TABLE OF CONTENTS

APPLICANT: AUTOSTART

FCC ID: NAHRTR433

TEST REPORT CONTAINING:

EXHIBIT ATTACHMENTS:

TEST EQUIPMENT LIST

1. Spectrum Analyzer: Hewlett Packard 8566B - Opt 462, w/ preselector 85685A, & Quasi-Peak Adapter HP 8565OA, & HP 8449B - OPT H02 Cal. 6/26/98
2. Signal Generator, Hewlett Packard 8640B, cal. 10/1/98
3. Signal Generator, HP 8614A Serial No.2015A07428 cal. 5/27/99
3. Eaton Biconnical Antenna Model 94455-1 20-200 MHz Serial No. 0997 Cal. 10/30/98
4. Electro-Metric Dipole Kit, 20-1000 MHz, Model TDA-30 10/31/98
5. Electro-Metric Horn 1-18 GHz, Model RGA-180, Cal. 10/30/98
6. Electro-Metric Antennas Model TDA-30/1-4,Cal. 10/15/98
7. Electro-Metric Line Impedance Stabilization Network Model No. EM-7821, Serial No. 101; 100KHz-30MHz 50uH. Cal.11/19/98
8. Electro-Metric Line Impedance Stabilization Network Model No. EM-7820, Serial No. 2682; 10KHz-30MHz 50uH. Cal. 11/19/98
9. Special low loss cable was used above 1 GHz
10. Tenney Temperature Chamber

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 100KHz and the video bandwidth was 300KHz. The ambient temperature of the UUT was 82.3oF with a humidity of 40%.

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

TEST PROCEDURES CONTD.

ANSI STANDARD C63.4-1992 10.1.7 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. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to 10th harmonic of the fundamental.

Peak readings were taken in three (3) orthogonal planes and the highest readings were converted to average readings based on the duration of "ON" time.

Measurements were made by TIMCO ENGINEERING INC. at the registered open field test site located at 6051 N.W. 19th Lane, Gainesville, Fl 32605.

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.

RULES:2.1033(b)(4) CIRCUIT DESCRIPTION

This unit is a low power security device transciever. In the receive mode the signal comes into the dual conversion super hetrodyne receiver to the RF amplifier Q6/Q5. From the RF amplifier the signal is coupled through a tuned circuit L13/C28 and is coupled through C24 to the base of the mixer Q4. The injection for the 1st mixer starts with the crystal oscillator Q10. The output of Q10 is coupled through a bandpass network to the base of the X3 multiplier Q9. Q9 drives a tuned circuit L15/C48 and is coupled to the mixer through C41. The output of the mixer is connected to a 10.7MHz crystal fliter and the output of the filter is connected to ta IF amplifier Q8. Q8 drives the intregrated circuit receiver U1.

When the transmitter is manually turned onwith the pushbutton the data FM modulates the crystal oscillator Q1. Q1 is connected to the tuned circuit L1/C7 with a coupling cap C10 to the tuned circuit L6/C17 and then through C11 to the base 3X multiplier Q2. The output of Q2 is fed through a double tuned circuit to the base of the 2nd 3X multiplier Q3. From Q3 is fed through a tuned circuit L3/C9 to a low pass filter C6, L4, and L8 to the aantenna.

ANTENNA & GROUND:

This unit uses the small inductor as the antenna. There is no provision for an external antenna.

APPLICANT: AUTOSTART

FCC ID: NAHRTR433

NAME OF TEST: RADIATION INTERFERENCE

RULES PART NO.: 15.231

REQUIREMENTS:

Fundamental Frequency MHz	Field Strength of Fundamental dBuV	Field Strength of Harmonics and Spurious Emissions (dBuV/m @ 3m)
40.66 to 40.70	67.04	47.04
70 to 130	61.94	41.94
130 to 174	61.94 to 71.48	41.94 to 51.48
174 to 260	71.48	51.48
260 to 470	71.48 to 81.94	51.48 to 61.94
470 and above	81.94	61.94

THE LIMIT FOR AVERAGE FIELD STRENGTH dBuV/m FOR THE FUNDAMENTAL FREQUENCY= 80.82 dBuV/m dBuV/m. NO FUNDAMENTAL IS ALLOWED IN THE RESTRICTED BANDS.

THE LIMIT FOR AVERAGE FIELD STRENGTH dBuV/m FOR THE HARMONICS AND SPURIOUS FREQUENCIES = 60.82 dBuV/m dBuV/m. SPURIOUS IN THE RESTRICTED BANDS MUST BE LESS THAN 54dBuV/m OR 15.209.

TEST DATA:

EMISSION FREQ. MHz	METER READING @ 3m dBuV	COAX LOSS dB	ACF dB	PEAK FIELD STRNGTH dBuV/m	AVERAGE FIELD STRNGTH dBuV/m	MARGIN dB	ANT.
433.92	60.40	1.60	17.78	79.78	79.78	1.04	V
867.85	32.20	2.90	23.81	58.91	58.91	1.91	H
216.95	12.30	1.20	12.42	25.92	25.92	34.90	H
1301.75R	9.60	1.00	25.21	35.81	35.81	18.19	H
1735.68	15.40	1.00	26.94	43.34	43.34	17.47	H
2169.61	1.50	1.06	28.42	30.98	30.98	29.84	H
2603.51	7.90	1.12	29.51	38.53	38.53	22.29	H
3471.37	6.90	1.25	31.68	39.83	39.83	20.99	H
3905.30R	5.20	1.32	32.76	39.28	39.28	14.72	H

SAMPLE CALCULATION OF LIMIT @ 303 MHz:
(470 - 260)Mhz = 210 MHz
(12500 - 3750)uV/m = 8750 uV/m
8750uV/m/210MHz = 41.67 uV/m/MHz
(303-260)MHz = 43 MHz
43 MHz * 41.67 uV/m/MHz = 1791.81 uV/m
(1791.81 + 3750)uV/m = 5541.81 uV/m limit @ 303 MHz
The transmitter ceases transmitting when the button is released.

TEST RESULTS: The unit DOES meet the FCC requirements.

PERFORMED BY:_S.S. SANDERS_____ DATE TESTED: 5/10/99

REPORT #: F:\CUS\A\AUTOSTAR\AUT215A9.RPT
PAGE #: 3

APPLICANT: AUTOSTART

FCC ID: NAHRTR433

CALCULATION OF DUTY CYCLE:

This unit is FM modulated. When the momentary pushbut-
ton is pushed the data FM modulates the transmitter and
the duty cycle is taken to be 100%.

APPLICANT: AUTOSTART

FCC ID: NAHRTR433

NAME OF TEST: Occupied Bandwidth

RULES PART NO.: 15.231(C)

REQUIREMENTS: The bandwidth of the emission shall be no wider than .25% of the center frequency for devices operating between 70 and 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

433.92 MHz * .0025 = 1.0848 MHz
1.0848 MHz/2 = +/- 542.40

THE GRAPH IN EXHIBIT 8 REPRESENTS THE EMISSIONS TAKEN FOR THE DEVICE.

METHOD OF MEASUREMENT: A small sample of the transmitter output was fed into the spectrum analyzer and the above photo was taken. The vertical scale is set to 10 dB per division: the horizontal scale is set to 100 kHz per division.

TEST RESULTS: The unit meets the FCC requirements.

PERFORMED BY: S. S. SANDERS DATE: 5/10/99