VM1550 Commericial Video Modulator

GENERAL DESCRIPTION

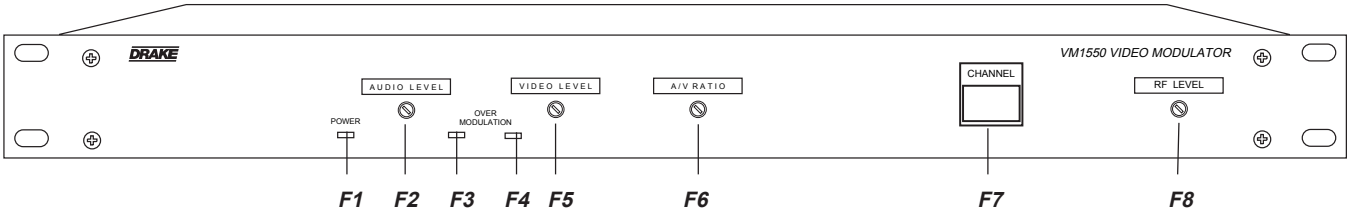
The R.L Drake VM1550 Video Modulator is a high quality vestigial sideband heterodyne audio/video modulator that provides a modulated visual and aural RF carrier output on VHF channels, 2-13; Midband, A-I; Superband, J-W; or Hyperband, AA-HH. Consult factory for custom channels. All aeronautical channels are offset positive with a tolerance of ±5 kHz as required by FCC rules. The VM1550 is designed to accept video and audio baseband signals from a satellite receiver, TV camera, video tape recorder, TV modulator or similar equipment. The heterodyne conversion system, in conjunction with the use of a SAW filter, insures optimum vestigial selectivity for adjacent channel headends.

IF loop-thru capability in the VM1550 supplies a padded IF output prior to channel conversion. This feature provides the capability to replace the standard internally generated IF output with an alternate source of composite IF, or allows insertion of IF scrambling equipment.

The modulator accepts standard (sync negative) polarity video at a 0.7 -2.5 Vpp level. All level controls and modulation indicators are located on the front panel for ease of operation.

Field-defeatable audio pre-emphasis enables transmission of BTSC encoded standard baseband stereo audio signals.

FRONT PANEL CONTROLS AND DISPLAY



F1 - POWER Indicator
Lights when the unit is connected to a source of AC power.

F2 - AUDIO LEVEL Control
The setting of this screwdriver adjustment determines the peak aural carrier deviation. Clockwise rotation increases the carrier deviation. Set this control to a level which causes the LED Over Modulation indicator (See Item '**F3**') to just begin lighting (25 kHz deviation).

F3 - AUDIO OVER MODULATION Indicator
Lights when the audio amplitude is greater than the 25 kHz deviation level.

F4 - VIDEO OVER MODULATION Indicator
Lights when the video amplitude is greater than the 87.5% depth of modulation.

F5 - VIDEO LEVEL Control
The setting of this screwdriver adjustment determines the video modulation level. Clockwise rotation increases the modulation depth. Set this control to a level which causes the LED Over Modulation indicator (See Item '**F4**') to just begin lighting (87.5% depth of modulation).

F6 - A/V RATIO Control
This screwdriver adjustment varies the level of the aural carrier over a range from 12 to 20 dB below the visual carrier. The aural carrier should be adjusted to approximately 15 dB below the visual carrier (normal operation). Clockwise rotation increases the aural carrier level and thus decreases the A/V ratio.

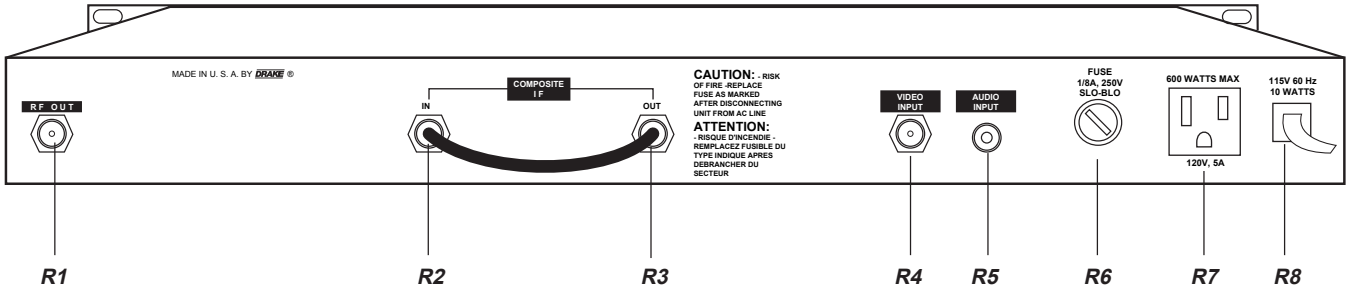
F7 - CHANNEL Designation
The label indicates the fixed channel output for your particular model. The VM1550 is capable of fixed channel output within the following ranges: VHF, 2-13; Lowband 1 (A8): Midband, 14-22 (A-I) and 95-99 (A5-A1); Superband, 23-36 (J-W); Hyperband, 37-44 (AA-HH);

F8 - RF OUTPUT LEVEL
This screwdriver adjustment permits decreasing the RF output level a minimum of 12 dB below its specified output level as the control is rotated counterclockwise. The maximum output level of +45 dBmV is set with the adjustment fully clockwise.

NOTE: If an output level of less than +35 dBmV is required, add an attenuator of the appropriate value at the modulator output.

Example: For an output level of +30 dBmV, add a 10 dB attenuator pad to the modulator output.

Rear Panel Connections



R1 - RF OUT
This is the modulator output.

R2 - COMPOSITE IF INPUT Connector
This is the composite IF input to the heterodyne converter. The composite IF has both the aural and visual IF combined. This connection is normally cabled directly to the "COMPOSITE IF OUT" connector (See Item `**R3**'). This external IF loop allows the use of accessories such as scramblers or alternate video sources. Note that accessory equipment must also have the visual carrier at 45.75 MHz and the aural carrier at 41.25 MHz. Both input levels must be at their nominally specified levels.

R3 - COMPOSITE IF OUTPUT Connector
This is the composite IF output from the IF circuits. The composite IF provides a vestigial sideband filtered visual carrier at 45.75 MHz combined with a level controlled (-15 dBc typical) aural carrier at 41.25 MHz. This connection is normally cabled directly to the "COMPOSITE IF IN" connector (See Item `**R2**').

R4 - VIDEO INPUT Connector
This is the baseband video input to the IF circuits. This input accepts baseband thru 4.2 MHz video at levels from 0.7 Vp-p to 1.5 Vp-p.

R5 - AUDIO INPUT Connector
This is an unbalanced audio input to the IF circuits. This "RCA" (phono) connector input accepts baseband through 15 kHz audio at a nominal level of 250 mV RMS (approximately 0 dBm). NOTE: An internally selected test point jumper defeats the audio pre-emphasis for stereo capability.

R6 - FUSE
Always replace this fuse with one of the same type and rating: 1/8 Amp, 250 V SLO-BLO® , 3AG type.

R7 - AC OUTLET Receptacle
This is a power receptacle for other other equipment and is rated at 600 WATTS maximum; 120 V, 5 Amp. This receptacle is unfused and unswitched.

R8 - LINE CORD
This is a three-wire power cable. When the cable is connected to a properly wired AC power line outlet, this cable grounds the instrument cabinet. Connect to a nominal 115 VAC ±10%, 60 Hz source. Do not defeat the safety purpose of the attached line cord plug.

Specifications

RF

Frequency Range:	54 - 348 MHz.
Channels Available:	VHF 2-13, Lowband 1 (A8) Midband 14-22 (A-I) and 95-99 (A5-A1), Superband 23-36 (J-W), Hyperband 37-44 (AA-HH) Factory tuned for single channel. *
Output Level:	+45 dBmV minimum, (typically adjustable from +35 to +45 dBmV). Note: If an output level of less than +35 dBmV is required, add an attenuator of the appropriate value to the modulator output.(eg., add a 10 dB pad for +30 dBmV output).
Output Impedance:	75 Ohms, return loss of 12 dB.
A/V Ratio:	Audio Carrier -20 to -12 dB referenced to video carrier, adjustable.
Frequency Stability:	± 5 kHz (Visual Carrier).
Intercarrier Frequency:	4.5 MHz.
FCC Frequency Offsets:	All aeronautical channels offset positive with a tolerance of ±5 kHz.
Spurious Outputs:	-65 dBc minimum, measured at -15 dB A/V ratio and with modulator output level of +45 dBmV.
Broadband Noise:	-77 dBc, referenced to video carrier. (4 MHz BW @ ±12 MHz offset). -95 dBc @ ±36 MHz 0ffset.

VIDEO

Input level for 87.5%:	1 Vp-p +/-3 dB, manual gain adjust with front panel control. Over-Modulation LED set for 87.5% depth of modulation indication.
Input Impedance:	75 Ohms, return loss of 18 dB minimum.
Frequency Response:	20 Hz to 4.2 MHz, ±1.0 dB.
Video S/N:	60 dB minimum, luminance weighted.
L/C Delay:	±35 nSec referenced to 0 nSec L/C delay (complies with FCC rules, 76.605).
Differential Gain:	± 4% (10 to 90% APL).
Differential Phase:	± 4 degrees (10 to 90% APL).

AUDIO

Input Level for 25 kHz Peak Deviation:	140 mV minimum. Manual gain adjustment with front panel control. Over-Modulation LED set for 25 kHz peak deviation indication.
Input Impedance:	10K Ohms, Unbalanced.
Pre-emphasis:	75 µSec. (internally defeatable).
Frequency Response:	20 Hz to 15 kHz, ± 1 dB, referenced to 75 µSec pre-emphasis curve. (20 Hz-100 kHz if preemphasis is defeated).
4.5 MHz Intercarrier Stability:	±5 kHz, 0^0 C to +50^0 C.
Total Harmonic Distortion:	1.0% maximum.
Hum and Noise:	-60 dB minimum, referenced to 25 kHz peak deviation.

COMPOSITE IF LOOP

Output Level (V carrier):	+28 dBmV.
Input Level (V carrier):	+28 dBmV.
Input/Output Impedances:	75 Ohms.

GENERAL

AC Power Input:	115 VAC ±10%, 60 Hz, 10 WATTS.
Operating Temperature Range:	0^0 C to +50^0 C, ambient.
Size:	19" W x 1.75" H x 6.75" D.
Weight:	5 Lbs. (2.25 Kg).

***Consult factory for custom channels**