

TABLE OF CONTENTS LIST

APPLICANT: CHIAYO ELECTRONICS CO., LTD.

FCC ID: CINM-809

TEST REPORT:

PAGE	1.....COVER SHEET - GENERAL INFORMATION & TECHNICAL DESCR.
PAGE	2.....RF POWER OUTPUT
PAGE	3.....MODULATION CHARACTERISTICS & OCCUPIED BANDWIDTH
PAGE	4.....OCCUPIED BANDWIDTH CONTINUED
PAGE	5.....SPURIOUS EMISSIONS AT ANTENNA TERMINALS
PAGE	6.....FIELD STRENGTH OF SPURIOUS EMISSIONS
PAGE	7.....METHOD OF MEASURING RADIATED SPURIOUS EMISSIONS
PAGE	8.....FREQUENCY STABILITY
PAGE	9.....LIST OF TEST EQUIPMENT

EXHIBITS:

EXHIBIT	1.....POWER OF ATTORNEY LETTER
EXHIBIT	2.....FCC ID LABEL SAMPLE AND SKETCH OF LOCATION
EXHIBIT	3A.....EXTERNAL FRONT VIEW PHOTOGRAPH
EXHIBIT	3B.....EXTERNAL REAR VIEW PHOTOGRAPH
EXHIBIT	3C.....INTERNAL COMPONENT SIDE PHOTOGRAPH
EXHIBIT	3D.....INTERNAL SOLDER SIDE PHOTOGRAPH
EXHIBIT	4.....BLOCK DIAGRAM
EXHIBIT	5A-5F.....PARTS LIST
EXHIBIT	6.....SCHEMATIC
EXHIBIT	7.....USER'S MANUAL
EXHIBIT	8.....TUNING PROCEDURE
EXHIBIT	9.....AUDIO FREQUENCY RESPONSE GRAPH
EXHIBIT	10A.....MODULATION LIMITING GRAPH - 300 Hz
EXHIBIT	10B.....MODULATION LIMITING GRAPH - 1000 Hz
EXHIBIT	10C.....MODULATION LIMITING GRAPH - 15000 Hz
EXHIBIT	11A.....OCCUPIED BANDWIDTH PLOT- CW
EXHIBIT	11B.....OCCUPIED BANDWIDTH PLOT- 2.5kHz 16 dB>23K DEV
EXHIBIT	11C.....OCCUPIED BANDWIDTH PLOT- 15kHz 48.5K DEV

APPLICANT: CHIAYO ELECTRONICS CO., LTD.

FCC ID: CINM-809

DATE: MARCH 15, 2000

REPORT #: T:\CUS\C\CHIAYO\CHI66T0\CHI66T0.RPT

PAGE: TABLE OF CONTENTS

GENERAL INFORMATION REQUIRED
FOR TYPE ACCEPTANCE

2.1033 (C)(1)(2) CHIAYO ELECTRONICS CO., LTD. will manufacture the CINM-809 in quantity, for use under FCC RULES PART 74.801, LOW POWER AUXILIARY STATIONS.

2.1033 (C)(1) TECHNICAL DESCRIPTION

(4) Type of Emission: 130KF3E

Bn = 2M + 2DK

M = 1000

D = 50.0KHz (Peak Deviation)

K = 1

Bn = 2(1K) + 2(50.0K)(1) = 2K + 100.0K = 102.0KHz

M = 15,000

D = 66KHz

K = 1

Bn = 2(15K) + 2(50K) = 30 + 100 = 130KHz

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

(5) Frequency Range: Part 74: 944.00-952.00MHz

TEST FREQ = 951.750MHz.

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

(7) Maximum Output Power Rating: 1.0 MilliWatts ERP.

(8) DC Voltages and Current into Final Amplifier:

FINAL AMPLIFIER ONLY

9.0V BATTERY

Vce = 8.9 Volts

Ice = 2.6mA.

Pce = 23.14mW

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

2.1033(C) (10) Complete Circuit Diagrams: The circuit diagram is included as EXHIBIT 6. The block diagram is included as EXHIBIT 4.

(11) The equipment label is included at exhibit 2 and the sketch of the label location is Exhibit #3.

(12) Photographs of the equipment are included as exhibit #4.

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

APPLICANT: CHIAYO ELECTRONICS CO., LTD.

FCC ID: CINM-809

DATE: MARCH 15, 2000

REPORT #: T:\CUS\C\CHIAYO\CHI66T0\CHI66T0.RPT

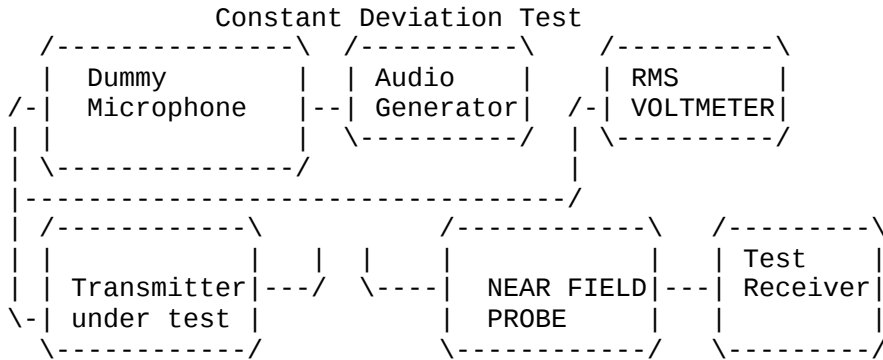
PAGE: 1

2.1033(C)(14) The data required by 2.1046 through 2.1057 is submitted below.

2.1047

(a) AUDIO FREQUENCY RESPONSE

(a) 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;



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.

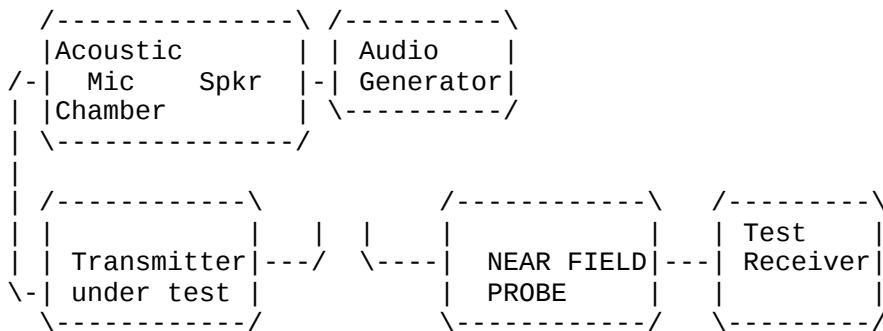
The audio frequency response curve is shown in EXHIBIT # 9.

(b) Modulation Limiting - See Exhibits # 10A-10C.

2.1049 (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



DATE: MARCH 15, 2000

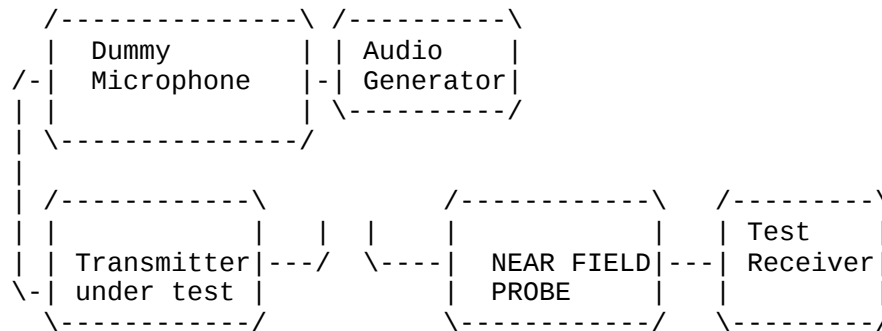
REPORT #: T:\CUS\C\CHIAYO\CHI66T0\CHI66T0.RPT

PAGE: 5

2.1049 Occupied Bandwidth (cont)

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.

2.1051 Spurious Emissions at antenna Terminals.

APPLICANT: CHIAYO ELECTRONICS CO., LTD.

FCC ID: CINM-809

DATE: MARCH 15, 2000

REPORT #: T:\CUS\C\CHIAYO\CHI66T0\CHI66T0.RPT

PAGE: 4

2.1053(a)(b) Field strength of spurious emissions:

NAME OF TEST: RADIATED SPURIOUS EMISSIONS

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

$$43 + 10 \log(0.02) = 43 - 17.0 = 26.9 \text{ dB}$$

TEST DATA:

EMISSION FREQUENCY MHZ	ATT. LEVEL @ 3m dBuV
------------------------------	----------------------------

951.75	0.0
1903.5	-47.34
2855.00	-41.67
3807.00	-41.65
4758.70	-43.57
5710.50	-59.26
6672.00	-58.23

METHOD OF MEASUREMENT: The procedure used was TIA/EIA 603 paragraph 2.2.12. 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 849 NW SR 45 ROAD, NEWBERRY, FL. 32669.

APPLICANT: CHIAYO ELECTRONICS CO., LTD.

FCC ID: CINM-809

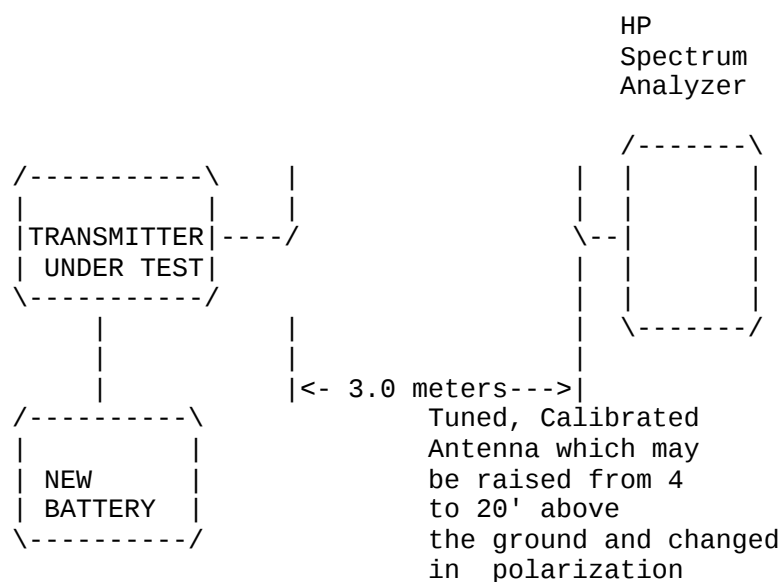
DATE: MARCH 15, 2000

REPORT #: T:\CUS\C\CHIAYO\CHI66T0\CHI66T0.RPT

PAGE: 6

2.1053(a)(b) Field strength of spurious emissions:

Method of Measuring Radiated Spurious Emissions



Equipment placed 4' above ground
on a rotatable platform.

2.1055(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): 951.750 000MHz

TEMPERATURE_C	FREQUENCY_MHz	PPM
-30	951.717 970	-33.68
-20	951.725 000	-26.26
-10	951.733 093	-17.76
0	951.739 259	-11.28
10	951.743 850	- 6.46
20	951.747 300	- 2.84
30	951.749 840	- 0.16
40	951.752 300	+ 2.42
50	951.755 210	+ 5.47

25c END BATT. Volt(3.0)= 2.25VDC 951.750 850 + 0.89

RESULTS OF MEASUREMENTS: The maximum frequency variation over the temperature range was -33.68 to + 5.47 ppm. The maximum frequency variation at the battery end-point was +0.89 ppm.

APPLICANT: CHIAYO ELECTRONICS CO., LTD.

FCC ID: CINM-809

DATE: MARCH 15, 2000

REPORT #: T:\CUS\C\CHIAYO\CHI66T0\CHI66T0.RPT

PAGE: 8

TEST EQUIPMENT LIST

1. ☒ Spectrum Analyzer: HP 8566B-Opt 462, S/N 3138A07786, w/
preselector HP 85685A, S/N 3221A01400, Quasi-Peak Adapter
HP 85650A, 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: EMC0 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
ANS-25/2, S/N 2604 Cal. 2/9/00
11. ☒ Temperature Chamber: Tenney Engineering Model TTRC, S/N 11717-7
12. ☒ AC Voltmeter: HP Model 400FL, S/N 2213A14499 Cal. 9/21/99
13. ☐ Digital Multimeter: Fluke Model 8012A, S/N 4810047 Cal 9/21/99
14. ☐ Digital Multimeter: Fluke Model 77, S/N 43850817 Cal 9/21/99
15. ☐ Oscilloscope: Tektronix Model 2230, S/N 300572 Cal 9/23/99
16. ☐ Frequency Counter: HP Model 5385A, S/N 3242A07460 Cal 10/6/99

APPLICANT: CHIAYO ELECTRONICS CO., LTD.

FCC ID: CINM-809

DATE: MARCH 15, 2000

REPORT #: T:\CUS\C\CHIAYO\CHI66T0\CHI66T0.RPT

PAGE #: 9