TABLE OF CONTENTS LIST

APPLICANT: CHIAYO ELECTRONICS CO., LTD.

FCC ID: CINM-1000

TEST REPORT:

PAGE 1.....COVER SHEET - GENERAL INFORMATION & TECHNICAL DESCR.
PAGE 2.....TECHNICAL DESCRIPTION CONTD. & RF POWER OUTPUT
PAGE 3.....RF POWER OUTPUT CONTD. & MODULATION CHARACTERISTICS
PAGE 4.....OCCUPIED BANDWIDTH
PAGE 5.....FIELD STRENGTH OF SPURIOUS EMISSIONS
PAGE 6.....METHOD OF MEASURING RADIATED SPURIOUS EMISSIONS
PAGE 7.....FREQUENCY STABILITY
PAGE 8.....CERTIFICATION OF TECHNICAL DATA AND
LIST OF TEST EQUIPMENT

EXHIBITS CONTAINING:

EXHIBIT 1.....POWER OF ATTORNEY LETTER
EXHIBIT 2.....FCC ID LABEL SAMPLE AND SKETCH OF LOCATION
EXHIBIT 3A.....EXTERNAL FRONT & REAR VIEW PHOTOGRAPH
EXHIBIT 3B.....EXTERNAL TOP VIEW PHOTOGRAPH
EXHIBIT 3C.....INTERNAL COMPONENT SIDE PHOTOGRAPH
EXHIBIT 3D.....INTERNAL SOLDER SIDE PHOTOGRAPH
EXHIBIT 4.....BLOCK DIAGRAM
EXHIBIT 5A-5C.....PARTS LIST
EXHIBIT 6.....SCHEMATIC
EXHIBIT 7.....TUNING PROCEDURE
EXHIBIT 8A-8G.....USER'S MANUAL
EXHIBIT 9.....AUDIO FREQUENCY RESPONSE GRAPH
EXHIBIT 10.....AUDIO INPUT VS DEVIATION GRAPH
EXHIBIT 11.....OCCUPIED BANDWIDTH PLOT - NO MODULATION
EXHIBIT 12.....OCCUPIED BANDWIDTH PLOT - 15 kHz TONE
EXHIBIT 13.....OCCUPIED BANDWIDTH PLOT - 2500 HZ TONE

GENERAL_INFORMATION_REQUIRED

FOR_TYPE_ACCEPTANCE

2.983 (a,b,c) CHIAYO ELECTRONICS CO., LTD. will manufacture the CINM-1000 in quantity, for use under FCC RULES PART 74.801, LOW POWER AUXILIARY STATIONS.

2.983 (d) TECHNICAL_DESCRIPTION

(1) Type of Emission: 110K0F3E

Bn = 2M + 2DK
M = 1000
D = 40.0KHz (Peak Deviation)
K = 1
Bn = 2(1K) + 2(40.0K)(1) = 2K +80.0K = 82.0KHz
M = 15,000
D = 28KHz
K = 1
Bn = 2(15K) + 2(28K) = 30 +56 = 86KHz

Bn = 2(15) + 2(40) = 30 + 80 = 110KHz

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

(2) Frequency Range: Part 74: 161.625-161.775MHz &
174-216MHz
TEST FREQ = 215.20MHz.

(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 = 4.0mA.

(6) Function of each electron tube or semiconductor device or other active circuit device:
See part list Exhibit 5B.

2.983(d) (7) Complete Circuit Diagrams: The circuit diagram is included as EXHIBIT 6. The block diagram is included as EXHIBIT 4. The part list is included EXHIBIT 5A-5C.

2.983(d) (8) Instruction book. The instruction manual is included as last item in this report.

(9) Tune-up procedure. The tune-up procedure is given in page 7.

(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 included in PAGE .

(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.

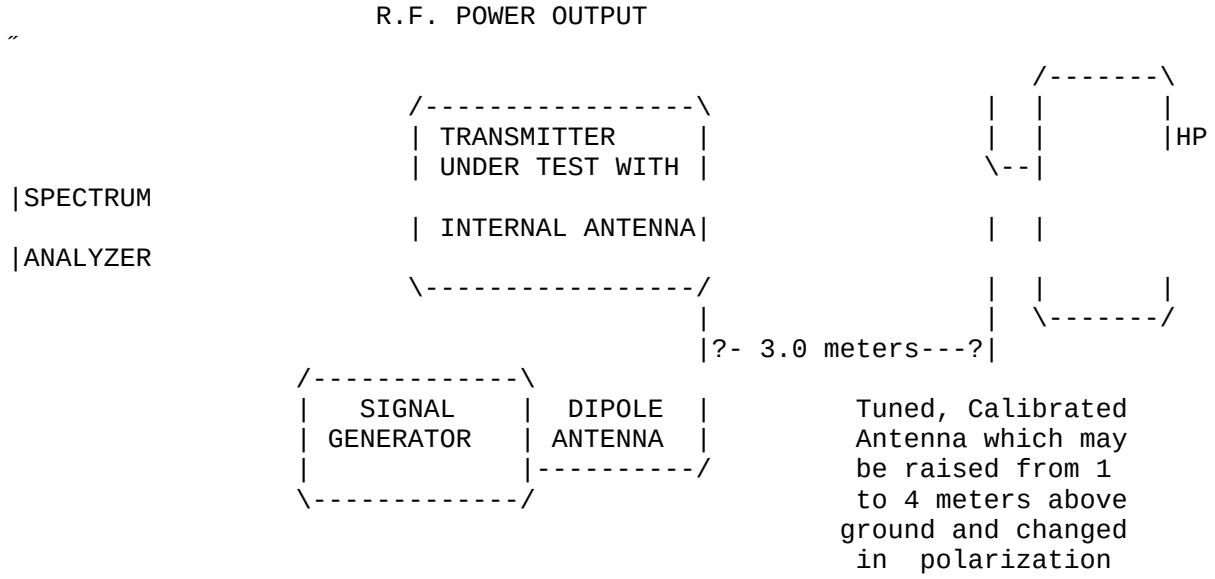
2.983(e) The data required by 2.985 through 2.997 is submitted below.

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 1.5V supply connected in place of the 1.5V battery.

INPUT POWER: FOR 9.0 V OPERATION
(8.9V)(0.004A) = 35.6milliWatts

OUTPUT POWER: FOR 9.0 V OPERATION
1.0 mWATTS ERP



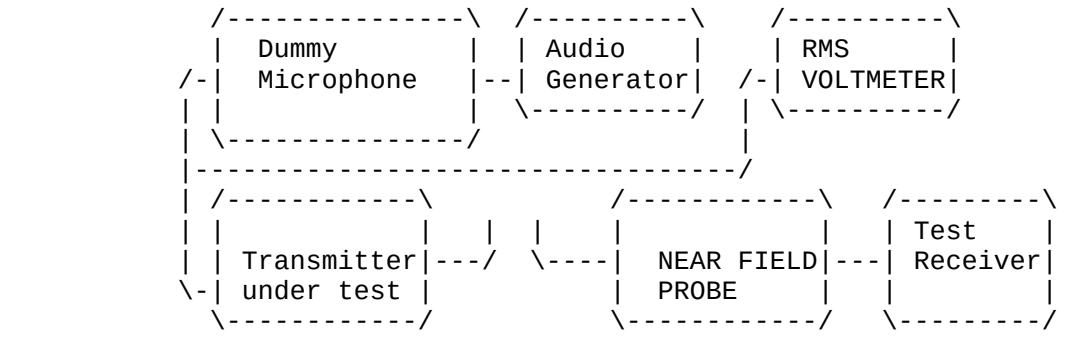
Equipment placed 1 meter above ground on a rotatable platform. The center of the Dipole antenna at the center of the platform and the output of the signal generator adjusted to produce the same meter reading as measured for the fundamental in the radiated emissions test.

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 follwoing 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 responce over the frequency range from 100Hz to 20,000Hz.

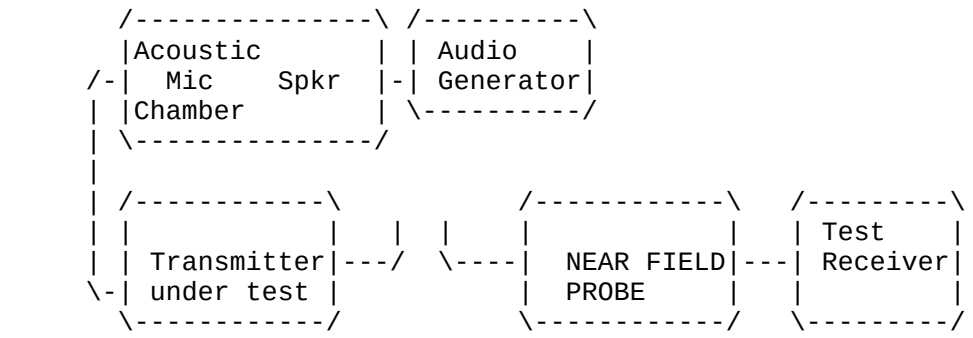
The audio frequency response curve is shown on the next page.

AUDIO_LOW_PASS_FILTER

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

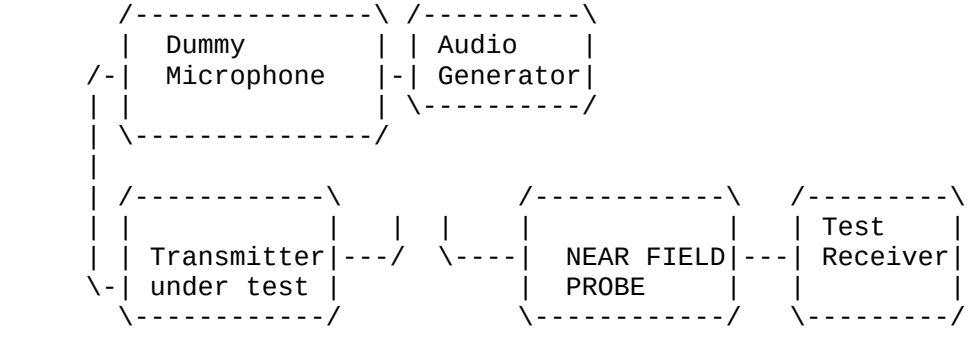
2.989(c) Occupied_bandwidth: Using TIA/EIA 2.2.10 aAccoustic Microphone Sensitivity test procedure to determine if the UUT could be put into modulation limiting and limiting could not be reached, the maximum deviation was only +40KHz. Using this test procedure the frequency of maximum sensitivity was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

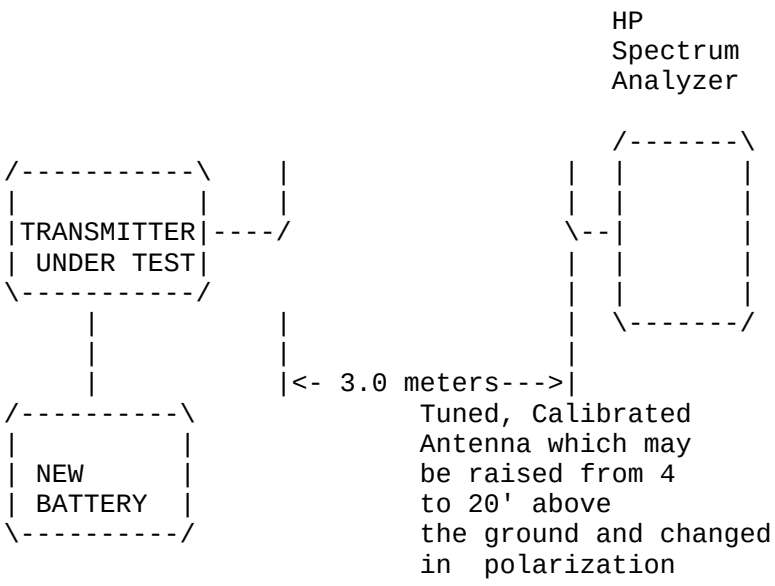
43 + 10 log(0.001) = 43 - 10.0 = 30 dB

TEST DATA:

EMISSION FREQUENCY MHz	METER READING @ 3m dBuV	COAX LOSS dB	ACF dB	FIELD STRENGTH dBuV/m	ATT. LEVEL dB	MARGIN dB	ANT.
215.20	85.80	1.20	12.37	99.37	0.0	0.0	H
430.41	25.20	1.60	17.70	44.50	54.87	24.87	H
645.60	12.40	1.60	21.10	35.10	64.27	34.27	V
860.82	8.70	2.90	23.73	35.33	64.04	34.04	V
1076.02	10.30	1.00	24.30	35.60	63.77	33.77	V
1291.20	5.20	1.00	25.16	31.36	68.01	38.01	H
1291.20	6.50	1.00	25.16	32.66	66.71	36.71	H
1506.40	7.00	1.00	26.03	34.03	65.34	35.34	V
1721.60	5.10	1.00	26.89	32.99	66.38	36.38	V
1936.80	3.00	1.02	27.75	31.77	67.60	37.60	H
2152.00	-1.00	1.05	28.38	28.43	70.94	40.94	H

METHOD OF MEASUREMENT: The procedure used was C63.4-1992 operated into its own built-in antenna at a height of 1.5 meters above the ground plane. 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): 215.200 000

TEMPERATURE_C	FREQUENCY_MHz	PPM
-30	215.201 160	+5.39
-20	215.201 790	+8.32
-10	215.202 440	+11.34
0	215.203 000	+13.94
10	215.203 420	+15.89
20	215.203 260	+15.14
30	215.202 500	+11.62
40	215.201 310	+ 6.09
50	215.199 920	- 0.37

25c END BATT. Volt(9.0)= 7.20VDC 215.200 350 + 1.62

RESULTS OF MEASUREMENTS: The maximum frequency variation over the temperature range was -0.37 to +15.89 ppm. The maximum frequency variation at the battery end-point was +1.62 ppm.

2.983(f) Photo_or_Drawing_of_Label:
See Exhibit 2.

2.983(g) Photos_of_Equipment:
See Exhibit 3A-3D.

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: Hewlett Packard 8566B - Opt 462, w/ preselector 85685A, & Quasi-Peak Adapter HP 8565OA, & HP 8449B - OPT H02 Cal. 6/26/98
2. Signal Generator, Hewlett Packard 8640B, cal. 10/1/98
3. Eaton Biconnical Antenna Model 94455-1 20-200 MHz Serial No. 0997 Cal. 10/30/98
4. Electro-Metric Dipole Kit, 20-1000 MHz, Model TDA-30 10/15/98
5. Electro-Metric Horn 1-18 GHz, Model RGA-180, Cal. 10/30/98
6. Electro-Metric Antennas Model TDA-30/1-4,Cal. 10/15/98
7. Electro-Metric Line Impedance Stabilization Network Model No. EM-7821, Serial No. 101; 100KHz-30MHz 50uH. Cal.11/19/98
8. Electro-Metric Line Impedance Stabilization Network Model No. EM-7820, Serial No. 2682; 10KHz-30MHz 50uH. Cal. 11/19/98
9. Special low loss cable was used above 1 GHz
10. Tenney Temperature Chamber