



**Series 3000**  
**Model R-174A**

**Audio/Video – IF/RF Relay Panel**  
**DTMF<sup>®</sup> Controlled**

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**The following accessories are included with this unit:**

Instruction Manual  
427A Power Supply  
3000R/22M Rack Mounting Kit  
phone cables

# WARRANTY

Monroe Electronics, Inc. warrants to the owners, each instrument and sub-assembly manufactured by them to be free from defects in material and workmanship for a period of one year after shipment from factory. This warranty is applicable to the original purchaser only.

Liability under this warranty is limited to service, adjustment or replacement of defective parts (other than fuses or batteries) on any instrument or sub-assembly returned to the factory for this purpose, transportation charges prepaid.

This warranty does not apply to instruments or sub-assemblies subjected to abuse, abnormal operating conditions, or unauthorized repair or modification.

Since Monroe Electronics, Inc. has no control over conditions of use; no warranty is made, or implied as to the suitability of our product for the customer's intended use.

THE WARRANTY SET FORTH IN THIS ARTICLE IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES AND REPRESENTATIONS, EXPRESSED, IMPLIED OR STATUTORY INCLUDING, BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS. Except for obligations expressly undertaken by Monroe Electronics, in this warranty, Owner hereby waives and releases all rights, claims and remedies with respect to any and all warranties, express, implied or statutory (including without limitation, the implied warranties of merchantability and fitness), and including but without being limited to any obligation of Monroe Electronics with respect to incidental or consequential damages, or damages for loss of use. No agreement or understanding varying or extending the warranty will be binding upon Monroe Electronics unless in writing signed by a duly authorized representative of Monroe Electronics.

In the event of a breach of the foregoing warranty, the liability of Monroe Electronics shall be limited to repairing or replacing the non-conforming goods and/or defective work, and in accordance with the foregoing; Monroe Electronics shall not be liable for any other damages, either direct or consequential.

## RETURN TO FACTORY POLICY

Materials returned to Monroe must have a Return Material Authorization number. To obtain an RMA number, contact our A/V Switching & Control Customer Service at 585-765-2254 or fax 585-765-9330. Customers have 30 days to determine that the product ordered fills their need and performs as described in Monroe's literature. Units returned for approved repair or credit, must be in the original packaging including all parts and paperwork plus be in very good physical condition. If not, the customer is billed the cost to refurbish the unit and for missing accessories and merchandise. No products may be returned for exchange or credit after 12 months of the shipment date. Monroe reserves the right to repair or replace units under warranty.

## DESCRIPTION

Monroe Series 3000, Model R174A Audio/Video-IF/RF Relay Panel will switch any combination of baseband audio follow video and IF/RF frequencies from 0 to 950 MHz.

The unit contains high quality RF and Audio relays capable of more than 100,000 operations without failure.

“BNC” connectors are used for the video and IF/RF signals and screw terminals for wiring the baseband audio signals.

Each of the four (4) switch sections contains a DTMF decoder that may be used for automatic switching of the section by a control tone sequence selected by the user. The sequences could come from networks, satellite providers or other programmers.

Switches can be controlled by DTMF (cue tones), contact closure, or an RS-485 command from a computer. Up to 15 of these units may be connected via RS-485 to one control computer. Priority of switching is described in the installation instructions.

# SPECIFICATIONS

## **RF Isolation**

> 60 dB @ 950 MHz.

## **Attenuation**

+/- 1 dB 0 to 750 MHz

*See Attached Frequency Charts on page 9.*

## **Power Requirement**

+12 VDC @ 220 mA maximum

(Monroe Model 427A UL/CSA approved wall supply.)

## **Control Inputs**

### **Contact Closure**

Absolute Maximum Input Voltage 5 VDC

Logical High Input Voltage  $\geq 3.5$  VDC Minimum

Logical Low Input Voltage  $\leq 1.5$  VDC Maximum

### **Serial Input**

Each unit (up to 15 maximum) is individually addressable

RS-485, 2 wires plus ground

SwitchWare© software, DOS based

### **DTMF Tone Input**

Unbalanced, 10k $\Omega$  impedance input

1 for each switch assembly

### **Control Output**

Single open collector to ground, 30 Volt 30 mA

1 for each switch assembly

### **Physical**

3.5" H X 3" D X 19" W, 1 Rack Mount

## ***WARNING:***

**The audio input jacks – RJ11 4/4 – on the rear of the unit are intended for audio input only. Do not connect a telephone line to them. It will damage the unit and void the warranty.**

# INSTALLATION

## Mounting:

The R174A requires a minimum of 3.5 vertical inches of space in a standard 19" wide EIA equipment rack. Slide the unit into the rack frame and secure it, using the 3000R/22M mounting hardware supplied with the unit.

## Connections:

1. The Video (or IF/RF) switches are mechanical relays. Connections to them are made through 75Ω BNC connectors on the rear of the unit. Connect your cable for the default signal to the NC (normally closed) connector. Connect your cable for your alternate signal - which you will substitute for the default signal - to the NO (normally open) connector. Connect the cable to your modulator or other destination to the COM (common or output) connector.

These connectors will switch either video signals, or may alternately be used to switch high frequency signals, such as IF or RF. The frequencies useable are shown on the frequency response charts included.

It is also permissible to use some relay sets for baseband video and some for high frequency, since all switch modules are isolated.

2. If the signals being switched are baseband audio follow video, with audio following, connect the audio signals to screw terminals of the same switch set, ensuring that the left and right channels for the default audio are connected to the L NC 1 and 2, and the R NC 1 and 2, and the signals for the alternate signal are attached to the L NO 1 and 2 and the R NO 1 and 2 connectors. The L OUT 1 and 2 and the R OUT 1 and 2 are routed to the modulator or other destination of the audio signals.
3. If you are using the unit with a contact closure switcher, connect the switch for each Relay Unit to the connector for Contact Closure as appropriate.
4. If you are using the unit with the optional SwitchWare© control software, refer to the SwitchWare© manual to connect the RS485 wiring to it's connector, and set the appropriate unit code.
5. Connect the +12 VDC lead (white and black) from the Monroe model 427A power supply to the +12V terminal on the POWER connector, and the black lead from the power supply to the GND terminal. Plug the model 427A into a 115 VAC power outlet, and the unit is ready to function.
6. To connect the audio DTMF tones to the individual switch, attach the supplied cable assembly to the RJ-11 4/4 connector. (if 2 cables are supplied terminated with RJ-11 connectors on each end they must be cut in half and the wires stripped before hook up.) Refer to the wiring diagram on page 7 in this manual for hook-up information. **DO NOT CONNECT A TELEPHONE LINE TO THE JACK. IT WILL VOID THE WARRANTY**

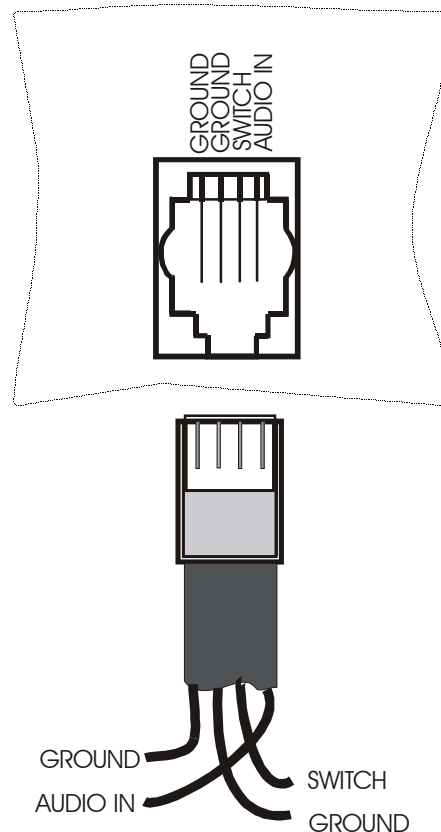
# OPERATION

The 2 x 1 relay sets may be switched three ways: By using a DTMF signal programmed into the included decoder for each switch assembly. By means of the contact-closure inputs on the control screw terminal. Or, by using Switchware© software on a PC, through an RS-485 circuit.

Switching priority is from contact closure first, RS-485 second, and DTMF third. This means that if the contact closure is used, the switch may be turned on or off no matter what the other controls do. If the RS-485 is used, it supercedes DTMF on or off commands.

When the unit receives a DTMF control sequence a 250 mS pulse is output as closure from SWITCH to GROUND (refer to drawing below). This allows activation of a VTR or other device as desired.

Switching time is <30 mS.



# PROGRAMMING DTMF CODES

1. Obtain a standard Touch Tone telephone set.

REMEMBER, **DO NOT** CONNECT THE TELEPHONE LINE TO THE R174A CONNECTORS. IT WILL DAMAGE THE UNIT AND VOID THE WARRANTY. CONNECT **ONLY** A STANDARD TOUCH TONE TELEPHONE SET, ALONE.

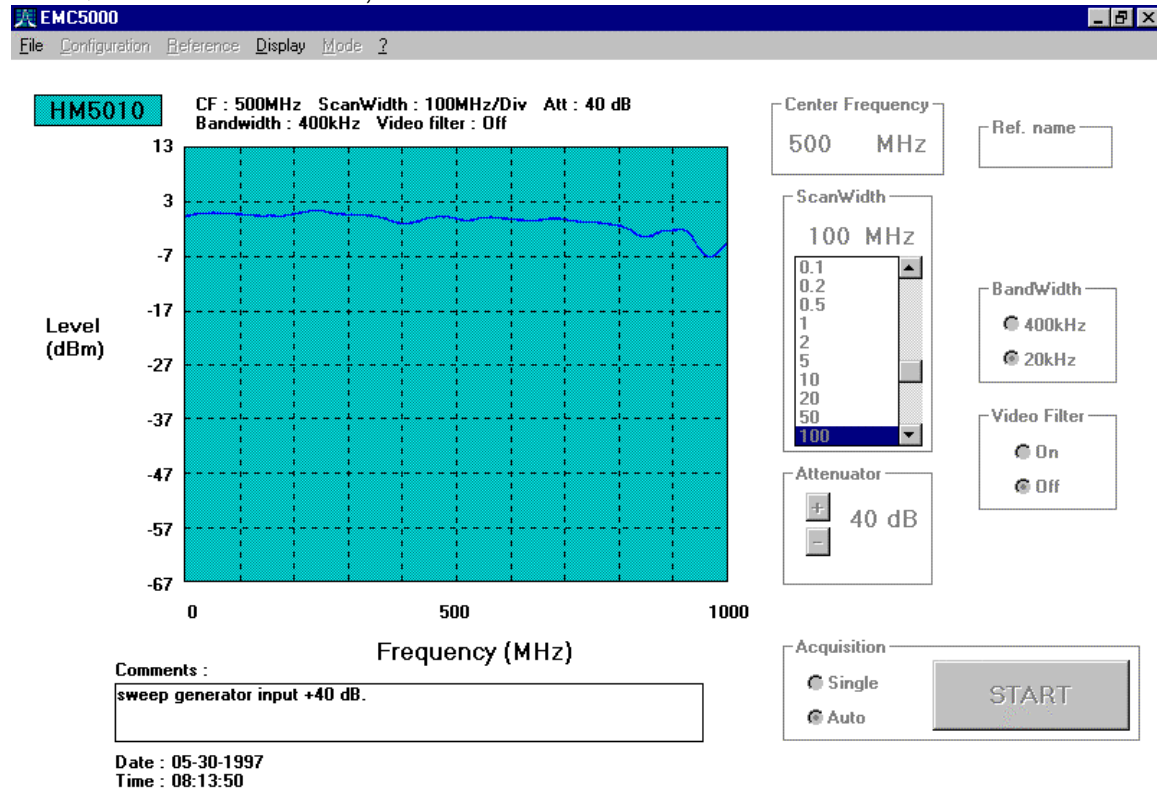
2. Using a standard double-ended RJ-11 connector equipped cable, plug into the telephone set and then into the R-174A connector for the switch to be programmed.
3. While listening to the handset, hold down the # key for 3 seconds. After 3 seconds a short tone will be heard.
4. Within 3 seconds, press the \* key for 3 seconds. After 3 seconds, 3 short tones will be heard.
5. Enter the 4 digit code for turning the relays on – for example, you might enter 3 4 5 \* as the on command. The telephone will sound 3 short tones.
6. Now enter the 4 digit code for turning the relays off – the usual form would be to then enter 3 4 5 # as the off command. The telephone will sound 3 short tones.

YOU MAY ENTER ANY 4 DIGIT COMBINATION OF TONES FOR ON AND OFF. BUT THEY MUST BE THE ONES THAT THE SERVICE YOU ARE USING SUPPLIES.

7. Now, unplug the telephone set from the jack on the unit, and plug in the wiring to your audio source for the tones you will be using. Repeat this operation for the other switches.



# FREQUENCY RESPONSE, NC CONTACTS



# ISOLATION, NO CONTACTS

