

PT-1 PET TRANSMITTER



Introduction

The Communications Specialists Model PT-1 pet transmitter attaches to your pet's collar so it can be found if lost. The transmitter is programmed to operate on one of 50 channels so multiple pets in a single household or neighborhood can operate at the same time without interference to each other. The channel number of the transmitter is shown on the sticker on the PT-1 case. It weighs less than 1/2 ounce including the battery which allows it to be used with the smallest of pets. The battery will power the PT-1 for approximately 6 weeks.

Installation

Remove the collar from around your pet's neck and punch a small hole in it with a sharp nail or icepick. Unscrew the small nut holding on the antenna from the threaded shaft on the back of the PT-1. Push the threaded shaft through the hole previously punched in the collar. Reinstall the antenna on the threaded shaft and secure it with the removed nut. Tighten down the nut so the PT-1 and antenna do not twist and are securely attached to the collar. The PT-1 should be on the outside of the collar and the antenna should be laying parallel against it.

Battery

The battery is a CR2032 Lithium cell that is available from us in a 12 pack conveniently labeled for monthly battery changes. It may also be found at drug stores or markets that sell photo or hearing aid batteries. To change the battery, pop off the front cover on the PT-1 using your fingernail and remove the battery by grasping the finger tab that is laying down against the + side of it. Pull out the battery and dispose of it properly. Remove the current month's battery from the 12 pack by pushing it through the back of the package. This way you will always know in which month you replaced it. Install the new battery by holding the finger tab and gently sliding it into the battery compartment. Pop the back cover on and you are done for another 6 weeks.

FCC Compliance

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications to this device will void the user's authority to operate the equipment.

Warranty

The PT-1 is warranted to be free of defects in materials and workmanship for a period of one (1) year from the date of purchase. Just return the unit to the factory and we will repair or replace it at no charge.



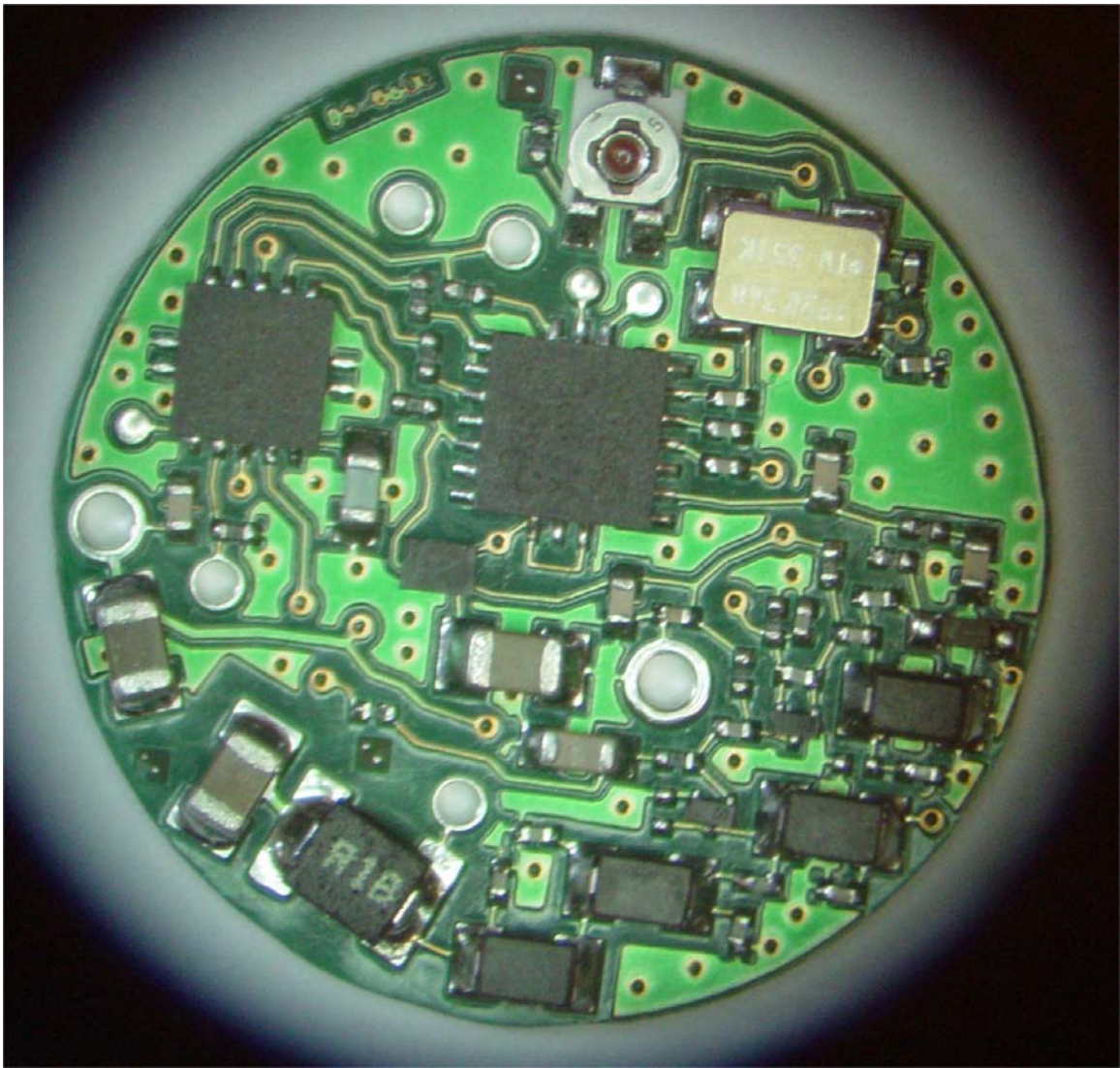
Operational Description-

The PT-1 transmitter generates a very low power pulsed CW signal on one operating frequency between 216.025Mhz and 235.000Mhz. The PT-1 is a synthesized design referenced to a .2PPM TCXO. The CPU controls the transmitter on/off switching and the PLL, which locks the VCO on the proper frequency. The output of the VCO feeds a single stage of amplification followed by a 5th order low pass filter connected to the antenna. The unit is powered by a CR2032 lithium battery.



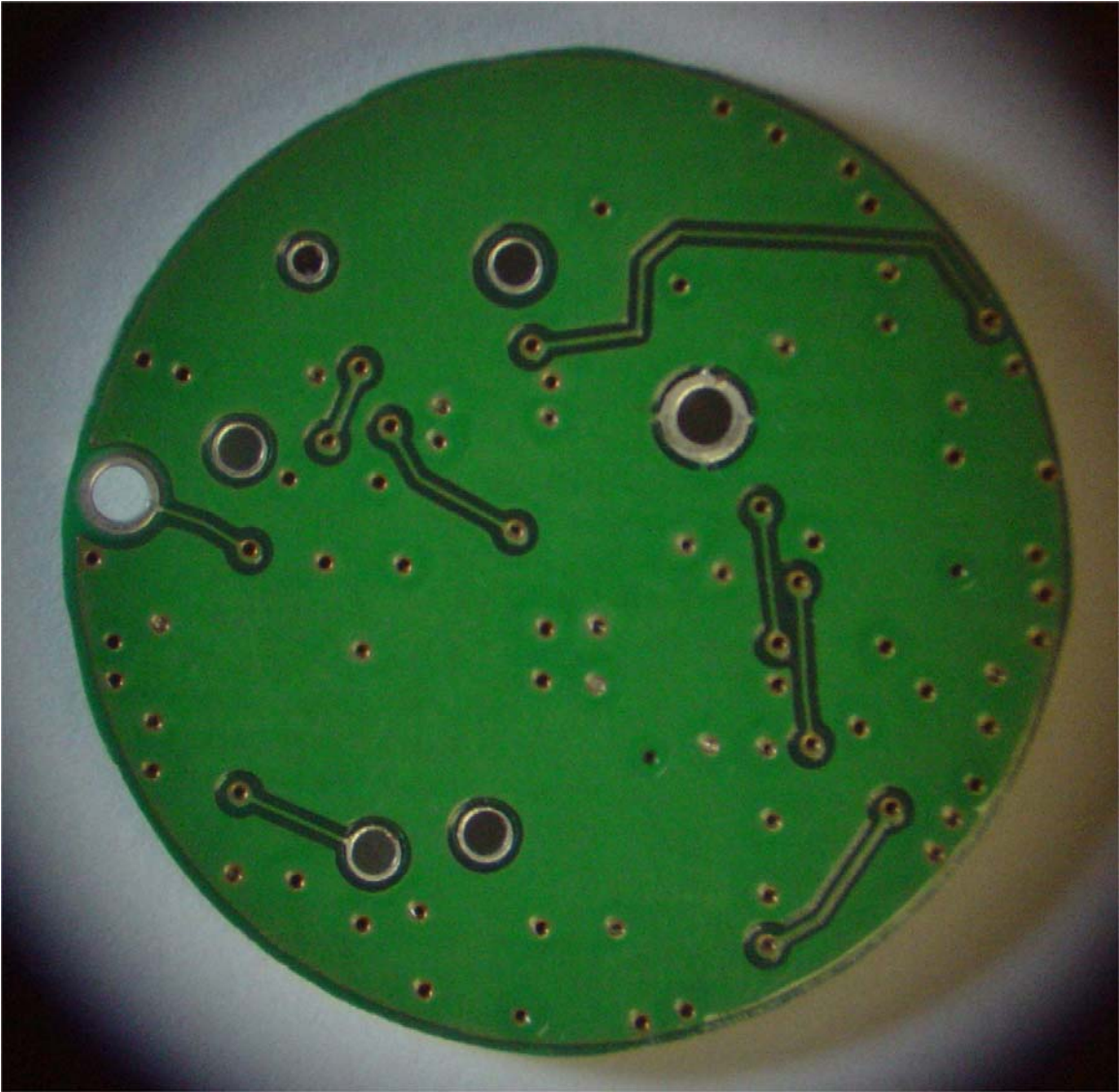
Outside Photo #1

Confidential



Trade Secret Material

Confidential



Trade Secret Material



FCC EMC TEST REPORT
for
COMMUNICATIONS SPECIALISTS
TRANSMITTER
Model: PT-1 Transmitter

GARWOOD LABORATORIES, INC.
TESTING AND ENGINEERING SERVICES



FCC PART 15 SUBPART C § 15.209

**Intentional Radiators
EVALUATION REPORT
RADIO FREQUENCY INTERFERENCE TEST**

Prepared for:
COMMUNICATIONS SPECIALISTS

Product Description:
TRANSMITTER
Model: PT-1 Transmitter



Test Completion Date:
January 19, 2004



GARWOOD LABORATORIES, INC.

950 Calle Negocio, San Clemente, CA 92673

Phone: 949-361-9189 Fax: 949-391-9597

*"EXCELLENCE
BUILT ON
INTEGRITY"*

Report No: FR26031SE

EMC TEST REPORT FOR COMMUNICATIONS SPECIALIST, INC.

TABLE OF CONTENTS

- 1.0 INTRODUCTORY SUMMARY**
- 2.0 SUMMARY OF TEST**
 - 2.1 ADMINISTRATIVE DATA AND TEST DESCRIPTION**
 - 2.2 TEST RESULT - CONDUCTED EMISSIONS**
 - 2.3 TEST RESULT - RADIATED EMISSIONS**
 - 2.4 MODIFICATIONS**
 - 2.5 INTENT TO INCORPORATE ENGINEERING REWORK**
 - 2.6 RECOMMENDATIONS**
- 3.0 TEST CONFIGURATION AND DESCRIPTION OF EUT**
 - 3.1 SKETCH OF EQUIPMENT AND CABLE CONFIGURATION**
 - 3.2.1 DESCRIPTION OF EUT**
 - 3.2.2 DESCRIPTION OF PERIPHERAL EQUIPMENT**
 - 3.3 TYPES OF CABLES USED**
 - 3.4 OPERATION MODES**
 - 3.5 PHOTOGRAPHS OF TEST SETUP AND EUT**
 - 3.6 DETAILED BLOCK DIAGRAM OF EUT**
- 4.0 TEST EQUIPMENT AND TEST SETUPS**
 - 4.1 LIST OF TEST EQUIPMENT USED AND CALIBRATION DATES**
 - 4.2 CONDUCTED EMISSIONS TEST SETUP**
 - 4.3 RADIATED EMISSIONS TEST SETUP**
- 5.0 TEST PROCEDURE**
 - 5.1 CONDUCTED EMISSIONS TEST**
 - 5.2 RADIATED PRELIMINARY TEST**
 - 5.3 RADIATED EMISSIONS TEST**
 - 5.4 FINAL RADIATED TESTING**
- 6.0 SAMPLE CALCULATIONS**
- 7.0 MEASUREMENTS AND UNCERTAINTIES**
- 8.0 LABELING AND NOTIFICATION REQUIREMENTS**



GARWOOD LABORATORIES, INC.

950 Calle Negocio, San Clemente, CA 92673

Phone: 949-361-9189 Fax: 949-391-9597

"EXCELLENCE
BUILT ON
INTEGRITY"

Report No: FR26031SE

EMC TEST REPORT FOR COMMUNICATIONS SPECIALIST, INC.

1.0 INTRODUCTORY SUMMARY

RESPONSIBLE SIGNATURES

This report is intended for the use by the organization to whom it is addressed, and will not be made available to any other parties without the expressed written consent of the aforementioned organization. This report shall not be reproduced, except in full, without the written approval of Garwood Laboratories, Inc.

WRITTEN BY:

Stephen Heyman
EMC Technical Writer

REVIEWED BY:

Arnulfo Tapia
Senior EMC Test Engineer

REVIEWED BY:

Tony Masone
EMC Manager

DOCUMENT HISTORY

Revision	Issue Date	Affected Page(s)	Description Of Modifications	Revised By	Approved By
N/C	January 19, 2004		Initial release		



GARWOOD LABORATORIES, INC.

950 Calle Negocio, San Clemente, CA 92673

Phone: 949-361-9189 Fax: 949-391-9597

"EXCELLENCE
BUILT ON
INTEGRITY"

Report No: FR26031SE

EMC TEST REPORT FOR COMMUNICATIONS SPECIALIST, INC.

CLIENT INFORMATION

Purchase Order	121703-SP
EUT Arrival Date	January 19, 2004
Company Name	Communications Specialist, Inc.
Address	426 West Taft Ave
City, State Zip	Orange, CA 92865
Contact Name	Spence Porter
Phone	714-998-3021
Fax	714-974-3420

GARWOOD INFORMATION

EMC Test Laboratory	Garwood Laboratories, Inc.
Address	950 Calle Negocio
City, State, Zip Code	San Clemente, CA 92673
Phone	(949) 361-9189
Fax	(949) 361-9597
Web Site	www.garwoodtestlabs.com
Contact Name	Tony Masone
Title	EMC Manager
Contact Phone	(562) 949-2727
Contact Fax	(562) 949-8757

Test Personnel	Test Dates
Terry Reysbergen – EMC Test Engineer	19 January 2004



GARWOOD LABORATORIES, INC.

950 Calle Negocio, San Clemente, CA 92673

Phone: 949-361-9189 Fax: 949-391-9597

"EXCELLENCE
BUILT ON
INTEGRITY"

Report No: FR26031SE

EMC TEST REPORT FOR COMMUNICATIONS SPECIALIST, INC.

Accreditations:

The Open Area Test Site (OATS) and measurement facilities used to collect the test data are located at Garwood Laboratories, Incorporated test facility in San Clemente, California.

The test facility is recognized, certified, or accredited by the following organizations:



Garwood Laboratories, Inc. is accredited by the U.S. National Institute Standards Technology under NVLAP as suppliers of test results to the criteria established by ISO/IEC 17025 and ISO 9002. The accreditation is valid through September 30, 2004.

BSMI

Garwood Laboratories, Inc. has been validated by the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) under the Asia Pacific Economic Cooperation Mutual Recognition Arrangement (APEC MRA). Garwood Laboratories is now provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase 1 Procedures of the APEC MRA. The BSMI assigned number is SL2-IN-E-059R.

TUV

Garwood Laboratories, Inc. is approved by TUV Product Services as a test facility testing to the EMC DIRECTIVE 89/336/EEC.

Garwood Laboratories, Inc. is approved as a contractor to Radio Frequency investigation LTD, a UK Competent Body and by Radio Frequency Technologies LTD, a Competent Body of Ireland.



GARWOOD LABORATORIES, INC.

950 Calle Negocio, San Clemente, CA 92673

Phone: 949-361-9189 Fax: 949-391-9597

"EXCELLENCE
BUILT ON
INTEGRITY"

Report No: FR26031SE

EMC TEST REPORT FOR COMMUNICATIONS SPECIALIST, INC.

2.0 SUMMARY OF TEST

2.1A ADMINISTRATIVE DATA

DEVICE TESTED: Description: Transmitter
Model: PT-1 Transmitter

ACCESSORIES: N/A

APPLICANT: Communications Specialists

CONTACT: Spence Porter

MANUFACTURER: Communications Specialists

2.1B TEST DESCRIPTION

FREQUENCY RANGES: Conducted: 0.45 - 30.0 MHz
Radiated: 30.0 - 1000 MHz
Radiated: All Harmonics of Fundamental frequency

TEST LOCATION: 950 Calle Negocio, San Clemente, Calif. 92673

TEST DATES: January 19, 2004

PURPOSE OF TEST: To demonstrate compliance with the limits of FCC Part 15C §15.209

TESTS PERFORMED:

1. Conducted Emissions Per ANSI C63.4.
2. Radiated Emissions Per ANSI C63.4 at 3 Meters.
3. Engineering Evaluations

All Measurement Data is acquired according to the content of ANSI C63.4. The Test Site Data and performance complies with ANSI C63.4, unless supplemented with additional requirements as noted in the test report.



GARWOOD LABORATORIES, INC.

950 Calle Negocio, San Clemente, CA 92673

Phone: 949-361-9189 Fax: 949-391-9597

"EXCELLENCE
BUILT ON
INTEGRITY"

Report No: FR26031SE

EMC TEST REPORT FOR COMMUNICATIONS SPECIALIST, INC.

2.2 TEST RESULTS - CONDUCTED EMISSIONS

Conducted Emission Results - High or Supply Lead

*****N/A Battery Powered**



GARWOOD LABORATORIES, INC.

950 Calle Negocio, San Clemente, CA 92673

Phone: 949-361-9189 Fax: 949-391-9597

"EXCELLENCE
BUILT ON
INTEGRITY"

Report No: FR26031SE

EMC TEST REPORT FOR COMMUNICATIONS SPECIALIST, INC.

2.2 TEST RESULTS - CONDUCTED EMISSIONS

Conducted Emission Results – Low or Return Lead

*****N/A Battery Powered**



GARWOOD LABORATORIES, INC.

950 Calle Negocio, San Clemente, CA 92673

Phone: 949-361-9189 Fax: 949-391-9597

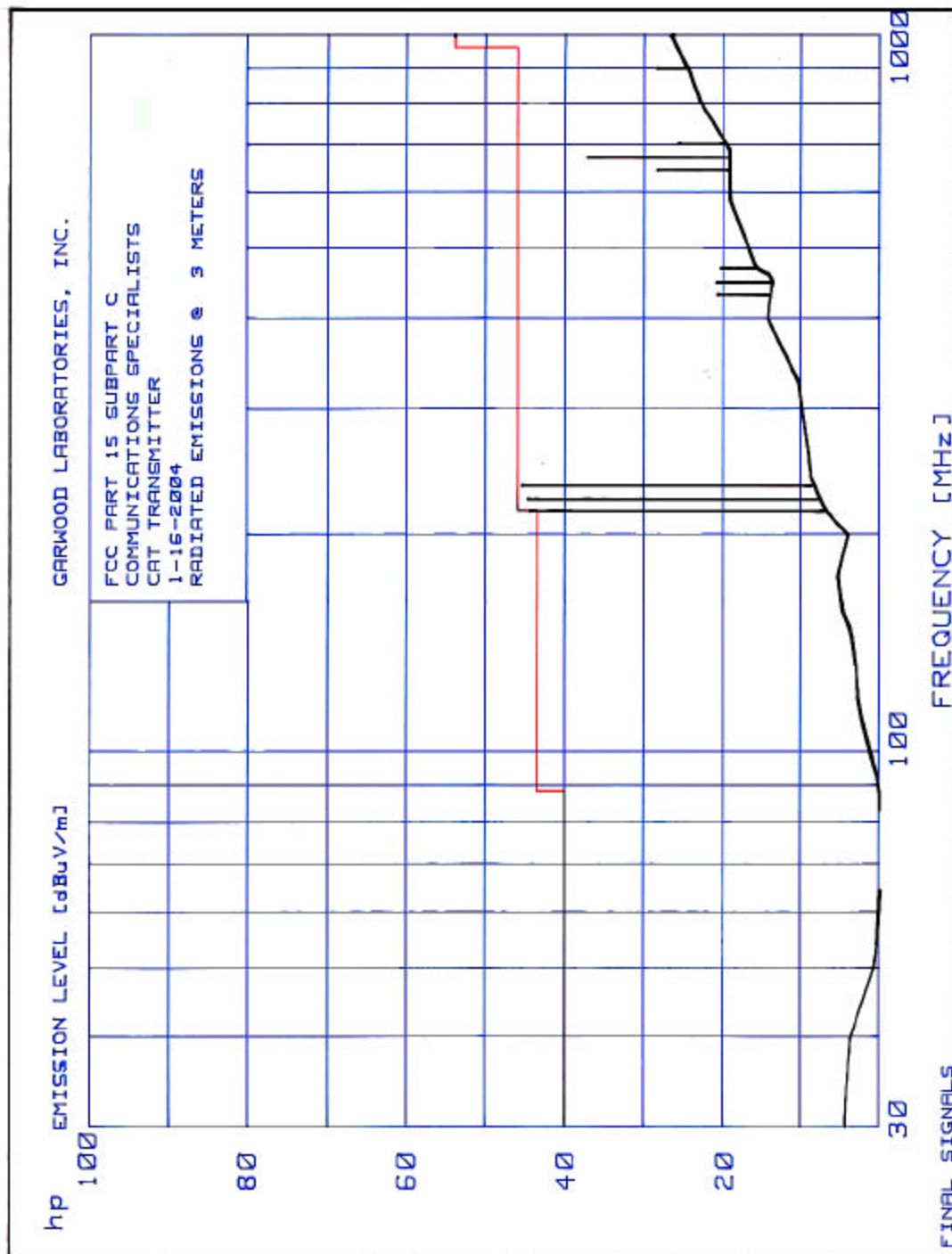
"EXCELLENCE
BUILT ON
INTEGRITY"

Report No: FR26031SE

EMC TEST REPORT FOR COMMUNICATIONS SPECIALIST, INC.

2.3 TEST RESULTS - RADIATED EMISSIONS

Measurements taken at 3 Meters.





GARWOOD LABORATORIES, INC.

950 Calle Negocio, San Clemente, CA 92673

Phone: 949-361-9189 Fax: 949-391-9597

"EXCELLENCE
BUILT ON
INTEGRITY"

Report No: FR26031SE

EMC TEST REPORT FOR COMMUNICATIONS SPECIALIST, INC.

PRODUCT EMISSIONS

FCC PART 15 SUBPART C

Data File: FINAL

215.025

16MS

No	EMISSION	SPEC LIMIT	MEASUREMENTS			SITE			CORR FACTOR	COMMENTS
	FREQUENCY MHz		ABS	dLIM	MODE	POL	HGT cm	AZM deg		
1	215.025	46.0	44.4	-1.6	QP	H	193	17	-6.7	
2	432.050	46.0	20.7	-25.3	PK	V	139	18	0.6	
3	648.061	46.0	26.4	-17.6	PK	V	139	18	6.6	
4	864.100	46.0	17.1	-28.9	PK	V	139	18	10.	

PRODUCT EMISSIONS

FCC PART 15 SUBPART C

Data File: FINAL

225.025

16MS

No	EMISSION	SPEC LIMIT	MEASUREMENTS			SITE			CORR FACTOR	COMMENTS
	FREQUENCY MHz		ABS	dLIM	MODE	POL	HGT cm	AZM deg		
1	225.022	46.0	44.7	-1.3	QP	H	193	17	-6.	
2	450.050	46.0	20.8	-25.2	PK	V	123	22	0.9	
3	675.07	46.0	37.1	-8.9	PK	V	123	22	6.1	
4	900.100	46.0	28.3	-17.7	PK	V	123	22	8.9	

PRODUCT EMISSIONS

FCC PART 15 SUBPART C

Data File: FINAL

235.025

16MS

No	EMISSION	SPEC LIMIT	MEASUREMENTS			SITE			CORR FACTOR	COMMENTS
	FREQUENCY MHz		ABS	dLIM	MODE	POL	HGT cm	AZM deg		
1	235.031	46.0	45.4	-0.6	QP	H	193	17	-6.	
2	470.05	46.0	20.3	-25.7	PK	H	107	18	1.5	
3	705.07	46.0	25.7	-20.3	PK	H	107	18	5.9	
4	940.100	46.0	-10.	-56.8	PK	H	107	18	-13.8	



GARWOOD LABORATORIES, INC.

950 Calle Negocio, San Clemente, CA 92673

Phone: 949-361-9189 Fax: 949-391-9597

"EXCELLENCE
BUILT ON
INTEGRITY"

Report No: FR26031SE

EMC TEST REPORT FOR COMMUNICATIONS SPECIALIST, INC.

2.4 MODIFICATIONS

None required to demonstrate compliance.

2.5 INTENT TO INCORPORATE ENGINEERING REWORK (If required by 2.4 above)

INTENT TO INCORPORATE ENGINEERING REWORK

This is a letter of Intent to Incorporate the Engineering Rework as described in the above referenced PDE Laboratories. Test Report, Section 2.4, to achieve compliance with the intent of the testing as documented. I, the undersigned have the responsibility for marketing the device tested, and have implemented procedures to monitor the quality of the product (device tested), during continued manufacturing processes and possible product changes or enhancements, and take the responsibility to monitor continued compliance through periodic re-testing during the life of product (device tested), and re-testing any new configuration which might alter the status of the product's continued compliance to the applicable Rules and Regulations.

[NOT APPLICABLE FOR THIS TEST REPORT]

Signature

Date

Name

Title



GARWOOD LABORATORIES, INC.

950 Calle Negocio, San Clemente, CA 92673

Phone: 949-361-9189 Fax: 949-391-9597

"EXCELLENCE
BUILT ON
INTEGRITY"

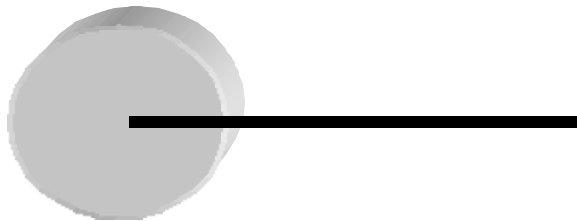
Report No: FR26031SE

EMC TEST REPORT FOR COMMUNICATIONS SPECIALIST, INC.

3.0 DESCRIPTION OF EUT CONFIGURATION

3.1 SKETCH OF EQUIPMENT AND CABLE CONFIGURATION

Battery Powered





GARWOOD LABORATORIES, INC.

950 Calle Negocio, San Clemente, CA 92673

Phone: 949-361-9189 Fax: 949-391-9597

"EXCELLENCE
BUILT ON
INTEGRITY"

Report No: FR26031SE

EMC TEST REPORT FOR COMMUNICATIONS SPECIALIST, INC.

3.2 DESCRIPTION OF EUT AND PERIPHERAL EQUIPMENT

3.2.1 DESCRIPTION OF EUT

The PT-1 transmitter generates a very low power pulsed CW signal on one operating frequency between 216.025Mhz and 235.000Mhz. The PT-1 is a synthesized design referenced to a .2PPM TCXO. The CPU controls the transmitter on/off switching and the PLL, which locks the VCO on the proper frequency. The output of the VCO feeds a single stage of amplification followed by a 5th order low pass filter connected to the antenna. The unit is powered by a CR2032 lithium battery.

Equipment: Transmitter
Manufacturer: Communications Specialists
Model No.: PT-1 Transmitter
Serial No.: N/A

Power Supply: Internal Battery Powered

RFI Suppression Features:

Powerline Filter: N/A
Ferrite chokes: N/A

Internal Components: N/A

Equipment: N/A
Manufacturer:
Model No.:
Serial No.:
Located:



GARWOOD LABORATORIES, INC.

950 Calle Negocio, San Clemente, CA 92673

Phone: 949-361-9189 Fax: 949-391-9597

"EXCELLENCE
BUILT ON
INTEGRITY"

Report No: FR26031SE

EMC TEST REPORT FOR COMMUNICATIONS SPECIALIST, INC.

3.2.2 DESCRIPTION OF PERIPHERAL EQUIPMENT

- 1) Equipment N/A
Manufacturer:
Model No.:
Serial No:

3.3 TYPES OF CABLES USED:

Power Cords

- 1) Unit: N/A
Manufacturer:
Shielded:
Length:

I/O Cables - External

- 1) Connection: N/A
Manufacturer:
Shielded:
Connectors:
Length:



GARWOOD LABORATORIES, INC.

950 Calle Negocio, San Clemente, CA 92673

Phone: 949-361-9189 Fax: 949-391-9597

"EXCELLENCE
BUILT ON
INTEGRITY"

Report No: FR26031SE

EMC TEST REPORT FOR COMMUNICATIONS SPECIALIST, INC.

3.4 OPERATING MODES

The Transmitter, Model: PT-1 Transmitter operated continuously during all tests.
EUT transmitted at 16ms burst, twice every minute.

Absolute emission level measurements were made with various orientations of the unit relative to the receiving antenna. Prior to actual OATS testing, a near-field RF probe was used to exhaustively survey the EUT for their internal Local Oscillator and clock frequencies. The emissions were quite weak.

All final data was taken with the EUT in the above mode of operation. The position of the peripherals (if required in the test set up) and interconnect cables (if required in the test set up) were varied to provide generally the highest emissions prior to the final tests.

Absolute emission level measurements were made in an automatic orientation fashion such that the EUT was uniquely positioned for each of the significant emissions detected in the prescan evaluation. Those data are hereby recorded.



GARWOOD LABORATORIES, INC.

950 Calle Negocio, San Clemente, CA 92673

Phone: 949-361-9189 Fax: 949-391-9597

"EXCELLENCE
BUILT ON
INTEGRITY"

Report No: FR26031SE

EMC TEST REPORT FOR COMMUNICATIONS SPECIALIST, INC.

3.5 PHOTOGRAPHS OF TEST SETUP AND EUT (Conducted)

****N/A Battery Powered



GARWOOD LABORATORIES, INC.

950 Calle Negocio, San Clemente, CA 92673

Phone: 949-361-9189 Fax: 949-391-9597

"EXCELLENCE
BUILT ON
INTEGRITY"

Report No: FR26031SE

EMC TEST REPORT FOR COMMUNICATIONS SPECIALIST, INC.

3.5 PHOTOGRAPHS OF TEST SETUP AND EUT (Radiated)





GARWOOD LABORATORIES, INC.

950 Calle Negocio, San Clemente, CA 92673

Phone: 949-361-9189 Fax: 949-391-9597

"EXCELLENCE
BUILT ON
INTEGRITY"

Report No: FR26031SE

EMC TEST REPORT FOR COMMUNICATIONS SPECIALIST, INC.

3.5 PHOTOGRAPHS OF TEST SETUP AND EUT (Radiated)





GARWOOD LABORATORIES, INC.

950 Calle Negocio, San Clemente, CA 92673

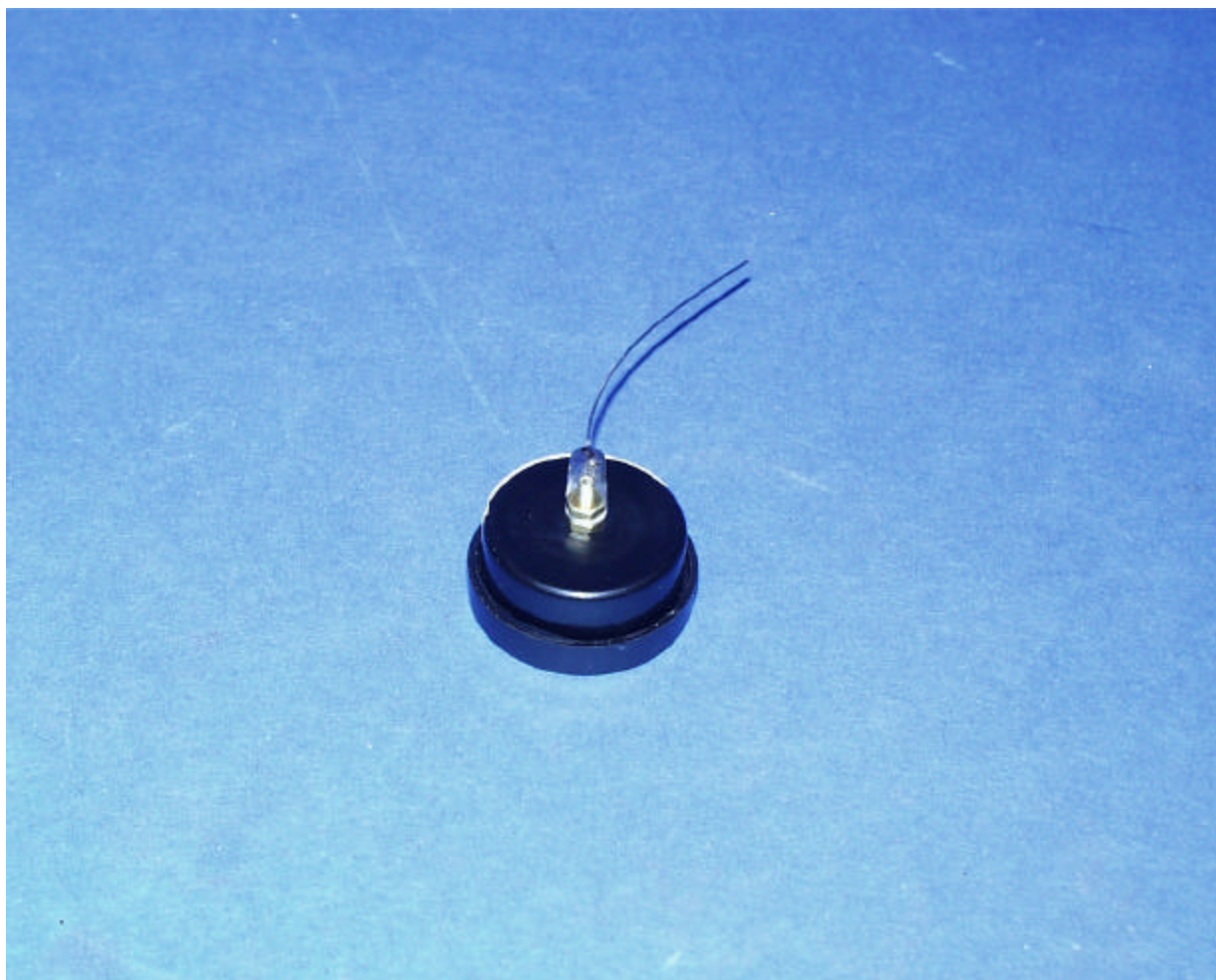
Phone: 949-361-9189 Fax: 949-391-9597

"EXCELLENCE
BUILT ON
INTEGRITY"

Report No: FR26031SE

EMC TEST REPORT FOR COMMUNICATIONS SPECIALIST, INC.

3.5 PHOTOGRAPHS OF TEST SETUP AND EUT





GARWOOD LABORATORIES, INC.

950 Calle Negocio, San Clemente, CA 92673

Phone: 949-361-9189 Fax: 949-391-9597

"EXCELLENCE
BUILT ON
INTEGRITY"

Report No: FR26031SE

EMC TEST REPORT FOR COMMUNICATIONS SPECIALIST, INC.

4.0 TEST EQUIPMENT AND TEST SET UPS

4.1 LIST OF EQUIPMENT USED IN TESTS. An "X" in the used column denotes applicability and use.

TEST EQUIPMENT			CALIBRATION		USED
DEVICE / MANUFACTURER	MODEL	SERIAL NO	DATE	DUE	
SITE NUMBER 2 (outside stack)	OATS	-----	8-8-03	8-8-04	X
SPECTRUM ANALYZER HEWLETT PACKARD	8566B	2427A04639	2-26-03	2-26-04	X
ANALYZER DISPLAY HEWLETT PACKARD	85662A	2848A17070	2-26-03	2-26-04	X
PRE SELECTOR HEWLETT PACKARD	85685A	2901A00858	2-26-03	2-26-04	X
QUASI-PEAK ADAPTOR HEWLETT PACKARD	85650A	2811A01210	2-26-03	2-26-04	X
PRE-AMP HEWLETT PACKARD	8447F	2805A03163	2-26-03	2-26-04	X
ANTENNA LOG PERIODICAL A. H. SYSTEMS	SAS-200-512	116	4-12-03	4-12-04	X
ANTENNA BICON A.H. SYSTEMS	SAS-200-540	343	4-12-03	4-12-04	X
ANTENNA HORN A.H. SYSTEMS	SAS-200/571	145	9-28-03	9-28-04	X
SITE NUMBER 3 (roof stack)	OATS	-----	5-02-03	5-02-04	
SPECTRUM ANALYZER HEWLETT PACKARD	8567A	2727A00415	9-22-03	9-22-04	
ANALYZER DISPLAY HEWLETT PACKARD	85662A	264815252	9-22-03	9-22-04	
PRE SELECTOR HEWLETT PACKARD	85685A	2837A00827	9-22-03	9-22-04	
QUASI-PEAK ADAPTOR HEWLETT PACKARD	85650A	2521A00678	9-22-03	9-22-04	
PRE-AMP HEWLETT PACKARD	8447F	1937A01214	9-22-03	9-22-04	
ANTENNA BICONILOG EMCO	3142	9603-1025	5-06-03	5-06-04	

FCC ID CFXPT-1