RSA6100B Series Real-Time Signal Analyzers Service Manual





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General safety summary

	Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it.
	To avoid potential hazards, use this product only as specified.
	Only qualified personnel should perform service procedures.
	While using this product, you may need to access other parts of a larger system. Read the safety sections of the other component manuals for warnings and cautions related to operating the system.
To avoid fire or personal injury	Use proper power cord. Use only the power cord specified for this product and certified for the country of use.
	Ground the product. This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.
	Observe all terminal ratings. To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the product manual for further ratings information before making connections to the product.
	The inputs are not rated for connection to mains or Category II, III, or IV circuits.
	Power disconnect. The power cord disconnects the product from the power source. Do not block the power cord; it must remain accessible to the user at all times.
	Do not operate without covers. Do not operate this product with covers or panels removed.
	Do not operate with suspected failures. If you suspect that there is damage to this product, have it inspected by qualified service personnel.
	Avoid exposed circuitry. Do not touch exposed connections and components when power is present.
	Replace batteries properly. Replace batteries only with the specified type and rating.
	Use proper fuse. Use only the fuse type and rating specified for this product.
	Wear eye protection. Wear eye protection if exposure to high-intensity rays or laser radiation exists.

Do not operate in wet/damp conditions.

Do not operate in an explosive atmosphere.

Keep product surfaces clean and dry.

Provide proper ventilation. Refer to the manual's installation instructions for details on installing the product so it has proper ventilation.

Terms in this manual These terms may appear in this manual:



WARNING. Warning statements identify conditions or practices that could result in injury or loss of life.



CAUTION. Caution statements identify conditions or practices that could result in damage to this product or other property.

Symbols and terms on the product

These terms may appear on the product:

- DANGER indicates an injury hazard immediately accessible as you read the marking.
- WARNING indicates an injury hazard not immediately accessible as you read the marking.
- CAUTION indicates a hazard to property including the product.

The following symbol(s) may appear on the product:







CAUTION Refer to Manual

(Earth) Terminal

Chassis Ground Standby

Service safety summary

Only qualified personnel should perform service procedures. Read this *Service safety summary* and the *General safety summary* before performing any service procedures.

Do not service alone. Do not perform internal service or adjustments of this product unless another person capable of rendering first aid and resuscitation is present.

Disconnect power. To avoid electric shock, switch off the instrument power, then disconnect the power cord from the mains power.

Use care when servicing with power on. Dangerous voltages or currents may exist in this product. Disconnect power, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

To avoid electric shock, do not touch exposed connections.

Preface

This is the service manual for the RSA6100B Series Real-time Signal Analyzers.

Read this preface to learn how this manual is structured, what conventions it uses, and where you can find other information related to servicing this product.

Manual Content

This manual contains only information related to servicing an RSA6100B Series Real-time Signal Analyzer. For information related to installing and operating the instrument or for a list of instrument specifications, refer to the appropriate user document as described in *Related User Documents* on the following page.

Be sure to read the introductions to all procedures. These introductions provide important information needed to perform the service correctly, safely, and efficiently.

Manual Conventions

This manual uses certain conventions that you should become familiar with before attempting service.

- **Module** The term module refers to a collection of items that are replaceable as a unit. A module may contain electrical and mechanical assemblies, circuit boards, and interconnecting cables.
- **Plug-in Module** The term Plug-in Module refers to the units that plug into the Main Digital Interface board.
- **Replaceable Parts** This manual refers to any field-replaceable assembly or mechanical part by its name or generically as a replaceable part. In general, a replaceable part is any circuit board or assembly that is listed in the Replaceable Parts section.
 - **Safety** Symbols and terms related to safety appear in the General Safety Summary found at the beginning of this manual. Be sure to read both the General Safety Summary and Service Safety Summary before performing any service to this instrument.

Related User Documents

The following related English user documents are available if you need more information about operating the instrument. These documents are located on the RSA6100B Series Real-time Signal Analyzer User Documentation CD-ROM or can be downloaded from the Tektronix Web site (www.tektronix.com/manuals).

- RSA6100B Series Real-time Signal Analyzer Quick Start User Manual. This document provides the basic information you need to install and operate the instrument. Included is a listing of the options and accessories available for the instrument.
- RSA6100B Series Real-time Signal Analyzer Series Specifications and Performance Verification Technical Reference (English). Contains the following technical information about the instrument:
 - Electrical and physical specifications, including a list of certifications and compliances.
 - A performance verification procedure to check instrument performance against guaranteed specifications.
- RSA6100B Series Real-time Signal Analyzer Programmer Manual (English). Describes the GPIB instrument programming commands and interface.
- RSA6100B Series Real-time Signal Analyzer Security and Declassification Instructions (English). Provides instruction on how customers with data security concerns can sanitize or remove memory devices from the instrument.

Operating Information

Operating Information

For information on installing and operating your RSA6100B Series Real-time Signal Analyzer, refer to the Quick Start User Manual.

Theory of Operation

Theory of Operation

This section provides a basic description of the Real-Time Signal Analyzer (RTSA) operation. A block diagram of the instrument is shown in this section. (See Figure 2-1 on page 2-4.)

General

A processor system controls the RSA6100B instrument. The instrument features an XGA resolution flat-panel display, a transparent touch-screen, and a front-panel with direct access to commonly used RTSA features. You can also use the RTSA with a mouse or other pointing device, and/or a keyboard.

The RTSA uses the Microsoft Windows 7 operating system.

Signal Path and Processing

RF Signal Path	An RF signal enters the RTSA through a direct coaxial connection (N-type for the RSA6106B and RSA6114B, 3.5 mm for the RSA6120B) to the input connector.
	The RF signal path conditions the input signals and passes them to the acquisition system for sampling and processing. The RF signal path consists of three frequency conversion stages, band-limiting filters, and signal level adjustment stages. The purpose of the RF signal path is to translate a band-limited replica of a portion of the input signal range to a intermediate frequency (IF) where it can be sampled by a high dynamic range A/D.
	Control of the RF signal path is performed by the processor system.
Acquisition System	The acquisition system samples the IF signal and converts it to digital signals. These digital signals are then filtered numerically and processed either for direct display or by measurement applications to provide metrics of signal quality to the user. The acquisition data processing is performed by one of several field-programmable gate arrays (FPGAs) under control of the processor. The processor performs measurement applications.
Processor System	The processor system consists of a COM Express PCI-based processor board and a digital interface board that connects the processor to the acquisition board.
Trigger Inputs	There are two coaxial trigger inputs. One is on the front panel below the display and the other is on the rear panel. Both trigger inputs connect directly to the digital interface board. Trigger signals are processed by an FPGA on the digital interface board. The information from the trigger system is combined with acquisition data by the processor system.

	The Trigger Out signal is accessed below the display with a coaxial connection. The trigger out signal comes from the Acquisition Control FPGA via the digital interface board.
Display Panel	
	Waveforms, spectral traces, measurement results, and control menus are displayed on a 10.4 inch, color, active-matrix LCD display with touch panel.
Display system	The display system consists of a display adapter board, which sends text and waveform information to the display panel.
Touch Panel	The display adapter board sends information from the touch panel to the processor. The touch panel appears as a USB HID device in the Window Device Manager tool.
Front Panel	
	The processor system reads the front-panel switches and encoder. The processor also turns the LEDs on and off.
	The ON/STBY switch passes through the display adapter board, the digital interface board, and to the processor on the front panel board.
	Communication between the processor system and the front panel is performed over an internal USB connection.
	The DVD-RW, removable HDD (hard disk drive), or removable solid-state hard drive communicate over a SATA connection directly to the processor system.

Rear Panel

The following table describes the connectors available on the rear panel.

Table 2-1: Rear panel connectors

Name	Input or Output	Connector type	Description
Reference In	Input	BNC	External time-base reference. See data sheet for signal quality requirements.
Reference Out	Output	BNC	10 MHz output or loop-through of user Reference In signal
LAN	Input/Output	RJ-45	10/100/1000baseT Ethernet connector
USB	Input/Output	USB	Two USB 2.0 connectors
Keyboard	Input	PS/2	Keyboard-only PS/2 connector

Name	Input or Output	Connector type	Description
VGA	Output	D-Sub	External monitor connector
Serial	Input/Output	D-Sub	Serial communications port (COM2) to processor system
Trigger In	Input	BNC	TTL Gate/trigger input signal
Headset	Output	3.5 mm stereo	External headphone connection
+28 V	Output	BNC	Noise source drive power
GPIB	Input/Output	IEEE-488	General Purpose Interface Bus
IF Output	Output	BNC	500 MHz Analog IF Output signal (Option 05)
Digital I/Q	Output	2 x 50	Two connectors for digital I and Q output signals. (Option 05)

Table 2-1: Rear panel connectors (cont.)

All connections except the IF Output and Digital I/Q are connected directly to the digital interface board. The IF Output and Digital I/Q outputs are connected to the Real-Time I/Q (RTIQ) option board.

Power Supply

The Power Conversion board provides instrument power. The Power Conversion board consists of several switching supplies that translate and balance the power taken from the power supply module.

Power is distributed from the Power Conversion board to both the RF Deck and the Digital Interface board.

The ON/STBY switch, located on the front panel, controls all of the power to the instrument except for the part of the circuitry in the standby power supply.

Fans

Seven individual fans provide cooling to the RTSA. Three fans are dedicated to the RF Deck and are controlled by the RF Interface. Two fans provide cooling for the digital side of the instrument.

The bulk power supply module has an internal fan. Control signals to the power supply fan are sent through the Power Conversion board from the Digital Interface board.

A seventh fan is resident on the processor board heat sink, and is controlled by the COM Express PC board.

If Option 200 is installed, an additional fan helps cool the instrument.



Figure 2-1: RSA6100B Series block diagram

Adjustment Procedures

Adjustment Procedure

There are no physical user adjustment procedures for the RSA6100B Series instruments. However, you can run Alignments from the RSA6100B Series application.

Running Alignments

Alignments are adjustment procedures run by the instrument using internal reference signals and measurements, and do not require any external equipment or connections.

There are two settings for Alignments:

- Automatically align as needed (Auto mode)
- Run alignments only when the "Align Now" button is pressed

If **Automatically align as needed** is selected, alignments run whenever the signal analyzer detects a sufficient change in ambient conditions to warrant an alignment.

If **Run alignments only when "Align Now" button is pressed** is selected, the signal analyzer never runs an alignment unless you manually initiate an alignment using the Align Now button.

NOTE. There are a few critical adjustments that must run occasionally even if *Automatically align as needed is not enabled.*

- Alignment Status When the signal analyzer needs to run an alignment, it displays a message on screen. If no message is displayed, you can assume that the signal analyzer is properly aligned.
- **Initiating an Alignment** To initiate an alignment:
 - 1. Select Setup > Alignments.
 - 2. Select the Align Now button.

The signal analyzer will run an alignment procedure. Status messages are displayed while the alignment procedure is running. If the instrument fails the alignment procedure, an error message will be displayed. If the instrument fails an alignment, run Diagnostics (Tools > Diagnostics) to determine why the alignment failed.

NOTE. While an alignment is running, both the IF and IQ outputs are disabled.

Alignments During Warm-Up	Alignments are not run during the 20 minute warm-up period (except, for the RF oscillator alignments) because default alignment values are used, (if Auto mode is selected). During the specified period for warm-up, the instrument performance is not warranted.
Alignments During Normal Operation	Once the signal analyzer reaches operating temperature, a full alignment is then run every two hours (for up to two minutes). Alignments can run more frequently if the operating temperature changes. If an alignment becomes necessary during a measurement cycle (if Auto mode is selected), the measurement is aborted and an alignment procedure is run. Once an alignment procedure is completed, the measurement cycle restarts.
Alignments Are Not Calibrations	Alignments are adjustment procedures run by the instrument using internal reference signals and measurements. Calibrations can only be performed at a Tektronix service center and require the use of traceable test equipment (signal sources and measuring equipment) to verify the performance of the instrument.

Maintenance

Maintenance

This section contains the information needed to do periodic and corrective maintenance on the instrument. The following subsections are included:

- Preventing ESD General information on preventing damage by electrostatic discharge.
- Inspection and Cleaning Information and procedures for inspecting the instrument and cleaning its external and internal modules.
- Removal and Installation Procedures Procedures for the removal of defective modules and replacement of new or repaired modules. Also included is a procedure for disassembly of the instrument for cleaning.
- Troubleshooting Information for isolating and troubleshooting failed modules. Included are instructions for operating the instrument diagnostic routines and troubleshooting trees. Most of the trees make use of the internal diagnostic routines to speed fault isolation to a module.
- Repackaging Instructions Information on returning an instrument for service.

Preventing ESD

Before servicing this product, read the *Safety Summary* and *Introduction* at the front of the manual and the ESD information below.



CAUTION. Static discharge can damage any semiconductor component in this instrument.

When performing any service that requires internal access to the instrument, adhere to the following precautions to avoid damaging internal modules and their components due to electrostatic discharge (ESD).

- 1. Minimize handling of static-sensitive circuit boards and components.
- 2. Transport and store static-sensitive modules in their static protected containers or on a metal rail. Label any package that contains static-sensitive boards.
- **3.** Discharge the static voltage from your body by wearing a grounded antistatic wrist strap while handling these modules. Perform service of static-sensitive modules only at a static-free work station.
- 4. Do not allow anything capable of generating or holding a static charge on the work station surface.
- 5. Handle circuit boards by the edges when possible.

- 6. Do not slide the circuit boards over any surface.
- 7. Avoid handling circuit boards in areas that have a floor or work-surface covering capable of generating a static charge.

Inspection and Cleaning

Inspection and Cleaning describes how to inspect for dirt and damage. It also describes how to clean the exterior and interior of the instrument. Inspection and cleaning are done as preventive maintenance. Preventive maintenance, when done regularly, may prevent instrument malfunction and enhance its reliability.

Preventive maintenance consists of visually inspecting and cleaning the instrument and using general care when operating it.

How often preventive maintenance should be performed depends on the severity of the environment in which the instrument is used. A proper time to perform preventive maintenance is just before instrument adjustment.

General Care The cabinet helps keep dust out of the instrument and should normally be in place when operating the instrument.

Interior Cleaning Use a dry, low-velocity stream of air to clean the interior of the chassis. Use a soft-bristle, non-static-producing brush for cleaning around components. If you must use a liquid for minor interior cleaning, use a 75% isopropyl alcohol solution and rinse with deionized water.



WARNING. Before performing any procedure that follows, power down the instrument and disconnect it from line voltage. Failure to do so could cause personal injury, or death.

Exterior Cleaning

Clean the exterior surfaces of the chassis with a dry lint-free cloth or a soft-bristle brush. If any dirt remains, use a cloth or swab dipped in a 75% isopropyl alcohol solution. Use a swab to clean narrow spaces around controls and connectors. Do not use abrasive compounds on any part of the chassis that may damage the chassis.

Clean the On/Standby switch using a dampened cleaning towel. Do not spray or wet the switch directly.



CAUTION. Avoid the use of chemical cleaning agents which might damage the plastics used in this instrument. Use only deionized water when cleaning the menu buttons or front-panel buttons. Use a 75% isopropyl alcohol solution as a cleaner and rinse with deionized water. Before using any other type of cleaner, consult your Tektronix Service Center or representative.

Inspection — **Exterior.** Inspect the outside of the instrument for damage, wear, and missing parts, using the following table as a guide. Immediately repair defects that could cause personal injury or lead to further damage to the instrument.

ltem	Inspect for	Repair action
Cabinet, front panel, and cover	Cracks, scratches, deformations, damaged hardware	Repair or replace defective module
Front-panel knob	Missing, damaged, or loose knob	Repair or replace missing or defective knob
Connectors	Broken shells, cracked insulation, and deformed contacts; dirt in connectors	Repair or replace defective modules; clear or wash out dirt
Carrying handle, and cabinet feet	Correct operation	Repair or replace defective module
Accessories	Missing items or parts of items, bent pins, broken or frayed cables, and damaged connectors	Repair or replace damaged or missing items, frayed cables, and defective modules

Table 4-1: External inspection checklist

Flat Panel Display Cleaning

The display is a soft plastic display and must be treated with care during cleaning.



CAUTION. Improper cleaning agents or methods can damage the flat panel display. Avoid using abrasive cleaners or commercial glass cleaners to clean the display surface. Avoid spraying liquids directly on the display surface. Avoid scrubbing the display with excessive force.

Clean the flat panel display surface by gently rubbing the display with a clean-room wipe (such as Wypall Medium Duty Wipes, #05701, available from Kimberly-Clark Corporation).

If the display is very dirty, moisten the wipe with distilled water or a 75% isopropyl alcohol solution and gently rub the display surface. Avoid using excess force or you may damage the plastic display surface.



CAUTION. To prevent moisture from getting inside the instrument during external cleaning, use only enough liquid to dampen the cloth or applicator.

Inspection — **Interior**. To access the inside of the instrument for inspection and cleaning, refer to the *Removal and Installation Procedures* in this section.

Inspect the inside of the instrument for damage and wear, using the following table as a guide. Defects found should be repaired immediately.



CAUTION. To prevent damage from electrical arcing, ensure that circuit boards and components are dry before applying power to the instrument.

Table 4-2: Internal inspection check list

Item	Inspect for	Repair action
Circuit boards	Loose, broken, or corroded solder connections. Burned circuit boards. Burned, broken, or cracked circuit-run plating.	Remove and replace damaged circuit board.
Resistors	Burned, cracked, broken, blistered condition.	Remove and replace damaged circuit board.
Solder connections	Cold solder or rosin joints.	Resolder joint and clean with isopropyl alcohol.
Capacitors	Damaged or leaking cases. Corroded solder on leads or terminals.	Remove and replace damaged circuit board.
Wiring and cables	Loose plugs or connectors. Burned, broken, or frayed wiring.	Firmly seat connectors. Repair or replace modules with defective wires or cables.
Chassis	Dents, deformations, and damaged hardware.	Straighten, repair, or replace defective hardware.

Cleaning Procedure — Interior. To clean the instrument interior, do the following steps:

- 1. Blow off dust with dry, low-pressure, deionized air (approximately 9 psi).
- 2. Remove any remaining dust with a lint-free cloth dampened in isopropyl alcohol (75% solution), and a clean lint-free cloth dampened in warm deionized water. (A cotton-tipped applicator is useful for cleaning in narrow spaces and on circuit boards.)

Lubrication. There is no lubrication required for this instrument.
Removal and Installation Procedures

This subsection contains procedures for the removal and installation of all customer-replaceable mechanical and electrical modules.

Preparation



WARNING. Before doing this or any other procedure in this manual, read the
 Safety Summary found at the beginning of this manual. Also, to prevent possible injury to service personnel or damage to the instrument components, read Installation in the RSA6100B Series Real-Time Signal Analyzers Quick Start User Manual, available on the Web at www.tektronix.com/manuals, and Preventing ESD in this section.

This subsection contains the following items:

- Preparatory information that you need to properly do the procedures that follow.
- A list of tools required to remove and disassemble all modules.
- Procedures for removal and reinstallation of the electrical and mechanical modules.



WARNING. Before doing any procedure in this subsection, disconnect the power cord from the line voltage source. Failure to do so could cause serious injury or death.

NOTE. Read the Equipment Required section for a list of the tools needed to remove and install modules in this instrument. (See Table 4-3 on page 4-6.) Read the cleaning procedure before disassembling the instrument for cleaning.

Equipment Required. Most modules in the instrument can be removed with a screwdriver handle mounted with a size T15, TORX screwdriver tip. Other tools needed for complete disassembly are listed in the following table.

ltem no.	Name	Description				
1	Screwdriver handle	Accepts TORX-driver bits				
2	T10 TORX tip	Used for removing instrument. screws TORX-driver bit for T10 size screw heads				
3	T15 TORX tip	Used for removing most instrument screws. TORX-driver bit for T15 size screw heads				
4	T20 TORX tip	Used for removing side handle screws. TORX-driver bit for T20 size screw heads				
5	T25 TORX tip	Used for removing side cover screws. TORX-driver bit for T25 size screw heads				
6	1/8 inch flat-bladed screwdriver	Screwdriver for unlocking cable connectors				
7	#0 Phillips screwdriver	Screwdriver for removing small phillips screws, CDRW, and hard drive				
8	Angle-tip Tweezers	Used to remove front panel knobs				
9	3/16 inch open-end wrench	Used to remove nut posts				
10	5/16 inch open-end wrench	Used to remove nut posts				
11	MA-800G Soldering Aid	Used to remove the front panel trim				

Table 4-3: Tools required for module removal

Trim, Cabinet, and Module Removal

Use the following two tables to determine items of the instrument that you will need to remove to access replaceable parts. The first table lists items that may need to be removed before you can access a replaceable module. The second table lists customer replaceable modules and which items must be removed to access the replaceable module. The approximate location of the primary customer replaceable modules is shown in the following figure. (See Figure 4-1 on page 4-8.)

A - Front Cover (if installed)	F- Internal Cover, bottom	K- Front Panel
B - Front panel trim	G- DVD Drive (if installed)	L- Internal HDD (if installed)
C- Cabinet, top	H- Removable HDD/Solid State Drive (if installed)	M- Power Conversion board
D- Cabinet, bottom	I- DVD Drive/Removable HDD Frame	N- Power Supply
E- Internal Cover, top	J- Display Assembly	

Table 4-4: Legend for Accessing Modules table

Table 4-5: Accessing Modules

	Remove these items to access the module													
Modules to replace	Α	В	С	D	Е	F	G	Н	Ι	J	K	L	М	Ν
Display Assembly	\checkmark	\checkmark												
Front Panel		\checkmark												
DVD Drive (if installed)	\checkmark	\checkmark												
Removable HDD Drive (if installed)														
Removable Solid State Drive (if installed)														
DVD Drive/ Removable HDD Frame	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark							\checkmark		
Digital Fan Tray (Upper Deck)	\checkmark	\checkmark	\checkmark		\checkmark									
RF Deck Fan Tray		\checkmark	\checkmark	\checkmark		\checkmark								
Real Time IQ/IF Output Acquisition board (if installed)														
RTT/DPSA board	\checkmark	\checkmark	\checkmark		\checkmark									
PC	\checkmark	\checkmark	\checkmark		\checkmark									
Internal HDD (if installed)		\checkmark	\checkmark		\checkmark									
Power Conversion board	\checkmark		\checkmark	\checkmark	\checkmark		\checkmark							
Power Supply	\checkmark		\checkmark	\checkmark	\checkmark									
RF Interface board	\checkmark	\checkmark	\checkmark	\checkmark		\checkmark								



Figure 4-1: Primary customer replaceable module locations

Removal Procedures

NOTE. Unless directed otherwise, installation is the reverse of the removal procedure.

These procedures assume you have access to the module you are removing. Use the tables to determine which trim and/or modules to remove to gain access. (See Table 4-4 on page 4-7.)(See Table 4-5 on page 4-7.) A figure is also provided as a quick reference for customer replaceable module locations. (See Figure 4-1 on page 4-8.)



CAUTION. When removing or installing the keypad, make sure you do not touch the switch contacts with your fingers. The oils in your fingers will degrade or damage the switch contacts. To help prevent damage to the keypad use cotton gloves when removing or installing the keyboard pad.



CAUTION. To avoid damage to the front panel Standby/On switch assembly, do not set the Display module assembly on a work surface. Sliding the instrument over the edge of the work surface could break off the On/Standby switch assembly.

Display

Perform these steps to remove the Display module:

- 1. Remove the four screws securing the display to the Main chassis; two on the top and two on the left side.
- **2.** Disconnect the cables from the COM Express PC board and keep the cables connected to the display assembly
- 3. Gently remove the Display module from the Main chassis.



CAUTION. Be careful when removing and reinstalling the Display module cables. If the connectors have bent pins or are installed incorrectly the Display may be destroyed.

- 4. Disconnect the smaller Display cable from the Display Adapter board.
- 5. Disconnect the larger Display cable from the Display Adapter board.
- **Front Panel** Perform these steps to remove the Front Panel:

1.	Remove the six T15 screws that secure the Front Panel to the chassis; two on
	the top, two on the right side, and two on the front.

- 2. Pull the Front Panel assembly from the chassis.
- **3.** Disconnect the Front Panel cable from connector J1 on the Front Panel circuit board.

Digital Deck Fans Perform these steps to remove the fan assembly from the digital deck:

- 1. Unplug the fan control cable from the Main board connector, marked Fan1 and Fan2.
- **2.** Remove the four T15 TORX screws securing the fan assembly, located on the left side of the instrument.
- **3.** Lift the fan assembly up through the narrow slot between the side panel and the card cage.

NOTE. You may have a DVD drive, solid-state drive, or a removable HDD mounted above the front panel. If you ordered a solid-state drive or a removable HDD, the instrument will not have an internal hard disk drive.

DVD Drive	Follow these steps to remove the DVD drive (i	if installed)):
-----------	---	---------------	----

- 1. Detach the DVD power and data cables from the COM Express PC board.
- **2.** Carefully cut the zip tie from the DVD cables and pull the cables through the chassis hole.
- 3. Remove the two screws from the front panel of the DVD.
- **4.** Pull the DVD drive out from the Main chassis, being careful to feed the cables as you pull.
- 5. Remove the four screws securing the DVD drive to the DVD drive bracket.

Removable Hard Disk Perform these steps to remove the removable hard disk drive (if installed): **Drive / Solid State Drive**

- 1. Loosen the thumbscrews securing the drive to the front panel.
- **2.** Grasp the drive assembly by the thumb screws and pull the assembly straight out of the instrument.
- 3. Remove the four screws securing the hard drive to the bottom bracket.
- **PC board** Perform these steps to remove the COM Express PC board:

	1. Disconnect all cables attached to the COM Express PC board.
	2. Lift the latch levers on the top edge of the COM Express PC board assembly to disconnect it from the Digital Interface board.
	3. Lift the COM Express PC board from the Signal Analyzer.
Internal Hard Disk Drive	Follow these steps to remove the internal hard disk drive:
	NOTE . If you have a removable HDD mounted above the front panel you will not have an internal hard disk drive.
	1. Disconnect the power/data cable from the hard disk drive.
	2. Disconnect the video cables from the COM Express PC board.
	3. Remove the four T15 screws securing the hard disk drive assembly to the Power Supply shield.
	4. Lift the hard disk drive up and remove it from the Signal Analyzer.
	5. Remove the four screws securing the hard drive to the bracket.
Power Conversion board	Perform these steps to remove the Power Conversion board:
	NOTE . Remove the Power Supply support bracket and the Power Supply before removing the Power Conversion board.

1. Remove the cables connected to the Power Conversion board:

Table 4-6: Power conversion board connectors

Connector		Connector	
Number	Name	Number	Name
J3	ATX POWER	J6	CD-ROM/HDD
J4	ANALOG POWER	J7	Line trigger sense
J5	RF PWR CTRL		

2. Remove the four T15 screws securing the Power Converter board to the chassis.

- **3.** Slide the Power Converter board to the right, to disengage the connector to the Power Supply.
- 4. Lift the Power Converter board from the signal analyzer.

Power Supply

NOTE. Remove any installed HDD/DVD drives from the Power Supply support bracket before removing the power supply.

Follow these steps to remove the power supply assembly:

- 1. Remove the DVD drive or removable HDD (if installed).
- 2. Remove the internal hard disk drive assembly (if installed).
- **3.** Remove the six T15 screws securing the power supply access cover from the end of the Power Supply.
- **4.** Remove the two T15 screws securing the right side of the power supply support bracket.
- 5. Remove the power supply support bracket.
- 6. Disconnect the line trigger cable from J7 of the Power Conversion board.
- 7. Disconnect the power supply cable from the line filter cable.
- **8.** Remove the two T15 screws securing the power supply shield tabs to the top front chassis.
- **9.** Pull the power supply assembly from the left side of the chassis. This will take a little effort to pull, as the power supply must disconnect from the power convertor board.



CAUTION. To prevent damage to the power convertor board connector, do not lift the left end of the power supply while pulling.

Troubleshooting

WARNING. Before doing this or any other procedure in this manual, read the **D** Safety Summary found at the beginning of this manual. Also, to prevent possible injury to service personnel or damage to the instrument components, read Installation in the RSA6100B Series Real-Time Signal Analyzers Quick Start User Manual, available on the Web at www.tektronix.com/manuals, and Preventing ESD in this section.

Troubleshooting contains information and procedures designed to help you isolate faults to a module.

This subsection assumes that service personnel have the skills required to work on the Real-Time Signal Analyzer, including PC troubleshooting and Windows operating system skills. Details of PC and Windows operation and service are not in this manual.

For assistance, please contact your local Tektronix Service Center.

Service Level

This section contains information and procedures designed to help you isolate faulty modules in the instrument. If a module needs to be replaced, follow the *Removal and Installation Procedures*, located in this section.

Check for Common Problems

Use the following table to quickly isolate possible failures. The table lists problems and possible causes. The list is not exhaustive, but it may help you eliminate a problem that is quick to fix, such as a blown fuse or loose cable.

Table 4-7: Failure symptoms and possible causes

Symptom	Ро	ssible cause(s)
Instrument will not power on		Power cord not plugged in
		Faulty power supply (check Status LEDs)
		Faulty power conditioner board
		Faulty front panel power switch
		Faulty display adapter board
Front panel light comes on (instrument		Faulty fan cable
powers on), but one or more fans will not operate		Defective fan assembly
		Faulty power supply (check Status LEDs)
		Faulty Slot PC
		Faulty CPU
		Digital Interface board problem
No beeps on startup or multiple beeps on startup (single beep is OK)		Faulty Slot PC

Symptom	Ро	Possible cause(s)				
Flat panel display blank		BIOS setting not Advanced Chipset Features > - On Chip VGA > Enabled - Boot Display > CRT + LFP				
		Defective cable from Slot PC board to Digital Interface board				
		Defective cable from display adapter board to digital interface board				
		Defective cable from inverter board to display adapter board				
		Defective cable from inverter board to backlighting display lamp				
	-	Defective backlighting display lamp				
	-	Faulty display				
	-	Faulty digital interface board				
		Faulty inverter board				
		Faulty display adapter board				
DVD-ROM related symptoms		Defective DVD-ROM				
		Defective DVD-ROM drive cable				
		Defective DVD-ROM Adapter board				
		Incorrect DVD-ROM configuration in the BIOS setup				
Hard disk drive related symptoms		Defective hard disk drive				
		Incorrect hard disk type selected in the BIOS setup				
		Replaceable hard disk drive not installed				
	-	Power supply failure				
		Corrupted BIOS module firmware, reinstall firmware				
	-	Loose cable				
		Corrupted OS image				

Table 4-7: Failure symptoms and possible causes (cont.)

Status Indicator LEDs

Check that the Status Indicator LEDs on the Power Converter and Digital Interface boards to ensure the power supplies are operating. (See Figure 4-2.) (See Table 4-8.) (See Table 4-9.)



Figure 4-2: Status indicator locations

Table 4-8: Power Converter board status indicators

LED	Status Indication	
DS171	STANDBY	
DS172	-15 V OK	
DS173	-8 V OK	
DS174	+8 V OK	
DS175	+15 V OK	
DS176	+30 V OK	

Table 4-9: Digital Interface board status indicators

LED	Status Indication
DS481	CLOCK FAIL (normally off)
DS482	+5 VSB OK
DS483	+5 V OK
DS484	+3.3 V OK
DS485	+2.5 V OK
DS486	+1.8 V OK
DS487	+1.5 V OK
DS488	FPGA INIT
DS489	FPGA DONE
DS4810	STATUS 0
DS4811	STATUS 1 (normally off)

Diagnostics

This section describes how to use and interpret the embedded Diagnostics Interface for both the Power On Self Tests (POST) and the Extended Diagnostics tests. These tests are used to determine whether there has been a module failure in the instrument.

Power On Self Tests (POST)

The Power On Self Tests (POST) run automatically, every time the instrument is powered up. If a failure is detected during this process the POST Result view will be displayed to show which module(s) failed. (See Figure 4-3.)

Diagnostics					
		_	Test Progress		
Diagnostics Power	-On Self Tests	Diagnostics Failure Info			
Module Name		Test Results			
Hardware Init		PASS			
RF Interface		PASS			
Reference Oscilla	tor	PASS			
First LO		PASS			
First Converter		PASS		Run POST	
Second Converter		PASS			
Third IF		PASS			
Narrow Band Acq	uisition	PASS			
Wide Band Acquis	ition	PASS			
DPSA Board		PASS			
Signal Path		PASS			
				Exit Diagnostics	

Figure 4-3: Diagnostics Power On Self Test results view

Further information about the failure can be obtained from the **Diags Failure Info** tab in the Diagnostics window. (See Figure 4-4.)

Diagnostics Power-On Self Tests Diagnos	tics Failure Info	st Progress	
For Diagnostics failure history and all other use the "Event Viewer" button to the right.	RSA6100A error messages	,	
		*	Event Viewer
			Print Log
			Clear Log
			C Verbose
			Dith Discussion

Figure 4-4: Diagnostics Failure Info tab

All failure information is logged in the Windows Event Viewer. You can access the Windows Event Viewer by clicking the Event Viewer button on the Diagnostics Failure Info tab. The Windows Event Viewer is also available in the Administrative Tools portion of the Windows Control Panel.

NOTE. Check the timestamp in the Event Viewer, as errors are stored on disk and may be from earlier power cycles.

Microsoft Windows Event Viewer

The Microsoft Windows Event Viewer maintains a permanent record of instrument diagnostics failure information, with other messages regarding the operating system. If there is not a shortcut to the Event Viewer on the desktop you can access it by clicking the Event Viewer button on the Diagnostics Failure Info tab.

😥 Event Viewer	-			_	
File Action View Help					
Event Viewer (Local)	Event Viewer (Local)				Actions
Custom Views	Overview and Sumn	nary		Lact refreched: 3/3/2011 //-36-15 DI	Event Viewer (Local)
Applications and Services Lo	Question	-			open Saved Log
📑 Subscriptions	Overview				🖌 🦞 Create Custom View
	To view events that h	ave occurred	on your computer, select	the appropriate source, log or custom	Import Custom View
	administrative events	regardless o	f source. An aggregate vie	w of all the logs is shown below.	Connect to Another C
	Summary of Administrative Ev	ents			View 🕨
					Refresh
	Event Type Event ID	Source	Log	Last hour 24 hours 7 da ^	👔 Help 🕨 🕨
	Critical -	1	-	0 0	
	•		m		
	Pacanthy Viewad Nadar				
	Recently viewed wodes				
	Name	Description	Modified	Created	
	Custom Views\View_1		N/A	N/A	
	Windows Logs\Applicati	N/A	3/3/2011 12:00:39 PM	7/29/2010 1:19:59 PM	
Log Summary					
	Log Name	Size (Curr	Modified	Enabled Retention Policy	
	Application	5.07 MB/2	3/3/2011 12:00:39 PM	Enabled Overwrite events a	
	Hardware Events	68 KR/20	8/3/2010 4-26-11 PM	Enabled Overwrite events a	
	L				
•					

To view the Diagnostics failure information, first click the **Windows Logs** icon in the left frame (under Event Viewer (Local)). Then click the **Applications** icon. The view changes to show the individual error reports, as shown in the following figure.

Scroll through the Event list to locate error events. Pay attention to the date and time stamps, as the information is a permanent record and shows failure information from earlier diagnostic sessions.

Also note that the Signal Analyzer diagnostic errors are labeled as **TekRSA** in the Source column, to differentiate them from operating system messages.

Event Viewer				
File Action View Help				
🗢 🔿 🙍 🖬 🚺				
Event Viewer (Local)	Application Number	of events: 7,624		
Vindows Logs	Level	Date and Time	Source	*
Application	(i) Information	3/3/2011 12:02:56 PM	Security-SPP	
Security	Error	3/3/2011 12:02:04 PM	TekRSA	
Setup	 Information 	3/3/2011 12:01:11 PM	Search	
😭 System	 Information 	3/3/2011 12:01:09 PM	ESENT	
Forwarded Events	(i) Information	3/3/2011 12:01:08 PM	ESENT	~
D Parameter Provide Applications and Services Lo		III		•
D Subscriptions	Event 2, TekRSA			×
	General Details			
	1006 RF Atten IF D	elector value = 400 Expected < 883		^

Scroll through the Event list to locate error events. Pay attention to the date and time stamps, as the information is a permanent record and shows failure information from earlier diagnostic sessions.

Also note that the Signal Analyzer diagnostic errors are labeled as **TekRSA** in the Source column, to differentiate them from operating system messages.

Clicking on an error message to display error information in the **General** or **Details** tabs located below the list.

General Details	;]			
10dB RF Atten 2nd IF 10dB At 2nd IF Amp ga Preamp signal Preamp on sig Straight throu	IF Detector value = 466 ten IF Detector value = 4 in path IF Detector valu path FAILED mal path IF Detector valu na path IF Detector value =	Expected < 883 176 :Expected < 883 e = 2141 :Expected > 933 ue = 632 :Expected > 933		^
LF 20dB Atten LF Amp IF Det	ation IF Detector value ector level = 1424 :Expe	= 274 :Expected < 689 cted > 739		-
Log Name:	Application			
-	TekRSA	Logged:	3/3/2011 12:02:04 PM	
Source:				
Source: Event ID:	2	Task Category:	None	
Source: Event ID: Level:	2 Error	Task Category: Keywords:	None Classic	
Source: Event ID: Level: User:	2 Error N/A	Task Category: Keywords: Computer:	None Classic rsa5106a-q002	
Source: Event ID: Level: User: OpCode:	2 Error N/A	Task Category: Keywords: Computer:	None Classic rsa5106a-q002	

Double-click an error message to open a separate window for that error message. The window shows the date and time the error message was generated and the source of the error message. The text of the error message is shown in the Description area. The three buttons at the upper right let you navigate through the error list (using the up and down arrows), or sends the record to the default printer.

If you scroll down in the error description, the event viewer always adds a line that says "For more information, see Help and Support Center at" and includes a link to Microsoft.com. **Do not use this link,** as Microsoft has no information on Tektronix instrument error messages.

Click **Help** in the Event Viewer Menu bar to open the online help and learn more information on using the Event Viewer.

Extended Diagnostics

The Extended Diagnostics allow you to run all of the diagnostics tests in the instrument, including the POST tests. Access the Extended Diagnostics by selecting Diagnostics in the Tools menu. (See Figure 4-5.)



Figure 4-5: Starting Extended Diagnostics

This opens the Embedded Diagnostics Interface. (See Figure 4-6.)

The Diagnostics Interface allows you to select specific tests, and control how many times the selected tests are repeated.



Figure 4-6: Embedded Diagnostics Interface

In the Repeat segment of the window (see the following figure), you can check the radio buttons to:

- A) Repeat the test(s) a specified number of times,
- B) Repeat the test(s) until a failure occurs,
- C) Repeat the test(s) continuously even if failures occur, or
- D) Run the test(s) only one time.



Figure 4-7: Diagnostics test iteration control

While the diagnostic tests are in process, a green dot is shown beside the test that is currently running. If the test completes successfully the green dot is replaced by a black check mark. If the test fails, the green dot is replaced by a red X.

Module	Test	Error message	Recommended action
Hardware	Hardware Init	Digital Interface Board Not Found.	The Slot PC is not communicating with the Digital Interface board. Restart the instrument and, if the problem persists, send the instrument to Tektronix Service Center for repair.
		Digital Discovery Failed.	Run digital tests in extended diagnostics.
		The Acquisition Board was not found.	Send the instrument to a Tektronix Service Center for repair.
		The Continuous Time Acquisition Board was not found.	Replace RTT/DPSA board.
		Load Digital Interface Board Failed.	Send the instrument to a Tektronix Service Center for repair.
		RF Interface Board not found or FPGA Load failed.	Replace RF Interface board.
		First LO not found or FPGA Load failed.	Send the instrument to a Tektronix Service Center for repair.
		Reference Oscillator not found or FPGA Load failed.	Send the instrument to a Tektronix Service Center for repair.
		Second Converter not found.	Send the instrument to a Tektronix Service Center for repair.
		The Third IF not found or FPGA Load failed.	Send the instrument to a Tektronix Service Center for repair.
		Device Driver Failed.	Possible Acquisition board problem. Restart the signal analyzer. If problem persists, return to Tektronix Service Center for repair.
	Read Programmable Part Versions	Error reading ID's.	Send the instrument to a Tektronix Service Center for repair.
		Unable to communicate with PPC.	Send the instrument to a Tektronix Service Center for repair.
Digital Interface Board	Digital Board ID Verification	Digital Board ID Verification Failed.	Send the instrument to a Tektronix Service Center for repair.
		Hardware driver is not initialized	Restart the signal analyzer. If problem persists, return to Tektronix Service Center for repair.
	Digital Board FPGA Load Test	Bad FPGA file path.	Reinstall the product software (use Tektronix part number 020-2715-XX).
		Done bit not returned high.	Send the instrument to a Tektronix Service Center for repair.

Module	Test	Error message	Recommended action
	Digital Board Register R/W Test	Read value did not match write value.	Send the instrument to a Tektronix Service Center for repair.
		Unable to communicate with Digital Interface Board.	Send the instrument to a Tektronix Service Center for repair.
	Digital Board SRAM Test	SRAM memory failure at "memory address"	Send the instrument to a Tektronix Service Center for repair.
	Hardware Discovery / PPC Load	Digital Interface Board Not Found.	Restart the instrument and, if the problem persists, send the instrument to a Tektronix Service Center for repair.
		Digital Discovery Failed.	Restart the instrument and, if the problem persists, send the instrument to a Tektronix Service Center for repair.
		The Acquisition Board was not found.	Send the instrument to a Tektronix Service Center for repair.
		The Continuous Time Acquisition Board was not found.	Replace RTT/DPSA board.
		Load Acquisition Board Failed.	Send the instrument to a Tektronix Service Center for repair.
		RF Interface Board not found or FPGA Load failed.	Restart the instrument and, if the problem persists, send the instrument to a Tektronix Service Center for repair.
		First LO not found or FPGA Load failed	Send the instrument to a Tektronix Service Center for repair.
		Reference Oscillator not found or FPGA Load failed.	Send the instrument to a Tektronix Service Center for repair.
		Second Converter not found.	Send the instrument to a Tektronix Service Center for repair.
		The Third IF not found or FPGA Load failed.	Send the instrument to a Tektronix Service Center for repair.
		Device Driver Failed.	Restart the signal analyzer. If problem persists, return to Tektronix Service Center for repair.
	Digital FIFO Test	Invalid number of return words.	Send the instrument to a Tektronix Service Center for repair.
		Bad value in returned buffer.	Send the instrument to a Tektronix Service Center for repair.

Module	Test	Error message	Recommended action
	PPC POST Results	PPC returned unknown status.	Send the instrument to a Tektronix Service Center for repair.
		PPC did not return POST status.	Send the instrument to a Tektronix Service Center for repair.
		PPC returned POST fail.	Send the instrument to a Tektronix Service Center for repair.
	Digital Board Acquisition Test	Error in returned Acquisition data.	Send the instrument to a Tektronix Service Center for repair.
	Digital Board SDRAM Test	Unexpected data in SDRAM memory.	Reseat the DIMM Acquisition memory module in the socket. If the problem persists, send the instrument to a Tektronix Service Center for repair.
	Digital Board FLASH Test	Unexpected data in Flash memory.	Send the instrument to a Tektronix Service Center for repair.
	Digital Board 28 Volt Supply Test	Verification of this supply is done by the operator.	If 28V is not present at the rear-panel BNC connector, check the +28V at the test point on the power conversion board. If the 28V is not present, replace the power conversion board. If the +28V is present on the power conversion board, send the instrument to a Tektronix Service Center for repair.
	Digital Board Audio Test	No audio was heard.	Verify that audio is not muted and level is set properly using Windows Volume control. If this does not correct the problem, send the instrument to a Tektronix Service Center for repair.
Narrow Band Acquisition Test	NB ID Verification	ID Verification Failed.	Send the instrument to a Tektronix Service Center for repair.
	NB FPGA Load Test	Bad FPGA file path. The file was not found in the directory.	Send the instrument to a Tektronix Service Center for repair.
		FPGA Load Failed.	Send the instrument to a Tektronix Service Center for repair.
		DCM Not locked.	Send the instrument to a Tektronix Service Center for repair.
	NB Register R/W Test	Read /Write test failed.	Send the instrument to a Tektronix Service Center for repair.

Module	Test	Error message	Recommended action
	NB ID, Load, R/W, and DCM Lock Test	Error reading Board ID.	Send the instrument to a Tektronix Service Center for repair.
		FPGA Load Failed.	Send the instrument to a Tektronix Service Center for repair.
		Bad FPGA File Path. File not found in directory.	If the FPGA file was not found, reinstall the product software (use Tektronix part number 020-2715-XX).
		Diagnostic R/W Failed.	Send the instrument to a Tektronix Service Center for repair.
		ADC DCM Not Locked.	Send the instrument to a Tektronix Service Center for repair.
		Local Bus DCM Not Locked.	Send the instrument to a Tektronix Service Center for repair.
	NB LVDS Test	NB LVDS test failed.	Send the instrument to a Tektronix Service Center for repair.
	NB Free Run Trigger Test	Free run trigger test failed.	Send the instrument to a Tektronix Service Center for repair.
	NB Acq Pattern Test	Unexpected Acquisition data.	Send the instrument to a Tektronix Service Center for repair.
		Trigger timeout occurred.	Send the instrument to a Tektronix Service Center for repair.
	NB Dither Test	Dither amplitude test failed. Dither frequency test failed.	Send the instrument to a Tektronix Service Center for repair.
	CW Acquisition Test	ADC Over range.	Signal too strong. Run signal path test. If the signal path test passes and this test fails, send the instrument to a Tektronix Service Center for repair.
		Signal below -50dBm.	Verify that the IF cable from the RF deck to the Narrowband Acquisition board IF connector is firmly connected. Repeat the test, if the problem persists, send the instrument to a Tektronix Service Center for repair.
		No signal found in acquired spectrum.	Verify Normalization source is functional by running the Signal Path test. If that test passes and this test still fails, send the instrument to a Tektronix Service Center for repair.
Wide Band Acquisition Test	WB ID Verification	ID Verification Failed.	Send the instrument to a Tektronix Service Center for repair.

Module	Test	Error message	Recommended action
	WB FPGA Load Test	FPGA File Not Found.	Reinstall the product software (use Tektronix part number 020-2715-XX).
		FPGA Load Failed.	Send the instrument to a Tektronix Service Center for repair.
		DCM Not locked.	Send the instrument to a Tektronix Service Center for repair.
	WB Register R/W Test	Read / Write test failed.	Send the instrument to a Tektronix Service Center for repair.
		Returns read and write values.	Send the instrument to a Tektronix Service Center for repair.
	WB ID, Load, R/W, and DCM Lock Test	Error reading board ID.	Send the instrument to a Tektronix Service Center for repair.
		FPGA Load Failed.	Send the instrument to a Tektronix Service Center for repair.
		FPGA File Not Found.	Reinstall the product software (use Tektronix part number 020-2715-XX).
		Diagnostic R/W Failed.	Send the instrument to a Tektronix Service Center for repair.
		ADC DCM Not Locked.	Send the instrument to a Tektronix Service Center for repair.
		Local Bus DCM Not Locked.	Send the instrument to a Tektronix Service Center for repair.
	WB LVDS Test	WB LVDS test failed.	Send the instrument to a Tektronix Service Center for repair.
	WB Free Run Trigger Test	Free run trigger test failed.	Send the instrument to a Tektronix Service Center for repair.
	WB Acq Pattern Test	Unexpected Acquisition data.	Send the instrument to a Tektronix Service Center for repair.
		Trigger timeout occurred.	Send the instrument to a Tektronix Service Center for repair.
	WB Dither Test	Dither amplitude test failed. Dither frequency test failed.	Send the instrument to a Tektronix Service Center for repair.
	WB CW Acquisition Test	ADC Overrange.	Signal too strong. Run signal path test, if that test passes, but this test still fails, send the instrument to a Tektronix Service Center for repair.
		Signal below -50dBm.	Verify that the IF cable from the RF deck to the Narrowband Acquisition board IF connector is firmly connected. Repeat the test, if the problem persists, send the instrument to a Tektronix Service Center for repair.

Module	Test	Error message	Recommended action
		No signal found in acquired spectrum.	Verify Normalization source is functional by running the Signal Path test. If that test passes and this test still fails, send the instrument to a Tektronix Service Center for repair.
DPSA Board	DPSA ID Verification	DPSA Board ID Verification Failed.	If ID was not found or a board other than the DPSA Board was found, Version/ID is nonfunctional. Replace the RTT/DPSA Board.
	DPSA and Power Trigger FPGA Load Test	Bad DPSA FPGA file path. The file was not found in the directory.	Reinstall the product software (use Tektronix part number 020-2715-XX).
		Bad Power Trigger FPGA file path. The file was not found in the directory.	Reinstall the product software (use Tektronix part number 020-2715-XX).
		DPSA FPGA Load Failed.	Replace the RTT/DPSA board. If the problem persists, send the instrument to a Tektronix Service Center for repair.
		Power Trigger FPGA Load Failed.	Replace the RTT/DPSA board. If the problem persists, send the instrument to a Tektronix Service Center for repair.
		DCM Not locked.	Replace the RTT/DPSA board. If the problem persists, send the instrument to a Tektronix Service Center for repair.
	DPSA Register R/W Test	Read /Write test failed.	Replace the RTT/DPSA board. If the problem persists, send the instrument to a Tektronix Service Center for repair.
		Returns read and write values.	Replace the RTT/DPSA board. If the problem persists, send the instrument to a Tektronix Service Center for repair.
	DPSA Frame Transfer Test	FPGA File not found.	Reinstall the product software (use Tektronix part number 020-2715-XX).
		FPGA Load Failed.	Replace the RTT/DPSA board. If the problem persists, send the instrument to a Tektronix Service Center for repair.
		Frame data test failed when looking for incrementing pattern.	Replace the RTT/DPSA board. If the problem persists, send the instrument to a Tektronix Service Center for repair.

Module	Test	Error message	Recommended action
	DPSA LVDS Test	The DPSA LVDS test failed.	Replace the RTT/DPSA board. If the problem persists, send the instrument to a Tektronix Service Center for repair.
	FM/AM Audio Test	No audio was heard.	Replace the RTT/DPSA board. If the problem persists, send the instrument to a Tektronix Service Center for repair.
First LO Module	First LO ID Test	Board not found.	Run the PPC load test. This will rerun hardware discovery. If error persists, send the instrument to a Tektronix Service Center for repair.
	First LO FPGA Load Test	FPGA Load failed.	Send the instrument to a Tektronix Service Center for repair.
	First LO Register R/W Test	Read /Write test failed.	Send the instrument to a Tektronix Service Center for repair.
	First LO ADC test	Offset loop error exceeds positive threshold.	Warning only.
		Offset loop error exceeds negative threshold.	Warning only.
		Yig loop is unlocked.	Send the instrument to a Tektronix Service Center for repair.
		Coarse loop is unlocked.	Send the instrument to a Tektronix Service Center for repair.
		Fine loop is unlocked.	Send the instrument to a Tektronix Service Center for repair.
		15V supply voltage is over/under voltage.	Run the RF Interface ADC test to verify a power supply problem. Check the Digital Interface board power supply status LEDs. (See Table 4-9.)
		8V supply voltage is over/under voltage.	Run the RF Interface ADC test to verify a power supply problem. Check the Digital Interface board power supply status LEDs. (See Table 4-9.)
		20V supply voltage is over/under voltage.	Run the RF Interface ADC test to verify a power supply problem. Check the Digital Interface board power supply status LEDs. (See Table 4-9.)

Module	Test	Error message	Recommended action
First Converter Module	First LO ID Test	Board not found.	Run the PPC load test. This will rerun hardware discovery. If error persists, send the instrument to a Tektronix Service Center for repair.
	First LO FPGA Load Test	FPGA Load failed.	Send the instrument to a Tektronix Service Center for repair.
	First Converter ADC test	FLK027 IF Ampl Drain over/under Current.	Send the instrument to a Tektronix Service Center for repair.
		FLK107 IF Amp Drain over/under Current.	Send the instrument to a Tektronix Service Center for repair.
		HMC464 LO Amp Drain over/under Current.	Send the instrument to a Tektronix Service Center for repair.
		UA5M20MC LO Amplifier Drain over/under Current.	Send the instrument to a Tektronix Service Center for repair.
		UA5M20MC Doubler Amplifier Drain over/under Current.	Send the instrument to a Tektronix Service Center for repair.
		5V Supply Over/Under Voltage.	Run the RF Interface ADC test to verify a power supply problem. Check the Digital Interface board power supply status LEDs. (See Table 4-9.)
		8V Supply Over/Under Voltage.	Run the RF Interface ADC test to verify a power supply problem. Check the Power Conversion board power supply status LEDs. (See Table 4-9.)
		10V Supply Over/Under Voltage.	Run the RF Interface ADC test to verify a power supply problem. Check the Power Conversion board power supply status LEDs. (See Table 4-9.)
		11.5V Supply Over/Under Voltage.	Run the RF Interface ADC test to verify a power supply problem. Check the Power Conversion board power supply status LEDs; see table 4-9.
		3V Supply Over/Under Voltage.	Run the RF Interface ADC test to verify a power supply problem. Check the Digital Interface board power supply status LEDs. (See Table 4-9.)

Module	Test	Error message	Recommended action
		-5V Supply Over/Under Voltage.	Run the RF Interface ADC test to verify a power supply problem. Check the Power Conversion board power supply status LEDs. (See Table 4-9.)
Second Converter Module	Second Converter ID Test	Board not found.	Run the PPC load test. This will rerun hardware discovery. If error persists, send the instrument to a Tektronix Service Center for repair.
	Second Converter ADC Test	LO2 Amplitude LOW	Send the instrument to a Tektronix Service Center for repair.
		No LO2 PLL Beatnote.	Send the instrument to a Tektronix Service Center for repair.
		LO2 not Phase Locked.	Send the instrument to a Tektronix Service Center for repair.
		LO2 Frequency control DAC is set too High.	Send the instrument to a Tektronix Service Center for repair.
		LO2 Frequency control DAC is set too Low.	Send the instrument to a Tektronix Service Center for repair.
Third IF Module	Third Converter ID Test	Board not found.	Run the PPC load test. This will rerun hardware discovery. If error persists, send the instrument to a Tektronix Service Center for repair.
	Third IF FPGA Load Test	FPGA Load failed.	Send the instrument to a Tektronix Service Center for repair.
	Third IF Register R/W Test	Read /Write test failed.	Send the instrument to a Tektronix Service Center for repair.
		Returns read and write values.	Send the instrument to a Tektronix Service Center for repair.
	Third IF ADC Test	3rd IF Offset Fine Step PII not locked.	Send the instrument to a Tektronix Service Center for repair.
		3rd IF Offset PII not locked.	Send the instrument to a Tektronix Service Center for repair.
		3rd IF Output PII not locked.	Send the instrument to a Tektronix Service Center for repair.
		3rd IF Output Pll Tune voltage out of range.	Run the RF Interface ADC test to verify a power supply problem.
		The +5V supply to the 3rd IF board is under voltage.	Run the RF Interface ADC test to verify a power supply problem. Check the Digital Interface board power supply status LEDs. (See Table 4-9.)

Module	Test	Error message	Recommended action
		The -12V supply to the 3rd IF board is over voltage.	Run the RF Interface ADC test to verify a power supply problem.
		The 12V supply to the 3rd IF board is over voltage.	Run the RF Interface ADC test to verify a power supply problem. Check the Digital Interface board power supply status LEDs. (See Table 4-9.)
		The 25V supply to the 3rd IF board is over voltage.	Run the RF Interface ADC test to verify a power supply problem. Check the Power Conversion board power supply status LEDs. (See Table 4-9.)
		The +5VA supply to the 3rd IF board is under voltage.	Run the RF Interface ADC test to verify a power supply problem. Check the Digital Interface board power supply status LEDs. (See Table 4-9.)
		The +5VA supply to the 3rd IF board over current.	Send the instrument to a Tektronix Service Center for repair.
		The +5VB supply to the 3rd IF board over current.	Send the instrument to a Tektronix Service Center for repair.
		The +5VC supply to the 3rd IF board over current.	Send the instrument to a Tektronix Service Center for repair.
Reference Oscillator Module	Reference Oscillator ID Test	Board not found.	Run the PPC load test. This will rerun hardware discovery. If error persists, send the instrument to a Tektronix Service Center for repair.
	Reference Oscillator FPGA Load Test	FPGA Load failed.	Send the instrument to a Tektronix Service Center for repair.
	Reference Oscillator Register R/W Test	Read /Write test failed.	Send the instrument to a Tektronix Service Center for repair.
	Reference Oscillator ADC test	VXCO is not locked.	Send the instrument to a Tektronix Service Center for repair.
		External Ref PLL is unlocked.	Information only.
		REF_OSC_CW_ALC_DAC is under/over voltage.	Send the instrument to a Tektronix Service Center for repair.
		100 MHz Tune Voltage is under/over voltage.	Send the instrument to a Tektronix Service Center for repair.
		10 MHz Tune Voltage is under/over voltage.	Send the instrument to a Tektronix Service Center for repair.
		Oven is under/over current.	Send the instrument to a Tektronix Service Center for repair.

Module	Test	Error message	Recommended action
RF Interface Board	RF Interface ID Test	Board not found.	Run the PPC load test. This will rerun hardware discovery. If error persists, replace the RF Interface board.
	RF Interface FPGA Load Test	FPGA Load failed.	Replace RF Interface board.
	RF Interface ADC test	The 15 Volt supply is over voltage.	Replace the Power Conversion board. If the problem persists, replace the RF Interface board. If the problem persists, replace the power supply. If the problem persists, send the instrument to a Tektronix Service Center for repair.
		The 15 Volt supply is under voltage.	Replace the Power Conversion board. If the problem persists, replace the RF Interface board. If the problem persists, replace the power supply. If the problem persists, send the instrument to a Tektronix Service Center for repair.
		The 8 Volt supply is over voltage.	Replace the Power Conversion board. If the problem persists, replace the RF Interface board. If the problem persists, replace the power supply. If the problem persists, send the instrument to a Tektronix Service Center for repair.
		The 8 Volt supply is under voltage.	Replace the Power Conversion board. If the problem persists, replace the RF Interface board. If the problem persists, replace the power supply. If the problem persists, send the instrument to a Tektronix Service Center for repair.
		The 12 Volt supply is over voltage.	Replace the Power Conversion board. If the problem persists, replace the RF Interface board. If the problem persists, replace the power supply. If the problem persists, send the instrument to a Tektronix Service Center for repair.

Module	Test	Error message	Recommended action
		The 12 Volt supply is under voltage.	Replace the Power Conversion board. If the problem persists, replace the RF Interface board. If the problem persists, replace the power supply. If the problem persists, send the instrument to a Tektronix Service Center for repair.
		The 30 Volt supply is over voltage.	Replace the Power Conversion board. If the problem persists, replace the RF Interface board. If the problem persists, replace the power supply. If the problem persists, send the instrument to a Tektronix Service Center for repair.
		The 30 Volt supply is under voltage.	Replace the Power Conversion board. If the problem persists, replace the RF Interface board. If the problem persists, replace the power supply. If the problem persists, send the instrument to a Tektronix Service Center for repair.
		The -8 Volt supply is under voltage.	Replace the Power Conversion board. If the problem persists, replace the RF Interface board. If the problem persists, replace the power supply. If the problem persists, send the instrument to a Tektronix Service Center for repair.
		The -8 Volt supply is under voltage.	Replace the Power Conversion board. If the problem persists, replace the RF Interface board. If the problem persists, replace the power supply. If the problem persists, send the instrument to a Tektronix Service Center for repair.
		The -15 Volt supply is over voltage.	Replace the Power Conversion board. If the problem persists, replace the RF Interface board. If the problem persists, replace the power supply. If the problem persists, send the instrument to a Tektronix Service Center for repair.

Module	Test	Error message	Recommended action
		The -15 Volt supply is under voltage.	Replace the Power Conversion board. If the problem persists, replace the RF Interface board. If the problem persists, replace the power supply. If the problem persists, send the instrument to a Tektronix Service Center for repair.
		The -5 Volt supply is over voltage.	Replace the Power Conversion board. If the problem persists, replace the RF Interface board. If the problem persists, replace the power supply. If the problem persists, send the instrument to a Tektronix Service Center for repair.
		The -5 Volt supply is under voltage.	Replace the Power Conversion board. If the problem persists, replace the RF Interface board. If the problem persists, replace the power supply. If the problem persists, send the instrument to a Tektronix Service Center for repair.
		The 2.5 Volt supply is over voltage.	Replace the Power Conversion board. If the problem persists, replace the RF Interface board. If the problem persists, replace the power supply. If the problem persists, send the instrument to a Tektronix Service Center for repair.
		The 2.5 Volt supply is under voltage.	Replace the Power Conversion board. If the problem persists, replace the RF Interface board. If the problem persists, replace the power supply. If the problem persists, send the instrument to a Tektronix Service Center for repair.
		LNA current is too high Upper limit = .095A Current read = .xxA	Send the instrument to a Tektronix Service Center for repair.
		LNA current is too low Lower limit = .055A Current read = .xxxA	Send the instrument to a Tektronix Service Center for repair.
20 GHz Module	ID Test	Board Not Found	Send the instrument to a Tektronix Service Center for repair.
	FPGA Load	FPGA Load Failed	Send the instrument to a Tektronix Service Center for repair.

Module	Test	Error message	Recommended action
	Read/Write Test	Read/Write Test Failed	Send the instrument to a Tektronix Service Center for repair.
	Diag ADC Test	5VA Supply Over Voltage	Send the instrument to a Tektronix Service Center for repair.
		5VA Supply Under Voltage	Send the instrument to a Tektronix Service Center for repair.
		5VC Supply Over Voltage	Send the instrument to a Tektronix Service Center for repair.
		5VC Supply Under Voltage	Send the instrument to a Tektronix Service Center for repair.
		5VPin Supply Over Voltage	Send the instrument to a Tektronix Service Center for repair.
		5VPin Supply Under Voltage	Send the instrument to a Tektronix Service Center for repair.
		-40V Supply Under Voltage	Send the instrument to a Tektronix Service Center for repair.
		-40V Supply Over Voltage	Send the instrument to a Tektronix Service Center for repair.
		–5VPin Supply Over Voltage	Send the instrument to a Tektronix Service Center for repair.
		-5VPin Supply Under Voltage	Send the instrument to a Tektronix Service Center for repair.
Signal Path	Signal Path Test	The attenuator test failed.	Send the instrument to a Tektronix Service Center for repair.
		The 200 MHz CW normalization source to 3rd IF path test failed.	Send the instrument to a Tektronix Service Center for repair.
		The PRN normalization source to 3rd IF path test failed.	Send the instrument to a Tektronix Service Center for repair.
		The 100 MHz CW normalization source to 3rd IF path test failed.	Send the instrument to a Tektronix Service Center for repair.
		The 3 GHz preamp path test failed.	Send the instrument to a Tektronix Service Center for repair.
		The 200 MHz CW source to NB Acquisition Board path failed.	Send the instrument to a Tektronix Service Center for repair.
		The 200 MHz CW source to WB Acquisition Board path failed.	Send the instrument to a Tektronix Service Center for repair.

Module	Test	Error message	Recommended action
Front Panel	Front Panel Test	Front Panel LCD test failed.	Replace the LCD display.
		Front Panel Button test failed.	Replace the front panel keypad.
	Sweep Speed Test	Sweep Speed failed.	Information only.
		A failure indicates that the sweep time is too long.	
		Failure limits are set wide: the WB failure limit equals 5 seconds and NB failure limit equals 10 seconds.	

Replaceable Parts

Replaceable Parts

This section contains a list of the replaceable modules for the instrument. Use this list to identify and order replacement parts.

Parts Ordering Information

Replacement parts are available through your local Tektronix field office or representative.

Changes to Tektronix products are sometimes made to accommodate improved components as they become available and to give you the benefit of the latest improvements. Therefore, when ordering parts, it is important to include the following information in your order:

- Part number
- Instrument type or model number
- Instrument serial number
- Instrument modification number, if applicable

If you order a part that has been replaced with a different or improved part, your local Tektronix field office or representative will contact you concerning any change in part number.

Module Servicing Modules can be serviced by selecting one of the following three options. Contact your local Tektronix service center or representative for repair assistance.

Module Exchange. In some cases you may exchange your module for a remanufactured module. These modules cost significantly less than new modules and meet the same factory specifications. For more information about the module exchange program, call 1-800-833-9200. Outside North America, contact a Tektronix sales office or distributor; see the Tektronix Web site for a list of offices: www.tektronix.com.

Module Repair and Return. You may ship your module to us for repair, after which we will return it to you.

New Modules. You may purchase replacement modules in the same way as other replacement parts.
Using the Replaceable Parts List

This section contains a list of the mechanical and/or electrical components that are replaceable for the instrument. Use this list to identify and order replacement parts. The following table describes each column in the parts list.

Column	Column name	Description Items in this section are referenced by figure and index numbers to the exploded view illustrations that follow.				
1	Figure & index number					
2	Tektronix part number	Use this part number when ordering replacement parts from Tektronix.				
3 and 4 Serial number		Column three indicates the serial number at which the part was first effective. Column four indicates the serial number at which the part was discontinued. No entry indicates the part is good for all serial numbers.				
5	Qty	This indicates the quantity of parts used.				
6	Name & description	An item name is separated from the description by a colon (:). Because of space limitations, an item name may sometimes appear as incomplete. Use the U.S. Federal Catalog handbook H6-1 for further item name identification.				

Abbreviations Abbreviations conform to American National Standard ANSI Y1.1-1972.

Table 5-1: External parts

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
5-1-1	200-5163-00			1	COVER; TOP COSMETIC, ALUM; SAFETY CONTROLLED
-2	367-0528-00			1	HANDLE,CARRYING; DUAL DUROMETER MOLDED,POLYPROPYLENE,VINYL GRIP SECTION,SAFETY CONTROLLED
					ATTACHED PARTS
	407-4887-00			1	BRACKET; HANDLE BASE,PC/ABS ALLOY,BAYER BAYBLEND FR-110,TEK BLUE,SAFETY CONTROLLED
					END ATTACHED PARTS
-3	212-0234-00			2	SCREW, MACHINE; 8-32X 1-1/2 PAN, TORX, ZINC PLATED STEEL, BLACK, 8C150MTPKZ
-4	211-0720-00			4	SCR, ASSEM WSHR; 6-32 X 0.500, PNH, STEEL, ZINC FINISH, T15 TORX DR, MACHINE
-5	348-1648-00			4	FOOT; REAR W/CORD WRAP, THERMO PLASTIC; SAFETY CONTROLLED
-6	200-5173-00			1	COVER; BOTTOM, INTERNAL; SAFETY CONTROLLED
-7	200-5196-00			1	COVER; BOTTOM COSMETIC; SAFETY CONTROLLED
-8	211-1224-00			11	SCREW, 6-32 X 0.375L, PNH, BLACK, T15, NYLOC
-9	211-1050-00			34	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STEEL, ZINC FINISH, T15
-10	200-4519-00			1	COVER,FRONT; PC ABS,17.420L X 8.670W X 2.000TH,TEK BLUE
-11	333-4664-00)		1	Replaced by item 19.
-12	211-1224-00			3	SCREW, 6-32 X 0.375L, PNH, BLACK, T15, NYLOC
-13	101-0152-00			1	Replaced by item 19.
-14	200-5149-00			1	COVER; TOP,INTERNAL; SAFETY CONTROLLED
-15	407-5530-00			2	BRACKET, MOUNTING; CARRYING HANDLE, LANCER
-16	367-0542-00			2	HANDLE, CARRYING; 0.375 AL, POWDER COAT, PEKING GRAY FULLER OBRIEN, SAFETY CONTROLLED
-17	211-1230-00			4	SCREW; 10-32X.500 SOC CAP,18-8 ZINC PLATED STEEL
-18	212-0650-00			4	SCREW,MACHINE; 10-32 X 0.437,FLH,100 DEG,SST PSVT,POZ
-19	101-0170-00			1	COSMETIC FRONT (ACQUISITION TO TRIG AND TRIM)
not shown	020-3016-00			1	SOFTWARE; OS RESTORE DVD KIT, WINXP EMBEDDED; RSA61XXB SERIES





Fig. & index	Tektronix part	Serial no.	Serial no. discontid	Otv	Name & description
		enective	discont d	4 1	
0-Z-1 0	200-5143-00			1	
-2	407-5470-00			1	
-3	119-7070-00			I	DISK DRIVE, OPTICAL,CD-RWIDVD-R/RW DVD+R/RW,16.7 MB/SEC,650MEG/8.5GIG,SATA/ATAPI;TEAC MODEL DV-W28S-V93
-4	065-0913-00			1	DRIVE ASSY; REMOVABLE SOLID STATE, PROGRAMMED
-5	407-5473-00			1	BRACKET; HARD DRIVE, 2.5 IN, REMOVABLE
-6	441-2620-01			1	CHASSIS ASSY; HD-FD-FRAME, SAFETY CONTROLLED
-7	211-1050-00			6	SCREW, MACHINE; 6-32 X 0.312L, PNH, STEEL, ZINC FINISH, T15
-8	407-5337-00			1	HDD CABLE BRACKET
-9	174-5349-00			1	CABLE ASSY; SATA COMBO, HARD DRIVE CABLE W LATCH
-10	174-5650-00			1	CABLE, SATA-DVD, DATA AND POWER, SAFETY CONTROLLED
-11	211-0950-00			4	SCREW, MACHINE; M2X.4X3L, PNL, PNH, STEEL
-12	211-1050-00			16	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STEEL, ZINC FINISH, T15
-13	614-1050-00			1	FRONT PANEL CONTROL ASSY,(STD);
-14	174-5080-00			1	CA ASSY,SP; IDC,RIBBON,FRT PANEL TO DIG INTF,2X10; SAFETY CONTROLLED
-15	174-5101-00			1	CA ASSY, SP, IDC, RIBBON, AUDIO COM EXPRESS DC TO DIG INTERF, 2X5
-16	878-0417-00			1	CIRCUIT BD ASSY; USB I/0
-17	878-0411-00			1	CIRCUIT BD SUBASSY; FRONT PANEL BOARD
-18	260-2719-00			1	SWITCH, KEYPAD; ELASTOMERIC, FRONT PANEL
-19	333-4618-00			1	FRONT SUBPANEL; ASSEMBLY, INCLUDES BRACKET, BEZEL, & LABEL, SAFETY CONTROLLED
-20	366-0849-00			1	KNOB; GENERAL PURPOSE
-21	650-5304-00			1	MODULE ASSY; DISPLAY WITH LCD
-22	259-0155-01			1	FLEX CIRCUIT; POWER SWITCH,W/LED
-23	407-5504-00			1	BRACKET, DISPLAY FRONT; SAFETY CONTROLLED
-24	119-7537-00			1	TOUCH SCREEN ; TOUCH PANEL; 10.4 RESISTIVE, 5-WIRE INTERFACE, W/GASKETS
-25	119-7550-00			1	DISPLAY MODULE; LCD;1024 X 768;10.4 INCHES DIAGONAL, TFT, LED
-26	407-5548-00			1	BRACKET, DISPLAY
-27	878-0414-00			1	CIRCUIT BD SUB-ASSY; INTERCONNECT DISPLAY ADAPTER
-28	174-5087-00			1	CA ASSY,SP; IDC,RIBBON,DISP ADAPT TO DIG INTERF,2MM,2X15; SAFETY CONTROLLED
-29	174-5086-00			1	CA ASSY,SP; IDC,RIBBON,DISP ADAPT TO DIG INTERF,2MM,2X10; SAFETY CONTROLLED
-30	174-4791-00			1	CA ASSY; DISPLAY ADAPTER TO XGA DISPLAY, SAFETY CONTROLLED

Table 5-2: Display, front panel, DVD, and removeable hard drive



Figure 5-2: Display, front panel, DVD, and removeable hard drive



Figure 5-3: Detail 1 of display and front panel cabling



Figure 5-4: Detail 2 of display and front panel cabling



Figure 5-5: Detail 3 of display and front panel cabling

Table 5-3: Modules

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
5-6-1	650-5572-00			1	CIRCUIT BD ASSY; COM EXPRESS, PB-FREE
-2	407-5478-00			1	BRACKET, COM EXPRESS CARRIER; SAFETY CONTROLLED
-3	211-1050-00			10	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STEEL, ZINC FINISH, T15
-4	039-0198-00			4	PROCESSOR MODULE; PCI, SOM-5787
-5	214-5296-00			1	FAN, TUBEAXIAL; 12 VDC, 0.073A, 0.876W, 6500 RPM, 6.0 CFM, 40 MM X 10 MM, W/LEADS; SAFETY CONTROLLED
-6	211-1346-00			4	SCREW, MACHINE, PANHEAD M3 X 0.5 X 26 MM, PHILLIPS
-7	863-0273-00			1	CIRCUIT BD ASSY; RTT/DPX,PB-FREE
-8	407-5358-00			1	BRACKET,HEATSINK FAN
-9	436-0435-00			1	FAN ASSEMBLY
-10	664-5898-05			1	CIRCUIT BD ASSY; REALTIME I/Q OUTPUT, (OPT. 05 ONLY)
-11	200-4961-00			1	COVER; REAR PANEL,OPTION(BLANK); SAFETY CONTROLLED (ALL EXCEPT OPT. 05)
-12	Opt 05			1	OPTION 05; IF OUTPUT, DIGITAL IQ OUTPUT
-13	211-0450-00			4	SCREW, MACHINE; 2.5MM X 0.45 X 6MM, PNH, STEEL, ZINC PLATED, T8 TORX DRIVE (OPT. 05 ONLY)
-14	200-4962-00			1	COVER; REAR PANEL, OPTION (I&Q OUT, IF OUT); SAFETY CONTROLLED (OPT. 05 ONLY)
-15	174-5106-01			2	CA ASSY,SP; IDC,TW FLAT,I & Q OUTPUT TO REAR PANEL,50 POS; SAFETY CONTROLLED, (OPT. 05 ONLY)
-16	407-5181-00			1	BRACKET, GROUNDING (LAN AND PS/2)



Figure 5-6: Modules



Figure 5-7: Detail 1 of PC cabling



, 174-5090-00 12 pin power cable

174-5089-00 20 pin power cable

Figure 5-8: Detail 2 of PC cabling



Figure 5-9: Detail of RT/IQ Option 05 cabling

Table 5-4: Power supply and internal hard drive

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
5-10-1	119-6986-06			1	POWER SUPPLY; AC-DC;460W;+3.3V 40A,+5V 34A,+12V 25A,-12V 1A,+5VSB 2A;90-264VAC,47-440HZ
-2	211-0718-00			6	SCREW, MACHINE; 6-32 X 0.312, FLH100, STEEL, ZINC FINISH, T10 TORX DR
-3	407-5477-00			1	BRACKET; POWER SUPPLY; SAFETY CONTROLLED
-4	441-2619-00			1	BRACKET; HARD DRIVE, 3.5 INCH HARD DRIVE
-5	211-1050-00			9	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STEEL, ZINC FINISH, T15
-6	407-5472-00			1	BRACKET; HARD DRIVE, 3.5 INCH HARD DRIVE
-7	065-0914-00			1	DRIVE ASSY, WITH PACKAGING AND COA; FIXED INTERNAL DISK, PROGRAMMED
-8	174-5089-00			1	CA ASSY, PWR; DISCRETE, DIG INTERFACE, 2X10, 18AWG; SAFETY CONTROLLED
-9	174-5090-00			1	CA ASSY,PWR; DISCRETE,DIG INTERFACE,2X6,20AWG; SAFETY CONTROLLED
-10	174-5101-00			1	CA ASSY,SP; IDC,RIBBON,AUDIO SLOTPC TO DIG INTERF,2X5,2MM; SAFETY CONTROLLED
-11	174-5100-00			1	CA ASSY,PWR; IDC,RIBBON,PWR CONV TO BULKHEAD,2X25,0.100 CTR; SAFETY CONTROLLED
-12	664-5887-01			1	CIRCUIT BD ASSY; POWER CONVERSION BOARD,TESTED,664588700,679588700,389366100,WIRED
-13	211-0510-00			8	SCREW, MACHINE; 6-32 X 0.375, PNH, ZINC PLATED STEEL, T15
-14	200-5135-00			1	COVER, POWER SUPPLY
-15	174-5227-00			1	CABLE ASSY;LINE FILTER; SAFETY CONTROLLED
					ATTACHED PARTS
	119-7086-00			1	FILTER,EMI; AC LINE CONNECTOR/INPUT FILTER;6.0A,120-250VAC,DC-400 HZ,2.2 NF CY,100 NF CX,IEC INPUT,FAST-ON/SOLDER LUG OUTPUT,CHASSIS MOUNT,SAFETY CONTROLLED;FN9222-6/06 (LINE FILTER)
					END ATTACHED PARTS
-16	211-0380-00			2	SCREW, MACHINE; 4-40 X 0.375, FLH, STEEL, ZINC FINISH, T8



Figure 5-10: Power supply and internal hard drive



Figure 5-11: Detail of power supply and internal hard drive cabling

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
5-12-1	211-1050-00			25	SCREW,MACHINE; 6-32 X 0.312 L,PNH, STEEL, ZINC FINISH, T10, TORX
-2	436-0424-00			1	ASSY, FAN TRAY; WITH FANS MOUNTED (UPPER DECK); SAFETY CONTROLLED
	119-7182-00			2	FAN, TUBEAXIAL; 12VDC, 0.40A, 4.80W, 2500RPM, 100.6CFM, 120MM, LEADS W/CONN; SAFETY CONTROLLED (SUBPARTS OF 436-0424-00)
	407-5062-00			1	BRACKET; FAN MOUNTING, UPPER DECK; SAFETY CONTROLLED (SUBPART OF 436-0424-00)
-3	174-5212-00			1	CA ASSY,SP; IDC,RIBBON,CONTROL LINES,BULKHEAD TO RF INTERFACE,2X7,0.100CTR SAFETY CONTROLLED
-4	174-5201-00			1	CA ASSY,SP; IDC,RIBBON,GPIB,DIG INTF TO REAR PANEL; SAFETY CONTROLLED
-5	213-1061-00			2	JACKSCREW; 6-32 EXT THD, M3.5 X 0.6-6 INT THD, 410 SS, PASSIVATE
-6	407-5055-00			1	BRACKET ASSY; SPEAKER
-7	119-7172-00			1	SPEAKER; DYNAMIC;28MM DIA,8 OHM,600-7KHZ,MYLAR CONE,MG ELECT 288BB20 WITH 28 INCH CABLE;
-8	407-5480-00			1	BRACKET; BNC ADAPTER
-9	174-5066-00			1	CA ASSY,RF,FLEX-COAX; FRONT PANEL ACQ
-10	436-0423-00			3	ASSY,FAN TRAY; WITH FANS MOUNTED(RF DECK); SAFETY CONTROLLED
	119-7183-00			1	FAN, TUBEAXIAL; 12VDC, 0.23A, 2.76W, 3250RPM, 39CFM, 80MM X 25MM, LEADS W/CONN; SAFETY CONTROLLED (SUBPARTS OF 436-0423-00)
	407-5052-00			1	BRACKET; FAN MOUNTING, RF DECK (SUBPART OF 436-0423-00)

Table 5-5: Upper and lower deck fans



Figure 5-12: Upper and lower deck fans



0648-018



Figure 5-13: Detail of cabling shown in Figure 5-13

Table 5-6: RF interface board and cables

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
5-14-1	878-0155-00			1	CIRCUIT BD SUBASSY; RF INTERFACE BOARD;
-2	211-1050-00			5	SCREW,MACHINE; 6-32 X 0.312 L,PNH,STEEL, ZINC FINISH, T15
-3	174-5097-00			1	CA ASSY,SP; IDC,RIBBON,CONTROL LINES,BULKHEAD TO RF INTERFACE,2X7; SAFETY CONTROLLED
-4	174-5119-00			1	CA ASSY,PWR; IDC,RIBBON,BULKHEAD TO RF INTERF,2X25,0.100 CTR; SAFETY CONTROLLED



Figure 5-14: RF interface board and cables