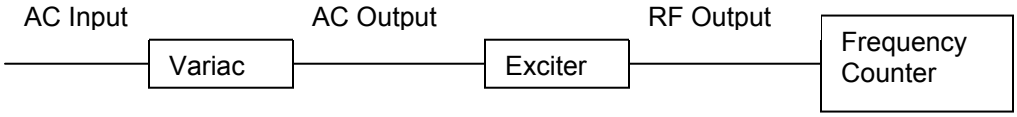
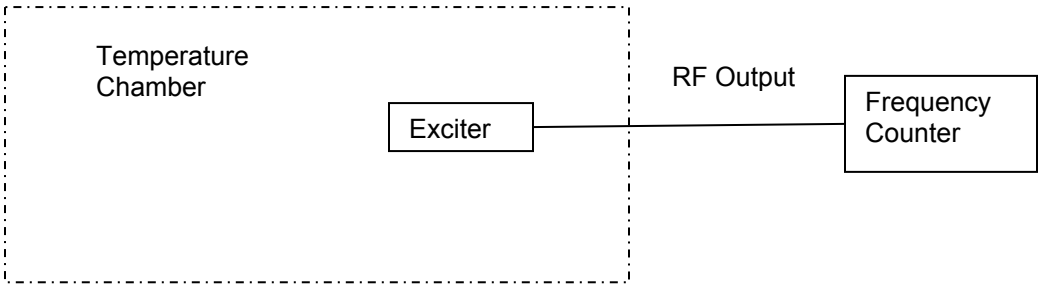
FREQUENCY STABILITY MEASUREMENTS

Frequency stability versus temperature and line voltage was measured in a controlled environment. For these tests the exciter RF output was fed to a frequency counter that has better than a 1ppm accuracy. The test equipment configuration is shown below. Only the exciter was placed in the temperature chamber instead of the whole transmitter because of space limitations. This has no impact on the frequency stability of the transmitter since the stability is determined solely by the exciter frequency generation scheme.

Frequency Stability versus line voltage variation



Frequency Stability versus temperature



The Variac was adjusted for nominal voltage and the frequency was recorded. Then the variac was adjusted to 85% and 115% of the nominal voltage and the frequency was recorded at each voltage level. For this test, the -10 kHz offset was used. The results are tabulated below.

LINE VOLTAGE (Volts)	Visual Frequency (MHz)	Aural Frequency (MHz)
100 (85%)	507.239979	511.739882
121 (nominal)	507.239979	511.739882
140 (115%)	507.239979	511.739882

For the temperature stability measurements the exciter was placed inside a Tenney temperature chamber equipped with a MicroTenn II temperature controller. The exciter frequency was measured on the frequency counter. Measurements were first recorded at room temperature. The temperature in the chamber was changed to each of the points identified in the table below. The chamber followed a prescribed rate of change to reach each temperature and was then allowed to stabilize at the desired temperature for 10-15 minutes at which time frequency measurements were made. The temperature was cycled hot to 50°C and then gradually decreased until the entire range was covered.

Temperature °C	Time	Visual Frequency (MHz)	Aural Frequency (MHz)
25	1:30	507.250,000	511.749,913
50	2:50	507.249,793	511.750,038
40	3:10	507.249,781	511.749,818
30	3:20	507.249,955	511.749,877
20	3:30	507.249,885	511.749,770
10	3:45	507.249,577	511.794,407
0	4:00	507.249,434	511.749,343
-10	4:10	507.249,523	511.749,397
-20	4:20	507.249,567	511.750,816
-30	4:30	507.249,613	511.750,255

The recorded data indicates that the frequency stability requirements of FCC Rule 2.1055 were met.