



Communications Test Set 3500 / 3500A Maintenance Manual

Issue-4

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MAINTENANCE MANUAL

COMMUNICATIONS TEST SET

3500 / 3500A

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, 3500 / 3500A, Test Set or Unit refers to the 3500 / 3500A 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

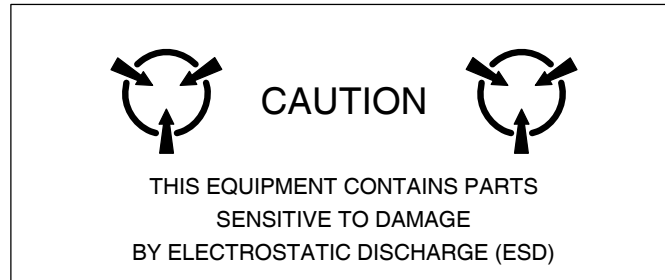
Use only fuses specifically recommended for the equipment at the specified current and voltage ratings.

WARNING: THE 3500 / 3500A USES A LITHIUM ION BATTERY PACK. THE FOLLOWING WARNINGS CONCERNING LITHIUM ION BATTERIES MUST BE HEEDED:

- **DO NOT RECHARGE OUTSIDE THE 3500 / 3500A.**
- **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 3500 / 3500A. 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 3500 / 3500A.

CHAPTER 2 - MAINTENANCE INSTRUCTIONS

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

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CHAPTER 1 - INTRODUCTION

1-1. GENERAL INFORMATION

A. Scope

Type of Manual: Maintenance Manual
Equipment Name and Model Number: 3500 / 3500A Communications Test Set
Purpose of Equipment: The 3500 / 3500A Communications Test Set is used for testing radios and related equipment.

B. Nomenclature Cross-Reference List

<u>COMMON NAME</u>	<u>OFFICIAL NOMENCLATURE</u>
3500 / 3500A	3500 / 3500A Communications Test Set
Test Set or Unit	3500 / 3500A Communications Test Set

1-2. EQUIPMENT DESCRIPTION

A. Equipment Characteristics, Capabilities and Features

Refer to the 3500 / 3500A Operation Manual for this information.

B. Equipment Data

Refer to the 3500 / 3500A Operation Manual for this information.

C. Safety, Care and Handling

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

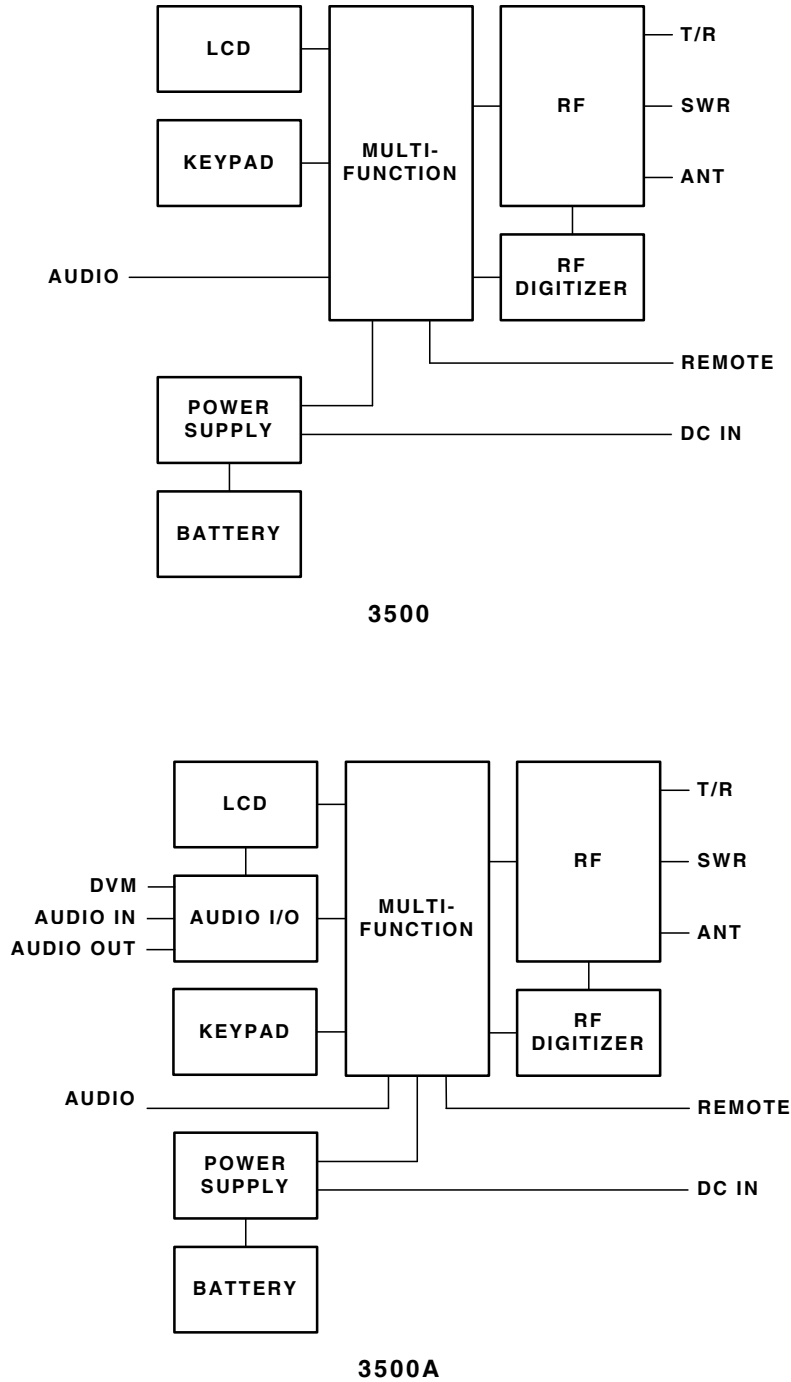


Figure 1-1. System Block Diagram

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 3500 / 3500A assemblies.

A. Power Supply PCB Assy (62A1A1) (Figure 1-2)

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°C to $+60^{\circ}\text{C}$ and the maximum charging temperature is 0°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 at full current 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° and 45°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 16 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 (62A1A1) (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 500 ms 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. A low voltage cutoff is also incorporated into the ON/OFF circuitry.

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. If the DC input voltage is too low, the input converter is disabled until the input voltage is within the allowable range.

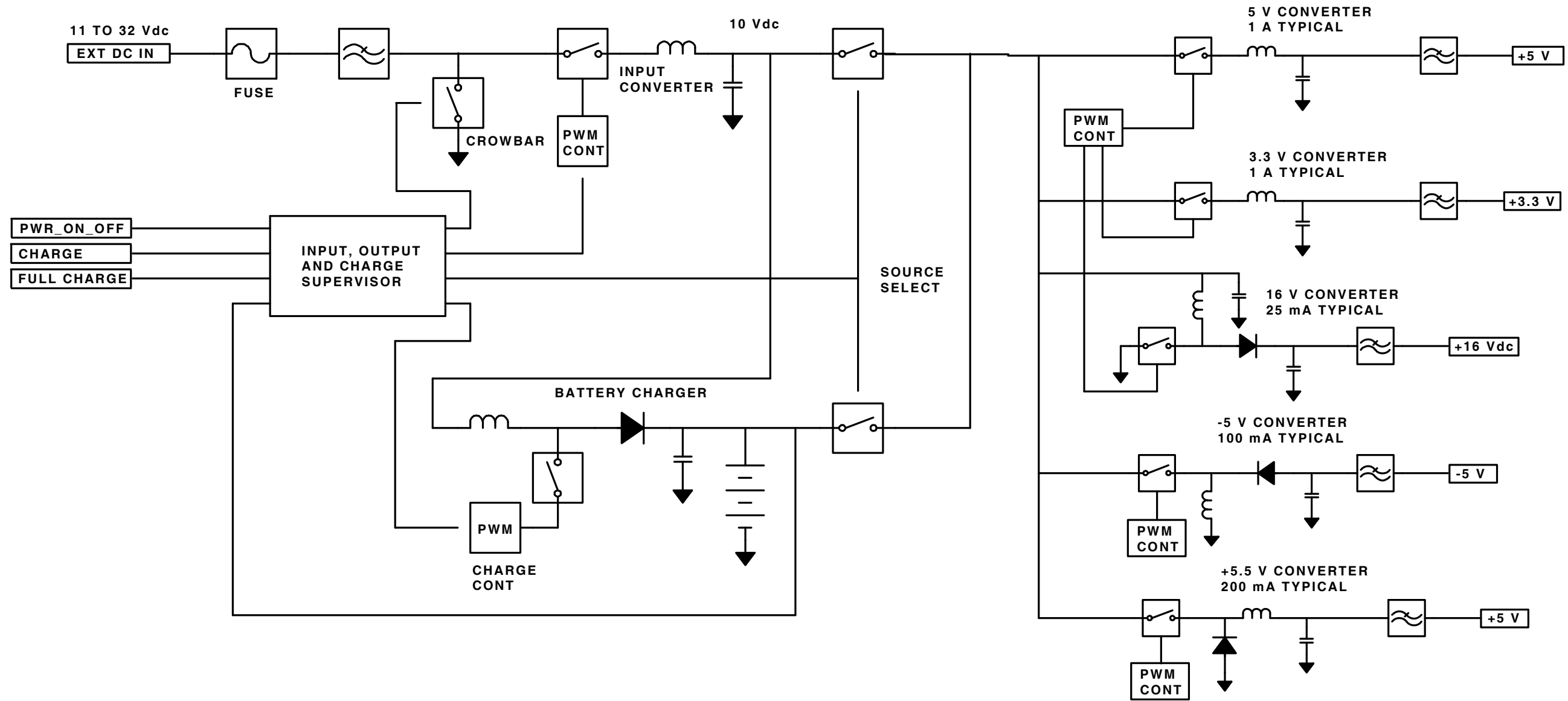


Figure 1-2. Power Supply PCB Assy Block Diagram

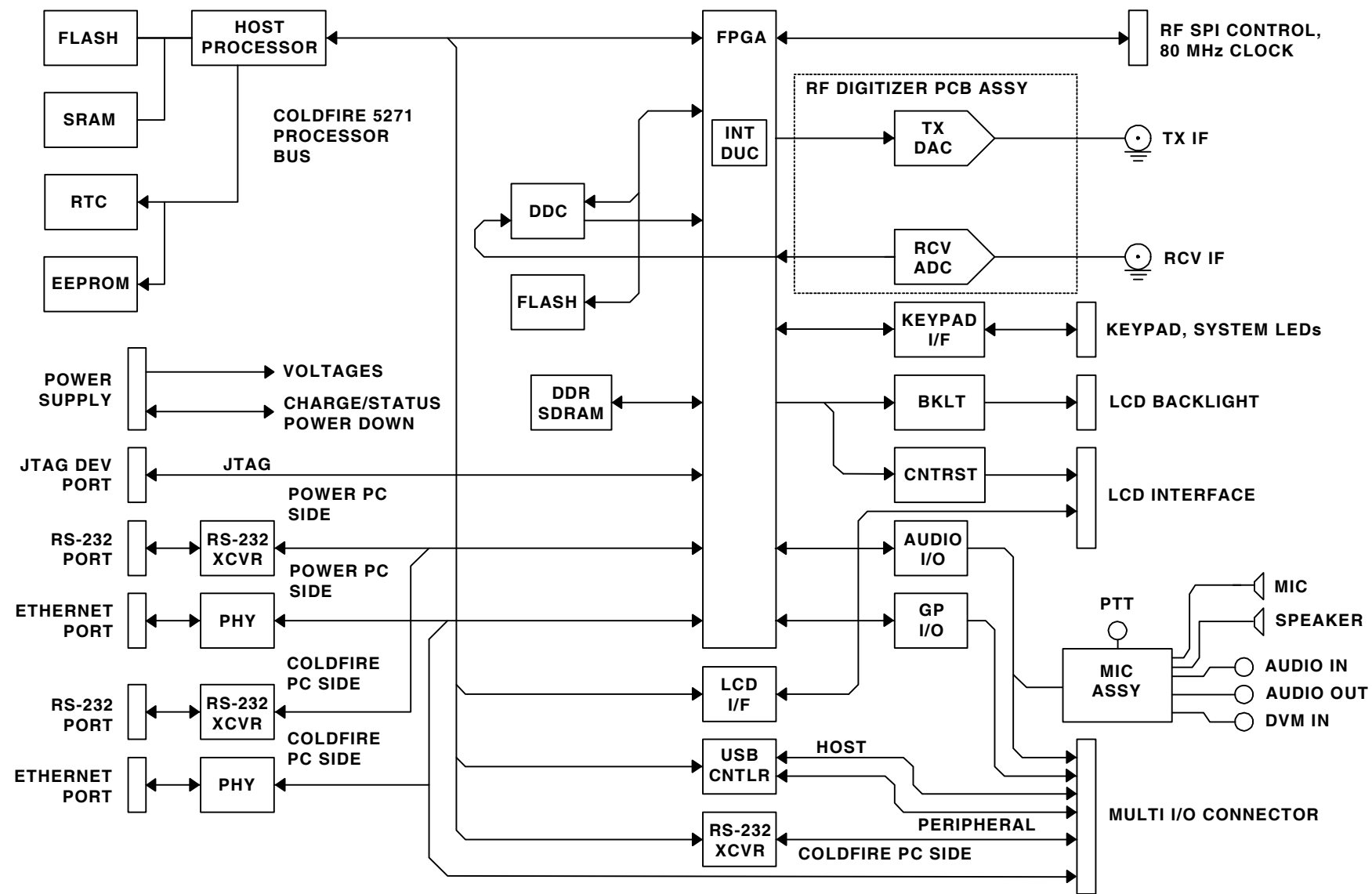


Figure 1-3. Multi-Function PCB Assy Block Diagram

B. Keypad PCB Assy (62A1A2A1)

The Keypad PCB Assy controls the ON/OFF status of the Test Set and the manipulation of the screens and menus. When a key is pressed, the Multi-Function PCB Assy interacts with the RF Digitizer PCB Assy and RF Assy to display or manipulate the data on the LCD Display.

C. RF Digitizer PCB Assy (62A1A2A2) (Figure 1-4)

The RF Digitizer PCB Assy is used for generating the source 10.5 MHz (± 500 kHz) output at approximately -10 dBm from the DUC (Digital Up Converter), while the receive input to the A2D is optimized for an input level of -10 dBm at 13 MHz (± 500 kHz). All other RF signaling, filtering, scaling and up/down conversion methodologies are accomplished in the RF Assy.

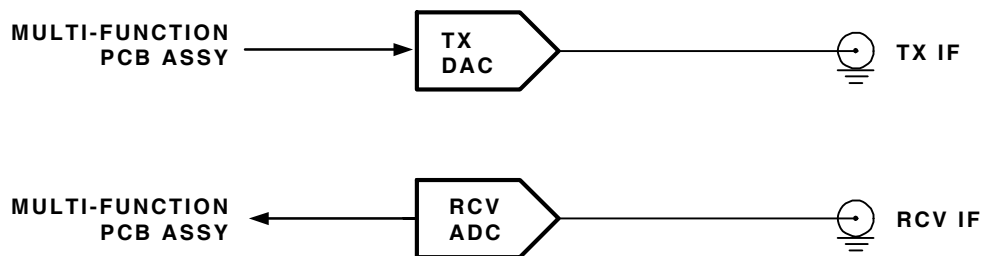


Figure 1-4. RF Digitizer PCB Assy Block Diagram

D. Multi-Function PCB Assy (62A1A2A3) (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, Keypad PCB Assy, Ethernet/RS-232/USB, Power Supply PCB Assy, RF Digitizer PCB Assy, Audio I/O (3500A only) and RF hardware.

For the Generator, Audio I/O (3500A) 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 A2D 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.

E. LCD Assy (62A1A2A4)

The LCD Assy is a 38 characters by 16 lines LCD display. The Multi-Function PCB Assy receives signals and data from the Keypad PCB Assy, RF Digitizer PCB Assy and RF Assy. The processed signals and data are sent to to the LCD Assy to display the various screens and menus with Soft Key boxes at the bottom of the screen.

F. Flex Assy (62A1A2A6)

The Flex Assy forms the link between the REMOTE Connector and the Multi-Function PCB Assy. The Test Set can be remotely controlled from the 44-Pin REMOTE Connector. Refer to Appendix C for the REMOTE Connector Pin-Out definitions.

G. Audio I/O PCB Assy (62A1A2A7) (Figure 1-5) (3500A Only)

The Audio I/O PCB Assy provides the DVM/Scope, Audio In and Audio Out signals to the 3500 / 3500A Front Panel.

The "DVM/Scope" input handles ± 40 Vdc through a voltage divider network. AC signals are limited to 1/2 the 50 kHz bandwidth of the TDM audio digitizing bus.

The "Audio In" is specified at 3 Vrms with HIGH Z, 600 Ω or 150 Ω loads available. AM/FM external signals are limited to 300 Hz to 5 kHz.

The "Audio Out" is rated to deliver 1.57 Vrms into a 600 Ω load with an output impedance of 100 Ω . 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.

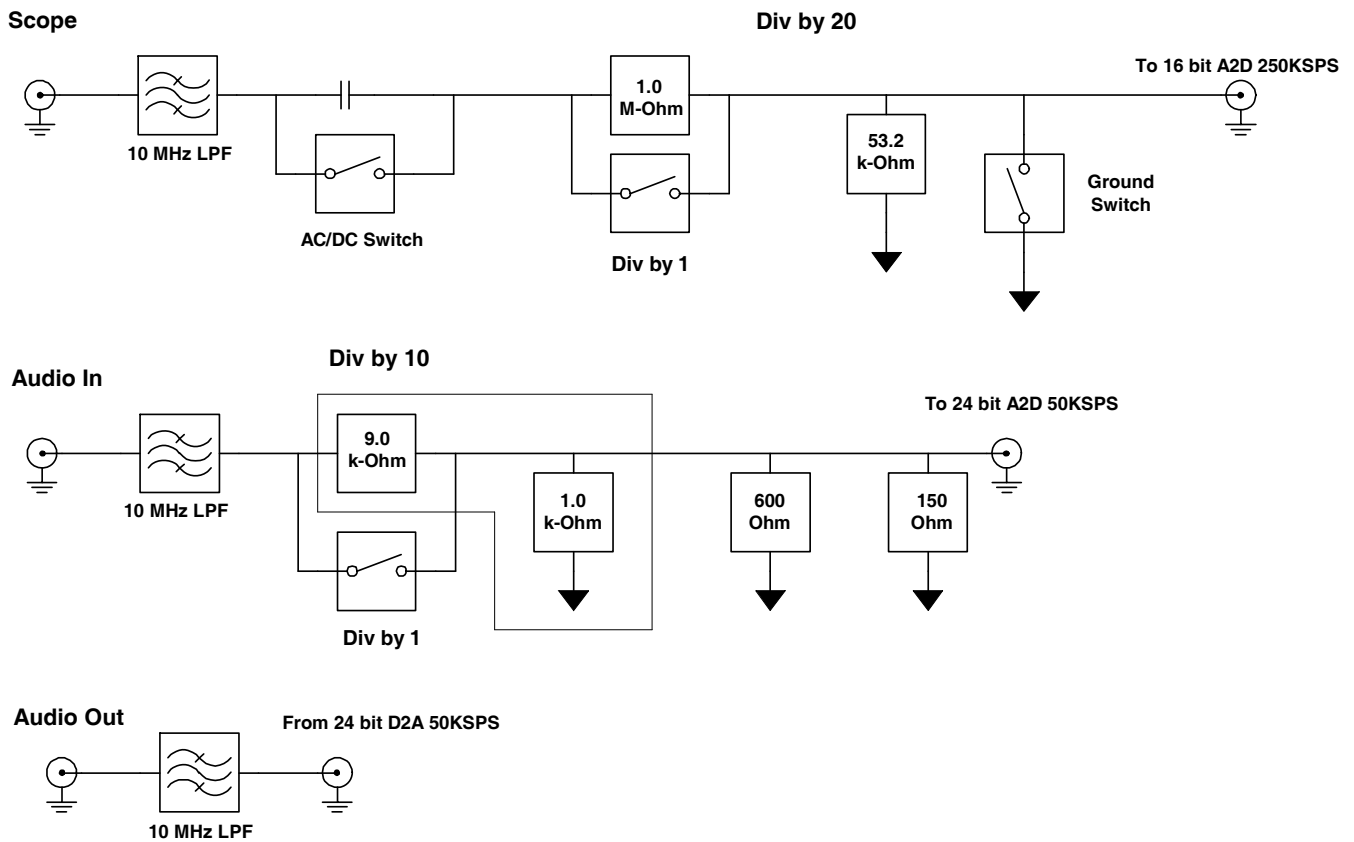


Figure 1-5. Audio I/O PCB Assy Block Diagram

H. RF Assy (62A1A3) (Figure 1-6)

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 measurement 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 Ω termination to the end of the cable connected to the UUT.

When the 3500 / 3500A is in a Receive Mode, either Transmitter Test or Duplex Test, the signal may be input to the T/R or ANT.

H. RF Assy (62A1A3) (Figure 1-6) (cont)

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.

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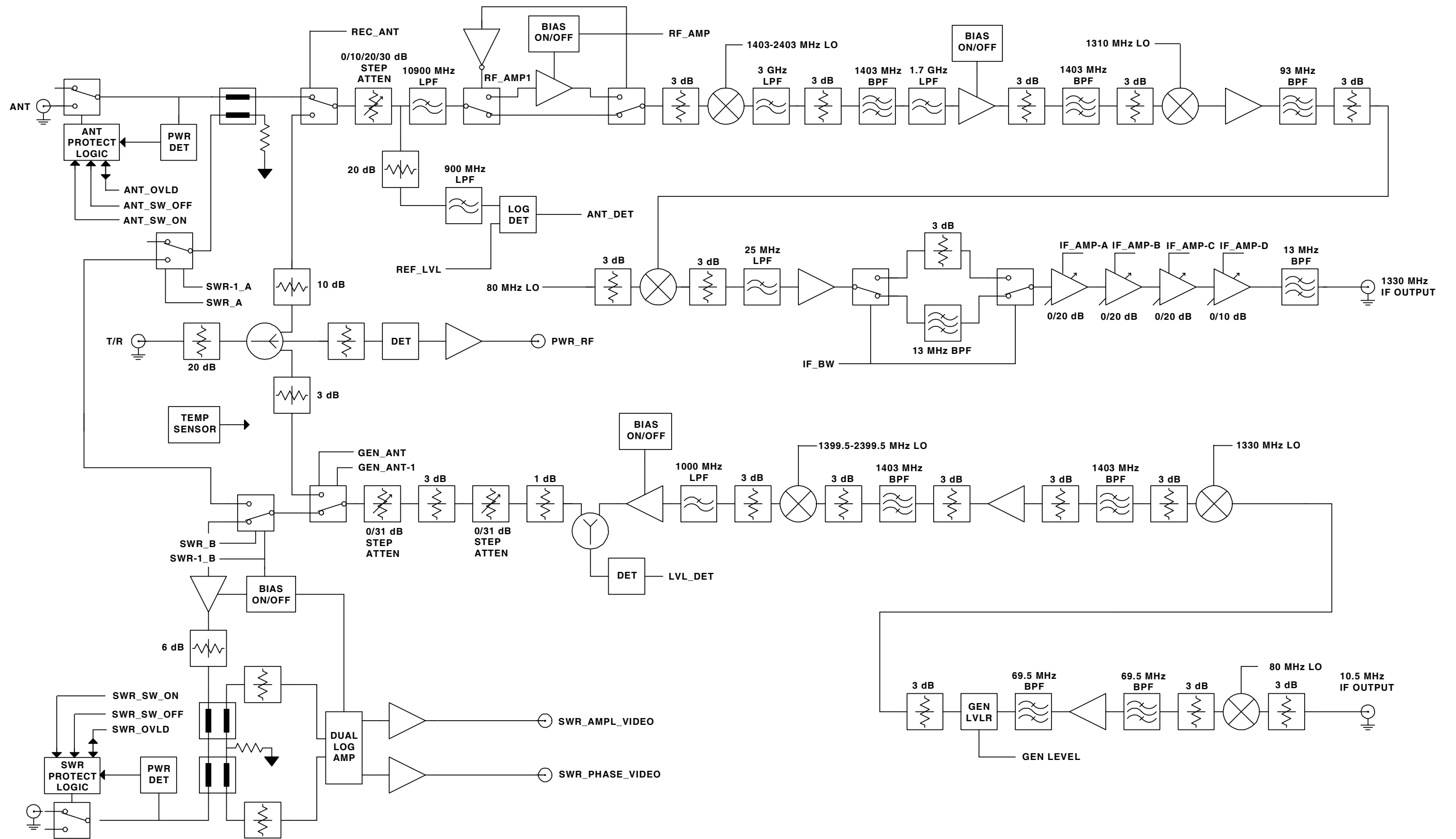


Figure 1-6. RF Assy Block Diagram

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MAINTENANCE INSTRUCTIONS

2-1. SERVICE UPON RECEIPT

2-1-1. SERVICE UPON RECEIPT OF MATERIEL

A. Unpacking

Special-design packing material inside this shipping carton provides maximum protection for the Test Set. Avoid damaging the carton and packing material during equipment unpacking. Use the following steps for unpacking the Test Set.

- Cut and remove the sealing tape on the carton top and open the carton.
- Grasp the Test Set transit case firmly, while restraining the shipping carton, and lift the equipment and packing material vertically.
- Place the Test Set transit case and end cap packing on a suitable flat, clean and dry surface.
- Remove the protective plastic bag from the Test Set transit case.
- Place protective plastic bag and end cap packing material inside shipping carton.
- Store the shipping carton for future use should the Test Set need to be returned.

B. Checking Unpacked Equipment

Use the following steps for checking the equipment.

- Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage.
- Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies.

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

Refer to the 3500 / 3500A 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 Test Set. 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 Test Set has a built-in Self Test to assist the technician in troubleshooting.

Many problems on Test Sets 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 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

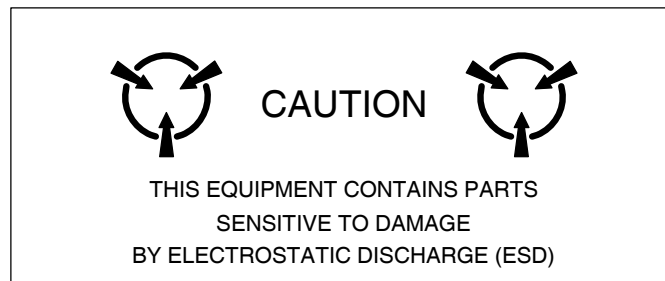
DO NOT DISCONNECT OR REMOVE ANY BOARD ASSEMBLIES IN THE TEST ADAPTER UNLESS INSTRUMENT IS UNPLUGGED. SOME ASSEMBLIES CONTAIN DEVICES THAT CAN BE DAMAGED IF BOARD IS REMOVED WHEN POWER IS ON. SEVERAL COMPONENTS, INCLUDING MOS DEVICES, CAN BE DAMAGED BY ELECTROSTATIC DISCHARGE. USE CONDUCTIVE FOAM AND GROUNDING STRAPS WHEN SERVICING IS REQUIRED AROUND SENSITIVE COMPONENTS. USE CARE 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 Test Set 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 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 Test Set 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 Test Set is powered by an internal Lithium Ion battery pack. The Test Set is supplied with an external DC Power Supply that enables the operator to recharge the battery when connected to AC power. The Test Set 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 Test Set for eight hours of continuous use, after which time, the Test Set 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.

The battery charger operates whenever DC power (11 to 32 Vdc) is applied to the Test Set with the supplied DC Power Supply or a suitable DC power source. When charging, the battery reaches an 100% charge in approximately four hours. The internal battery charger allows the battery to charge between a temperature range of 5° to 40°C. The Test Set can operate, connected to an external DC source, outside the battery charging temperature range (5° to 40°C).

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 Test Set are <-20°C or >60°C)

SYMPTOM INDEX

SYMPTOM	DESCRIPTION	PAGE
1	External DC Power Supply failure	2-6
2	POWER Indicator does not light	2-6
3	CHARGE Indicator does not light	2-7
4	FAULT Indicator is Red	2-7
5	FAULT Indicator is Yellow	2-8
6	Blows Fuse	2-8
7	Battery does not charge	2-8
8	Display is blank or abnormality exists in Display	2-9
9	Display Contrast cannot be adjusted	2-9
10	Display Backlight cannot be adjusted	2-9
11	Keys inoperable	2-9
12	Self Test failure	2-10
13	Diagnostics failure	2-10
14	ANT Connector failure	2-11
15	T/R Connector failure	2-11
16	DC IN Connector failure	2-12
17	AUDIO Connector failure	2-12
18	SWR Connector failure	2-12
19	REMOTE Connector failure	2-12
20	DVM Connector failure (3500A only)	2-12
21	AUDIO IN Connector failure (3500A only)	2-13
22	AUDIO OUT Connector failure (3500A only)	2-13

TROUBLESHOOTING TABLE

NOTE

The Troubleshooting Table lists common malfunctions found during normal operation of the Test Set. 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.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1 External DC Power Supply failure		
	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 DMM on the External DC Power Supply output, verify +18 Vdc (± 1 Vdc).	◆ If incorrect, replace the External DC Power Supply.
2 POWER Indicator does not illuminate		
	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 DMM on the External DC Power Supply output, verify +18 Vdc (± 1 Vdc).	◆ If incorrect, replace the External DC Power Supply.
	Step 3. Verify the Battery is installed.	◆ If incorrect, install the Battery (para 2-4A).
	Step 4. Verify the Fuse is not blown.	◆ If incorrect, replace the Fuse (para 2-4B).
	Step 5. Remove any external power sources from the Test Set. Using a DMM, verify 11.1 Vdc Nominal at the Battery Connector (Red wire).	◆ If incorrect, replace the Battery (para 2-4A).
	Step 6. Connect the External DC Power Supply to the Test Set. Using a DMM, verify 12.6 Vdc at the Battery Connector (Red wire).	◆ If incorrect, replace the Power Supply PCB Assy (para 2-4D).
	Step 7. Troubleshoot the circuit between the Power Supply PCB Assy and the LCD Assy.	◆ Probable source of failure is the Power Supply PCB Assy. ◆ Probable source of failure is the RF Digitizer PCB Assy. ◆ Probable source of failure is the Multi-Function PCB Assy. ◆ Probable source of failure is the LCD Assy.

TROUBLESHOOTING TABLE (cont)

<i>MALFUNCTION</i>	<i>TEST OR INSPECTION</i>	<i>CORRECTIVE ACTION</i>
<hr/>		
3	CHARGE Indicator does not illuminate	
Step 1.	Connect the External DC Power Supply to a verifiable AC Power Source and verify the LED is lit.	<ul style="list-style-type: none">◆ If incorrect, replace the External DC Power Supply.
Step 2.	Using a DMM on the External DC Power Supply output, verify +18 Vdc (± 1 Vdc).	<ul style="list-style-type: none">◆ If incorrect, replace the External DC Power Supply.
Step 3.	Verify the Battery is installed.	<ul style="list-style-type: none">◆ If incorrect, install the Battery (para 2-4A).
Step 4.	Verify the Fuse is not blown.	<ul style="list-style-type: none">◆ If incorrect, replace the Fuse (para 2-4B).
Step 5.	Remove any external power sources from the Test Set. Using a DMM, verify 11.1 Vdc Nominal at the Battery Connector (Red wire).	<ul style="list-style-type: none">◆ If incorrect, replace the Battery (para 2-4A).
Step 6.	Connect the External DC Power Supply to the Test Set. Using a DMM, verify 12.6 Vdc at the Battery Connector (Red wire).	<ul style="list-style-type: none">◆ If incorrect, replace the Power Supply PCB Assy (para 2-4D).
Step 7.	Troubleshoot the circuit between the Power Supply PCB Assy and the LCD Assy.	<ul style="list-style-type: none">◆ Probable source of failure is the Power Supply PCB Assy.◆ Probable source of failure is the RF Digitizer PCB Assy.◆ Probable source of failure is the Multi-Function PCB Assy.◆ Probable source of failure is the LCD Assy.
<hr/>		
4	FAULT Indicator is Red	
Step 1.	Clear Warning condition in the Test Set.	
Step 2.	Press the POWER Key twice to cycle power.	
Step 3.	Troubleshoot the circuit between the Power Supply PCB Assy and the RF Assy.	<ul style="list-style-type: none">◆ Probable source of failure is the Power Supply PCB Assy.◆ Probable source of failure is the RF Digitizer PCB Assy.◆ Probable source of failure is the Multi-Function PCB Assy.◆ Probable source of failure is the RF Assy.

TROUBLESHOOTING TABLE (cont)

<i>MALFUNCTION</i>	<i>TEST OR INSPECTION</i>	<i>CORRECTIVE ACTION</i>
<hr/>		
5	FAULT Indicator is Yellow	
	Step 1.	Clear Warning condition in the Test Set.
	Step 2.	Press the POWER Key twice to cycle power.
	Step 3.	Troubleshoot the circuit between the Power Supply PCB Assy and the RF Assy. <ul style="list-style-type: none">◆ Probable source of failure is the Power Supply PCB Assy.◆ Probable source of failure is the RF Digitizer PCB Assy.◆ Probable source of failure is the Multi-Function PCB Assy.◆ Probable source of failure is the RF Assy.
<hr/>		
6	Blows Fuse	
	Step 1.	Connect the External DC Power Supply to a verifiable AC Power Source and verify the LED is lit. <ul style="list-style-type: none">◆ If incorrect, replace the External DC Power Supply.
	Step 2.	Using a DMM on the External DC Power Supply output, verify +18 Vdc (± 1 Vdc). <ul style="list-style-type: none">◆ If incorrect, replace the External DC Power Supply.
	Step 3.	Replace the Fuse (para 2-4B).
	Step 4.	If the fuse continues to blow, replace the Power Supply PCB Assy (para 2-4D).
<hr/>		
7	Battery does not charge	
	Step 1.	Connect the External DC Power Supply to the Test Set and verify the CHARGE Indicator is Green or Yellow. <ul style="list-style-type: none">◆ If incorrect, replace the Battery (para 2-4A).
	Step 2.	Allow four hours for Battery to fully charge and verify the CHARGE Indicator is Green. <ul style="list-style-type: none">◆ If incorrect, replace the Battery (para 2-4A).

TROUBLESHOOTING TABLE (cont)

<i>MALFUNCTION</i>	<i>TEST OR INSPECTION</i>	<i>CORRECTIVE ACTION</i>
8	Display is blank or abnormality exists in Display	<p>Step 1. Press the POWER Key.</p> <p>Step 2. Check and/or adjust Contrast and Backlight levels.</p> <p>Step 3. Troubleshoot the circuit between the Power Supply PCB Assy and the LCD Assy.</p> <ul style="list-style-type: none">◆ Probable source of failure is the Power Supply PCB Assy.◆ Probable source of failure is the RF Digitizer PCB Assy.◆ Probable source of failure is the Multi-Function PCB Assy.◆ Probable source of failure is the LCD Assy. <p>Step 4. Look for a short on the RF Digitizer PCB Assy, Multi-Function PCB Assy and RF Assy.</p> <ul style="list-style-type: none">◆ Probable source of failure is the RF Digitizer PCB Assy.◆ Probable source of failure is the Multi-Function PCB Assy.◆ Probable source of failure is the RF Assy.
9	Display Contrast cannot be adjusted	<p>Troubleshoot the circuitry between the Multi-Function PCB Assy and the Keypad PCB Assy.</p> <ul style="list-style-type: none">◆ Probable source of failure is the Multi-Function PCB Assy.◆ Probable source of failure is the Keypad PCB Assy.
10	Display Backlight cannot be adjusted	<p>Troubleshoot the circuitry between the Multi-Function PCB Assy and the Keypad PCB Assy.</p> <ul style="list-style-type: none">◆ Probable source of failure is the Multi-Function PCB Assy.◆ Probable source of failure is the Keypad PCB Assy.
11	Keys inoperable	<p>Troubleshoot the circuit between the Power Supply PCB Assy and the Keypad PCB Assy.</p> <ul style="list-style-type: none">◆ Probable source of failure is the Power Supply PCB Assy.◆ Probable source of failure is the RF Digitizer PCB Assy.◆ Probable source of failure is the Multi-Function PCB Assy.◆ Probable source of failure is the Keypad PCB Assy.

TROUBLESHOOTING TABLE (cont)

<i>MALFUNCTION</i>	<i>TEST OR INSPECTION</i>	<i>CORRECTIVE ACTION</i>
---------------------------	----------------------------------	---------------------------------

12 Self Test Failure

TDM Test fails.

- ◆ Probable source of failure is the Multi-Function PCB Assy.

Modulation Test fails.

- ◆ Probable source of failure is the Multi-Function PCB Assy.
-

13 Diagnostics Failure

RF CPLD Test fails.

- ◆ Probable source of failure is the Multi-Function PCB Assy.

TDM Test fails.

- ◆ Probable source of failure is the Multi-Function PCB Assy.

FPGA Test fails.

- ◆ Probable source of failure is the Multi-Function PCB Assy.

Temperature Test fails.

- ◆ Probable source of failure is the Multi-Function PCB Assy.

AM Mod Test fails.

- ◆ Probable source of failure is the Multi-Function PCB Assy.

FM Mod Test fails.

- ◆ Probable source of failure is the Multi-Function PCB Assy.

RF Power Test fails.

- ◆ Probable source of failure is the Multi-Function PCB Assy.

RF Error Test fails.

- ◆ Probable source of failure is the Multi-Function PCB Assy.

RSSI Test fails.

- ◆ Probable source of failure is the Multi-Function PCB Assy.

SPI Test fails.

- ◆ Probable source of failure is the Multi-Function PCB Assy.

SINAD Test fails.

- ◆ Probable source of failure is the Multi-Function PCB Assy.

Distortion Test fails.

- ◆ Probable source of failure is the Multi-Function PCB Assy.

Gen Lock Test fails.

- ◆ Probable source of failure is the RF Assy.

TROUBLESHOOTING TABLE (cont)

<i>MALFUNCTION</i>	<i>TEST OR INSPECTION</i>	<i>CORRECTIVE ACTION</i>
---------------------------	----------------------------------	---------------------------------

13 Diagnostics Failure (cont)

Rec Lock Test fails.

- ◆ Probable source of failure is the RF Assy.

Button Battery Test fails.

- ◆ Probable source of failure is the RF Assy.

AF Counter Test fails.

- ◆ Probable source of failure is the RF Assy.

Time Domain Test fails.

- ◆ Probable source of failure is the Multi-Function PCB Assy.

Freq Domain Test fails.

- ◆ Probable source of failure is the Multi-Function PCB Assy.

SWR Test fails.

- ◆ Probable source of failure is the RF Assy

DTMF Test fails.

- ◆ Probable source of failure is the Multi-Function PCB Assy.

DCS Test fails.

- ◆ Probable source of failure is the Multi-Function PCB Assy.
-

14 ANT Connector failure

Step 1. Inspect connector for damage and/or wear.

- ◆ Replace the ANT Connector (para 2-4O).

Step 2. Troubleshoot the circuitry between the RF Assy and the ANT Connector.

- ◆ Probable source of failure is the RF Assy.
 - ◆ Probable source of failure is the ANT Connector.
-

15 T/R Connector failure

Step 1. Inspect connector for damage and/or wear.

- ◆ Replace the T/R Connector (para 2-4P).

Step 2. Troubleshoot the circuitry between the RF Assy and the T/R Connector.

- ◆ Probable source of failure is the RF Assy.
 - ◆ Probable source of failure is the T/R Connector.
-

TROUBLESHOOTING TABLE (cont)

<i>MALFUNCTION</i>	<i>TEST OR INSPECTION</i>	<i>CORRECTIVE ACTION</i>
<hr/>		
16 DC IN Connector failure		
Step 1.	Inspect connector for damage and/or wear.	
		◆ Replace the DC IN Connector (para 2-4Q).
Step 2.	Troubleshoot the circuitry between the Power Supply PCB Assy and the DC IN Connector.	
		◆ Probable source of failure is the Power Supply PCB Assy.
		◆ Probable source of failure is the DC IN Connector.
<hr/>		
17 AUDIO Connector failure		
Step 1.	Inspect connector for damage and/or wear.	
		◆ Replace the AUDIO Connector (para 2-4R).
Step 2.	Troubleshoot the circuitry between the RF Digitizer PCB Assy and the AUDIO Connector.	
		◆ Probable source of failure is the RF Digitizer PCB Assy.
		◆ Probable source of failure is the AUDIO Connector.
<hr/>		
18 SWR Connector failure		
Step 1.	Inspect connector for damage and/or wear.	
		◆ Replace the SWR Connector (para 2-4S).
Step 2.	Troubleshoot the circuitry between the RF Assy and the SWR Connector.	
		◆ Probable source of failure is the RF Assy.
		◆ Probable source of failure is the SWR Connector.
<hr/>		
19 REMOTE Connector failure		
Step 1.	Inspect connector for damage and/or wear.	
		◆ Replace the Flex Assy (para 2-4T).
Step 2.	Troubleshoot the circuitry between the Multi-Function PCB Assy and the Flex Assy.	
		◆ Probable source of failure is the Multi-Function PCB Assy.
		◆ Probable source of failure is the Flex Assy.
<hr/>		
20 DVM Connector failure (3500A only)		
Step 1.	Inspect connector for damage and/or wear.	
		◆ Replace the DVM Connector (para 2-4U).
Step 2.	Troubleshoot the circuitry between the AUDIO I/O Assy and the DVM Connector.	
		◆ Probable source of failure is the AUDIO I/O Assy.
		◆ Probable source of failure is the DVM Connector.

TROUBLESHOOTING TABLE (cont)

<i>MALFUNCTION</i>	<i>TEST OR INSPECTION</i>	<i>CORRECTIVE ACTION</i>
<hr/>		
21	AUDIO IN Connector failure (3500A only)	
Step 1.	Inspect connector for damage and/or wear.	
		◆ Replace the AUDIO IN Connector (para 2-4V).
Step 2.	Troubleshoot the circuitry between the AUDIO I/O Assy and the AUDIO IN Connector.	
		◆ Probable source of failure is the AUDIO I/O Assy.
		◆ Probable source of failure is the AUDIO IN Connector.
<hr/>		
22	AUDIO OUT Connector failure (3500A only)	
Step 1.	Inspect connector for damage and/or wear.	
		◆ Replace the AUDIO OUT Connector (para 2-4W).
Step 2.	Troubleshoot the circuitry between the AUDIO I/O Assy and the AUDIO OUT Connector.	
		◆ Probable source of failure is the AUDIO I/O Assy.
		◆ Probable source of failure is the AUDIO OUT Connector.

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2-3. CALIBRATION/VERIFICATION PROCEDURES

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Receiver RSSI Verification	2-20
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SWR Phase Detector Calibration	2-50
Audio Level Meter Calibration	2-51

2-3-1. CALIBRATION/VERIFICATION SCHEDULE

The Calibration/Verification Procedures should be performed when:

Failure to Meet Specifications	If, during the course of normal operation, the Test Set or any major function thereof fails to meet the performance specifications.
Module/Assembly Replacement	If one or more of the Test Set assemblies are replaced.
Annual Calibration/Verification	Aeroflex recommends an annual Calibration/Verification on the Test Set 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. TEST EQUIPMENT

TYPE	MODEL
Digital Multimeter	HP 34401A or Equivalent
Universal Counter	Agilent 53131A or Equivalent
Frequency Counter	
Power Meter	Agilent N1911A or Equivalent
Power Meter Sensor	Agilent E4412A or Equivalent
Function Generator	HP 3325B or Equivalent
Comm Breakout Box	Aeroflex (64598) (7005-6242-900)
Broadband Resistive Power Splitter	Weinschel 93459 Model 1870A
TNC to N Adapter	PE 9446
TNC to N Adapter	Amphenol RF Division 79825 Adapter
TNC (M) to TNC (M) Adapter	PE 9443
Crossover Ethernet Cable	
TNC to BNC Cable	
RF Signal Generator	HP 8648C or Equivalent
RF Power Amplifier (50 W)	
Power Splitter (2-Way, Resistive)	
Directional Coupler	Narda 3020A or Equivalent
100 MHz Low-Pass Filter	
300 MHz Low-Pass Filter	
700 MHz Low-Pass Filter	
1200 MHz Low-Pass Filter	
50 Ω Termination	
10 dB Attenuator (10 W)	
Stub Tuner	Murray Microwave 1778E or 1778EQ
Short-Open-Load VSWR Calibrator	Aeroflex (38245) (2901-0000-054)

2-3-4. VERIFICATION PROCEDURES

A. Generator Verification

TEST EQUIPMENT: Power Meter w/ Sensor

NOTE

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

1. Press POWER Key to turn ON the Test Set. Allow Test Set to warm up before continuing with Verification Procedure.
2. With the System Menu displayed, press the 2 Key to display the Receiver Test Screen.

T/R CONNECTOR

3. Move the cursor to the MHz: field.
4. Press the F1 "Edit" Key to highlight the field. Press the 2 Key to set the field to 2 MHz. Press the F1 "Done" Key to store the setting.
5. Move the cursor to the Port: field.
6. Press the F1 "Edit" Key to highlight the field. Using the Arrow Keys (▼ ▲), select T/R. Press the F1 "Done" Key to store the setting.
7. Move the cursor to the Level: field.
8. Press the F1 "Edit" Key to highlight the field. Press the ± Key, 5 Key and 0 Key to set the field to -50.0 dBm. Press the F1 "Done" Key to store the setting.
9. **Insure Power Meter Sensor range covers -50 dBm.** Zero and calibrate the Power Meter.
10. Connect the Power Meter Sensor to the T/R Connector with TNC/N Adapter.
11. Record Power Meter reading.
12. Move the cursor to the MHz: field.
13. Press the F1 "Edit" Key to highlight the field. Press the 2 Key and 0 Key to set the field to 20 MHz. Press the F1 "Done" Key to store the setting.
14. Record Power Meter reading.
15. Repeat Steps 12 to 14 for the following frequencies:

100 MHz	600 MHz
200 MHz	700 MHz
300 MHz	800 MHz
400 MHz	900 MHz
500 MHz	1000 MHz

ANT CONNECTOR

16. Move the cursor to the Port: field.
17. Press the F1 "Edit" Key to highlight the field. Using the Arrow Keys (▼ ▲), select ANT. Press the F1 "Done" Key to store the setting.

A. Generator Verification (cont)

18. Move the cursor to the Level dBm: field.
19. Press the F1 "Edit" Key to highlight the field. Press the \pm Key, 3 Key and 0 Key to set the field to -30.0 dBm. Press the F1 "Done" Key to store the setting.
20. **Insure Power Meter Sensor range covers -30 dBm.** Zero and calibrate the Power Meter.
21. Disconnect the Power Meter Sensor from the T/R Connector and connect the Power Meter Sensor to the ANT Connector with TNC/N Adapter.
22. Move the cursor to the MHz: field.
23. Press the F1 "Edit" Key to highlight the field. Press the 2 Key to set the field to 2 MHz. Press the F1 "Done" Key to store the setting.
24. Record Power Meter reading.
25. Repeat Steps 22 to 24 for the following frequencies:

20 MHz	600 MHz
100 MHz	700 MHz
200 MHz	800 MHz
300 MHz	900 MHz
400 MHz	1000 MHz
500 MHz	

SWR CONNECTOR

26. Move the cursor to the Port: field.
27. Press the F1 "Edit" Key to highlight the field. Using the Arrow Keys (\blacktriangledown \blacktriangle), select SWR. Press the F1 "Done" Key to store the setting.
28. Move the cursor to the Level: field.
29. Press the F1 "Edit" Key to highlight the field. Press the \pm Key, 5 Key to set the field to -5.0 dBm. Press the F1 "Done" Key to store the setting.
30. **Insure Power Meter Sensor range covers -5 dBm.** Zero and calibrate the Power Meter.
31. Disconnect the Power Meter Sensor from the ANT Connector and connect the Power Meter Sensor to the T/R Connector with TNC/N Adapter.
32. Move the cursor to the MHz: field.
33. Press the F1 "Edit" Key to highlight the field. Press the 2 Key to set the field to 2 MHz. Press the F1 "Done" Key to store the setting.
34. Record Power Meter reading.
35. Repeat Steps 32 to 34 for the following frequencies:

20 MHz	600 MHz
100 MHz	700 MHz
200 MHz	800 MHz
300 MHz	900 MHz
400 MHz	1000 MHz
500 MHz	

A. Generator Verification (cont)

RF GENERATOR ERROR

36. 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 $<\pm 3$ dB, the Test Set is out of specified limits and must be calibrated.
 - If error is $<\pm 1.5$ dB, the Test Set should be calibrated to insure correct operation over temperature.

B. Receiver RSSI Verification

TEST EQUIPMENT: Power Meter w/ Sensor
Signal Generator
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 Test Set. Allow Test Set to warm up before continuing with Verification Procedure.
2. With the System Menu displayed, press the 3 Key to display the Transmitter Test Screen.

T/R CONNECTOR

3. Move the cursor to the Port: field.
4. Press the F1 "Edit" Key to highlight the field. Using the Arrow Keys (▼ ▲), select T/R. Press the F1 "Done" Key to store the setting.
5. Move the cursor to the Mod: field.
6. Press the F1 "Edit" Key to highlight the field. Using the Arrow Keys (▼ ▲), select FM. Press the F1 "Done" Key to store the setting.
7. Move the cursor to the IFBW: field (field to right of Mod: Field).
8. Press the F1 "Edit" Key to highlight the field. Using the Arrow Keys (▼ ▲), select 25k. Press the F1 "Done" Key to store the setting.
9. Press the F4 "Setup" Key to display the Transmitter Test Setup Screen.
10. Move the cursor to RSSI Meter.
11. Press the F1 "Edit" Key to highlight the field. Press a number key corresponding to an open Meter position. Press the F1 "Done" Key to store the setting.
12. Press the F2 "Return" Key to display the Transmitter Test Screen.
13. Using the Arrow Keys (◀ ▶), move the cursor to the RSSI field.
14. Press the F1 "Zoom" Key to display the RSSI Meter Screen.
15. Press the F4 "Norm" Key to display the RSSI Normalize pop-up screen. Follow instructions on screen.
16. When Normalize is complete, press the F5 "Enter" Key to store the settings.
17. Press the F5 "Return" Key to display the Transmitter Test Screen.
18. Zero and calibrate the Power Meter.
19. Connect the Power Splitter Output to the T/R Connector. (Use Adapter if required.)
20. Connect the Power Meter Sensor to the other Power Splitter Output. (Use Adapter if required.)
21. Connect the Signal Generator Output to the Power Splitter Input.
22. Set Signal Generator to -5 dBm (Output Power) and 2 MHz (Frequency).
23. Move the cursor to the MHz: field.

B. Receiver RSSI Verification (cont)

24. Press the F1 "Edit" Key to highlight the field. Press the 2 Key to set the field to 2 MHz. Press the F1 "Done" Key to store the setting.
25. Record Power Meter reading and RSSI Meter reading.
26. Repeat Steps 22 to 25 for the following frequencies:

20 MHz	600 MHz
100 MHz	700 MHz
200 MHz	800 MHz
300 MHz	900 MHz
400 MHz	1000 MHz
500 MHz	

ANT CONNECTOR

27. Disconnect the Power Splitter Output from the T/R Connector and connect the Power Splitter Output to the ANT Connector. (Use Adapter if required.)
28. Move the cursor to the Port: field.
29. Press the F1 "Edit" Key to highlight the field. Using the Arrow Keys (▼ ▲), select ANT. Press the F1 "Done" Key to store the setting.
30. Set Signal Generator to -20 dBm (Output Power) and 2 MHz (Frequency).
31. Move the cursor to the MHz: field.
32. Press the F1 "Edit" Key to highlight the field. Press the 2 Key to set the field to 2 MHz. Press the F1 "Done" Key to store the setting.
33. Record Power Meter reading and RSSI Meter reading.
34. Repeat Steps 30 to 35 for the following frequencies:

20 MHz	600 MHz
100 MHz	700 MHz
200 MHz	800 MHz
300 MHz	900 MHz
400 MHz	1000 MHz
500 MHz	

RSSI METER ERROR

35. 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 $<\pm 3$ dB, the Test Set is out of specified limits and must be calibrated.
 - If error is $<\pm 1.5$ dB, the Test Set should be calibrated to insure correct operation over temperature.

C. TCXO Verification

TEST EQUIPMENT: Frequency Counter

1. Press POWER Key to turn ON the Test Set. Allow Test Set to warm up before continuing with Verification Procedure.
2. With the System Menu displayed, press the 2 Key to display the Receiver Test Screen.
3. Move the cursor to the MHz: field.
4. Press the F1 "Edit" Key to highlight the field. Press the 5 Key and 0 Key twice to set the field to 500 MHz. Press the F1 "Done" Key to store the setting.
5. Move the cursor to the Port: field.
6. Press the F1 "Edit" Key to highlight the field. Using the Arrow Keys (▼ ▲), select SWR. Press the F1 "Done" Key to store the setting.
7. Move the cursor to the Level: field.
8. Press the F1 "Edit" Key to highlight the field. Press the ± Key and 5 Key to set the field to -5.0 dBm. Press the F1 "Done" Key to store the setting.
9. Connect the Frequency Counter to the SWR Connector.
10. Record the Frequency Counter reading.
11. Calculate the TCXO Error by subtracting 500 MHz from the Frequency Counter reading.
 - If error is $>\pm 500$ Hz, the Test Set is out of specified limits and must be calibrated.
 - If error is $>\pm 150$ Hz, the Test Set should be calibrated to insure correct operation over temperature.

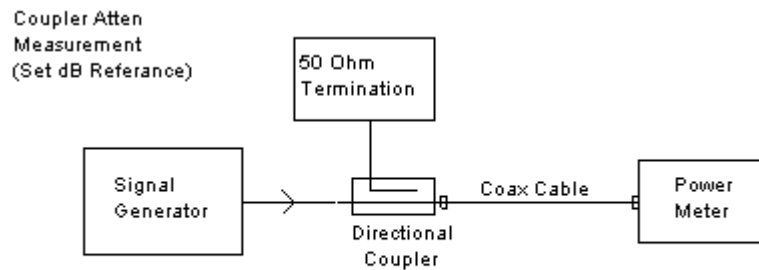
D. RF Power Meter Verification

TEST EQUIPMENT: RF Signal Generator
RF Power Meter
RF Power Amplifier (50 W)
Coupler
100 MHz Low-Pass Filter
300 MHz Low-Pass Filter
700 MHz Low-Pass Filter
1200 MHz Low-Pass Filter
50 Ω Termination
10 dB Attenuator (50 W)

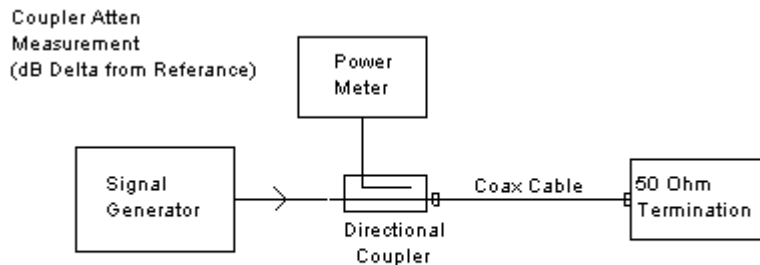
The following steps must be performed in the order shown.

RF COUPLED PORT ATTENUATION

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



3. Set the RF 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.
6. Move the Power Sensor to the Coupler's forward-coupled port and move the 50 Ω Termination to the end of the coaxial cable:

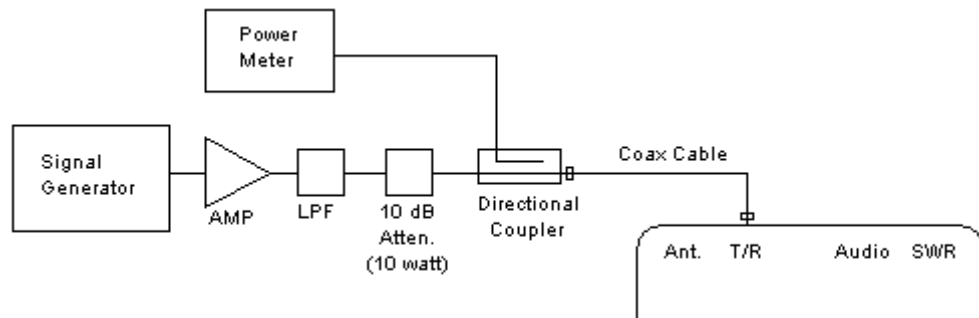


D. RF Power Meter Verification (cont)

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):



13. Set the RF 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. With the System Menu displayed, press the 3 Key to display the Transmitter Test Screen.
 18. Move the cursor to the MHz: field.
 19. Press the F1 "Edit" Key to highlight the field. Press the 1 Key and 0 Key twice to set the field to 100 MHz. Press the F1 "Done" Key to store the setting.
 20. Move the cursor to the Port: field.
 21. Press the F1 "Edit" Key to highlight the field. Using the Arrow Keys (▼ ▲), select T/R. Press the F1 "Done" Key to store the setting.
 22. Press the F4 "Setup" Key to display the Transmitter Test Setup Screen.

D. RF Power Meter Verification (cont)

23. Move the cursor to RF Power Meter.
24. Press the F1 "Edit" Key to highlight the field. Press a number key corresponding to an open Meter position. Press the F1 "Done" Key to store the setting.
25. Press the F2 "Return" Key to display the Transmitter Test Screen.
26. Move the cursor to the RF Power Meter.
27. Press the F1 "Zoom" Key.
28. Move the cursor to the Units: Field.
29. Press the F1 "Edit" Key to highlight the field. Using the Arrow Keys (▼ ▲), select dBm. Press the F1 "Done" Key to store the setting.
30. Press the F4 "Zero" Key to zero the RF Power Meter on the Test Set.
31. Press the F5 "Return" Key.
32. Set the RF Power Amplifier to ON.
33. Set the RF Signal Generator to RF ON.
34. Adjust the RF Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to +27 dBm value (± 0.3 dB).
35. Record RF Power Meter reading and Test Set Power Meter reading.
36. Adjust the RF 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.)
37. Record RF Power Meter reading and Test Set Power Meter reading.
38. Set the RF Signal Generator to RF OFF.
39. Set the RF Power Amplifier to OFF.
40. Replace the 100 MHz Low-Pass Filter with the 300 MHz Low-Pass Filter in the Test Setup.
41. Set the RF Signal Generator to 300 MHz.
42. Set the RF Power Meter to 300 MHz, Relative OFF and Offset value to 300 MHz coupled port attenuation recorded in Step 7.
43. Set the RF Power Amplifier to ON.
44. Set the RF Signal Generator to RF ON.
45. Adjust the RF Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to +27 dBm value (± 0.3 dB).
46. Record the RF Power Meter reading and Test Set Power Meter reading.
47. Adjust the RF 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.)
48. Record the RF Power Meter reading and Test Set Power Meter reading.
49. Set the RF Signal Generator to RF OFF.
50. Set the RF Power Amplifier to OFF.
51. Replace the 300 MHz Low-Pass Filter with the 700 MHz Low-Pass Filter in the Test Setup.
52. Set the RF Signal Generator to 500 MHz.

D. RF Power Meter Verification (cont)

53. Set the RF Power Meter to 500 MHz, Relative OFF and Offset value to 500 MHz coupled port attenuation recorded in Step 7.
54. Set the RF Power Amplifier to ON.
55. Set the RF Signal Generator to RF ON.
56. Adjust the RF Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to +27 dBm value (± 0.3 dB).
57. Record the RF Power Meter reading and Test Set Power Meter reading.
58. Adjust the RF 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 Test Set Power Meter reading.
60. Set the RF Signal Generator to RF OFF.
61. Set the RF Power Amplifier to OFF.
62. Set the RF Signal Generator to 700 MHz.
63. Set the RF Power Meter to 700 MHz, Relative OFF and Offset value to 700 MHz coupled port attenuation recorded in Step 7.
64. Set RF Power Amplifier to ON.
65. Set RF Signal Generator to RF ON.
66. Adjust the RF Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to +27 dBm value (± 0.3 dB).
67. Record the RF Power Meter reading and Test Set Power Meter reading.
68. Adjust the RF 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.)
69. Record the RF Power Meter reading and Test Set Power Meter reading.
70. Set the RF Signal Generator to RF OFF.
71. Set the RF Power Amplifier to OFF.
72. Replace the 700 MHz Low-Pass Filter with the 1200 MHz Low-Pass Filter in the Test Setup.
73. Set the RF Signal Generator to 900 MHz.
74. Set the RF Power Meter to 900 MHz, Relative OFF and Offset value to 900 MHz coupled port attenuation recorded in Step 7.
75. Set the RF Signal Generator to RF ON.
76. Set the RF Power Amplifier to ON.
77. Adjust the RF Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to +27 dBm value (± 0.3 dB).
78. Record the RF Power Meter reading and Test Set Power Meter reading.
79. Adjust the RF 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.)

D. RF Power Meter Verification (cont)

80. Record the RF Power Meter reading and Test Set Power Meter reading.
81. Set the RF Signal Generator to RF OFF.
82. Set the RF Power Amplifier to OFF.
83. Calculate the Test Set Power Meter Error by subtracting the Actual Power Meter reading from the Test Set reading.
 - If error is $>+0.6$ dB or <-0.7 dB, the Test Set is out of specified limits and must be recalibrated.
 - If error is $>\pm 0.3$ dB, the Test Set should be calibrated to insure correct operation over temperature.

E. SWR Meter Verification

TEST EQUIPMENT: None

1. Press POWER Key to turn ON the Test Set. Allow Test Set to warm up before continuing with Verification Procedure.
2. With the System Menu displayed, press the 4 Key to display the ANT-Cable Test Screen.
3. Press the F1 "Edit" Key to highlight the "Type" field. Using the Arrow Keys (▼ ▲), select SWR. Press the F1 "Done" Key to store the setting.
4. Press the F4 "Cal" Key. The VSWR CAL pop-up screen appears. Follow instructions on the screen.
5. When "Calibration Complete" is displayed, press the F5 "Enter" Key to store the settings.
6. Using the Arrow Keys (◀ ▶), move the cursor to the Span field.
7. Press the F1 "Enter" Key to highlight the field. Enter "998." Press the F1 "Done" Key to store the setting.
8. Connect BNC T-Connector to the SWR Connector.
9. Connect a 20 dB Pad to each open connector of BNC T-Connector.
10. Allowing minimum 2 sweeps (updates) of the display, verify SWR Reading is 2:1 ($\pm 10\%$ - 2 to 300 MHz) ($\pm 20\%$ - 300 to 1000 MHz).

F. Audio Level Meter Verification

TEST EQUIPMENT: Function Generator
 Digital Multimeter

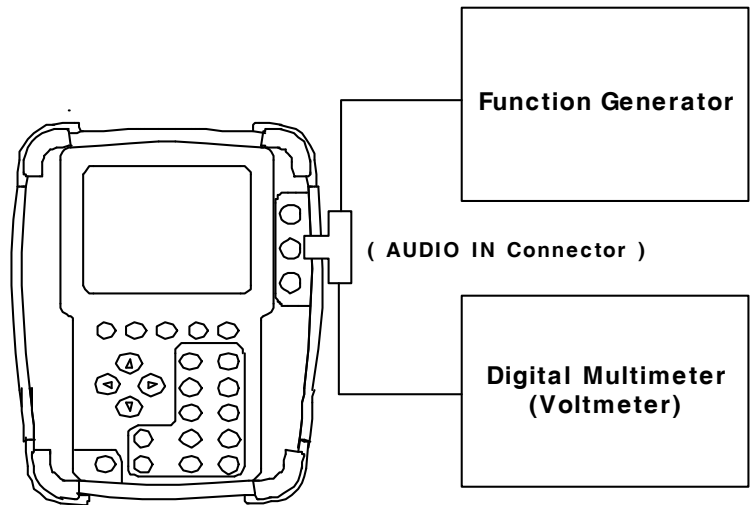
NOTE

This procedure is for the 3500A only.

1. Press POWER Key to turn ON the Test Set. Allow Test Set to warm up before continuing with Verification Procedure.
2. With the System Menu displayed, press the F2 "Meters" Key to display the Meters Menu.
3. Press the 4 Key to display the Audio Level Meter Screen.
4. Set the Test Set as follows:

<u>FIELD</u>	<u>SETTING</u>
Source	Audio In
Detector	RMS
Load	High Z
Range	AUTO
Unit	V
Avg Reading	10

5. Connect test equipment:



6. Set the Function Generator as follows (use the Digital Multimeter to set level ± 10 mV):

<u>FIELD</u>	<u>SETTING</u>
Level	1 Vrms
Freq	1 kHz

7. Record the Digital Multimeter (Voltmeter) reading and the level displayed on the Test Set.
8. Verify the level displayed on the Test Set is within $\pm 5\%$ of the reading on the Digital Multimeter (Voltmeter).

F. Audio Level Meter Verification (cont)

9. Set the Load field to 150 (Ω).
10. Set the Function Generator as follows (use the Digital Multimeter to set level ± 10 mV):
- | <u>FIELD</u> | <u>SETTING</u> |
|--------------|----------------|
| Level | 1 Vrms |
| Freq | 1 kHz |
11. Record the Digital Multimeter (Voltmeter) reading and the level displayed on the Test Set.
12. Verify the level displayed on the Test Set is within $\pm 5\%$ of the reading on the Digital Multimeter (Voltmeter).
13. Set the Load field to 600 (Ω).
14. Set the Function Generator as follows (use the Digital Multimeter to set level ± 10 mV):
- | <u>FIELD</u> | <u>SETTING</u> |
|--------------|----------------|
| Level | 1 Vrms |
| Freq | 1 kHz |
15. Record the Digital Multimeter (Voltmeter) reading and the level displayed on the Test Set.
16. Verify the level displayed on the Test Set is within $\pm 5\%$ of the reading on the Digital Multimeter (Voltmeter).
17. Set the Load field to 1K (Ω).
18. Set the Function Generator as follows (use the Digital Multimeter to set level ± 10 mV):
- | <u>FIELD</u> | <u>SETTING</u> |
|--------------|----------------|
| Level | 1 Vrms |
| Freq | 1 kHz |
19. Record the Digital Multimeter (Voltmeter) reading and the level displayed on the Test Set.
20. Verify the level displayed on the Test Set is within $\pm 5\%$ of the reading on the Digital Multimeter (Voltmeter).
21. Set the Load field to Div10 (Ω).
22. Set the AF Generator Level to 3 Vrms.
23. Record the Digital Multimeter (Voltmeter) reading and the level displayed on the Test Set.
24. Verify the level displayed on the Test Set is within $\pm 5\%$ of the reading on the Digital Multimeter (Voltmeter).

G. Verification Data Sheets

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

FREQUENCY (MHz)	POWER METER (dBm)	EXPECTED (dBm)	ERROR (Power Meter - Expected)
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)

RECEIVER RSSI VERIFICATION

T/R Connector

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

ANT Connector

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

G. Verification Data Sheets (cont)

RF POWER METER VERIFICATION

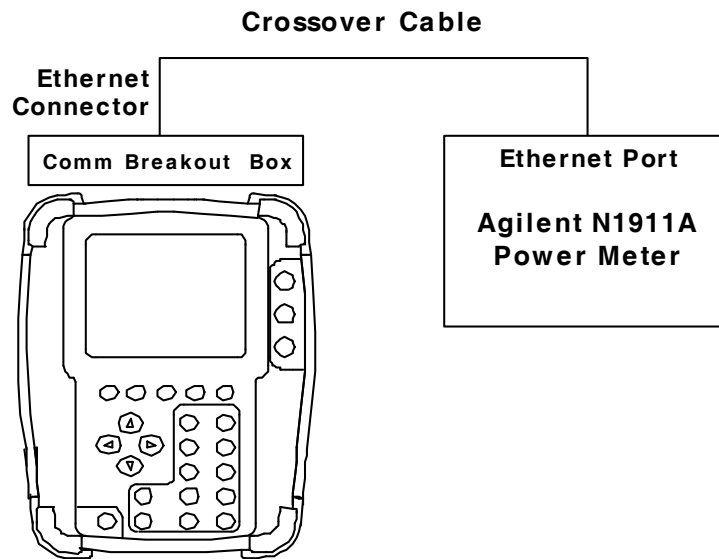
FREQUENCY (MHz)	SET POWER (dBm)	POWER METER ACTUAL (dBm)	TEST SET MEASURED (dBm)	ERROR TEST SET - ACTUAL (dB)
100	+27			
100	+37			
300	+27			
300	+37			
500	+27			
500	+37			
700	+27			
700	+37			
900	+27			
900	+37			

2-3-5. CALIBRATION PROCEDURES

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

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

1. Turn on both the Test Set and the Agilent N1911A Power Meter, and then connect a Crossover Cable between the Test Set and the Agilent N1911A Power Meter:



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. Zero and calibrate the Agilent N1911A Power Meter.
4. With the System Menu displayed, press the F5 “Util” Key to display the Utilities Menu.
5. Press the 2 Key to display the Remote Screen.
6. Move the cursor to the IP field. Note IP Address.
7. Press the F1 “Edit” Key to highlight the field. Enter IP Address (**10 10 10 193**). Press the F1 “Done” Key to store the setting.
8. Move the cursor to the Subnet Mask: field. Note Subnet Mask Address.
9. Press the F1 “Edit” Key to highlight the field. Enter Subnet Mask Address (**255 255 0 0**). Press the F1 “Done” Key to store the setting.
10. Move the cursor to the Gateway field. Note Gateway Address.

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

11. Press the F1 "Edit" Key to highlight the field. Enter Gateway Address (10 10 10 1). Press the F1 "Done" Key to store the setting.
12. Press the F5 "Config" Key.
13. Press the F2 "Return" Key to display the Utilities Menu.
14. Press the F3 "System" Key to display the System Menu.

B. Generator Calibration

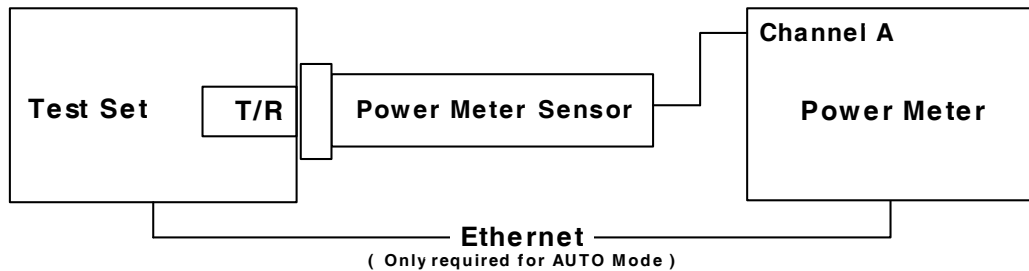
TEST EQUIPMENT: Power Meter
 Power Meter Sensor

1. With the System Menu displayed, press the F4 "Selftest" Key to display the Self Test Menu.
2. Press the 3 Key to display the Calibration Screen.
3. Enter the Calibration Password (**30203**). Press the F1 "Done" Key to display the Internal Calibration Menu.
4. Press the 7 Key (GEN CAL) to display the Generator Calibration Screen.
5. With the cursor on the Mode field, set the Mode selection based on the Power Meter used:

AUTO Agilent N1911A Power Meter / Agilent E4412 Power Sensor
MANUAL Other Power Meter / Power Meter Sensor.

T/R CONNECTOR

6. Establish the following test setup:



7. Press the F3 "CAL" Key.
8. Press the F2 "T/R" Key and follow the instructions on the screen to calibrate the UUT T/R Port.

In MANUAL Mode the Test Set prompts the user to enter readings from the Power Meter.

NOTE

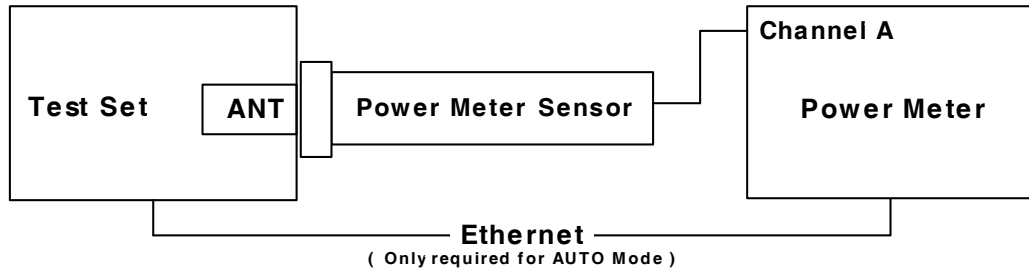
This is an interactive process. At each frequency the output level is adjusted based upon the Power Meter reading entered by the user until the reading is within acceptable limits.

9. When the message "CALIBRATION COMPLETED" appears, press the F5 "Enter" Key to display the Generator Calibration Screen.

B. Generator Calibration (cont)

ANT CONNECTOR

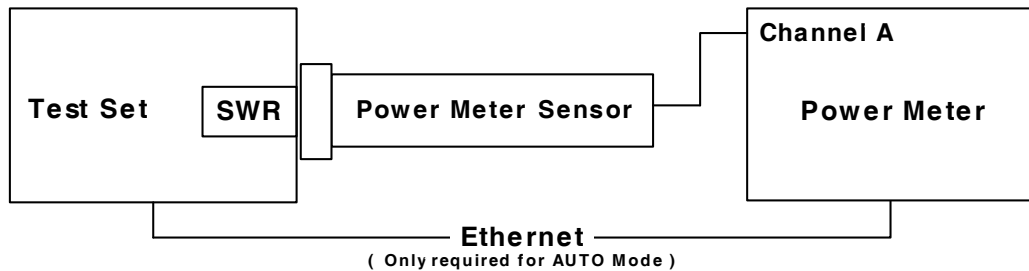
10. Establish the following test setup:



11. Press the F3 "CAL" Key.
12. Press the F1 "ANT" Key and follow the instructions on the screen to calibrate the UUT ANT Port.
13. When the message "CALIBRATION COMPLETED" appears, press the F1 "Enter" Key to display the Generator Calibration Screen.

SWR CONNECTOR

14. Establish the following test setup:



15. Press the F3 "CAL" Key.
16. Press the F3 "SWR" Key and follow the instructions on the screen to calibrate the UUT SWR Port.
17. When the message "CALIBRATION COMPLETED" appears, press the F5 "Enter" Key to display the Generator Calibration Screen.
18. Cycle power on the Test Set.

C. Receiver Calibration

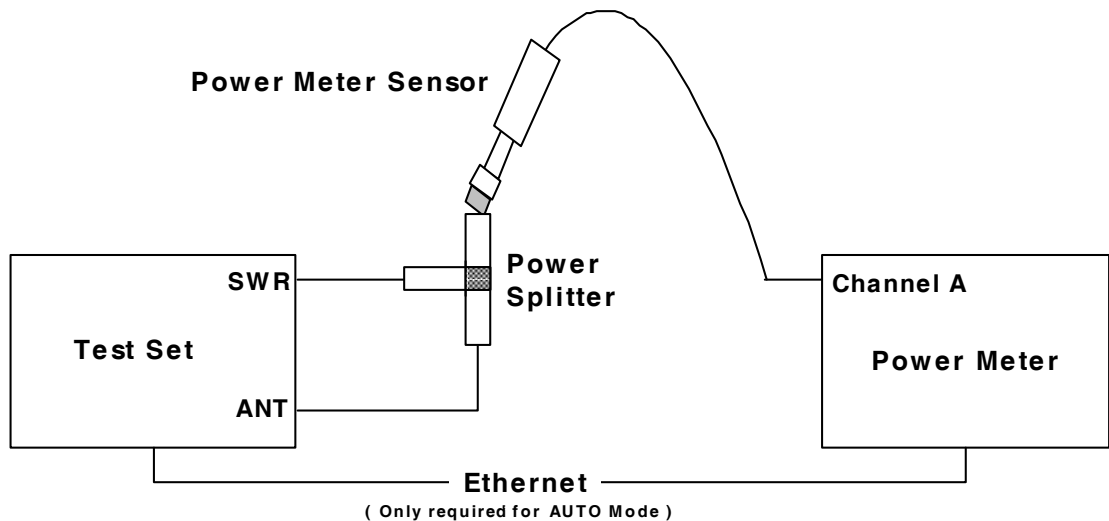
TEST EQUIPMENT: Power Meter
Power Meter Sensor
Power Splitter (2-Way Resistive)

1. With the System Menu displayed, press the F4 "Selftest" Key to display the Self Test Menu.
2. Press the 3 Key to display the Calibration Screen.
3. Enter the Calibration Password (**30203**). Press the F1 "Done" Key to display the Internal Calibration Menu.
4. Press the 8 Key (REC CAL AUTO) to display the Receiver Calibration Screen.
5. With the cursor on the Mode field, set the Mode selection based on the Power Meter used:

AUTO Agilent N1911A Power Meter / Agilent E4412 Power Sensor
MANUAL Other Power Meter / Power Meter Sensor.

ANT CONNECTOR

6. Establish the following test setup:



7. Press the F3 "CAL" Key.
8. Press the F1 "ANT" Key and follow the instructions on the screen to calibrate the UUT ANT Port.

In MANUAL Mode the Test Set prompts the user to enter readings from the Power Meter.

NOTE

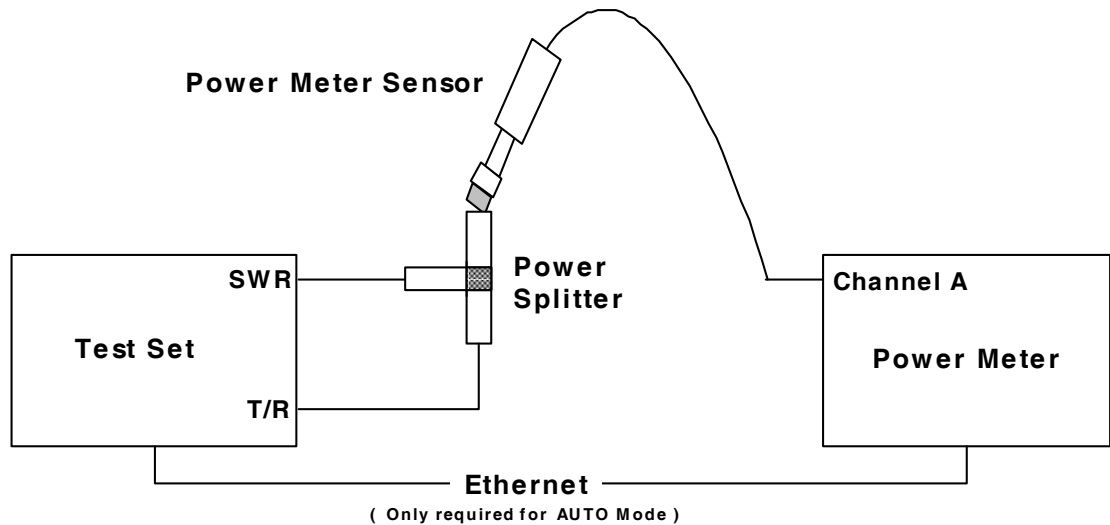
This is an interactive process. At each frequency the output level is adjusted based upon the Power Meter reading entered by the user until the reading is within acceptable limits.

C. Receiver Calibration (cont)

9. When the message "CALIBRATION COMPLETED" appears, press the F5 "Enter" Key to display the Receiver Calibration Screen.

T/R CONNECTOR

10. Establish the following test setup:



11. Press the F3 "CAL" Key.
12. Press the F2 "T/R" Key and follow the instructions on the screen to calibrate the UUT T/R Port.
13. When the message "CALIBRATION COMPLETED" appears, press the F5 "Enter" Key to display the Receiver Calibration Screen.

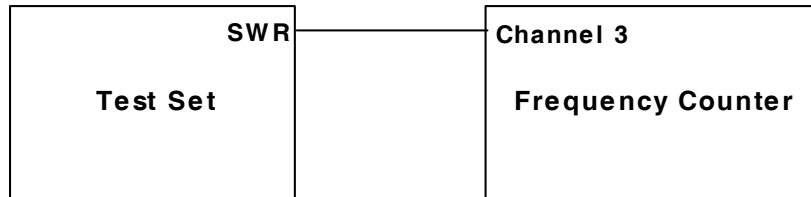
PRE AMP

14. Press the F3 "CAL" Key.
15. Press the F3 "AMP" Key and follow the instructions on the screen.
16. When the message "CALIBRATION COMPLETED" appears, press the F5 "Enter" Key to display the Receiver Calibration Screen.
17. Cycle power on the Test Set.
18. With the System Menu displayed, press the F4 "Selftest" Key to display the Self Test Menu.
19. Press the 3 Key to display the Calibration Screen.
20. Enter the Calibration Password (30203). Press the F1 "Done" Key to display the Internal Calibration Menu.
21. Press the 8 Key (REC CAL AUTO) to display the Receiver Calibration Screen.
22. Press the F4 "Pre Norm" Key to to normalize the UUT Receiver.
23. Verify Normalize Numbers are within acceptable range of -15 to -10.
24. Cycle power on the Test Set.

D. TCXO Calibration

TEST EQUIPMENT: Frequency Counter

1. With the System Menu displayed, press the F4 "Selftest" Key to display the Self Test Menu.
2. Press the 3 Key to display the Calibration Screen.
3. Enter the Calibration Password (**30203**). Press the F1 "Done" Key to display the Internal Calibration Menu.
4. Press the 6 Key (TCXO CAL ADJUSTMENT) to display the TCXO Calibration Screen.
5. Establish the following test setup:



6. Move the cursor to the TXCO: field. Press the F1 "Edit" Key to highlight the field. Enter the TXCO Value (**2100**) as the initial value.
7. Adjust the TCXO Value as needed so the reading on the Frequency Counter is as close to 500 MHz as possible. Press the F1 "Done" Key to save the field setting.
8. Press the F3 "Save" Key.
9. Cycle power on the Test Set.

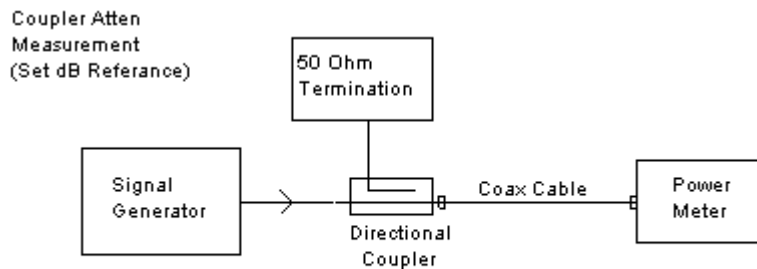
E. RF Power Meter Calibration

TEST EQUIPMENT: RF Signal Generator
RF Power Meter
RF Power Amplifier (50 W)
Coupler
100 MHz Low-Pass Filter
300 MHz Low-Pass Filter
700 MHz Low-Pass Filter
1200 MHz Low-Pass Filter
50 Ω Termination
Stub Tuner
10 dB Attenuator (10 W)

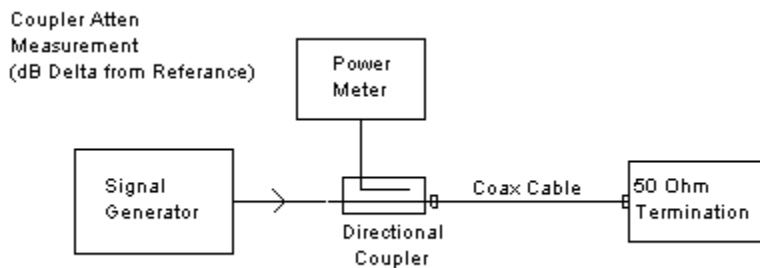
The following steps must be performed in the order shown.

RF COUPLED PORT ATTENUATION

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



3. Set the RF 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.
6. Move the Power Sensor to the Coupler's forward-coupled port and move the 50 Ω Termination to the end of the coaxial cable:



E. RF Power Meter Calibration (cont)

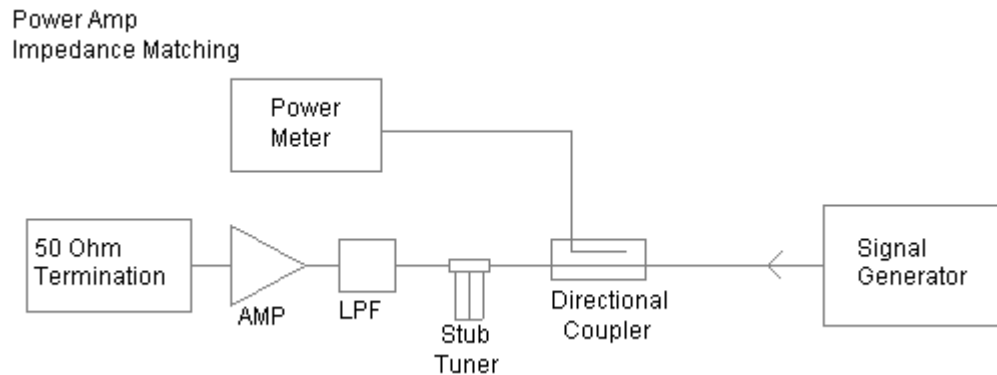
7. Record the RF Power Meter relative dB value for 100 MHz:

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.

RF COUPLED PORT ATTENUATION

12. Connect test equipment:

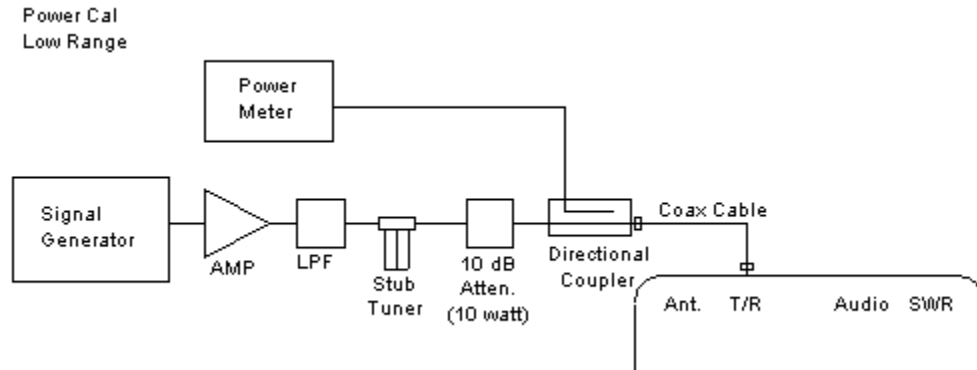


13. Set the RF Signal Generator to 500 MHz, CW and 10 dBm.
 14. Set the RF Power Meter to 500 MHz, Relative OFF and Offset value to 500 MHz coupled port attenuation recorded in Step 7.
 15. Connect a 50 Ω Termination to the RF Power Amplifier input.
 16. Turn RF Power Amplifier to ON, set Gain to maximum and ALC to OFF.
 17. Adjust Stub Tuner for lowest RF Power Meter reading <-15 dBm (25 dB return loss).
 18. Turn RF Power Amplifier to OFF.

E. RF Power Meter Calibration (cont)

RF POWER CAL LOW RANGE

19. Connect test equipment:



20. Set the RF Signal Generator to 500 MHz, CW, -50 dBm and RF OFF.
21. Set the RF Power Meter to 500 MHz, Relative OFF and Offset value to 500 MHz coupled port attenuation recorded in Step 7.
22. Set RF Power Amplifier Gain to maximum, ALC to OFF and Power to OFF.
23. With the System Menu displayed, press the F4 "Selftest" Key to display the Self Test Menu.
24. Press the 3 Key to display the Calibration Screen.
25. Enter the Calibration Password (**30203**). Press the F1 "Done" Key to display the Internal Calibration Menu.
26. Press the 3 Key (POWER CAL LOW RANGE).
27. Press the F4 "Zero" Key and follow the instructions on the Test Set display.

NOTE

Corrected A2D value is 0 (± 5).

28. Press the F5 "Next" Key until the displayed Index is 0.

NOTE

Index: numbers increment by one and the Target dBm indicates the cal point power.

29. Using the Arrow Keys (\blacktriangleleft \blacktriangleright), move the cursor to the Table dBm Value.
30. Turn the RF Power Amplifier to ON.
31. Set the RF Signal Generator to RF ON.
32. Adjust the RF Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to the Target dBm value (± 0.3 dB).
33. Press the F1 "Edit" Key to highlight the field. Change the Table dBm value to match the RF Power Meter value. Press the F1 "Done" Key to store the setting.

E. RF Power Meter Calibration (cont)

34. Press the F5 “Next” Key to move to the next cal point.

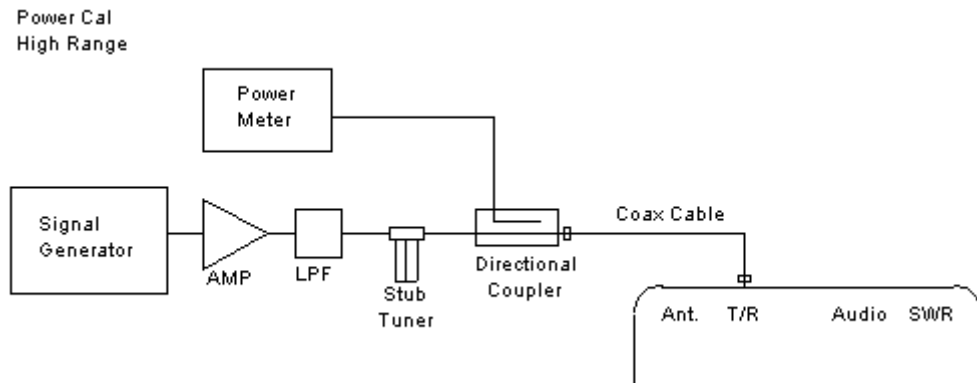
NOTE

Index: numbers increment by one and the Target dBm: indicates the next cal point level.

35. Repeat Steps 32 to 34 until the Index returns to 0.
36. Set the RF Signal Generator to RF OFF.
37. Set the RF Amplifier to OFF.
38. Press the F3 “Save” Key.
39. Cycle power on the Test Set.

RF POWER CAL HIGH RANGE

40. Connect test equipment:



41. Set the RF Signal Generator to 500 MHz, CW, -50 dBm and RF OFF.
42. Set the RF Power Meter to 500 MHz, Relative OFF and Offset value to 500 MHz coupled port attenuation recorded in Step 7.
43. Set RF Power Amplifier Gain to maximum, ALC to OFF and Power to OFF.
44. With the System Menu displayed, press the F4 “Selftest” Key to display the Self Test Menu.
45. Press the 3 Key to display the Calibration Screen.
46. Enter the Calibration Password (30203). Press the F1 “Done” Key to display the Internal Calibration Menu.
47. Press the 4 Key (POWER CAL HIGH RANGE).
48. Press the F4 “Zero” Key and follow the instructions on the Test Set display.

NOTE

Corrected A2D value is 0 (± 5).

E. RF Power Meter Calibration (cont)

49. Press the F5 "Next" Key until the displayed Index is 0.

NOTE

Index: numbers increment by one and the Target dBm: indicates the cal point power.

50. Using the Arrow Keys (◀ ▶), move the cursor to the Table dBm Value.
51. Turn the RF Power Amplifier to ON.
52. Set the RF Signal Generator to RF ON.
53. Adjust the RF Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to the Target dBm value (± 0.3 dB).
54. Press the F1 "Edit" Key to highlight the field. Change the Table dBm value to match the RF Power Meter value. Press the F1 "Done" Key to store the setting.
55. Press the F5 "Next" Key to move to the next cal point.

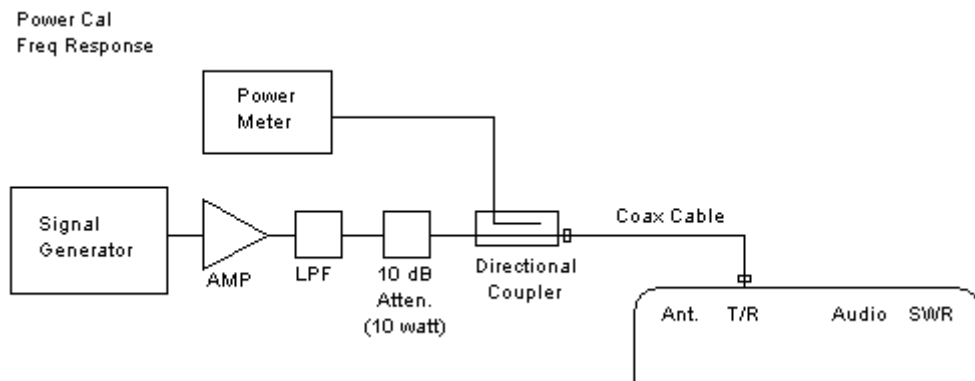
NOTE

Index: numbers increment by one and the Target dBm indicates the cal point power.

56. Repeat Steps 53 to 55 until the Index returns to 0.
57. Set the RF Signal Generator to RF OFF.
58. Set the RF Amplifier to OFF.
59. Press the F3 "Save" Key.
60. Cycle power on the Test Set.

FREQUENCY RESPONSE POWER CAL

61. Connect test equipment (using 100 MHz Low-Pass Filter):



E. RF Power Meter Calibration (cont)

62. Set the RF Signal Generator to 100 MHz, CW, -50 dBm and RF OFF.
63. Set the RF Power Meter to 100 MHz, Relative OFF and Offset value to 100 MHz coupled port attenuation recorded in Step 7.
64. Set RF Power Amplifier Gain to maximum, ALC to OFF and Power to OFF.
65. With the System Menu displayed, press the F4 "Selftest" Key to display the Self Test Menu.
66. Press the 3 Key to display the Calibration Screen.
67. Enter the Calibration Password (**30203**). Press the F1 "Done" Key to display the Internal Calibration Menu.
68. Press the 5 Key (POWER CAL FREQ RESPONSE).
69. Move the cursor to the RF Power Meter and press the F1 "Zoom" Key.
70. Move the cursor to the Units: field.
71. Press the F1 "Edit" Key to highlight the field. Using the Arrow Keys (▼ ▲), select dBm. Press the F1 "Done" Key to store the setting.
72. Press the F4 "Zero" Key. Follow instructions.
73. Press the F5 "Return" Key.
74. Press the F2 "Return" Key to display the Calibration Menu.
75. Press the 5 Key (POWER CAL FREQ RESPONSE).
76. Press the F4 "Zero" Key to clear the previous calibration values.
77. Press the F5 "Next" Key until the displayed Index is 0.

NOTE

Index: numbers increment by one and the MHz: indicates the cal point frequency.

78. Turn the RF Power Amplifier to ON.
79. Set the RF Signal Generator to RF ON.
80. Adjust the RF Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to the Target dBm value (± 0.3 dB).
81. Move the cursor to the Actual dBm field. Press the F1 "Edit" Key to highlight the field. Change the Actual dBm value to match the RF Power Meter value. Press the F1 "Done" Key. Press the F4 "Copy" Key to store the setting.
82. Press the F5 "Next" Key to move to the next cal point.

NOTE

Index: numbers increment by one and the MHz: indicates the cal point frequency.

83. Set the RF Signal Generator to RF OFF.
84. Set the RF Amplifier to OFF.
85. Replace 100 MHz Low-Pass Filter with 300 MHz Low-Pass Filter in Test Setup.
86. Set the RF Signal Generator to 300 MHz.

E. RF Power Meter Calibration (cont)

87. Set the RF Power Meter to 300 MHz, Relative OFF and Offset value to 300 MHz coupled port attenuation recorded in Step 7.
88. Set RF Power Amplifier to ON.
89. Set RF Signal Generator to RF ON.
90. Adjust the RF Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to the Target dBm value (± 0.3 dB).
91. Press the F1 "Edit" Key to highlight the field. Change the Actual dBm value to match the RF Power Meter value. Press the F1 "Done" Key. Press the F4 "Copy" Key to store the setting.
92. Press the F5 "Next" Key to move to the next cal point.

NOTE

Index: numbers increment by one and the MHz: indicates the cal point frequency.

93. Set the RF Signal Generator to RF OFF.
94. Set the RF Amplifier to OFF.
95. Replace 300 MHz Low-Pass Filter with 700 MHz Low-Pass Filter in Test Setup.
96. Set the RF Signal Generator to 500 MHz.
97. Set the RF Power Meter to 500 MHz, Relative OFF and Offset value to 500 MHz coupled port attenuation recorded in Step 7.
98. Set RF Power Amplifier to ON.
99. Set RF Signal Generator to RF ON.
100. Adjust the RF Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to the Target dBm value (± 0.3 dB).
101. Press the F1 "Edit" Key to highlight the field. Change the Actual dBm value to match the RF Power Meter value. Press the F1 "Done" Key. Press the F4 "Copy" Key to store the setting.
102. Press the F5 "Next" Key to move to the next cal point.

NOTE

Index: numbers increment by one and the MHz: indicates the cal point frequency.

103. Set the RF Signal Generator to RF OFF.
104. Set the RF Amplifier to OFF.
105. Set the RF Signal Generator to 700 MHz.
106. Set the RF Power Meter to 700 MHz, Relative OFF and Offset value to 700 MHz coupled port attenuation recorded in Step 7.
107. Set RF Power Amplifier to ON.
108. Set RF Signal Generator to RF ON.
109. Adjust the RF Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to the Target dBm value (± 0.3 dB).

E. RF Power Meter Calibration (cont)

110. Press the F1 "Edit" Key to highlight the field. Change the Actual dBm value to match the RF Power Meter value. Press the F1 "Done" Key. Press the F4 "Copy" Key to store the setting.
111. Press the F5 "Next" Key to move to the next cal point.

NOTE

Index: numbers increment by one and the MHz: indicates the cal point frequency.

112. Set the RF Signal Generator to RF OFF.
113. Set the RF Amplifier to OFF.
114. Replace 700 MHz Low-Pass Filter with 1200 MHz Low-Pass Filter in Test Setup.
115. Set the RF Signal Generator to 900 MHz.
116. Set the RF Power Meter to 900 MHz, Relative OFF and Offset value to 900 MHz coupled port attenuation recorded in Step 7.
117. Set RF Power Amplifier to ON.
118. Set RF Signal Generator to RF ON.
119. Adjust the RF Signal Generator level until the power into the T/R Connector, displayed on the RF Power Meter, is equal to the Target dBm value (± 0.3 dB).
120. Press the F1 "Edit" Key to highlight the field. Change the Actual dBm value to match the RF Power Meter value. Press the F1 "Done" Key. Press the F4 "Copy" Key to store the setting.
121. Press the F3 "Save" Key.
122. Cycle power on the Test Set.
123. Set the RF Signal Generator to RF OFF.
124. Set the RF Amplifier to OFF.

F. SWR Phase Detector Calibration

TEST EQUIPMENT: Short-Open-Load VSWR Calibrator

1. With the System Menu displayed, press the F4 "Selftest" Key to display the Self Test Menu.
2. Press the 3 Key to display the Calibration Screen.
3. Enter the Calibration Password (**30203**). Press the F1 "Done" Key to display the Internal Calibration Menu.
4. Press the 0 Key (SWR PHASE DETECT CAL) to display the SWR Phase Detector Calibration Screen.
5. Press the F4 "CAL" Key and follow instructions.
6. When the message 'Calibration Complete' appears, press the F5 "Enter" Key to return to the SWR Phase Detector Calibration Screen.
7. Cycle power on the Test Set.

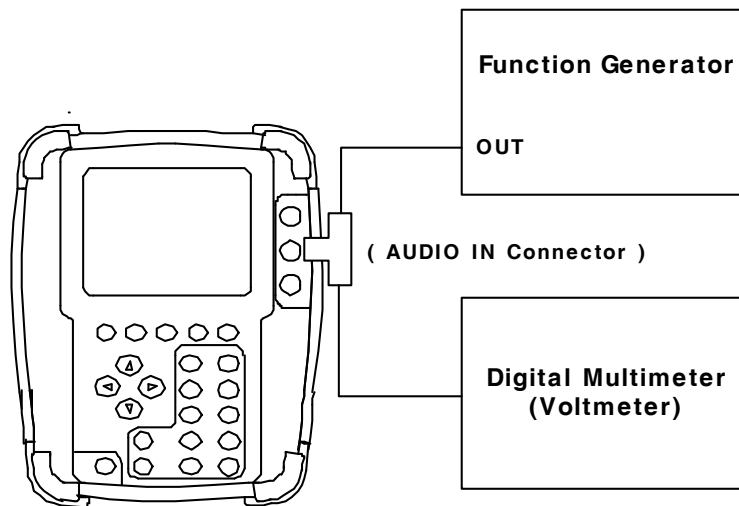
G. Audio Level Meter Calibration

TEST EQUIPMENT: Function Generator
 Digital Multimeter

NOTE

This procedure is for the 3500A only.

1. With the System Menu displayed, press the F4 "Selftest" Key to display the Self Test Menu.
2. Press the 3 Key to display the Calibration Screen.
3. Enter the Calibration Password (**30203**). Press the F1 "Done" Key to display the Internal Calibration Menu.
4. Press the 2 Key (AUDIO LEVEL CAL) to display the Audio Level Calibration Screen.
5. Establish the following test setup:

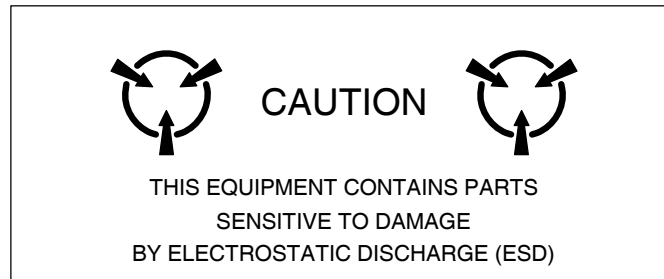


6. Press the F3 "CAL" Key and follow the instructions on the screen.
7. When the message "CALIBRATION COMPLETED" appears, press the F5 "Enter" Key to display the Audio Level Calibration Screen.
8. Cycle power on the Test Set.
9. Verify no errors are shown in the progress indicator.

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2-4. REMOVE/REPLACE PROCEDURES

SUBJECT	PAGE
Battery	2-54
Fuse	2-57
Open Case Assy	2-60
Power Supply PCB Assy (62A1A1)	2-62
Keypad PCB Assy (62A1A2A1)	2-64
RF Digitizer PCB Assy (62A1A2A2)	2-65
Multi-Function PCB Assy (62A1A2A3) (3500)	2-67
Multi-Function PCB Assy (62A1A2A3) (3500A)	2-69
LCD Assy (62A1A2A4) (3500)	2-71
LCD Assy (62A1A2A4) (3500A)	2-73
Keypad Assy (62A1A2A5)	2-75
Flex Assy (62A1A2A6)	2-76
Audio I/O PCB Assy (62A1A2A7) (3500A Only)	2-77
RF Assy (62A1A3)	2-79
ANT Connector	2-82
T/R Connector	2-83
DC IN Connector	2-84
AUDIO Connector (3500)	2-85
AUDIO Connector (3500A)	2-86
SWR Connector	2-87
DVM Connector (3500A Only)	2-88
AUDIO IN Connector (3500A Only)	2-89
AUDIO OUT Connector (3500A Only)	2-90



A. Battery

DESCRIPTION

This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

None.

CAUTION

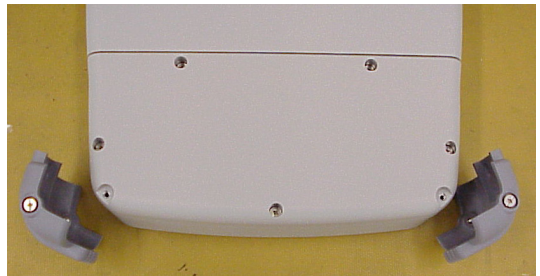
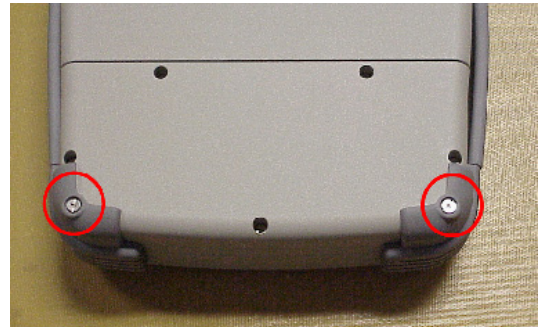
REPLACE ONLY WITH THE BATTERY SPECIFIED. DO NOT ATTEMPT TO INSTALL A NON-RECHARGEABLE BATTERY.

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

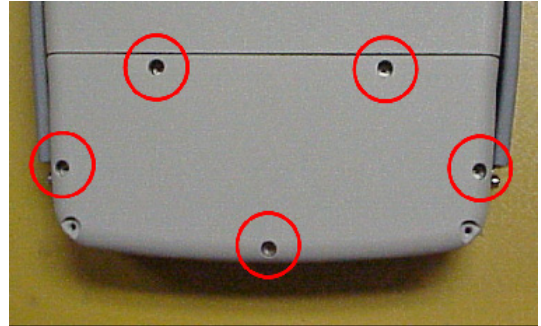
1. Fully loosen the captive screws (on each side of the bumper) in the two lower bumpers
2. Remove the bumpers from the Test Set.



A. Battery (cont)

REMOVE (cont)

3. Fully loosen five captive screws holding the Battery Cover to the Test Set.



4. Remove the Battery Cover from the Test Set.



5. Disconnect the Battery Wire Harness.



6. Remove the Battery from the Test Set.



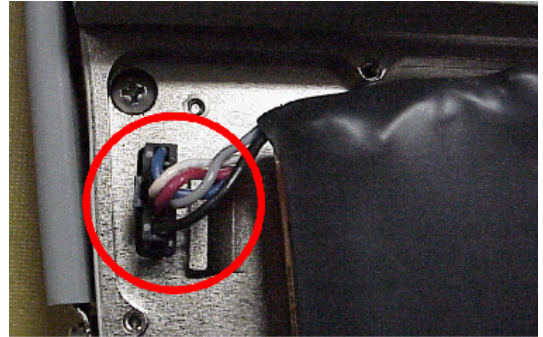
A. Battery (cont)

INSTALL

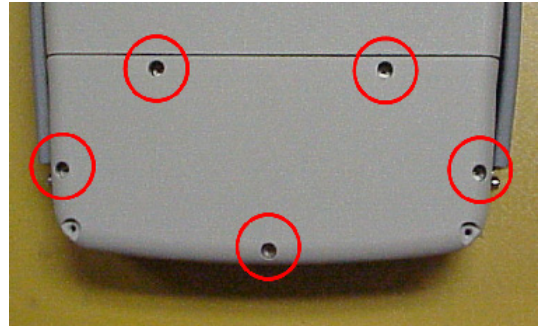
1. Install the Battery in the Test Set.



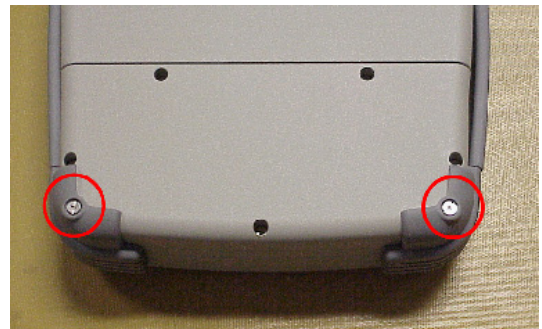
2. Connect the Battery Wire Harness.



3. Install the Battery Cover on the Test Set and tighten five captive screws (8 in/lbs.).



4. Install the two lower bumpers on the Test Set 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

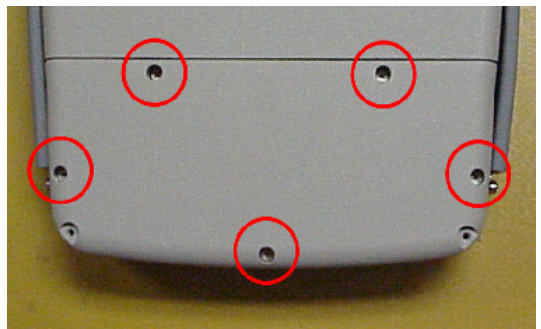
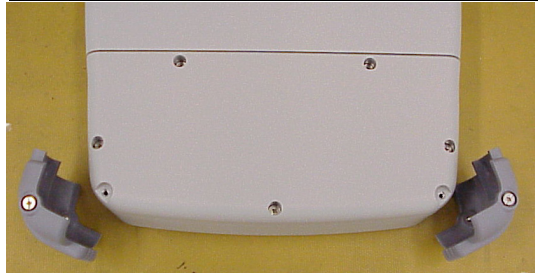
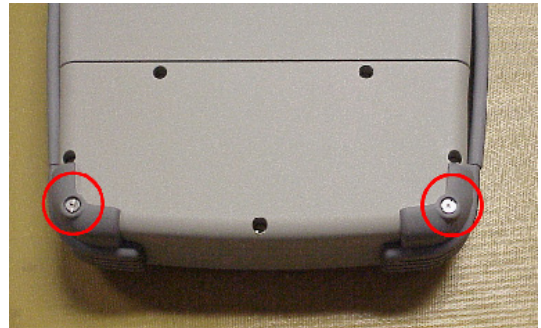
None.

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 Test Set.
3. Fully loosen five captive screws holding the Battery Cover to the Test Set.



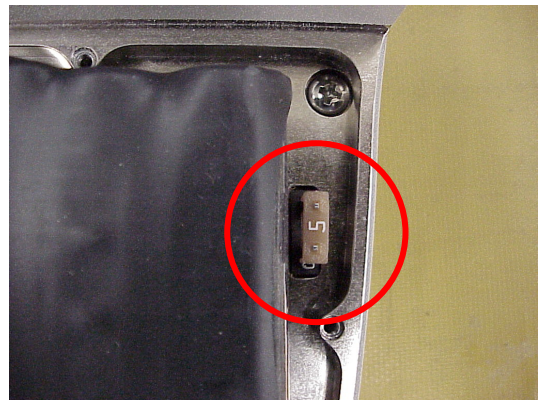
B. Fuse (cont)

REMOVE (cont)

4. Remove the Battery Cover from the Test Set.

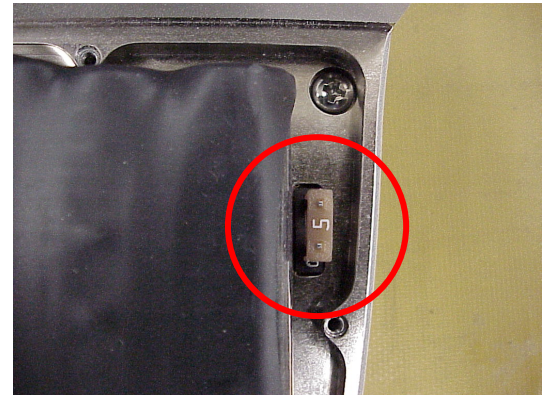


5. Locate and remove the Fuse.

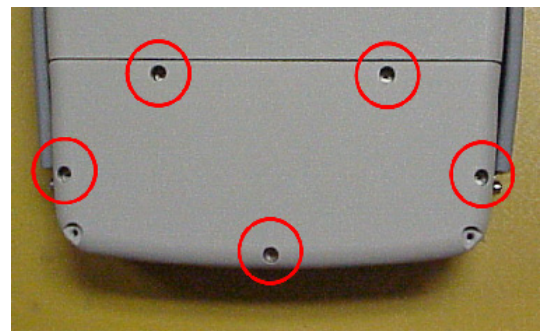


INSTALL

1. Install the Fuse.



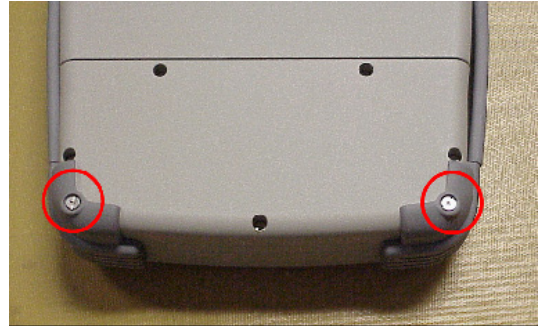
2. Install the Battery Cover on the Test Set and tighten five captive screws (8 in/lbs.).



B. Fuse (cont)

INSTALL (cont)

3. Install the two lower bumpers on the Test Set 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

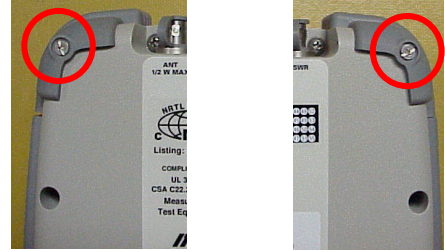
This procedure covers: Open. Close.

PRELIMINARY PROCEDURES

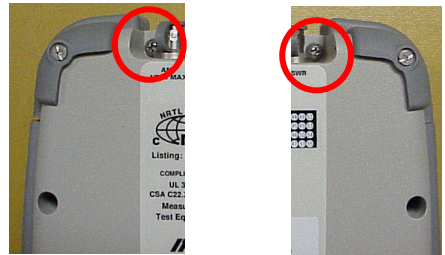
Remove Battery (para 2-4A).

OPEN

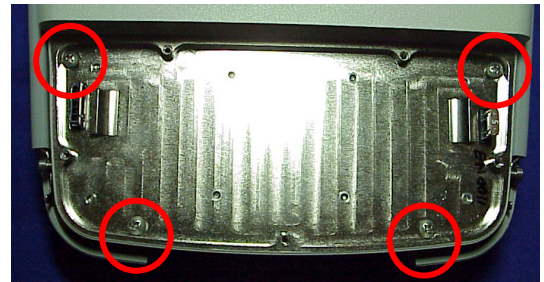
1. Loosen the four captive screws holding bumpers (two in back and two in front). Remove bumpers.



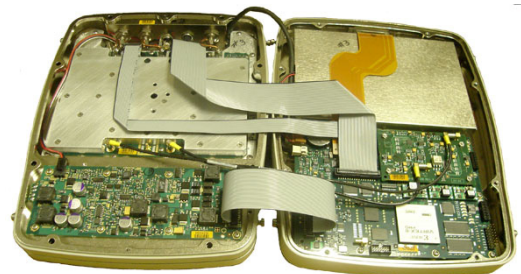
2. Remove four screws.



3. Remove four screws.



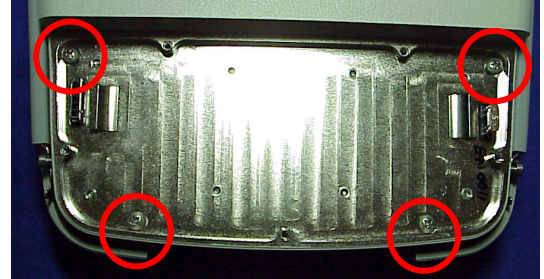
4. Open the Case Assy.



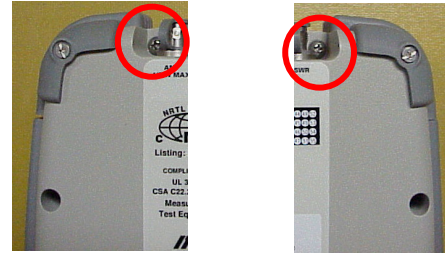
C. Open Case Assy (cont)

CLOSE

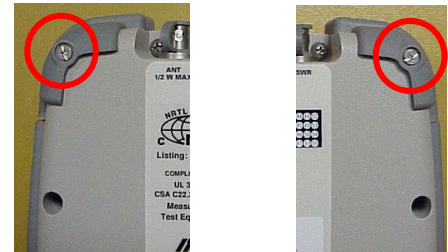
1. Close the Case Assy.
2. Install four screws (17 in/lbs).



3. Install four screws (17 in/lbs).



2. Install bumpers. Tighten the four captive screws holding the bumpers (two in back and two in front).



FOLLOW-ON MAINTENANCE

Install Battery (para 2-4A).

END OF TASK

D. Power Supply Assy (62A1A1)

DESCRIPTION

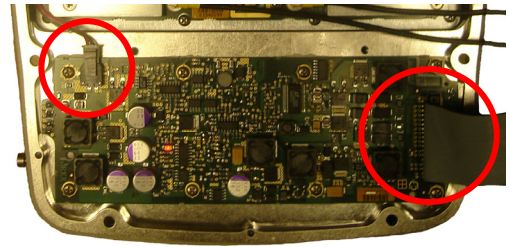
This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

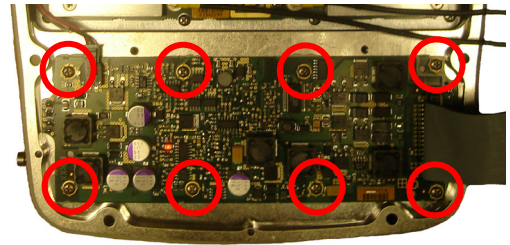
Remove Battery (para 2-4A).
Open Case Assy (para 2-4C).

REMOVE

1. Disconnect wire cable and ribbon cable.



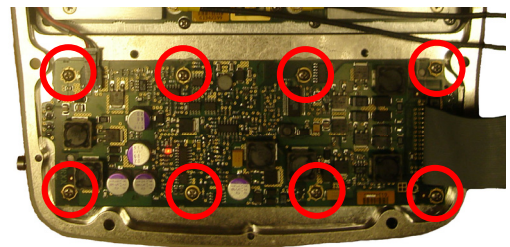
2. Remove eight screws.



3. Remove Power Supply PCB Assy.

INSTALL

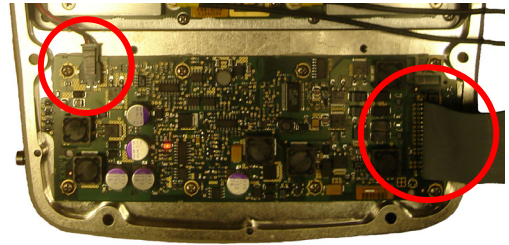
1. Install Power Supply PCB Assy.
2. Install eight screws (6 in/lbs.).



D. Power Supply Assy (62A1A1) (cont)

CLOSE (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. Keypad PCB Assy (62A1A2A1)

DESCRIPTION

This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

Remove Battery (para 2-4A).

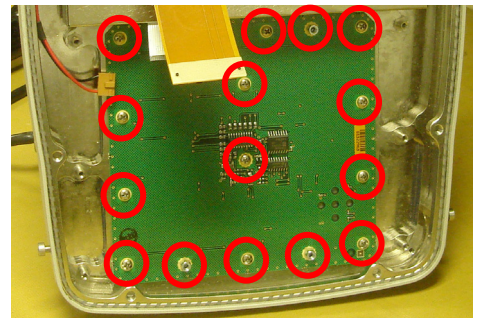
Open Case Assy (para 2-4C).

Remove RF Digitizer PCB Assy (para 2-4F).

Remove Multi-Function PCB Assy (para 2-4G or para 2-4H).

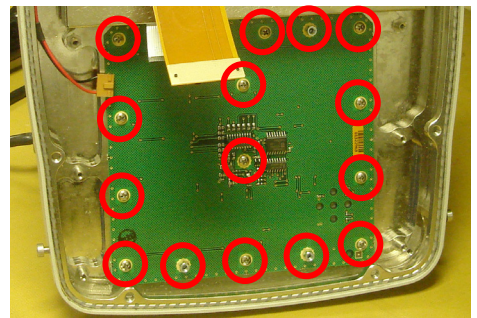
REMOVE

1. Remove 12 screws and five shell nuts.
2. Remove Keypad PCB Assy.



INSTALL

1. Install Keypad PCB Assy.
2. Install 12 screws and five shell nuts (6 in/lbs.).



FOLLOW-ON MAINTENANCE

Install Multi-Function PCB Assy (para 2-4G or para 2-4H).

Install RF Digitizer PCB Assy (para 2-4F).

Close Case Assy (para 2-4C).

Install Battery (para 2-4A).

END OF TASK

F. RF Digitizer PCB Assy (62A1A2A2)

DESCRIPTION

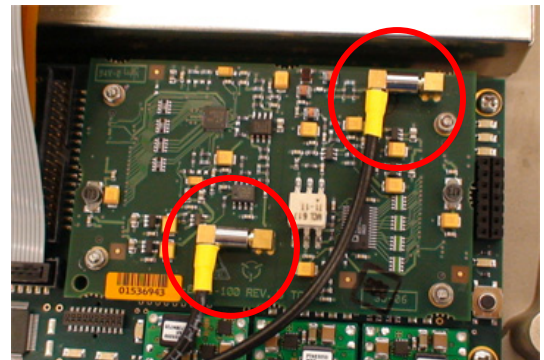
This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

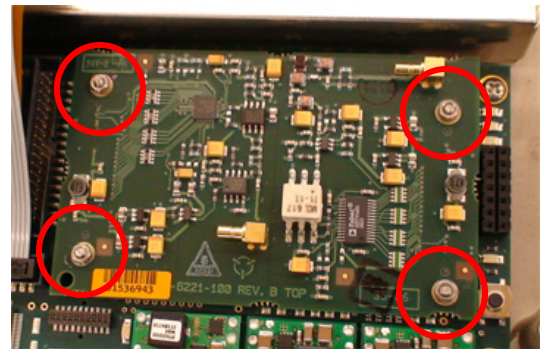
Remove Battery (para 2-4A).
Open Case Assy (para 2-4C).

REMOVE

1. Remove two coaxial cables.



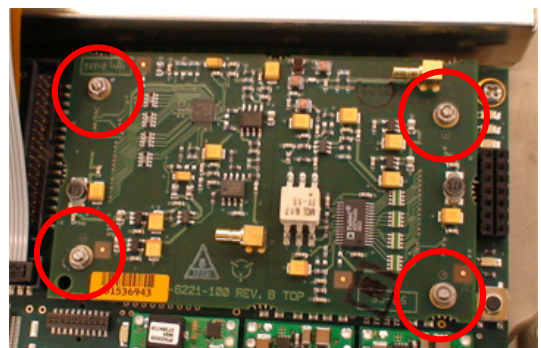
2. Remove four nuts and four lock washers.



3. Remove the RF Digitizer PCB Assy.

INSTALL

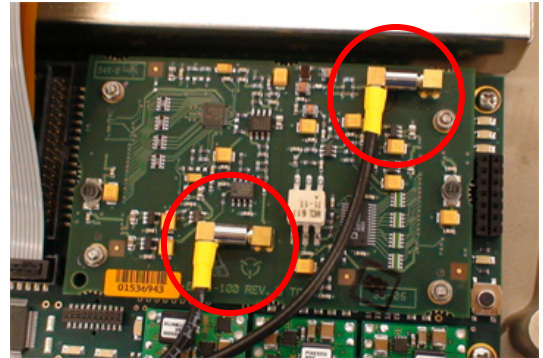
1. Install the RF Digitizer PCB Assy.
2. Install four lock washers and four nuts (3 in/lbs.).



F. RF Digitizer PCB Assy (62A1A2A2) (cont)

INSTALL (cont)

3. Install two coaxial cables.



FOLLOW-ON MAINTENANCE

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

END OF TASK

G. Multi-Function PCB Assy (62A1A2A3) (3500 Only)

DESCRIPTION

This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

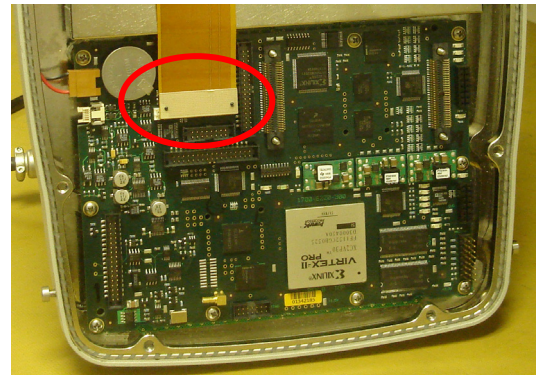
Remove Battery (para 2-4A).

Open Case Assy (para 2-4C).

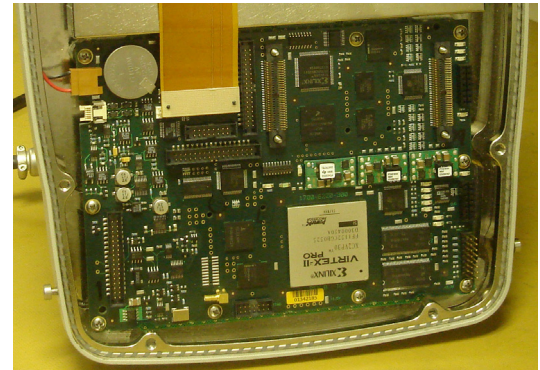
Remove RF Digitizer PCB Assy (para 2-4F).

REMOVE

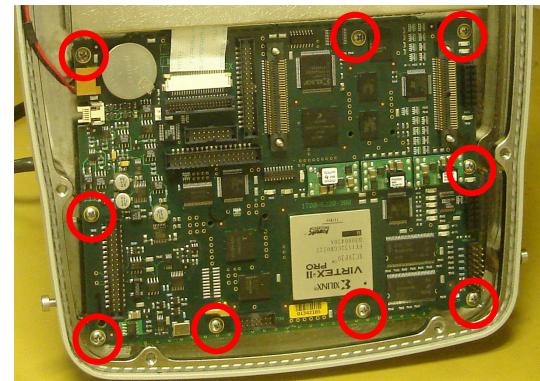
1. Remove Flex Assy.



2. Disconnect two wire cables and four ribbon cables.



3. Remove 10 screws.

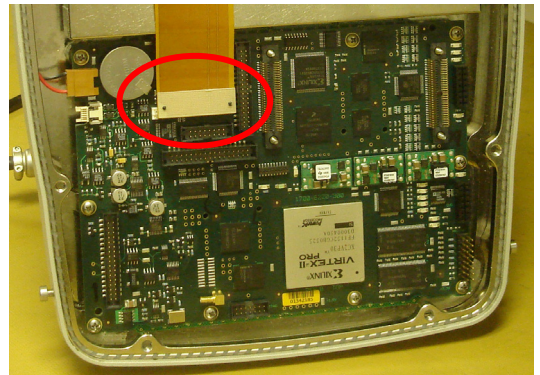
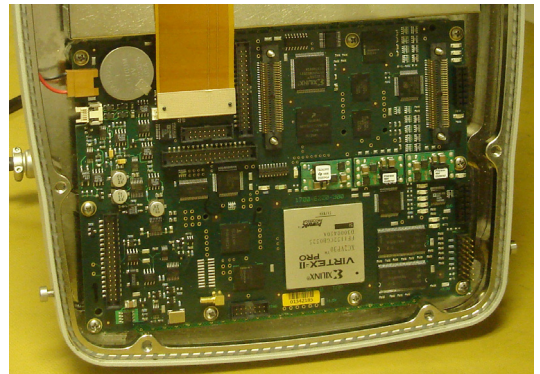
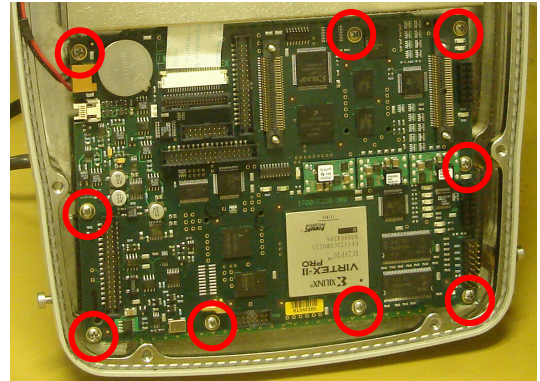


4. Remove Multi-Function PCB Assy.

G. Multi-Function PCB Assy (62A1A2A3) (3500 Only) (cont)

INSTALL

1. Install Multi-Function PCB Assy.
2. Install 10 screws (6 in/lbs.).
3. Connect two wire cables and four ribbon cables.
4. Connect Flex Assy.



FOLLOW-ON MAINTENANCE

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

END OF TASK

H. Multi-Function PCB Assy (62A1A2A3) (3500A Only)

DESCRIPTION

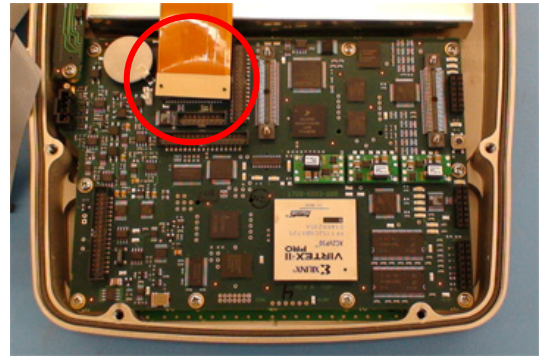
This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

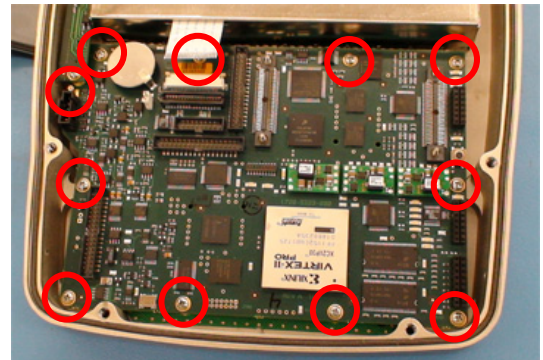
Remove Battery (para 2-4A).
Open Case Assy (para 2-4C).
Remove Audio I/O Assy (para 2-4M)
Remove RF Digitizer PCB Assy (para 2-4F).

REMOVE

1. Disconnect ribbon cable and Flex Assembly (62A1A2A6).



2. Remove standoff and 10 screws

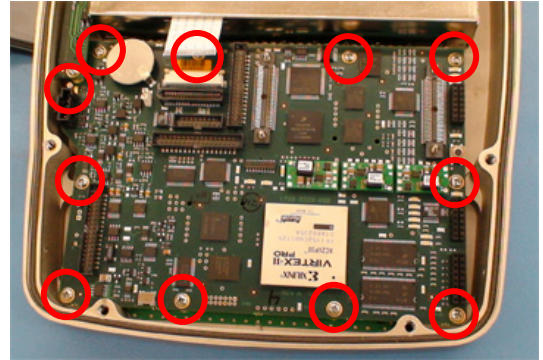


3. Remove Multi-Function PCB Assy.

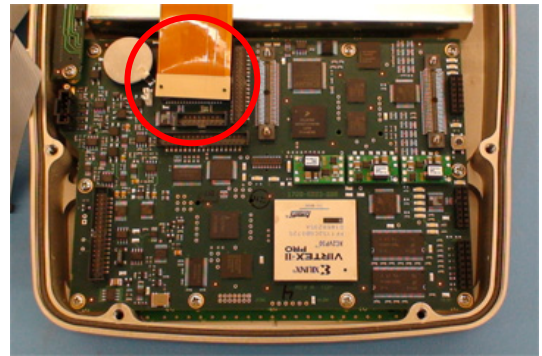
H. Multi-Function PCB Assy (62A1A2A3) (3500A Only) (cont)

INSTALL

1. Install Multi-Function PCB Assy.
2. Install standoff and 10 screws (6 in/lbs.).



3. Connect ribbon cable and Flex Assy (62A1A2A6),



FOLLOW-ON MAINTENANCE

Install RF Digitizer PCB Assy (para 2-4F).
Install Audio I/O Assy (para 2-4M)
Close Case Assy (para 2-4C).
Install Battery (para 2-4A).

END OF TASK

I. LCD Assy (62A1A2A4) (3500 Only)

DESCRIPTION

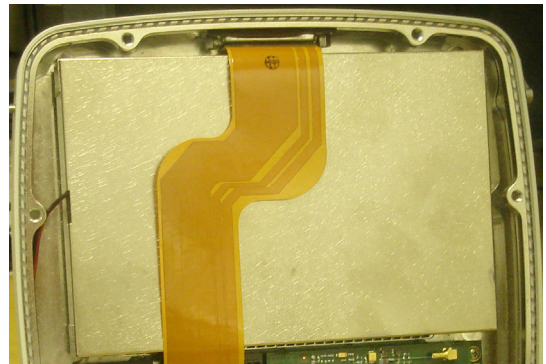
This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

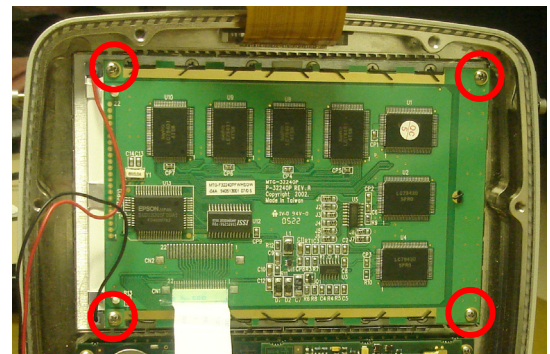
Remove Battery (para 2-4A).
Open Case Assy (para 2-4C).

REMOVE

1. Remove the Display Cover.



2. Remove four screws.

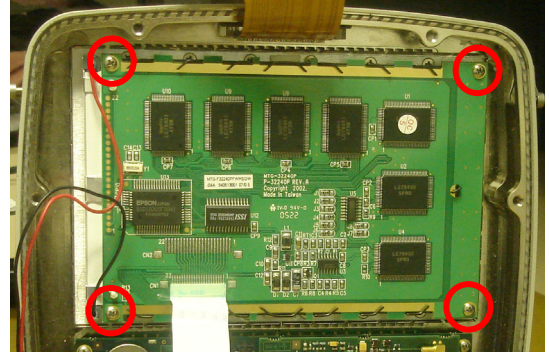


3. Remove the LCD PCB Assy

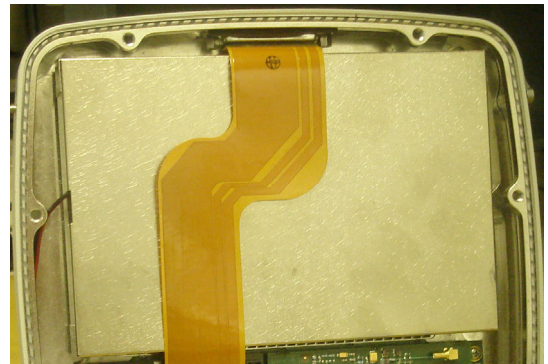
I. LCD Assy (62A1A2A4 (3500 Only) (cont)

INSTALL

1. Install the LCD PCB Assy
2. Install four screws (6 in/lbs.).



3. Install the Display Cover.



FOLLOW-ON MAINTENANCE

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

END OF TASK

J. LCD Assy (62A1A2A4) (3500A Only)

DESCRIPTION

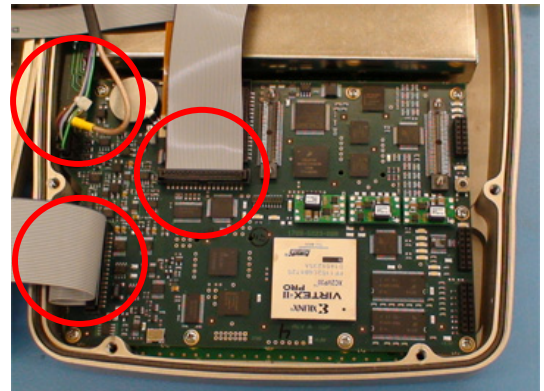
This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

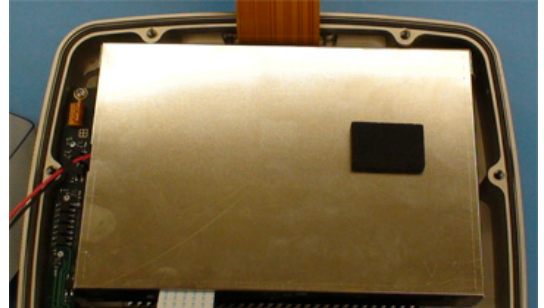
Remove Battery (para 2-4A).
Open Case Assy (para 2-4C).

REMOVE

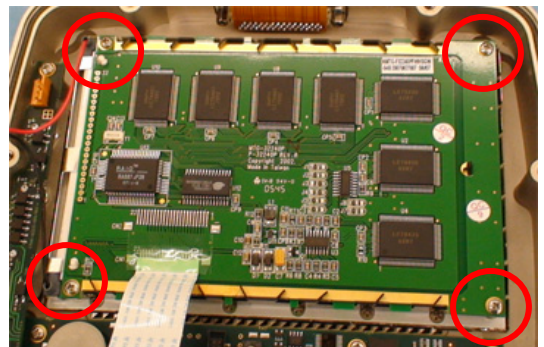
1. Disconnect wire/ribbon cable, three ribbon cables and the Flex Assy (62A1A2A6).



2. Remove the Display Cover.



3. Remove four screws.

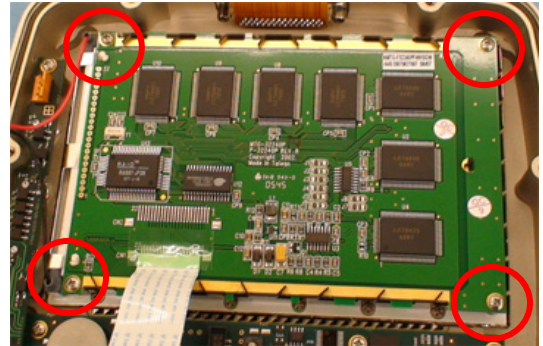


4. Remove the LCD Assy

J. LCD Assy (62A1A2A4) (3500A Only) (cont)

INSTALL

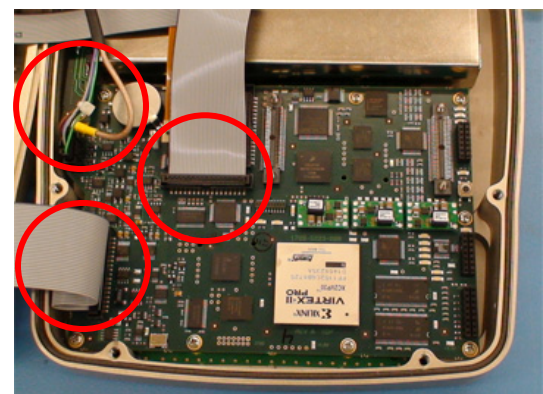
1. Install the LCD Assy
2. Install four screws (6 in/lbs.).



3. Install the Display Cover.



4. Connect wire/ribbon cable, three ribbon cables and the Flex Assy (62A1A2A6).



FOLLOW-ON MAINTENANCE

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

END OF TASK

K. Keypad Assy (62A1A2A5)

DESCRIPTION

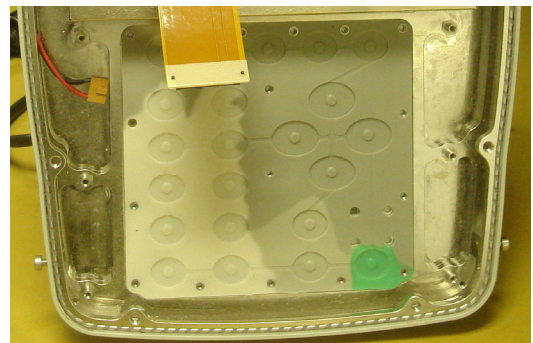
This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

Remove Battery (para 2-4A).
Open Case Assy (para 2-4C).
Remove RF Digitizer PCB Assy (para 2-4F).
Remove Multi-Function PCB Assy (para 2-4G or para 2-4H).
Remove Keypad PCB Assy (para 2-4E).

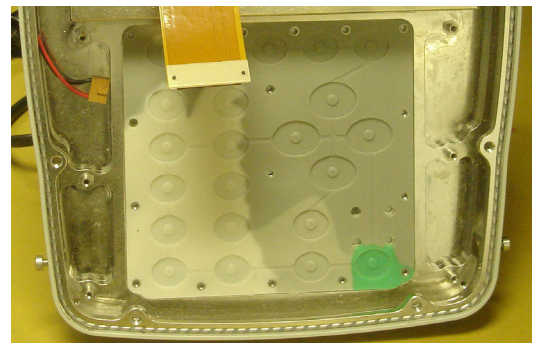
REMOVE

Remove Keypad Assy.



INSTALL

Install Keypad Assy.



FOLLOW-ON MAINTENANCE

Install Keypad PCB Assy (para 2-4E).
Install Multi-Function PCB Assy (para 2-4G or para 2-4H).
Install RF Digitizer PCB Assy (para 2-4F).
Close Case Assy (para 2-4C).
Install Battery (para 2-4A).

END OF TASK

L. Flex Assy (62A1A2A6)

DESCRIPTION

This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

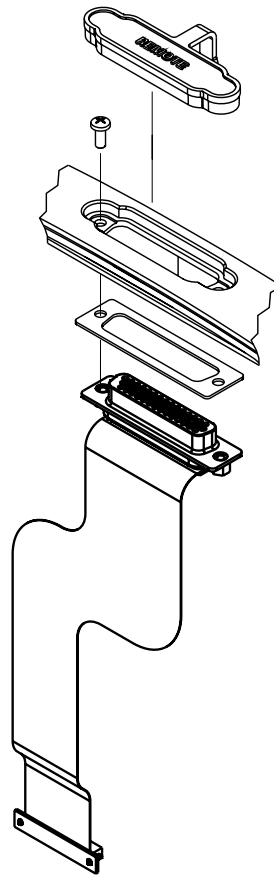
Remove Battery (para 2-4A).
Open Case Assy (para 2-4C).
Remove LCD Assy (62A1A2A4) (para 2-4H).

REMOVE

1. Remove cover from REMOTE Connector.
2. Remove two screws.
3. Remove Flex Assy.

INSTALL

1. Install Flex Assy.
2. Install two screws (6 in/lbs.).
3. Install cover on REMOTE Connector.



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FOLLOW-ON MAINTENANCE

Install LCD Assy (62A1A2A4) (para 2-4H).
Close Case Assy (para 2-4C).
Install Battery (para 2-4A).

END OF TASK

M. Audio I/O PCB Assy (62A1A2A7) (3500A Only)

DESCRIPTION

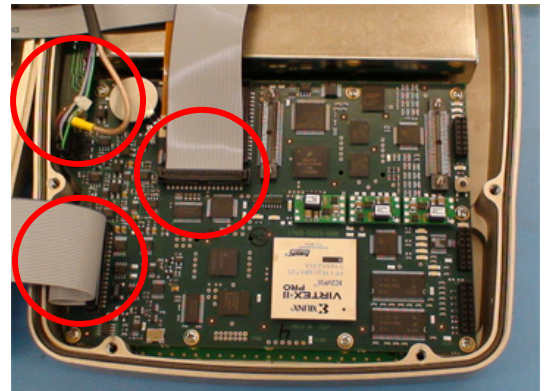
This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

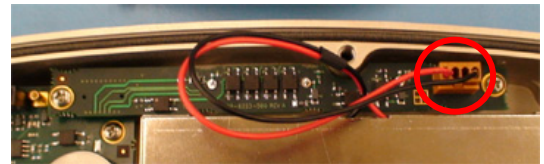
Remove Battery (para 2-4A).
Open Case Assy (para 2-4C).

REMOVE

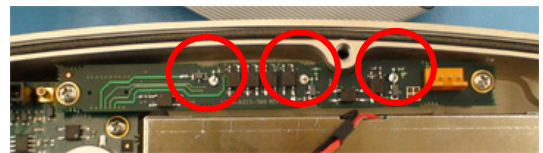
1. Disconnect wire/ribbon cable and three ribbon cables.



2. Disconnect wire cable connector.



3. Unsolder three connectors.



4. Remove two screws and washers.

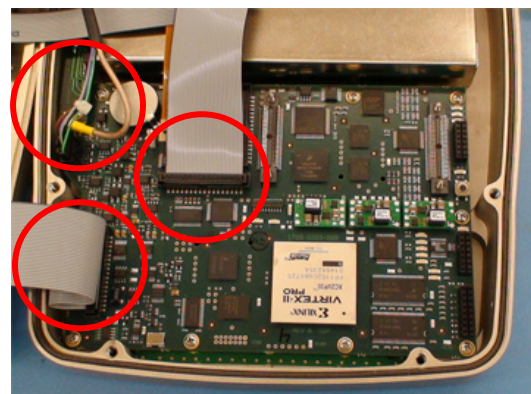
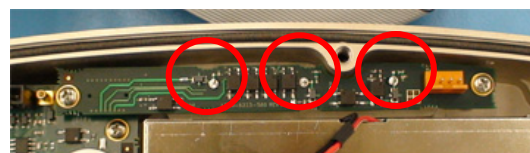


5. Remove Audio I/O PCB Assy.

M. Audio I/O PCB Assy (62A1A2A7) (3500A Only) (cont)

INSTALL

1. Install Audio I/O PCB Assy.
2. Install two screws and washers (6 in/lbs.).
3. Solder three connectors to Audio I/O PCB Assy.
4. Connect wire cable connector.
5. Connect wire/ribbon cable and three ribbon cables.



FOLLOW-ON MAINTENANCE

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

END OF TASK

N. RF Assy (62A1A3)

DESCRIPTION

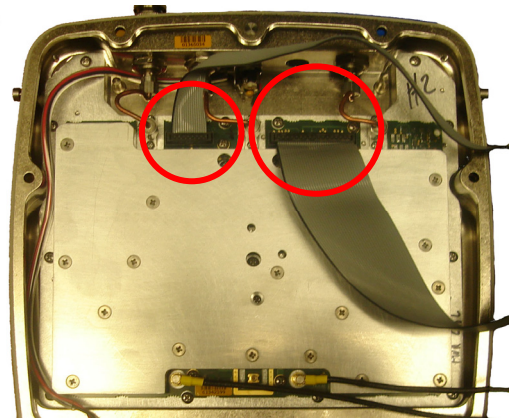
This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

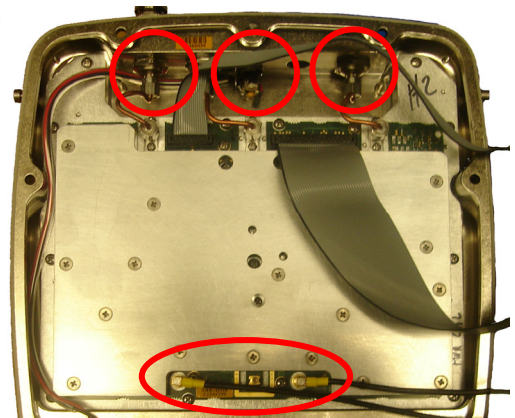
Remove Battery (para 2-4A).
Open Case Assy (para 2-4C).

REMOVE

1. Disconnect two ribbon cables.



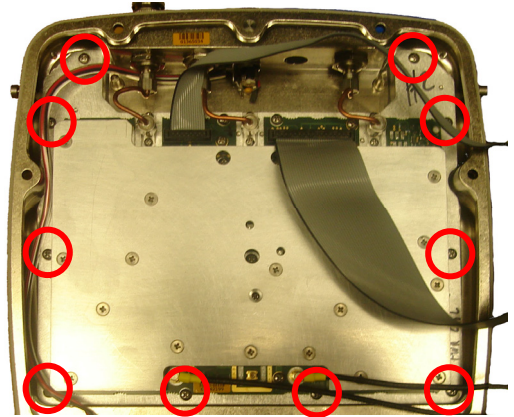
2. Remove five coaxial cables.



N. RF Assy (62A1A3) (cont)

REMOVE (cont)

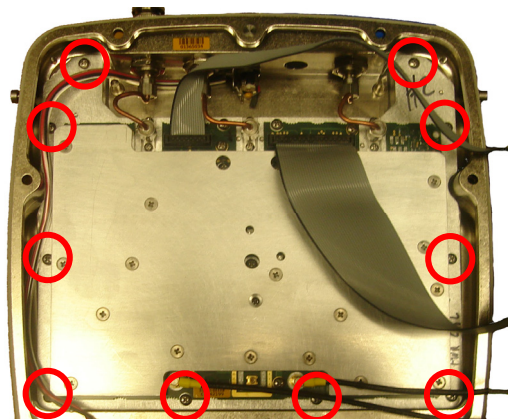
3. Remove 11 screws.



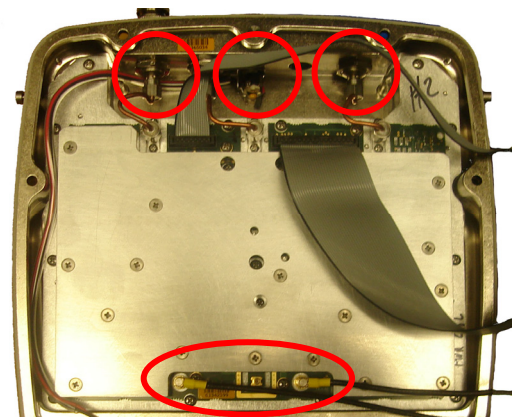
4. Remove the RF Assy.

INSTALL

1. Install the RF Assy.
2. Install 11 screws (8 in/lbs.).



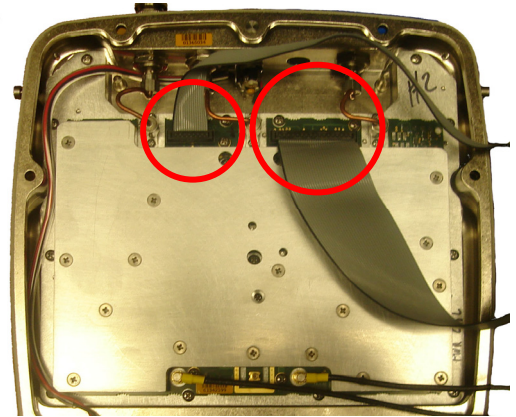
3. Connect five coaxial cables.



N. RF Assy (62A1A3) (cont)

INSTALL (cont)

4. Connect two ribbon cables.



FOLLOW-ON MAINTENANCE

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

END OF TASK

O. ANT Connector

DESCRIPTION

This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

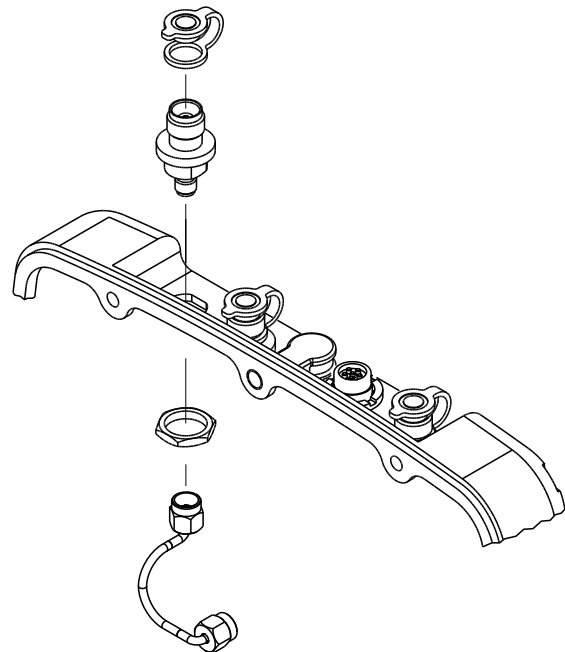
Remove Battery (para 2-4A).
Open Case Assy (para 2-4C).
Remove RF Assy (para 2-4N).

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

END OF TASK

P. T/R Connector

DESCRIPTION

This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

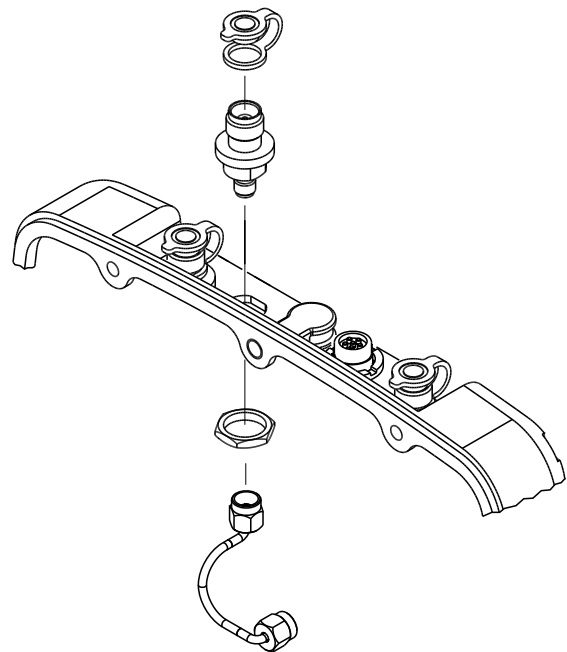
Remove Battery (para 2-4A).
Open Case Assy (para 2-4C).
Remove RF Assy (para 2-4N).

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

END OF TASK

Q. DC IN Connector

DESCRIPTION

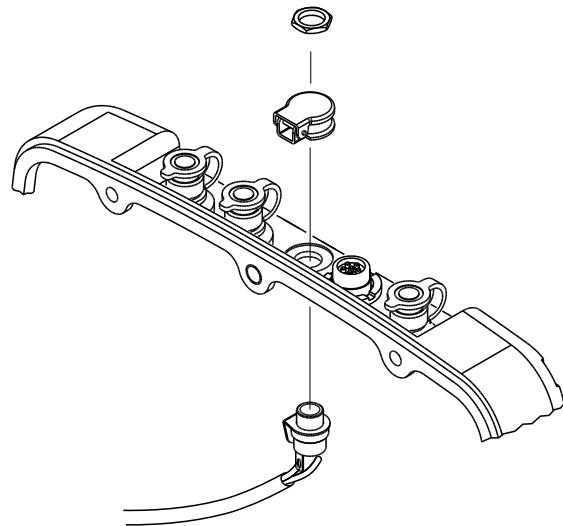
This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

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

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

END OF TASK

R. AUDIO Connector (3500 Only)

DESCRIPTION

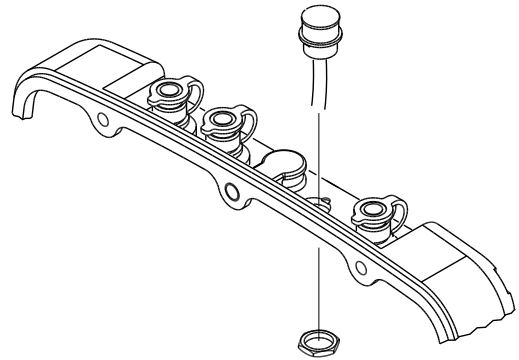
This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

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

REMOVE

1. Remove connector cap.
2. Disconnect coaxial cable.
3. Remove nut.
4. Remove AUDIO Connector and wire harness.



INSTALL

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

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FOLLOW-ON MAINTENANCE

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

END OF TASK

S. AUDIO Connector (3500A Only)

DESCRIPTION

This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

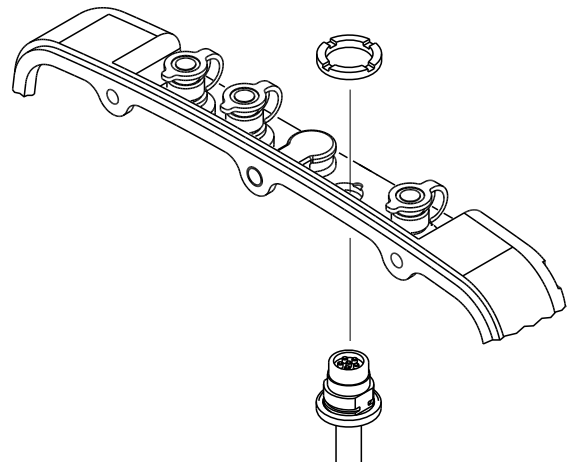
Remove Battery (para 2-4A).
Open Case Assy (para 2-4C).
Remove RF Assy (para 2-4N).

REMOVE

1. Remove connector cap.
2. Disconnect coaxial cable.
3. Remove nut.
4. 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 2-4N).
Close Case Assy (para 2-4C).
Install Battery (para 2-4A).

END OF TASK

T. SWR Connector

DESCRIPTION

This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

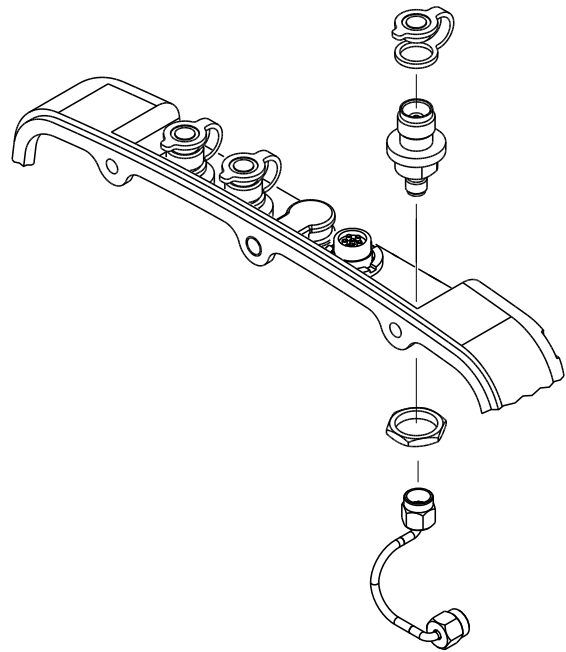
Remove Battery (para 2-4A).
Open Case Assy (para 2-4C).
Remove RF Assy (para 2-4N).

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

END OF TASK

U. DVM Connector (3500A Only)

DESCRIPTION

This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

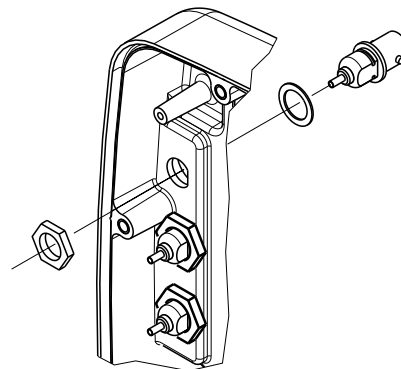
Remove Battery (para 2-4A).
Open Case Assy (para 2-4C).
Remove Audio I/O PCB Assy (para 2-4M).

REMOVE

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

INSTALL

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



062M-17A

FOLLOW-ON MAINTENANCE

Install Audio I/O PCB Assy (para 2-4M).
Close Case Assy (para 2-4C).
Install Battery (para 2-4A).

END OF TASK

V. AUDIO IN Connector (3500A Only)

DESCRIPTION

This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

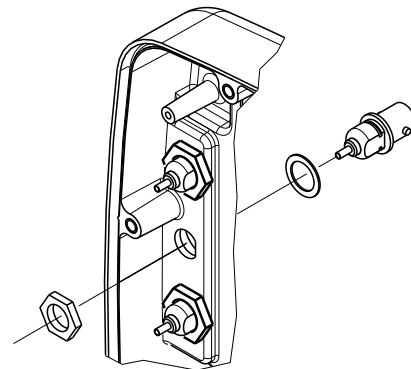
Remove Battery (para 2-4A).
Open Case Assy (para 2-4C).
Remove Audio I/O PCB Assy (para 2-4M).

REMOVE

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

INSTALL

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



062M-17B

FOLLOW-ON MAINTENANCE

Install Audio I/O PCB Assy (para 2-4M).
Close Case Assy (para 2-4C).
Install Battery (para 2-4A).

END OF TASK

W. AUDIO OUT Connector (3500A Only)

DESCRIPTION

This procedure covers: Remove. Install.

PRELIMINARY PROCEDURES

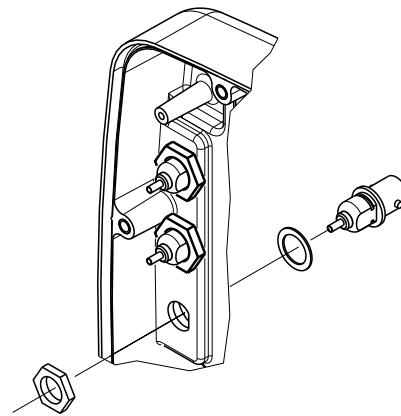
Remove Battery (para 2-4A).
Open Case Assy (para 2-4C).
Remove Audio I/O PCB Assy (para 2-4M).

REMOVE

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

INSTALL

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



062M-17C

FOLLOW-ON MAINTENANCE

Install Audio I/O PCB Assy (para 2-4M).
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 Test Set in the original shipping container. When using packing materials other than the original, use the following guidelines:

- Wrap the Test Set transit case in plastic packing material.
- Use a double-wall cardboard shipping container.
- Protect all sides with shock-absorbing material to prevent the Test Set 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 Test Set should be stored in a clean, dry environment. In high humidity environments, protect the Test Set 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.

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APPENDIX A - REPLACEMENT PARTS

STANDARD ITEMS

DESCRIPTION	PART NUMBER	QTY	MODEL
3500 Communications Test Set		1	3500 ONLY
3500A Communications Test Set		1	3500A ONLY
Adapter (BNC-F to TNC-M)	23758 (2200-0410-700)	5	3500 / 3500A
Antenna (BNC) (50 MHz)	9149 (1201-7617-001)	1	3500A ONLY
Antenna (BNC) (150 MHz)	9145 (1201-7616-801)	1	3500A ONLY
Antenna (BNC) (450 MHz)	9147 (1201-7616-901)	1	3500A ONLY
Antenna (BNC) (800 MHz)	9143 (1201-7616-001)	1	3500A ONLY
Cable (BNC) (M-M) (48 in)	62368 (6041-4284-400)	2	3500 / 3500A
Cable (TNC) (M-M) (48 in)	62398 (6041-5680-800)	1	3500 / 3500A
Case, Accessory	5763 (1000-6200-800)	1	3500 ONLY
Case, Accessory	5762 (1000-6200-700)	1	3500A ONLY
Case, Soft-Sided Carrying	10191 (1412-0006-006)	1	3500 ONLY
Case, Soft-Sided Carrying	10192 (1412-0006-007)	1	3500A ONLY
Comm Breakout Box	64598 (7005-6242-900)	1	3500 / 3500A
External DC Power Supply	67374 (7110-6200-200)	1	3500 / 3500A
Fuse, Spare (5 A, 32 Vdc, Type F)	56080 (5106-0000-057)	2	3500 / 3500A
Handset	64592 (7005-6240-200)	1	3500 ONLY
Handset Cable	62403 (6041-6280-000)	1	3500 ONLY
Handset	64606 (7005-6244-700)	1	3500A ONLY
Manual, Getting Started (Paper)	6107 (1002-6200-8P0)	1	3500 / 3500A
Manual, Operation/ICW (CD)	6105 (1002-6200-2C0)	1	3500 / 3500A
Power Cable (AC)	62302 (6041-0001-000)	1	3500 ONLY
Power Cable (AC) (3-wire leads)	27516 (23424/159)	1	3500A ONLY
Power Cable (AC) (Continental Europe)	27480 (23422/007)	1	3500A ONLY
Power Cable (AC) (North America)	27478 (23422/005)	1	3500A ONLY
Power Cable (AC) (UK)	27477 (23422/002)	1	3500A ONLY
Power Cable (DC Cigarette Lighter)	62404 (6041-6281-400)	1	3500 / 3500A
Short-Open-Load VSWR Calibrator (TNC)	38245 (2901-0000-054)	1	3500 / 3500A
USB Flash Drive (1 GB)	67327 (7110-1100-600)	1	3500A ONLY

STANDARD ITEMS (cont)



Adapter (BNC-F to TNC-M)

(23758) (2200-0410-700)



Antenna (BNC) (50 MHz)

(9149) (1201-7617-001)



Antenna (BNC) (150 MHz)

(9145) (1201-7616-801)



Antenna (BNC) (450 MHz)

(9147) (1201-7616-901)



Antenna (BNC) (800 MHz)

(9143) (1201-7616-001)



BNC Cable (M-M) (48 in)

(62368) (6041-4284-400)



TNC Cable (M-M) (48 in)

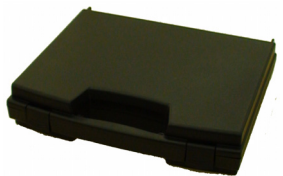
(62398) (6041-5680-800)



Accessory Case (3500)

(5763) (1000-6200-800)

STANDARD ITEMS (cont)



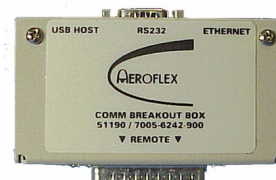
Accessory Case (3500A)
(5762) (1000-6200-700)



Soft-Sided Carrying Case
(10191) (1412-0006-006)



Soft-Sided Carrying Case
(10192) (1412-0006-007)



Comm Breakout Box
(64598) (7005-6242-900)



External DC Power Supply
(67374) (7110-6200-200)



Spare Fuse (5 A, 32 Vdc, Type F)
(56080) (5106-0000-057)



Handset (3500)
(64592) (7005-6240-200)



Handset Cable (3500)
(62403) (6041-6280-000)

STANDARD ITEMS (cont)



Handset (3500A)
(64606) (7005-6244-700)



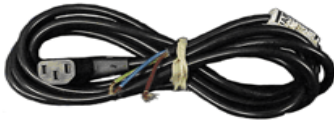
Getting Started Manual
(6107) (1002-6200-8P0)



Operation / ICW Manual
(61105) (1002-6200-2C0)



AC Power Cable
(62302) (6041-0001-000)



Power Cable (AC) (3 wire leads)
(27516) (23424/159)



Power Cable (AC) (Continental Europe)
(27480) (23422/007)



Power Cable (AC) (North America)
(27478) (23422/005)



Power Cable (AC) (UK)
(27477) (23422/002)

STANDARD ITEMS (cont)



Power Cable (DC Cigarette Lighter)

(62404) (6041-6281-400)



VSWR Calibrator (TNC)

(38245) (2901-0000-054)



USB Flash Drive (1 GB)

(67327) (7110-1100-600)

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OPTIONAL ITEMS

DESCRIPTION	PART NUMBER	QTY	MODEL
Antenna (BNC) (50 MHz)	9149 (1201-7617-001)	1	3500 ONLY
Antenna (BNC) (150 MHz)	9145 (1201-7616-801)	1	3500 ONLY
Antenna (BNC) (450 MHz)	9147 (1201-7616-901)	1	3500 ONLY
Antenna (BNC) (800 MHz)	9143 (1201-7616-001)	1	3500 ONLY
Attenuator (20 dB / 50 W)	82559		3500 / 3500A
Attenuator (20 dB / 50 W)	38240 (2901-0000-049)	1	
Adapter (N-F to BNC-F)	23770 (2200-0412-800)	1	
Adapter (N-M to TNC-M)	23766 (2200-0412-400)	1	
Attenuator (20 dB / 150 W)	82560		3500 / 3500A
Attenuator (20 dB / 150 W)	38242 (2901-0000-051)	1	
Adapter (N-F to BNC-F)	23770 (2200-0412-800)	1	
Adapter (N-M to BNC-F)	20327 (2113-0000-004)	1	
Battery, Spare	67076 (7020-0012-500)	1	3500 / 3500A
Case, Transit	10242 (1412-6200-500)	1	3500 / 3500A
Desk Top Stand	63656 (6500-5681-000)	1	3500 / 3500A
Directional Coupler (20 to 200 MHz)	63964		3500 / 3500A
Directional Coupler (20 to 200 MHz)	47290 (4100-0900-000)	1	
Attenuator (10 dB)	38255 (2901-0401-010)	1	
Adapter (N-M to BNC-F)	20327 (2113-0000-004)	2	
Cable (BNC) (M-M) (16 in)	62405 (6041-6282-000)	2	
Flip Cover	63966 (7001-6242-100)	1	3500 / 3500A
Maintenance Manual (CD)	6108 (1002-6201-4C0)	1	3500 / 3500A
Tripod	67474 (7112-8102-500)	1	3500 / 3500A
Tripod and Stand with Dolly	82553	1	3500 / 3500A
Tripod	67474 (7112-8102-500)		
Tripod Stand	63659 (6500-5881-100)		
Dolly	6361 (1005-1000-000)		

OPTIONAL ITEMS (cont)



Antenna (BNC) (50 MHz)
(9149) (1201-7617-001)



Antenna (BNC) (150 MHz)
(9145) (1201-7616-801)



Antenna (BNC) (450 MHz)
(9147) (1201-7616-901)



Antenna (BNC) (800 MHz)
(9143) (1201-7616-001)



20 dB / 50 W Attenuator
(38240) (2901-0000-049)



20 dB / 150 W Attenuator
(38242) (2901-0000-051)



Adapter (N-M to TNC-M)
(23766) (2200-0412-400)



Adapter (N-M to BNC-F)
(20327) (2113-0000-004)



Adapter (N-F to BNC-F)
(23770) (2200-0412-800)



Spare Battery
(67076) (7020-0012-500)

OPTIONAL ITEMS (cont)



Transit Case

(10242) (1412-6200-500)



Directional Coupler

(47290) (4100-0900-000)



10 dB Attenuator

(38255) (2901-0401-010)



BNC Cable (M-M) (16 in)

(62405) (6041-6282-000)



Desk Top Stand

(63656) (6500-6242-100)



Flip Cover

(63966) (7001-6242-100)



Maintenance Manual

(6108) (1002-6201-4C0)



Tripod

(67474) (7112-8102-500)

OPTIONAL ITEMS (cont)



Tripod / Stand / Dolly

**(67474) (7112-8102-500) / (63659) (6500-5881-100) /
(6361) (1005-1000-000)**

3500

72427

3500

REFERENCE DESIGNATOR	PART NUMBER	CAGE CODE	DESCRIPTION
1	9846 (1403-6250-300)	51190	CHASSIS,REAR
2	10602 (1414-5650-800)	51190	COVER,BATTERY
3	35565 (2803-0125-006)	51190	SCREW,4-40 X 1/8 PPHM
4	35611 (2803-0500-006)	51190	SCREW,4-40 X 1/2 PPHM
5	35700 (2805-0438-006)	51190	SCREW,8-32 X 7/16 PPHM
6	36272 (2840-0000-060)	51190	WASHER,NYL,.312OD,.171ID,.032T
7	10259 (1414-0000-008)	51190	COVER,MINI POWER JACK
8	11238 (1421-6256-900)	51190	BUMPER,CORNER,SSHDW
9	10127 (1407-5651-400)	51190	HANDLE,EXTRUDED
10	10128 (1407-5651-500)	51190	HANDLE,STRAP
11	10603 (1414-5651-700)	51190	COVER,BNC/TNC
12	10610 (1414-5851-800)	51190	COVER, REMOTE
13	35564 (2803-0125-005)	51190	SCREW,4-40 X 1/8 SHOULDER
14	35642 (2803-6256-500)	51190	SCREW,CAPTIVE,4-40,.39L PH
A1	66001 (7010-6231-000)	51190	PCB ASSY,POWER SUPPLY
A2	64591 (7005-6240-100)	51190	MECH ASSY,FRONT CHASSIS
A3	64597 (7005-6242-700)	51190	MECH ASSY,RF
BT1	67076 (7020-0012-500)	51190	PURCH ASSY,LIION BATTERY PACK
J1	20952 (2123-0000-109)	51190	CONN,F,TNC,BH,ADP,SMA,WTRPRF
J2	20952 (2123-0000-109)	51190	CONN,F,TNC,BH,ADP,SMA,WTRPRF
J4	20952 (2123-0000-109)	51190	CONN,F,TNC,BH,ADP,SMA,WTRPRF
W1	65007 (7007-5680-100)	51190	WIRE HARN ASSY,DC INPUT
W2	62982 (6045-5680-400)	51190	RBN CA ASSY,28GA,34C,6.0L,2MM
W3	62988 (6045-6280-800)	51190	RBN CA ASSY,28GA,34P,13.0L,2MM
W4	65015 (7007-6281-200)	51190	WIRE HARN ASSY,12P MIC MAIN
W5	62990 (6045-6281-600)	51190	RBN CA ASSY,28GA,16P,14.25L,2M
W6	63367 (6061-1991-200)	51190	COAX ASSY,RFSSMB/RFSSMB
W7	63367 (6061-1991-200)	51190	COAX ASSY,RFSSMB/RFSSMB
W10	62628 (6042-6282-400)	51190	COAX ASSY,CONF,2.125 FLSH MNT
W11	62628 (6042-6282-400)	51190	COAX ASSY,CONF,2.125 FLSH MNT
W12	62628 (6042-6282-400)	51190	COAX ASSY,CONF,2.125 FLSH MNT

3500A

72433

3500A

REFERENCE DESIGNATOR	PART NUMBER	CAGE CODE	DESCRIPTION
1	9851 (1403-6255-000)	51190	CHASSIS,REAR
2	64604 (7005-6244-500)	51190	MECH ASSY,BATTERY COVER
3	35566 (2803-0156-006)	51190	SCREW,4-40 X 5/32 PPHM
4	35615 (2803-0563-006)	51190	SCREW,4-40 X 9/16 PPHM
5	35700 (2805-0438-006)	51190	SCREW,8-32 X 7/16 PPHM
6	36284 (2840-0027-000)	51190	WASHER,NYL,.275OD,.17ID,.062T
7	10259 (1414-0000-008)	51190	COVER,MINI POWER JACK
8	11238 (1421-6256-900)	51190	BUMPER,CORNER,SSH DW
9	10128 (1407-5651-500)	51190	HANDLE,STRAP
10	10127 (1407-5651-400)	51190	HANDLE,EXTRUDED
11	10603 (1414-5651-700)	51190	COVER,BNC/TNC
12	10610 (1414-5851-800)	51190	COVER, REMOTE
13	35564 (2803-0125-005)	51190	SCREW,4-40 X 1/8 SHOULDER
14	35642 (2803-6256-500)	51190	SCREW,CAPTIVE,4-40,.39L PH
15	36273 (2840-0000-061)	51190	WASHER,SS,.75ID,.87OD,.020T
A1	66001 (7010-6231-000)	51190	PCB ASSY,POWER SUPPLY
A2	64603 (7005-6244-400)	51190	MECH ASSY,FRONT CHASSIS
A3	64597 (7005-6242-700)	51190	MECH ASSY,RF
BT1	67076 (7020-0012-500)	51190	PURCH ASSY,LIION BATTERY PACK
J1	20952 (2123-0000-109)	51190	CONN,F,TNC,BH,ADP,SMA,WTRPRF
J2	20952 (2123-0000-109)	51190	CONN,F,TNC,BH,ADP,SMA,WTRPRF
J4	20952 (2123-0000-109)	51190	CONN,F,TNC,BH,ADP,SMA,WTRPRF
W1	65007 (7007-5680-100)	51190	WIRE HARN ASSY,DC INPUT
W2	62982 (6045-5680-400)	51190	RBN CA ASSY,28GA,34C,6.0L,2MM
W3	62988 (6045-6280-800)	51190	RBN CA ASSY,28GA,34P,13.0L,2MM
W4	65017 (7007-6282-700)	51190	WIRE HARN ASSY,12P MIC MAIN
W5	62990 (6045-6281-600)	51190	RBN CA ASSY,28GA,16P,14.25L,2M
W6	63367 (6061-1991-200)	51190	COAX ASSY,RFSSMB/RFSSMB
W7	63367 (6061-1991-200)	51190	COAX ASSY,RFSSMB/RFSSMB
W10	62628 (6042-6282-400)	51190	COAX ASSY,CONF,2.125 FLSH MNT
W11	62628 (6042-6282-400)	51190	COAX ASSY,CONF,2.125 FLSH MNT
W12	62628 (6042-6282-400)	51190	COAX ASSY,CONF,2.125 FLSH MNT

72433

3500A

A0

Contains all parts shown in original with the following exception:

REFERENCE DESIGNATOR	PART NUMBER	CAGE CODE	DESCRIPTION
A3	64601 (7005-6243-600)	51190	MECH ASSY,RF

72433

3500A

A1

Contains all parts shown in Revision A0.

CHASSIS ASSY (3500)

64591 (7005-6240-100) ASSY, CHASSIS

REFERENCE DESIGNATOR	PART NUMBER	CAGE CODE	DESCRIPTION
1	9847 (1403-6250-400)	51190	CHASSIS,FRONT
2	9502 (1400-5650-200)	51190	BRACKET,DISPLAY
3	10601 (1414-5650-300)	51190	COVER,DISPLAY
4	33893 (2508-5650-400)	51190	SHIELD,DISPLAY
5	46697 (3900-5650-500)	51190	LENS,DISPLAY
6	35569 (2803-0188-003)	51190	SCREW,4-40 X 3/16 PFHM
7	35571 (2803-0188-006)	51190	SCREW,4-40 X 3/16 PPHM
8	35582 (2803-0250-006)	51190	SCREW,4-40 X 1/4 PPHM
9	35600 (2803-0375-006)	51190	SCREW, 4-40 X 3/8 PPHM
10	35536 (2801-0375-006)	51190	SCREW,2-56 X 3/8 PPHM
11	35844 (2818-0000-017)	51190	STANDOFF,.188 HEX M/F,.187LG
12	37773 (2850-0000-012)	51190	NUT,HEX,SMALL PAT,2-56
13	36239 (2840-0000-004)	51190	WASHER,LOCK,INT TOOTH,2
A1	65999 (7010-6230-700)	51190	PCB ASSY,KEYPAD
A2	66002 (7010-6231-100)	51190	PCB ASSY,RF DIGITIZER
A3	65995 (7010-6230-300)	51190	PCB ASSY,MULTIFUNCTION
A4	67364 (7110-5600-000)	51190	PURCHASED ASSY,LCD
A5	67373 (7110-6200-100)	51190	PURCH ASSY,KEYPAD
A6	67377 (7110-6231-300)	51190	PURCH ASSY,FLEX
JTB1	21440 (2132-0004-000)	51190	CONN,JUMPER BLOCK,.1C,.025 PIN

CHASSIS ASSY (3500A)

64603 (7005-6244-400) ASSY, CHASSIS

REFERENCE DESIGNATOR	PART NUMBER	CAGE CODE	DESCRIPTION
1	9850 (1403-6253-700)	51190	CHASSIS,FRONT
2	9516 (1400-6255-300)	51190	BRACKET,DISPLAY
3	10623 (1414-6255-200)	51190	COVER,DISPLAY
4	33903 (2508-6255-400)	51190	SHIELD,DISPLAY
5	46697 (3900-5650-500)	51190	LENS,DISPLAY
6	36283 (2840-0026-000)	51190	WASHER,NYL,0.5310D,0.375ID,0.020T
7	35569 (2803-0188-003)	51190	SCREW,4-40 X 3/16 PFHM
8	35571 (2803-0188-006)	51190	SCREW,4-40 X 3/16 PPHM
9	37932 (2850-7866-300)	51190	STANDOFF,HEX,MALE-FEMALE
10	35600 (2803-0375-006)	51190	SCREW, 4-40 X 3/8 PPHM
11	35536 (2801-0375-006)	51190	SCREW,2-56 X 3/8 PPHM
12	35844 (2818-0000-017)	51190	STANDOFF,.188 HEX M/F,.187LG
13	37773 (2850-0000-012)	51190	NUT,HEX,SMALL PAT,2-56
14	36239 (2840-0000-004)	51190	WASHER,LOCK,INT TOOTH,2
A1	66010 (7010-6233-700)	51190	PCB ASSY,KEYPAD
A2	66002 (7010-6231-100)	51190	PCB ASSY,RF DIGITIZER
A3	66007 (7010-6233-200)	51190	PCB ASSY,MULTIFUNCTION
A4	67364 (7110-5600-000)	51190	PURCHASED ASSY,LCD
A5	67375 (7110-6200-300)	51190	PURCH ASSY,KEYPAD
A6	67377 (7110-6231-300)	51190	PURCH ASSY,FLEX
A7	66008 (7010-6233-500)	51190	PCB ASSY,HITS AUDIO I/O
J5	20338 (2113-0000-020)	51190	CONN UG1094/U
J6	20338 (2113-0000-020)	51190	CONN UG1094/U
J7	20338 (2113-0000-020)	51190	CONN UG1094/U
JTB1	21440 (2132-0004-000)	51190	CONN,JUMPER BLOCK,.1C,.025 PIN

64603 (7005-6244-400) ASSY, CHASSIS

A0

Contains all parts shown in original with the following exception:

REFERENCE DESIGNATOR	PART NUMBER	CAGE CODE	DESCRIPTION
A4	67376 (7110-6200-400)	51190	PURCHASED ASSY,LCD

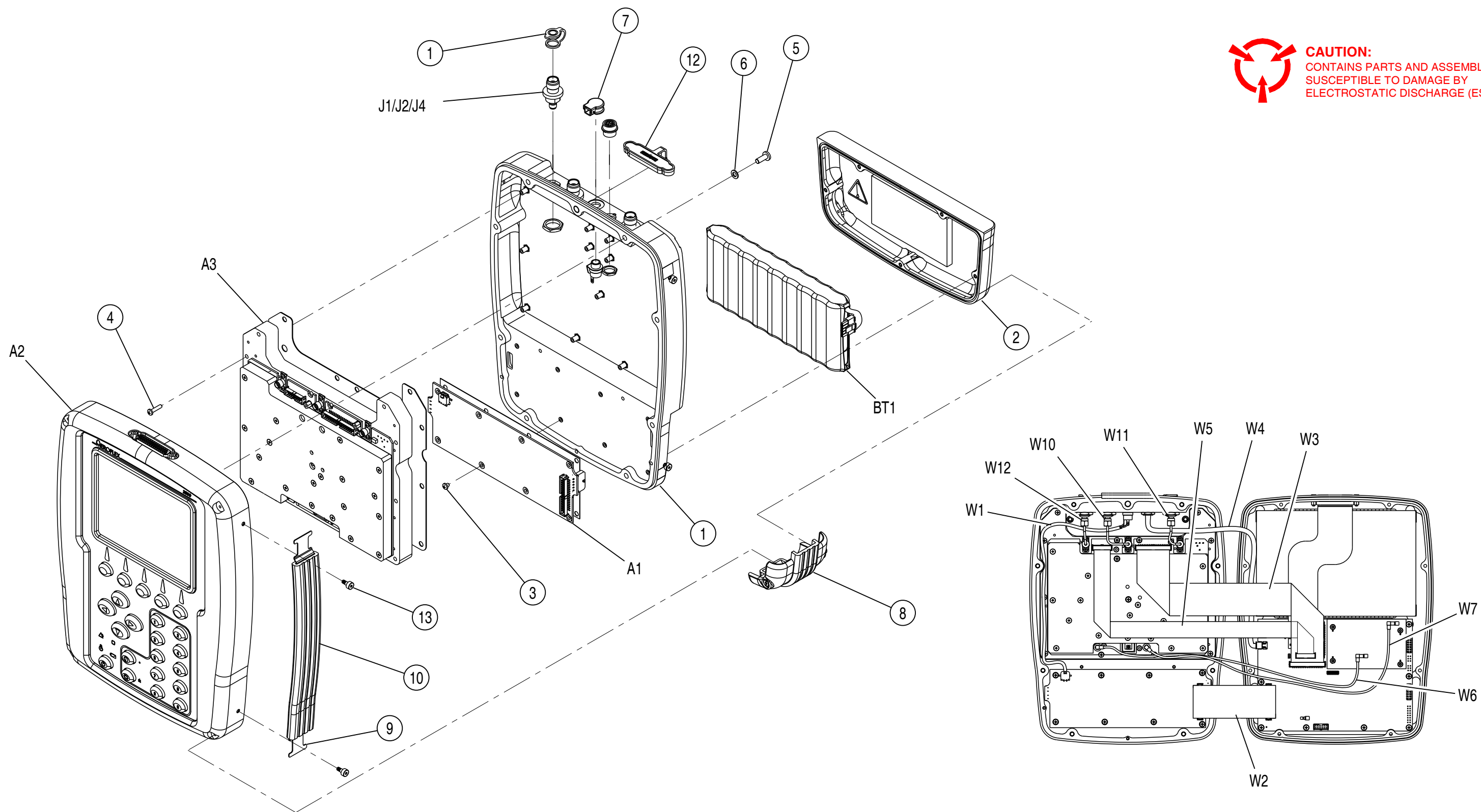
64603 (7005-6244-400) ASSY, CHASSIS

A1


Contains all parts shown in Revision A0 with the following exception:

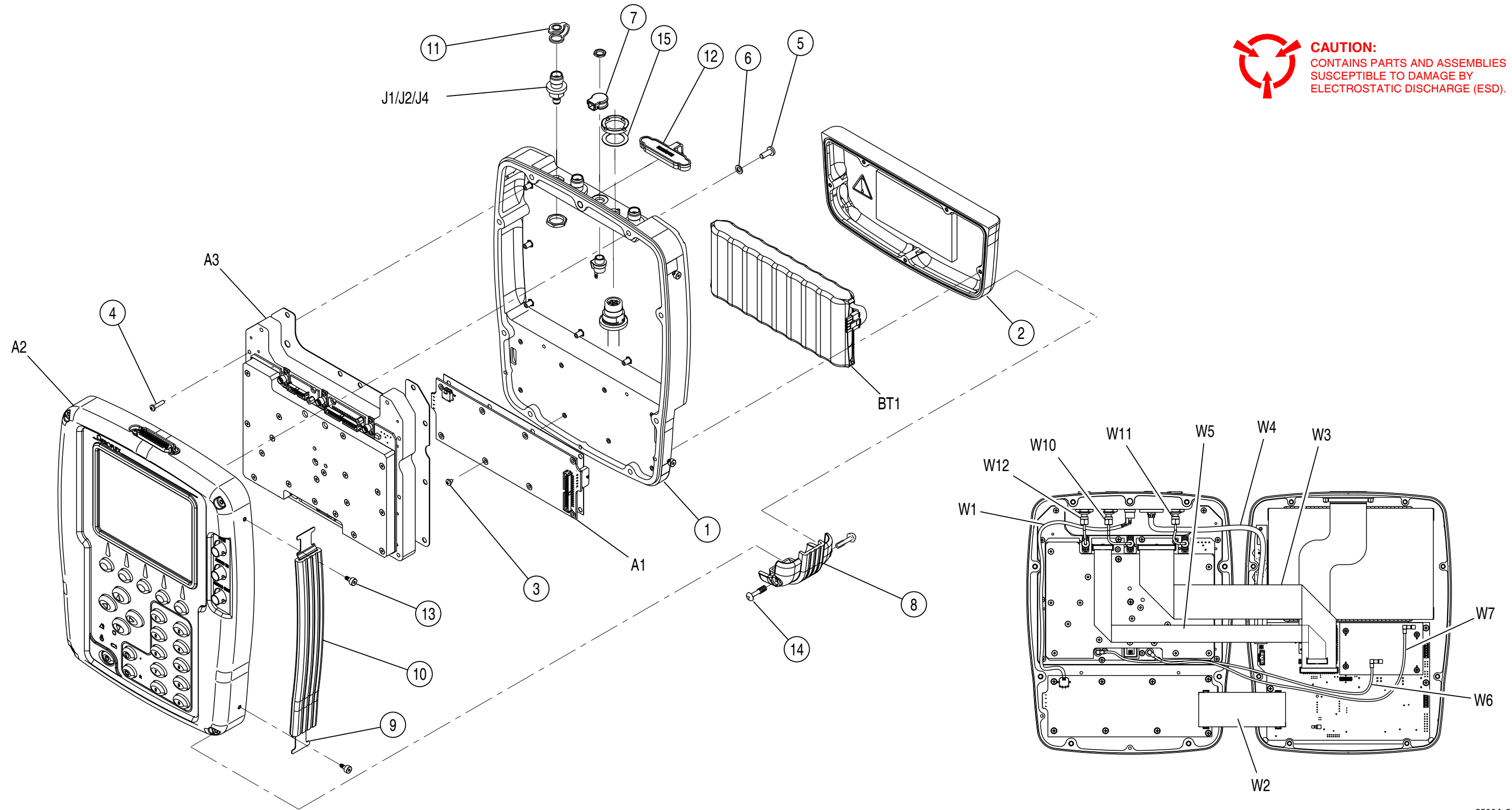
REFERENCE DESIGNATOR	PART NUMBER	CAGE CODE	DESCRIPTION
A3	66017 (7010-6235-600)	51190	PCB ASSY,MULTIFUNCTION

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



3500-20

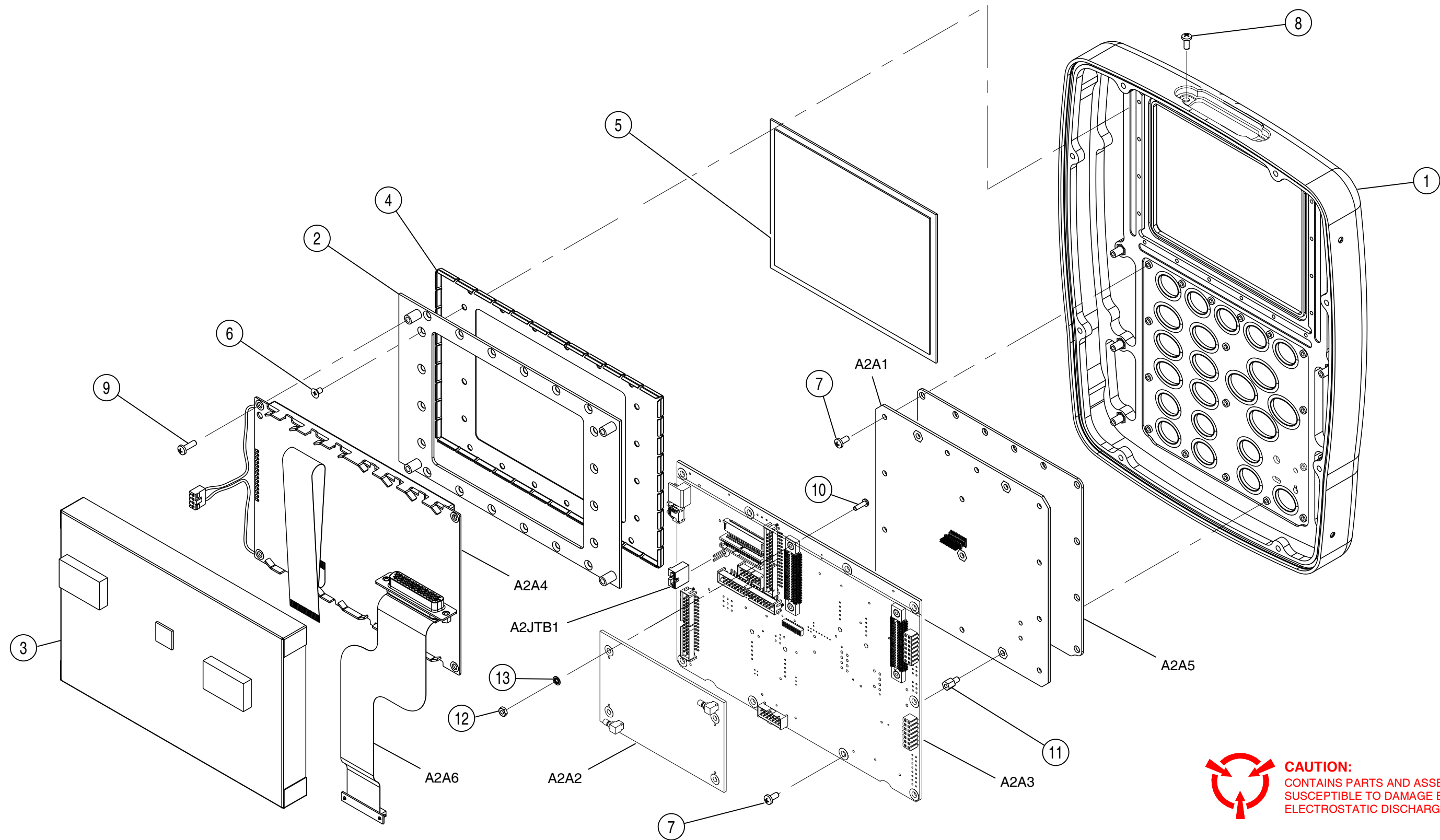
 **CAUTION:**
CONTAINS PARTS AND ASSEMBLIES
SUSCEPTIBLE TO DAMAGE BY
ELECTROSTATIC DISCHARGE (ESD).



3500A-20

Figure A-2. 3500A
(72433)

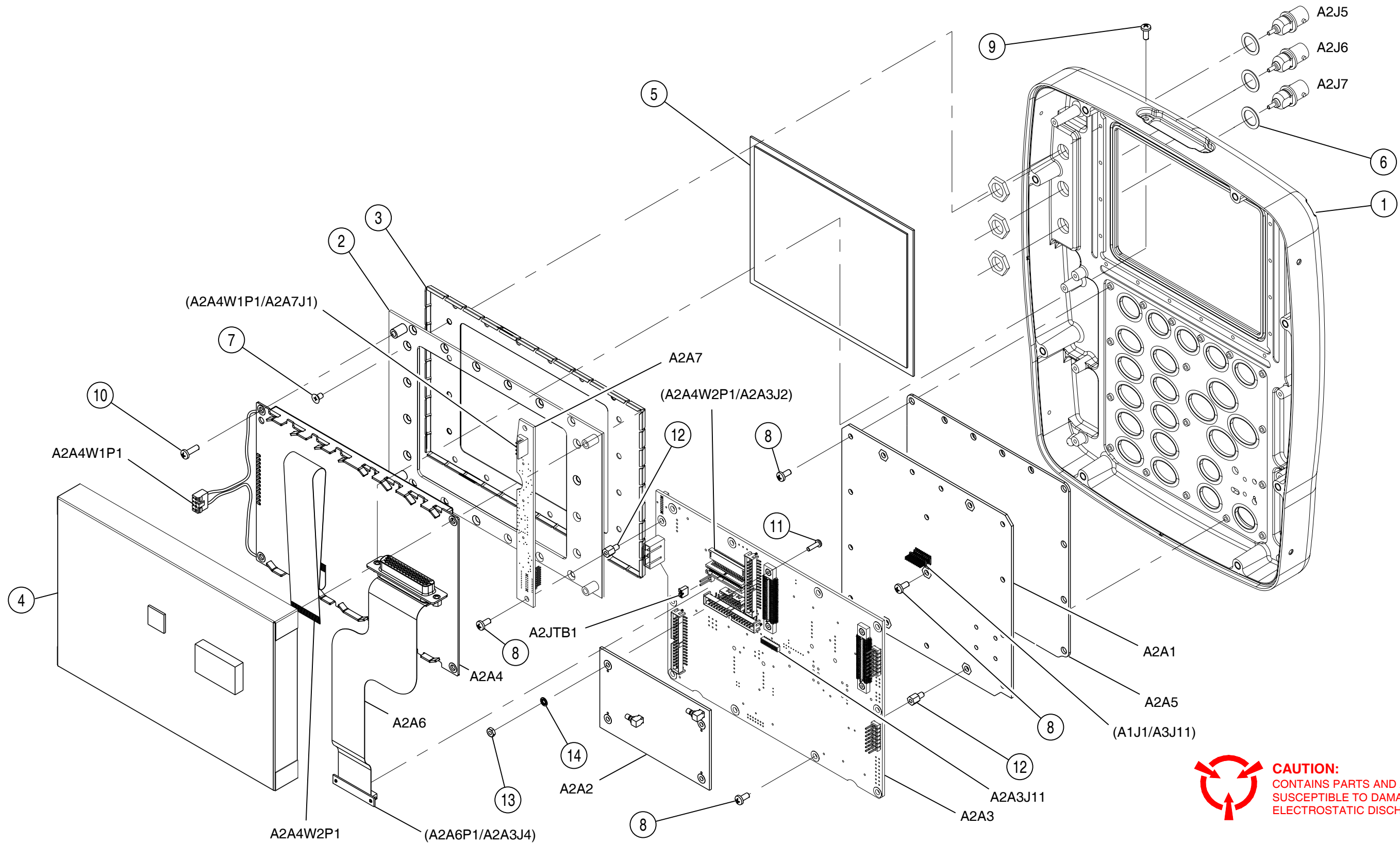
A-16



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

3500-30

Figure A-3. Chassis Assy (3500)
(64591)



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

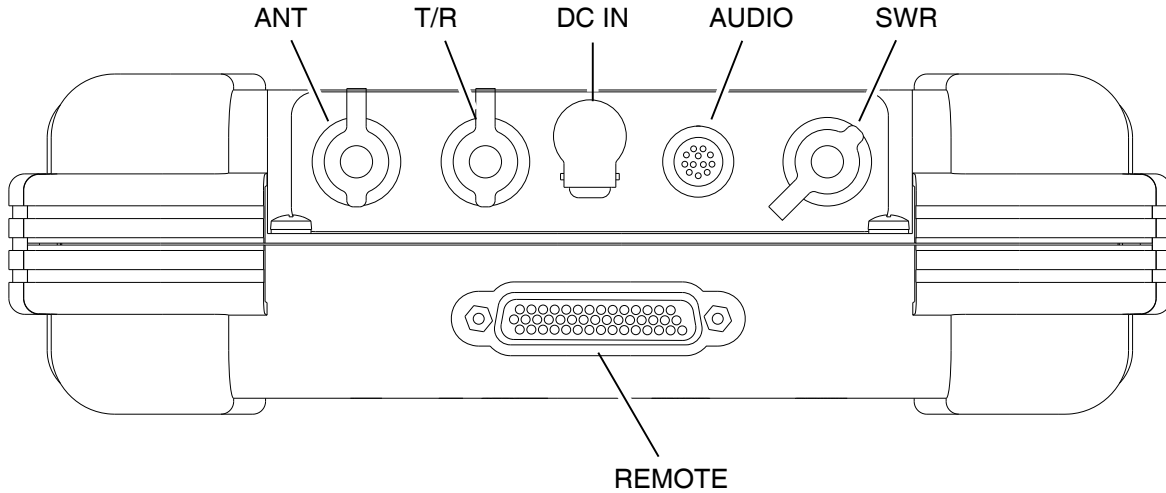
3500A-30

Figure A-4. Chassis Assy (3500A)
(64603)

APPENDIX B - CONNECTOR PIN-OUT TABLES

B-1. I/O CONNECTORS

3500



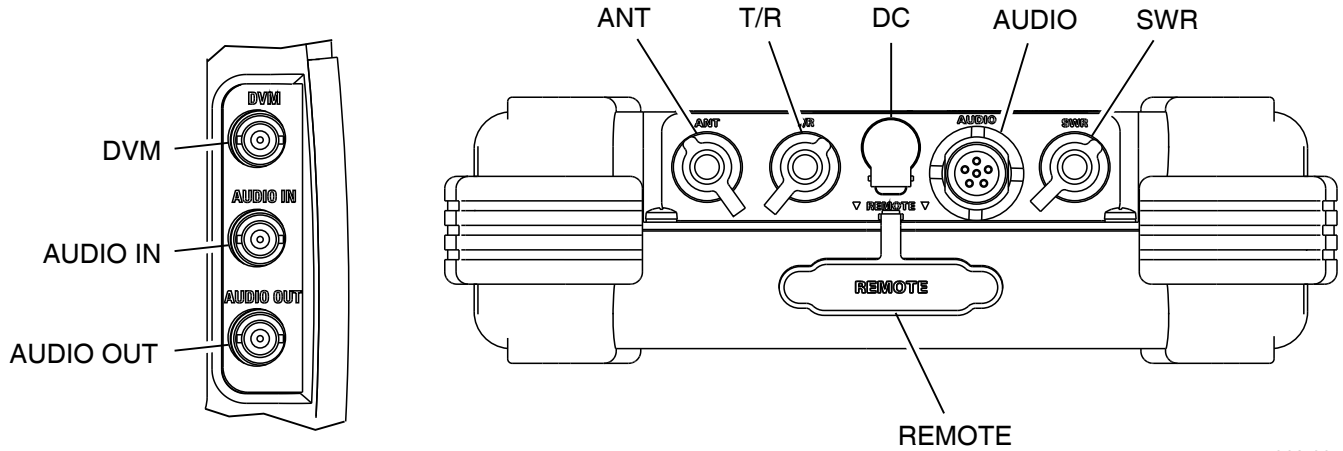
062-005

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	12-Pin CIRCULAR Female	MIXED	INPUT/OUTPUT
	Refer to Table B-3 for 3500 AUDIO Connector description		
REMOTE	44-Pin D-SUB Female	MIXED	INPUT/OUTPUT
	Refer to Table B-5 for 3500 REMOTE Connector description		

Table B-1. 3500 I/O Connectors

B-1. I/O CONNECTORS (cont)

3500A



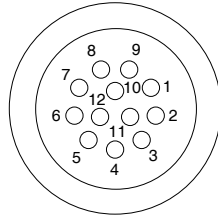
062-005

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 Table B-4 for 3500A AUDIO Connector description		
REMOTE	44-Pin D-SUB Female	MIXED	INPUT/OUTPUT
	Refer to Table B-5 for 3500A REMOTE Connector description		
DVM	BNC Female		INPUT
AUDIO IN	BNC Female		INPUT
AUDIO OUT	BNC Female		OUTPUT

Table B-2. 3500A I/O Connectors

B-2. AUDIO CONNECTOR PIN-OUT TABLE

3500



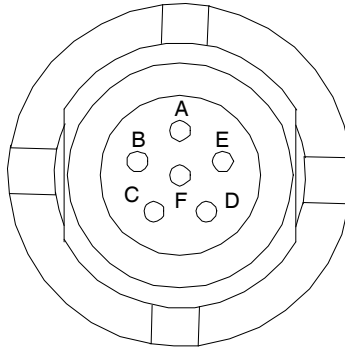
062-004

PIN NO.	SIGNAL NAME
1	PTT
2	AMP_SW
3	MIC
4	GND
5	AUDIO_IN
6	GND
7	DVM+
8	DVM-
9	AUDIO_OUT
10	GND
11	SPKR+
12	SPKR-

Table B-3. 3500 AUDIO Connector Pin-Out Table

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

3500A

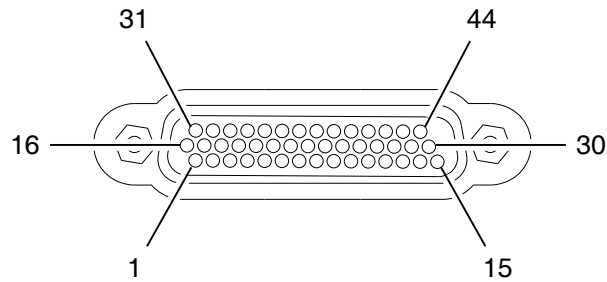


PIN NO.	SIGNAL NAME
A	GND
B	SPEAKER+
C	PTT
D	MIC
E	MICSEL1
F	MICSEL2

Table B-4. 3500A AUDIO Connector Pin-Out Table

B-3. REMOTE CONNECTOR PIN-OUT TABLE

3500 / 3500A

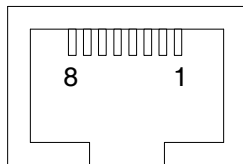


062-003

PIN NO.	SIGNALNAME	PIN NO.	SIGNALNAME
1	VBUS_DN1	23	GND
2	GND_DN1	24	CF_ETD+
3	+5 Vdc	25	GND
4	J-TAGSENSE	26	PPC_CTS
5	GND	27	PPC_TXD
6	CF0RTS	28	REM_IN2
7	GND	29	REM_OUT2
8	CF_ERX-	30	REM_OUT4
9	CF_ETD-	31	VBUS_DN1
10	GND	32	GND_DN1
11	PPC_RTS	33	+5 Vdc
12	PPC_RXD	34	J-TAGSENSE
13	REM_IN4	35	GND
14	REM_IN3	36	CF0RX
15	REM_OUT3	37	GND
16	H_D-	38	CF_ERX+
17	H_D+	39	GND
18	TNS	40	REM_IN1
19	TCK	41	REM_OUT1
20	GND	42	TDO
21	CF0TX	43	TDI
22	CF0CTS	44	GND

Table B-5. 3500 / 3500A REMOTE Connector Pin-Out Table

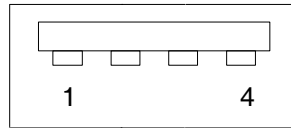
B-4. COMM BREAKOUT BOX - ETHERNET CONNECTOR PIN-OUT TABLE



PIN NO.	SIGNAL NAME
1	TCT
2	TD+
3	TD-
4	RD+
5	RD-
6	RCT
7	GND
8	GND

Table B-6. Comm Breakout Box - ETHERNET Connector Pin-Out Table

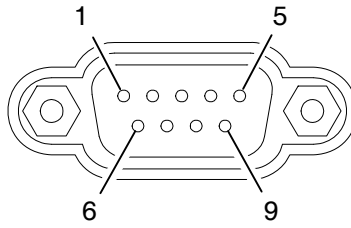
B-5. COMM BREAKOUT BOX - USB HOST CONNECTOR PIN-OUT TABLE



PIN NO.	SIGNAL NAME
1	GND
2	VBUS_DN1
3	H_D-
4	H-D+

Table B-7. Comm Breakout Box - USB HOST Connector Pin-Out Table

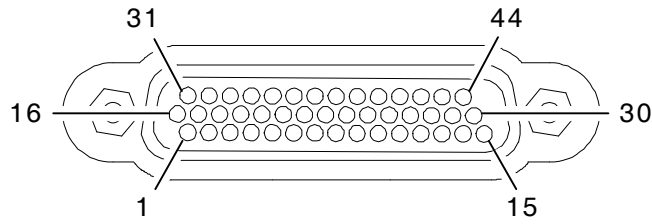
B-6. COMM BREAKOUT BOX - RS-232 CONNECTOR PIN-OUT TABLE



PIN NO.	SIGNAL NAME
1	NOT USED
2	TX
3	RX
4	NOT USED
5	GND
6	NOT USED
7	$\overline{\text{CTS}}$
8	$\overline{\text{RTS}}$
9	NOT USED

Table B-8. Comm Breakout Box - RS-232 Connector Pin-Out Table

B-7. COMM BREAKOUT BOX - REMOTE CONNECTOR PIN-OUT TABLE



PIN NO.	SIGNALNAME	PIN NO.	SIGNALNAME
1	VBUS_DN1	23	GND
2	GND_DN1	24	CF_ETD+
3	+5 Vdc	25	GND
4	J-TAGSENSE	26	PPC_CTS
5	GND	27	PPC_TXD
6	CF0RTS	28	REM_IN2
7	GND	29	REM_OUT2
8	CF_ERX-	30	REM_OUT4
9	CF_ETD-	31	VBUS_DN1
10	GND	32	GND_DN1
11	PPC_RTS	33	+5 Vdc
12	PPC_RXD	34	J-TAGSENSE
13	REM_IN4	35	GND
14	REM_IN3	36	CF0RX
15	REM_OUT3	37	GND
16	H_D-	38	CF_ERX+
17	H_D+	39	GND
18	TNS	40	REM_IN1
19	TCK	41	REM_OUT1
20	GND	42	TDO
21	CF0TX	43	TDI
22	CF0CTS	44	GND

Table B-9. Comm Breakout Box - REMOTE Connector Pin-Out Table

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APPENDIX C - TEST 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
Universal Counter	Agilent 53131A or Equivalent
Frequency Counter	
Power Meter	Agilent N1911A or Equivalent
Power Meter Sensor	Agilent E4412A or Equivalent
Function Generator	HP 3325B or Equivalent
Comm Breakout Box	Aeroflex (64598) (7005-6242-900)
Broadband Resistive Power Splitter	Weinschel 93459 Model 1870A
TNC to N Adapter	PE 9446
TNC to N Adapter	Amphenol RF Division 79825 Adapter
TNC (M) to TNC (M) Adapter	PE 9443
Crossover Ethernet Cable	
TNC to BNC Cable	
RF Signal Generator	HP 8648C or Equivalent
RF Power Amplifier (50 W)	
Power Splitter (2-Way, Resistive)	
Directional Coupler	Narda 3020A or Equivalent
100 MHz Low-Pass Filter	
300 MHz Low-Pass Filter	
700 MHz Low-Pass Filter	
1200 MHz Low-Pass Filter	
50 Ω Termination	
10 dB Attenuator (10 W)	
Stub Tuner	Murray Microwave 1778E or 1778EQ
Short-Open-Load VSWR Calibrator	Aeroflex (38245) (2901-0000-054)

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APPENDIX D - ABBREVIATIONS

A		H	
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		I	
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
C		K	
C	Celsius or Centigrade		
CAL	Calibrate/Calibration	kHz	Kilohertz (10 ³ Hertz)
CAL'D	Calibrated		
CFM	Coldfire Firmware		
Config	Configure/Configuration		
CPLD	Complex Processing Logic Device		
CW	Continuous Wave		
D		L	
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		
E		M	
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 ⁶ Hertz)
ESC	Escape	MIC	Microphone
		MIN, min	Minimum or Minutes
		MOD	Modulation
		mm	Millimeter (10 ⁻³ Meters)
F		N	
FH	Frequency Hop	NORM	Normal or Normalize
Fgen	Function Generator		
FM	Frequency Modulation		
FPGA	Field Programmable Gate Array		
FREQ	Frequency		
G		O	
Gen	Generate	OUT	Output
GHz	Gigahertz (10 ⁹ Hertz)	Ovr	Overload
H		P	
		para	Paragraph
		PC	Printed Circuit
		PCB	Printed Circuit Board
		PPC	PowerPC
		ppm	Parts per Million
		PTT	Push to Talk
		Pwr	Power
I		R	
		REC	Receive
		RF	Radio Frequency
		RSSI	Received Signal Strength Indication
		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

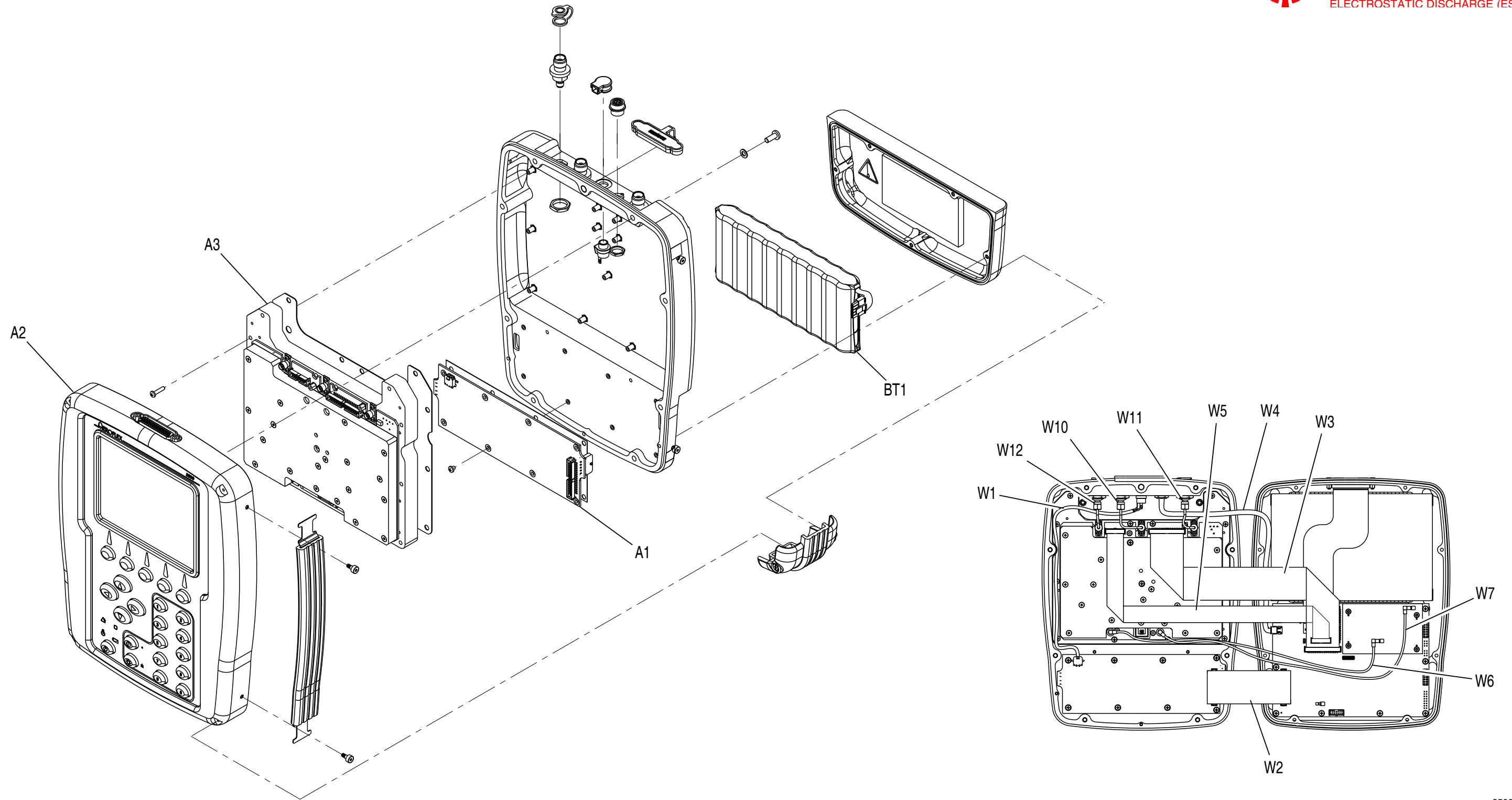
APPENDIX E - ASSEMBLY DRAWINGS / SCHEMATICS

ASSEMBLY	PAGE
62A1 3500	(72427)..... E-3
Interconnect Diagram (3500)	(0000-6240-000) E-4
62A1 3500A	(72433)..... E-5
Interconnect Diagram (3500A)	(0000-6244-300) E-6
62A1A1 Power Supply PCB Assy (3500) (3500A)	(66001) (7010-6231-000) E-7
62A1A2 Chassis Assy (3500)	(64591) (7005-6240-100) E-8
62A1A2 Chassis Assy (3500A)	(64603) (7005-6244-400) E-9
62A1A2A1 Keypad PCB Assy (3500)	(65999) (7010-6230-700) E-10
62A1A2A1 Keypad PCB Assy (3500A)	(66010) (7010-6233-700) E-10
62A1A2A2 RF Digitizer PCB Assy (3500) (3500A)	(66002) (7010-6231-100) E-11
62A1A2A3 Multi-Function PCB Assy (3500)	(65995) (7010-6230-300) E-12
62A1A2A3 Multi-Function PCB Assy (3500A)	(66007) (7010-6233-200) E-12
62A1A2A3 Multi-Function PCB Assy (3500A)	(66017) (7010-6235-600) E-12
62A1A2A4 LCD Assy (3500) (3500A)	(67364) (7110-5600-000) E-13
62A1A2A4 LCD Assy (3500A)	(67376) (7110-6200-400) E-13
62A1A2A5 Keypad Assy (3500)	(67373) (7110-6200-100) E-14
62A1A2A5 Keypad Assy (3500A)	(67375) (7110-6200-300) E-14
62A1A2A6 Flex Assy (3500) (3500A)	(67377) (7110-6231-300) E-15
62A1A2A7 Audio I/O PCB Assy (3500A Only)	(66008) (7010-6233-500) E-16
62A1A3 RF Assy (3500) (3500A)	(64597) (7005-6242-700) E-17
62A1A3 RF Assy (3500A)	(64601) (7005-6243-600) E-17

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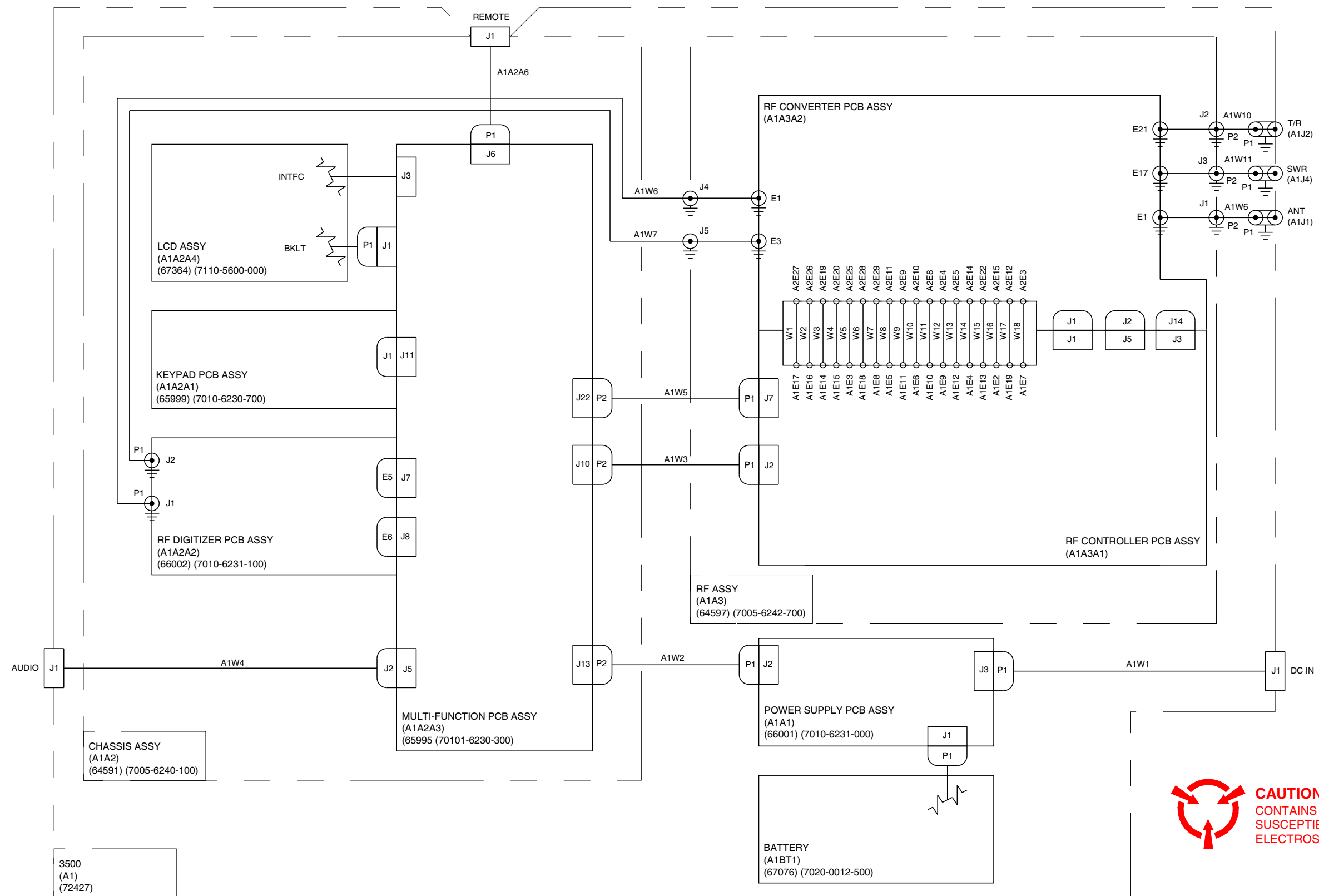
CAUTION:
CONTAINS PARTS AND ASSEMBLIES
SUSCEPTIBLE TO DAMAGE BY
ELECTROSTATIC DISCHARGE (ESD).



3500

3500-21

Figure E-1. 3500 / 3500A (Sheet 1 of 4)
(72427) (62A1)



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

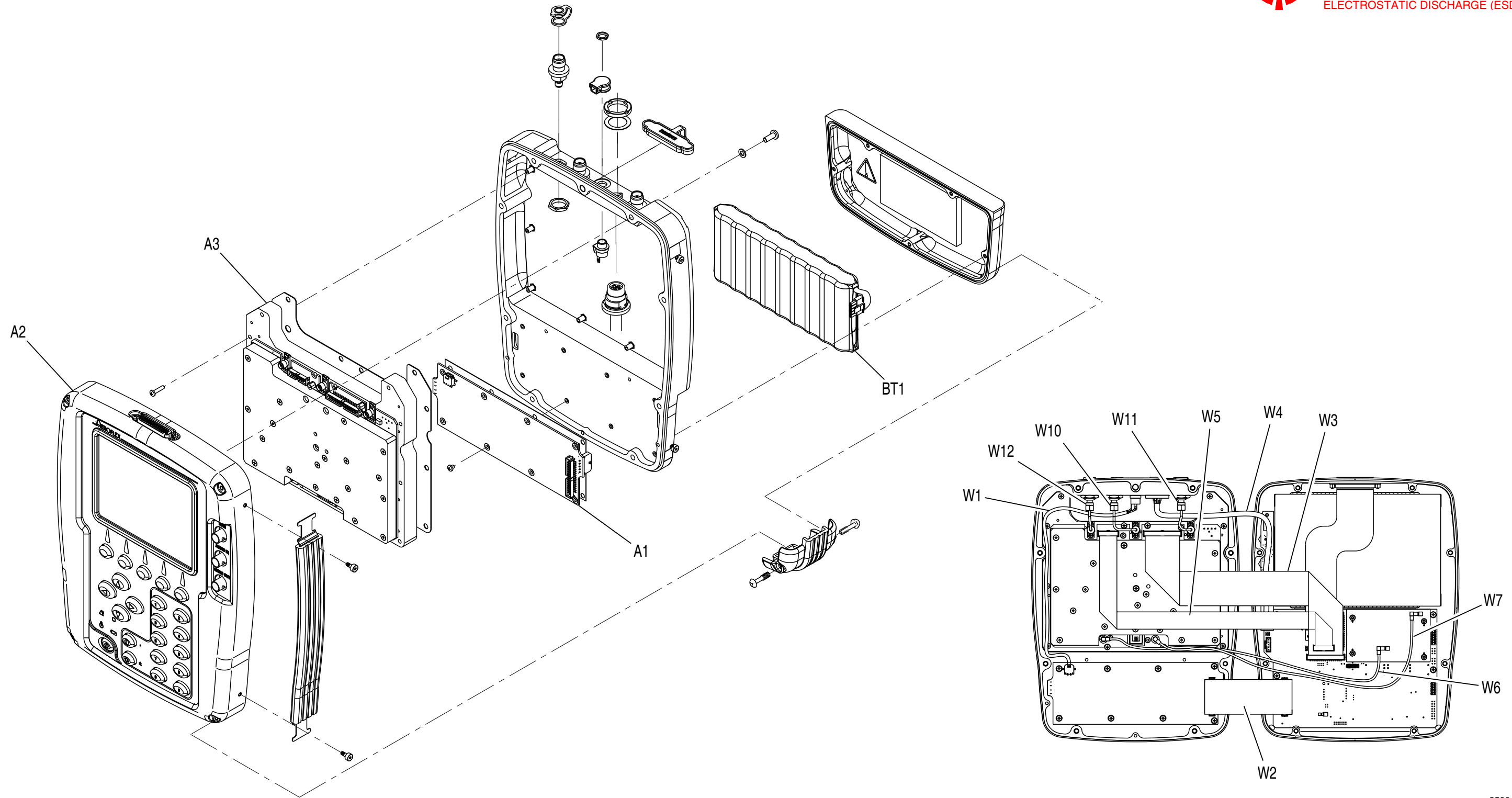
3500

3500-NT

Figure E-1. 3500 / 3500A (Sheet 2 of 4)
(72427) (62A1)
(0000-6240-000)



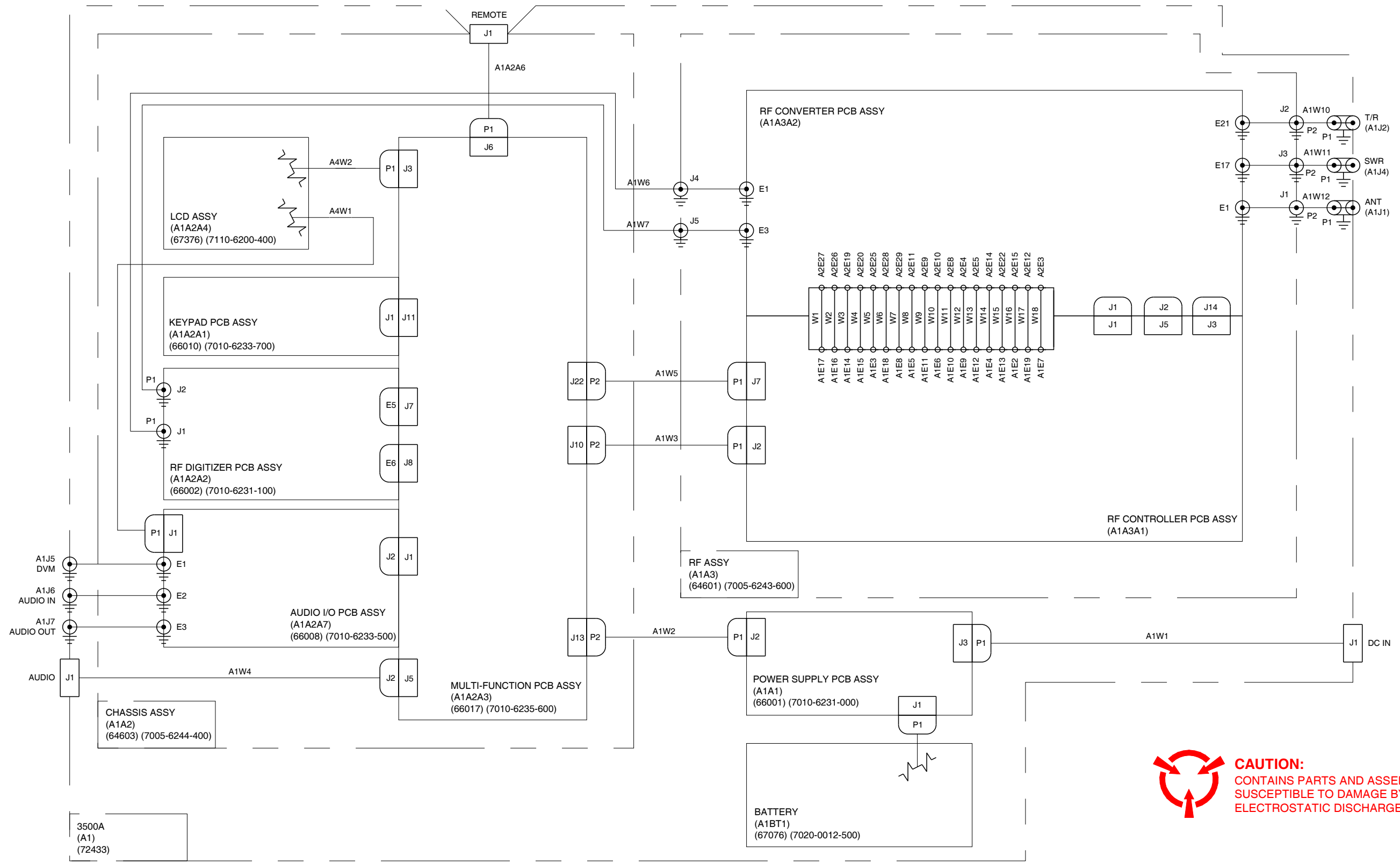
CAUTION:
CONTAINS PARTS AND ASSEMBLIES
SUSCEPTIBLE TO DAMAGE BY
ELECTROSTATIC DISCHARGE (ESD).



3500A

3500-21

Figure E-1. 3500 / 3500A (Sheet 3 of 4)
(72433-A1) (62A1)



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

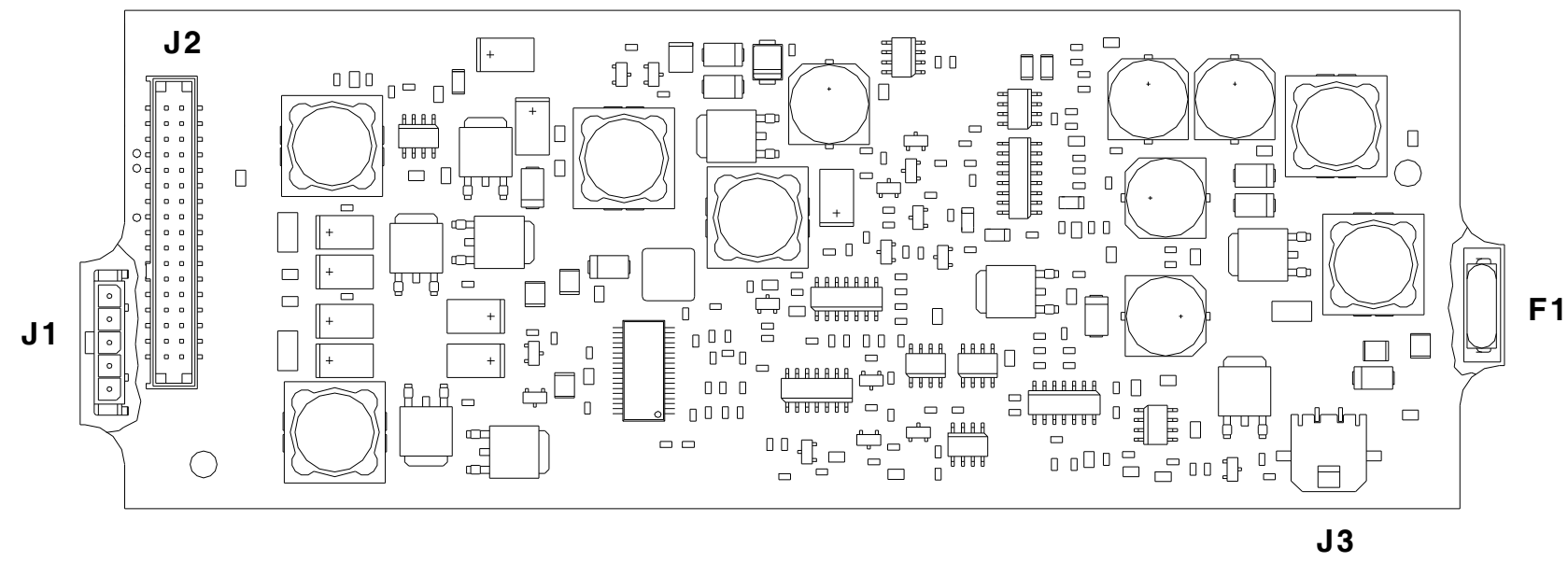
3500A

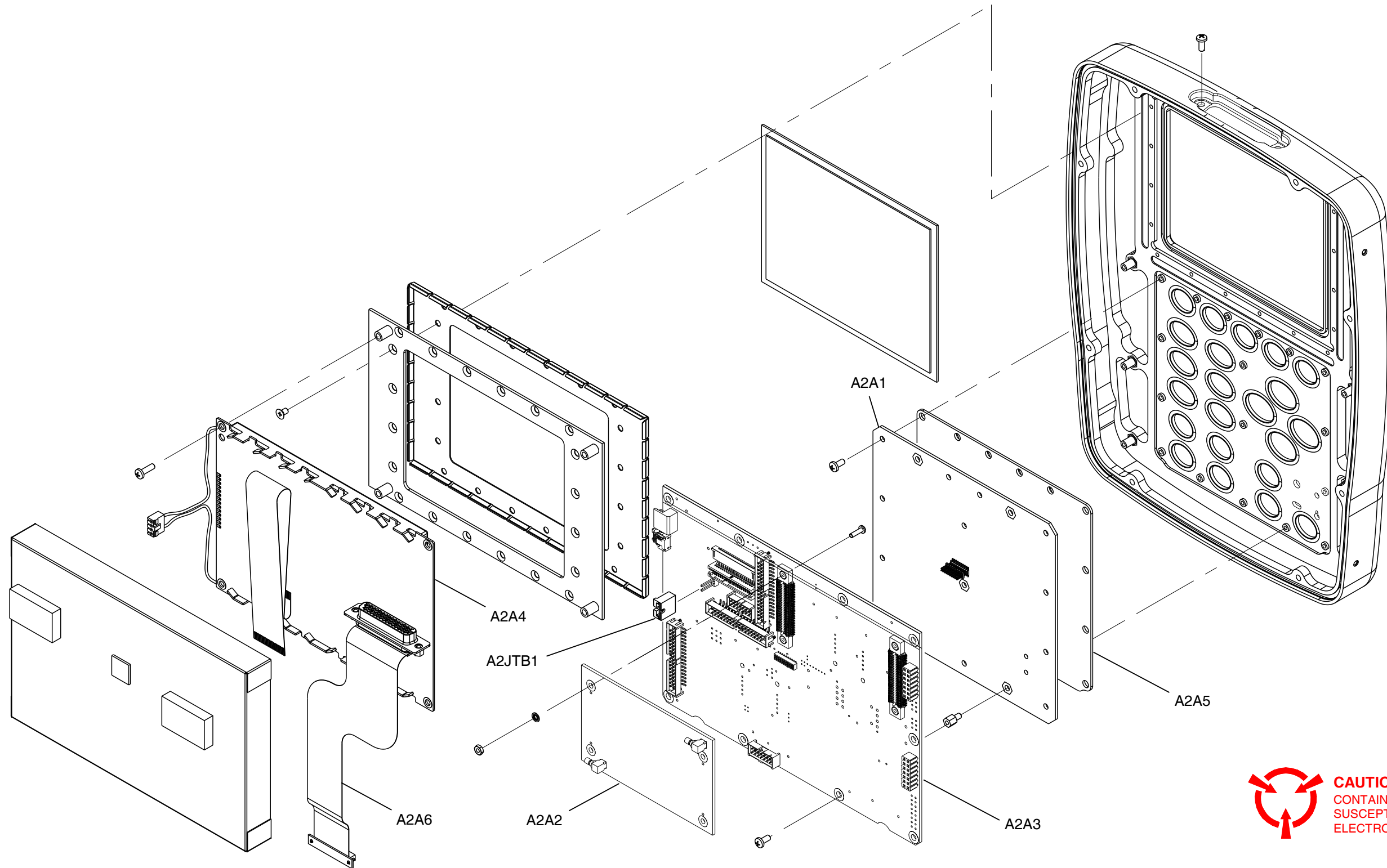
3500A-NT

Figure E-1. 3500 / 3500A (Sheet 4 of 4)
(72433-A1) (62A1)
(0000-6244-300)



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





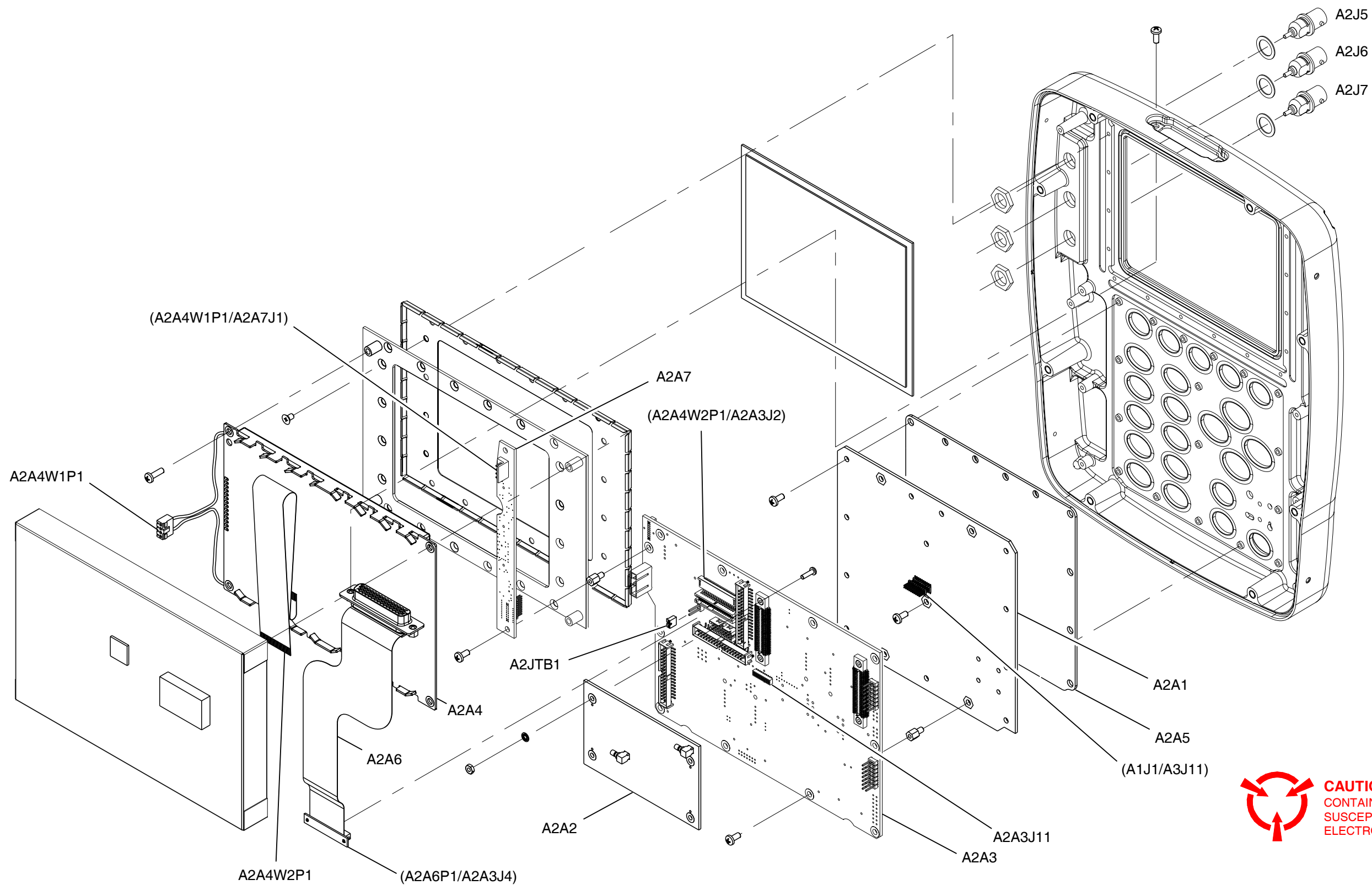
3500



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

3500-31

Figure E-3. Chassis Assy (Sheet 1 of 2)
(64591) (7005-6240-100) (62A1A2)



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

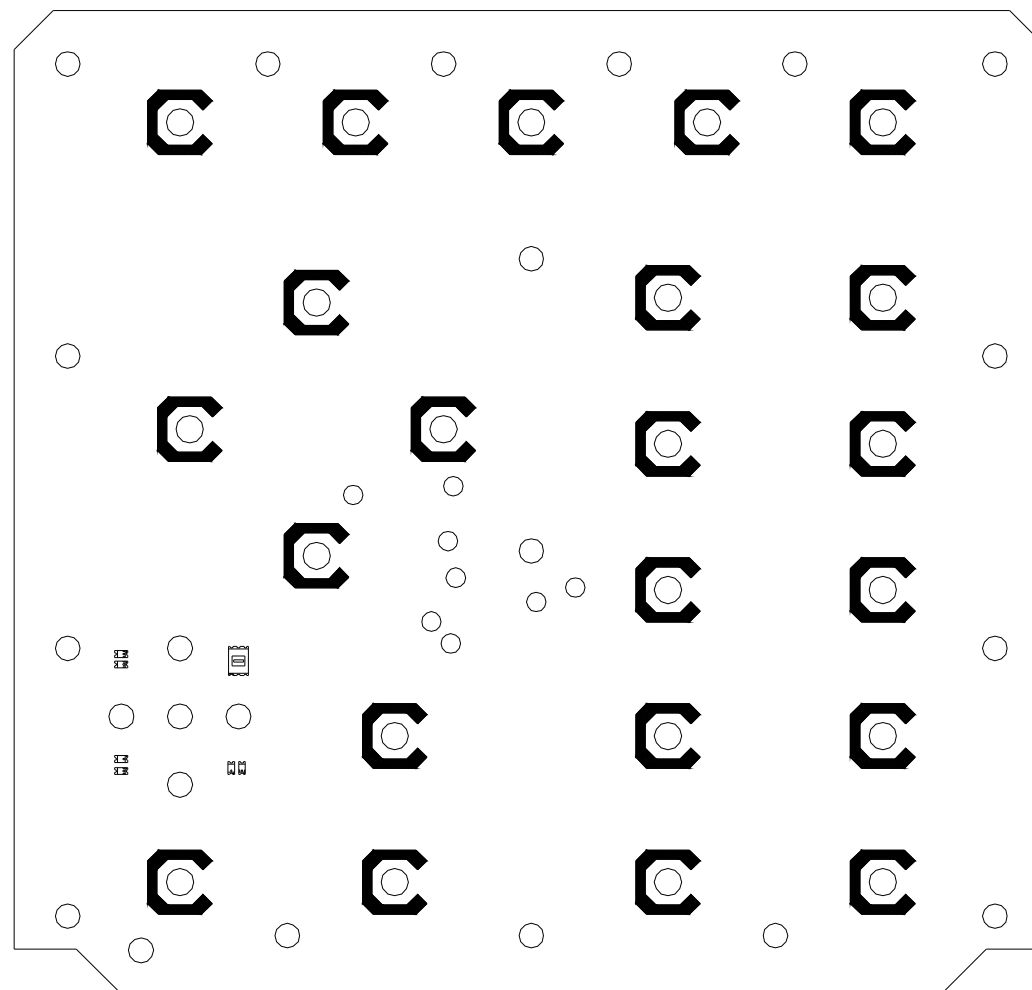
3500A-31

3500A

Figure E-3. Chassis Assy (Sheet 2 of 2)
(64603-A1) (7005-6244-400) (62A1A2)

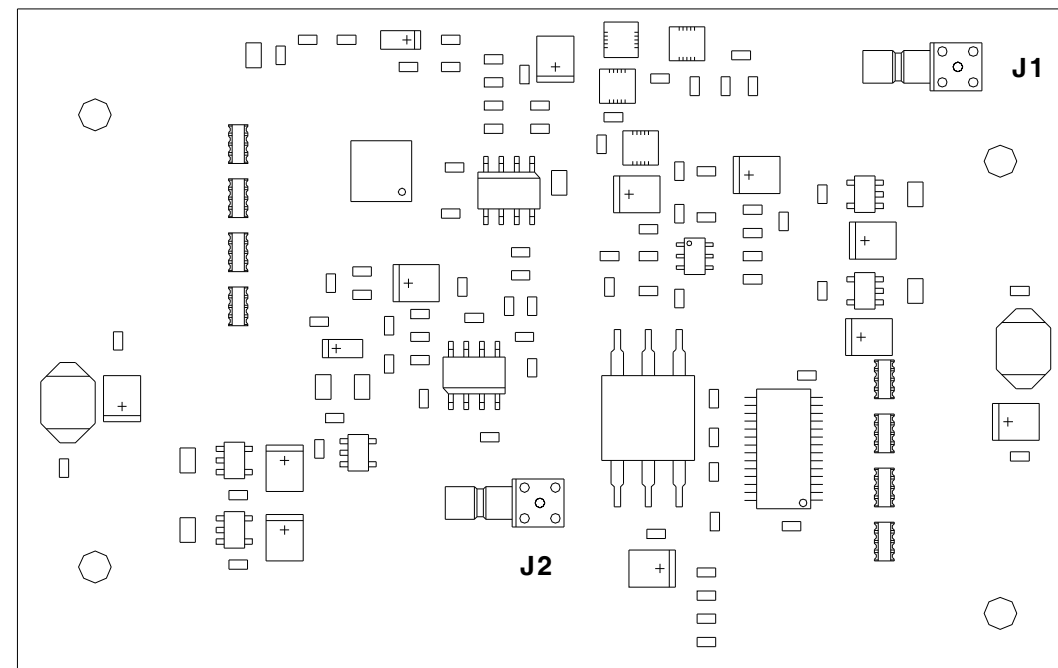


CAUTION:
CONTAINS PARTS AND ASSEMBLIES
SUSCEPTIBLE TO DAMAGE BY
ELECTROSTATIC DISCHARGE (ESD).



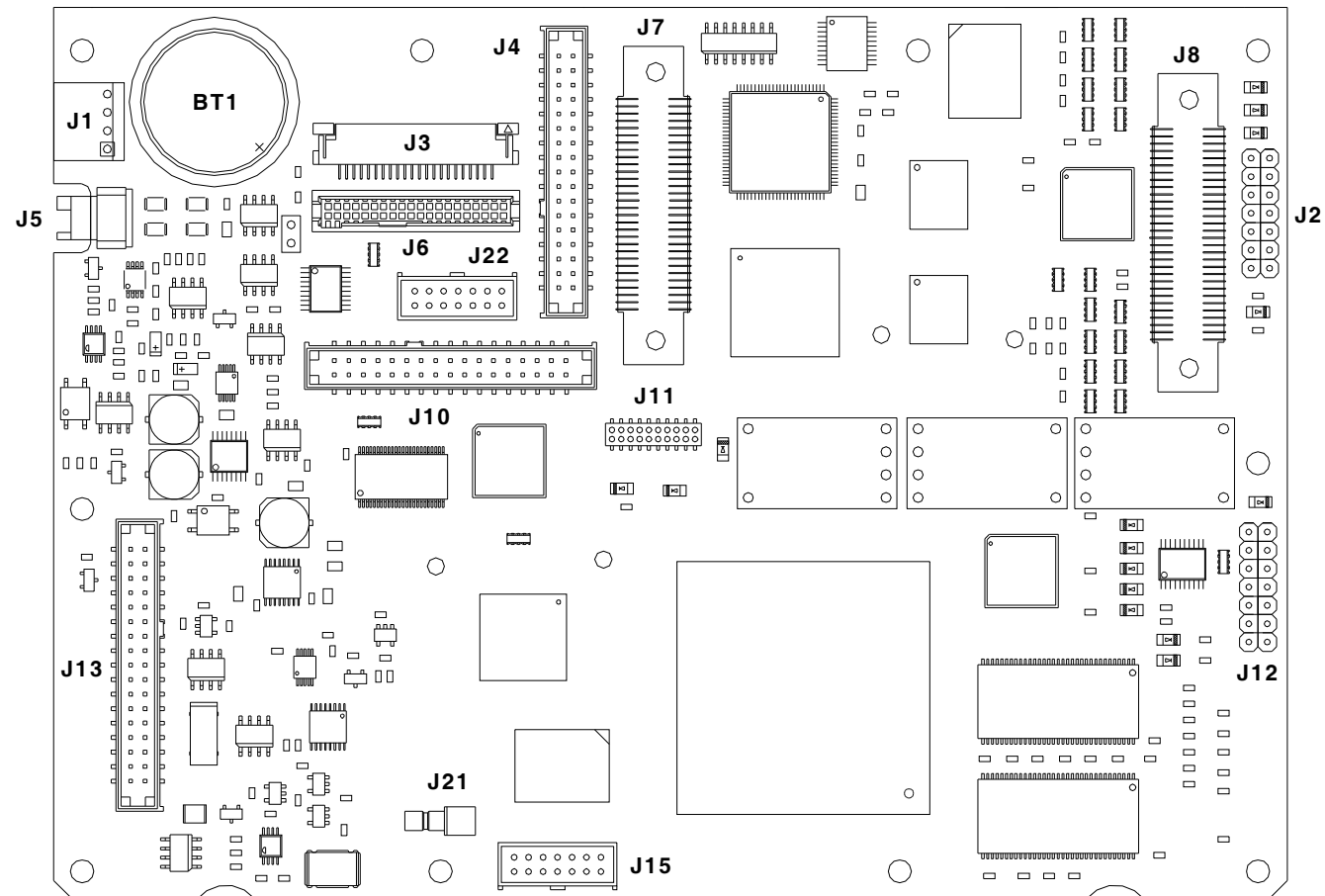


CAUTION:
CONTAINS PARTS AND ASSEMBLIES
SUSCEPTIBLE TO DAMAGE BY
ELECTROSTATIC DISCHARGE (ESD).

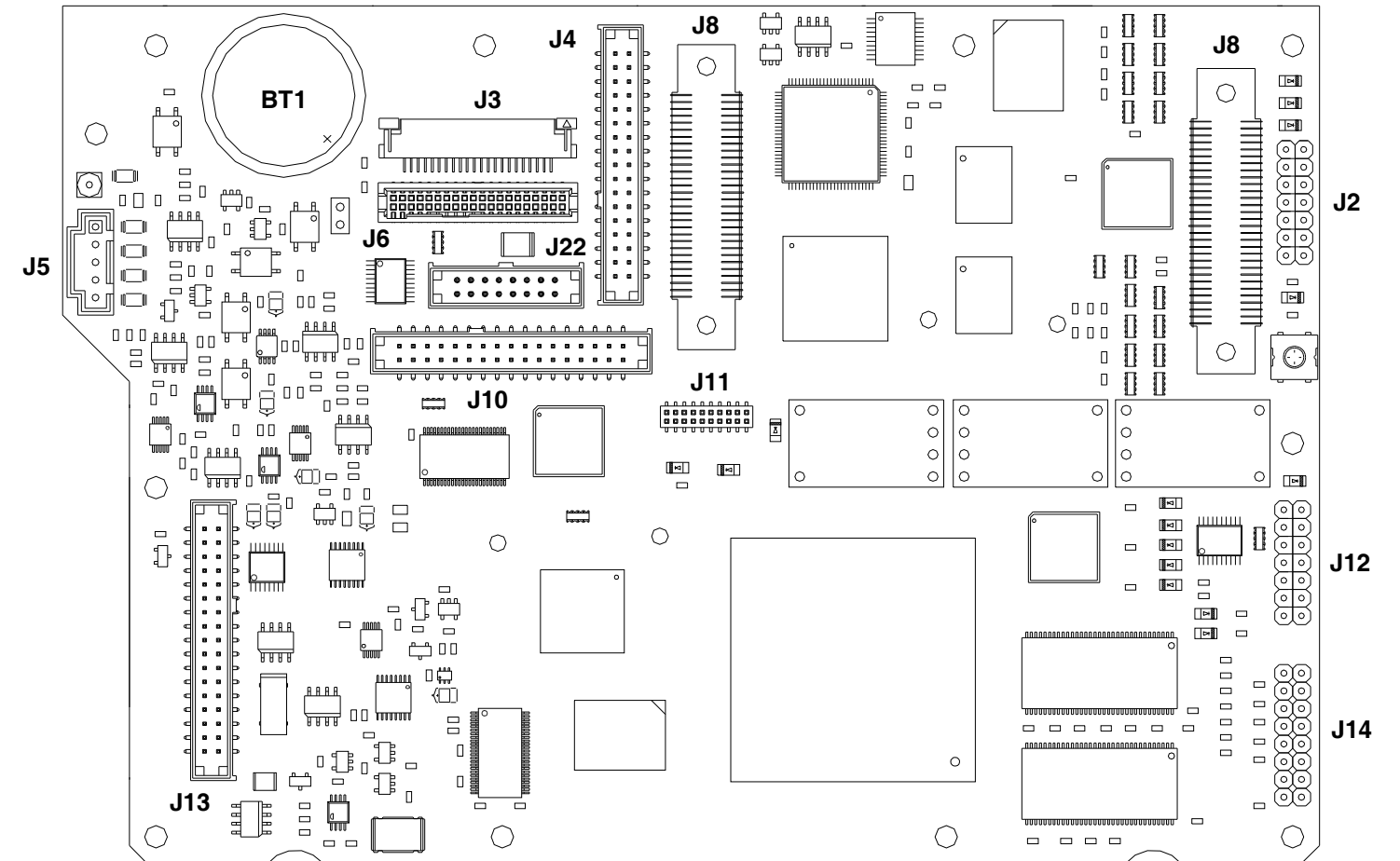




CAUTION:
CONTAINS PARTS AND ASSEMBLIES
SUSCEPTIBLE TO DAMAGE BY
ELECTROSTATIC DISCHARGE (ESD).



3500



3500A

Figure E-6. Multi-Function PCB Assy
(6AA1A2A3)
(65995-A2) (7010-6230-300) (3500)
(66007-A0) (7010-6233-200) (3500A)
(66017-A4) (7010-6235-600) (3500A)



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

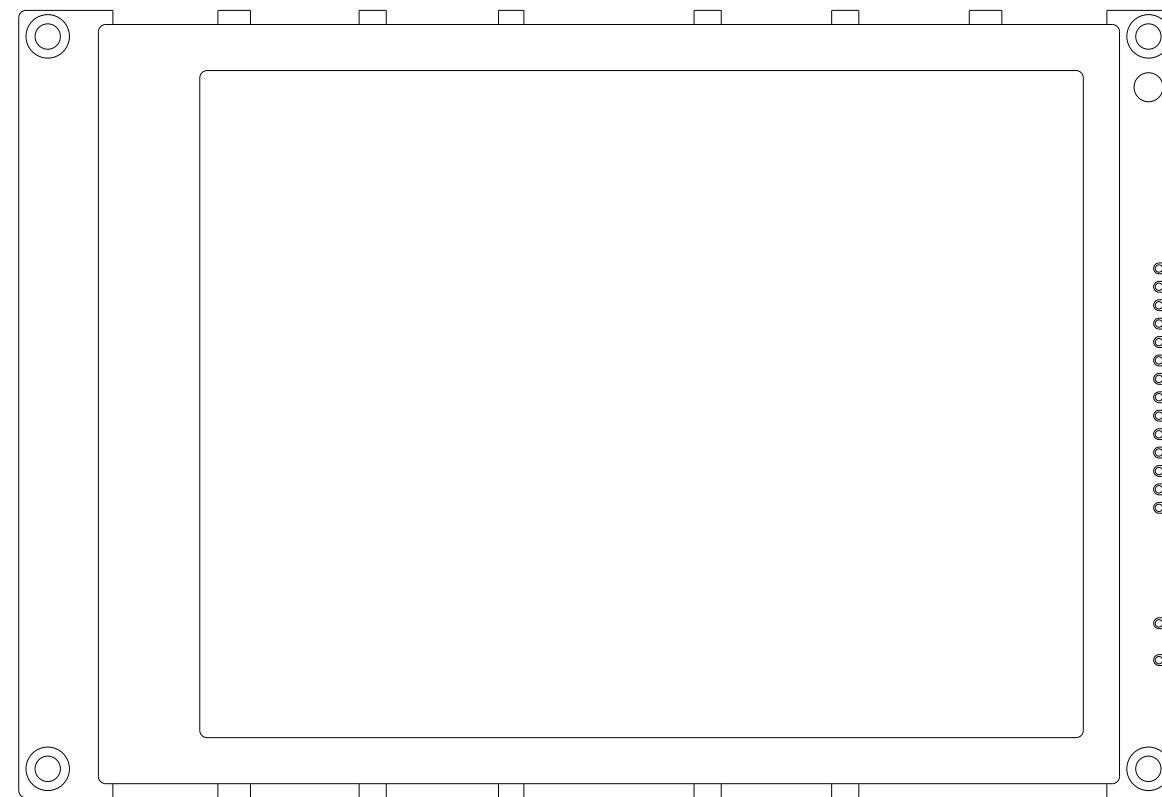


Figure E-7. 62A1A2A4 LCD Assy
(62A1A2A4)
(67364) (7110-5600-000) (3500) (3500A)
(67376) (7110-6200-400) (3500A)

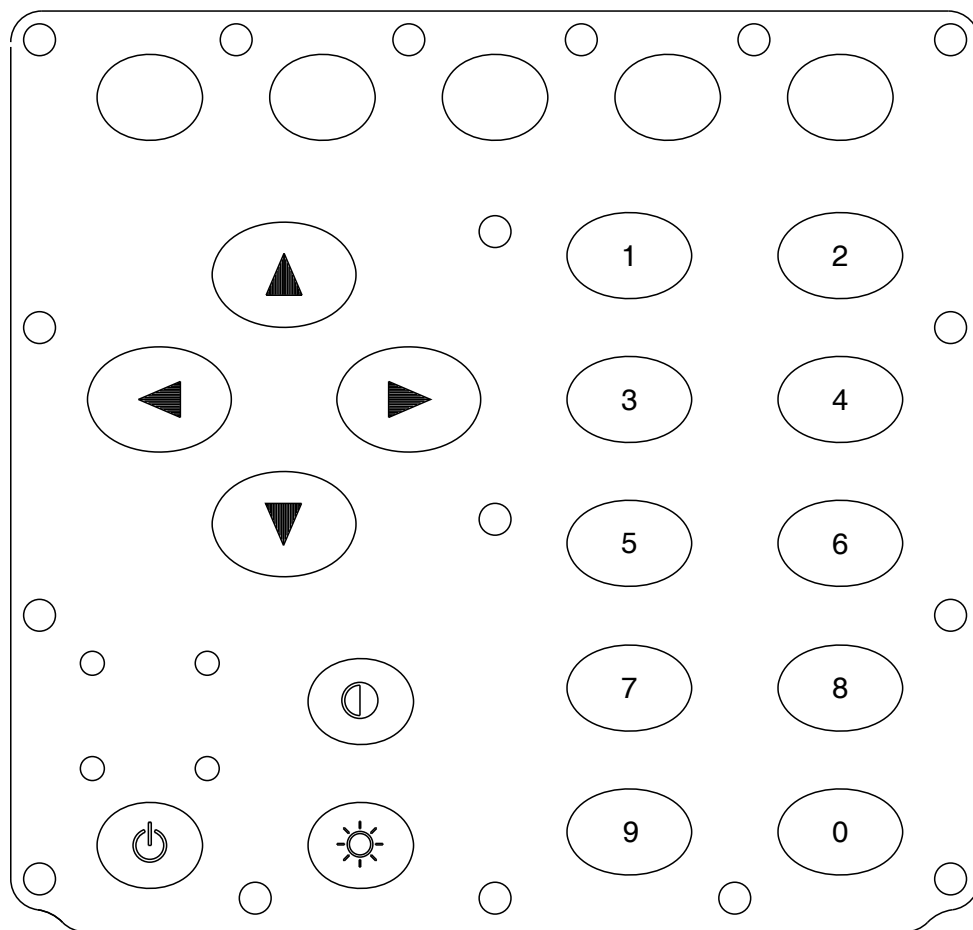

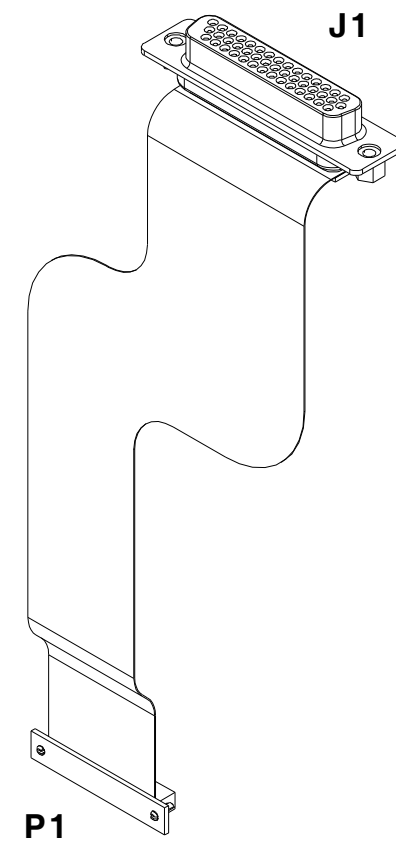


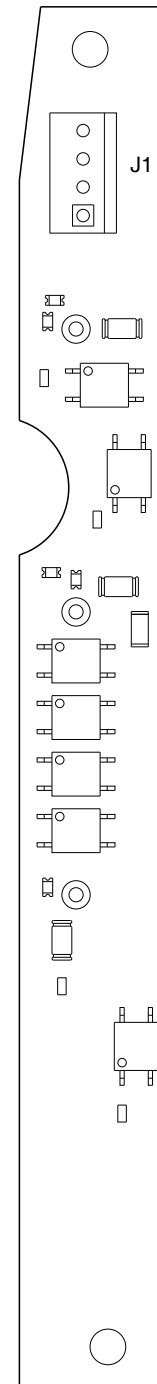
Figure E-8. Keypad Assy
(62A1A2A5)
(67373) (7110-6200-100) (3500)
(67375) (7110-6200-300) (3500A)

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

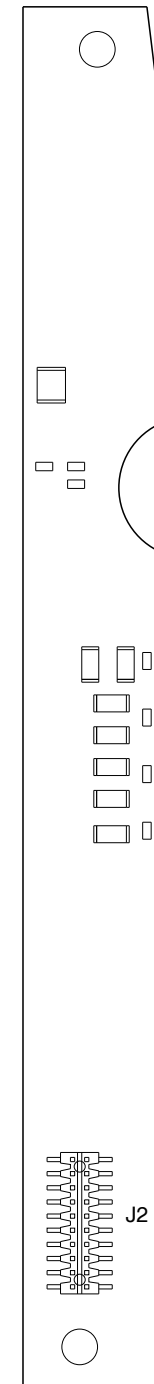




CAUTION:
CONTAINS PARTS AND ASSEMBLIES
SUSCEPTIBLE TO DAMAGE BY
ELECTROSTATIC DISCHARGE (ESD).



(TOP VIEW)



(BOTTOM VIEW)



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

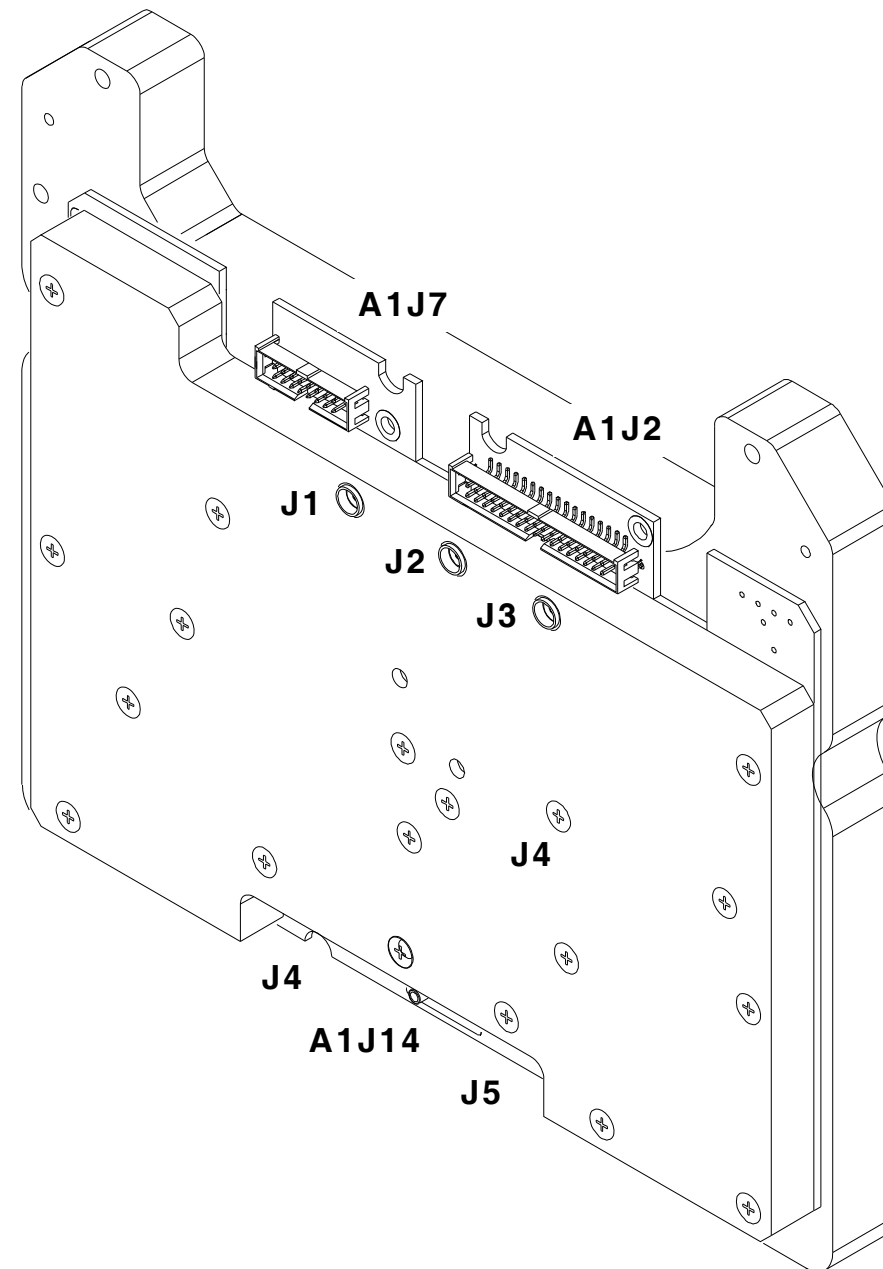


Figure E-10. RF Assy
(62A1A3)
(64597) (7005-6242-700) (3500) (3500A)
(64601-A0) (7005-6243-600) (3500A)

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P	
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3500 / 3500A	A-11, A12
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Power Supply PCB Assy (62A1A1)	1-3
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RF Digitizer PCB Assy (62A1A2A2)	1-7
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Our passion for performance is defined by three attributes represented by these three icons: solution-minded, performance-driven, customer-focused.