ROGERS LABS, INC.
4405 West 259th Terrace
Louisburg, KS 66053
Phone / Fax (913) 837-3214

TEST REPORT

For

CLASS two PERMISSIVE CHANGE of

CERTIFICATED EQUIPMENT

For

TEKK Incorporated

226 NW Parkway
Kansas City, MO 64150

Steve Dinsmore,
National Sales Manager
Phone: 1 800-521-8355

MODEL: KS-960
UHF TRANSMITTER
FREQUENCY: 450-470 MHz

FCC ID: GOX KS-960

Test Date: May 28, 2003

Certifying Engineer: Scot D Rogers

Scot D. Rogers
ROGERS LABS, INC.
4405 West 259th Terrace
Louisburg, KS 66053
Phone: (913) 837-3214
FAX: (913) 837-3214

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FORWARD:

The following is information is submitted in accordance with the Federal Communications Code of Federal Regulations, dated October 1, 2002, Part 2 Subpart J, Paragraphs 2.1043, 2.1049, and 90.210(d).

List of Test Equipment

A Hewlett Packard 8591EM and or 8562A Spectrum Analyzer was used as the measuring device for the emissions testing. The analyzer settings used are described in the following table. Refer to the Appendix for a complete list of Test Equipment.

HP 8591EM SPECTRUM ANALYZER SETTINGS		
CONDUCTED EMISSIONS:		
RBW	AVG. BW	DETECTOR FUNCTION
9 kHz	30 kHz	Peak/Quasi Peak
RADIATED EMISSIONS (30 – 1000 MHz):		
RBW	AVG. BW	DETECTOR FUNCTION
120 kHz	300 kHz	Peak/Quasi Peak
HP 8562A SPECTRUM ANALYZER SETTINGS		
RADIATED EMISSIONS (1 – 40 GHz):		
RBW	AVG. BW	DETECTOR FUNCTION
1 MHz	1 MHz	Peak/Average
ANTENNA CONDUCTED EMISSIONS:		
RBW	AVG. BW	DETECTOR FUNCTION
120 kHz	300 kHz	Peak
Or as directed in TIA/EIA 603		

2.1033(c) Application for Certification

(1) Manufacturer:
Marketer/Vendor:
TEKK Incorporated
226 NW Parkway
Kansas City, MO 64150

(2) Identification: Model: KS-960
S/N: OBK 01574
FCC I.D.: GOX KS-960

(3) Instruction Book:

Refer to original submittal exhibit for Instruction Manual.

(4) Emission Type: 11K5F1D

(5) Frequency Range: 450 to 470 MHz,

(6) Operating Power Level: 2 Watts with 9.6 Volt battery supply

(7) Max P_o: 2 Watts

(8) Power into final amplifier:
Refer to original submittal for final amplifier power.

(9) Tune Up Procedure for Output Power:

Refer to original submittal exhibit for Transceiver Alignment Procedure.

(10) Circuit Diagrams; description of circuits, frequency stability, spurious suppression, and power and modulation limiting:
Refer to original submittal for Circuit Diagrams.
Refer to original submittal for Theory of Operation.

(11) Photograph or drawing of the Identification Plate:

Refer to original submittal for Photograph or Drawing.

(12) Drawings of Construction and Layout:

Refer to original submittal for Drawings of Components Layout and Chassis Drawings.

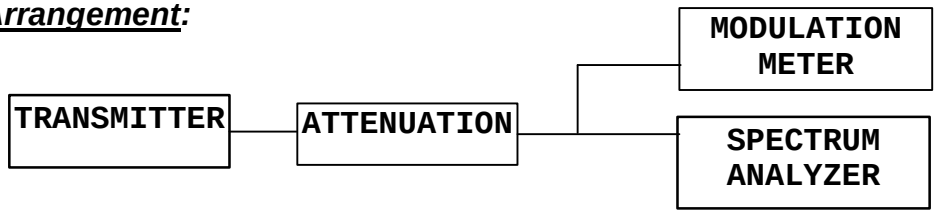
(13) Detail Description of Digital Modulation:
Not applicable.

2.1049 Occupied Bandwidth

Measurements Required:

The occupied bandwidth, that is the frequency bandwidth such that below its lower and above its upper frequency limits, the mean powers radiated are equal to 0.5 percent of the total mean power radiated by a given emission.

Test Arrangement:



Results:

f_c (MHz)	O.B.(kHz)
464.500	9.5

A spectrum analyzer was used to observe the radio frequency spectrum with the transmitter operating in a normal mode, modulated by a frequency of 2500 Hz at a level 16 dB above 50% modulation. The power ratio in dB representing 99.5% of the total mean power was recorded from the spectrum analyzer. Refer to figure1 showing compliance with paragraph 90.210(d) emission mask.
The necessary bandwidth calculation for this unit is as follows:

$B_N = 2M + 2Dk$ (k=1), M=2350, and D=3400
$B_N = 2(2350) + 2(3400)(1)$
$B_N = 11.5$ kHz

Then B_N equates to 11k5.

Requirements of 2.1049(c)(1) and applicable paragraphs of Part 90 are met. There are no deviations to the specifications.

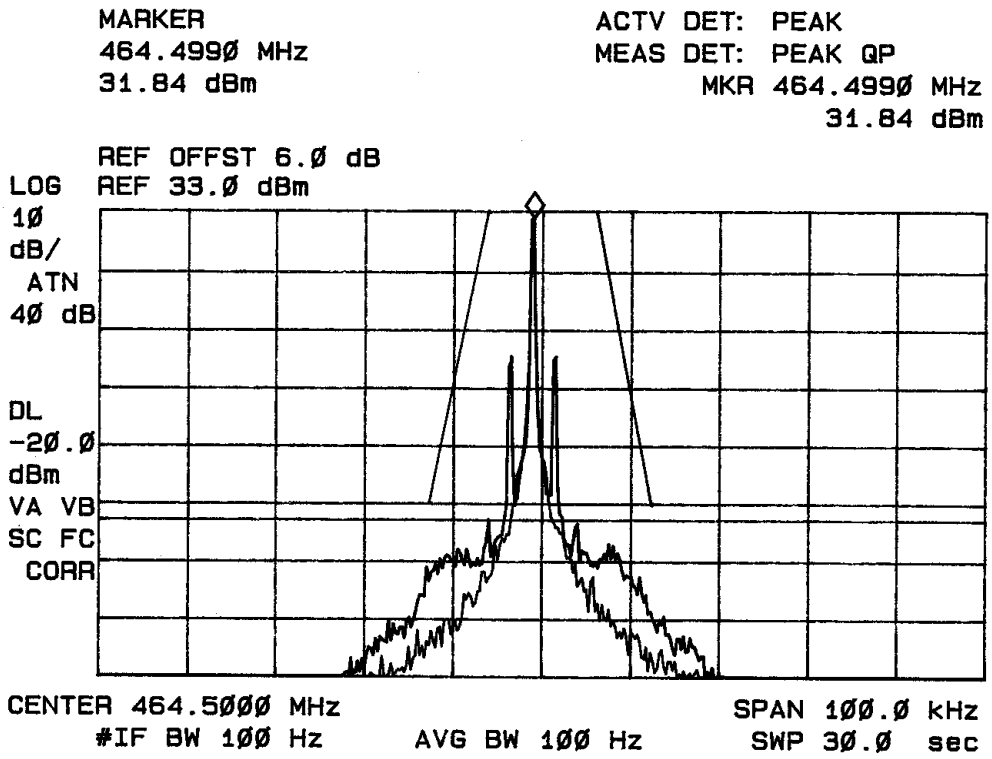


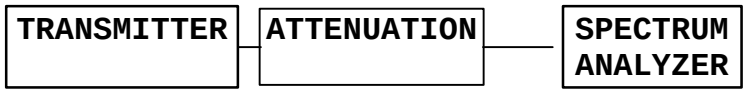
Figure 1 part 90.210 emission mask d compliance.

2.1051 Spurious Emissions at Antenna Terminals

Measurements Required:

The radio frequency voltage or power generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna.

Test Arrangement:



The radio frequency output was coupled to a HP 8562 Spectrum Analyzer. The spectrum analyzer was used to observe the radio frequency spectrum with the transmitter operated in a normal mode. The frequency spectrum from 0 MHz to 10.0 GHz was observed and plots produced of the frequency spectrum. Figures 2 through 4 represent data for the KS-960. Data was taken per 2.1051, 2.1057, and applicable paragraphs of Part 90.

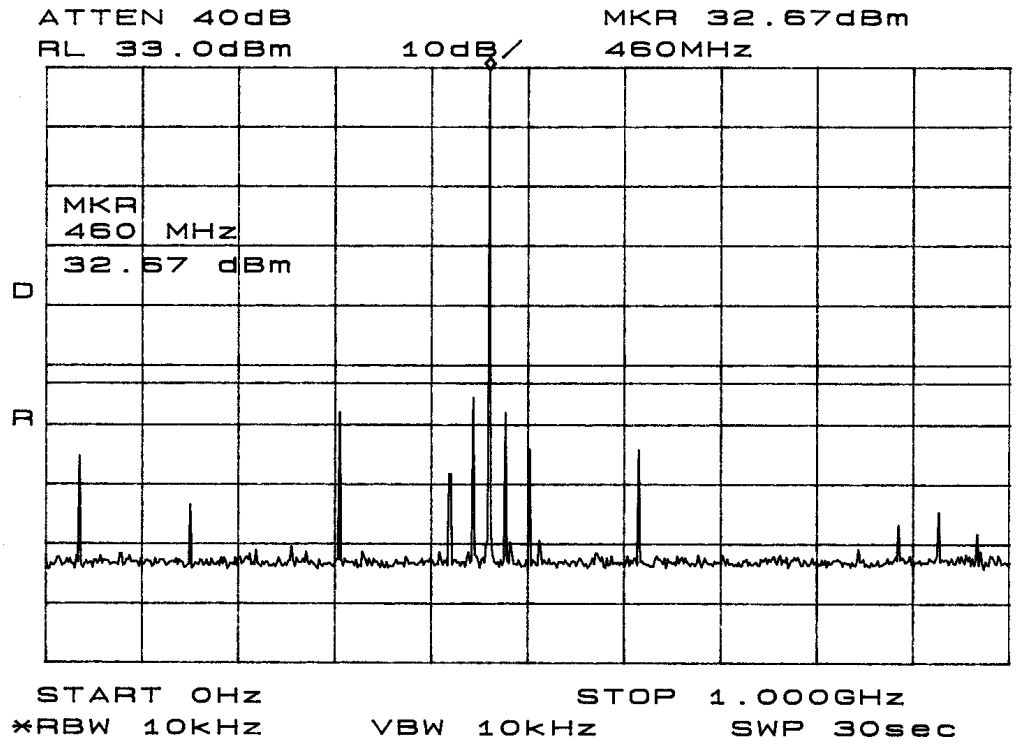


Figure 2: Emissions at Antenna Terminal

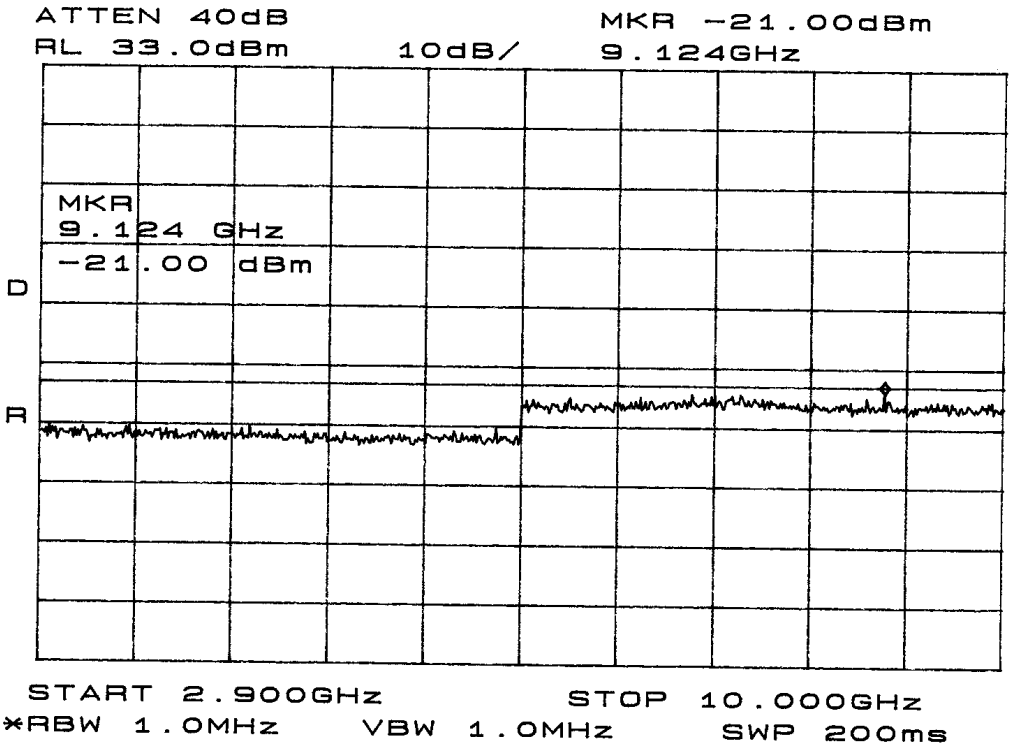


Figure 3: Emissions at Antenna Terminal

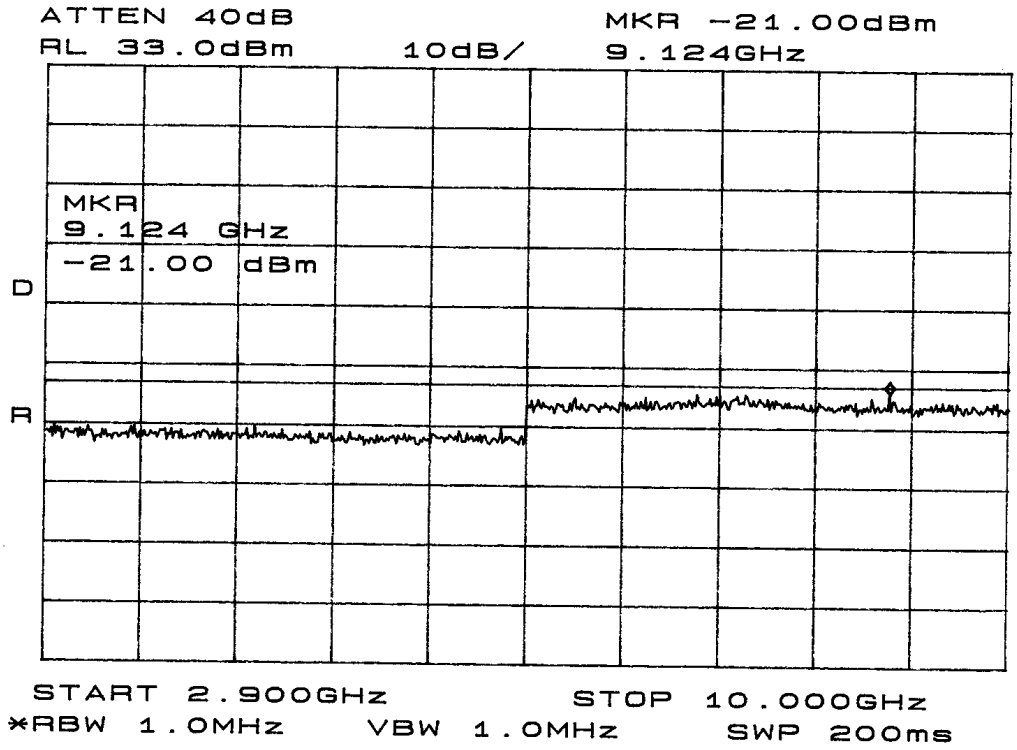


Figure 4: Emissions at Antenna Terminal

Results:

The output of the unit was coupled to a HP Spectrum Analyzer and the frequency emissions were measured. Data was taken as per 2.1051 and applicable paragraphs of Parts 2 and 90. Specifications of Paragraphs 2.1051, 2.1057 and applicable paragraphs of parts of 22, 74, and 90 are met. There are no deviations to the specifications.

FCC Limit (attenuation below carrier):
2 Watt = 50 + 10 LOG(P_o)
= 50 + 10 LOG(2)
= 53.0 dBc

2 Watt Output

CHANNEL MHz	SPURIOUS FREQ. (MHz)	LEVEL BELOW CARRIER (dB)
464.500	929.00	-74.2
	1393.50	-65.2
	1858.00	-55.7
	2322.50	-66.8
	2787.00	-68.1
	3251.50	-70.4

APPENDIX

Model: KS-960

1. Test Equipment List.
2. Rogers Qualifications.
3. FCC Site Approval Letter.

TEST EQUIPMENT LIST FOR ROGERS LABS, INC.

The test equipment used is maintained in calibration and good operating condition. Use of this calibrated equipment ensures measurements are traceable to national standards.

List of Test Equipment:	Calibration Date:
Scope: Tektronix 2230	2/03
Wattmeter: Bird 43 with Load Bird 8085	2/03
Power Supplies: Sorensen SRL 20-25, SRL 40-25, DCR 150, DCR 140	2/03
H/V Power Supply: Fluke Model: 408B (SN: 573)	2/03
R.F. Generator: HP 606A	2/03
R.F. Generator: HP 8614A	2/03
R.F. Generator: HP 8640B	2/03
Spectrum Analyzer: HP 8562A, Mixers: 11517A, 11970A, 11970K, 11970U, 11970V, 11970W HP Adapters: 11518, 11519, 11520	2/03
Spectrum Analyzer: HP 8591 EM	5/03
Frequency Counter: Leader LDC 825	2/03
Antenna: EMCO Biconilog Model: 3143	5/03
Antenna: EMCO Log Periodic Model: 3147	10/02
Antenna: Antenna Research Biconical Model: BCD 235	10/02
Antenna: EMCO Dipole Set 3121C	2/03
Antenna: C.D. B-101	2/03
Antenna: Solar 9229-1 & 9230-1	2/03
Antenna: EMCO 6509	2/03
Audio Oscillator: H.P. 201CD	2/03
R.F. Power Amp 65W Model: 470-A-1010	2/03
R.F. Power Amp 50W M185- 10-501	2/03
R.F. PreAmp CPPA-102	2/03
LISN 50 µHy/50 ohm/0.1 µf	10/02
LISN Compliance Eng. 240/20	2/03
Peavey Power Amp Model: IPS 801	2/03
Power Amp A.R. Model: 10W 1010M7	2/03
Power Amp EIN Model: A301	2/03
ELGAR Model: 1751	2/03
ELGAR Model: TG 704A-3D	2/03
ESD Test Set 2010i	2/03
Fast Transient Burst Generator Model: EFT/B-101	2/03
Current Probe: Singer CP-105	2/03
Current Probe: Solar 9108-1N	2/03
Field Intensity Meter: EFM-018	2/03
KEYTEK Ecat Surge Generator	2/03
Shielded Room 5 M x 3 M x 3.0 M (101 dB Integrity)	

05/20/2003

QUALIFICATIONS

Of

SCOT D. ROGERS, ENGINEER

ROGERS LABS, INC.

Mr. Rogers has approximately 13 years experience in the field of electronics. Six years working in the automated controls industry and 6 years working with the design, development and testing of radio communications and electronic equipment.

POSITIONS HELD:

Systems Engineer:	A/C Controls Mfg. Co., Inc. 6 Years
Electrical Engineer:	Rogers Consulting Labs, Inc. 5 Years
Electrical Engineer:	Rogers Labs, Inc. Current

EDUCATIONAL BACKGROUND:

1) Bachelor of Science Degree in Electrical Engineering from Kansas State University.

2) Bachelor of Science Degree in Business Administration Kansas State University.

3) Several Specialized Training courses and seminars pertaining to Microprocessors and Software programming.

Scot D Rogers

Scot D. Rogers

May 28, 2003
Date

1/11/00

FEDERAL COMMUNICATIONS COMMISSION
Laboratory Division
7435 Oakland Mills Road
Columbia, MD. 21046

December 08, 2000

Registration Number: 90910

Rogers Labs, Inc.
4405 West 259th Terrace
Louisburg, KS 66053

Attention: Scot D. Rogers

Re: Measurement facility located at Louisburg
3 & 10 meter site
Date of Listing: December 08, 2000

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

Thomas W Phillips
Electronics Engineer