UltraTech
Group of Labs

FCC TCB & IC CB

Ultratech's Accreditations:

0685

FCC
91038

1309

Industry Canada
Industrie Canada
Approved Test Facility
46390-2049

NvLap Lab Code 200093-0

SL2-IN-E-1119R

Korea KCC-RRL
CA2049

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March 02, 2015

To,
Ms. Annette Allender
ATO Spectrum Planning and International
Federal Aviation Administration

Subject: **Information for FAA Review for FCC Certification Application for following VHF Radio under FCC 47 CFR, Parts 2 and 87 (Subpart D) - Non-broadcast Aviation Radio Services Operating in the Frequency Band 118-136.9917MHz**

Applicant: **ICOM Incorporated**
Product: **VHF Air Band Transceiver**
Models: **IC-A220**
FCC ID: **AFJ297410**

Dear Ms. Allander,

As appointed agent for **ICOM Incorporated**, we herewith submit the necessary information required for FAA review & approval. This may enable us (FCC TCB, UltraTech Engineering Labs Inc.) to review & grant FCC application for Certification of the above product.

Please find them in following pages and let us know if you may have any question or require further information.

Thanking you.

Sincerely,

Dharmajit Solanki

Dharmajit Solanki
Authorized Agent

Email:dharmajit@ultratech-labs.com

ENGINEERING TEST SUMMARY

VHF Air Band Transceiver
Model Nos.: IC-A220
FCC ID: AFJ297410

Applicant:

ICOM Incorporated
1-1-32, Kamiminami, Hirano-ku
Osaka, Japan, 547-0003

Tested as Required for FAA Review

For FCC Certification under
Federal Communications Commission (FCC)
47 CFR, Parts 2 and 87 (Subpart D) – Aviation Services

UltraTech's File No.: 15ICOM404_FAA

This Test report is Issued under the Authority of
Tri M. Luu, BASc
Vice President of Engineering
UltraTech Group of Labs

Date: March 02, 2015

Report Prepared by: Dharmajit Solanki Issued Date: March 02, 2015	Tested by: Wei Wu Test Dates: March 02, 2015

- *The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.*
- *This report must not be used by the client to claim product endorsement by NVLAP or any agency of the US Government.*

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91038 | 1309 | 46390-2049 | NVLAP LAB CODE 200093-0 | SL2-IN-E-1119R | CA2049 | TL363_B | TPTDP DA1300

FAA Requested Information:-

1.) FCC identification number

FCC ID: AFJ297410

2.) Manufacture and Model number

Manufacture: Icom Inc, 1-1-32, Kamiminami, Hirano-ku, Osaka, Japan, 547-0003
Model number: IC-A220

3.) Rated transmitter output power

Rated Output Power: 8 W

4.) Frequency Range (capable of tuning).

Frequency Tuning Range : 118.000 to 136.9917 MHz
Receive Only: 161 to 164 MHz

5.) Method of tuning

Microprocessor controlled phased lock loop (PLL) arrangement

6.) Channeling capability

The Transceiver will operate from
118 MHz -136.975 MHz for 25 kHz Ch Spacing &
118 MHz -136.9917 MHz for 8.33 kHz Ch Spacing

7.) Frequency stability (transmitter).

+/- 5.0 ppm

8.) Emission bandwidth(s)

6.00 kHz

9.) Emission type(s)

Amplitude modulation (AM) A3E
25 kHz: 6K00A3E
8.33 kHz: 5K60A3E

10.) Spectral emission plots:

(1) One centered on frequency middle of the range and measured across that range.
(2) Another of frequencies measured out to its corresponding 12th or 13th harmonic.

Test Frequencies & Plots #: Refer to plots for details

1. 118.025 MHz – Plots # 1 & 2
2. 127.500 MHz – Plots # 3 & 4
3. 136.975 MHz – Plots # 5 & 6

11.) Harmonics levels for the (ground) transceiver frequencies listed in Fig.1.

11.1 Transmit Frequency Harmonics (12 & 13)

Transmit Frequency (MHz)	Harmonic	Harmonic Frequency (MHz)	Plot # & Level (dBm)*
130.625	12	1567.500	# 7 & - 68.1
131.275	12	1575.300	# 8 & - 67.4
134.150	12	1609.800	# 9 & - 68.4
120.925	13	1572.025	# 10 & - 68.0
121.175	13	1575.275	# 11 & - 68.7
123.825	13	1609.725	# 12 & - 68.0

* See the plots for details of measurements

12.) Receiver RF characteristics

Sensitivity:	**6 dB S/N 2 µV**
Selectivity:	**6 dB ± 3 KHz (Ch Space 25 kHz)**
	6 dB ± 2.778 KHz (Ch Space 8.33 kHz)
	60 dB ± 22 KHz (Ch Space 25 kHz)
	60 dB ± 7.37 KHz (Ch Space 8.33 kHz)
Spurious Responses:	**74 dB µ**
Audio Output Power:	**5 W (4 ohms) / 60 mW (500 ohms)**
Receive System:	**Double Conversion Superheterodyne**
Intermediate Frequency:	**1st 38.85 MHz**
	2nd 450 KHz

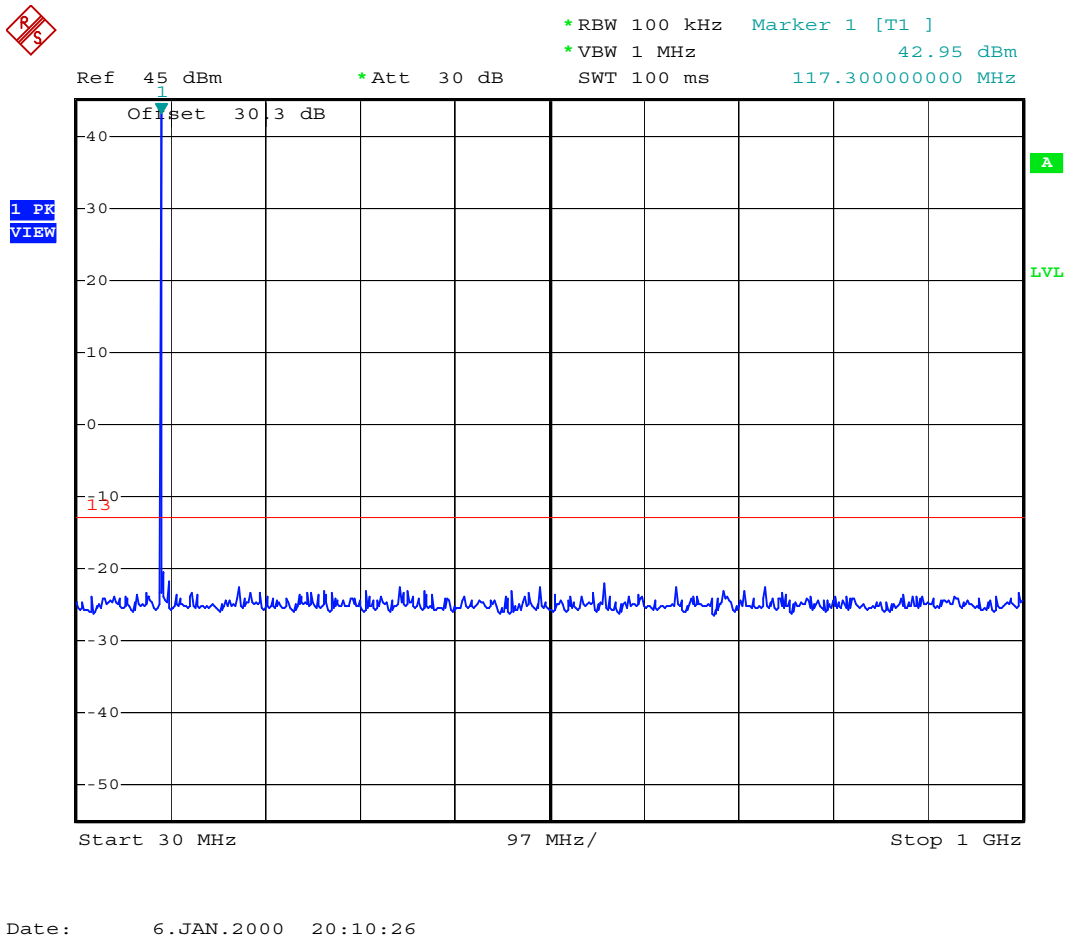
13.) Avionics

Does the transceiver meet the standard for desensitization? (They are specified in Section 2.2.11 of RTCA DO-186 Minimum Operational Performance Standards for Airborne Radio Communications Equipment Operating within the radio frequency Range 117.975-137.000 MHz), which provides immunity from FM broadcast.

No, this is non TSO radio, and does not meet Section 2.2.11 of RTCA DO-186 Minimum Operational Performance Standards

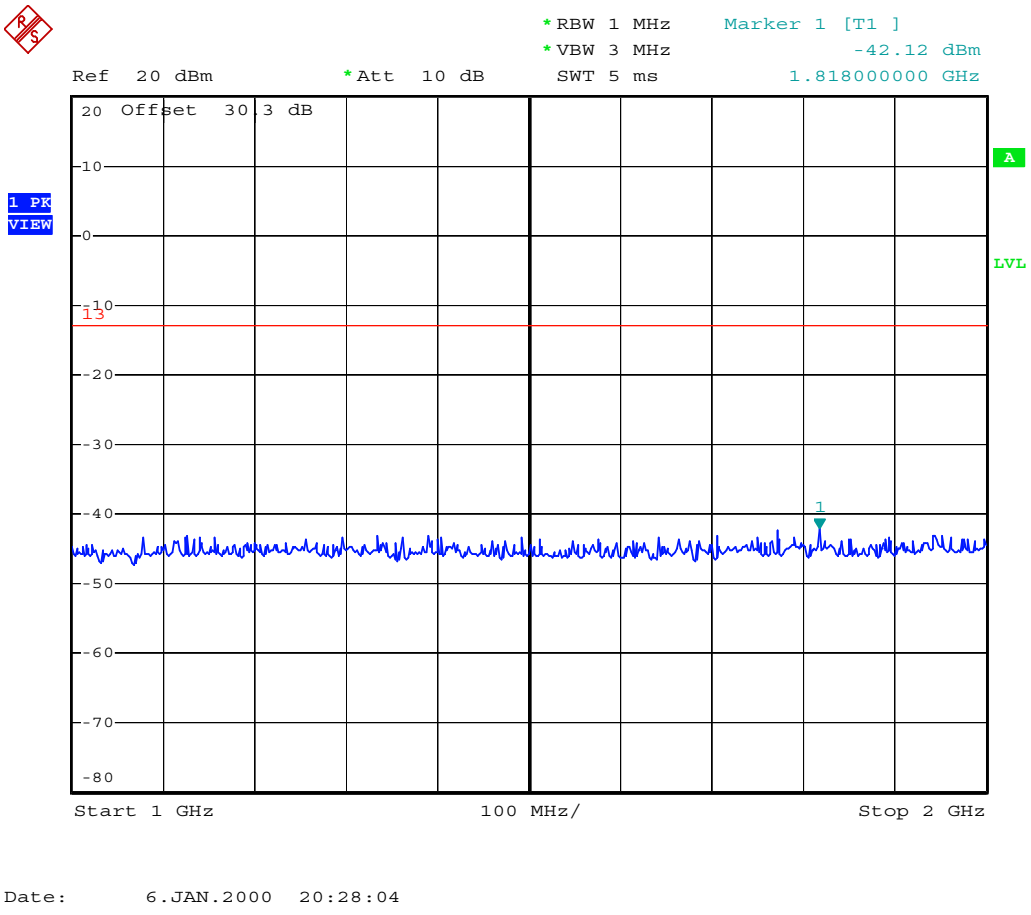
Plot 1 Tx Conducted Emission

Test Frequency:	118.025 MHz, High Power, With 2.5KHz audio signal
Channel Spacing:	25 KHz
Power:	8 W



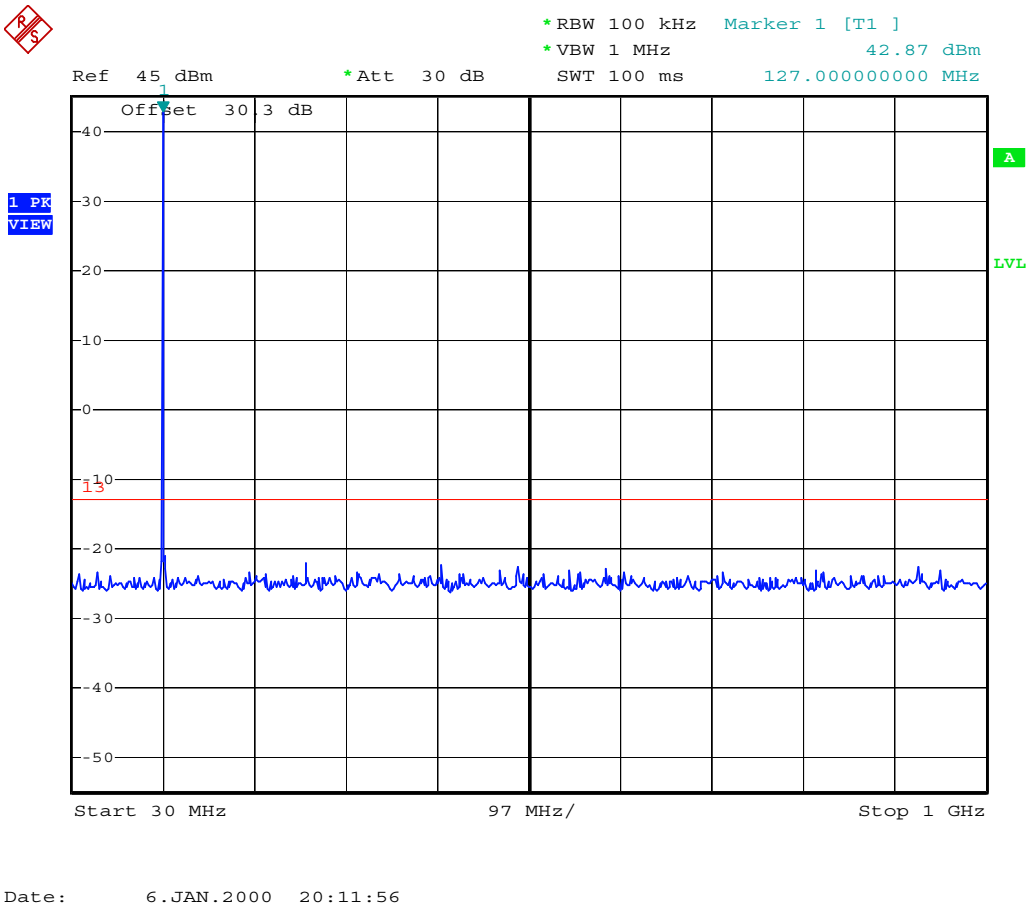
Plot 2 Tx Conducted Emission

Test Frequency:	118.025 MHz, High Power, With 2.5KHz audio signal
Channel Spacing:	25 KHz
Power:	8 W



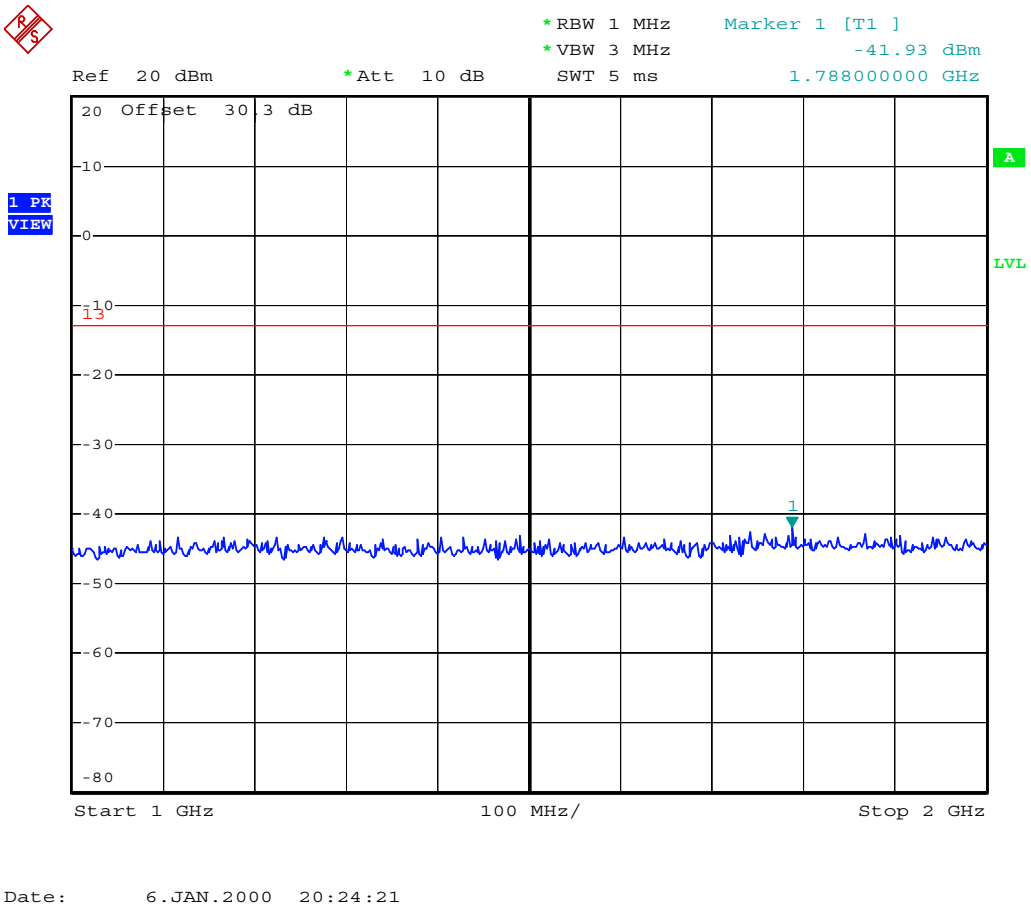
Plot 3 Tx Conducted Emission

Test Frequency:	127.500 MHz, High Power, With 2.5KHz audio signal
Channel Spacing:	25 KHz
Power:	8 W



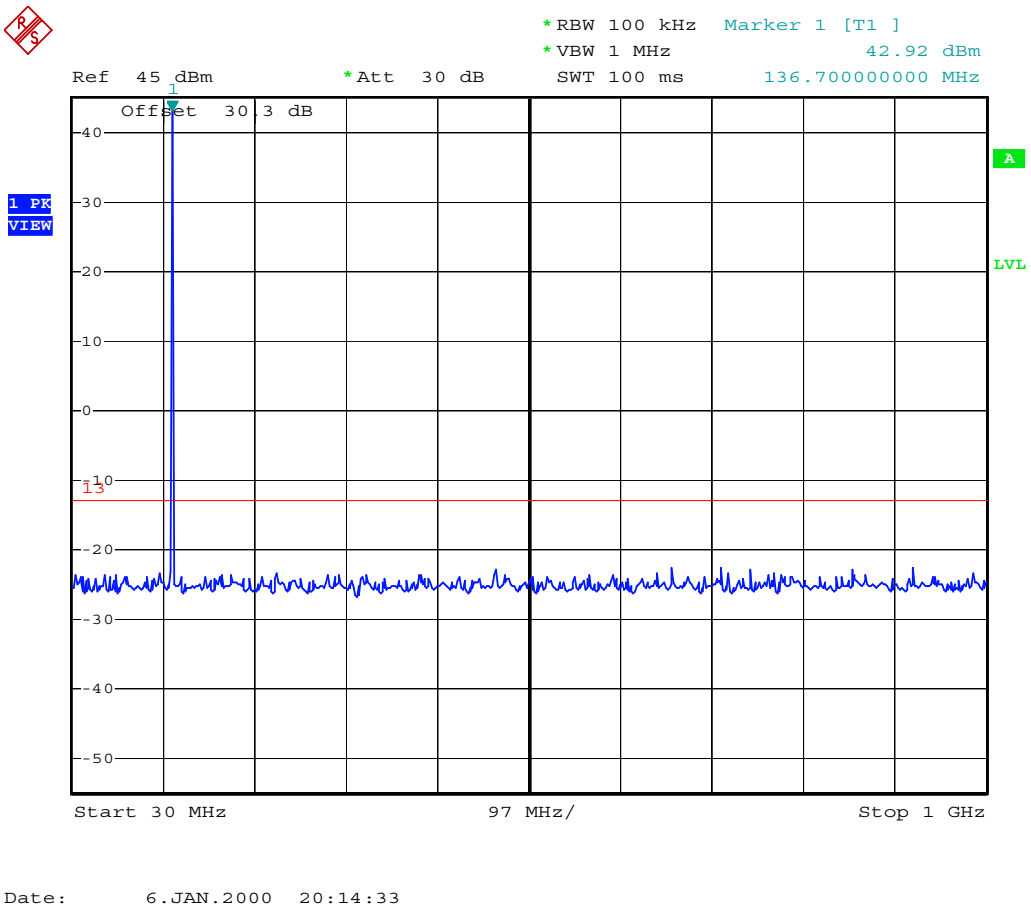
Plot 4 Tx Conducted Emission

Test Frequency:	127.500 MHz, High Power, With 2.5KHz audio signal
Channel Spacing:	25 KHz
Power:	8 W



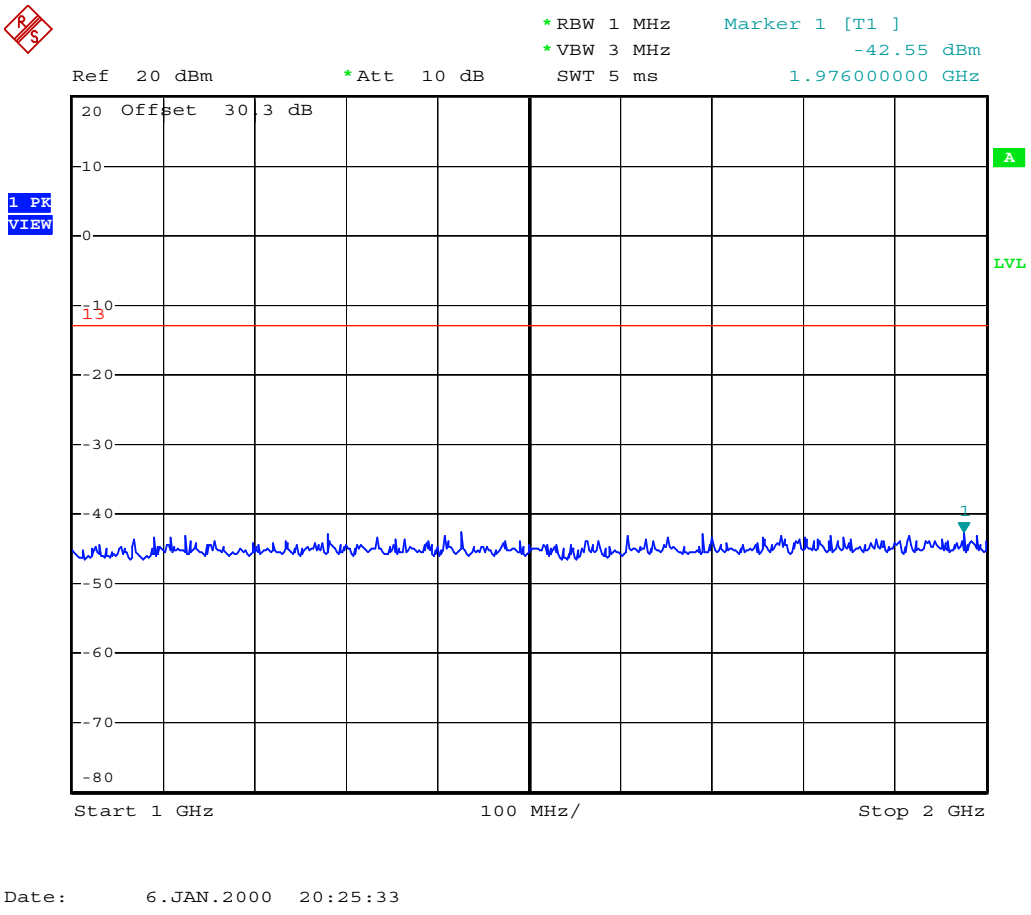
Plot 5 Tx Conducted Emission

Test Frequency:	136.975 MHz, High Power, With 2.5KHz audio signal
Channel Spacing:	25 KHz
Power:	8 W



Plot 6 Tx Conducted Emission

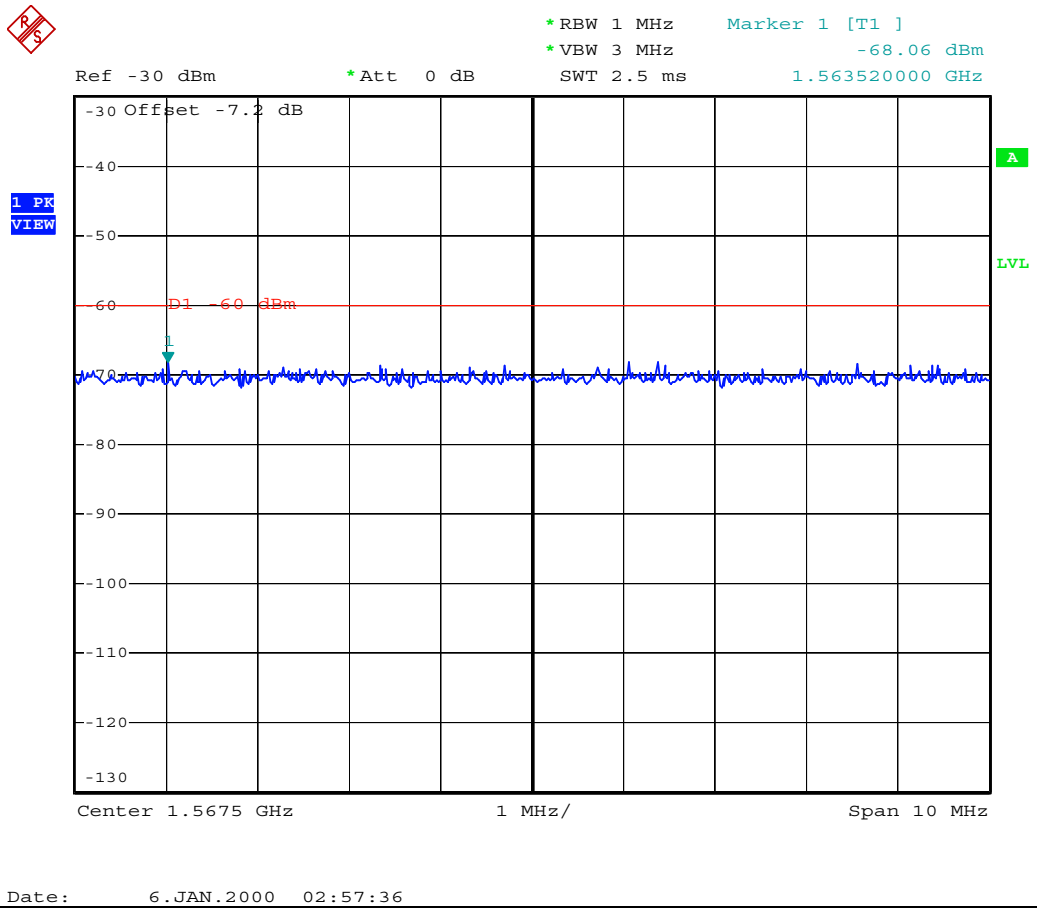
Test Frequency:	136.975 MHz, High Power, With 2.5KHz audio signal
Channel Spacing:	25 KHz
Power:	8 W



Transmit Frequency Harmonics:

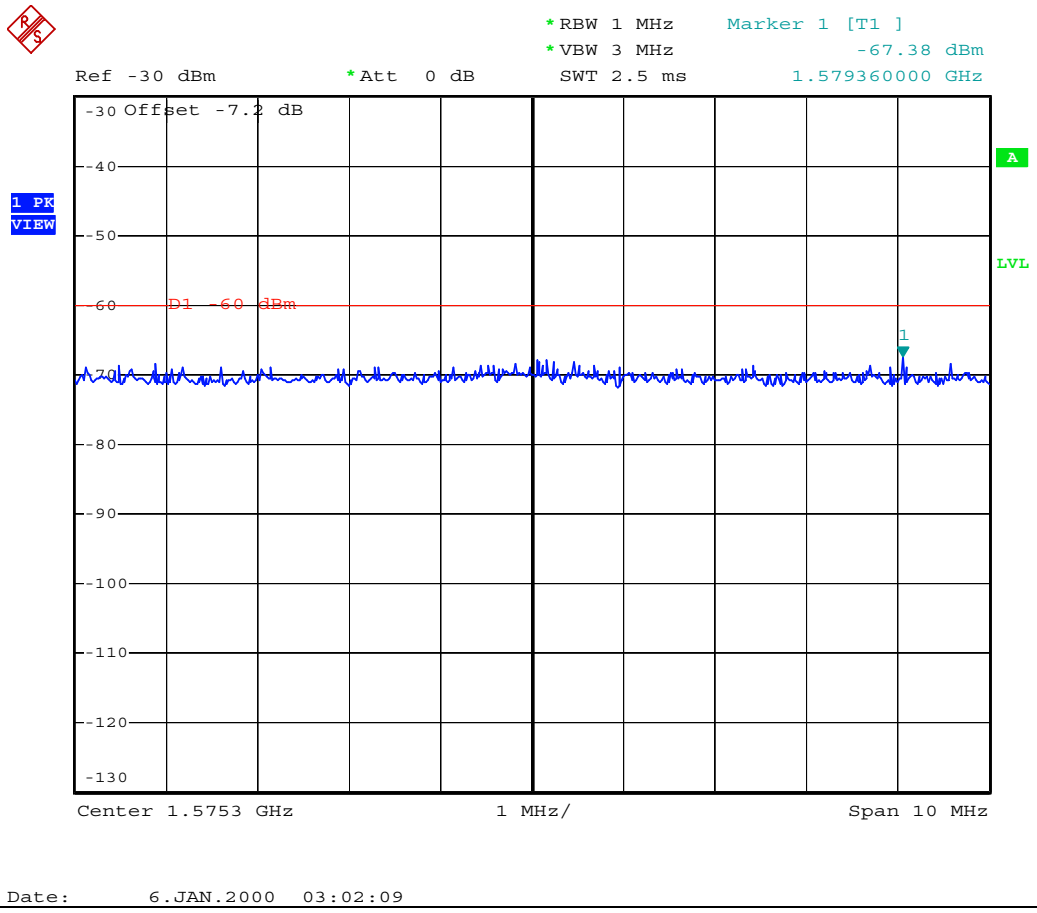
Plot 7 Harmonic Level

Test Frequency:	130.625 MHz 12th Harmonic, 1567.500 MHz
Channel Spacing:	25 KHz
Power:	8 W



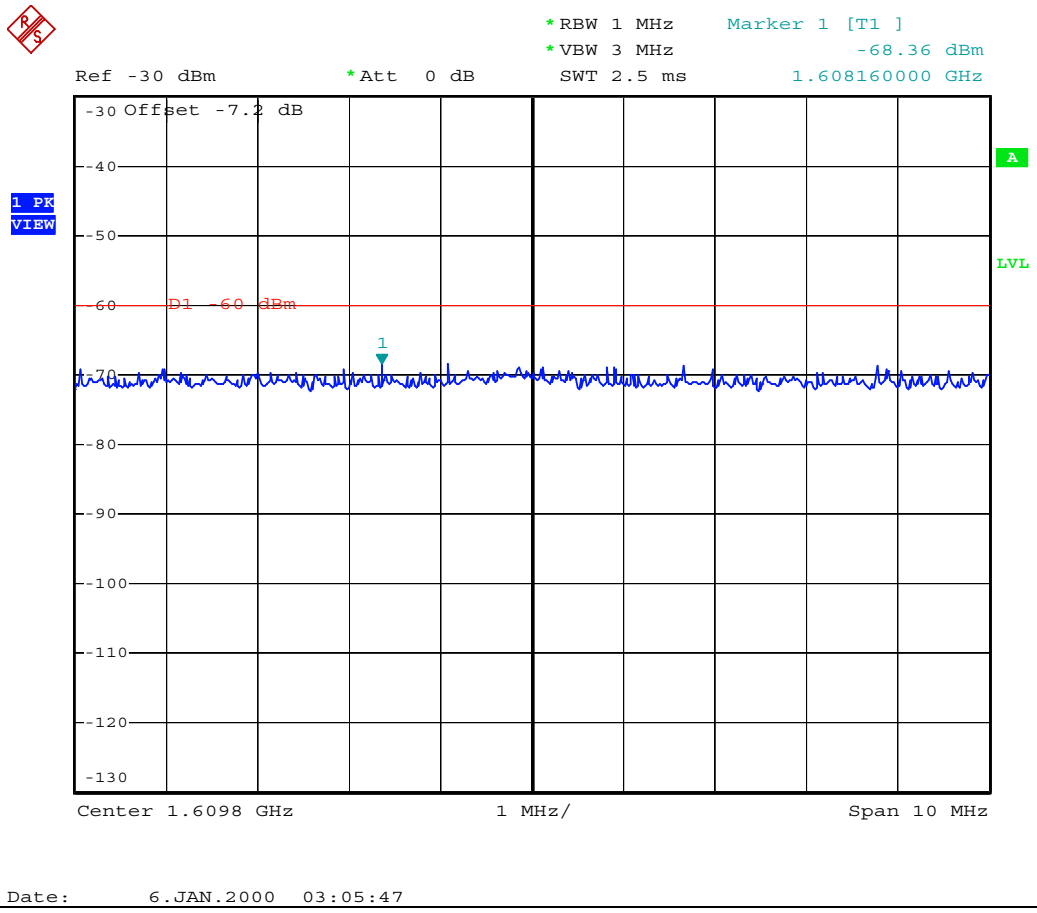
Plot 8 Harmonic Level

Test Frequency:	131.275 MHz 12th Harmonic, 1575.300 MHz
Channel Spacing:	25 KHz
Power:	8 W



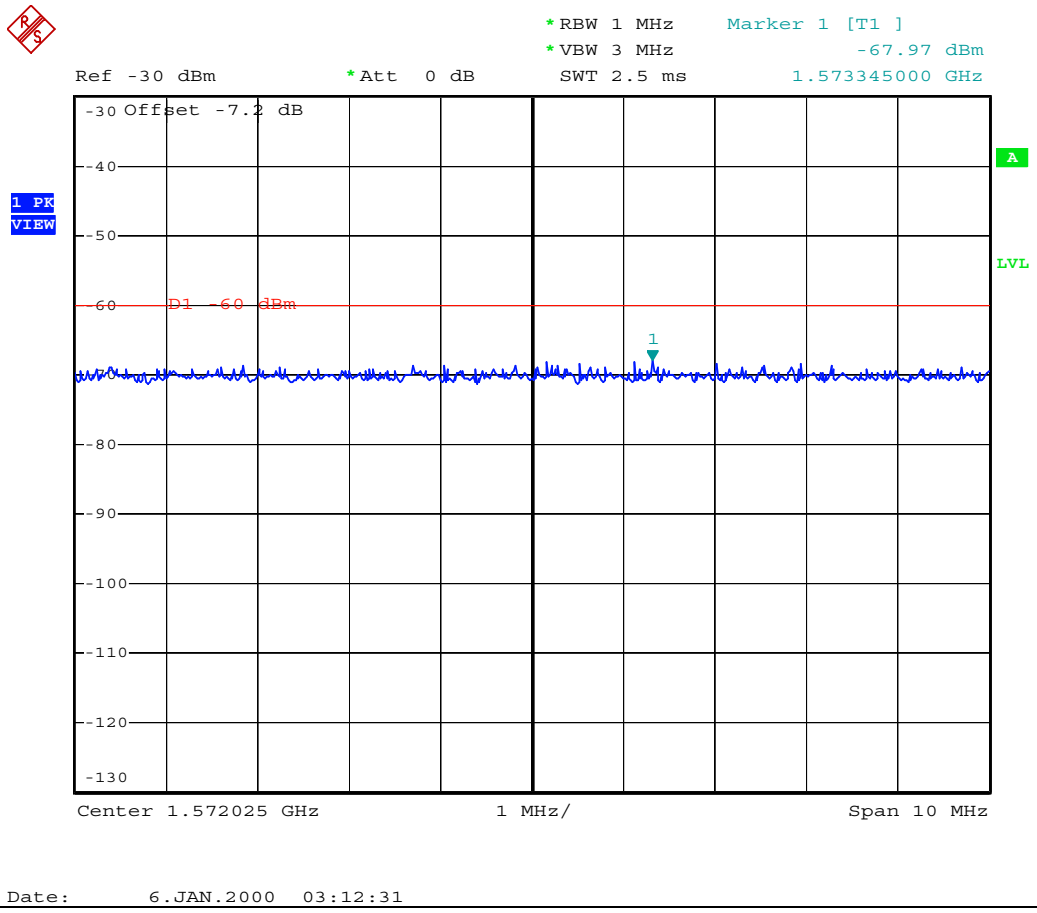
Plot 9 Harmonic Level

Test Frequency:	134.150 MHz 12th Harmonic, 1609.800 MHz
Channel Spacing:	25 KHz
Power:	8 W



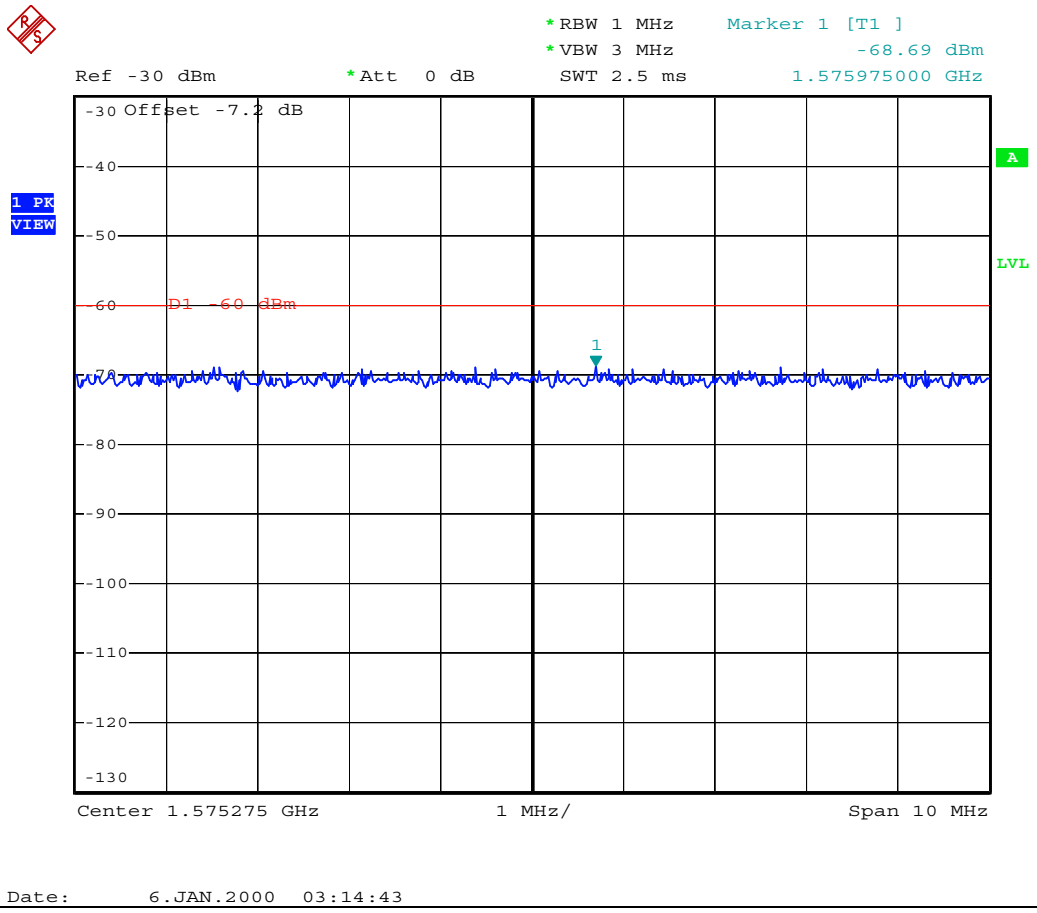
Plot 10 Harmonic Level

Test Frequency:	120.925 MHz 13th Harmonic, 1572.025 MHz
Channel Spacing:	25 KHz
Power:	8 W



Plot 11 Harmonic Level

Test Frequency:	121.175 MHz 13th Harmonic, 1575.275 MHz
Channel Spacing:	25 KHz
Power:	8 W



Plot 12 Harmonic Level

Test Frequency:	123.825 MHz 13th Harmonic, 1609.725 MHz
Channel Spacing:	25 KHz
Power:	8 W