new wash plate (notice that the pump has been moved forward and the reed switch is clear of the plate). Place the new wash plate onto the base of the Spectrum and reinstall the wash manifold and the sample pressure manifold.
5. Reconnect P-565 and reinstall the two screws holding the wash plate to the instrument base. Ensure that no tubing is being pinched.
6. Reconnect all of the connectors that were previously removed, and any tubing that was disconnected, being sure that the cabling does not interfere with the pump fan.

**E. SAMPLE CAROUSEL ASSEMBLY**

1. Install the new sample carousel drive assembly onto the four standoffs (Reference Figure 4). Attach the ground strap to the ground strap bar, and reconnect P-492 & P-495.
2. Tie wrap any cabling that may be loose being sure there is no binding or crimping of cabling to the boards.
3. Loosen the screws holding the sample carousel ID reader in place.

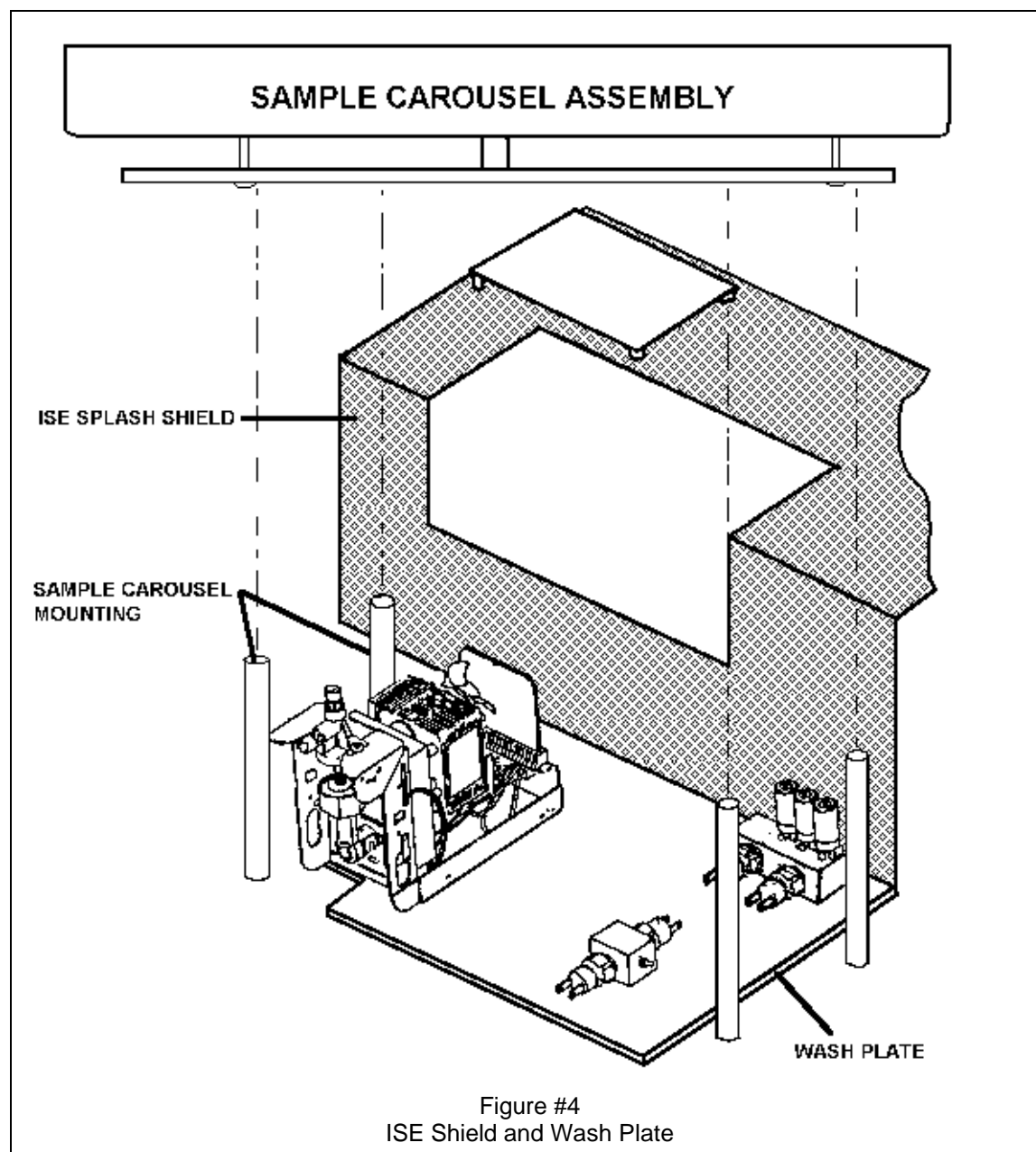


Figure #4  
ISE Shield and Wash Plate

4. INSTALL A SAMPLE CAROUSEL FOR ALIGNMENT PURPOSES ONLY. Adjust the reader so that the carousel moves freely when rotated. Tighten the screws after achieving this to install the carousel and test the carousel again.
5. Jumper the two wires going to the diluent weight sensor switch in order to home robotics after the system is powered up. Insulate the jumper so it does not come in contact with the chassis.
6. Apply power to the system.
7. After the homing of robotics install the sample carousel. In order to achieve this, loosen the two screws holding the encoder disc to the carousel (underneath by the motor). The object is to place the number 9 on the sample carousel in the middle of the ID reader. Rotate the encoder disc either clockwise or counterclockwise in order to achieve this.

A clockwise adjust of the encoder wheel will result in a counterclockwise movement of the carousel and vice-versa.

8. Tighten at least one of the encoder disk screws to prevent the disk from moving and home robotics to see where the carousel is. Tighten both screws once correct position is achieved.
9. The sample probe and ISE probe may not be directly in the center of the sample cup, therefore, you may have to loosen the screws holding the motor plate and adjust the plate so the two probes are centered in the sample cup.

**\*\*Potential Biohazard & Voltage Hazard. Observe Proper Safety Precautions.\*\***



10. Cover an ID notch on the sample carousel and proceed to the review and run screen. Verify that the reader reads the tray correctly. If not, readjust the ID reader board per steps 7 and 8 above.
11. Access the pump & valves screen. Cycle the diluent valve open. Cycle the diluent pump to purge and purge the pump 4 times. Check the diluent dispense mechanism in accordance to ISA 43-033A for correct diluent volume.
12. Remove the jumper from the two wires going to the diluent weight sensor switch and install the new modified weight sensor bracket. Once installed test the diluent pump to be sure it does not rub against the bracket. Reinstall the diluent weight sensor assembly (Reference Figure 3).

## VI. SYSTEM CHECKS

Retrain the sample arm as prescribed in the Operations Manual Addendum supplied in the kit (LN1367-14) or as prescribed in Maintenance and Troubleshooting manual.

### Sample Arm Retraining

Retrain the sample arm as prescribed in the Operations Manual Addendum supplied in the kit (LN 1367-14).

Minimum serum volume for the tubes is 2.62 inches. Clot level heights should be checked against the gauge shipped with the kit.

Minimum sample volume using sample cups is 500 uL in the inner or outer ring (150 uL with the -108 sample arm). The highest bottom will be on the inner ring, and bottom will be trained on the outer ring.

### A. Perform sample arm robotic training per Maintenance and Troubleshooting Manual procedure.

### B. Fluid Sensitivity

Perform ISA 43-110 to adjust fluid sensitivity  **DOUBLE CLICK ON THIS DOCLINK TO VIEW THE ISA**). This will not be necessary for the new style sample arm.

### C. ISE Top Of Cup

1. Access the CALIBRATION screen, and touch ISE STATUS, SELECT. Touch MOVE CAROUSEL. Enter Position number of the highest bottom on the inner ring. Press ENTER.
2. Move ISE to Inner.
3. Touch TOP OF CUP. The probe should be centered over the cup. If not adjust it using the ISE left to Right Positioning.
4. Touch STEP UP or STEP DOWN to adjust the probe until it is even with the top of the cup. Touch SAVE POSITION.

**NOTE: The ISE will allow movement outside the range of 175-288 using step Up and Step Down. However, positions outside the range will not be stored.**

5. Touch BOTTOM OF CUP to determine that the probe depth is approximately 1/8" from the bottom of the cup. Lift the sample cup to check. The sample cup should lift up slightly. If an adjustment is necessary, repeat Steps 2 and 3.
6. Go back to TOP OF CUP and Touch SAVE POSITION, then Exit.
7. AFTER COMPLETION OF THE ROBOTICS TRAINING, GIVE THE CUSTOMER THE RECORDED ROBOTICS POSITIONS. THIS IS TO BE DONE EVERY TIME THE ROBOTICS ARE RETRAINED.
8. Probe positioning should be verified with sample carousel in place.
9. Sample carousel cover fit should be verified during operation.

### D. Sample Carousel Resistance Check

1. Measure the Resistance between the Sample Carousel hub and chassis ground. (See Figure 1) This measurement should be less than one (1) ohm. If not, ensure that the ground wire and the Sample Carousel hub are not corroded.

**\*\*Potential Biohazard & Voltage Hazard. Observe Proper Safety Precautions.\*\***

2. Now manually spin the Sample Carousel conductor plate while taking the same Resistance measurement. Ensure that this resistance is less than 10 Ohms.
3. Perform the total service call in accordance with the service manual.

END OF DOCUMENT

	<b>ABBOTT ADD</b>	<h1>TECHNICAL SERVICE BULLETIN</h1>
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SUBJECT:  
**4.8 AND GROUNDING MODIFICATION**

TSB#: **43-059E**

ORIGINATOR:  
**DEBRA WARDEN**

PRODUCT:  
**ABBOTT SPECTRUM® (43)**

APPROVED: **Michael Manion 27-SEP-94**

REF. ECN: **PI-8947**

IMPLEMENTATION: <input type="checkbox"/> <b>Immediate</b> <input type="checkbox"/> <b>Next Service Call</b> <input checked="" type="checkbox"/> <b>Next Failure</b> <input type="checkbox"/> <b>Optional</b>  Instruments Requiring Modification: <b>n/a</b>	TSB Part/Kit #: <b>1370-39</b>  TSB Effectivity/ Part(s) Availability: <b>27-SEP-94</b>	Upgrade Time: <b>6 Hrs.</b>  Validation Time: <b>4 Hrs.</b>  Total Mod. Time: <b>10 Hrs.</b>
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**\*\*NOTE\*\* The instrument must be at TSB Level n/a prior to performing this TSB.**

ABBOTT SPECTRUM is a registered trademark of Abbott Laboratories.

SERIES II is a trademark of Abbott Laboratories.

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**NOTE: This TSB replaces TSB 43-059D. Remove TSB 43-59D and put this document in its place.**

I. DISTRIBUTION:  
Complete Distribution

II. PURPOSE:  
This TSB outlines the procedure for upgrading a version 3.3 or 3.7 software ABBOTT SPECTRUM® instrument with both the 4.8 software upgrade and the Grounding Modification (TSB 43-059 and 43-071).

III. ADMINISTRATIVE NOTES:  
Customers using Version 3.3 software will upgrade to Version 4.8 software as needed. The 3.3 software is NO LONGER AVAILABLE.

Customers using Version 3.7 software will be replaced with the same software. A 3.7 instrument will not be upgraded with version 4.8 software to accomplish field repairs.

IV. SPECIAL NOTES:  
N/A

V. PARTS  
The 4.8 / Grounding Modification kit list number is 1370-39.

**PCB's and IC's:**

<u>Part Number</u>	<u>Description</u>	<u>Quantity</u>	<u>Catalog Number</u>
19645-102	Motor Controller	1	2-19645-02
07216-301	Slave Boot Prom	1	2-07216-03
18626-101	CCx Prom	1	2-18262-01
18155-109	Master CPU	1	2-18155-01
18165-102	Dual Port RAM	1	2-18165-02
18095-103	CRT Controller	1	2-18095-03
18890-102	CRT Junction	1	2-18890-01

**\*\*Potential Biohazard & Voltage Hazard. Observe Proper Safety Precautions.\*\***

18885-102	Lamp Servo	1	2-18885-01
18880-103	Incubator Servo	1	2-18880-01
18895-102	4.8 Grounded Bus I/O	1	2-18895-01
18632-101	50Hz M. CPU Prom	1	LN 1370-47
19900-102	Keyboard PCB	1	2-19900-01
19912-310	4.8 ROM Memory	1	2-19912-02
06700-106	AD Converter PCB	1	2-06700-02
06705-108	Front End PCB	1	2-06705-03
19465-103	ROM Decode	1	2-19465-01
19400-105	SRAM	1	2-19400-01

**Cabling:**

<b><u>Part Number</u></b>	<b><u>Description</u></b>	<b><u>Quantity</u></b>	<b><u>Catalog Number</u></b>
18852-102	Touchscreen Cable	1	2-18852-01
18857-101	SII Keyboard Cable	1	2-18857-01
06921-107	CRT Cable	1	2-06921-02
18854-102	System Reference Cable	1	
18855-103	Ground Reference Cable	1	
18855-104	Ground Reference Cable	1	
06927-301	Printer Cable	1	
18479-101	Shutter Control Cable	1	2-18479-01
19039-102	Shutter Cable	1	
18162-101	Interrupt Cable	1	2-18162-01
06917-107	Shielded Dual Port Cable	1	2-06917-02
14276-020	Cable Tie Wraps	6	
14333-003	Ribbon Cable Clips	4	
14382-831	3 ft. of 18 AWG Wire (Ylw/Grn)	1	
19990-102	ROM Cable	1	

**Hardware:**

<b><u>Part Number</u></b>	<b><u>Description</u></b>	<b><u>Quantity</u></b>
14302-004	RS232 Mounting Hardware	1
14489-134	Screw, PHP, #4-40x.375, S.S.	4
10890-114	Washer, Flat, #8 S.S.	1
14522-306	Washer, Ext. Tooth #8 S.S.	12
10946-117	Washer, Shoulder	8
14422-105	Nut, Hex, #8-32, S.S.	1
10890-108	Washer, Flat, #4 x.312, S.S.	4
14522-303	Washer, Ext., Tooth #4 S.S.	4
10891-002	Washer, Flat #6	4
14494-106	Screw, 6-32	4
14414-002	Nut 4-40 UNC Self Locking	2
10890-210	Washer, Flat #6 x .325	2
14702-012	Standoff, Nylon Hex, 6-32	4
14438-519	Screw #6-33 x .25, SS	2
14478-556	Screw #6-32 x .31, PHP, CRES	1

**Additional Parts:**

<b><u>Part Number</u></b>	<b><u>Description</u></b>	<b><u>Quantity</u></b>	<b><u>Catalog Number</u></b>
07908-102	Jumper Asy	1	
18711-301	SII Key Caps	1	
18764-101	Shutter Alignment Tool	1	2-18764-01
06137-102	Heat Glass	1	2-06137-01
19043-301	Vibration Isolator	1	
18767-101	Adhesive Shutter Mounting Asy	1	2-18767-01
07814-303	Probe Shield, Top	1	
14107-126	Fuse (250V 4A)	1	
07590-302	Shutter Solenoid Bracket	1	
19046-102	Shutter Assembly	1	2-19046-01

14283-174	Receptacle Connector Kit	1	
54575-101	Grounding Mod Label	1	
07643-104	Rear Power Panel (220 VAC)	1	2-07643-01
07305-104	CRT Foot	2	
18861-102	CRT Isolator	2	
18459-101	Probe Shield, bottom	1	
71767-101	ABBOTT SPECTRUM® SERIES II™ Training Manual	1	

**DOMESTIC:** When replacing version 3.3 software, order this kit through normal channels. The U.S. Marketing group will order the kit for a version 3.7 software upgrade.

**INTERNATIONAL:** When replacing version 3.3 software, order this kit through normal channels. For version 3.7 software, the upgrade will be scheduled by the country Sales/Marketing organization.

#### VI. SERVICE KIT IMPACT:

N/A

#### Replaced Parts:

All PCB's must be returned through proper channels for rework.

**Domestic:** FSR is to show usage of upgrade kit 1370-79 on call closeout and return PCB's in one box with one Material Return tag enclosed.

#### Compatibility:

For 120 VAC instruments (SN 1835 and below) a Rear Power Panel Assembly is needed; 2-18262-01. (Some systems may already have the 2-18262-01 panel installed. To verify, the 2-18262-01 has a power cord that **is not** removable.)

A new keyboard assembly 2-06824-02 may need to be ordered for systems that have a keyboard with a black background. The key caps that are included in this upgrade will not fit that keyboard.

#### VII. SAVE THE CUSTOMER'S SOFTWARE SETTINGS

Verify that the Customer has a current print of the following settings. If not, it will be necessary to save the following information from the Customer's existing software:

#### TEST PARAMETER FILES:

Print ALL files from the Test Parameter Files. Print both the Test Definition and the Reagent Definition screens. Remember to get any user defined tests.

#### QUALITY CONTROL FILES:

Print ALL screens from the QC files for all the tests.

#### PROCESSING ORDER, PRINT ORDER & INSTRUMENT OPTIONS:

Print the Processing Order screen, the Print Order screen, and the Instrument Options screen.

#### TEST PANELS:

Enter the Patient Sample Test Screen and note any test panels that are defined. Then enter the Panel Definition screen, enter the names of the panels defined, and note the tests assigned to each panel.

NOTE: Using PRINT SCREEN will not produce a usable printout.

#### ROBOTICS POSITIONING:

Enter the Robotics screen and print the step tables.

#### WASH MATRIX:

Ensure that copies are made of all user defined tests in order to edit the wash matrix.

#### INTERFACE PARAMETERS:

FOR 3.7 SEMI-CONDUCTOR: Note Baud Rate, Stop Bit, Parity, Data Bits, and Delay (sec).

#### A/D READ & A/D OFFSET:

Confirm that the incubator water and lenses are clean, then recalculate A/D offsets; PRINT SCREEN. Set

the A/D Read screen to read lamp voltage; PRINT SCREEN.

## VIII. SYSTEM SHUTDOWN

1. Perform the ISE Shutdown procedure found under ANTICIPATED POWER LOSS in the customer OPERATIONS manual.
2. Remove the Customer's reagents from the reagent cooler and store the refrigerated reagents in the refrigerator.
3. Switch the Maintenance Power to OFF.
4. Switch the Main Power to OFF.
5. Switch the Line Conditioner Power, if installed, to OFF.
6. Disconnect the system's power cable from the Line Conditioner, or the wall receptacle.

## IX. PROCEDURE

### A. PCB REMOVAL

1. Remove the following boards from the Master and Slave Card Cages. Not all boards will be present depending on which version of software you are upgrading from. Remove if applicable. They will not be put back in the system. They should be marked accordingly and returned through proper channels for re-work:

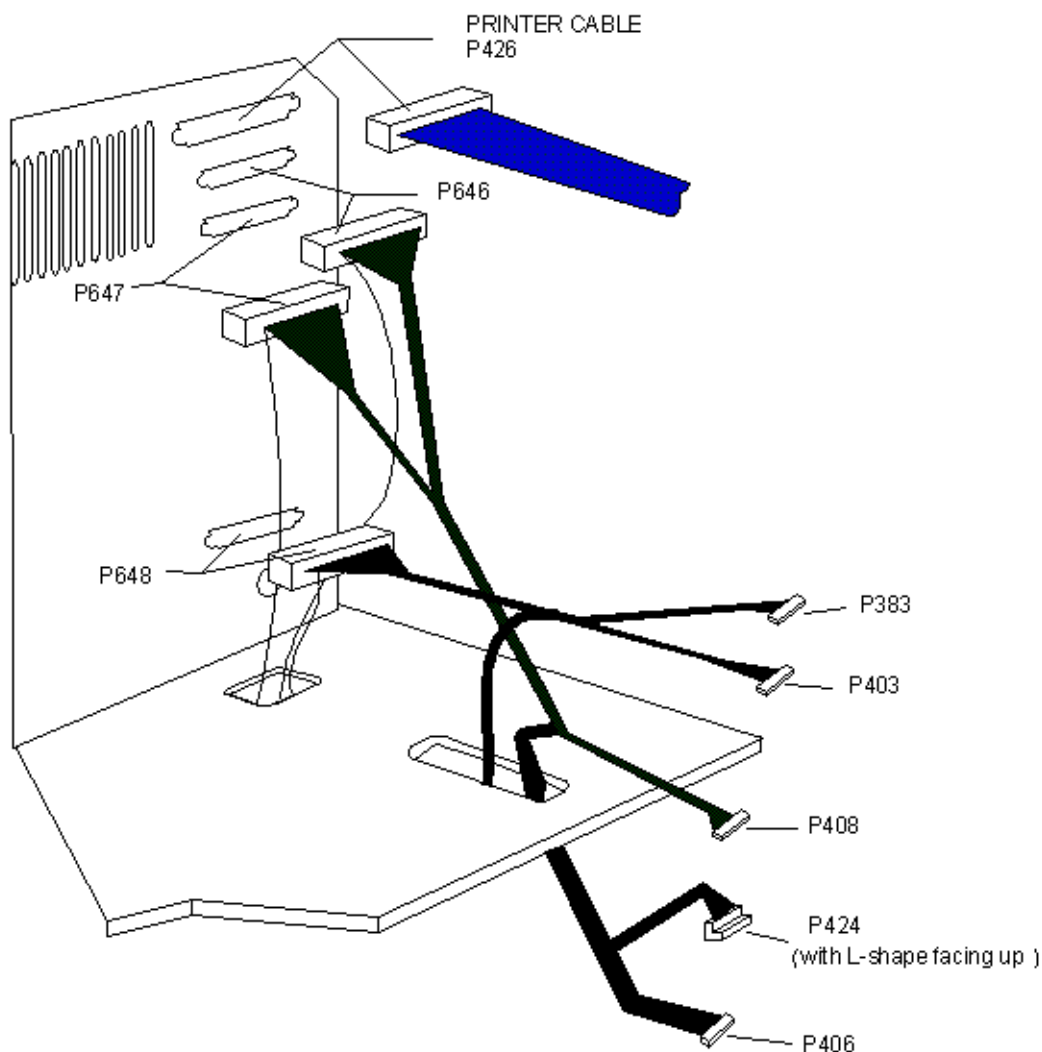
Dual Port Ram	Master slot #1
Master CPU	Master slot #3
Dynamic Ram	Master slot #4 and/or #5
Bubble Set	Master slots #6, #7, #8
ROM Memory	Master slot #8
Quad UART	Master slot #9
Lamp Servo	Master slot #11
Incubator Servo	Master slot #12
Power Monitor	Master slot #13
CRT Controller	Master slot #14
Bus I/O	Master slot #16
A/D Converter	Slave slot #16

### B. CRT REMOVAL

1. Remove the top deck and lower front panel.
2. Remove the two screws at the top of the bezel that hold the CRT / Keyboard to the chassis.
3. Tilt the bezel forward to access and remove the keyboard ribbon connector (P420). Remove the bottom ground strap. Move the bezel aside.
4. Remove the four (4) screws that hold the CRT to the mounting plate. Slide the CRT forward to remove the green CRT power cable (P384), the touchscreen power cable (P424), and the data cable (P406).
5. Remove the CRT from the instrument and set aside for later modifications.
6. Tie back the touchscreen power cable (P424) to a harness. It will not be used again.

### C. RS232 CONNECTORS

1. Either remove the right rear panel or lean the panel out for access to the RS232 connectors.
2. Remove the AD Read port (P646), the Uni-Directional port (P647), the Bi-Directional port (P648), and the Printer port (P426) from the panel. Discard the ribbon cables and the printer cable that were attached to the P646, P647 and P648 ports (not the printer cable), but save the mounting hardware from these connectors. (One extra set of mounting hardware is included [14302-004] if needed.)



3. Mount the 18857-101 cable to P648 on the back panel using the previously saved hardware. Route P420 (the longest of the cables) through the opening located near the front of the chassis for the keyboard. Route the P206 ground connector through the chassis towards the rear power panel.

**NOTE:** If the right rear panel has only three openings: Route the printer cable P426 to the top port. Then route P647 to the middle port (Label "Uni-host") and P648 to the bottom port (Label "Bi-host"). The P646 cable is a research cable that is not used on most systems so do not connect.

4. Install the 18852-102 ribbon cable to P647 and the P646 ports on the back panel. Route the two (2) P206 ground connectors down through the chassis to the rear power panel. Route P424 and P406 through the opening near the front of the chassis for the touchscreen assembly.
5. Install the new printer ribbon cable (06927-301) to P426 on the back panel. Route the cable under the Master Card Cage.

#### D. REAR POWER PANEL

1. Locate the white wire attached to J210 on the main power switch. Follow the wire to the line filter that is located by the maintenance power switch and disconnect it from J219.
2. Remove the two (2) screws that attach the rear power panel to the back of the instrument. Disconnect the black wire from J209 and the green wire from J206 on the power switch.
3. Install the new rear power panel (07643-104) that has an extended ground lug to accept the new ground wires from the Master Card Cage area. (For 120 VAC Systems, use the 2-18262-01 power panel if needed.)

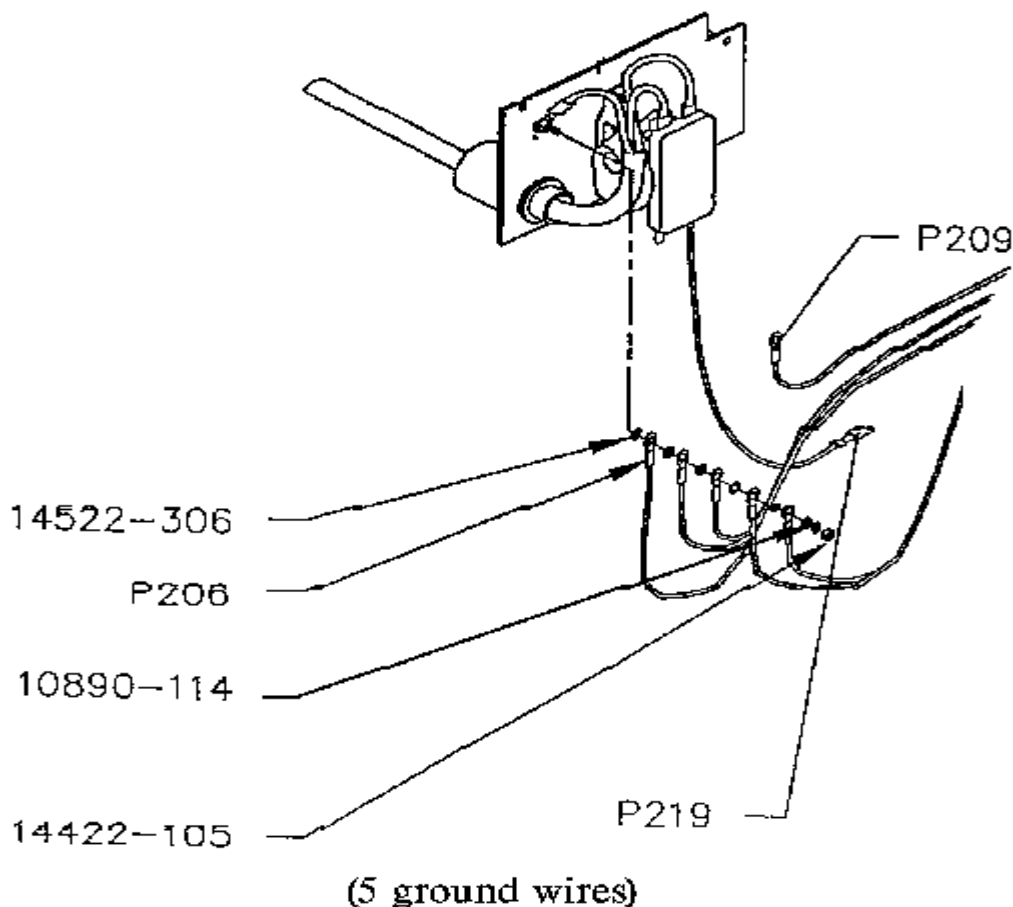
**\*\*Potential Biohazard & Voltage Hazard. Observe Proper Safety Precautions.\*\***

4. Reconnect P219 to the line filter.
5. Reconnect P209 to the Main Power Switch.

#### E. SYSTEM REFERENCE WIRE ASSEMBLY

1. Locate the wire assembly labeled 18854-102.
2. Route the P206 connector down through the opening near the front of the chassis towards the rear power panel.
3. Route P380 near the CRT Junction board.

#### F. STACKING OF THE GROUND CONNECTORS P206



1. Stack the ground connectors on the new rear power panel with the external tooth washers (14522-306) in the following order (Extra star washers are included.):
  - a. Place an external tooth washer on top of the existing hex nut.
  - b. Alternate the five P206 connectors and the external tooth washers.
  - c. Attach a flat washer (10890-114), an external tooth washer (14522-306), and tighten the stack with the Hex nut (14422-105).
2. Extra 18 AWG wire is included if the P206 wires do not reach the ground lug.
3. All wires must be tight or the purpose of the ground will be defeated. Do not attach rear panel yet.

#### G. CARD CAGE MODIFICATION

1. Remove and discard the top left and the top right screws and washers from the rear of the Master Card Cage.
2. Using a knife, remove the soldermask (green coating) from around the two (2) exposed mounting holes for a minimum diameter of 3/8 inch (1 cm).
3. Install a #4 screw (14489-134), and a #8 external tooth washer (14522-306) where each of the screws from step #2 were removed. Ensure that the washers etch into the solder on the

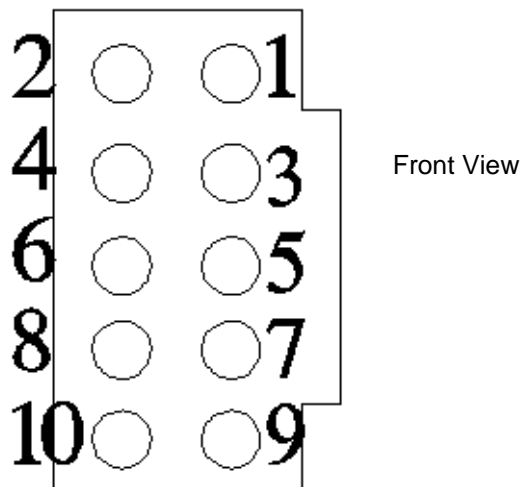


back plane.

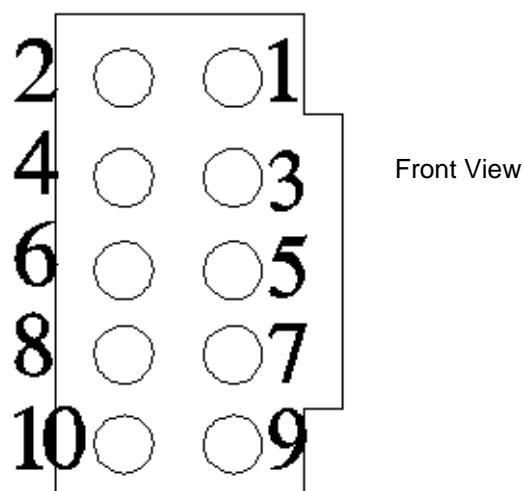
4. Remove, or lean back, the center back panel to access the Slave Card Cage.
5. Repeat step 1-3 to modify the Slave Card Cage.
6. Reattach both the center and right back panel to the instrument.  
Make certain that the bi-host, uni-host, and printer cables are not pinched by the top screw of the Master Card Cage.

#### H. GROUND REFERENCE WIRE ASSEMBLY

1. Add the 18855-103 ground reference wire assembly to the instrument as follows:
  - a. Locate the cable connector P284 on the Incubator Servo board.
  - b. Insert the female contact pin of wire cable 18855-103 into position 8 of the connector.



- c. Move the keying plug from position 10 to position 9 of the connector. This is done to ensure the old board is not used.
  - d. Remove the GREEN ground wire from the +24 volt return stud J304 to the case of the +24 volt power supply. (This modification makes the power supply a 2-06577-02 - write new C/N on power supply.)
  - e. Route the free end of the 18855-103 wire along the cable harness down through the chassis in the front of the multi-output power supply and attach the connector to the +24 volt return stud labeled J304.
  - f. Tighten the locknut on the J304 return stud.
2. Add the 18855-104 wire assembly to the instrument as follows:
  - a. Locate the cable connector P393 on the Lamp Regulator Servo board.
  - b. Remove the keying plug located in position 3 of the connector.



- c. Insert the female contact pin of wire cable 18855-104 into position 3 of the connector.
- d. Completely remove the following three GREEN wires from the +5 volt return stud (J314) of the multi-output power supply. (This modification makes the power supply a 2-06578-02 - write new C/N on power supply.)
  - \* The ground wire from the +19 volt return stud (J322) to the +5 volt return stud (J314).
  - \* The ground wire from the +12 volt return terminal (J317) to the +5 volt return stud (J314).
  - \* Remove the yellow cover in order to remove the ground wire from the ground terminal on the case (J312) to the +5 volt return stud.
- e. Route the free end of the 18855-104 wire along the cable harness down through the chassis, and attach connector to the +19 volt return stud labeled J322 on the multi-output power supply.
- f. Tighten the locknut on the J322, J314, J317, and J312 return studs.
3. Cable tie the two new wires to the cable harness.

#### I. MASTER CARD CAGE \* VERIFY JUMPERING WITH ISA 43-014G.\*

1. Install the new Dual Port RAM (18165-102) in slot 1. Connect the new cable (06917-107) between the Dual Port RAM (P373) and the Slave Card Cage (P371). Connect P994 (interrupt cable)
2. Remove jumper JU20 from the new Master CPU (18155-109). Place the CPU in slot 3.

**NOTE:** If the system is operating on 50Hz power, remove the U34 PROM and replace it with PROM 18632-101.

3. Install the new SRAM PCB (19400-105) in slot 6. (No cables attach)
4. If the system was a 3.3 Bubble Memory system, install the new ROM Decode PCB (19465-103) in slot 7. If the system was a 3.7 Semi-conductor Memory system, do not replace the board. Mark the PCB unused and return via normal channels.
5. Install the new ROM Memory PCB (19912-310) in slot 8.
6. Connect the new ROM Cable (19990-102) between the ROM Memory and the ROM Decode.
7. Remove and discard the interrupt cable and replace it with the new interrupt cable (18162-101). Connect P995 to the Barcode Reader in slot 10.
8. Install the new Lamp Servo (18885-102) in slot 11 and connect P393.
9. Install the new Incubator Servo (18880-103) in slot 12 and connect P284 and P285.
10. Install the new CRT Controller (18095-103) in slot 14.
11. Install the new Bus I/O board (18895-102) in slot 16. Reconnect P401 (16 pin from the ISE), P407 (10 pin from the new interrupt cable), P402 (26 pin from the cuvette change light), P403 (Keyboard), P408 (touchscreen), and P405 (40 pin from the printer). \* **Verify DTE vs DCE configuration.** \*

#### J. SLAVE CARD CAGE \* VERIFY JUMPERING WITH ISA 43-014G.\*

1. Jumper the new Motor Controller (19645-102) PCB #6 as follows:  
E2, E5, E6

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**NOTE:** The old style motor controller PCB (06765-110) cannot be used.

Install Motor Controller #6 in slot #12 of the Slave Card Cage.

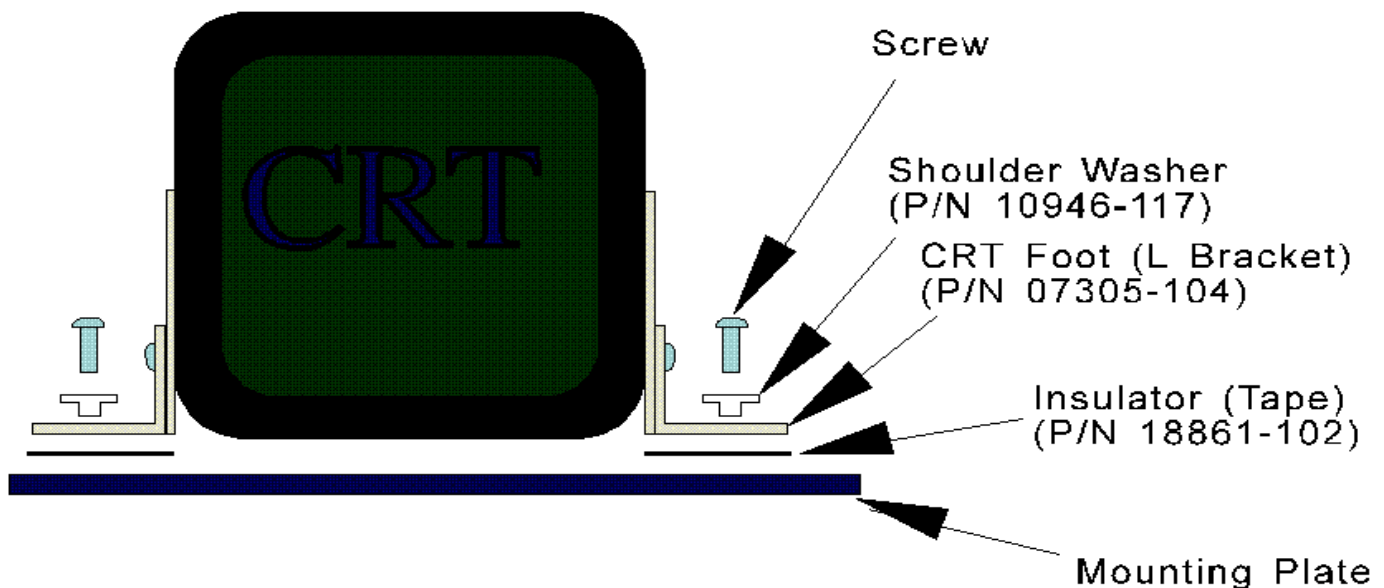
2. Remove the Real Time CPU from slot 14.
  - a. Check that there is not black and white wires attached to J993 (the "pig tail"). If there is, ISA 43-093 needs to be performed.
  - >> On the trace side, use a soldering iron to remove the 30 AWG wire from pin 10 of U8 and attach it to E3.
  - b. Remove the U25 EPROM and replace it with EPROM 5.3 (07216-301). Make sure the IC pin leads do not bend when installing. Remove the jumpers from E3 to E4 and E5 to E6 and reinsert them from E3 to E5 and E4 to E6. Return the board to slot 14 and connect P993 (interrupt cable).
3. Install the new A/D Converter (06700-106) in slot 16 and reconnect P570.

#### K. CRT JUNCTION PCB

1. Remove and discard the ribbon cable that interfaces the CRT Controller PCB and the CRT Junction PCB.
2. Unplug P380 from the CRT junction PCB (a two pin connector with blue and gray wires). Route this connector through an opening in the top shelf and tie-wrap it to the support bracket.
3. Remove the CRT Junction PCB and re-install the new CRT Junction PCB (18890-102).
4. Install the new CRT cable (06921-107) between the CRT Junction PCB and the CRT Controller PCB. Connect P385 to the CRT Controller PCB. Connect P380 (ground), P381 (CRT), P382 (CRT Controller), and P383 (Bus IO connector 403) to the CRT Junction PCB.

#### L. CRT MODIFICATION AND INSTALLATION

1. Remove the two (2) feet of the CRT frame and replace them with the new CRT feet (07305-104).
2. Orient the CRT Insulators (18861-102) so that they are flush with the edge of the CRT mounting plate and center the holes with the short side forward.
3. Remove the adhesive liner from the insulators and press them onto the mounting plate.



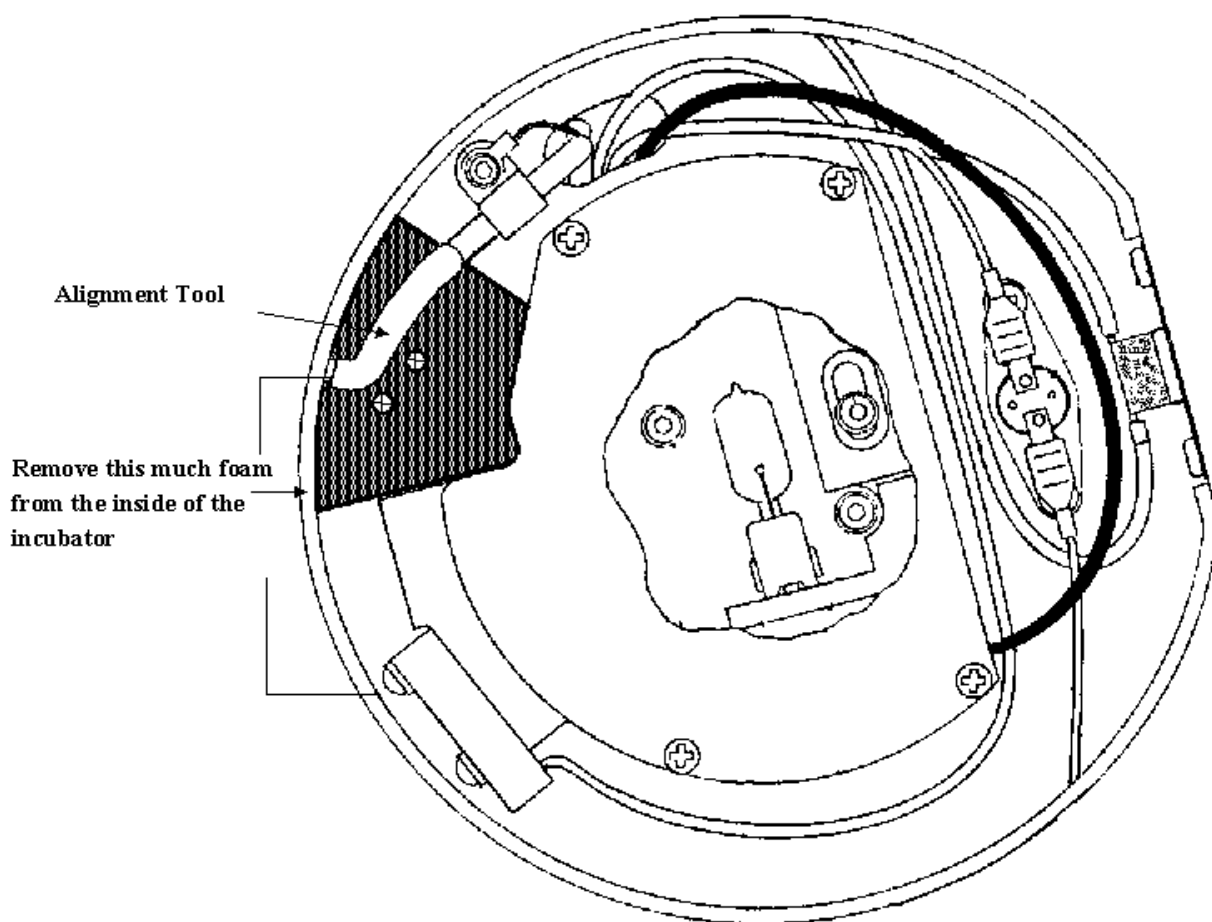
4. Set the CRT on the edge of the mounting plate. Attach the CRT power cable connector (P384). Attach the new touchscreen power connector (P424) and the new touchscreen data

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- cable (P406) to the CRT.
5. Install the CRT onto the insulators and place the nylon shoulder washers (10946-117) into the slots cut in the CRT feet. Attach the CRT assembly to the mounting plate.

Be sure the CRT is not too far back that it may hit the heatsinks on the back of the instrument.

## M. SHUTTER INSTALLATION



1. Connect the 50 pin connector (P540) of the shutter control cable (18479-101) to motor controller #6.
2. Route P670 from the shutter control cable through the top shelf opening under the slave card cage, and between the reagent cooler and incubator to the front to the incubator/optics assembly. Connect P670.
3. Attach the J242 connector to the upper 24 VDC distribution board. Run the cable behind the slave card cage.
4. Insert the 4Amp fuse (14107-126) in F4 on the upper 24 VDC distribution PCB.

**NOTE:** If the incubator does not have a shutter cable running through the heatsink, beneath the lamp housing, you will have to attach this cable (19039-102). This is a DC lamp and orientation of the wires in the plug (14283-174) is important.

5. Ensure that foam on the side of the incubator is removed from an area that is approximately 1 inch on each side of the inner incubator lens hole.
6. **INCUBATORS WITH SHUTTER MOUNTING SCREW HOLES**

Install the Shutter Assembly in the light path between the lamp housing and the incubator. Line the shutter up with the two screw holes beneath the fill flow tube, use the 6-32 screws (14494-106).

7. **INCUBATORS WITHOUT SHUTTER MOUNTING SCREW HOLES**

For incubators without the screw holes underneath the incubator fill tube, an adhesive shutter mount assembly (18767-101) has been included.

- a. Physically place the shutter assembly in the incubator assembly to determine where the shutter will have to be mounted.
- b. Sand the spot where the assembly will be placed. Wipe down with an alcohol pad.
- c. Disconnect the water line at the incubator inlet and set aside.

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- d. Attach the vibration isolator (19043-301) to the shutter mount.
- e. Install the shutter alignment tool (18764-101).
- f. Remove the solenoid from the original bracket and install it on the new bracket (07590-302).
- g. Install the bracket using the 4-40 locking nuts (14414-002) to the screws holding the bracket to the bottom plate.
- h. Route the shutter wires underneath the fill flow tube and reconnect the water inlet tubing.

#### N. KEYBOARD

1. Remove the seven (7) screws that hold the Keyboard PCB to the keyboard. Detach the three (3) ribbon cables. Discard the keyboard PCB.
2. Install the new Keyboard PCB (19900-102) using the four (4) nylon standoffs (14702-012) and washers (10891-002) and old screws. Connect J420.
3. Install the new Key caps: Cuvette Change key replaces F1 key, Daily Main. key replaces the F5 key, and Pause, Halt, and Reset replace their respective keys.

#### O. ISE SOFTWARE

1. Ensure that the ISE software is version 18.1 or higher per TSB 43-045.
2. Re-assemble the ISE.

#### X. CONTINUITY CHECK

1. that the resistance from the chassis to the +24 volt return stud J304 is less than 1.5 ohms. Unplug the Incubator Servo Board connector P284. Verify that the resistance from chassis to the +24 volt return stud is greater the 2K ohms. Reconnect the P284 connector to the board.

If Continuity Check Fails, do the following to verify the +24 volt power supply is isolated:

- a. Disconnect the returns to the +24 volt ground lug
- b. Measure the resistance between +24 volt ground lug and chassis. It should be greater the 2Kohms.

2. Verify that the resistance from chassis to the +19 volt return ground connector J322 (not the brass stud) is less than 1.5 ohms. Unplug P393 connector from the Lamp Servo board. Verify that the resistance between chassis and the +19 volt return stud is greater than 2K ohms. Reconnect P393 to the board.

If the Continuity Check Fails, do the following to verify the reagent cooler is isolated:

- a. Disconnect the blue and white wire connector from the main 24 volt distribution board.
- b. Measure resistance between the wires and chassis. It should be greater than 2Kohms.

3. Verify that the resistance from chassis to the frame of the CRT Monitor is 1.5 ohms +/-1 ohm. Unplug P382 and P383 connector from the CRT Junction board. Verify that the resistance between chassis and the frame of the CRT Monitor is between 80 and 120ohms. Reconnect the connector to the CRT Junction board.

If the Continuity Check Fails, do the following to verify the CRT is isolated:

- a. Totally unplug the CRT. Disconnect P382 and P383 from the CRT Junction board.
- b. Measure resistance between CRT Housing and chassis. It should be greater the 2Kohms.

4. Verify that the resistance between chassis and the ground lug of the System Power Plug on the Rear Power Panel is less than 2 ohms.

#### XI. SYSTEM CHECKOUTS

1. Reattach the P420 connector to the Keyboard and reattach the CRT / Keyboard Bezel to the instrument.
2. Reconnect the power cords.
3. Turning the SRAM PCB battery on:
  - a. Power on the system for 5 to 10 seconds.
  - b. Power the system back off. Wait approximately 30-45 seconds and power back on.
4. SRAM initialization. This activates the new software.
  - a. During POWER UP access the system diagnostics by typing "D" when prompted to.
  - b. Select number 3 for initialization, and (Y) Yes to proceed.

A prompt appears: ALL EXISTING TEST PARAMETERS AND TRAINING DATA WILL

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**BE LOST ARE YOU SURE YOU WISH TO PROCEED (Y/N)**

The initialization process will continue unaided. Key "RETURN" (#4) to reboot the system.

5. Ensure a proper power on sequence. "INTERVENE" when prompted to in the ROBOTICS section.
6. Ensure a proper CRT display and touchscreen. Adjust the brightness and contrast on the CRT Junction board if necessary. Also adjust the tone if necessary.
7. From the MAIN menu: SPECIAL PROCEDURES, ROBOTICS, STEP TABLES.

Enter the correct Step Tables and key HOME & SAVE to retain the tables in memory.

8. HOME ROBOTICS and verify proper probe positioning.
9. Remove the old probe shield from the cuvette cover and install the new probe shield top (07814-303) and bottom (18459-101) with the 6-32 screw (14478-556). Position the tab on the left side.
10. Train Dual Reagent Cartridge Positions P1-P8
  - a. Enter the Reagent Arm Screen and Home Robotics.
  - b. Enter P1 for the position of the right side of the reagent. This position is located in back of position 1.
  - c. Center the probe over the P1 location, then verify. Adjust if needed.
  - d. Repeat steps a through c to train all 8 positions.
11. Train auxiliary dispense position 102
  - a. In the Reagent Arm Robotics screen enter 102 in the cuvette dispense position.
  - b. Train the reagent probe in the center of cell 95.
  - c. Home robotics to save the position.
12. Re-enter all the customer's files that were printed before modification began. Note that the TEST DEFINITION file is now divided into three sections: TEST DEFINITION, CALIBRATION DEFINITION, and REAGENT DEFINITION AND EXTINCTION FACTORS.
13. Verify proper functioning of the lamp shutter.
  - a. Set the A/D READ screen to read cells 1 to 96.
  - b. Start. The shutter should not strike the cuvette carrier in any area.
14. Perform A/D READ and A/D OFFSET to verify proper positioning of the lamp. The Lamp Servo may need to be adjusted. If the lamp voltage is too low (less than 8.5V) replace the front end PCB with the low gain front end PCB (06705-108) from the upgrade kit. Also change the heat glass (06137-102).
15. Check that the printer, the ISE and the RS232 ports operate properly (Uni-Host or Bi-Host).
16. Perform the Incubator Servo Alignment.
  - a. Disconnect the thermistor at J282. The thermistor is located at the right of the Incubator Assembly.
  - b. Install a 30k ohm, 1/4-watt resistor across P282, Pins 1 and 2.
  - c. Connect a DVM between TP-1 and TP-5 of the Incubator Servo board. While monitoring the DVM, adjust R-60 (top pot) to 1.217 ( $\pm 0.001$ ) VDC.
  - d. Use a jumper wire and short between TP-2 and TP-5.
  - e. Connect a DVM between TP-3 and TP-4. While monitoring the DVM, adjust R-61 to 0.00 ( $\pm .05$ ) VDC.
  - f. Reconnect the thermistor at J282.
17. Perform a Temperature Calibration.
18. Perform DAILY MAINTENANCE by pressing the corresponding key. Refer to the ABBOTT SPECTRUM® SERIES II™ Maintenance and Troubleshooting Manual.
19. If the system does not have the noise reduction modification (TSB 43-058), a status code "REAGENT COOLER TEMPERATURE UNSTABLE" will be generated. Remove P285 from the Incubator Servo PCB to eliminate the error.
20. Perform a Total Service Call procedure. Calibrate all assays and run the customer's controls to verify the values are within the customer's ranges.
21. Apply the Grounding modification Label on the shelf above the CRT in front of the Master Card Cage.
22. Mark the modification control label accordingly.

**DO NOT FORGET TO MARK FOR BOTH THE 4.8 UPGRADE AND THE GROUNDING MODIFICATION TSB's 59 and 71.**

**U. S. FSR NOTE:**

**It is the responsibility of the U. S. FSR performing the modification to contact the Customer Service Center and inform them that TSB's 43-059 and 43-071 have been completed. CSC will input this information in the software version category in FieldWatch.**

END OF DOCUMENT