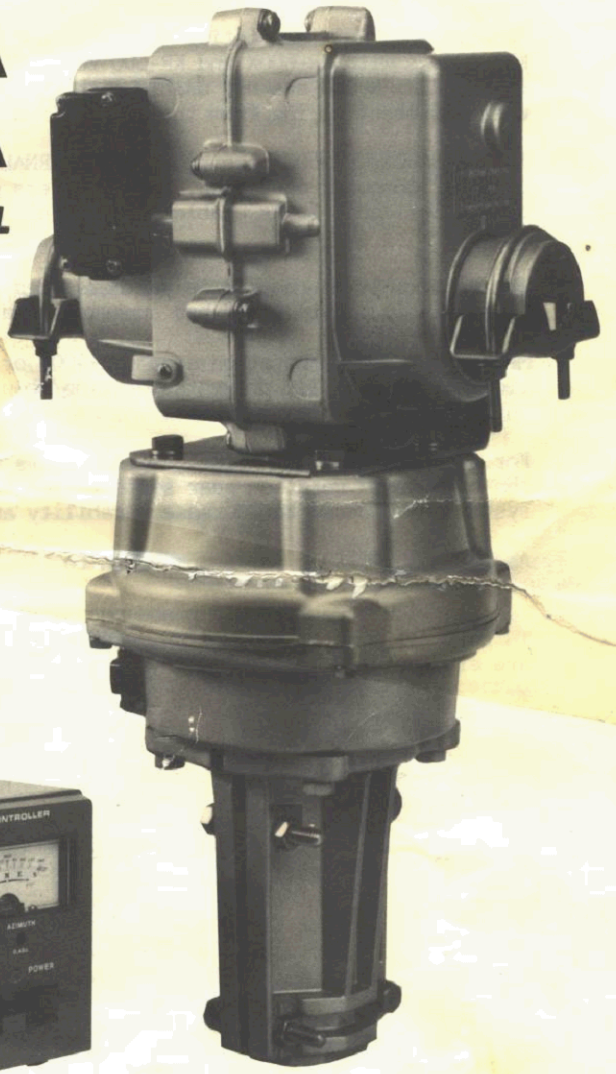
DUAL CONTROL ANTENNA ROTOR

MODEL

KR-5400A
KR-5600A

INSTRUCTION MANUAL



KENPRO

DUAL CONTROL ANTENNA ROTOR

MODEL:KR-5400A/5600A

* FEATURES

1. The KR-5400A/5600A is designed to control the AZIMUTH using rotor unit KR-400 or the KR-600X and the ELEVATION using rotor unit KR-500 with one control box.

2. Model:KR-5400A is consisting of KR-400 and KR-500 rotor units, and Model : KR5600A is with KR-600X and KR-500 rotor units, but the rotor unit of ordinary KR-600RC or KR-600 are not usable with the control box of the KR-600A, since it uses different wiring from the control box of the KR-600RCand KR-600 units.

3. The KR-5400A/KR-5600A are provided EXTERNAL CONTROL TERMINAL(DIN connector) for using of computer operation, and it offers great convenience for satellite tracking. Besideds, it is usable for digital indication of angular or preset control.

4. The rotor unit is housed in weathersealed aluminum die-cast housing with melamine-resin coating, and has superior durability.

5. Mechanical End-of-Rotation stop (KR-400) or Electrical/Mechanical End-of-Rotation stop (KR-600X), prevents worrying about the coaxial cable being wrapped or cut.

6. For the prevention of noise,, molded gears and precision cut gears are used in the high speed rotation gear system, and the gear in the low speed rotation system is tempered to increase durability and strong.

7. As the main voltage is stepped down to 24VAC, it provides safe operation.

8. The Sandwich type mast clamp and mast gauge on the top and bottom of the AZIMUTH rotor eliminates, any aligning problems of the antenna or rotor installation are eliminated.

* BEFORE INSTALLATION

Please be sure that following articles should be contained in a packing carton after unpacked.

AZIMUTH rotor unit(KR-400 or KR-600X).....1
ELEVATION rotor unit (KR-500).....1
Control Box 1
Mast Clamp(KC-038) for AZIMUTH.....1
L Bracket for KR-500.....1
Stud Bolt for KR-500.....4
M8 - 16 Bolt for KR-400/600X & L bracket...4
M8 - 25 Bolt forKR-400/600X & KC-038.....4
M8 - 70 Bolt for KC-038.....4
U Bolt for KR-500 & Boom.....2
Boom Clamp for KR-500.....2
ø6 Spring Washer.....4
ø8 Spring Washer.....20
ø6 Washer.....4
ø8 Washer.....4
M6 Nut for U Bolt.....4
M8 Nut for KR-500 & L Bracked.....8
Instruactution Book.....1

A part of stamped 'UP' on the top of the rotor units must be faced up, when install them to a tower or a supporting mast, otherwise damage may occur caused by water leakage.

Please do not over tighten the screws of the mast. It is enough support for a mast to tighten the clamp bolts and add 1 or 1½ revolution after spring washer comes flat.

It is not necessary to change the grease in the rotor unit.
Molybdenum grease of the most excellent performance is used as lublication.

Please do not run for hours continuously. Recommendable continuous run is not more than 5 minutes.

Please do not suddenly reverse the run during operation, as abnomal load is given to the inner mechanism and can result in damage.

*PERMISSIBLE ANTENNA SIZE

Wind load area be not more than 0.8M².(8.5 sq.ft.)
Estimated wind velocity is up to 30Mph.

It is recommended to use with plenty of reserve capacity depending on the conditions of use.

Weight of the antenna should be balanced on either side of the boom at the mast-to - boom clamp. Unbalanced installation results in leverage force which strains the mast at the clamping point on the rotor. Greate care should be given especially in high wind area.

*INTERCONNECTION

1. Connect 6 conductor cable between the terminals of AZIMUTH rotor unit and terminal for AZIMUTH of the control box, and each wire must be connected between same numbers of the terminals on control and rotor as shown in Figure 3.
   Same procedures are required in the ELEVATION rotor wiring.

2. Plug the line cord of the control box into an AC power outlet. Use the correct voltage your control box model.

3. Depress the power switch to ON and pilot lamp in the meter units of the control box will light and both indication needles move and stop at the direction the rotor was set at the factory.

4. Depress LEFT(CCW) switch and AZIMUTH rotor runs to the left (looking from top). Again, depress the LEFT switch untill the indication needle stops automatically, and be sure that the needle exactly reads 'N' of the left. If not, adjust the needle by 'O' ADJ. screw located under the meter unit.

5. Put a 'MARK' on the top of the rotor unit to know rotation of the rotor unit.

6. Depress RIGHT(CW) switch and rotor runs to the Right (looking from top), and release the switch when the MARK rotates full 360° clockwise, and be sure that the needle exactly reads 'N' of the right. If not, adjust the needle by FULL SCALE ADJ. VR. located rear panel.

7. Again, depress LEFT switch and rotates the rotor unit full 360° counter clockwise untill indication needle exactly reaDS "N' of the left.

8. Depress DOWN switch and ELEVATION rotor unit rotates, and when the hallmark located

on the rotation part of the rotor unit comes to '0' point, rlease the switch. At the time,be sure that the indication needle also exactly reads '0' in the meter. If not, adjust the needle by ADJ. screw located under the meter unit.

9.Depress UP switch until the hallmark comes to 180° point, and be sure that the indication needle exactly reads 180° in the meter unit. If not, adjust the needle by FULL SCALE ADJ. VR. in the rear panel.
Again, depress DOWN switch until the indication needle comes to '0' point of the left in the meter unit.

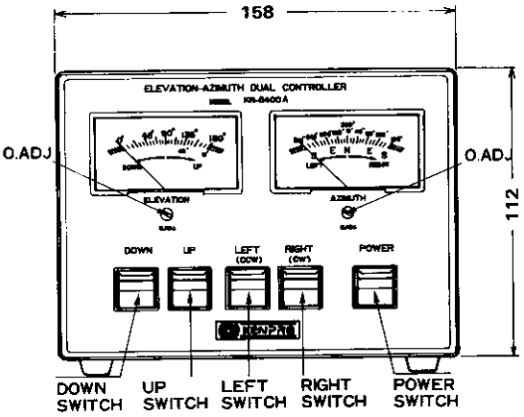


Fig 1

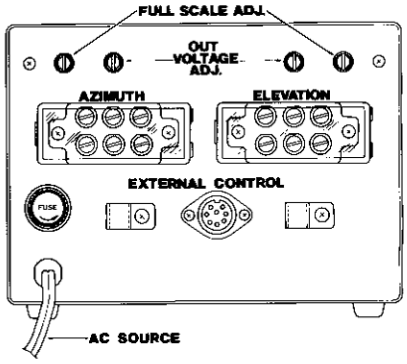


Fig 2

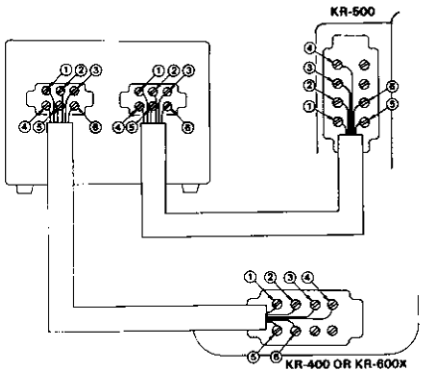


Fig 3

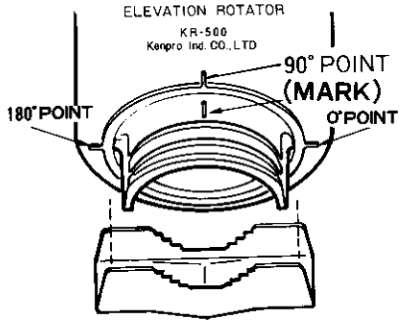


Fig 4

* INSTALLATION

1.Provisionally attach the mast clamp to the AZIMUTH rotor unit. Please make use of the mast gauge which is shown on the both surface of the rotor unit to install a mast to center.
(Put inner surface of the clamp on the mast gauge in accordance with your desired mast size.)

2.CAREFULLY INSTALL THE ROTOR UNIT NOT UP SIDE DOWN.

3.Fix the 'L' bracket for the ELEVATION rotor unit on the top of AZIMUTH rotor unit by using M8-16 bolts with Ø8 spring washers, and attach the stud bolts to the side of ELEVATION rotor unit with Ø8 spring washer and fix to the 'L' bracket.

(Attached sticker on the side of ELEVATION rotor unit is the NOTE for using option mast clamp.)

4. Install the mounted rotor units to a supporting mast with using the mast clamp which is provisionally attached to bottom side of AZIMUTH rotor unit, and fix the rotator units to the supporting mast. At this time, it must be adjusted to face the antenna beam to the NORTH supposing an antenna has been installed. (Please refer to Fig.6)

5. Insert a boom mast to the ELEVATION rotor unit and fix it with 'U' bolts.

6. Antenna beam must be faced horizontally in the antenna installation.

7. Again, depress the LEFT(CCW) switch and RIGHT(CW) switch alternately, and be sure that if the rotor direction should be coincide with the meter indication. In the same way, be sure of ELEVATION rotor.

8. Except in the above mentioned installation, other installation as shown in Figure 8. Require the use of the boom mast clamp for ELEVATION rotor unit.

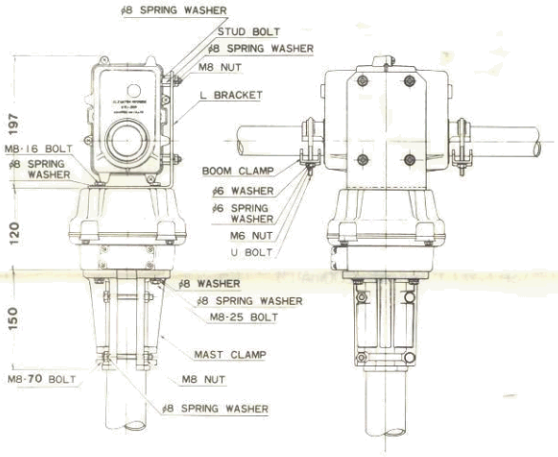


Fig 5

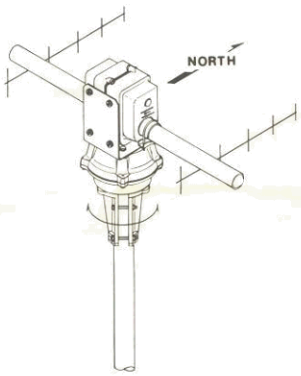


Fig 6

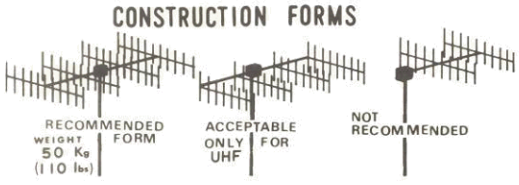
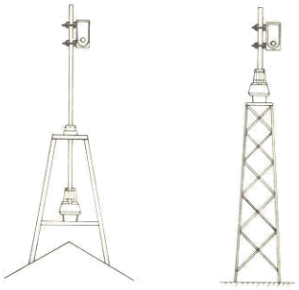


Fig 7



This installation needs OPTION mast clamp.

Fig 8

* TERMINAL CONNECTION

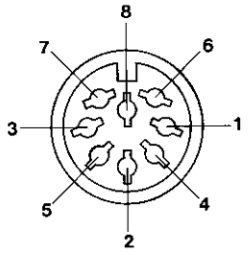


Table:1

FUNCTIONS	TERM. NO.	CONTENTS
Horizontal Rotation Angular Detection Terminal	6	Indicated rotation angular is converted into voltage. (Output Impedance 10 Kohms)
Vertical Rotation Angular Detection Terminal	1	Indicated elevation angular is converted into voltage. (Output Impedance 10 Kohms)
LEFT Direction Control Terminal	4	When connect with terminal No.8, the rotor rotates to counter clockwise.
RIGHT Direction Control Terminal	2	When connect with terminal No.8, the rotor rotates to clockwise.
DOWN Direction Control Terminal	5	When connect with terminal No.8, the rotor rotates to down.
UP Direction Control Terminal	3	When connect with terminal No.8, the rotor rotates to up.
Output Voltage : approx. 13 - 6v Output Current : less than 200mA	7	This voltage is varied depending on the output current. Available utilized voltage is approx. 6v at 200mA
Earth Terminal	8	

1. Terminal No.6 and No.1.

   This terminal enables to detect holizontal angular in 0° to 360° by output voltage. The output voltage is 0v at full counter clockwise rotation, and max. output voltage becomes 4.5v at full clockwise rotation.

   Also, the max output voltage is able to vary down to approx. till 2v at will by using OUT VOLTAGE ADJ. VR for AZIMUTH on the rear panel.

   For example, if the max. output voltage is adjusted to 3.6v, 1° of holizontal angular is detected as 0.01v.
   In the same manner, on the terminal No.1, if adjust output voltage to 3.6v at full 180° vertical rotation, 1° of elevation angular is detected as 0.02v.

2. Terminal No.2,3,4, and 5.

   Each terminal is a rotation control terminal by combination with terminal No.8.

3. Terminal No.7.

   This terminal presens the voltage, but it does not staible voltage, besides current capacity is small, therefore, it is necessary to consider in the utilization.

¶ CAUTION

0v at full counter clockwise supplies not exactly 0v due to exixtence of inner resistance in a cable and in a volume control, therefore, in case of computer control, it is recommended to make program in consideration of the allowance.

If remove a control cable from terminal No.6 of the rotor unit and connect it to the terminal No.7, the thermostat is released and not protected from overheating. Therefore, greate care is necessary to this usage.

* TROUBLE SHOOTING

1. Hindrance : No moving indication needle in the meter unit.
   Cause : Disconnective wiring terminals No.1 or No.2.

2. Hindrance : Indication needle moves full scale, but not return.
   Cause : Terminal No.3. is disconnected

3. Hindrance : Occurs unstable moving of the indication needle.
   Cause : Difective VR in the rotor unit.

4. Hindrance : No rotation.
   Cause : a) Terminal No.4,5 and 6 are disconnected.
   b) Difective Gear.

5. Checking voltage between each terminals of the control box.
   Disconnect cable from the control box.

   a) Power switch to ON.

   1 to 3 : approx. 6VDC

   b) LEFT switch to ON.(AZIMUTH only)

   4 to 6 & 5 to 6 : approx. 30VAC (Model:KR-5400A)
   4 to 6 : approx. 30VAC (Model:KR-5600A)
   5 to 6 : 0 (Model:KR-5600A)

   c) RIGHT switch to ON.(AZIMUTH only)

   4 to 6 & 5 to 6 : approx. 30VAC (Model:KR-5400A)

   4 to 6 : 0 (Model:KR-5600A)
   5 to 6 : approx. 30VAC (Model:KR-5600A)

   d) DOWN switch to ON.(ELEVATION only)

   4 to 6 & 5 to 6 : approx. 30VAC

   e) UP swithc to ON.(ELEVATION only)

   4 to 6 & 5 to 6 : approx. 30VAC

6. Checking resistance between each terminal of the rotor unit.
   Disconnect cable from the control box.

   a) KR-400 & KR-500

   1 to 2 : 0 - 500 ohms (Depending on rotor position)
   2 to 3 : - do -
   4 to 5 : 8 ohms
   4 to 6 : 4 ohms
   5 to 6 : 4 ohms

   b) KR-600X

   5 to 6 & 4 to 6 : 10 ohms
   4 to 5 : 20 ohms

   4 to 5 & 4 to 6 : Infiniteness (At full CCW rotation stop)
   4 to 5 & 5 to 6 : Infiniteness (At full CW rotation stop)

* SPECIFICATIONS

A. Model:KR-5400A

§ AZIMUTH (KR-400)

Rotation Torque	:	600 Kg.- Cm.(520 Lbs.- In.)
Stationary Brake Torque	:	2000 Kg.- Cm.(1730 Lbs.- In.)
Vertical Load	:	200 Kg. (440 Lbs.)
End-of-Rotation Stopper	:	Mechanical
Rotation Time	:	60sec./50Hz, 50sec./60Hz
Thermostat is installed.		

§ ELEVATION (KR-500)

Rotation Torque	:	1000 Kg. Cm.(866 Lbs.-In.)
Stationary Brake Torque	:	2000 Kg.- Cm.(1730 Lbs.- In.)
End-of-Rotation Stopper	:	Mechanical
Rotation	:	0° to 180° (+5°/-0°)
Thermostat is installed.		
Permissible Mast Size	:	Ø38 - Ø63
Permissible Boom Size	:	Ø32 - Ø43
Continuous Operation Time	:	Max. 5 Minutes
Antenna Wind Load Area	:	Less than 0.8M²
Control Cable	:	6 Conductor
Input Voltage	:	AC 115/230V, 50Hz/60Hz
Motor (Rotor Unit)	:	AC24V
Meter Indication Difference	:	±4°
Weight (Incl. Rotor & Clamps)	:	12 Kgs.

B. Model:KR-5600A

§ AZIMUTH (KR-600X)

Rotation Torque	:	700 Kg.- Cm.(606 Lbs.-In.)
Stationary Brake Torque	:	4000 Kg.- Cm.(3460 Lbs.- In.)
Vertical Load	:	200 Kg. (440 Lbs.)
End-of-Rotation Stopper	:	Electrical/Mechanical
Rotation Time	:	60sec./50Hz, 50sec./60Hz
Thermostat is installed.		

§ ELEVATION (KR-500)

Rotation Torque	:	1000 Kg.- Cm.(866 Lbs.- In.)
Stationary Brake Torque	:	2000 Kg.- Cm.(1730 Lbs.- In.)
End-of-Rotation Stopper	:	Mechanical
Rotation	:	0° - 180° (+5°/-0°)
Permissible Mast Size	:	Ø38 - Ø63
Permissible Boom Size	:	Ø32 - Ø43
Continuous Operation Time	:	Max. 5 Minutes
Antenna Wind Load Area	:	Less than 0.8M²
Control Cable	:	6 Conductor
Input Voltage	:	AC 115/230V, 50Hz/60Hz
Motor (Rotor)	:	AC24V
Meter Indication Difference	:	±4°
Weight (Incl. Rotor & Clamps)	:	12 Kgs.

¶ A ROTOR UNIT OF ORDINARY KR-600RC and KR-600 DOES NOT USE WITH THE CONTROL BOX OF MODEL:KR-5600.

P A R T S L I S T

¶ CONTROL BOX

1. Front Panel
2. Front Frame
3. Rear Frame
4. Top Cover
5. Bottom Cover
6. AZIMUTH Meter
7. ELEVATION Meter
8. Transformer
9. Power Switch
10. LEFT (CCW) Switch
11. RIGHT (CW) Switch
12. DOWN Switch
13. UP Switch
14. Full Scale Adjusting VR.
15. VR. Bracket
16. AC Power Cord
17. Terminal Board
18. Terminal Cover
19. AC Power Cord Stopper
20. Grommet
21. Control Cable Holder
22. Fuse Holder
23. Fuse
24. Printed Board Assembly
25. 26. Pilot Lamp
27. 28. Lamp P.C. Board
29. Electrolytic Condenenser
    (2 pcs. used in KR-5400, but 1 pc. used in KR-5600.)
30. DIN Connector (Receptacle)
31. DIN Plug
32,33. OUT VOLTAGE ADJ. VR

¶ ELEVATION Rotor Unit (KR-500)

1.2. Rotor Housing
3. Gear Mount Plate
4. Gear Mount Support
5. Gear Stud Sleeve
6. Stud Support Sleeve
7.8. Gear Shaft
9. Assmb. Gear
10.11. Internal Gear
12. Plastic Motor Gear
13. Stud Support Sleeve
14. Gear Pot. Shaft
15. Plastic Pot. Gear
17. Potentiometer
18. Insulator Sheet
22. Pot. Devider Gear
23. Gear Stopper Screw
24. Gear/Motor Mount Plate
25. AC 24V Motor
26. Motor Mount Plate
27. Disc Brake/Pinion Motor Gear
28. Disc Pad
29. Boom Shaft Tube
30. Stopper Stud Pin
31. Assmb. Tube Gear
32. 'C' Ring
33.34 Ball Bearing Holder
35. Rubber Terminal Sheet
36. Terminal Board
37. Terminal Cover
38. Rubber Grommet
39. Control Cable Holder
40. Name Plate
41,42. Gear Mount Screw
43.44. Motor Mount Screw
45.46.47. Motor Holder Screw
48.49. Housing Mount Screw
50.51. Housing Screw
52. Terminal/Cable Holder Screw
54.55. Terminal Cover Screw
56. 'U' Bolt
57. Clamp
61. Mast Clamp Stud Bolt

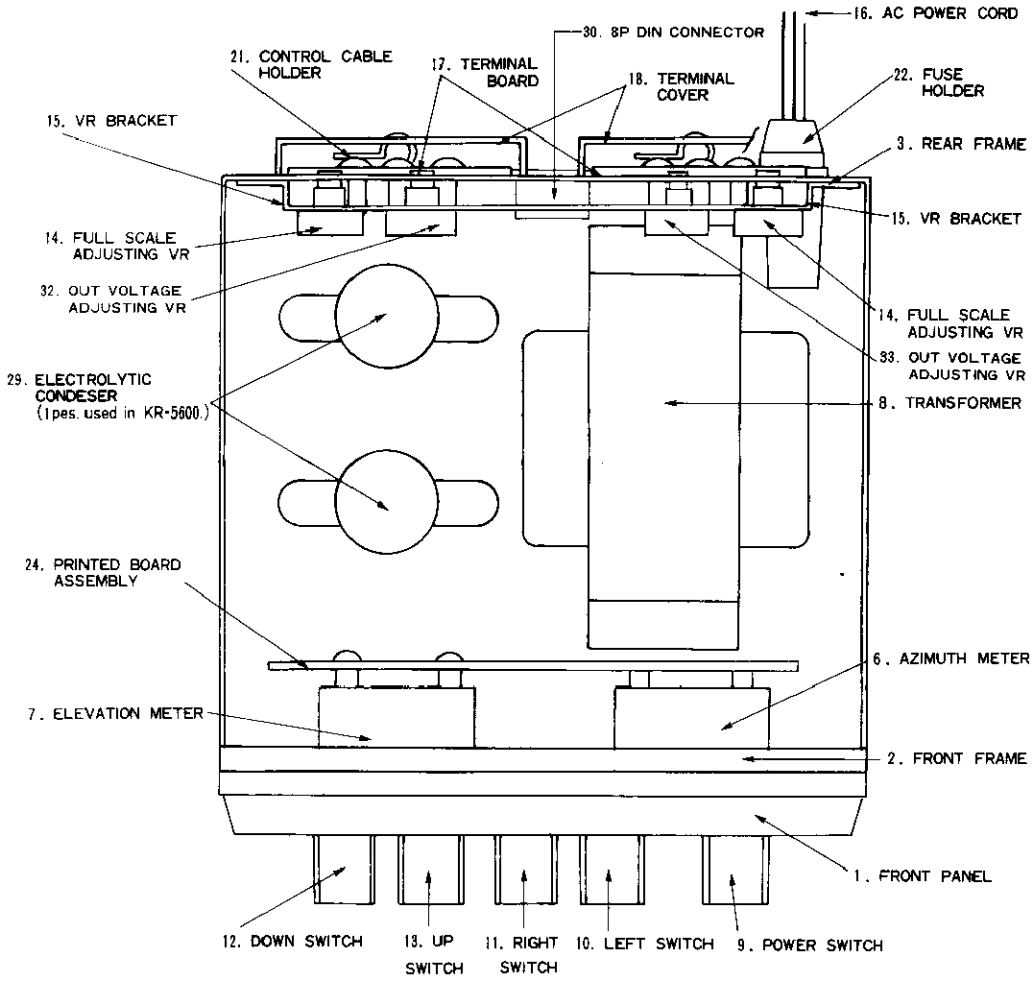
P A R T S L I S T

¶ AZIMUTH Rotor Unit (KR-400)

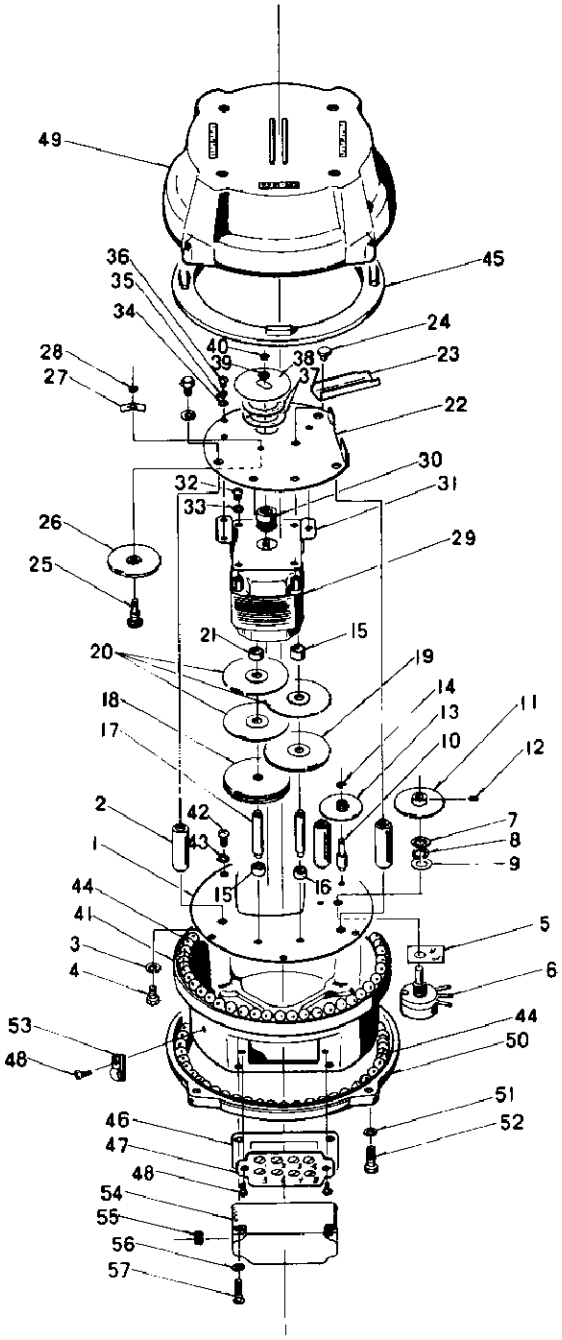
1. Gear Mount Plate
2. Gear Mount Support
3. Washer (Ø6)
4. Gear Mount Screw
5. Insulator Sheet
6. Potentiometer
10. Gear Pot Shaft
11. Pot. Devider Gear
12. Gear Stopper Screw
13. Plastic Pot. Gear
14. 'E' Ring
15.16.21. Stud Support Sleeve
17. Gear Shaft
18. Gear
19.20. Pinion/Gear Assmb.
22 Gear/Motor Mount Plate
23. Revolution Stopper
24. Fixing Pin
25. Gear Pot. Shaft
26. Plastic Gear
29. AC 24V Motor
30. Motor Pinion
31. Motor Mount Plate
32. Motor Mount Screw
33. Washer
34. Washer
35. Washer
36. Motor Holder Screw
37. Disc Pad
38. Brake Plate
39. Washer
40. Ø2.5 'E' Ring
41. Case
42. Gear Mount Plate Holder Screw
43. Washer
44. Ball Bearing
45. Internal Gear
46. Rubber Terminal Sheet
47. Terminal
48. Terminal/Cable Holder Screw
49. Rotor Housing
50. Housing
51. Washer
52. Housing Screw
53. Cable Holder
54. Terminal Cover
55. Rubber Grommet
56. Washer
57. Terminal Cover Screw

¶ AZIMUTH Rotor Unit (KR-600X)

1. Gear Mount Plate Assmb.
2. Gear Mount Support
3. Washer
4. Gear Mount Screw
5. Insulator Sheet
6. Potentiometer
7. Nut
8. Spring Washer
9. Washer
10. Gear Pot. Shaft
11. Pot. Devider Gear
12. Gear Stopper Screw
13. Plastic Pot. Gear
14. 'E' Ring
15.21. Stud Support Sleeve
16.17. Gear Shaft
18. Gear
19.20. Pinion/Gear Assmb.
22 Gear/Motor Mount Assmb.
29. Motor Assmb.
34. Washer
35.56. Washer
36. Screw for Motor Holder
37. Limit Switch
41. Case
42. Mount Plate Holder Screw
43. Washer
46. Rubber Sheet
47. Terminal
48. Terminal/Cable Holder Screw
49. Rotor Housing
50. Housing
51. Washer
52. Housing Screw
53. Cable Holder
54. Terminal Cover
55. Rubber Grommet
56. Spring Washer
57. Terminal Cover Screw
58. 59. Mast Clamp
60. Washer
61. Spring Washer
62.63. Screw
64. Nut
65. Condenser Bracket
66. Electrolytic Condenser (100mfd/60WVAC)
67. Screw M3 x 6



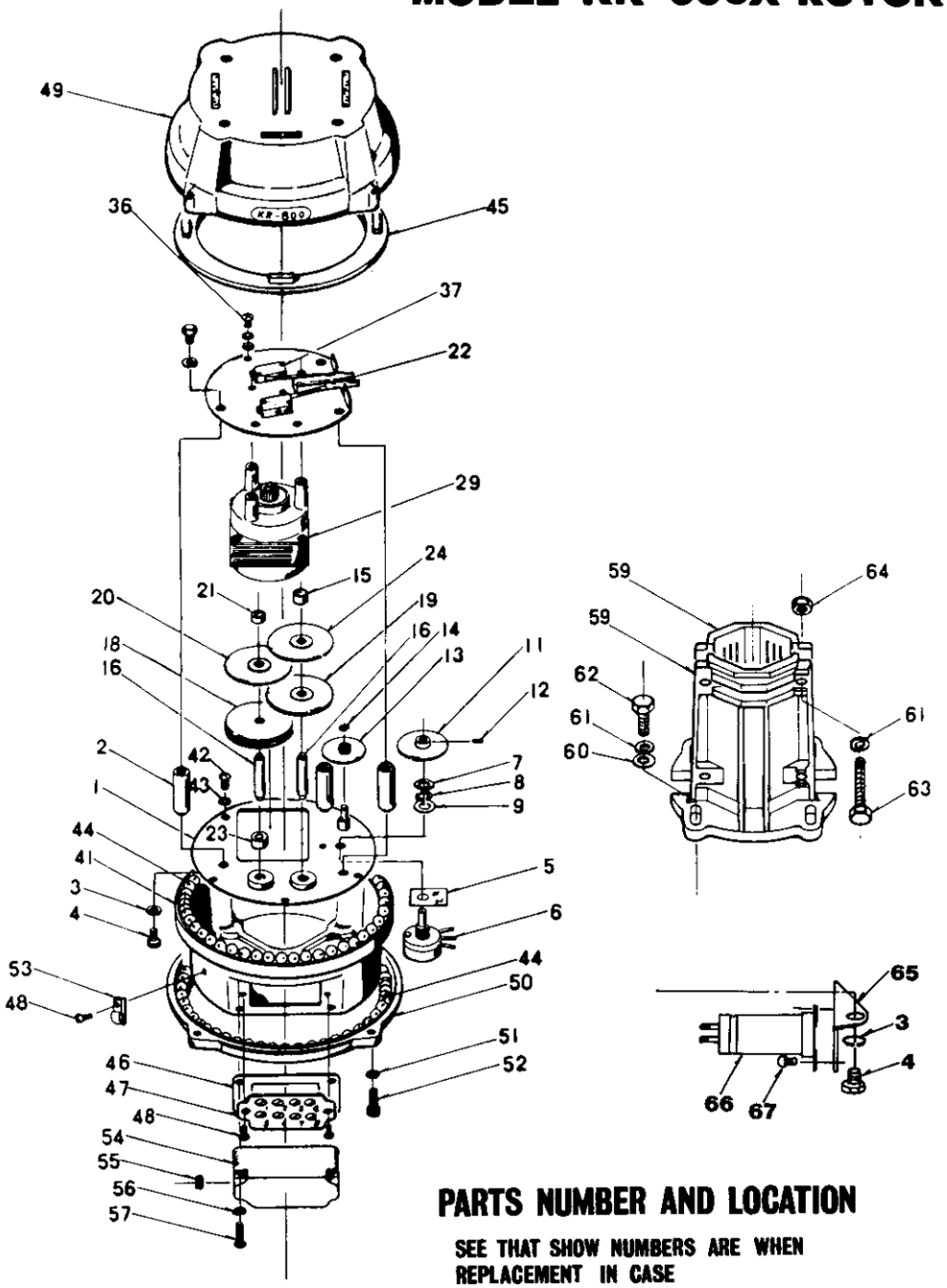
MODEL KR-400 ROTOR



PARTS NUMBER AND LOCATION

SEE THAT SHOW NUMBERS ARE WHEN REPLACEMENT IN CASE

MODEL KR-600X ROTOR



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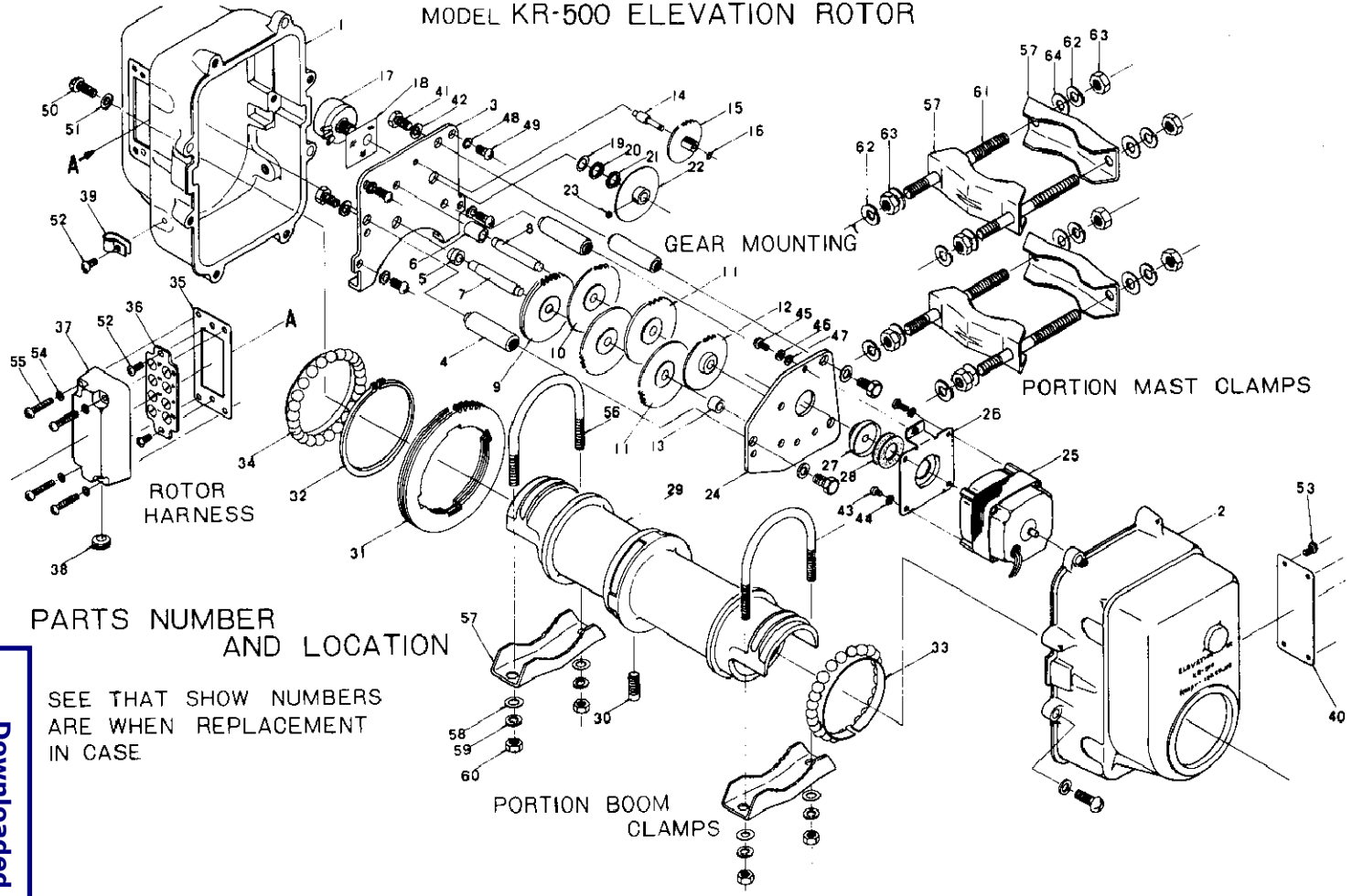

PARTS NUMBER AND LOCATION

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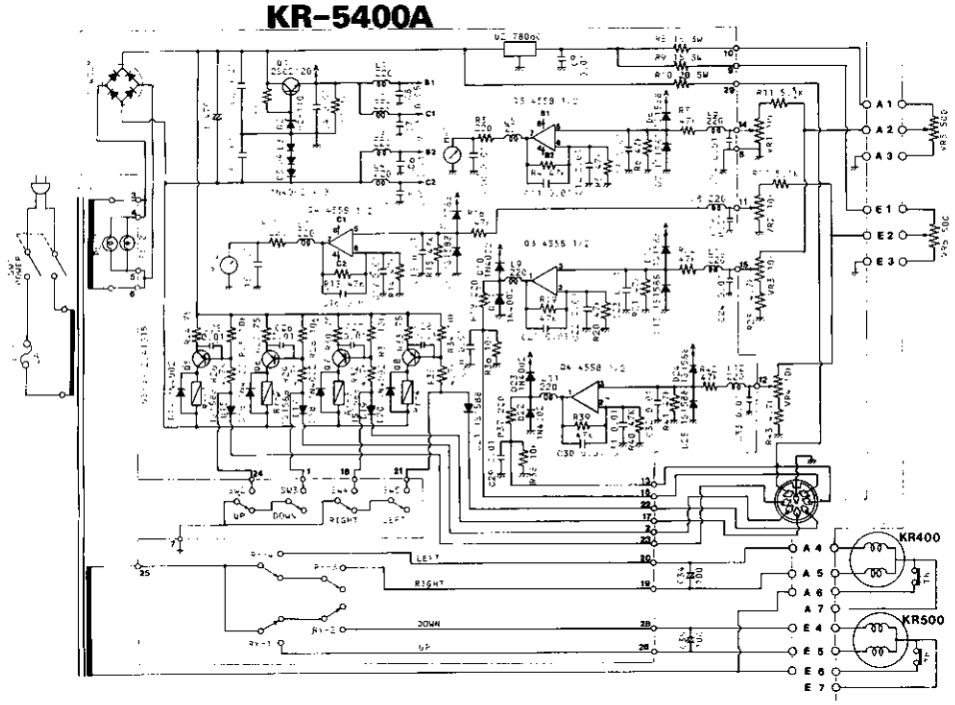
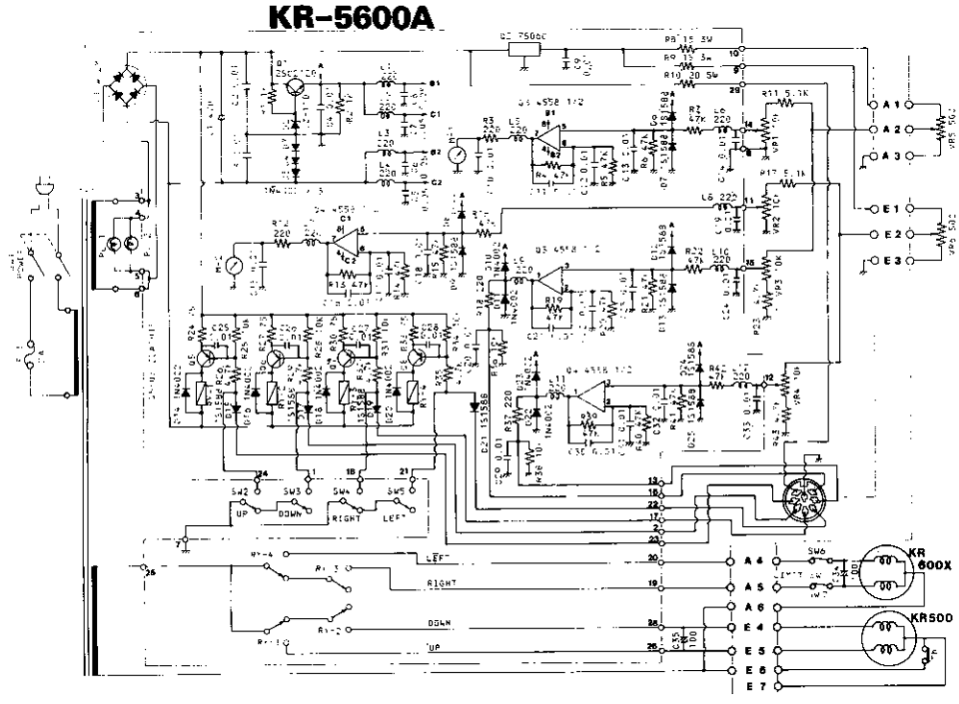
KR-5400A



KR-5600A



MANUFACTURER.

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