

## Instructions to replace the A/D Converter and Inguard Logic Assembly (A3)

These instructions are intended for the replacement of the A3 assembly in the 3458A that has been diagnosed with the short term drift problem described in Service Note 3458A-18.

After completing the A3 assembly replacement the 3458A needs to be warmed up for 4 hours in its operating environment and an ACAL ALL initiated.

The ACAL ALL will adjust the 3458A to its internal references and it will be ready to make accurate measurements. Where necessary, a DC Gain Adjustment may be required. (see [3458A Multimeter Calibration Manual](#) P/N 03458-90017 on the Agilent web at: <http://cp.literature.agilent.com/litweb/pdf/03458-90017.pdf>)

This document contains general precautions that should be utilized when the 3458A is opened for internal service procedures.

### WARNING

*Only personnel with knowledge of electronic circuitry and an awareness of the hazards involved should remove and install any printed circuit board assemblies.*

**Caution:** To prevent equipment circuit damage, always remove the AC line power cord before removing or replacing any assembly. To prevent electrostatic discharge (ESD) damage to ICs, always observe anti-static techniques when assemblies are handled or serviced.

### Static Handling

Static electricity is a familiar phenomenon which, except for an occasional shock, doesn't seem very serious. However, it has been proven that in the electronics industry ESD is a major cause of component failure. In many cases, the component damaged may not immediately fail, causing low instrument reliability and future repairs. ESD damage can occur at static levels below human perception. It has also been shown that ESD can affect both passive and active devices.

The following guidelines are the minimum requirements for static safe service environments:

- The workbench should be equipped with a conductive table mat. The mat should be grounded to earth ground through a 1 M ohm resistor. The mat should be equipped with at least one swivel connector for connecting wrist straps.
- All service and handling personnel should wear a conductive wrist strap in contact with bare skin. This strap should be connected to the swivel connector on the conductive table mat through a 1 M ohm resistor.
- All metal equipment at the workstation must be grounded. This includes soldering irons, solder removers, shelving and equipment stands.
- Only one common ground should be provided at the workstation.
- The workstation should be kept free of nonconductors. No common plastics, polybags, cardboards, cigarette or candy wrappers should be allowed. There should not be rugs or carpet on the floor, shelving or bench top.

- Only proper containers should be used for shipping, storing, or transporting assemblies. This is required on any assembly shipped to Agilent Technologies for repair or replacement.

## Clean Handling

Due to the accuracy of the 3458A, use the following clean handling techniques when removing/installing printed circuit board assemblies.

- Hand the assemblies only by their edges.
- Be sure to place them on a clean workbench away from dirty or dusty conditions.

## A3 Replacement Service Procedure

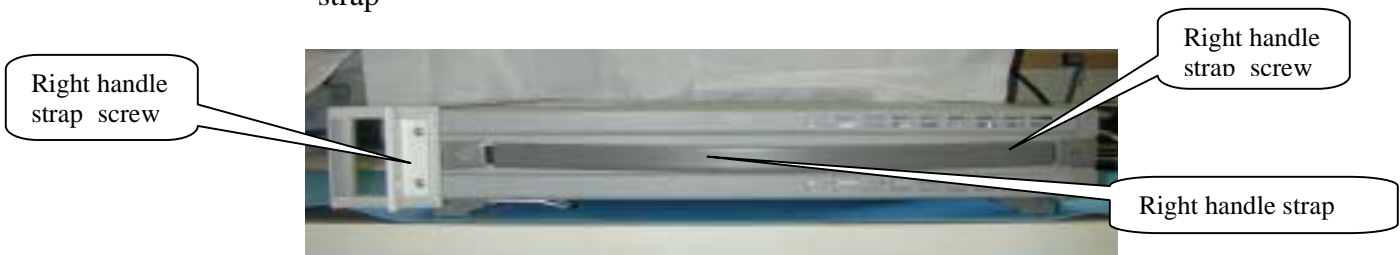
The following procedures describe how to remove the bottom cover and shields on the 3458A. Removal of the cover and shields are required to replace the printed circuit board assemblies (A3) for this repair.

### Tools Required

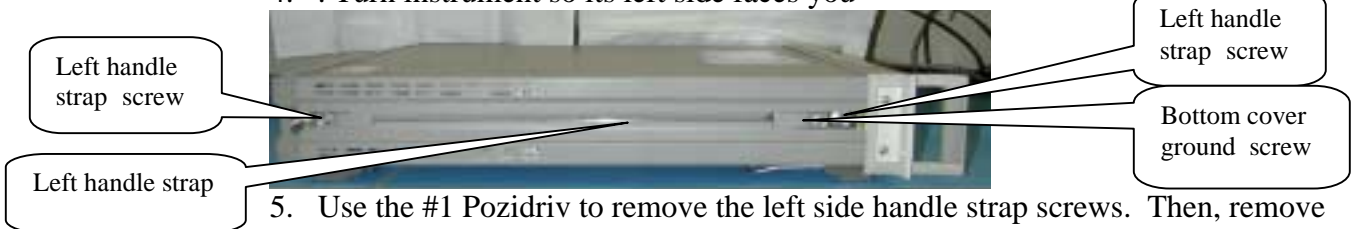
1. #1 Pozidriv screwdriver
2. #TX15 Torx driver
3. #TX10 Torx driver

### Covers Removal Procedure

1. Remove all connections to the 3458A.
2. Remove AC power to the 3458A.
3. Turn the instrument so its right side (as seen from the front) faces you. Use the #1 Pozidriv to remove the right side handle strap screws. Then remove the strap



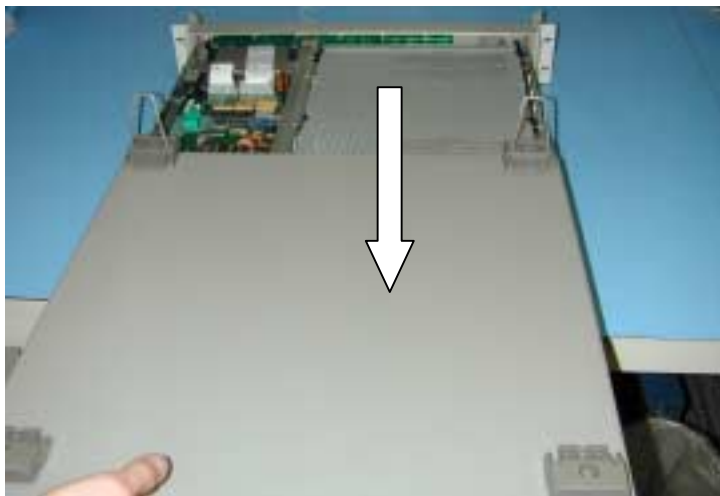
4. Turn instrument so its left side faces you



5. Use the #1 Pozidriv to remove the left side handle strap screws. Then, remove the handle.
6. Remove the cover ground screw.
7. Turn the instrument so its rear is facing you



8. Use the #TX15 Torx driver to remove the 4 rear bezel screws. Then remove the rear bezel.
9. Turn over the 3458A so the top sits on your workbench. To remove the bottom cover, pull the cover toward the rear of the instrument until it clears the front panel. Then, slide it forward and away from the instrument. Leave the instrument in this position



10. Use the #TX10 Torx driver to remove the bottom shield screw. Then remove the shield. Pull the shield toward the rear of the instrument until the shield retainers line up with the slots on the shield. Lift the shield off



## Removal of the A3 Assembly



20 pin  
cable DC  
Circuitry

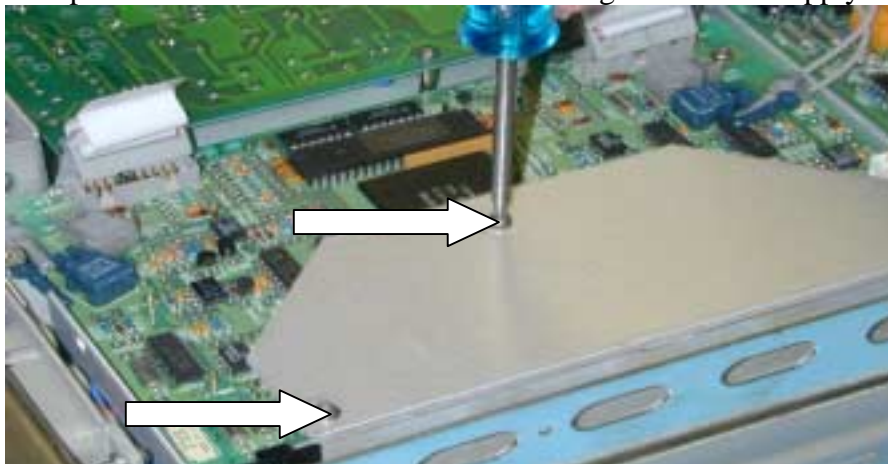
20 pin  
cable PS

1. Locate the 20-pin cable that connects the A3 to the Inguard Power Supply assembly and unplug the cable from the A3 assembly
2. Locate the grey 20-pin cable that connects the A3 assembly to the DC Circuitry assembly and unplug this cable



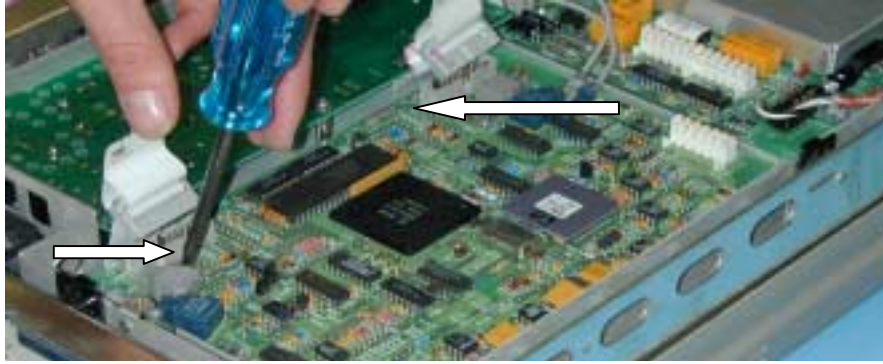
Fiber optic  
cables

3. On the A3 assembly, unplug both sets (4 cables total) of the blue and grey fiber optic cables that connect the A3 to the Outguard Power Supply assembly.



4. Use the #TX10 Torx driver to remove the 3 screws on the shield AND 2 screws on the A3 assembly. Then, remove the shield.





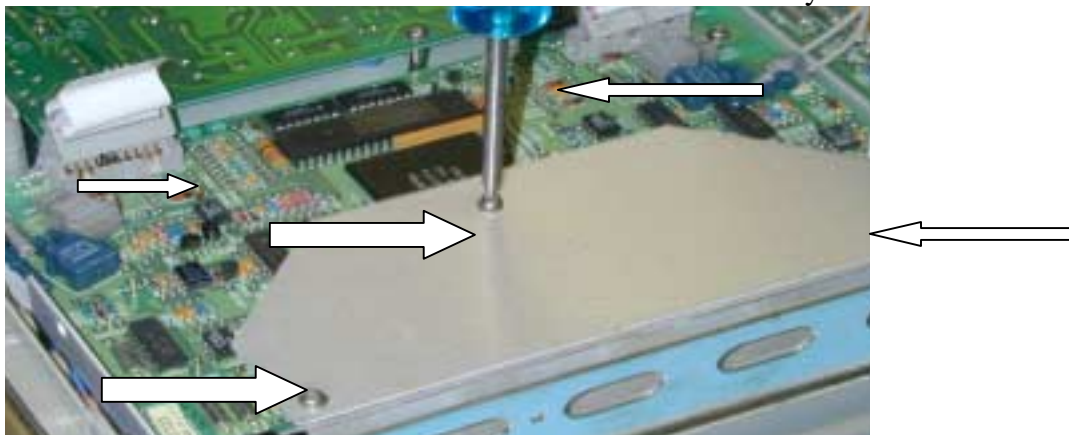
5. Unplug and remove the A3 assembly from the inguard chassis

### Installation of the new A3 assembly.

1. Line up the A3 assembly with the connector on the inguard chassis. Plug the board all the way into the connector.



2. Place the A3 shield on the board. Use the #TX10 Torx driver to install the 3 screws on the shield. Install the 2 screws that hold down the A3 assembly.



3. Locate the grey 20-pin cable connected to the Inguard Power Supply assembly. Line up the cable assembly with the socket on the A3 and fully engage the cable.



4. Locate the grey 20-pin cable connected to the DC Circuitry assembly. Line up the cable assembly with the socket on the A3 and fully engage the cable.



5. Plug in both sets of grey and blue fiber optic cables into the corresponding sockets on the A3 assembly.

### Cover Installation Procedure:

1. The 3458A should still be upside down on the bench with the rear of the instrument facing you.



2. Line up the front slots on the bottom shield with the shield retainers. Then, push the shield toward the front of the instrument until the shield screw hole lines up with the screw hole in the chassis. Use the #TX10 Torx driver to reinstall the shield screw.



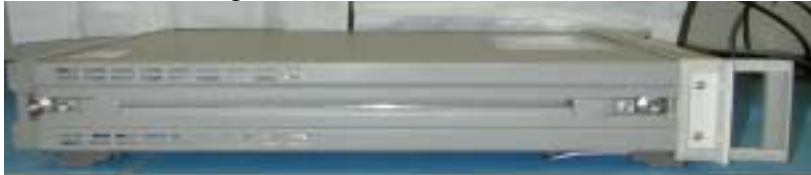
3. Install the bottom cover by placing it over the chassis with the front of the cover just clearing the front panel. Then, push the cover toward the front of the instrument into the front panel bezel. Turn instrument right side up.

**Warning:**  
*For safety purposes and proper operation, it is imperative that the cover grounding screws be reinstalled*

4. With the rear of the instrument still facing you, reinstall the rear bezel with the bezel screws using the #TX15 Torx driver.



5. Turn the instrument so the left side faces you. Use the #TX10 Torx driver to reinstall the bottom cover ground screw.



6. Reinstall the left side handle strap. Use the #1 Pozidriv to reinstall the side handle strap screws.



7. Turn the instrument so the right side faces you. Reinstall the right side handle strap. Use the #1 Pozidriv to reinstall side handle strap screws.
8. Your instrument is now ready to use. Agilent Technologies suggests that after you apply power that you perform an automatic calibration on the instrument. To do this, use the “ACAL ALL” command.

***End of A3 Assembly Installation Procedure.***

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