

MAINTENANCE AND INTERFACING INFORMATION

Preventive Maintenance

There are no special preventive maintenance procedures that apply to the SG 503. Refer to the power module instruction manual for general preventive maintenance procedures and instructions.

Corrective Maintenance

Refer to the power module instruction manual for general corrective maintenance procedures and instructions.

System Maintenance

System maintenance procedures are provided in the power module manual; i.e., preventive maintenance, troubleshooting aids, parts removal and replacement procedures, parts ordering information, etc.

In certain areas in this instrument, it is not recommended to use a suction type desoldering tool when repairing or replacing parts. Use a soldering wick when removing or replacing oscillator coils or the Output Buffer Amplifier (Q190).

Oscillator Maintenance

The oscillator sections can be checked out independent of the leveling circuitry (feedback loop) by removing Q300 and connecting a 500-ohm potentiometer between the socket pins for the collector and emitter.

When replacing components for the oscillator sections be certain that they are as close to the original mechanical layout as possible. Lead length for the transistors, Q130 and Q140, should be 0.2 inch. Replace the heat sinks as originally installed (flush with the top of the transistor case). Do not allow any heat sink to touch any other part or the chassis. Distributed capacity from Q140 heat sinks to surroundings determines the upper frequency limit on the 100-250 megahertz range.

The air-core coil for the 100-250 megahertz range should not need adjustment or repair. If it becomes necessary to perform a repair in this area, use extreme caution and do not break or damage the 50 nanofarad disc capacitor that grounds one end of the coil to the variable capacitor.

Replacing Output Buffer Amplifier

WARNING

The ceramic portions of power transistor Q190 contain BERYLLIUM OXIDE as a major ingredient. Beryllium Oxide heat sinks are safe under most conditions. The only hazard is that a toxic effect may occur if fumes or fine particles are inhaled. Grinding, crushing, or heating above 1800° F can produce fumes or fine particles. Avoidance of such action and subsequent inhalation will assure the absence of any hazard. No hazard is present in normal instrument operation or maintenance.

The Output Buffer Amplifier power transistor (Q190) can be replaced without removing the Attenuator-Output Buffer Amplifier circuit board by unsoldering the leads and removing a 5/16 nut on the mounting stud. Cut the leads of the new transistor to the proper length, keeping note of the position of the collector lead. Apply Dow Corning 4 silicone compound on the under surface of the transistor and about two threads of the mounting stud. Use a very small amount and avoid placing silicone compound on the transistor leads or on the ceramic case. Orient the collector lead toward the rear of the instrument. Seat the transistor to its heat sink and tighten the 5/16 nut on the mounting stud. For efficient heat sinking, the maximum torque for first time replacement should be 6 and 1/2 inch-pounds and 5 inch-pounds for repeated installation of the same transistor. When resoldering the transistor leads to the circuit board, avoid large amounts of solder which may flow through the circuit board holes.

Removal and Replacement of Attenuator-Output Buffer Circuit Board

Remove metal shield cover for the attenuators. The circuit board is held in place by six screws. Four corner screws hold this circuit board to the main board and two counter-sunk screws hold the Output Buffer Amplifier heat sink bracket to the side rail of the chassis. For removal of this board, it may be necessary to loosen the screws holding the main circuit board to the same side rail so that the heat-sink bracket can be withdrawn.

NOTE

Do not loosen the three nuts that hold the heat sink bracket to the circuit board. If it becomes necessary to remove this heat sink from the circuit board it is important to reinstall the three 35-mil washers and plastic insulation between the heat sink and the under side of the board.

When replacing the Attenuator-Output Buffer circuit board, ensure that all pin connections from the main circuit board are aligned and seated properly. Install the six screws, but do not tighten. The two counter-sunk screws on the chassis side rail must be tightened first in order to ensure efficient heat transfer and minimum stress. Tighten the main circuit board screws, and then tighten the four Attenuator-Output Buffer Amplifier circuit board screws last. Replace metal shield.

Alignment of FREQUENCY RANGE (MHz) Control

If it becomes necessary to remove this knob from the front panel, or if it becomes loose on the shaft of the high frequency cam switch, alignment upon reinstallation is accomplished by setting the cam switch on the 50-100 megahertz range. This position can be noted by observing when the three switch contacts on the main circuit board first open when rotating the shaft clockwise.

Selected Component Criteria

If the 0.5-1.0 MHz frequency range is outside the specified range, C118 may be selected to raise or lower the frequency range. Optimum value is normally 33 pF, with 20 pF to 47 pF as upper and lower limits. An increase in capacitance will lower the frequency.

Resistor R118 is selected for oscillator stability (e.g., the oscillator may break in and out of oscillation). The nominal value is approximately 470 Ω, with a range of values from 300 Ω to 1 kΩ.

Resistor R116 is also selected for oscillator stability with the same range of values as R118.

Resistor R177 is selected for improved oscillator leveling at 250 MHz. If the oscillator at 250 MHz has an uneveled output, a 10 Ω resistor may be installed between the Main Board (A1) and the Attenuator-Output Buffer Board (A3). The only choice for R177 is either a 10 Ω resistor or no resistor at all.

		Rear View		
		Pin # Left (B side)	Right (A side)	
28B	28A	28	Floating ground for SINE OUT	SINE OUT
27B	27A	27	Decimal .XXX (10^{-1})	Floating ground for SINE OUT
26B	26A	26	Decimal X.XX (10^0)	Reference Ground for BCD and Decimal Output
25B	25A	25	Floating ground for pin #24B	LSD, BCD, (3D) (8)
24B	24A	24	Signal input referenced to pin #25B	MSD, BCD, (1A) (1)
23B	23A	23	Decimal XX.X (10^1)	MSD, BCD, (1B) (2)
22B	22A	22	Floating ground for REMOTE Amplitude	MSD, BCD (1C) (4)
21B	21A	21	REMOTE Amplitude input	MSD, BCD, (1D) (8)
	20A	20	No connection	MD, BCD (2A) (1)
	19A	19	No connection	MD, BCD (2B) (2)
	18A	18	No connection	MD, BCD (2C) (4)
	17A	17	No connection	MD, BCD (2D) (8)
	16A	16	No connection	LSD, BCD (3A) (1)
	15A	15	No connection	LSD, BCD (3B) (2)
	14A	14	No connection	LSD, BCD (3C) (4)

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Fig. 4-1. Input/Output assignments at rear connector.

Troubleshooting

Use the Performance Check, Adjustment Procedure, and Circuit Description as aids to locate trouble in the event of equipment failure. The test equipment listed in the Performance Check and Adjustment Procedure will prove useful in troubleshooting the SG 503.

Functions Available at Rear Connector

A slot between pins 23 and 24 on the rear connector identifies the SG 503 as a member of the signal source family. Insert a barrier in the corresponding position of the power module jack to prevent other than signal source plug-ins from being used in that compartment. This protects the plug-in should specialized connections be made to that compartment. Consult the Building A System section of the power module manual for further information.

Signal outputs, or other specialized connections, may be made to the rear interface connectors as shown in Fig. 4-1. The instrument is not supplied with these connections. If you wish to wire them to the interface connector, consult your local Tektronix Field Office or representative for further information.

REPACKAGING FOR SHIPMENT

If the Tektronix instrument is to be shipped to a Tektronix Service Center for service or repair, attach a tag showing: owner (with address) and the name of an individual at your firm that can be contacted. Include complete instrument serial number and a description of the service required.

Save and re-use the package in which your instrument was shipped. If the original packaging is unfit for use or not available, repackage the instrument as follows:

Surround the instrument with polyethylene sheeting to protect the finish of the instrument. Obtain a carton of corrugated cardboard of the correct carton strength and having inside dimensions of no less than six inches more than the instrument dimensions. Cushion the instrument by tightly packing three inches of dunnage or urethane foam between carton and instrument, on all sides. Seal carton with shipping tape or industrial stapler.

The carton test strength for your instrument is 200 pounds.