

TABLE OF CONTENTS LIST

APPLICANT: UNIMO TECHNOLOGY CO., LTD.

FCC ID: 025KGMR-401A

TEST REPORT:

|      |                                                            |
|------|------------------------------------------------------------|
| PAGE | 1.....COVER SHEET - GENERAL INFORMATION & TECHNICAL DESCR. |
| PAGE | 2.....TECHNICAL DESCRIPTION CONTINUED & RF POWER OUTPUT    |
| PAGE | 3.....MODULATION CHARACTERISTICS & OCCUPIED BANDWIDTH      |
| PAGE | 4.....SPURIOUS EMISSIONS AT ANTENNA TERMINALS              |
| PAGE | 5.....UNWANTED RADIATION                                   |
| PAGE | 6.....FREQUENCY STABILITY                                  |
| PAGE | 7.....LIST OF TEST EQUIPMENT                               |

EXHIBITS CONTAINING:

|         |                                                      |
|---------|------------------------------------------------------|
| EXHIBIT | 1.....FCC ID LABEL SAMPLE                            |
| EXHIBIT | 2.....SKETCH OF LABEL LOCATION                       |
| EXHIBIT | 3A.....EXTERNAL FRONT VIEW PHOTOGRAPH                |
| EXHIBIT | 3B.....EXTERNAL BACK VIEW PHOTOGRAPH                 |
| EXHIBIT | 3C.....EXTERNAL TOP VIEW PHOTOGRAPH                  |
| EXHIBIT | 3D.....EXTERNAL SIDE VIEW PHOTOGRAPH                 |
| EXHIBIT | 3E.....INTERNAL COMPONENT VIEW PHOTOGRAPH            |
| EXHIBIT | 3F.....INTERNAL COPPER VIEW PHOTOGRAPH               |
| EXHIBIT | 4.....BLOCK DIAGRAM                                  |
| EXHIBIT | 5A-5B.....SCHEMATICS                                 |
| EXHIBIT | 6A-6H.....USER'S MANUAL                              |
| EXHIBIT | 7A-7F.....CIRCUIT DESCRIPTION AND TUNING PROCEDURE   |
| EXHIBIT | 8A-8F.....PARTS LIST                                 |
| EXHIBIT | 9A.....MODULATION LIMITING 300 Hz                    |
| EXHIBIT | 9B.....MODULATION LIMITING 1000 Hz                   |
| EXHIBIT | 9C.....MODULATION LIMITING 3000 Hz                   |
| EXHIBIT | 10.....AUDIO FREQUENCY RESPONSE GRAPH                |
| EXHIBIT | 11.....OCCUPIED BANDWIDTH CW PLOT                    |
| EXHIBIT | 12.....OCCUPIED BANDWIDTH With MODULATION 2.5 K TONE |

APPLICANT: UNIMO TECHNOLOGY CO., LTD.

FCC ID: 025KGMR-401A

DATE: JUNE 5, 2000

REPORT #: T:\CUS\U\UNIMO\171AK0\171AK0.RPT

PAGE: TABLE OF CONTENTS

GENERAL INFORMATION REQUIRED  
FOR TYPE ACCEPTANCE

2.1033(c)(1)(2) UNIMO TECHNOLOGY CO., LTD. will manufacture the  
FCCID: 025KGMR-401A GMRS CHANNELS  
TRANSCIVER in quantity, for use under FCC RULES  
PART 95.

UNIMO TECHNOLOGY CO., LTD.  
626 DANGJEONG-DONG,  
GUNPO-S, GYEONGGI-DO 435-030  
KOREA

2.1033 (c) TECHNICAL DESCRIPTION

2.1033(c)(3) Instruction book. A draft copy of the instruction  
manual is included as EXHIBIT 6.

2.1033(c) (4) Type of Emission: 10K5F3E  
95.629

Bn = 2M + 2DK

M = 3000

D = 2.25K

Bn = 2(3.0)+2(2.25) = 10.5K

Authorized Bandwidth 20.0KHz

|              |                  |          |          |          |
|--------------|------------------|----------|----------|----------|
| 2.1033(c)(5) | Frequency Range: | 462.5500 | 462.5625 | 462.5750 |
| 95.627       |                  | 462.5875 | 462.6000 | 462.6125 |
|              |                  | 462.6250 | 462.6375 | 462.6500 |
|              |                  | 462.6625 | 462.6750 | 462.6875 |
|              |                  | 462.7000 | 462.7125 | 462.7250 |
|              |                  | 467.5500 | 467.5750 | 467.6000 |
|              |                  | 467.6250 | 467.6500 | MHz      |

2.10311c)(6)(7)Power Output shall not exceed 50.0Watts effective  
95.637 radiated power. There can be no provisions for  
95.647 increasing the power or varying the power. The Maximum  
Output Power Rating: 2.5 Watts  
effective radiated power.

95.645 The antenna is an integral part to the unit, it cannot  
be removed without rendering the unit inoperative. In  
order to remove the antenna the case must unscrewed,  
then the PCB assemblies must be removed then the  
antenna can be removed.

2.1033(c)(8) DC Voltages and Current into Final Amplifier:  
FINAL AMPLIFIER ONLY  
Vce = 7.5 Volts DC Ice = 0.92A.  
Pin = 6.90 Watts

2.1033(c)(9) Tune-up procedure. The tune-up procedure is included  
7A-7F.



2.1047(a)(b) Modulation characteristics:

AUDIO FREQUENCY RESPONSE

The audio frequency response was measured in accordance with TIA/EIA Specification 603. The audio frequency response curve is shown on the next page. The audio signal was fed into a dummy microphone circuit and into the microphone connector. The input required to produce 30 percent modulation level was measured.

2.1047(b)

Audio input versus modulation

The audio input level needed for a particular percentage of modulation was measured in accordance with TIA/EIA Specification 603. The audio input curves versus modulation are on the following pages. Curves are provided for audio input frequencies of 300, 1000, and 3000 Hz.

95.637

Post Limiter Filter Each GMRS transmitter, except a mobile station transmitter with a power of 2.5Watts or less, must be equipped with an audio low pass filter. At any frequency between 3 & 20KHz the filter must have an attenuation of  $60\log(f/3)$  greater than the attenuation at 1KHz.

2.1049

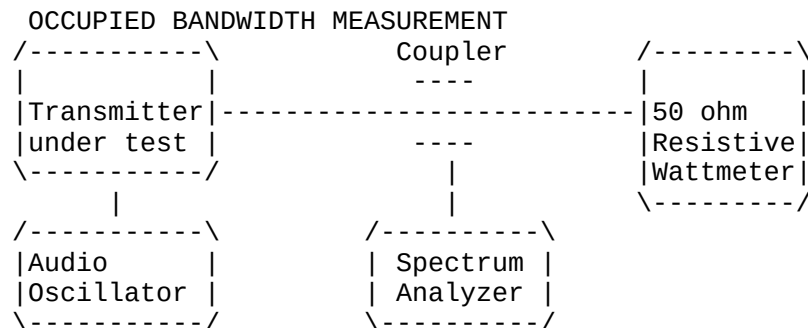
Occupied bandwidth:

95.635(b)(1)(3)(7)

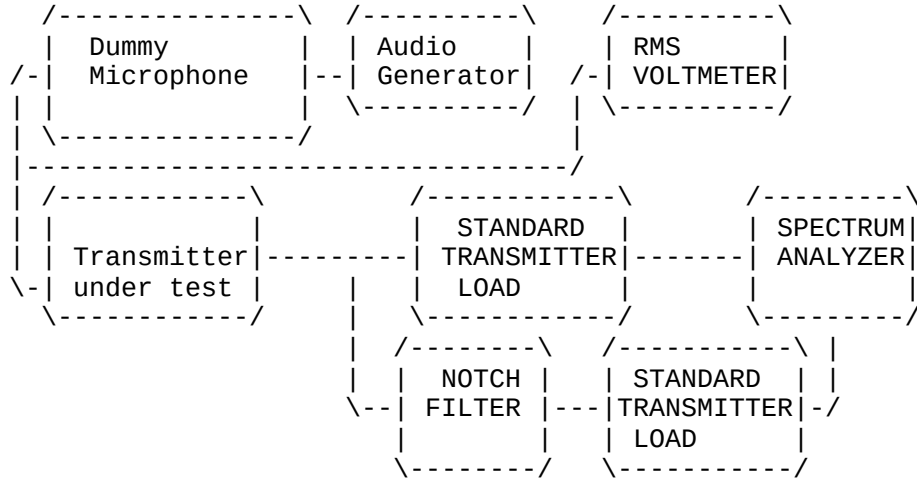
At least  $83\log(f_d/5)$  dB on any frequency removed from the center of the authorized bandwidth by a displacement frequency ( $f_d$  in kHz), of more than 5kHz up to 10kHz. At least  $116\log(f_d/6.1)$ , or if less,  $50+\log(T)$  dB on any frequency removed from the center of the authorized bandwidth by a displacement frequency ( $f_d$  in kHz), of more than 10kHz up to and including 250% of the authorized bandwidth. At least  $43+\log_{10}(T)$  on any frequency removed from the center of the authorized bandwidth by more than 250%.

Radiotelephone transmitter with modulation limiter.

Test procedure diagram



2.1051 Spurious emissions at antenna terminals(conducted):  
The following data shows the level of conducted spurious responses at the antenna terminal. The test procedure used was TIA/EIA 603 S2.2.13 with the exception that the emissions were recorded in dBc. The spectrum was scanned from 0.4 to at least the 10th harmonic of the fundamental.



#### Method of Measuring Conducted Spurious Emissions

2.1051 Spurious emissions at the Antenna Terminals

NAME OF TEST: SPURIOUS EMISSIONS AT ANTENNA TERMINALS

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

$$43 + 10\log(2.5) = 47.0\text{dB}$$

| EMISSION<br>FREQUENCY<br>MHz | dB BELOW<br>CARRIER |
|------------------------------|---------------------|
| 462.70                       | 00.0                |
| 925.40                       | -89.9               |
| 1388.10                      | -80.6               |
| 1850.80                      | -89.2               |
| 2313.50                      | -83.9               |
| 2776.20                      | -92.2               |
| 3238.90                      | -90.7               |
| 3701.60                      | -95.7               |
| 4164.30                      | -92.5               |
| 4627.00                      | -95.9               |

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REPORT #: T:\CUS\U\UNIMO\171AK0\171AK0.RPT

PAGE #: 4

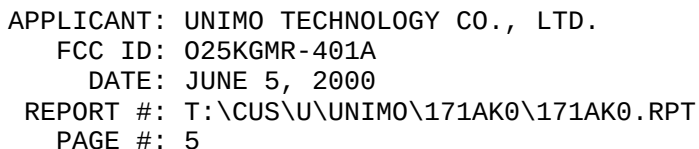
UNWANTED RADIATION:

REQUIREMENTS: POWER  $43 + 10\log(2.5) = 47.0\text{dB}$

TEST DATA:

| EMISSION<br>FREQUENCY<br>MHZ | ATT.<br>LEVEL<br>dB | MARGIN<br>dB |
|------------------------------|---------------------|--------------|
| 462.70                       | 0.0                 | 0.0          |
| 925.40                       | 49.5                | 2.5          |
| 1388.10                      | 53.05               | 6.05         |
| 1850.80                      | 54.59               | 7.59         |
| 2313.60                      | 50.34               | 3.34         |
| 2776.30                      | 55.21               | 8.21         |
| 3239.00                      | 62.39               | 15.39        |
| 3701.80                      | 61.96               | 14.96        |
| 4164.50                      | 53.96               | 6.96         |
| 4627.20                      | 55.97               | 8.97         |

## Method of Measuring Radiated Spurious Emissions



2.1055  
95.621(b)

Frequency stability:

Temperature and voltage tests were performed to verify that the frequency remains within the 0.00025%, 2.5 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.

Readings were also taken at plus and minus 15% of the battery voltage of 4.5 VDC.

MEASUREMENT DATA:

Assigned Frequency (Ref. Frequency): 462.725 000

| TEMPERATURE C  | FREQUENCY MHZ | PPM   |
|----------------|---------------|-------|
| REFERENCE_____ | 462.725 000   | 00.00 |
| -30_____       | 462.724 153   | -1.83 |
| -20_____       | 462.724 782   | -0.47 |
| -10_____       | 462.724 641   | -0.78 |
| 0_____         | 462.725 200   | +0.43 |
| +10_____       | 462.725 281   | +0.61 |
| +20_____       | 462.725 066   | +0.14 |
| +30_____       | 462.724 709   | -0.63 |
| +40_____       | 462.724 472   | -1.14 |
| +50_____       | 462.724 435   | -1.22 |

20c BATT. End-Point 6.3V/dc 462.724 776 -0.48

RESULTS OF MEASUREMENTS: The maximum frequency variation over the temperature range was -1.83 to +0.61 ppm. The maximum frequency variation with voltage was -0.48ppm.

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REPORT #: T:\CUS\U\UNIMO\171AK0\171AK0.RPT  
PAGE #: 6

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#### TEST EQUIPMENT LIST

1. X 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. X Biconnical Antenna: Eaton Model 94455-1, S/N 1057
6. X 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. X 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. 11/30/99
11.    Line Impedance Stabilization Network: Electro-Metrics Model  
EM-7820, S/N 2682 Cal. 12/1/99
12. X Temperature Chamber: Tenney Engineering Model TTRC, S/N 11717-7
13.    AC Voltmeter: HP Model 400FL, S/N 2213A14499 Cal. 9/21/99
14.    Digital Multimeter: Fluke Model 8012A, S/N 4810047 Cal 9/21/99
15.    Digital Multimeter: Fluke Model 77, S/N 43850817 Cal 9/21/99
16.    Oscilloscope: Tektronix Model 2230, S/N 300572 Cal 9/23/99
17. X Frequency Counter: HP Model 5385A, S/N 3242A07460 Cal 10/6/99

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FCC ID: 025KGMR-401A  
DATE: JUNE 5, 2000  
REPORT #: T:\CUS\U\UNIMO\171AK0\171AK0.RPT  
PAGE #: 7