



Channelized Agile Audio/Video Modulators

CAM Series

Headend



○ Features & Benefits

- EAS/ALT IF Ready Via Manual or Automatic Mode
- Front Panel Accessible Level Controls for Easy Set-Up and Adjustments
- Rack Mountable - 1 EIA (1.75") Rack Space
- Exceptional Broadband Noise Performance of -110 dBc
- -60 dBc Spurious Response for the Entire Level Range
- Works in Conjunction with High Performance Channelized Output Filter Modules (OFM)

The CAM-60 Series are professional quality, channelized, heterodyne audio/video modulators. These units provide audio and video modulated RF carrier output on any SUB, VHF, UHF, or CATV channel (7 to 450 MHz and 50 to 860 MHz). Any standard audio/video source can be used, such as satellite receivers, television cameras, video tape recorders, or television demodulators. These modulators feature a frequency agile output converter followed by a single channel removable output filter providing +60 dBmV output. This design configuration permits easy channel changes in the field by simply replacing the output filter module and setting the output converts dip switches to the new channel.

The CAM-60 Series takes baseband audio and video and modulates these signals onto the desired output channel (each modulator has separate audio and video inputs). The heterodyne conversion process used in the CAM-60 Series employs a crystal referenced, PLL synthesized local oscillator, with a 12.5 kHz tuning increment. This guarantees rock solid, no-drift output for the life of the modulator. A custom SAW filter is employed to provide true vestigial sideband selectivity with built-in FCC group delay pre-distortion.

The CAMD-60 Series provide separate external visual and aural IF loops. An external IF loop is provided, which allows interfacing with video all-call and signal scrambling systems while CAMD-60 models have dual IF loops. The CAM-60 Series meets FCC Docket 21006 aeronautical frequency offset requirements (± 5 kHz video carrier accuracy) and accepts standard polarity (sync negative) video in the range of 0.7 to 2.8 V p-p. A 4.5 MHz audio input is provided, which preserves the stereo audio available from most satellite receivers and demodulators. A rear panel switch allows selection of either baseband audio or 4.5 MHz audio.



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○ Specifications

RF

Frequency Range
 VHF, UHF, CATV: 54-860 MHz
 SUB BAND: 5-36 MHz

Channels: SUB, VHF, CATV, UHF

Output Level - Min: +60 dBmV

Output Level Adjust: 15 dB

Aural/Visual Carrier Ratio: -9 to -20 dB

Visual Sub Carrier Frequency Tolerance
 Standard Channels: ±5 kHz
 FCC Aeronautical Channels: ±3 kHz

Aural Carrier Frequency
 Offset from Visual Carrier: +4.5 MHz
 Tolerance: ±100 Hz

Channel Selectivity:
 Adjacent Aural and Below: -42, min dB
 Adjacent Picture and Above: -45, min dB

Spurious Outputs: -60 dBc

C/N Ratio In Channel: 68 dB

Broadband Noise: -110 dBc

Output Impedance: 75 Ohm

Output Return Loss: 18 dB

IF

Aural Frequency: 41.25 MHz

Visual Frequency: 45.75 MHz

Separate IF Loops:
 Aural Loop Level: +30 dBmV
 Visual Loop Level: +40 dBmV

Composite IF Loop Output
 Aural Carrier Level: +20 dBmV
 Visual Carrier Level: +35 dBmV

Output/Input Impedance: 75 Ohm

Output Return Loss: 18 dB

Input Return Loss: 18 dB

Video

Input Level: 1.0 V p-p

Frequency Response
 fv-0.5 MHz to fv+4.2 MHz: ±0.5 dB

P-P Video to RMS Hum Ratio: 65 dB

Video Signal-to-Noise Ratio, Weighted: 64 dB

Differential Gain: 2.0 %

Differential Phase: 1.0 °

Over Modulation Indicator: 87.5, ±2.5 %

Input Impedance: 75 Ohm

Input Return Loss: 30 dB

Audio

Input Level: -10 to +10 dBm

Ext. 4.5 MHz Input Level: +40 dBmV

Frequency Response
 Mono (30 Hz to 15 kHz): ±0.5 dB

Pre-Emphasis-Mono: 75 µs

Audio Signal-to-Noise
 Mono @ 25 kHz Deviation: 64 dB

Total Harmonic Distortion: 0.6 %

Over Modulation Indicator: 25 ±2 kHz

Input Impedance: 600, Balanced Ohm

General

Power Requirements
 Voltage: 117, ±10% VAC
 Frequency: 60 Hz
 Power - CAMS-60: 14 W
 Power - CAMD-60: 16 W

Fuse
 CAMS-60: 1/4 A
 CAMD-60: 3/8 A

Temperature Range: 0 to +50 °C

Mechanical

Dimensions (WxHxD)
 CAMS-60: 19.0 x 1.75 x 14.5 in.
 (483 x 44 x 368) mm
 CAMD-60: 19.0 x 1.75 x 14.5 in.
 (483 x 44 x 368) mm

Weight
 CAMS-60: 6 lbs. (2.73 kg)
 CAMD-60: 6 lbs. (2.73 kg)

Connectors (Rear Panel)

Video Input: "F" type, female

Audio Input
 Standard - Mono: Barrier Strip
 4.5 MHz Input: "F" Type, Female

Aural IF IN/OUT (CAMD-Only):
 "F" Type, Female

Visual IF IN/OUT (CAMD-Only):
 "F" Type, Female

Composite IF Output: "F" Type, Female

Composite IF Input: "F" Type, Female

RF Output: "F" Type, Female

Connectors (Front Panel)

-20 dB Test Port: "F" Type, Female

Controls (Front Panel)

Video Level: Control

Aural Carrier Level: Control

Audio Level: Control

RF Output Level: Control

Indicators (Front Panel)

Power ON: LED Green

Video Over Modulation: LED, Red

Audio Over Modulation: LED, Red

External IF: LED, Green

Refer to product instruction manual for additional specification measurements and notes.

○ Ordering Information

Model	Stock No.	Description
CAMD-60 ✕	7895 300	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 54-300 MHz, Dual IF L
CAMD-60 ✕	7895 756	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 300-756 MHz, Dual IF Loops
CAMS-60	5895 300	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 54-300 MHz, Single IF Loop
CAMS-60	5895 756	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 300-756 MHz, Single IF Loop
CAMS-60	5895 860	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 756-860 MHz, Single IF Loop
CAMS-60	S5895 49	Channelized Agile Stereo Compatible Audio/Video Modulator +60 dBmV, 5-36 MHz (SUB) Single IF Loop

Channelized Agile Audio/Video Modulator

MAVM Series

Headend



○ Features & Benefits

- EAS/ALT IF Ready Via Manual or Automatic Mode
- Front Panel Accessible Level Controls for Easy Set-Up and Adjustments
- Rack Mountable - 1 EIA (1.75") Rack Space
- Exceptional Broadband Noise Performance of -110 dBc
- -60 dBc Spurious Response for the Entire Level Range

The MAVM Series are professional quality, channelized agile, heterodyne audio/video modulators. They provide audio and video modulated RF output on any VHF, UHF, or CATV channel (7 to 860 MHz). SUB-BAND channels T7-T11 are available.

Any standard audio/video source can be used, such as satellite receivers, television cameras, video tape recorders, or television demodulators. These modulators feature a low cost, removable single channel output filter module to provide a channelized configuration. Customer requests for individual channels can be easily accomplished by combining the frequency agile mainframe with the desired removable output filter module. Modulators may be ordered as completed assemblies or as configurable modules.

The MAVM Series takes baseband audio and video and modulates these signals onto the desired output channel (each modulator has separate audio and video inputs). The heterodyne conversion process used in the MAVM Series employs a crystal referenced, PLL synthesized local oscillator, with a 12.5 kHz tuning increment. This guarantees rock solid, no-drift output for the life of the modulator. A custom SAW filter is employed to provide true vestigial sideband selectivity with built-in FCC group delay pre-distortion.

An external IF loop is standard which allows interfacing with video all-call and signal scrambling systems as well as the ability to lock to either baseband or a 4.5 MHz aural carrier. The MAVM Series meets FCC Docket 21006 aeronautical frequency offset requirements (± 5 kHz video carrier accuracy) and accepts standard polarity (sync negative) video in the range of 0.7 to 2.8 V p-p. Field-defeatable audio pre-emphasis enables transmission of BTSC standard composite stereo signals.

Output Filter Modules (OFM)

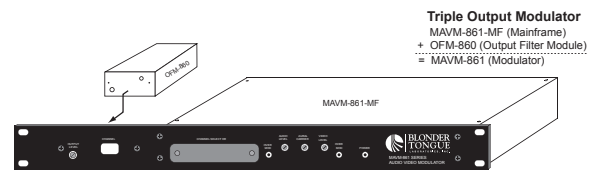
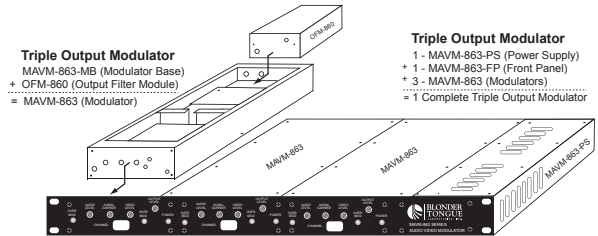
Output Filter Modules are factory tuned channelized units that are used with the CAM, CAP, MAVM & SAIP product lines. They are available with +40 dBmV or +60 dBmV output levels and can be order for any channel in the CATV (2-135), UHF (14-69) or Sub-Band (T7-T11) channel ranges.

Channelized Agile Audio/Video Modulator

MAVM Series

The MAVM-861 is a single output modulator consisting of the MAVM-861-MF mainframe and a channelized OFM-40-860 output filter module. The MAVM-60-861 is a single output modulator consisting of the MAVM-861-MF mainframe and a channelized OFM-60-860 output filter module. The MAVM-863 is a triple output modulator consisting of a MAVM-863-FP faceplate to which are attached a MAVM-863-PS power supply and three MAVM-863-MB modulator bases. The MAVM-60-863 is a triple output modulator consisting of a MAVM-863-FP faceplate to which are attached a MAVM-863-PS power supply and three MAVM-863-MB modulator bases.

Sample Diagrams



Headend

Specifications and Ordering Information are located on the following pages.

Channelized Agile Audio/Video Modulator

MAVM Series

○ Specifications

RF

Frequency Range: 7-37 and 54-860 MHz

Channels: SUB, CATV, VHF, UHF

Output Level - Min

7-37 MHz: +42/+60 dBmV

54-648 MHz: +42/+60 dBmV

648-860 MHz: +40/+58 dBmV

Output Level Adjust: 15 dB

Aural/Visual Carrier Ratio: -9 to -20 dB

Visual Carrier Frequency Tolerance

Standard Channels: ± 5 kHz

FCC Aeronautical Channels: ± 5 kHz

Aural Carrier Frequency

Offset from Visual Carrier: 4.5 MHz

Accuracy, Settable To (STD.): ± 1.5 kHz

Channel Selectivity:

Adjacent Aural and Below: -40 dB

Adjacent Picture and Above: -40 dB

Spurious Outputs OFM-40: -66 dBc

Spurious Outputs OFM-60: -60 dBc

C/N Ratio In Channel: 65 dB

Broadband Noise (40/60): -95/-110 dBc

Output Impedance: 75 Ohm

Output Return Loss: 15 dB

IF

Frequency: 45.750 MHz

Output Level: +30 dBmV

Input Level Range: +25 to +32 dBmV

In/Out Return Loss: 12 dB

EAS/ALT Input: +32 dBmV

Video

Input Level: 1.0 V p-p

Frequency Response

$f_v - 0.5$ MHz to $f_v + 4.2$ MHz: ± 1.0 dB

P-P Video to RMS Hum Ratio: 60 dB

Video Signal-to-Noise Ratio, Weighted: 62 dB

Differential Gain: ± 2.0 %

Differential Phase: ± 1.0 °

Over Modulation Indicator: 87.5, ± 2.5 %

Input Impedance: 75 Ohm

Input Return Loss: 18 dB

Audio

Input Level: mV RMS

Frequency Range: 20 Hz to 20 kHz

Frequency Response: ± 1.0 dB

Pre-Emphasis-Mono: 75 μ s

Audio Signal-to-Noise: 60 dB

Total Harmonic Distortion: 0.5 %

Over Modulation Indicator: 25, ± 2 kHz

Input Impedance: 10 k, unbalanced Ohm

Sub-Carrier Audio

Frequency: 4.5 MHz

Stability Standard: ± 500 Hz

General

Power Requirements

Voltage: 117, ± 10 % VAC

Frequency: 60 Hz

Power

MAVM-40-861: 6.5 W

MAVM-60-861: 9.0 W

MAVM-40-863: 16.5 W

MAVM-60-863: 22.5 W

Fuse: 1/8 or 1/4 A

Temperature Range: 0 to +50 °C

Mechanical

Dimensions (WxHxD)

MAVM-861: 19.0 x 1.75 x 5.5 in.

(483 x 44 x 140) mm

MAVM-863-3: 19.0 x 1.75 x 16.25 in.

(483 x 44 x 413)

Weight

MAVM-861: 6.0 lbs. (2.73 kg)

MAVM-863-3: 10.8 lbs. (4.91 kg)

Connectors (Rear Panel)

Video Input: "F" Type, Female

Audio Input: RCA Phono, Female

IF Output: "F" Type, Female

IF Input: "F" Type, Female

RF Output: "F" Type, Female

EAS/ALT Input: 75 Ohm "F" Type Female

Controls (Front Panel)

Channel Selection: DIP Switches

Video Level: Control

Aural Carrier Level: Control

Audio Level: Control

RF Output Level: Control

Controls (Rear Panel)

EAS/ALT Manual/Auto: Barrier Strip

Indicators (Front Panel)

Power ON: LED, Green

Video Over Modulation: LED, Red

Audio Over Modulation: LED, Red

Refer to product instruction manual for additional specification measurements and notes.

Channelized Agile Audio/Video Modulator

MAVM Series

Ordering Information

Model	Stock No.	Description
MAVM-60-861	7977B 300	Channelized Agile Audio/Video Modulator +60 dBmV, 54-300 MHz
MAVM-60-861	7977B 756	Channelized Agile Audio/Video Modulator +60 dBmV, 300-756 MHz
MAVM-60-861	7977B 860	Channelized Agile Audio/Video Modulator +60 dBmV, 756-860 MHz
MAVM-60-861	S7977B 450	Channelized Agile Audio/Video Modulator +60 dBmV, 7-450 MHz (SUB & VHF)
MAVM-60-861	U7977B 758	Channelized Agile Audio/Video Modulator +60 dBmV, 470-758 MHz (UHF)
MAVM-60-861	U7977B 806	Channelized Agile Audio/Video Modulator +60 dBmV, 758-806 MHz (UHF)
MAVM-60-863-1	7978B 300	Channelized Agile Audio/Video Modulator +60 dBmV, 54-300 MHz
MAVM-60-863-1	7978B 756	Channelized Agile Audio/Video Modulator +60 dBmV, 300-756 MHz
MAVM-60-863-1	7978B 860	Channelized Agile Audio/Video Modulator +60 dBmV, 756-860 MHz
MAVM-60-863-1	S7978B 450	Channelized Agile Audio/Video Modulator +60 dBmV, 7-450 MHz (SUB & VHF)
MAVM-60-863-1	U7978B 806	Channelized Agile Audio/Video Modulator +60 dBmV, 758-806 MHz (UHF)
MAVM-60-863-3	7979B 300	Channelized Agile Audio/Video Modulator +60 dBmV, 54-300 MHz, Three Channel Modulator
MAVM-60-863-3	7979B 756	Channelized Agile Audio/Video Modulator +60 dBmV, 300-756 MHz, Three Channel Modulator
MAVM-60-863-3	7979B 860	Channelized Agile Audio/Video Modulator +60 dBmV, 756-860 MHz, Three Channel Modulator
MAVM-60-863-3	S7979B 450	Channelized Agile Audio/Video Modulator +60 dBmV, 7-450 MHz (SUB & VHF), Three Channel Modulator
MAVM-60-863-3	U7979B 758	Channelized Agile Audio/Video Modulator +60 dBmV, 470-758 MHz (UHF), Three Channel Modulator
MAVM-60-863-3	U7979B 806	Channelized Agile Audio/Video Modulator +60 dBmV, 758-806 MHz (UHF), Three Channel Modulator
MAVM-861	7992B 400	Channelized Agile Audio/Video Modulator +40 dBmV, 54-400 MHz
MAVM-861	7992B 756	Channelized Agile Audio/Video Modulator +40 dBmV, 400-756 MHz
MAVM-861	7992B 860	Channelized Agile Audio/Video Modulator +40 dBmV, 756-860 MHz
MAVM-861	S7992B 450	Channelized Agile Audio/Video Modulator +40 dBmV, 7-450 MHz (SUB & VHF)
MAVM-861	U7992B 758	Channelized Agile Audio/Video Modulator +40 dBmV, 470-758 MHz (UHF)
MAVM-861	U7992B 806	Channelized Agile Audio/Video Modulator +40 dBmV, 758-806 MHz (UHF)
MAVM-861-MF	7982C	Channelized Agile Audio/Video Modulator 54-860 MHz, Mainframe
MAVM-863-1	7993B 300	Channelized Agile Audio/Video Modulator +40 dBmV, 54-300 MHz
MAVM-863-1	7993B 756	Channelized Agile Audio/Video Modulator +40 dBmV, 300-756 MHz
MAVM-863-1	7993B 860	Channelized Agile Audio/Video Modulator +40 dBmV, 756-860 MHz
MAVM-863-1	S7993B 450	Channelized Agile Audio/Video Modulator +40 dBmV, 7-450 MHz (SUB & VHF)
MAVM-863-1	U7993B 758	Channelized Agile Audio/Video Modulator +40 dBmV, 470-758 MHz (UHF)
MAVM-863-1	U7993B 806	Channelized Agile Audio/Video Modulator +40 dBmV, 758-806 MHz (UHF)
MAVM-863-3	7999B 300	Channelized Agile Audio/Video Modulator +40 dBmV, 54-300 MHz, Three Channel Modulator
MAVM-863-3	7999B 756	Channelized Agile Audio/Video Modulator +40 dBmV, 300-756 MHz, Three Channel Modulator
MAVM-863-3	7999B 860	Channelized Agile Audio/Video Modulator +40 dBmV, 756-860 MHz, Three Channel Modulator
MAVM-863-3	S7999B 450	Channelized Agile Audio/Video Modulator +40 dBmV, 7-450 MHz (SUB & VHF), Three Channel Modulator
MAVM-863-3	U7999B 758	Channelized Agile Audio/Video Modulator +40 dBmV, 470-758 MHz (UHF), Three Channel Modulator
MAVM-863-3	U7999B 806	Channelized Agile Audio/Video Modulator +40 dBmV, 758-806 MHz (UHF), Three Channel Modulator
MAVM-863-FP	7963B	Channelized Agile Audio/Video Modulator 860 MHz, Front Panel
MAVM-863-MB	7983B	Channelized Agile Audio/Video Modulator, 860 MHz, Modulator Base
MAVM-863-PS	7972A	Channelized Agile Audio/Video Modulator, 860 MHz, Power Supply
Output Filter Modules (OFM)		
Model	Stock No.	Description
OFM-40-860	U7984A 806	Output Filter Module +40 dBmV, 758-806 MHz (UHF)
OFM-40-860	U7984A 758	Output Filter Module +40 dBmV, 470-758 MHz (UHF)
OFM-40-860	S7984A 37	Output Filter Module +40 dBmV, 7-37 MHz (SUB)
OFM-40-860	7984A 860	Output Filter Module +40 dBmV, 756-860 MHz
OFM-40-860	7984A 300	Output Filter Module +40 dBmV, 54-300 MHz
OFM-40-860	7984A 756	Output Filter Module +40 dBmV, 300-756 MHz
OFM-60-860	U7985A 758	Output Filter Module +60 dBmV, 470-758 MHz (UHF)
OFM-60-860	U7985A 806	Output Filter Module +60 dBmV, 758-806 MHz (UHF)
OFM-60-860	S7985A 37	Output Filter Module +60 dBmV, 7-37 MHz (SUB)
OFM-60-860	7985A 860	Output Filter Module +60 dBmV, 756-860 MHz
OFM-60-860	7985A 756	Output Filter Module +60 dBmV, 300-756 MHz
OFM-60-860	7985A 300	Output Filter Module +60 dBmV, 54-300 MHz