APPENDIX 2
REMOTE UNIT TEST & TUNE-UP PROCEDURE

DC CHECKS AND BIASING

- Required DC source: +12V 2A
  -12V 0.5A
  +5V 1A

BIASING THE PA:

Initial Set-up:

- Apply power to the PA circuit by turn the PA_ON switch to the ON position.
- Adjust R229 and R139 to draw less than 50mA on the 12V supply.

Q22 DC Bias:

- Adjust R229 to draw 110mA on the 12V supply.

Q17 DC Bias:

- Adjust R139 to draw 400mA on the 12V supply.

TUNING THE PA:

Test equipment required: HP network analyzer, Spectrum Analyzer, Power meter & Power sensor.

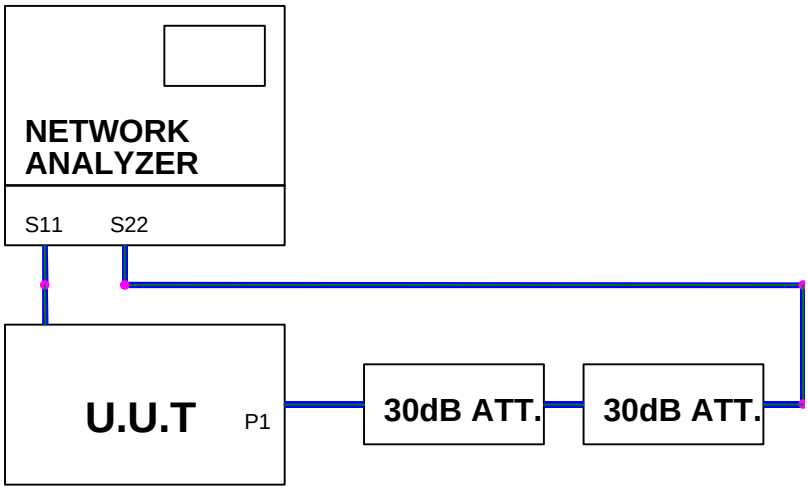

Figure 1: PA Tuning Set-Up

NETWORK ANALYZER SET UP:

Center frequency:	224 MHz		
Span:	100 MHz		
Swept Source Power:	-25 dBm		
Channel 1:	S11	MAG: 5dB/	REF: 0dB
Channel 2:	S21	MAG: 2dB/	REF: 50dB

Obtain the response on the Network Analyzer of gain and input return loss. The following trimmer caps may be used to achieve the Gain flatness and return loss as shown in Figure 2:

- Trimmer cap C119 (Impedance matching for the output of Q17 and the input of CP1)
- Trimmer cap C188 (Can only be used to reduce gain)
- Trimmer cap C191 (Impedance matching for the output of Q22 and the input of Q17)
- Trimmer cap C229 (Impedance matching for the output of Q25 and the input of Q22)
- Trimmer cap C238 (Gain adjustment)

By varying the trimmers it should be possible to achieve a gain of 60 dB across the 216-220 MHz band. An input return loss of >9dB across the band should be available at this gain level.

Remove Network Analyzer from the set-up, and replace the input with a single-frequency synthesizer with the power set at -33dBm. Use the coupler and pad arrangement at the output as shown in figure 2, to connect the spectrum analyzer and power meter.

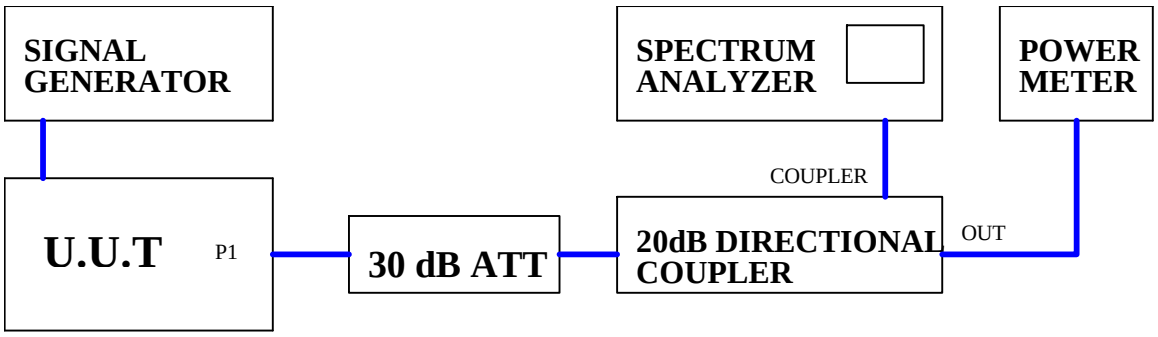

Figure 2

Record the output power for each of the frequencies shown in the following table.. By using trimmer cap C188, ensure that +27 dBm (0.5 watt) +/-0.5 dB is achieved at the top and bottom of the band.

Frequency	Power
216 MHz	
218 MHz	
220 MHz	

Use the Spectrum Analyzer to check that spurs are at least -70 dBc down from DC to 1 GHz. Record the results in the following table:

Frequency	Value	Spur level	Spur frequency
+/- 25MHz	-70dBc		
DC - 1GHz	-70dBc		