



Engineering and Testing for EMC and Safety Compliance

FCC Certification Report

American Traffic Solutions
7681 East Gray Road
Scottsdale, AZ 85260

Model: SC-300

FCC ID: KXRSC-300

November 15, 2010

Standards Referenced for this Report	
Part 2: 2009	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
Part 90: 2009	Private Land Mobile Radio Services
ANSI/TIA-603-C-2004	Land Mobile FM or PM Communications Equipment – Measurement and Performance Standards

Frequency Range (MHz)	Rated Conducted Output Power (W)	Frequency Tolerance (ppm)	Emission Designator
34600	0.015	126.7	NON

Report Prepared By: Daniel Baltzell

Document Number: 2010138

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These tests are accredited and meet the requirements of ISO/IEC 17025 as verified by ANSI-ASQ National Accreditation Board/ACCLASS. Refer to certificate and scope of accreditation AT-1445.

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1 Test Result Summary

Test	FCC Reference	Result
RF Power Output	2.1046(a), 90.205	Complies
Spurious Emissions at Antenna Terminals	2.1046(a), 90.210	N/A
Field Strength of Spurious Radiation	2.1053(a), 90.210	Complies
Occupied Bandwidth/Emission Masks	2.1049(c)(1), 90.210	Complies
Frequency Stability vs. Temperature and Voltage	2.1055, 90.213	Complies

2 General Information

The following Type Certification Report is prepared on behalf of **American Traffic Solutions** in accordance with the Federal Communications Commission rules and regulations. The Equipment Under Test (EUT) was the **SC-300; FCC ID: KXRSC-300**.

All measurements contained in this application were conducted in accordance with FCC Rules and Regulations CFR 47 Parts 2 and 90. Calibration checks are performed regularly on the instruments, and all accessories including high pass filter, coaxial attenuator, preamplifier and cables.

Testing of Spurious Emissions at Antenna Terminal cannot be accomplished since the device has an integral antenna; instead spurious emissions are accomplished by radiated means which have been found to be passing.

2.1 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the parking lot of Rhein Tech Laboratories, Inc. 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report submitted to, and approved by, the Federal Communications Commission to perform AC line conducted and radiated emissions testing.

2.2 Related Submittal(s)/Grant(s)

N/A

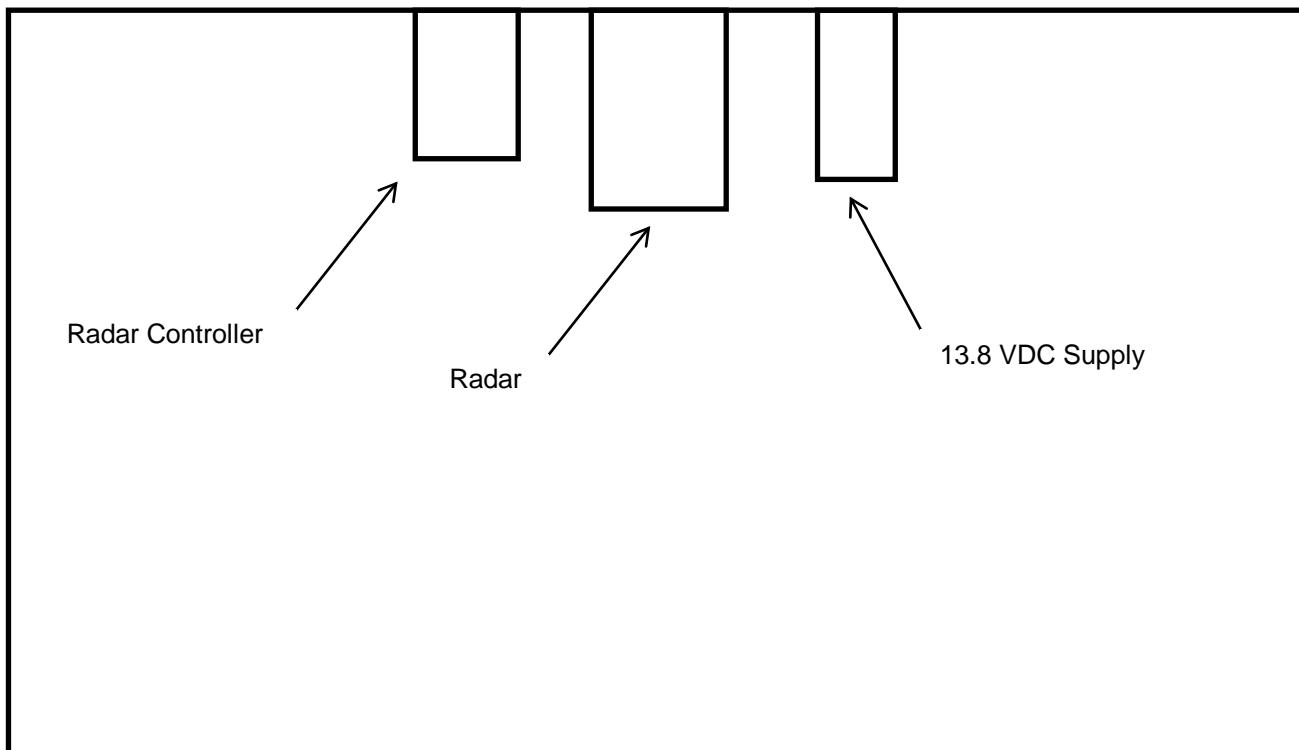
3 Tested System Details

The test sample was received on November 11, 2010. Listed below are the identifiers and descriptions of all equipment, cables, and internal devices used with the EUT for this test, as applicable.

Table 3-1: Equipment Under Test (EUT)

Part	Manufacturer	Model	PN	FCC ID	RTL Bar Code
Radar	American Traffic Solutions	SC-300	#6400-0001-002	KXRSC-300	19928
Radar Controller	American Traffic Solutions	SC-300	#6400-0002-002	N/A	19926

Figure 3-1: Configuration of Tested System



4 FCC Rules and Regulations Part 2.1033(C)(8) Voltages and Currents Through The Final Amplifying Stage

13.8 VDC / 1.523 A

5 FCC Rules and Regulations Part 2.1046(a): RF Power Output: Part 90.205 Transmitting Power Limits

5.1 Test Procedure

ANSI/TIA-603-C-2004 Section 2.2.1

The EUT was connected to a coaxial attenuator having a $50\ \Omega$ load impedance.

Manufacturer's Rated Power: 15 mW (11.8 dBm) +/- 5 dB

5.2 Test Data

Table 5-1: RF Conducted Output Power - Measured

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Site Correction Factor (dB/m)	EIRP (dBuV/m)	EIRP (dBm)	Limit (dBm) (20% of 15mW)	Margin (dB)
34600.0	81.9	35.5	117.4	12.6	12.6	0.0

Conducted power = EIRP 12.6 dBm + antenna gain (3dBi) = 15.6 dBm (36.3mW)

Limit: §90.205(s) The output power shall not exceed by more than 20 percent either the output power shown in the Radio Equipment List [available in accordance with § 90.203(a)(1)] for transmitters included in this list or when not so listed, the manufacturer's rated output power for the particular transmitter specifically listed on the authorization.

$$12.6 \text{ dBm (18mW)} - 11.8 \text{ dBm (15mW)} = +0.8 \text{ dB}$$

Plot 5-1: RF Power Output

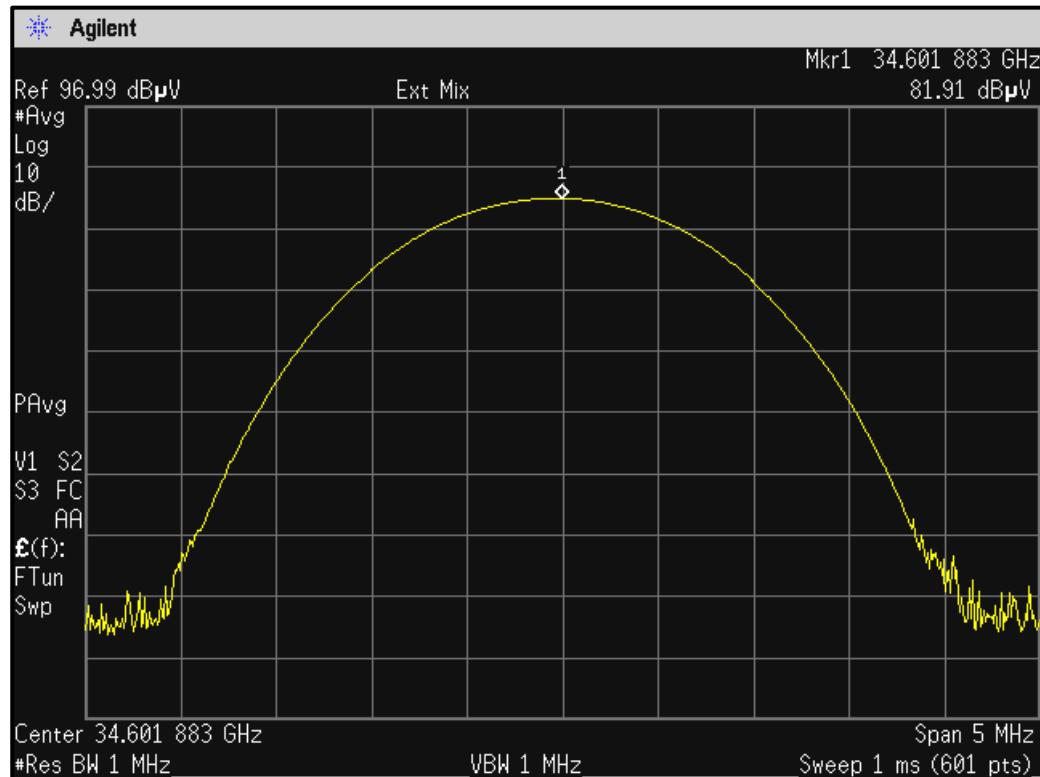


Table 5-2: Test Equipment Used For Testing RF Power Output - Conducted

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	11/11/11
901235	IW Microwave Products	KPS-1503-360-KPS	High Frequency RF Cables	N/A	4/5/11
901517	Insulated Wire Inc.	KPS-1503-360-KPS	RF cable 36"	N/A	10/19/11
900126	Hewlett Packard	11970A	Harmonic Mixer 26 - 40 GHz	2332A01199	10/29/11

Test Personnel:

Daniel Baltzell
 EMC Test Engineer

Signature

November 19, 2010

Date Of Test

Rhein Tech Laboratories, Inc.
360 Herndon Parkway
Suite 1400
Herndon, VA 20170
<http://www.rheintech.com>

Client: American Traffic Solutions
Model: SC-300
FCC ID: KXRSC-300
Standards: FCC Part 90
Report #: 2010138

6 FCC Rules and Regulations Part 2.1053(a): Field Strength of Spurious Radiation; Part 90.210: Out of Band Emissions Limit

6.1 Test Procedure

ANSI/TIA-603-C-2004 Section 2.2.12

The spurious emissions levels were measured relative to the carrier.

6.2 Test Data

6.2.1 CFR 47 Part 90.210 Requirements

No emissions were found within 20 dB of the limits; therefore, no emissions are reported.

Table 6-1: Test Equipment Used For Testing Field Strength of Spurious Radiation

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900791	Chase	CBL6111B	Bilog Antenna (30 MHz – 2000 MHz)	N/A	12/12/10
901364	MITEQ	JS4-01002600-36-5P	Amplifier 0.1-26 GHz, 28 dB gain, power 5 dB	849863	2/22/11
901426	Insulated Wire Inc.	KPS-1503-3600-KPS	RF Cable, 30'	NA	10/19/11
901516	Insulated Wire, Inc.	KPS-1503-2400-KPS-09302008	RF Cable, 20'	NA	10/19/11
901517	Insulated Wire Inc.	KPS-1503-360-KPS-09302008	RF Cable 36"	NA	10/19/11
901424	Insulated Wire Inc.	KPS-1503-360-KPS	RF Cable 36"	NA	10/19/11
901262	ETS	3160-9	Double ridged Antenna (1 - 18 GHz)	6748	5/1/11
900321	EMCO	3161-03	Horn Antennas (4 – 8 GHz)	9508-1020	6/14/11
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	6/14/11
900905	Rhein Tech Laboratories	PR-1040	OATS 1 Preamplifier 40dB (30 MHz – 2 GHz)	1006	4/10/11
901257	OML	M05HW	Harmonic Mixer (140 – 220 GHz)	G80814-1	12/4/10
900323	EMCO	3160-07	Horn Antennas (8.2 – 12 GHz)	9605-1054	6/14/11
900356	EMCO	3160-08	Horn Antennas (12.4 – 18 GHz)	9607-1044	6/14/11
901218	EMCO	3160-09	Horn Antenna (18 - 26 GHz)	960281-003	6/19/11
900126	Hewlett Packard	11970A	Harmonic Mixer (26.5 - 40 GHz)	2332A01199	10/29/11
901303	EMCO	3160-10	Horn Antenna (26.5 - 40.0 GHz)	960452-007	6/19/11
900826	ATM	08-443-6R	Horn Antenna (90 - 140 GHz)	8041904-1	5/20/11
900752	OML	MO5HW	Mixer (140 - 220 GHz)	G80814-1	12/21/10
900750	OML	DPL26	Diplexer for M05HW mixer	G80814-1	12/21/10
900751	OML	MO8HW	Mixer (90 - 140 GHz)	F80814-1	12/21/10
900711	ATM	10-443-6R	Horn Antenna (75 - 110 GHz)	8051905-1	5/20/11
900712	ATM	15-443-6R	Horn Antenna (50 - 75 GHz)	8051805-1	5/20/11
900713	ATM	05-443-6R	Horn Antenna (140-220 GHz)	S0685	5/20/11
900715	Hewlett Packard	11970V	Harmonic Mixer (50 - 75 GHz)	2521A00512	5/20/11
900716	Hewlett Packard	11970W	Harmonic Mixer (75 - 110 GHz)	2521A00710	5/20/11
900717	Hewlett Packard	11970U	Harmonic Mixer (40 - 60 GHz)	2332A01110	5/20/11
900127	Hewlett Packard	015-0385-00	Harmonic Mixer	62-412	5/20/11
900126	Hewlett Packard	11970A	Harmonic Mixer (26 - 40 GHz)	2332A01199	10/29/11

Rhein Tech Laboratories, Inc.
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Client: American Traffic Solutions
Model: SC-300
FCC ID: KXRSC-300
Standards: FCC Part 90
Report #: 2010138

Test Personnel:

Daniel Baltzell
Test Engineer



Signature

November 19, 2010
Date Of Test

7 FCC Rules and Regulations Part 2.1049(c)(1): Occupied Bandwidth; Part 90.210 Authorized Bandwidth

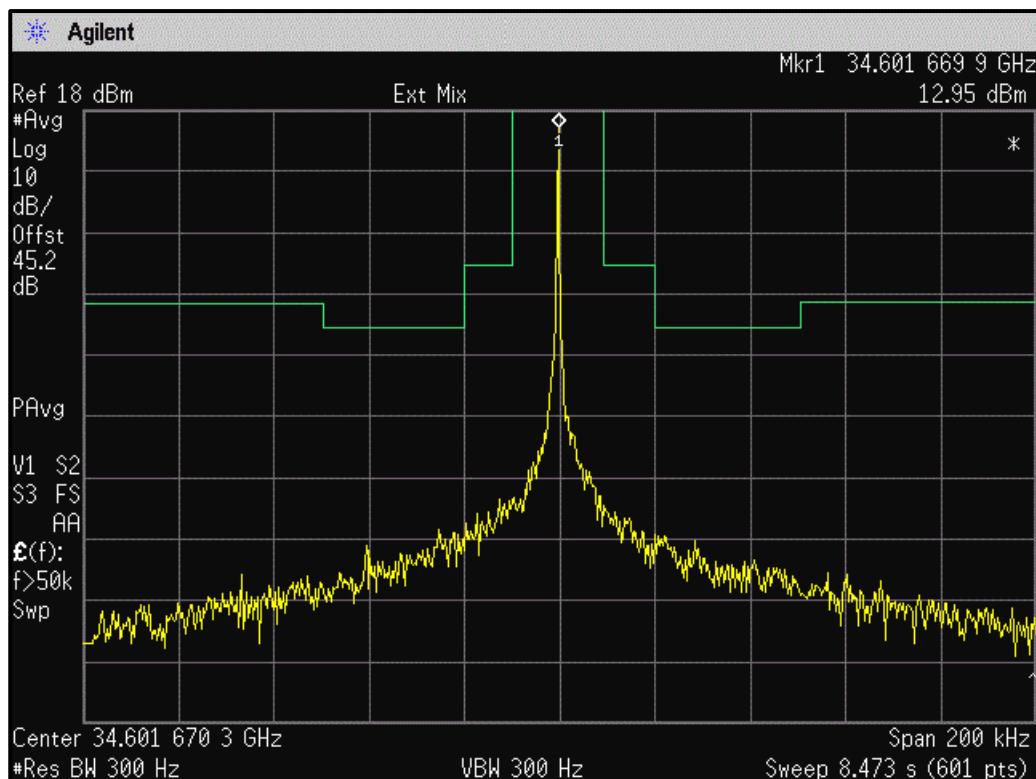
Occupied Bandwidth - Compliance with the Emission Masks

7.1 Test Procedure

ANSI/TIA-603-C-2004 Section 2.2.11

7.2 Test Data

Plot 7-1: Occupied Bandwidth – 34600 MHz; (Mask B)



Rhein Tech Laboratories, Inc.
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Suite 1400
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Client: American Traffic Solutions
Model: SC-300
FCC ID: KXRSC-300
Standards: FCC Part 90
Report #: 2010138

Table 7-1: Test Equipment Used For Testing Occupied Bandwidth

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	11/11/11
901235	IW Microwave Products	KPS-1503-360-KPS	High Frequency RF Cables	N/A	4/5/11
901517	Insulated Wire Inc.	KPS-1503-360-KPS	RF Cable 36"	N/A	10/19/11
900126	Hewlett Packard	11970A	Harmonic Mixer (26 - 40 GHz)	2332A01199	10/29/11

Test Personnel:

Daniel Baltzell
Test Engineer



Signature

November 19, 2010
Date Of Test

8 FCC Rules and Regulation Part 2.1055: Frequency Stability; Part 90.213: Frequency Stability

8.1 Test Procedure

ANSI/TIA-603-C-2004 Section 2.2.2

The carrier frequency stability is the ability of the transmitter to maintain an assigned carrier frequency. The EUT was evaluated over the temperature range -30°C to +50°C. The temperature was initially set to -30°C and a 2-hour period was observed for stabilization of the EUT. The frequency stability was measured within one minute after application of primary power to the transmitter. The temperature was raised at intervals of 10 degrees centigrade through the range. A ½-hour period was observed to stabilize the EUT at each measurement step and the frequency stability was measured within one minute after application of primary power to the transmitter. The measurement was noted and normalized to 20°C. The voltage stability was measured at +/- 15% and normalized to 20°C.

8.2 Test Data

Table 8-1: Temperature Frequency Stability – 34600 MHz

Temperature (°C)	Normalized Frequency (Hz)	ppm
-30	34602.767	80.0
-20	34603.858	111.5
-10	34604.383	126.7
0	34604.100	118.5
10	34603.408	98.5
20	34602.533	73.2
30	34601.075	31.1
40	34600.025	0.7
50	34599.625	-10.8

Table 8-2: Voltage Frequency Stability – 34600 MHz

Voltage (VDC)	Normalized Frequency (MHz)	ppm
11.73	34602.508	72.5
13.80	34602.533	73.2
15.87	34602.517	72.7

The worst-case deviation was found to be 126.7 ppm.

Result: The EUT is compliant.

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Client: American Traffic Solutions
Model: SC-300
FCC ID: KXRSC-300
Standards: FCC Part 90
Report #: 2010138

Table 8-3: Test Equipment Used For Testing Frequency Stability

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900946	Tenney Engineering, Inc.	TH65	Temperature Chamber with Humidity	11380	7/23/11
901350	Meterman	33XR	Multimeter	040402802	11/23/11
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	11/11/11
901235	IW Microwave Products	KPS-1503-360-KPS	High Frequency RF Cables	N/A	4/5/11
901517	Insulated Wire Inc.	KPS-1503-360-KPS	RF Cable 36"	N/A	10/19/11
900126	Hewlett Packard	11970A	Harmonic Mixer (26 - 40 GHz)	2332A01199	10/29/11

Test Personnel:

Daniel Baltzell
EMC Test Engineer



Signature

November 22, 2010
Date Of Test

9 FCC Rules and Regulations Part 2.202: Necessary Bandwidth and Emission Bandwidth

Type of Emission NON

10 Conclusion

The data in this measurement report shows that the **American Traffic Solutions Model SC-300, FCC ID: KXRSC-300**, complies with all the applicable requirements of Parts 90 and 2 of the FCC Rules.