Model 6350
Television Modulator

Scientific Atlanta

19557

The advanced circuit design of the Model 6350 Television Modulator generates a high-quality vestigial sideband TV signal for superior picture and sound fidelity.

DESCRIPTION

The Model 6350 Television Modulator generates a high-quality vestigial sideband TV signal. Advanced circuit design results in superior picture and sound fidelity from color or black-and-white video inputs and from either baseband audio or 4.5 MHz subcarrier inputs.

Scientific-Atlanta's pioneering application of the Surface Acoustic Wave (SAW) filter results in unequaled vestigial sideband response characteristics. The SAW filter provides superior adjacent channel performance while retaining excellent group delay characteristics. Vestigial sideband filter adjustments are virtually eliminated and temperature stability is excellent.

Most of the modular circuits, including the power supply, are contained in plug-in modules, easily accessible from the front panel. Some modules are interchangeable with those of the Model 6150 Signal Processor and Model 6250 Television Demodulator, thereby reducing spare inventory requirements.

FEATURES

- Superior adjacent channel performance
- Surface Acoustic Wave (SAW) filter technology
- Covers all standard and nonstandard television channels
- -48 V DC powering option
- RF monitor test point
- Integrated stereo encoder module available
- Full BTSC stereo compatibility
- Meets FCC offsets and stability requirements
- Delay predistortion network provided to conform with standard FCC predistortion requirements

OPTIONS

Frequency Agile Output Converter (Option FAO) —
allows additional agility while retaining benefits of modularity; capable of tuning to all EIA channels from 50 MHz to 550 MHz.

Agile Phase-Lock Reference Module (Option PLA) —
allows FAO Module to be phase-locked to an IRC or HRC comb generator.

Fixed Channel Phase-Lock (Option PLF) —
permits fixed channel modulator output to be phase-locked to an interfering local off-air station, resulting in significantly reduced or eliminated interference. A reference video output is furnished for gen-locking to eliminate the moving sync bar. May also be used to lock a modulator in a coherent headend system to a master reference (HRC and IRC headends) for use with fixed channel output sets.

Video Switching (Option VSA) —
allows automatic switchover to a secondary video source when primary video is lost. This can be switched manually by an external contact closure. VSA provides a switching voltage for the companion audio switch option (audio-follow-video operation). An AGC circuit provides a constant output level of 1 V p-p with input level variations of 0.5 V p-p to 2 V p-p. Sync amplitude is continually monitored so picture level will not affect AGC action.

Audio Switching (Option AS) —
permits switchover to an alternate audio source. Control can be manual or automatic from VSA. AS is not necessary when one or both inputs are accompanied by a 4.5 MHz audio subcarrier. An additional switch input is provided to permit switching emergency override audio. The alternate audio may be stereo.

Audio Modulation Limiter (Option AML) —
limits sound deviation to 25 kHz on all baseband audio inputs. There are no detectable thumping or pumping effects. This option cannot be used with BTSC stereo signals.

High-Level IF Switching (Option HIS) —
can switch alternate high-level IF signal into the modulator output converter. Composite IF is interrupted just before upconversion. With VSA installed, switching can be actuated automatically upon loss of video. Switch control can also be manual by an external contact closure.

Audio Subcarrier Loop-through (Option ASL) —
provides separate paths for video and 4.5 MHz subcarrier audio for optimum performance when injecting 4.5 MHz BTSC stereo.

IF Automatic Gain Control (Option IGC) —
provides amplification and automatic gain control of an external high-level IF input. This option can be used with HIS.

IF Loop-through (Option SIL) —
furnishes a composite IF output signal for processing by a scrambler. The scrambled composite IF signal is then returned to the output converter.

DIA (Option DIA) —
furnishes separate audio and video IF signals before the vestigial sideband filter for use with pulse-sync suppression scrambler systems.

DIB (Option DIB) —
provides separate audio and video IF signals after the vestigial sideband filter for use with sinewave-suppressed scrambler systems.

Spectrum Inversion (Option SI) —
inverts the video and audio carriers, with the video carrier 4.5 MHz above the audio carrier at RF. The signal is contained within the normal channel allocation.

Signal, Voltage Metering (Option MTR) —
installs a metering module in the front panel of the modulator. A switch-selectable meter displays audio deviation, video modulation depth and DC operating voltage.

Integrated Stereo Encoder (Option ISE) —
provides ability to generate BTSC stereo signals within the modulator, saving rack space.

-48 V DC Option (Option -48) —
provides -40 V DC to -56 V DC, dual A/B input powering.

SPECIFICATIONS

Video

Input type
  Baseband video, sync negative
Input level
  0.5 V p-p minimum for 87.5% depth of modulation
Input impedance
  75 Ω unbalanced (or high-impedance loop-through, switch selected)
Return loss
  >30 dB
Frequency response
  From 10 Hz to 4.15 MHz,
  -1.5 dB max @ 4.2 MHz
  (Reference @ 240 kHz)
  18°C ≤ T ambient ≤ 30°C
Differential gain
  0.18 dB (2%) max @ 87.5% modulation
Differential phase
  1.0° max @ 87.5% modulation

S/N
65 dB from 0 kHz to 10 kHz
68 dB from 0.01 MHz to 4.2 MHz weighted
Tilt
1% max on 60 Hz, 50% square wave

Audio

Input level
Normally set for -10 dBm to 10 dBm
Internally switchable to:
5 dBm to 25 dBm
-25 dBm to -5 dBm
Input impedance
600 Ω balanced; may be field modified for high-impedance bridging input
Common mode hum rejection
40 dB
Frequency response
Mono ±0.5 dB from 30 Hz to 15 kHz
Stereo ±0.5 dB from 30 Hz to 105 kHz
Stereo ±0.1 dB from 50 Hz to 50 kHz
Carrier shift with modulation
±100 Hz or less
Harmonic distortion (mono)
0.5% max, 30 Hz to 15 kHz @ 25 kHz deviation
Distortion and noise (stereo)
<1% max, 1 kHz to 100 kHz @ 70 kHz deviation
FM hum and noise (80 kHz bandwidth)
60 dB down with respect to 25 kHz deviation
Intercarrier frequency tolerance
Within ±250 Hz of being 4.5 MHz above video carrier

4.5 MHz FM Input

Input level
28 dBmV to 45 dBmV or 25 mV to 177 mV
Input impedance
75 Ω unbalanced (normally supplied as composite picture and aural subcarrier input — optionally as separate inputs with ASL option)

RF Output

Output frequency
Any standard VHF channel, sub-low, midband, superband, hyperband, extended hyperband. Transposed video-sound channels available. Incremental and harmonically related coherent outputs are available, as are nonstandard output frequencies.
Output impedance
75 Ω unbalanced
VSWR
1.35:1
Output level
40 dBmV to 60 dBmV, continuously variable
Spurious outputs
60 dB below video with video carrier at 60 dBmV and sound carrier at 45 dBmV
Frequency tolerance stability
VHF, midband ±8 kHz
Superband ±10 kHz
Hyperband ±20 kHz
Extended hyperband ±24 kHz
Crystal controlled FCC channels ±5 kHz
Group delay response
Meets FCC Predistortion No. 73.687 requirements for color transmission
Vestigial sideband response
-20 dB at channel edge
-40 dB at adjacent picture and sound carrier frequencies and all frequencies farther removed from channel

Spectrum Inversion (Option SI)

Flatness
±0.3 dB
IF output frequencies
Video 42.25 MHz, audio 46.75 MHz
Frequency accuracy
±5 kHz
Spurious outputs 60 dB below video carrier with video IF carrier set at 42 dBmV and audio IF carrier set at 27 dBmV (this corresponds to 60 dBmV output level)

DIF levels

DIA
Video IF output level
46 dBmV
Sound IF output level
38 dBmV
DIB
Video IF output level
42 dBmV
Sound IF output level
36 dBmV

Phase-Lock (Option PLF)

Reference input frequency
Available in same frequency selections as output video carrier (except sub-low)
Reference input level
-10 dBmV to 30 dBmV (except hyperband)
2 dBmV to 20 dBmV (hyperband only)
Acquisition range
Channels 2 to 13 and A to S
Channels T to W and AA to PPP
Demodulated video output
1 V p-p nominal negative sync. Can be used for gen-locking to interfacing modulation. Color burst included (channels 2 to 13 only)

General Characteristics

Ambient operating temperature range
-7°C to 50°C (20°F to 122°F)
Power requirements
Standard 105 V AC to 125 V AC, 60 Hz, 57 W fully loaded 40 W typical
Dimensions
19 in. W x 3.5 in. H x 19.5 in. D
483 mm W x 89 mm H x 495 mm D
Weight (approx)
Net: 10.4 kg (23 lbs)
Shipping: 12.5 kg (28 lbs)

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ORDERING INFORMATION

Any of the options previously listed can be installed in the modulator, whether the option is ordered as part of a new modulator or added later in the field. However, because of physical restrictions within the modulator chassis, all options cannot be simultaneously installed.

Group 1 options are plug-in modules (as follows), any one of which can be installed:

Option PLF — phase lock
Option SI — spectrum inversion

Group 2 options are installed in the rear of the chassis. Both of the following can be installed:

Option HIS — high-level IF switching
Option IGC — IF automatic gain control

Group 1 and Group 2 options may be installed in different combinations.

Configuration Identification

Each Model 6350 Television Modulator is furnished with the following standard plug-in modules:

- AC power supply
- Video modulator
- Audio modulator
- Vestigial filter

To this basic configuration add a local oscillator, output converter and options as desired. Simply insert the proper information after the basic model number specifying exactly what output channel and options you desire:

6350 — ( ) — ( )
Output Channel 2-13
A-W AA-PP
T7-T11 FAO
Options Desired

As an example:
6350-PLF-MTR-HIS-12 signifies the phase-locked TV modulator with metering module and IF switching, with output on VHF channel 12.

Option SI Only

Specify the following to allow us to install the proper crystal in the output converter LO module when this option is ordered:

- Video output RF frequency
- Audio output RF frequency

Basic Television Modulator Chassis

The Model 6350 Television Modulator is available without the output converter. Other standard modules are provided, and options can be ordered.
Specify 6350 — (Options)

Specifications and product availability are subject to change without notice.

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