



# 3900 Series

## Digital Radio Test Set

### Getting Started Manual

Issue-4

**EXPORT CONTROL WARNING:** This document contains controlled technology or technical data under the jurisdiction of the Export Administration Regulations (EAR), 15 CFR 730-774. It cannot be transferred to any foreign third party without the specific prior approval of the U.S. Department of Commerce Bureau of Industry and Security (BIS). Violations of these regulations are punishable by fine, imprisonment, or both.

# GETTING STARTED MANUAL

## 3900 SERIES

### RADIO TEST SET

PUBLISHED By  
Aeroflex

COPYRIGHT © Aeroflex 2013

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without the prior permission of the publisher.

Reissued	Jan 2010
Issue-2	Nov 2010
Issue-3	Mar 2013
Issue-4	Sep 2013

10200 West York Street/ Wichita, Kansas 67215 U.S.A. / (316) 522-4981 / FAX (316) 524-2623

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

---

This manual contains essential information relating to initial use of the unit.

Aeroflex recommends the operator become familiar with the Operation Manual contained on the accompanying CD-ROM.

The 3901, 3902, 3920 and 3920B Digital Radio Test Set is the official nomenclature for the test sets currently included in the 3900 Digital Radio Test Set Series. In this manual, 3900, unit or Test Set, refers to the 3901, 3902, 3920 and 3920B Digital Radio Test Sets unless otherwise indicated.

## **Standard Hardware Warranty**

THIS WARRANTY APPLIES ONLY TO PRODUCTS MANUFACTURED AT THE WICHITA, STEVENAGE AND KANSAS CITY LOCATIONS.

Aeroflex warrants, under customary use and service, the hardware product to be free from defects in material and workmanship for a period of ONE (1), TWO (2) or THREE (3) YEARS from the shipping date, depending on product. In addition, battery packs and external optional equipment has a 90-day warranty. This period shall be referred to as "The Standard Limited Warranty Period".

Aeroflex's obligation under this warranty is limited to replacing or repairing, at Aeroflex's option, free of charge except for certain freight charges as described herein, any defective part or parts of the instrument. If the instrument is found not to be defective in material or workmanship, or in the event the warranty claim is invalid because of failure to comply with the provisions herein, Aeroflex shall notify the customer and shall only repair or replace the instrument parts at customer's direction and expense.

The warranty does not apply to any instrument that has been subject to misuse, alteration, negligence, accident, shipping damage, improper installation, or improper operation, or that in any way has been tampered with or repaired by any person other than an authorized Aeroflex service organization or any employee thereof, or to any instrument whose serial number has been altered, defaced or removed. Annual certified calibration is not included in the warranty.

Aeroflex shall not be liable for any delay or failure to repair or furnish a replacement part, including but not limited to, delays resulting directly or indirectly from any governmental restriction, priority, or allocation, or any other governmental regulatory order or action, nor shall Aeroflex be liable for damages (direct, indirect, or consequential) by reason of the failure of the instrument to perform properly.

Aeroflex performed repairs shall be warranted from defective material and workmanship for NINETY (90) DAYS or until the end of the Standard Limited Warranty Period whichever is longer. Risk of loss or damage to Product returned to Aeroflex for repair or replacement shall be borne by customer until delivery to Aeroflex. Upon delivery of such product, Aeroflex shall assume the risk of loss or damage until such time as the product being repaired or replaced is returned and delivered to customer. Customer shall pay all transportation costs for equipment or software shipped to Aeroflex for repair or replacement. Aeroflex shall pay all transportation costs associated with returning repaired or replaced product to customer.

This warranty shall, at Aeroflex's option, become void if the equipment ownership is transferred, unless the prior owner or the proposed owner obtains approval from Aeroflex of continuation of the warranty prior to the transfer of ownership.

**THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE NOT SET FORTH IN WRITING SIGNED BY AN AUTHORIZED REPRESENTATIVE OF ATS.**

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

---

**Standard Software Warranty**

THIS WARRANTY APPLIES ONLY TO PRODUCTS MANUFACTURED AT THE WICHITA, STEVENAGE AND KANSAS CITY LOCATIONS.

ATS warrants that Software Products licensed to Customer shall, under normal use and service, and for a period of ninety (90) days from the date of shipment of the Software to Licensee (the "Standard Limited Warranty Period"), perform in all material respects in accordance with the published specifications for such Software as established by ATS. However, ATS does not warrant that the Software will operate uninterrupted or error free, operate in the combination with other software, meet Customer's requirements, or that its use will be uninterrupted.

**THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE NOT SET FORTH IN WRITING SIGNED BY AN AUTHORIZED REPRESENTATIVE OF ATS.**

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

---

Dear Customer,

Thank you for purchasing this test instrument. Aeroflex takes pride in the products that it manufactures. In designing instruments with leading edge technology, and building instruments using state of the art manufacturing processes, Aeroflex aims to build a reliable, robust, functional and 'fit for purpose' test instrument.

If, for some reason, your test instrument does not reach you in perfect working order, or you have any questions about your test instrument, please do not hesitate to contact the sales office where you originally purchased your instrument, or contact one of our Aeroflex Regional Support Centers using the contact information below:

<b>Americas:</b>	
<b>Tel:</b>	[+1] 800-835-2350 Toll Free (US Only)
	[+1] (316)-529-5511
<b>Fax:</b>	866-325-1180 Toll Free (US Only)
	[+1] (316) 529-5330
americas.service@aeroflex.com	

<b>EMEA:</b>	
<b>Tel:</b>	[+44] (0) 8706 080134
<b>Fax:</b>	[+44] (1438) 772203
emea.service@aeroflex.com	

<b>APAC:</b>	
<b>Tel:</b>	[+65] 6873 0991
<b>Fax:</b>	[+65] 6873 0992
apac.service@aeroflex.com	

Aeroflex also offers extended warranty contracts, which enable you to lock in maintenance cost savings when you purchase a new instrument. If you did not take this option at the time of your initial sale, Aeroflex is pleased to extend the same offer for 90 days from the date of your product delivery. For information about extended warranty options and pricing, contact the sales office where you originally purchased your instrument, or contact one of our Aeroflex Regional Support Centers using the contact information above.

If you decide not to participate in one of our extended warranty programs and the manufacturer's warranty has expired, Aeroflex offers a number of additional support options. These support programs are designed for maintenance cost predictability and cost containment in easy to use convenient packages. For more in depth information on any Aeroflex support package, please contact 1-800-835-2350, or (316)-529-5511, contact us via [americas.service@aeroflex.com](mailto:americas.service@aeroflex.com), or visit our web site at [www.aeroflex.com](http://www.aeroflex.com).

Thank You,

The Aeroflex Customer Support Team

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

---

This page intentionally left blank.

# Safety Precautions

## Safety First - To All Operations Personnel

### General Conditions of Use

This product is designed and tested to comply with the requirements of IEC/EN61010-1 'Safety requirements for electrical equipment for measurement, control and laboratory use' for Class I portable equipment and is for use in a pollution degree 2 environment. The equipment is designed to operate from installation supply Category II.

Equipment should be protected from all liquids such as spills, leaks, etc. and precipitation such as rain, snow, etc. When moving the equipment from a cold to a hot environment, it is important to allow the temperature of the equipment to stabilize before it is connected to the supply to avoid condensation forming. The equipment must only be operated within the environmental conditions specified in the performance data.

**Refer all servicing of unit to Qualified Technical Personnel. This unit contains no operator serviceable parts.**

#### **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 may result in electrical shock or equipment damage. Do not operate this Test Set with 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 or servicing this equipment.

#### **CAUTION**

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

#### **WARNING**

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

### Equipment Grounding Protection

Improper grounding of equipment can result in electrical shock.



### Safety / Hazard 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.)



Indicates a Toxic hazard. Some of the components used in this equipment include resins and other materials which give off toxic fumes if incinerated. Take appropriate precautions in the disposal of these items.



Indicates item is static sensitive.



**AC TERMINAL:** May supply or be supplied with AC or alternating voltage.



### Use of Probes

Check the 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 be in good working condition. Do not use frayed, broken or exposed 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.

### Internal Battery

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

### EMI

#### CAUTION

SIGNAL GENERATORS CAN BE A SOURCE OF ELECTROMAGNETIC INTERFERENCE (EMI) TO COMMUNICATION RECEIVERS. SOME TRANSMITTED SIGNALS CAN CAUSE DISRUPTION AND INTERFERENCE TO COMMUNICATION SERVICE OUT TO A DISTANCE OF SEVERAL MILES. USERS SHOULD EXAMINE ANY OPERATION THAT RESULTS IN RADIATION OF A SIGNAL (DIRECTLY OR INDIRECTLY) AND SHOULD TAKE NECESSARY PRECAUTIONS TO AVOID POTENTIAL COMMUNICATION INTERFERENCE PROBLEMS.

### Fire Hazard

#### WARNING

MAKE SURE THAT ONLY FUSES OF THE CORRECT RATING AND TYPE ARE USED FOR REPLACEMENT. IF AN INTEGRALLY FUSED PLUG IS USED ON THE SUPPLY LEAD, ENSURE THAT THE FUSE RATING IS COMMENSURATE WITH THE CURRENT REQUIREMENTS OF THIS EQUIPMENT.

### Electrical Hazards (AC supply voltage)

#### WARNING

THIS EQUIPMENT CONTAINS A PROTECTIVE GROUNDING LEAD THAT CONFORMS TO IEC SAFETY CLASS I. TO MAINTAIN THIS PROTECTION THE SUPPLY LEAD MUST ALWAYS BE CONNECTED TO THE SOURCE OF SUPPLY VIA A SOCKET WITH A GROUNDED CONTACT.

THE SUPPLY FILTER CONTAINS CAPACITORS THAT MAY REMAIN CHARGED AFTER THE EQUIPMENT IS DISCONNECTED FROM THE SUPPLY. ALTHOUGH THE STORED ENERGY IS WITHIN THE APPROVED SAFETY REQUIREMENTS, A SLIGHT SHOCK MAY BE FELT IF THE PLUG PINS ARE TOUCHED IMMEDIATELY AFTER REMOVAL.

### Fuses

#### NOTE

The internal supply fuse is in series with the live conductor of the supply lead. If connection is made to a 2-pin un-polarized supply socket, the fuse may become transposed to the neutral conductor. If this occurs equipment components could remain at supply potential even after the fuse has ruptured.

### Beryllia

#### WARNING

BERYLLIA (BERYLLIUM OXIDE) IS USED IN THE CONSTRUCTION OF SOME OF THE COMPONENTS IN THIS UNIT. USE CARE WHEN REMOVING AND DISPOSING OF THESE COMPONENTS. DO NOT PUT THEM IN THE GENERAL INDUSTRIAL OR DOMESTIC WASTE. THEY SHOULD BE SEPARATELY AND SECURELY PACKED AND CLEARLY IDENTIFIED TO SHOW THE NATURE OF THE HAZARD AND THEN DISPOSED OF IN A SAFE MANNER BY AN AUTHORIZED TOXIC WASTE CONTRACTOR.



#### Beryllium Copper

##### **WARNING**

SOME MECHANICAL COMPONENTS WITHIN THIS INSTRUMENT ARE MANUFACTURED FROM BERYLLIUM COPPER. THIS IS AN ALLOY WITH A BERYLLIUM CONTENT OF APPROXIMATELY 5%. IT REPRESENTS NO RISK IN NORMAL USE.

THE MATERIAL SHOULD NOT BE MACHINED, WELDED OR SUBJECTED TO ANY PROCESS WHERE HEAT IS INVOLVED. IT MUST BE DISPOSED OF AS "SPECIAL WASTE." IT MUST NOT BE DISPOSED OF BY INCINERATION.



#### Lithium

##### **WARNING**

LITHIUM IS A TOXIC SUBSTANCE. A LITHIUM BATTERY IS USED IN THIS EQUIPMENT. THE BATTERY SHOULD IN NO CIRCUMSTANCES BE CRUSHED, INCINERATED OR DISPOSED OF IN NORMAL WASTE. DO NOT ATTEMPT TO RECHARGE THIS TYPE OF BATTERY. DO NOT SHORT CIRCUIT OR FORCE DISCHARGE SINCE THIS MIGHT CAUSE THE BATTERY TO VENT, OVERHEAT OR EXPLODE.

#### Tilt

##### **WARNING**

DO NOT STACK OTHER INSTRUMENTS ON TEST SET WHEN THE INSTRUMENT IS IN THE TILT POSITION.

#### Input Overload

##### **CAUTION**

ON THE RF N-TYPE CONNECTOR, THE INPUT POWER SHOULD NOT EXCEED 125 W (+51 DBM). ON THE RF TNC CONNECTOR, THE INPUT POWER SHOULD NOT EXCEED 10 MW (+10 DBM).



#### Static Sensitive Components

##### **CAUTION**

THIS EQUIPMENT CONTAINS STATIC SENSITIVE COMPONENTS WHICH MAY BE DAMAGED BY HANDLING. DO NOT REMOVE INSTRUMENT COVERS AS THIS MAY RESULT IN DAMAGE TO THE TEST SET. THERE ARE NO USER-SERVICEABLE PARTS INSIDE.

### Suitability for Use

#### CAUTION

THIS EQUIPMENT HAS BEEN DESIGNED AND MANUFACTURED BY AEROFLEX TO GENERATE, RECEIVE AND ANALYZE RF/AUDIO SIGNALS. IF THE EQUIPMENT IS NOT USED IN A MANNER SPECIFIED BY AEROFLEX, THE PROTECTION PROVIDED BY THE EQUIPMENT MAY BE IMPAIRED.  
AEROFLEX HAS NO CONTROL OVER THE USE OF THIS EQUIPMENT AND CANNOT BE HELD RESPONSIBLE FOR EVENTS ARISING FROM ITS USE OTHER THAN FOR ITS INTENDED PURPOSE.

---

Subject to Export Control, see Cover Page for details.

**Table of Contents**

**Service Upon Receipt of Material . . . . . 7**

**Installation . . . . . 9**

**Specifications . . . . . 10**

**External Cleaning . . . . . 11**

**Controls, Connectors and Indicators . . . . . 12**

**Operation . . . . . 19**

**Display Layout. . . . . 22**

**Fuse Replacement . . . . . 25**

## Service Upon Receipt of Material

### Unpacking

Special design packing material inside this shipping carton provide maximum protection for the 3900 Radio Test Set. Avoid damaging ship carton and packing material when unpacking equipment; if necessary it can be reused to ship Test Set.

#### CAUTION

TO PREVENT PERSONAL INJURY OR DAMAGE TO THE TEST SET,  
AEROFLEX RECOMMENDS TWO PEOPLE UNPACK THE TEST SET.

Use the following steps to unpack the 3900:

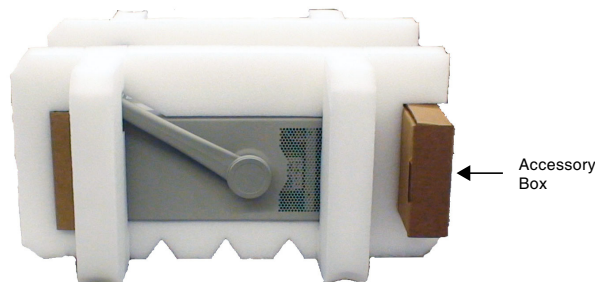
STEP	PROCEDURE
------	-----------

---

1. Cut and remove sealing tape on top of the carton. Open shipping container.



2. Grasp Test Set firmly while restraining the shipping container. Lift the equipment and packing material vertically out of the shipping container.
3. Place Test Set and packing material on a flat, clean and dry surface.
4. Remove Accessory Box from foam inserts.



5. Remove foam inserts from the Test Set.
6. Store packing materials (foam inserts and cardboard insert) inside shipping container. Store shipping container and materials for possible future use.

Subject to Export Control, see Cover Page for details.

---

### Checking Unpacked Equipment

Inspect equipment for possible damage incurred during shipment. If the Test Set has been damaged, report the damage to Aeroflex Customer Service. Review packing slip to verify shipment is complete. Packing slip identifies the following standard items as well as purchased options. Report all discrepancies to Aeroflex.

#### Contact:

##### **Aeroflex Customer Service**

10200 West York Street

Wichita, Kansas 67215

**Telephone:** 800-835-2350

**Fax:** 316-529-5330

**email:** [americas.service@aeroflex.com](mailto:americas.service@aeroflex.com)

### Standard Items

Description	Part Number	QTY
Ship Unit (see Model Name)	Model Specific	1
3901	72411	
3902	72410	
3920	72412	
3920B	91164	
3900 Series Operation Manual (CD-ROM)	6047	1
3900 Series Getting Started Manual	6050	1
RTS Accessory Kit	63929	1
390X Power Cords Kit	63933	1
Coaxial Cable Kit	65175	1

### Cord Configuration

- 27477: Cord configuration for use in the UK.
- 27478: Cord configuration for use in North America.
- 27480: Cord configuration for use in Continental Europe
- 27516: 3-Wire (grounded) power cord

---

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

---

## Installation

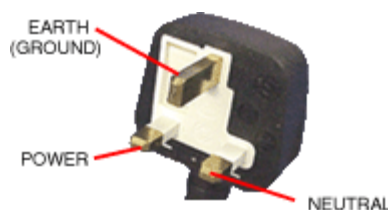
### General

The 3900 Radio Test Set is a Safety Class 1 instrument that must be grounded before use. The power cord supplied with the test set, or an appropriate replacement, should be used to connect the Test Set to a grounded AC supply outlet. Ensure that the power cord is properly connected to the AC Power Connector on the rear panel of the Test Set prior to connecting unit to AC supply outlet.

#### Class I Power Cords (3-core)

To connect the test set to a Class II (ungrounded) 2 terminal socket outlet, fit the power cord with either a 3 pin Class I plug used in conjunction with an adapter incorporating a ground wire, or fit it with a Class II plug containing an integral ground wire. The ground wire must be securely fastened to ground; grounding one terminal on a 2 terminal socket does not provide adequate protection.

A 3-wire (grounded) power cord containing a molded IEC 320 connector is included with the 3900. The cable must be fitted with an approved plug which, when plugged into an appropriate 3 terminal socket outlet, grounds the case of the test set. Failure to ground the test set or using a damaged power cord may expose the operator to hazardous voltage levels.



United Kingdom



North America

### Ventilation

The 3900 is force air-cooled by three fans that draw air through vents in the sides of the case. Do not obstruct the air vents while the instrument is in use. Avoid standing the instrument on or close to other equipment that is hot.



## Specifications

Tested in accordance with MIL-PRF-28800F Class 3.

### Power Requirements

#### AC Voltage

100 V to 120 VAC @ 60 Hz

220 V to 240 VAC @ 50 Hz

#### Power Consumption

Nominally 120 W (200 W Max)

#### Mains Supply Voltage Fluctuations

10% of the nominal voltage

#### Fuse Requirements

3 A, 250 V, Type F

### Environmental

#### Operating Temperature

0 to 50°C

#### Warm-up Time

15 minutes<sup>1</sup>

#### Storage Temperature

-40 to 71°C

#### Relative Humidity

80% up to 31°C decreasingly linearly to 50%  
at 40°C

Altitude

4,000 m (13,123 ft)

#### Shock and Vibrations

30 G Shock (Functional Shock)

5-500 Hz random vibrations

#### Use

Pollution Degree 2

#### EMC

EN 61326

### Dimensions and Weight

Height: 19.7 cm (7.75 in)

Width: 35.6 cm (14.0 in)

Depth: 52.0 cm (20.5 in)

Weight: 16.5 kg (36.8 lbs)

---

Subject to Export Control, see Cover Page for details.

## External Cleaning

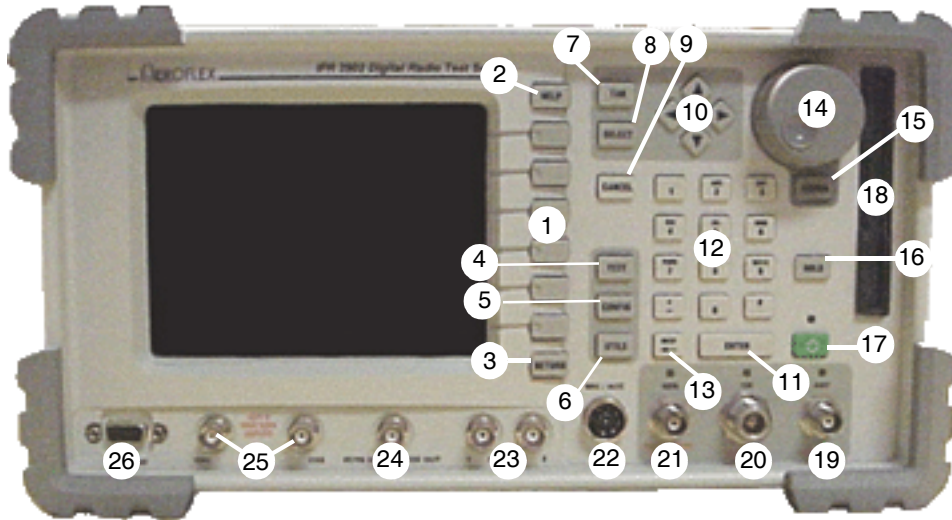
The following procedure contains routine instructions for cleaning the outside of the Test Set.

<b>CAUTION</b>	<b>DISCONNECT POWER FROM TEST SET TO AVOID POSSIBLE DAMAGE TO ELECTRONIC CIRCUITS.</b>
----------------	--

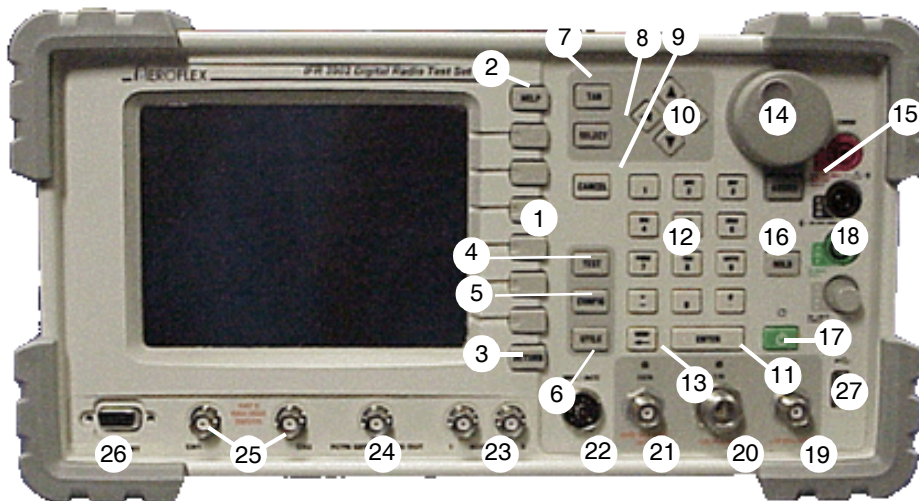
STEP	PROCEDURE
1.	Clean front panel buttons and display face with soft lint-free cloth. If dirt is difficult to remove, dampen cloth with water and a mild liquid detergent.
2.	Remove grease, fungus and ground-in dirt from surfaces with soft lint-free cloth dampened (not soaked) with isopropyl alcohol.
3.	Remove dust and dirt from connectors with soft-bristled brush.
4.	Cover connectors, not in use, with suitable dust cover to prevent tarnishing of connector contacts.
5.	Clean cables with soft lint-free cloth.
6.	Paint exposed metal surface to avoid corrosion.

## Controls, Connectors and Indicators

### Front Panel Control and Connectors



3901/3902 Front Panel Connectors



3920/3920B Front Panel Connectors

Numerical references are indicated in parenthesis (nn).

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

### **Soft Keys (1)**

The 3900 contains six soft keys that are active when a label is displayed on the screen to the left of the soft key. The text on the label identifies the key, the outline and background color provide information about the purpose, state and type of action the key initiates.

### **HELP Key (2)**

Accesses operational description for Test Set fields and functions.

### **RETURN Key (3)**

Returns the soft key menu back one level from a soft key sub-menu. Each press of the RETURN Key moves back through one level.

### **TEST Key (4)**

Selects the TEST function. When the TEST function is selected, pressing the TEST Key displays the TEST floating menu.

### **CONFIG Key (5)**

Selects the CONFIG (Configuration) function of the current operating system which provides access to configuration settings for the currently selected system.

### **UTILS Key (6)**

This key selects the UTILS (Utilities) function. When the UTILS (Utilities) function is selected, pressing the UTILS Key displays the Utilities floating menu. The UTILS (Utilities) function provides access to general Test Set features which are not system specific.

### **TAB Key (7)**

When the TEST function is selected and the display Tiles are minimized, each press of the TAB Key sequentially moves the focus to a different Tile.

When the TEST function is selected and one of the display Tiles is maximized, pressing the TAB Key displays a menu listing the Tiles currently active on the minimized display. Selecting from the menu displays the requested Tile in maximized view.

### **SELECT Key (8)**

When a menu item is highlighted pressing SELECT activates that item. When a settings box is highlighted pressing SELECT selects the box for editing, indicated by a gold background.

When a toggle or option button is selected, pressing SELECT changes the state of the button.

### **CANCEL Key (9)**

When Data Input Keys are used to select a Numeric Entry Box or Text Entry Box for editing this key cancels any changes that have been made and restores the original setting as long as the ENTER Key or the RETURN Key has not been pressed. CANCEL does not restore a value to a previous setting if the setting has been changed using the Cursor Keys or Rotary Control Knob.

While a menu is displayed, pressing CANCEL closes the menu without activating the highlighted menu item.

### **Cursor Keys (10)**

The Test Set contains four directional cursor keys that are used to navigate display screens.

### **ENTER Key (11)**

Enables the values that have been entered using the Data Input Keys. New values are not effective until this key or the SELECT Key has been pressed. The background on a selected Numeric Input Box or Text Entry Box remains gold while the box is in the edit state.

### Data Input Keys (12)

#### Numeric/Alphabetic Keys

Data Input Keys enter numeric values or text into a selected data entry box.

#### Signage Keys

- (minus)
- . (decimal point)
- \* (star/asterik)
- # (hash)

### BKSP (BACKSPACE) Key (13)

When a numeric entry box or a text box is selected for editing, this key deletes the character or digit to the left of the position indicator.

### Rotary Control Knob (14)

The Rotary Control Knob can be used to used to navigate between fields of a selected Tile, select data from drop-down menus, edit numerical content in data fields and to adjust various Test Set settings.

### ASSIGN Key (15)

Functions such as loudspeaker volume, squelch level and display brightness are adjusted by assigning the functions to the Rotary Control Knob. Pressing the ASSIGN Key displays soft keys for functions applicable to the current operating system. Pressing one of these soft key assigns the associated function to the Rotary Control Knob.

### Display HOLD Key (16)

The Hold Key freezes the display to allow the user to capture and save the current screen display. Refer to the section titled Display Hold Tile for use of this feature.

### On/Standby Key (17)

The Power Supply On/Standby Key is referred to as the On/Standby Key. This key is used to power down the Test Set to retain current settings. This key is active when the associated LED is illuminated. If the LED is not illuminated, the Test Set is in an OFF condition.

### 3.5 inch Floppy Disk Drive (18) (3901/3902)

The 3.5 inch floppy disk drive provides an interface to the Test Set for downloading data, settings and captured display files. The Floppy Disk Drive is only available on the 3901 and 3902.

### Digital Multimeter (18) (3920)

The DMM (Digital Multimeter) provides users with the ability to perform resistance measurements and AC and DC current and voltage measurements.

The Digital Multimeter (DMM) Option (390XOPT035) is available on the 3920. The 3901 and 3902 Test Sets may be upgraded to this option.

### RF Input and Output Connectors

The routing of signals within the Test Set to and from the RF input and output connectors is controlled from the selected Test System. There is an LED above each connector that indicates when a connector has been selected; the LED does not indicate when the connector is ON.

#### Audible and Visual Overload Warning

If the RF Signal applied to the ANT Connector exceeds the safe maximum level, an audible and visual warning is triggered. The overload warning is also triggered if excessive reverse power is applied to the GEN Connector. The Overload Warning is reset on the User Calibration Tile and Operations/Status Tile.

#### CAUTION

IF THE AUDIBLE WARNING TRIGGERS, REDUCE POWER IMMEDIATELY. DO NOT POWER DOWN THE TEST SET AS THIS DOES NOT REMOVE THE OVERLOAD POWER FROM THE CONNECTION.

#### WARNING

DO NOT DISCONNECT THE RF CABLE FROM THE TEST SET AS THIS MAY CAUSE BURNS TO THE HANDS.

#### ANT (Antenna) Connector (19)

The RF analyzer input is a 50 ohm TNC input, providing maximum sensitivity input to the RF analyzer of the Test Set.

The rated maximum input level for the ANT Connector is +10 dBm.

#### T/R Connector (20)

The combined (Duplexed) RF Gen output and high power RF analyzer input is a 50 ohm N type connector which provides an RF Gen output connection and an RF analyzer input and broadband power meter connection. The RF Gen maximum output level and the RF analyzer sensitivity are lower than when using the separate GEN Connector and ANT Connector.

The rated maximum input power level for the T/R Connector is 125 W.

#### GEN (Generator) Connector (21)

The RF Gen output is a 50 ohm TNC output, providing the maximum RF output level from the RF Gen. The RF GEN Connector is reverse power protected to a level of +10 dBm.

#### MIC/ACC Connector (22)

This connector can be used to connect a microphone, headset, or speaker. The Connector accepts a PTT (Press To Talk) microphone for testing simplex trunked radios.

#### Audio 1 and 2 IN Connectors (23)

AUDIO IN 1 and 2 are the primary AF input and external modulation input connectors. The Connectors can be configured as high impedance or 600 ohm unbalanced.

AUDIO IN 1 and AUDIO IN 2 can be jointly configured as 600 ohm balanced for AF IN only, in which case AUDIO IN 2 is not available for EXT MOD. The MIC/ACC Connector can be used for EXT MOD IN if required.

#### FCTN GEN/DEMODO Connector (24)

##### (Function Generator and Demodulated Signal Output)

This connector is the primary AF GEN output. The connector can be configured as DEMOD OUT and can also be used for Demod Audio, Audio 1, Audio 2 or MIC.

#### Scope CH1/CH2 Connectors (25)

The Scope CH1 and CH2 connectors are the signal input connectors for the Oscilloscope. They provide a maximum input rating of 100 Vpp.

### Test Connector (26)

Reserved for future development.

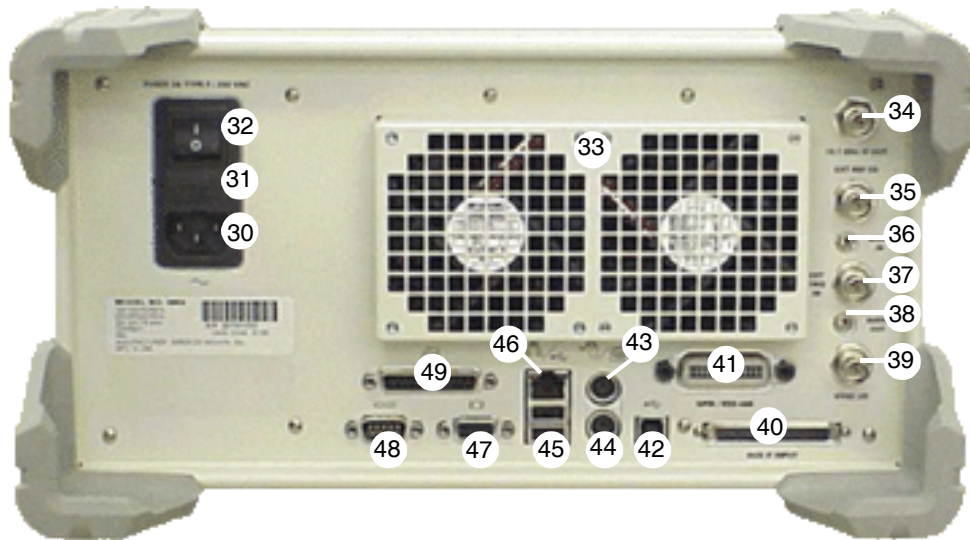
**CAUTION**

DO NOT CONNECT A VGA MONITOR TO THIS CONNECTOR.

### USB Connector (27)

This connector is a USB standard connection that allows connection of USB 1.1 devices (e.g. a USB memory stick or Network connectors). Recommended USB memory device is Aeroflex PN 67325. The Front Panel USB Connector is only found on the 3920 Test Set.

### Rear Panel Controls and Connectors



3900 Series Rear Panel Connectors

Numerical references are shown in parenthesis (nn).

#### **AC Power Connector (30)**

The AC Power Connector is the AC Power source for the Test Set. Connector accepts an IEC 320 connector.

#### **AC Power Fuse (31)**

A 3 amp, 250 volt, Type F, 20 mm cartridge fuse (F3AL250V) is included in the unit's supply current path to the power supply module. The AC Power Fuse is located in the Fuse Carrier located on the rear of the Test Set.

#### **AC Power Supply Switch (32)**

The AC Power Supply Switch disconnects the 3900 from the AC power supply. The AC Power Supply Switch should not be used for powering down the Test Set: the On/Standby Key should be used for routine powering down because it initiates the power-down procedure, ensuring all settings and test results are saved.

#### **Rear Cooling Outlets (33)**

Refer to the section titled Installation Requirements in Chapter 2 of the 3900 Series Operation Manual for information on proper ventilation.

#### **IF Output Signal Connector (34)**

The IF Output Signal is available at this BNC connector. The 10.7 MHz IF Output is the RF signal received and down-converted by the Test Set RF Analyzer. The output level is -10 dBm typical at 10.7 MHz (50 ohm nominal).

---

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

---



### **Ext Ref I/O External Interface (35)**

This is a BNC connection used to connect the Test Set to an external frequency standard, or to output the internal frequency standard from the Test Set to other equipment.

### **Audio Input Connector (36)**

The auxiliary I/O Audio Connector is internally connected and ready for future development. Do not make any external connection to this connector.

### **External Trigger Signal Input Connector (37)**

This is the Oscilloscope external trigger input, BNC connection. Input impedance 10 kOhm.

### **Audio Output Connector (38)**

This auxiliary I/O Audio Connector is internally connected and ready for future development. Do not make any external connection to this connector.

### **Synchronization Signal Input or Output Connector (39)**

This BNC connection is used with the TETRA Base Station Test System for base station receivers generating a sync output signal.

### **Auxiliary IF Input Connector (40)**

Reserved for future development.

### **GPIO/IEEE-488 Interface Connection (41)**

This connector is provided for interconnection to a GPIO/IEEE-488 interface bus.

### **Standard USB Client Connector (42)**

Reserved for future development.

### **PS/2 Mouse Interface Connector (43)**

PS/2 Mouse Interface Connector not currently supported. Only applies to 3901/3902.

### **Keyboard Interface Connector (44)**

Standard PS/2 connection for use of Standard PS/2 keyboard. Only applies to 3901/3902.

### **USB Connector (45)**

Double USB standard connection for use of USB 1.1 devices. Recommended USB memory device is Aeroflex PN 67325.

### **Ethernet Connector (46)**

Standard Base T RJ45 connection.

### **VGA Monitor Output Connector (47)**

This connector is a standard VGA style, 15 way, D-type connection that allows a VGA monitor or video projector to duplicate the Test Set's screen display.

### **RS-232 Serial Connector (48)**

Standard 9 way, D-type connection. Reserved for future development.

### **Parallel Printer Output Connector (49)**

This is a standard 25 way, D-type printer connection.

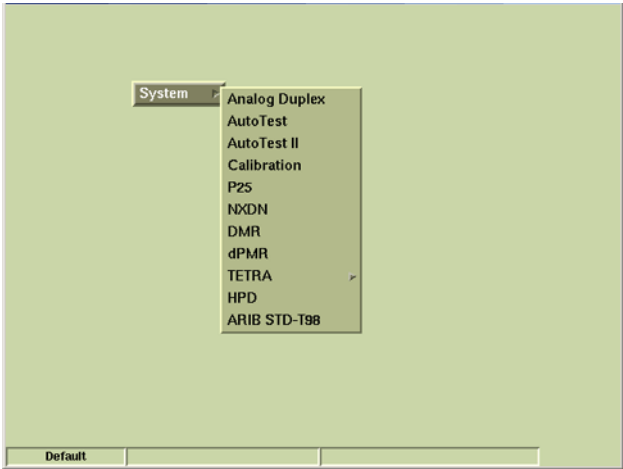
## Operation

### Powering On Test Set

Unless specifically mentioned, this refers to local operation of a 3900 configured with factory default settings. To power on the test set:

STEP	PROCEDURE
------	-----------

- |    |   |
|----|---|
| 1. | Complete Installation Instructions (refer to page 9).   |
| 2. | Connect the Test Set to the AC Power Supply.  |
| 3. | Turn the AC Power Switch on the rear panel to the ON position. The LED above the Supply (power) On/Standby Key on the front panel turns <b>RED</b> .  |
| 4. | Press the Supply (power) On/Standby Key to power on the Test Set.   |
| 5. | Verify no error messages appear on the display during power-up process. The Factory Default screen appears upon initial start-up; if the Test Set has been used the screen is displayed that was active when the Test Set was powered down. |



**NOTE**

System menu contents vary according to the options installed in the Test Set.

### Powering Down Test Set

The Test Set should always be powered down using the Supply (power) On/Standby Key on front panel. The Supply (power) On/Standby Key initiates a power-down sequence which stores all current settings and results in the Test Set's internal memory.

If the Test Set is to be left in an unused state for an extended period of time, power down the unit using the Supply (power) On/Standby Key on the front panel. After the unit has stored settings and is in the OFF state, switch the AC Power Switch on the rear panel to the OFF position. When the Test Set is next powered up it will be restored in the last saved settings state.

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

### Modes of Operation

The 3900 has three primary functional modes of operation: Test, Configuration and Utilities.

TEST mode provides access to the current operating system and measurement tiles.

CONFIG (Configuration) mode provides access to the Configuration menu and functions of the current operating System.

UTILS (Utilities) mode provides access to general Test Set functions. These functions are not specific to a particular system.

### Test Setups

The 3900 is suitable for performing radio system measurements on high performance equipment in research and development environments as well as in production and maintenance facilities. The Test Set supports one and two port duplex test configurations.

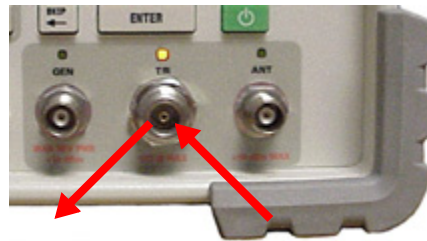
#### One Port Duplex

The One Port Duplex arrangement uses the T/R Connector for RF input and RF output.

This arrangement is typically used for testing mobile radios using a single direct connection to the unit under test.

This arrangement can also be used for over-the-air testing when only a single antenna is available, or for testing Base stations that use a combined Rx/Tx antenna system.

RF Out = T/R  
RF In = T/R



#### Two Port Duplex

##### GEN / ANT

Selecting the GEN Connector for RF Out and the ANT Connector for RF Input provides the highest level of RF Gen Output and the most sensitive RF Analyzer input.

The ANT Connector is typically used as the Input connector for “over-the-air” testing with separate antennas.

RF Out = GEN  
RF In = ANT



---

Subject to Export Control, see Cover Page for details.

### GEN / TR

Selecting the GEN Connector for RF Out and T/R Connector for RF Input provides the highest level of RF Gen Output and accepts the highest level of RF Analyzer Input.

The T/R Connector should be selected as the RF Input connector when connecting the Test Set directly to UUT via RF Cable.

RF Out = GEN  
RF In = T/R



### TR / ANT

Selecting the T/R Connector for RF Output and the ANT Connector for RF Input provides the lowest level of RF Gen output and the most sensitive RF Analyzer Input.

The ANT Connector is typically used as the Input connector for “over-the-air” testing.

RF Out = T/R  
RF In = ANT



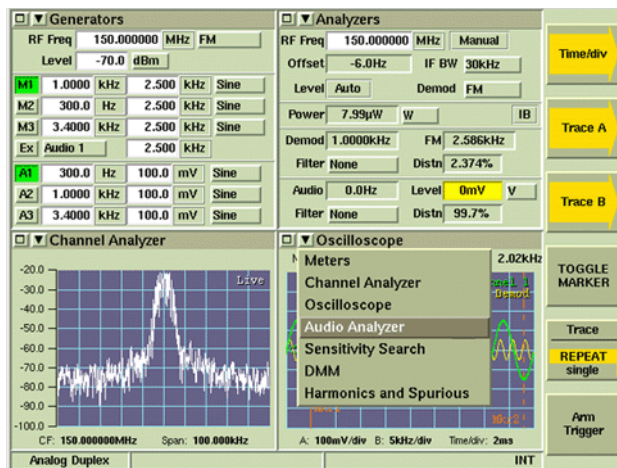
## Display Layout

### Display

Screen configuration is defined by the 3900 System currently selected. The screen appears as a single tile of fixed size, or a tile or group of tiles that can be minimized or maximized. The area on the right of the display shows any soft keys applicable to the active screen or tile.

### Configuring Tiles

Measurement tiles are selected from the drop-down menus on each tile. Selections are limited to the current operating system and tile location.



### Soft Keys

Soft keys are displayed on the right of the user screen. Soft key labels identify the key's function.

#### Action

Action keys initiate immediate actions when pressed.

#### Toggle Soft key

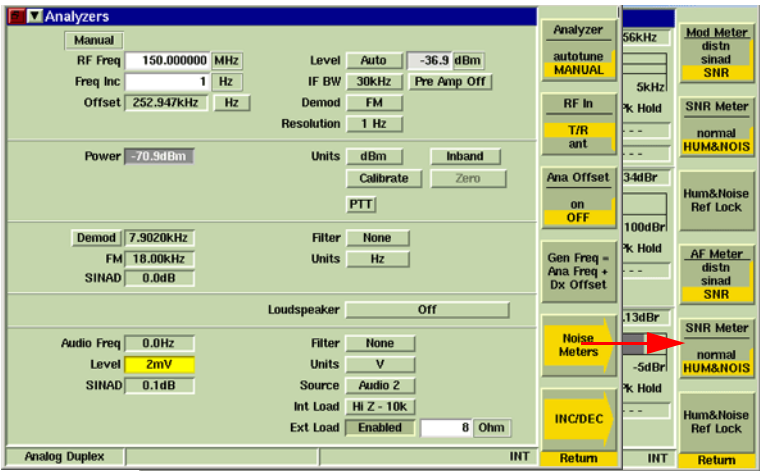
Toggle soft keys offer a choice of two, three or four options.



Subject to Export Control, see Cover Page for details.

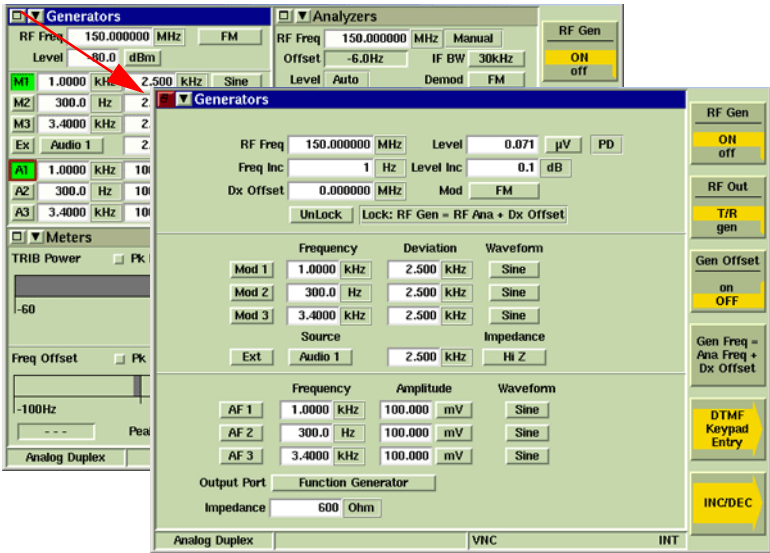
Next Level

Next Level soft keys lead to soft key sub-menus that provide additional functions and features.



Maximized and Minimized Views

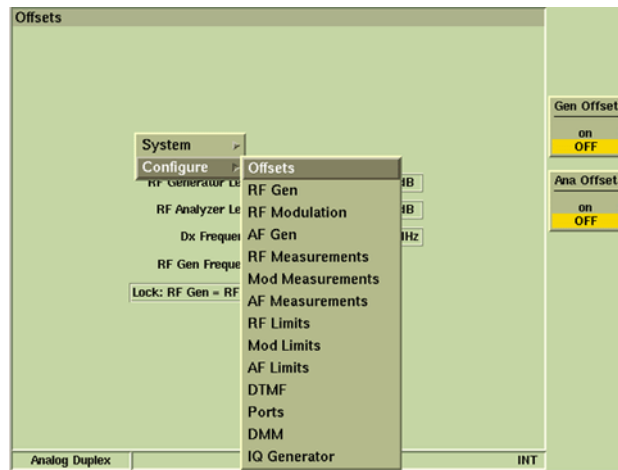
3900 Test Tiles can be viewed in a Maximized or Minimized state. The Spectrum Analyzer Tile can only be viewed in maximized state.



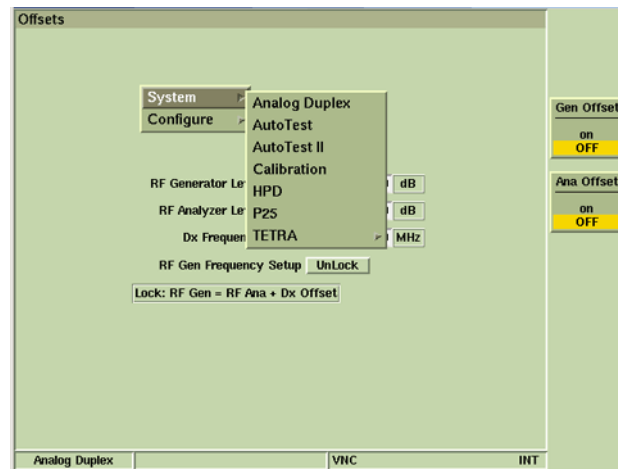
Subject to Export Control, see Cover Page for details.

### Floating Menus

Floating Menus are used throughout 3900 Systems to access information such as Configuration and Utilities screens and to change operating Systems.



Configuration Floating Menu



System Floating Menu

Subject to Export Control, see Cover Page for details.

## Fuse Replacement Instructions

### Fuse Replacement Procedure

STEP	PROCEDURE
------	-----------

---

1. Verify 3900 is OFF and AC Power is disconnected from Test Set.
2. Press inward on pressure clip to remove Fuse Carrier.
3. Remove Fuse Carrier from Test Set.
4. Replace fuse:



5. Remove Fuse Carrier from Test Set.



3 amp, 250 volt, Type F  
20 mm cartridge fuse (F3AL250V)  
Aeroflex P/N: 56078

<b>CAUTION</b>	FOR CONTINUOUS PROTECTION AGAINST FIRE, REPLACE FUSE WITH FUSES OF THE SPECIFIED VOLTAGE AND CURRENT RATINGS.
----------------	---

6. Replace Fuse Carrier by pressing into place.
7. Replace Fuse Cover.

---

Subject to Export Control, see Cover Page for details.



This page intentionally left blank.

As we are always seeking to improve our products, the information in this document gives only a general indication of the product capacity, performance and suitability, none of which shall form part of any contract. We reserve the right to make design changes without notice.

<b>CHINA / Beijing</b>	Tel: [+86] (10) 6539 1166	Fax: [+86] (10) 6539 1778
<b>CHINA / Shanghai</b>	Tel: [+86] (21) 5109 5128	Fax: [+86] (21) 6457 7668
<b>FINLAND</b>	Tel: [+358] (9) 2709 5541	Fax: [+358] (9) 804 2441
<b>FRANCE</b>	Tel: [+33] 1 60 79 96 00	Fax: [+33] 1 60 77 69 22
<b>GERMANY</b>	Tel: [+49] 8131 2926-0	Fax: [+49] 8131 2926-130
<b>HONG KONG</b>	Tel: [+852] 2832 7988	Fax: [+852] 2834 5364
<b>INDIA</b>	Tel: [+91] (0) 80 4115 4501	Fax: [+91] (0) 80 4115 4502
<b>JAPAN</b>	Tel: [+81] 3 3500 5591	Fax: [+81] 3 3500 5592
<b>KOREA</b>	Tel: [+82] (2) 3424 2719	Fax: [+82] (2) 3424 8620
<b>SCANDINAVIA</b>	Tel: [+45] 9614 0045	Fax: [+45] 9614 0047
<b>*SINGAPORE</b>	Tel: [+65] 6873 0991	Fax: [+65] 6873 0992
<b>SPAIN</b>	Tel: [+34] (91) 640 11 34	Fax: [+34] (91) 640 06 40
<b>UK / Cambridge</b>	Tel: [+44] (0) 1763 262277	Fax: [+44] (0) 1763 285353
<b>*UK / Stevenage</b>	Tel: [+44] (0) 1438 742200	Fax: [+44] (0) 1438 727601
	Freephone: 0800 282388	
<b>*USA</b>	Tel: [+1] (316) 522 4981	Fax: [+1] (316) 522 1360
	Toll Free: 800 835 2352	

\* Indicates Regional Service Center

**EXPORT CONTROL WARNING:** This document contains controlled technology or technical data under the jurisdiction of the Export Administration Regulations (EAR), 15 CFR 730-774. It cannot be transferred to any foreign third party without the specific prior approval of the U.S. Department of Commerce, Bureau of Industry and Security BIS). Violations of these regulations are punishable by fine, imprisonment, or both.

DIR #: 10000008761 CA



6050 C0

 **AEROFLEX**



Our passion for performance is defined by three attributes represented by these three icons: solution-minded, performance-driven, customer-focused.