

TABLE OF CONTENTS LIST

APPLICANT: TAC SYSTEMS INC.

FCC ID: I32TA-7425

TEST REPORT:

PAGE	1.....	COVER SHEET - GENERAL INFORMATION & TECHNICAL DESCR.
PAGE	2.....	TECHNICAL DESCRIP. CONT'D & OCCUPIED BANDWIDTH
PAGE	3.....	METHOD OF SPURIOUS EMISSIONS
PAGE	4.....	RADIATED SPURIOUS EMISSIONS
PAGE	5.....	METHOD OF MEASURING RADIATED SPURIOUS EMISSIONS
PAGE	6.....	FREQUENCY STABILITY
PAGE	7.....	TEST EQUIPMENT LIST

EXHIBIT CONTAINING:

EXHIBIT	1.....	FAA LETTER
EXHIBIT	2.....	FCC ID LABEL SAMPLE
EXHIBIT	3.....	FCC ID LABEL LOCATION
EXHIBIT	4A.....	EXTERNAL PHOTO - FRONT VIEW
EXHIBIT	4B.....	EXTERNAL PHOTO - REAR VIEW
EXHIBIT	4C.....	INTERNAL PHOTO - COMPONENT-POWER AMPLIFIER
EXHIBIT	4D.....	INTERNAL PHOTO - COMPONENT-EXCITER/MODULATOR
EXHIBIT	4E.....	INTERNAL PHOTO - COPPER - EXCITER/MODULATOR
EXHIBIT	5.....	BLOCK DIAGRAM
EXHIBIT	6.....	CIRCUIT DIAGRAM RF BOARD 1/3
EXHIBIT	7.....	CIRCUIT DIAGRAM RF BOARD 2/3
EXHIBIT	8.....	CIRCUIT DIAGRAM RF BOARD 3/3
EXHIBIT	9.....	CIRCUIT DIAGRAM SYNTHESIZER UNIT
EXHIBIT	10.....	CIRCUIT DIAGRAM LF BOARD 1/3
EXHIBIT	11.....	CIRCUIT DIAGRAM LF BOARD 2/3
EXHIBIT	12.....	CIRCUIT DIAGRAM LF BOARD 3/3
EXHIBIT	13A.....	ANTENNA NOTICE & INSTALLATION INSTRUCTIONS
EXHIBIT	13B-C.....	SYSTEM DESCRIPTION
EXHIBIT	14A-I.....	FUNCTIONAL DESCRIPTION
EXHIBIT	15A-R.....	OPERATING INSTRUCTIONS
EXHIBIT	16.....	TUNING PROCEDURE
EXHIBIT	17A-F.....	TECHNICAL DESCRIPTION
EXHIBIT	18.....	AUDIO FREQUENCY PLOT
EXHIBIT	19.....	MODULATION LIMITING PLOT - 300 Hz
EXHIBIT	20.....	MODULATION LIMITING PLOT - 1000 Hz
EXHIBIT	21.....	MODULATION LIMITING PLOT - 3000 Hz
EXHIBIT	22A-B.....	OCCUPIED BANDWIDTH PLOTS

APPLICANT: TAC SYSTEMS INC.

FCC ID: I32TA-7425

REPORT #: T:\CUS\T\TAC\TAC161U0\EXTRA\161U0.RPT
TABLE OF CONTENTS

GENERAL INFORMATION REQUIRED
FOR TYPE ACCEPTANCE

- 2.1033(c)(1)(2) TAC SYSTEMS INC. will sell their FCC ID:
I32TA-7425 in quantity, for use under FCC
RULES PART 87, AERONAUTICAL GROUND STATION. This
UNIT has an antenna connector.
- TAC SYSTEMS INC.
PO Box 705
Coconut Grove, Florida 33222-0705
- 2.1033(c)(3) Instruction book. The instruction manual is
included as Exhibit # 15A-R.
- 2.1033(c)(4) TECHNICAL DESCRIPTION
(4) Type of Emission: 6K00A3E
- ALLOWED AUTHORIZED BANDWIDTH = 25KHz.
- Frequency Range: Part 87: 118-137MHz,
TEST FREQ = 127.000MHz.
- (5) Power Range and Controls: The output of this UNIT is NOT
adjustable.
- (6)(7) Maximum Output Power Rating: 25.0 Watt average power
into 50 ohms resistive load.
- (8) DC Voltages and Current into Final Amplifier:
- FINAL AMPLIFIER ONLY
27.0VDC
Vce = 27.0Volts
Ice = 3.10A.
- (9) Tune-up procedure. The tune-up procedure is given
as Exhibit # 16
- 2.1033(c)(10) Complete Circuit Diagrams: The circuit diagram is
included as Exhibit #: 6-12. The
block diagram is also included as Exhibit #:
5.
- 2.1033(c)(11) The equipment identification is shown as
Exhibit No. 2.
- 2.1033(c)(12) Photographs of the equipment are shown as Exhibits
No. 4A-E.
- 2.1033(c)(13) Equipment employing Digital modulation.

APPLICANT: TAC SYSTEMS INC.
FCC ID: I32TA-7425
DATE: 22 May 2000
REPORT #: T:\CUS\T\TAC\TAC161U0\EXTRA\161U0.RPT
PAGE #: 1

TECHNICAL DESCRIPTION CONT.'D/OCCUPIED BANDWIDTH

2.1033(c)(14) The data required by 2.1046 through 2.1057 follows;

2.1046 Limiting Power:

There is no provision for limiting power, the design limits the power to 25Watts. There is NO provision for reducing the power.

2.1047 Modulation Characteristics:

The transmitter audio circuitry is contained in the audio processing board and is controlled by that assembly dependent upon which combination of modulation. The audio frequency response is attached as Exhibit #18 and the modulation limiting plots are attached as Exhibits #19-21. The audio frequency response was measured in accordance with TIA/EIA Specification 603 Paragraph 2.2.6.

87.141 AUDIO LOW PASS FILTER

The audio low pass filter is not required in this unit.

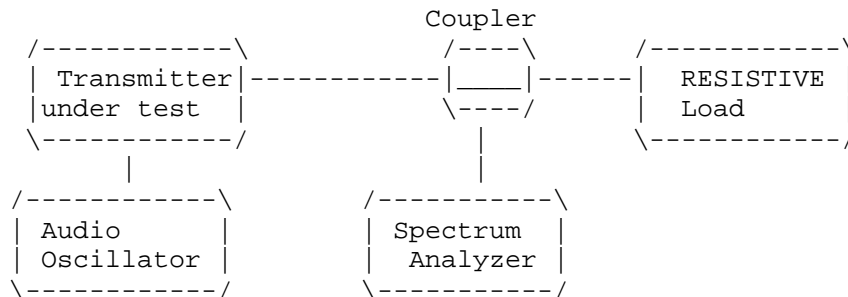
2.1049 Occupied bandwidth:

Data in the plots shows that frequencies removed from the assigned frequency by more than 50%(12.5KHz) up to and including 100% percent of the authorized bandwidth the attenuation must be at least 25dB. When the frequency is removed from the assigned frequency by more than 100% up to and including 250% of the authorized bandwidth the attenuation must be at least 35dB. When the frequency is removed from the assigned frequency by more than 250% of the authorized bandwidth the attenuation must be at least $43 + \log pY$ dB. The plots show the transmitter modulated with 2500 Hz(the highest modulation frequency), adjusted for 50% modulation plus 16dB. The spectrum analyzer was set with the unmodulated carrier at the top of the screen. The test procedure diagram and occupied bandwidth plots follow.

Microphone transmitter.

Test procedure diagram

OCCUPIED BANDWIDTH MEASUREMENT



APPLICANT: TAC SYSTEMS INC.

FCC ID: I32TA-7425

DATE: 22 May 2000

REPORT #: T:\CUS\T\TAC\TAC161U0\EXTRA\161U0.RPT

PAGE #:2

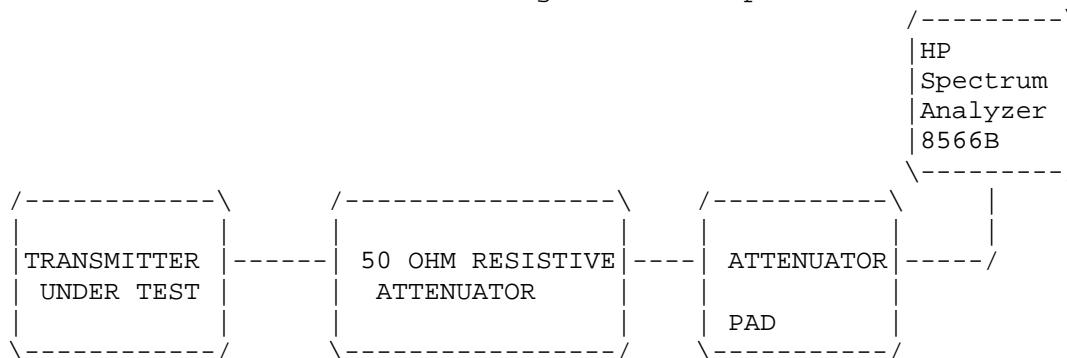
METHOD OF SPURIOUS EMISSIONS
SPURIOUS EMISSIONS AT ANTENNA TERMINALS

2.1051

Spurious emissions at antenna terminals(conducted):

Data on the following page shows the level of conducted spurious responses. The carrier was modulated 90% using a 2500Hz tone. The spectrum was scanned from 30 to at least the 10th harmonic of the fundamental.

Method of Measuring Conducted Spurious Emissions



NAME OF TEST: SPURIOUS EMISSIONS AT ANTENNA TERMINALS

REQUIREMENTS: Emissions must be 43 +10log(Po) dB below the mean power output of the transmitter.

$$43 + 10 \log(25) = 57.0\text{dB}$$

EMISSION FREQUENCY MHz	dB BELOW CARRIER
137.00	00.00
274.00	-70.80
411.00	-67.20
548.00	-97.80
685.00	-86.00
822.00	-97.90
959.00	-97.20
1096.00	-108.50
1370.00	-110.20

METHOD OF MEASUREMENT: The procedure used was TIA/EIA 603. The spectrum was scanned from 30 to at least the tenth harmonic of the fundamental using a HP model 8566B spectrum analyzer. The measurements were made using the shielded room located at TIMCO ENGINEERING INC. 849 N.W. STATE ROAD 45, NEWBERRY, FLORIDA 32669.

APPLICANT: TAC SYSTEMS INC.

FCC ID: I32TA-7425

DATE: 22 May 2000

REPORT #: T:\CUS\T\TAC\TAC161U0\EXTRA\161U0.RPT

PAGE #: 3

RADIATED SPURIOUS EMISSIONS

2.1053 Field strength of spurious emissions:

The tabulated Data shows the results of the radiated field strength emissions test. The spectrum was scanned from 30 to at least the 10th harmonic of the fundamental. This test was conducted per TIA/EIA 603.

NAME OF TEST: RADIATED SPURIOUS EMISSIONS

REQUIREMENTS: Emissions must be $43 + 10\log(P_o)$ dB below the mean power output of the transmitter.

$$43 + 10 \log(25.0) = 57 \text{ dB}$$

EMISSION	RELATIVE
FREQUENCY	ATTENUATION

MHz	db
118.03	0.0
236.06	-63.42
346.00	-61.15
472.10	-63.20
590.10	-71.50
708.10	-77.60
826.20	-79.40
944.20	-79.50
1180.30	-84.20

METHOD OF MEASUREMENT: The procedure used was Tested in accordance with TIA/EIA 603 paragraph 2.2.12. The spectrum was scanned from 30.000 to at least the tenth harmonic of the fundamental using a HP model 8566B spectrum analyzer, an Eaton model 94455-1 Biconical Antenna, a ElectroMetrics antennas models TDA, TDS-25-1, TDS-25-2. Measurements were made at the open field test site of TIMCO ENGINEERING INC. located at 849 N.W. State Road 45 Newberry, Florida 32669.

APPLICANT: TAC SYSTEMS INC.

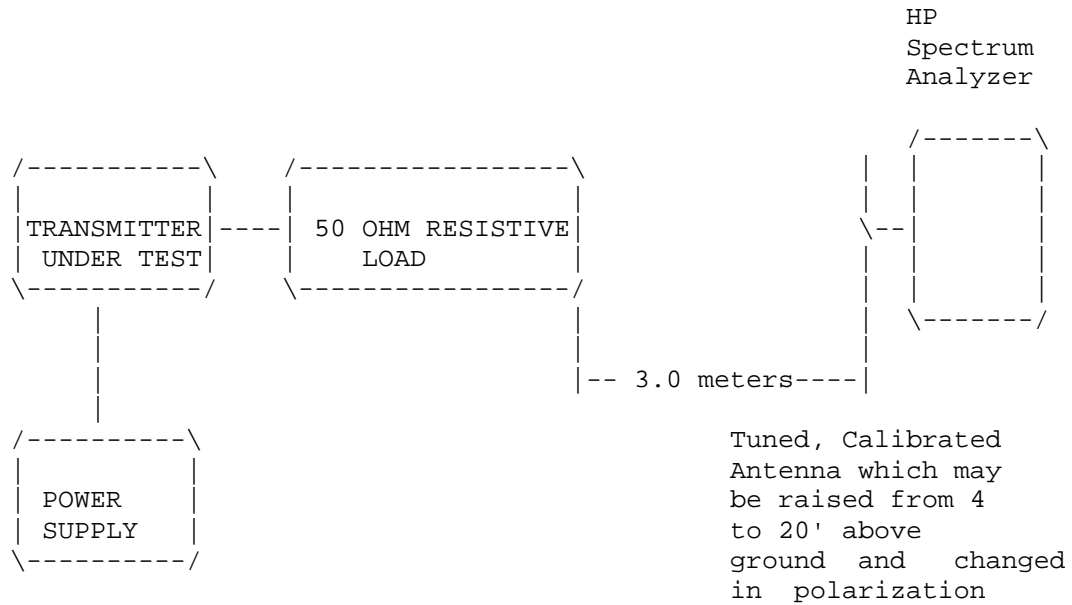
FCC ID: I32TA-7425

DATE: 22 May 2000

REPORT #: T:\CUS\T\TAC\TAC161U0\EXTRA\161U0.RPT

PAGE #: 4

Method of Measuring Radiated Spurious Emissions



Equipment placed 4' above ground on a rotatable platform.

APPLICANT: TAC SYSTEMS INC.

FCC ID: I32TA-7425

DATE: 22 May 2000

REPORT #: T:\CUS\T\TAC\TAC161U0\EXTRA\161U0.RPT

PAGE #: 5

FREQUENCY STABILITY

2.1055 Frequency stability:
87.133

Temperature and voltage tests were performed to verify that the frequency remains within the .0020%, (20 ppm) (87.133) specification limit.

The test was conducted as follows: The transmitter was placed in the temperature chamber at 25 degrees C and allowed to stabilize for one hour. The transmitter was keyed ON for one minute during which four frequency readings were recorded at 15 second intervals. The worse case number was taken for temperature plotting. The assigned channel frequency was considered to be the reference frequency. The temperature was then reduced to -30 degrees C after which the transmitter was again allowed to stabilize for one hour. The transmitter was keyed ON for one minute, and again frequency readings were noted at 15 second intervals. The worst case number was recorded for temperature plotting. This procedure was repeated in 10 degree increments up to + 50 degrees C.

MEASUREMENT DATA:

Assigned Frequency (Ref. Frequency): 118.02505 MHz

TEMPERATURE C	FREQUENCY MHz	PPM
REFERENCE	118.025 000	00.00
-30	118.025 985	+ 8.35
-20	118.025 927	+ 7.85
-10	118.025 893	+ 5.90
0	118.025 697	+ 5.91
+10	118.025 486	+ 4.12
+20	118.025 368	+ 3.12
+30	118.025 326	+ 2.76
+40	118.025 428	+ 3.63
+50	118.025 667	+ 5.65

25c -15% Supply Voltage 22.95 VDC	118.025 350	+ 2.96
25c +15% Supply Voltage 31.05VDC	118.025 390	+ 3.30

RESULTS OF MEASUREMENTS: The maximum frequency variation over the temperature range was + 8.35 to +2.76 ppm. The maximum frequency variation over the voltage range was +3.30 ppm.

APPLICANT: TAC SYSTEMS INC.

FCC ID: I32TA-7425

DATE: 22 May 2000

REPORT #: T:\CUS\T\TAC\TAC161U0\EXTRA\161U0.RPT

PAGE #: 6

TEST EQUIPMENT LIST

1. X Spectrum Analyzer: HP 8566B-Opt 462, S/N 3138A07786, w/
preselector HP 85685A, S/N 3221A01400, Quasi-Peak Adapter
HP 85650A, S/N 3303A01690 & Preamplifier HP 8449B-OPT H02,
S/N 3008A00372 Cal. 10/17/99
2. X Biconnical Antenna: Eaton Model 94455-1, S/N 1057
3. X Log-Periodic Antenna: Electro-Metrics Model EM-6950, S/N 632
4. X Double-Ridged Horn Antenna: Electro-Metrics Model RGA-180,
1-18 GHz, S/N 2319 Cal. 4/27/99
5. ___ Horn 40-60GHz: ATM Part #19-443-6R
6. ___ Line Impedance Stabilization Network: Electro-Metrics Model
ANS-25/2, S/N 2604 Cal. 2/9/00
7. X Temperature Chamber: Tenney Engineering Model TTRC, S/N 11717-7
8. X Frequency Counter: HP Model 5385A, S/N 3242A07460 Cal 10/6/99
9. ___ Peak Power Meter: HP Model 8900C, S/N 2131A00545 Cal 7/19/99
10. X Open Area Test Site #1-3meters Cal. 12/22/99
11. ___ Signal Generator: HP 8640B, S/N 2308A21464 Cal. 9/23/99
12. ___ Signal Generator: HP 8614A, S/N 2015A07428 Cal. 5/29/99
13. ___ Passive Loop Antenna: EMCO Model 6512, 9KHz to 30MHz, S/N
9706-1211 Cal. 6/23/97
14. ___ Dipole Antenna Kit: Electro-Metrics Model TDA-30/1-4, S/N 153
Cal. 11/24/99
15. ___ AC Voltmeter: HP Model 400FL, S/N 2213A14499 Cal. 9/21/99
16. ___ Digital Multimeter: Fluke Model 8012A, S/N 4810047 Cal 9/21/99
17. ___ Digital Multimeter: Fluke Model 77, S/N 43850817 Cal 9/21/99
18. ___ Oscilloscope: Tektronix Model 2230, S/N 300572 Cal 9/23/99

APPLICANT: TAC SYSTEMS INC.

FCC ID: I32TA-7425

DATE: 22 May 2000

REPORT #: T:\CUS\T\TAC\TAC161U0\EXTRA\161U0.RPT

PAGE #: 7