



EMC Test Services
1250 Peterson Drive
Wheeling, IL 60090, USA

Report No. 9342

TEST SPECIFICATION:

FCC "Rules and Regulations", Part 74,
Experimental Radio, Auxiliary, Special Broadcast and Other Program
Distribution Services for Operation in the

554 MHz to 584 MHz Band

Subpart H, Low Power Auxiliary Stations
Sections 74.801 to 74.882

THE FOLLOWING **MEETS** THE ABOVE TEST SPECIFICATION

Formal Name: UHF

Kind of Equipment: Bodypack Wireless Microphone

Test Configuration: Tested at 3 vdc

Emission Designator: 120KF3E

Transmitter FCC ID: DD4U1J4

Model Number: U1J4

Serial Number: NA

Dates of Test: October 22 & 24, 2001

Test Conducted For: Shure, Inc.

222 Hartrey Avenue

Evanston, Illinois 60015

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SIGNATURE PAGE

Report Written By:

A handwritten signature in black ink that reads "Arnom C. Rowe". The signature is written in a cursive style.

Arnom C. Rowe
Test Engineer
EMC-001375-NE

Report Reviewed by:

A handwritten signature in black ink that reads "Jack Prawica". The signature is written in a cursive style.

Jack Prawica
Lab Manager

Report Approved by:

A handwritten signature in black ink that reads "Brian J. Mattson". The signature is written in a cursive style.

Brian J. Mattson
General Manager

Company Official:

Shure, Inc.



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NVLAP Certificate of Accreditation available upon request.



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NVLAP Scope of Accreditation available upon request.



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1.0 SUMMARY OF TEST REPORT

It was found that the UHF S/N NA meets the radio interference emission requirements of the FCC "Rules and Regulations", Part 74, Subpart H, Sections 74.801 to 74.882 for Low Power Auxiliary Stations operating in the 554 MHz to 584 MHz Frequency Band.

This report contains the following number of pages.

Text, Data Summary & Charts: 62 pages

2.0 INTRODUCTION

On October 22 & 24, 2001, a series of radio frequency interference measurements were performed on Bodypack Wireless Microphone, S/N NA. The tests were performed according to the procedures of FCC as stated in Part 2 Subpart J, Equipment Authorization Procedures of the Code of Federal Regulations 47, by personnel of D.L.S. Electronic Systems, Inc. who are responsible to Donald L. Sweeney, Senior EMC Engineer.

3.0 OBJECT

The purpose of this series of tests was to determine if the test sample could meet the radio frequency emission requirements of the FCC "Rules and Regulations", Part 74, Subpart H, Sections 74.801 to 74.882 for Low Power Auxiliary Stations operating in the 554 MHz to 584 MHz Frequency Band.

4.0 TEST SET-UP

All radiated emission tests were performed at D.L.S. Electronic Systems, Inc. The radiated tests were made with the test item placed on a wooden turntable located in the Test Room with the receive antenna placed at three meters, or one meter from the device under test, as indicated on the charts.



5.0 TEST EQUIPMENT (Bandwidths and Detector Function)

All data was automatically plotted using peak detector function. This information was then used to determine the frequencies of maximum emissions. Manual measurements were performed on these frequencies using a Quasi Peak or Average Detector with the bandwidths specified by the FCC. From 200 MHz to 1000 MHz a bandwidth of 100 kHz was used (except for Occupied Bandwidth), and above 1000 MHz, wide enough bandwidths were used, depending upon the test being made, to ensure proper measurement of the narrowband signal. A list of the equipment used can be found in Table 1. All equipment was calibrated per the instruction manuals supplied by the manufacturer.

6.0 Modulation Characteristics - Part 2.1047

a. Voice modulated communication equipment

A curve showing the frequency response of the audio modulating circuit over a range of 20 to 20000 Hz is submitted with this report.

NOTE: See the following pages for the actual chart made during testing.

b. Equipment which employs modulation limiting

A family of curves showing the percentage of modulation versus the modulation input voltage with sufficient information showing the modulation limiting capability throughout the range of modulating frequencies and input modulating signal levels employed.

NOTE:

These tests were not run because the device under test does not use limiting.



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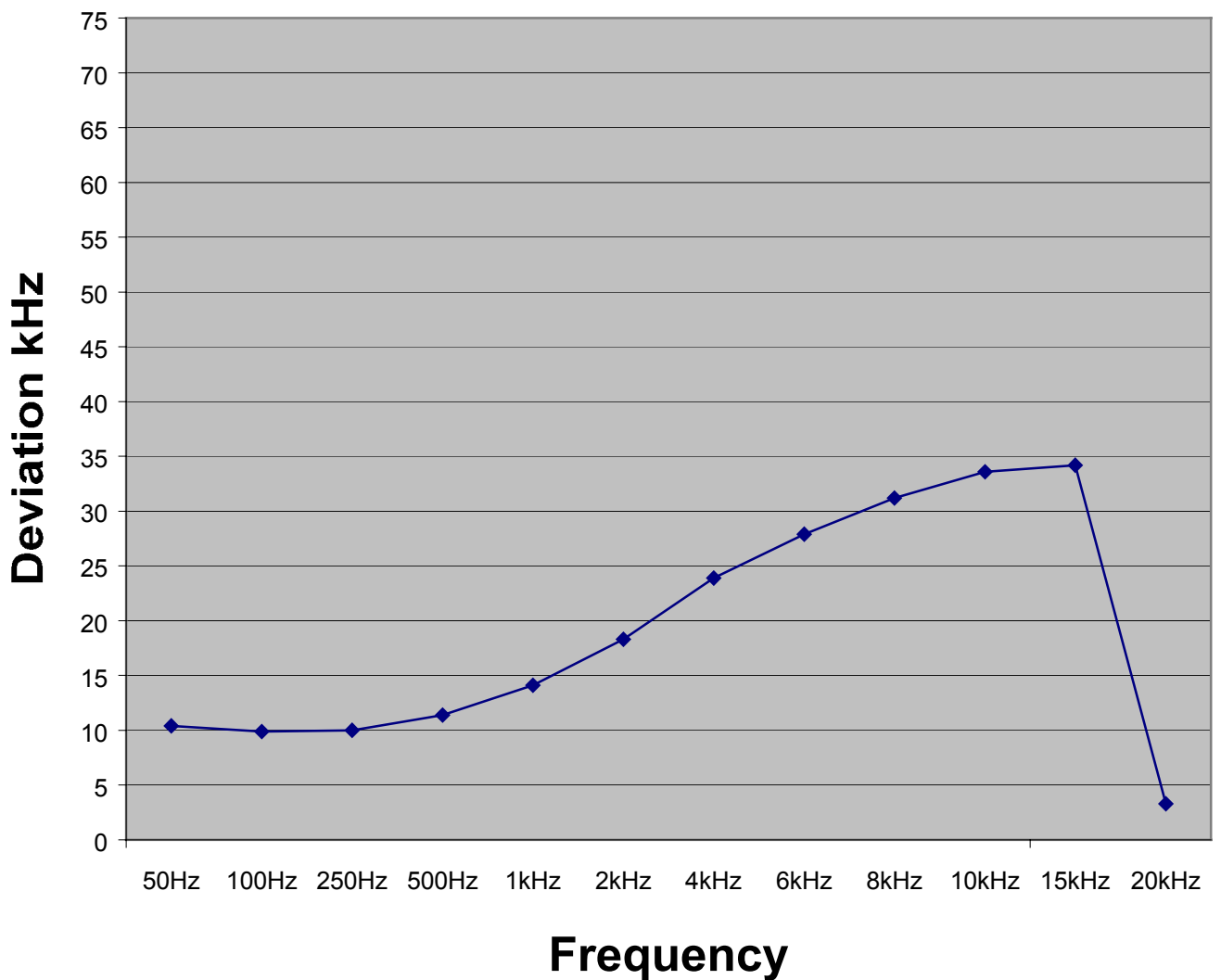
GRAPHS TAKEN SHOWING THE FREQUENCY

RESPONSE OF THE

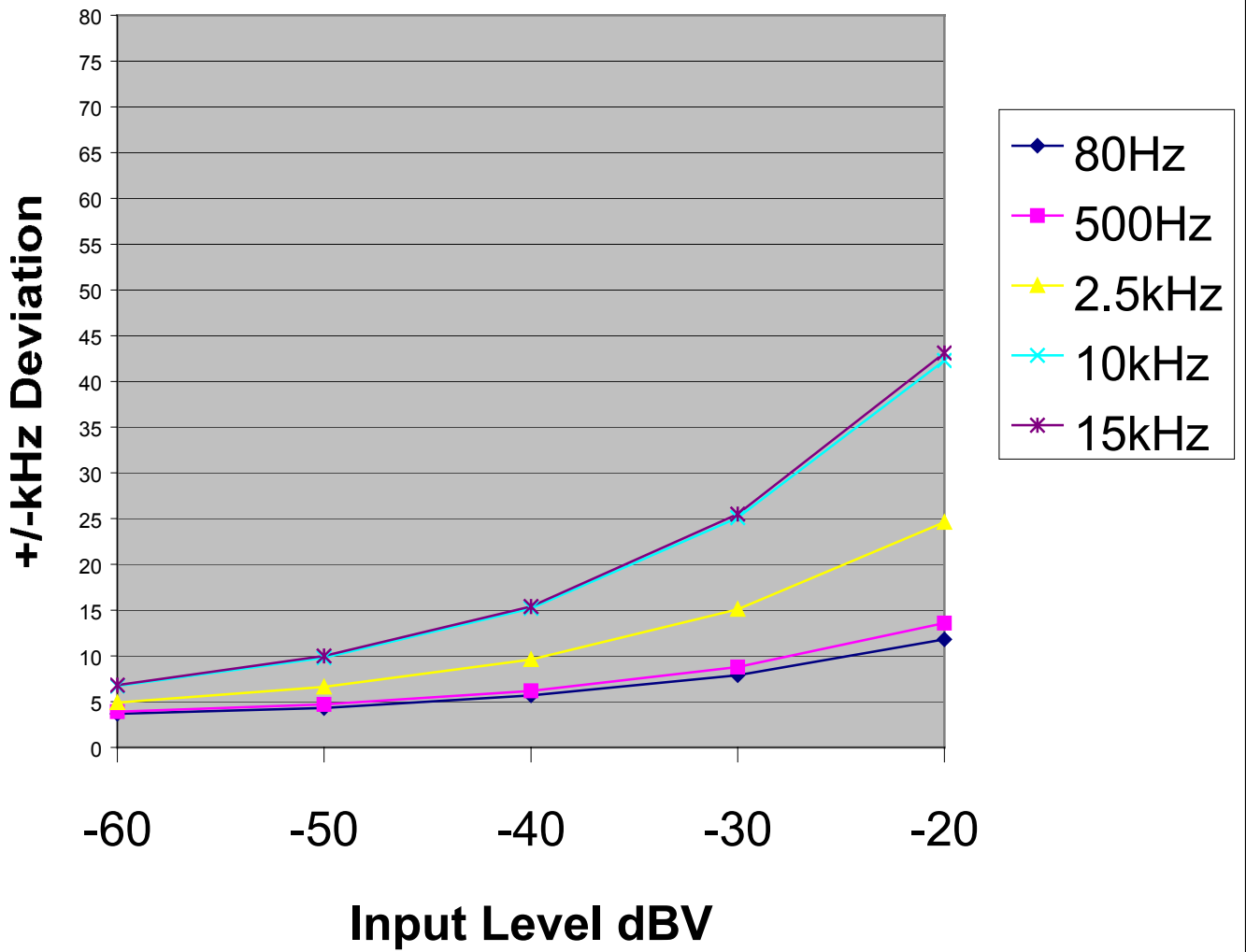
AUDIO MODULATING CIRCUIT

PART 2.1047

U1J4 569MHz Modulation vs Frequency for 60mV RMS Input



U1J4 569MHz Input Level Vs Deviation





7.0 OCCUPIED BANDWIDTH – PART 2.1049

The frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to .5% of the total mean power radiated by a given emission.

As stated in Part 2.1049 c-1 the UHF was modulated by a 2500 Hz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation. This input level was established at the frequency of maximum response of the audio modulating circuit.

The UHF uses the same frequency range as television broadcast monaural transmitters so the test was also run using a 15 kHz input signal modulated by 85% as stated in Part 2.1049 e-6.

Paragraph e-5 states that the maximum authorized bandwidth shall be 200 kHz for all emissions inside these frequency bands.

Carson's Rule:

Section 2.202 (g)

$$B_n = 2M + 2DK, \quad K=1 \quad B_n = \text{Bandwidth}$$

$$M = 15 \text{ kHz}, \quad M = \text{Maximum Modulating Frequency}$$

$$D = 45 \text{ kHz}, \quad D = \text{Peak Deviation}$$

$$B_n = 2(15) + 2(45)(1) = \mathbf{120 \text{ kHz}}$$

NOTE: See the following pages for the graphs of the actual measurements made:



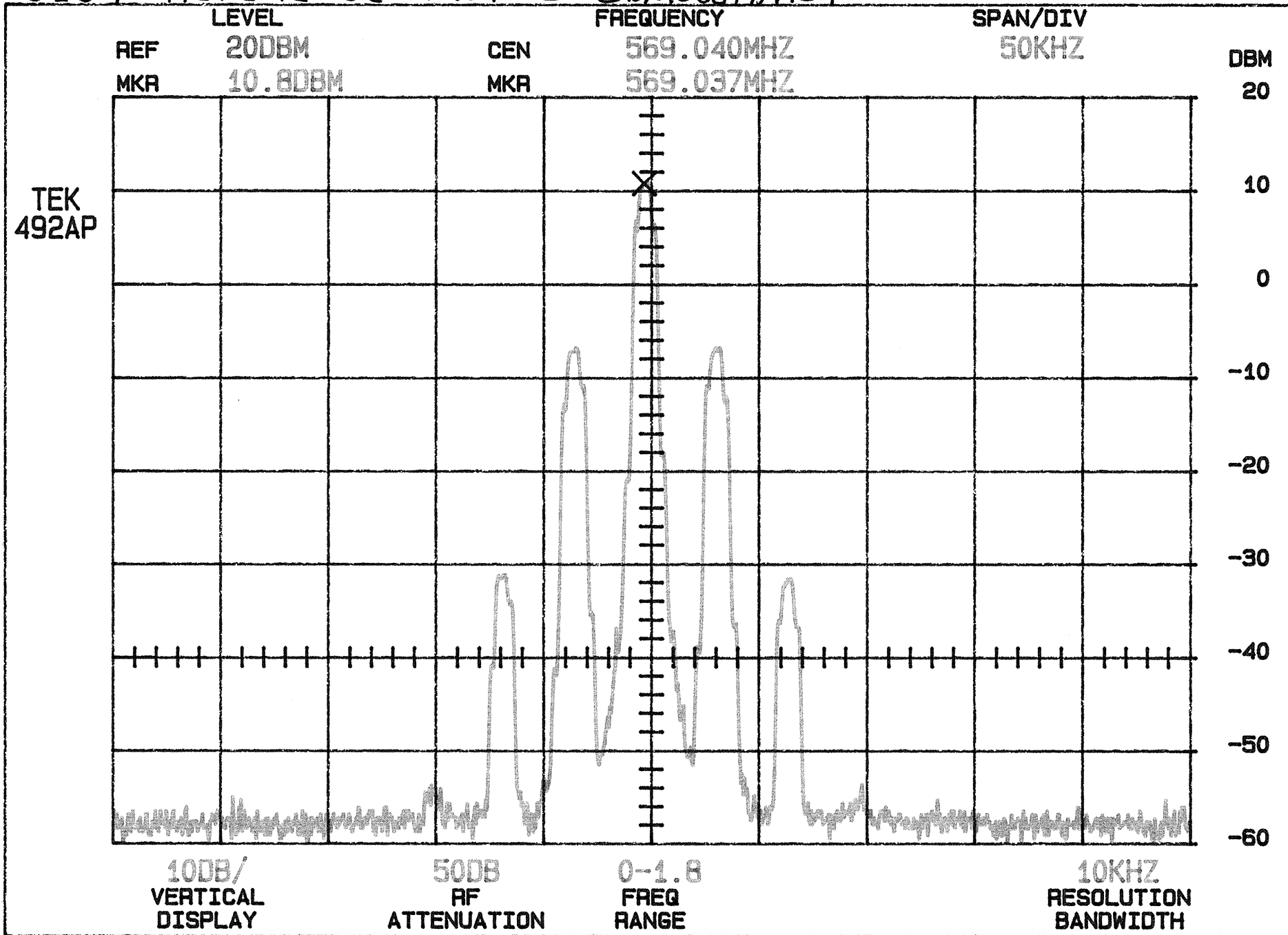
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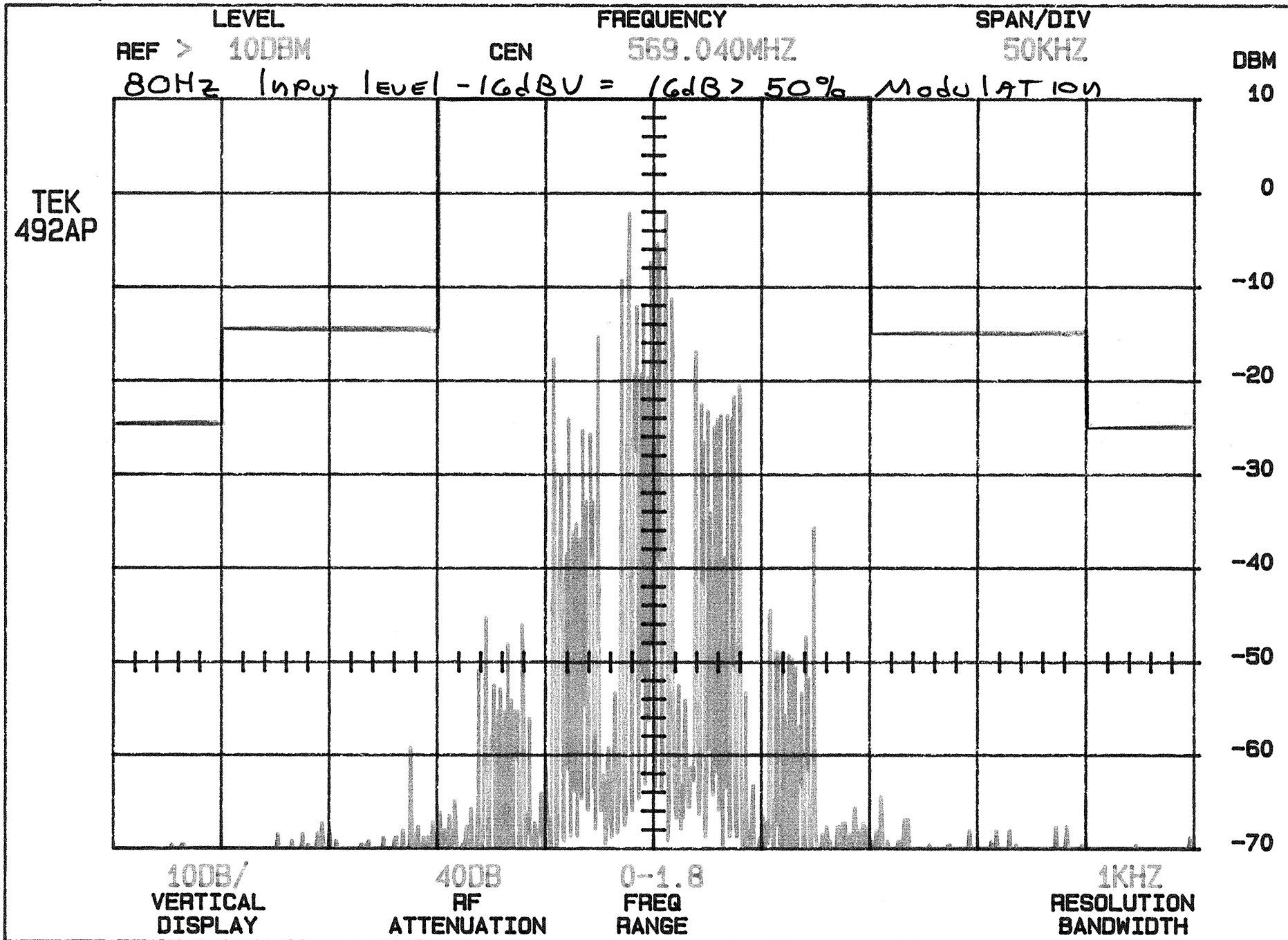
GRAPHS TAKEN OF THE OCCUPIED BANDWIDTH

PART 2.1049

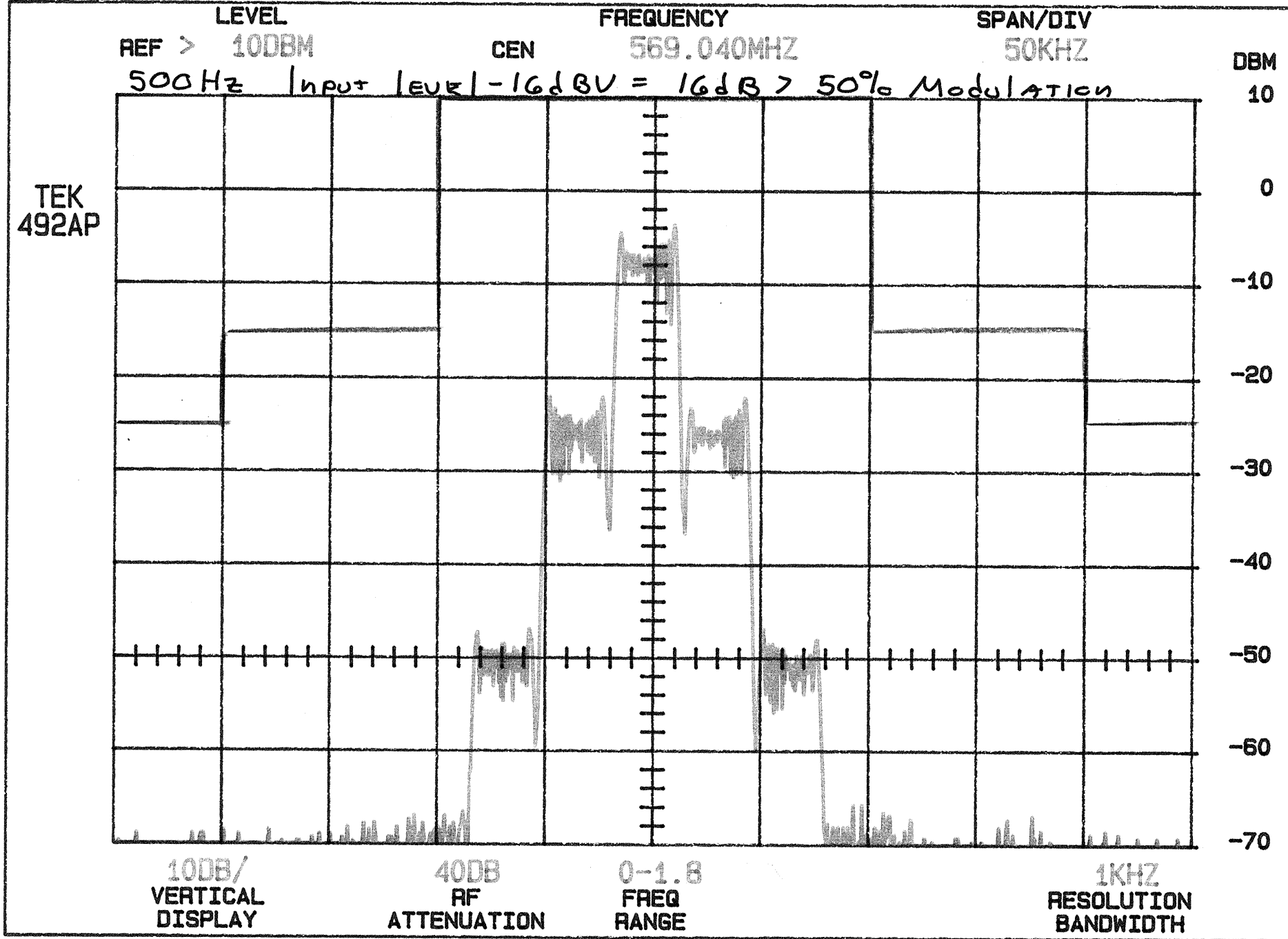
U1J4 REFERENCE Plot @ 0% Modulation



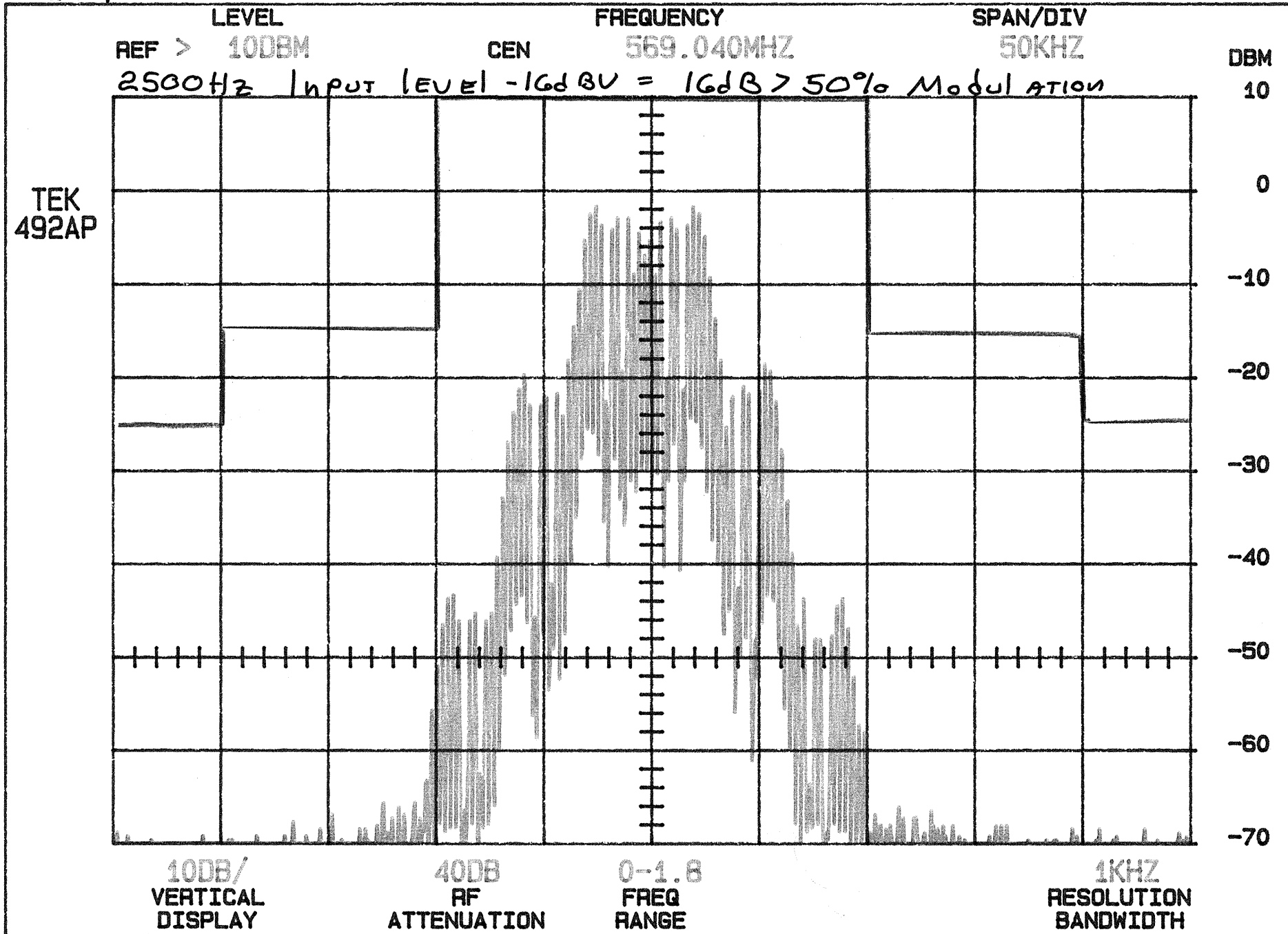
U1J4



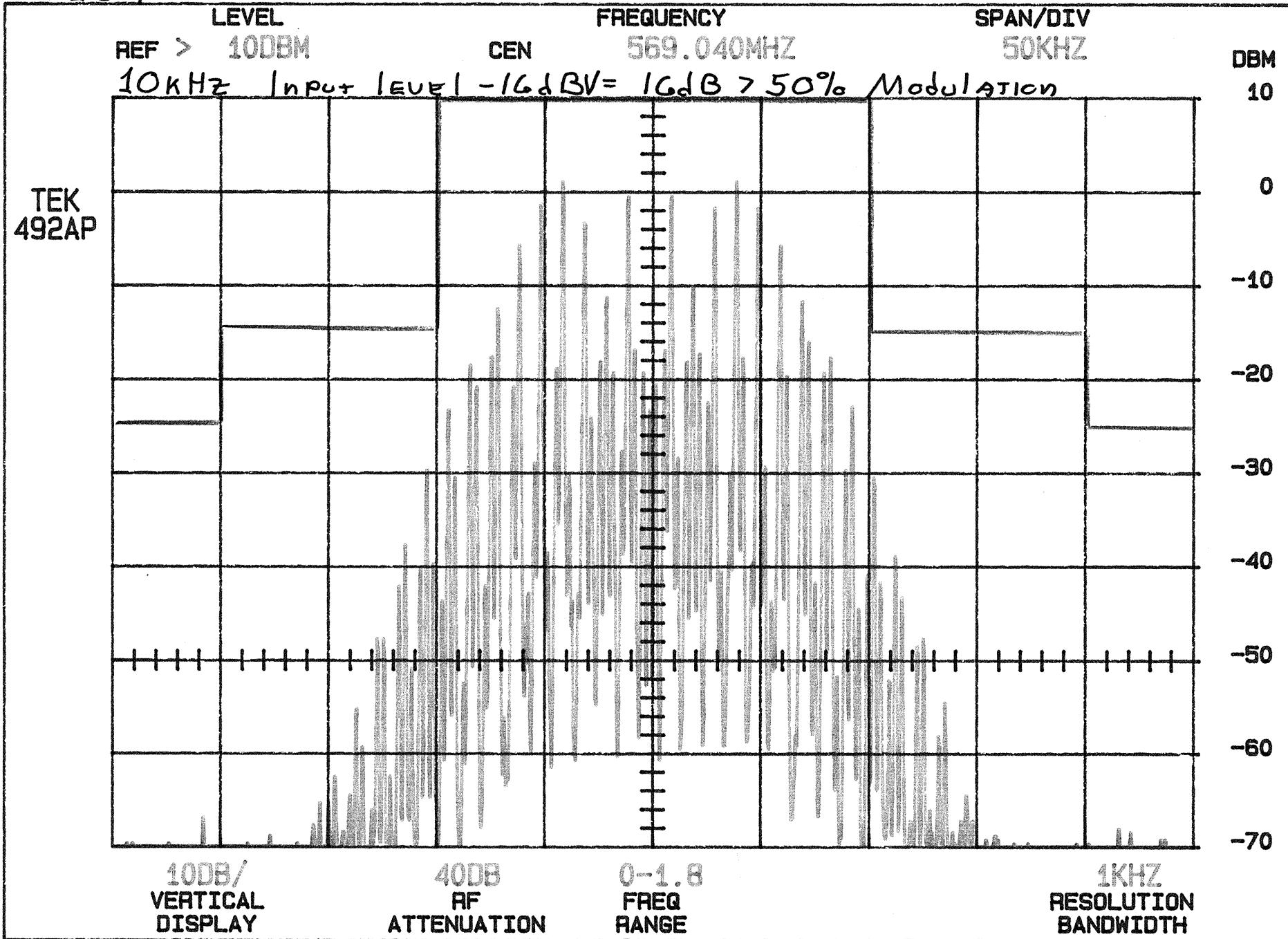
U1J4



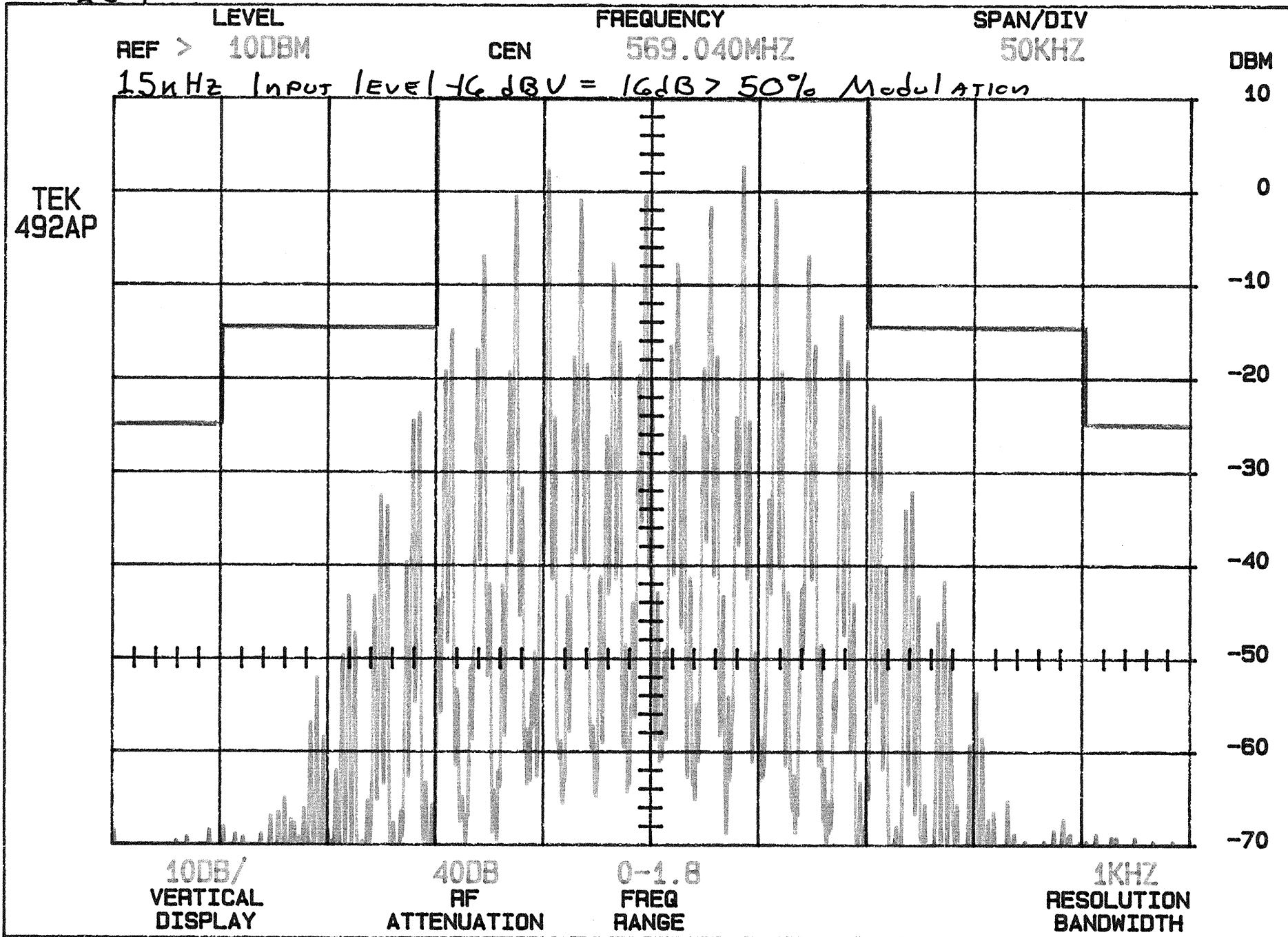
U1J4



U1J4



U1J4





8.0 RF POWER OUTPUT - PART 2.1046

As stated in PART 74.861 (e-1), the output power should not exceed 250 milliwatts (24 dBm). The UHF was tuned according to the tune-up procedures specified in Part 2.1033 (c-9), and adjusted for its maximum output power. The RF output power was measured in the open field, using one of the following test methods:

For the conducted test measurement, the antenna was removed and the output of the device was connected via a BNC connector to the test equipment.

For the radiated test measurement, the signal from the EUT was measured. The EUT was then substituted with a signal generator and a tuned dipole antenna. The output of the signal generator was increased until the level received by the tuned dipole equaled that of the previous measured from the EUT.

Actual measurements were made at a room temperature of **70 °F** with a humidity of **42%**.

Actual Measurements Taken in open field:

75.70 dBuV measured output of signal generator
+44.94 dBuV Amplifier + (Antenna, Pads & Cable)
120.64 dBuV = 0.02317 watts

LIMIT:

Manufacturer's rated output maximum power (50 ohm system)	= 0.03 watts
Manufacturer's actual output power (50 ohm system)	= 0.02317 watts

NOTE:

See the following pages for the graphs of the actual measurements made:



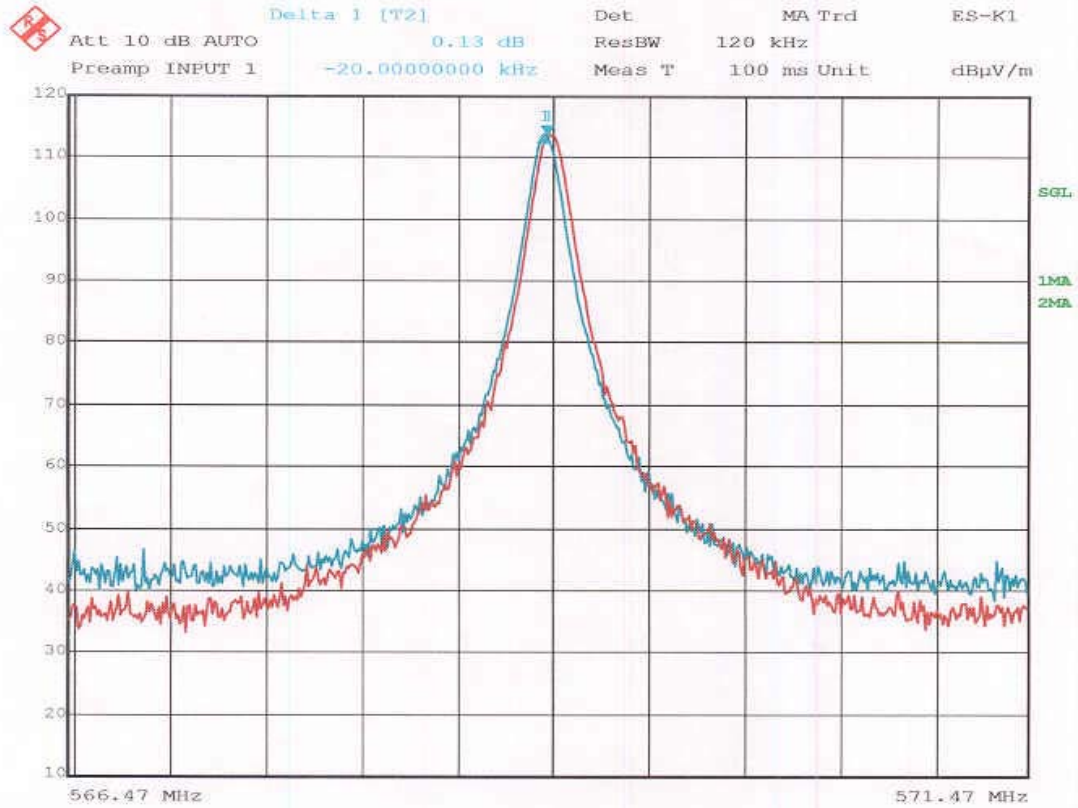
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GRAPHS TAKEN OF THE RF POWER

OUTPUT MEASUREMENTS

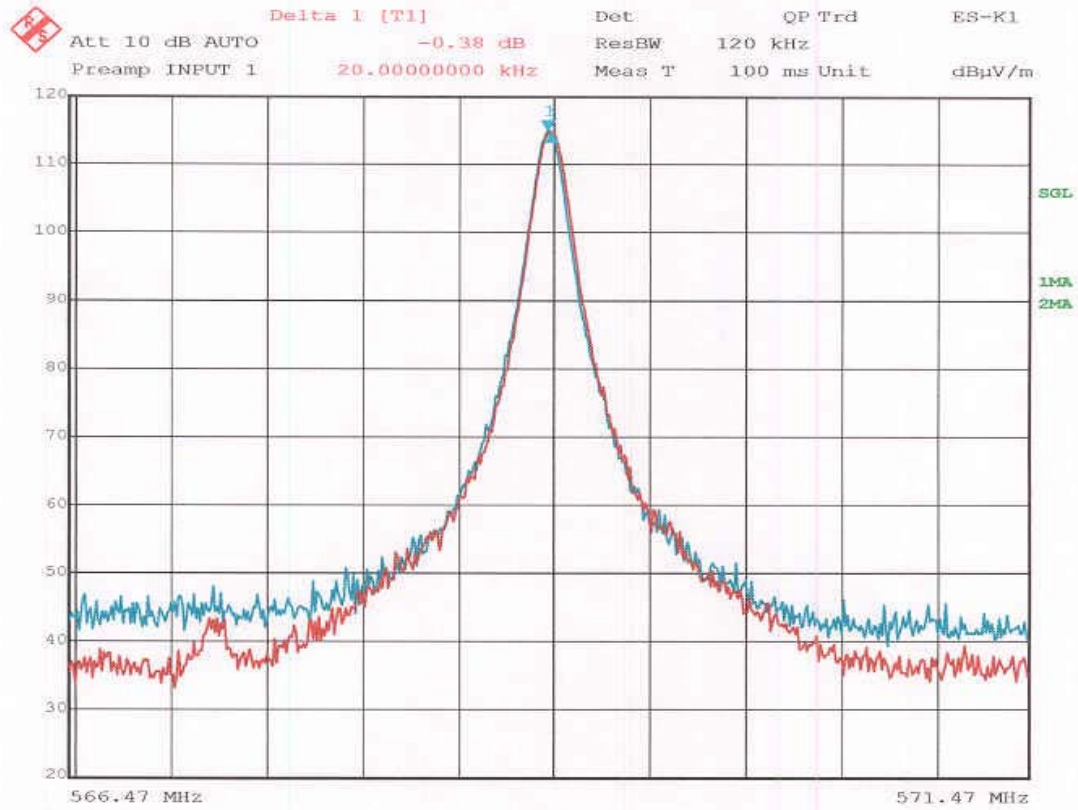
PART 2.1046



Title: Output Power Substitution Method
Comment B: Shure Inc., U1-J4 568.97 MHz, Vertical
75.7 dBuV sig.gen. + 44.94 dB Amp. = 120.64 dBuV = 23.17 mW
Date: 16.OCT.2001 08:48:33

Red = EUT
Blue = Sig. Gen.

FINAL ^{CP}
Genoa



Title: Output Power Substitution Method
 Comment B: Shure Inc., U1-J4 568.97 MHz, Horizontal
 75.6 dBuV sig.gen. + 44.94 dB Amp. = 120.54 dBuV = 22.64 mW
 Date: 15.OCT.2001 15:47:01

Red = EUT
 Blue = Sig. Gen.

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9.0 Frequency Deviation and Tolerance - PART 74.861

Paragraph e-3 states that the maximum authorized deviation shall be 75 kHz for all frequency modulation emissions in the frequency bands 554 MHz to 584 MHz.

Frequency Deviation used: + or -45 kHz deviation for 100% modulation

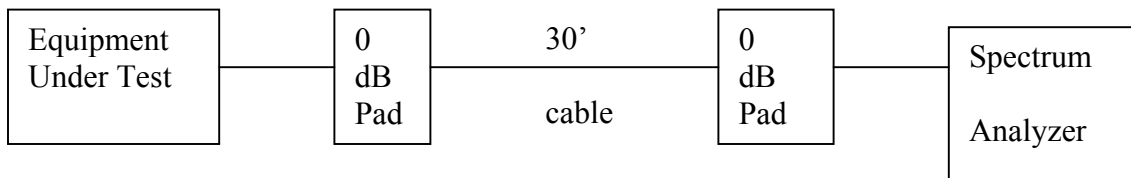
Paragraph e-4 states that the frequency tolerance of the transmitter shall be .005 percent.

NOTE:

See Section 12 of this test report for the frequency tolerance test results.

10.0 SPURIOUS CONDUCTED EMISSION MEASUREMENTS AT ANTENNA TERMINALS PART 2.1051

Spurious conducted emissions were measured at the antenna terminals using an artificial load. Plots were made showing the amplitude of each harmonic emission with the equipment operated as specified in 2.1049. As shown by the radiated charts there was no reason to believe that there were any spurious emissions other than the harmonics that were than individually investigated when doing the conducted test at the antenna terminals. Measurements were made up to the 10th Harmonic of the fundamental. The following setup was used showing placement of the attenuators:



The allowed emissions for transmitters operating in the 554 MHz to 584 MHz bands for UHF equipment are found under Part 74, Section 74.861, Paragraph e-6 for Low Power Auxiliary Stations. This paragraph states the mean power of the emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

- (1) On any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB.
- (2) On any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB.
- (3) On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least $43+10\text{Log}_{10}$ (mean output power in watts) dB.

NOTE: See the following pages for the data and graphs of the actual measurements made:

NOTE: This test was not run because there is no detachable antenna.



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**CONDUCTED EMISSION DATA TAKEN FOR
SPURIOUS EMISSION MEASUREMENTS MADE
AT THE ANTENNA TERMINALS**

PART 2.1051

NOTE: This test was not run because there is no detachable antenna.



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**CONDUCTED EMISSION GRAPHS TAKEN FOR
SPURIOUS EMISSION MEASUREMENTS MADE
AT THE ANTENNA TERMINALS**

PART 2.1051

NOTE: This test was not run because there is no detachable antenna.



11.0 FIELD STRENGTH OF SPURIOUS EMISSION MEASUREMENTS PART 2.1053

Radiated measurements were performed at a 1 or 3 meter test distance automatically scanning the frequency range from 200 MHz to 6000 MHz, depending upon the fundamental frequency.

For the UHF, the highest fundamental frequency is 568.97 MHz so the scans were made up to 6000 MHz, to cover the tenth harmonic.

All signals in the frequency range of 30 MHz to 200 MHz were measured with a Biconical Antenna and from 200 MHz to 1000 MHz a Log Periodic Antenna was used as the pickup devices. From 1000 MHz to 10000 MHz, a Double Ridge Horn Antenna was used. The cables and equipment were placed and moved within the range of positions likely to find their maximum emissions. Tests were made in both the horizontal and vertical planes of polarization.

The allowed emissions for transmitters operating in the 554 MHz to 584 MHz bands for UHF equipment are found under Part 74, Section 74.861, Paragraph e-6 for Low Power Auxiliary Stations. This paragraph states the mean power of the emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

- (1) On any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB.
- (2) On any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB.
- (3) On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least $43+10\text{Log}_{10}$ (mean output power in watts) dB.



11.0 FIELD STRENGTH OF SPURIOUS EMISSION MEASUREMENTS (CON'T)
PART 2.1053

To determine the **LIMIT** for Spurious Emissions the following method was used:

Maximum output power in watts:

Maximum Transmitter output power in watts **0.03**

Free Space Formula:

Convert to 3 meter test distance using the Free Space Formula

$$\frac{\sqrt{49.2 * \text{rated wattage}}}{\text{Distance}} = \frac{(49.2 * .03)^{.5}}{3} = 0.4049691 \text{ volts/meter}$$

$$0.4049691 \text{ v/m} = 404969.1 \text{ uV/m}$$

$$20 * \text{Log}(404969.1) = 108.09 \text{ dBuV/m}$$

Spurious emission limit at three meters equals **108.09 dBuV**

The emissions must be reduced by:

$$43 + 10 * \text{LOG}_{10}(0.03) = \underline{23.71 \text{ dB}}$$

Therefore, the **LIMIT** at three meters equals:

$$\begin{aligned} &108.09 \text{ dBuV/m extrapolated level for 0.03 watts} \\ &\underline{-23.71 \text{ dB required reduction below the unmodulated fundamental}} \\ &\mathbf{84.38 \text{ dBuV/m spurious emissions limit}} \end{aligned}$$



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RADIATED DATA TAKEN FOR FIELD STRENGTH

SPURIOUS EMISSION MEASUREMENTS

PART 2.1053



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SUMMARY DATA SHEET OF **RADIATED EMISSIONS >1000 MHz**

TEST DATE:----- October 16, 2001
 MANUFACTURER:----- Shure, Inc.
 MODEL NO:----- U1J4
 S/N:----- NA
 CONFIGURATION:----- **NA**
 RATED POWER:----- 0.0300

TEST SPECIFICATION: FCC "RULES AND REGULATION", PART 74
 SUBPART H / SECTION 74.861

******LOW POWER AUXILIARY STATIONS******

TEST EQUIPMENT: Spectrum Analyzer ----- HP 8566B
 Quasi Peak Adapter ----- HP 85650A

TYPE OF TEST: RADIATED EMISSIONS USING **VERTICAL** POLARIZATION

THE FOLLOWING ARE SIGNIFICANT RADIATED LEVELS FOUND:

FREQ IN MHz.	METER READING dBuV	ANTENNA PLUS CABLE	PRE-AMP GAIN dB	TOTAL dBuV	ANTENNA DISTANCE IN METERS	LIMIT dBuV	MARGIN dB
1138.00	65.69	26.98	-41.53	51.14	3	84.46	33.32
1707.00	63.34	30.22	-41.43	52.13	3	84.46	32.33
2275.90	61.92	32.15	-41.35	52.72	3	84.46	31.74
2844.90	74.22	31.82	-41.50	64.54	3	84.46	19.92
3982.90	55.89	37.60	-40.08	53.41	3	84.46	31.05
5121.00	53.10	39.06	-39.08	53.08	3	84.46	31.38



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SUMMARY DATA SHEET OF **RADIATED EMISSIONS >1000 MHz**

TEST DATE:----- October 16, 2001
 MANUFACTURER:----- Shure, Inc.
 MODEL NO:----- U1J4
 S/N:----- NA
 CONFIGURATION:----- **NA**
 RATED POWER:----- 0.0300

TEST SPECIFICATION: FCC "RULES AND REGULATION", PART 74
 SUBPART H / SECTION 74.861

******LOW POWER AUXILIARY STATIONS******

TEST EQUIPMENT: Spectrum Analyzer ----- HP 8566B
 Quasi Peak Adapter ----- HP 85650A

TYPE OF TEST: RADIATED EMISSIONS USING **HORIZONTAL** POLARIZATION

THE FOLLOWING ARE SIGNIFICANT RADIATED LEVELS FOUND:

FREQ IN MHz.	METER READING dBuV	ANTENNA PLUS CABLE	PRE-AMP GAIN dB	TOTAL dBuV	ANTENNA DISTANCE IN METERS	LIMIT dBuV	MARGIN dB
1138.00	71.22	26.98	-41.53	56.67	3	84.46	27.79
1707.00	64.34	30.22	-41.43	53.13	3	84.46	31.33
2275.90	63.22	32.15	-41.35	54.02	3	84.46	30.44
2844.90	77.84	31.82	-41.50	68.16	3	84.46	16.30
3982.90	53.96	37.60	-40.08	51.48	3	84.46	32.98
5121.00	50.81	39.06	-39.80	50.07	3	84.46	34.39



EDIT PEAK LIST (Final Measurement Results)			
Trace1: FCC74A		Trace2: RSS123A	
Trace3: ---		Trace4: ---	
TRACE	FREQUENCY	LEVEL dB μ V/m	DELTA LIMIT dB

Title: Radiated Emissions 500 MHz to 1 GHz
Comment A: Shure Inc.
 UI-J4 568.97 MHz
Comment B: Vertical
Date: 16.OCT.2001 09:01:46

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EDIT PEAK LIST (Final Measurement Results)			
Trace1: FCC74A		Trace2: RSS123A	
Trace3: ---		Trace4: ---	
TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Average	1.1380 GHz	51.14	-32.85 FCC
2 Average	1.1380 GHz	51.17	-20.82 IC
1 Average	1.7070 GHz	52.13	-31.86 FCC
2 Average	1.7070 GHz	52.14	-19.85 IC

Title: Radiated Emissions 1 to 2 GHz
 Comment A: Shure Inc.
 U1-J4 568.97 MHz
 Comment B: Vertical
 Date: 15.OCT.2001 14:10:00

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EDIT PEAK LIST (Final Measurement Results)			
Trace1: FCC74A		Trace2: RSS123A	
Trace3: ---		Trace4: ---	
TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Average	2.2759 GHz	52.72	-31.28 FCC
2 Average	2.2759 GHz	52.74	-19.25 IC
1 Average	2.8449 GHz	64.54	-19.46 FCC
2 Average	2.8449 GHz	64.40	-7.59 IC
1 Average	3.9829 GHz	53.41	-30.59 FCC
2 Average	3.9829 GHz	53.40	-18.59 IC

Title: Radiated Emissions 2 to 4 GHz
 Comment A: Shure Inc.
 U1-J4 568.97 MHz
 Comment B: Vertical
 Date: 15.OCT.2001 14:52:48

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EDIT PEAK LIST (Final Measurement Results)			
Trace1: FCC74A		Trace2: RSS123A	
Trace3: ---		Trace4: ---	
TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
2 Average	5.1210 GHz	53.05	-18.94 IC
1 Average	5.1210 GHz	53.08	-30.91 FCC

Title: Radiated Emissions 4 to 6 GHz
 Comment A: Shure Inc.
 U1-J4 568.97 MHz
 Comment B: Vertical
 Date: 15.OCT.2001 15:00:28

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EDIT PEAK LIST (Final Measurement Results)			
Trace1: FCC74A		Trace2: RSS123A	
Trace3: ---		Trace4: ---	
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB

Title: Radiated Emissions 500 MHz to 1 GHz
 Comment A: Shure Inc.
 U1-J4 568.97 MHz
 Comment B: Horizontal
 Date: 16.OCT.2001 09:06:15

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EDIT PEAK LIST (Final Measurement Results)				
Trace1: FCC74A		Trace2: RSS123A		
Trace3: ---		Trace4: ---		
TRACE	FREQUENCY	LEVEL dB μ V/m	DELTA LIMIT dB	
1 Average	1.1380 GHz	56.67	-27.33	FCC
2 Average	1.1380 GHz	56.76	-15.23	IC
1 Average	1.7070 GHz	53.13	-30.86	FCC
2 Average	1.7070 GHz	53.15	-18.84	IC

Title: Radiated Emissions 1 to 2 GHz
Comment A: Shure Inc.
U1-J4 568.97 MHz
Comment B: Horizontal
Date: 15.OCT.2001 14:16:50

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EDIT PEAK LIST (Final Measurement Results)			
Trace1: FCC74A		Trace2: RSS123A	
Trace3: ---		Trace4: ---	
TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Average	2.2759 GHz	54.02	-29.97 FCC
2 Average	2.2759 GHz	54.02	-17.97 IC
1 Average	2.8449 GHz	68.16	-15.83 FCC
2 Average	2.8449 GHz	68.16	-3.83 IC
1 Average	3.9829 GHz	51.48	-32.52 FCC
2 Average	3.9829 GHz	51.63	-20.36 IC

Title: Radiated Emissions 2 to 4 GHz
 Comment A: Shure Inc.
 U1-J4 568.97 MHz
 Comment B: Horizontal
 Date: 15.OCT.2001 14:35:59

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EDIT PEAK LIST (Final Measurement Results)			
Trace1: FCC74A		Trace2: RSS123A	
Trace3: ---		Trace4: ---	
TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
2 Average	5.1210 GHz	50.04	-21.95 IC
1 Average	5.1210 GHz	50.07	-33.93 FCC

Title: Radiated Emissions 4 to 6 GHz
 Comment A: Shure Inc.
 U1-J4 568.97 MHz
 Comment B: Horizontal
 Date: 15.OCT.2001 15:07:46

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12.0 FREQUENCY STABILITY - PART 2.1055a (**Temperature**)

The frequency stability was measured from -30° to +50° centigrade at intervals of 10° centigrade throughout the range. Prior to each frequency measurement, the equipment was left alone for a sufficient period of time (approximately 30 minutes or more) to allow the components of the UHF oscillator circuitry to stabilize. The following information was taken:

FREQUENCY STABILITY FOR TEMPERATURE VARIATION IN MHz:

-30°	593.00365
-20°	569.0053
-10°	569.00515
0°	569.0041
+10°	569.0022
+20°	569.00025
+30°	568.9973
+40°	568.9947
+50°	568.9925

Worst Case Variance:

6500 Hz

As stated in Part 74, Section 74.861 e-4 the Frequency Tolerance and Margin for this range are as follows:

Frequency Tolerance: = **0.00005**

Ambient Frequency: = **568998800 Hz**

568998800 * 0.00005 = **28449.94 Hz**

28449.94 - 6500 = **21949.94 Hz Margin**

This is well within the specified limits.



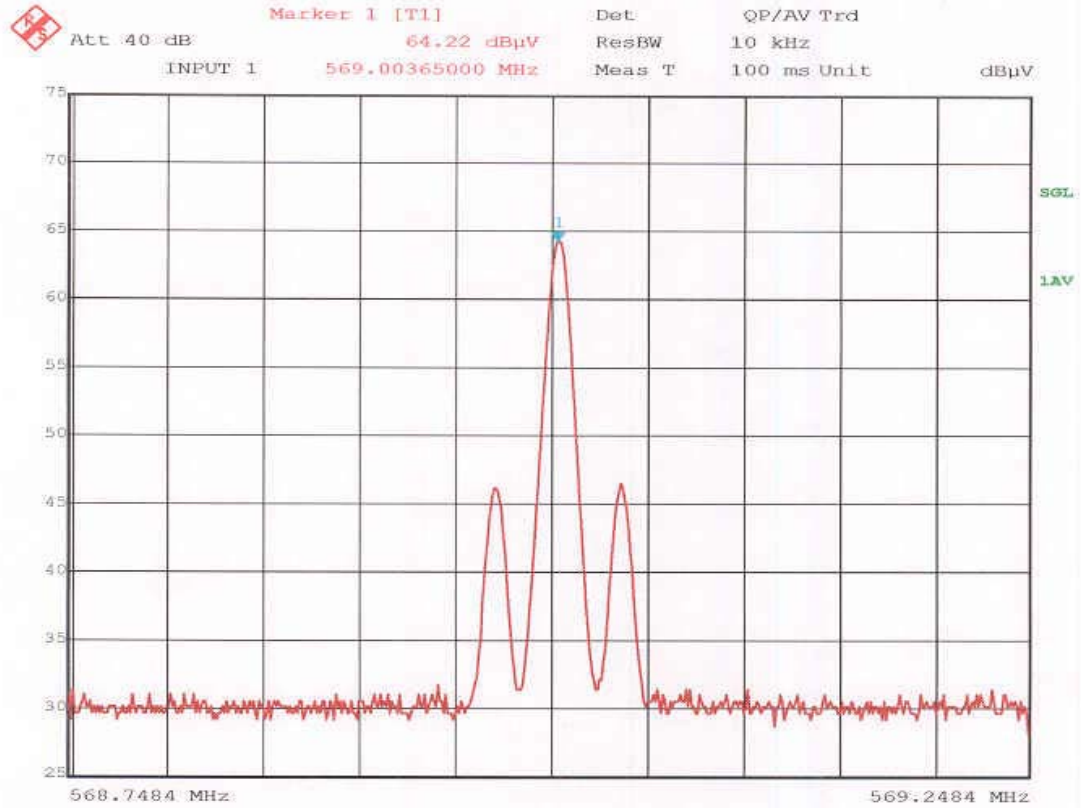
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GRAPHS TAKEN FOR FREQUENCY

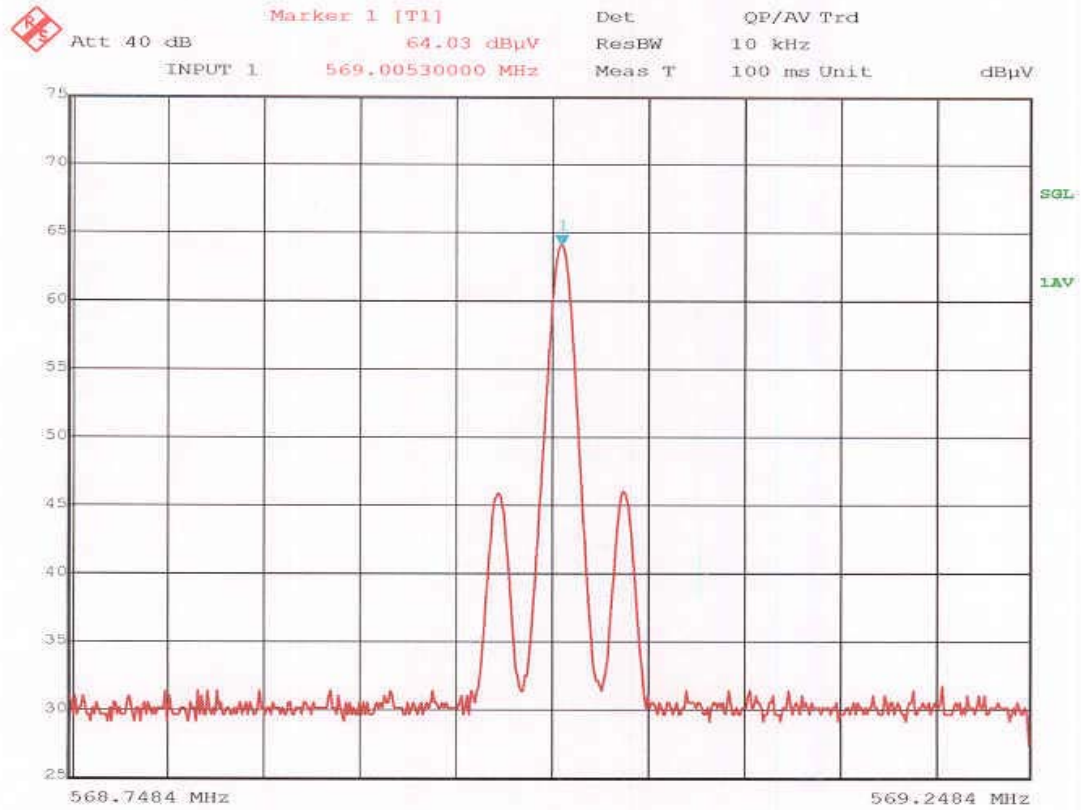
STABILITY WHEN VARYING THE TEMPERATURE

PART 2.1055a

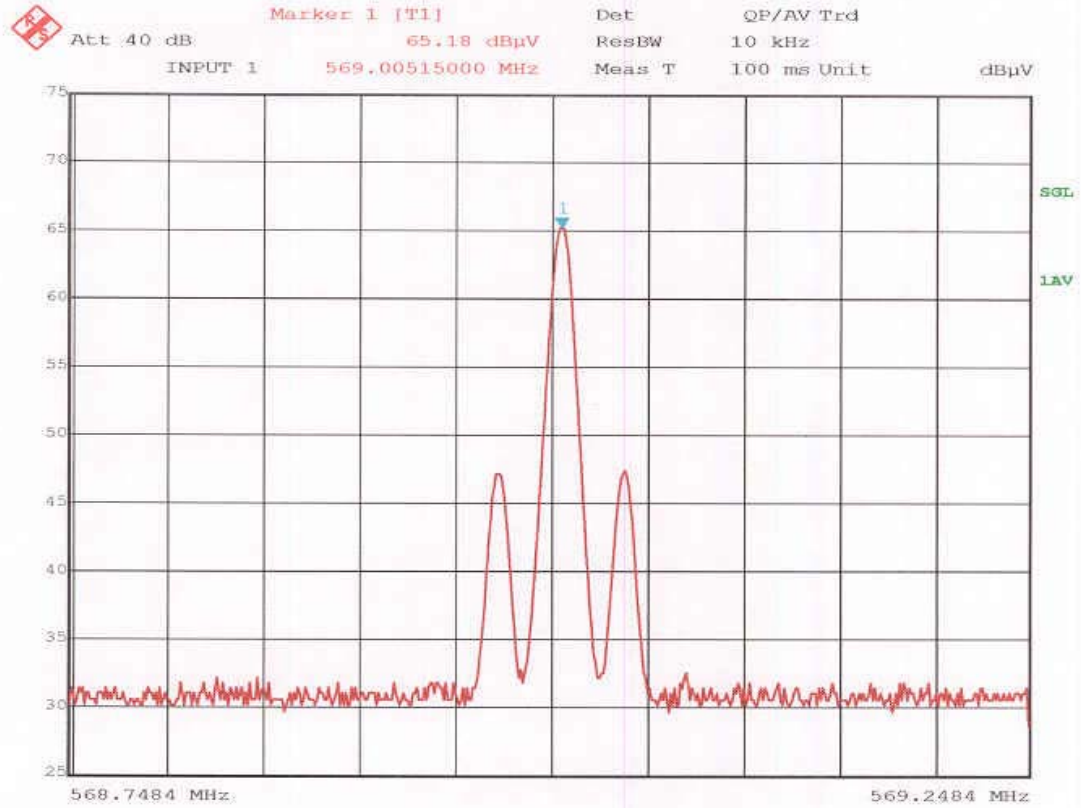


Title: Frequency Stability Temperature
 Comment B: Shure Inc., U1-J4 569.000 MHz
 -30 deg. C
 Date: 19.OCT.2001 15:15:33

FINAL ^{CEP}
Genoa

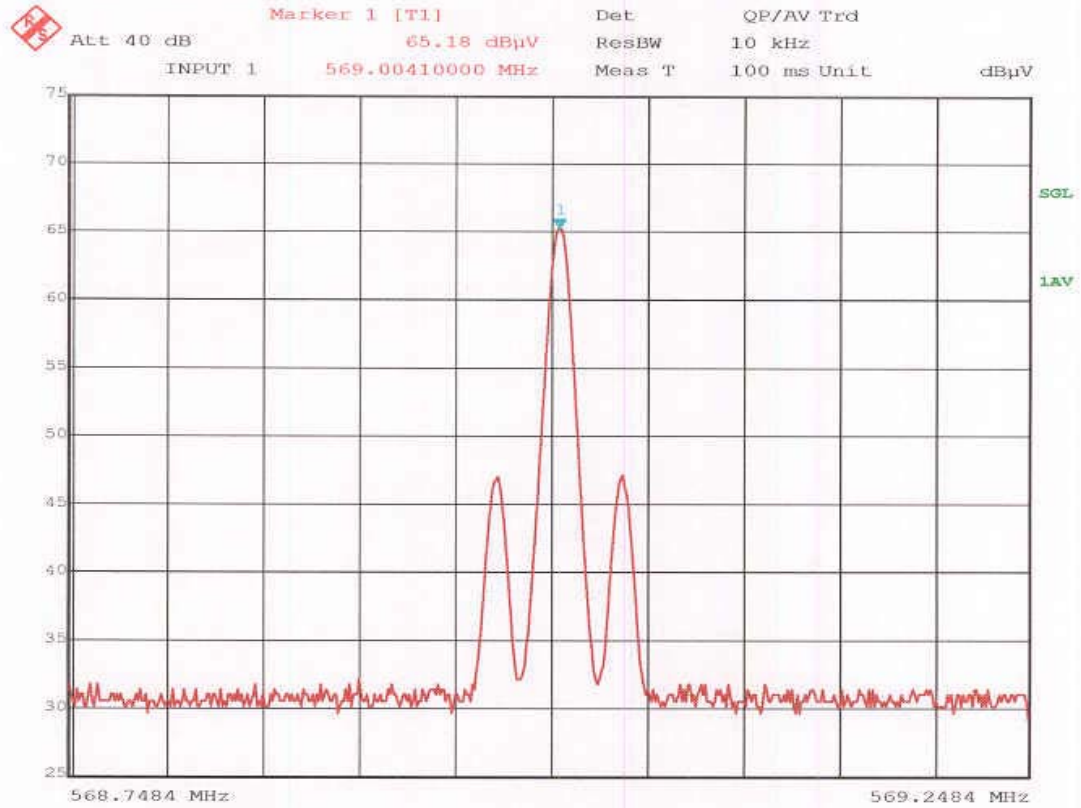


Title: Frequency Stability Temperature
 Comment B: Shure Inc., U1-J4 569.000 MHz
 -20 deg. C
 Date: 19.OCT.2001 15:43:06



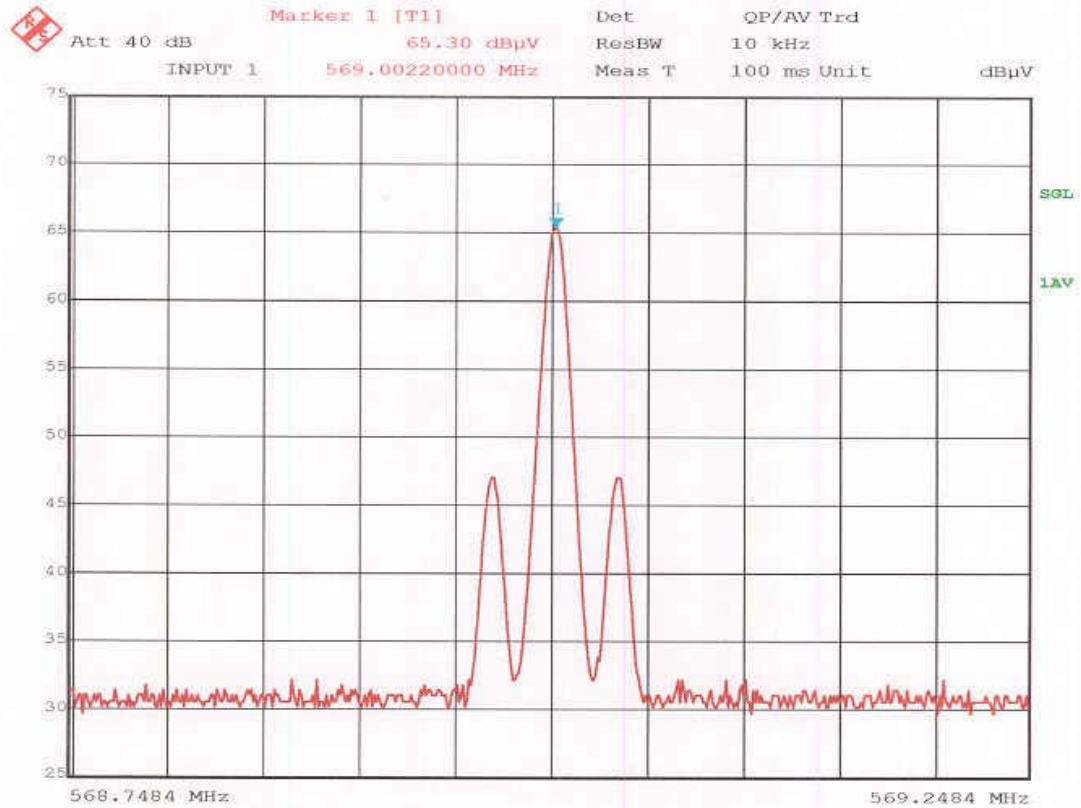
Title: Frequency Stability Temperature
 Comment B: Shure Inc., U1-J4 569.000 MHz
 -10 deg. C
 Date: 22.OCT.2001 09:27:14

FINAL ^{CP}
Genoa



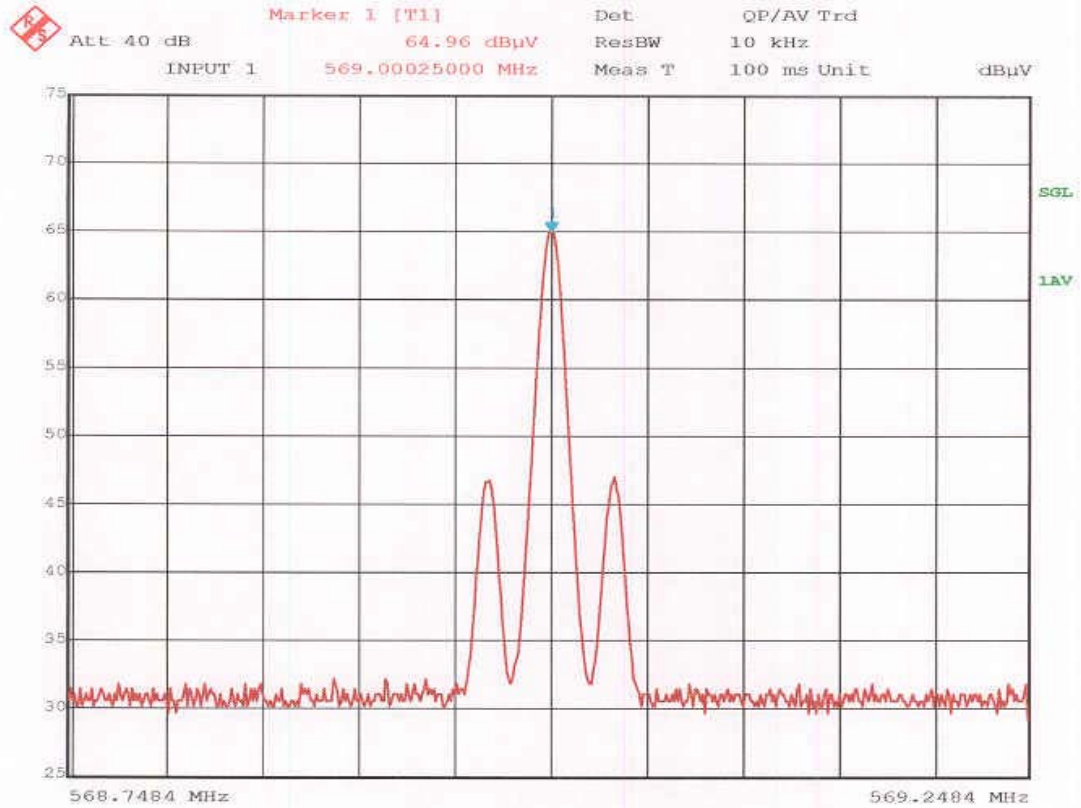
Title: Frequency Stability Temperature
 Comment B: Shure Inc., U1-J4 569.000 MHz
 0 deg. C
 Date: 22.OCT.2001 09:56:52

FINAL ^{CB}
Genoa



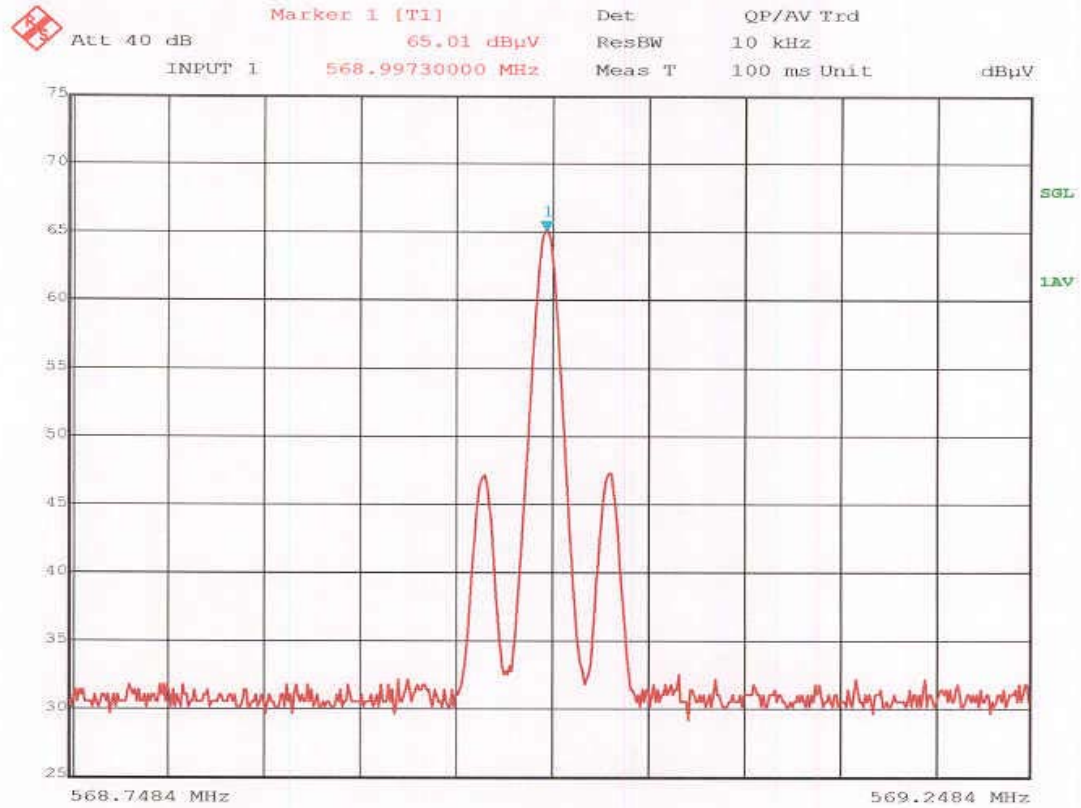
Title: Frequency Stability Temperature
Comment B: Shure Inc., U1-J4 569.000 MHz
10 deg. C
Date: 22.OCT.2001 10:32:04

FINAL ^{CP}
Genoa



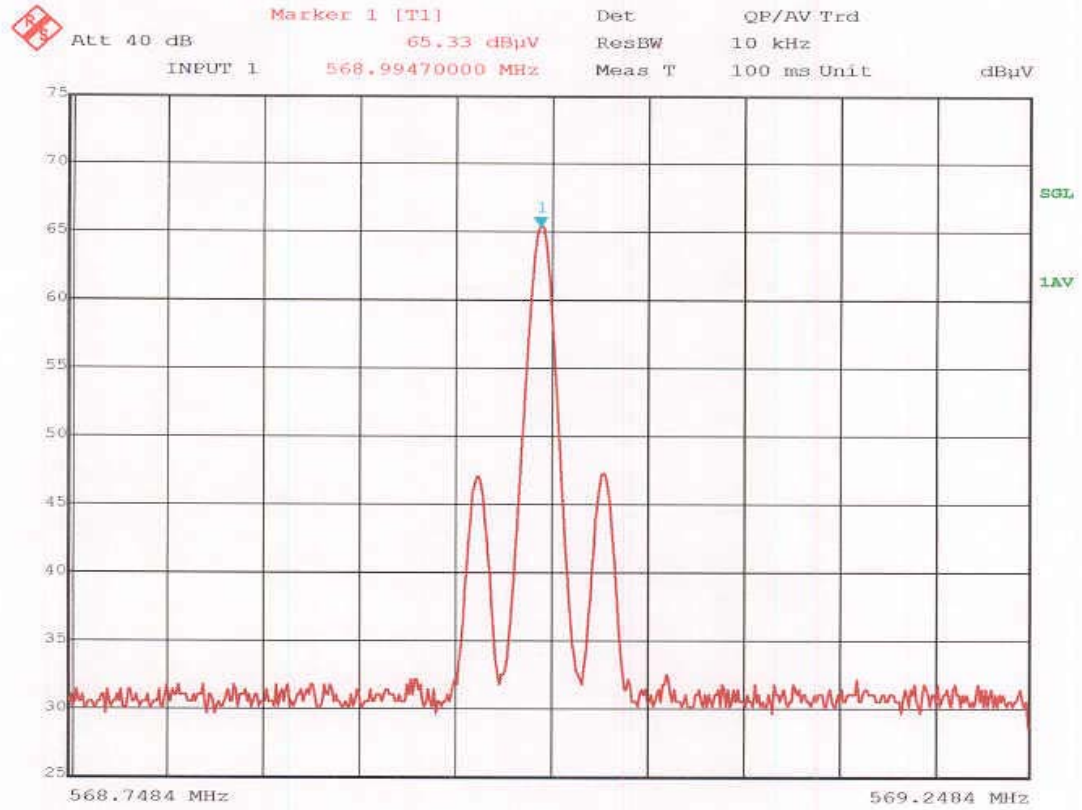
Title: Frequency Stability Temperature
Comment B: Shure Inc., U1-J4 569.000 MHz
20 deg. C
Date: 22.OCT.2001 11:02:37

FINAL ^{CP}
Genoa



Title: Frequency Stability Temperature
Comment B: Shure Inc., U1-J4 569.000 MHz
30 deg. C
Date: 22.OCT.2001 13:39:50

FINAL ^{EB}
Genoa



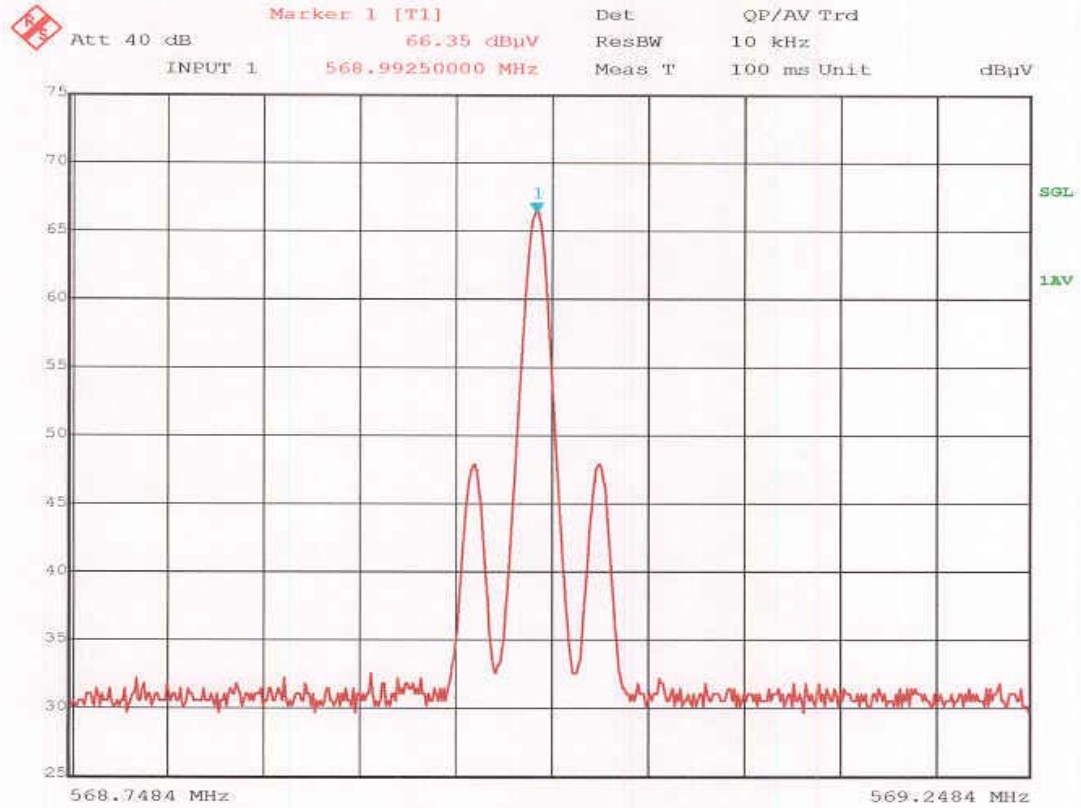
Title: Frequency Stability Temperature

Comment B: Shure Inc., U1-J4 569.000 MHz

40 deg. C

Date: 22.OCT.2001 14:14:35

FINAL 
Genoa



Title: Frequency Stability Temperature
 Comment B: Shure Inc., U1-J4 569.000 MHz
 50 deg. C
 Date: 22.OCT.2001 14:46:44

FINAL (C3)
Genoa



13.0 FREQUENCY STABILITY - PART 2.1055d (Voltage)

The frequency stability of UHF was measured by varying the primary supply voltage from 85% to 115% of nominal value for all equipment other than hand carried battery equipment.

FREQUENCY STABILITY FOR VOLTAGE VARIATION:

85%	0
100%	0
115%	0

This test was not run since the device is battery operated.

FREQUENCY STABILITY FOR HAND HELD DEVICES:

For hand carried, battery powered equipment, the supply voltage was reduced to the battery operating end point specified by the manufacturer. Readings were taken at the reduced end point and with a fresh battery:

Fresh Battery verses Battery end point:

- Frequency #1 **250 Hz**
- Frequency #2 **0 Hz**
- Frequency #3 **0 Hz**
- Frequency #4 **0 Hz**
- Frequency #5 **0 Hz**
- Frequency #6 **0 Hz**

As stated in Part 74, Section 74.861 e-4 the Frequency Tolerance and Margin for this range are as follows:

Frequency Tolerance: 0.00005

Limit: 28449.95

This is well within the specified limits.



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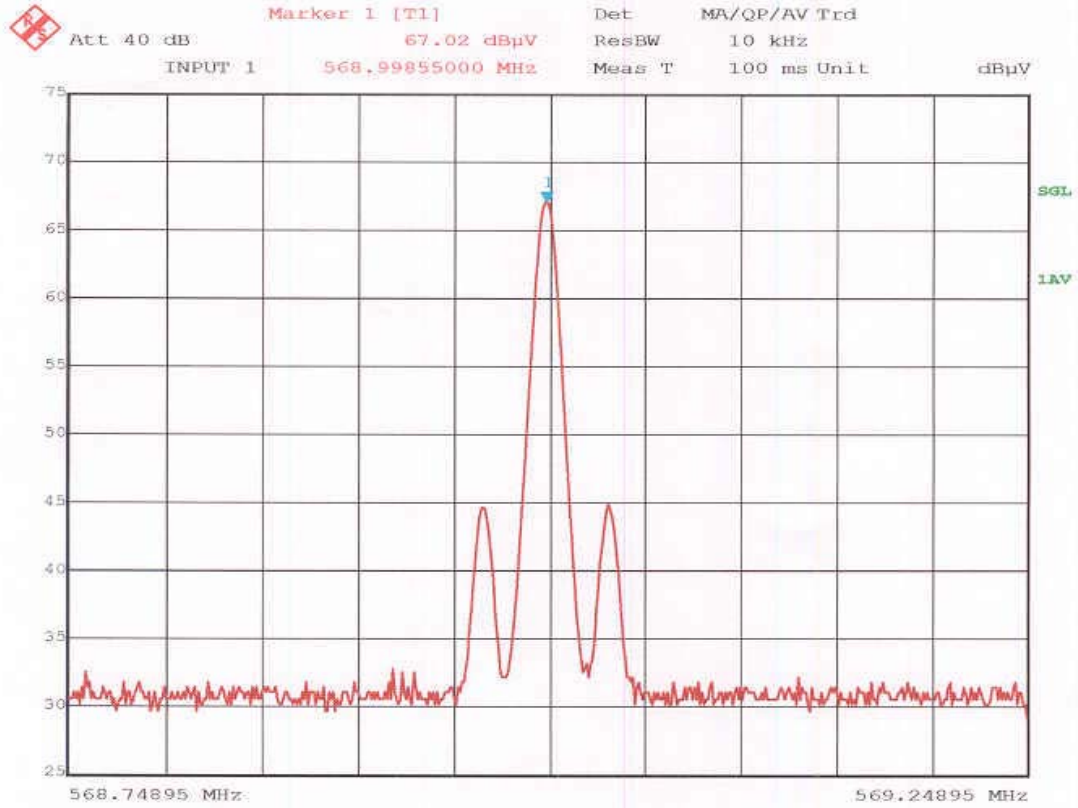
GRAPHS TAKEN FOR FREQUENCY

STABILITY WHEN VARYING THE

PRIMARY SUPPLY VOLTAGE

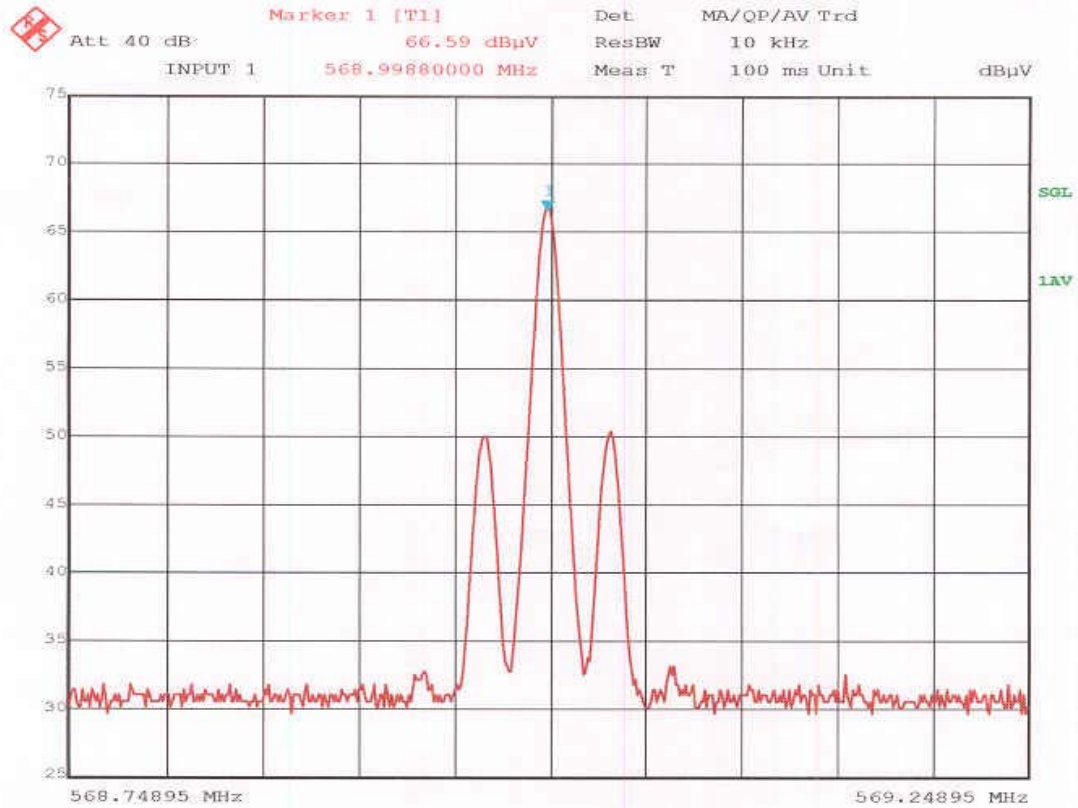
PART 2.1055d

This is well within the specified limits.



Title: Frequency Stability Supply Voltage
 Comment B: Shure Inc., U1-J4 569.000 MHz
 2.2 Volt Supply
 Date: 24.OCT.2001 15:24:58

FINAL 
Genoa



Title: Frequency Stability Supply Voltage
Comment B: Shure Inc., U1-J4 569.000 MHz
3.0 Volt Supply
Date: 24.OCT.2001 15:21:27

FINAL ^{CB}
Genoa



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14.0 PHOTO INFORMATION AND TEST SET-UP

The test set-up can be seen on the accompanying photo page.

Item 0 UHF
U1J4 SN: NA

Item 1 Shielded Microphone Cable with Metal Shells. 1m

Item 2

Item 3

Item 4

Item 5

Item 6

Item 7

Item 8

Item 9

Item 10

15.0 RADIATED PHOTOS TAKEN DURING TESTING.



15.0 RADIATED PHOTOS TAKEN DURING TESTING



15.0 RADIATED PHOTOS TAKEN DURING TESTING





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16.0 CHANGE INFORMATION

The following changes were implemented during the testing and must be incorporated into the production units to ensure compliance.

Change 1. There were no changes made at D.L.S. Electronic Systems, Inc.

Change 2.

Change 3.

Change 4.

Change 5.



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16.0 CHANGE INFORMATION (CON'T)

Change 6.

Change 7.

Change 8.

Change 9.

Change 10.

The responsibility of implementing the changes listed in this report is accepted or I certify that no changes were made

by _____
Signature Title

for _____
Company Name Date



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17.0 RESULTS OF TESTS

The emission test results can be seen on pages at the end of this report. Data sheets indicating the open field radiated measurements can also be found with this report. Those points on the radiated charts shown with a yellow mark are background frequencies that were verified during the test.

18.0 CONCLUSION

It was found that the UHF, Model Number: U1J4, S/N: NA **meets** the radio interference emission requirements of the FCC "Rules and Regulations", Part 74, Subpart H, Sections 74.801 to 74.882 for Low Power Auxiliary Stations operating in the 554 MHz to 584 MHz Frequency Band. This test report relates only to the items tested.



TABLE 1 - EQUIPMENT LIST

Test Equipment	Manufacturer/Description	Model Number	Serial Number	Frequency Range	Cal Due Date
Receiver	Rohde & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	2/02
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	3/02
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	4/02
Preamp	Rohde & Schwarz	TS-PR10	032001/005	9 kHz- 1000 MHz	3/02
Signal Generator	Marconi	2022A	119026	.01-1000 MHz	01/02
Antenna	Electrometrics	BIA-25	2453	20 - 200 MHz	4/02
Antenna	Electrometrics	LPA-25	1114	200 - 1000 MHz	4/02
Antenna	Electrometrics	BIA-25	2614	20 - 200 MHz	4/02
Antenna	Electrometrics	LPA-25	1205	200 - 1000 MHz	4/02
Antenna	Electrometrics	BIA-25	4785	20 - 200 MHz	4/02
Antenna	Electrometrics	LPA-25	4895	200 - 1000 MHz	4/02
Antenna	EMCO	3115	2479	1 – 18 GHz	3/02

I/O Initial Calibration Only