

Exhibit N: Frequency Stability

FCC ID: CW21669-3

Frequency Stability

The Frequency Stability data that was approved by the FCC during the certification of CW21668-1 is being referenced for this application.

9. Frequency Stability

9.1 Test Requirement

Sec. 2.1055 Measurements required: Frequency stability.

- (a) The frequency stability shall be measured with variation of ambient temperature as follows: (1) From -30 deg. to +50 deg. centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section.
- (b) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10 deg. centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. The short term transient effects on the frequency of the transmitter due to keying (except for broadcast transmitters) and any heating element cycling normally occurring at each ambient temperature level also shall be shown. Only the portion or portions of the transmitter containing the frequency determining and stabilizing circuitry need be subjected to the temperature variation test.
- (d) The frequency stability shall be measured with variation of primary supply voltage as follows:
 - (1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.
 - (2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point, which shall be specified by the manufacturer.
 - (3) The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided. Effects on frequency of transmitter keying (except for broadcast transmitters) and any heating element cycling at the nominal supply voltage and at each extreme also shall be shown.

9.2 Test Technical Standard

Sec. 90.213 Frequency stability

(a) Unless noted elsewhere, transmitters used in the services governed by this part must have a minimum frequency stability as specified in the following table.

Minimum Frequency Stability [Parts per million (ppm)]			
Frequency range (MHz)	Mobile stations		
	Fixed and base stations	Over 2 watts output power	2 watts or less output power
150-174	5,115	65	4,650

⁴ Stations operating in the 154.45 to 154.49 MHz or the 173.2 to 173.4 MHz bands must have a frequency stability of 5 ppm.

⁵ In the 150-174 MHz band, fixed and base stations with a 12.5 kHz channel bandwidth must have a frequency stability of 2.5 ppm. Fixed and base stations with a 6.25 kHz channel bandwidth must have a frequency stability of 1.0 ppm.

⁶ In the 150-174 MHz band, mobile stations designed to operate with a 12.5 kHz channel bandwidth or designed to operate on a frequency specifically designated for itinerant use or designed for low-power operation of two watts or less, must have a frequency stability of 5.0 ppm. Mobile stations designed to operate with a 6.25 kHz channel bandwidth must have a frequency stability of 2.0 ppm.

¹¹ Paging transmitters operating on paging-only frequencies must operate with frequency stability of 5 ppm in the 150-174 MHz band and 2.5 ppm in the 421-512 MHz band.

9.3 Test Procedure

TIA/EIA-603:1993 Section 2.2.1

9.4 Test equipment

Communication Analyzer: IFR COM 120A, Serial Number 485002436

9.5 Test Results

Test run at nominal battery voltage of 12.0Vdc on 152.87 MHz. Temperature in deg C, Error in ppm

-30	-20	-10	0	10	20	30	40	50	60
-2.9	0.6	3.7	4.8	4.9	2.9	0.9	-0.8	-1.9	-2.1

Test run at LOW battery voltage of 11.0 Vdc on 152.87 MHz, Temperature in deg. C, Error in ppm

-30	-20	-10	0	10	20	30	40	50	60
-4.0	0.8	3.6	4.7	4.8	2.7	0.8	-1.0	-2.0	-2.3