



LS Research Inc.

500 mW Surveillance Transmitter

RESPONSE TO CORRESPONDANCE NUMBER 10178

Part 90 Type Acceptance, Conducted Measurements

prepared for

Audio Intelligence Devices

Revision 1.0



Surveillance Transmitter

I. Component Changes

The following component modifications were performed to achieve more audio limiting:

1. R15, D2 and D3 were populated.
2. The value of C96 was changed from 2.2 nF to 6.8 uF.

II. FCC Conducted Tests

A. Part 90 Subpart I

1. 90.207 (a) (1) Types of Emissions (Device Classification)

Classified as an **F3E** emitter (Frequency Modulation, Analog Modulation, Voice). Power level: 500 mW. The Emission Designator becomes **9K4 F3E**

2. 90.209 (a) (5) Bandwidth Limitations (Device Classification, Test Condition).

12.5 kHz Nominal Channel Bandwidth

a) Test Indications Part 2. 989 Occupied Bandwidth

1. Deviation Set as indicated in Stimulus Test Conditions.
3. Reference Level setting under these conditions:
 - (a) Span = 10 MHz.
 - (b) Resolution Bandwidth = 100 kHz.
 - (c) Video Bandwidth = 100 kHz.
 - (d) Video Averaging for 10 sweeps. Display and Set Reference Level to Peak.
4. Measurement Indication under these conditions:
 - (a) Span = 50 kHz
 - (b) Resolution Bandwidth = 100 Hz.
 - (c) Video Bandwidth = 100 Hz.
 - (d) Video Averaging for 10 Sweeps.
 - (e) Both Compression and ALC Modes are shown.



3. Part 2.985 Output Power, Part 2.991 Spurious Emissions at Antenna terminals and Part 2.989 Occupied bandwidth using 90.210 (d) Emission Mask for F3E Transmitter.

c) Test Conditions: Stimulus

Input nominal audio signal at 3 kHz: (3.4 mV).

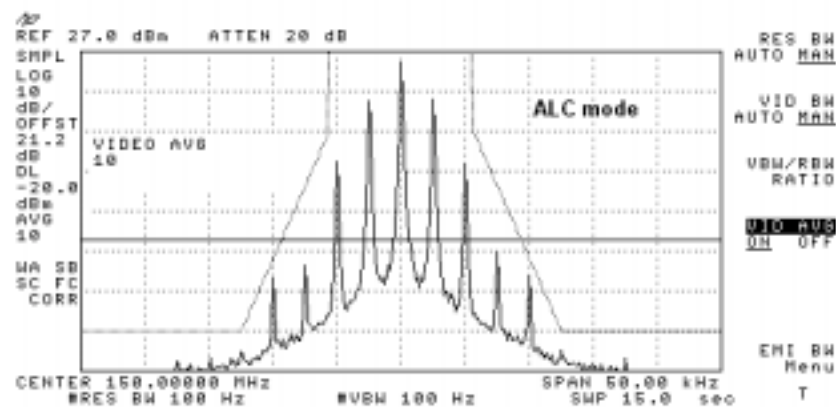
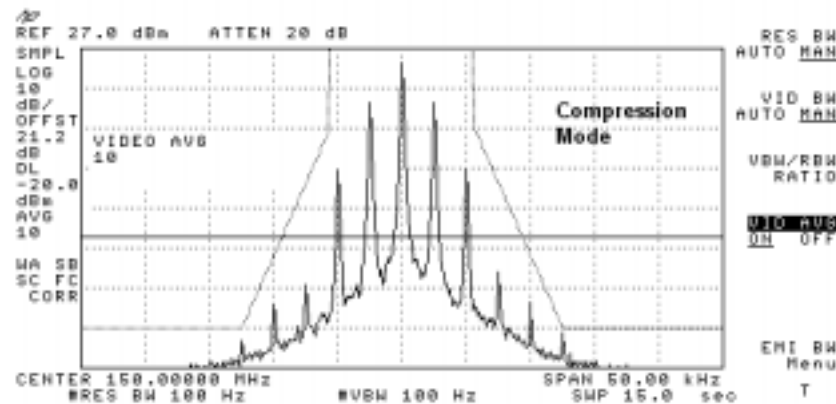
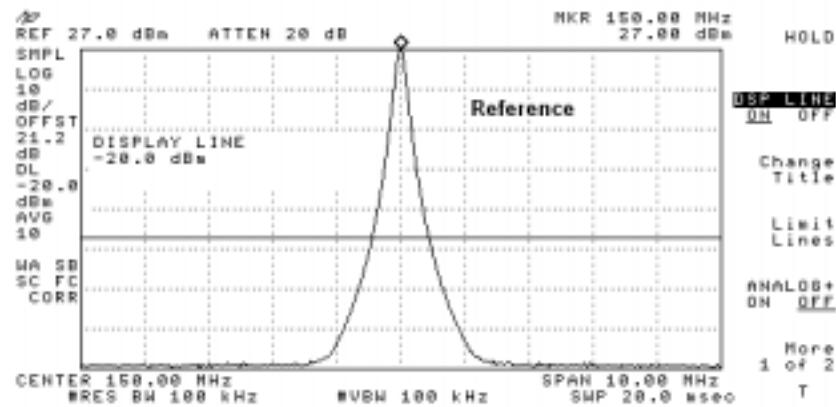
Set level to 50% rated deviation in Compression Mode.
(100 % is +/- 1.4 kHz, 50% is 0.7 kHz)

This level occurs at 0.45 mV.

Set modulating frequency to 2500 Hz

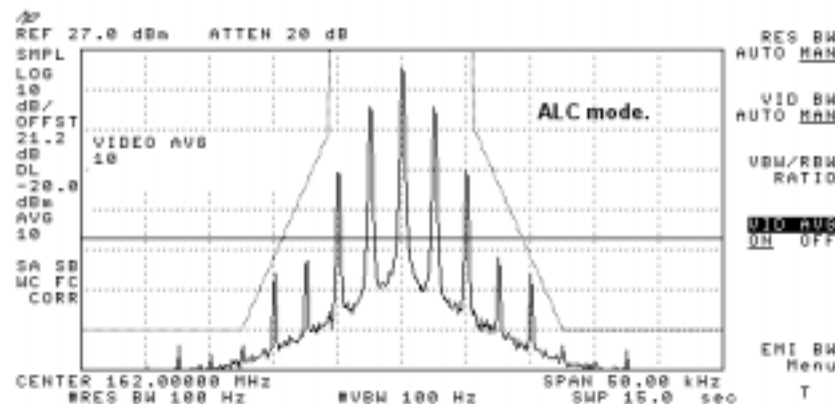
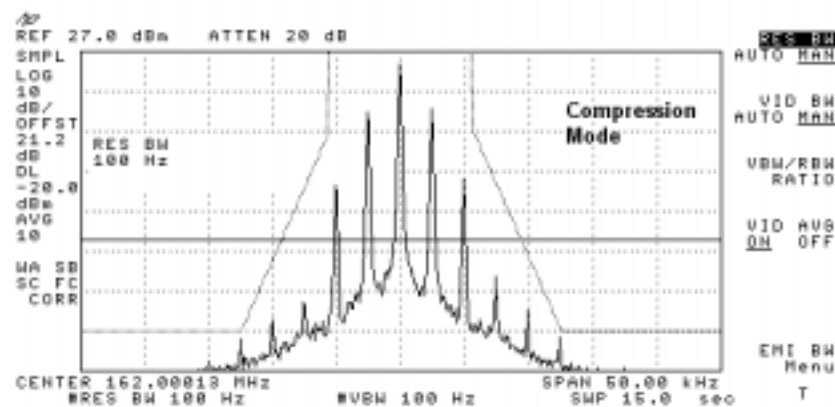
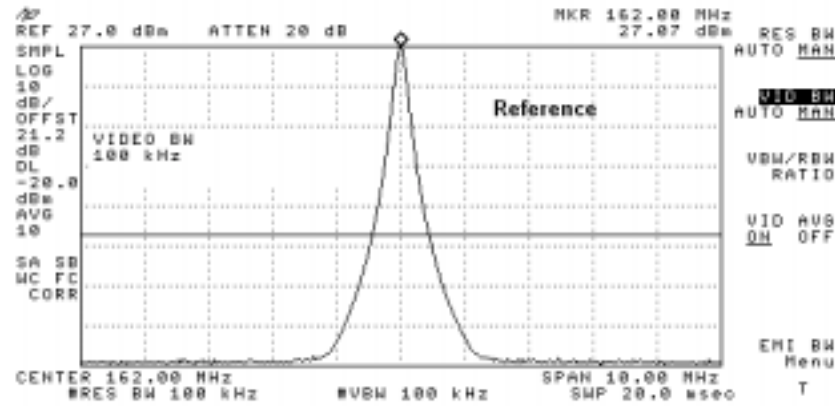
Increase Level by 16 dB 2.84 mV.

Measure Spectrum Mask.



Test Condition: 150 MHz, 500 mW

Test Outcome: Spectrum falls below Indicated Mask → PASS

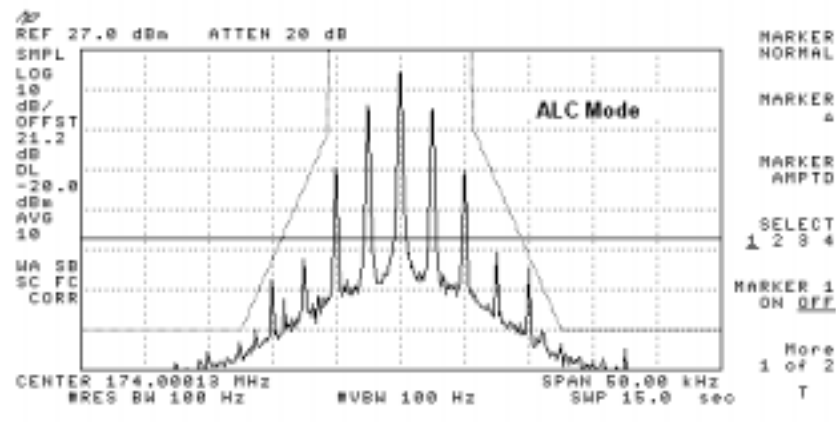
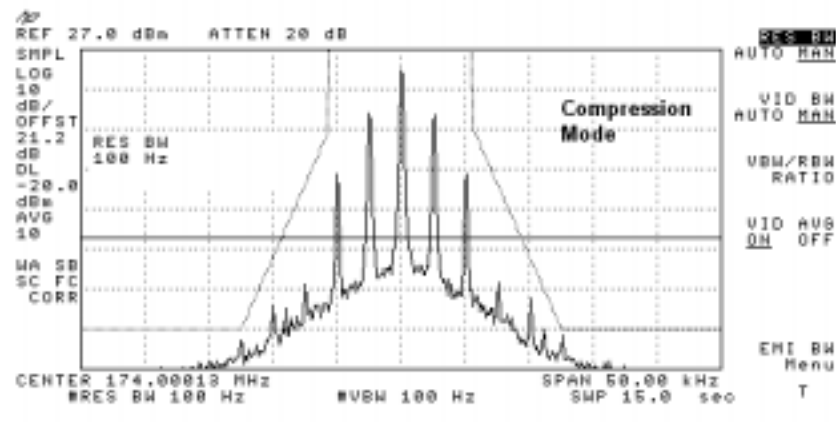
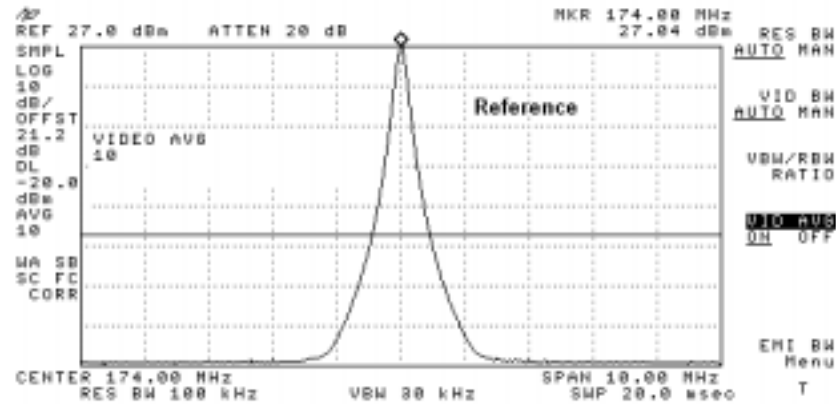


Test Condition: 162 MHz, 500 mW

Test Outcome: Spectrum falls below Indicated Mask → PASS

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Test Condition: 174 MHz, 500 mW

Test Outcome: Spectrum falls below Indicated Mask → PASS

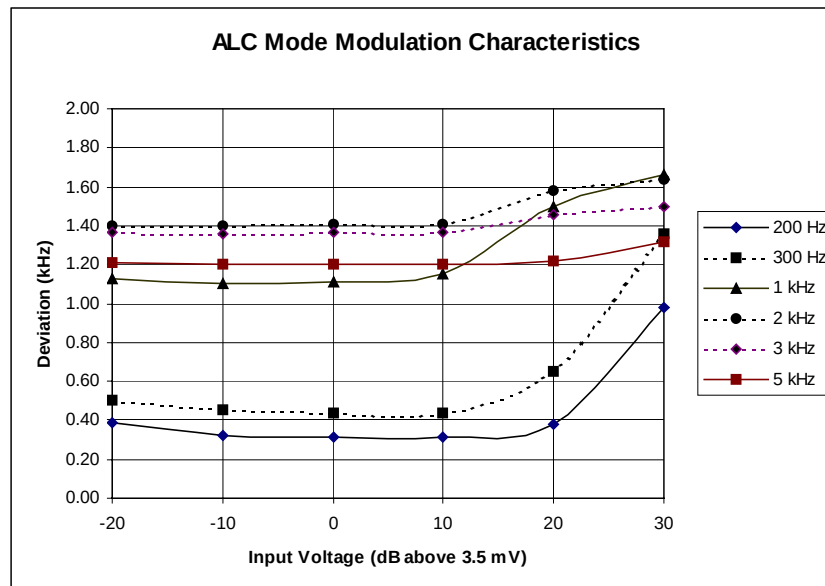
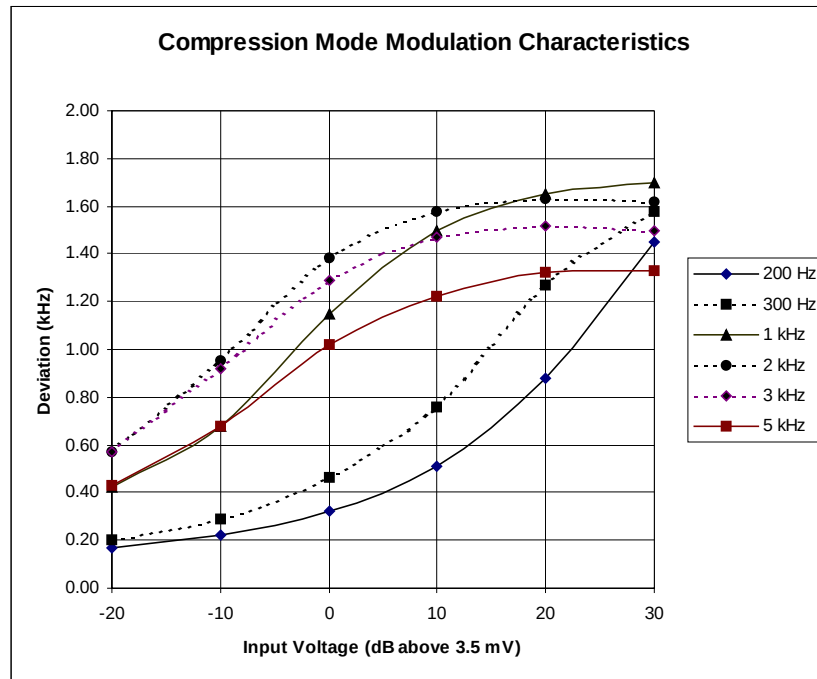


Modulation Characteristics: Peak Frequency Deviation versus Audio Level

Test Conditions: 162 MHz, 500 mW.

Comp. : 2:1 Dynamic Range Compressor

ALC: Automatic Leveling Control.



The new Emission Designator becomes: $2 (M + D) = 2 (3k + 1k7) = 9k4$.

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