OWNER'S MANUAL

CORNELL-DUBILIER ELECTRONICS

MODEL AR-20

AUTOMATIC ANTENNA ROTOR SYSTEM

GENERAL

The Cornell-Dubilier AR-20 antenna rotor is designed to support and rotate an intermediate size television antenna. Directional control and indication is provided by a remote decorator styled automatic control unit. Ideal service can be obtained from one of the current YAGI or log periodic "in-line" antennae in suburban service with the antenna mounted in close proximity to the rotator. These antennae will normally be rated by the manufacturer for service up to 60 miles. When it is necessary to mount the antenna more than three (3) feet above the rotor, it is recommended that the thrust bearing, part number 50653-10, be used to prevent side thrust overload to the rotator upper mast support.

For larger television antennae, or heavy duty service, we recommend one of the Cornell-Dubilier rotors; AR-22R Automatic, AR-33 Push Button Automatic, or TR-2C Manual. These rotors should be used when large cross-braced type or stacked array type antennae are necessary because of installation-to-station distance.

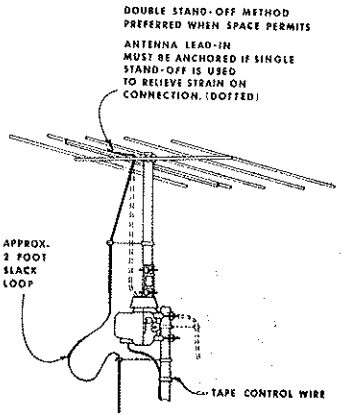


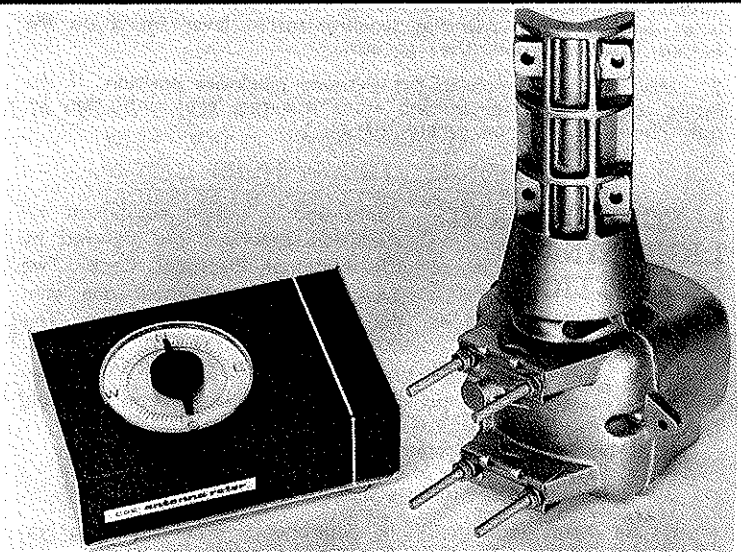
Fig. 1 — AR-20 INSTALLED

INSTALLATION

Prior to mounting the rotator on the mast, it is well to check the operation of both rotator and control box wired for each of the four connections using the recommended wire sizes and lengths that will be utilized in the installation. The rotator unit is shipped from the factory set at the end of rotation in full "NORTH" counter-clockwise position (looking down at the top of the rotator). After assuring that operation is correct, return rotator to full north counter-clockwise end of rotation. Then clamp the antenna in final position after mounting, facing the antenna due north. IF DUE NORTH HAPPENS TO COINCIDE DIRECTLY WITH ONE STATION DIRECTION, IT IS BEST TO ADJUST SLIGHTLY AWAY (COUNTER-CLOCK) FROM THAT POSITION SO THAT THE ROTATOR WILL NOT CUSTOMARILY RUN UP AGAINST THE STOP POSITION IN ORDINARY SERVICE. TO DO SO WILL PROLONG THE LIFE OF THE GEAR TRAIN.

It is intended that this rotor be clamped to 1¼" to 1⅝" O.D. aluminum or thin-wall steel masts. The clamps and hardware provided will dig into such masts and hold them securely so that the antenna will not slip, once it is installed.

In mounting the antenna, be certain that the receiving side of the antenna is pointed to compass North and that sufficient slack is provided in the lead-in to allow full 360° rotation from North through West, South, East and back to North. It is suggested that a stand-off insulator be placed as shown in Figure 1 so that there



is no chance of the slack in the lead-in loop becoming fouled. It is suggested that careful attention be paid to a neat and workmanlike connection of the control cable to the rotor terminals. Be sure to wind the connecting wires around the terminal screws so that tightening of the screws tightens the wire. Also be sure that no excess wire is left between terminals; that insulation is snug against the terminals; and that a little slack is left between the terminals and the cover plate. The control cable should be run in a short loop to the mast and taped securely in place. To avoid flexing in wind the cable should be secured at 4 to 6 foot intervals down the mast and tower. The lead-in should be anchored using appropriate stand-off insulators.

USE THE FOLLOWING WIRE SIZES:

AWG Wire Size	Max. No. of Feet
22	100
20	150
18	220
16	350
14	550

GUYING THE ROTATOR

The rotator is designed so that the unit may be guyed using two lugs cast into the smaller of the two housing die castings. It is recommended that tall mast installations be guyed to stabilize the system and help prevent wind damage. Figure 2 shows in plan view (viewed from top) an ideal method of guying.

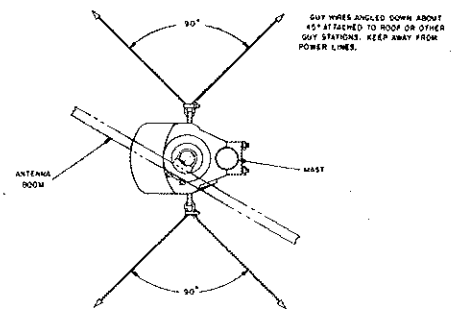


Fig. 2 — GUY WIRES

NOTICE TO SERVICEMAN: Leave this instruction sheet with the Customer. It contains his operating instructions.

Parts and service can be obtained through your local dealer, or by writing to Cornell-Dubilier Electronics, Rotor Parts Department, 118 E. Jones St., Fuquay-Varina, North Carolina 27526

CDE Rotor System AR-20

SYCHRONIZATION

1. Synchronize the Rotor unit with the control box unit in 2 steps as follows:

1. Turn the knob to the extreme **counter-clockwise** position — do not force. If the lights remain on after pulsing stops, trip the synchronization lever found on the bottom of chassis until they go out.

2. Now turn the knob to the extreme **clockwise** position. If the lights remain on after pulsing stops trip the lever until they go out. The units are now synchronized.

ELECTRICAL AND LIGHTNING PROTECTION

Radio and television equipment installation practices are covered by the National Electrical Code. Two pamphlets are published, one concerning the electrical code, the other lightning protection. The former, Pamphlet NFPA 70-1971, Article 810 ($3.50) covers installation. The latter, Pamphlet NFPA 78-1968 ($1.25) covers lightning protection. Both pamphlets are published by and available from:

National Fire Protection Association
60 Batterymarch Street
Boston, Massachusetts 02110

Masts and metal parts should be permanently grounded using No. 10 copper or No. 8 aluminum building wire. Grounding wires should not make sharp bends and should run as straight as possible to the grounding stake or if possible to the nearest cold water pipe outside the building. Clamps should be permanent and secure. Do not bury aluminum wire in ground. Grounding stakes should be ¾" I.D. galvanized pipe or equivalent at least 18" away from house foundation. The ground rod should be driven as deeply as possible but not less than 4 feet.

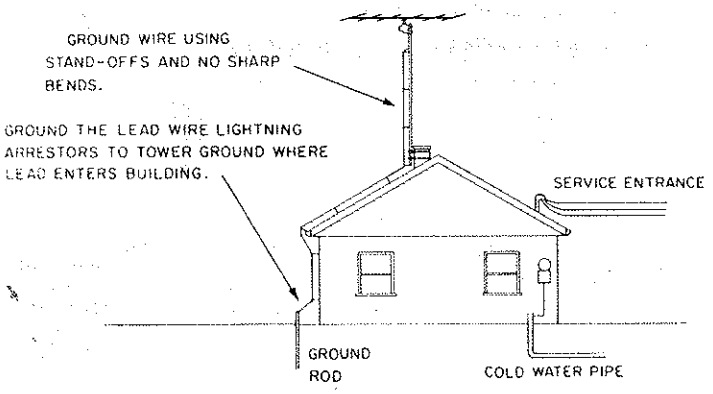


Fig. 3 — TYPICAL GROUNDING SYSTEM

UHF & COLOR RECEPTION

Special care must be exercised when installing UHF or color TV antenna lead-ins. It is recommended that shielded twin lead or coaxial lead in wire be used for UHF and color. Follow the manufacturers recommendations for matching the impedance of the lead-in wire to the TV set and to the antenna.

If ordinary 300 ohms TV lead-in wire is used for UHF or color, special care must be exercised to avoid grounding out the signal or changing the phase relation of the color signal. Avoid running the lead-in close to building or anything metal. Twist the lead-in to minimize ghosts. You may have to experiment to find the best installation method and location.

CIRCUIT

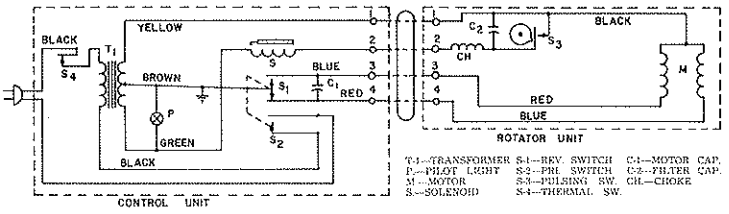


Fig. 4 — SCHEMATIC

OPERATION

Move the dial knob until the knob marking indicates the desired direction. The red pointer will now show the position of the antenna as it is moving. It is desirable to have the red pointer come to a stop before reversing direction.

When turning the knob thru an angle greater than 330° allow the unit to pulse a few times before completing the turn. Do not force the knob when the end of rotation is reached.

(A) IMPORTANT — IF LIGHTS REMAIN ON AFTER PULSING HAS STOPPED it indicates [with the exception noted in (B)] that the ROTOR and control box are not synchronized with each other and the motor is stalled. Do not allow this condiction to continue because the temperature of the motor is rising unnecessarily. Correct this condition by synchronizing per instructions under paragraph on "Synchronization", or on the underside of the control box.

(B) IMPORTANT — IF PULSING SOUND IS NOT EVIDENT WHEN YOU TURN THE KNOB, either to the right or left, it indicates that the thermoswitch has come into play. This protective device in the transformer automatically shuts off the power to the ROTOR unit when the rotator has been operated continuously for too long a period of time (usually 10 to 15 minutes) or when the ROTOR and control box have been allowed to remain out of synchronization with each other with the power on as mentioned above. To REMEDY, line the knob up with the red pointer, and allow the rotator to rest until the temperature drops. This will take about 5 minutes. The thermoswitch will then close and the rotator will again be operative.

Test for synchronization by following the instructions for synchronizing.

To replace dial light, type No. 47, in the control unit, remove the four cover screws and lift cover from chassis.

WARRANTY

CORNELL-DUBILIER ELECTRONICS warrants each new CORNELL-DUBILIER ROTOR to be free from defects in material arising from normal usage. Its obligation under this warranty is limited to replacing, or at its option repairing the rotor which, after regular installation and under normal usage and service, shall be returned within **ONE (1) YEAR** from date of original consumer purchase of the rotor to **Cornell-Dubilier Electronics, Rotor Service Dept., 118 E. Jones St., Fuquay-Varina, N. C. 27526,** together with satisfactory evidence of such purchase, and which shall be found to have been thus defective in accordance with the policies established by CORNELL-DUBILIER ELECTRONICS.

The obligation of CORNELL-DUBILIER ELECTRONICS does not include either the making or the furnishing of any labor in connection with the installation of such repaired or replacement rotor, nor does it include responsibility for any transportation expense.

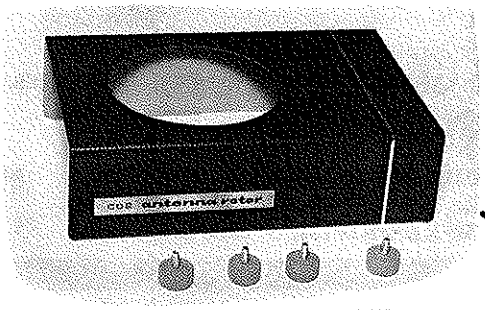
CONDITIONS AND EXCLUSIONS

This warranty is expressly in lieu of all other agreements and warranties, expressed or implied, and CORNELL-DUBILIER ELECTRONICS does not authorize any person to assume for it the obligation contained in this warranty and neither assumes nor authorizes any representative or other person to assume for it any other liability in connection with such CORNELL-DUILIER Rotor.

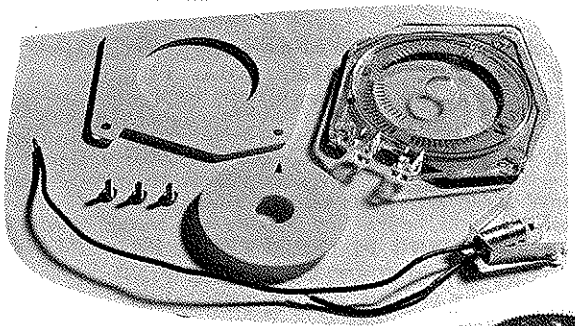
The warranty herein extends only to the original consumer and is not assignable or transferable, and shall not apply to any rotor which has been subject to alteration, misuse, negligence or accident.

CORNELL-DUBILIER ELECTRONICS
118 E. Jones Street
Fuquay-Varina, N. C. 27526

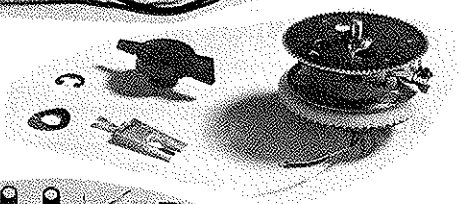
AR-20 CONTROL BOX



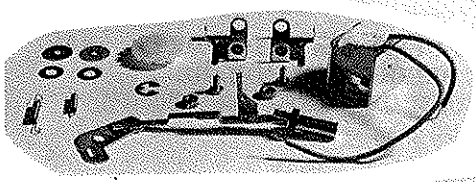
50065-10	CONTROL BOX ASSEMBLY COMPLETE	$24.00
50580-10	COVER KIT COVER & RECESS BUMPERS (4)	3.30



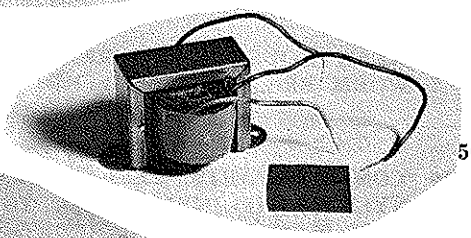
50581-10	DIAL FACE KIT DIAL FACE, LIGHT SHIELD OVERLAY, METAL LIGHT SHIELD, LIGHT SOCKET, LIGHT BULB #47, SCREWS AND INDICATOR PLATE	2.00



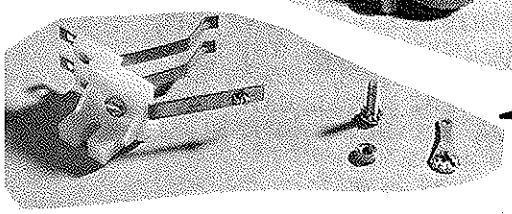
50433-10	GEAR SPRING & INS. DISC. ASSEMBLY GEAR SPRING AND INS. DISC. ASSEMBLY, VINYL SLEEVING, RET. RING, KNOB ASSEMBLY, LOST MOTION LEVER AND SPRING WASHER	4.20



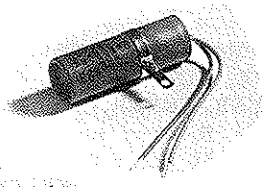
50584-10	SOLENOID & CONNECTING BAR KIT COIL ASS'Y, PAWL ARM & CONNECTING BAR ASS'Y, L.H. PAWL, R.H. PAWL, PAWL SPRING, RET. RING, LEVER SPRING ESCAPE WHEEL, FLAT WASHER, SCREWS, HEX NUTS, & FLAT WASHERS	2.30



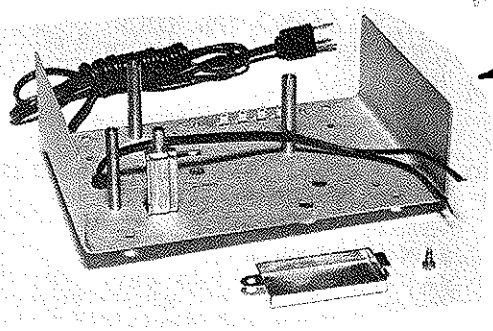
50436-10	TRANSFORMER	5.50



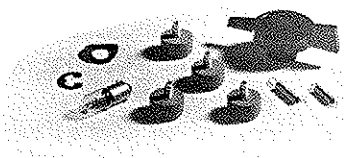
50582-10	INSULATOR BLOCK KIT INSULATOR BLOCK & CONTACTS, HEX NUT, SCREW, GROUND LUG, & LOCK WASHER	.60



50040-10	CAPACITOR, ELECTROLYTIC	1.65

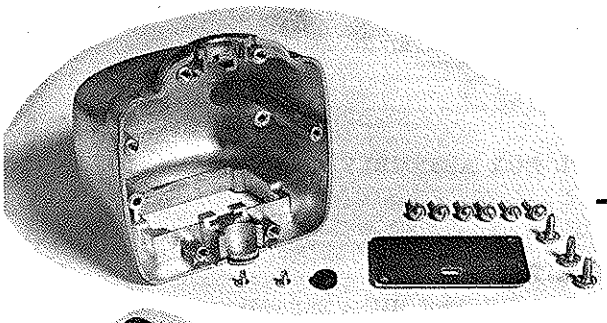


50586-10	CHASSIS KIT CHASSIS KIT, BOTTOM COVER & SCREW	3.70
50647-10	COMMON REPLACEMENT PARTS KIT RECESS BUMPERS (4), KNOB ASSEMBLY, LAMP, SPRING WASHER BOWED, PAWL SPRING, LEVER SPRING & RET. RING	1.10

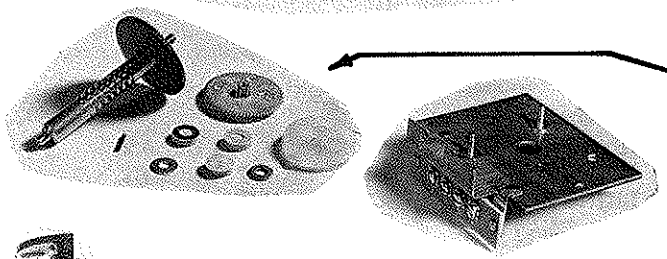


ORDER PARTS USING COMPLETE NUMBER & DESCRIPTION

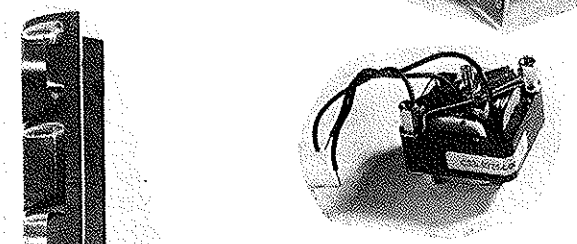
AR-20 ROTATOR



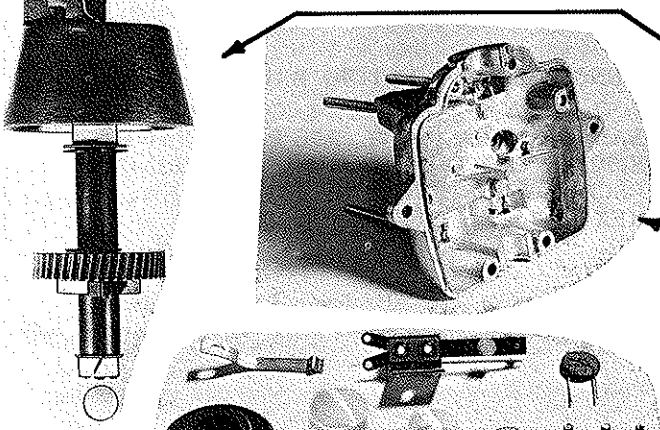
50704-10	ROTATOR ASSEMBLY, COMPLETE	$29.95
50714-10	FRONT HOUSING KIT, FRONT HOUSING, COVER PLATE, GROMMET, SCREW, SEMS (6), SCREW HEX HD (3), SCREW BH TH'D FORM (2)	4.00



50651-10	GEAR KIT, NYLON WASHER, NYLON BEARING WORM WASHER, ROLL PIN, STL. WASHER, BRASS WASHER, PULSING GEAR, PINION GEAR, SPUR GEAR, WORM, SPUR GEAR RETAINING RING	3.10



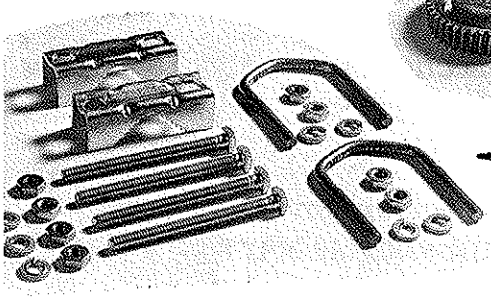
50648-10	MOTOR MOUNTING PLATE & TERM. BD. KIT, RIVET (2), MOUNTING PLATE, PINION STUDS, BRACKET, RIVET, TERMINAL STRIP, TERMINAL LUGS (4)	1.60
50254-10	MOTOR	8.50



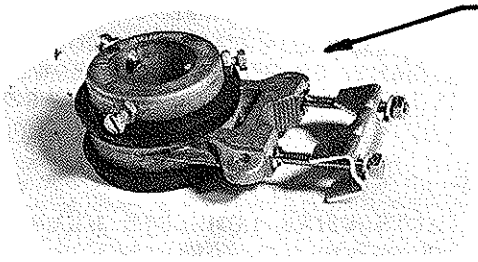
50707-10	DRIVE SHAFT & UPPER MAST SUPPORT ASSEMBLY KIT, DRIVE SHAFT, NYLINER, NYLON DISC, WORM GEAR, STOP LEVER, LEVER PIN	6.00
50708-10	REAR HOUSING KIT, REAR HOUSING, WORM BRG., SCREW SQ. HD. (4)	4.00

50649-10	COMMON PARTS REPLACEMENT KIT, NYLINERS (2), NYLON DISC, TOP SEAL, LOCK-WASHERS, SCREWS, DETENT SPRING SCREWS SHEET METAL, CAPACITOR COTTER PIN, PULSING SWITCH & BRACKET	2.15

50446-10	WORM GEAR ASSY. KIT, RETAINING RING, PIN, WORM GEAR, MECH. STOP-LEVER, LEVER PIN	2.40



50706-10	HARDWARE KIT, MAST CLAMPS, LOCK-WASHERS (8), HEX NUTS (8), "U" BOLTS (2), SQ. HD. BOLTS (4)	2.00



50653-10	THRUST BEARING KIT, THRUST BEARING, MAST CLAMP, WASHERS (2), HEX NUTS (2), INSTRUCTION SHEET THIS KIT IS NOT FURNISHED WITH AR-20 BUT MAY BE PURCHASED SEPARATELY.	3.80

ORDER PARTS USING COMPLETE NUMBER & DESCRIPTION