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APPLICANT: CHIAYO ELECTRONICS CO., LTD.

FCC ID: CINSM-216

TEST REPORT:

EXHIBITS:

GENERAL_INFORMATION_REQUIRED
FOR_TYPE_ACCEPTANCE

2.983 (a,b,c) CHIAYO ELECTRONICS CO., LTD. will manufacture the CINSM-216 in quantity, for use under FCC RULES PART 74.801, LOW POWER AUXILIARY STATIONS.

2.983 (d) TECHNICAL DESCRIPTION

(1) Type of Emission: 160KF3E

Bn = 2M + 2DK
M = 1000
D = 72.0KHz (Peak Deviation)
K = 1
Bn = 2(1K) + 2(72.0K)(1) = 2K +144.0K = 146.0KHz
M = 10,000
D = 70KHz
K = 1
Bn = 2(10K) + 2(70K) = 20 +140 = 160KHz

74.861(e)(5) ALLOWED AUTHORIZED BANDWIDTH = 200KHz.

(2) Frequency Range: Part 74: 161.625-161.775 & 174-216MHz

TEST FREQ = 174.10MHz.

(3) Power Range and Controls: UNIT has no power controls.

(4) Maximum Output Power Rating: 2.0 MilliWatts ERP.

(5) DC Voltages and Current into Final Amplifier:
FINAL AMPLIFIER ONLY
9.0V BATTERY
Vce = 8.9 Volts
Ice = 1.6mA.

(6) Function of each electron tube or semiconductor device or other active circuit device:

SEE EXHIBIT #: 5A-5G.

2.983(d) (7) Complete Circuit Diagrams: The circuit diagram is included as EXHIBIT 6. The block diagram is included as EXHIBIT 4.

2.983(d) (8) Instruction book. The instruction manual is included as EXHIBIT #: 7.

(9) Tune-up procedure. The tune-up procedure is given in EXHIBIT #: 8.

(10) Description of all circuitry and devices provided for determining and stabilizing frequency.

The transmitter frequency is controlled by a crystal, the crystal specifications are not applicable.

(11) Description of any circuits or devices employed for suppression of spurious radiation, for limiting modulation, and for limiting power. There are no devices or circuitry to limit the power, since this is a low power device. The interstage coupling between TR1, TR2, TR3, TR4, and TR6 as well as the low pass filter made up of L2, VC1, C26, L3, VC2, C28, L4, L6, VC3, & C29 suppress the harmonics.

Limiting Modulation:
The transmitter audio circuitry is contained in IC2. The modulation limiting is also provided by IC1B.

Limiting Power:
There is no provision for limiting power.

(12) Digital modulation. This unit does not use digital modulation.

2.983(e) The data required by 2.985 through 2.997 is submitted below.

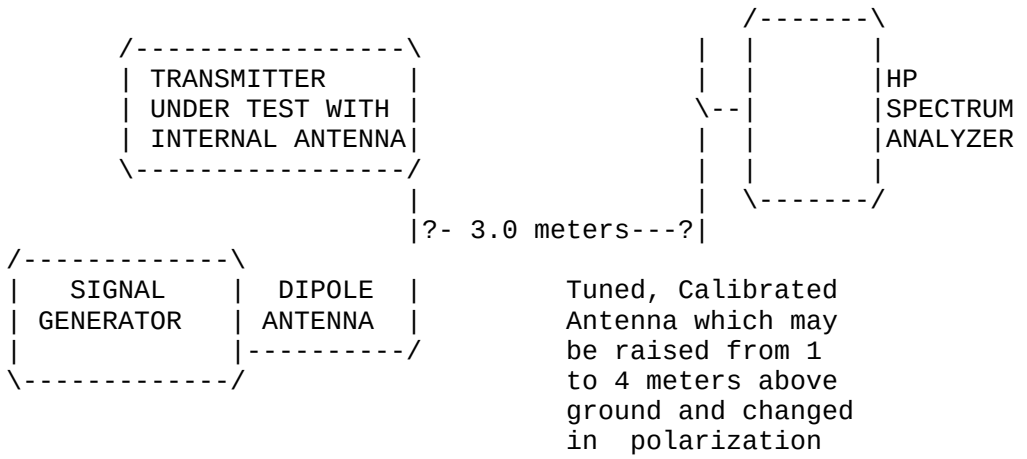
2.985(a) RF power output.

ERP was measured by the method described later in this report. The input power to the final stage was measured with a 9.0V supply connected in place of the 1.5V battery.

INPUT POWER: FOR 9.0 V OPERATION
(8.9V)(0.0016A) = 14.3milliWatts

OUTPUT POWER: FOR 9.0 V OPERATION
4.0 mWATTS ERP

R.F. POWER OUTPUT



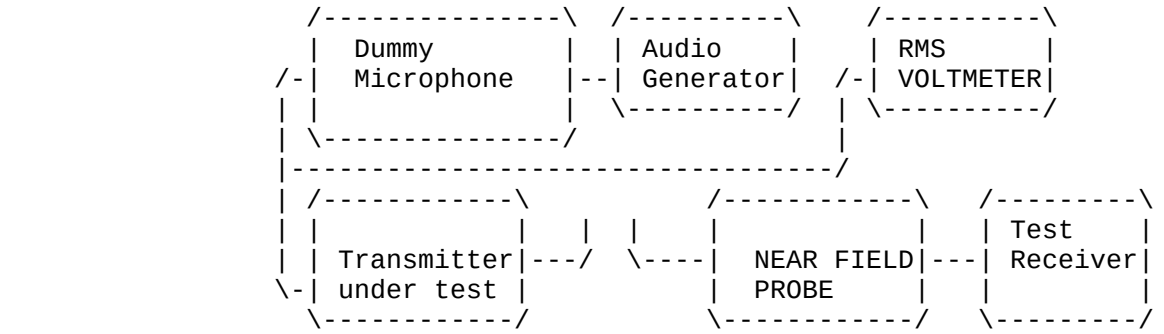
Equipment placed 1 meter above ground on a rotatable platform. The center of the Dipole antenna at the center of the platform and the output of the signal generator adjusted to produce the same meter reading as measured for the fundamental in the radiated emissions test.

2.987(a)(b) Modulation characteristics:

AUDIO FREQUENCY RESPONSE

The audio frequency response was measured in accordance with TIA/EIA Specification 603 S2.2.6.2.1. with the following exceptions;

Constant Deviation Test



1. The test receiver audio bandwidth was <50Hz to >20,000Hz.
2. Apply a 1000Hz tone and adjust the audio generator to produce 10% of the rated system deviation.
3. Measure frequency response over the frequency range from 100Hz to 20,000Hz.

The audio frequency response curve is shown in EXHIBIT # 9.

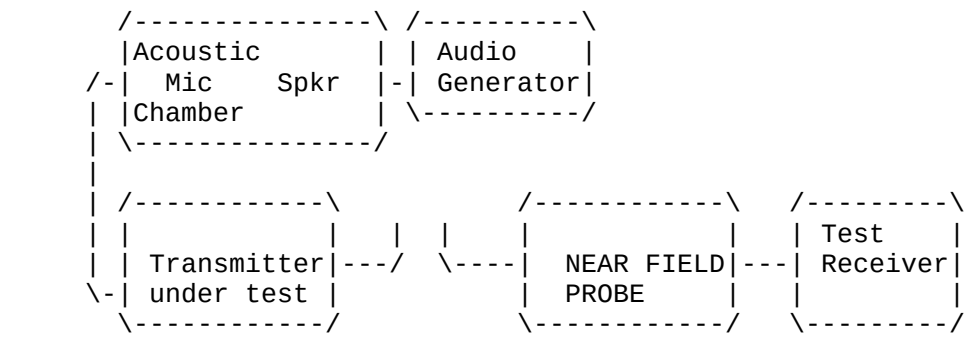
AUDIO LOW PASS FILTER

The audio low pass filter is not required in this unit.

2.989(c) Occupied bandwidth: Using TIA/EIA 2.2.10 Acoustic Microphone Sensitivity test procedure to determine if the UUT could be put into modulation limiting and limiting could not be reached, the maximum deviation was only +40KHz. Using this test procedure the frequency of maximum sensitivity was determined to be 500Hz.

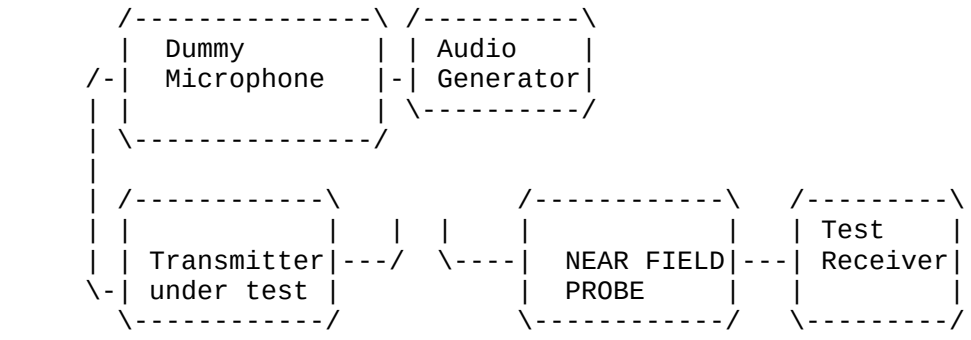
a.

Test procedure diagram
OCCUPIED BANDWIDTH MEASUREMENT



b. Since the UUT could not be put into modulation limiting with an acoustic coupling a dummy microphone was used to connect to the UUT and a test procedure similar to TIA/EIA-603 S2.2.11 was used to measure the occupied bandwidth. Plots were made of the frequency of maximum sensitivity, at 10KHz and at the highest frequency for the UUT. Data in the plots show that all sidebands beyond the authorized bandwidth are less than 0.5% of the unmodulated carrier. The plot show the transmitter modulated with 10,000 Hz(the highest modulation frequency), adjusted for 50% modulation plus 16 dB. The spectrum analyzer was set with the unmodulated carrier at the top of the screen. The test procedure diagram and occupied bandwidth plots follow.

Test procedure diagram
OCCUPIED BANDWIDTH MEASUREMENT



REQUIREMENT: PART 74: 200kHz EMISSION BANDWIDTH.

2.993(a)(b) Field strength of spurious emissions:

NAME OF TEST: RADIATED SPURIOUS EMISSIONS

REQUIREMENTS: Emissions must be 43 +10log(Po) dB below the mean power output of the transmitter.

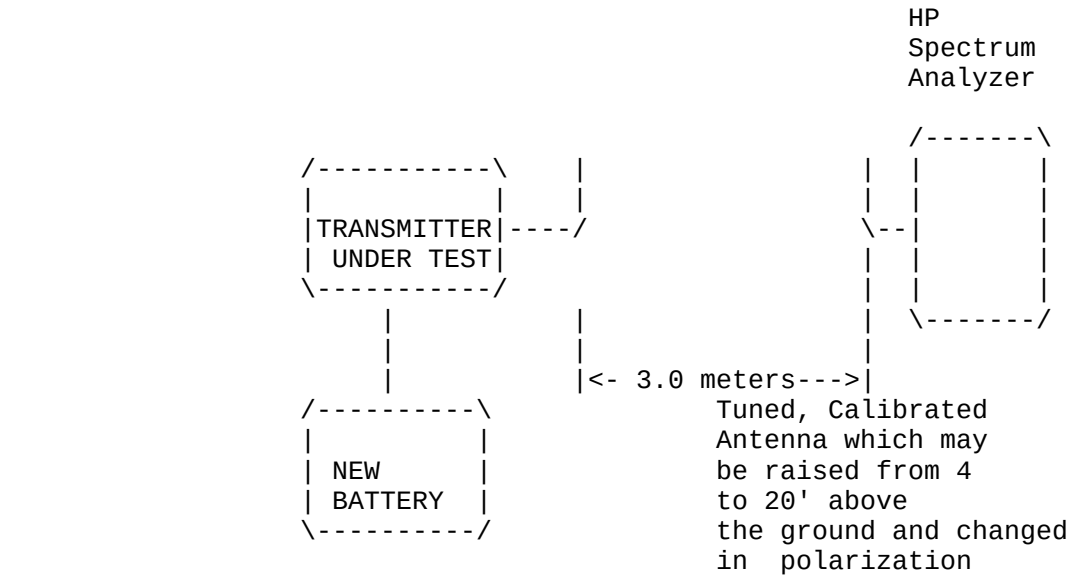
43 + 10 log(0.004) = 43 - 2.39 = 40.9 dB

TEST DATA:

EMISSION FREQUENCY MHz	@	ATT. LEVEL dBc	dB
175.00		0.00	
350.00		75.35	40.90
525.00		72.90	40.90
700.00		70.30	40.90

METHOD OF MEASUREMENT: The procedure used was TIA/EIA 603. The spectrum was scanned from 30 to at least the tenth harmonic of the fundamental using a HP model 8566B spectrum analyzer, an Eaton model 94455-1 Biconical Antenna, ElectroMetrics antennas models TDA, TDS-25-1, TDS-25-2 RGA 180. Measurements were made at the open field test site of TIMCO ENGINEERING INC. located at 6051 N.W. 19th LANE, GAINESVILLE, FL. 32605.

Method of Measuring Radiated Spurious Emissions



Equipment placed 4' above ground
on a rotatable platform.

2.995(a)(b)(d) Frequency stability:

Temperature and voltage tests were performed to verify that the frequency remains within the .0050%,(50 ppm) specification limit.

The test was conducted as follows: The transmitter was placed in the temperature chamber at 25 degrees C and allowed to stabilize for one hour. The transmitter was keyed ON for one minute during which four frequency readings were recorded at 15 second intervals. The worse case number was taken for temperature plotting. The assigned channel frequency was considered to be the reference frequency. The temperature was then reduced to -30 degrees C after which the transmitter was again allowed to stabilize for one hour. The transmitter was keyed ON for one minute, and again frequency readings were noted at 15 second intervals. The worst case number was recorded for temperature plotting. This procedure was repeated in 10 degree increments up to + 50 degrees C.

MEASUREMENT DATA:

Assigned Frequency (Ref. Frequency): 210.200 830MHz

TEMPERATURE C	FREQUENCY MHz	PPM
-30	210.203 980	+1.50
-20	210.204 420	+1.71
-10	210.204 500	+1.75
0	210.203 980	+1.50
10	210.203 100	+1.10
20	210.201 850	-0.48
30	210.200 350	-0.23
40	210.198 750	-0.99
50	210.197 000	-1.82
+Battery End-Point VDC	210.201 06	-0.16

RESULTS OF MEASUREMENTS: The maximum frequency variation over the temperature range was +1.75 to -1.82 ppm. The maximum frequency variation at the battery end-point was -0.16 ppm.

2.983(f) Photo or Drawing of Label:
See Exhibit 2.

2.983(g) Photos of Equipment:
See Exhibit 3A-3E.

2.997 Frequency Spectrum Investigated The Spectrum was investigated from 0.400 to at least the tenth harmonic of the fundamental.

2.999 Measurement Procedures for Type Acceptance:

Measurement techniques have been in accordance with EIA specifications and the FCC requirements.

2.909 Certification of Technical Data by Engineers

We, the undersigned, certify that the enclosed measurements and enclosed data are true and correct.

_____
S.S. Sanders
Engineer

TEST EQUIPMENT LIST

1. Spectrum Analyzer: HP 8566B-Opt 462, S/N 3138A07786, w/ preselector HP 85685A, S/N 3221A01400, Quasi-Peak Adapter HP 8565OA, S/N 3303A01690 & Preamplifier HP 8449B-OPT H02, S/N 3008A00372 Cal. 10/17/99
2. Signal Generator: HP 8640B, S/N 2308A21464 Cal. 9/23/99
3. Signal Generator: HP 8614A, S/N 2015A07428 Cal. 5/29/99
4. Passive Loop Antenna: EMCO Model 6512, 9KHz to 30MHz, S/N 9706-1211 Cal. 6/23/97
5. Biconnical Antenna: Eaton Model 94455-1, S/N 1057
6. Log-Periodic Antenna: Electro-Metrics Model EM-6950, S/N 632
7. Dipole Antenna Kit: Electro-Metrics Model TDA-30/1-4, S/N 153 Cal. 11/24/99
8. Double-Ridged Horn Antenna: Electro-Metrics Model RGA-180, 1-18 GHz, S/N 2319 Cal. 4/27/99
9. Horn 40-60GHz: ATM Part #19-443-6R
10. Line Impedance Stabilization Network: Electro-Metrics Model FCC-25/2, S/N 2512 Cal. 11/18/99
11. Line Impedance Stabilization Network: Electro-Metrics Model ANS-25/2, S/N 2604 Cal. 11/30/99
12. Line Impedance Stabilization Network: Electro-Metrics Model EM-7820, S/N 2682 Cal. 12/1/99
13. Line Impedance Stabilization Network: Electro-Metrics Model EM-7821, S/N 101 Cal. 12/1/99
14. Temperature Chamber: Tenney Engineering Model TTRC, S/N 11717-7
15. AC Voltmeter: HP Model 400FL, S/N 2213A14499 Cal. 9/21/99
16. Digital Multimeter: Fluke Model 8012A, S/N 4810047 Cal 9/21/99
17. Digital Multimeter: Fluke Model 77, S/N 43850817 Cal 9/21/99
18. Oscilloscope: Tektronix Model 2230, S/N 300572 Cal 9/23/99
19. Frequency Counter: HP Model 5385A, S/N 3242A07460 Cal 10/6/99