ACOM International, Inc.

Exhibit 12: Measurements Demonstrating Conformance to 97.307 and 97.317

External Radio Frequency Power Amplifier ACOM 1000 Model 1000

157 Horse Pond Road, Sudbury, MA 01776
Tel: (978) 440-7555
Fax: (978) 440-9080
e-mail: aa1nd@aol.com

97.317(a)(1)&(3) & 97.317(b): Spurious Emissions per 97.307(d) and Gain versus Frequency

Amplifier under test operated at frequencies f1 with CW (A1A) excitation. Spectrum analyzer used to observe all frequencies from f1 through at least 10 x f1 for harmonic and spurious emissions.

Results reflect amplifier as shipped with 24.5 and 28 MHz Bands disabled

Power Gain 97.317 (a) (1) (2) (3), (c) (6) (ii)				Spurious emissions 97.307 (d)			
Frequency (MHz) f_1	**Power in (W)**	**Power out (W)**	**Gain dB**	**2f1 dBc**	**3f1 dBc**	**4f1 dBc**	**5-10f1 dBc worst case**
1.900	71	891	11	-51.1	-73.8	-73.4	-73.9
3.750	69	914	11.21	-52.6	-75.0	-73.9	>-76.6
7.150	71	885	10.98	-57.9	>-77.1	>-78.0	>-76.2
10.125	74	931	11.02	-57.8	>-76.1	>-75.4	>-76.0
14.175	75	889	10.72	-55.5	-73.2	-72.2	-61.5
18.118	74	881	10.75	-61.9	>-76.3	>-75.4	>-74.9
21.225	74	871	10.7	-61.50	>-76. 0	>-73.9	>-72.5
52	35	537	11.88	-66.4	-63.0	-64.9	-64.4
97.317 (b) (1) (2) 0 dB gain was noted in the 12 & 10 meter amateur bands and measured at the points below (data for: amplifier in Stand-by / amplifier ON)							
24.930	91/92	92/0	0.04/-37.8				
28.500	92/92	93/0	0.03/-29.4				
97.317 (c) (6) (i) was not capable of full power output when driven with <50 watts							
1.9	33	388	10.72				
3.75	29	387	11.28				
7.150	27	297	10.34				
10.125	27	352	11.08				
14.175	27	349	11.13				
18.118	27	286	10.28				
21.225	27	383	11.47				
52	30	528	12.39				
24.930*	27	290	10.28				
28.500*	28	344	10.92				
After owner modification to activate 24-28 MHz bands:							
Frequency (MHz) f_1	**Power in (W)**	**Power out (W)**	**Gain dB**	**2f1 dBc**	**3f1 dBc**	**4f1 dBc**	**5-10f1 dBc worst case**
24.930*	66	828	10.98	-68.7	-70.9	-70.9	>-73.8
28.500*	69	822	10.77	-71.4	-73.0	-70.1	-70.2

*Not usable as shipped; data applicable only after enabling of 24.5 & 28 MHz bands as follows.

When delivered to any buyer located within the FCC's jurisdiction, the equipment is operable on authorized amateur bands only from 1.8 through 21.45 MHz. To meet the requirements of 97.317(b), the equipment employs two internal lock-out systems: one is mechanical and the other is software.

- The mechanical block system ensures that three top frequency bands (namely 24-28 and 50 MHz) cannot be selected. This is achieved by mechanical means. A solid steel lug prevents the band switch from being fixed on two top band positions. As seen on the photo below (Figure 1), moving the band switch axis clockwise is limited to the steel lug. It is pointed with an yellow arrow on the photo only but not in the construction.

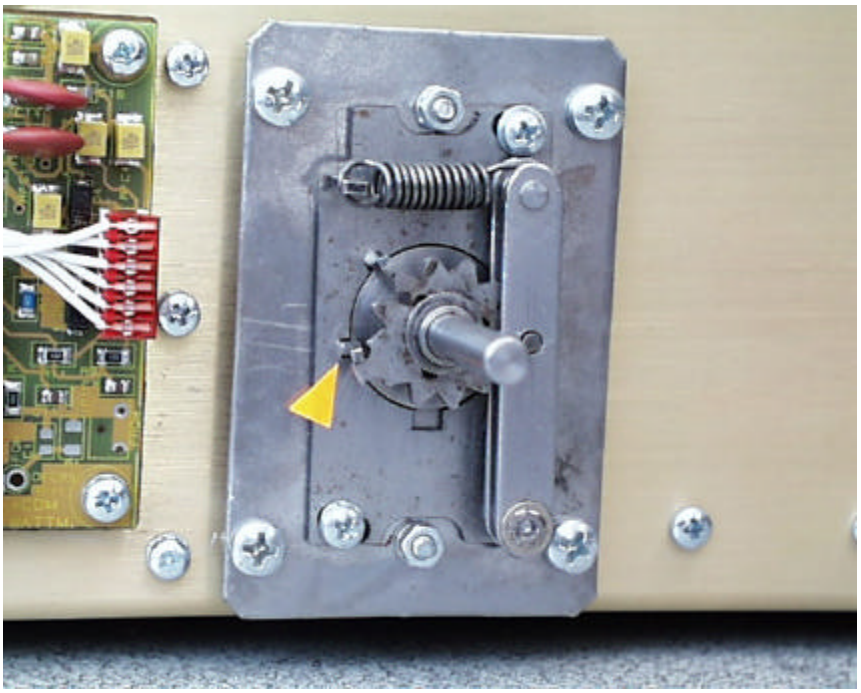

Figure 1. Mechanical block on 24-28 and 50MHz Bands

- The software lock-out system resets the amplifier in stand-by mode always when RF excitation in the frequency range between 24 and 35 MHz is detected on the tube grid. This system is fully independent from the mechanical one, so the amplifier will not work between 24 and 35MHz even though one might overcome the mechanical system. A software message “Frequency Violation!” is issued to the operator in such a case, as seen on the next photo (Figure 2):

Figure 2. The “Frequency Violation!” message

Operation on the 50 MHz amateur band in full conformance with FCC rules only by amateurs whose FCC licenses authorize such operation is possible after such owners partly disassembly the front panel of the amplifier and bend the mechanical block lug. In order to operate the 24.5 and 28 MHz amateur bands they have to make an additional, simple but subtle modification in the electronic circuit too – removing one of the resistors (there are 82 of them) on the micro-controller PCB, which is yet accessible only after an additional mechanical disassembly of the CONTROL module. ACOM International advises an owner how to perform this modification ONLY after receiving proof that he holds an appropriate FCC license. This is the FCC-approved process that has been adopted industry-wide to ensure that amateur amplifiers are used in conformance with FCC rules.

97.307(a)(b): Intermodulation & Linearity

Exciter operating in SSB (A3E, J3E) mode with two-equal-tone audio applied to the microphone input. Amplifier under test driven to 1 kW PEP output at center of each amateur band, 60-70 W PEP excitation.

Intermodulation in dB relative to 1 kW PEP:

Order:	**D3**	**D5**	**D7**	**D9**	**D11**
Frequency (MHz)	**dB**	**dB**	**dB**	**dB**	**dB**
1.900	-43	-45	-48	-52	-55
3.750	-46	-52	-46	-50	-53
7.150	-39	-52	-46	-50	-54
10.125	-43	-47	-45	-49	-52
14.175	-42	-45	-46	-50	-54
18.118	-38	-46	-45	-50	-53
21.225	-39	-47	-46	-51	-53
24.940*	-46	-45	-47	-50	-54
28.900*	-39	-43	-46	-51	-53
52	-38	-44	-45	-50	-53
Worst Case	-38	-42	-45	-49	-52

*Not usable as shipped; data applicable only after authorized owner modification.

97.317(a)(2)&(3): When the amplifier is in the “standby” or “off” positions, but still connected to the exciter, no measurable change from the normal output of the exciter is detectable with the spectrum analyzer (noise floor approximately –70dBc) when amplifier is driven with 0 to 150 W mean RF power.

97.317(c): The amplifier possesses none of the prohibited characteristics listed in this section.

97.317(c)(6)(iii): The amplifier gain does not exceed 13 dB for any level of input signal.

97.317(c)(6)(iv): The amplifier is capable of greater than 50% duty cycle at rated power output with A1A, A3E(J3E), or F1B, F3E, and J3F emission.

97.317(c)(7): Amplifier gain is established principally by RF negative feedback in the cathode circuit. The input swamping resistor is used only to present a 50 ohm load to the broadband grid matching circuit, not as an attenuator. Removal of this resistor or changing its value will result in a severe load mismatch to the exciter output.

Additional data: Information and data supplied by tube manufacturer SVETLANA concerning the GU74B/4CX800A tetrode is available by request from the manufacturer.