



# Communications Test Set 3550 / 3550R Maintenance Manual

Issue-5

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# **MAINTENANCE MANUAL**

## **COMMUNICATIONS TEST SET**

### **3550 / 3550R**

PUBLISHED BY  
Aeroflex

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**Subject to Export Control, see Cover Page for details.**

**Electromagnetic Compatibility:**

For continued EMC compliance, all external cables must be shielded and three meters or less in length.

**Nomenclature Statement:**

In this manual, 3550 / 3550R, Test Set or Unit refers to the 3550 / 3550R Communications Test Set.

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## **SAFETY FIRST: TO ALL SERVICE PERSONNEL**

**REFER ALL SERVICING OF UNIT TO QUALIFIED TECHNICAL PERSONNEL.**

**WARNING: USING THIS EQUIPMENT IN A MANNER NOT SPECIFIED BY THE ACCOMPANYING DOCUMENTATION MAY IMPAIR THE SAFETY PROTECTION PROVIDED BY THE EQUIPMENT.**

### **CASE, COVER OR PANEL REMOVAL**

Opening the Case Assembly exposes the operator to electrical hazards that can result in electrical shock or equipment damage. Do not operate this Test Set with the Case Assembly open.

### **SAFETY IDENTIFICATION IN TECHNICAL MANUAL**

This manual uses the following terms to draw attention to possible safety hazards that may exist when operating this equipment.

**CAUTION:** THIS TERM IDENTIFIES CONDITIONS OR ACTIVITIES THAT, IF IGNORED, CAN RESULT IN EQUIPMENT OR PROPERTY DAMAGE (E.G., FIRE).

**WARNING:** THIS TERM IDENTIFIES CONDITIONS OR ACTIVITIES THAT, IF IGNORED, CAN RESULT IN PERSONAL INJURY OR DEATH.

### **SAFETY SYMBOLS IN MANUALS AND ON UNITS**



**CAUTION:** Refer to accompanying documents. (This symbol refers to specific CAUTIONS represented on the unit and clarified in the text.)



**AC OR DC TERMINAL:** Terminal that may supply or be supplied with AC or DC voltage.



**DC TERMINAL:** Terminal that may supply or be supplied with DC voltage.



**AC TERMINAL:** Terminal that may supply or be supplied with AC or alternating voltage.

### **EQUIPMENT GROUNDING PRECAUTION**

Improper grounding of equipment can result in electrical shock.

### **USE OF PROBES**

Check specifications for the maximum voltage, current and power ratings of any connector on the Test Set before connecting it with a probe from a terminal device. Be sure the terminal device performs within these specifications before using it for measurement, to prevent electrical shock or damage to the equipment.

### **POWER CORDS**

Power cords must not be frayed, broken nor expose bare wiring when operating this equipment.

### **USE RECOMMENDED FUSES ONLY**

Use only fuses specifically recommended for the equipment at the specified current and voltage ratings.

### **INTENDED USE**

The 3550 is intended for indoor use only and should not be subjected to conditions which cause water or other liquids to collect on the Touch Screen Display.

The 3550R is intended for use in both indoor and outdoor environments and remains functional in typical rain conditions.

## SAFETY FIRST: TO ALL SERVICE PERSONNEL (cont)

### INTERNAL BATTERY

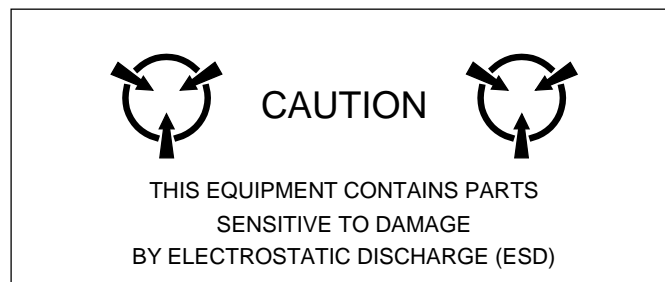
This unit contains a Lithium Ion Battery, serviceable only by a qualified technician.

**WARNING: THE 3550 / 3550R USES A LITHIUM ION BATTERY PACK. THE FOLLOWING WARNINGS CONCERNING LITHIUM ION BATTERIES MUST BE HEEDED:**

- DO NOT RECHARGE OUTSIDE THE 3550 / 3550R.
- DO NOT CRUSH, INCINERATE OR DISPOSE OF IN NORMAL WASTE.
- DO NOT SHORT CIRCUIT OR FORCE DISCHARGE AS THIS MIGHT CAUSE THE BATTERY TO VENT, OVERHEAT OR EXPLODE.

**CAUTION:** INTEGRATED CIRCUITS AND SOLID STATE DEVICES SUCH AS MOS FETS, ESPECIALLY CMOS TYPES, ARE SUSCEPTIBLE TO DAMAGE BY ELECTROSTATIC DISCHARGES RECEIVED FROM IMPROPER HANDLING, THE USE OF UNGROUNDED TOOLS AND IMPROPER STORAGE AND PACKAGING. ANY MAINTENANCE TO THIS UNIT MUST BE PERFORMED WITH THE FOLLOWING PRECAUTIONS:

- BEFORE USE IN A CIRCUIT, KEEP ALL LEADS SHORTED TOGETHER EITHER BY THE USE OF VENDOR-SUPPLIED SHORTING SPRINGS OR BY INSERTING LEADS INTO A CONDUCTIVE MATERIAL.
- WHEN REMOVING DEVICES FROM THEIR CONTAINERS, GROUND THE HAND BEING USED WITH A CONDUCTIVE WRISTBAND.
- TIPS OF SOLDERING IRONS AND/OR ANY TOOLS USED MUST BE GROUNDED.
- DEVICES MUST NEVER BE INSERTED INTO NOR REMOVED FROM CIRCUITS WITH POWER ON.
- PC BOARDS, WHEN TAKEN OUT OF THE SET, MUST BE LAID ON A GROUNDED CONDUCTIVE MAT OR STORED IN A CONDUCTIVE STORAGE BAG. REMOVE ANY BUILT-IN POWER SOURCE, SUCH AS A BATTERY, BEFORE LAYING PC BOARDS ON A CONDUCTIVE MAT OR STORING IN A CONDUCTIVE BAG.
- PC BOARDS, IF BEING SHIPPED TO THE FACTORY FOR REPAIR, MUST BE PACKAGED IN A CONDUCTIVE BAG AND PLACED IN A WELL-CUSHIONED SHIPPING CONTAINER.



**CAUTION:** SIGNAL GENERATORS CAN BE A SOURCE OF ELECTROMAGNETIC INTERFERENCE (EMI) TO COMMUNICATION RECEIVERS. SOME TRANSMITTED SIGNALS CAN CAUSE DISRUPTION AND INTERFERENCE TO COMMUNICATION SERVICES OUT TO A DISTANCE OF SEVERAL MILES. USERS OF THIS EQUIPMENT SHOULD SCRUTINIZE ANY OPERATION THAT RESULTS IN RADIATION OF A SIGNAL (DIRECTLY OR INDIRECTLY) AND ENSURE COMPLIANCE WITH INSTRUCTIONS IN FAA CIRCULAR AC 170-6C, DATED FEBRUARY 19, 1981.

# PREFACE

## SCOPE

This Manual contains instructions for maintaining the 3550 / 3550R. It is strongly recommended that the technician be thoroughly familiar with this manual before attempting to perform maintenance on the equipment.

## ORGANIZATION

The Manual is composed of the following Chapters:

### CHAPTER 1 - INTRODUCTION

Provides an Introduction and Functional Descriptions for each assembly in the 3550 / 3550R.

### CHAPTER 2 - MAINTENANCE INSTRUCTIONS

Identifies and explains Routine Service, Troubleshooting, Calibration/Verification, Remove/Replace and Shipping/Storage Procedures.

# TABLE OF CONTENTS

PARAGRAPH		PAGE
<b>CHAPTER 1 - INTRODUCTION</b>		
1-1	General Information .....	1-1
1-1A	Scope .....	1-1
1-1B	Nomenclature Cross-Reference List.....	1-1
1-2	Equipment Description .....	1-1
1-2A	Equipment Characteristics, Capabilities and Features .....	1-1
1-2B	Equipment Data.....	1-1
1-2C	Safety, Care and Handling.....	1-1
1-3	Principles of Operation.....	1-2
1-3-1	General Description .....	1-2
1-3-2	Detailed Description .....	1-3
1-3-2A	Power Supply PCB Assy (1A1) .....	1-3
1-3-2B	Multi-Function PCB Assy (1A2A1) .....	1-7
1-3-2C	LCD Assy (1A2A2).....	1-8
1-3-2D	RF Assy (1A3).....	1-9
<b>CHAPTER 2- MAINTENANCE INSTRUCTIONS</b>		
2-1	Service Upon Receipt.....	2-1
2-1-1	Service Upon Receipt of Materiel .....	2-1
2-1-1A	Unpacking .....	2-1
2-1-1B	Checking Unpacked Equipment .....	2-1
2-1-2	Preliminary Servicing and Adjustment of Equipment .....	2-1
2-2	Troubleshooting .....	2-2
2-2-1	Troubleshooting Guidelines .....	2-2
2-2-2	Equipment Inspection.....	2-2
2-2-3	Troubleshooting Precautions.....	2-3
2-2-4	EMC / Safety Compliance .....	2-3
2-2-5	Battery Precautions .....	2-4
2-2-6	Support Equipment .....	2-4
2-2-7	Troubleshooting Tests.....	2-9
2-2-7A	Unit Power-Up Failure.....	2-9
2-2-7B	BATT Indicator Failure .....	2-11
2-2-7C	Display Failure.....	2-12
2-2-7D	ANT Connector Failure.....	2-14
2-2-7E	T/R Connector Failure.....	2-16
2-2-7F	AUDIO Connector Failure .....	2-18
2-2-7G	SWR Connector Failure .....	2-22
2-2-7H	AUDIO OUT Connector Failure.....	2-24
2-2-7I	AUDIO IN Connector Failure .....	2-27
2-2-7J	DVM Connector Failure .....	2-30
2-3	Calibration / Verification Procedures.....	2-33
2-3-1	Calibration / Verification Schedule .....	2-33
2-3-2	Testing Conditions.....	2-33
2-3-3	Support Equipment .....	2-34
2-3-4	Verification Procedures .....	2-35
2-3-4A	Generator Verification.....	2-35
2-3-4B	Receiver RSSI Verification .....	2-38
2-3-4C	TCXO Verification.....	2-42
2-3-4D	RF Power Meter Verification .....	2-43
2-3-4E	SWR Meter Verification .....	2-49
2-3-4F	Audio Level Meter Verification .....	2-51
2-3-4G	Verification Data Sheets .....	2-55
2-3-5	Calibration Procedures.....	2-59
2-3-5A	Calibration Setup .....	2-59
2-3-5B	TXCO Calibration .....	2-61
2-3-5C	Generator Calibration .....	2-63



**CHAPTER 2- MAINTENANCE INSTRUCTIONS (cont)**

2-3-5D	Receiver Calibration .....	2-66
2-3-5E	RF Power Meter Calibration .....	2-69
2-3-5F	SWR Phase Detector Calibration .....	2-73
2-3-5G	Audio Level Meter Calibration .....	2-74
2-4	Remove/Replace Procedures .....	2-75
2-4A	Battery .....	2-76
2-4B	Fuse .....	2-79
2-4C	Open Case Assembly .....	2-82
2-4D	Power Supply PCB Assy (1A1) .....	2-84
2-4E	Multi-Function PCB Assy (1A2A1) .....	2-86
2-4F	RF Assy (1A3).....	2-90
2-4G	ANT Connector.....	2-92
2-4H	T/R Connector.....	2-93
2-4I	DC IN Connector .....	2-94
2-4J	AUDIO Connector .....	2-95
2-4K	SWR Connector.....	2-96
2-4L	DVM Connector .....	2-97
2-4M	AUDIO IN Connector .....	2-98
2-4N	AUDIO OUT Connector.....	2-99
2-5	Preparation for Storage or Shipment.....	2-100
2-5A	Packaging.....	2-100
2-5B	Environment.....	2-100

**APPENDICES**

A	Replacement Parts.....	A-1
B	Connector Pin-Out Tables.....	B-1
C	Support Equipment Requirements .....	C-1
D	Abbreviations .....	D-1
E	Assembly Drawings.....	E-1

# LIST OF ILLUSTRATIONS / TABLES

## LIST OF ILLUSTRATIONS

TITLE	PAGE
System Block Diagram .....	1-2
Power Supply PCB Assy Block Diagram .....	1-5
Multi-Function PCB Assy Block Diagram .....	1-6
RF Assy Block Diagram .....	1-11
3550 / 3550R .....	E-3
Power Supply PCB Assy .....	E-9
Chassis Assy .....	E-11
Multi-Function PCB Assy .....	E-13
RF Assy .....	E-16

## LIST OF TABLES

TITLE	PAGE
I/O Connectors .....	B-1
AUDIO Connector Pin-Out Table .....	B-2
REMOTE Connector Pin-Out Table .....	B-3
ETHERNET Connector Pin-Out Table .....	B-4
USB Connector Pin-Out Table .....	B-5

# CHAPTER 1 - INTRODUCTION

## 1-1. GENERAL INFORMATION

### A. Scope

---

Type of Manual:	Maintenance Manual
Equipment Name and Model Number:	3550 / 3550R Communications Test Set
Purpose of Equipment:	The 3550 / 3550R Communications Test Set is used for testing radios and related equipment.

### B. Nomenclature Cross-Reference List

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<u>COMMON NAME</u>	<u>OFFICIAL NOMENCLATURE</u>
3550 / 3550R	3550 / 3550R Communications Test Set
Test Set or Unit	3550 / 3550R Communications Test Set

## 1-2. EQUIPMENT DESCRIPTION

### A. Equipment Characteristics, Capabilities and Features

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Refer to the 3550 / 3550R Operation Manual for this information.

### B. Equipment Data

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Refer to the 3550 / 3550R Operation Manual for this information.

### C. Safety, Care and Handling

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Observe all WARNINGS, CAUTIONS and NOTES in this manual. This equipment can be extremely dangerous if these instructions are not followed.



### 1-3. PRINCIPLES OF OPERATION

#### 1-3-1 GENERAL DESCRIPTION

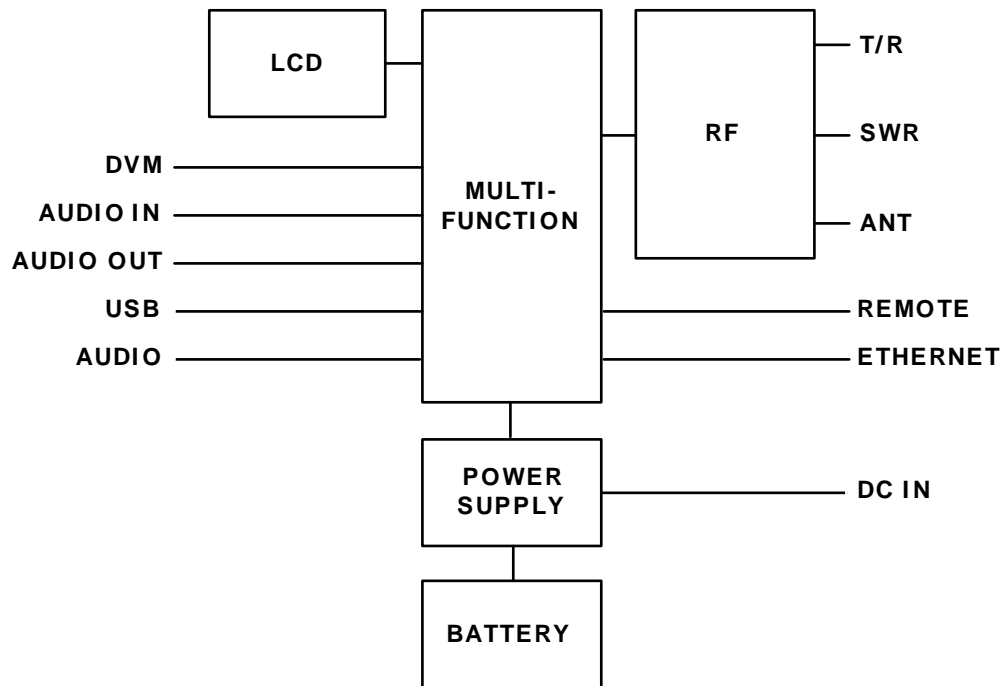


Figure 1-1. System Block Diagram

## 1-3-2 DETAILED DESCRIPTION

The System Block Diagram (Figure 1-1) and the System Interconnect Diagram (Figure E-1) shows the relationship of all assemblies. The following paragraphs are detailed descriptions of the 3550 / 3550R assemblies.

### A. Power Supply PCB Assy (1A1) (Figure 1-2)

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The Power Supply PCB Assy is responsible for supplying power to the internal modules for operation and for charging the internal batteries. The Power Supply PCB Assy operates from externally supplied DC power and provides simultaneous run and battery charge, or battery charge only. The battery charge time increases when in the run and charge mode. The Power Supply PCB Assy consists of a DC-DC Converter, ON/OFF Control circuitry and the Battery Charger circuitry. The external DC input is supplied from an External DC Power Supply (supplied).

The internal batteries are removable/replaceable Li Ion battery packs with an internal "gas-gauge" feature that allows accurate determination of remaining battery life. Maximum operating and storage temperature for Li Ion batteries is  $-20^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$  and the maximum charging temperature is  $0^{\circ}\text{C}$  to  $+45^{\circ}\text{C}$ .

The Power Supply PCB Assy contains a synchronous buck converter to convert the input voltage to a fixed output voltage (+10 Vdc). The Power Supply PCB Assy also contains a low-pass filter to reduce the amount of internal emissions. The Input Converter Assembly is capable of providing enough output current to charge the battery and run the Test Set at the same time, as long as the input voltage is within range.

#### Battery Charger

The battery charger is a boost type converter. The battery charger monitors the battery voltage and temperature to determine if the battery is capable of being recharged, and if safe to attempt to recharge the battery. The battery must be at least at a 9.2 V level and the temperature must be between  $0^{\circ}$  and  $45^{\circ}\text{C}$  before a charge cycle initiates.

#### Output Circuitry

The output converters are comprised of a dual-phase synchronous buck converter for developing +3.3 and +5 V outputs. The converter also has an auxiliary output that is used to generate +18 V from the +VS source (either the battery or input converter). A separate buck/boost converter is used to generate the -5 V output. A separate buck converter is used to generate the +5.5 V output. The primary converter provides dual phase control, as well as gate drive for the switching MOSFETS and over-current protection. The main converter runs at 220 kHz, while the auxiliary converter runs at 1.2 MHz.

Both +3.3 and +5 V outputs are capable of delivering up to 3 A of current and the 18 V output can deliver up to 80 mA. If any of these three outputs experience a severe over-current, the supply turns OFF.

The -5 V converter is a stand-alone buck/boost converter that runs at approximately 220 kHz and can deliver up to 400 mA of current before starting to fold back. If the supply experiences a severe over-current condition, the supply stays in fold-back mode until the short is removed.

The +5.5 V converter is a stand-alone buck converter that runs at approximately 500 kHz and can deliver up to 500 mA of current before starting to fold back. If the supply experiences a severe over-current condition, the supply stays in fold-back mode until the short is removed.

## **A. Power Supply PCB Assy (1A1) (Figure 1-2) (cont)**

---

### **ON/OFF Control**

The ON/OFF control circuit provides debounce for the POWER Key and turn off delay, as well as monitoring the protection circuitry.

Pressing the POWER Key shorts that point to ground providing a low to the ON/OFF control circuit input, which turns the power supply circuits ON or OFF. To turn the unit ON, the POWER Key must be pressed for a minimum of 128 ms. To turn the unit OFF, the PWR button must be pressed for approximately 250 ms. After the 250 ms, an interrupt signal is sent by the ON/OFF circuit to the software, indicating that the power supply circuits are shutting down and allowing the software to perform an orderly shutdown. Approximately 5 sec after the generation of the interrupt the power supply circuits shuts down.

The ON/OFF circuit also monitors the protection circuitry for a +3.3 V or +5 V over current condition or a low battery condition, and shuts down the power supply circuits if any of these conditions are present.

### **Source Select Circuitry**

The source select circuitry is designed as a low-loss switch that selects the appropriate source when the output of the ON/OFF circuitry is high. The external DC (+Vdc) is selected if present. If external DC is not present, the battery (VBAT+) connects to +VS. If the Test Set is running the power source, either external DC or battery may be switched without interrupting system operation.

The second function of the switching circuitry is to prevent battery current from flowing into the input converter section when the Test Set is running on battery power.

### **Protection Circuitry**

The protection circuitry has four basic functions related to the DC input. The battery has internal protection circuitry. The external DC input has a fuse, an over-voltage crowbar and reverse protection diodes. The fuse is the primary disconnect to protect against any of the fault conditions. If the DC input is too high (>32 V), the over-voltage crowbar triggers and the SCR opens the fuse. If the DC input polarity is incorrect, the input clamp diodes forward bias and open the fuse. If the input converter fails and the output of the converter is above 12 V, the SCR triggers and opens the fuse.

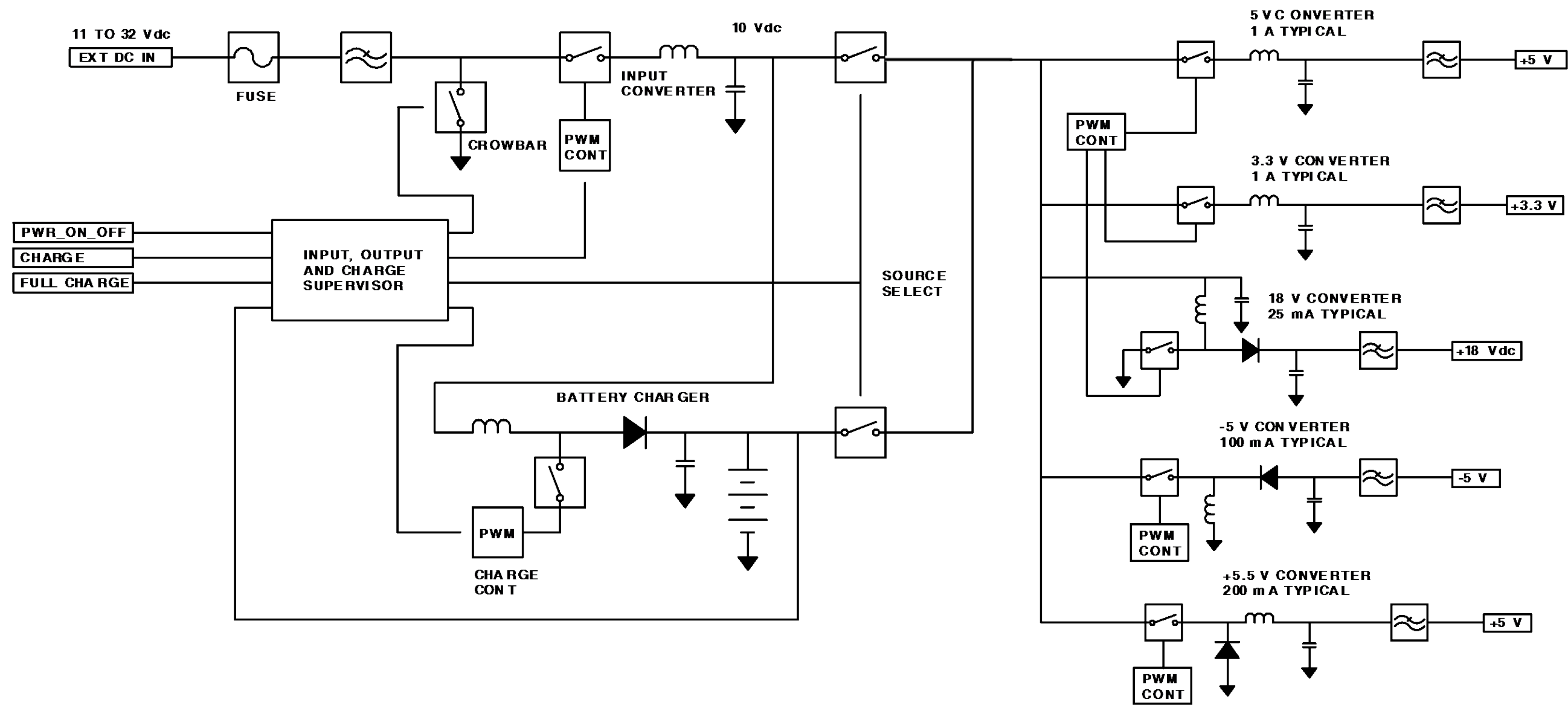


Figure 1-2. Power Supply PCB Assy Block Diagram

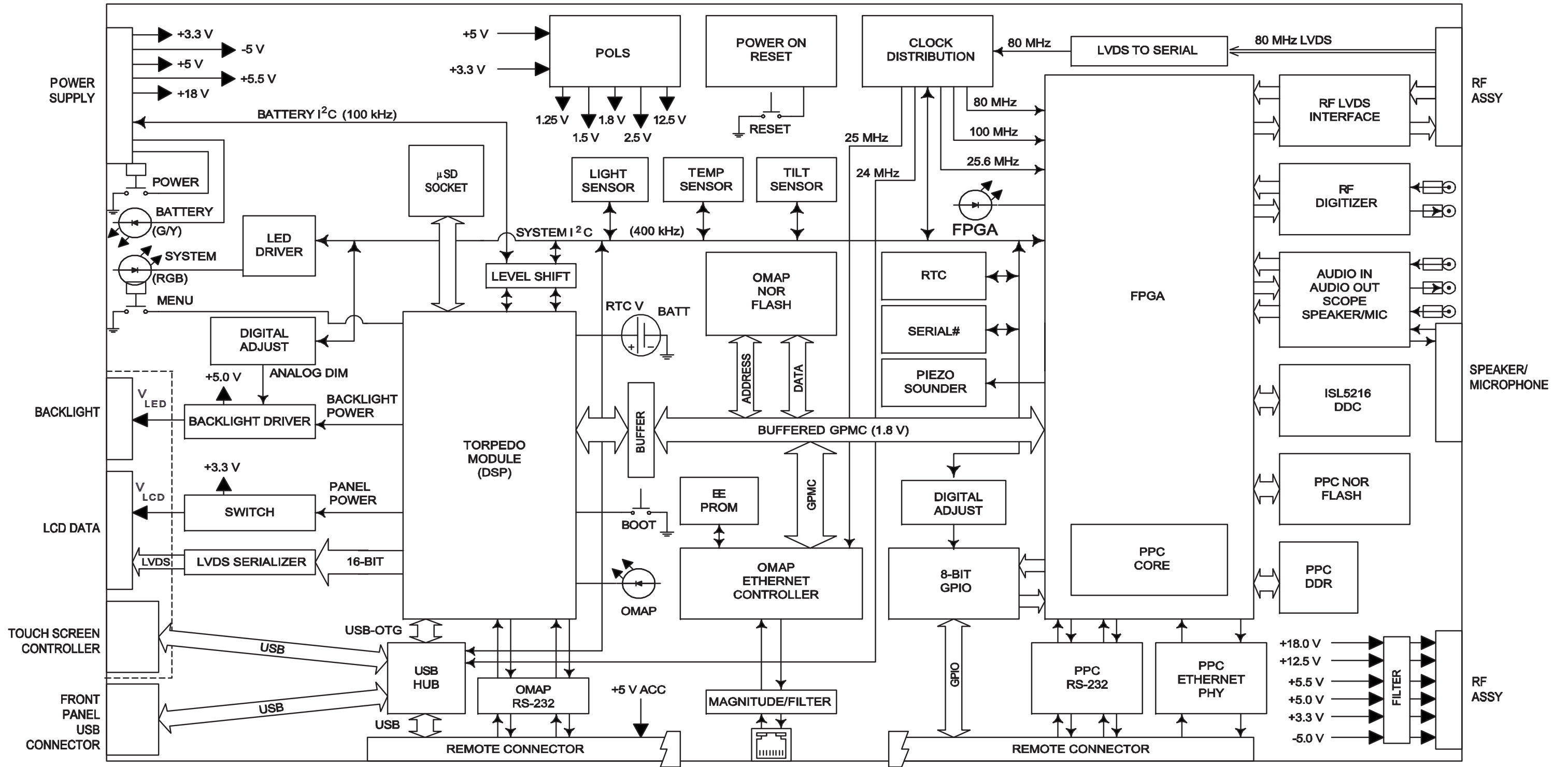


Figure 1-3. Multi-Function PCB Assy Block Diagram



## B. Multi-Function PCB Assy (1A2A1) (Figure 1-3)

The Multi-Function PCB Assy provides processor control of various digital, analog and RF sub-circuits used to generate or receive RF signaling normally used in mobile radio communication. The Multi-Function PCB Assy also contains the application specific circuits to control the other assemblies. These circuits include interfaces to the LCD Assy, Power Supply PCB Assy and RF Assembly.

The user interface consists of the LCD Panel and Touch Screen, along with the Power and Menu Buttons. The ETHERNET, USB and REMOTE Connectors provide digital connectivity to the external devices. (Refer to Appendix B for the Connector Pin-Out Tables.)

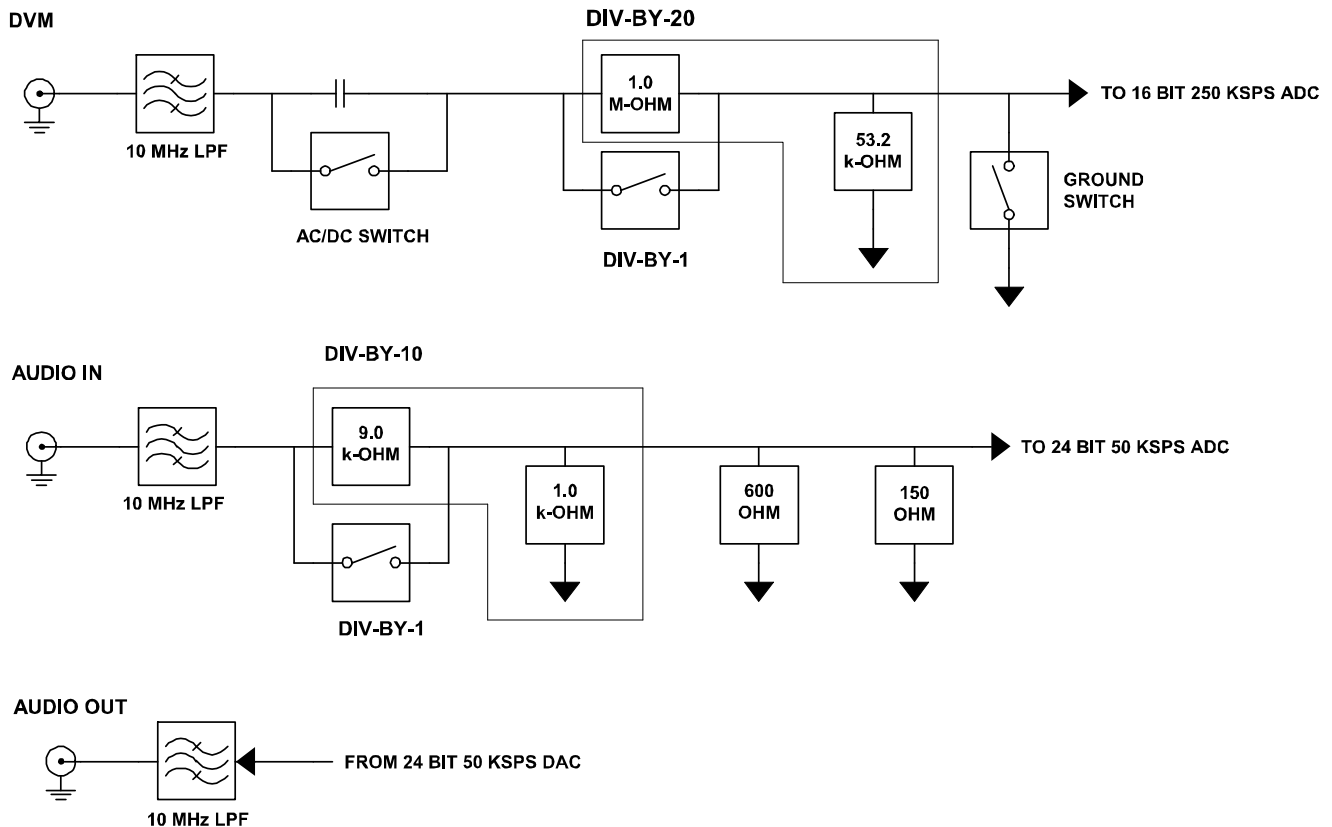
### AUDIO I/O

The Audio I/O circuitry provides the DVM, Audio In and Audio Out signals to the 3550 / 3550R Front Panel.

The DVM Connector has an input range of  $\pm 2.5$  Vdc in divide-by-1 mode and an input range of  $\pm 40$  Vdc in divide-by-20 mode. AC signals are limited to be 1/2 the 50 kHz bandwidth of the TDM audio digitizing bus.

The Audio In Connector is specified at 3 Vrms with High-Z, 1 k $\Omega$ , 600  $\Omega$  or 150  $\Omega$  loads available. There is also a divide-by-10 mode with a fixed 1 k $\Omega$  load that allows input signals up to 30 Vrms. AM/FM external signals are limited from 300 Hz to 5 kHz.

The Audio Out Connector is rated to deliver 1.57 Vrms into a 600  $\Omega$  load with an output impedance of 100  $\Omega$ . Driven by a sample rate of 50 kHz, the specified frequency range is 30 Hz to 5 kHz. The usable frequency range is 0 to 20 kHz.

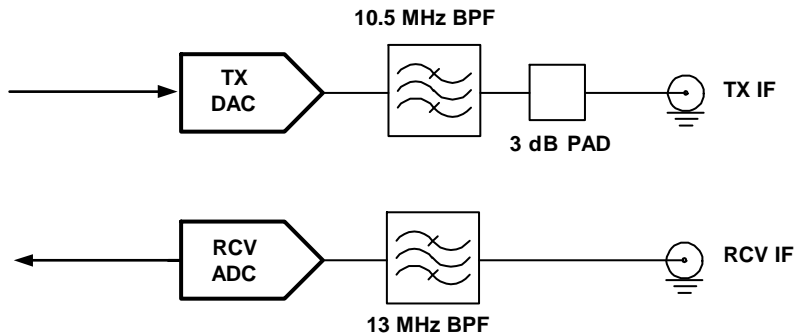


## B. Multi-Function PCB Assy (1A2A1) (Figure 1-3) (cont)

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### RF DIGITIZER

The RF Digitizer circuitry is used for generating the source 10.5 MHz ( $\pm 500$  kHz) output at approximately -10 dBm from the DUC (Digital Up Converter), while the receive input to the ADC is optimized for an input level of -10 dBm at 13 MHz ( $\pm 500$  kHz). All other RF signaling, filtering, scaling and up/down conversion methodologies are accomplished in the RF Assy.



For the Generator, Audio I/O and modulation signals are handled by the FPGA's TDM measurement bus. This bus runs at a 50 kHz-sample rate capable of delivering high quality audio to the DUC (Digital Up Converter). The output of the DUC feeds a 14-Bit DAC for the digital-to-analog conversion needed to form the output source RF signal.

For the Receiver, the output of the 14-Bit ADC is passed to the FPGA. The FPGA sends the data to the DDC (Digital Down Converter) IC which processes the demodulation schemes needed and passes the resultant data to the TDM audio bus for final interpretation by one of the system processors. The system processors move the resultant modulation data to the LCD where the user can view the final measurements.

## C. LCD Assy (1A2A2)

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The LCD Assy is composed of a Color LCD Panel, Touch Screen Sensor and Touch Screen Controller. The Touch Screen is the User Interface. The Touch Screen input is detected and processed by the Touch Screen Controller. The Multi-Function PCB Assy receives signals and data from the external connectors and the RF Assy. The processed signals and data are sent to the LCD Assy to display on the various function screens.

## D. RF Assy (1A3) (Figure 1-4)

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The RF Assy consists of the RF Converter PCB Assy and the RF Controller PCB Assy. The RF Assy receives power and control via the Multi-Function PCB Assy.

The RF Converter PCB Assy contains the RF termination for the T/R Connector, ANT Connector and SWR Connector, as well as the frequency translation circuitry and step attenuator for both the receive and generate paths. The RF Controller PCB Assy interfaces directly with the Multi-Function PCB Assy to control the RF Assy. The RF Controller PCB Assy contains the 80 MHz TCXO system clock and the RF synthesizers that generate the required Local Oscillator (LO) signals.

An 80 MHz TCXO with a stability of 1 ppm provides the reference signal for the RF Assy as well as the Multi-Function PCB Assy. The 80 MHz TCXO provides the reference signal to the five Phase Lock Loops (PLL) used to generate the required Local Oscillator (LO) signals.

The Generate path of the RF Assy receives a 10.5 MHz IF signal from the Multi-Function PCB Assy. This signal is mixed with the 80 MHz Gen. 3rd LO to create a 69.5 MHz IF that is filtered to remove unwanted mixing products and amplified before being input to the Generate leveler circuit. The Generate leveler circuit is used to set the desired output signal level by compensating for variations in flatness over the 2 to 1000 MHz output band. The 69.5 MHz IF is then mixed with the 1330 MHz Generate 2nd LO to produce a 1399.5 MHz IF. The output of the mixer is filtered to remove unwanted mixing products and amplified before being input to the last mixer. The Generate 1st LO, which covers 1401.5 to 2399.5 MHz, is mixed with the 1399.5 MHz IF to produce an output frequency of 2 to 1000 MHz. Following the mixer the signal passes through a low-pass filter and into an amplifier. The output of the amplifier is tapped off to the Generate Level detector. The output of the detector is feed back to the Generate Leveler to level the generate system. The RF signal out of the amplifier then passes through the step attenuators. The step attenuators provide 60 dB of attenuation in 1 dB steps to set the signal level out of the Unit. The signal is then input to a RF switch. One port of the switch goes to the T/R Connector via a 3 dB pad, 3 way resistive splitter, and the 20 dB power pad. This attenuator allows the T/R Connector to accept signal levels up to 20 W directly into the Test Set.

The other port of the RF switch is input to a second RF switch which steers the signal to either the ANT Connector or the SWR circuit. When the ANT Connector is selected, the signal passes through another RF switch to insure sufficient isolation and is coupled to the ANT Connector through the ANT Connector protection relay.

Connected to the ANT and SWR Connectors are the connector protection circuits. These circuits are designed to protect the rest of the circuitry from damage if a high power signal is inadvertently input to either of these connectors. If the signal level input to either connector is too high, the signal level is detected by diode detector and the mechanical relay at the connector is opened. Additionally a signal is sent to the software via the Multi-Function PCB Assy that alerts the operator that an overload condition exists.

The SWR Connector can be used to measure SWR and Distance to Fault (DTF) or as a generate connector providing up to -5 dBm output. When SWR or DTF testing is selected, the signal is amplified and passes through a 6 dB pad to insure a good match at the SWR Connector. The signal then goes through two directional couplers and the SWR connector protection relay. The coupler couples off the forward and reverse power at the SWR Connector. The coupled signals are input to a dual Log Amp that outputs video signal proportional to the amplitude and phase difference of the forward and reverse power. From these measurements the software can calculate the SWR of the UUT. It is necessary to calibrate the SWR circuitry by connecting a short, an open and a 50  $\Omega$  termination to the end of the cable connected to the UUT.

When the 3550 / 3550R is in a Receive Mode, either Transmitter Test or Duplex Test, the signal may be input to the T/R or ANT.

#### **D. RF Assy (1A3) (Figure 1-4) (cont)**

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When the T/R Connector is selected, the signal is routed through a 20 dB high power attenuator. This attenuator allows the T/R Connector to accept signal levels up to 20 W directly into the Test Set. A temperature sensor mounted next to the attenuator is monitored by software. If the temperature rise is too great, the operator is alerted. Following the attenuator are resistive splitter feeds, part of the received signal to the power detect circuit. The power detect circuit is a diode detector used to measure the input power for the Power Meter function. The resistive splitter also feeds the signal through a 10 dB pad to the receive connector selection switch.

When the ANT Connector is selected, a signal input to the ANT Connector passes through the protection circuitry to the receive connector selection switch. From this point on both the ANT and T/R Connectors share a common path. The signal is input to the step attenuator that provides 0 to 30 dB of attenuation in 10 dB steps. Following the attenuator part of the signal is tapped off to feed the log amp detector. The detected level out of the log amp is used to insure that the receiver does not go into compression.

The received signal passes through a low-pass filter to remove out-of-band signal to the switchable pre-amp. The pre-amp is selected by software to increase sensitivity for low-level signals. The signal is then input to a mixer where the signal is mixed with the Receive 1st LO. The LO is tunable from 1405 to 2403 MHz to produce an IF signal at 1403 MHz. The IF signal is filtered to remove unwanted mixing products and amplified before being input to a second mixer. The signal is then mixed with the Receive 2nd LO of 1310 MHz to down-convert the signal to a 93 MHz IF. The 93 MHz IF is amplified and filtered then input to the 3rd mixer. The signal is mixed with the Receive 3rd LO of 80 MHz to down-convert the signal to the final IF of 13 MHz. The IF then passes through a low-pass filter and an amplifier before being input to a switchable filter network. At this point the signal either passes through a 1 MHz wide bandpass filter or a 3 dB pad that compensates for the insertion loss of the filter. Following the switchable filter, the signal then passes through several selectable gain amplifiers before being output to the Multi-Function PCB Assy for digital processing. The amplifiers are selectable in gain increments of 10 dB and controlled by the AGC software.

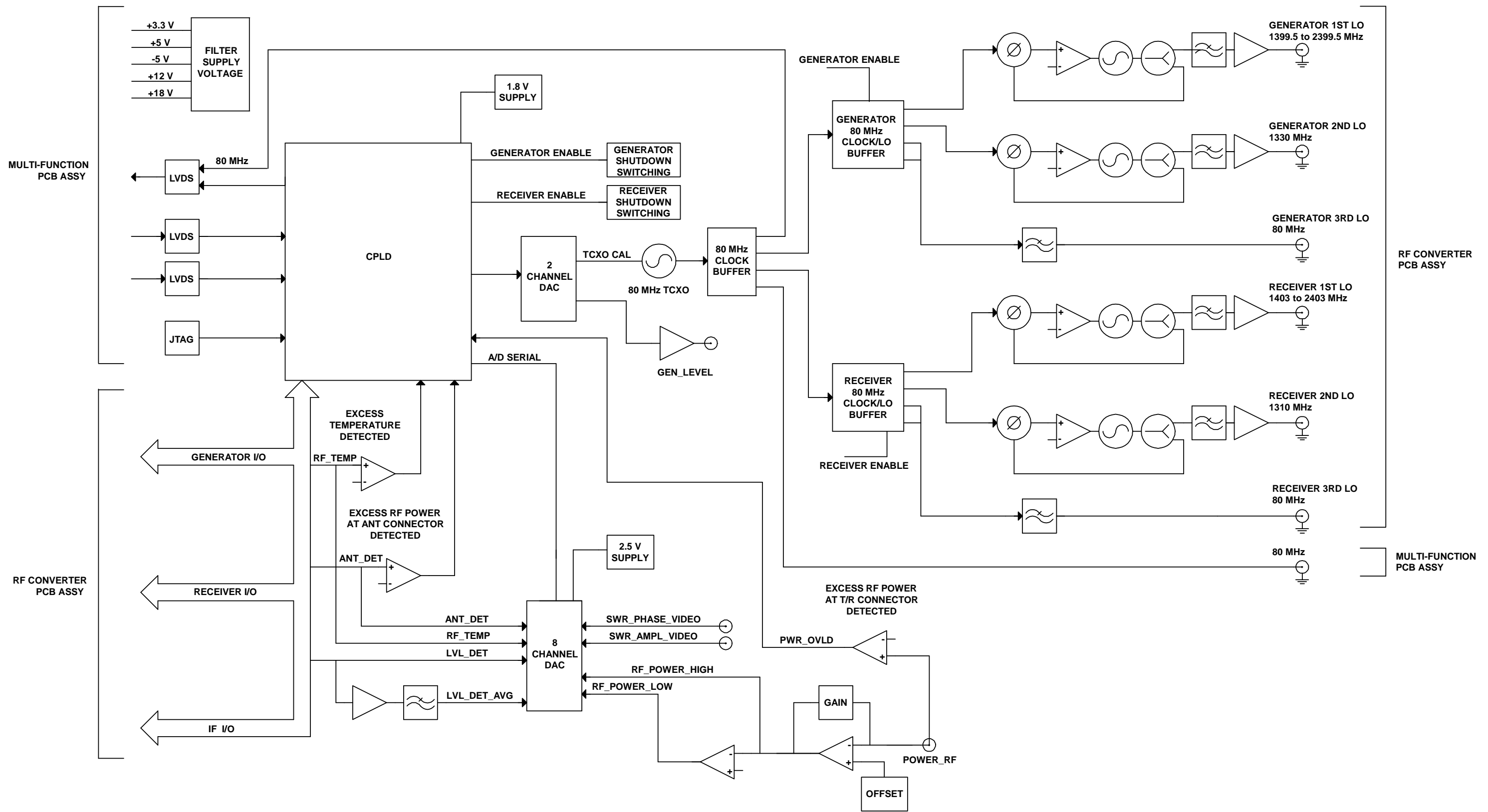


Figure 1-4. RF Assy Block Diagram (Sheet 1 of 2)  
(RF Controller PCB Assy)

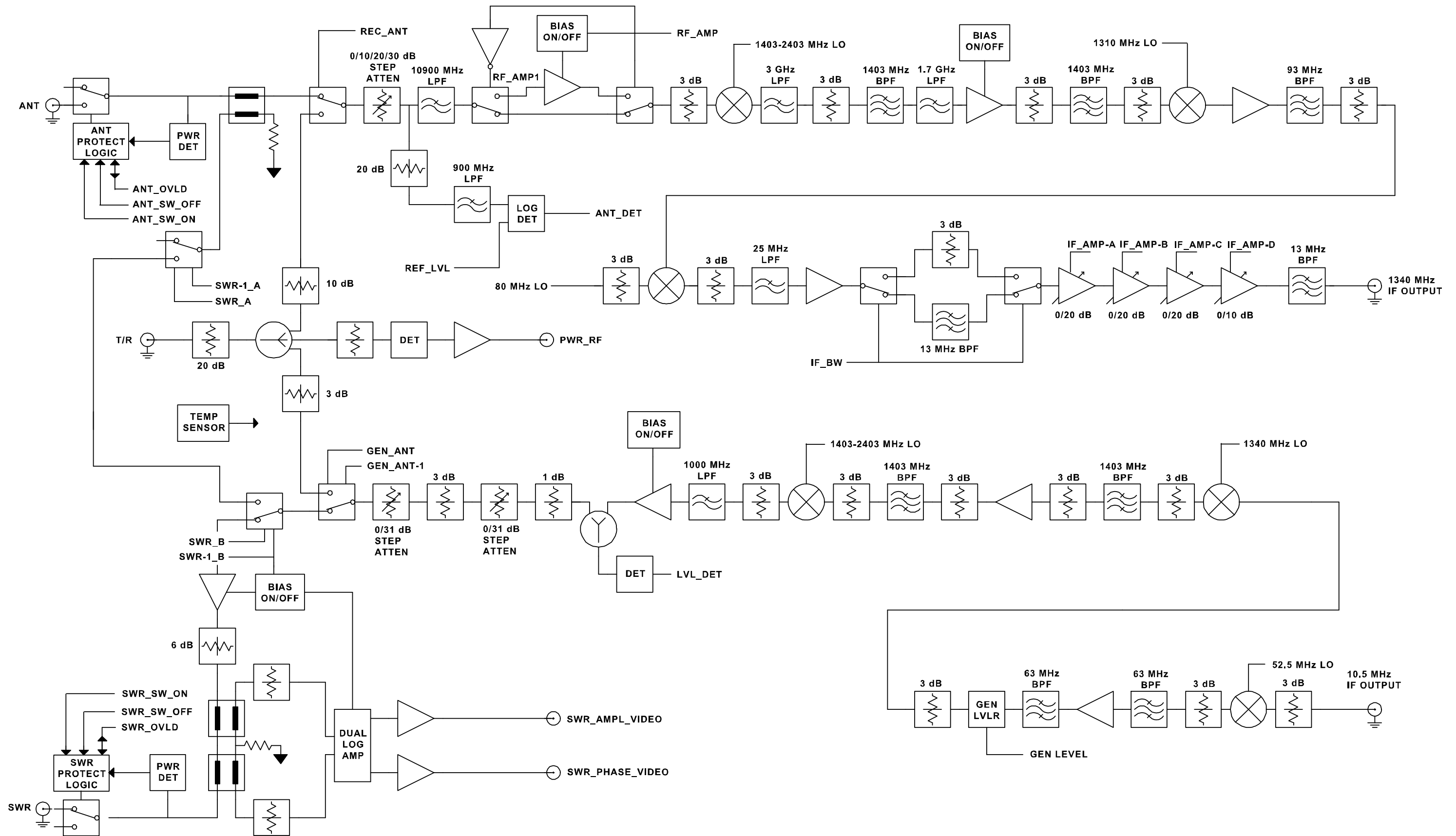


Figure 1-4. RF Assy Block Diagram (Sheet 2 of 2)  
(RF Converter PCB Assy)

# MAINTENANCE INSTRUCTIONS

## 2-1. SERVICE UPON RECEIPT

### 2-1-1. SERVICE UPON RECEIPT OF MATERIEL

#### A. Unpacking

---

Use the following steps for unpacking the 3550 / 3550R.

- Cut and remove the sealing tape on top of the shipping container.
- Open the shipping container and remove the Transit Case.
- Place the Transit Case on a clean and dry surface.
- Open the Transit Case to inspect contents.
- Store the shipping carton for future use should the 3550 / 3550R need to be returned.

#### B. Checking Unpacked Equipment

---

Check the equipment for damage incurred during shipment. If the equipment has been damaged or if items seem to be absent from the shipment, report the damage and/or discrepancies to Aeroflex Customer Service.

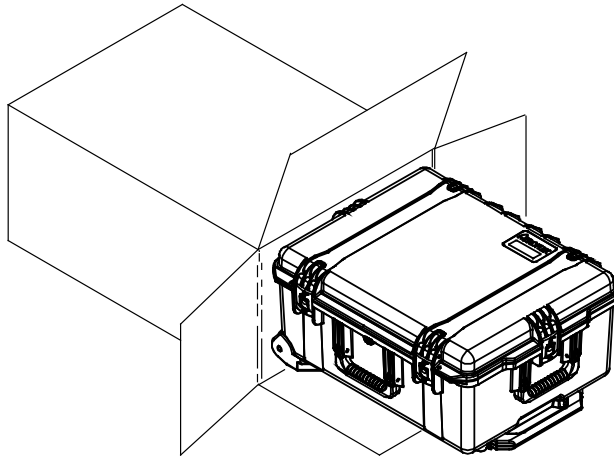
**CONTACT:** Aeroflex

Telephone: (800) 835-2350 (U.S. only)

(316) 522-4981

FAX: (316) 524-2623

E-Mail: [americas.service@aeroflex.com](mailto:americas.service@aeroflex.com)



### 2-1-2. PRELIMINARY SERVICING AND ADJUSTMENT OF EQUIPMENT

Refer to the 3550 / 3550R Operation Manual for this information.

## 2-2. TROUBLESHOOTING

Troubleshooting is divided into a Symptom Index and a Troubleshooting Table.

The Troubleshooting Table lists common malfunctions which may occur during operation of 3550 / 3550R. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. Perform tests/inspections and corrective actions in order listed.

If a malfunction is not listed or is not corrected by listed corrective actions, the troubleshooting technique (the formulation of a logical approach in locating the source of trouble) is left to the technician's discretion.

After the faulty assembly has been located, refer to para 2-4 for remove/replace instructions.

### 2-2-1. TROUBLESHOOTING GUIDELINES

The 3550 / 3550R has a built-in Self Test to assist the technician in troubleshooting.

Many problems on the 3550 / 3550R in service are caused by corrosion. Sometimes removing and reseating an affected cable or circuit card corrects the malfunction. Cleaning connector and/or switch contacts with alcohol repairs corrects many types of digital and analog circuit malfunctions.

### 2-2-2. EQUIPMENT INSPECTION

The following inspection procedures are used to locate obvious malfunctions with the Test Adapter:

- Inspect all external surfaces of the Test Adapter for physical damage, breakage, loose or dirty contacts and missing components.

#### WARNING

**DANGEROUS VOLTAGES ARE PRESENT WITH COVERS REMOVED.**

#### CAUTION

DO NOT DISCONNECT OR REMOVE ANY BOARD ASSEMBLIES IN THE TEST ADAPTER UNLESS INSTRUMENT IS UNPLUGGED. SOME ASSEMBLIES CONTAIN DEVICES THAT CAN BE DAMAGED IF BOARD IS REMOVED WHEN POWER IS ON. SEVERAL COMPONENTS, INCLUDING MOS DEVICES, CAN BE DAMAGED BY ELECTROSTATIC DISCHARGE. USE CONDUCTIVE FOAM AND GROUNDING STRAPS WHEN SERVICING IS REQUIRED AROUND SENSITIVE COMPONENTS. USE CAUTION WHEN UNPLUGGING ICS FROM HIGH-GRIP SOCKETS.

- Inspect printed circuit board surfaces for discoloration, cracks, breaks and warping and printed circuit board conductors for breaks, cracks, cuts, erosion or looseness.
- Inspect all assemblies for burnt or loose components.
- Inspect all chassis-mounted components for looseness, breakage, loose contacts or conductors.
- Inspect 3550 / 3550R for disconnected, broken, cut, loose or frayed cables or wires.



### 2-2-3. TROUBLESHOOTING PRECAUTIONS

#### WARNING

- REMOVE ALL JEWELRY OR OTHER COSMETIC APPAREL BEFORE PERFORMING ANY TROUBLESHOOTING INVOLVING LIVE CIRCUITS.
- WHEN WORKING WITH LIVE CIRCUITS OF HIGH POTENTIAL, KEEP ONE HAND IN POCKET OR BEHIND BACK TO AVOID SERIOUS SHOCK HAZARD.
- USE ONLY INSULATED TROUBLESHOOTING TOOLS WHEN WORKING WITH LIVE CIRCUITS.
- FOR ADDED INSULATION, PLACE RUBBER BENCH MAT UNDERNEATH ALL POWERED BENCH EQUIPMENT, AS WELL AS A RUBBER MAT UNDERNEATH TECHNICIAN'S CHAIR.
- HEED ALL WARNINGS AND CAUTIONS CONCERNING MAXIMUM VOLTAGES AND POWER INPUTS.



#### CAUTION

ALL ASSEMBLIES CONTAIN PARTS SENSITIVE TO DAMAGE BY ELECTROSTATIC DISCHARGE (ESD). ALL PERSONNEL PERFORMING TROUBLESHOOTING PROCEDURES SHOULD HAVE KNOWLEDGE OF ACCEPTED ESD PRACTICES AND/OR BE ESD CERTIFIED.

### 2-2-4. EMC / SAFETY COMPLIANCE

All assemblies, cables, connectors, plastic fasteners, gaskets, fingerstock and miscellaneous hardware within the 3550 / 3550R are configured to satisfy the safety and EMC compliance standards.

#### CAUTION

UPON COMPLETION OF ANY MAINTENANCE ACTION; ALL ASSEMBLIES, CABLES, CONNECTORS, PLASTIC FASTENERS, GASKETS, FINGERSTOCK AND MISCELLANEOUS HARDWARE MUST BE CONFIGURED AS INSTALLED AT THE FACTORY.

## 2-2-5. BATTERY PRECAUTIONS

The 3550 / 3550R is powered by an internal Lithium Ion battery pack. The 3550 / 3550R is supplied with an external DC Power Supply that enables the operator to recharge the battery when connected to AC power. The 3550 / 3550R can operate continuously on AC power via the DC Power Supply, for servicing and/or bench tests.

The internal battery is equipped to power the 3550 / 3550R for 4.5 hours of continuous use, after which time, the 3550 / 3550R battery needs recharging. When the POWER Indicator is GREEN, the battery is at >25% capacity. When the POWER Indicator is YELLOW, the battery is at <25% capacity.

If the battery level, shown in the BAT Field on most Test Screens, drops to 10 (10%), the 3550 / 3550R powers down automatically.

The battery charger operates whenever the supplied External DC Power Supply or a suitable (11 to 32 Vdc) DC Power source is applied to the 3550 / 3550R. When charging, the battery reaches a 100% charge in approximately four hours (Unit OFF) / eight hours (Unit ON). The internal battery charger allows the battery to charge between a temperature range of 0° to 45°C. The 3550 / 3550R can operate, connected to an external DC source, outside the battery charging temperature range (0° to 45°C). Allow 20 minutes for the battery to charge when turning the 3550 / 3550R ON from a dead battery condition.

The battery should be charged every three months (minimum) or disconnected for long term inactive storage periods of more than six months. The Battery must be removed when conditions surrounding the 3550 / 3550R are <-20°C and >60°C).

## 2-2-6. SUPPORT EQUIPMENT

TYPE	MODEL
Digital Multimeter	HP 34401A or Equivalent
Spectrum Analyzer	Aeroflex AN940 or Equivalent
Handset (Microphone)	Aeroflex (64606)

## SYMPTOM INDEX

SYMPTOM	DESCRIPTION	PAGE
1	External DC Power Supply failure	2-6
2	Unit Power Up failure	2-6
3	BATT Indicator does not illuminate	2-6
4	Blows Fuse	2-6
5	Battery does not charge	2-6
6	Display is blank or abnormality exists in Display	2-7
7	Keys inoperable	2-7
8	ANT Connector failure	2-7
9	T/R Connector failure	2-7
10	AUDIO Connector failure	2-7
11	SWR Connector failure	2-7
12	REMOTE Connector failure	2-7
13	ETHERNET Connector failure	2-7
14	AUDIO OUT Connector failure	2-7
15	AUDIO IN Connector failure	2-8
16	DVM Connector failure	2-8
17	USB Connector failure	2-8

## TROUBLESHOOTING TABLE

### NOTE

The Troubleshooting Table lists common malfunctions found during normal operation of the 3550 / 3550R. The tests or inspections and corrective actions should be performed in the order listed. Failure to do so may result in troubleshooting recommendations that replace working items.

<b>MALFUNCTION</b>	<b>TEST OR INSPECTION</b>	<b>CORRECTIVE ACTION</b>
<b>1 External DC Power Supply failure</b>	Step 1. Connect the External DC Power Supply to a verifiable AC Power Source and verify the LED is lit.  ◆ If incorrect, replace the External DC Power Supply.	
	Step 2. Using a Digital Multimeter on the External DC Power Supply output, verify 11 to 32 Vdc.  ◆ If incorrect, replace the External DC Power Supply.	
<b>2 Unit Power Up failure</b>		Perform the Unit Power Up Failure Troubleshooting Test (para 2-2-6A).
<b>3 BATT Indicator does not illuminate</b>		Perform the BATT Indicator Failure Troubleshooting Test (para 2-2-6B).
<b>4 Blows Fuse</b>	Step 1. Remove the External DC Power Supply from the 3550 / 3550R (DC IN Connector).  Step 2. Replace the Fuse (para 2-4B).  Step 3. Connect the External DC Power Supply to the 3550 / 3550R (DC IN Connector).  Step 4. Press the POWER Key.  Step 5. If the Fuse continues to blow, replace the Power Supply PCB Assy (para 2-4D).	
<b>5 Battery does not charge</b>	Step 1. Connect the External DC Power Supply to the 3550 / 3550R (DC IN Connector) and verify the BATT Indicator is Green or Yellow.  ◆ If incorrect, replace the Battery (para 2-4A).  Step 2. Allow four hours (Unit OFF) / eight hours (Unit ON) for Battery to fully charge and verify the BATT Indicator is Green.  ◆ If incorrect, replace the Battery (para 2-4A).	

## TROUBLESHOOTING TABLE (cont)

<b>MALFUNCTION</b>	<b>TEST OR INSPECTION</b>	<b>CORRECTIVE ACTION</b>
<b>6</b>	<b>Display is blank or abnormality exists in Display</b>	Perform the Display Failure Troubleshooting Test (para 2-2-6C).
<b>7</b>	<b>Keys inoperable</b>	◆ Replace the Multi-Function PCB Assy (para 2-4E).
<b>8</b>	<b>ANT Connector failure</b>	Step 1. Inspect connector for damage and/or wear. ◆ Replace the ANT Connector (para 2-4G). Step 2. Perform the ANT Connector Failure Troubleshooting Test (para 2-2-6D).
<b>9</b>	<b>T/R Connector failure</b>	Step 1. Inspect connector for damage and/or wear. ◆ Replace the T/R Connector (para 2-4H). Step 2. Perform the T/R Connector Failure Troubleshooting Test (para 2-2-6E).
<b>10</b>	<b>AUDIO Connector failure</b>	Step 1. Inspect connector for damage and/or wear. ◆ Replace the AUDIO Connector (para 2-4J). Step 2. Perform the AUDIO Connector Failure Troubleshooting Test (para 2-2-6F).
<b>11</b>	<b>SWR Connector failure</b>	Step 1. Inspect connector for damage and/or wear. ◆ Replace the SWR Connector (para 2-4K). Step 2. Perform the SWR Connector Failure Troubleshooting Test (para 2-2-6G).
<b>12</b>	<b>REMOTE Connector failure</b>	◆ Replace the Multi-Function PCB Assy (para 2-4E).
<b>13</b>	<b>ETHERNET Connector failure</b>	◆ Replace the Multi-Function PCB Assy (para 2-4E).
<b>14</b>	<b>AUDIO OUT Connector failure</b>	Step 1. Inspect connector for damage and/or wear. ◆ Replace the AUDIO OUT Connector (para 2-4N). Step 2. Perform the AUDIO OUT Connector Failure Troubleshooting Test (para 2-2-6H).

## TROUBLESHOOTING TABLE (cont)

---

<i><b>MALFUNCTION</b></i>	<i><b>TEST OR INSPECTION</b></i>	<i><b>CORRECTIVE ACTION</b></i>
<hr/>		
<b>15</b>	<b>AUDIO IN Connector failure</b>	
	Step 1.	Inspect connector for damage and/or wear. ◆ Replace the AUDIO IN Connector (para 2-4M).
	Step 2.	Perform the AUDIO IN Connector Failure Troubleshooting Test (para 2-2-6I).
<hr/>		
<b>16</b>	<b>DVM Connector failure</b>	
	Step 1.	Inspect connector for damage and/or wear. ◆ Replace the DVM Connector (para 2-4L).
	Step 2.	Perform the DVM Connector Failure Troubleshooting Test (para 2-2-6J).
<hr/>		
<b>17</b>	<b>USB Connector failure</b>	
		◆ Replace the Multi-Function PCB Assy (para 2-4E).

---

## 2-2-7. TROUBLESHOOTING TESTS

### A. Unit Power-Up Failure

---

**TEST EQUIPMENT:** Digital Multimeter

**REFERENCE FIGURES:** Figure E-1  
Figure E-2

---

#### NOTE

Perform this test only when instructed from the Troubleshooting Table or another troubleshooting test. Do not perform this troubleshooting test as a separate procedure unless otherwise instructed. Certain conditions have been established and/or tested prior to performing this test.

#### **PART 1**

1. Remove the External DC Power Supply from the 3550 / 3550R.
2. Remove the Battery Cover (para 2-4A).
3. Verify the Battery is installed.
  - ◆ **INCORRECT** - Install the Battery (para 2-4A).
4. Verify the Fuse is not blown.
  - ◆ **INCORRECT** - Replace the Fuse (para 2-4B).
5. Remove the External DC Power Supply from the 3550 / 3550R.
6. Open the Case Assembly (para 2-4C).
7. Connect the External DC Power Supply to the 3550 / 3550R (DC IN Connector).
8. Verify the Green LED (Charged) or Amber LED (Charging) is illuminated on the Power Supply PCB Assy.
  - ◆ **INCORRECT** - Go to Part 2.
9. Connect the Digital Multimeter to A1J2, Pin 10.
10. Verify 10 Vdc nominal.
  - ◆ **INCORRECT** - Go to Part 3.
11. Press the POWER Key.
12. Verify voltage goes down to 0 then back up to current reading.
  - ◆ **INCORRECT** - Replace the Multi-Function PCB Assy (para 2-4E).
13. Connect the Digital Multimeter to A1J2 and verify the following voltages:

Pin 3	5 Vdc ( $\pm 0.5$ Vdc)
Pin 13	3.3 Vdc ( $\pm 0.3$ Vdc)
Pin 23	18 Vdc ( $\pm 2$ Vdc)
Pin 27	-5 Vdc ( $\pm 0.5$ Vdc)

  - ◆ **INCORRECT** - Go to Part 3.

## A. Unit Power Up Failure (cont)

---

### PART 1 (cont)

14. Disconnect W2P1 (Multi-Function PCB Assy).
  15. Connect the Digital Multimeter to W2P1 and verify the following voltages:

Pin 3	5 Vdc ( $\pm 0.5$ Vdc)
Pin 13	3.3 Vdc ( $\pm 0.3$ Vdc)
Pin 23	18 Vdc ( $\pm 2$ Vdc)
Pin 27	-5 Vdc ( $\pm 0.5$ Vdc)
- ◆ **CORRECT** - Replace the Multi-Function PCB Assy (para 2-4E).
  - ◆ **INCORRECT** - Replace W2.

### PART 2

16. Connect Digital Multimeter to A1J3, Pin 2.
  17. Verify 24 Vdc nominal.
- ◆ **CORRECT** - Replace the Power Supply PCB Assy (para 2-4D).
  - ◆ **INCORRECT** - Replace W1.

### PART 3

18. Disconnect W2P2 (Power Supply PCB Assy).
  19. Verify 10 Vdc nominal.
- ◆ **INCORRECT** - Replace the Power Supply PCB Assy (para 2-4D).
20. Reconnect W2P2 (Power Supply PCB Assy).
  21. Disconnect W2P1 (Multi-Function PCB Assy).
  22. Verify 10 Vdc nominal.
- ◆ **CORRECT** - Replace the Multi-Function PCB Assy (para 2-4E).
  - ◆ **INCORRECT** - Replace W2.

**Contact Aeroflex if further assistance is required.**



## B. BATT Indicator Failure

---

**TEST EQUIPMENT:** Digital Multimeter

**REFERENCE FIGURES:** Figure E-2

---

### NOTE

Perform this test only when instructed from the Troubleshooting Table or another troubleshooting test. Do not perform this troubleshooting test as a separate procedure unless otherwise instructed. Certain conditions have been established and/or tested prior to performing this test.

1. Remove the External DC Power Supply from the 3550 / 3550R.
2. Remove the Battery Cover (para 2-4A).
3. Verify the Battery is installed.
  - ◆ **INCORRECT** - Install the Battery (para 2-4A).
4. Connect the Digital Multimeter to BT1, Pin 4 (Red Wire).



5. Verify 11.1 Vdc nominal.
  - ◆ **INCORRECT** - Replace the Battery (para 2-4A).
6. Open the Case Assembly (para 2-4C).
7. Connect the External DC Power Supply to the 3550 / 3550R (DC IN Connector).
8. Press the POWER Key.
9. Verify the Green LED (Charged) or the Amber LED (Charging) is illuminated on the Power Supply PCB Assy.
  - ◆ **CORRECT** - Replace the Multi-Function PCB Assy (para 2-4E).
  - ◆ **INCORRECT** - Replace the Power Supply PCB Assy (para 2-4D).

**Contact Aeroflex if further assistance is required.**

## C. Display Failure

---

**TEST EQUIPMENT:** Digital Multimeter

**REFERENCE FIGURES:** Figure E-1  
Figure E-3  
Figure E-4

---

### NOTE

Perform this test only when instructed from the Troubleshooting Table or another troubleshooting test. Do not perform this troubleshooting test as a separate procedure unless otherwise instructed. Certain conditions have been established and/or tested prior to performing this test.

#### PART 1

1. Press the POWER Key.
2. Verify the SYS Indicator is illuminated.
  - ◆ **INCORRECT** - Go to Part 2.
3. Connect the Digital Multimeter to A2A1J27, Pin 1, 3, 5 or 7.
4. Verify 23 Vdc nominal.
  - ◆ **INCORRECT** - Replace the Multi-Function PCB Assy (para 2-4E).
5. Connect the Digital Multimeter to A2W16, Pin 1, 3, 5 or 7.
6. Verify 23 Vdc nominal.
  - ◆ **CORRECT** - Replace the Display. (Contact Aeroflex Customer Service)
  - ◆ **INCORRECT** - Replace A2W16.

#### PART 2

7. Connect the Digital Multimeter to A1J2, Pin 10.
8. Verify 10 Vdc nominal.
  - ◆ **INCORRECT** - Go to Part 3.
9. Press the POWER Key. Verify voltage goes down to 0 then back up to current reading.
  - ◆ **INCORRECT** - Replace the Multi-Function PCB Assy (para 2-4E).
10. Connect the Digital Multimeter to A1J2 and verify the following voltages:

Pin 3	5 Vdc ( $\pm 0.5$ Vdc)
Pin 13	3.3 Vdc ( $\pm 0.3$ Vdc)
Pin 23	18 Vdc ( $\pm 2$ Vdc)
Pin 27	-5 Vdc ( $\pm 0.5$ Vdc)

  - ◆ **INCORRECT** - Go to Part 4.
11. Disconnect W2P1 (Multi-Function PCB Assy).

## C. Display Failure (cont)

---

### PART 2 (cont)

12. Connect the Digital Multimeter to W2P1 and verify the following voltages:

Pin 3	5 Vdc ( $\pm 0.5$ Vdc)
Pin 13	3.3 Vdc ( $\pm 0.3$ Vdc)
Pin 23	18 Vdc ( $\pm 2$ Vdc)
Pin 27	-5 Vdc ( $\pm 0.5$ Vdc)

- ◆ **CORRECT** - Replace the Multi-Function PCB Assy (para 2-4E).
- ◆ **INCORRECT** - Replace W2.

### PART 3

13. Disconnect W2P2 (Power Supply PCB Assy).

14. Verify 10 Vdc nominal.

- ◆ **INCORRECT** - Replace the Power Supply PCB Assy (para 2-4D).

15. Reconnect W2P2 (Power Supply PCB Assy).

16. Disconnect W2P1 (Multi-Function PCB Assy).

17. Verify 10 Vdc nominal.

- ◆ **CORRECT** - Replace the Multi-Function PCB Assy (para 2-4E).
- ◆ **INCORRECT** - Replace W2.

### PART 4

18. Disconnect W2P2 (Power Supply PCB Assy).

19. Connect the Digital Multimeter to W2P2 and verify the following voltages:

Pin 3	5 Vdc ( $\pm 0.5$ Vdc)
Pin 13	3.3 Vdc ( $\pm 0.3$ Vdc)
Pin 23	18 Vdc ( $\pm 2$ Vdc)
Pin 27	-5 Vdc ( $\pm 0.5$ Vdc)

- ◆ **INCORRECT** - Replace the Power Supply PCB Assy (para 2-4D).

20. Reconnect W2P2 (Power Supply PCB Assy).

21. Disconnect W2P1 (Multi-Function PCB Assy).

22. Verify 10 Vdc nominal.

- ◆ **CORRECT** - Replace the Multi-Function PCB Assy (para 2-4E).
- ◆ **INCORRECT** - Replace W2.

**Contact Aeroflex if further assistance is required.**

## D. ANT Connector Failure

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**TEST EQUIPMENT:** Spectrum Analyzer

**REFERENCE FIGURES:** Figure E-1  
Figure E-5

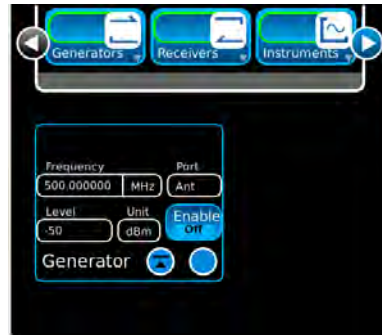
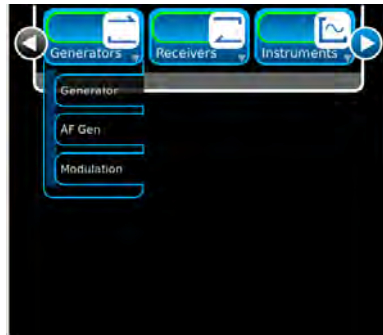
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### NOTE

Perform this test only when instructed from the Troubleshooting Table or another troubleshooting test. Do not perform this troubleshooting test as a separate procedure unless otherwise instructed. Certain conditions have been established and/or tested prior to performing this test.

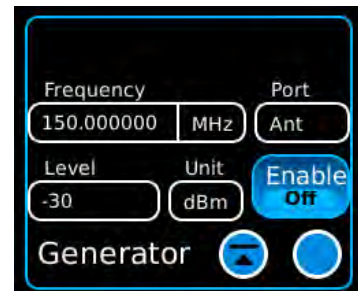
#### **PART 1**

1. Remove the External DC Power Supply from the 3550 / 3550R.
2. Open the Case Assembly (para 2-4C).
3. Connect the External DC Power Supply to the 3550 / 3550R (DC IN Connector).
4. Press the POWER Key.
5. Select the Generators Function Tab to display the Generators Dropdown selections. Select "Generator" to display the Generator Function Window.



6. Connect the Spectrum Analyzer to the ANT Connector.
7. Select the following field settings:

Frequency	150.000000 MHz
Port	ANT
Level	-30 dBm



8. Verify the signal is 150 MHz at -30 dBm on the Spectrum Analyzer.
  - ◆ **CORRECT** - Contact Aeroflex for further assistance.
  - ◆ **INCORRECT** - Go to Part 2.

## D. ANT Connector Failure (cont)

---

### PART 2

9. Remove the External DC Power Supply from the 3550 / 3550R.
10. Remove W12.
11. Disconnect the Spectrum Analyzer from the ANT Connector.
12. Connect the Spectrum Analyzer to A3J1 (RF Assy).
13. Connect the External DC Power Supply to the 3550 / 3550R (DC IN Connector).
14. Press the POWER Key.
15. Verify the signal is 150 MHz at -30 dBm on the Spectrum Analyzer.
  - ◆ **INCORRECT** - Replace the RF Assy (para 2-4F).
16. Remove the External DC Power Supply from the 3550 / 3550R.
17. Disconnect the Spectrum Analyzer from A3J1 (RF Assy).
18. Connect W12P1 to A3J1 (RF Assy).
19. Connect the Spectrum Analyzer to W12P2.
20. Connect the External DC Power Supply to the 3550 / 3550R (DC IN Connector).
21. Press the POWER Key.
22. Verify the signal is 150 MHz at -30 dBm on the Spectrum Analyzer.
  - ◆ **CORRECT** - Replace the ANT Connector (para 2-4G).
  - ◆ **INCORRECT** - Replace W12.

**Contact Aeroflex if further assistance is required.**

## E. T/R Connector Failure

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**TEST EQUIPMENT:** Spectrum Analyzer

**REFERENCE FIGURES:** Figure E-1  
Figure E-5

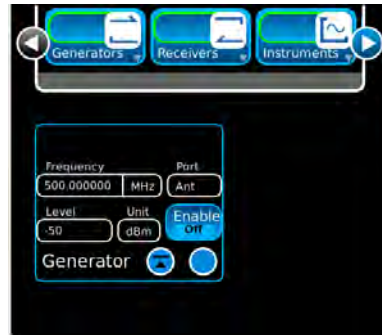
---

### NOTE

Perform this test only when instructed from the Troubleshooting Table or another troubleshooting test. Do not perform this troubleshooting test as a separate procedure unless otherwise instructed. Certain conditions have been established and/or tested prior to performing this test.

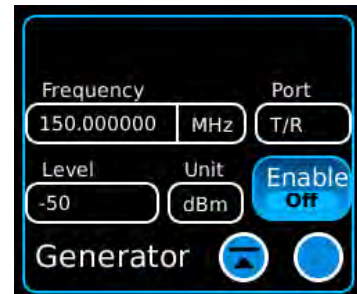
#### **PART 1**

1. Remove the External DC Power Supply from the 3550 / 3550R.
2. Open the Case Assembly (para 2-4C).
3. Connect the External DC Power Supply to the 3550 / 3550R (DC IN Connector).
4. Press the POWER Key.
5. Select the Generators Function Tab to display the Generators Dropdown selections. Select "Generator" to display the Generator Function Window.



6. Connect the Spectrum Analyzer to the T/R Connector.
7. Select the following field settings:

Frequency	150.000000 MHz
Port	T/R
Level	-50 dBm



8. Verify the signal is 150 MHz at -50 dBm on the Spectrum Analyzer.
  - ◆ **CORRECT** - Contact Aeroflex for further assistance.
  - ◆ **INCORRECT** - Go to Part 2.

## E. T/R Connector Failure (cont)

---

### PART 2

9. Remove the External DC Power Supply from the 3550 / 3550R.
10. Remove W10.
11. Disconnect the Spectrum Analyzer from the SWR Connector.
12. Connect the Spectrum Analyzer to A3J2 (RF Assy).
13. Connect the External DC Power Supply to the 3550 / 3550R (DC IN Connector).
14. Press the POWER Key.
15. Verify the signal is 150 MHz at -50 dBm on the Spectrum Analyzer.
  - ◆ **INCORRECT** - Replace the RF Assy (para 2-4F).
16. Remove the External DC Power Supply from the 3550 / 3550R.
17. Disconnect the Spectrum Analyzer from A3J2 (RF Assy).
18. Connect W11P1 to A3J2 (RF Assy).
19. Connect the Spectrum Analyzer to W10P2.
20. Connect the External DC Power Supply to the 3550 / 3550R (DC IN Connector).
21. Press the POWER Key.
22. Verify the signal is 150 MHz at -50 dBm on the Spectrum Analyzer.
  - ◆ **CORRECT** - Replace T/R Connector (para 2-4H).
  - ◆ **INCORRECT** - Replace W10.

**Contact Aeroflex if further assistance is required.**

## F. AUDIO Connector Failure

---

**TEST EQUIPMENT:** Digital Multimeter  
Handset (Microphone)

**REFERENCE FIGURES:** Figure E-1

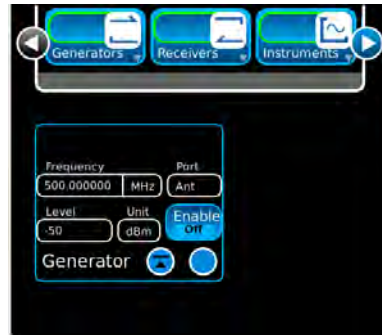
---

### NOTE

Perform this test only when instructed from the Troubleshooting Table or another troubleshooting test. Do not perform this troubleshooting test as a separate procedure unless otherwise instructed. Certain conditions have been established and/or tested prior to performing this test.

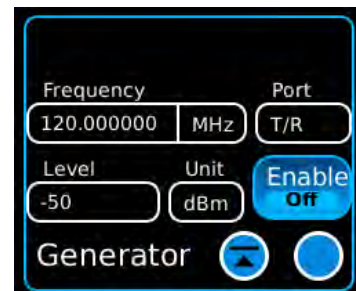
#### **PART 1**

1. Remove the External DC Power Supply from the 3550 / 3550R.
2. Open the Case Assembly (para 2-4C).
3. Connect the External DC Power Supply to the 3550 / 3550R (DC IN Connector).
4. Press the POWER Key.
5. Select the Generators Function Tab to display the Generators Dropdown selections. Select "Generator" to display the Generator Function Window.



6. Select the following field settings:

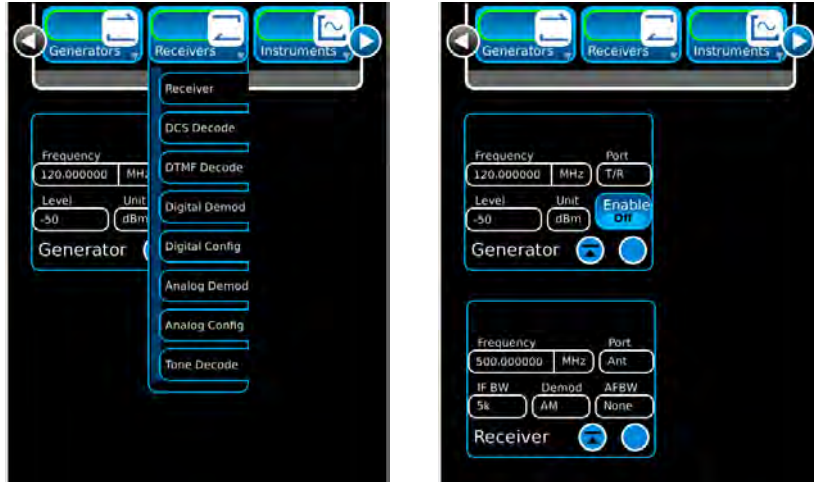
Frequency	120.000000 MHz
Port	T/R





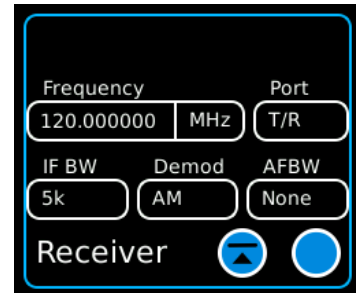
## F. AUDIO Connector Failure (cont)

7. Select the Receivers Function Tab to display the Receivers Dropdown selections. Select "Receiver" to display the Receiver Function Window.



8. Select the following field settings:  

Frequency	120.000000 MHz
Port	T/R



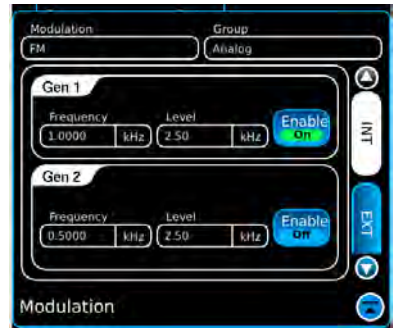
9. Select the Generators Function Tab to display the Generators Dropdown selections. Select "Modulation" to display the Modulation Function Window.



## F. AUDIO Connector Failure (cont)

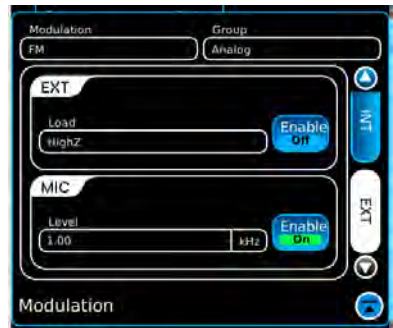
10. Select the INT Tab. Select the following field settings:

Gen 1 - Frequency 1.0000 kHz  
 Enable On

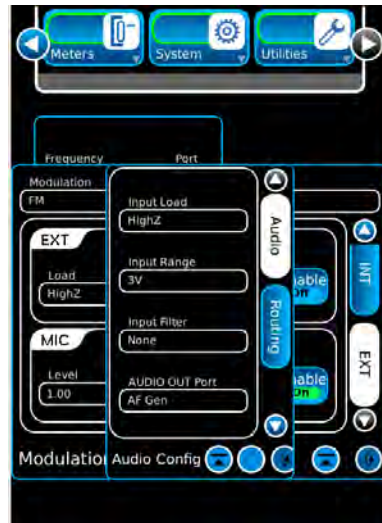
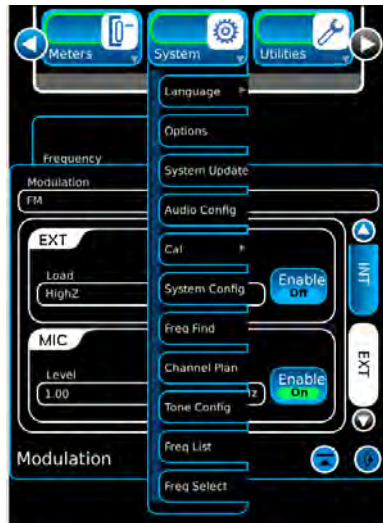


11. Select the EXT Tab. Select the following field settings:

MIC - Frequency 1.00 kHz  
 Enable On



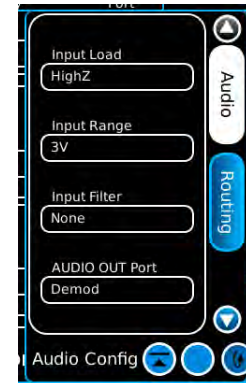
12. Select the System Function Tab to display the System Dropdown selections. Select "Audio Config" to display the Audio Configuration Function Window.



## F. AUDIO Connector Failure (cont)

13. Select the following field setting:

Audio Out	Demod
Input Range	3 V



14. Connect the Handset (Microphone) to the AUDIO Connector.
15. Verify squelch is heard in the Handset (Microphone) Microphone.

Press the Handset (Microphone) key and verify the PTT LED is illuminated on the Generator Function Window.

- ◆ **CORRECT** - Contact Aeroflex for further assistance.
- ◆ **INCORRECT** - Go to Part 2.



### PART 2

16. Connect the Digital Multimeter to W4P1.
17. Press the Handset (Microphone) key and verify the voltage drops on the Digital Multimeter.
- ◆ **CORRECT** - Replace the AUDIO Connector (para 2-4J).
  - ◆ **INCORRECT** - Replace the Multi-Function PCB Assy (para 2-4E).

**Contact Aeroflex if further assistance is required.**

## G. SWR Connector Failure

---

**TEST EQUIPMENT:** Spectrum Analyzer

**REFERENCE FIGURES:** Figure E-1  
Figure E-5

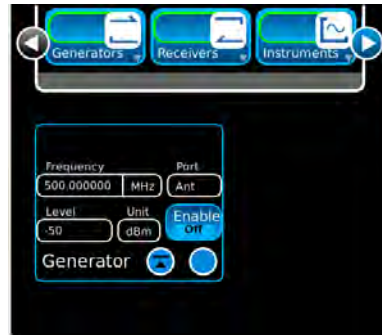
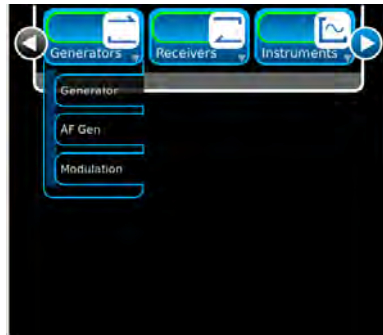
---

### NOTE

Perform this test only when instructed from the Troubleshooting Table or another troubleshooting test. Do not perform this troubleshooting test as a separate procedure unless otherwise instructed. Certain conditions have been established and/or tested prior to performing this test.

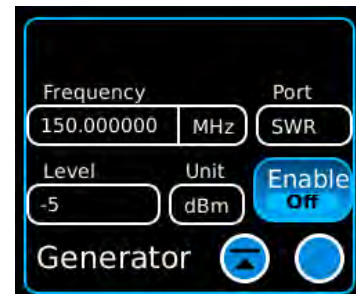
#### **PART 1**

1. Remove the External DC Power Supply from the 3550 / 3550R.
2. Open the Case Assembly (para 2-4C).
3. Connect the External DC Power Supply to the 3550 / 3550R (DC IN Connector).
4. Press the POWER Key.
5. Select the Generators Function Tab to display the Generators Dropdown selections. Select "Generator" to display the Generator Function Window.



6. Connect the Spectrum Analyzer to the SWR Connector.
7. Select the following field settings:

Frequency	150.000000 MHz
Port	SWR
Level	-5 dBm



8. Verify the signal is 150 MHz at -5 dBm on the Spectrum Analyzer.
  - ◆ **CORRECT** - Contact Aeroflex for further assistance.
  - ◆ **INCORRECT** - Go to Part 2.

## G. SWR Connector Failure (cont)

---

### PART 2

9. Remove the External DC Power Supply from the 3550 / 3550R.
10. Remove W11.
11. Disconnect the Spectrum Analyzer from the SWR Connector.
12. Connect the Spectrum Analyzer to A3J3 (RF Assy).
13. Connect the External DC Power Supply to the 3550 / 3550R (DC IN Connector).
14. Press the POWER Key.
16. Remove the External DC Power Supply from the 3550 / 3550R.
17. Disconnect the Spectrum Analyzer from A3J3 (RF Assy).
18. Connect W11P1 to A3J3 (RF Assy).
19. Connect the Spectrum Analyzer to W11P2.
20. Connect the External DC Power Supply to the 3550 / 3550R (DC IN Connector).
21. Press the POWER Key.
22. Verify the signal is 150 MHz at -5 dBm on the Spectrum Analyzer.
  - ◆ **CORRECT** - Replace the SWR Connector (para 2-4K).
  - ◆ **INCORRECT** - Replace W11.

**Contact Aeroflex if further assistance is required.**

## H. AUDIO OUT Connector Failure

---

**TEST EQUIPMENT:** Spectrum Analyzer

**REFERENCE FIGURES:** Figure E-3

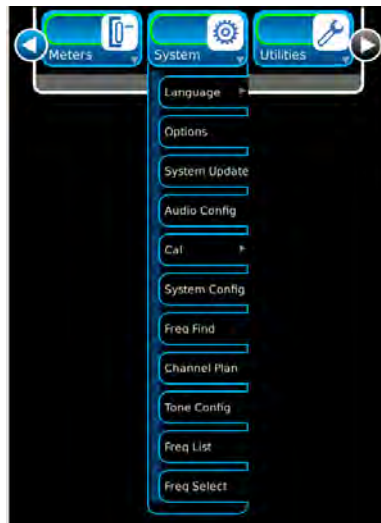
---

### NOTE

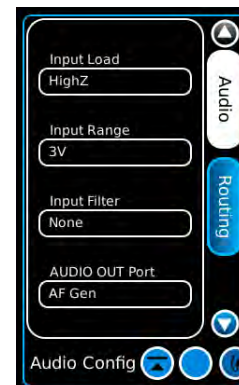
Perform this test only when instructed from the Troubleshooting Table or another troubleshooting test. Do not perform this troubleshooting test as a separate procedure unless otherwise instructed. Certain conditions have been established and/or tested prior to performing this test.

### PART 1

1. Remove the External DC Power Supply from the 3550 / 3550R.
2. Open the Case Assembly (para 2-4C).
3. Connect the External DC Power Supply to the 3550 / 3550R (DC IN Connector).
4. Press the POWER Key.
5. Select the System Function Tab to display the System Dropdown selections. Select "Audio Config" to display the Audio Configuration Function Window.

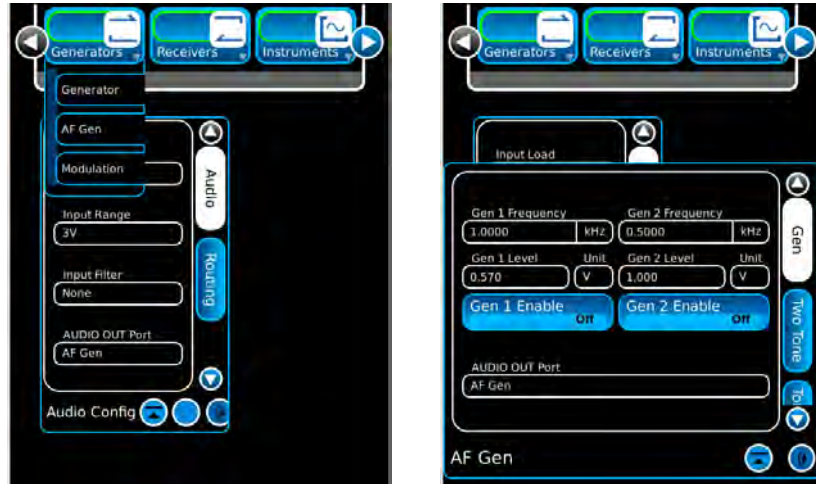


6. Select the following field setting:  
Audio Out Port      AF Gen  
Input Range          3 V



## H. AUDIO OUT Connector Failure (cont)

7. Select the Generators Function Tab to display the Generators Dropdown selections. Select "AF Gen" to display the AF Generator Function Window.



8. Select the following field settings:

Gen 1 Frequency	1.00 kHz
Gen 1 Level	1.000 V
Gen 1 Enable	Off



9. Connect the Spectrum Analyzer to the AUDIO OUT Connector.
10. Verify 1 kHz tone on the Spectrum Analyzer.
  - ◆ **CORRECT** - Contact Aeroflex for further assistance.
  - ◆ **INCORRECT** - Go to Part 2.

## H. AUDIO OUT Connector Failure (cont)

---

### PART 2

11. Disconnect A2W15P1 (Multi-Function PCB Assy).
12. Connect the Spectrum Analyzer to A2A1J25 (Multi-Function PCB Assy).
13. Verify 1 kHz tone.
  - ◆ **INCORRECT** - Replace the Multi-Function PCB Assy (para 2-4E).
14. Reconnect A2W15P1 (Multi-Function PCB Assy).
15. Disconnect A2W15P2 (AUDIO OUT Connector).
16. Connect the Spectrum Analyzer to A2W15P2.
17. Verify 1 kHz tone.
  - ◆ **CORRECT** - Replace the AUDIO OUT Connector (para 2-4N).
  - ◆ **INCORRECT** - Replace A2W15.



## I. AUDIO IN Connector Failure

---

**TEST EQUIPMENT:** Spectrum Analyzer

**REFERENCE FIGURES:** Figure E-3

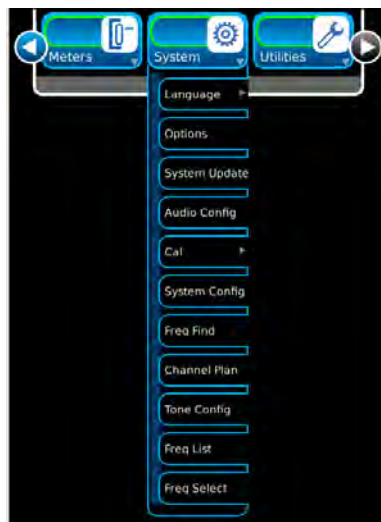
---

### NOTE

Perform this test only when instructed from the Troubleshooting Table or another troubleshooting test. Do not perform this troubleshooting test as a separate procedure unless otherwise instructed. Certain conditions have been established and/or tested prior to performing this test.

### PART 1

1. Remove the External DC Power Supply from the 3550 / 3550R.
2. Open the Case Assembly (para 2-4C).
3. Connect the External DC Power Supply to the 3550 / 3550R (DC IN Connector).
4. Press the POWER Key.
5. Select the System Function Tab to display the System Dropdown selections. Select "Audio Config" to display the Audio Configuration Function Window.



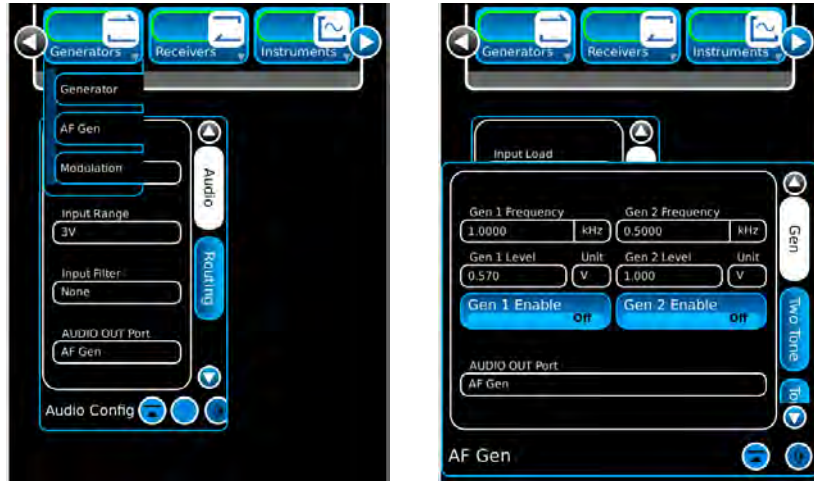
6. Select the following field setting:

Audio Out Port	AF Gen
Input Range	3 V



## I. AUDIO IN Connector Failure (cont)

7. Select the Generators Function Tab to display the Generators Dropdown selections. Select "AF Gen" to display the AF Generator Function Window.



8. Select the following field settings:

Gen 1 Frequency	1.00 kHz
Gen 1 Level	1.000 V
Gen 1 Enable	Off



9. Connect coaxial cable to the AUDIO OUT Connector and the AUDIO IN Connector.
10. Select the Meters Function Tab to display the Meters Dropdown selections. Select "AF Counter" to display the AF Counter Function Window.



## I. AUDIO IN Connector Failure (cont)

---

11. Verify 1 kHz tone on the Spectrum Analyzer.
  - ◆ **CORRECT** - Contact Aeroflex for further assistance.
  - ◆ **INCORRECT** - Go to Part 2.

### **PART 2**

12. Disconnect A2W14P1 (Multi-Function PCB Assy).
13. Connect the Spectrum Analyzer to A2A1J26 (Multi-Function PCB Assy).
14. Verify 1 kHz tone.
  - ◆ **INCORRECT** - Replace the Multi-Function PCB Assy (para 2-4E).
15. Reconnect A2W14P1 (Multi-Function PCB Assy).
16. Disconnect A2W14P2 (AUDIO IN Connector).
17. Connect the Spectrum Analyzer to A2W14P2.
18. Verify 1 kHz tone.
  - ◆ **CORRECT** - Replace the AUDIO IN Connector (para 2-4M).
  - ◆ **INCORRECT** - Replace A2W14.

**Contact Aeroflex if further assistance is required.**

## J. DVM Connector Failure

---

**TEST EQUIPMENT:** Spectrum Analyzer

**REFERENCE FIGURES:** Figure E-3

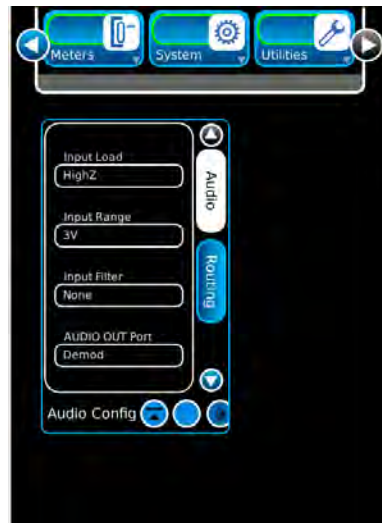
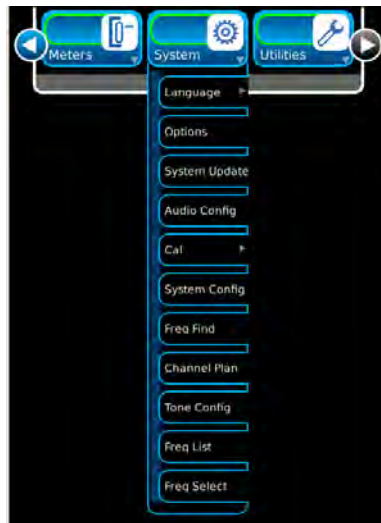
---

### NOTE

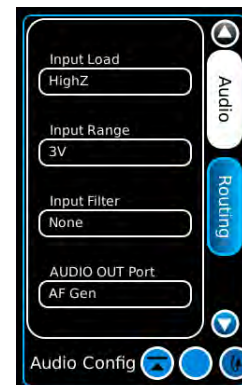
Perform this test only when instructed from the Troubleshooting Table or another troubleshooting test. Do not perform this troubleshooting test as a separate procedure unless otherwise instructed. Certain conditions have been established and/or tested prior to performing this test.

### PART 1

1. Remove the External DC Power Supply from the 3550 / 3550R.
2. Open the Case Assembly (para 2-4C).
3. Connect the External DC Power Supply to the 3550 / 3550R (DC IN Connector).
4. Press the POWER Key.
5. Select the System Function Tab to display the System Dropdown selections. Select "Audio Config" to display the Audio Configuration Function Window.



6. Select the following field setting:  
Audio Out Port      AF Gen  
Input Range          3 V



## J. DVM Connector Failure (cont)

7. Select the Generators Function Tab to display the Generators Dropdown selections. Select "AF Gen" to display the AF Generator Function Window.



8. Select the following field settings:

Gen 1 Frequency	1.00 kHz
Gen 1 Level	1.000 V
Gen 1 Enable	Off



9. Select the Meters Function Tab to display the Meters Dropdown selections. Select "Audio Level" to display the Audio Level Function Window.



## J. DVM Connector Failure (cont)

---

10. Select the following field setting:  
Source                      DVM



11. Connect coaxial cable to the AUDIO OUT Connector and the DVM Connector.  
12. Verify 1 kHz tone on the Spectrum Analyzer.  
◆ **CORRECT** - Contact Aeroflex for further assistance.  
◆ **INCORRECT** - Go to Part 2.

### PART 2

13. Disconnect A2W13P1 (Multi-Function PCB Assy).  
14. Connect the Spectrum Analyzer to A2A1J23 (Multi-Function PCB Assy).  
15. Verify 1 kHz tone.  
◆ **INCORRECT** - Replace the Multi-Function PCB Assy (para 2-4E).  
16. Reconnect A2W13P1 (Multi-Function PCB Assy).  
17. Disconnect A2W13P2 (AUDIO IN Connector).  
18. Connect the Spectrum Analyzer to A2W13P2.  
19. Verify 1 kHz tone.  
◆ **CORRECT** - Replace the DVM Connector (para 2-4L).  
◆ **INCORRECT** - Replace A2W13.

**Contact Aeroflex if further assistance is required.**

## 2-3. CALIBRATION/VERIFICATION PROCEDURES

SUBJECT	PAGE
Generator Verification.....	2-35
Receiver RSSI Verification .....	2-38
TCXO Verification.....	2-42
RF Power Meter Verification .....	2-43
SWR Meter Verification .....	2-49
Audio Level Meter Verification .....	2-51
Calibration Setup .....	2-59
TCXO Calibration .....	2-61
Generator Calibration .....	2-63
Receiver Calibration .....	2-66
RF Power Meter Calibration.....	2-69
SWR Phase Detector Calibration.....	2-73
Audio Level Meter Calibration.....	2-74

### 2-3-1. CALIBRATION/VERIFICATION SCHEDULE

The Calibration/Verification Procedures should be performed when:

<b>Failure to Meet Specifications</b>	If, during the course of normal operation, the 3550 / 3550R or any major function thereof fails to meet the performance specifications.
<b>Module/Assembly Replacement</b>	If one or more of the 3550 / 3550R assemblies are replaced.
<b>Annual Calibration/Verification</b>	Aeroflex recommends an annual Calibration/Verification on the 3550 / 3550R to maintain proper testing standards.

### 2-3-2. TESTING CONDITIONS

The Calibration/Verification Procedures should be performed at room ambient temperature (+20°C to +30°C).

### 2-3-3. SUPPORT EQUIPMENT

#### TEST EQUIPMENT

TYPE	MODEL
Digital Multimeter	HP 34401A or Equivalent
Universal Frequency Counter	Agilent 53131A or Equivalent
Calibrator	Fluke 5520 or Equivalent
Power Meter	Agilent N1911A or Equivalent
Power Meter Sensor	Agilent E4412A or Equivalent
Signal Generator	HP 8648C or Equivalent
RF Power Amplifier (50 W)	

#### ADAPTERS, CABLES AND ACCESSORIES

TYPE	MODEL
Short-Open-Load VSWR Calibrator	Aeroflex (38245)
Directional Coupler	Narda 3020A or Equivalent
Power Splitter (2-Way, Resistive)	
Stub Tuner	Maury Microwave 1778A
TNC (M) to N (M) Adapter	PE 9446
TNC (M) to TNC (M) Adapter	PE 9443
N (F) to N (F) Adapter	Amphenol 082-101
100 MHz Low-Pass Filter	
300 MHz Low-Pass Filter	
700 MHz Low-Pass Filter	
1200 MHz Low-Pass Filter	
50 $\Omega$ Termination	
10 dB Attenuator (10 W)	
20 dB Pad	
BNC T-Connector	
Ethernet Crossover Cable	
TNC to BNC Cable	



## 2-3-4. VERIFICATION PROCEDURES

### A. Generator Verification

---

**TEST EQUIPMENT:** Power Meter  
Power Meter Sensor

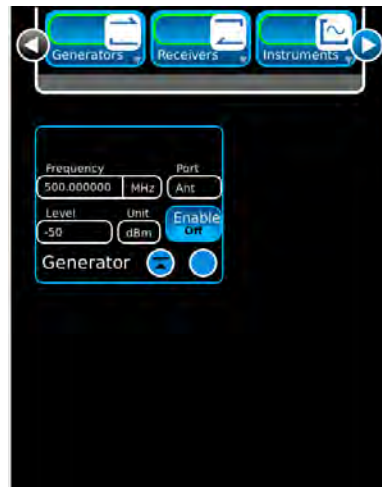
**TEST ACCESSORIES:** TNC (M) to N (M) Adapter

---

#### NOTE

Results of the Generator Verification Procedure can be recorded on the Verification Data Sheets.

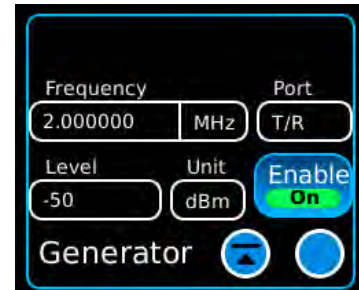
1. Press POWER Key to turn ON the 3550 / 3550R. Allow 3550 / 3550R to warm up before continuing with Verification Procedure.
2. Select the Generators Function Tab to display the Generators Dropdown selections. Select "Generator" to display the Generator Function Window.



#### T/R CONNECTOR

3. Select the following field settings:

Frequency	2.000000 MHz
Port	T/R
Level	-50 dBm
Enable	On



**A. Generator Verification (cont)**

---

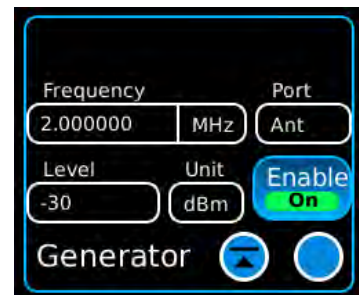
4. **Insure Power Meter Sensor range covers -50 dBm.** Zero and calibrate the Power Meter.
5. Connect the Power Meter Sensor to the T/R Connector.
6. Record Power Meter reading.
7. Set the Frequency Field to 20 MHz.
8. Record Power Meter reading.
9. Repeat Steps 7 and 8 for the following frequencies:

100.000000 MHz	600.000000 MHz
200.000000 MHz	700.000000 MHz
300.000000 MHz	800.000000 MHz
400.000000 MHz	900.000000 MHz
500.000000 MHz	1000.000000 MHz

**ANT CONNECTOR**

10. Select the following field settings:
 

Frequency	2.000000 MHz
Port	Ant
Level	-30 dBm
Enable	On



11. **Insure Power Meter Sensor range covers -30 dBm.** Zero and calibrate the Power Meter.
12. Disconnect the Power Meter Sensor from the T/R Connector and connect the Power Meter Sensor to the ANT Connector.
13. Record Power Meter reading.
14. Set the Frequency Field to 20 MHz.
15. Record Power Meter reading.
16. Repeat Steps 14 and 15 for the following frequencies:

100.000000 MHz	600.000000 MHz
200.000000 MHz	700.000000 MHz
300.000000 MHz	800.000000 MHz
400.000000 MHz	900.000000 MHz
500.000000 MHz	1000.000000 MHz

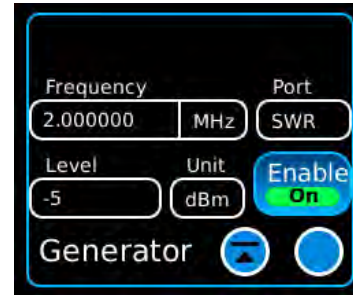
## A. Generator Verification (cont)

---

### SWR CONNECTOR

17. Select the following field settings:

Frequency	2.000000 MHz
Port	SWR
Level	-5 dBm
Enable	On



18. **Insure Power Meter Sensor range covers -5 dBm.** Zero and calibrate the Power Meter.
19. Disconnect the Power Meter Sensor from the ANT Connector and connect the Power Meter Sensor to the T/R Connector.
20. Record Power Meter reading.
21. Set the Frequency Field to 20 MHz.
22. Record Power Meter reading.
23. Repeat Steps 21 and 22 for the following frequencies:

100.000000 MHz	600.000000 MHz
200.000000 MHz	700.000000 MHz
300.000000 MHz	800.000000 MHz
400.000000 MHz	900.000000 MHz
500.000000 MHz	1000.000000 MHz

### RF GENERATOR ERROR

24. Calculate the RF Generator Error by subtracting the Expected reading from the Power Meter reading at each frequency tested on each connector.
- If error is  $>\pm 2$  dB, the 3550 / 3550R is out of specified limits and must be calibrated.
  - If error is  $>\pm 1.5$  dB, the 3550 / 3550R should be calibrated to insure correct operation over temperature.

## B. Receiver RSSI Verification

---

**TEST EQUIPMENT:** Power Meter  
Power Meter Sensor  
Signal Generator

**TEST ACCESSORIES:** Power Splitter (2-Way, Resistive)

---

### NOTE

Results of the Receiver RSSI Verification Procedure can be recorded on the Verification Data Sheets.

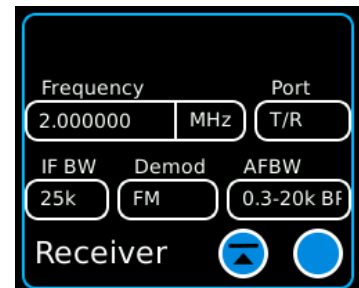
1. Press POWER Key to turn ON the 3550 / 3550R. Allow 3550 / 3550R to warm up before continuing with Verification Procedure.
2. Select the Receivers Function Tab to display the Receivers Dropdown selections. Select "Receiver" to display the Receiver Function Window.



### T/R CONNECTOR

3. Select the following field settings:

Port	T/R
Demod	FM
IF BW	25k



## B. Receiver RSSI Verification (cont)

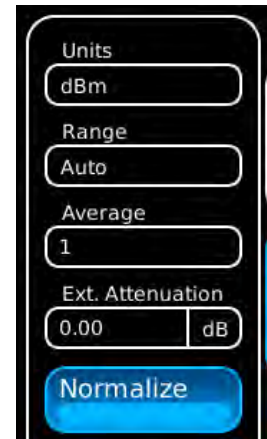
4. Select the Meters Function Tab to display the Meters Dropdown selections. Select "RSSI" to display the RSSI (Meter) Function Window. Press the View Icon twice to access the RSSI (Meter) Field settings.



5. Select "Normalize" on the Config Configuration Screen.

Follow the instructions on the screen.

When the process is completed ("Normalization Completed Successfully" displayed on the screen), press "Ok" to return to the RSSI (Meter) Screen.



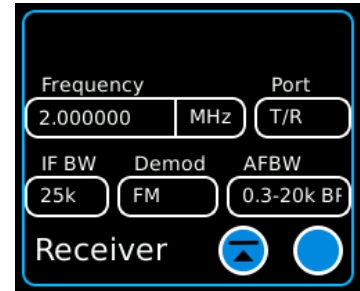
6. Zero and calibrate the Power Meter.
7. Connect the Power Splitter Output to the T/R Connector.
8. Connect the Power Meter Sensor to the other Power Splitter Output.
9. Connect the Signal Generator Output to the Power Splitter Input.
10. Set Signal Generator to -5 dBm (Output Power) and 2 MHz (Frequency).

## B. Receiver RSSI Verification (cont)

---

11. Select the following field settings:

Frequency                      2.000000 MHz



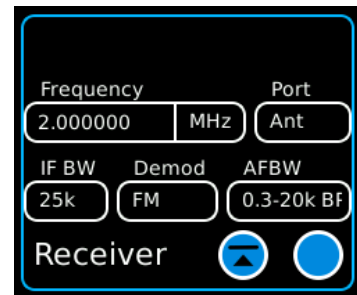
12. Record Power Meter reading and RSSI Meter reading.  
13. Repeat Steps 10 to 12 for the following frequencies:

20.000000 MHz	600.000000 MHz
100.000000 MHz	700.000000 MHz
200.000000 MHz	800.000000 MHz
300.000000 MHz	900.000000 MHz
400.000000 MHz	1000.000000 MHz
500.000000 MHz	

### ANT CONNECTOR

14. Disconnect the Power Splitter Output from the T/R Connector and connect the Power Splitter Output to the ANT Connector.  
15. Select the following field setting:

Port                              Ant  
Frequency                      2.000000 MHz



16. Set Signal Generator to -20 dBm (Output Power) and 2 MHz (Frequency).  
17. Record Power Meter reading and RSSI Meter reading.

## B. Receiver RSSI Verification (cont)

---

18. Repeat Steps 15 to 17 for the following frequencies:

20.000000 MHz	600.000000 MHz
100.000000 MHz	700.000000 MHz
200.000000 MHz	800.000000 MHz
300.000000 MHz	900.000000 MHz
400.000000 MHz	1000.000000 MHz
500.000000 MHz	

### **RSSI METER ERROR**

19. Calculate the RSSI Meter Error by subtracting the Power Meter reading from the RSSI Meter reading at each frequency tested on each connector.
- If error is  $>\pm 2$  dB, the 3550 / 3550R is out of specified limits and must be calibrated.
  - If error is  $>\pm 1.5$  dB, the 3550 / 3550R should be calibrated to insure correct operation over temperature.

### C. TCXO Verification

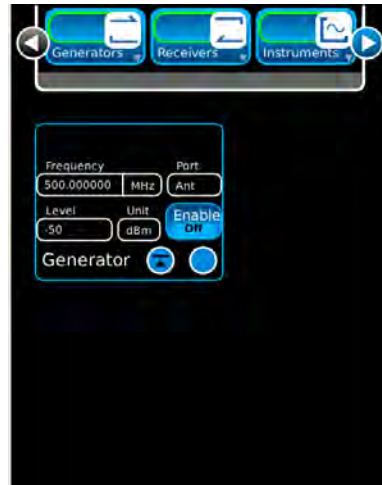
---

**TEST EQUIPMENT:** Universal Frequency Counter

**TEST ACCESSORIES:** None

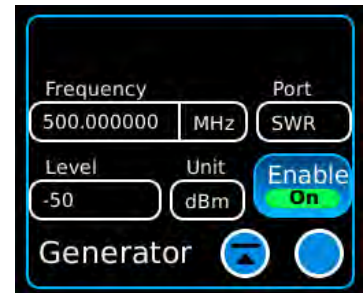
---

1. Press POWER Key to turn ON the 3550 / 3550R. Allow 3550 / 3550R to warm up before continuing with Verification Procedure.
2. Select the Generators Function Tab to display the Generators Dropdown selections. Select "Generator" to display the Generator Function Window.



3. Select the following field settings:

Frequency	500.000000 MHz
Port	SWR
Level	-5 dBm
Enable	On



4. Connect the Universal Frequency Counter to the SWR Connector.
5. Record the Universal Frequency Counter reading.
6. Calculate the TCXO Error by subtracting 500 MHz from the Universal Frequency Counter reading.
  - If error is  $>\pm 500$  Hz, the 3550 / 3550R is out of specified limits and must be calibrated.
  - If error is  $>\pm 150$  Hz, the 3550 / 3550R should be calibrated to insure correct operation over temperature.



## D. RF Power Meter Verification

---

**TEST EQUIPMENT:** Coupler  
Power Meter  
RF Power Amplifier (50 W)  
Signal Generator

**TEST ACCESSORIES:** 10 dB Attenuator (50 W)  
50  $\Omega$  Termination  
100 MHz Low-Pass Filter  
300 MHz Low-Pass Filter  
700 MHz Low-Pass Filter  
1200 MHz Low-Pass Filter  
Stub Tuner

---

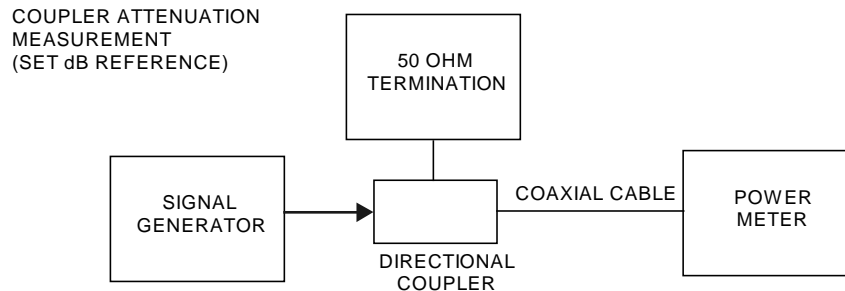
**The following steps must be performed in the order shown.**

### NOTE

Results of the RF Power Meter Verification Procedure can be recorded on the Verification Data Sheets.

### RF COUPLED PORT ATTENUATION

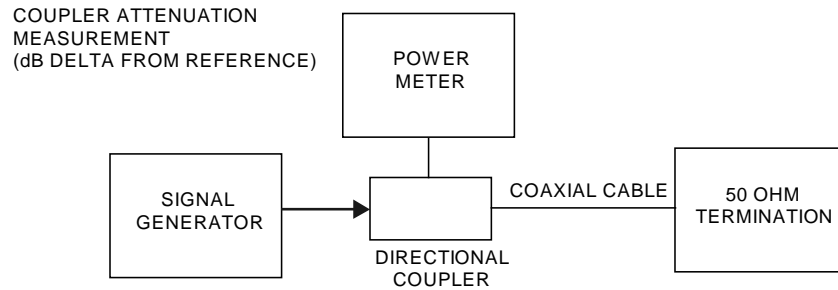
1. Zero and calibrate the RF Power Meter.
2. Connect test equipment:



3. Set the Signal Generator to 100 MHz, CW and 0 dBm.
4. Set the RF Power Meter to 100 MHz.
5. Press Relative on the RF Power Meter to reference the output power level at the end of the coaxial cable.

## D. RF Power Meter Verification (cont)

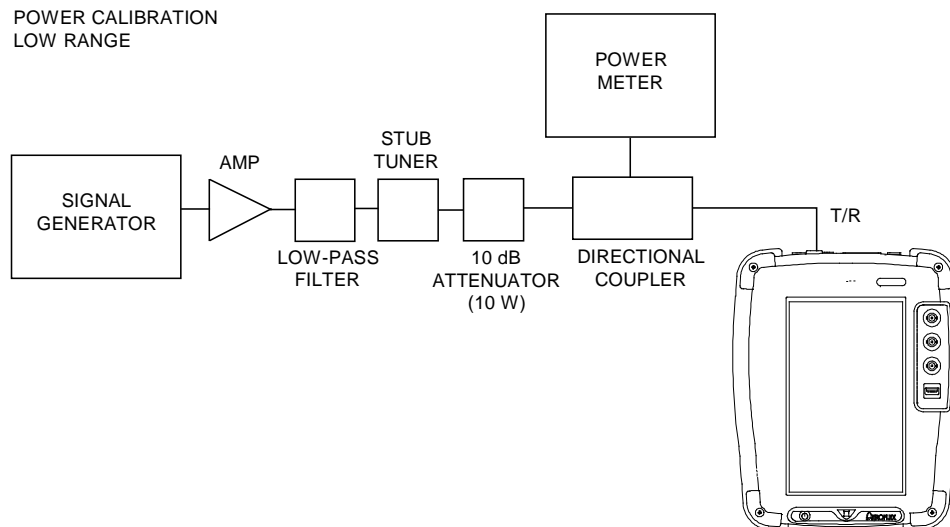
6. Move the Power Sensor to the Coupler's forward-coupled port and move the 50  $\Omega$  Termination to the end of the coaxial cable:



7. Record the RF Power Meter relative dB value for 100 MHz:

Coupled Port Attenuation (dB)	
100 MHz	
300 MHz	
500 MHz	
700 MHz	
900 MHz	

8. Repeat Steps 2 to 7 for 300 MHz.
9. Repeat Steps 2 to 7 for 500 MHz.
10. Repeat Steps 2 to 7 for 700 MHz.
11. Repeat Steps 2 to 7 for 900 MHz.
12. Connect test equipment (using 100 MHz Low-Pass Filter):



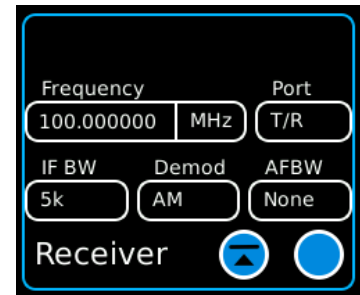
## D. RF Power Meter Verification (cont)

13. Set the Signal Generator to 100 MHz, CW, -50 dBm and RF OFF.
14. Set the RF Power Meter to 100 MHz, Relative OFF and Offset value to 100 MHz coupled port attenuation recorded in Step 7.
15. Set RF Power Amplifier Gain to Maximum and ALC to OFF.
16. Set the RF Power Amplifier to OFF.
17. Select the Receivers Function Tab to display the Receivers Dropdown selections. Select "Receiver" to display the Receiver Function Window.



18. Select the following field settings:

Frequency	100.000000 MHz
Port	T/R





#### D. RF Power Meter Verification (cont)

---

24. Adjust the Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to +27 dBm value ( $\pm 0.3$  dB).
25. Record RF Power Meter reading and 3550 / 3550R Power Meter reading.
26. Adjust the Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to +37 dBm value. (If +37 dBm is not achievable due to setup losses, set as high as possible.)
27. Record RF Power Meter reading and 3550 / 3550R Power Meter reading.
28. Set the Signal Generator to RF OFF.
29. Set the RF Power Amplifier to OFF.
30. Replace the 100 MHz Low-Pass Filter with the 300 MHz Low-Pass Filter in the Test Setup.
31. Set the Signal Generator to 300 MHz.
32. Set the RF Power Meter to 300 MHz, Relative OFF and Offset value to 300 MHz coupled port attenuation recorded in Step 7.
33. Set the RF Power Amplifier to ON.
34. Set the Signal Generator to RF ON.
35. Adjust the Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to +27 dBm value ( $\pm 0.3$  dB).
36. Record the RF Power Meter reading and 3550 / 3550R Power Meter reading.
37. Adjust the Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to +37 dBm value. (If +37 dBm is not achievable due to setup losses, set as high as possible.)
38. Record the RF Power Meter reading and 3550 / 3550R Power Meter reading.
39. Set the Signal Generator to RF OFF.
40. Set the RF Power Amplifier to OFF.
41. Replace the 300 MHz Low-Pass Filter with the 700 MHz Low-Pass Filter in the Test Setup.
42. Set the Signal Generator to 500 MHz.
43. Set the RF Power Meter to 500 MHz, Relative OFF and Offset value to 500 MHz coupled port attenuation recorded in Step 7.
44. Set the RF Power Amplifier to ON.
45. Set the Signal Generator to RF ON.
46. Adjust the Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to +27 dBm value ( $\pm 0.3$  dB).
47. Record the RF Power Meter reading and 3550 / 3550R Power Meter reading.
48. Adjust the Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to +37 dBm value. (If +37 dBm is not achievable due to setup losses, set as high as possible.)
49. Record the RF Power Meter reading and 3550 / 3550R Power Meter reading.
50. Set the Signal Generator to RF OFF.
51. Set the RF Power Amplifier to OFF.

## D. RF Power Meter Verification (cont)

---

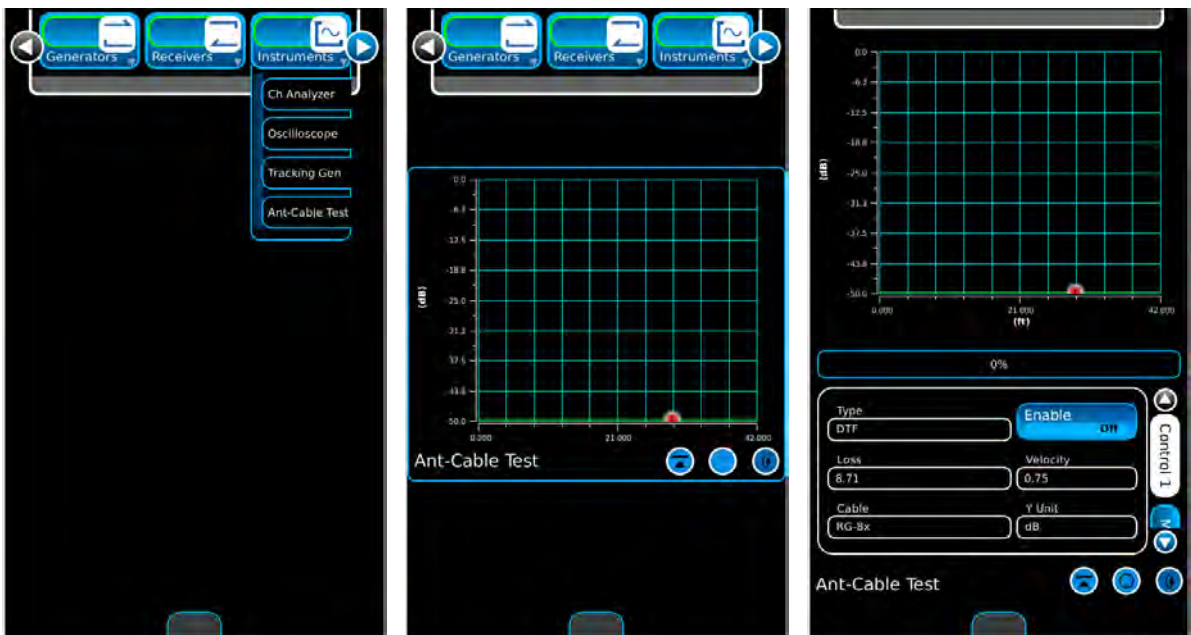
52. Set the Signal Generator to 700 MHz.
53. Set the RF Power Meter to 700 MHz, Relative OFF and Offset value to 700 MHz coupled port attenuation recorded in Step 7.
54. Set RF Power Amplifier to ON.
55. Set Signal Generator to RF ON.
56. Adjust the Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to +27 dBm value ( $\pm 0.3$  dB).
57. Record the RF Power Meter reading and 3550 / 3550R Power Meter reading.
58. Adjust the Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to +37 dBm value. (If +37 dBm is not achievable due to setup losses, set as high as possible.)
59. Record the RF Power Meter reading and 3550 / 3550R Power Meter reading.
60. Set the Signal Generator to RF OFF.
61. Set the RF Power Amplifier to OFF.
62. Replace the 700 MHz Low-Pass Filter with the 1200 MHz Low-Pass Filter in the Test Setup.
63. Set the Signal Generator to 900 MHz.
64. Set the RF Power Meter to 900 MHz, Relative OFF and Offset value to 900 MHz coupled port attenuation recorded in Step 7.
65. Set the Signal Generator to RF ON.
66. Set the RF Power Amplifier to ON.
67. Adjust the Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to +27 dBm value ( $\pm 0.3$  dB).
68. Record the RF Power Meter reading and 3550 / 3550R Power Meter reading.
69. Adjust the Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to +37 dBm value. (If +37 dBm is not achievable due to setup losses, set as high as possible.)
70. Record the RF Power Meter reading and 3550 / 3550R Power Meter reading.
71. Set the Signal Generator to RF OFF.
72. Set the RF Power Amplifier to OFF.
73. Calculate the 3550 / 3550R Power Meter Error by subtracting the Actual Power Meter reading from the 3550 / 3550R reading.
  - If error is  $>+0.6$  dB or  $<-0.7$  dB, the 3550 / 3550R is out of specified limits and must be recalibrated.
  - If error is  $>\pm 0.3$  dB, the 3550 / 3550R should be calibrated to insure correct operation over temperature.

## E. SWR Meter Verification

**TEST EQUIPMENT:** None

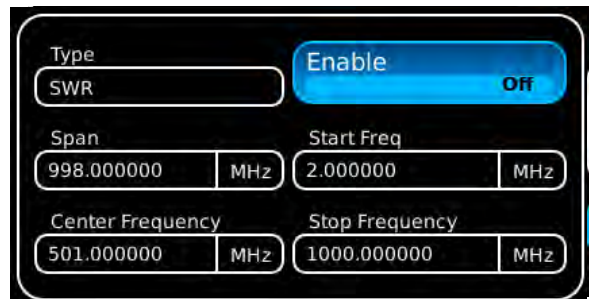
**TEST ACCESSORIES:** 20 dB Pad (2)  
BNC T-Connector

1. Press POWER Key to turn ON the 3550 / 3550R. Allow 3550 / 3550R to warm up before continuing with Verification Procedure.
2. Select the Instruments Function Tab to display the Instruments Dropdown selections. Select "Ant-Cable Test" to display the Ant-Cable Test Function Window. Press the View Icon to access the Ant-Cable Field settings.



3. Select the following field setting on the Control 1 Configuration Screen:

Type	SWR
Start Freq	2.000000 MHz
Stop Freq	1000.000000 MHz



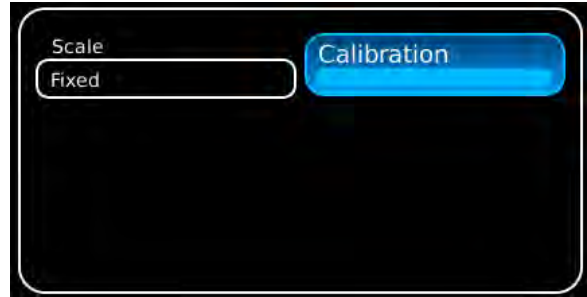
## E. SWR Meter Verification (cont)

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4. Select "Calibration" on the Control 2 Configuration Screen.

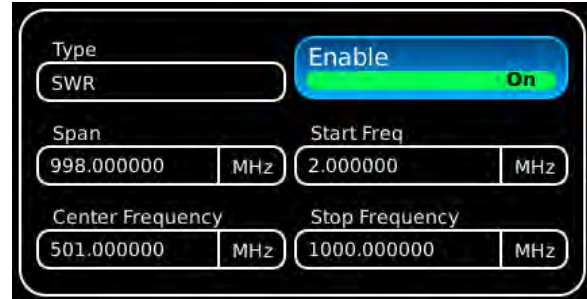
Follow the instructions on the screen to complete the SWR Calibration.

When SWR Calibration is completed ("Calibration Complete" displayed on screen), press "Ok" to return to the ANT-Cable Test Screen.



5. Select the following field settings on the Control 1 Configuration Screen:

Span                      998.000000 MHz  
Enable                    On



6. Connect the BNC T-Connector to the SWR Connector.
7. Connect a 20 dB Pad to each open connector of the BNC T-Connector.
8. Allowing a minimum of 2 sweeps (updates) of the display, verify the SWR Reading is:  
2:1 ( $\pm 10\%$  - 2 to 300 MHz) ( $\pm 20\%$  - 300 to 1000 MHz)



## F. Audio Level Meter Verification

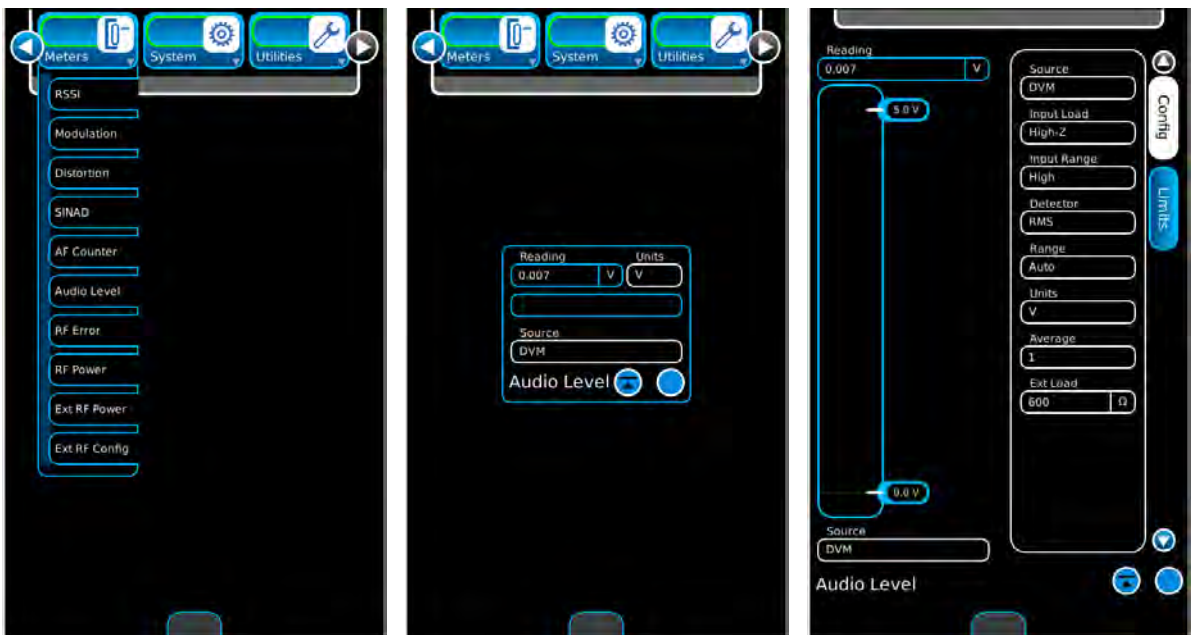
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**TEST EQUIPMENT:**      Calibrator  
                                 Digital Multimeter

**TEST ACCESSORIES:**    BNC T-Connector

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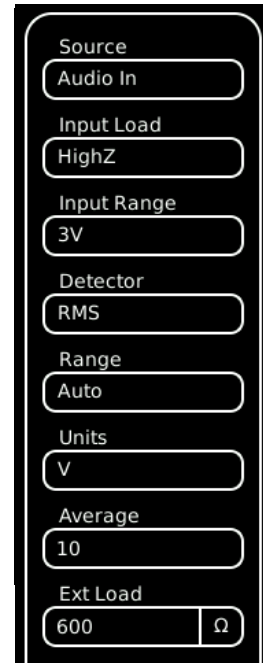
1. Press POWER Key to turn ON the 3550 / 3550R. Allow 3550 / 3550R to warm up before continuing with Verification Procedure.
2. Select the Meters Function Tab to display the Meters Dropdown selections. Select “Audio Level” to display the Audio Level (Meter) Function Window. Press the View Icon twice to access the Audio Level (Meter) Field settings.



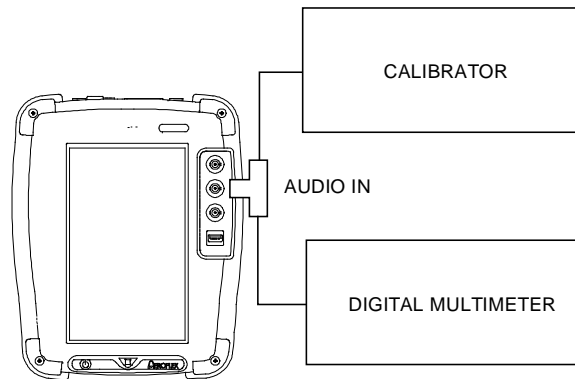
**F. Audio Level Meter Verification (cont)**

3. Select the following field settings on the Config Configuration Screen:

Source	Audio In
Input Load	High-Z
Input Range	3V
Detector	RMS
Range	Auto
Units	V
Average	10



4. Connect test equipment:

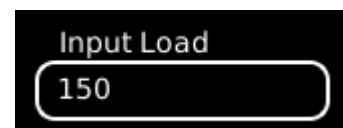


5. Set the Calibrator as follows (use the Digital Multimeter to set level  $\pm 10$  mV):

Level	1 Vrms
Frequency	1 kHz

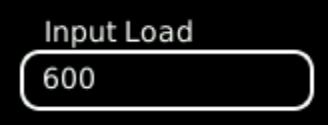
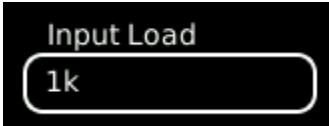
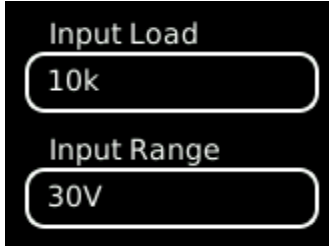
6. Record the Digital Multimeter reading and the level displayed on the 3550 / 3550R.  
 7. Verify the level displayed on the 3550 / 3550R is within  $\pm 5\%$  of the reading on the Digital Multimeter.  
 8. Select the following field setting on the Config Configuration Screen:

Input Load	150
------------	-----



## F. Audio Level Meter Verification (cont)

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9. Record the Digital Multimeter reading and the level displayed on the 3550 / 3550R.
10. Verify the level displayed on the 3550 / 3550R is within  $\pm 5\%$  of the reading on the Digital Multimeter.
11. Select the following field setting on the Config Configuration Screen:  
Ext Load                      600  $\Omega$   

12. Record the Digital Multimeter reading and the level displayed on the 3550 / 3550R.
13. Verify the level displayed on the 3550 / 3550R is within  $\pm 5\%$  of the reading on the Digital Multimeter.
14. Select the following field setting on the Config Configuration Screen:  
Ext Load                      1 k $\Omega$   

15. Record the Digital Multimeter reading and the level displayed on the 3550 / 3550R.
16. Verify the level displayed on the 3550 / 3550R is within  $\pm 5\%$  of the reading on the Digital Multimeter.
17. Select the following field setting on the Config Configuration Screen:  
Input Range                      30V  

18. Set the Calibrator Level to 3 Vrms.
19. Record the Digital Multimeter reading and the level displayed on the 3550 / 3550R.
20. Verify the level displayed on the 3550 / 3550R is within  $\pm 5\%$  of the reading on the Digital Multimeter.

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## G. Verification Data Sheets

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### GENERATOR VERIFICATION

#### T/R Connector

FREQUENCY (MHz)	POWER METER (dBm)	EXPECTED (dBm)	ERROR (Power Meter - Expected)
2		-50	
20		-50	
100		-50	
200		-50	
300		-50	
400		-50	
500		-50	
600		-50	
700		-50	
800		-50	
900		-50	
1000		-50	

#### ANT Connector

FREQUENCY (MHz)	POWER METER (dBm)	EXPECTED (dBm)	ERROR (Power Meter - Expected)
2		-30	
20		-30	
100		-30	
200		-30	
300		-30	
400		-30	
500		-30	
600		-30	
700		-30	
800		-30	
900		-30	
1000		-30	

**G. Verification Data Sheets (cont)**

---

**GENERATOR VERIFICATION (cont)**

**SWR Connector**

<b>FREQUENCY (MHz)</b>	<b>POWER METER (dBm)</b>	<b>EXPECTED (dBm)</b>	<b>ERROR (Power Meter - Expected)</b>
2		-5	
20		-5	
100		-5	
200		-5	
300		-5	
400		-5	
500		-5	
600		-5	
700		-5	
800		-5	
900		-5	
1000		-5	

**G. Verification Data Sheets (cont)**

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**RECEIVER RSSI VERIFICATION**

**T/R Connector**

<b>FREQUENCY (MHz)</b>	<b>POWER METER (dBm)</b>	<b>RSSI METER (dBm)</b>	<b>ERROR (RSSI Meter - Power Meter)</b>
2			
20			
100			
200			
300			
400			
500			
600			
700			
800			
900			
1000			

**ANT Connector**

<b>FREQUENCY (MHz)</b>	<b>POWER METER (dBm)</b>	<b>RSSI METER (dBm)</b>	<b>ERROR (RSSI Meter - Power Meter)</b>
2			
20			
100			
200			
300			
400			
500			
600			
700			
800			
900			
1000			

**G. Verification Data Sheets (cont)**

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**RF POWER METER VERIFICATION**

<b>FREQUENCY (MHz)</b>	<b>SET POWER (dBm)</b>	<b>POWER METER ACTUAL (dBm)</b>	<b>3550 / 3550R MEASURED (dBm)</b>	<b>ERROR 3550 / 3550R - ACTUAL (dB)</b>
100	+27			
100	+37			
300	+27			
300	+37			
500	+27			
500	+37			
700	+27			
700	+37			
900	+27			
900	+37			



## 2-3-5. CALIBRATION PROCEDURES

### A. Calibration Setup (using the Agilent N1911A Power Meter)

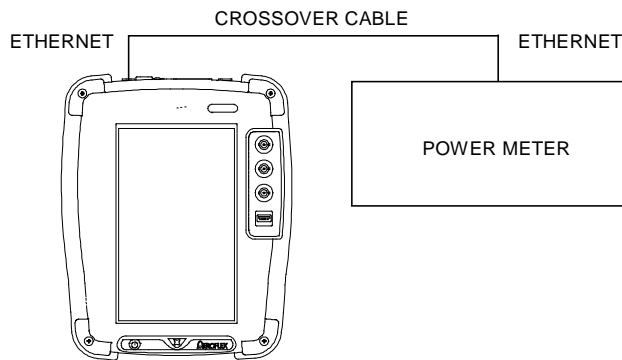
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**TEST EQUIPMENT:** Agilent N1911A Power Meter  
Agilent E4412A Power Meter Sensor

**TEST ACCESSORIES:** Ethernet Crossover Cable

---

1. Turn on both the 3550 / 3550R and the Agilent N1911A Power Meter, and then connect a Crossover Cable between the 3550 / 3550R ETHERNET Connector and the Agilent N1911A Power Meter Ethernet Connector:



2. Perform the following steps to set the IP Address of the Agilent N1911A Power Meter:  
Press the "System" -> "Remote Interface" -> "Network Manual" Buttons.  
Use the Arrow and Select Keys to set information for the Power Meter:  
IP Address: **10.10.10.10**  
Subnet Mask: **255.255.0.0**  
Default Gateway: **10.10.10.1**
3. Allow the Agilent N1911A Power Meter to warm up for 30 minutes before proceeding.
4. Zero and calibrate the Agilent N1911A Power Meter.

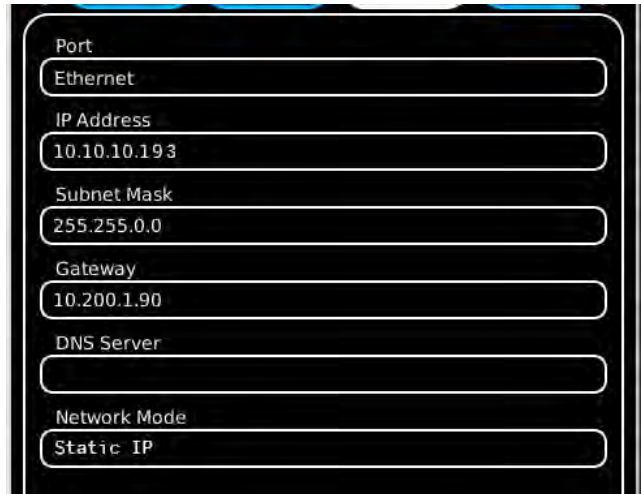
## A. Calibration Setup (using the Agilent N1911A Power Meter) (cont)

- Select the System Function Tab to display the System Dropdown selections. Select “System Config” to display the System Config (Configuration) Function Window. Press the “Remote” Button to display the Remote Configuration Screen.



- Select the following field settings:

Port	Ethernet
IP Address	10.10.10.193
Subnet Mask	255.255.0.0
Network Mode	Static IP



## B. TCXO Calibration

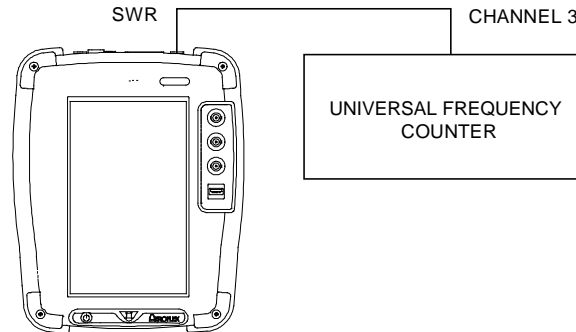
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**TEST EQUIPMENT:** Universal Frequency Counter

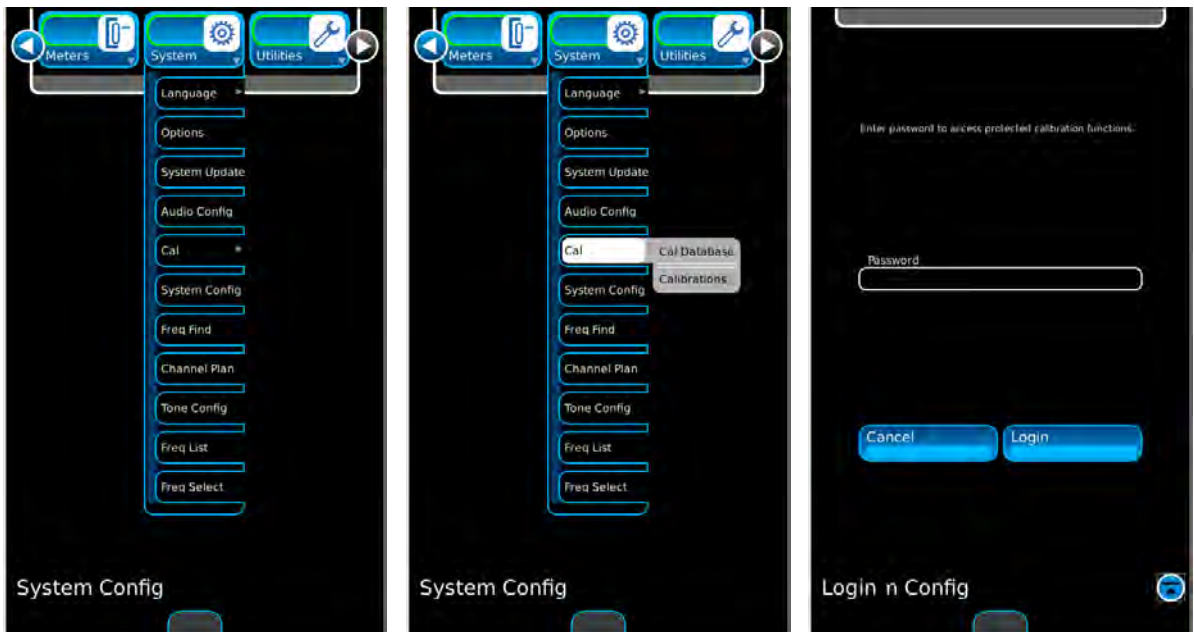
**TEST ACCESSORIES:** None

---

1. Establish the following test setup:



1. On the Universal Frequency Counter, press the “Freq & Ratio” Button until “Frequency 3” is displayed.
2. Select the System Function Tab to display the System Dropdown selections. Select “Cal” to select the Calibration Dropdown selections. Select “Calibrations” to display the Calibration Login Screen.

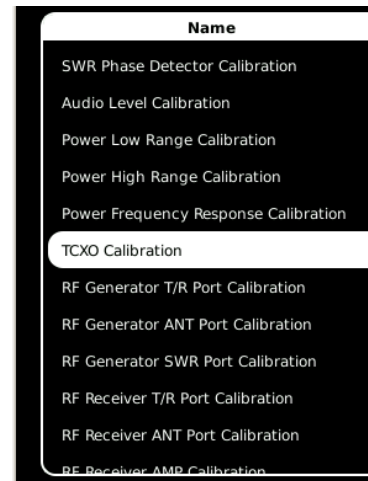


3. Type in the Calibration Password (9992) and press Enter.

## B. TCXO Calibration (cont)

---

4. With the Calibration Screen displayed, select “TCXO Calibration” and select “Run Selected.”  
  
Move the cursor to the TXCO: field. Enter the TXCO Value (**2100**) as the initial value.  
  
Adjust the TCXO Value as needed so the reading on the Universal Counter is as close to 500 MHz as possible.  
  
Select “Enter” to store the value.  
  
Select “Save.”  
  
Select “Ok” to complete the TCXO Calibration.



5. Cycle power on the 3550 / 3550R.

### C. Generator Calibration

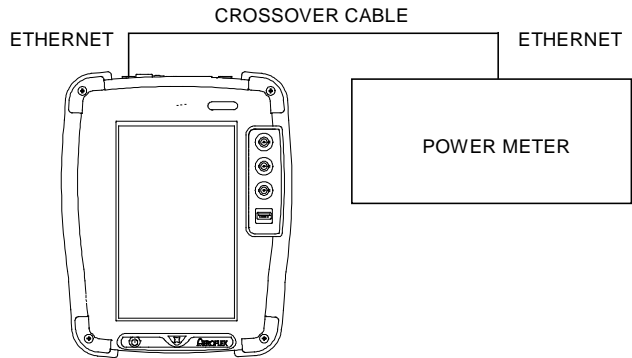
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**TEST EQUIPMENT:** Power Meter  
Power Meter Sensor

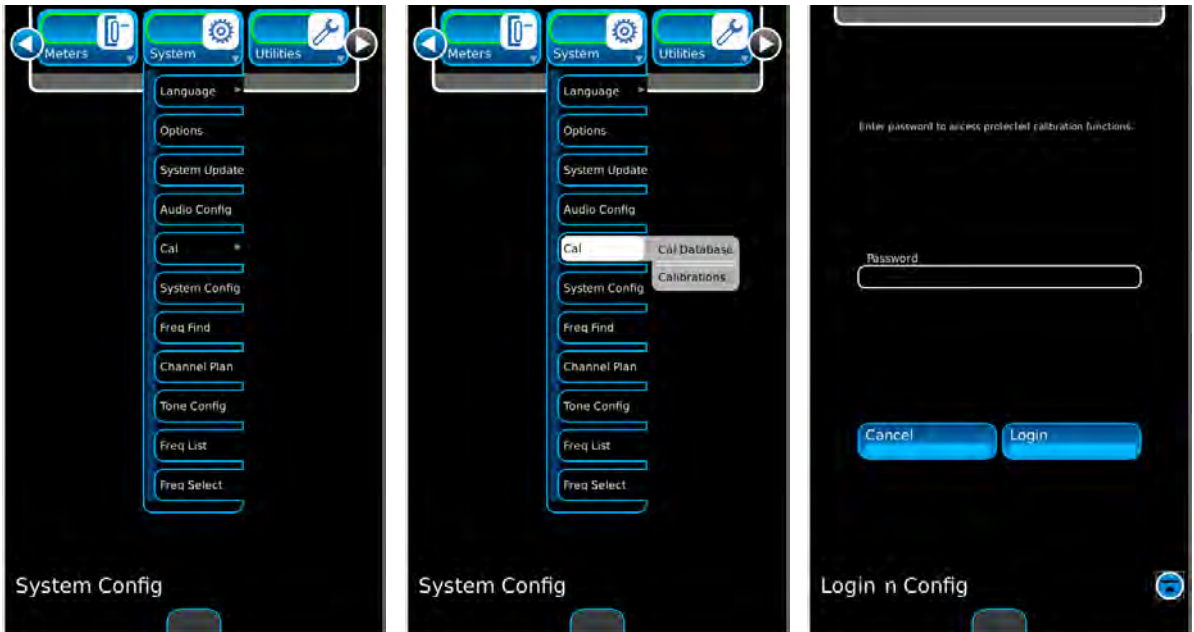
**TEST ACCESSORIES:** Ethernet Crossover Cable

---

1. Establish the following test setup:



2. Select the System Function Tab to display the System Dropdown selections. Select “Cal” to select the Calibration Dropdown selections. Select “Calibrations” to display the Calibration Login Screen.



3. Type in the Calibration Password (9992) and press Enter.

## C. Generator Calibration (cont)

---

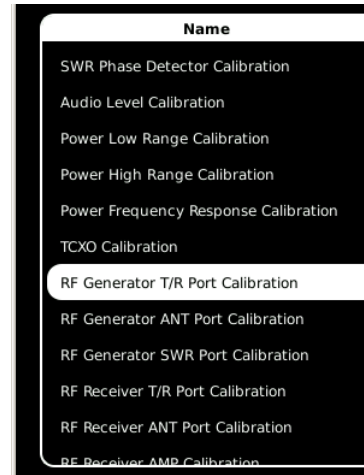
### T/R CONNECTOR

4. With the Calibration Screen displayed, select "RF Generator T/R Port Calibration."

Select "Run Selected."

Select "Auto" and follow instructions.

When the RF Generator T/R Port Calibration is completed ("Calibration Completed Successfully" is displayed on screen), press "Ok" to return to the Calibrations Screen.



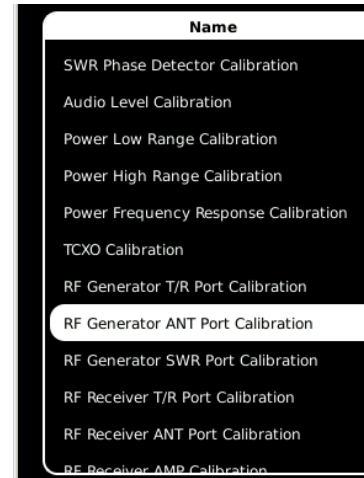
### ANT CONNECTOR

5. With the Calibration Screen displayed, select "RF Generator ANT Port Calibration."

Select "Run Selected."

Select "Auto" and follow instructions.

When the RF Generator ANT Port Calibration is completed ("Calibration Completed Successfully" is displayed on screen), press "Ok" to return to the Calibrations Screen.



## C. Generator Calibration (cont)

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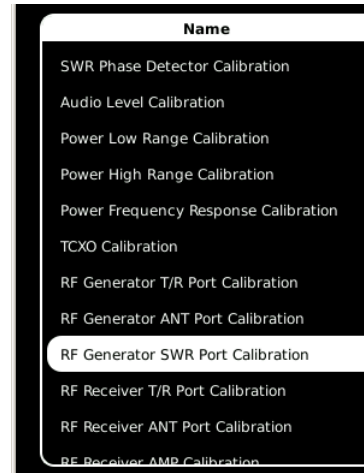
### SWR CONNECTOR

6. With the Calibration Screen displayed, select "RF Generator SWR Port Calibration."

Select "Run Selected."

Select "Auto" and follow instructions.

When the RF Generator SWR Port Calibration is completed ("Calibration Completed Successfully" is displayed on screen), press "Ok" to return to the Calibrations Screen.



7. Cycle power on the 3550 / 3550R.

## D. Receiver Calibration

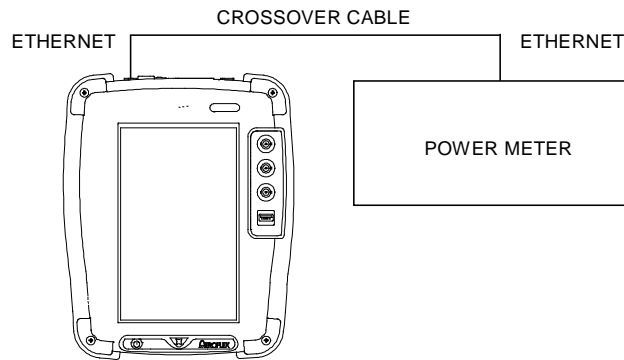
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**TEST EQUIPMENT:** Power Meter  
Power Meter Sensor

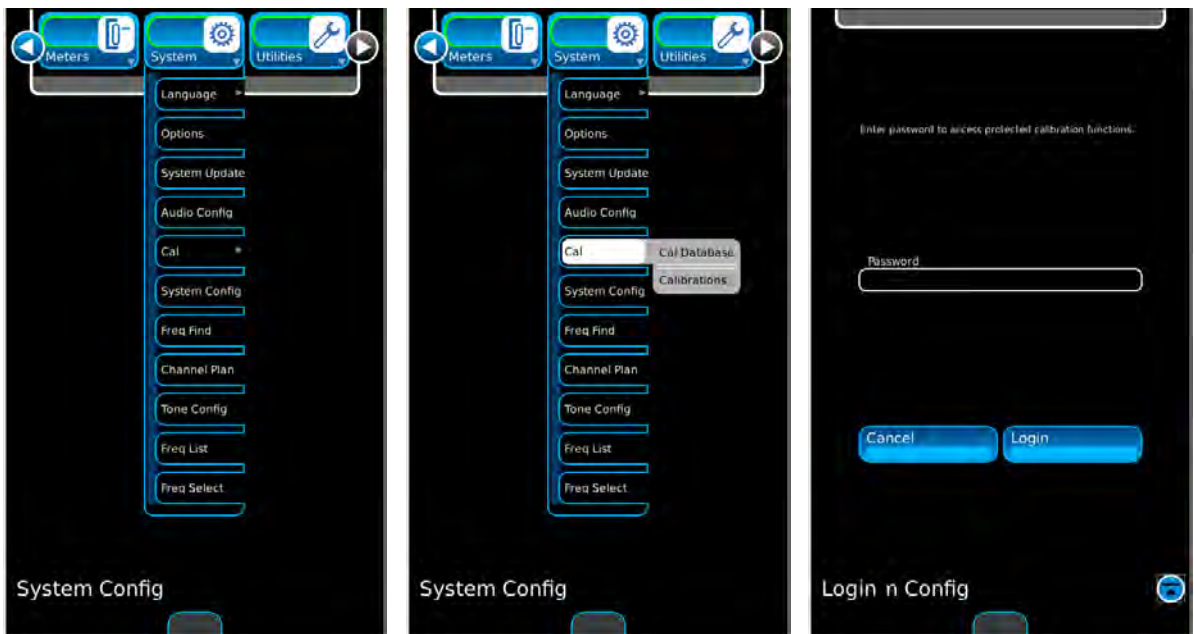
**TEST ACCESSORIES:** Ethernet Crossover Cable  
Power Splitter (2-Way, Resistive)

---

1. Establish the following test setup:



2. Select the System Function Tab to display the System Dropdown selections. Select “Cal” to select the Calibration Dropdown selections. Select “Calibrations” to display the Calibration Login Screen.



3. Type in the Calibration Password (9992) and press Enter.



## D. Receiver Calibration (cont)

---

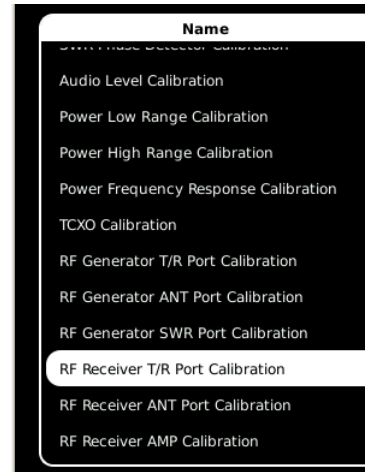
### T/R CONNECTOR

4. With the Calibration Screen displayed, select “RF Receiver T/R Port Calibration.”

Select “Run Selected.”

Select “Auto” and follow instructions.

When the RF Receiver T/R Port Calibration is completed (“Calibration Completed Successfully” is displayed on screen), press “Ok” to return to the Calibrations Screen.



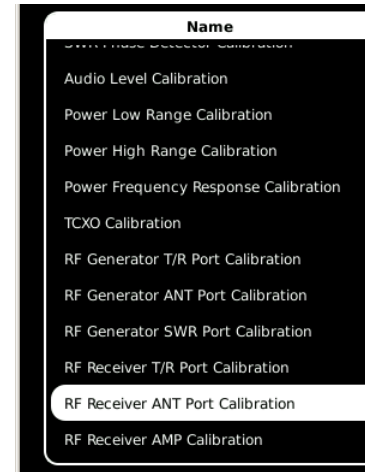
### ANT CONNECTOR

5. With the Calibration Screen displayed, select “RF Receiver ANT Port Calibration.”

Select “Run Selected.”

Select “Auto” and follow instructions.

When the RF Receiver ANT Port Calibration is completed (“Calibration Completed Successfully” is displayed on screen), press “Ok” to return to the Calibrations Screen.



## D. Receiver Calibration (cont)

---

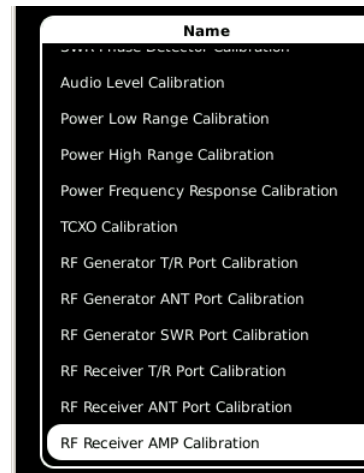
### PRE AMP

6. With the Calibration Screen displayed, select "RF Receiver AMP Calibration."

Select "Run Selected."

Select "Auto" and follow instructions.

When the RF Receiver AMP Calibration is completed ("Calibration Completed Successfully" is displayed on screen), press "Ok" to return to the Calibrations Screen.



7. Cycle power on the 3550 / 3550R.

## E. RF Power Meter Calibration

---

**TEST EQUIPMENT:** Coupler  
Power Meter  
RF Power Amplifier (50 W)  
Signal Generator

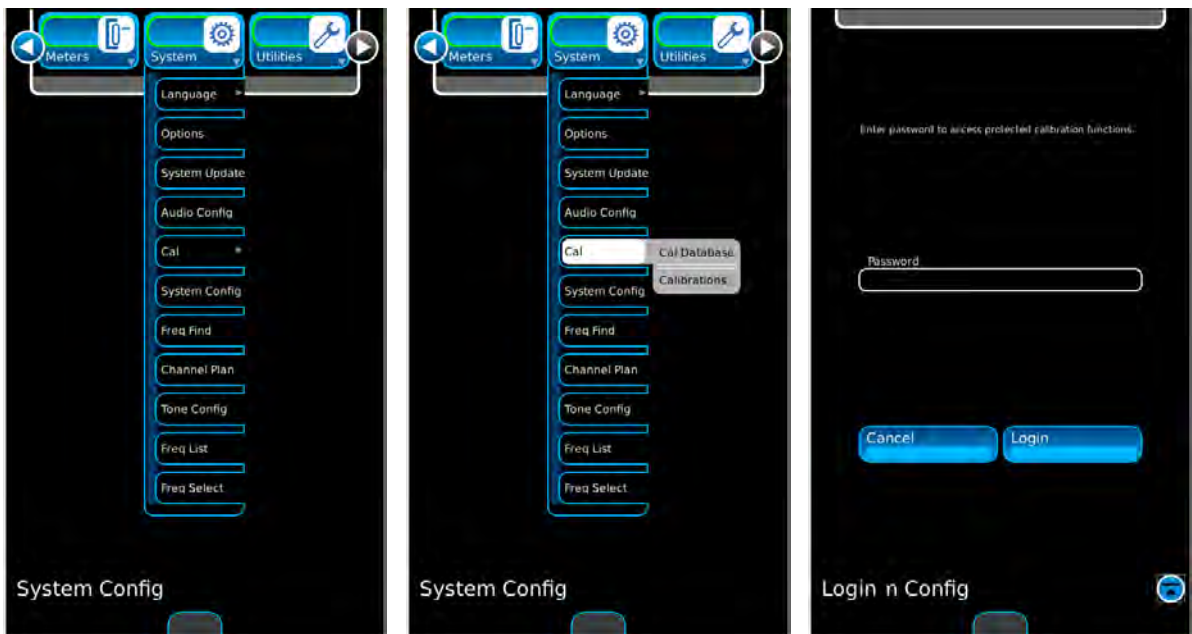
**TEST ACCESSORIES:** 10 dB Attenuator (50 W)  
50  $\Omega$  Termination  
100 MHz Low-Pass Filter  
300 MHz Low-Pass Filter  
700 MHz Low-Pass Filter  
1200 MHz Low-Pass Filter  
Stub Tuner

---

**The following steps must be performed in the order shown.**

### RF POWER CAL LOW RANGE

1. Select the System Function Tab to display the System Dropdown selections. Select “Cal” to select the Calibration Dropdown selections. Select “Calibrations” to display the Calibration Login Screen.



2. Type in the Calibration Password (9992) and press Enter.

## E. RF Power Meter Calibration (cont)

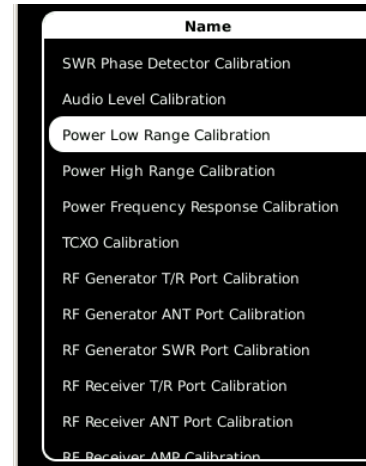
---

3. With the Calibration Screen displayed, select “Power Low Range Calibration.”

Select “Run Selected.”

Follow the instructions.

Coupled Port Attenuation (dB)	
100 MHz	
300 MHz	
500 MHz	
700 MHz	
900 MHz	



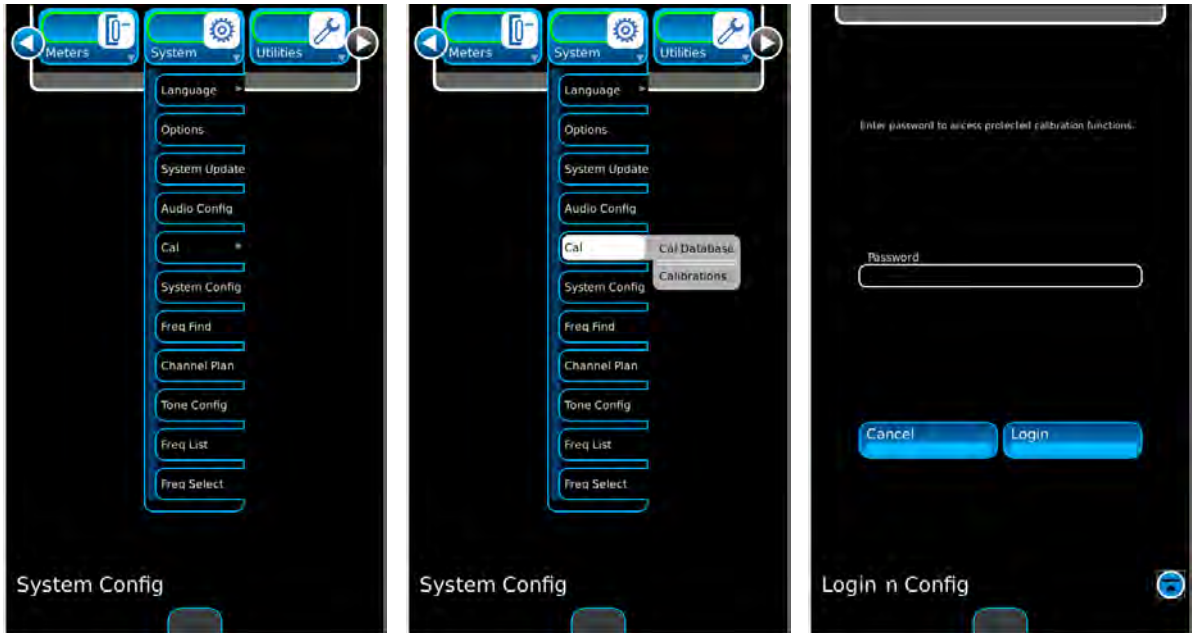
When the Power Low Range Calibration is completed (“Calibration Completed Successfully” is displayed on screen), press “Ok” to return to the Calibrations Screen.

4. Cycle power on the 3550 / 3550R.

## E. RF Power Meter Calibration (cont)

### RF POWER CAL HIGH RANGE

5. Select the System Function Tab to display the System Dropdown selections. Select “Cal” to select the Calibration Dropdown selections. Select “Calibrations” to display the Calibration Login Screen.

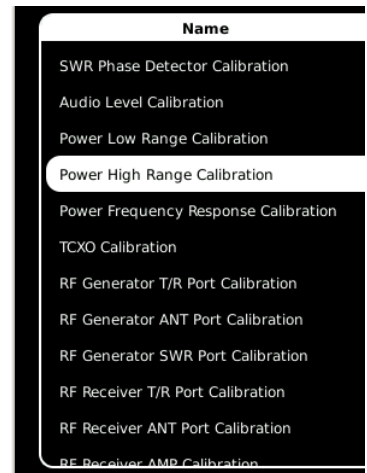


6. Type in the Calibration Password (9992) and press Enter.
7. With the Calibration Screen displayed, select “Power High Range Calibration.”

Select “Run Selected.”

Follow the instructions.

When the Power High Range Calibration is completed (“Calibration Completed Successfully” is displayed on screen), press “Ok” to return to the Calibrations Screen.

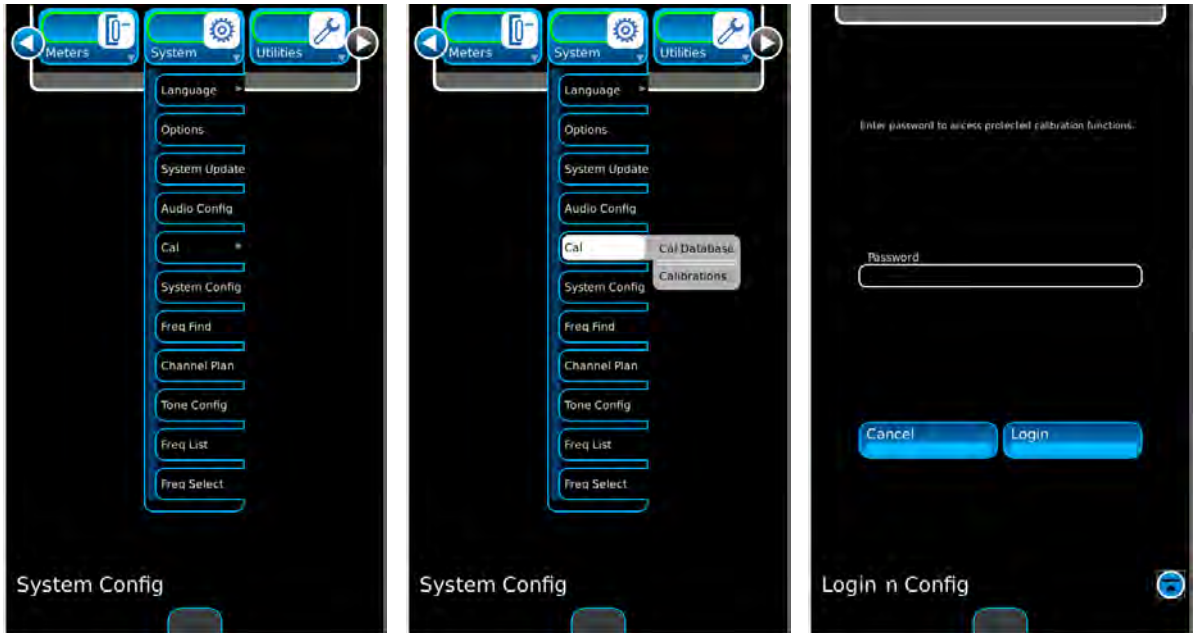


8. Cycle power on the 3550 / 3550R.

## E. RF Power Meter Calibration (cont)

### FREQUENCY RESPONSE POWER CAL

9. Select the System Function Tab to display the System Dropdown selections. Select "Cal" to select the Calibration Dropdown selections. Select "Calibrations" to display the Calibration Login Screen.



10. Type in the Calibration Password (9992) and press Enter.

11. With the Calibration Screen displayed, select "Power Frequency Response Calibration."

Select "Run Selected."

Follow the instructions.

When the Power Frequency Response Calibration is completed ("Calibration Completed Successfully" is displayed on screen), press "Ok" to return to the Calibrations Screen.

Name
SWR Phase Detector Calibration
Audio Level Calibration
Power Low Range Calibration
Power High Range Calibration
Power Frequency Response Calibration
TCXO Calibration
RF Generator T/R Port Calibration
RF Generator ANT Port Calibration
RF Generator SWR Port Calibration
RF Receiver T/R Port Calibration
RF Receiver ANT Port Calibration
RF Receiver AMP Calibration

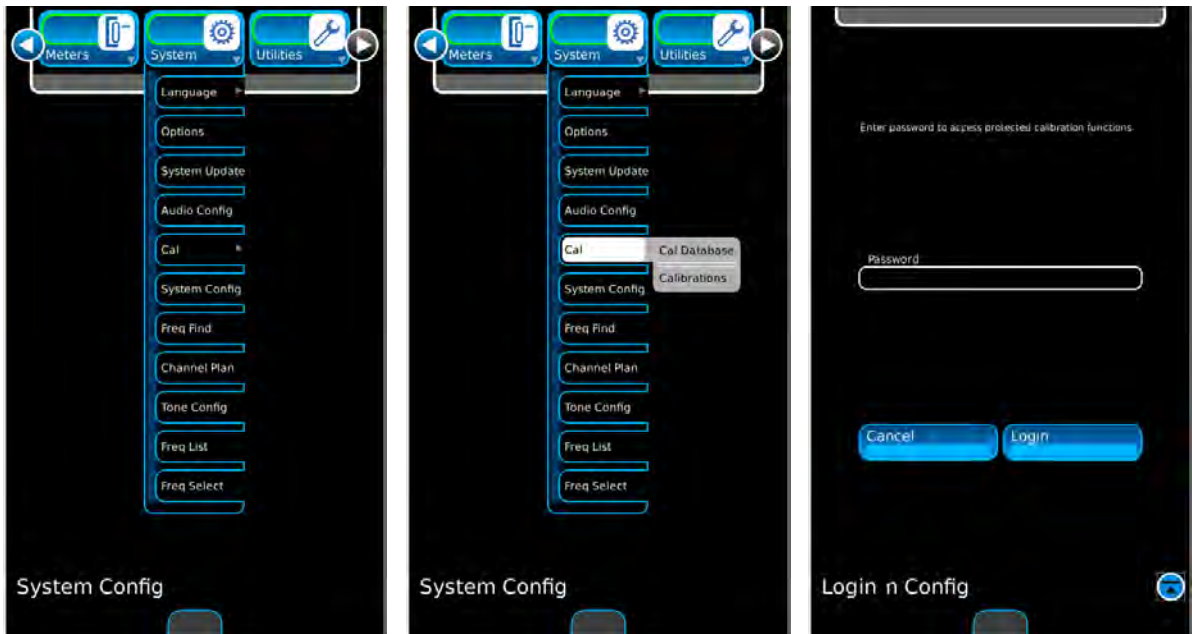
12. Cycle power on the 3550 / 3550R.
13. Set the Signal Generator to RF OFF.
14. Set the RF Amplifier to OFF.

## F. SWR Phase Detector Calibration

**TEST EQUIPMENT:** None

**TEST ACCESSORIES:** Short-Open-Load VSWR Calibrator

1. Select the System Function Tab to display the System Dropdown selections. Select “Cal” to select the Calibration Dropdown selections. Select “Calibrations” to display the Calibration Login Screen.



2. Type in the Calibration Password (9992) and press Enter.
3. With the Calibration Screen displayed, select “SWR Phase Detector Calibration.”

Select “Run Selected.”

Follow instructions.

When the SWR Phase Detector Calibration is completed (“Calibration Completed Successfully” is displayed on screen), press “Ok” to return to the Calibrations Screen.

Name
SWR Phase Detector Calibration
Audio Level Calibration
Power Low Range Calibration
Power High Range Calibration
Power Frequency Response Calibration
TCXO Calibration
RF Generator T/R Port Calibration
RF Generator ANT Port Calibration
RF Generator SWR Port Calibration
RF Receiver T/R Port Calibration
RF Receiver ANT Port Calibration
RF Receiver AMP Calibration

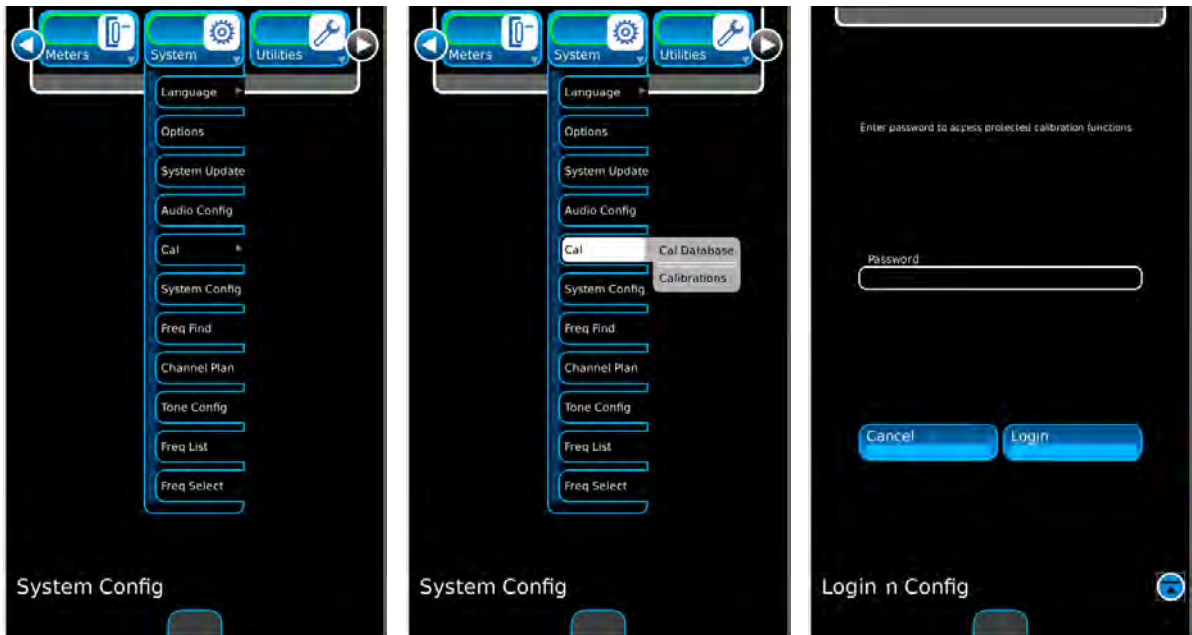
4. Cycle power on the 3550 / 3550R.

## G. Audio Level Meter Calibration

**TEST EQUIPMENT:**      Calibrator  
                                Digital Multimeter

**TEST ACCESSORIES:**    BNC T-Connector

1. Select the System Function Tab to display the System Dropdown selections. Select “Cal” to select the Calibration Dropdown selections. Select “Calibrations” to display the Calibration Login Screen.



2. Type in the Calibration Password (9992) and press Enter.
3. With the Calibration Screen displayed, select “Audio Level Calibration.”

Select “Run Selected.”

Follow instructions.

When the Audio Level Calibration is completed (“Calibration Completed Successfully” is displayed on screen), press “Ok” to return to the Calibrations Screen.

Name
SWR Phase Detector Calibration
Audio Level Calibration
Power Low Range Calibration
Power High Range Calibration
Power Frequency Response Calibration
TCXO Calibration
RF Generator T/R Port Calibration
RF Generator ANT Port Calibration
RF Generator SWR Port Calibration
RF Receiver T/R Port Calibration
RF Receiver ANT Port Calibration
RF Receiver AMP Calibration

4. Cycle power on the 3550 / 3550R.



## 2-4. REMOVE/REPLACE PROCEDURES

SUBJECT	PAGE
Battery .....	2-76
Fuse .....	2-79
Open Case Assy.....	2-82
Power Supply PCB Assy (A1).....	2-84
Multi-Function PCB Assy (A2A1) .....	2-86
RF Assy (A3) .....	2-90
ANT Connector.....	2-92
T/R Connector.....	2-93
DC IN Connector .....	2-94
AUDIO Connector .....	2-95
SWR Connector.....	2-96
DVM Connector .....	2-97
AUDIO IN Connector.....	2-98
AUDIO OUT Connector.....	2-99

TOOL	SIZE	DESCRIPTION
SCREWDRIVER	#2	PHILLIPS
WRENCH	5/32" 3/16"	SOCKET
PLIERS		NEEDLE-NOSE

### CAUTION

REPLACE ONLY WITH THE BATTERY SPECIFIED. DO NOT ATTEMPT TO INSTALL A NON-RECHARGEABLE BATTERY.

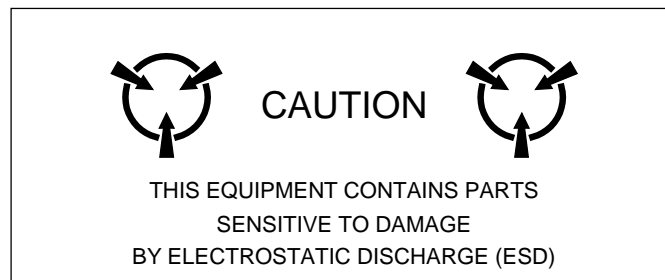
TAG EACH WIRE AND CABLE PRIOR TO REMOVAL.

AVOID BENDING OR TWISTING SEMI-RIGID COAXIAL CABLES.

AVOID PLACING UNDUE STRAIN ON ANY WIRE OR CABLE.

AVOID DISCARDING LOOSE ITEMS (NUTS, SCREWS, WASHERS, ETC.).

UPON COMPLETION OF ANY MAINTENANCE ACTION; ALL ASSEMBLIES, CABLES, CONNECTORS, PLASTIC FASTENERS, GASKETS, FINGERSTOCK AND MISCELLANEOUS HARDWARE MUST BE CONFIGURED AS INSTALLED AT THE FACTORY TO SATISFY THE SAFETY AND EMC COMPLIANCE STANDARDS.



## A. Battery

---

### DESCRIPTION

This procedure covers: Remove. Install.

---

### PRELIMINARY PROCEDURES

None.

---



### CAUTION

REPLACE ONLY WITH THE BATTERY SPECIFIED. DO NOT ATTEMPT TO INSTALL A NON-RECHARGEABLE BATTERY.

### WARNING





- **DISPOSE OF THE LITHIUM ION BATTERY PACK ACCORDING TO LOCAL STANDARD SAFETY PROCEDURES. DO NOT CRUSH, INCINERATE OR DISPOSE OF THE LITHIUM ION BATTERY PACK IN NORMAL WASTE.**
- **DO NOT SHORT CIRCUIT OR FORCE DISCHARGE THE LITHIUM ION BATTERY PACK AS THIS MIGHT CAUSE THE LITHIUM ION BATTERY PACK TO VENT, OVERHEAT OR EXPLODE.**

### REMOVE

1.	Fully loosen the captive screws (on each side of the bumper) in the two lower bumpers.	
2.	Remove the bumpers from the 3550 / 3550R.	





## A. Battery (cont)

### REMOVE (cont)

<p>3.</p>	<p>Fully loosen five captive screws holding the Battery Cover to the 3550 / 3550R.</p>	
<p>4.</p>	<p>Remove the Battery Cover from the 3550 / 3550R.</p>	
<p>5.</p>	<p>Disconnect the Battery Wire Harness.</p>	
<p>6.</p>	<p>Remove the Battery from the 3550 / 3550R.</p>	

## A. Battery (cont)

### INSTALL

1.	Install the Battery in the 3550 / 3550R.	
2.	Connect the Battery Wire Harness.	
3.	Install the Battery Cover on the 3550 / 3550R and tighten five captive screws (8 in/lbs.).	
4.	Install the two lower bumpers on the 3550 / 3550R and tighten the captive screws (on each side of the bumpers) (8 in/lbs.).	

### FOLLOW-ON MAINTENANCE

None.

END OF TASK

## B. Fuse

### DESCRIPTION

This procedure covers: Remove. Install.



### PRELIMINARY PROCEDURES

None.

### CAUTION



FOR CONTINUOUS PROTECTION AGAINST FIRE, REPLACE ONLY WITH FUSES OF THE SPECIFIED VOLTAGE AND CURRENT RATINGS. (5 A, 32 Vdc, Type F - Mini Blade Fuse)

### REMOVE



1.	Fully loosen the captive screws (on each side of the bumper) in the two lower bumpers.	
2.	Remove the bumpers from the 3550 / 3550R.	
3.	Fully loosen five captive screws holding the Battery Cover to the 3550 / 3550R.	

## B. Fuse (cont)

### REMOVE (cont)

4.	Remove the Battery Cover from the 3550 / 3550R.	
5.	Locate and remove the Fuse.	


### INSTALL

1.	Install the Fuse.	
2.	Install the Battery Cover on the 3550 / 3550R and tighten five captive screws (8 in/lbs.).	

## B. Fuse (cont)

---

### INSTALL (cont)

3.	Install the two lower bumpers on the 3550 / 3550R and tighten the captive screws (on each side of the bumpers) (8 in/lbs.).	
----	-----------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------

---

### FOLLOW-ON MAINTENANCE

None.

END OF TASK

---



## C. Open Case Assy



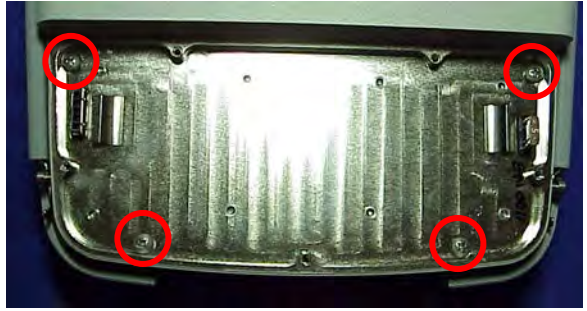

### DESCRIPTION

This procedure covers: Open. Close.

### PRELIMINARY PROCEDURES

Remove Battery (para 2-4A).



### OPEN

1.	Fully loosen the captive screws (on each side of the bumper) in the two upper bumpers. Remove bumpers.	
2.	Remove four screws.	
3.	Remove four screws.	
4.	Open the Case Assy.	



## C. Open Case Assy (cont)

### CLOSE

1.	Close the Case Assy.	
2.	Install four screws (17 in/lbs.).	
3.	Install four screws (17 in/lbs.).	
4.	Install the two upper bumpers on the 3550 / 3550R and and tighten the captive screws (on each side of the bumpers) (8 in/lbs.).	

### FOLLOW-ON MAINTENANCE

Install Battery (para 2-4A).

END OF TASK

## D. Power Supply Assy (1A1)

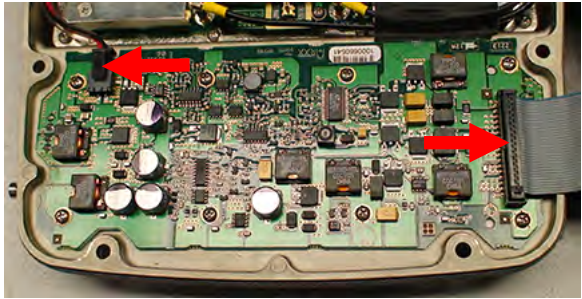
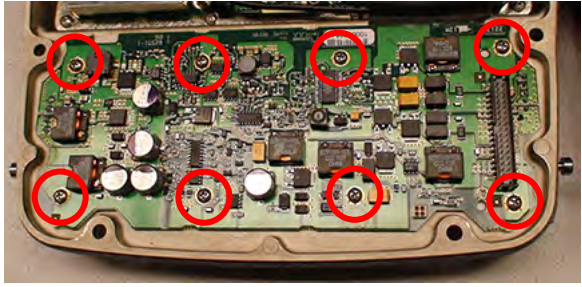
### DESCRIPTION

This procedure covers: Remove. Install.

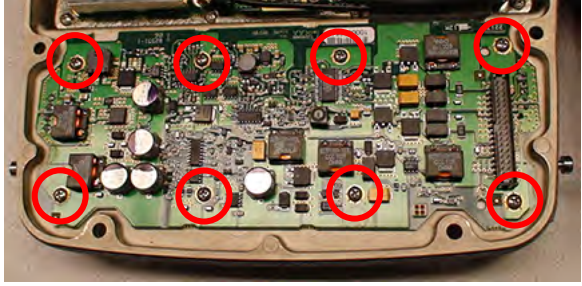
### PRELIMINARY PROCEDURES

Remove Battery (para 2-4A).  
Open Case Assy (para 2-4C).

### REMOVE

1.	Disconnect wire cable and ribbon cable.	
2.	Remove eight screws.	
3.	Remove Power Supply PCB Assy.	

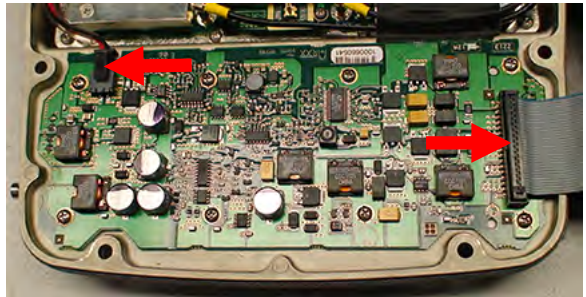
### INSTALL

1.	Install Power Supply PCB Assy.	
2.	Install eight screws (6 in/lbs.).	

## D. Power Supply Assy (1A1) (cont)

---

### INSTALL (cont)

3.	Connect wire cable and ribbon cable.	
----	--------------------------------------	------------------------------------------------------------------------------------

---

### FOLLOW-ON MAINTENANCE

Close Case Assy (para 2-4C).  
Install Battery (para 2-4A).

END OF TASK

---

## E. Multi-Function PCB Assy (1A2A1)

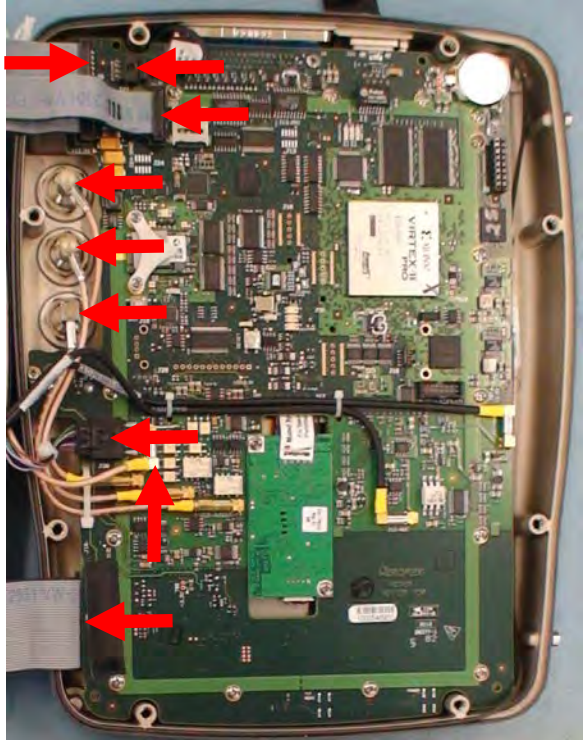
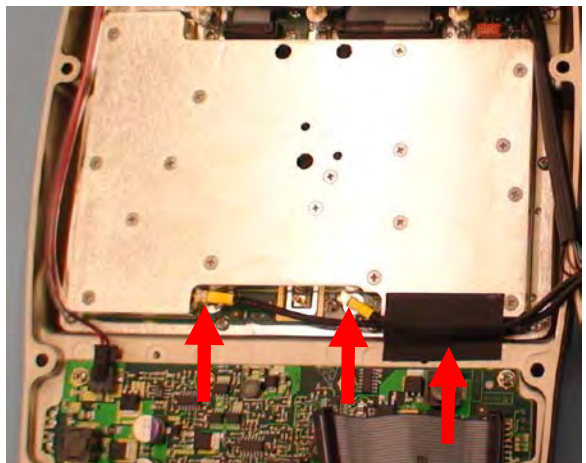
### DESCRIPTION

This procedure covers: Remove. Install.

### PRELIMINARY PROCEDURES

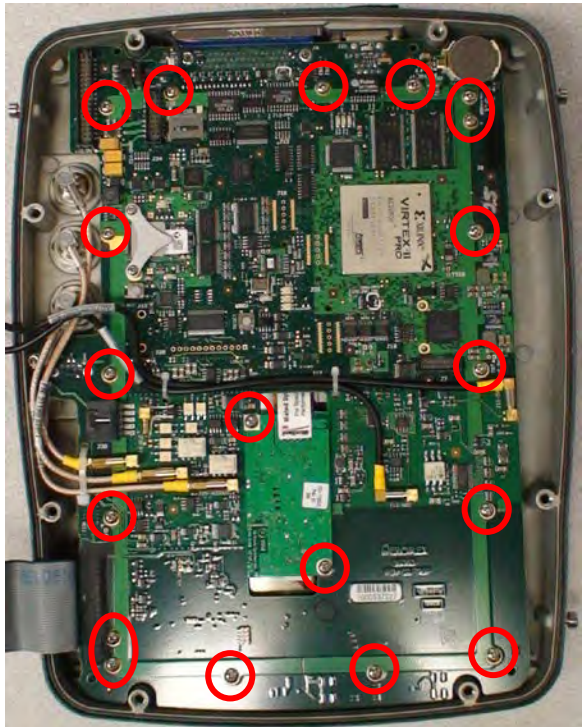
Remove Battery (para 2-4A).  
Open Case Assy (para 2-4C).

### REMOVE

1.	Disconnect three ribbon cables. Disconnect two wire cables. Disconnect four coaxial cables.	
2.	Remove fabric tape. Disconnect two coaxial cables.	
3.	Disconnect two coaxial cables.	

## E. Multi-Function PCB Assy (1A2A1) (cont)

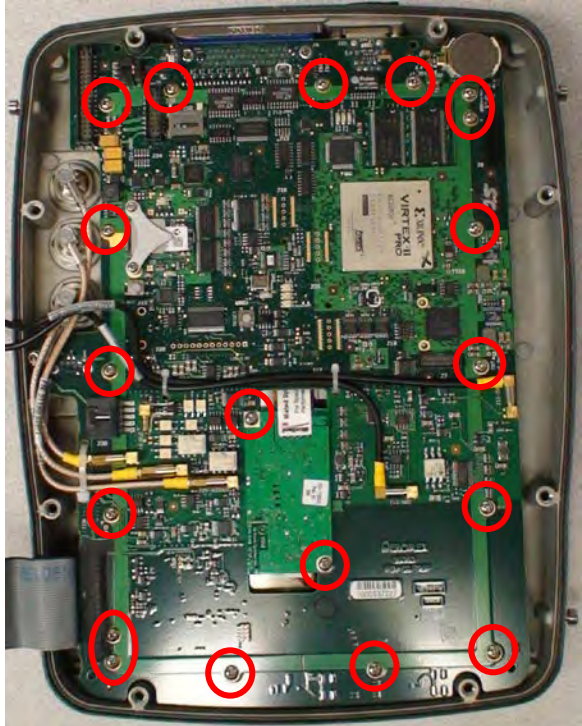
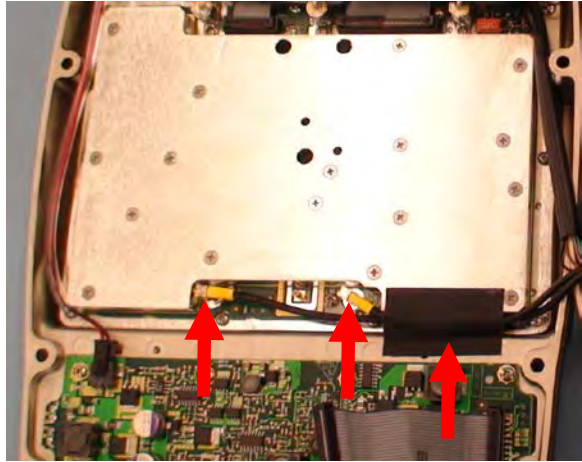
### REMOVE (cont)

4.	Remove 19 screws.	 A photograph of the Multi-Function PCB Assy (1A2A1) installed in a metal housing. The PCB is green and populated with various components, including a large white integrated circuit labeled 'XILINX VIRTEx II PRO'. Nineteen screws are circled in red, indicating the locations to be removed. The screws are distributed across the top, sides, and bottom of the PCB assembly.
5.	Remove Multi-Function PCB Assy.	



## E. Multi-Function PCB Assy (1A2A1) (cont)

### INSTALL

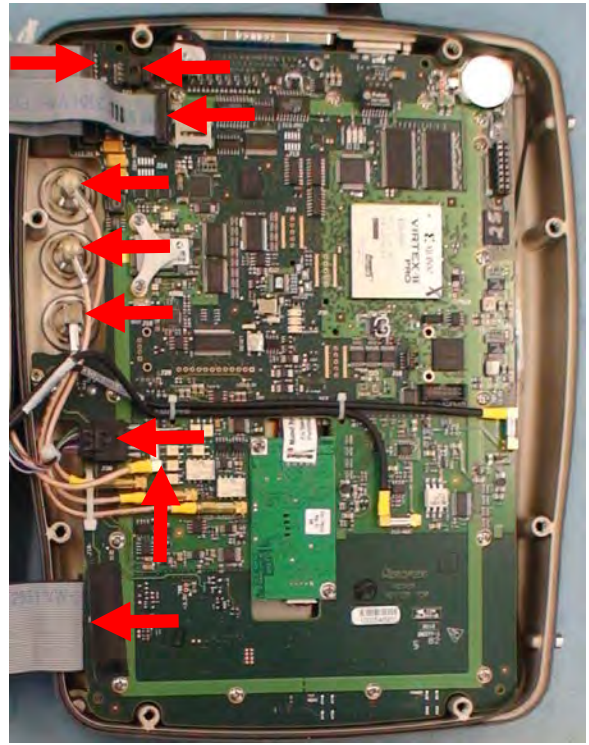
1.	Install Multi-Function PCB Assy.	
2.	Install 19 screws (8 in/lbs.).	
3.	Connect two coaxial cables. Apply fabric tape.	

## E. Multi-Function PCB Assy (1A2A1) (cont)

---

### INSTALL (cont)

- |    |                                                                                          |
|----|------------------------------------------------------------------------------------------|
| 4. | Connect three ribbon cables.<br>Connect two wire cables.<br>Connect four coaxial cables. |
|----|------------------------------------------------------------------------------------------|



---

### FOLLOW-ON MAINTENANCE

Close Case Assy (para 2-4C).  
Install Battery (para 2-4A).

END OF TASK

---

## F. RF Assy (1A3)

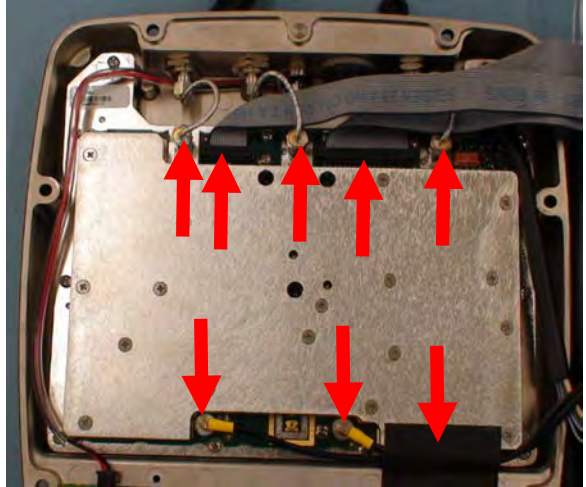
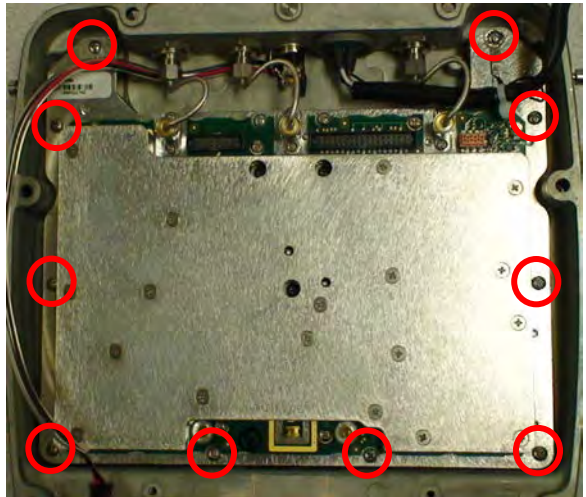
### DESCRIPTION

This procedure covers: Remove. Install.

### PRELIMINARY PROCEDURES

Remove Battery (para 2-4A).  
Open Case Assy (para 2-4C).

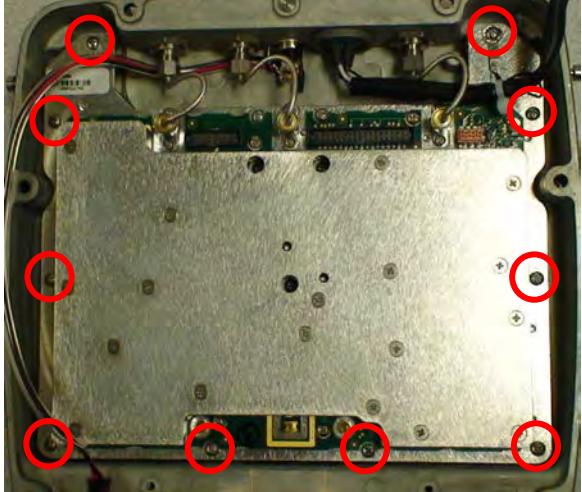
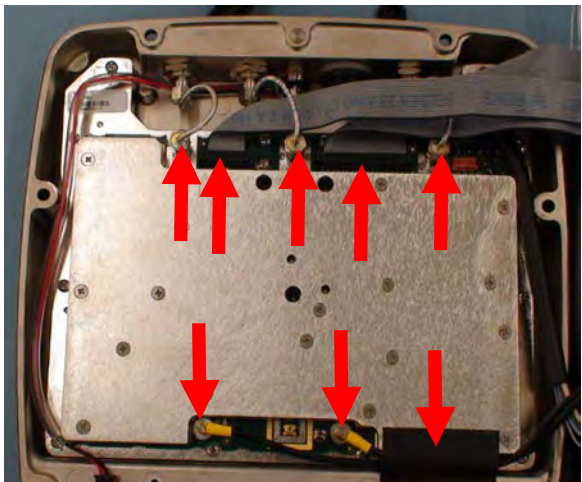
### REMOVE

1.	Disconnect two ribbon cables. Disconnect five coaxial cables. Remove fabric tape.	 A photograph showing the internal components of a device. A large, rectangular, metallic RF assembly is mounted on a printed circuit board. Five red arrows point upwards to five coaxial cable connectors along the top edge of the assembly. Three red arrows point downwards to three other connectors along the bottom edge of the assembly. Two ribbon cables are visible at the top left.
2.	Remove 10 screws.	 A photograph of the same RF assembly as in the previous image. Ten screws are circled in red, indicating they need to be removed. The screws are located at the corners and along the edges of the assembly's mounting area.
3.	Remove the RF Assy.	



## F. RF Assy (1A3) (cont)

### INSTALL

1.	Install the RF Assy.	
2.	Install 10 screws (8 in/lbs.).	 A photograph showing the internal components of a device, including a large silver metal plate and various electronic components. Ten screws are circled in red, indicating their installation points.
3.	Connect two ribbon cables. Connect five coaxial cables. Apply fabric tape.	 A photograph showing the internal components of a device, including a large silver metal plate and various electronic components. Red arrows point to specific connection points on the metal plate and components, indicating where to connect ribbon cables, coaxial cables, and apply fabric tape.

### FOLLOW-ON MAINTENANCE

Close Case Assy (para 2-4C).  
Install Battery (para 2-4A).

END OF TASK

## G. ANT Connector

---

### DESCRIPTION

This procedure covers: Remove. Install.

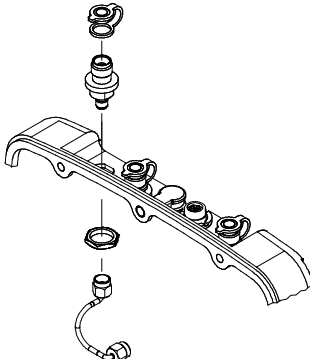
---

### PRELIMINARY PROCEDURES

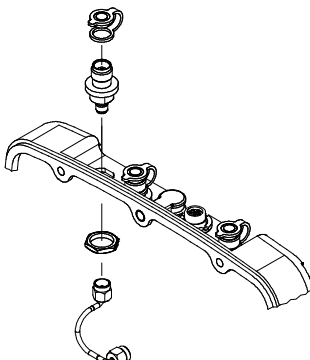
Remove Battery (para 2-4A).  
Open Case Assy (para 2-4C).  
Remove RF Assy (para 2-4F).

---

### REMOVE

1.	Remove connector cap.	
2.	Disconnect coaxial cable.	
3.	Remove nut.	
4.	Remove ANT Connector.	

### INSTALL

1.	Install ANT Connector.	
2.	Install nut (45 in/lbs.).	
3.	Connect coaxial cable.	
4.	Install connector cap.	

---

### FOLLOW-ON MAINTENANCE

Install RF Assy (para 2-4F).  
Close Case Assy (para 2-4C).  
Install Battery (para 2-4A).

END OF TASK

---

## H. T/R Connector

---

### DESCRIPTION

This procedure covers: Remove. Install.

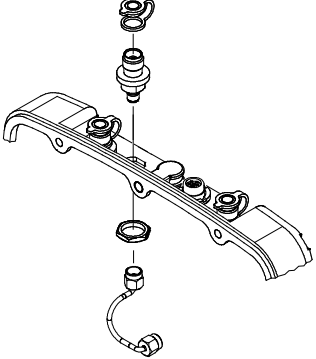
---

### PRELIMINARY PROCEDURES

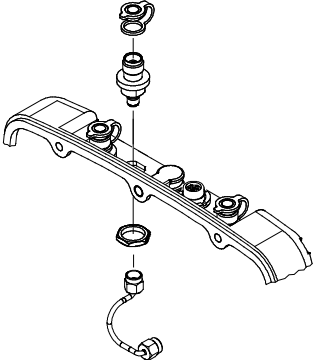
Remove Battery (para 2-4A).  
Open Case Assy (para 2-4C).  
Remove RF Assy (para 2-4F).

---

### REMOVE

1.	Remove connector cap.	
2.	Disconnect coaxial cable.	
3.	Remove nut.	
4.	Remove T/R Connector.	

### INSTALL

1.	Install T/R Connector.	
2.	Install nut (45 in/lbs.).	
3.	Connect coaxial cable.	
4.	Install connector cap.	

---

### FOLLOW-ON MAINTENANCE

Install RF Assy (para 2-4F).  
Close Case Assy (para 2-4C).  
Install Battery (para 2-4A).

END OF TASK

---

## I. DC IN Connector

---

### DESCRIPTION

This procedure covers: Remove. Install.

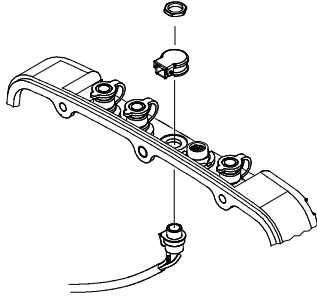
---

### PRELIMINARY PROCEDURES

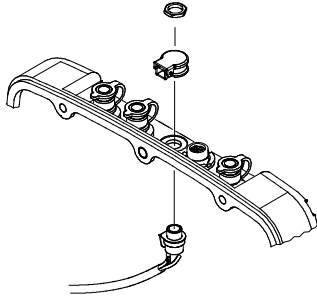
Remove Battery (para 2-4A).  
Open Case Assy (para 2-4C).  
Remove RF Assy (para 2-4F).

---

### REMOVE

1.	Disconnect wire cable.	
2.	Lift up connector cap and loosen nut.	
3.	Remove nut and connector cap.	
4.	Remove DC IN Connector.	

### INSTALL

1.	Install DC IN Connector.	
2.	Apply RTV.	
3.	Install connector cap and nut (4 in/lbs.).	
4.	Connect wire cable.	

---

### FOLLOW-ON MAINTENANCE

Install RF Assy (para 2-4F).  
Close Case Assy (para 2-4C).  
Install Battery (para 2-4A).

END OF TASK

---

## J. AUDIO Connector

---

### DESCRIPTION

This procedure covers: Remove. Install.

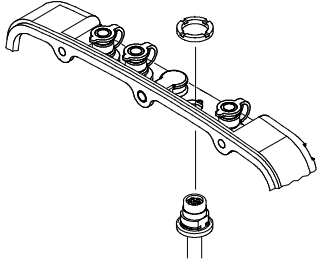
---

### PRELIMINARY PROCEDURES

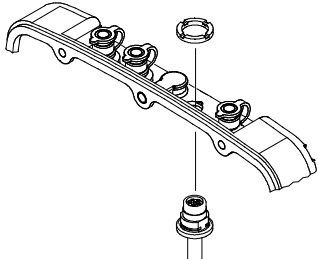
Remove Battery (para 2-4A).  
Open Case Assy (para 2-4C).  
Remove RF Assy (para 2-4F).

---

### REMOVE

1.	Disconnect coaxial cable.	
2.	Remove nut.	
3.	Remove AUDIO Connector.	

### INSTALL

1.	Install AUDIO Connector.	
2.	Install nut (45 in/lbs.).	
3.	Connect coaxial cable.	
4.	Install connector cap.	

---

### FOLLOW-ON MAINTENANCE

Install RF Assy (para 2-4F).  
Close Case Assy (para 2-4C).  
Install Battery (para 2-4A).

END OF TASK

---

## K. SWR Connector

---

### DESCRIPTION

This procedure covers: Remove. Install.

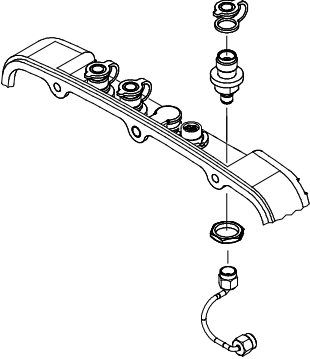
---

### PRELIMINARY PROCEDURES

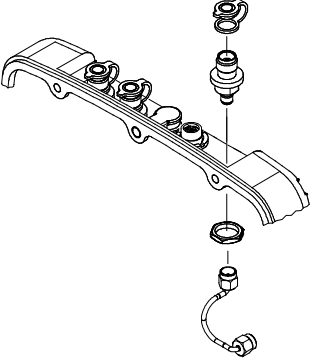
Remove Battery (para 2-4A).  
Open Case Assy (para 2-4C).  
Remove RF Assy (para 2-4F).

---

### REMOVE

1.	Remove connector cap.	
2.	Disconnect coaxial cable.	
3.	Remove nut.	
4.	Remove SWR Connector.	

### INSTALL

1.	Install SWR Connector.	
2.	Install nut (45 in/lbs.).	
3.	Connect coaxial cable.	
4.	Install connector cap.	

---

### FOLLOW-ON MAINTENANCE

Install RF Assy (para 2-4F).  
Close Case Assy (para 2-4C).  
Install Battery (para 2-4A).

END OF TASK

---

## L. DVM Connector

---

### DESCRIPTION

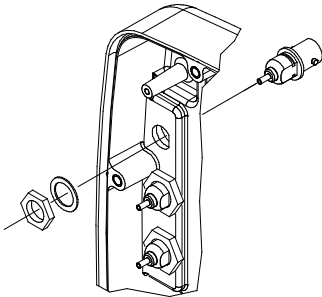
This procedure covers: Remove. Install.

---

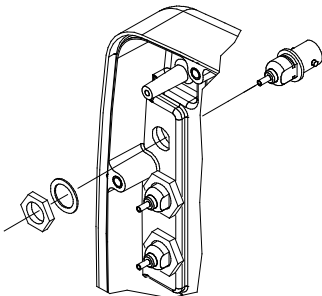
### PRELIMINARY PROCEDURES

Remove Battery (para 2-4A).  
Open Case Assy (para 2-4C).

### REMOVE

1.	Remove nut and washer.	
2.	Remove DVM Connector.	

### INSTALL

1.	Install DVM Connector.	
2.	Install washer and nut (25 in/lbs.).	

---

### FOLLOW-ON MAINTENANCE

Close Case Assy (para 2-4C).  
Install Battery (para 2-4A).

END OF TASK

---

## M. AUDIO IN Connector

---

### DESCRIPTION

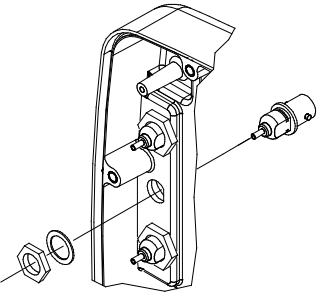
This procedure covers: Remove. Install.

---

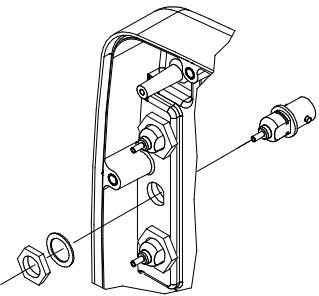
### PRELIMINARY PROCEDURES

Remove Battery (para 2-4A).  
Open Case Assy (para 2-4C).

### REMOVE

1.	Remove nut and washer.	
2.	Remove AUDIO IN Connector.	

### INSTALL

1.	Install AUDIO IN Connector.	
2.	Install washer and nut (25 in/lbs.).	

---

### FOLLOW-ON MAINTENANCE

Close Case Assy (para 2-4C).  
Install Battery (para 2-4A).

END OF TASK

---



## N. AUDIO OUT Connector

---

### DESCRIPTION

This procedure covers: Remove. Install.

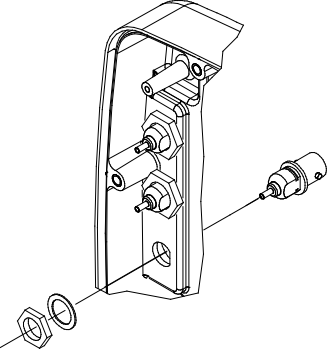
---

### PRELIMINARY PROCEDURES

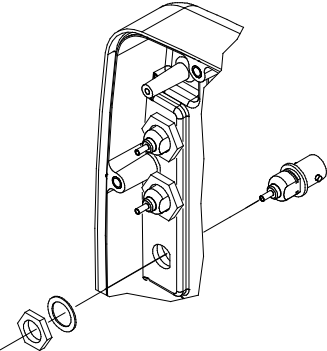
Remove Battery (para 2-4A).  
Open Case Assy (para 2-4C).

---

### REMOVE

1.	Remove nut and washer.	
2.	Remove AUDIO OUT Connector.	

### INSTALL

1.	Install AUDIO OUT Connector.	
2.	Install washer and nut (25 in/lbs.).	

---

### FOLLOW-ON MAINTENANCE

Close Case Assy (para 2-4C).  
Install Battery (para 2-4A).

END OF TASK

---

## 2-5. PREPARATION FOR STORAGE OR SHIPMENT

### A. Packaging

---

Package the 3550 / 3550R in the original shipping container. When using packing materials other than the original, use the following guidelines:

- Wrap the 3550 / 3550R transit case in plastic packing material.
- Use a double-wall cardboard shipping container.
- Protect all sides with shock-absorbing material to prevent the 3550 / 3550R transit case from moving within the container.
- Seal the shipping container with approved sealing tape.
- Mark "FRAGILE" on the top, bottom and all sides of the shipping container.

### B. Environment

---

The 3550 / 3550R should be stored in a clean, dry environment. In high humidity environments, protect the 3550 / 3550R from temperature variations that could cause internal condensation. The following environmental conditions apply to both shipping and storage:

Temperature:..... -30°C to +71°C\*  
Relative Humidity:..... 0% to 95%  
Altitude:..... 0 to 4600 m  
Vibration:..... <2 g  
Shock: ..... <30 g

\* The Battery must not be subjected to temperatures <-20°C or >+60°C.

# APPENDIX A - REPLACEMENT PARTS

## STANDARD ITEMS

DESCRIPTION	PART NUMBER	QTY
3550 / 3550R Communications Test Set		1
Adapter (BNC-F to TNC-M)*	23758	5
Antenna (BNC) (50 MHz) (HF)*	9149	1
Antenna (BNC) (150 MHz) (VHF)*	9145	1
Antenna (BNC) (450 MHz) (UHF)*	9147	1
Antenna (BNC) (800 MHz)*	9143	1
Cable (BNC) (M-M) (48 in)*	62368	2
Cable (TNC) (M-M) (48 in)*	62398	1
Case, Accessory*	5762	1
Case, Transit*	91706	1
Cover / Stand*	91679	1
External DC Power Supply	67374	1
Fuse, Spare (5 A, 32 Vdc, Type F)*	56080	2
Handset*	64606	1
Manual, Getting Started (Paper) (English)	90521	1
Manual, Operation (CD) (English)	90520	1
Power Cable (AC) (3-wire leads)*	27516	1
Power Cable (AC) (Continental Europe)*	27480	1
Power Cable (AC) (North America)*	27478	1
Power Cable (AC) (UK)*	27477	1
Power Cable (AC) (China)*	91803	1
Power Cable (DC Cigarette Lighter)*	62404	1
Short-Open-Load VSWR Calibrator (TNC)*	38245	1

\* Included with Regional Accessory Kit (U.S., International or China)

**STANDARD ITEMS (cont)**



Adapter (BNC-F to TNC-M)  
23758



Antenna (BNC) (50 MHz) (HF)  
9149



Antenna (BNC) (150 MHz) (VHF)  
9145



Antenna (BNC) (450 MHz) (UHF)  
9147



Antenna (BNC) (800 MHz)  
9143



Cable (BNC) (M-M) (48 in)  
62368



Cable (TNC) (M-M) (48 in)  
62398



Case, Accessory  
5762

**STANDARD ITEMS (cont)**



Case, Transit  
91706



Cover / Stand  
91679



External DC Power Supply  
67374



Fuse, Spare (5 A, 32 Vdc, Type F)  
56080



Handset  
64606



Manual, Getting Started (Paper) (English)  
90521



Manual, Operation/ICW (CD) (English)  
90520



Power Cable (AC) (3-wire leads)  
27516

**STANDARD ITEMS (cont)**



Power Cable (AC) (Continental Europe)  
27480



Power Cable (AC) (North America)  
27478



Power Cable (AC) (UK)  
27477



Power Cable (AC) (China)  
91803



Power Cable (DC Cigarette Lighter)  
91803



(or)



Short-Open-Load VSWR Calibrator (TNC)  
38245

## OPTIONAL ITEMS

DESCRIPTION	PART NUMBER	QTY
Attenuator (20 dB / 50 W)	82559 (Kit No.)	
Attenuator (20 dB / 50 W)	38240	1
Adapter (N-F to BNC-F)	23770	1
Adapter (N-M to TNC-M)	23766	1
Attenuator (20 dB / 150 W)	82560 (Kit No.)	
Attenuator (20 dB / 150 W)	38242	1
Adapter (N-F to BNC-F)	23770	1
Adapter (N-M to BNC-F)	20327	1
Battery, Spare	67076	1
Case, Soft-Sided Carrying	10192	1
Manual, Getting Started (Paper)		
Arabic	91859	1
Chinese - Simplified	91860	1
Chinese - Traditional	91862	1
French	91952	1
German	91863	1
Japanese	91864	1
Korean	91865	1
Malay	91866	1
Polish	91867	1
Portuguese	91868	1
Russian	91869	1
Spanish	91870	1
Manual, Maintenance (CD) (English)	90523	1
Manual, Operation (CD)		
Arabic	91848	1
Chinese - Simplified	91849	1
Chinese - Traditional	91850	1
French	91947	1
German	91851	1
Japanese	91852	1
Korean	91853	1
Malay	91854	1
Polish	91855	1
Portuguese	91856	1
Russian	91857	1
Spanish	91858	1
Tripod	67474	1
Tripod Stand	6361	1
Tripod Dolly	63659	1

## OPTIONAL ITEMS (cont)



Adapter (N-M to TNC-M)  
23766



Adapter (N-M to BNC-F)  
20327



Adapter (N-F to BNC-F)  
23770



Attenuator (20 dB / 50 W)  
38240



Attenuator (20 dB / 150 W)  
38242



Battery, Spare  
67076



Case, Soft-Sided Carrying  
10192



Tripod  
67474



Tripod Stand  
6361



Tripod Dolly  
63659



## OPTIONAL ITEMS (cont)



Manual, Getting Started (Paper)	
(Arabic)	91859
(Chinese - Simplified)	91860
(Chinese - Traditional)	91862
(French)	91952
(German)	91863
(Japanese)	91864
(Korean)	91865
(Malay)	91866
(Polish)	91867
(Portuguese)	91868
(Russian)	91869
(Spanish)	91870

Manual, Maintenance (CD) (English)
90523



Manual, Operation (CD)	
(Arabic)	91848
(Chinese - Simplified)	91849
(Chinese - Traditional)	91850
(French)	91947
(German)	91851
(Japanese)	91852
(Korean)	91853
(Malay)	91854
(Polish)	91855
(Portuguese)	91856
(Russian)	91857
(Spanish)	91858

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90462

3550 / 3550R

B4

REFERENCE DESIGNATOR	PART NUMBER	CAGE CODE	DESCRIPTION
1	90450	51190	CHASSIS,REAR,DARK GRAY
2	90477	51190	MECH ASSY,BATTERY COVER,DARK GRAY
3	35566	51190	SCREW,4-40 X 5/32 PPHM
4	35615	51190	SCREW,4-40 X 9/16 PPHM
5	35700	51190	SM, 8-32 x 7/16", PPH, SS, PA, TL
6	36284	51190	WASHER,NYL,.275OD,.17ID,.062T
7	10259	51190	COVER,MINI POWER JACK
8	90468	51190	BUMPER,CORNER,SSHWD,BLACK
9	10128	51190	HANDLE,STRAP
10	90469	51190	HANDLE,EXTRUDED,BLACK
11	87818	51190	COVER,RUBBER,BNC/TNC
12	90514	51190	COVER,REMOTE
13	35564	51190	SCREW,4-40 X 1/8 SHOULDER
14	35642	51190	SCREW,CAPTIVE,4-40,.39L PH
15	36273	51190	WASHER,SS,.75ID,.87OD,.020T
A1	66001	51190	PCB ASSY,POWER SUPPLY 35XX
A2	90476	51190	MECH ASSY,FRONT,CAPACITIVE,DARK GRAY
A3	91092	51190	MECH ASSY,RF
BT1	67076	51190	BATTERY, SPARE
J1	20952	51190	CONN,F,TNC,BH,ADP,SMA,WTRPRF
J2	20952	51190	CONN,F,TNC,BH,ADP,SMA,WTRPRF
J4	20952	51190	CONN,F,TNC,BH,ADP,SMA,WTRPRF
W1	65007	51190	WIRE HARN ASSY,DC INPUT
W2	90841	51190	RBN CA ASSY, 28GA, 34C, 3.5, 2MM
W3	90862	51190	RBN CA ASSY, 28GA, 34P, 6.0, 2MM
W4	65017	51190	WIRE HARN,MICROPHONE
W5	90861	51190	RBN CA ASSY, 28GA, 16P, 9.0, 2MM
W10	62628	51190	COAX ASSY,CONF,2.125 FLSH MNT
W11	62628	51190	COAX ASSY,CONF,2.125 FLSH MNT
W12	62628	51190	COAX ASSY,CONF,2.125 FLSH MNT

90462

3550 / 3550R

B5

Contains all parts shown in Revision B4.

90462

3550 / 3550R

B6

Contains all parts shown in Revision B5.

90462

3550 / 3550R

C0

Contains all parts shown in Revision B6 with the following exception:

REFERENCE DESIGNATOR	PART NUMBER	CAGE CODE	DESCRIPTION
A1	92680	51190	PCB ASSY,POWER SUPPLY 35XX

90476

CHASSIS ASSY (3550)

B2

REFERENCE DESIGNATOR	PART NUMBER	CAGE CODE	DESCRIPTION
1	35582	51190	SCREW,4-40 X 1/4 PPHM
2	86964	51190	SM, M3 X .5 X 8, ABT, A2, PA, TL
3	35611	51190	SCREW,4-40 X 1/2 PPHM
4	35579	51190	SCREW,4-40X1/4,SHCSSS
5	35844	51190	STANDOFF,.188 HEX M/F,.187LG
6	36238	51190	WASHER, LOCK, INT TOOTH, 4
7	87852	51190	COVER,ETHERNET
8	37779	51190	NUT, HEX, SMALL PAT, 4-40
9	91485	51190	SCREW,TETHER,M3X.5X14,ASH,SS,PA
10	90496	51190	PUSHROD, SWITCH
11	90489	51190	PANEL, ON/OFF CONTROL
A1	90384	51190	PCB ASSY,MFB-OMAP
A2	90428	51190	PURCHASED ASSY,TFT-LCD,9"
A3	90509	51190	TOUCH SCREEN,CAPACITIVE
J1	20953	51190	CONN,F,BNC,BH,ADP,SMB,WTRPRF
J2	20953	51190	CONN,F,BNC,BH,ADP,SMB,WTRPRF
J3	20953	51190	CONN,F,BNC,BH,ADP,SMB,WTRPRF
W6	63369	51190	COAX ASSY,LMR,14.0,SSMB,F,RA/SSMB,F,RA
W7	63367	51190	COAX ASSY,LMR,12.0,SSMB,F,RA/SSMB,F,RA
W13	88992	51190	COAX ASSY,RG316,5.5,SMB,F,RA/SSMB,F,ST
W14	88992	51190	COAX ASSY,RG316,5.5,SMB,F,RA/SSMB,F,ST
W15	88992	51190	COAX ASSY,RG316,5.5,SMB,F,RA/SSMB,F,ST
W16	90830	51190	WIRE HARN ASSY, BACKLIGHT, 3550
W17	90831	51190	WIRE HARN ASSY, LVDS 3550 DISPLAY
W18	90832	51190	WIRE HARN ASSY,TOUCH PNL, 3550

90476

CHASSIS ASSY (3550)

C0

Contains all parts shown in Revision B2.

90588

CHASSIS ASSY (3550R)

B1

REFERENCE DESIGNATOR	PART NUMBER	CAGE CODE	DESCRIPTION
1	35582	51190	SCREW,4-40 X 1/4 PPHM
2	86964	51190	SM, M3 X .5 X 8, ABT, A2, PA, TL
3	35611	51190	SCREW,4-40 X 1/2 PPHM
4	35579	51190	SCREW,4-40X1/4,SHCSSS
5	35844	51190	STANDOFF,.188 HEX M/F,.187LG
6	36238	51190	WASHER, LOCK, INT TOOTH, 4
7	87852	51190	COVER,ETHERNET
8	37779	51190	NUT, HEX, SMALL PAT, 4-40
9	91485	51190	SCREW,TETHER,M3X.5X14,ASH,SS,PA
10	90496	51190	PUSHROD, SWITCH
11	90489	51190	PANEL, ON/OFF CONTROL
A1	90384	51190	PCB ASSY,MFB-OMAP
A2	N/A	51190	PURCHASED ASSY,TFT-LCD,9"
A3	N/A	51190	TOUCHSCREEN,RESISTIVE,3550
A4	N/A	51190	PCB ASSY,3550 RESISTIVE TCHSCREEN CNTL
J1	20953	51190	CONN,F,BNC,BH,ADP,SMB,WTRPRF
J2	20953	51190	CONN,F,BNC,BH,ADP,SMB,WTRPRF
J3	20953	51190	CONN,F,BNC,BH,ADP,SMB,WTRPRF
W6	63369	51190	COAX ASSY,LMR,14.0,SSMB,F,RA/SSMB,F,RA
W7	63367	51190	COAX ASSY,LMR,12.0,SSMB,F,RA/SSMB,F,RA
W13	88992	51190	COAX ASSY,RG316,5.5,SMB,F,RA/SSMB,F,ST
W14	88992	51190	COAX ASSY,RG316,5.5,SMB,F,RA/SSMB,F,ST
W15	88992	51190	COAX ASSY,RG316,5.5,SMB,F,RA/SSMB,F,ST
W16	90830	51190	WIRE HARN ASSY, BACKLIGHT, 3550
W17	90831	51190	WIRE HARN ASSY, LVDS 3550 DISPLAY
W18	90832	51190	WIRE HARN ASSY,TOUCH PNL, 3550

90588

CHASSIS ASSY (3550R)

B2

Contains all parts shown in Revision B1.

90588

CHASSIS ASSY (3550R)

B3

Contains all parts shown in Revision B2.

90588

CHASSIS ASSY (3550R)

C0

Contains all parts shown in Revision B3.

90588

CHASSIS ASSY (3550R)

D0

Contains all parts shown in Revision C0 with the following exceptions:

REFERENCE DESIGNATOR	PART NUMBER	CAGE CODE	DESCRIPTION
A5	N/A	51190	PCB ASSY,TOUCH SCREEN CONT MTG
W18	112779	51190	WIRE HARN ASSY,RES. TOUCH PNL

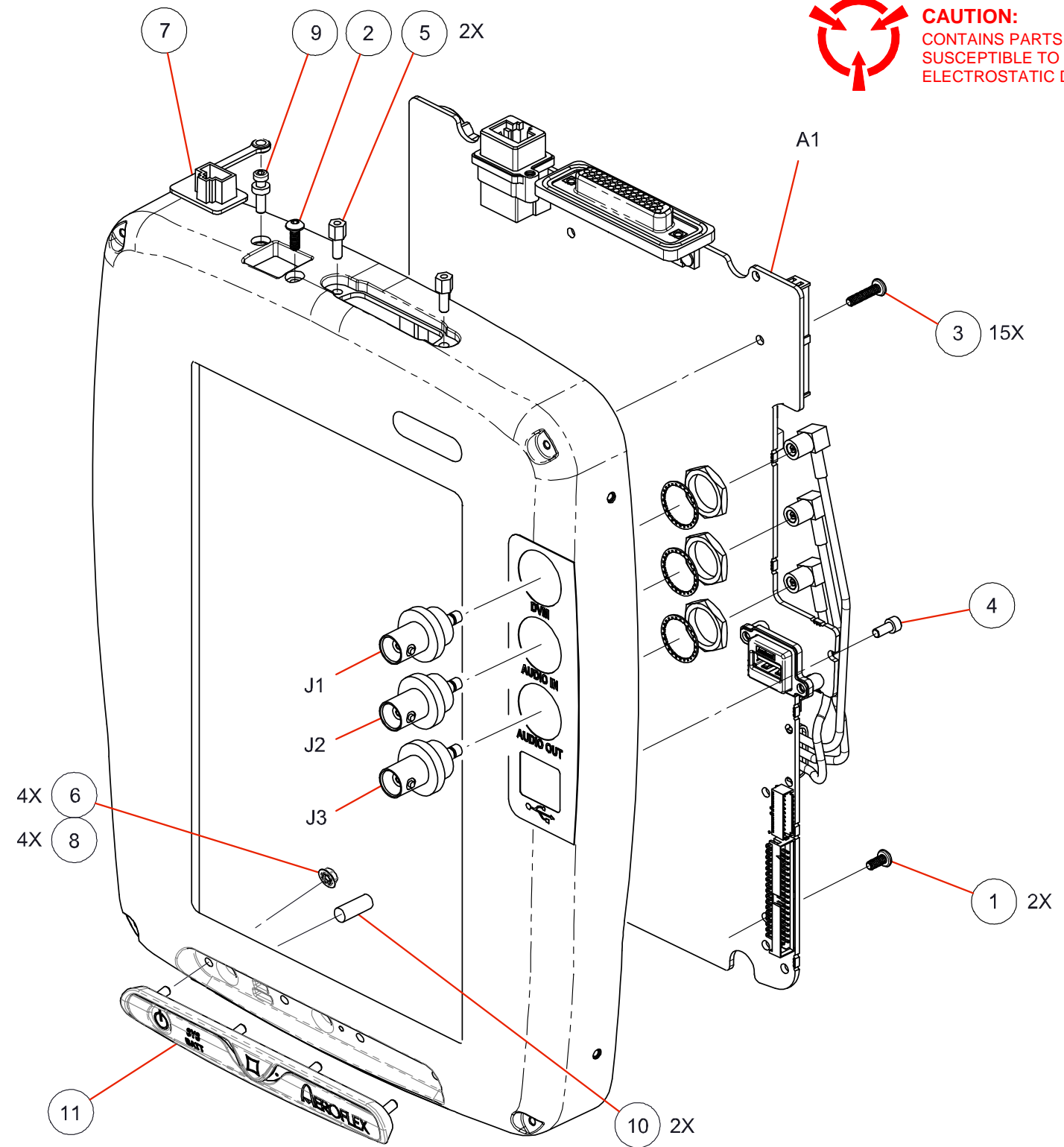
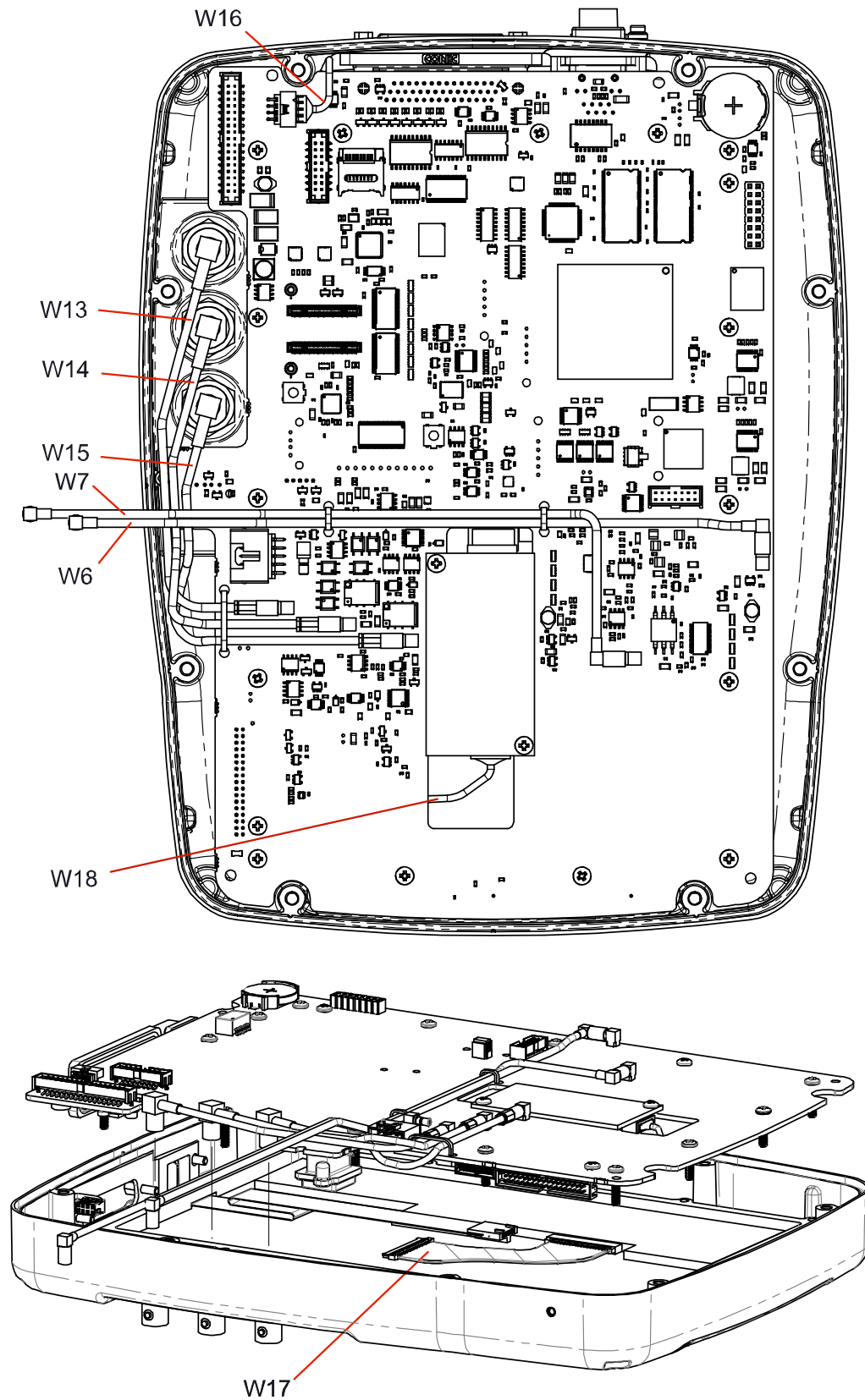
90384

MULTI-FUNCTION PCB ASSY

E1

REFERENCE DESIGNATOR	PART NUMBER	CAGE CODE	DESCRIPTION
BT1	86980	51190	BATT,BR2032,3V,195MAH,LITHIUM,INDST,TRAY





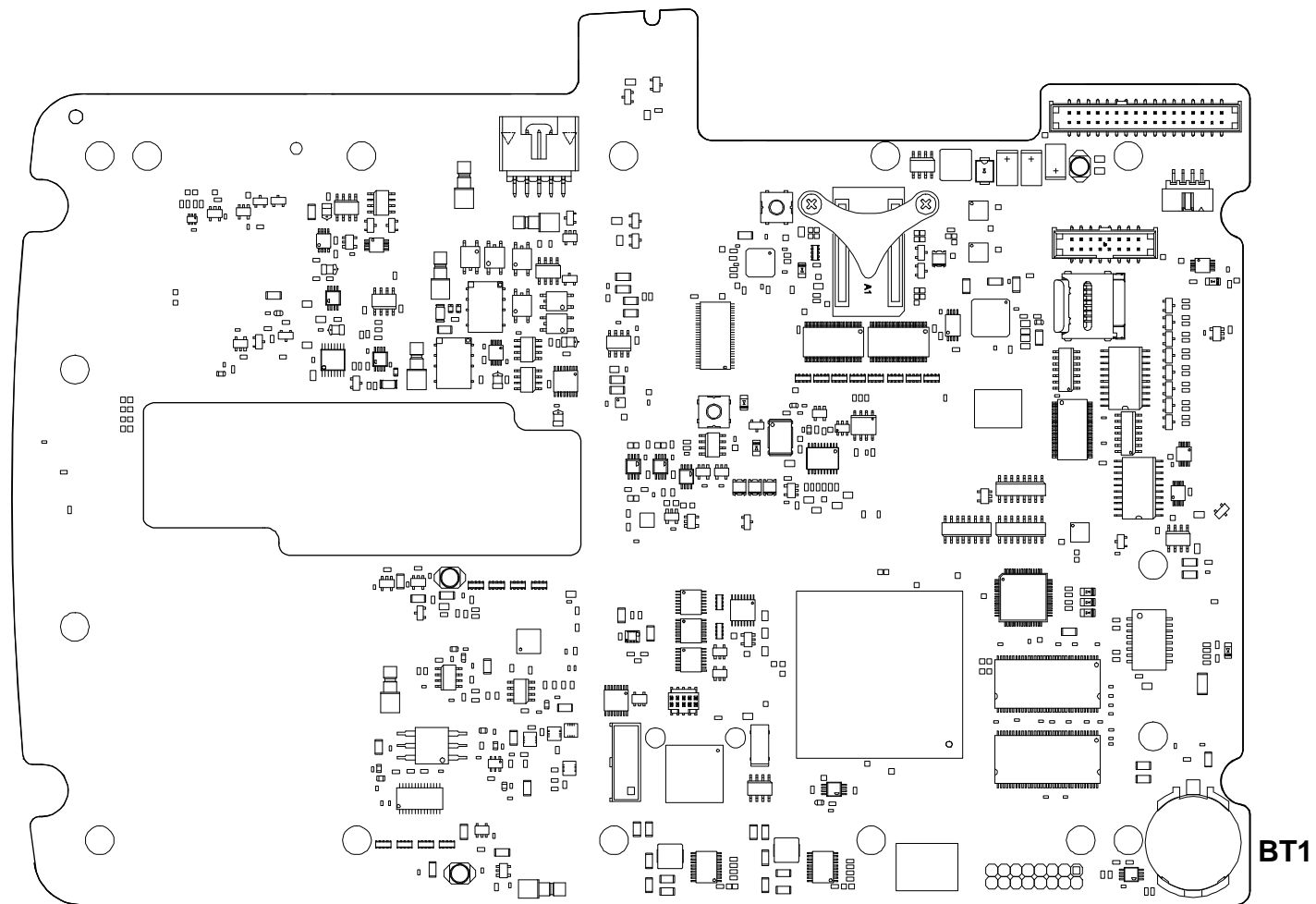
**CAUTION:**  
CONTAINS PARTS AND ASSEMBLIES  
SUSCEPTIBLE TO DAMAGE BY  
ELECTROSTATIC DISCHARGE (ESD).

Figure A-2. Chassis Assy  
(3550) (90476)  
(3550R) (90588)





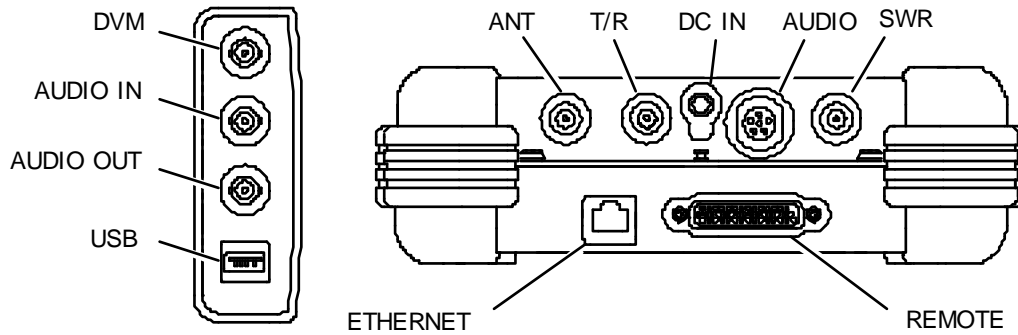
**CAUTION:**  
CONTAINS PARTS AND ASSEMBLIES  
SUSCEPTIBLE TO DAMAGE BY  
ELECTROSTATIC DISCHARGE (ESD).



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# APPENDIX B - CONNECTOR PIN-OUT TABLES

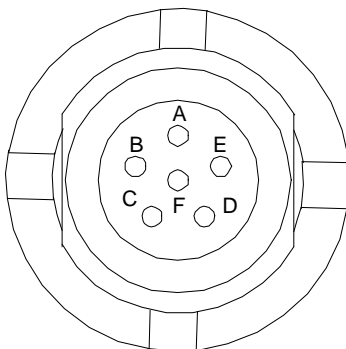
## B-1. I/O CONNECTORS



CONNECTOR	TYPE	SIGNAL TYPE	INPUT/OUTPUT
ANT	TNC Female		INPUT/OUTPUT
T/R	TNC Female		INPUT/OUTPUT
SWR	TNC Female		OUTPUT
DC IN	2.5 mm CIRCULAR (2.5 mm center, 5.5 mm outer diameter, center positive)		INPUT
AUDIO	6-Pin CIRCULAR Female	MIXED	INPUT/OUTPUT
	Refer to Appendix B, Table 2 for AUDIO Connector description		
REMOTE	44-Pin D-SUB Female	MIXED	INPUT/OUTPUT
	Refer to Appendix B, Table 3 for REMOTE Connector description		
ETHERNET		MIXED	INPUT/OUTPUT
	Refer to Appendix B, Table 4 for ETHERNET Connector description		
DVM	BNC Female		INPUT
AUDIO IN	BNC Female		INPUT
AUDIO OUT	BNC Female		OUTPUT
USB		MIXED	INPUT/OUTPUT
	Refer to Appendix B, Table 5 for USB Connector description		

Table B-1. I/O Connectors

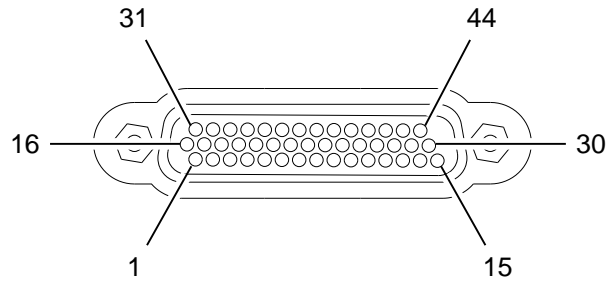
## B-2. AUDIO CONNECTOR PIN-OUT TABLE (cont)



PIN NO.	SIGNAL NAME
A	GND
B	SPEAKER+
C	PTT
D	MIC
E	MICSEL1
F	MICSEL2

Table B-2. AUDIO Connector Pin-Out Table

### B-3. REMOTE CONNECTOR PIN-OUT TABLE

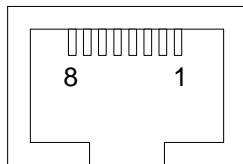


062-003

PIN NO.	SIGNAL NAME	PIN NO.	SIGNAL NAME
1	USB3_VBUS	23	GND
2	USB3_GND	24	PPC_ETX_P
3	+5V_ACC	25	GND
4	PPCDEBUG_TXD	26	PPCUSR_CTS
5	GND	27	PPCUSR_TXD
6	OMAPRCI_RTS	28	REM_GPIO(5)
7	GND	29	REM_GPIO(1)
8	PPC_ERX_N	30	REM_GPIO(3)
9	PPC_ETX_N	31	USB3_VBUS
10	GND	32	USB3_GND
11	PPCUSR_RTS	33	+5V_ACC
12	PPCUSR_RXD	34	PPCDEBUG_RXD
13	REM_GPIO(7)	35	GND
14	REM_GPIO(6)	36	OMAPRCI_RXD
15	REM_GPIO(2)	37	GND
16	USB3_FD_N	38	PPC_ERX_P
17	USB3_FD_P	39	GND
18	OMAPCON_TXD	40	REM_GPIO(4)
19	OMAPCON_RXD	41	REM_GPIO(0)
20	GND	42	OMAPCON_RTS
21	OMAPRCI_TXD	43	OMAPCON_CTS
22	OMAPRCI_CTS	44	BKBOX#

Table B-3. REMOTE Connector Pin-Out Table

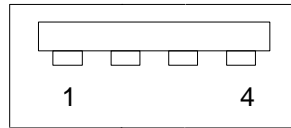
## B-4. ETHERNET CONNECTOR PIN-OUT TABLE



PIN NO.	SIGNAL NAME
1	TX+
2	TX-
3	RX+
4	NOT USED
5	NOT USED
6	RX-
7	NOT USED
8	NOT USED

Table B-4. ETHERNET Connector Pin-Out Table

## B-5. USB CONNECTOR PIN-OUT TABLE



PIN NO.	SIGNAL NAME
1	VCC
2	D-
3	D+
4	GND

Table B-5. USB Connector Pin-Out Table

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## APPENDIX C - SUPPORT EQUIPMENT REQUIREMENTS

This Appendix contains a list of test equipment suitable for performing all testing procedures contained in this manual. Other equipment meeting specifications listed in this Appendix may be substituted in place of recommended models. Equipment listed in this Appendix may exceed minimum required specifications for some procedures contained in this manual.

TYPE	MODEL
Digital Multimeter	HP 34401A or Equivalent
Spectrum Analyzer	Aeroflex AN940 or Equivalent
Universal Frequency Counter	Agilent 53131A or Equivalent
Calibrator	Fluke 5520 or Equivalent
Power Meter	Agilent N1911A or Equivalent
Power Meter Sensor	Agilent E4412A or Equivalent
Signal Generator	HP 8648C or Equivalent
RF Power Amplifier (50 W)	

Table C-1. Test Equipment

TYPE	MODEL
Short-Open-Load VSWR Calibrator	Aeroflex (38245)
Handset (Microphone)	Aeroflex (64606)
Directional Coupler	Narda 3020A or Equivalent
Power Splitter (2-Way, Resistive)	
Stub Tuner	Maury Microwave 1778A
TNC (M) to N (M) Adapter	PE 9446
TNC (M) to TNC (M) Adapter	PE 9443
N (F) to N (F) Adapter	Amphenol 082-101
100 MHz Low-Pass Filter	
300 MHz Low-Pass Filter	
700 MHz Low-Pass Filter	
1200 MHz Low-Pass Filter	
50 $\Omega$ Termination	
10 dB Attenuator (10 W)	
20 dB Pad	
BNC T-Connector	
Ethernet Crossover Cable	
TNC to BNC Cable	

Table C-2. Adapters, Cables and Accessories

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## APPENDIX D - ABBREVIATIONS

<b>A</b>		<b>H</b>	
A	Amperes	H	Hour
AC	Alternating Current	HI	High
AF	Audio Frequency	HP	High-Pass
AFBW	Audio Frequency Bandwidth	Hr	Hour
AM	Amplitude Modulation	Hz	Hertz
ANT	Antenna		
Assy	Assembly		
ATTN	Attenuation		
Aud	Audio		
<b>B</b>		<b>I</b>	
Bat	Battery	i.e.,	That is ...
Batt	Battery	IF	Intermediate Frequency
BP	Bandpass	IN	Input
BW	Bandwidth	In/lbs.	Inch/Pounds
		I/O	Input/Output
<b>C</b>		<b>K</b>	
C	Celsius or Centigrade		
CAL	Calibrate/Calibration		
CAL'D	Calibrated		
CFM	Coldfire Firmware		
Config	Configure/Configuration		
CPLD	Complex Processing Logic Device		
CW	Continuous Wave	kHz	Kilohertz (10 <sup>3</sup> Hertz)
<b>D</b>		<b>L</b>	
D	Day	LCD	Liquid Crystal Display
dB	Decibel	LO	Low
dBc	Decibels below Carrier	LP	Low-Pass
dBm	Decibels above one Milliwatt	Lvl	Level
DC	Direct Current		
DEV	Deviation		
DIST	Distortion		
<b>E</b>		<b>M</b>	
e.g.	For Example ...	M, m	Month or Meters or Minutes
EMC	Electromagnetic Compatibility	Mm	Millimeter
EMI	Electromagnetic Interference	MFIO	Multi-Function I/O
Err	Error	MHz	Megahertz (10 <sup>6</sup> Hertz)
ESC	Escape	MIC	Microphone
		MIN, min	Minimum or Minutes
		MOD	Modulation
		mm	Millimeter (10 <sup>-3</sup> Meters)
<b>F</b>		<b>N</b>	
FH	Frequency Hop	NORM	Normal or Normalize
Fgen	Function Generator		
FM	Frequency Modulation		
FPGA	Field Programmable Gate Array		
FREQ	Frequency		
<b>G</b>		<b>O</b>	
Gen	Generate		
GHz	Gigahertz (10 <sup>9</sup> Hertz)	OUT	Output
		Ovr	Overload
<b>H</b>		<b>P</b>	
		para	Paragraph
		PC	Printed Circuit
		PCB	Printed Circuit Board
		PPC	PowerPC
		ppm	Parts per Million
		PTT	Push to Talk
		Pwr	Power
<b>I</b>		<b>R</b>	
		REC	Receive
		RF	Radio Frequency
		RSSI	Received Signal Strength Indication
			Receive
		RX	Receive

**S**

SWR Standing Wave Ratio

**T**

Tem Temperature  
Temp Temperature  
T/R Transmit/Receive  
TX Transmit

**U**

UNCAL'D Uncalibrated  
UUT Unit Under Test

**V**

V Volt  
VAC Volts, Alternating Current  
Vdc Volts, Direct Current  
VHF Very High Frequency  
Vol Volume  
Vrms Volts Root Mean Square  
VSWR Voltage Standing Wave Ratio

**W**

W Watt

**Y**

Y Year

## APPENDIX E - ASSEMBLY DRAWINGS / SCHEMATICS

ASSEMBLY		PAGE
(1) 3550 Interconnect Diagram (3550)	(90462)	E-3 E-5
(1) 3550R Interconnect Diagram (3550R)	(90462)	E-3 E-7
(A1) Power Supply PCB Assy	(66001)	E-9
(A1) Power Supply PCB Assy	(92680)	E-10
(A2) Chassis Assy (3550)	(90476)	E-11
(A2) Chassis Assy (3550R)	(90588)	E-11
(1A2A1) Multi-Function PCB Assy	(90384)	E-13
(A3) RF Assy	(91092)	E-16

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**CAUTION:**  
CONTAINS PARTS AND ASSEMBLIES  
SUSCEPTIBLE TO DAMAGE BY  
ELECTROSTATIC DISCHARGE (ESD).

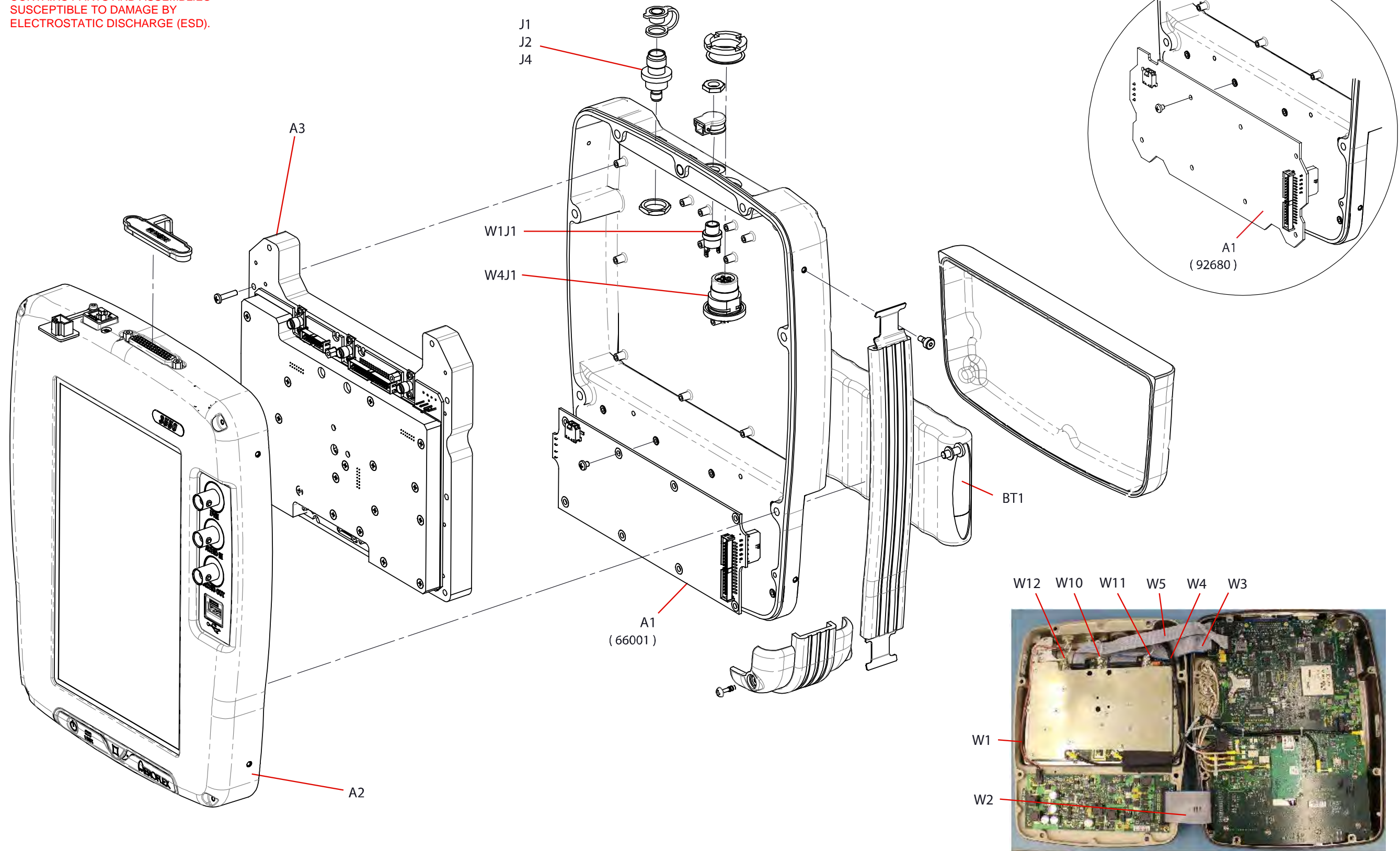


Figure E-1. 3550 / 3550R (Sheet 1 of 6)  
(90462 B4, B5, B6) (C0) (1)



 **CAUTION:**  
CONTAINS PARTS AND ASSEMBLIES  
SUSCEPTIBLE TO DAMAGE BY  
ELECTROSTATIC DISCHARGE (ESD).

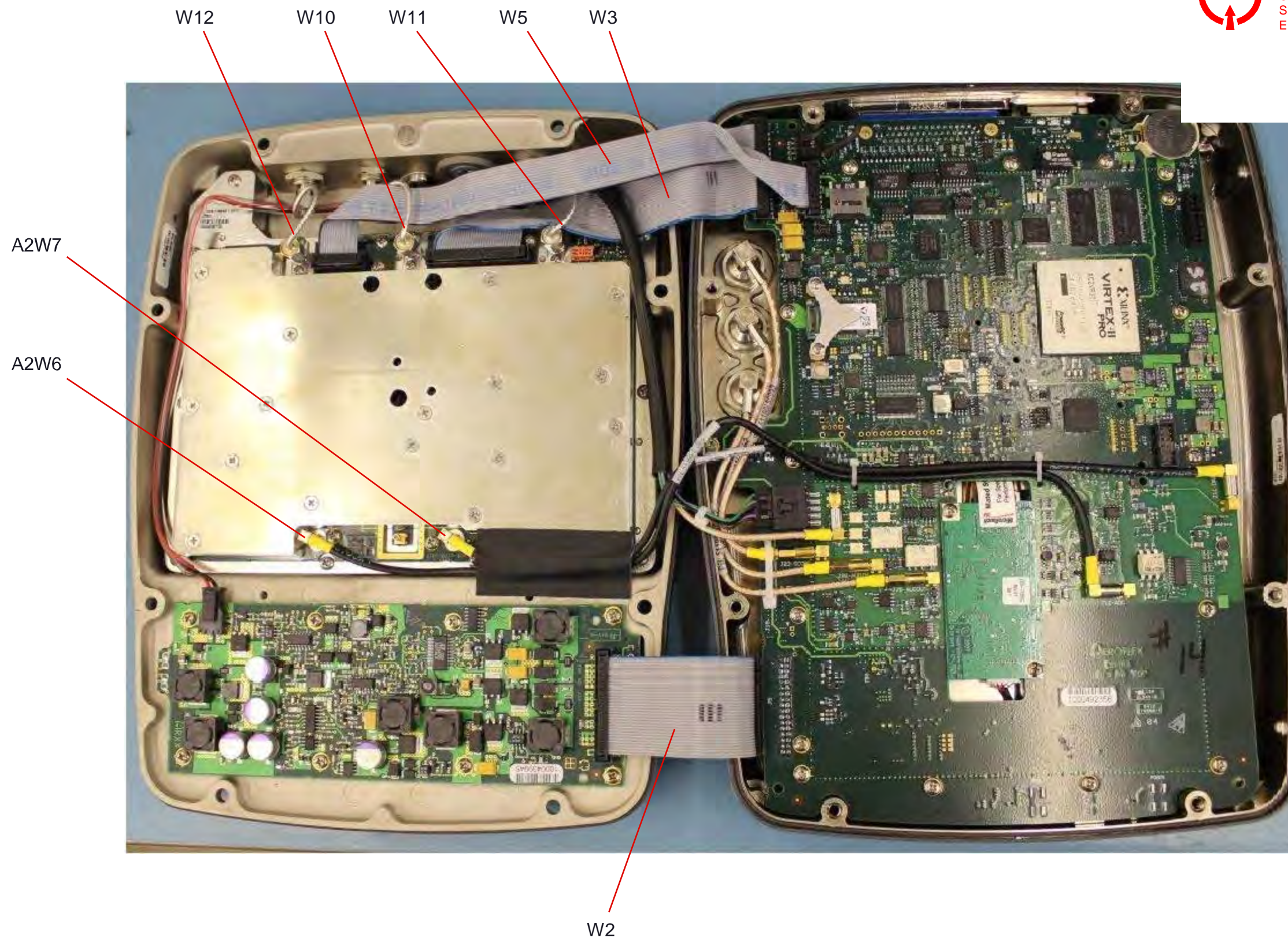


Figure E-1. 3550 / 3550R (Sheet 2 of 6)  
(90462 B4, B5, B6) (C0) (1)



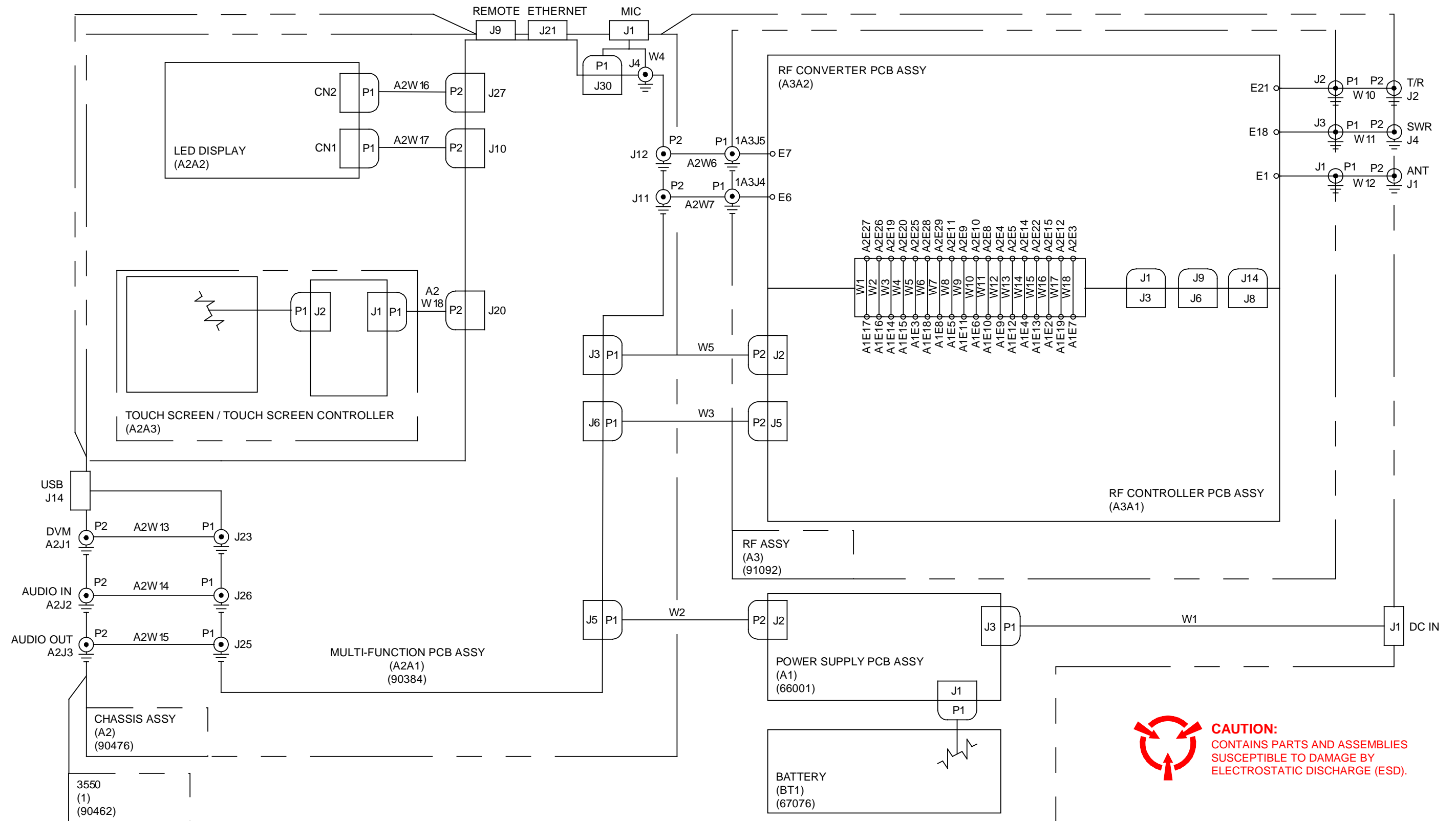
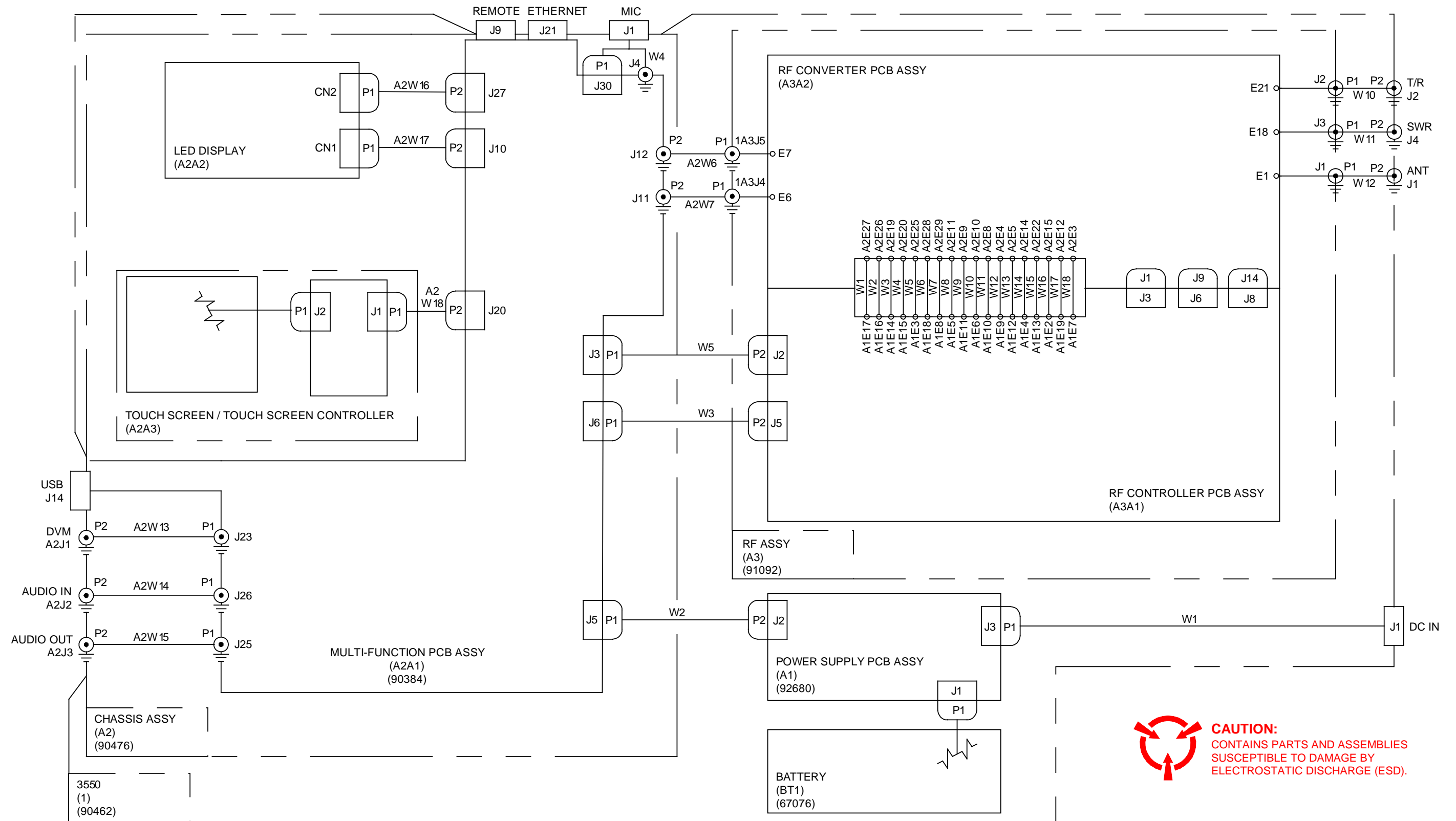
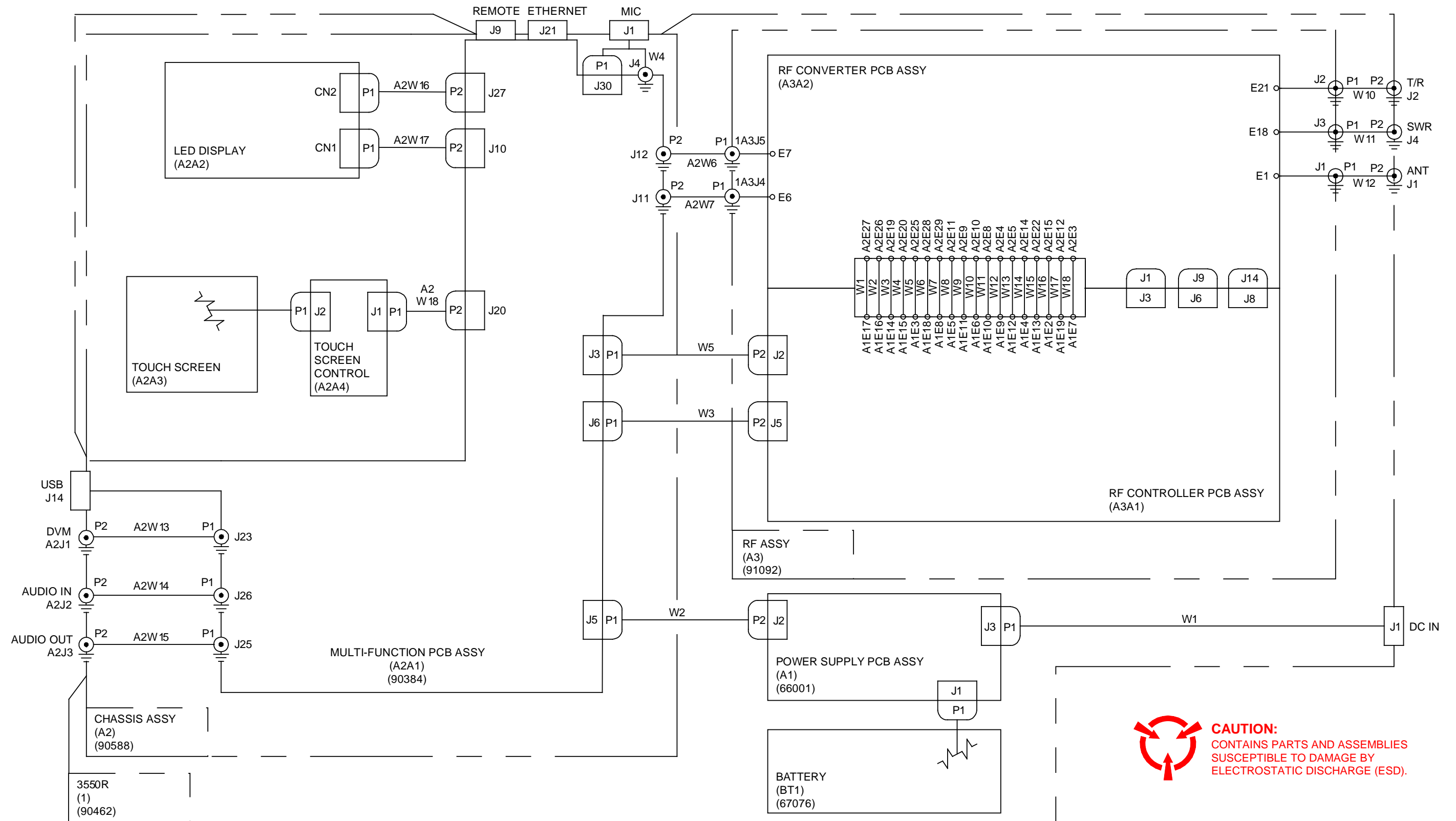


Figure E-1. 3550 / 3550R (Sheet 3 of 6)  
(90462 B4, B5, B6) (1)



3550

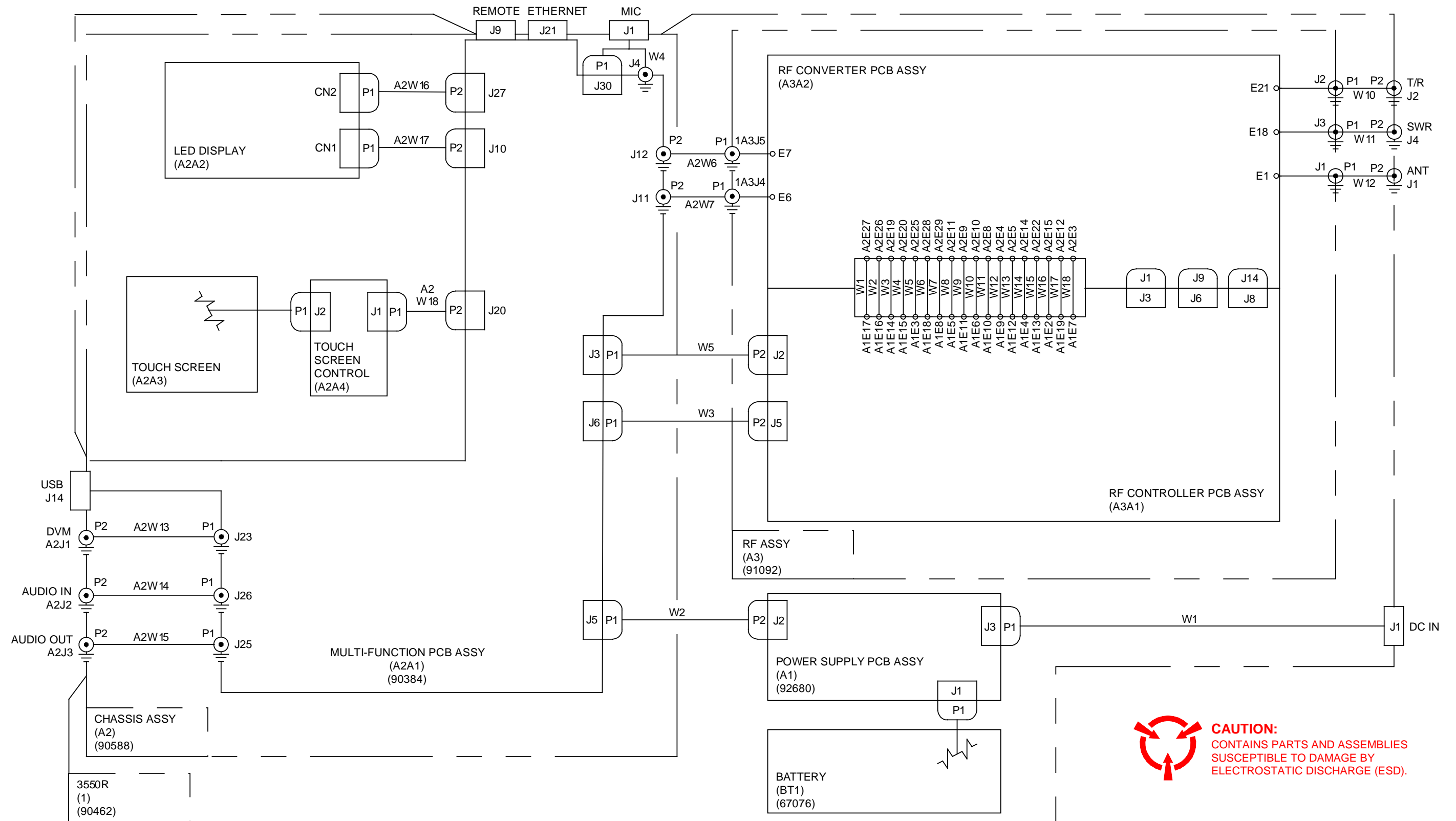
Figure E-1. 3550 / 3550R (Sheet 4 of 6)  
(90462 C0) (1)



**CAUTION:**  
CONTAINS PARTS AND ASSEMBLIES  
SUSCEPTIBLE TO DAMAGE BY  
ELECTROSTATIC DISCHARGE (ESD).

3550R

Figure E-1. 3550 / 3550R (Sheet 5 of 6)  
(90462 B4, B5, B6) (1)



 **CAUTION:**  
CONTAINS PARTS AND ASSEMBLIES  
SUSCEPTIBLE TO DAMAGE BY  
ELECTROSTATIC DISCHARGE (ESD).

**3550R**

Figure E-1. 3550 / 3550R (Sheet 6 of 6)  
(90462 C0) (1)



**CAUTION:**  
CONTAINS PARTS AND ASSEMBLIES  
SUSCEPTIBLE TO DAMAGE BY  
ELECTROSTATIC DISCHARGE (ESD).

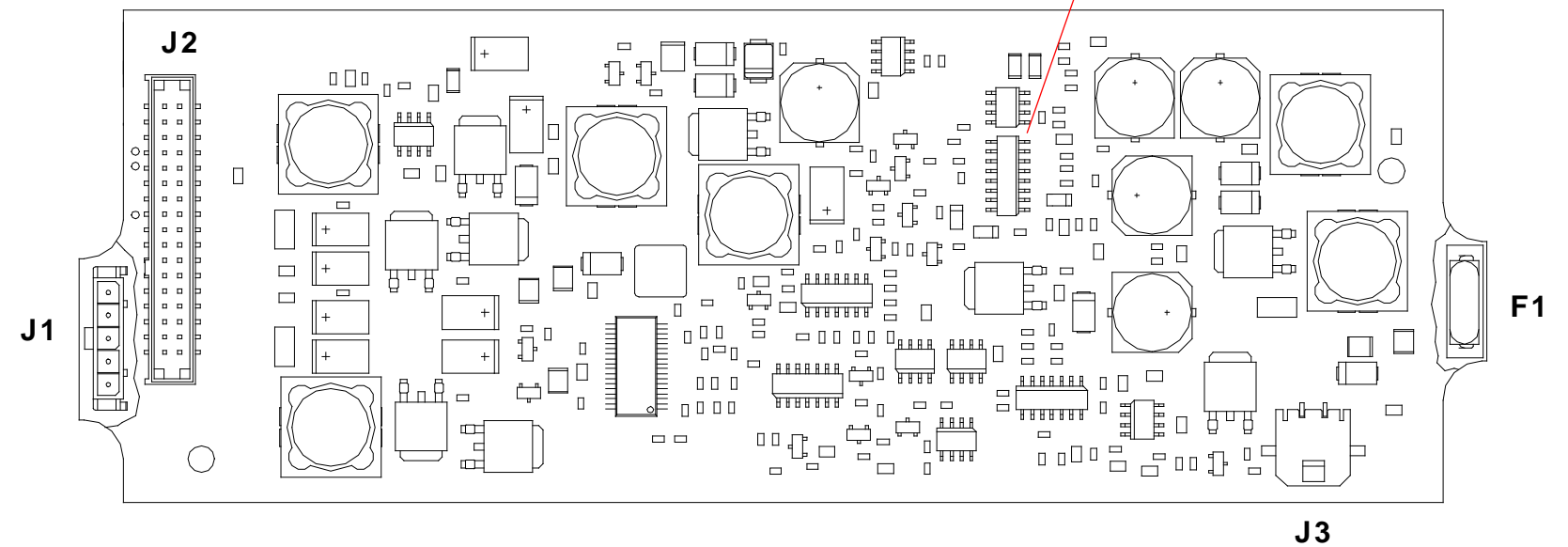
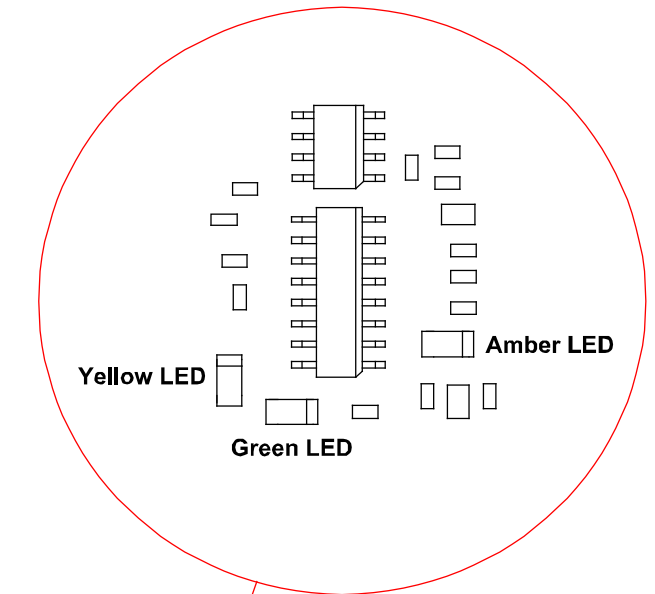
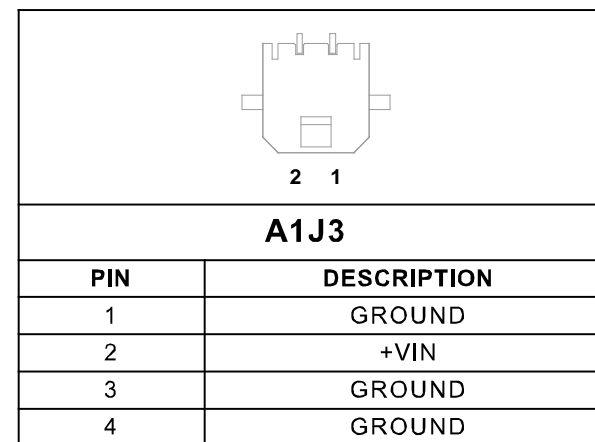
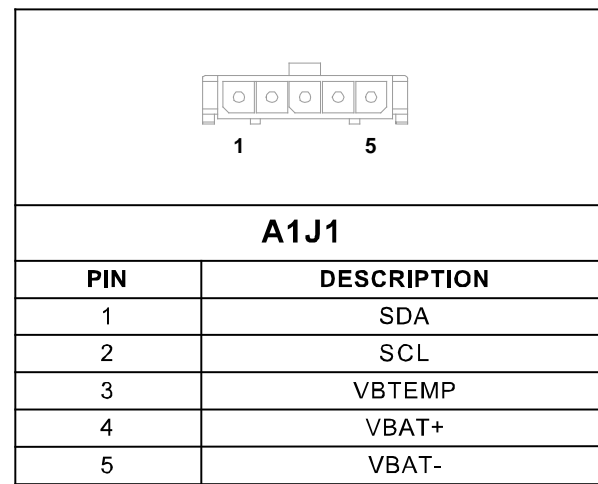
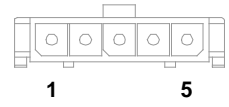


Figure E-2. Power Supply PCB Assy (Sheet 1 of 2)  
(66001 B0) (A1)



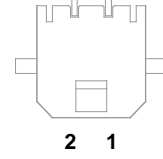
**CAUTION:**  
CONTAINS PARTS AND ASSEMBLIES  
SUSCEPTIBLE TO DAMAGE BY  
ELECTROSTATIC DISCHARGE (ESD).



A1J1	
PIN	DESCRIPTION
1	SDA
2	SCL
3	VBTEMP
4	VBAT+
5	VBAT-



A1J2	
PIN	DESCRIPTION
1	GROUND
2	GROUND
3	+5 V
4	GROUND
5	+5 V
6	SDA
7	+5 V
8	SCL
9	+5 V
10	PWR_ON_OFF
11	+5 V
12	GROUND
13	+3.3 V
14	GROUND
15	+3.3 V
16	GROUND
17	+3.3 V
18	GROUND
19	+3.3 V
20	PSINT
21	+3.3 V
22	CHG
23	+18 V
24	FCHG
25	+18 V
26	+5.5 V
27	-5 V
28	+5.5 V
29	-5 V
30	GROUND
31	-5 V
32	GROUND
33	GROUND
34	GROUND



A1J3	
PIN	DESCRIPTION
1	GROUND
2	+VIN
3	GROUND
4	GROUND

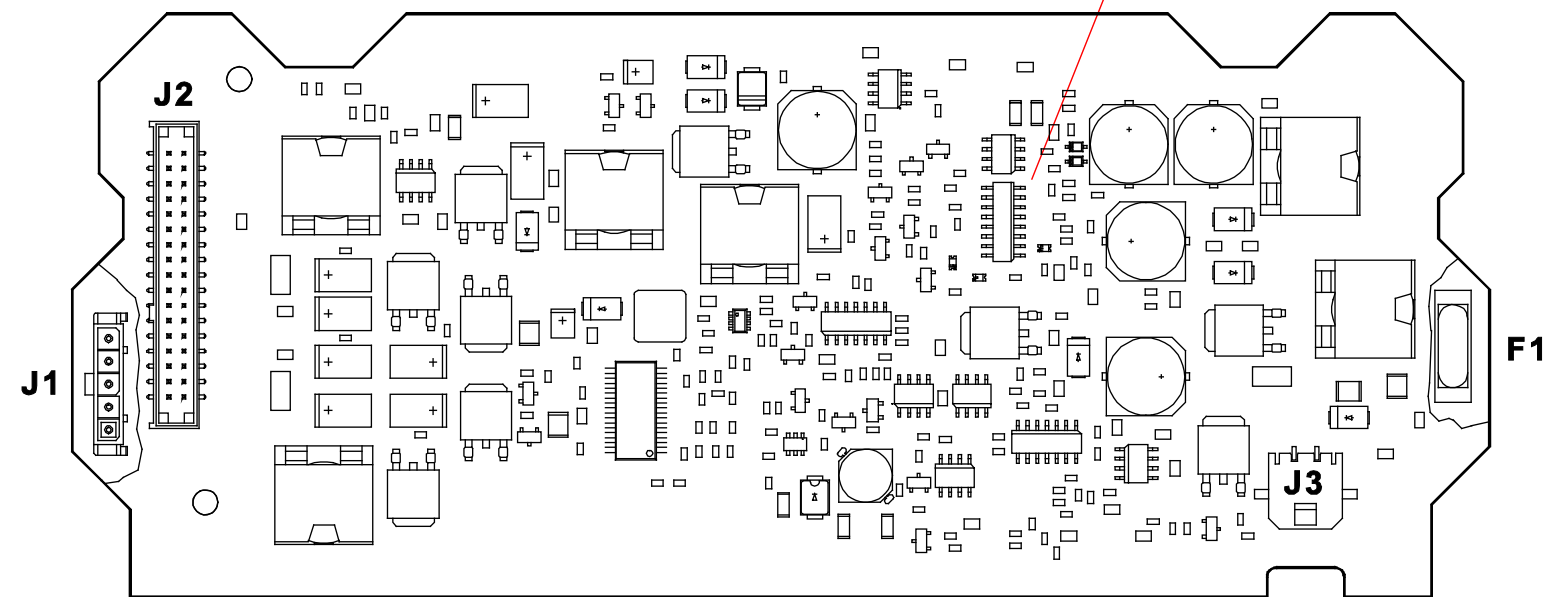
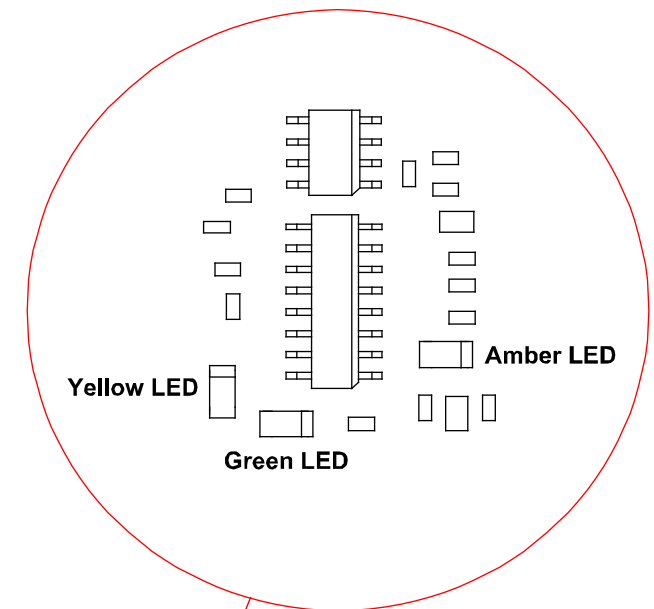

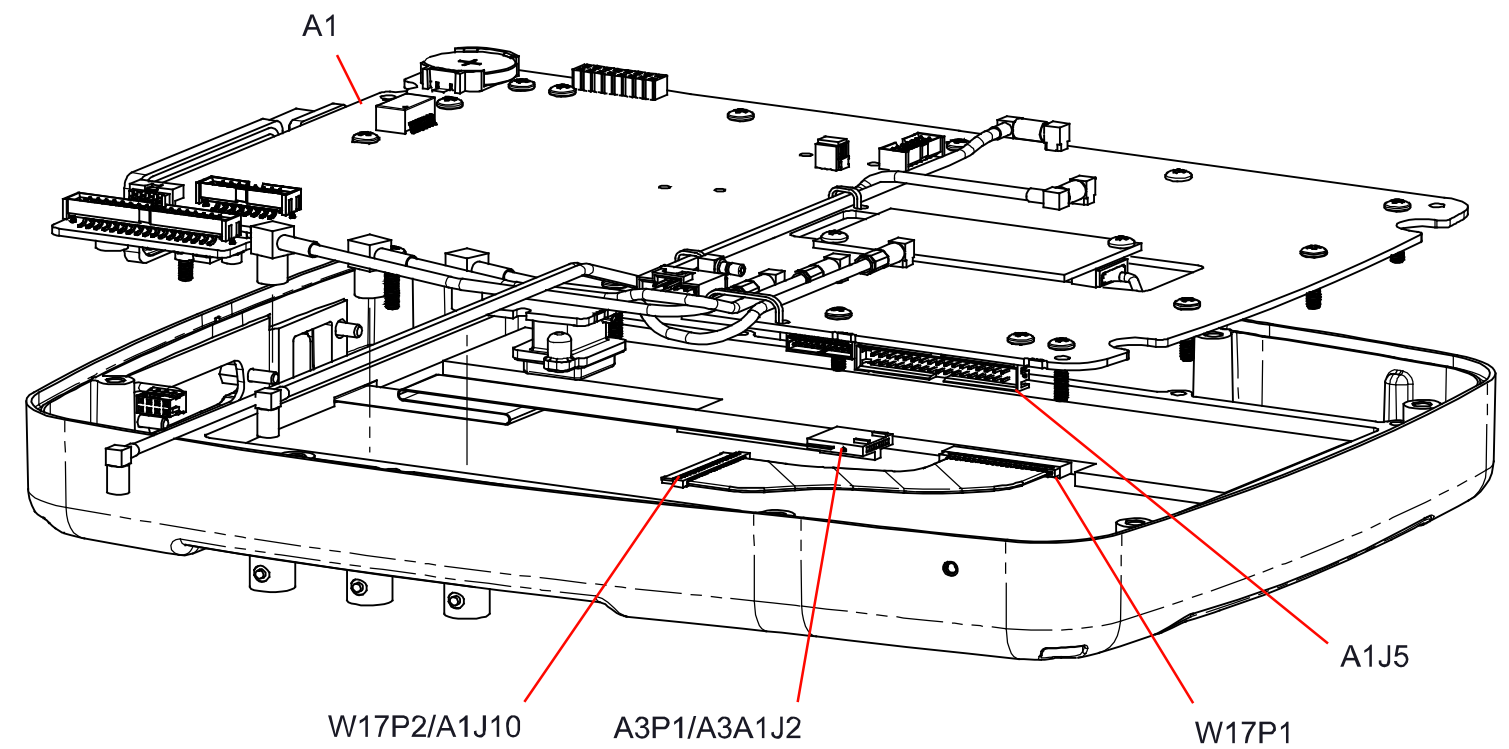
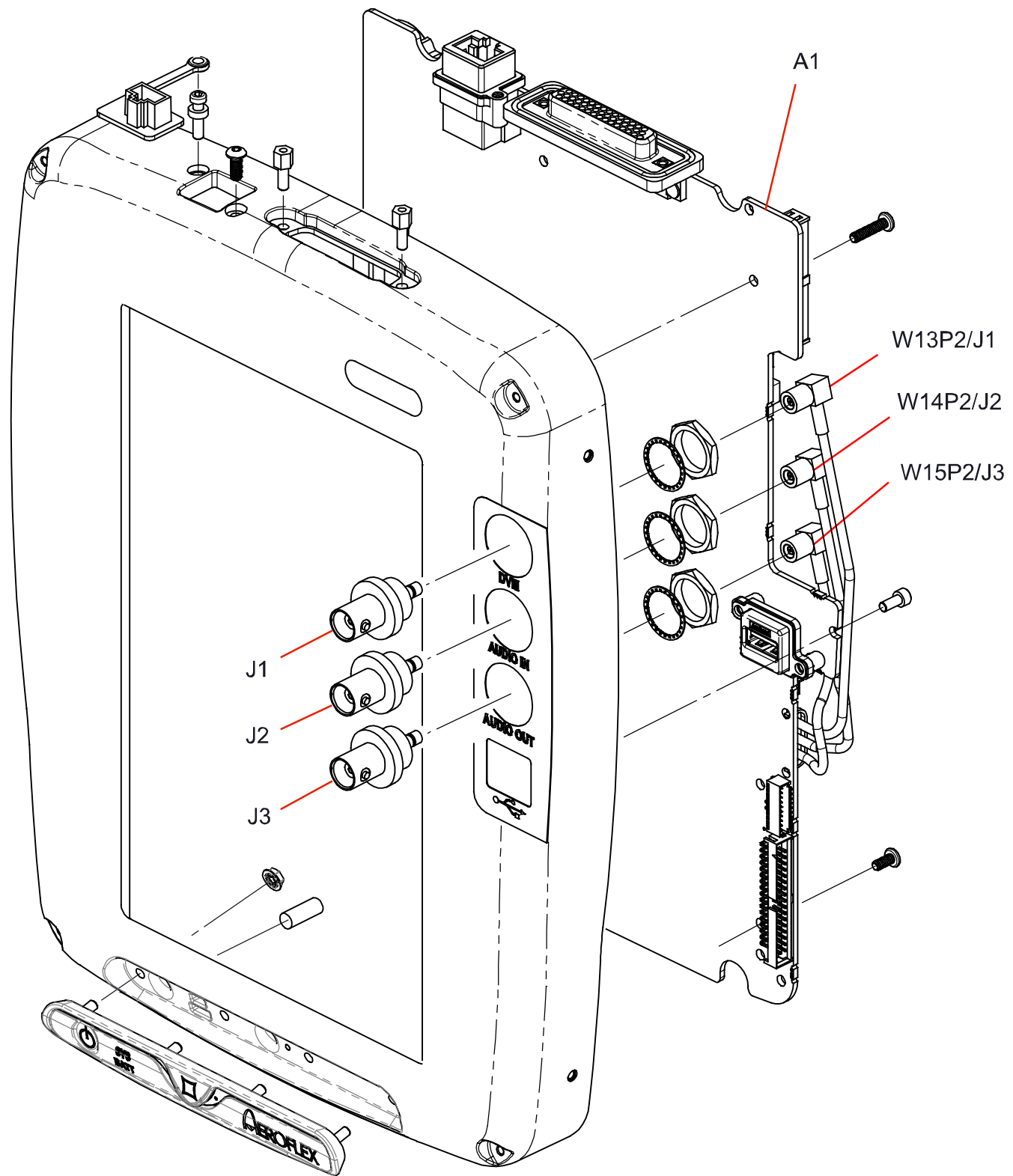


Figure E-2. Power Supply PCB Assy (Sheet 2 of 2)  
(92680 A0, B0) (A1)

 **CAUTION:**  
CONTAINS PARTS AND ASSEMBLIES  
SUSCEPTIBLE TO DAMAGE BY  
ELECTROSTATIC DISCHARGE (ESD).







**CAUTION:**  
CONTAINS PARTS AND ASSEMBLIES  
SUSCEPTIBLE TO DAMAGE BY  
ELECTROSTATIC DISCHARGE (ESD).

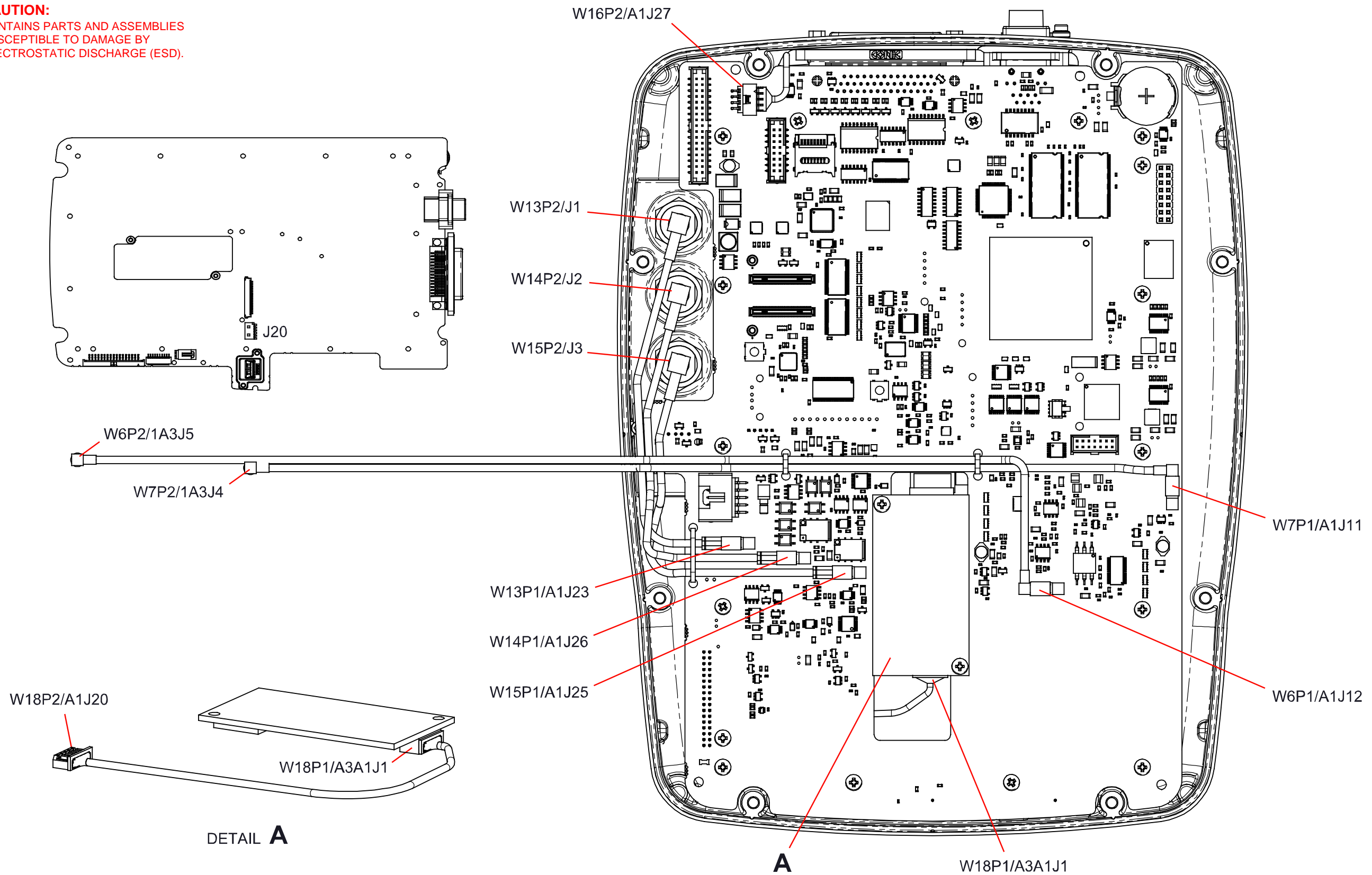


Figure E-3. Chassis Assy (Sheet 2 of 2)  
(3550) (90476 B2, C0) (A2)  
(3550R) (90588 B1, B2, B3, C0, D0) (A2)





**CAUTION:**  
CONTAINS PARTS AND ASSEMBLIES  
SUSCEPTIBLE TO DAMAGE BY  
ELECTROSTATIC DISCHARGE (ESD).

( REV D0, E0, E1, F0 )

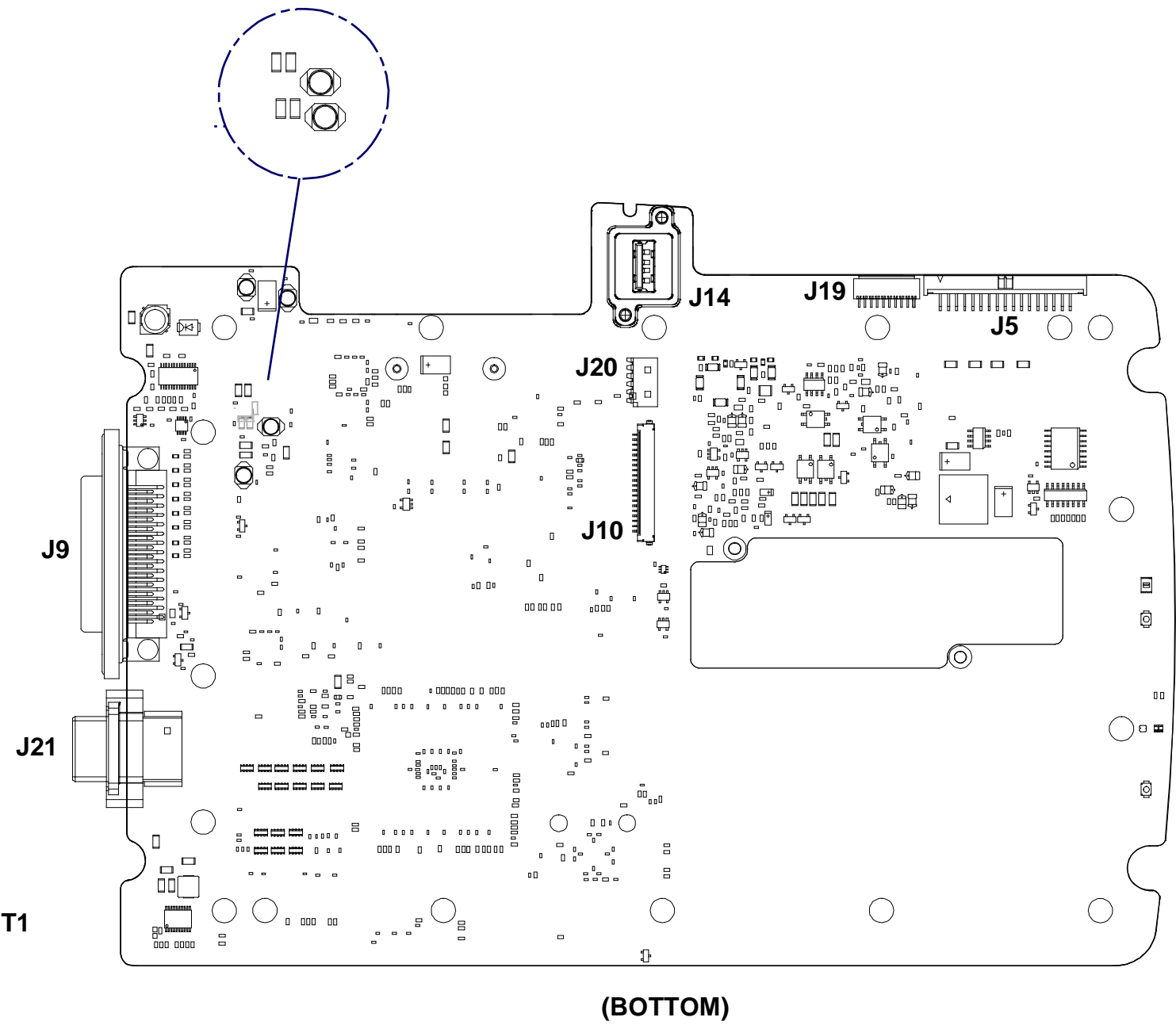
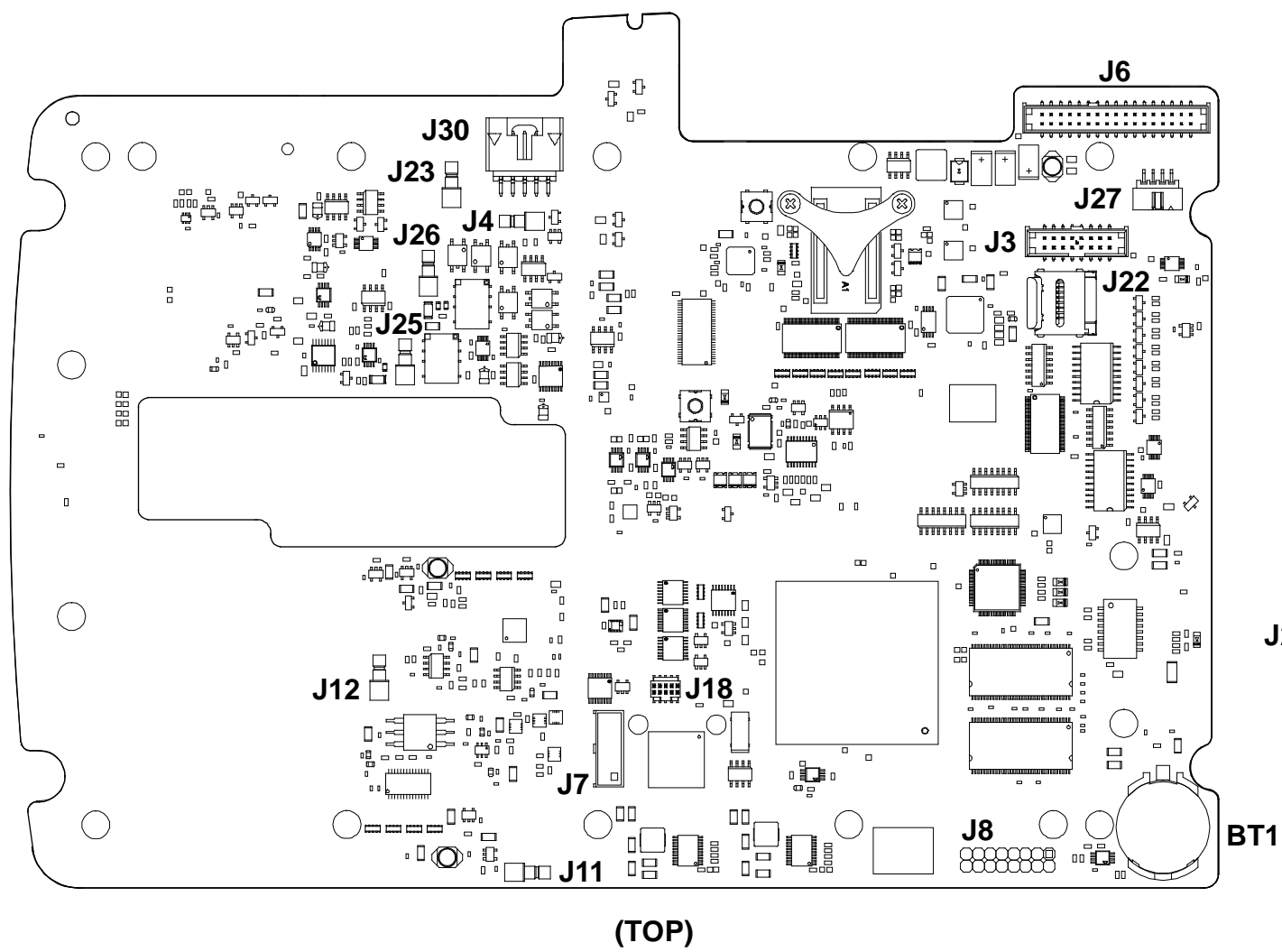


Figure E-4. Multi-Function PCB Assy (Sheet 1 of 3)  
(90384-G0) (A2A1)



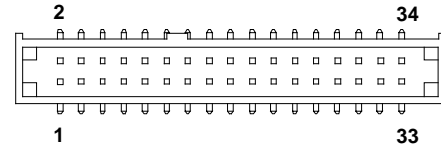
**CAUTION:**  
CONTAINS PARTS AND ASSEMBLIES  
SUSCEPTIBLE TO DAMAGE BY  
ELECTROSTATIC DISCHARGE (ESD).



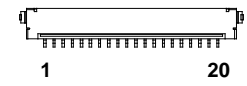
A2A1J3	
PIN	DESCRIPTION
1	+18.0 V POWER
2	+18.0 V POWER
3	+12.5 V POWER
4	+12.5 V POWER
5	GROUND
6	GROUND
7	-5.0 V POWER
8	-5.0 V POWER
9	+5.0 V POWER
10	+5.0 V POWER
11	+5.0 V POWER
12	+5.0 V POWER
13	GROUND
14	GROUND
15	+3.3 V POWER
16	+3.3 V POWER



A2A1J5	
PIN	DESCRIPTION
1	GROUND
2	GROUND
3	+5 V
4	GROUND
5	+5 V
6	SDA
7	+5 V
8	SCL
9	+5 V
10	PWR_ON_OFF
11	+5 V
12	GROUND
13	+3.3 V
14	GROUND
15	+3.3 V
16	GROUND
17	+3.3 V
18	GROUND
19	+3.3 V
20	PSINT
21	+3.3 V
22	CHG
23	+18 V
24	FCHG
25	+18 V
26	+5.5 V
27	-5 V
28	+5.5 V
29	-5 V
30	GROUND
31	-5 V
32	GROUND
33	GROUND
34	GROUND



A2A1J6	
PIN	DESCRIPTION
1	SPI2_IN_P
2	SPI2_IN_N
3	SPI2_CLK_P
4	SPI2_CLK_N
5	SPI2_DATA_P
6	SPI2_DATA_N
7	SPI2_LATCH0_P
8	SPI2_LATCH0_N
9	SPI2_LATCH1_P
10	SPI2_LATCH1_N
11	RFCLK80_EN
12	RF_INT
13	GROUND
14	GROUND
15	SPI_CLK_P
16	SPI_CLK_N
17	GROUND
18	GROUND
19	SPI_DATA_P
20	SPI_DATA_N
21	GROUND
22	SPI_DI_P
23	SPI_DI_N
24	GROUND
25	SPI_L0_P
26	SPI_L1_N
27	SPI_L0_P
28	SPI_L1_N
29	SPI_L2_P
30	SPI_L2_N
31	GROUND
32	GROUND
33	80 LVDS_P
34	80 LVDS_N




A3A1J10	
PIN	DESCRIPTION
1	LCD +3.3 V POWER
2	LCD +3.3 V POWER
3	GROUND
4	GROUND
5	LVDS CHAN0 DATA-
6	LVDS CHAN0 DATA+
7	GROUND
8	LVDS CHAN1 DATA-
9	LVDS CHAN1 DATA+
10	GROUND
11	LVDS CHAN2 DATA-
12	LVDS CHAN2 DATA+
13	GROUND
14	LVDS CLOCK-
15	LVDS CLOCK+
16	GROUND
17	LVDS CHAN3 DATA-
18	LVDS CHAN3 DATA+
19	8-BIT/6-BIT MODE
20	MIRROR/NORMAL SCAN


Figure E-4. Multi-Function PCB Assy (Sheet 2 of 3)  
(90384-D0, E0, E1, F0) (A2A1)



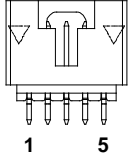
**CAUTION:**  
CONTAINS PARTS AND ASSEMBLIES  
SUSCEPTIBLE TO DAMAGE BY  
ELECTROSTATIC DISCHARGE (ESD).



A2A1J20	
PIN	DESCRIPTION
1	VBUS +5 V
2	DATA-
3	DATA+
4	GROUND
5	SHIELD



A2A1J27	
PIN	DESCRIPTION
1	CH1 ANODE (+)
2	CH1 CATHODE (-)
3	CH3 ANODE (+)
4	CH3 CATHODE (-)
5	CH4 ANODE (+)
6	CH4 CATHODE (-)
7	CH2 ANODE (+)
8	CH2 CATHODE (-)



A2A1J30	
PIN	DESCRIPTION
1	PUSH-TO-TALK SWITCH
2	MIC SELECT 1
3	GROUND
4	SPEAKER OUTPUT
5	MIC SELECT 2

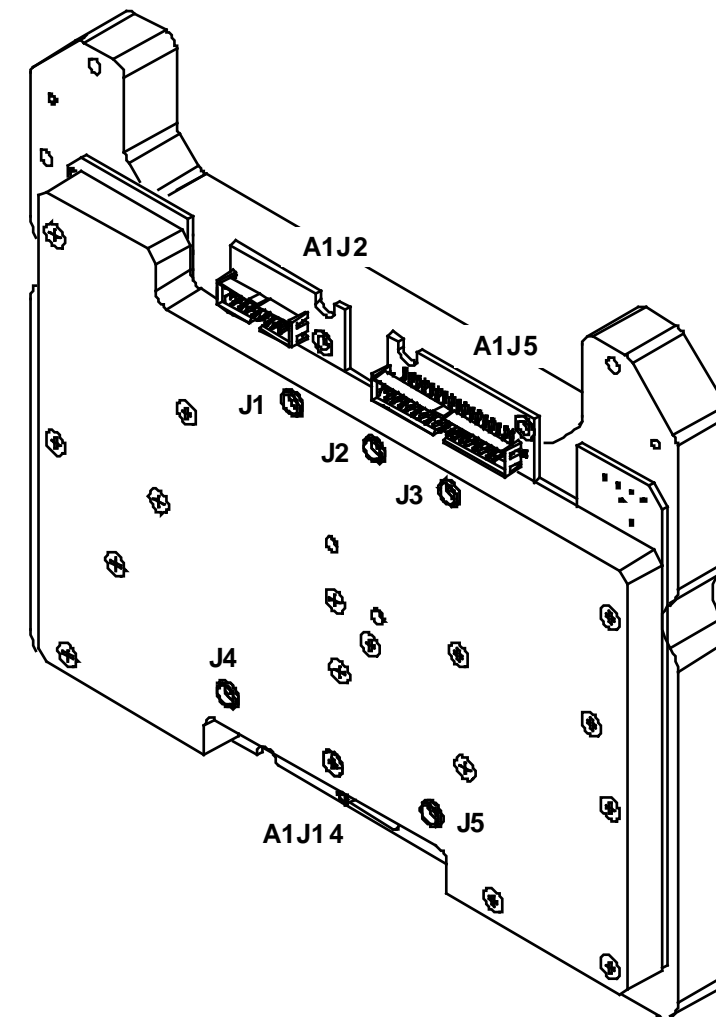
Figure E-4. Multi-Function PCB Assy (Sheet 3 of 3)  
(90384-D0, E0, E1, F0) (A2A1)



**CAUTION:**  
CONTAINS PARTS AND ASSEMBLIES  
SUSCEPTIBLE TO DAMAGE BY  
ELECTROSTATIC DISCHARGE (ESD).

A3A1J2	
PIN	DESCRIPTION
1	+18.0 V POWER
2	+18.0 V POWER
3	+12.5 V POWER
4	+12.5 V POWER
5	GROUND
6	GROUND
7	-5.0 V POWER
8	-5.0 V POWER
9	+5.0 V POWER
10	+5.0 V POWER
11	+5.0 V POWER
12	+5.0 V POWER
13	GROUND
14	GROUND
15	+3.3 V POWER
16	+3.3 V POWER

A3A1J5	
PIN	DESCRIPTION
1	SPI2_IN_P
2	SPI2_IN_N
3	SPI2_CLK_P
4	SPI2_CLK_N
5	SPI2_DATA_P
6	SPI2_DATA_N
7	SPI2_LATCH0_P
8	SPI2_LATCH0_N
9	SPI2_LATCH1_P
10	SPI2_LATCH1_N
11	RFCLK80_EN
12	RF_INT
13	GROUND
14	GROUND
15	SPI_CLK_P
16	SPI_CLK_N
17	GROUND
18	GROUND
19	SPI_DATA_P
20	SPI_DATA_N
21	GROUND
22	SPI_DI_P
23	SPI_DI_N
24	GROUND
25	SPI_L0_P
26	SPI_L1_N
27	SPI_L0_P
28	SPI_L1_N
29	SPI_L2_P
30	SPI_L2_N
31	GROUND
32	GROUND
33	80 LVDS_P
34	80 LVDS_N



# INDEX

<p>3550 / 3550R            Assembly Layout E-3            Parts List A-9            Parts Locator A-13            System Block Diagram 1-2            System Interconnect Diagram E-5, E-7</p>	<p style="text-align: center;"><b>E</b></p> <p>Equipment Data 1-1            Equipment Description 1-1              Capabilities 1-1              Characteristics 1-1              Features 1-1            ETHERNET Connector Pin-Out Table B-4</p>
<p><b>A</b></p>	<p><b>G</b></p>
<p>Abbreviations D-1            Accessories A-1              Optional A-5              Standard A-1            AUDIO Connector Pin-Out Table B-2            Assembly Drawings and Schematics              (1) 3550 / 3550R E-3                (A1) Power Supply PCB Assy E-9                (A2) Chassis Assy E-11                (A2A1) Multi-Function PCB Assy E-13                (A3) RF Assy E-16              Interconnect Diagram E-5, E-7</p>	<p>General Information 1-1            Nomenclature Cross-Reference List 1-1            Scope</p>
<p><b>B</b></p>	<p><b>I</b></p>
<p>Battery              Remove/Replace Procedure 2-76              Troubleshooting 2-5            Battery Precautions (Troubleshooting) 2-4</p>	<p>I/O Connectors (Table) B-1</p>
<p><b>C</b></p>	<p><b>L</b></p>
<p>Calibration / Verification Procedures 2-33            Calibration Procedures 2-59              Audio Level Meter Calibration 2-74              Calibration Setup 2-59              Generator Calibration 2-63              Receiver Calibration 2-66              RF Power Meter Calibration 2-69              SWR Phase Detector Calibration 2-73              TCXO Calibration 2-61            Calibration / Verification Schedule 2-33            Support Equipment 2-34            Testing Conditions 2-33            Verification Data Sheets 2-55            Verification Procedures 2-35              Audio Level Meter Verification 2-51              Generator Verification 2-35              Receiver RSSI Verification 2-38              RF Power Meter Verification 2-43              SWR Meter Verification 2-49              TCXO Verification 2-42</p>	<p>LCD Assy (A2A2)              Principles of Operation 1-8</p>
<p><b>M</b></p>	<p><b>M</b></p>
<p>Chassis Assy (A2)              Assembly Layout E-11              Parts List A-10, A-11              Parts Locator A-14</p>	<p>Multi-Function PCB Assy (A2A1)              Assembly Layout E-13              Block Diagram 1-6              Parts List A-12              Parts Locator A-15              Principles of Operation 1-7              Remove/Replace Procedure 2-86</p>
<p>Connector Pin-Out Tables B-1            AUDIO Connector B-2            ETHERNET Connector B-4            REMOTE Connector B-3            I/O Connectors B-1</p>	

<b>P</b>	
Parts List	
3550 / 3550R	A-9
Accessories	
Optional	A-5
Standard	A-1
Chassis Assy	A-10, A-11
Multi-Function PCB Assy	A-12
Power Supply PCB Assy (A1)	
Assembly Layout	E-9
Block Diagram	1-5
Principles of Operation	1-3
Remove/Replace Procedure	2-84
Preparation for Storage or Shipment	2-100
Environment	2-100
Packaging	2-100
Principles of Operation	1-2
Detailed Description	1-3
LCD Assy (A2A2)	1-8
Multi-Function PCB Assy (A2A1)	1-7
Power Supply PCB Assy (A1)	1-3
RF Assy (A3)	1-9
General Description	1-2

<b>R</b>	
REMOTE Connector Pin-Out Table	B-3
Remove/Replace Procedures	2-75
ANT Connector	2-92
AUDIO Connector	2-95
AUDIO IN Connector	2-98
AUDIO OUT Connector	2-99
Battery	2-76
DC IN Connector	2-94
DVM Connector	2-97
Fuse	2-79
Multi-Function PCB Assy (A2A1)	2-86
Open Case Assembly	2-82
Power Supply PCB Assy (A1)	2-84
RF Assy (A3)	2-90
SWR Connector	2-96
T/R Connector	2-93
Replacement Parts	A-1
3550 / 3550R	A-9
Accessories	
Optional	A-5
Standard	A-1
Chassis Assy	A-10, A-11
Multi-Function PCB Assy	A-12
RF Assy (A3)	
Assembly Layout	E-16
Block Diagram	1-11
Principles of Operation	1-9
Remove/Replace Procedure	2-90

<b>S</b>	
Safety, Care and Handling	1-1
Support Equipment Requirements	C-1
Symptom Index (Troubleshooting)	2-5

<b>T</b>	
Support Equipment Requirements	C-1
Troubleshooting	2-2
Battery Precautions	2-4
Equipment Inspection	2-2
EMC / Safety Compliance	2-3
Guidelines	2-2
Precautions	2-3
Support Equipment	2-4
Symptom Index	2-5
Troubleshooting Table	2-6
Troubleshooting Tests	2-9
ANT Connector Failure	2-14
AUDIO Connector Failure	2-18
AUDIO IN Connector Failure	2-27
AUDIO OUT Connector Failure	2-24
BATT Indicator Failure	2-11
Display Failure	2-12
DVM Connector Failure	2-30
SWR Connector Failure	2-22
T/R Connector Failure	2-16
Unit Power-Up Failure	2-9

<b>V</b>	
Verification Data Sheets	2-55
Verification Procedures	2-35
Audio Level Meter Verification	2-51
Generator Verification	2-35
Receiver RSSI Verification	2-38
RF Power Meter Verification	2-43
SWR Meter Verification	2-49
TCXO Verification	2-42

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