SECTION 3 – VC-401B ALIGNMENT PROCEDURES

1. Introduction

This section contains alignment procedures for VC-401B Receiver and Audio/CPU Modules.

2. VC-401B Receiver Alignment Procedure

A. General

The Receiver Assembly receives and processes RF signals in the frequency range of 118.000 MHz to 151.975 MHz in 25 kHz or 8.33 kHz increments. These tests are based on the tests outlined in RTCA Document RTCA/DO186A.

All input RF signals are "hard" microvolts. Ensure a 6 dB 50 ohm pad is installed on the output of the signal generator. Input levels specified in this procedure already take into account the 6 dB pad.

B. Instrumentation

Test Equipment Required or Equivalent

Test Fixture:	Chelton TBD
RF Signal Generator:	HP 8640B (with internal audio generator)
DVM:	Fluke 8000A (Readout to .001)
Oscilloscope:	TEK 465B
Audio Analyzer:	HP8903B
6 dB Pad:	MDS1110B-6
RF Power Meter:	8901B Mod Analyzer (power meter function)
RF Frequency Counter:	8901B Mod Analyzer (frequency counter function)

C. Alignment Procedure

The unit under test must contain a visual indication that it has satisfactorily met all previous test and inspection requirements before being tested per under specification. All test equipment used must have an in-date calibration sticker.

(1) Setup

(a) Install the unit under test (UUT) on to the Receiver Test Fixture. Insure that the Power ON/OFF switch is in the OFF position.

(b) Connect the power and control signal ribbon jumper from the Receiver Test Fixture to P2 of the UUT.

(c) Set up the general test configuration as shown in Figure 3-1.

(d) Center potentiometer R143 (TCXO Frequency Adjustment).

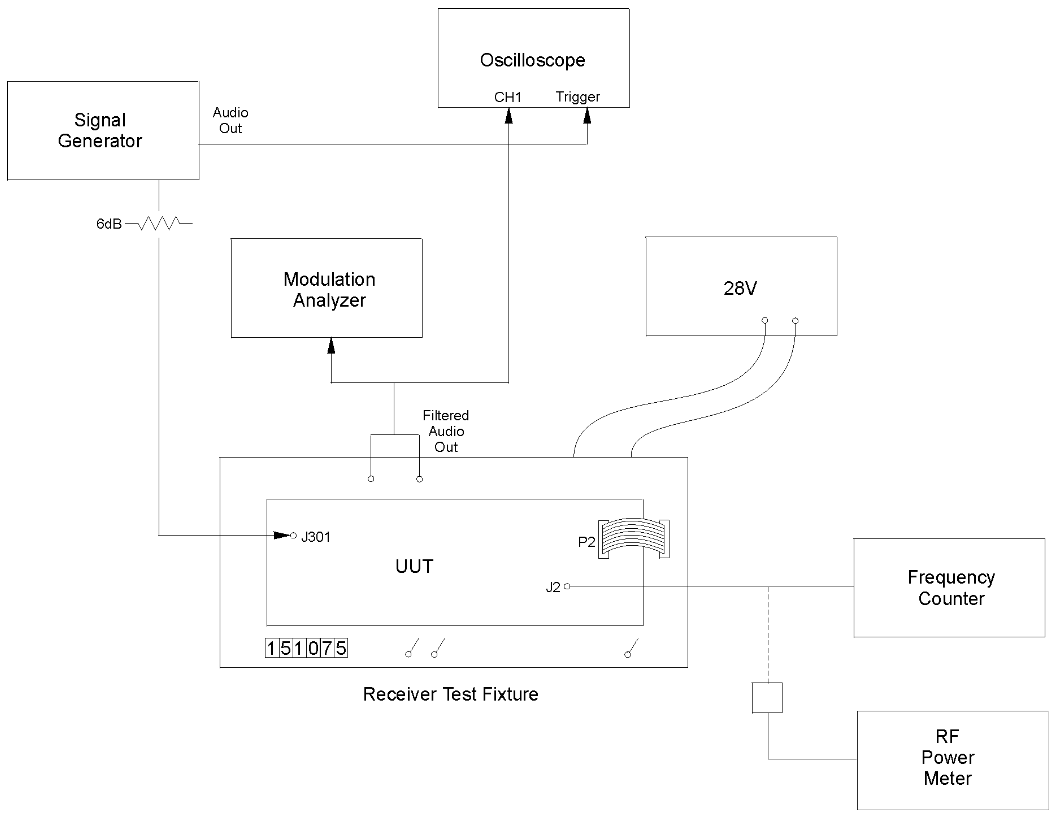

Figure 3-1. General Receiver Test Configuration

(e) Remove R448 and connect power supply to TP 400. Set supply for 11 Volts.

(f) Remove R441 and connect power supply to TP 420. Set supply for 1.5 Volts.

NOTE: This is for the X8 version of the receiver only. Full production will have potentiometers in place of the Select-in-test resistors, R475:R448 and R464:R441.

(2) Pre-alignment

(a) Connect J2 (Transmitter Local Oscillator) to a frequency counter's 50 ohm input. The expected output level is approximately 9 dBm. Use the appropriate size attenuator pad in-line with the counter.

(b) Set the Receiver Test Fixture Controls as follows:

Mode	**TX**
TX Interlock	Disable
Frequency	148.000
Power	ON

(c) Verify the frequency counter is showing a signal present around 148 MHz +/- 375 Hz.

(d) Set the Receiver Test Fixture TX Interlock Mode to RX.

(e) Verify that the 28 Volt current from the input power supply is < 400 mA.

(f) Measure the voltage at TP314 (Pre-selector control voltage). Adjust the varactor trim potentiometers for 9/10 of the measured voltage at TP314: (.9 x 12.346 = 11.11 Volts)

Test Point	**Pot**
308	R312
304	R311
305	R314
309	R313

(g) Center the cores in inductors L303, L305, L307 and L309.

(3) VCO Alignment

(a) Set the frequency for 174 MHz on the Receiver Test Set. Select TX/RX switch to TX. Observe the frequency indicated on the frequency counter.

(b) Adjust R143 until the counter reads 174.000 MHz +/- 100 Hz.

(c) Verify the lock detect LED CR108 is not lit.

(4) Pre-Selector Alignment

(a) Place covers on the pre-selectors.

(b) Connect a voltmeter with 3 decimal place readout to TP413 (AUDIO OUT OF THE TEST BOX) (Primary AGC voltage). Note this AGC output can be accessed at the AGC test points on the test fixture.

(c) Set the Receiver Test Set Mode TX/RX to RX.

(d) Connect a signal generator to J301. Set the generator for 148 MHz with 1000 Hz 30% AM modulation.

(e) Set the generator signal level for –100 dBm. Increase the signal level until the AGC voltage starts to increase. The voltage should be in the range of 5.0 volts.

(f) Adjust L303, L305, L307 and L309 to increase the AGC voltage. Verify the voltage present at TP413 (AGC OUT OF THE TEST BOX).

NOTE: The delayed AGC voltage is > 8 volts. If the voltage is < 8 volts, decrease the signal generator level.

(g) Set the Receiver Test Set Frequency to 118.000. Set the signal generator to 118.0 MHz.

(h) Observe the AGC voltage on TP413 (AUDIO OUT OF THE TEST BOX). Adjust R311, R312, R313 and R314 to peak the AGC voltage at 118 MHz. (Make small adjustments. If an adjustment has no effect, set the pot back to its original position and go on the next adjustment.)

(5) IF Alignment

(a) Set the signal generator for 118 MHz AM modulated 30% with 1000 Hz.

(b) Observe the AGC voltage at TP413 (AUDIO OUT OF THE TEST BOX). Adjust the IF transformers (T401, T402 and T403) to peak the AGC voltage.

(c) Observe the AGC voltage at TP413 (AUDIO OUT OF THE TEST BOX). Adjust capacitors C409 and C404 to peak the AGC voltage.

(6) AGC Alignment

(a) Set the signal generator for 118 MHz AM modulated 30% with 1000 Hz.

(b) Connect Oscilloscope unfiltered Audio Out of the Test fixture. Observe the 1000 Hz sine wave displayed on the Oscilloscope.

(c) Increase the RF input level on the signal generator until the displayed signal is no longer noisy. This should be around –80 dBm.

(d) Adjust the power supply connected to TP 420 until the sinewave is I volt P-P +/- .1 Volts. Measure and record this AGC Reference voltage (between 1 and 2 volts).

(e) Set up the modulation analyzer to indicate SINAD in dB. Adjust the signal generator RF level until the SINAD is around 22 dB.

(f) Observe the delayed AGC voltage present at TP 413 with a DVM. The reading should be between 8 and 10 volts DC.

(g) Adjust the power supply until the voltage on the DVM reaches it's maximum and then decreases by around 0.1 volts. Measure and record the Delayed AGC Threshold voltage and the TP413 voltage. (Between 4.5 and 6.5 Volts.)

(h) Calculate the value of R476 (between 200K and 150K) and the value of R448 (between 150K and 100K) necessary to achieve the Delayed AGC Threshold Voltage within 5%.

(i) Calculate the value of R464 (between 200K and 150K) and the value of R441 (between 50K and 10K) necessary to achieve the AGC Reference Voltage within 5%.

(j) Install the calculated values of resistors. Reconnect the receiver to the test set.

(j) Set the input frequency for 118.000 MHz at 1000 Hz 30% AM modulated.

(l) Set the level to –80 dBm. Verify the 1000 Hz sinewave displayed on the oscilloscope is 1 Volt P-P +/- .1 Volt.

(m) Set the level to –100 dBm. Observe the voltage at TP413 (AGC out of the test fixture) with a DVM increase the RF input level until the observed voltage drops by 0.1 Volt. Verify the SINAD is 22 to 28 dB.

(n) Increase the RF input level in 5 dB increments. Observe the 1000 Hz sinewave displayed on the Oscilloscope. Verify the signal stays linear from –80 dBm to +10 dBm.

(7) Wideband IF Filter Alignment

(a) Set the signal generator for 135 MHz FM modulated at a 100 Hz rate with a 10 kHz Deviation.

(b) Connect an Oscilloscope to the unfiltered Audio Out of the test fixture.

(c) Observe the signal on the oscilloscope display. A FM signal is being swept through the filter passband. The amplitude of the response shows the amount of ripple across the filter.

(d) Adjust C409 and C404 to minimize the ripple across the passband.

(8) ICAO Input Filter Alignment

(a) Set the signal generator for 98.000 MHz 30% AM modulated at 1000 Hz.

(b) Set frequency controls on the Receiver Test Fixture for 110.000. (This programs the receiver to receive 98 MHz.)

(c) Set the signal generator frequency for 98 MHz and adjust the signal generator input level for –47 dBm. SINAD should be around 20 dB 30 dB.

(d) Connect a DVM to TP412 (AUDIO OUT of the Test Fixture).

(e) Adjust L315 and L316 as required to decrease AGC voltage and SINAD. The AGC voltage should be around 5.75 volts.

(9) TX Interlock Alignment

(a) Set the signal generator for 135.000 MHz 30% AM modulated at 1000 Hz.

(b) Adjust the signal generator input level for a 20 dB SINAD on the modulation Analyzer.

(c) Set the TX Interlock to Enable on the Receiver Test Fixture.

(d) Adjust R325 until the SINAD is between 9 and 11 dB. Set the TX Interlock on the Receiver Test Fixture to Disable. Verify the SINAD returns to 20 dB.

(10) Carrier Squelch Alignment

(a) Set the signal generator for 135 MHz for –100 dBm, modulation OFF.

(b) Set the Receiver test fixture for 135.000, RX mode. Observe the carrier squelch output on a DVM it should be 10 Volts DC.

(c) Set the signal generator for –89 dBm. Adjust R TBD until the DVM voltage changes from +10 Volts to –10 Volts.

(d) Vary the input RF amplitude in 0.5 dB steps. Verify that the carrier squelch signal goes to –10 Volts before the RF signal increases to –85 dBm and goes back to +10 Volts before the RF signal decreases to –93 dBm.

3. VC-401B Audio/CPU Module Alignment Procedure

A. RX Noise Squelch

(1) Channel the unit to 126.000 MHz receive mode.

(2) Apply a 126.000 MHz RF signal of .5 µV, amplitude modulated 30% at 1000 Hz to the antenna jack.

(3) Connect a 600 ohm audio load across the audio output pins of the unit (J101 pins 62 and 88).

(4) Monitor the audio output and adjust R223 clockwise until the audio is squelched.

(5) Slowly increase the RF level and adjust R223 as necessary so the audio unsquelches at 3 µV.

B. RX Main Audio Out (40mW)

(1) Channel the unit to 126.000 MHz receive mode.

(2) Apply a 126.000 MHz RF signal of 1000 µV, amplitude modulated 30% at 1000 Hz to the antenna jack.

(3) Connect a 600 ohm audio load across the audio output pins of the unit (J101 pins 62 and 88).

(4) Adjust R308 for 4.9 Vrms across the audio load.

C. RX Data Audio Out (0dBm)

(1) Channel the unit to 126.000 MHz receive mode.

(2) Apply a 126.000 MHz RF signal of 1000 µV, amplitude modulated 30% at 1000 Hz to the antenna jack.

(3) Connect a 600 ohm audio load across the Data audio output pins of the unit (J101 pins 9 and 11).

(4) Adjust R336 for .77 Vrms across the audio load.

D. TX Voice Mic Input Gain and Transmit Modulation

(1) Channel the unit to 126.000 MHz voice mode.

(2) Apply an audio signal of 1000 Hz at .25 Vrms to the mic input pin of the rear connector (J101 pin 60).

(3) Connect the antenna jack to the modulation meter through a 40 dB pad.

(4) Connect the voltmeter to TP200 on the audio board.

(5) Ground the PTT line to place the unit in Voice transmit mode.

(6) Adjust R206 for .25 vrms at TP200.

(7) Adjust R321 for 80% modulation on the modulation meter.

E. TX Sidetone Out (40mW)

(1) Verify that the TX voice mic input gain and transmit modulation has been adjusted first.

(2) Channel the unit to 126.000 MHz voice mode.

(3) Connect a 600 ohm audio load across the Sidetone audio output pins of the unit (J101 pins 105 and 77).

(4) Connect the antenna jack to a dummy load.

(5) Apply an audio signal of 1000 Hz at .25 vrms to the mic input pin of the rear connector (J101 pin 60).

(6) Ground the PTT line to place the unit in Voice transmit mode.

(7) Adjust R324 for 4.9 Vrms across the audio load.

F. TX Data Input Gain and Transmit Modulation

(1) Verify that the TX voice mic input gain and transmit modulation has been adjusted first.

(2) Channel the unit to 126.000 MHz data mode.

(3) Apply an audio signal of 1000 Hz at .77 vrms to the Data input pins of the rear connector (J101 pins 25 and 38).

(4) Connect the antenna jack to the modulation meter through a 40 dB pad.

(5) Connect the voltmeter to TP200 on the audio board.

(6) Ground the Data Key line to place the unit in Data transmit mode.

(7) Adjust R210 for .25 vrms at TP200.

(8) Verify at least 80% modulation on the modulation meter.

4. VC-401B Transmitter Power Amplifier Module Alignment Procedure

A. Purpose

The following paragraphs explain how to align the VC-401B transmitter power amplifier for power flatness. It includes the initial low pass filter alignment and initial power amplifier flatness adjustment. This is done in the transmitter test box fixture at the module level.

B. Test Equipment Required

VC-401B power amplifier test fixture

HP combination RF power, frequency meter and modulation analyzer

HP RF generator

HP spectrum analyzer with tracking generator

Mini Circuits ZFL2000 amplifier called out as Mini ckts amp

30dB 150 watt RF power attenuator

40dB high power RF directional coupler

VC-401B test panel

28 volt 10 amp or greater DC power supply

Digital voltmeter

Powdered iron/ brass tuning wand

VC-401B aligned Receiver/Synthesizer Module

VC-401B aligned Audio/CPU module

VC-401B chassis assembly with mother board

VC-401B Power Supply Module

VC-401B TX Cable Cal block

BNC-pigtail 50 ohm coax (length must match TX cable cal block within .2”)

2 BNC-SMB 50 ohm coax (length must match TX cable cal block within .2”)

Needle nose pliers

Insulated probe/alignment tool

Double shielded 50 ohm cables A/R for interconnections (length should be kept to under 12”)

C. Low Pass Filter and Power Amplifier Flatness Adjustments

The Power Amplifier is initially aligned in this section with the aid of the VC-401B power amp test fixture. This requires the use of the spectrum analyzer with tracking generator to simulate the synthesizer.

(1) Initial adjustments

Set the equipment up as shown in Figure 3.2. Before applying power to the test fixture, turn controls R1, R5 and R 72 fully counter clockwise (typically, several turns will be sufficient).

(2) DC Voltage Check

Apply power to the test box. Using the digital voltmeter, record the DC voltages listed in Part 1, Initial DC Voltage Measurements, in the Test Sheet at the end of this section.

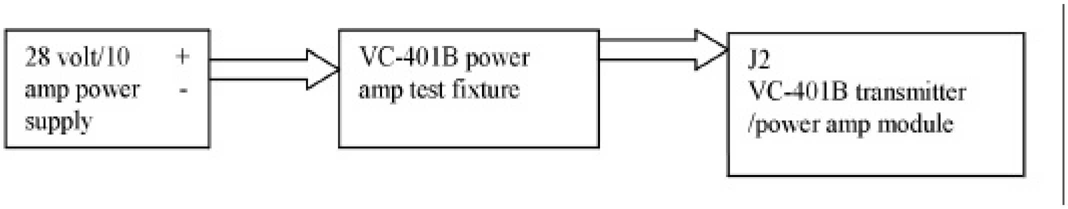

Figure 3-2. Initial Setup

(3) Low pass filter alignment

Set up the connections shown in Figure 3-3.

a. Cable Calibration Connection

1. Connect the alignment fixture to the analyzer/tracking generator.

2. Set the tracking generator for 0dBm output power and the span to track from 100 to 500 MHz

3. Perform a through loss zero cal by performing a

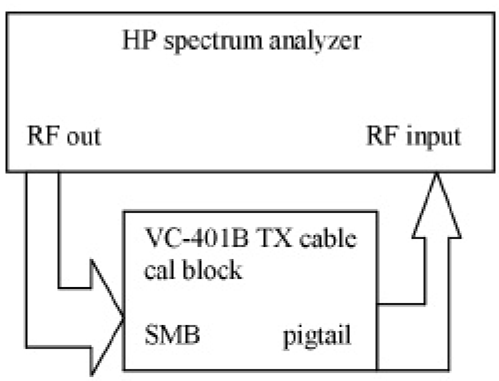

Figure 3-3. Cable Calibration Connection Diagram

b. Low Pass Filter Input/Output Connections

After calibration is complete, set up the connections shown in Figure 3-4.

1. Connect the matching BNC- pigtail cable from the analyzer's RF out to the low pass filters input by soldering the center conductor to the junction of L111, C124 and C122 at the input of the low pass filter. Do this by unsoldering the output end of T4 and lifting it away from the board.

2. Solder the BNC-pigtails center conductor where the T4 center conductor would normally be soldered.

3. Connect the BNC-pigtail shield to the adjacent fence.

4. Connect the SMB-BNC cable from the antenna connector J4 to the analyzer's RF in

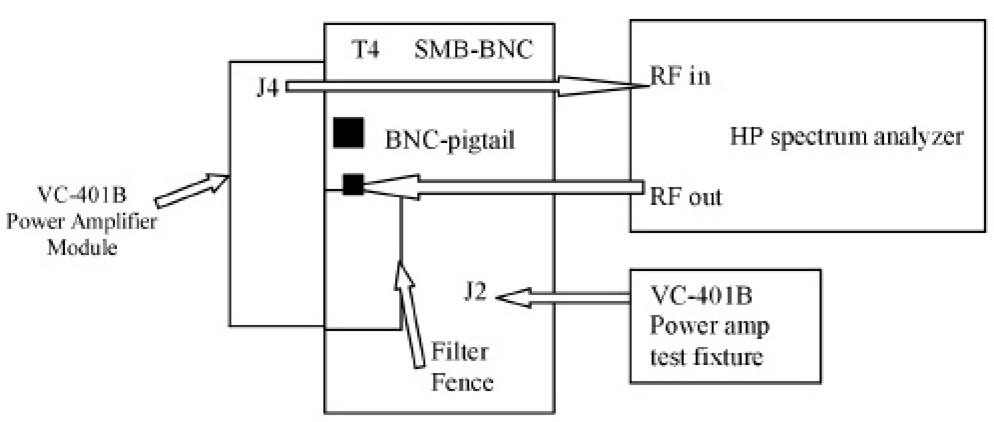

Figure 3-4 Low Pass Filter Input/Output Connection Diagram

c. Low Pass Filter Alignment Measurement Procedure

1. Turn the test fixture power on

2. Place the TX/RX switch in the TX position. Note that the pass band which covers 118 to 152 MHz will probably have more than 1 dB of loss at the high band end and the stop band that starts at 235 MHz may have excessive ripple above the -60dBc level.

3. Use needle nose pliers to carefully break the plastic covering away from inductors L111, L112 and 114 so that the turns may be spread apart.

4. Adjust the turns so that the pass band loss from 118 to 152 MHz is less than 1 dB and the stop band attenuation from 235 out to 500 MHz is greater than –60 dB down. As a reference, the analyzer display should be similar to the graph shown in Figure 3-5

5. Record the attenuation values measured at 118, 130, 140, 152, 236, 250, 300, 350 and 400 MHz in listed in Part 2, Low Pass Filter Attenuation Values, in the Test Sheet at the end of this section.

d. Power Amplifier Bias Setting and Pre-Filter Flatness Adjustment Connections

Set up the connections shown in Figure 3-6.

1. Move the center conductor of the BNC-pigtail from the low pass filter input to the center conductor of T4 output end.

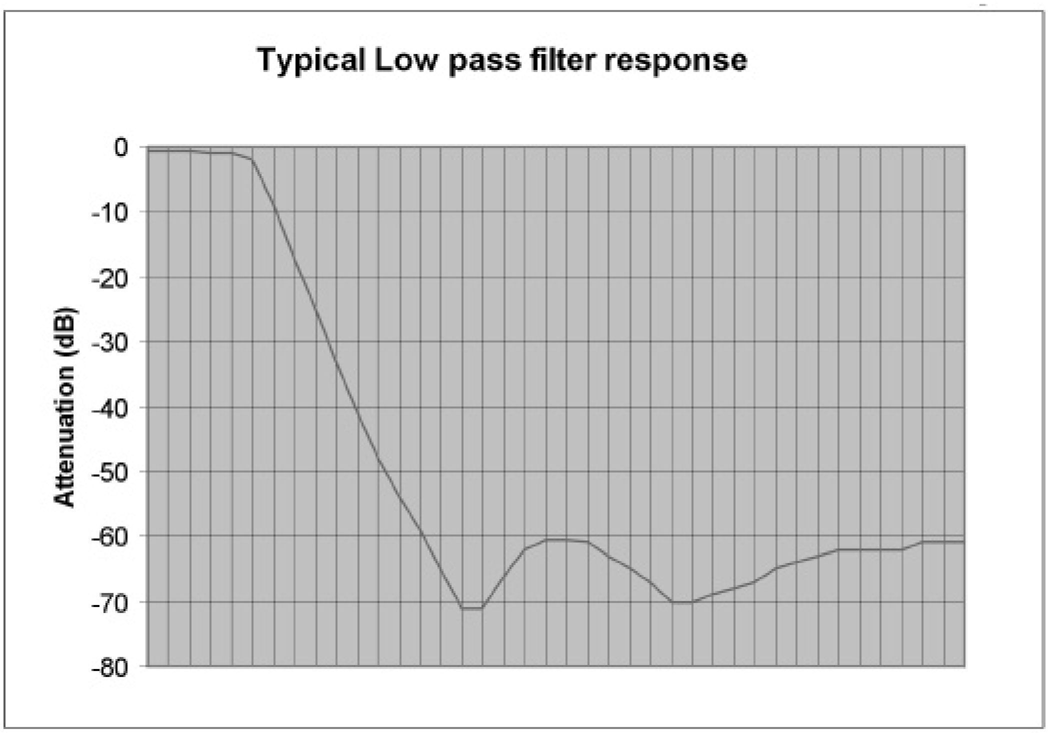

Figure 3-5. Properly Adjusted Low Pass Filter Response

2. Leave the pigtail shield soldered to the adjacent fence, this cable will now become the RF output connection

3. Disconnect the BNC end of the BNC-pigtail coax from the analyzers RF out.

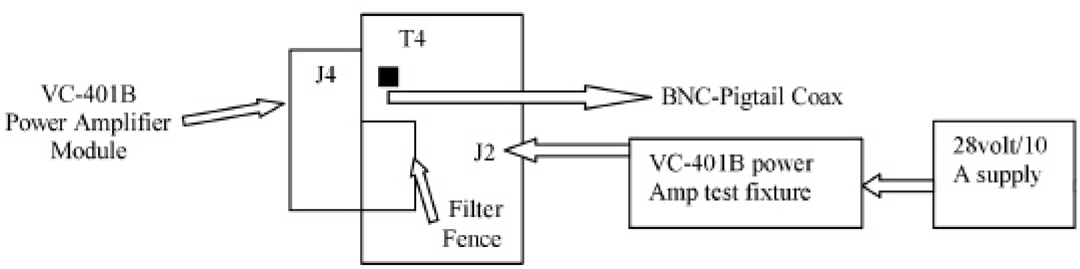

Figure 3-6. Power Amplifier Initial Bias Connection

e. Power Amplifier Bias Setting and Pre-Filter Flatness Adjustment Procedure

1. Temporarily disconnect the cable at J1.

2. Set the TX/RX switch in the TX position. Record the current under Init in Part 3, Power Amp Bias Current and Swept Power Flatness, in the Test Sheet at the end of this section.

3. Slowly adjust R5 clockwise so the power supply current increases by .035 amps (±0.005 amps). Record this current under Init + Iq5 in Part 3 of the Test Sheet at the end of this section.

4. Very slowly adjust R1 clockwise so the power supply current increases by an additional .250 amps (±0.01 amps). Record this Iinit + Iq5 +Iq1 in Part 3 of the Test Sheet at the end of this section.

5. Set the analyzer to sweep from 115 to 153MHz and adjust the tracking generator to TBD dBm.

6. Connect the cable from the Mini Circuits driver amp to J1 as shown in Figure 3-7

7. Turn the generator RF power on.

8. Place the TX/RX switch to TX.

9. While watching the power meter, slowly adjust R72 clockwise until the power meter reading doesn't change (typically several turns)

   NOTE: Since this is a swept test the power meter reading may change slowly. In this case, several turns clockwise with R72 should produce maximum power out.

10. Note that the analyzer response will not be flat over the range of 118 to 152 MHz, so adjust capacitors C45 and C36 for best power flatness. Additionally, using the powdered iron/brass tuning wand adjust inductors L7 and L4 by spreading their turns and adjust inductor L2 by turning the system power off, unsoldering it and changing its diameter to obtain the flattest response from 118 to 152,

11. Measure the maximum value and the minimum value between 118 and 152 MHz and record these under swept power flatness in Part 3 of the Test Sheet at the end of this section.

12. Calculate the difference, Swept min minus Swept max. This should be no more than 2 dB. Record this value in Part 3 of the Test Sheet at the end of this section.

   NOTE: If the response becomes better when probing the inductors with the brass end, spread the turns of L7,L4 and decrease the size of L2. Do the opposite if the powdered iron end results in an improved response.

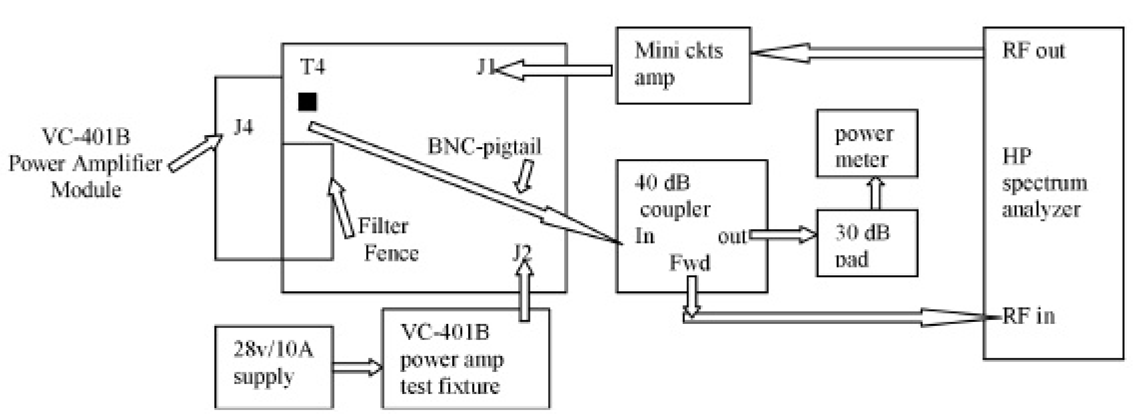

Figure 3-7 Power Amplifier Pre-Filter Swept Flatness Connection

13. Place the TX/RX switch in RX.

14. Turn the test box power off.

f. CW Pre-Filter Peak Power Test

Figure 3-8 shows the initial and final connections for this test.

1. With the pigtail-BNC still connected to the output of T4, temporarily connect the RF generator output, set for –30 dBm, to the mini circuits amp input. The mini circuits amp output should be connected directly to the RF power meter, bypassing the 30 dB attenuator (initial connection in Figure 3-8).

2. Set the generator frequency to 145 MHz and slowly adjust the generator power up in 1dB steps until the RF power meter reads +10 dBm (10 milliwatts).

   <u>NOTE</u>: Leave the RF generator at this setting for the tests in Paragraphs g and h.

3. Reconnect the RF power meter to the 30 dB attenuator pad output and connect the output of the mini ckts amp to J1 (final connection in Figure 3-8).

4. Turn the test box power on and set the RF generator to 118 MHz and place the TX switch to TX

5. Measure the power and record in Part 4, PA Peak Power Prior to Filter, in the Test Sheet at the end of this section.

6. Repeat for 125, 135, 145 and 151 MHz and record in Part 4 of the Test Sheet under the appropriate Pre-Filter peak power section.

   NOTE: Place the TX switch in TX just for the amount of time it takes to obtain a reading on the power meter.

7. When finished, adjust R72 several turns counter clockwise and turn the test box power off.

8. Turn the RF generator power off.

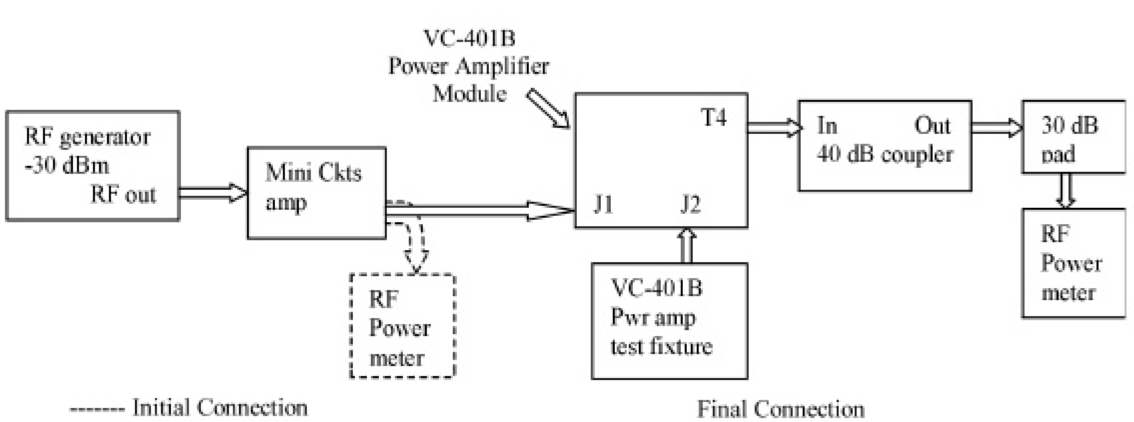

Figure 3-8 Connections for CW Pre-Filter Peak Power Measurements

g. 20 Watt Power Flatness through Low Pass Filter Measurement

Figure 3-9 shows the connections for this test.

1. Remove the output BNC-pigtail and solder the output center conductor of T4 back in the circuit at the low pass filter input.

2. Connect the second SMB-BNC cable from J4 to the coupler input.

3. Initially set the RF generator to 145 MHz

4. Turn the generator RF on and place the TX switch to TX,

5. Slowly adjust R72 clockwise until the RF power meter reads 20 watts. Note the power.

6. Repeat for 118, 125, 135, and 151 MHz and note the minimum and maximum power readings. The power should not change by more than ± 2.0 watts from the 20 watt setting over 118 to 151 MHz.

7. If the power is out of specs, inductors L4, L7, L2 and capacitors C45 and C86 need to be adjusted for best flatness. This can be done by balancing the power at 118 and 151 MHz so that they are less than 2 watts difference. Typically, 1.5 watts should be attainable.

8. Record the power at 118, 125, 135, 145 and 151 MHz in Part 53, 20 Watt Power Flatness through Low Pass Filter Measurements, in the Test Sheet at the end of this section.

9. Place the TX switch to the RX position.

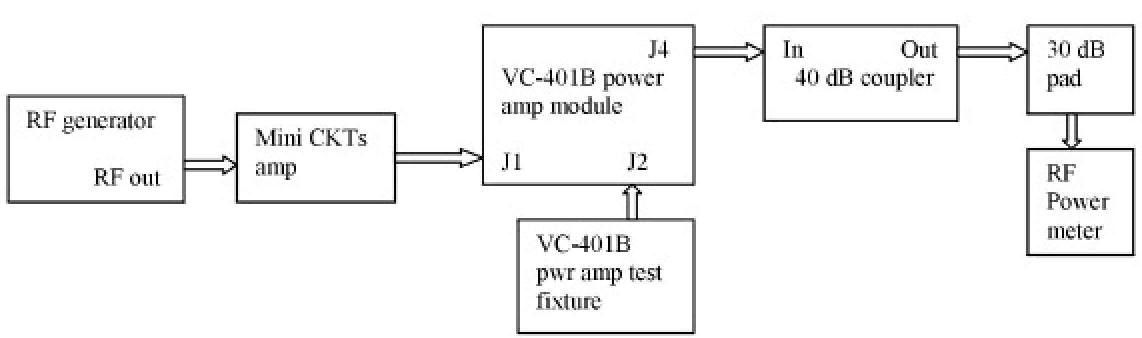

Figure 3-9. 20 Watt Power Flatness through Low Pass Filter Measurement Connections

h. Harmonics and Spurious Check

Figure 3-10 shows the connections for this test.

1. Adjust the analyzer for an attenuation of 10 dB and the span to display 5 to 1000 MHz.

2. Set the generator for 118 MHz and place the TX switch to TX, The power should be 20 watts ±2 watts.

3. Place a marker peak at the fundamental signal at 118 MHz and select marker delta.

4. Perform a next peak and record the ratio of harmonic rejection in Part 6, Harmonics and Spurious Responses, in the Test Sheet at the end of this section. for 118 MHz.

5. Repeat for 120, 125, 130, 135, 140, 145 and 151 MHz and record in Part 6 of the Test Sheet for the respective frequency. For each test, note that the power out should be 20 ±2 watts at each frequency. Also note for each test frequency that there are no other non-harmonically related signals either above or below the fundamental frequency that are less than –70 dB down from the fundamental.

6. Check the line in Part 6 of the Test Sheet that says all non harmonically related spurs are less than –70 dBc

   NOTE: Non-harmonically related signals (spurious or spurs) appear at a random non-integral point on the analyzers display. If any harmonic is above –59 dBc, the low pass filters will require re-alignment starting at Paragraph (3) above.

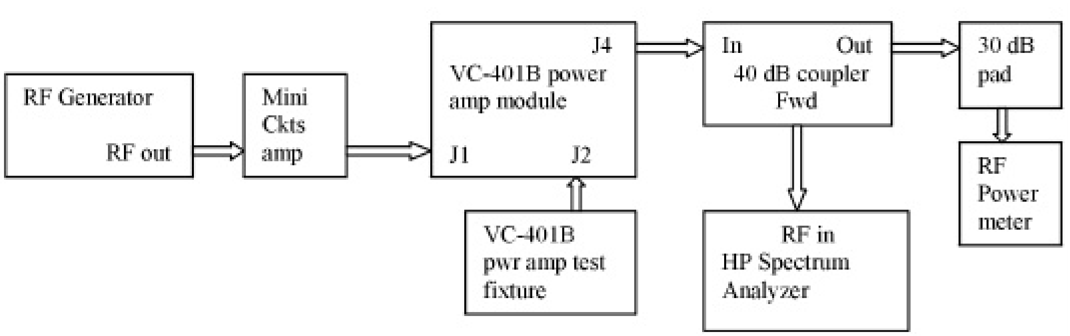

Figure 3-10 Spurious Response Connections

VC-401B Transmitter Power Amplifier Module Alignment Procedure Test Sheet

Part 1. Initial DC Voltage Measurements

a. Place the TX switch in TX and leave J1 unterminated

Test Point	Reading (Volts DC)	Limits
At pin 2 or 3 of Q17		12.8 to 14.0 Volts
At pins 6 or 7 of Q17		1.5 to 1.7 Volts
At pins 1, 4, 5 or 8 of Q17		75-1.0 Volts
At pins 2 or 3 of Q4		12.8 to 14.0 Volts
At pins 6 or 7 of Q4		1.75 to 2.0 Volts
At pins 1, 4, 5 or 8 of Q4		1.0-1.3 Volts
At pin 2 or 3 of Q1		27-29 Volts
At pin 4 of Q5		27-29 Volts
At the junction of L113 and CR113		+11 to +14 Volts
At the junction of L116 and CR114		–11 to –14 Volts

b. Place the TX/RX switch in RX

Test Point	Reading (Volts DC)	Limits
At the junction of L113 and CR113		–11 to –14 Volts
At the junction of L116 and CR114		+11 to +14 Volts
At pin 8 or 9 of U300		4.8 to 5.2 Volts

Part 2. Low Pass Filter Attenuation Values

Attenuation Measured at	Attenuation Value (dB)	Limits
118 MHz		0 to –1 dB
130 MHz		0 to –1 dB
140 MHz		0 to –1 dB
152MHz		0 to –1 dB
236 MHz		not above –60 dB
250 MHz		not above –60 dB
300 MHz		not above –60 dB
350 MHz		not above –60 dB
400 MHz		not above –60 dB

Part 3. Power Amp Bias Current and Swept Power Flatness

Init		amps (limits
Init+IQ5		amps (limits
Init+IQ5+IQ1		amps (limits
Swept power flatness maximum value		dB
Swept power flatness minimum value		dB
Swept maximum – Swept minimum		(limit 2.0 dB)

Part 4. PA Peak Power Prior to Filter

Peak power at 118 MHz		Watts (limit >80 watts)
Peak power at 125 MHz		Watts (limit >80 watts)
Peak power at 135 MHz		Watts (limit >80 watts)
Peak power at 145 MHz		Watts (limit >80 watts)
Peak power at 151 MHz		Watts (limit >80 watts)

Part 5. 20 Watt Power Flatness through Low Pass Filter Measurements

Power at 118 MHz		Watts (limits 18 to 22 watts)
Power at 125 MHz		Watts (limits 18 to 22 watts)
Power at 135 MHz		Watts (limits 18 to 22 watts)
Power at 145 MHz		Watts (limits 18 to 22 watts)
Power at 151 MHz		Watts (limits 18 to 22 watts)

Part 6. Harmonics and Spurious Responses

Harmonic level with TX at 118 MHz		dBc (limit not above –59 dBc)
Harmonic level with TX at 120 MHz		dBc (limit not above –59 dBc)
Harmonic level with TX at 125 MHz		dBc (limit not above –59 dBc)
Harmonic level with TX at 135 MHz		dBc (limit not above –59 dBc)
Harmonic level with TX at 145 MHz		dBc (limit not above –59 dBc)
Harmonic level with TX at 151 MHz		dBc (limit not above –59 dBc)
Check all non harmonic spurs less than -70 dBc		(place check mark)

5. VC-401B Power Supply Module Check Procedure

(1) Remove the lid on the power supply.

(2) Measure and verify the following voltages are within tolerance.

- Positive side of C146 should measure +7.5 ± .25 Vdc.
- Positive side of C148 should measure +15 ± 1.25 Vdc.
- Negative side of C147 should measure -15 ± 1.25 Vdc.
- Positive side of C149 should measure +28 ± 3 Vdc.