

**ROGERS**

**Labs, Inc.**

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4405 West 259TH Terrace • Louisburg, KS 66053 • PHONE & FAX: (913) 837-3214

## **CERTIFICATION APPLICATION**

For

AlliedSignal, INC.  
Electronic and Avionic Systems  
23500 West 105th Street  
Olathe, KS 66061

Dave Berneking,  
Engineering Team Leader

MODEL: KY196B  
P/N 064-01084-0101  
FREQUENCY: 118.0-136.990 MHz

FCC ID: ASY KY196B

Test Date: January 23, 1999

Certifying Engineer:

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**FORWARD:**

In accordance with the Federal Communications Code of Federal Regulations, dated October 1, 1997, Part 2 Subpart J, Paragraphs 2.907, 2.911, 2.913, 2.915, 2.925, 2.926, 2.1031 through 2.1057, Part 87, Subchapter D, Paragraphs 87.131 through 87.147, and FCC document FCC98-58, the following is submitted:

**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.

| <b>HP 8591EM SPECTRUM ANALYZER SETTINGS</b> |         |                   |
|---------------------------------------------|---------|-------------------|
| 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   |
| <b>HP 8562A SPECTRUM ANALYZER SETTINGS</b>  |         |                   |
| 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              |

**2.1033(c) Application for Certification**

- (1) Manufacturer: AlliedSignal, INC.  
Electronic and Avionics Systems  
23500 West 105th Street  
Olathe, KS 66061
- (2) Identification: Model: KY196B P/N 064-01084-0101  
FCC I.D.: ASY KY196B

Refer to the attached Product Description Sheet.

- (3) Instruction Book:

Draft Instruction Manual attached

- (4) Emission Type: 6K00A3E, 6K00A9W

- (5) Frequency Range: 118.0 - 136.990 MHz,  
Adjustable in 8.33 or 25 kHz steps.

- (6) Operating Power Level:

25 Watts

- (7) Max  $P_o$ : 25 Watts

- (8) Power into final amplifier: 165 Watts (27.5V @ 6A).

- (9) Tune Up Procedure for Output Power:

Refer to Appendix for Transceiver Alignment Procedure.

- (10) Circuit Diagrams; description of circuits, frequency stability, spurious suppression, and power and modulation limiting:

Refer to Appendix for Circuit Diagrams.  
Refer to Appendix for Theory of Operation.

- (11) Photograph or drawing of the Identification Plate:

Refer to Appendix for Photograph or Drawing.

- (12) Drawings of Construction and Layout:

Refer to Appendix for Drawings of Components Layout and Chassis Drawings.

- (13) Detail Description of Digital Modulation:

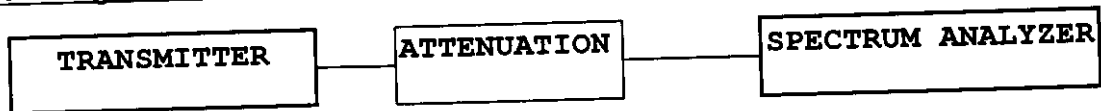
Refer to Appendix for Description of Digital Modulation.

## 2.1046 RF Power Output

### Measurements Required:

Measurements shall be made to establish the radio frequency power delivered by the transmitter into the standard output termination. The power output shall be monitored and recorded and no adjustment shall be made to the transmitter after the test has begun, except as noted below:  
If the power output is adjustable, measurements shall be made for the highest and lowest power levels.

### Test Arrangement:



The radio frequency power output was measured at the antenna terminal by replacing the antenna with a spectrum analyzer, 40-dB attenuation and cable. The spectrum analyzer had an impedance of  $50\Omega$  to match the impedance of the standard antenna. A HP 8591EM Spectrum Analyzer was used to measure the radio frequency power at the antenna port. The data was taken in dBm and converted to watts as shown in the following Table. Refer to Figures 1 through 4 showing the output power of the transmitter. Data taken per Paragraph 2.1046(a) and applicable parts of Part 87.

$P_{dBm}$  = power in dB above 1 milliwatt.  
 Milliwatts =  $10^{(P_{dBm}/10)}$   
 Watts = (Milliwatts) (0.001) (W/mW)

43.6 dBm =  $10^{(43.6/10)}$   
 = 23,067 mW  
 = 23 Watts

### Results:

| REQUENCY | $P_{dBm}$ | $P_{mW}$ | $P_W$ |
|----------|-----------|----------|-------|
| 118.0    | 43.6      | 23,067   | 23    |
| 127.5    | 43.9      | 24,604   | 25    |
| 136.975  | 43.7      | 23,442   | 23    |
| 136.990  | 43.6      | 22,909   | 23    |

The specifications of Paragraph 2.1046(a) and applicable Parts of 87 are met. There are no deviations to the specifications.

MARKER  
118.025 MHz  
3.63 dBm

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 118.025 MHz  
3.63 dBm

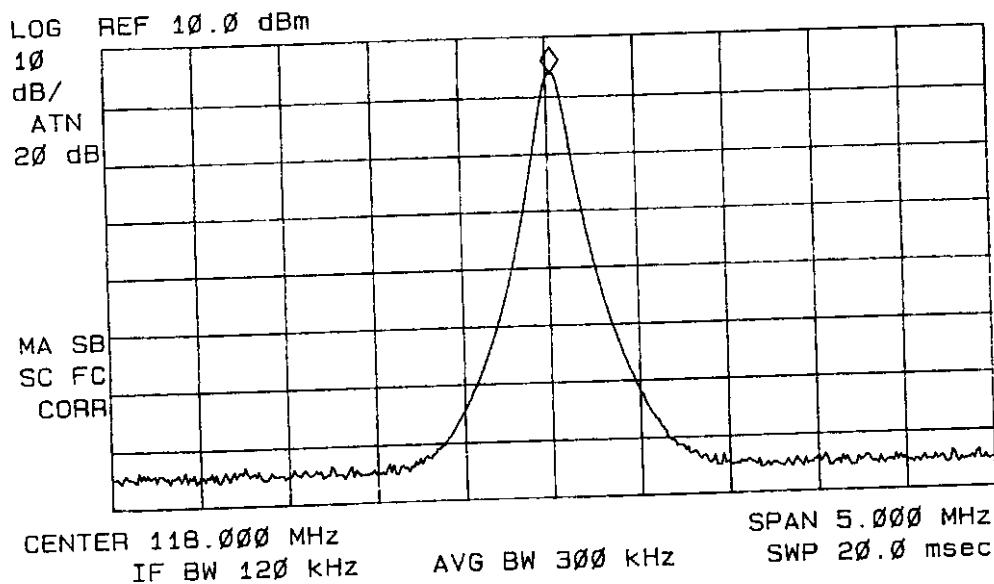


Figure 1: Power Output Channel 118.0

MARKER  
127.525 MHz  
3.91 dBm

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 127.525 MHz  
3.91 dBm

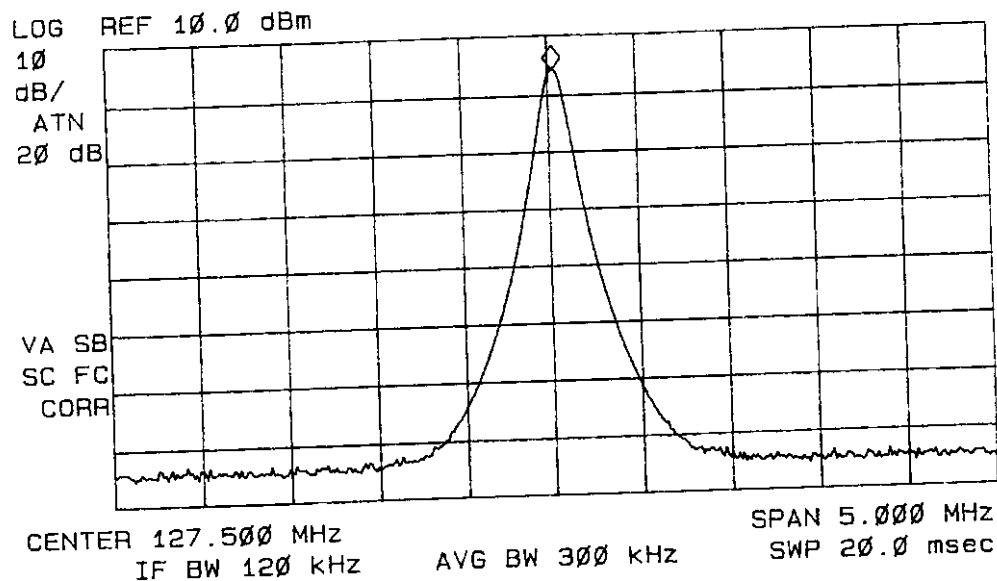


Figure 2: Power Output Channel 127.5

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AlliedSignal, INC. Electronics and Avionics Systems  
MODEL: KY196B P/N 064-01084-0101  
Test #: 990120 FCC ID#: ASY KY196B  
Test to: FCC Parts 2 and 87

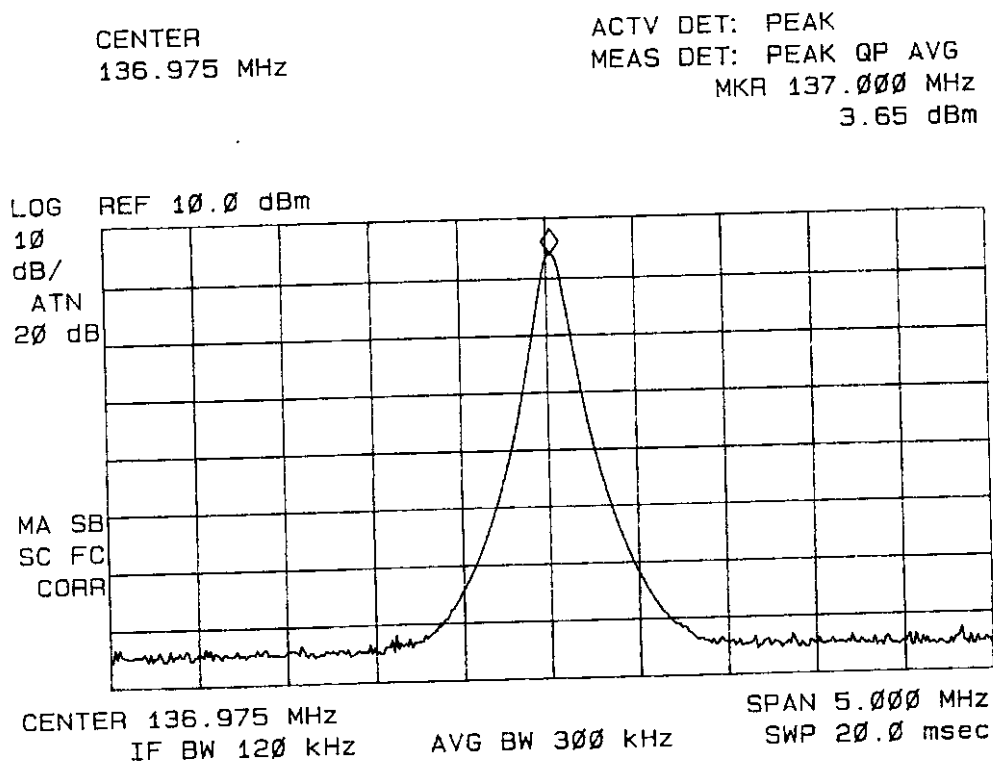


Figure 3: Power Output Channel 136.975

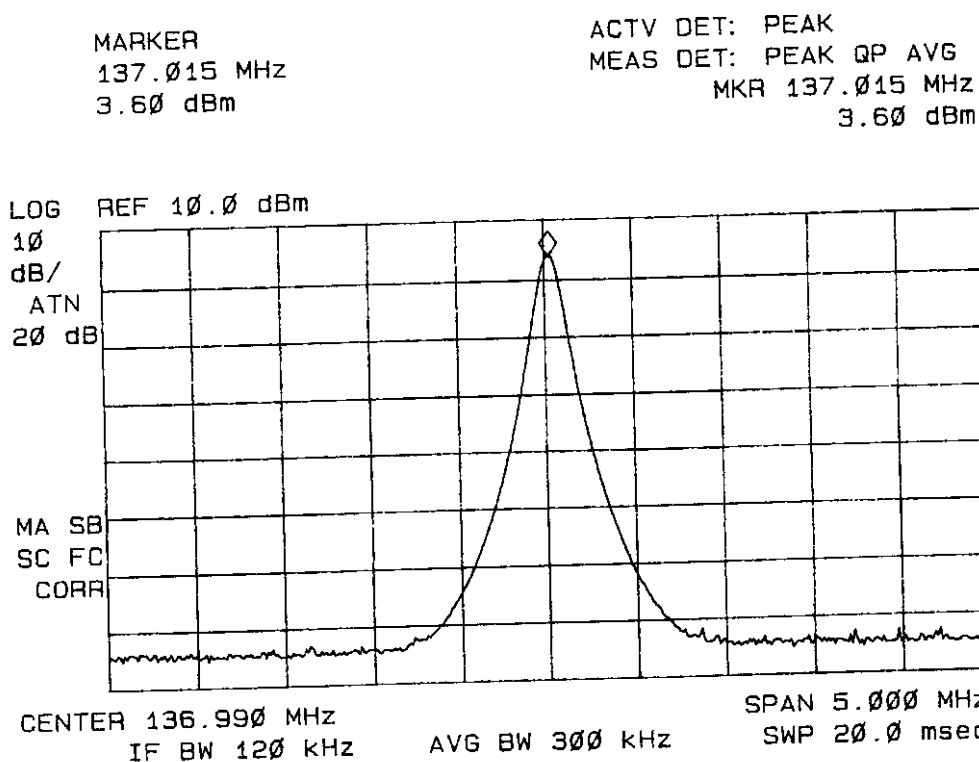


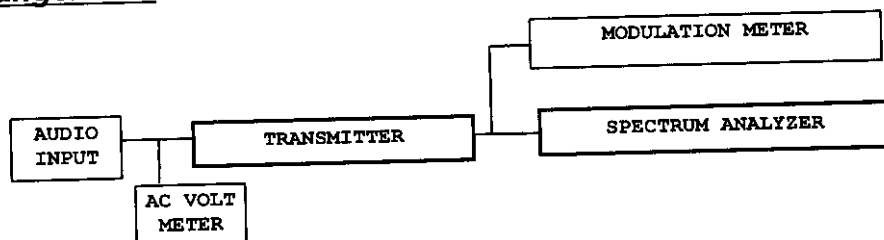
Figure 4: Power Output Channel 136.990

## 2.1047 Modulation Characteristics

### Measurements Required:

A curve or equivalent data, which shows that the equipment will meet the modulation requirements of the rules, under which the equipment is to be licensed, shall be submitted.

### Test Arrangement:



The radio frequency output was coupled to a HP Spectrum Analyzer and a modulation meter. The spectrum analyzer was used to observe the radio frequency spectrum with the transmitter operating in its various modes. The modulation meter was used to measure the percent modulation.

### Results:

Figure 5 displays the graph made showing the audio frequency response of the modulator. The frequency generator was set to 1 kHz and injected into the audio input port of the EUT. The amplitude was adjusted to obtain 50% modulation at 1000 Hz. This level was then taken as the 0-dB reference. The frequency of the generator was then varied and the output level recorded while holding the input levels constant.

| Audio Frequency<br>(Hz) | Response normalized to 1000<br>Hz (dB) |
|-------------------------|----------------------------------------|
| 100                     | -14.0                                  |
| 200                     | -7.0                                   |
| 500                     | -4.0                                   |
| 1000                    | 0                                      |
| 2000                    | -1.0                                   |
| 3000                    | -40                                    |

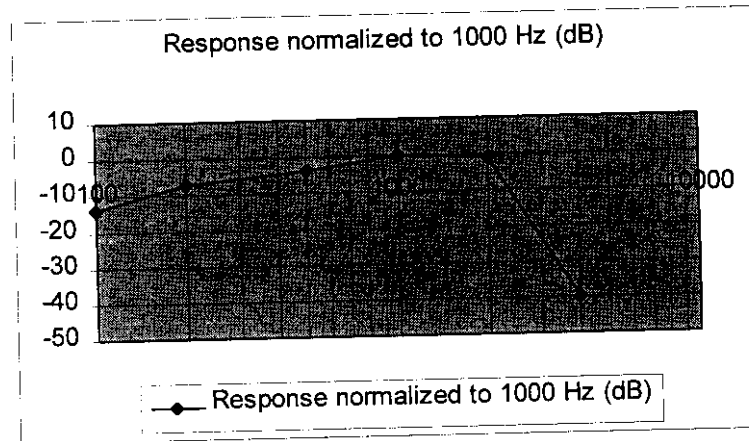


Figure 5: Audio Response Characteristics.

Figure 6 shows the modulation response for each of three tones while the input voltage was varied. The frequency is held constant the input voltage is varied and the modulation is read from the modulation meter. The specifications of Paragraph 2.987(b) and applicable parts of 87 are met.

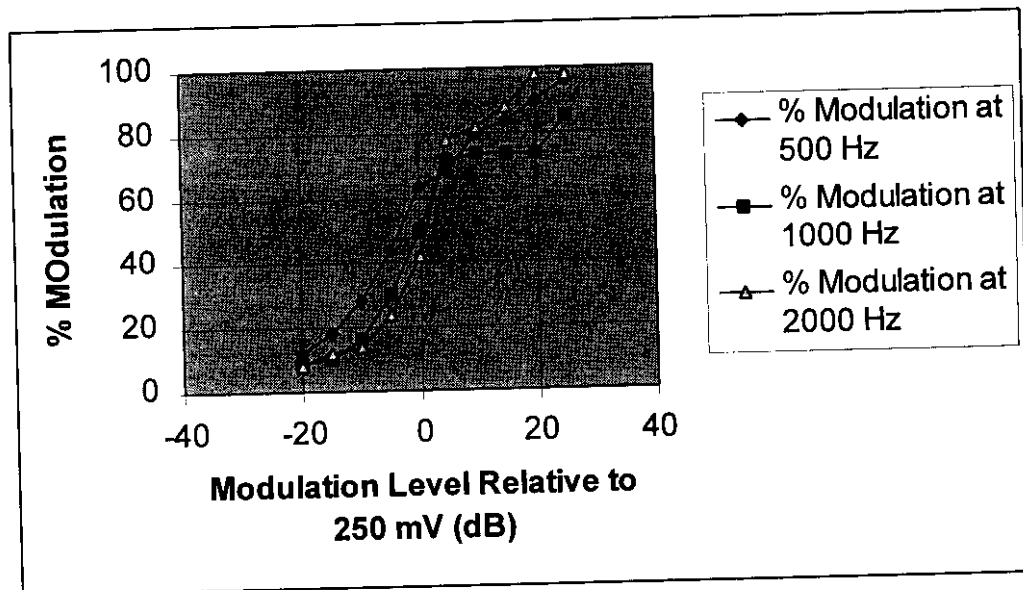


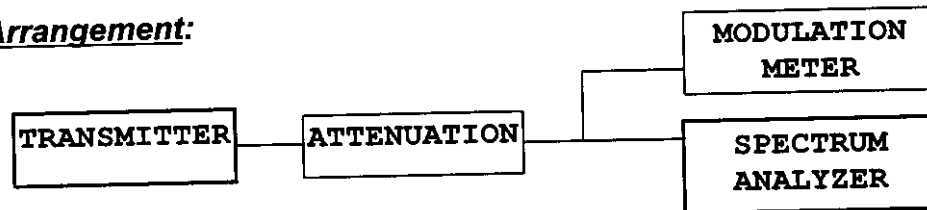
Figure 6: Modulation Characteristics.

## 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:

| Channel Spacing | F <sub>c</sub> | O.B. kHz |
|-----------------|----------------|----------|
| 25 kHz          | 127.500        | 5.7      |
| 25 kHz ACARS    | 127.500        | 5.3      |
| 8.33 kHz        | 127.505        | 5.6      |

Refer to Figures 7, 8 and 9.

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.

Requirements of 2.1049(c)(1) and applicable paragraphs of Part 87 are met. There are no deviations to the specifications.

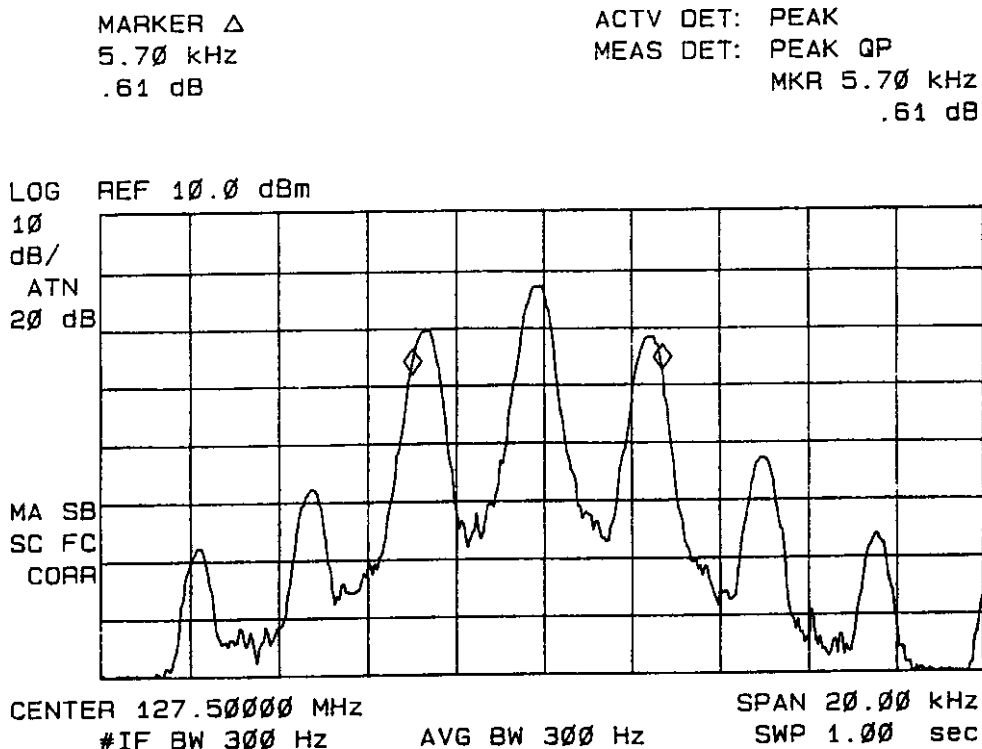


Figure 7: Occupied Band Width, Channel Spacing 25 kHz, Audio

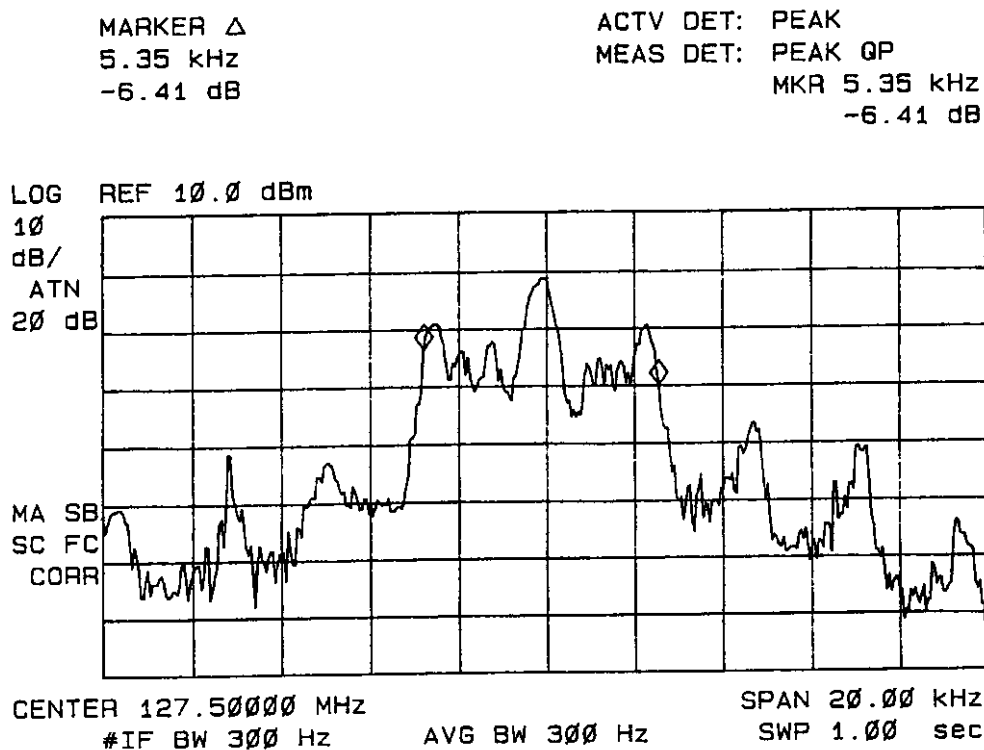


Figure 8: Occupied Band Width, Channel Spacing 25 kHz, ACARS

MARKER  $\Delta$   
5.60 kHz  
2.03 dB

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 5.60 kHz  
2.03 dB

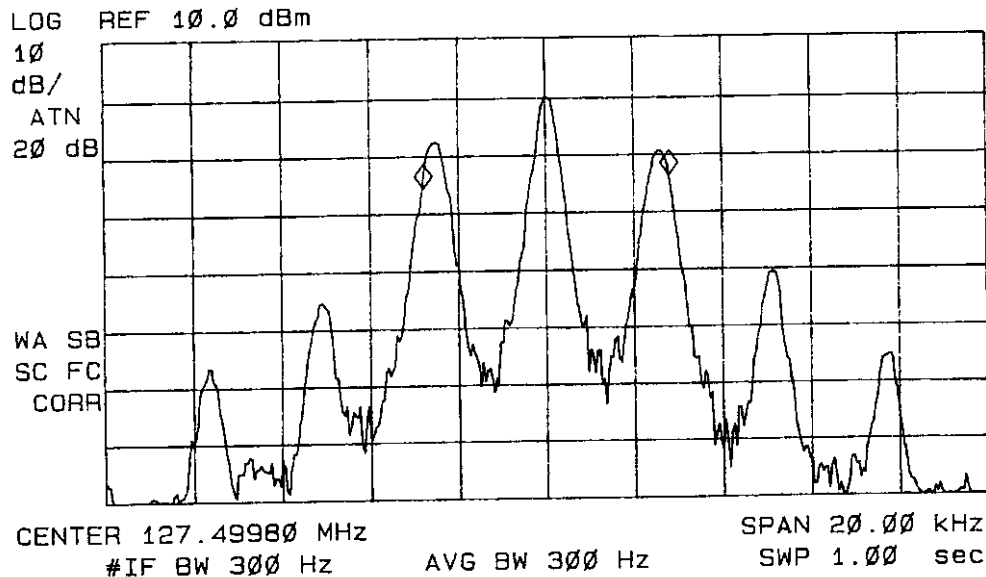


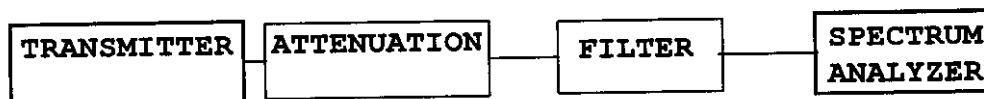
Figure 9: Occupied Band Width, Channel Spacing 8.33 kHz, Audio

## 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 8591EM 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 10 MHz to 1.5 GHz was observed and plots produced of the frequency spectrum. Figures 10 and 11 represent data for the KY196B. Data taken per 2.1051, 2.1057, and applicable paragraphs of Part 87.

MARKER  
1.399 GHz  
-64.13 dBm

ACTV DET: PEAK  
MEAS DET: PEAK QP  
MKR 1.399 GHz  
-64.13 dBm

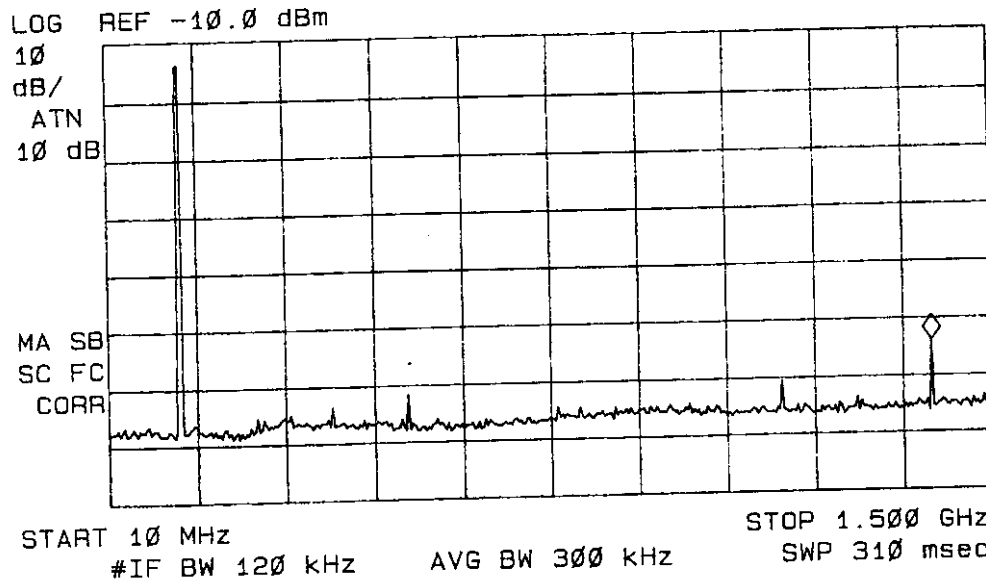


Figure 10: Emissions at Antenna Terminal 25 kHz Channel Spacing

MARKER  
1.399 GHz  
-61.20 dBm

ACTV DET: PEAK  
MEAS DET: PEAK QP  
MKR 1.399 GHz  
-61.20 dBm

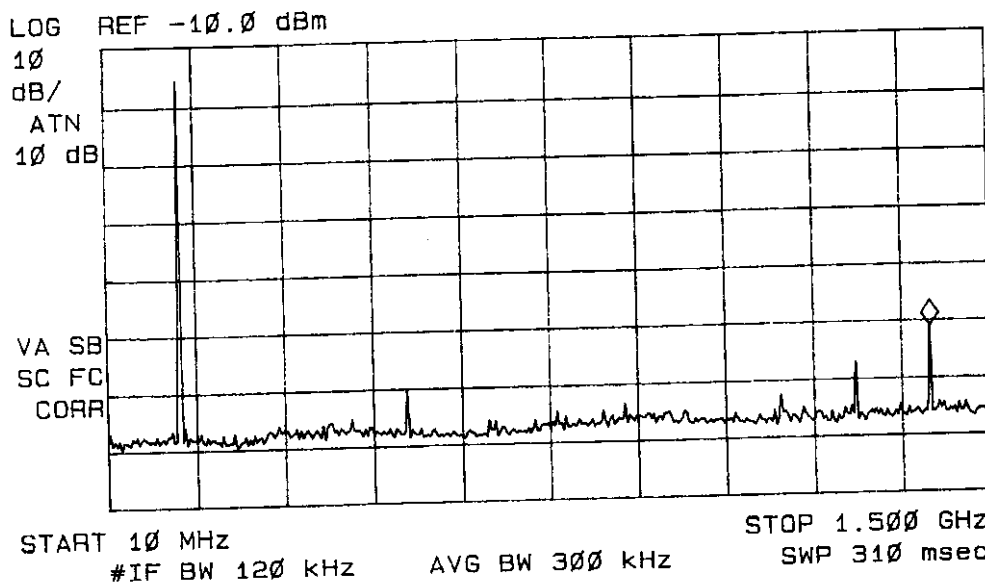


Figure 11: Emissions at Antenna Terminal 8.33 kHz Channel Spacing

**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 Part 87. Specifications of Paragraphs 2.1051, 2.1057 and applicable parts of 87 are met. There are no deviations to the specifications.

**FCC Limit:**

$$\begin{aligned} 25 \text{ Watt} &= 43 + 10 \text{ LOG}(P.) \\ &= 43 + 10 \text{ LOG}(25) \\ &= 54.4 \end{aligned}$$

**Level below carrier:**

$$\begin{aligned} &\text{Amplitude of carrier less amplitude of harmonic} \\ &= 43.9 - (-79.5) \\ &= 123.1 \end{aligned}$$

| CHANNEL<br>MHz | SPURIOUS<br>FREQ. (MHz) | LEVEL BELOW<br>CARRIER (dB) | SPURIOUS<br>AMPLITUDE (dB) |
|----------------|-------------------------|-----------------------------|----------------------------|
| 118.000        | 236.0                   | 123.1                       | -79.5                      |
|                | 354.0                   | 121.5                       | -77.9                      |
|                | 472.0                   | 118.1                       | -74.3                      |

| CHANNEL<br>MHz | SPURIOUS<br>FREQ. (MHz) | LEVEL BELOW<br>CARRIER (dB) | SPURIOUS<br>AMPLITUDE (dB) |
|----------------|-------------------------|-----------------------------|----------------------------|
| 127.500        | 255.0                   | 122.2                       | -78.3                      |
|                | 382.5                   | 121.5                       | -77.6                      |
|                | 51.0                    | 116.0                       | -72.1                      |
|                | 1402.5                  | 105.1                       | -61.2                      |

| CHANNEL<br>MHz | SPURIOUS<br>FREQ. (MHz) | LEVEL BELOW<br>CARRIER (dB) | SPURIOUS<br>AMPLITUDE (dB) |
|----------------|-------------------------|-----------------------------|----------------------------|
| 136.975        | 273.95                  | 120.7                       | -77.1                      |
|                | 410.93                  | 118.9                       | -75.3                      |
|                | 547.90                  | 120.2                       | -76.6                      |
|                | 1232.78                 | 112.1                       | -68.5                      |

| CHANNEL<br>MHz | SPURIOUS<br>FREQ. (MHz) | LEVEL BELOW<br>CARRIER (dB) | SPURIOUS<br>AMPLITUDE (dB) |
|----------------|-------------------------|-----------------------------|----------------------------|
| 127.505        | 255.0                   | 120.1                       | -76.2                      |
|                | 382.5                   | 119.7                       | -75.8                      |
|                | 510.0                   | 114.1                       | -70.2                      |
|                | 1420.5                  | 105.1                       | -61.2                      |

## 2.1053 Field Strength of Spurious Radiation

### Measurements Required:

Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation.

### Test Arrangement:



The transmitter was placed on a wooden turntable 0.8 meters above the ground plane and at a distance of 3 meters from the FSM antenna. The turntable was rotated through 360 degrees to locate the position registering the highest amplitude emission. The frequency spectrum was then searched for spurious emissions generated from the transmitter. The amplitude of each spurious emission was maximized by raising and lowering the FSM antenna and rotating the turntable before data was recorded. A log periodic antenna was used for frequencies of 200 MHz to 5 GHz and pyramidal horn antennas were used for frequencies of 5 GHz to 40 GHz. Emission levels were measured and recorded from the spectrum analyzer in dBμV. This level was then added to the antenna factor to calculate the field strength at 3 meters. Data was taken at the ROGERS LABS, INC. 3 meters open area test site (OATS). A description of the test facility is on file with the FCC, Reference 31040/SIT, 1300F2, dated February 6, 1998. The testing procedures used conform to the procedures stated in the ANSI 63.4-1992 document.

Calculations made are as follows:

CFS = Calculated Field Strength  
FSM = Field Strength Measurement  
CFS = FSM + Antenna Factor  
CFS = 40.4 + 13.5 - 35  
CFS = 18.9

The limit for emissions are defined by the following equations:

Limit = Amplitude of spurious emission must be attenuated by this amount below the level of the fundamental.

Calculating the field strength at 3 meters for the 25-watt transmitter was done as follows:

$$E = \frac{5.5 \sqrt{PG}}{d} \quad \text{where } E \text{ is V/m, } P \text{ is Watts, } G = 1.64 \text{ and } d \text{ is meters.}$$

$$E = \frac{5.5 \sqrt{25(1.64)}}{3} = 11.74 \text{ V/m} = 11.74\text{E}6\mu\text{V/m at 3 meters.}$$

This was converted to dBμV/m using (20\*log μV/m) for convenience.

$$20 \cdot \text{Log}(11.74\text{E}6) = 141.4 \text{ dB}\mu\text{V/m @ 3 meters}$$

On any frequency removed from the assigned frequency by more than 250% of the authorized bandwidth: at least 43 + 10 Log (P.) dB.

$$\begin{aligned} \text{Attenuation} &= 43 + 10 \text{ Log}_{10}(P_w) \\ &= 43 + 10 \text{ Log}_{10}(25) \\ &= 54.4 \text{ dB} \end{aligned}$$

$$\begin{aligned} \text{Limit} &= 141.4 - 54.4 \\ &= 87.0 \end{aligned}$$

### **Results:**

Channel 118.000 MHz

| Frequency (MHz) | FSM Horz. (dBμV) | FSM Vert. (dBμV) | Ant. Factor (dB) | Amp. Gain (dB) | CFS Horz. @ 3m (dBμV/m) | CFS Vert. @ 3m (dBμV/m) | Limit |
|-----------------|------------------|------------------|------------------|----------------|-------------------------|-------------------------|-------|
| 236.0           | 40.4             | 37.3             | 13.5             | 35             | 18.9                    | 15.8                    | 87    |
| 354.0           | 41.2             | 39.9             | 16.5             | 35             | 22.7                    | 21.4                    | 87    |
| 472.0           | 55.8             | 44.7             | 20.8             | 35             | 41.6                    | 30.5                    | 87    |
| 590.0           | 51.4             | 54.9             | 21.7             | 33             | 38.1                    | 41.6                    | 87    |

## Channel 127.500 MHz

| Frequency (MHz) | FSM Horz. (dB $\mu$ V) | FSM Vert. (dB $\mu$ V) | Ant. Factor (dB) | Amp. Gain (dB) | CFS Horz. @ 3m (dB $\mu$ V/m) | CFS Vert. @ 3m (dB $\mu$ V/m) | Limit |
|-----------------|------------------------|------------------------|------------------|----------------|-------------------------------|-------------------------------|-------|
| 255.0           | 55.7                   | 51.3                   | 12.4             | 35             | 33.1                          | 28.7                          | 87    |
| 382.5           | 63.7                   | 69.5                   | 15.6             | 35             | 44.3                          | 50.1                          | 87    |
| 510.0           | 51.8                   | 52.5                   | 17.6             | 35             | 34.4                          | 35.1                          | 87    |
| 637.5           | 59.5                   | 56.6                   | 20               | 35             | 44.5                          | 41.6                          | 87    |

## Channel 136.975 MHz

| Frequency (MHz) | FSM Horz. (dB $\mu$ V) | FSM Vert. (dB $\mu$ V) | Ant. Factor (dB) | Amp. Gain (dB) | CFS Horz. @ 3m (dB $\mu$ V/m) | CFS Vert. @ 3m (dB $\mu$ V/m) | Limit |
|-----------------|------------------------|------------------------|------------------|----------------|-------------------------------|-------------------------------|-------|
| 273.98          | 57.5                   | 54.3                   | 13.5             | 35             | 36                            | 32.8                          | 87    |
| 410.93          | 60.7                   | 60.5                   | 16.1             | 35             | 41.8                          | 41.6                          | 87    |
| 547.90          | 52.9                   | 47.0                   | 18.6             | 35             | 36.5                          | 30.6                          | 87    |
| 684.90          | 53.1                   | 52.1                   | 20.5             | 35             | 38.6                          | 37.6                          | 87    |

## Channel 127.505 MHz

| Frequency (MHz) | FSM Horz. (dB $\mu$ V) | FSM Vert. (dB $\mu$ V) | Ant. Factor (dB) | Amp. Gain (dB) | CFS Horz. @ 3m (dB $\mu$ V/m) | CFS Vert. @ 3m (dB $\mu$ V/m) | Limit |
|-----------------|------------------------|------------------------|------------------|----------------|-------------------------------|-------------------------------|-------|
| 255.0           | 56.0                   | 52.5                   | 12.4             | 35             | 33.4                          | 29.9                          | 87    |
| 382.0           | 63.1                   | 67.5                   | 15.6             | 35             | 43.7                          | 48.1                          | 87    |
| 510.0           | 52.2                   | 53.4                   | 17.6             | 35             | 34.8                          | 36.0                          | 87    |
| 637.5           | 58.9                   | 57.7                   | 20               | 35             | 43.9                          | 42.8                          | 87    |

Specifications of Paragraph 2.1053, 2.1057 and 87.139 are met.  
There are no deviations to the specifications.

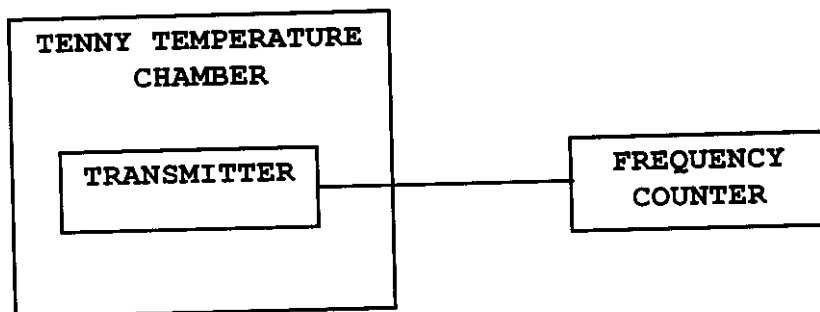
## 2.1055 Frequency Stability

### Measurements Required:

The frequency stability shall be measured with variations of ambient temperature from  $-30^{\circ}$  to  $+50^{\circ}$  centigrade. Measurements shall be made at the extremes of the temperature range and at intervals of not more than  $10^{\circ}$  centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. In addition to temperature stability the frequency stability shall be measured with variation of primary supply voltage as follows:

- (1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.
- (2) For hand carried, batteries powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.
- (3) The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

### Test Arrangement:



The measurement procedure outlined below shall be followed:

Steps 1: The transmitter shall be installed in an environmental test chamber whose temperature is controllable. Provision shall be made to measure the frequency of the transmitter.

Step 2: With the transmitter inoperative (power switched "OFF"), the temperature of the test chamber shall be adjusted to  $+25^{\circ}\text{C}$ . After a temperature stabilization period of one hour at  $+25^{\circ}\text{C}$ , the transmitter shall be switched "ON" with standard test voltage applied.

Step 3: The carrier shall be keyed "ON", and the transmitter shall be operated unmodulated at full radio frequency power output at the duty cycle, for which it is rated, for a duration of at least 5 minutes. The radio frequency carrier frequency shall be monitored and measurements shall be recorded.

Step 4: The test procedures outlined in Steps 2 and 3, shall be repeated after stabilizing the transmitter at the environmental temperatures specified, -30°C to 50°C in 10 degree increments.

The frequency stability was measured with variations in the power supply voltage from 85 to 115 percent of the nominal value. A Sorenson DC Power Supply was used to vary the dc voltage for the power input from 23.8 Vdc to 32.2 Vdc. The frequency was measured and the variation in parts per million was calculated. Data was taken per Paragraphs 2.1055 and 87.133.

### **Results:**

| FREQ.<br>(MHz) | FREQUENCY STABILITY VS. TEMPERATURE IN PARTS PER MILLION (PPM) |     |     |     |      |     |      |      |      |
|----------------|----------------------------------------------------------------|-----|-----|-----|------|-----|------|------|------|
|                | Temperature in °C                                              |     |     |     |      |     |      |      |      |
|                | -30                                                            | -20 | -10 | 0   | +10  | +20 | +30  | +40  | +50  |
| 118.000        | 0.8                                                            | 0.8 | 0.5 | 0.3 | -0.3 | 0   | -0.5 | -0.8 | -0.2 |
| 127.500        | 1.0                                                            | 1.0 | 0.7 | 0.4 | -0.1 | 0   | -0.4 | -0.7 | -0.2 |
| 136.990        | 1.0                                                            | 1.0 | 0.7 | 0.4 | -0.1 | 0   | -0.4 | -0.7 | -0.2 |

| FREQUENCY<br>IN MHz | STABILITY VS. VOLTAGE VARIATION (±15%) IN PPM INPUT VOLTAGE |          |          |
|---------------------|-------------------------------------------------------------|----------|----------|
|                     | 23.8 Vdc                                                    | 28.0 Vdc | 32.2 Vdc |
| 118.000             | 0                                                           | 0        | 0        |
| 127.500             | 0                                                           | 0        | 0        |
| 136.975             | 0                                                           | 0        | 0        |
| 136.990             | 0                                                           | 0        | 0        |

Specifications of Paragraphs 2.1055 and applicable parts of 87 are met. There are no deviations to the specifications.

## APPENDIX

Model: KY196B

1. Photos of Radiated Emissions Test Set Up.
2. Photos Case front and back.
3. Photo FCC ID Label Location.
4. Test Equipment List.
5. Rogers Qualifications.
6. FCC Site Approval Letter.
7. Operating Procedure.
8. Theory of Operation.
9. Alignment Procedure.

**TEST EQUIPMENT LIST FOR ROGERS LABS, INC.**

The equipment is used daily and kept in good calibration and operating condition. Calibration of critical items are checked for accuracy each time used.

List of Test Equipment:Calibration Date:

|                                                      |       |
|------------------------------------------------------|-------|
| Scope: Tektronix 2230                                | 2/98  |
| Wattmeter: Bird 43 with Load Bird 8085               | 2/98  |
| Power Supplies: Sorensen SRL 20-25, DCR 150, DCR 140 | 2/98  |
| H/V Power Supply: Fluke Model: 408B (SN: 573)        | 2/98  |
| R.F. Generator: Boonton 102F                         | 2/98  |
| R.F. Generator: HP 606A                              | 2/98  |
| R.F. Generator: HP 8614A                             | 2/98  |
| R.F. Generator: HP 8640B                             | 2/98  |
| Spectrum Analyzer: HP 8562A,                         | 2/98  |
| Mixers: 11517A, 11980A & 11980K                      |       |
| HP Adapters: 11518, 11519, 11520                     |       |
| Spectrum Analyzer: HP 8591 EM                        | 6/98  |
| Frequency Counter: Weston 1255                       | 2/98  |
| Frequency Counter: Leader LDC 825                    | 2/98  |
| Antenna: EMCO Log Periodic                           | 9/98  |
| Antenna: BCD 235/BNC Antenna Research                | 9/98  |
| Antenna: EMCO Dipole Set 3121C                       | 2/98  |
| Antenna: C.D. B-100                                  | 2/98  |
| Antenna: Solar 9229-1 & 9230-1                       | 2/98  |
| Antenna: EMCO 6509                                   | 2/98  |
| Microline Freq. Meter: Model 27B                     | 2/98  |
| Dana Modulation Meter: Model 9008                    | 2/98  |
| Audio Oscillator: H.P. 200CD                         | 2/98  |
| R.F. Power Amp 65W Model: 470-A-1000                 | 9/97  |
| R.F. Power Amp 50W M185- 10-500                      | 9/97  |
| R.F. PreAmp CPPA-102                                 | 9/97  |
| Shielded Room 5 M x 3 M x 3.0 M (100 dB Integrity)   |       |
| LISN 50 $\mu$ Hy/50 ohm/0.1 $\mu$ f                  | 9/98  |
| LISN Compliance Eng. 240/20                          | 2/98  |
| SCS Power Amp Model: 2350A                           | 2/98  |
| Power Amp A.R. Model: 10W 1000M7                     | 2/98  |
| Linear Amp Mini Circuits: ZHL-1A (2 Units)           | 2/98  |
| Combiner Unit Mini Circuits: ZSC-2-1 (2 Units)       | 2/98  |
| ELGAR Model: 1751                                    | 2/98  |
| ELGAR Model: TG 704A-3D                              | 2/98  |
| ELGAR Model: 400SD (PB)                              | 2/98  |
| ESD Test Set 2000i                                   | 10/95 |
| Fast Transient Burst Generator Model: EFT/B-100      | 10/95 |
| Current Probe: Singer CP-105                         | 8/97  |
| Current Probe: Solar 9108-1N                         | 8/97  |
| Field Intensity Meter: EFM-018                       | 10/95 |

10/01/98

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

AlliedSignal, INC. Electronics and Avionics Systems  
MODEL: KY196B P/N 064-01084-0101  
Test #:990120 FCC ID#: ASY KY196B  
Test to: FCC Parts 2 and 87 Page 24 of 26

Certification\ALLIE196.doc 1/22/99

**QUALIFICATIONS**

Of

**SCOT D. ROGERS, ENGINEER****ROGERS LABS, INC.**

Mr. Rogers has approximately 12 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.<br>6 Years  |
| Electrical Engineer: | Rogers Consulting Labs, Inc.<br>5 Years |
| Electrical Engineer: | Rogers Labs, Inc.<br>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  
1/26/99  
Date

1/11/99

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

AlliedSignal, INC. Electronics and Avionics Systems  
MODEL: KY196B P/N 064-01084-0101  
Test #: 990120 FCC ID#: ASY KY196B  
Test to: FCC Parts 2 and 87

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# **FEDERAL COMMUNICATIONS COMMISSION**

7435 Oakland Mills Road  
Columbia, MD 21046  
Telephone: 301-725-1585 (ext-218)  
Facsimile: 301-344-2050

February 6, 1998

IN REPLY REFER TO  
**31040/SIT**  
**1300F2**

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

**Attention: Scot D. Rogers**

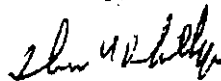
**Re: Measurement facility located at above address**  
**(3 and 10 meter site)**

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 or notification under Parts 15 or 18 of the Commission's Rules. Our list will also indicate that the facility complies with the radiated and AC line conducted test site criteria in ANSI C63.4-1992. Please note that this filing must be updated for any changes made to the facility, and at least every three years the data on file must be certified as current.

Per your request, the above mentioned facility has been also added to our list of those who perform these measurement services for the public on a fee basis. This list is updated monthly and is available on the Laboratory's Public Access Link (PAL) at 301-725-1072, and also on the Internet at the FCC Website [www.fcc.gov/oet/info/database/testsite/](http://www.fcc.gov/oet/info/database/testsite/).

Sincerely,



**Thomas W. Phillips**  
**Electronics Engineer**  
**Customer Service Branch**

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

AlliedSignal, INC. Electronics and Avionics Systems  
MODEL: KY196B P/N 064-01084-0101  
Test #:990120 FCC ID#: ASY KY196B  
Test to: FCC Parts 2 and 87 Page 26 of 26

# APPENDIX

(Continued)

## Contains the following information:

1. Product Description Sheet one page.
2. Instruction Book: (Operating procedure) installation Manual P/N 006-010570-0000 twenty three pages.
3. Transceiver Alignment Procedure P/N 001-01192-0000 seven pages.
4. Main Board Schematic P/N 002-07469-0040 five pages.
5. Transmitter Board Schematic P/N 002-06047-0010 two pages.
6. Filter Board Schematic P/N 002-08939-0000 one page.
7. Processor Board Schematic P/N 002-09507-0000 four pages.
8. Display Board Schematic P/N 002-09508-0000 one page.
9. Peak Response Board P/N 002-09652-01 one page.
10. AM-FM Control/TX Interlock (Top) Board Schematic P/N 002-09501-0000 two pages.
11. VCO/Synth. Board Schematic P/N 002-09628-01 one page.
12. RF Amp Board Schematic P/N 002-08506-0000 one page.
13. Theory Of Operation ten pages.
14. RF Block Diagram one page.
15. Microprocessor Block Diagram one page.
16. Identification Plate: Serial Number Tag, KY 196B three pages.
17. Final Assembly Drawing P/N 064-01084-02 three pages.
18. Main Board Assembly P/N 300-07469-0040 three pages.
19. Transmitter Board Assembly P/N 300-06047-0010 one page.
20. Filter Board Assembly P/N 300-08939-0000 one page.
21. Processor Board Assembly P/N 300-09507-0000 two pages.
22. Display Board Assembly P/N 300-09508-0000/0099 two pages.
23. Peak Response Board P/N 300-09652-01 one page.
24. AM-FM Control/TX Interlock (Top) Board Assembly P/N 300-09501-0000 two pages.
25. VCO/Synth. Board Assembly P/N 300-09628-01/0099 two pages.
26. RF Amp Board Assembly P/N 300-08506-0000 one page.
27. Description of Digital Information one page.