ANTENNA MART MANUFACTURERS OF COMMUNICATIONS ACCESSORIES

Box 1010, I.S.U. Station ● Ames, Iowa 50010 ● (515)292-7114

MODEL 50/MODEL 50G

INSTALLATION AND OPERATING INSTRUCTIONS

Description

Your ANTENNA MART Model 50 is a remote-controlled coaxial switch which allows switch selection of multiple communications antennas or other RF devices at distances up to several hundred feet from the control point. It is designed to provide many years of reliable operation at high power levels and under extreme operating conditions. Installation and operation are simple and straightforward; attention to the instructions below will help to assure trouble-free operation.

Operating Principles

The remote switch is positioned by a rotary-solenoid selector, a pulse-operated device which turns the switch through a fixed angular step each time a DC operating voltage is momentarily applied to the solenoid winding. In this equipment the control unit supplies a constant DC voltage, and the necessary pulses are internally generated by the control circuitry in the remote switch, causing the rotary selector to "self-step". When the desired position is reached the circuit between the control and remote units is broken, and the remote switch remains in the selected position.

Installation

Installing the equipment consists simply of interconnecting the control and remote units with a seven-conductor control cable, placing the units in their desired locations, and connecting the antennas to the remote switch.

The control cable is connected to the control unit through an octal plug and socket, and to the remote switch at the barrier terminal strip inside the unit. The connectors are wired pin to pin by number, 1 to 1, 2 to 2 etc. Pins 1-5 correspond to antenna positions 1-5, pin 6 is the Ground position and pin 7 is common. Pin 8 on the octal connectors is not used.

When connecting the cable to the remote switch, first remove the enclosure cover and the strain-relief bushing which is temporarily snapped into the bottom of the unit. Feed the cable through the hole until the cable end is visible along the right edge of the enclosure, and pull a length of the cable up around the edge of the sub-panel while feeding it through the bottom hole with the other hand. Strip and dress the cable conductors to appropriate lengths and connect them to the terminal strip. After the connections are made inspect the cable placement to be sure that the cable does not interfere with the solenoid armature end piece. Finally, place the strain relief bushing around the cable, squeeze it around the cable with pliers and snap it into the hole.

The bushing will accept cable diameters up to about ¼" (6 mm). If a larger cable is used it will be necessary to replace the bushing with a grommet of adequate inside diameter. In this case, care should be taken to secure the cable to a fixed support a few inches from the switch.

When wiring the connectors be sure to note the colors of the conductor jackets and ensure that the connectors are wired pin-for-pin. When you are sure the connections are correct (and before mounting the remote switch) plug the octal plug into the control unit socket and connect the AC line cord to a 110-120V outlet. Turn on the unit. Number 1 LED should light and the remote unit should be silent. Turn the control switch clockwise to position 2. The solenoid in the remote switch will operate, accompanied by an audible click, advancing the switch to the next position. If operation seems satisfactory, continue to turn the control switch through the succeeding positions. In position 6, the Ground position, LED's 1 and 5 will light simultaneously. Proper operation can be verified with an ohmmeter or continuity checker between the common coaxial receptacle and the switched connectors.

If the unit does not operate properly TURN OFF THE POWER SUPPLY until the cause of the malfunction is determined. The commonest causes of difficulty are improper control cable wiring and, occasionally, excessive control cable resistance. The switch will operate correctly with control cable series resistance of up to about 5 ohms, although this figure will vary slightly from unit to unit. With #20 AWG conductors, cable runs of 200 to 250 feet are allowable. The popular seven and eight conductor rotator cables containing two #18 conductors and five or six #22's are equivalent if one of the heavy conductors is used as the common.

The solenoid actuator is a snap-action device which cannot operate at low speeds. The stepping rate will slow slightly as cable resistance increases, but a rather abrupt point will be reached at which the voltage drop across the cable prevents the solenoid from making a complete stroke. Depending on the position of the switch rotor, the actuator may continue to self-step in partial strokes, becoming in effect a buzzer, or it may make a single stroke too short to open the interrupter contacts, causing the coil to draw heavy current. In the latter case the "Slo-Blo" load fuse will open, protecting the solenoid and transformer from damage.

These difficulties are rare in actual operation, but they indicate the need to check the entire system for operation with the full length of control cable in the circuit before installing the remote switch in an inaccessable location. When extremely long cable runs are required it will be necessary to use heavier control cable. Or consult ANTENNA MART on the availability of optional higher-voltage transformers.

When you have determined that operation is satisfactory, the remote switch may be mounted in the desired location. It may be bolted to a wall or tower-mounted plate using the existing holes in the mounting feet, or additional holes may be drilled in the feet to accomodate U-bolts for mounting to a tower leg or mast.

The main transmission line from the station to the switch is connected to the common receptacle (stamped "C") and the several antennas are connected by shorter feedlines to connectors 1-5. In outdoor installations the switch should be mounted with the connectors downward to prevent rain from running into the connectors.

Operation

Antenna selection is as simple as turning a knob. When the control unit switch is operated, the remote switch automatically homes to the selected position, connecting the main feedline to the antenna desired. The control switch has no stops and may be turned directly from position 6 (Ground) to position 1.

When you wish to "back up" (going from position 5 to position 4, for example) simply turn the control to the new position. If it is desired to back up more than one or two positions it is advisable to turn the control clockwise until the desired position is reached. The speed of the actuator (which can rotate in one direction only) is such that when the control is turned counterclockwise the remote switch will often reach a particular position before you reach it with the control. The result is another complete revolution of the remote switch before it finds the selected position. While this will cause no damage to the unit, it may result in unnecessary wear on the switch and operating mechanism over a long period of time. When two or three antennas are frequently used in conjunction, e.g. separate receiving and transmitting antennas or antennas used alternately for on-the-air comparison testing, they should be connected to adjacent switch positions for operator convenience.

Control position #6 is the ground position. In the Model 50, this position grounds the main transmission line at the remote switch location and leaves all other positions open. The Model 50G grounds all unused positions at all times, and grounds the main feedline and all five outlets in the Ground position. In either case the remote switch enclosure should be connected to a good earth ground or grounded structure. A ground post is provided for this purpose.

After an antenna has been selected the remote switch no longer requires operating voltage and the power supply may be turned off unless continuous indication of antenna position is required.

Service and Maintainence

No periodic maintainence is required in normal use. If the antenna system components are inspected from time to time the remote switch can be inspected as well. If rust appears on the outside of the enclosure it should be removed with fine sandpaper and the area sprayed with a clear lacquer.

The power supply is fused in the AC line and in the negative return from the load. If either fuse opens the unit will be non-operational and the LED's will not light. If a fuse opens TURN OFF THE POWER SWITCH AND DISCONNECT THE POWER CORD FROM THE AC LINE! Remove the cabinet cover by removing the four screws on the sides of the unit. Do not remove the mounting feet. The fuse block is located under the protective shield at the right side of the cabinet. BE SURE the AC line cord is UNPLUGGED before removing this shield. Viewed from the front top, the line fuse is on the left and the load fuse is on the right. Replace only with the values shown in the schematic diagram. Determine the cause of the blown fuse before re-connecting the equipment.

Operational problems, although rare, can be caused by electrical or mechanical failure of any component. In case of difficulty, a simple check of power supply output and continuity checks of the control switching and solenoid coil will usually pinpoint the faulty part. Consult the schematic, and make

all checks with the equipment disconnected from the AC line except when power is required for voltage checks.

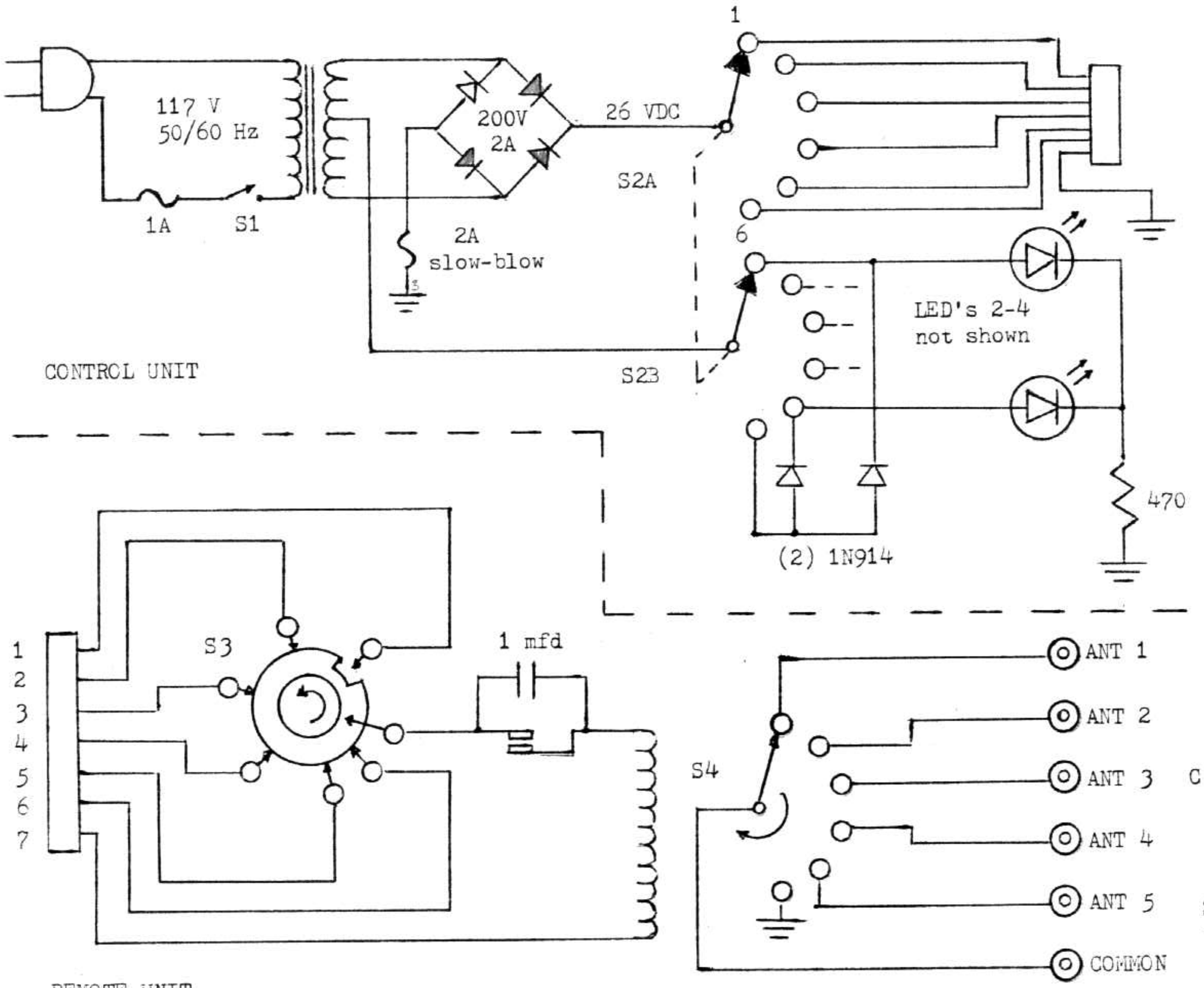
ANTENNA MART will be happy to help you in trouble-shooting your switch, or to make the required repairs if they become necessary. Just contact the factory, giving model and serial number of your unit.

REMEMBER: LINE VOLTAGE CAN KILL!
ANY DEVICE OPERATING FROM AC MAINS
CAN BE DANGEROUS AND POTENTIALLY
DEADLY WHEN CARELESSLY OR IMPROPER-
LY USED. BE CAREFUL!

ONE-YEAR LIMITED WARRANTY

ANTENNA MART warrants each of its products to be free from defects in materials and workmanship for a period of one year from date of purchase. This warranty is made to the original purchaser and to any other party to whom ownership of the product is legally transferred within the warranty period. ANTENNA MART will repair or replace at its option any product which fails to operate in conformance with published descriptions and specifications within the period of the warranty. Malfunctions arising from abuse, improper installation, acts of nature or other causes beyond our control are specifically excluded from warranty coverage.

ANTENNA MART products are also sold with a fifteen (15) day MONEY-BACK GUARANTEE. If our product is unsatisfactory for any reason it may be returned prepaid to the factory within 15 days of receipt for a refund of the purchase price, less shipping charges.



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MODEL 50

REMOTE-CONTROLLED RF SWITCH