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FCC PART 15.249 TEST REPORT

UNLICENSED INTENTIONAL RADIATOR

| | |
|----------------------|--|
| Applicant | HYPER-INTERACTIVE TEACHING TECHNOLOGY LLC |
| Address | 1625 RIDGEWAY DRIVE |
| | FAYETTEVILLE, ARKANSAS 72701 |
| FCC ID | UH9TX3000 |
| Model Number | TX 3000 |
| Product Description | TRANSMITTER |
| Date Sample Received | 8/3/2006 |
| Date Tested | 8/23/06 |
| Tested By | Nam Nguyen |
| Approved By | Mario de Aranzeta |
| Report Number | H\HYPER\2295UT6\2295UT6TestReport.doc |
| Total Pages | 9 |
| Test Results | <input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL |

**THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL
WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.**



Certificate # 0955-01



Certificate # 0955-01



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STATEMENT OF COMPLIANCE

This equipment has been tested in accordance with the standards identified in the referenced test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report and demonstrate that the equipment complies with the appropriate standards. No modifications were made to the equipment during testing in order to demonstrate compliance with these standards.

I attest that the necessary measurements were made by me or under my supervision, at TIMCO ENGINEERING, INC. located at 849 N.W. State Road 45, Newberry, Florida 32669.

Authorized by: Mario de Aranzeta

Signature: <Mario de Aranzeta>

Function: Engineer

Date: 8/23/2006



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**GENERAL INFORMATION****DUT Specification**

| | | | |
|---|--|---|--|
| The test results relate only to the items tested. | | | |
| Applicable Standard | Part 15.249 | | |
| DUT Description | TRANSMITTER | | |
| FCC ID | UH9TX3000 | | |
| Model Number | TX 3000 | | |
| Serial Number | N/A | | |
| Operating Frequency | TX: 2401.00 MHz – 2462.50 MHz | RX | |
| No. of Channels | 62 | | |
| DUT Power Source | <input type="checkbox"/> 110–120Vac/50– 60Hz | | |
| | <input type="checkbox"/> DC Power | | |
| | <input checked="" type="checkbox"/> Battery Operated Exclusively | | |
| Test Item | <input type="checkbox"/> Prototype | <input type="checkbox"/> Pre-Production | <input checked="" type="checkbox"/> Production |
| Type of Equipment | <input checked="" type="checkbox"/> Fixed | <input type="checkbox"/> Mobile | <input type="checkbox"/> Portable |
| Antenna | N/A | | |
| Antenna Connector | N/A | | |
| Test Conditions | Temperature - 26°C Humidity – 50% | | |
| Modifications | None | | |
| Test Exercise | Continuous transmit mode of operation | | |
| Test Standard | ANSI C63.4 - 2003 | | |

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**EMC EQUIPMENT LIST**

| Device | Manufacturer | Model | Serial Number | Cal/Char Date | Due Date |
|--------------------------------------|------------------------|-----------------|----------------------|-----------------------|-----------------|
| 3/10-Meter OATS | TEI | N/A | N/A | Listed 3/27/04 | 3/26/07 |
| 3-Meter OATS | TEI | N/A | N/A | Listed 1/11/06 | 1/10/09 |
| Antenna: Biconnical | Eaton | 94455-1 | 1057 | CAL 12/12/05 | 12/12/07 |
| Antenna: Biconnical | Electro-Metrics | BIA-25 | 1171 | CAL 4/29/05 | 4/29/07 |
| Analyzer | HP | 85650A | 2811A01279 | CAL 4/13/05 | 4/13/07 |
| Blue Tower Quasi-Peak Adapter | | | | | |
| Analyzer | HP | 85685A | 2926A00983 | CAL 9/5/05 | 9/5/07 |
| Blue Tower RF Preselector | | | | | |
| Analyzer | HP | 8568B | 2928A04729 | CAL 4/13/05 | 4/13/07 |
| Blue Tower Spectrum Analyzer | | | 2848A18049 | | |
| LISN | Electro-Metrics | ANS-25/2 | 2604 | CAL 10/5/06 | 10/5/08 |
| LISN | Electro-Metrics | EM-7820 | 2682 | CAL 4/28/05 | 4/28/07 |
| Antenna: Log-Periodic | Eaton | 96005 | 1243 | CAL 12/14/05 | 12/14/07 |

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TEST PROCEDURE

Radiation Interference: ANSI Standard C63.4-2003 using a spectrum analyzer, a preselector, a quasi-peak adapter, and an appropriate antenna. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100 kHz with an appropriate sweep speed and the video bandwidth was 300 kHz up to 1.0GHz and 1.0 MHz with a video BW of 3.0 MHz above 1.0GHz. 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 spectrum was searched to at least the tenth (10) harmonic of the fundamental.

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 | + CL | = FS |
| 33 | 20 dBuV | + 10.36 dB | + 0.5 | = 30.86 dBuV/m @ 3m |

Power Line Conducted Interference: The procedure used was ANSI Standard C63.4-2003 using a 50uH LISN. Both lines were observed. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed. The spectrum was scanned from 0.15 to 30 MHz.

Occupied Bandwidth: A small sample of the transmitter output was fed into the spectrum analyzer and the attached plot was printed. The vertical scale is set to -10 dBm per division.

ANSI Standard C63.4-2003 10.1 Measurement Procedures: The UUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The UUT was placed in the center of the table (1.5m side). 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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**RADIATION INTERFERENCE****Rules Part No.:** 15.249, 15.209**Requirements:**

| Frequency | Limits |
|------------------------------|-------------------------------------|
| Part 15.209 | |
| 9 to 490 kHz | 2400/F (kHz) μ V/m @ 300 meters |
| 490 to 1705 kHz | 24000/F (kHz) μ V/m @ 30 meters |
| 1705 kHz to 30 MHz | 29.54 dB μ V/m @ 30 meters |
| 30 – 88 | 40.0 dB μ V/m @ 3 meters |
| 80 – 216 | 43.5 dB μ V/m @ 3 meters |
| 216 – 960 | 46.0 dB μ V/m @ 3 meters |
| Above 960 | 54.0 dB μ V/m @ 3 meters |
| Part 15.249 | |
| Fundamental 902 – 928 MHz | 94.0 dB μ V/m @ 3 meters |
| Fundamental 2.4 – 2.4835 MHz | 94.0 dB μ V/m @ 3 meters |
| Harmonics | 54.0 dB μ V/m @ 3 meters |

Test Data:

| Tuned Frequency MHz | Emission Frequency MHz | Meter Reading dBuV | Ant. Polarity V/H | Coax Loss dB | Correction Factor db/m | Field Strength dBuV/m | Margin dB |
|---------------------|------------------------|--------------------|-------------------|--------------|------------------------|-----------------------|-----------|
| 2,401.40 | 2,401.40 | 50.7 | H | 3.18 | 32.32 | 86.2 | 7.8 |
| 2,401.40 | 2,401.40 | 57.4 | V | 3.18 | 32.32 | 92.9 | 1.1 |
| 2,401.40 | 4,802.80 | 14.4 | V | 4.9 | 34.34 | 53.64 | 0.36 |
| 2,401.40 | 4,802.80 | 14.6 | H | 4.9 | 34.34 | 53.84 | 0.16 |
| 2,401.40 | 7,203.90 | 8.1 | V | 5.72 | 36.14 | 49.96 | 4.04 |
| 2,401.40 | 7,203.90 | 8.7 | H | 5.72 | 36.14 | 50.56 | 3.44 |
| 2,401.40 | 9,605.30 | 6.4 | H | 6.78 | 37.53 | 50.71 | 3.29 |
| 2,401.40 | 9,605.30 | 8.4 | V | 6.78 | 37.53 | 52.71 | 1.29 |
| 2,401.40 | 12,007.00 | 6.3 | H | 7.8 | 38.9 | 53 | 1 |
| 2,401.40 | 12,007.00 | 6.5 | V | 7.8 | 38.9 | 53.2 | 0.8 |
| 2,431.40 | 2,431.40 | 49.3 | H | 3.2 | 32.41 | 84.91 | 9.09 |
| 2,431.40 | 2,431.40 | 54.9 | V | 3.2 | 32.41 | 90.51 | 3.49 |
| 2,431.40 | 4,862.80 | 13.8 | H | 4.93 | 34.39 | 53.12 | 0.88 |
| 2,431.40 | 4,863.80 | 14.2 | V | 4.93 | 34.39 | 53.52 | 0.48 |
| 2,431.40 | 7,295.70 | 8.1 | H | 5.78 | 36.25 | 50.13 | 3.87 |
| 2,431.40 | 7,295.70 | 8.4 | V | 5.78 | 36.25 | 50.43 | 3.57 |
| 2,431.40 | 9,727.60 | 7.1 | H | 6.82 | 37.67 | 51.59 | 2.41 |
| 2,431.40 | 9,727.60 | 8 | V | 6.82 | 37.67 | 52.49 | 1.51 |
| 2,431.40 | 12,159.50 | 6.3 | V | 7.91 | 38.96 | 53.17 | 0.83 |
| 2,431.40 | 12,159.50 | 6.9 | H | 7.91 | 38.96 | 53.77 | 0.23 |
| 2,462.30 | 2,462.30 | 50.8 | H | 3.22 | 32.49 | 86.51 | 7.49 |
| 2,462.30 | 2,462.30 | 55.9 | V | 3.22 | 32.49 | 91.61 | 2.39 |
| 2,462.30 | 4,924.60 | 14.4 | V | 4.96 | 34.44 | 53.8 | 0.2 |
| 2,462.30 | 4,924.60 | 14.2 | H | 4.96 | 34.44 | 53.6 | 0.4 |
| 2,462.30 | 7,386.90 | 8.8 | V | 5.83 | 36.36 | 50.99 | 3.01 |
| 2,462.30 | 7,387.50 | 9.1 | H | 5.83 | 36.37 | 51.3 | 2.7 |
| 2,462.30 | 9,841.20 | 6.8 | H | 6.85 | 37.81 | 51.46 | 2.54 |
| 2,462.30 | 9,849.20 | 7.3 | V | 6.85 | 37.82 | 51.97 | 2.03 |
| 2,462.30 | 12,311.50 | 6.5 | V | 8.02 | 39.02 | 53.54 | 0.46 |
| 2,462.30 | 12,312.10 | 6.4 | H | 8.02 | 39.02 | 53.44 | 0.56 |

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OCCUPIED BANDWIDTH

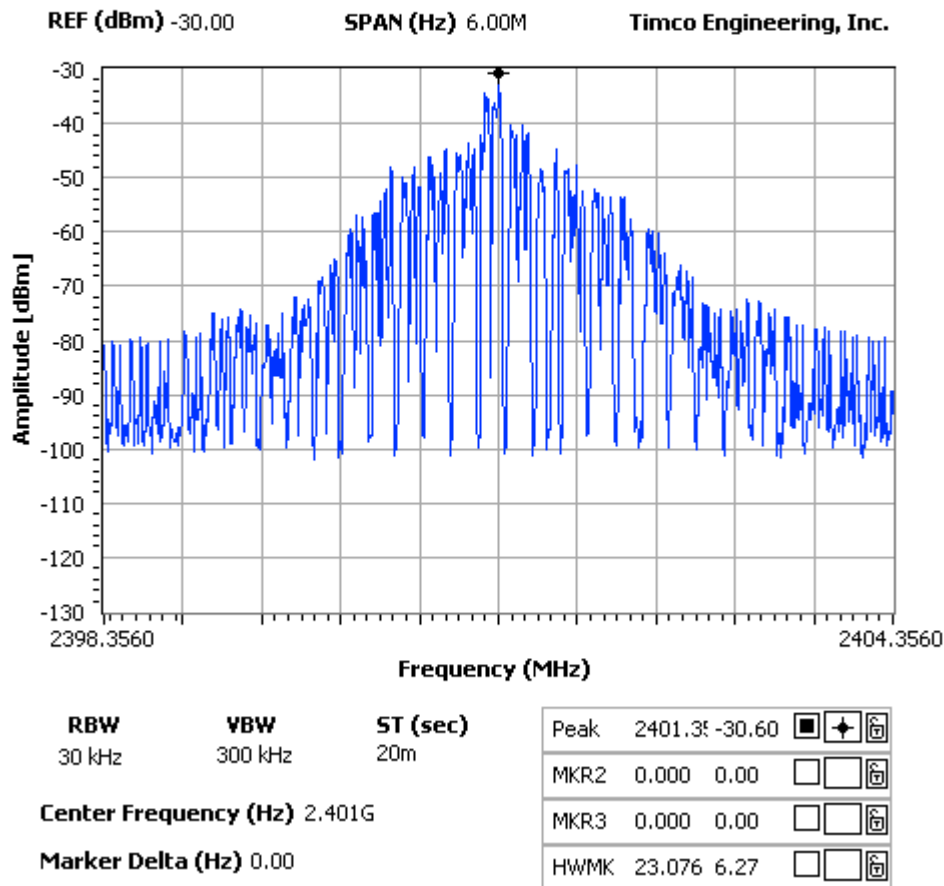
Rules Part No.: 15.249 (d)

Requirements: The field strength of any emissions appearing outside the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 50 dB below the level of the carrier or to the general limits of 15.249.

Test Data:

NOTES:

HYPER-INTERACTIVE TEACHING TECHNOLOGY LLC - FCC ID: UH9TX3000
OCCUPIED BANDWIDTH PLOT



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RADIATED EMISSIONS TEST SET UP PHOTO



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