Tune up Procedure of 20W High Power RF Repeater System

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1. Tune Up Procedure for Forward Link

1.1. Maximum Output Power, System Gain and Gain Control

1.1.1. Object

The characteristics of Maximum Output Power and System Gain shall meet the standard specification

1.1.2. Standard

Input Power	Output Power	Error
-52dBm/1FA	43dBm/1FA	-2dB ~ +2dB

Gain	Error
95 dB	< ∓2dB

1.1.3. Instrument List

1) HP8563E Spectrum Analyzer 1 Set
2) HP4432B Digital Signal Generator 1 Set
3) Power Meter 1 set and Power sensor 1 set
4) High Power 30dB Attenuator 1 EA (Over 100W) 1 Set
5) Cable Set
6) N-type(F) to N-type(F) Connector 1 Set

1.1.4. Calibration Procedure

1) Set System as follow Figure 1.

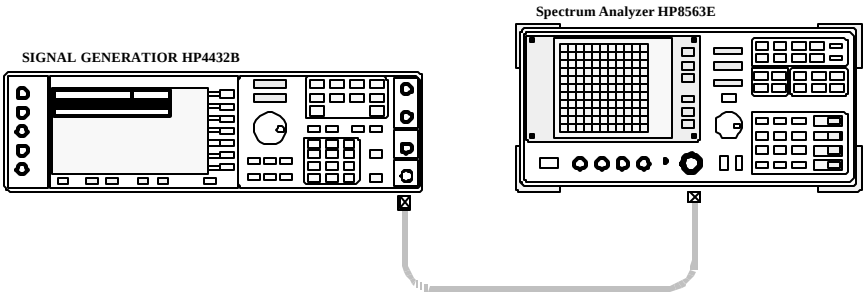

Figure 1 Signal Generator Calibration Configuration for Forward Link

2) Set Signal Generator as below.
   (1) Frequency: 1932.5MHz
   (2) Amplitude: -10dBm
   (3) Mode > CDMA Formats > IS-95
   (4) Multi carrier Define > Carrier: 9CH, 3 Carriers
   (5) Offset Frequency: -1.25MHz, +1.25MHz
   (6) CDMA: ON, Mult-Carrier: Off
   (7) Amp Offset: 0dB

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(8) Mod: On, RF: On

3) Set Spectrum Analyzer as below.
   (1) Center Frequency: 1932.5MHz
   (2) Span: 10MHz
   (3) RBW: 30KHz, VBW: 300Hz
   (4) Amplitude
      - ATTEN: 10dB
      - REF LVL: 0dBm
   (5) Set to Channel Power Mode
   (6) Channel Bandwidth > 1.25MHz
4) Set Input Cable loss offset to Signal Generator
5) Set more Offset to Signal Generator the difference between the Amplitude of Signal Generator and the Power level of Spectrum Analyzer.
   - Ampl > More (1 of 2) > Ampl Offset : TBD

6) Set System as follow Figure 2.

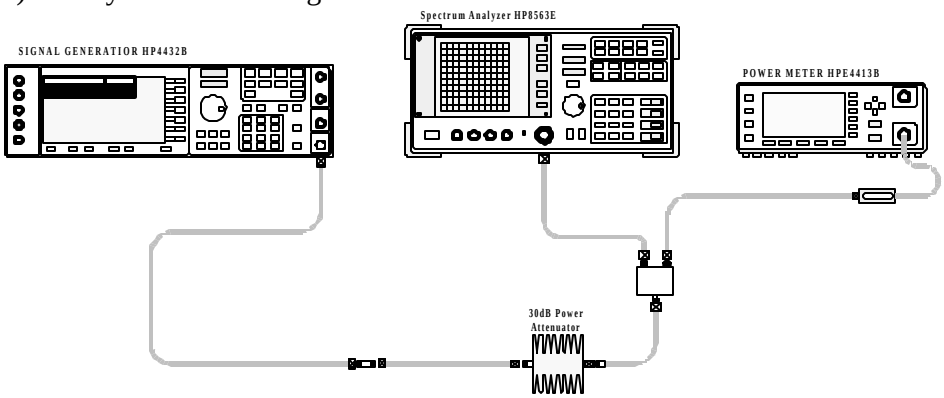

Figure 2 Spectrum Analyzer Calibration Configuration for Forward Link

7) Set Output cable loss offset to Spectrum Analyzer
8) Set more Offset to Spectrum Analyzer and Power Meter the difference between the Amplitude of Signal Generator and the power level of Power Meter.: Amplitude > More (1 of 2) > REF LVL OFFSET : TBD
9) Set signal Generator as below
   - RF: OFF
10) Record the Offset data of Signal Generator and Spectrum Analyzer

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1.1.5. Test Configuration Diagram

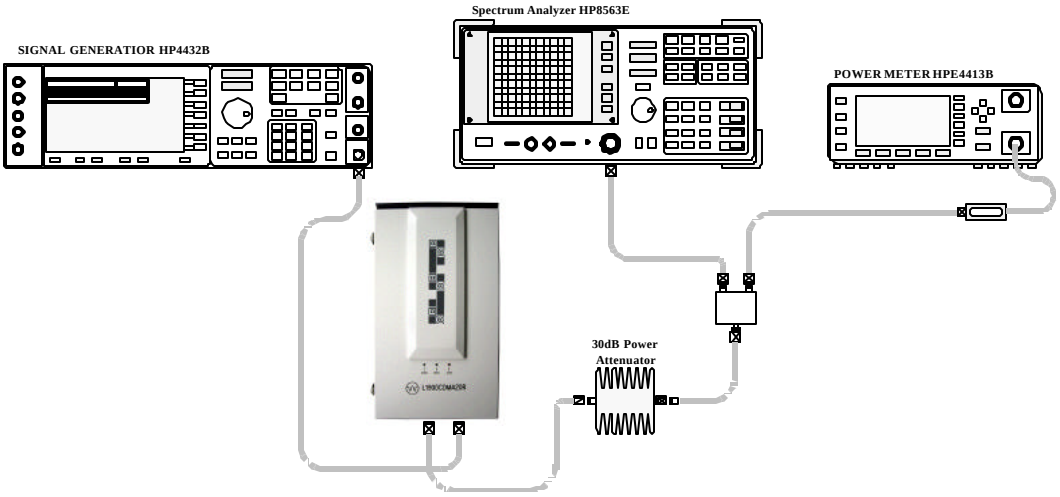

Figure 3 System Configuration Diagram with Spectrum Analyzer for forward link

1.1.6. Test Procedure

1) Set system as Figure 3.
   (Connect: Signal Generator – RX-OUT, Spectrum Analyzer – TX-OUT)

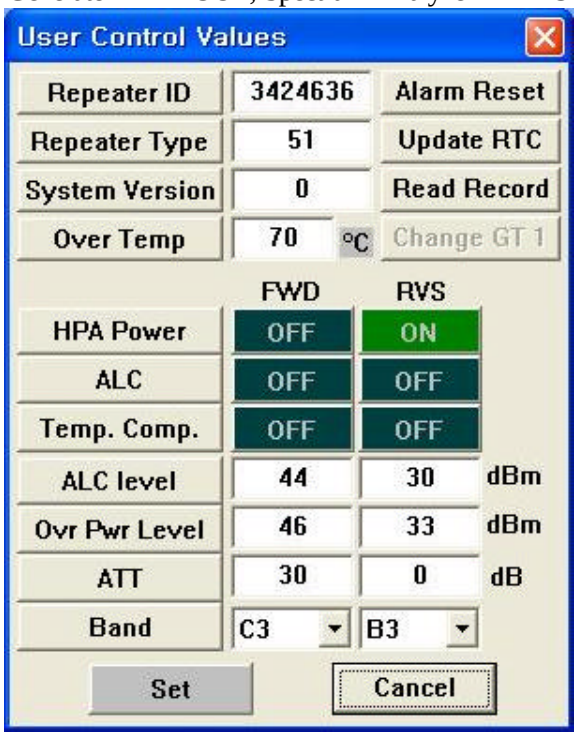

Figure 1 Control Window GUI

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2) Set the Forward Link of Repeater System to maximum gain (= ATT: 0dB) with Laptop or Key Pad, and HPA (FWD): ON, select A1 band, ALC: Off and Temp. Comp: Off (Please refer to Operating Manual)
3) Set Signal Generator as below
   - Amplitude: -52dBm
   - RF: ON
4) Set Spectrum Analyzer as below
   - ATTEN: 30dB
   - REF LVL: +50dBm
5) Measure and record the output power on Power Meter.
6) Calculate and record the system gain

7) Set Signal Generator as below;
   - Frequency: 1962.5MHz
8) Set Spectrum Analyzer as below
   - Frequency: 1962.5MHz
9) Set the Forward Link band: B3
10) Measure and record the output power on Power Meter.
11) Calculate and record the system gain

12) Set Signal Generator as below;
   - Frequency: 1987.5MHz
13) Set Spectrum Analyzer as below
   - Frequency: 1987.5MHz
14) Set the Forward Link band: C3
15) Measure and record the output power on Power Meter.
16) Calculate and record the system gain

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1.2. Gain Control Test

1.2.1. Object

The characteristics of Gain Control Range and Gain Control Error shall meet the standard specification

1.2.2. Standard

Gain Control Range	Step Size	Remarks
30 dB	1dB	

Step	Step Size	Error/Step
0 dB ~ 10 dB	1 dB	< ±1.0 dB
10 dB ~ 20 dB	1 dB	< ±1.0 dB
20 dB ~ 30 dB	1 dB	< ±1.0dB

1.2.3. Instrument List

1) HP8563E Spectrum Analyzer 1 Set
2) HP4432B Digital Signal Generator 1 Set
3) Power Meter 1 set and Power sensor 1 set
4) High Power 30dB Attenuator 1 EA (Over 100W) 1 Set
5) Cable Set
6) N-type(F) to N-type(F) Connector 1 Set

1.2.4. Test Configuration Diagram

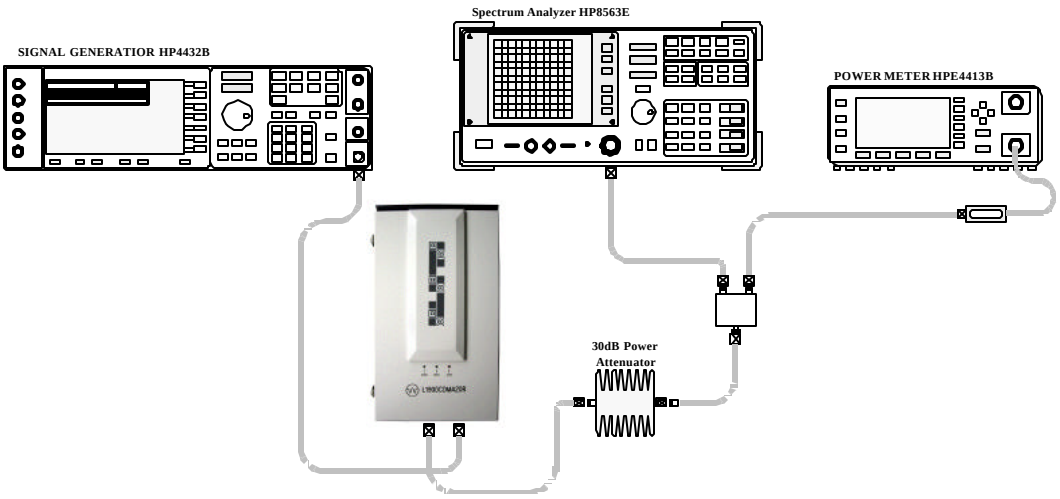

Figure 4 System Configuration Diagram with Spectrum Analyzer for forward link

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