

## PARTS LIST/TUNE UP INFO

**Table 1: List of active devices.**

<b>DRIVER</b>	
<i>RF Precorrector</i>	<i>Module 04-299-02</i>
<b>Board 40-226-01</b>	
U1-U3	RF Amplifiers
D1, D2	Diodes
<b>Board 40-227-01</b>	
U1, U2	RF Amplifiers
U3	Regulator
U4	OP Amplifiers
Q1 – Q4	Transistors
D1 – D8	Diodes
<i>Final Amplifier</i>	<i>Module 04-292-02</i>
<b>Board 40-202-01</b>	
Q1	GaAs FET
<i>Phase Locked Crystal Oscillator</i>	<i>Module 09-067-02</i>
XPCRO-2303-FREQ	OEM
<i>IF Linear Processor</i>	<i>Module 05-073-02</i>
<b>Board 33-435-01</b>	
D1, D3	Pin Diodes
U1	IF Amplifier
D7, D8	Varactor Diodes
Q3 - Q6	Transistors
<i>Visual Driver Module</i>	<i>Module 04-128-02</i>
<b>Mixer</b>	
D1, D2	Diodes
<b>Amp #1</b>	
Q1 - Q3	Transistors
<b>Amp #2</b>	
Q4, Q5	Transistors
<i>Envelope Detector</i>	<i>Module 12-017-02</i>
<b>Board 33-094-02</b>	
D1,D2	Detector Diodes
<b>POWER AMPLIFIER SEGMENTS</b>	
<i>Power Amplifier Segments</i>	<i>Module 04-294-02</i>
<b>Board 40-240-02</b>	
U1	SPDT Switch
D1 - D3	Diodes
Q1 – Q5	GaAs FET

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## METERING CALIBRATION

Doc16-0003

Before shipping COMWAVE technicians complete system calibrations; however, re-calibration of the driver may become necessary when the input or output power levels are changed. Due to the equal gain of the power amplifiers, re-calibration of the segments is not necessary. Contact<sup>1</sup> customer support for assistance; refer to DOC20-0000 for contact information.

**THIS PROCEDURE IS APPLICABLE FOR ONLY MAKING MINOR ADJUSTMENTS TO OUTPUT POWER AND ANALOG METERING. DO NOT ADJUST POWER MORE THAN  $\pm .5$  dB. ADJUSTMENTS MORE THAN  $\pm .5$  dB MAY RESULT IN INCREASED INTERMODULATION DISTORTION PRODUCTS. FOR LARGER ADJUSTMENTS TO OUTPUT POWER RE-CALIBRATION OF THE IF PRECORRECTOR IS NECESSARY.**

For proper calibration, adjustments are performed in a specific sequence. Before beginning, place the driver into "STANDBY" and attach a -30 dB directional coupler and a termination to the internal combiner as shown in Figure 1.

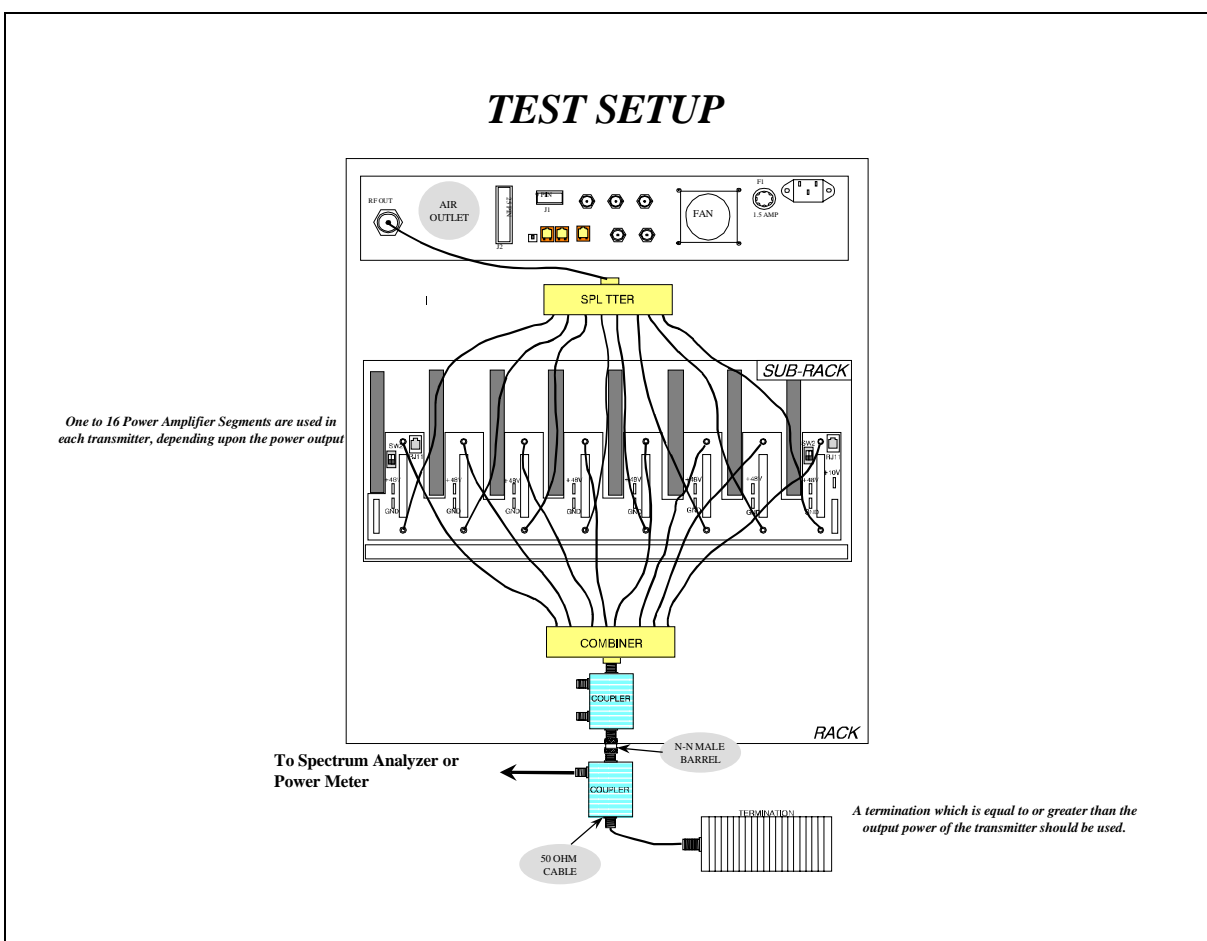


Figure 1: Test setup.

<sup>1</sup> Document DOC20-0001 provides detailed contact information. International phone 001-570-474-6751; USA & Canada phone 1-800-266-9283.

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### **DIGITAL OUTPUT POWER CALIBRATION**

Refer to [Figure2](#) for numerical references unless otherwise noted.

1. Apply a digital IF input signal.
2. Remove the RF Precorrector cover.
3. Turn the RF Precorrector ALC switch<sup>1</sup> to "MANUAL".
4. Connect an HP435B power meter or equivalent to the -30 dB coupler forward port.
5. Calculate the power meter reading necessary for 100% output power.


**Table 2: Digital output power example.**

Transmitter Output @ 25 Watts	=	+44.00 dBm
-30 dB Coupler	=	-30.00 dB
Expected Power Meter Reading	=	+14.00 dBm

6. Rotate the function switch from "STANDBY" to "FWD PWR" to enable transmit.
7. Adjust the  $\mu$ W attenuator<sup>2</sup> located on the RF Precorrector so that the power meter reads the desired output power.
8. Adjust the motherboard forward metering potentiometer, VR4, so that the driver front panel meter indicates 100% forward power output. Refer to [Figure3](#) for potentiometer locations.
9. Turn the ALC switch<sup>1</sup> to "AUTO".

### **ANALOG OUTPUT POWER CALIBRATION**

Refer to [Figure2](#) for numerical references unless otherwise noted.

 Analog Power output is dependent upon Modulation Depth. Obtain proper Modulation Depth before setting Output Power levels. Use a video generator capable of Black No Burst (O IRE = 2.2 dB correction factor) or Black Burst with setup (2.6 dB correction factor) for proper power level adjustments.

1. Apply an analog IF input signal.
2. Remove the RF Precorrector cover.
3. Turn the RF Precorrector ALC switch<sup>1</sup> "MANUAL".
4. Connect an HP435B power meter or equivalent to the -30 dB coupler forward port.
5. Calculate the power meter reading necessary for 100% output, accounting for the coupler loss and correction factor.

**Table 3: Analog output power example.**

Transmitter Output @ 100 Watts	=	+50.00 dBm
-30 dB Coupler	=	-30.00 dB
Correction Factor	=	- 2.60 dB
Expected Power Meter Reading	=	+17.40 dBm

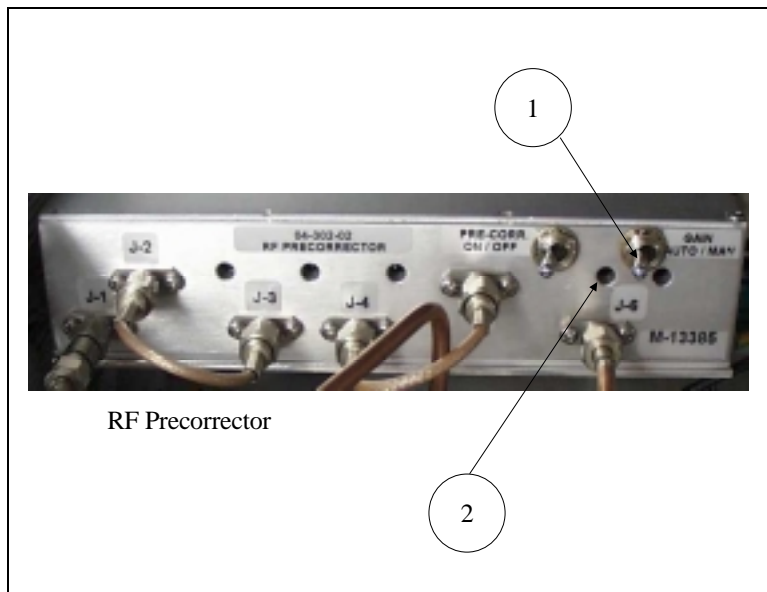
6. Rotate the function switch from "STANDBY" to "FWD PWR" to enable transmit.
7. Adjust the  $\mu$ W attenuator<sup>2</sup>, located on the RF Precorrector, so that the power meter reads the desired output power.
8. Adjust the motherboard forward metering potentiometer, VR4, so that the driver front panel meter indicates 100% forward power output. Refer to [Figure3](#) for potentiometer locations.
9. Turn the ALC switch<sup>1</sup> to "AUTO".

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### ***Reflected Output Power Metering***

1. Rotate the function switch to "STANDBY"
2. Turn the RF Precorrector ALC switch<sup>1</sup> to "MANUAL".
3. Briefly interchange the coax cables<sup>3</sup> at the envelope detector sample ports, refer to [Figure 3](#) for location of cables.
4. Rotate the function knob from "STANDBY" to "REF" to enable transmitting.
5. Adjust the motherboard reflected metering potentiometer, VR1, so that the driver front panel meter indicates 100% reflected power. Refer to [Figure 3](#) for potentiometer locations.
6. Rotate the function knob to "STANDBY".
7. Return the envelope detector coax cables<sup>3</sup> to the original configuration.
8. Turn the RF Precorrector ALC switch<sup>1</sup> to "AUTO".
9. Rotate the function knob to "REF". The meter should indicate less than 7% residual reflected power reading into a resistive termination.



**Figure 2: RF precorrector adjustments.**

### ***+11V<sub>DC</sub> SWITCHING POWER SUPPLY METERING***

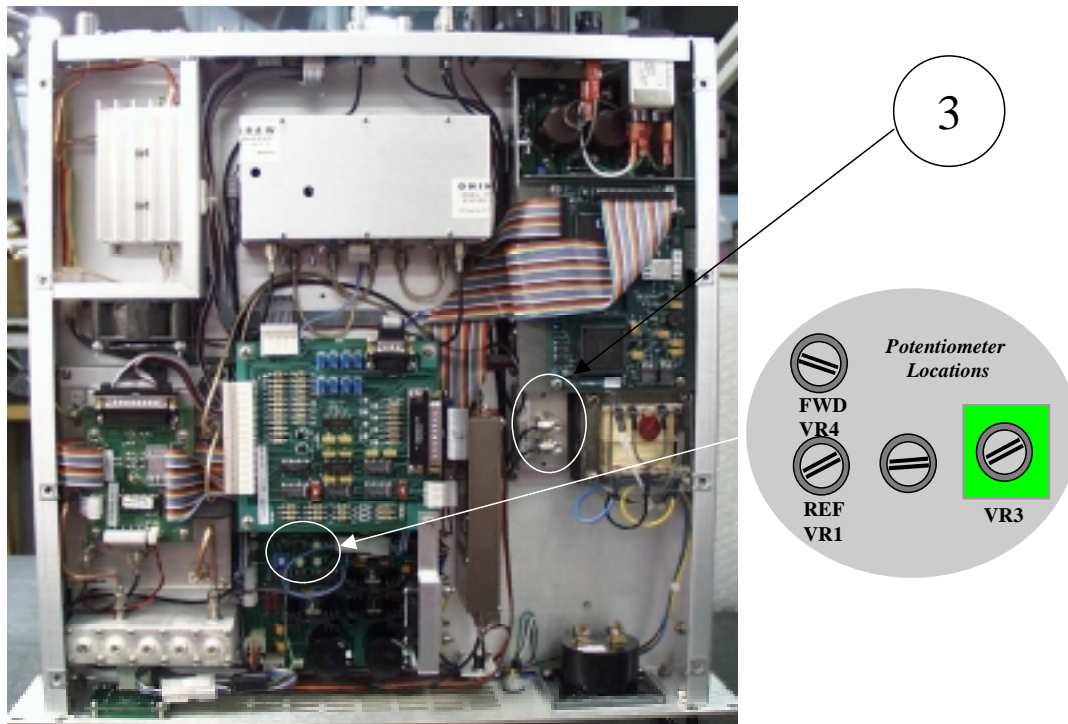
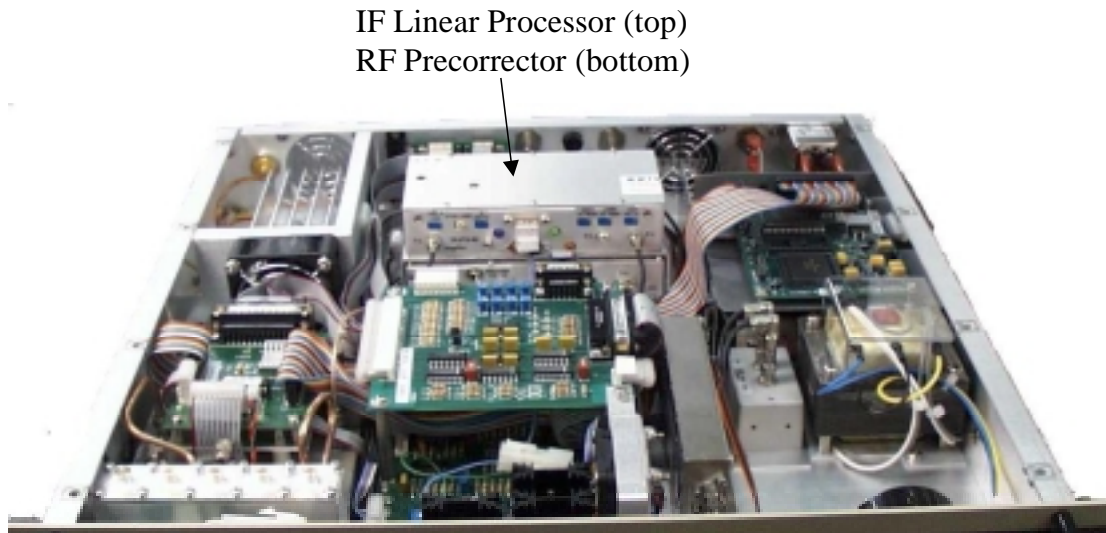
1. Using a digital voltmeter, measure the switching power supply output.
2. Confirm that the switching power supply voltage output is +10.80 V<sub>DC</sub>.
3. Rotate the function switch to +11 V PS.
4. Adjust the motherboard +11 V PS potentiometer, VR3, so that the driver front panel meter indicates 100% +11 V PS metering. Refer to [Figure 3](#) for potentiometer locations.

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This photo doesn't depict the agile driver, however, all points of reference are in the same location.

**Figure 3: Potentiometer locations.**

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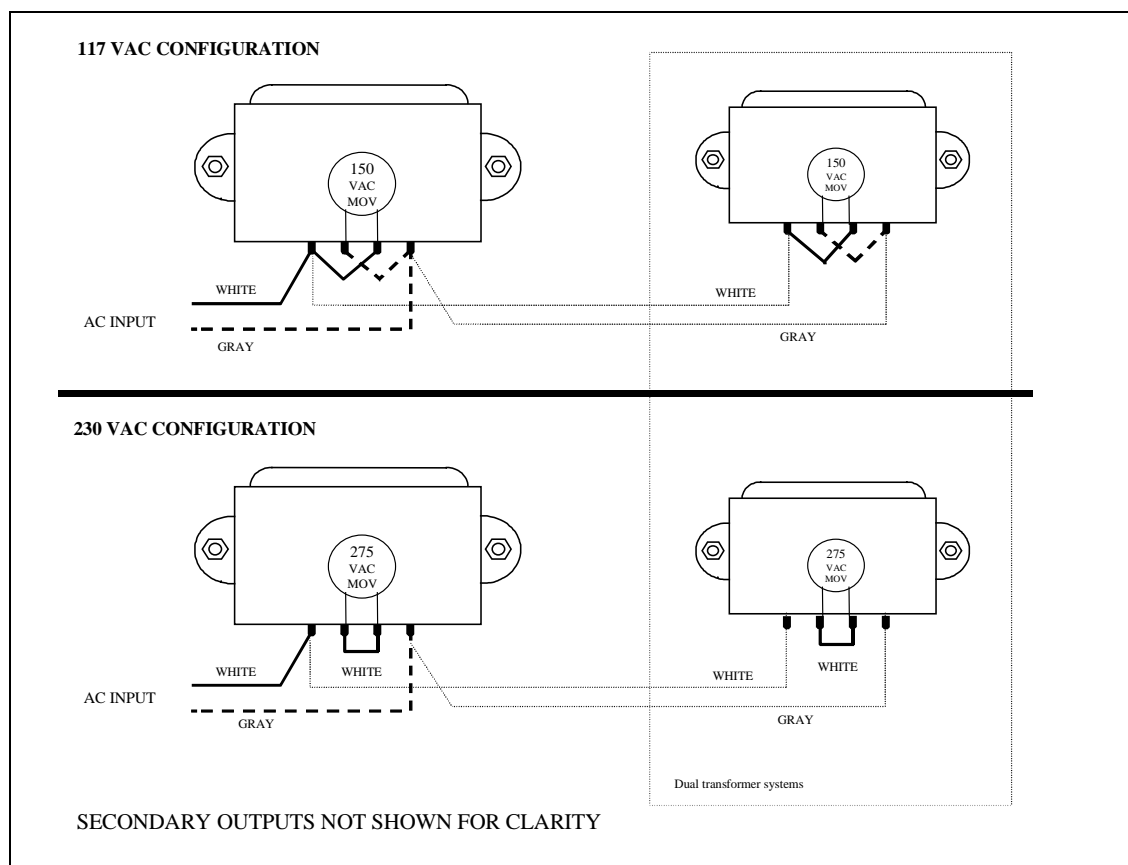
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## LINEAR POWER SUPPLY INPUT LINE VOLTAGE CONFIGURING

DOC17-0034

The linear power supply operates from a power transformer that requires specific configuring for the AC input source used. The primary transformer is wired in parallel for 117 V<sub>AC</sub> and is wired in series for 230 V<sub>AC</sub> operation. For 230 V<sub>AC</sub> operation, the center terminals are connected using a white jumper wire. For 117 V<sub>AC</sub> operation, one center terminal is connected to one primary input. [Figure4](#) offers a pictorial view how to wire the transformer(s).

- 1) Turn off the transmitter AC power and disconnect the AC line cord from the power receptacle.
- 2) Locate the switching power supply and/or transformer; refer to the appropriate chassis layout document in the technical manual.
- 3) See [Figure4](#) for assistance in reconfiguring the transformer.
- 4) For proper surge protection, the correct MOV must be installed across the transformer terminals. See the chassis layout for the location of the MOV.
  - a) 110 to 120 V<sub>AC</sub> line voltages use an MOV rated at 150 V<sub>AC</sub> (part number 150L10A).
  - b) 220 to 240 V<sub>AC</sub> line voltages use an MOV rated at 275 V<sub>AC</sub> (part number 275L20).
- 5) The linear power supply has been reconfigured.
- 6) Reconnect the AC line cord and turn the transmitter back on.



**Figure 4: Linear power supply/transformer input line voltage configuring.**

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