25 June 2001

Chris Gustaf
Trango Systems
9939 Via Pasar
San Diego, CA 92126

Dear Mr. Gustaf,

Enclosed is the report for the Video Transmitter, model MTX2500. Please check it thoroughly for discrepancies This is an official copy of this report complete with the original Acme Testing staff signatures, which should be retained by you as the official record of testing, as it may be required for future verification of compliance. The EMC Directive requires that either the manufacturer or your authorized representative in Europe keep this data for a period of ten (10) years after the equipment was placed on the market. Please be aware that our internal controls require us to keep a historical copy of your report on file for three years only.

Acme Testing is accredited by the American Association for Laboratory Accreditation. There is a current Mutual Recognition Agreement between the United States, Australia, New Zealand, Singapore, and Hong Kong. This means that the data contained in this report is acceptable to the authorities of these countries.

Acme Testing has been nominated by NIST as a Conformity Assessment Body under the US-EU Mutual Recognition Agreement, and we are a registered facility with the Japanese Voluntary Control Council for Interference by Information Technology Equipment (VCCI).

Thank you for your business. We look forward to working with you when you next require testing services.

Yours Sincerely,

Harry H. Hodes
Principal Engineer
President/CEO

The following are samples of what the FCC expects to see displayed prominently in your users manual and/or on your FCC ID label (more information can be found in the CFR 47):

§ 15.19 Labelling requirements.

The following is a sample of the statement that must appear on the FCC ID Label that will be place on your product:

COMPANY NAME
FCC ID:
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.

For devices that are so small that a label can not be affixed upon the product the FCC states: "When the device is so small or for such use that it is not practicable to place the statement specified in this section on it, the information required by these paragraphs shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. **However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.**

§ 15.21 Information to user.

> The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

PLEASE NOTE: INFORMATION TO THIS EFFECT MUST APPEAR IN THE MANUAL OR THE FCC WILL DENY YOUR APPLICATION FOR EQUIPMENT AUTHORIZATION!!!!

2002 Valley Highway PO Box 3 Acme WA 98220-0003
phone:888 226-3837 fax: 360 595-2722

REPORT OF MEASUREMENTS
FCC RULES 47CFR PART 15 SUBPART C (15.249)

DEVICE: VIDEO TRANSMITTER

MODEL: MTX2500-MP

MANUFACTURER: TRANGO SYSTEMS

ADDRESS: 9939 VIA PASAR
SAN DIEGO, CA 92126

WORK ORDER: 01-EMC-0328-01

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1. General

1.1 Document History

REVISION	DATE	COMMENTS
-	21 May 2001	Initial Release, Harry H. Hodes
A	25 June 2001	Re-measurement of test data for FCC

Note: Acme Testing Co. hereby makes the following statements so as to conform with Chapter 10 (Test Reports) Requirement of ANSI C63.4:1992 "Methods and Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz":

- The units described in this report were received at Acme Testing Co.'s facilities on 3 May 2001. Testing was performed on the units described in this report on 3 May 2001.
- The Test Results reported herein apply only to the Units actually tested, and to substantially identical Units.
- This test report must not be used to claim product endorsement by A2LA or any agency of the U.S. Government, or any other foreign government.

1.2 Purpose

The purpose of this report is to present data that demonstrates compliance of the Trango Systems Inc. Model MTX2500-MP Digital Transmitter to the 47CFR Part C Section 15.249. This report references the applicable electromagnetic requirements.

1.3 Manufacturer

Company Name:	Trango Systems
Contact:	Chris Gustaf
Street Address:	9939 Via Pasar
City/State/Zip:	San Diego, CA 92126
Telephone:	619 621-2700
Fax:	619 621-2722
Web:	www.trangosys.com

1.4 Test location

Laboratory:	Test Site #1
Street Address:	2002 Valley Highway
Mailing Address:	PO Box 3
City/State/Zip:	Acme WA 98220-0003
Telephone:	888 226-3837
Fax:	360 595-2722
E-mail:	acmetest@acmetesting.com
Web:	www.acmetesting.com

1.5 Accreditations and Listings

Acme Testing Co.'s test facilities are accredited by A2LA for a specific scope of accreditation which includes the tests detailed herein, under Certificate Numbers: 0829-01 (Acme, WA), and 0829-02 (Plummer, ID). Acme Testing Co.'s test facilities that are used to perform radiated and conducted emissions are currently registered with the Federal Communications Commission under registration numbers: 90420 (Acme, WA), and 96502 (Plummer, ID). In addition, Acme Testing Co.'s test facilities are also registered with the Industry Canada under registration numbers: IC3251 (Acme, WA), and IC3618 (Plummer, ID).

2. Test Results Summary

Summary of Test Results

Test Specification	Test Description	Compliance Criteria	Status
FCC CFR 47, PART 15C, 15.207(a)	**Conducted Emissions** 0.45 MHz - 30 MHz	**15.207(a)**	**Pass**
FCC CFR 47, PART 15C, 15.249	**Radiated Emissions** 30 MHz – 40 GHz	**15.249**	**Pass**

The signed original of this report, supplied to the client, represents the only "official" copy. Retention of any additional copies (electronic or non-electronic media) is at Acme Testing's discretion to meet internal requirements only. The client has made the determination that EUT Condition, Characterization, and Mode of Operation are representative of production units, and meet the requirements of the specifications referenced herein.

Consistent with Industry practice, measurement and test equipment not directly involved in obtaining measurement results but having an impact on measurements (such as cable loss, antenna factors, etc.) is factored into the "Correction Factor" documented in certain test results. Instrumentation employed for testing meets tolerances consistent with known Industry Standards and Regulations.

The measurements contained in this report were made in accordance with the referenced standards and all applicable Public Notices received prior to the date of testing. Acme Testing assumes responsibility only for the accuracy and completeness of this data as it pertains to the sample tested.

REVIEWED AND APPROVED BY:

Harry H. Hodes
President/CEO
Principal EMC Engineer

Date of Issuance

2.1 Manufacturer's Statement of Responsibility

This equipment has been tested in accordance with the requirements contained in the appropriate Commission regulations. To the best of my knowledge, these tests were performed using measurement procedures consistent with industry or Commission standards and demonstrate that the equipment complies with the appropriate standards. Each unit manufactured, imported or marketed, as defined in the Commission's regulations, will conform to the sample(s) tested within the variations that can be expected due to quantity production and testing on a statistical basis. I further certify that the necessary measurements were made by:

Acme Testing
2002 Valley Highway
P.O. Box 3
Acme, Washington 98220-0003
360-595-2785

_____
Signature

_____
Title

3. Description of Equipment and Peripherals

3.1 Equipment Under Test (EUT)

Device:	Video Transmitter
Model Number:	MTX2500-MP
Serial Number:	None
FCC ID:	None
Power:	9 V Battery
Grounding:	None
Size of EUT:	1 in x 2 in x 0.5 in

3.2 Functional Description

The MTX2500-MP is a small battery powered surveillance video transmitter. It employs audio and video RCA inputs and an antenna jack.

3.3 EUT Peripherals

Device	Manufacturer	Model Number	FCC ID	Serial Number
Signal Generator	Tektronix	TSG95	None	B024509

3.4 The Mode of Operation During Tests

Unless otherwise stated in the specific test procedures: The EUT was powered by a 9 V battery. An omni directional whip antenna was used to transmit a signal at 2.4 GHz. The modulation (audio and video) was supplied via the signal generator.

3.5 Modifications Required for Emissions Compliance

1. None.

3.6 Description of Interface Cables

EUT/Signal Generator (Audio)

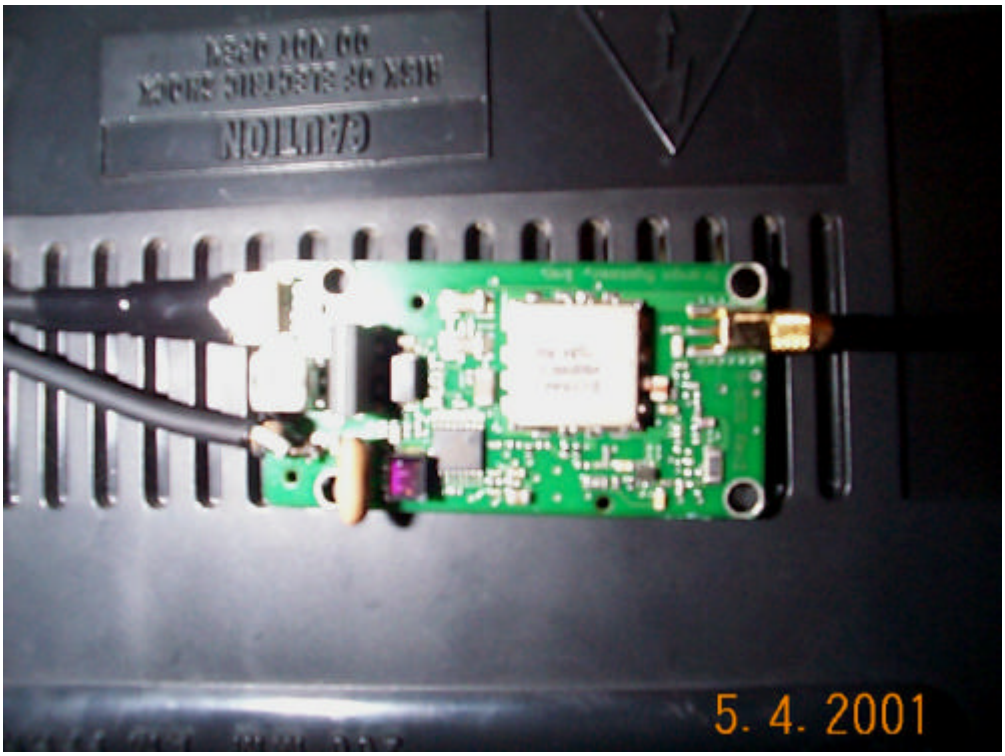
Shielded	Unshielded	Flat	Round	Length	Ferrite
Yes	No	No	Yes	28 inch	No

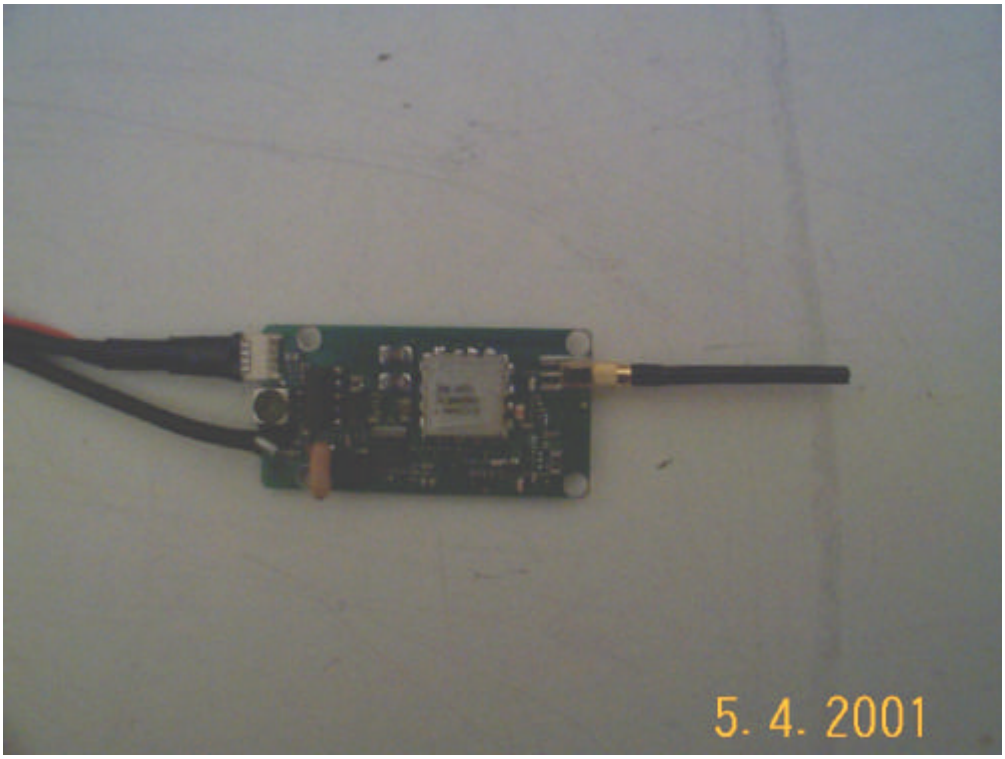
EUT/Signal Generator (Video)

Shielded	Unshielded	Flat	Round	Length	Ferrite
Yes	No	No	Yes	8 inch	No

ARRANGEMENT OF INTERFACE CABLES: All interface cables were positioned for worst case maximum emissions within the manner assumed to be a typical operation condition (please reference photographs).

3.7 EUT Photographs





4. Antenna requirement FCC CFR 47, Part 15C, 15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited.

The EUT uses a unique coupling device for the antenna. The EUT's antenna is a standard MMCX connector specifically designed for FCC compliance.

5. Conducted Emissions Tests

Test Requirement: CFR 47, Part 15C, 15.207(a)

Test Procedure: ANSI C63.4:1992

5.1 Purpose

The purpose of this test is to evaluate the level of conducted noise the EUT imposes on the A/C mains.

5.2 Test Results

The EUT is battery powered, therefore Conducted Emissions is not applicable.

6. Radiated Emissions Tests

Test Requirement: FCC Rules: 47CFR, Part 15, Subpart C (15.249)

Test Procedure: ANSI C63.4:1992

Date of Test: 3 May 2001

Laboratory: Test Site #1 (Acme, WA)

6.1 Test Equipment

⇒ Spectrum Analyzer (yellow): Hewlett-Packard 8566B, Serial Number 2403A06519, Calibrated: 20 November 2000, Calibration due Date: 20 November 2001

⇒ RF Preselector (yellow): Hewlett-Packard 85685A, Serial Number 2648A00392, Calibrated: 20 November 2000, Calibration due Date: 20 November 2001

⇒ Quasi Peak Adapter (yellow): Hewlett-Packard 85650A, Serial Number 2521A-00689, Calibrated: 20 November 2000, Calibration due Date: 20 November 2001

⇒ 1 GHz to 26.5 GHz: Milliwave 8449B, Serial Number 3008A00982, Calibrated: 27 April 2001, Calibration Due Date: 27 April 2002

⇒ 1 GHz to 26 GHz Preamplifier: Milliwave 8449B/H02, Serial Number 2933A00198, Calibrated: 03 May 2001, Calibration Due Date: 03 May 2003

⇒ Open Area Test Site: Acme Testing Co., Test Site Number 1, Calibrated: 1 December 2000, Calibration due Date: 1 December 2001

⇒ Broadband Biconical Antenna (blue) (20 MHz to 200 MHz): EMCO 3110, Serial Number 1180, Calibrated: 19 June 2000, Calibration due Date: 19 June 2001

⇒ Broadband Log Periodic Antenna (blue) (200 MHz to 1000 MHz): EMCO 3146, Serial Number 2852, Calibrated: 19 June 2000, Calibration due Date: 19 June 2001

⇒ EUT Turntable Position Controller: Rothenbuhler Engineering, Custom, No Calibration Required

⇒ Antenna Mast: Compliance Design, model M100/200, No Calibration Required

⇒ 2 GHz to 10 GHz Low Noise Preamplifier: Milliwave 593-2898, Serial Number 2494, Calibrated: 5 May 2000, Calibration Due Date: 5 May 2001

⇒ 1 GHz to 18 GHz Double Ridge Guide Horn Antenna: EMCO 3115, Serial Number 9807-5534,

Calibrated: 5 January 2001, Calibration due Date: 5 January 2002

6.2 Regulation

(a) The field strength of emissions from intentional radiators operated within these frequency banks shall comply with the following:

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902 – 928 MHz	50	500
2400 – 2483.5 MHz	50	500
5725 – 5875 MHz	50	500
24.0 – 24.25 GHz	250	2500

(b) Field strength limits are specified at a distance of 3 meters.
(c) Emissions radiated outside of the specified frequency bands except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.
(d) As shown in Section 15.35(b), for frequencies above 1000 MHz, the above field strength limits are based on average limits. However, the peak field strength of any emissions shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.
(e) Parties considering the manufacture, importation, marketing or operation of equipment under this section should also note the requirement in Section 15.37(d).

6.3 Test Procedures

For tabletop equipment, the EUT is placed on a 1 meter by 1.5 meters wide and 0.8 meter high nonconductive table that sits on a flush mounted metal turntable. Floor standing equipment is placed directly on the flush mounted metal turntable. The EUT is connected to its associated peripherals with any excess I/O cabling bundled to approximately 1 meter.

Preview tests are performed to determine the "worst case" mode of operation. With the EUT operating in "worst case" mode, emissions from the unit are maximized by adjusting the polarization and height of the receive antenna and rotating the EUT on the turntable. EUT emissions are also maximized by manipulating the system cables.

Radiated Emissions Test Characteristics

Frequency range	30 MHz – 40 GHz
Test distance	3 meter
Test instrumentation resolution bandwidth	120 kHz (30 MHz-1 GHz) 1 MHz (1 GHz – 18 GHz)
Receive antenna scan height	1 - 4 meters
Receive antenna polarization	Vertical/Horizontal

6.4 Test Results

CHANNEL 1 FUNDAMENTAL PEAK – OMNI ANTENNA
PRODUCT EMISSIONS

No	EMISSION FREQUENCY MHz	SPEC LIMIT dBuV/m	MEASUREMENTS ABS	dLIM dB	MODE	POL	SITE HGT cm	AZM deg	CORRECTION FACTOR
1	2411.69	114.0	99.0	15.0	PK	V	100	305	22.5

CHANNEL 3 FUNDAMENTAL PEAK – OMNI ANTENNA
PRODUCT EMISSIONS

No	EMISSION FREQUENCY MHz	SPEC LIMIT dBuV/m	MEASUREMENTS ABS	dLIM dB	MODE	POL	SITE HGT cm	AZM deg	CORRECTION FACTOR
1	2450.05	114.0	99.0	15.0	PK	V	120	223	22.5

CHANNEL 4 FUNDAMENTAL PEAK – OMNI ANTENNA
PRODUCT EMISSIONS

No	EMISSION FREQUENCY MHz	SPEC LIMIT dBuV/m	MEASUREMENTS ABS	dLIM dB	MODE	POL	SITE HGT cm	AZM deg	CORRECTION FACTOR
1	2468.00	114.0	99.9	14.1	PK	V	138	256	225

CHANNEL 1 FUNDAMENTAL AVERAGE – OMNI ANTENNA
PRODUCT EMISSIONS

No	EMISSION FREQUENCY MHz	SPEC LIMIT dBuV/m	MEASUREMENTS ABS	dLIM dB	MODE	POL	SITE HGT cm	AZM deg	CORRECTION FACTOR
1	2412.75	94.0	92.0	-2.0	AVG	V	100	305	22.5

CHANNEL 3 FUNDAMENTAL AVERAGE – OMNI ANTENNA
PRODUCT EMISSIONS

No	EMISSION FREQUENCY MHz	SPEC LIMIT dBuV/m	MEASUREMENTS ABS	dLIM dB	MODE	POL	SITE HGT cm	AZM deg	CORRECTION FACTOR
1	2450.85	94.0	91.3	-2.7	AVG	V	120	223	22.5

CHANNEL 4 FUNDAMENTAL AVERAGE – OMNI ANTENNA
PRODUCT EMISSIONS

No	EMISSION FREQUENCY MHz	SPEC LIMIT dBuV/m	MEASUREMENTS ABS	dLIM dB	MODE	POL	SITE HGT cm	AZM deg	CORRECTION FACTOR
1	2469.71	94.0	91.5	-2.5	AVG	V	138	256	22.5

CHANNEL 1 SPURIOUS EMISSIONS – OMNI ANTENNA

PRODUCT EMISSIONS

No	EMISSION FREQUENCY MHz	SPEC LIMIT dBuV/m	MEASUREMENTS ABS	dLIM dB	MODE	POL	SITE HGT cm	AZM deg	CORRECTION FACTOR
1	4827.8	74.0	66.7	-7.3	PK	V	153	193	18.9
1	4827.8	54.0	52.9	-1.1	AVG	V	153	193	18.9
2*	12058.45	54.0	40.6	-13.4	AVG	V			3.9
3*	14470.14	54.0	39.4	-14.6	AVG	V			-1.2
4**	19293.52	54.0			AVG	V			

CHANNEL 3 SPURIOUS EMISSIONS – OMNI ANTENNA

PRODUCT EMISSIONS

No	EMISSION FREQUENCY MHz	SPEC LIMIT dBuV/m	MEASUREMENTS ABS	dLIM dB	MODE	POL	SITE HGT cm	AZM deg	CORRECTION FACTOR
1	4899.5	74.0	66.9	-7.1	PK	V	130	205	18.9
1	4900.1	54.0	53.5	-0.5	AVG	V	130	205	18.9
2	7350.15	74.0	63.0	-11.0	PK	V	113	234	10.6
2	7350.15	54.0	51.2	-2.8	AVG	V	113	234	10.6
3	12250.25	74.0	42.1	-31.9	PK	V	115	245	3.9
3	12250.25	54.0	28.5	-25.5	AVG	V	115	245	3.9
4**	19600.4	54.0			AVG	V			
5**	22050.45	54.0			AVG	V			

CHANNEL 4 SPURIOUS EMISSIONS – OMNI ANTENNA

PRODUCT EMISSIONS

No	EMISSION FREQUENCY MHz	SPEC LIMIT dBuV/m	MEASUREMENTS ABS	dLIM dB	MODE	POL	SITE HGT cm	AZM deg	CORRECTION FACTOR
1	4942.75	74.0	53.5	-20.5	PK	V	118	185	18.9
1	4936.00	54.0	53.5	-.5	AVG	V	188	185	18.9
2*	7404.00	54.00	43.1		AVG	V			10.6
3*	1234.00	54.0	37.2		AVG	V			3.9
4**	19744.00	54.0			AVG	V			
5**	22212.00	54.0			AVG	V			

* Note: No signal, amplitude is a noise floor measurement.

** Note: Measurement not taken due to the small amplitude of the lower harmonics.

6.5 Test Set Up Photographs

2002 Valley Highway PO Box 3 Acme WA 98220-0003
phone:888 226-3837 fax: 360 595-2722

7. Miscellaneous Comments and Notes

1. None

8. Informative Information

American Association for Laboratory Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC GUIDE 25-1990 (EN45001)

ACME TESTING
2002 Valley Highway
Acme, WA 98220-0003
Steve Fitzgerald Phone: 360 595 2785

ELECTRICAL (EMC)

Valid to: November 30, 2001 Certificate Number: 0829-01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following Electromagnetic Compatibility (EMC) tests:

Radiated & Conducted Emissions
Immunity
Voltage sags
Harmonics
Flicker

On the following materials and products:
Electrical and electronic equipment for information technology; industrial, scientific, and medical applications; residential service; receivers; and licensed and unlicensed transmitters.

Using the following standards:
U.S. Code of Federal Regulations (CFR) 47, FCC Method Parts 15 (using ANSI C63.4-1992), 18 & 90
CISPR: 11; 13; 14 (*excluding click measurements*); 22 (*including Amendments 1 and 2*)
CNS: 13439; 13438
EN: 50081-1; 50081-2; 50082-1; 50082-2; 55011; 55013; 55014-1 (*excluding click measurements*); 55014-2; 55022; 55103-1; 55103-2; 60601-1-2; 60945 (*sections 9 & 10 only*); 61000-4-2; 61000-4-3; 61000-4-4; 61000-4-5 (*single phase only, excluding 10/700 surge testing*); 61000-4-6; 61000-4-8; 61000-4-11; 61000-3-2; 61000-3-3
AS/NZS: 3548, 2064.1/2, 4251.1, 4252.1
IEC: 801-2; 801-3; 801-4; 801-5; 1000-4-2; 1000-4-3; 1000-4-4; 1000-4-5; 1000-4-6
ENV: 50140; 50204
ICES-003 Issue 2 Revision 1
RSS-210 Issue 2
Bellcore GR-1089-CORE (*Sections 2 through 3.2.4*)

Peter Mayer

5301 Buckeystown Pike, Suite 350 • Frederick, MD 21704-8370 • Phone: 301 644 3248 • Fax: 301 662 2974

2002 Valley Highway PO Box 3 Acme WA 98220-0003
phone:888 226-3837 fax: 360 595-2722

Laboratory Division
7435 Oakland Mills Road
Columbia, MD. 21046

November 22, 1999

Registration Number: 90420

Acme Testing Company
P.O. Box 3
2002 Valley Highway
Acme, WA 98220-0003

Attention: Paul Slavens

Re: Measurement facility located at Acme, Sites 1 & 2
3, 10 & 30 meter sites
Date of Listing: November 22, 1999

Gentlemen:

Your submission of the description of the subject measurement facility has been reviewed and found to be in compliance with the requirements of Section 2.948 of the FCC Rules. The description has, therefore, been placed on file and the name of your organization added to the Commission's list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that this filing must be updated for any changes made to the facility, and at least every three years from the date of listing the data on file must be certified as current.

If requested, the above mentioned facility has been added to our list of those who perform these measurement services for the public on a fee basis. An up-to-date list of such public test facilities is available on the Internet on the FCC Website at WWW.FCC.GOV, E-Filing, OET Equipment Authorization Electronic Filing.

Sincerely,

Thomas W Phillips
Electronics Engineer