

## 5-1 Test Equipment Required For Test

Test equipment required to test the amplifier is listed in Table 5-2. Equivalent test equipment may be substituted for any item, keeping in mind that a thermistor type power meter is required.

### NOTE

All RF test equipment required must be calibrated to 0.05 dB resolution. *Any deviation from the nominal attenuation must be accounted for and factored into all output readings.*

**Table 5-2. Test Equipment Required**

| Nomenclature                       | Manufacturer | Model        |
|------------------------------------|--------------|--------------|
| Signal Generator                   | H.P.         | 8656B        |
| 20 dB Attenuator, 250 Watt         | Bird         | Tenuline     |
| 20 dB Attenuator, 20 Watt (2 each) | Bird         | Tenuline     |
| Spectrum Analyzer                  | H.P.         | 8560E        |
| Coax Directional Coupler           | H.P.         | 778D         |
| Power Meter / Sensor               | H.P.         | 437B / 8481A |
| Arbitrary Waveform Generator       | Sony         | AWG2021      |
| Network Analyzer                   | H.P.         | 8753C        |
| Source Diskette                    | Powerwave    |              |

## 5-2 Performance Test

Performance testing should be conducted every 12 months to ensure that the amplifier system meets the operational specifications listed in Table 5-3. Also verify system performance after any amplifier module is replaced in the field. The test equipment required to perform the testing is listed in Table 5-2, and the test setup is shown in Figure 5-1.

### NOTE

The frequencies used in this test are typical for an amplifier with a 5 MHz band from 869 MHz to 894 MHz. Select evenly spaced F1, F2, F3, and F4 frequencies that cover the instantaneous bandwidth of your system.

### 5-2.1 Amplifier Performance Test

To perform this test, proceed as follows:

Connect test equipment as shown in Figure 5-1.

### WARNING

Do not apply any RF signals at this time.

#### 5-2.1.1 Amplifier Spurious Emissions Test:

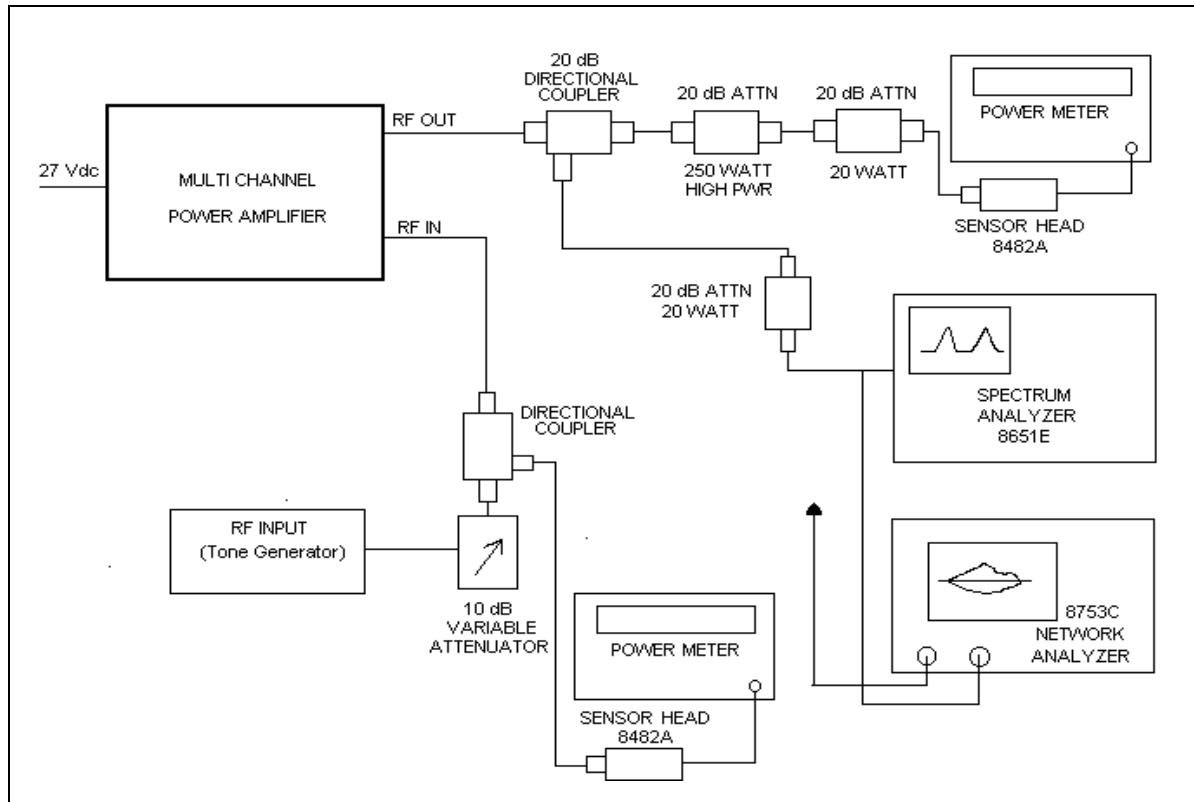
With the RF input signal to the amplifier set to be as shown in Figure 5-1, use the spectrum analyzer to measure the spurious emissions performance. Record test data in Table 5-3. Verify that it is within the specifications shown in Table 1-2. Switch tested amplifier to OFF.

## 5-2.1.2 Gain Test:

1. Disconnect spectrum analyzer from test setup, and connect the network analyzer.
2. Set network analyzer as follows:
  - A. Power output to -13 dBm.
  - B. Frequency start to 869 MHz.
  - C. Frequency stop to 894 MHz.
  - D. Normalize the network analyzer for gain and return loss.
3. Check the amplifier gain across the band from 869 MHz to 894 MHz. Gain should be as specified in Table 1-2. Record test data in Table 5-3.

## 5-2.1.3 Input Return Loss:

Read and record the  $S_{11}$  return loss measurement on network analyzer. Record test data in Table 5-3.



*Figure 5-1 Amplifier Test Setup Diagram*



**Table 5-3. Multi-Carrier Power Amplifier Test Data Sheet**

DATE \_\_\_\_\_

MODULE S/N \_\_\_\_\_

**TEST CONDITIONS:**

Load and Source Impedance: 50 Ohms

VSWR: < 1.2:1

Supply Voltage: +27 Vdc  $\pm$ 0.1 Vdc

| TEST               | SPECIFICATION                                      | MIN                   | MAX                  | DATA |
|--------------------|--|-----------------------|----------------------|------|
| RF Gain            | Vcc = 27 Vdc<br>PO = 50 W<br>Freq. = 869 – 894 MHz | Table 1-2 -<br>0.5 dB | Table 1-2<br>+0.5 dB |      |
| Spurious Emissions | Vcc = 27 Vdc<br>PO =50 W<br>869 - 894 MHz Band     |                       | -65 dBc              |      |
| Gain Flatness      | Vcc = 27 Vdc<br>PO =50 W<br>869 - 894 MHz Band     |                       | $\pm$ 0.5 dB         |      |
| Input Return Loss  | Vcc = 27 Vdc<br>PO = 50 W<br>869 - 894 MHz Band    | -12 dB                |                      |      |

PASS \_\_\_\_\_ FAIL \_\_\_\_\_

Tested by \_\_\_\_\_

## 5-3 Field Replacement of the Module

The GL3-900-60 multi-carrier power amplifier module can be replaced in the field on site by a qualified technician with experience maintaining RF power amplifiers and similar equipment:

To replace a power amplifier module, proceed as follows:

1. Set on/off switch on the front panel of the amplifier module to OFF (down).
2. Loosen two thumbscrews that secure amplifier module to subrack.

### CAUTION

When removing the amplifier from the subrack, it is very important to support the amplifier such that the rear of the module does not suddenly drop when the guide rail disengages from the track. A drop such as this could damage the rear 21WA4 multipin connector.

3. With steady even pressure, use handle on front of amplifier to pull module out of subrack.
4. Install replacement in reverse order of steps 1 through 3 above.