

CCA Optimod-FM Stereo Processor/Generator

FM-O

CCA

CCA Electronics Corporation

716 JERSEY AVENUE, GLOUCESTER CITY, NEW JERSEY 08030
PHONE: (609) 456-1716 or toll-free: 800-257-8171 TELEX: 845200

Features

- Totally integrated FM stereo processor/generator
- Provides complementary broadband and high frequency limiting
- Precisely matched phase compensated active filters
- Extensive front panel metering and control provide for convenient set-up and adjustment
- Optically isolated remote stereo switching eliminates ground loop problems
- Suitable for operation in high RF fields
- Unsurpassed linear process generator
- 100% compatible with all CCA direct FM exciters

Description

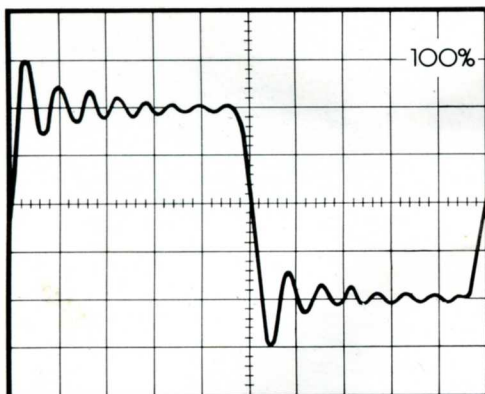
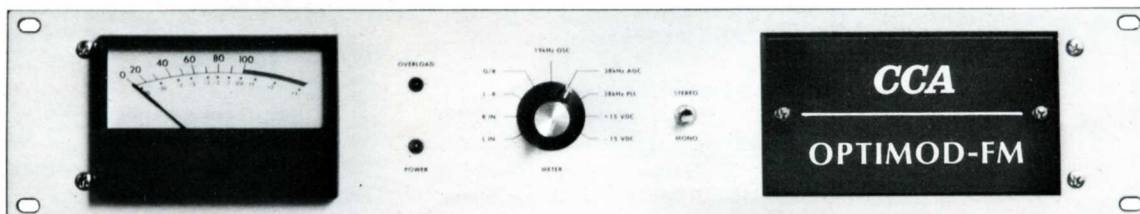
The CCA Optimod-FM is a rack mounted, independently powered stereo generator system, incorporating specially designed audio processing circuitry to provide the differential advantage needed in today's competitive market. The system is totally compatible with all CCA direct FM exciters, as well as other manufacturers' exciters, which in some cases, require wideband interface.

The input is through 600-ohm balanced transformers which are RF filtered, followed by input level controls, preamplifiers and a 30Hz high-pass filter. The signal is then processed by a broadband automatic gain control amplifier with a sophisticated control loop which provides precise program control before application to the high frequency limiter. The limiter stage provides program control of pre-emphasis on a moment-to-moment basis to eliminate overmodulation due to excessive high frequency content in the program material. The left and right channels are coupled into phase compensated lowpass filters and instantaneous limiters which eliminate audio frequency components above 15kHz and provide precise preconditioning of peak levels prior to further processing in the stereo generator.

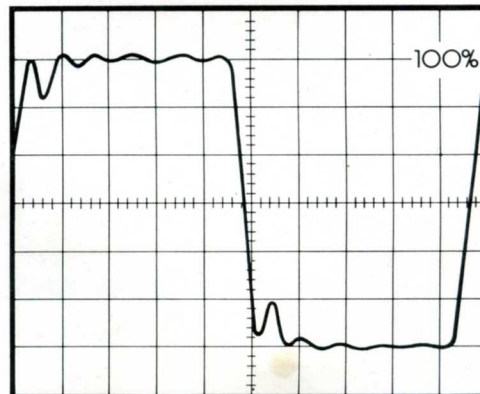
The stereo generator has a leveled 19kHz crystal oscillator providing a low distortion pilot signal, stable in output amplitude and phase. The 38kHz generator is a buffered phase locked loop driven by the 19kHz oscillator providing an exceptionally low distortion signal to the linear stereo modulator stage. The stereo modulator uses a two quadrant Gilbert Linearized Transconductance Multiplier which exhibits a substantially lower level of noise and distortion than conventional stereo generation techniques.

Stereo/Mono switching is effected through opto-isolated inputs and digital memory logic. The power supply is a regulated bipolar supply that can be monitored on the front panel meter along the levels of the left and right audio inputs, L-R, gain reduction, 19kHz oscillator and 38kHz generator. An LED overload indicator is provided to indicate unsuitably high audio input levels.

The CCA Optimod-FM is contained in a 3½" EIA 19" rack mounting cabinet. For ease of adjustment, all necessary controls are under a front mounted trim panel.



Conventional elliptic function filter excited by 1kHz square wave



CCA Optimod-FM phase-compensated filter excited by 1kHz square wave

Technical Specifications

Frequency Response (System in TEST mode)

Follows standard 75 μ S pre-emphasis curve: ± 1 dB, 50-15,000 Hz. 50 μ S and 25 μ S available on special order.

High Pass Filter

3rd order Chebychev with 30 Hz cutoff. Down 0.5 dB at 30 Hz; 10.5 dB at 20 Hz; 31.5 dB at 10 Hz.

Noise

—75 dB max; —80 dB typical (50-15,000 Hz through 75 μ S de-emphasis).

Distortion, Total System

0.3% THD max, 50-15,000 Hz with any degree of gain reduction; 0.1% THD typical. In TEST mode (instantaneous limiters & AGC defeated), below 0.05% typical.

Broadband Limiter Characteristics

Attack Time: Approx. 2 ms for 10 dB gain reduction. Release Time: Program controlled by means of quadruple time-constant release time analog processor. Release time may be scaled fast or slow by means of continuously variable Release Time control available to user. Gain Reduction Range: At least 15 dB.

High Frequency Limiter Characteristics

Attack Time: Approx. 3 ms. Release Time: Varies around 15 ms according to program material.

System Separation

Better than 40 dB, 50-15,000 Hz. Typically 50 dB or better overall.

Crosstalk

(Main Channel to Subchannel or Subchannel to Main Channel) Better than —40 dB, 50-15,000 Hz, as measured at input terminals of stereo generator per interpretation of Part 73.322 of FCC Rules. Crosstalk representing distortion components is typically better than —70 dB, as measured on a baseband spectrum analyzer.

38 kHz Subcarrier Suppression

—40 dB minimum, —55 dB typical.

Suppression of All Spurious Emissions in 67 kHz SCA Region

Better than —70 dB.

Modulation Control

System will overshoot no more than 3% with any program material whatever.

Pilot Frequency

19 kHz ± 2 Hz, 0-50° C.

Pilot Injection Adjustment Range

Less than 8% to greater than 10%.

Input

Impedance: 600 ohms balanced and floating, RF suppressed. Level: —10 dBm produces 10 dB gain reduction with Input Attenuator controls full CW. Removal of internal 20 dB pad permits —30 dBm to produce the same effect. Connector: Cinch-Jones 140 style barrier strip (#5 screw).

Composite Output

Impedance: 0-1250 ohms dependent on setting of Output Level control: unbalanced. Level: 4 volts peak-to-peak max., continuously variable by means of 10-turn Output Level control available to user. Connector: Type BNC held floating over ground which permits interface to various exciters without use of wideband transformer and without creation of ground loops. RF suppressed. Cable: Max. length recommended: 24" (61 cm).

Auxiliary Input/Output (for test use only)

Provides L and R lowpass filter output or L and R stereo generator input depending upon setting of rear apron NORMAL/TEST switch. Connectors are RCA Phono type, unbalanced. Stereo Generator requires approx. 3.0 V RMS for 100% modulation, unbalanced, with a source impedance of less than 50 ohms.

Operating Controls

Meter Selector: Stereo/Mono Mode.

Mode may be remote controlled by application of 6 to 24 V AC or DC pulses to appropriate rear terminals. Terminals are optically isolated, and may be floated ± 50 volts above ground. Three pairs of remote terminals will select either left or right audio inputs in mono mode, or stereo. Front panel switch may be strapped for either L or R mono.

Setup Controls

(Front Panel, behind security cover)

Left and Right Input Attenuators; Release Time; Output Attenuator; Pilot Level; Pilot Phase; L-R Gain; Test/Operate Switch; Pilot On-Off Switch. Test/Operate Switch defeats all compression and instantaneous limiting in TEST position.

Indicators

Power On is indicated by green LED driven by unregulated negative DC supply. Overload is indicated by red LED which lights if operator attempts to exceed maximum achievable gain reduction. Meter (VU scale and characteristics) reads L and R input levels, L-R level, broadband gain reduction, 19 kHz oscillator level; 38 kHz gain control voltage; 38 kHz phase control voltage, ± 15 VDC regulated power supply busses. The gain reduction metering signal is available on the rear apron for remote application. +5 VDC corresponds to 0 dB gain reduction.

Power Requirement

115/230 VAC, $\pm 15\%$, 50-60 Hz, approx. 12 watts. 3 prong, U-ground power cord attached. AC is RF suppressed.

Dimensions

19" (48.3 cm) wide x 3.5" (8.9 cm) high x 9.25" (23.5 cm) deep behind panel. Allow 2.5" (6.4 cm) additional depth for connections.

Weight Approx. 13 lb. (5.9 kg) Net; 20 lb. (9.1 kg) packed.

Operating Temperature Range

0-50° C.

