

TIMCO ENGINEERING INC.

849 NW State Road 45

Newberry, Florida 32669

<http://www.timcoengr.com>

888.472.2424 F 352.472.2030 email: sid@timcoengr.com



Test Report

Product Name: 49 MHz R/C TRANSMITTER

FCC ID: IYF2CH700-49

Applicant:

**HOBBICO INC.
2904 RESEARCH ROAD
CHAMPAIGN IL 61821**

Date Receipt: 8/21/2003

Date Tested: 9/3/2003

APPLICANT: HOBBICO INC.

FCC ID: IYF2CH700-49

REPORT #: H\HOBBICO\1198UT3\1198UT3TestReport.doc

COVER SHEET

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Equipment List

| Device | Manufacturer | Model | Serial Number | Cal/Char Date Listed | Due Date |
|---------------------------------|-----------------|---------------|--------------------------|----------------------|----------|
| 3-Meter OATS | TEI | N/A | N/A | 1/13/03 | 1/13/06 |
| Biconnical Antenna | Eaton | 94455-1 | 1057 | CAL 3/18/03 | 3/18/05 |
| Biconnical Antenna | Eaton | 94455-1 | 1096 | CAL 10/1/01 | 10/1/03 |
| Biconnical Antenna | Electro-Metrics | BIA-25 | 1171 | CAL 4/26/01 | 4/26/03 |
| Blue Tower Quasi-Peak Adapter | HP | 85650A | 2811A01279 | CAL 4/15/03 | 4/15/05 |
| Blue Tower RF Preselector | HP | 85685A | 2926A00983 | CAL 4/15/03 | 4/15/05 |
| Blue Tower Spectrum Analyzer | HP | 8568B | 2928A04729 2848A18049 | CAL 4/15/03 | 4/15/05 |
| LISN | Electro-Metrics | ANS-25/2 | 2604 | CAL 10/9/01 | 10/9/03 |
| LISN | Electro-Metrics | EM-7820 | 2682 | CAL 3/12/03 | 3/12/05 |
| Log-Periodic Antenna | Eaton | 96005 | 1243 | CAL 5/8/03 | 5/8/05 |
| Log-Periodic Antenna | Electro-Metrics | EM-6950 | 632 | CHAR 10/15/01 | 10/15/03 |
| Log-Periodic Antenna | Electro-Metrics | LPA-25 | 1122 | CAL 10/2/01 | 10/2/03 |
| Log-Periodic Antenna | Electro-Metrics | LPA-30 | 409 | CAL 3/4/03 | 3/4/05 |
| Silver Tower Preamplifier | HP | 8449B | 3008A01075 | CHAR 1/28/02 | 1/28/04 |
| Silver Tower Quasi-Peak Adapter | HP | 85650A | 3303A01844 | CAL 10/14/02 | 10/14/04 |
| Silver Tower RF Preselector | HP | 85685A | 2620A00294 | CAL 10/14/02 | 10/14/04 |
| Silver Tower Spectrum Analyzer | HP | 8566B Opt 462 | 3552A22064 3638A08608 | CAL 10/14/02 | 10/14/04 |
| Tan Tower Preamplifier | HP | 8449B-H02 | 3008A00372 | CHAR 3/4/01 | 3/4/03 |
| Tan Tower Quasi-Peak Adapter | HP | 85650A | 3303A01690 | CAL 8/31/01 | 8/31/03 |
| Tan Tower RF Preselector | HP | 85685A | 3221A01400 | CAL 8/31/01 | 8/31/03 |
| Tan Tower Spectrum Analyzer | HP | 8566B Opt 462 | 3138A07786 3144A20661 | CAL 8/31/01 | 8/31/03 |
| 3/10-Meter OATS | TEI | N/A | N/A | Listed 3/26/01 | 3/26/04 |

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TEST PROCEDURE

GENERAL: This report shall NOT be reproduced except in full without the written approval of TIMCO ENGINEERING, INC.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-1992 using a HEWLETT PACKARD spectrum analyzer with a preselector. The bandwidth of the spectrum analyzer was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100 kHz and the video bandwidth was 300 kHz. The ambient temperature of the UUT was 80°C with a humidity of 76%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

Freq (MHz) METER READING + ACF = FS
33 20 dBuV + 10.36 dB = 30.36 dBuV/m @ 3m

ANSI STANDARD C63.4-1992 10.1.7 MEASUREMENT PROCEDURES: The unit under test was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The table used for radiated measurements is capable of continuous rotation.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

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APPLICANT: HOBBICO INC.
FCC ID: IYF2CH700-49
NAME OF TEST: RADIATION INTERFERENCE
RULES PART NO.: 15.235
REQUIREMENTS: CARRIER FREQUENCY WILL NOT EXCEEDS 80 dBuV/m AT 3M.
OUT-OF-BAND EMISSIONS SHALL NOT EXCEED:
30 - 88 MHz 40.0 dBuV/M MEASURED AT 3 METERS
88 - 216 MHz 43.5 dBuV/M
216 - 960 MHz 46.0 dBuV/M
ABOVE 960 MHz 54.0 dBuV/M

TEST DATA:

| Emission Frequency MHz | Meter Reading dBuV | ANT. POLARITY | Coax Loss dB | Correction Factor dB | Field Strength dBuV/m | Margin dB |
|------------------------|--------------------|---------------|--------------|----------------------|-----------------------|-----------|
| 49.86 | 43.6 | H | 0.79 | 11.63 | 56.02 | 23.98 |
| 49.86 | 60.0 | V | 0.79 | 11.63 | 72.42 | 7.58 |
| 99.96 | 19.6 | H | 0.80 | 10.50 | 30.90 | 12.60 |
| 99.96 | 22.7 | V | 0.80 | 10.50 | 34.00 | 9.50 |
| 149.67 | 7.4 | H | 0.90 | 15.78 | 24.08 | 19.42 |
| 149.67 | 10.4 | V | 0.90 | 15.78 | 27.08 | 16.42 |
| 199.86 | 7.9 | H | 1.20 | 16.76 | 25.86 | 17.64 |
| 199.86 | 10.8 | V | 1.20 | 16.76 | 28.76 | 14.74 |
| 249.36 | 8.3 | H | 1.40 | 12.54 | 22.24 | 23.76 |
| 249.36 | 12.2 | V | 1.40 | 12.54 | 26.14 | 19.86 |
| 299.22 | 15.9 | H | 1.40 | 14.67 | 31.97 | 14.03 |
| 299.22 | 21.5 | V | 1.40 | 14.67 | 37.57 | 8.43 |
| 349.08 | 8.8 | H | 1.40 | 14.42 | 24.62 | 21.38 |
| 349.08 | 19.4 | V | 1.40 | 14.42 | 35.22 | 10.78 |
| 398.90 | 10.6 | H | 1.60 | 15.88 | 28.08 | 17.92 |
| 398.90 | 17.0 | V | 1.60 | 15.88 | 34.48 | 11.52 |
| 448.83 | 12.6 | H | 1.60 | 16.74 | 30.94 | 15.06 |
| 448.83 | 16.2 | V | 1.60 | 16.74 | 34.54 | 11.46 |
| 498.65 | 11.7 | H | 1.60 | 18.21 | 31.51 | 14.49 |
| 498.65 | 16.1 | V | 1.60 | 18.21 | 35.91 | 10.09 |

SAMPLE CALCULATION: FSdBuV/m = MR (dBuV) + ACFdB.

TEST PROCEDURE: The procedure used was ANSI STANDARD C63.4-1992. The spectrum was scanned from 30 MHz to 1000 MHz. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported. The UUT was tested in 3 orthogonal planes.

TEST RESULTS: THE UNIT DOES MEET THE FCC REQUIREMENTS.

PERFORMED BY: NAM NGUYEN

DATE: 9/3/2003

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APPLICANT: HOBBICO INC.
FCC ID: IYF2CH700-49
NAME OF TEST: Occupied Bandwidth
RULES PART NO.: 15.235

REQUIREMENTS: The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier or to the general limits of 15.209, whichever permits the higher emission levels.

**THE GRAPHS ON THE NEXT PAGES REPRESENTS THE EMISSIONS
TAKEN FOR THE DEVICE.**

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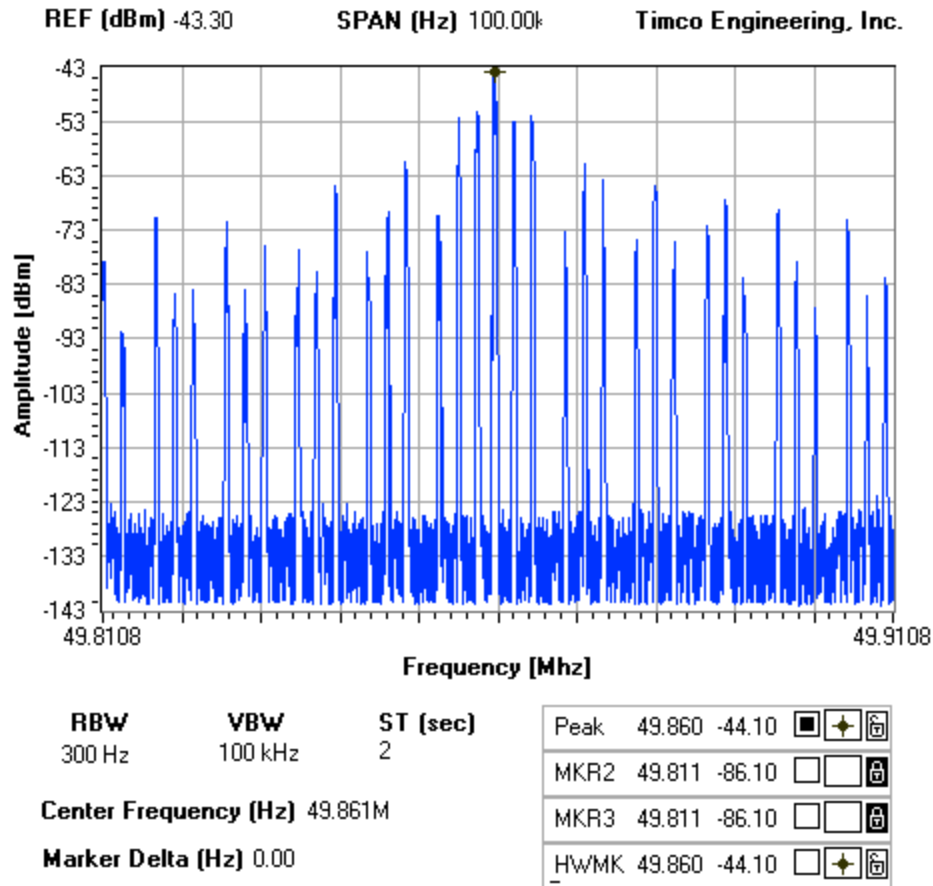
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NOTES:

Occupied Bandwidth : 49 MHz R/C TRANSMITTER
 1198UT3_49xA

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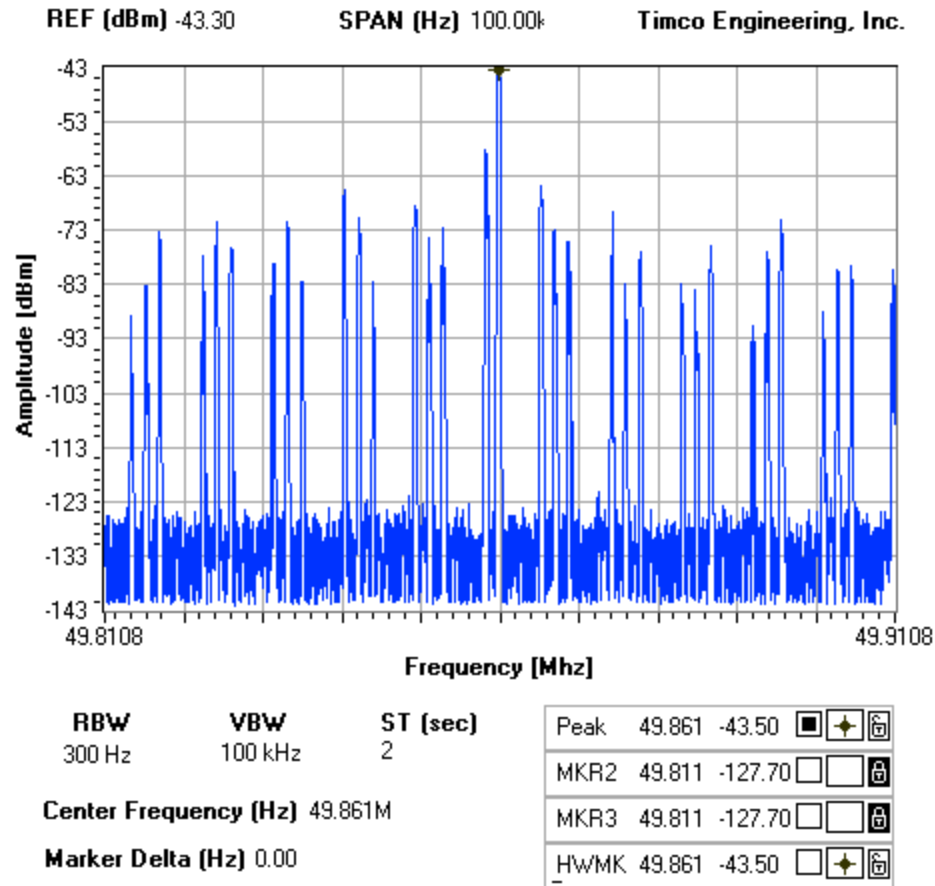
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NOTES:

Occupied Bandwidth : 49 MHz R/C TRANSMITTER
 1198UT3_49xB

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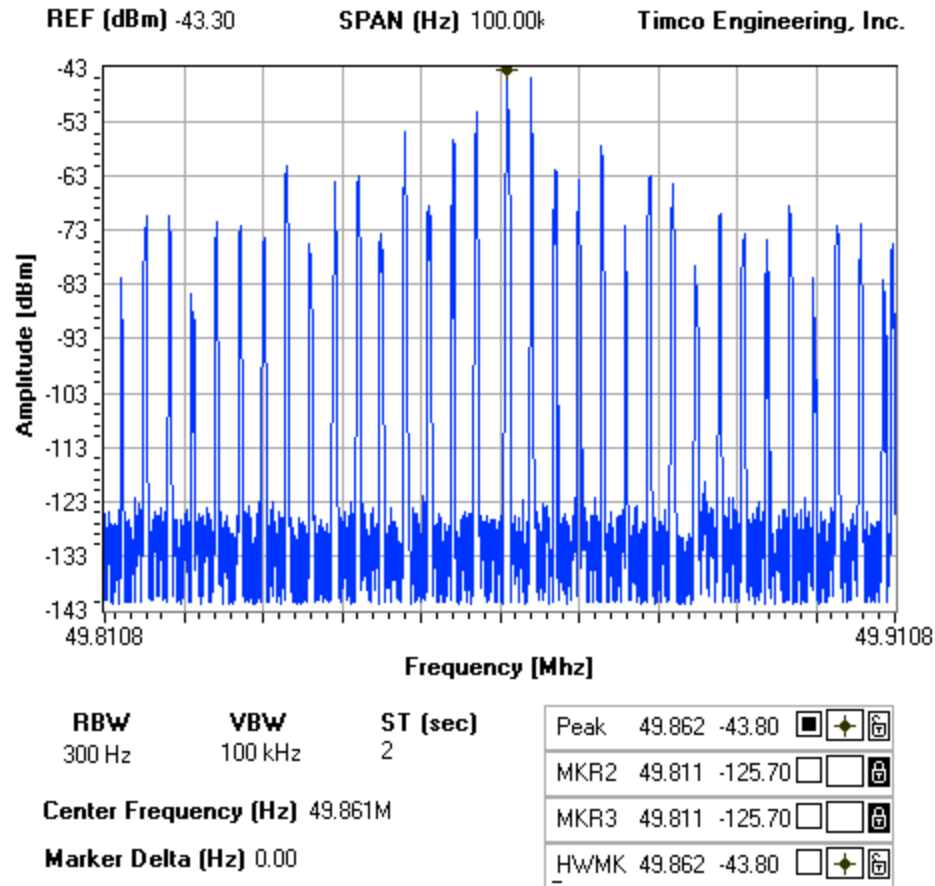
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NOTES:

Occupied Bandwidth : 49 MHz R/C TRANSMITTER
 1198UT3_49xC

HOBBICO INC.



METHOD OF MEASUREMENT: A small sample of the transmitter output was fed into the spectrum analyzer and the attached plot was taken. The vertical scale is set to 10 dB per division. The horizontal scale is set to 5 kHz per division.

TEST RESULTS: The unit DOES meet the FCC requirements.

PERFORMED BY: NAM NGUYEN

DATE: 9/3/2003

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