





VM2550A  
*Commercial Video Modulator*  
*(For use in NTSC systems)*

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# ***Instruction Manual***

## 2 Caution Statements

WARNING: TO PREVENT FIRE OR ELECTRICAL SHOCK DO NOT EXPOSE TO RAIN OR MOISTURE

	<b>CAUTION</b> RISK OF ELECTRIC SHOCK DO NOT OPEN	
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER NO USER-SERVICEABLE PARTS INSIDE REFER SERVICING TO QUALIFIED PERSONNEL		



A product and cart combination should be moved with care. Quick stops, excessive force and uneven surfaces may cause the product and cart combination to overturn.



The lightning flash with arrow head symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.  
DO NOT OPEN THE CABINET, REFER SERVICING TO QUALIFIED PERSONNEL ONLY.

CAUTION: TO PREVENT ELECTRIC SHOCK, DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

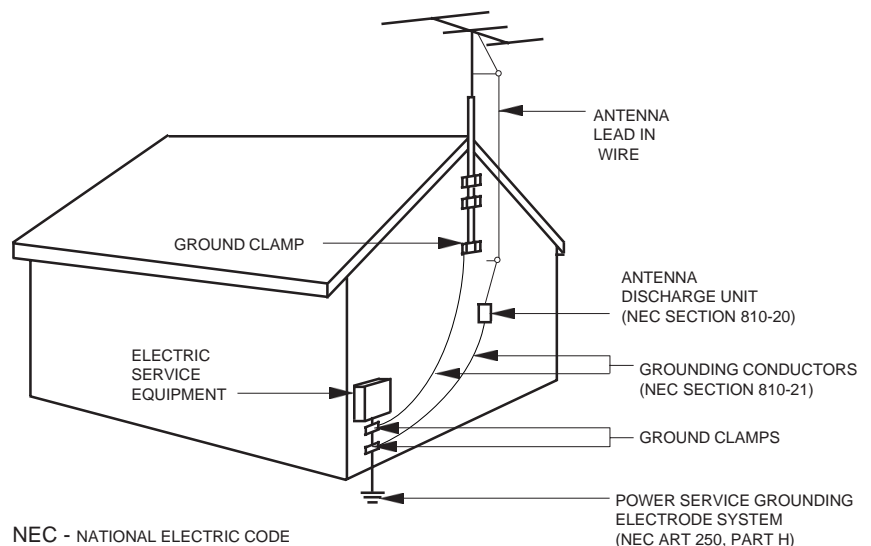
ATTENTION: POUR PREVENIR LES CHOCS ELECTRIQUES, NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR, UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT.

- 1. Read Instructions**—All the safety and operating instructions should be read before the product is operated.
- 2. Retain Instructions**—The safety and operating instructions should be retained for future reference.
- 3. Heed Warnings**—All warnings on the product and in the operating instructions should be adhered to.
- 4. Follow Instructions**—All operating and use instructions should be followed.
- 5. Cleaning**—Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleansers. Use a damp cloth for cleaning.
- 6. Attachments**—Do not use attachments that are not recommended by the product manufacturer as they may cause hazards.
- 7. Water and Moisture**—Do not use this product near water—for example, near a bathtub, wash bowl, kitchen sink or laundry tub; in a wet basement; or near a swimming pool; and the like.
- 8. Accessories**—Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the product. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.
- 9.** A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.
- 10. Ventilation**—Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or similar surface. This product should not be placed in a built-in installation such as bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.
- 11. Power Sources**—This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supplied to your home, consult your product dealer or local power company. For products intended to operate from battery power, or other sources, refer to the operating instructions.
- 12. Grounding or Polarization**—This product may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug. Alternate Warnings—If this product is equipped with a three-wire grounding-type plug, a plug having a third (grounding) pin, the plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.
  - 12 a. Mise à la terre ou Polarisation**—Cet appareil est équipé avec un cordon d'alimentation à trois fils. Il est à brancher sur une prise ayant un connecteur à la terre. Assurez-vous que la connection à la terre ne manque pas.
- 13. Power-Cord Protection**—Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.

- 14. Outdoor Antenna Grounding**—If an outside antenna or cable system is connected to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See Figure A.
- 15. Lightning**—For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power-line surges.
- 16. Power Lines**—An outside antenna system should not be located in the vicinity of overhead power lines, other electric light or power circuits, where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them may be fatal.
- 17. Overloading**—Do not overload wall outlets, extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.
- 18. Object and Liquid Entry**—Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.
- 19. Servicing**—Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
- 20. Damage Requiring Service**—Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
  - a. When the power-supply cord or plug is damaged,
  - b. If liquid has been spilled, or objects have fallen into the product,
  - c. If the product has been exposed to rain or water,
  - d. If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation,
  - e. If the product has been dropped or damaged in any way, and
  - f. When the product exhibits a distinct change in performance—this indicates a need for service.
- 21. Replacement Parts**—When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutes may result in fire, electric shock or other hazards.
- 22. Safety Check**—Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.
- 23. Wall or Ceiling Mounting**—The product should be mounted to a wall or ceiling only as recommended by the manufacturer.
- 24. Heat**—The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

**NOTE TO CATV SYSTEM INSTALLERS:**  
 THIS REMINDER IS PROVIDED TO CALL THE CATV SYSTEM INSTALLER'S ATTENTION TO ARTICLE 820 - 40 OF THE NEC THAT PROVIDES GUIDELINES FOR PROPER GROUNDING AND, IN PARTICULAR, SPECIFIES THAT THE CABLE GROUND SHALL BE CONNECTED TO THE GROUNDING SYSTEM OF THE BUILDING, AS CLOSE TO THE POINT OF CABLE ENTRY AS PRACTICAL.

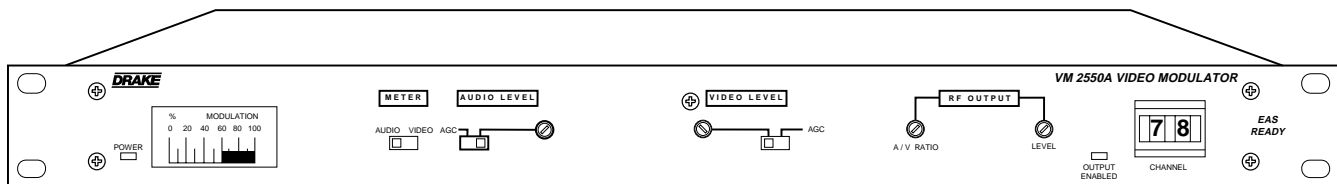
Figure A  
 Example of antenna grounding as per National Electrical Code, ANSI/NFPA 70



NEC - NATIONAL ELECTRIC CODE

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The R.L. Drake VM2550A Audio-Video Modulator is a high quality, vestigial sideband unit with synthesized visual and audio carriers. The VM2550A is designed to accept video and audio baseband signals from a satellite receiver or similar equipment. Both video and audio AGC can be selected via front panel switches to maintain nearly constant modulation levels. The audio input can be either unbalanced or balanced. IF loops are provided at 45.75 MHz and 41.25MHz. In addition, a 4.5 MHz audio carrier input is provided that accepts an audio modulated 4.5 MHz carrier. This input is selected by a rear panel screw terminal and is used with stereo generators or satellite receivers that provide the audio in this form. The composite video/audio IF input and output is also provided. Synthesized operation provides complete frequency agility, allowing front panel selection of any standard CATV channel from 2 to 78 and 95-99.

FCC required channel frequency offsets are automatically provided. Offsets of  $\pm$  and zero can be selected from a rear panel switch. A video low-pass filter and high quality IF SAW filter eliminate adjacent channel interference. This modulator is also equipped with a C-L delay predistortion filter specified by the FCC for broadcast transmitters to compensate for chroma delay in television receivers. Additionally, this modulator accepts Emergency Alert System (EAS) IF signals as required by the FCC Part 11 for many CATV systems after July 1, 1997. Either manual or automatic activation of the Emergency Alert System input is controlled by the rear panel (EAS) screw terminals. These features, combined with a carefully designed low intermodulation output stage, provide reliable operation in a densely crowded SMATV or cable environment.

## RF

Frequency Range:	82 channels, 54-550 MHz channels 2 -78 and 95-99.
Output Level:	+60 dBmV, (adjustable +50 to +60 dBmV) Note: If an output level of less than +50 dBmV is required, add an attenuator of the appropriate value to the modulator output. (example, add a 10 dB pad for +45 dBmV output).
Output Impedance:	75 Ohms.
A/V Ratio:	Audio carrier -20 to -12 dB referenced to video carrier, adjustable.
Frequency Stability:	± 10PPM.
Intercarrier Frequency:	4.5 MHz ± 10PPM.
FCC Frequency Offsets:	Automatic (+ or - or none, selectable via rear panel).
Spurious Outputs:	-60 dBc typical, -58 dBc minimum, measured at -15 dB A/V ratio and with modulator output level of +60 dBmV.
Broadband Noise:	-75 dBc typical, referenced to video carrier, (4 MHz BW @ ±12 MHz offset).

## VIDEO

Input Level for 87.5%:	1Vp-p ±3 dB manual gain adjust with front panel metering or AGC.
Video AGC:	Sync pulse gated. Automatically maintains 25% modulation of sync pulse, which equals 87.5% modulation for a full white level signal.
Input Impedance:	75 Ohms, return loss of 30 dB minimum.
Frequency Response:	20 Hz to 4.2 MHz, ± 1.0 dB.
Weighted Video S/N:	60 dB minimum.
Differential Gain:	± 3% (10 to 90% APL).
Differential Phase:	± 3 deg. (10 to 90% APL).

## AUDIO

Input Level for 25 kHz Peak	
Deviation:	-10 to +10 dBm manual gain adjustment with front panel metering or AGC.
Audio AGC:	Adaptive attack, slow release provides 25 kHz peak deviation for input levels of -10 to +10 dBm.
Input Impedance:	600 Ohms balanced, 300 Ohms unbalanced.
Pre-emphasis:	75 µSec.
Frequency Response:	50 Hz to 15 kHz, ±1dB.
Total Harmonic Distortion:	0.5% maximum.
Hum and Noise:	-60 dB minimum, referenced to 25 kHz peak deviation.

## 4.5 MHz AUDIO INPUT

Input Level:	+38 dBmV ± 2 dB.
Input Impedance:	75 Ohms - Return loss greater than 20 dB with this port enabled.

## VISUAL IF LOOP

Visual Carrier Frequency:	45.75 MHz.
Frequency Stability:	± 10 PPM.
Output Level (45.75 MHz):	+43 dBmV ±2 dB.
Spurious Outputs:	-60 dBc minimum.
Input Level (45.75 MHz):	+43 dBmV.
Input/Output Impedances:	75 Ohms, return loss greater than 20 dB.
Isolation:	Greater than 60 dB.

## AURAL IF LOOP

Aural Carrier Frequency:	41.25 MHz nominal, (-4.5 MHz ± 10 PPM of visual carrier frequency).
Output Level (41.25 MHz):	+28 dBmV ±3 dB.
Spurious Outputs:	-50 dBc minimum.
Input Level (41.25 MHz):	+28 dBmV Nominal.
Input/Output Impedance:	75 Ohms, Return loss greater than 15 dB.
Isolation:	Aural carrier is greater than 60 dB below the visual carrier with loop open and terminated.

## COMPOSITE IF LOOP

Output Level (V carrier):	+28 dBmV ± 2 dB.
Spurious Outputs:	-60 dBc minimum.
Input Level (V carrier):	+28 dBmV Nominal. +30 dBmV Maximum.
Input/Output Impedances:	75 Ohms, return loss greater than 20 dB.
Isolation:	Greater than 60 dB.

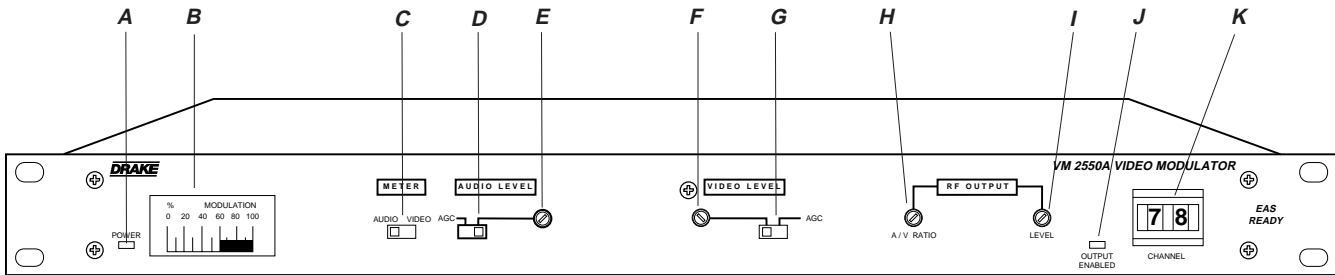
## EAS INPUT

Input Level:	+28 dBmV nominal.
Input Impedance:	75 Ohms - Return loss greater than 20 dB with this port enabled.
Auto Switching Level:	Greater than +20 dBmV, nominal.
Isolation between Composite and EAS Inputs:	Greater than 60 dB.

## GENERAL

AC Power Input:	115 VAC, ±10%, 60 Hz, 35 Watts.
Operating Temperature	
Range:	0° to +50° C, ambient.
Size:	19" W x 1.75" H x 14.3" D.
Weight:	8.8 lbs. (4 Kg).

## 6 Front Panel Controls and Indicators



**A. POWER INDICATOR** - Lights when the unit is connected to a source of AC power.

**B. % MODULATION METER** - Displays the level of video modulation or audio deviation depending on the setting of the 'METER' switch. See Item 'C'. The video modulation is normally set for 87.5%, which is indicated by a notch in the meter scale. The audio modulation is normally set for 100%, which corresponds to 25 kHz deviation on peaks.

**C. METER Switch** - Set this switch to select either video or audio modulation to be indicated on the '% MODULATION' meter.

**D. AUDIO LEVEL AGC Switch** - This switch selects Manual or AGC Audio Gain Control and is used to reset the AGC to maximum gain.

When the switch is set to the right-hand position, the Audio AGC is disabled and the audio gain/modulation level can be set manually by the "AUDIO LEVEL" control (item E). Observe the modulation level on the meter (item B) with the "METER" switch (item C) set to the "A" position. Use manual gain when it is not desirable for the modulator to vary the audio gain of the program source.

The VM2550A provides an audio AGC which will automatically set the long term peak modulation at 25 kHz when the "AGC" position is selected by switch D. Use the "AGC" position when different program source levels may be expected and unattended operation is desirable.

To facilitate faster checking of the "AGC" after making an adjustment in the source audio level, temporarily select the manual position of the "AGC" switch (item D) which will immediately reset the AGC to maximum gain. Then, return the switch to the "AGC" mode.

**E. AUDIO LEVEL Control** - The setting of this screwdriver adjustment determines the audio deviation level if audio AGC is not selected. See Item D. Clockwise rotation increases the level.

**F. VIDEO LEVEL Control** - The setting of this screwdriver adjustment determines the video modulation level if video AGC is not selected. See Item G. Clockwise rotation increases the level.

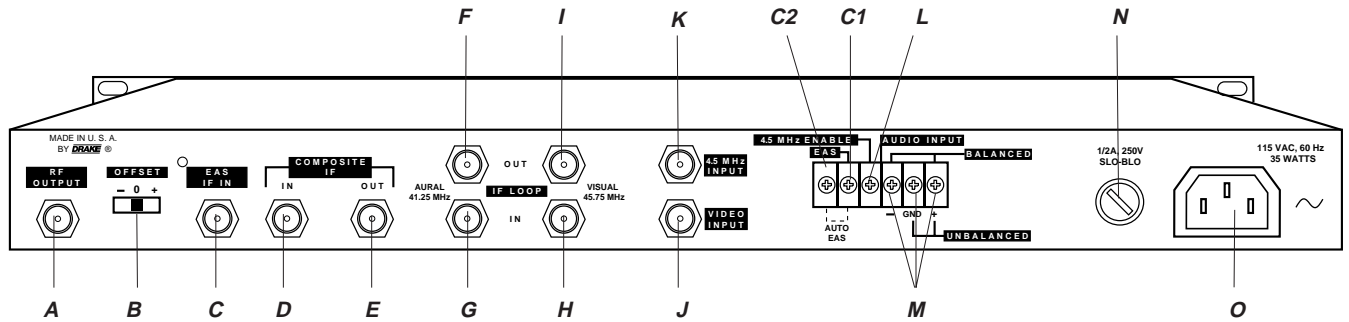
**G. VIDEO LEVEL AGC Switch** - Set this switch to the 'AGC' position to activate the video AGC to maintain an 87.5% depth of modulation. Setting this switch to the left selects a manual setting of the video modulation level by the control. See Item F.

**H. 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.

**I. RF OUTPUT LEVEL** - This screwdriver adjustment varies the RF Output Level. Clockwise rotation increases level.

**J. OUTPUT ENABLED Indicator** - Lights to indicate a valid channel is selected. The RF output is switched off for any invalid channel settings or other conditions that would cause the unit to operate on an invalid frequency.

**K. CHANNEL Switch** - These switches allow the selection of the desired operating channel from 02 to 78 and channels 95 through 99. See Table 1 - CHANNEL ASSIGNMENTS for list.



**A. RF OUT** - This is the modulator output.

**B. OFFSET** - The VM2550A synthesizer has been programmed to comply with FCC requirements for offsets on cable channel frequencies assigned to aviation and navigation communications with the "OFFSET" switch set to the "+" position. With the switch in the "+" position, the VM2550A will automatically offset the visual carrier either +12.5 kHz or +25 kHz above the frequency listed in Table 1 as required. **Be certain of the permissible operating frequency** if this switch is to be set to the "0" position since **NO** offset will be applied to any channel. Similarly, setting the switch to the "-" position forces the offset to a programmed -12.5 kHz or -25 kHz as required. **The normal setting for this switch is in the "+" position.**

**C. EAS IF IN Connector** - This is an alternate composite IF input intended for the Emergency Alert System (EAS) signals as defined by Part 11 of the FCC requirements. This input is manually activated by grounding the EAS screw terminal (C1) or is automatically activated by strapping the EAS terminal (C1) to the adjacent terminal (C2). When the unit is strapped for automatic switching to the EAS input, switching will occur for levels of the 45.75 MHz RF signal exceeding +20 dBmV at the EAS IF IN connector. The nominal operating EAS composite IF input level is +28 dBmV. Note that the composite signal must have the visual carrier at 45.75 MHz and the aural carrier at 41.25 MHz.

**C1. EAS** - Connect this screw terminal to ground for manual activation of the EAS input (see item C).

**C2. AUTO EAS** - Connect this screw terminal to the adjacent EAS terminal to enable the EAS IF input for automatic activation. See items C and C1.

**D. COMPOSITE IF IN** - This is the composite IF input to the synthesizer circuits. The composite IF has both the aural IF and visual IF combined. It is normally connected directly to the composite IF out connector (see item E). This external IF loop allows the use of accessories such as scramblers or alternate video sources. Note that accessory equipment must have the visual carrier at 45.75 MHz and the aural carrier at 41.25 MHz.

**E. COMPOSITE IF OUT** - This is the composite IF output from the IF circuits. The composite IF has both the aural IF and the visual IF combined. It is normally connected directly to the composite IF in connector (see item D).

**F. AURAL IF OUT** - This is the aural IF output from the IF board. It is normally connected directly to the aural IF in connector (see item G). This external loop allows the use of a scrambler that requires a separate aural carrier at 41.25 MHz.

**G. AURAL IF IN** - This is the aural input to the IF circuits. It is normally connected directly to the aural IF out connector (see item F). This external IF loop allows the use of accessories such as scramblers or alternate audio sources. Note that accessory equipment must have the aural carrier at 41.25 MHz.

**H. VISUAL IF IN** - This is the visual IF input to the IF circuits. It is normally connected directly to the visual IF out connector (see item I). This external IF loop allows the use of accessories such as scramblers or alternate video sources. Note that accessory equipment must have the visual carrier at 45.75 MHz.

**I. VISUAL IF OUT** - This is the visual IF output from the IF circuits. It is normally connected directly to the visual IF in connector (see item H). This external loop allows the use of a scrambler that requires a separate visual carrier at 45.75 MHz.

**J. VIDEO INPUT** - This is the baseband video input to the IF circuits.

**K. 4.5 MHz AUDIO INPUT Connector** - This input accepts a 4.5 MHz audio modulated carrier from stereo generators or satellite receivers which provide the audio in this form. This input is selected by connecting the 4.5 MHz ENABLE screw terminal to ground. Required 4.5 MHz input level is +38 dBmV  $\pm$  2 dB.

**L. 4.5 MHz ENABLE** - Ground this screw terminal to select the 4.5 MHz INPUT. See item K.

**M. AUDIO INPUT** - This terminal strip provides for the connection of either an unbalanced or balanced audio source. A balanced source should be connected to the two outside terminals, while an unbalanced source is connected between either outside terminal and ground.

**N. FUSE** - Always replace with a **1/2 Amp, 250V Slo-Blo** fuse.

**O. LINE CORD RECEPTACLE** - Accepts a 3-wire detachable power cord. Connect to a 115 VAC, 60 Hz source.



**CONNECTIONS AND CONTROLS** - All connections to and from the VM2550A are made through the rear panel. **Figure 3** shows a typical two channel installation using a typical satellite receiver as a signal source. Additional channels can be added by using additional VM2550A modulators and either multi-port combiners or combinations of two-port combiners.

**INSTALLATION NOTES** - Level adjustment provides optimum performance in multichannel installations. The modulator outputs should be checked periodically with a spectrum analyzer to maintain a  $\pm 1$  dB variation of adjacent channel carriers. Aural/Visual (A/V) ratios should be held to -15 dB or less. The 'Output Level' and 'A/V Ratio' controls are used respectively to make these adjustments. If an output level of less than +50 dBmV is required, add an attenuator of the appropriate value to the modulator output.

**Example:** For an output level of +45 dBmV, add a 10 dB attenuator pad to the modulator output.

**RACK MOUNTING** - Adequate ventilation is very important in multichannel installations. Units should be spaced apart by at least one panel height wherever possible, and some air movement is advisable in enclosed rack cabinets. Excessive heat will shorten component life and modulator performance will be degraded without proper cooling.

**FCC PAR.76.612** - The VM2550A synthesizer has been programmed to comply with FCC requirements for offsets on cable channel frequencies assigned to aviation and navigation communications with the "OFFSET" switch set to the "+" or "-" position. With the switch in the "+" position, the VM2550A will automatically offset the visual carrier either +12.5 kHz or +25 kHz above the frequency listed in Table 1 as required. **Be certain of the permissible operating frequency** if this switch is to be set to the "0" position since **NO** offset will be applied to any channel. Similarly, setting the switch to the "-" position forces the offset to a programmed -12.5 kHz or -25 kHz as required.

**Table 1 CHANNEL ASSIGNMENTS**

Switch Position	Visual Carrier MHz	Offset kHz	Switch Position	Visual Carrier MHz	Offset kHz
02	55.25	NONE	44	343.25	+/-12.5
03	61.25	NONE	45	349.25	+/-12.5
04	67.25	NONE	46	355.25	+/-12.5
05	77.25	NONE	47	361.25	+/-12.5
06	83.25	NONE	48	367.25	+/-12.5
07	175.25	NONE	49	373.25	+/-12.5
08	181.25	NONE	50	379.25	+/-12.5
09	187.25	NONE	51	385.25	+/-12.5
10	193.25	NONE	52	391.25	+/-12.5
11	199.25	NONE	53	397.25	+/-12.5
12	205.25	NONE	54	403.25	NONE
13	211.25	NONE	55	409.25	NONE
14	121.25	+/-12.5	56	415.25	NONE
15	127.25	+/-12.5	57	421.25	NONE
16	133.25	+/-12.5	58	427.25	NONE
17	139.25	NONE	59	433.25	NONE
18	145.25	NONE	60	439.25	NONE
19	151.25	NONE	61	445.25	NONE
20	157.25	NONE	62	451.25	NONE
21	163.25	NONE	63	457.25	NONE
22	169.25	NONE	64	463.25	NONE
23	217.25	NONE	65	469.25	NONE
24	223.25	+/-12.5	66	475.25	NONE
25	229.25	+/-12.5	67	481.25	NONE
26	235.25	+/-12.5	68	487.25	NONE
27	241.25	+/-12.5	69	493.25	NONE
28	247.25	+/-12.5	70	499.25	NONE
29	253.25	+/-12.5	71	505.25	NONE
30	259.25	+/-12.5	72	511.25	NONE
31	265.25	+/-12.5	73	517.25	NONE
32	271.25	+/-12.5	74	523.25	NONE
33	277.25	+/-12.5	75	529.25	NONE
34	283.25	+/-12.5	76	535.25	NONE
35	289.25	+/-12.5	77	541.25	NONE
36	295.25	+/-12.5	78	547.25	NONE
37	301.25	+/-12.5	95	91.25	NONE
38	307.25	+/-12.5	96	97.25	NONE
39	313.25	+/-12.5	97	103.25	NONE
40	319.25	+/-12.5	98	109.25	+/- 25
41	325.25	+/-12.5	99	115.25	+/- 25
42	331.25	+/-25			
43	337.25	+/-12.5			



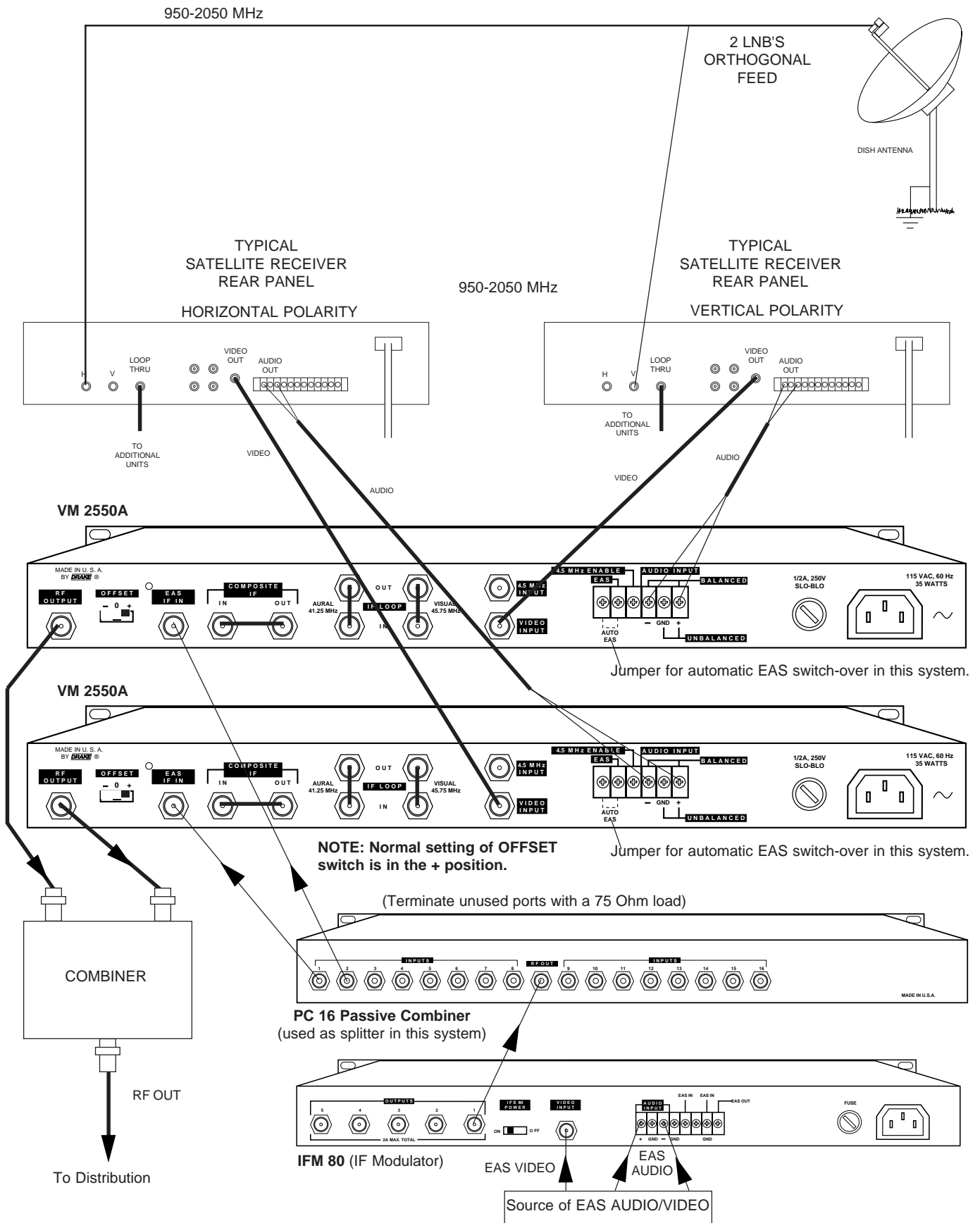


Figure 3 - TYPICAL MULTIPLE MODULATOR INSTALLATION WITH EMERGENCY ALERT SYSTEM (EAS) INPUT.

# 10 Internal Settings

The VM2550A Audio-Video Modulator has been designed and produced to provide trouble-free service. Should the need for repair arise or to set the internal jumpers, **EXTREME CAUTION SHOULD BE USED TO AVOID A POTENTIALLY LETHAL ELECTRIC SHOCK.**

The top cover is removable, and provides access to all serviceable components. Schematic diagrams are available from our customer service department for a nominal charge.

All internal adjustments require test equipment, and alignment should be attempted only by a trained technician. For service information, contact:

**R.L. DRAKE COMPANY**  
**230 INDUSTRIAL DRIVE**  
**FRANKLIN, OHIO 45005**  
**CUSTOMER SERVICE AND PARTS TELEPHONE:**  
**+1 (937) 746-6990**  
**TELEFAX: +1 (937) 743-4576**

## INTERNAL JUMPER SELECTION



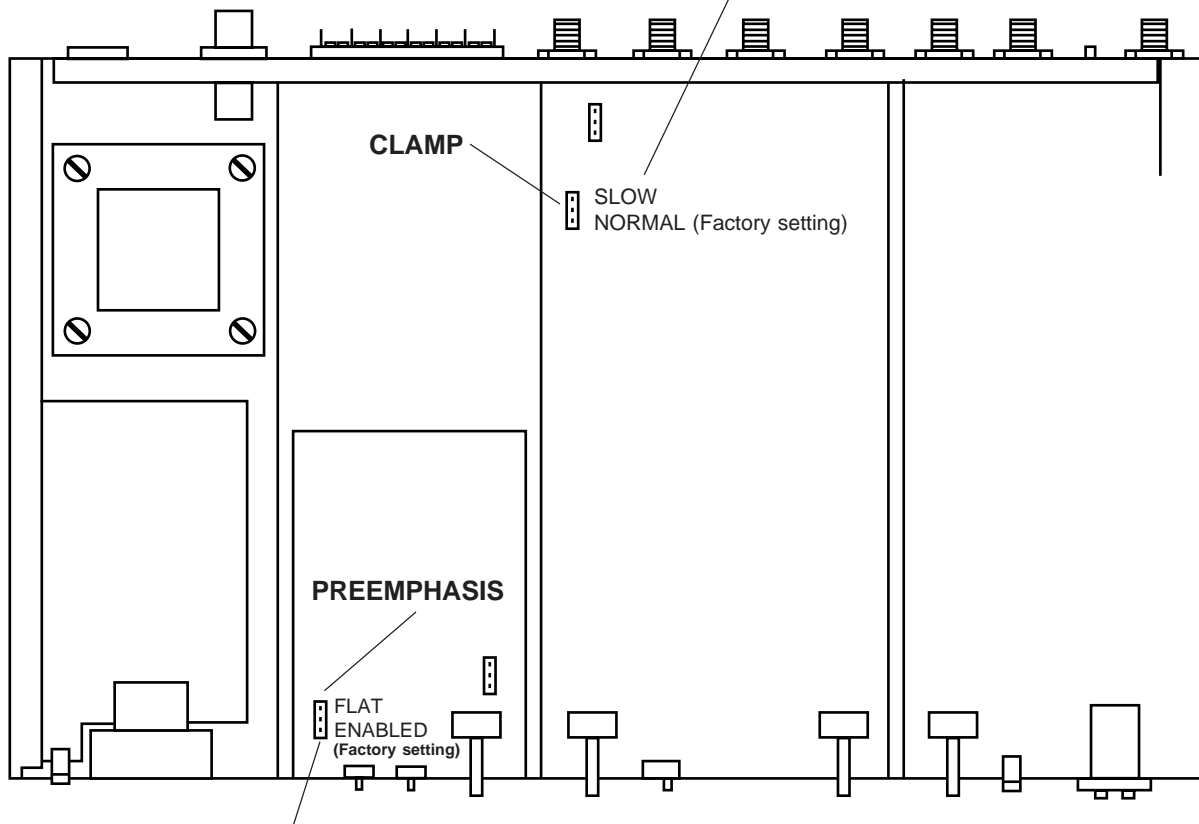
### CAUTION

NOTE: THE FOLLOWING PROCEDURE REQUIRES REMOVAL OF AN EQUIPMENT COVER THAT EXPOSES POTENTIALLY LETHAL VOLTAGES IF THE EQUIPMENT IS POWERED FROM AN AC POWER SOURCE. REFER SERVICING TO A QUALIFIED TECHNICIAN ONLY



### REAR PANEL (TOP VIEW)

Normally used in NORMAL position. Should be placed in SLOW position for use with Z-TAC or other sync suppressed, or inverting scrambling systems.



Normally ENABLED. Should be placed in FLAT position for use with external baseband BTSC stereo generators.

### FRONT PANEL (TOP VIEW)

**SERVICE INFORMATION**

You may contact the R.L. DRAKE Service Department for additional information or assistance by calling +1 (937) 746-6990, Monday through Friday, between 8:00 A.M. and 4:00 P.M. Eastern Time, except on holidays.

You may also contact the R.L. DRAKE Service Department by E-mail at the following address:  
service@rldrake.com  
or by Telefax:  
+1 (937) 743-4576.

Should you want to return your unit for service, package the unit carefully using the original carton or other suitable container.

Write your return address clearly on the shipping carton and on an enclosed cover letter describing the service required, symptoms or problems. Also include your daytime telephone number and a copy of your proof of purchase.

The unit will be serviced under the terms of the R.L. DRAKE COMPANY Limited Warranty and returned to you.

**IF YOU NEED TO CALL FOR HELP**

Call our Customer Service/Technical Support line at +1 (937) 746-6990 between 8:00 A.M. and 4:00 P.M. Eastern Time, weekdays. Please have the unit's serial number available. We will also need to know the specifics of any other equipment connected to the unit. When calling, please have the unit up and running, near the phone if possible. Our technician(s) will likely ask certain questions to aid in diagnosis of the problem. Also, have a voltmeter handy, if possible.

R.L. DRAKE also provides technical assistance by e-mail: service@rldrake.com  
or by Telefax: +1 (937) 743-4576.

Many of the products that are sent to us for repair are in perfect working order when we receive them. For these units, there is a standard checkout fee that you will be charged. Please perform whatever steps are applicable from the installation sections of the Owner's Manual before calling or writing—this could save unnecessary phone charges. Please do not return the unit without contacting R.L. DRAKE first: it is preferred to help troubleshoot the problem over the phone (or by mail) first, saving you both time and money.

Inside the carton, enclose a note with your name, address, daytime phone number, and a description of the unit's problem.  
The unit must be sent to the following address:

**Service Department  
R.L. DRAKE COMPANY  
230 Industrial Drive  
Franklin, Ohio 45005 U.S.A.**

Be sure to include your street address which will be needed for UPS return. UPS Surface (Brown Label) takes 7-10 days to reach us depending on your location, Blue takes 2-3 days.

Red is an overnight service. Send the unit in a way that it can be traced if we can't verify receipt of shipment. We suggest UPS or insured postal shipment.

If the unit is still under the original owner's warranty, R.L. DRAKE will pay the cost of the return shipment to you. Our return shipping policy is that we will return it UPS Brown if received Brown or by US Mail, it will be returned Blue if received Blue or Red—or it will be returned however you prefer if you furnish the return cost for the method you select.

If the unit is out of warranty, it will be returned by UPS Brown label COD (UPS does not accept cash/currency) unless:

- 1) It was received UPS Blue/Red, in which case it will be returned UPS Blue/Red COD;
- 2) You designate billing to American ExPress, VISA, MasterCard or Discover card;
- 3) You prepay the service charges with a personal check, or
- 4) You specify some other method of return.

When calling, the technician can estimate the repair charges for you over the phone. This is another good reason to call before sending a unit in for repair. Typically, equipment is repaired in five to ten working days after it arrives at R.L. DRAKE if we have all the facts. If we must call you, it may take longer. R.L. DRAKE is not responsible for damage caused by lightning, nonprofessional alterations, "acts of God", shipping damage, poor storage/handling, etc. R.L. DRAKE will make note of any shipping damage upon receipt. Should your warranty card not be on file at R.L. DRAKE, you will need to send proof of purchase to receive warranty service. Typically, a copy of the invoice from an R.L. DRAKE dealer will suffice. The warranty is for the original owner only and is not transferable.



## Three Year Limited Warranty

R.L. DRAKE COMPANY warrants to the original purchaser this product shall be free from defects in material or workmanship for three (3) years from the date of original purchase.

During the warranty period the R.L. DRAKE COMPANY or an authorized Drake service facility will provide, free of charge, both parts and labor necessary to correct defects in material and workmanship. At its option, R.L. DRAKE COMPANY may replace a defective unit.

To obtain such a warranty service, the original purchaser must:

- (1) Retain invoice or original proof of purchase to establish the start of the warranty period.
- (2) Notify the R.L. DRAKE COMPANY or the nearest authorized service facility, as soon as possible after discovery of a possible defect, of:
  - (a) the model and serial number,
  - (b) the identity of the seller and the approximate date of purchase; and
  - (c) A detailed description of the problem, including details on the electrical connection to associated equipment and the list of such equipment.
- (3) Deliver the product to the R.L. DRAKE COMPANY or the nearest authorized service facility, or ship the same in its original container or equivalent, fully insured and shipping charges prepaid.

Correct maintenance, repair, and use are important to obtain proper performance from this product. Therefore carefully read the Instruction Manual. This warranty does not apply to any defect that R.L. DRAKE COMPANY determines is due to:

- (1) Improper maintenance or repair, including the installation of parts or accessories that do not conform to the quality and specifications of the original parts.
- (2) Misuse, abuse, neglect or improper installation.
- (3) Accidental or intentional damage.

All implied warranties, if any, including warranties of merchantability and fitness for a particular purpose, terminate three (3) years from the date of the original purchase.

The foregoing constitutes R.L. DRAKE COMPANY'S entire obligation with respect to this product, and the original purchaser shall have no other remedy and no claim for incidental or consequential damages, losses or expenses. Some states do not allow limitations on how long an implied warranty lasts or do not allow the exclusions or limitation of incidental or consequential damages, so the above limitation and exclusion may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state. This warranty shall be construed under the laws of Ohio.

For Service, contact:

**R.L. DRAKE COMPANY**  
230 Industrial Drive  
Franklin, Ohio 45005 U.S.A.  
**Customer Service and Parts Telephone:** +1 (937) 746-6990  
**Telefax:** +1 (937) 743-4576  
**World Wide Web Site:** <http://www.rldrake.com>



**R.L. DRAKE COMPANY**  
230 INDUSTRIAL DRIVE  
FRANKLIN, OHIO 45005 U.S.A.  
**CUSTOMER SERVICE AND PARTS TELEPHONE:** +1 (937) 746-6990  
**TELEFAX:** +1 (937) 743-4576  
**WORLD WIDE WEB SITE:** <http://www.rldrake.com>