2.0 TECHNICAL DESCRIPTION

2.5 Alignment Procedure

In the following procedure, the complete Multi-Channel Boaster is adjusted for optimum performance. This alignment procedure is performed by adjusting each circuit for its specified performance while observing the appropriate output parameters of the board or subassembly being adjusted.

Because of the broadband nature of the amplifier stages, this is a straightforward procedure, easily accomplished is RF test equipment is available. In this procedure, the input signals are first connected and each circuit is adjusted in sequence by connecting the test equipment to the specified point.

Equipment required:

1. Spectrum Analyzer (with tracking generator)
2. Network Analyzer
3. Power Meter
4. Multi-channel test signal
5. 30 dB Coupler
6. Attenuators
7. Digital Multimeter (DMM)

1. Connect power to the booster. Terminate the output with a 50W 50Ω load.

2. Set the network analyzer for the following settings:

Start Frequency	beginning of range
Stop Frequency	end of range
Power Level	-45 dB (in combination with attenuators and power level)
Reference Level	0 dB

3. Set S2 on Booster Control board for manual.

4. Calibrate cables from network analyzer for transmission.

5. Connect the RF out cable to J1 RF I/P and the RF In cable to J2 of the Broadband Bandpass Filter. Tune the filter, and verify that it is within specifications.

6. Reconnect rigid to J2 of the filter, and move RF In cable of the analyzer to J2 of the A10 Two Stage Amplifier. Tune the module for gain and output power specifications.

2.0 TECHNICAL DESCRIPTION

2.5 Alignment Procedure - continued

7. Reconnect J2 to Two Stage Amplifier and move RF In cable of the analyzer to J2 of the PIN Attenuator Module. Turn ALC PIN Attenuator Bias voltage to maximum using R56 on the Booster Control board and measure gain. ALC PIN Attenuator bias voltage should be > 11.5V at FL2 of the module. There should be 4 dB of loss through this module. Reset voltage to 4.0V at FL2 of the PIN Attenuator Module. Response should be within ±0.5 dB. Reconnect J2 to PIN Attenuator Module.

8. Calibrate cables from network analyzer for Ch. 1 for Transmission, and Ch. 2 for Reflection. Connect RF Out cable to J1 of A14 Single Stage Amplifier Module. Connect RF In cable to J2 of module. Tune the module for gain, reflected, and output power specifications. Reconnect rigid to J1 and J2 of the module.

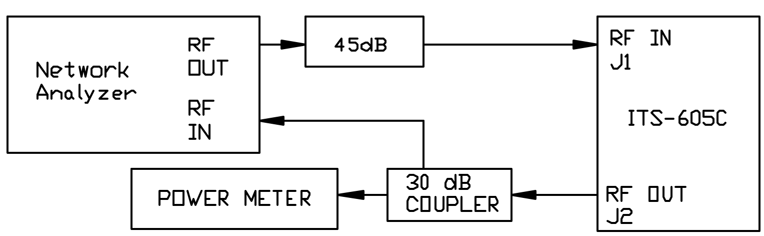
9. Move RF Out cable from the analyzer to J1 of the circulator (A15) and the RF In cable from the analyzer to J2 of the Three Stage Amplifier Module. Tune the Module for gain and output power specifications. Reconnect the rigid to J1 of the circulator and J2 of the amplifier module.

10. Move RF Out In cable from J2 of the Three Stage Amplifier Module to the RF output (J2) of the booster. Tune the Single Stage Amplifier Module (A18) for gain and output power specifications. Reconnect rigid to J1 of the circulator and J2 of the amplifier module.

11. Verify that the voltage at FL2 of the Single Stage Amplifier Module is 10.2V.

12. Connect 45 dB of attenuation on the RF Out port of the network analyzer. Calibrate the cables from the network analyzer to transmission.

13. Connect the calibrated cables as shown in the figure below.



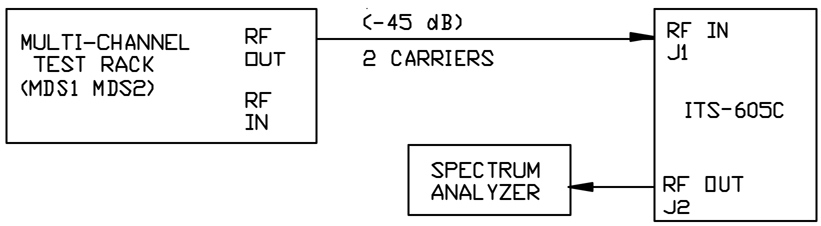
14. Turn PIN Attenuator bias voltage to maximum at FL2 of the PIN Attenuator Module. Measure the open loop gain of the booster. (Note: compensate for the 30 dB coupler). Verify that the open loop gain is within specifications. Reset PIN Attenuator voltage for 4.0V at FL2 of the module.

15. Measure response across the frequency band. Response should be within ±1 dB.

2.0 TECHNICAL DESCRIPTION

2.5 Alignment Procedure - continued

16. Connect the booster as shown below:



17. Record the Peak Power/Ch and the average power with two input carriers.

18. Measure and record the Composite Triple Beat for the booster. Verify CTB meets specifications.

19. Set spectrum analyzer for the following settings:

Span	10MHz
Res BW	300KHz
Sweep	500msec
Atten	0 dB
Reference	Top line of analyzer

20. With one carrier present, set delta marker on carrier peak and disconnect the RF I/P to the booster. Subtract 13 from the absolute value of the difference in level. This is the Carrier to noise level. Verify the level is within specifications.

21. Apply two carriers (MDS1 and MDS2) to the input of the booster.

22. Set voltage on J8 (center pin) on Booster Control Board to 0.2V using R13 on the Average Power Detector board.

23. Switch S2 to ALC, set R42 on Booster Control board for 29 dBm.

24. Decrease input level in 1 dB increments until the output power drops 1 dB. Adjust R57 on the Booster Control board until Low Output LED (DS4) lights.

25. Verify that the Low Output LED turns off when the input level is increased 1 dB.

26. Increase input level until the output level is 0.3 dB higher than the original output power level.. Adjust R55 on the Booster Control board until the Overdrive LED (DS3) lights.

27. Verify that the Overdrive LED turns off when the input level is decreased by 1 dB.

28. Verify that there is a 30 dB ALC range for the booster.

2.0 TECHNICAL DESCRIPTION

2.5 Alignment Procedure--continued

29. Adjust the input signal to the proper level.

30. Set S2 switch on the Booster Control board to manual.

31. Calibrate and connect network analyzer as in step 2, 4, and 5.

32. Plot the response of the booster and verify the flatness is within specifications.