

**AMI-2**  
ANTENNA MONITOR INTERFACE

Instruction Manual

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# Section One

## INTRODUCTION

### Description

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The Model AMI Antenna Monitor Interface provides convenient control of a Potomac AM-19 or similar antenna monitor from an ARC-16 Remote Control System. Up to eight towers may be monitored from any connected site. Monitoring is continuous, providing instantaneous phase and ratio readings from all towers.

### Physical Description

The AMI is firmware based and consists of a single EPROM which replaces the EPROM on the CPU board of the ARC-16.

### Required Equipment

The AMI-2 may be installed in any ARC-16 unit which has an I/O card installed for channels 9-16. This includes all standard ARC-16T and ARC-16SA units. An IP-8 Interface Panel must be provided for channels 9-16. In addition, the user will need a 33-pin Jones plug and multi-conductor cable to connect the IP-8 to the AM-19. (Consult the antenna monitor manual for interface to monitors other than the AM-19.)

Note: The AMI-2 may not be used in a 4-unit multi-site configuration. If more than three sites are to be connected, a computer interface will be required. Please contact the factory for more information.

### Channels Used

Regardless of the number of towers monitored, the AMI-2 will require the use of control channels 13-16 and metering channels 15 and 16. All status and all remaining control and metering channels may be used for other purposes.

### Operation

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The antenna monitor readings appear on the ARC-16 as an additional "site.". To access this phantom site, press MODE on any connected ARC-16. At the SELECT SITE prompt, select "TOWERS." Hold the MODE switch for one second (or press clear) to return to a normal display. The status lights will display which tower is being scanned.

The AMI-2 continuously scans all towers, waiting three seconds for the monitor to settle, then storing the readings in the appropriate channels. The sampled data may be viewed at any time without disrupting the scan.

Use the CHANNEL switches to select the desired reading.

# Section Two

## INSTALLATION

ARC-16 systems ordered with the AMI-2 will need no further internal installation. If your unit is marked as having the AMI-2 option, proceed to the EXTERNAL CONNECTIONS section. If in doubt, U4 on the ARC-16 CPU board will be labeled “AMI-2” if the option is installed.

### **EPROM installation**

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Verify that the AMI-2 EPROM is at the same major revision level as the ARC EPROM it is replacing. AMI-2 version 4.4 will directly replace ARC versions 4.0 through 4.4. If a Model ESI Enhanced Speech Interface is installed, the AMI-2 EPROM must be version 4.5 or higher.

If the ARC EPROM is at a lower revision level, it will also be necessary to upgrade any other units in the system.

To install the AMI-2 EPROM, unplug the unit and remove the top cover. Remove the EPROM at location U4 and install the new EPROM, carefully observing the orientation of pin 1.

Re-apply power and check the ARC-16 for normal operation.

If the ARC-16 fails to operate after changing the EPROM, check for a bent pin on the IC.

## Selecting the AMI Option

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If the AMI Option is not selected in the configuration menu, the AMI-2 EPROM will operate as a normal ARC EPROM. To enable the AMI option, follow these steps:

- 1) Remove power from the ARC-16 and enter the configuration menu by holding MODE and CLEAR while reapplying power. Release the MODE and CLEAR switches after two seconds. The mode light should remain on.
- 2) Press MODE repeatedly until OPTION is displayed on the second line.
- 3) Use the channel keys to select the AMI option.
- 4) Press the raise key to set this option to YES.
- 5) Hold MODE until the mode light is extinguished.
- 6) Wait at least five seconds, then repeat step one.
- 7) Press MODE repeatedly until SITE USED FOR ANTENNA ARRAY is displayed. If this prompt does not appear, either the AMI option is not set to YES, or the ARC EPROM is being used instead of AMI- 2.
- 8) Use the RAISE and LOWER keys to select a site letter that is not used elsewhere in the system.
- 9) Use the MODE key to advance to the MAX CHAN display. This sets the highest channel that will be sent or displayed for this site.
- 10) Use the RAISE/LOWER keys to select the site chosen in step 8.
- 11) Use the Channel keys to set MAX CHAN to TWICE the number of towers.
- 12) Hold MODE until the mode light is extinguished.

## Configuring Other Units

Each unit in the system must be set to receive data from the site selected above. Enter the configuration menu as above, and press MODE to display “x DATA RECEIVED FROM PORT n”. Use the channel keys to select the desired site letter, and the RAISE/LOWER to select the port number. Select the same port as that being used for the unit containing the AMI-2.

If the unit being configured has two ports, press MODE to display “x DATA SENT OUT PORT n” Again, select the same port assignment as that being used for the ARC-16 with AMI.

Press mode until MAX CHAN appears. Select the site used for the AMI-2 using the channel keys, and set for twice the number of towers using the RAISE/LOWER keys.

The AMI option should only be set to YES on the unit containing the AMI-2. Other connected units should be set to NO.

## External Connections

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The antenna monitor tower select lines are controlled by channel 13-16 RAISE and LOWER relays on the IP-8 I/O board.

The appropriate relay is latched in for the duration of the measurement on the selected tower. Metering inputs 15 and 16 are connected to the antenna monitor PHASE and RATIO outputs, respectively.

Instructions are given here for connection to a Potomac Instruments AM-19 Antenna Monitor. Refer to the monitor instruction manual for other monitors.

All connections to the AM-19 are made to the 33-pin Cinch-Jones connector. A multi-conductor cable should be prepared to make connections between the antenna monitor and the IP-8 interface panel.

### Tower Select Connections

For the following connections, use the normally open relay contacts on the IP-8 as indicated. If less than eight towers are used, connect only as many lines as necessary, starting with Pin 1.

IP-8	AM-19
13 raise	Pin 1
13 lower	Pin 2
14 raise	Pin 3
14 lower	Pin 4
15 raise	Pin 5
15 lower	Pin 6
16 raise	Pin 7
16 lower	Pin 8
Relay Commons	Pin 27

It will also be necessary to jumper Pin 23 to Pin 26 on the Jones plug.

These connections assume that tower 1 is the reference. You may rearrange the pins as necessary to present the towers in the desired order.

### Analog Connections

Connect Channel 15 analog input on the IP-8 to Pin 32 (phase) on the Jones plug and Channel 16 analog input to Pin 29 (ratio). Connect both analog grounds to Pin 14.

# Section Three

## CALIBRATION

### Coarse Adjustment

Manually select the tower with the highest possible phase reading and adjust the 20 turn trimmers on the AM-19 to produce about 4 volts if possible. This can be accomplished by putting channel 15 in the millivolt mode and trimming for a reading close to 4000, ignoring the decimal point. Repeat the process with the highest possible ratio reading on channel 16. This adjustment should only be necessary once. Select the linear (LIN) mode for both channels when coarse adjustment has been completed.

### Fine Adjustment

Again using the highest normal readings, calibrate the ARC-16 display to match the antenna monitor readings. This is easiest with the automatic scan overridden at the AM-19, but may be verified during automatic scan by comparing the readings as each tower is selected. This adjustment should be checked as often as necessary to assure that the remote readings compare accurately with the readings on the antenna monitor.

### Day/Night Calibration

The A/D converter in the ARC-16 is extremely linear, requiring no separate day/night calibration in most installations. Some stations will require separate calibrations due to mistracking in the sample voltages from the antenna monitor, particularly where the samples are very small.

If the antenna monitor has separate calibrations for day and night, the monitor can be calibrated directly in each mode. If it is not possible to obtain valid calibration in both modes, it may be necessary to install separate calibration pots for each mode. Two 10K-ohm linear potentiometers may be added externally. Both pots should be fed from the antenna monitor ratio output, with the armature of each pot connected to the NO and NC contacts of a Form C type relay. The common contact of the relay is connected to the ARC-16 metering input. The relay is driven by the latched Day/Night control signal in the station phasing equipment.

Contact Technical Support if additional help is required.