

Section 6 Maintenance

6.1 Introduction

This section contains periodic maintenance and performance test procedures for Paradigm Wireless Systems MAF 900-60S Multi-Carrier Power Amplifier.

NOTE

Check your sales order and equipment warranty before attempting to service or repair the unit. Do not break the seals on equipment under warranty or the warranty will be voided. Do not return equipment for warranty or repair service until proper shipping instructions are received from the factory.

6.2 Periodic Maintenance

Periodic maintenance is recommended. Table 6-1 lists the intervals at which the task should be performed.

Table 6-1 Periodic Maintenance

<i>Task</i>	<i>Interval</i>	<i>Action</i>
Inspection		
Cables and Connectors	3 months	Inspect signal and power cables for frayed insulation. Check RF connectors ensure connectors are tight
Performance Tests	12 months	Annual performance test as outlined in paragraph 6.4
Clean Fans/Heat Sinks	3 months	Inspect for debris. Remove dust with soft cloth, brush or vacuum cleaner.

6.3 Test Equipment Required for Test

Test equipment required to test the amplifier is listed in table 6-2. Equivalent test equipment may be substituted for any item. Use of a thermistor type power meter is recommended for optimum results.

NOTE

All RF test equipment must be calibrated and within the calibration date. Any deviation from the nominal attenuation must be accounted for and factored into all output readings.

Table 6-2 Test Equipment Required

Nomenclature	Manufacturer	Model
Network Analyzer	Agilent	8753 ET
Spectrum Analyzer	Agilent	8560E
Power Meter	Agilent	E4418B
Power Meter/Sensor	Agilent	437B / 8481A
Signal Generator	RDL	IMD-801D-03A
Directional Coupler	Agilent	778D
Attenuator	Weinschel Corp	53-30-34
Attenuator	Narda	766-20

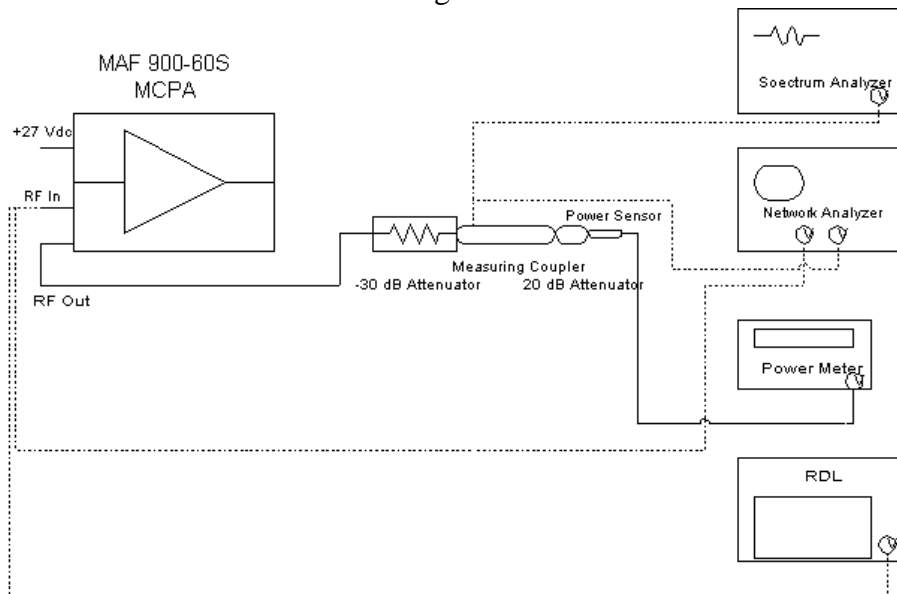
6.4 Performance Test

Performance test should be performed every 12 months to ensure that the amplifier meets the operational specifications.

NOTE

The frequencies used in this test are typically within the operating 5 MHz band of 935 MHz to 940 MHz. Select evenly spaced F1, F2, F3, and F4 frequencies that cover the instantaneous bandwidth of your system.

Figure 6-2



6.5 Amplifier Performance Test

To perform this test proceed as follows:

Connect test equipment as shown in figure 6-2.

WARNING
DO NOT APPLY ANY RF AT THIS TIME

6.6 Amplifier Spurious Emission Test:

Apply +27 Vdc from the power source. Apply 4-15 Watt continuous random tones from the RDL to the MAF 900-60S MCPA. Composite power will be 60 Watts measured from the Power Meter. Setup Spectrum Analyzer for Center Frequency (937.00 MHz), Start Frequency (930 MHz), Stop Frequency (945 MHz) Span (200 kHz) RES BW (1.0 kHz) Video BW (1.0 kHz) Measure and record data on Table 6-3.

6.7 Gain Test:

Disconnect spectrum analyzer from the MAF 900-60S. Connect Network Analyzer to MCPA.

Set Network Analyzer as follows:

- a. Normalize Network Analyzer for gain and return loss.
- b. Set start frequency to 935 MHz. Set stop frequency to 940 MHz. Setup Network Analyzer for 2- channel measurement. Set markers to 935 MHz, 937 MHz, 940 MHz.
- c. Adjust input power of Network Analyzer to measure 60 watts on the Power Meter.
- d. Measure and record amplifier gain on Table 6-3.
- e. Set marker to 935 MHz scroll marker (delta) across bandwidth to 940 MHz. Measure Gain Flatness and record on table 6-3.
- f. With Network Analyzer setup for 2-channel operation measure return loss using S_{11} data Record on. Table 6-3.

Table 6-3 MAF 900-60S MCPA Test Data Sheet

Date_____

Module S/N_____

TEST CONDITIONS:

Load and Source Impedance: 50 Ohms

VSWR: < 1.2:1

Supply Voltage: +27 Vdc

Temperature: Room Temperature

TEST	SPECIFICATION	MIN	MAX	DATA
Spurious Emission	Voltage = +27 Vdc $P(out) = 15$ Watts per channel 935 MHz-940MHz		-63 dBc	
RF Gain	Voltage = +27 Vdc $P(out) = 60$ Watts 935 MHz-940MHz	58 dB		
Gain Flatness	Voltage = +27 Vdc $P(out) = 60$ Watts 935 MHz-940MHz		± 0.5 dB	
Input Return Loss	Voltage = +27 Vdc $P(out) = 60$ Watts 935 MHz-940MHz	-15 dB		

PASS_____

FAIL_____

Tested By:_____

6.8 Field Replacement of the MAF 900-60S

The MAF 900-60S MCPA can be replaced in the field on the site by a qualified technician with experience maintaining RF power amplifiers and radio equipment.

To replace a power amplifier module, proceed as follows:

1. Set ON/OFF switch on front of amplifier to OFF position.
2. Loosen the thumbscrews that secure the amplifier to the sub-rack.
3. Slide amplifier out of sub-rack.

CAUTION

When removing amplifier from the sub-rack, it is important to support the amplifier such that the rear of the module does not suddenly drop when the guide rail disengages from the rack. A drop such as this could damage the rear of the 21-pin-D-sub connector.

4. Replacement of module is done in the reverse order of removal steps 1-3.