

14. ALC POWER LEVEL ACCURACY

Description and Procedure

This adjustment sets the absolute power accuracy in each frequency band at a CW frequency. The digital ALC calibration array is loaded with zeroes for the 0 dB attenuator setting to eliminate any power offset from this source. Calibration constants set the power accuracy at four power levels. A potentiometer sets the power accuracy at an 18 dBm level in the low band (not applicable for all models).

Note



This adjustment procedure zeros the digital ALC calibration array at the 0 dB attenuator setting. The "Power Flatness" adjustment must be performed after this procedure.

1. Preset the equipment shown in figure 3-27 and let them warm up for at least one hour. Do *not* connect the power sensor to the synthesizer RF OUTPUT yet.

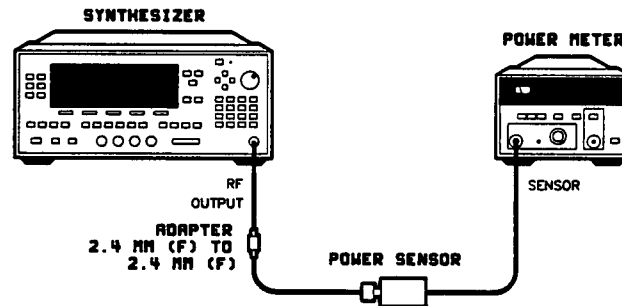


Figure 3-27. ALC Power Accuracy Adjustment Setup

2. Zero and calibrate the power meter/sensor and set the power meter to dBm mode. Connect the power sensor to the synthesizer's RF OUTPUT.

Set the CAL FACTOR % for the power sensor 1 GHz calibration factor.

3. On the synthesizer, set:

USER CAL [Tracking Menu] [RF Peak Always] (asterisk on)

POWER **MENU** [Uncoupl Atten] (option 001 only)

4. On the synthesizer, zero the digital ALC calibration for the 0 dB attenuator setting for all frequency ranges:

[SERVICE] [Adjust Menu] [DigALC Menu]

[AtnStep To Cal] 0 dB

[Cal Freq Range Lo Band] [ALC Cal Array (Atn, Freq) Zero] (not applicable for all models)

[Cal Freq Range Hi Band] [ALC Cal Array (Atn, Freq) Zero]

Note



The default values given in the next step are a general starting point. If the current ALC power accuracy is within 1 dB, fewer repetitions are required if you start with the existing calibration constants unchanged.

5. Set the default values given in table 3-7 into the corresponding ALC calibration constants. On the synthesizer, set:

[SERVICE] [Adjust Menu] [Calib Menu]

[Select Cal] Enter the number of the calibration constant from table 3-7 and terminate the entry with **[ENTER]**.

[Modify Cal] Enter the default value from table 3-7 and terminate the entry with **[ENTER]**.

Table 3-7. ALC Calibration Constants and Default Values

ALC Calibration Constant	Default Value
Low Band 0.01 to 2.4 GHz (not applicable for all models)	
#265 LVL DAC Ofs Lo Bnd	150
#252 LVL DAC Gain Lo Bnd	0
#284 ALC Det Ofs; Lo	128
#293 ALC Log Brkpt; Lo	128
High Band 2.3 to 20 GHz	
#264 LVL DAC Ofs Hi Bnd	0
#251 LVL DAC Gain Hi Bnd	0
#283 ALC Det Ofs; Hi	128
#292 ALC Log Brkpt; Hi	128

6. For instruments without low band, set A10R188 +20 DBM to the center of its adjustment range.

Low Band ALC Power Accuracy Adjustment (not applicable for all models)

7. On the synthesizer, set:

[CW] 1 GHz

[SERVICE] [Adjust Menu] [Calib Menu]

8. On the synthesizer, set:
[POWER LEVEL] First power level in table 3-8
9. Select the first calibration constant in table 3-8:
[Select Cal] **[265]** **[ENTER]**
10. On the synthesizer, select **[Modify Cal]** and, using the rotary knob, modify the calibration constant so that the power meter and the power level setting are the same.
11. Repeat steps 8 through 10 for each power level and calibration constant given in table 3-8.

Table 3-8. Power Level and Calibration Constant Adjustment

Power Level (dBm)	Calibration Constant Adjustment
0.0	#265 LVL DAC Ofs Lo Bnd
-10.0	#252 LVL DAC Gain Lo Bnd
-20.0	#284 ALC Det Ofs; Lo
+10.0	#293 ALC Det Log Brkpt; Lo

12. On the synthesizer, set:

[POWER LEVEL] **[18]** **[dBm]**

Adjust A10R125, +20 DBM, until the power meter and the power level setting are the same. Figure 3-28 shows the location of A10R125.

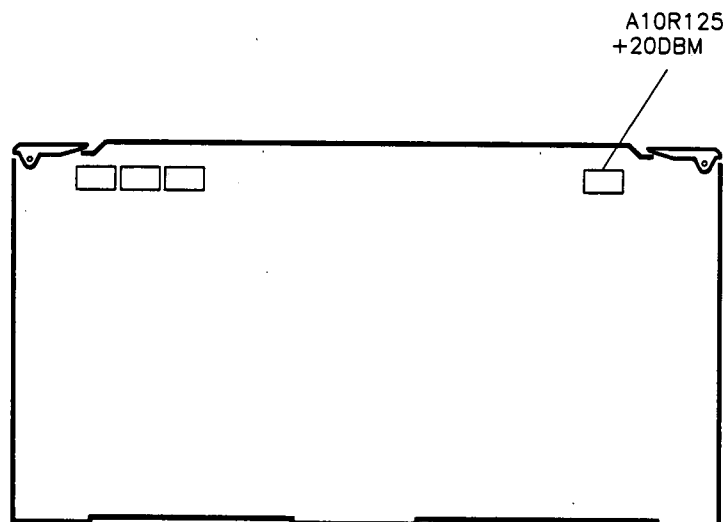


Figure 3-28. A10R125 Location

13. Repeat steps 8 through 12 until the power accuracy for each calibration constant is within ± 0.01 dBm.

High Band Power Accuracy Adjustment

14. On the synthesizer, set:

CW **10** **GHz**

SERVICE **[Adjust Menu]** **[Calib Menu]**

15. On the power meter, set the CAL FACTOR % for the power sensor 10 GHz calibration factor.
16. On the synthesizer, set:

POWER LEVEL First power level in table 3-9

17. Select the first calibration constant in table 3-9:

[Select Cal] **264** **ENTER**

18. On the synthesizer, select **[Modify Cal]** and, using the rotary knob, modify the calibration constant so that the power meter and the power level setting are the same.
19. Repeat steps 16 through 18 for each power level and calibration constant given in table 3-9.
20. Repeat steps 16 through 19 until the power accuracy for each calibration constant is within ± 0.01 dBm.

Table 3-9. Power Level and Calibration Constant Adjustment

Power Level (dBm)	Calibration Constant Adjustment
0.0	#264 LVL DAC Ofs Hi Bnd
-10.0	#251 LVL DAC Gain Hi Bnd
-20.0	#283 ALC Det Ofs; Hi
+10.0	#292 ALC Det Log Brkpt; Hi

21. If this is the last calibration constant you will be adjusting, see "Calibration Constants" in this manual to store the calibration constants as protected data (in EEPROM).

Related Performance Tests

Power Accuracy

In Case of Difficulty

See "TROUBLESHOOTING" in the *Assembly-Level Repair* manual.