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APPLICANT: LINKOMM COMMUNICATIONS NETWORK

FCC ID: PHC1420

TEST REPORT:

EXHIBITS CONTAINING:

GENERAL INFORMATION REQUIRED FOR TYPE ACCEPTANCE

2.1033(c)(1)(2) LINKOMM COMMUNICATIONS NETWORK will manufacture the FCCID: PHC1420 FAMILY RADIO SERVICES 14 CHANNEL TRANSCEIVER in quantity, for use under FCC RULES PART 95. The UUT is a PTT Radio with a maximum duty cycle of 50%.

LINKOMM COMMUNICATIONS NETWORK
#371-36, GASAN-DONG
GEUMCHEON-GU
SEOUL, KOREA 158-803

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: 10K0F3E
95.631

Bn = 2M + 2DK
M = 3000
D = 2.0K
Bn = 2(3.0)+2(2.0) = 10.0K

Authorized Bandwidth 12.5KHz

2.1033(c)(5) Frequency Range: 1. 462.5625 8. 467.5625
95.627 2. 462.5875 9. 467.5875
3. 462.6125 10. 467.6125
4. 462.6375 11. 467.6375
5. 462.6625 12. 467.6625
6. 462.6875 13. 467.6875
7. 462.7125 14. 467.7125 MHz

2.1033(c)(6)(7) Power Output shall not exceed 0.500Watts effective
95.639 radiated power. There can be no provisions for
95.649 increasing the power or varing the power. The Maximum Output Power Rating: 300 milliWatts effective radiated power.

95.647 The antenna is an intergral 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 = 4.5 Volts DC Ice = 0.12A.
Pin = 0.54 Watts

2.1033(c)(10) Complete Circuit Diagrams: The circuit diagram is Included as EXHIBIT 5A-5B of this report. The block diagram is included as EXHIBIT 4 of this report.

2.1033(c)(11) A photograph or a drawing of the equipment identification label is included as exhibit No. 1.

2.1033(c)(12) Photographs(8"X10") of the equipment of sufficient clarity to reveal equipment construction and layout, including meters, labels for controls, including any view under shields - See EXHIBIT 3A-3H.

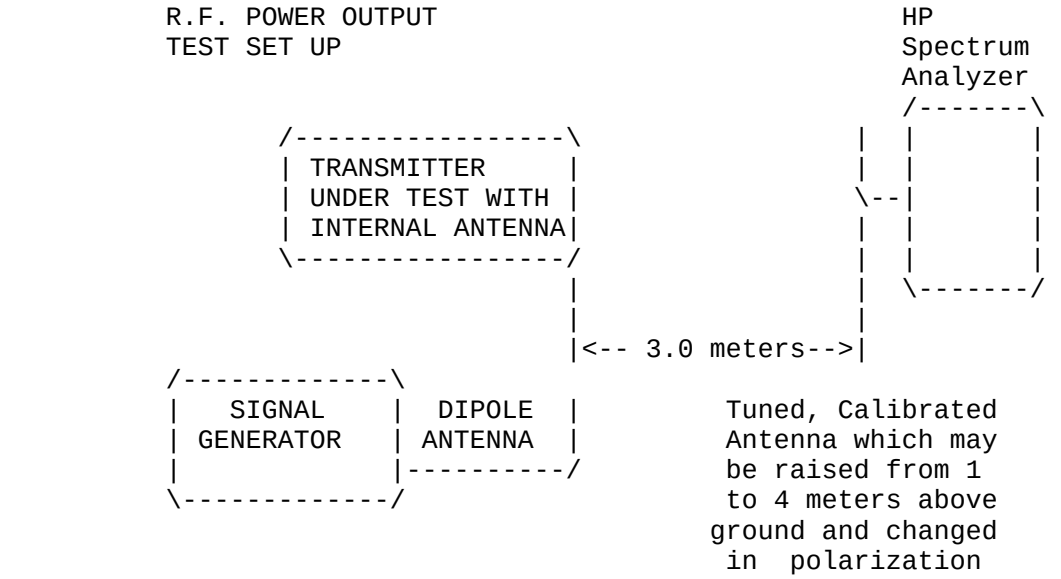
2.1033(c)(13) Digital modulation is not allowed.

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

2.1046(a) RF power output.

95.639 RF power is measured by measuring the radiated power at 3 meters and then replacing the transmitter with a signal generator to determine the effective radiated power. The ERP shall not exceed 0.500 Watts.
MEASURED POWER OUTPUT = 300 milliWatts ERP

R.F. POWER OUTPUT
TEST SET UP



Equipment placed 80cm above ground
on a rotatable platform.

2.1047(a)(b) Modulation characteristics:

AUDIO FREQUENCY RESPONSE

The audio frequency response was measured in accordance with TIA/EIA Specification 603.
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. See Exhibit 9.

2.1047(b) Audio input versus modulation

The audio input level needed for a particular per-percentage of modulation was measured in accordance with TIA/EIA Specification 603.
Curves are provided for audio input frequencies of 300, 1000, and 3000 Hz. See Exhibit 10A-10C.

95.637(b) Post Limiter Filter The filter must be between the modulation limiter and the modulated stage. At any frequency between 3 & 20KHz the filter must have an attenuation of 60log (f/3) greater that the attenuation at 1KHz. See Exhibit 11.

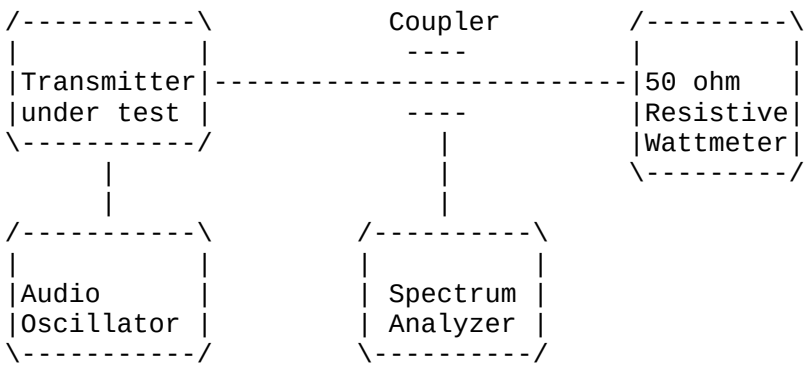
2.9895c) EMISSION BANDWIDTH:
95.633(b)(1)(3)(7)

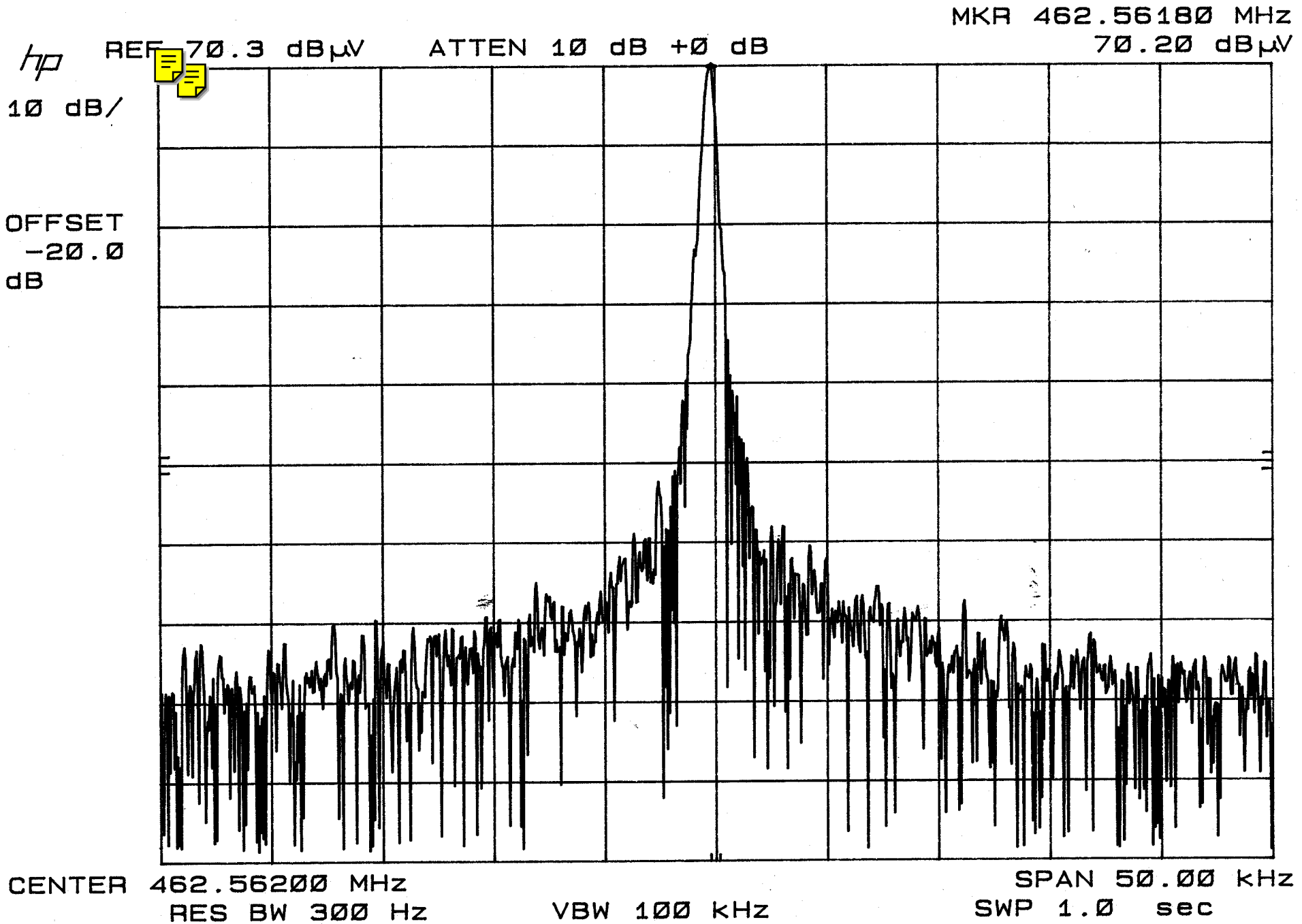
Data in the plots shows that the sidebands from greater than 50% to 100% of the authorized bandwidth must be attenuated by at least 25dB and from 100% to 250% the sidebands must be attenuated by at least 35dB. Beyond 250% the sidebands must be attenuated by at least 43+log10(TP). The transmitter was modulated with 2500 Hz, and 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 are shown on the following pages.

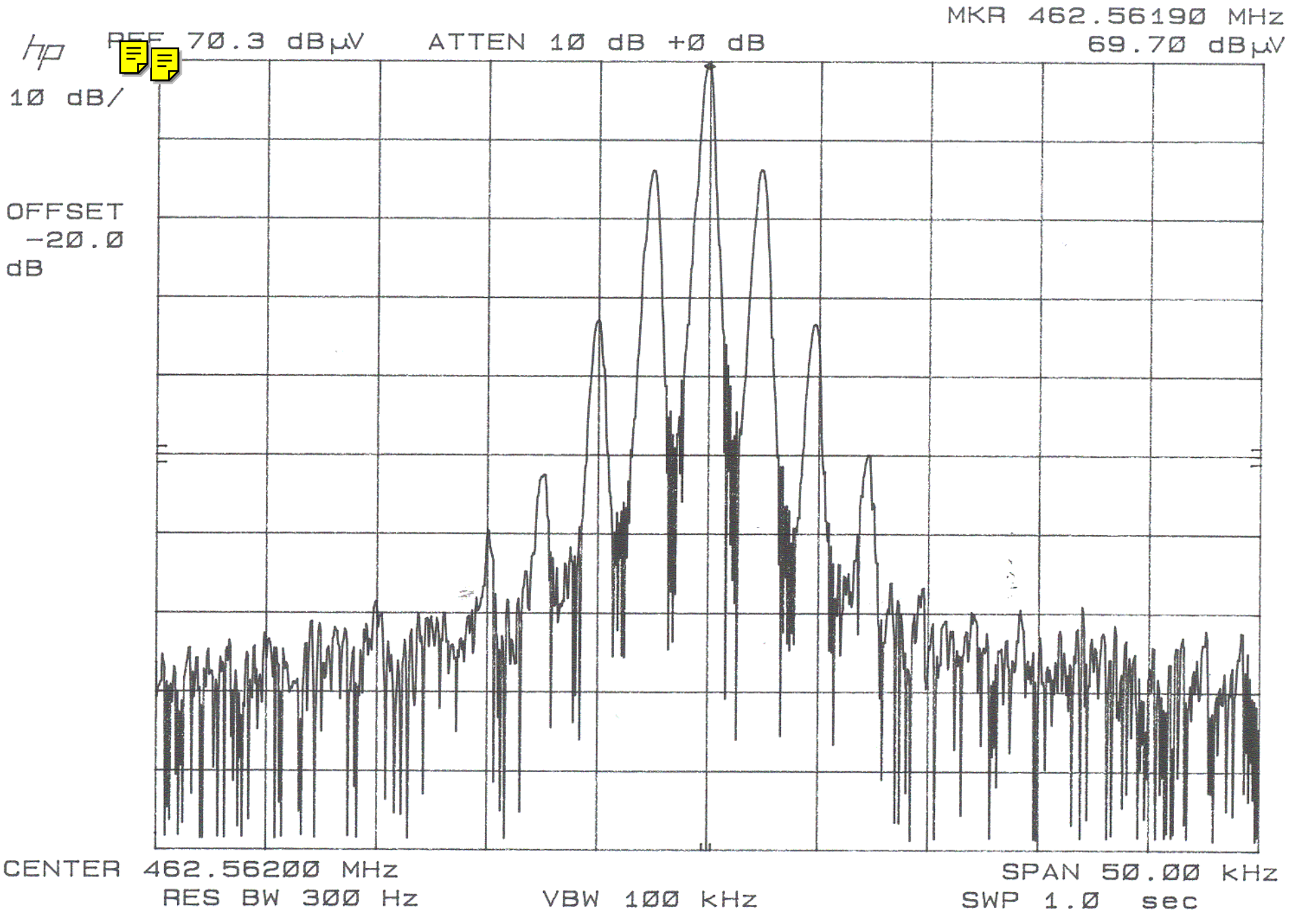
Radiotelephone transmitter with modulation limiter.

Test procedure diagram

OCCUPIED BANDWIDTH MEASUREMENT




MKR 462.56180 MHz
70.20 dBµV
REF 70.3 dBµV
ATTEN 10 dB +0 dB
10 dB/
OFFSET
−20.0
dB
CENTER 462.56200 MHz
RES BW 300 Hz
VBW 100 kHz
SPAN 50.00 kHz
SWP 1.0 sec


MKR 462.56190 MHz
69.70 dBµV
REF 70.3 dBµV
ATTEN 10 dB +0 dB
10 dB/
OFFSET
-20.0
dB
CENTER 462.56200 MHz
RES BW 300 Hz
VBW 100 kHz
SPAN 50.00 kHz
SWP 1.0 sec

2.1051 Not Applicable, no antenna terminal allowed.

2.1053 UNWANTED RADIATION:
95.635(c)

REQUIREMENTS: Emissions must be attenuated by at least the following below the output of the transmitter.

43 + 10log(TP) = 43 + 10log(0.3) = 37.77dB

TEST DATA:

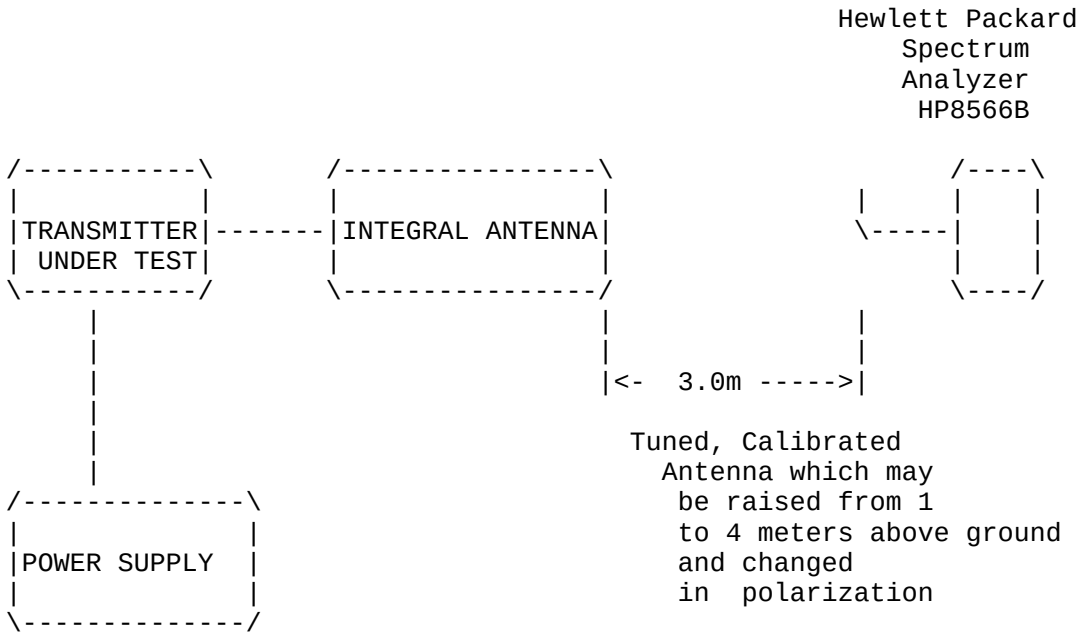
EMISSION FREQ. MHz	ATTENUATION dB @dB
467.71	0.0
935.48	45.60
1403.38	41.50
1870.94	55.60
2338.58	41.60
2806.32	45.60
3274.02	52.75
3741.72	55.61
4209.40R	61.20
4677.18R	62.69

MARGIN = (Field strength of Fund – 37.77dB) - FS OF EMISSION

METHOD OF MEASUREMENT: The procedure used was C63.4-1992 for intentional radiators. 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 and RGA-180. Measurements were made at the open field test site of TIMCO ENGINEERING INC. located at 849 N.W. State Road 45, Newberry, FL 32669.

2.1053 UNWANTED RADIATION:
95.631(b)(8)(9)

Method of Measuring Radiated Spurious Emissions



Equipment placed 80cm above ground
on a rotatable platform.

2.1055 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): 462.662 500

TEMPERATURE_C	FREQUENCY_MHz	PPM
REFERENCE_____	462.662 500	0.00
-20_____	462.663 381	1.91
-10_____	462.662 770	0.58
0_____	462.663 387	1.92
+10_____	462.663 386	1.92
+20_____	462.663 019	1.12
+30_____	462.662 954	0.98
+40_____	462.662 219	-0.61
+50_____	462.662 067	-0.93
BATT. End-Point 5.1V/dc	462.662 350	-0.32

RESULTS OF MEASUREMENTS: The maximum frequency variation over the temperature range was -0.93 to 1.91 ppm. The maximum frequency variation with voltage was -0.32 ppm.

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FCC ID: PHC1420

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 8565OA, S/N 3303A01690 & Preamplifier HP 8449B-OPT H02, S/N 3008A00372 Cal. 10/17/99
2._X_Biconnical Antenna: Eaton Model 94455-1, S/N 1057
3.___Biconnical Antenna: Electro-Metrics Model BIA-25, S/N 1171
4._X_Log-Periodic Antenna: Electro-Metrics Model EM-6950, S/N 632
5.___Log-Periodic Antenna: Electro-Metrics Model LPA-30, S/N 409
6._X_Double-Ridged Horn Antenna: Electro-Metrics Model RGA-180, 1-18 GHz, S/N 2319
7.___Horn 40-60GHz: ATM Part #19-443-6R
8.___Line Impedance Stabilization Network: Electro-Metrics Model ANS-25/2, S/N 2604 Cal. 2/9/00
9.___Temperature Chamber: Tenney Engineering Model TTRC, S/N 11717-7
10.___Frequency Counter: HP Model 5385A, S/N 3242A07460 Cal 10/6/99
11.___Peak Power Meter: HP Model 8900C, S/N 2131A00545
12._X_Open Area Test Site #1-3meters Cal. 12/22/99
13.___Signal Generator: HP 8640B, S/N 2308A21464 Cal. 9/23/99
14.___Signal Generator: HP 8614A, S/N 2015A07428
15.___Passive Loop Antenna: EMCO Model 6512, 9KHz to 30MHz, S/N 9706-1211 Cal. 6/10/00
16.___Dipole Antenna Kit: Electro-Metrics Model TDA-30/1-4, S/N 153 Cal. 11/24/99
17.___AC Voltmeter: HP Model 400FL, S/N 2213A14499 Cal. 9/21/99
18.___Digital Multimeter: Fluke Model 8012A, S/N 4810047 Cal 9/21/99
19.___Digital Multimeter: Fluke Model 77, S/N 43850817 Cal 9/21/99
20.___Oscilloscope: Tektronix Model 2230, S/N 300572 Cal 9/23/99