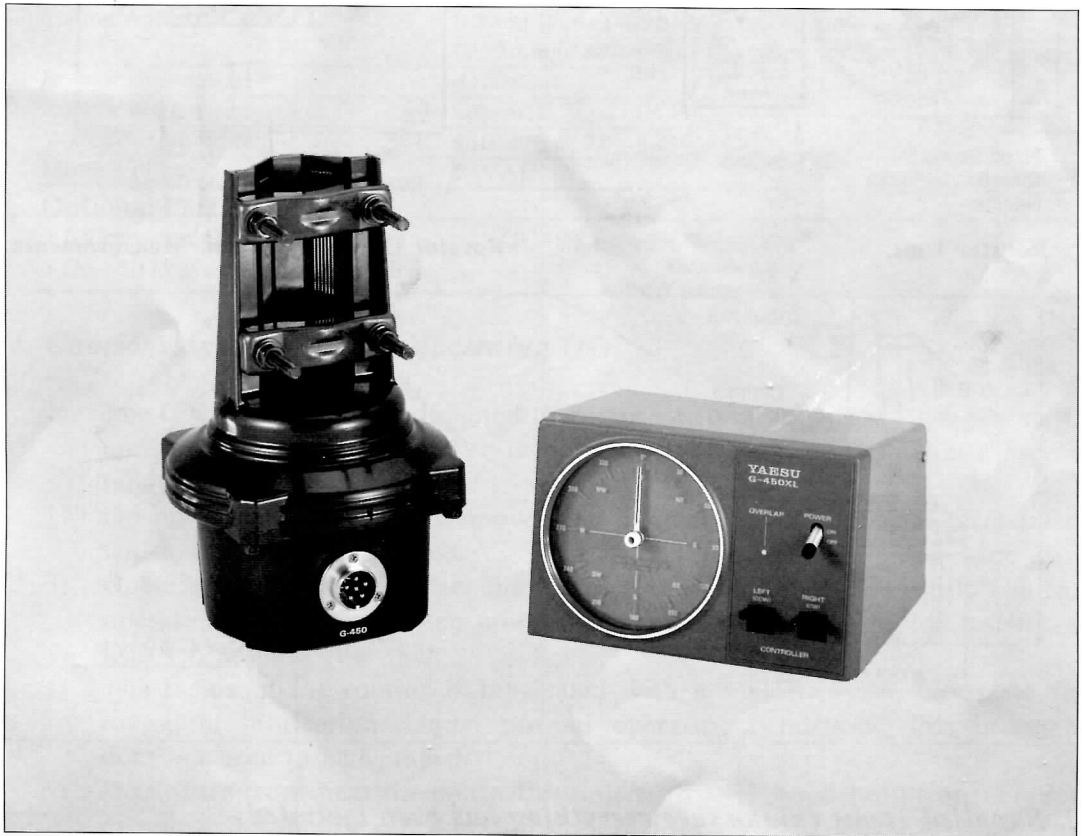


YAESU

Antenna Rotator

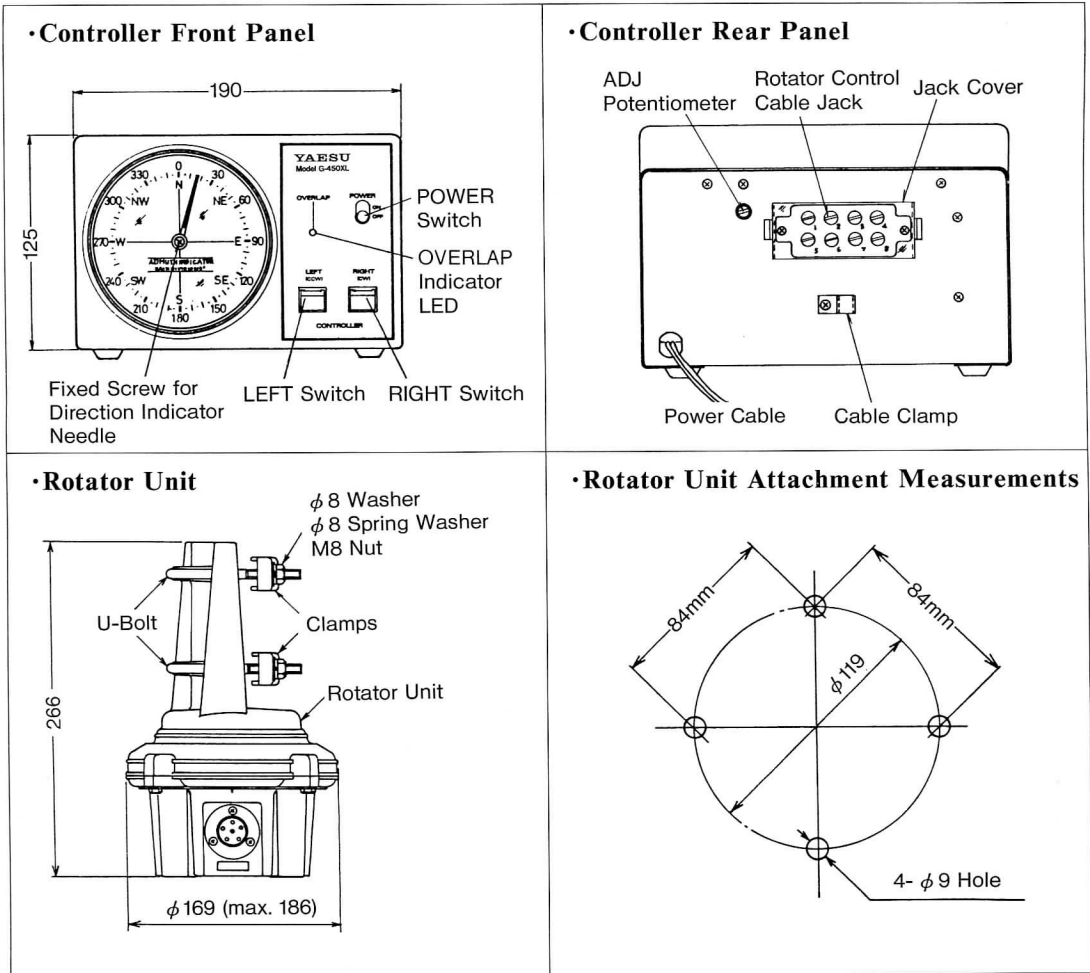
Model G-450XL



Antenna Rotator Model G-450XL

Thank you for your purchase of the Yaesu G-450XL Antenna Rotator. It has been designed to provide many years of trouble-free operation. Before using the rotator, read this manual thoroughly to learn about its installing and operation.

1. Description of Parts (dimensions in mm)



2. Supplied Items (make sure everything has been included)

Rotator	1	M8 Spring Washers	8
Controller	1	M8 Hex Nuts	4
U-Bolts	2	6-Pin Metal Connector	1
Clamps	2	Waterproof Cap	1
M8 \times 16 Hex Bolts	4	Instruction Manual	1
M8 Flat Washers	4	Warranty Card	1

Antenna Rotator Model G-450XL

3. G-450XL Specifications

Rotation Torque	650Kgf-cm (47.0 ft-lbs) at 60Hz {550Kgf-cm (39.8 ft-lbs) at 50Hz}
Braking Torque	3000Kgf-cm (217 ft-lbs)
Max. Vertical Load	110kg or less (normal) (242 lbs) 300kg (momentarily) (660 lbs)
Mast Outside Diameter	$\phi 48-\phi 50$
Rotation Range	450°
360° Rotation Time	51sec at 60Hz (63sec at 50Hz)
Braking Type	Drum Brake
Antenna K Coefficient (See page 4)	100
Wind Loading Area	Unsupported Mast: 0.5m ² (used with 0.5m mast) Tower Supported Mast: 1m ²
Max. Continuous Duty	5 minutes
Station/Antenna Cable	0.5mm (#24 AWG) 5-conductor cable (0.75mm (#22 AWG) when cable is 40m (131 ft) or longer)
Rotator Dimensions	$\phi 169 \times 266$
Rotator Weight	approx. 3.2kg (7.04 lbs.)
Voltage Requirement	110-120 or 220-240 VAC
Motor Voltage	24VAC

Optional Parts

- 6-Conductor Cable
- GC-038 Lower Mast Clamp
- GS-050 Universal Thrust Bearing

4. Cautions and Warnings Concerning Use

- 1) The G-450XL has been designed to rotate antenna masts measuring from 48 mm to 50mm in diameter. We recommend that only masts in that diameter range be used.
- 2) Do not reverse the antenna movement suddenly, as the internal mechanism will undergo excessive stress.
- 3) Operate the rotator no longer than five minutes continuously. While you can operate it for as long as ten minutes, make sure to let the motor rest for at least ten minutes after that.
- 4) The inside of the rotator is lubricated with a high-performance grease for long-term lubrication. Under normal operating conditions, this lubricant does not need to be changed.
- 5) Do not transmit near the controller unit with VHF hand-held transceivers, as controller needle malfunction may result.

5. Mounting Antenna

IMPORTANT: The tolerance limits for mounting your antenna vary to a large extent, depending on the mounting method, geographical location, wind velocity, and antenna height. Take into consideration the special conditions of your area when mounting the antenna, making adjustments as necessary.

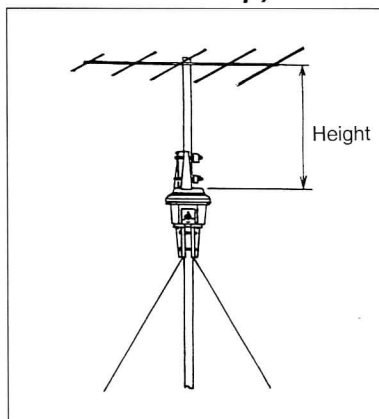
Antenna Rotator Model G-450XL

1) Pole Mounting (using with optional GC-038 Lower Mast Clamp)

- Use the following formula to calculate the height restrictions for installing the antenna:
 $(\text{Antenna Wind Loading Area}) \times (\text{Height in meters}) < 0.25$

(Example: An antenna with a wind loading area of 0.4m² and a mounted height of 0.6m is acceptable, as the product of the two is 0.24.)

An antenna with a wind loading area of 0.4m² can be used if the indicated height is less than 60cm (23.6 inches).



IMPOTANT: Keep the weight of the mounted antenna under 10 kg (22 lbs) for pole mounting.

2) Tower Mounting

Make sure that the antenna K coefficient and the wind loading area of the antenna to be installed do not exceed the specified ranges.

IMPOTANT: You can more reliable operation if you keep the parameters within 60 percent of the maximum specified ranges.

Antenna K Coefficient =

Antenna Rotation Radius (in m) \times Total Antenna Weight Incl. Mast (in kg)

- Calculate the rotation radius and antenna weight based on the figures given by the antenna manufacturer.

As the wind loading area is often not specified, we have listed the average values in the chart below:

Wind Loading Areas for Common Antennas

Band	7	7	7	7	14	14	14	21	21	21	21	21
Elements	2	1	2	3	3	4	5	3	4	5	6	2
Type		Loaded	Loaded	Loaded								Swiss Quad
Area (m ²)	2.2	0.2	0.6	1.1	0.7	1.2	1.7	0.45	0.6	0.8	1.3	0.3

Band	28	28	28	28	7 / 14	7 / 14	14 / 21	14 / 21	21 / 28	21 / 28	14/21/28	14/21/28
Elements	3	4	5	2	3	4	3	4	3	4	3	4
Type				Swiss Quad	trapped	trapped	trapped	trapped	trapped	trapped	trapped	trapped
Area (m ²)	0.3	0.42	0.6	0.3	0.5	0.8	0.4	0.5	0.3	0.4	0.4	0.5

Band	50	50	50	50	144	144	144	144	430	430	430	430
Elements	4	5	6	2	10	10	10	10	12	12	12	12
Type				Swiss Quad		Stacked	x 4	x 2 x 4		Stacked	x 4	x 2 x 4
Area (m ²)	0.25	0.3	0.37	0.3	0.2	0.44	0.95	2.0	0.06	0.12	0.3	0.6

Antenna Rotator Model G-450XL

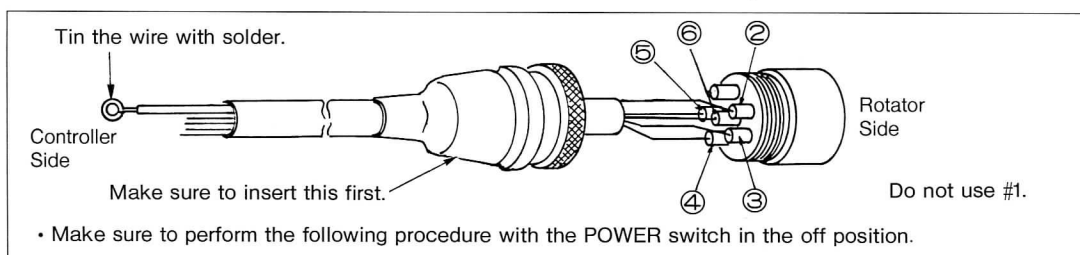
Use the following chart to calculate configurations for tower-mounted antennas:

Antenna Type	Rotation Radius	Weight	Antenna K Coefficient	Wind Loading Area (in m ²)
50M 5 el	2.5 m (98.4 inches)	7 kg (15.4 lbs) (mast: 2.5kg, or 5.5 lbs)*	17.5	0.3
21M 3 el	4.2 m (165.4 inches)	10 kg (22 lbs) (mast: 2.5 kg, or 5.5 lbs)*	42	0.45
		TOTAL	59.5	0.75

* Mast weight of 5kg (11 lbs) is divided equally between the two calculations.

6. Installing and Adjusting

- 1) Use 5-conductor (or 6-conductor) cable with a diameter of 0.5mm (#24 AWG). Only use as much cable as you need.
NOTE: If the cable exceeds 40m (131ft) in length, increase the diameter to 0.75mm (#22 AWG).
- 2) Assemble the cable according to the following diagram:



- 3) Connect the round plug to the rotator, and attach the other end to the Rotator Control Cable Jack on the controller, making sure to match the numbers on the pins (use only pins #2 to #6).
- 4) Check the power switch with the cable in this state. Insert the power plug in the wall socket, and turn the POWER switch on. The pilot lamp should light, and the direction indicator will rotate until it reaches the current direction of the rotator.
- 5) Press the LEFT switch on the controller to turn the rotator counterclockwise. It will stop automatically. Confirm that the needle of the direction indicator rests exactly on the 0° (N) position. If there is needle error, loosen the screw in the center of the indicator and adjust the needle to 0°.
- 6) Look at the rotator, choosing a point from which to mark its rotation.
- 7) Next, press the RIGHT switch on the controller to turn the rotator 360° in a clockwise direction, watching the point on the rotator that you chose in step #6. Make sure that the rotator returns to the correct position.
Also watch the needle on the direction indicator, checking that it returns exactly to the 0° (N) position. If it does not align correctly, adjust the ADJ potentiometer on the rear panel of the controller.
Furthermore, ensure the OVERLAP indicator LED lights up when the rotator near the end of its 360° rotation (If it does not light up, adjust the potentiometer (VR1) on the printed circuit board in the controller).

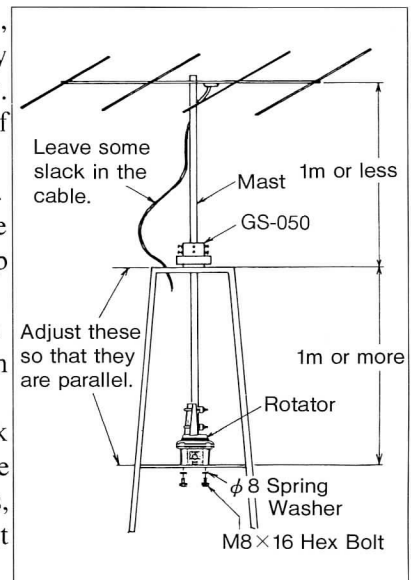
Antenna Rotator Model G-450XL

- 8) Press the RIGHT switch again, moving the rotator and the direction indicator 90° clockwise. The OVERLAP indicator LED will light up, informing of the 90° rotation overlap (use this warning for safe operation).
- 9) Test the clockwise and counterclockwise rotational movements a few more times.
 - If you turn on the controller with the cable unattached, the direction indicator will rotate about 300° from the 0°(N) position before stopping.
 - If you want to change the original position of the direction indicator (e.g. clockwise stop at south), adjust the screw in the center of the indicator to the desired position.
 - If both (LEFT/RIGHT) switch are pressed simultaneously, RIGHT (clockwise) movement takes precedence.

7. Installing Rotator Unit

IMPORTANT: The method of installation depends on the type of tower being used. The following example describes the procedure for installing on a roof tower.

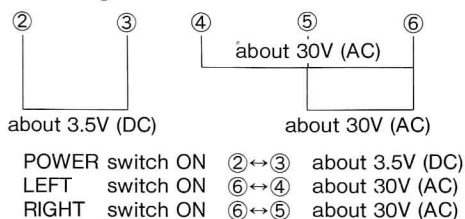
- 1) After completing the previous inspection, move the rotator back to the initial fully counterclockwise point and turn off the power.
- 2) Attach the rotator to the center of the roof tower attachment plate.
- 3) Attach a bearing to the top of the roof tower.
- 4) Take the mast and pass it through the top side of the bearing, then set it in the mast clamp on the rotator and tighten the bolts.
- 5) Leave enough slack in the coaxial cable from the antenna so that it can rotate more than 360° and still not be too tight.
- 6) After the above procedure is finished, check the movement of the rotator. Especially make sure that no part is receiving excessive stress, and that the antenna direction matches that of the indicator.



8. Maintenance and Inspection

If you experience trouble during rotator operation, refer to the following charts for troubleshooting.

• Voltage between Controller Jacks



• Resistance between Rotator Jacks

	1	2	3	4	5	6
1		0~500Ω	500Ω	∞	∞	∞
2			0~500Ω	∞	∞	∞
3				∞	∞	∞
4					8Ω	4Ω
5						4Ω
6						

Antenna Rotator Model G-450XL

Controller

No.	DESCRIPTION	Yaesu P/N	QTY
1	FRONT PANEL	S8000164	1
2	POWER SWITCH	N7090051	1
3	Not Used	—	—
4	M3x6 SCREW FOR POWER SWITCH	S8000784	2
5	L/ROTATE SWITCH (2P)	N7090052	1
6	Not Used	—	—
7	R/ROTATE SWITCH (3P)	N7090053	1
8	Not Used	—	—
9	3x8 SCREW	S8000785	15
10	OVERLAP LED	S8100437	1
11	LED P.C.B.	S8100438	1
12	NAME PLATE	S8001252	1
⋮	⋮	⋮	⋮
15	GEAR BASE	S8000811	1
16	VR CONTROL	Q9000405	1
17	MOTOR	M2190008	1
18	PULLEY	S8000787	1
19	M2.6x5 SCREW FOR MOTOR	S8000788	2
20	LARGE PULLEY	S8000789	1
21	RUBBER BELT	S8000738	1
22	GEAR #1	S8000790	1
23	GEAR #1	S8000790	1
24	"E" RING	S8000791	1
25	GEAR #2	S8000792	1
26	VR GEAR	S8000159	1
27	M3x3 VR GEAR SETSCREW	S8000793	1
28	3x5.5 SPACER	S8000794	1
29	COLLAR	S8000795	1
30	INDICATOR PLATE	S8000155	1
31	3x6 SCREW	S8000796	11
32	DIAL SCALE	S8000161	1
33	EYELET	S8000797	2
34	LAMP	Q1000068	1
35	Not Used	—	—
36	SPACER	S8000160	3
37	M3x10 SCREW	S8000798	3
38	INDICATING NEEDLE	S8000162	1
39	INDICATOR NEEDLE SETSCREW	S8000799	1
40	CHASSIS	S8000166	1
41	POWER TRANSFORMER	L3190004	1
42	Not Used	—	—
43	M4x10 SCREW	S8000800	4
44	M4 NUT	S8000801	4
45	TERMINAL BOARD	S8000169	1
46	M3 SPRING WASHER	S8001254	1
⋮	⋮	⋮	⋮
49	LOCK WASHER	S8000802	1
50	M3x15 SCREW	S8000803	1
51	M3 NUT	S8000804	2
52	VR MOUNTING BRACKET	S8000163	1
53	VR 10kΩ (NV17CA-10S)	Q9000404	1
54	P.C.B. ASSY	S8100439	1
55	RUBBER GROMMET	S8000805	1
56	POWER CORD (117V3W)	S8100271	1
	POWER CORD (220V3W)	S8100270	1
57	FRONT PANEL SUPPORTING PLATE	S8000172	2
58	3x6 SCREW	S8000806	2
59	CABLE CLAMP	S8000171	1
60	4x8 SCREW	S8000807	1
61	COVER	S8000167	1
62	RUBBER FOOT	S8000173	4
63	3x8 SCREW	S8000808	2
64	TERMINAL COVER	S8000170	1

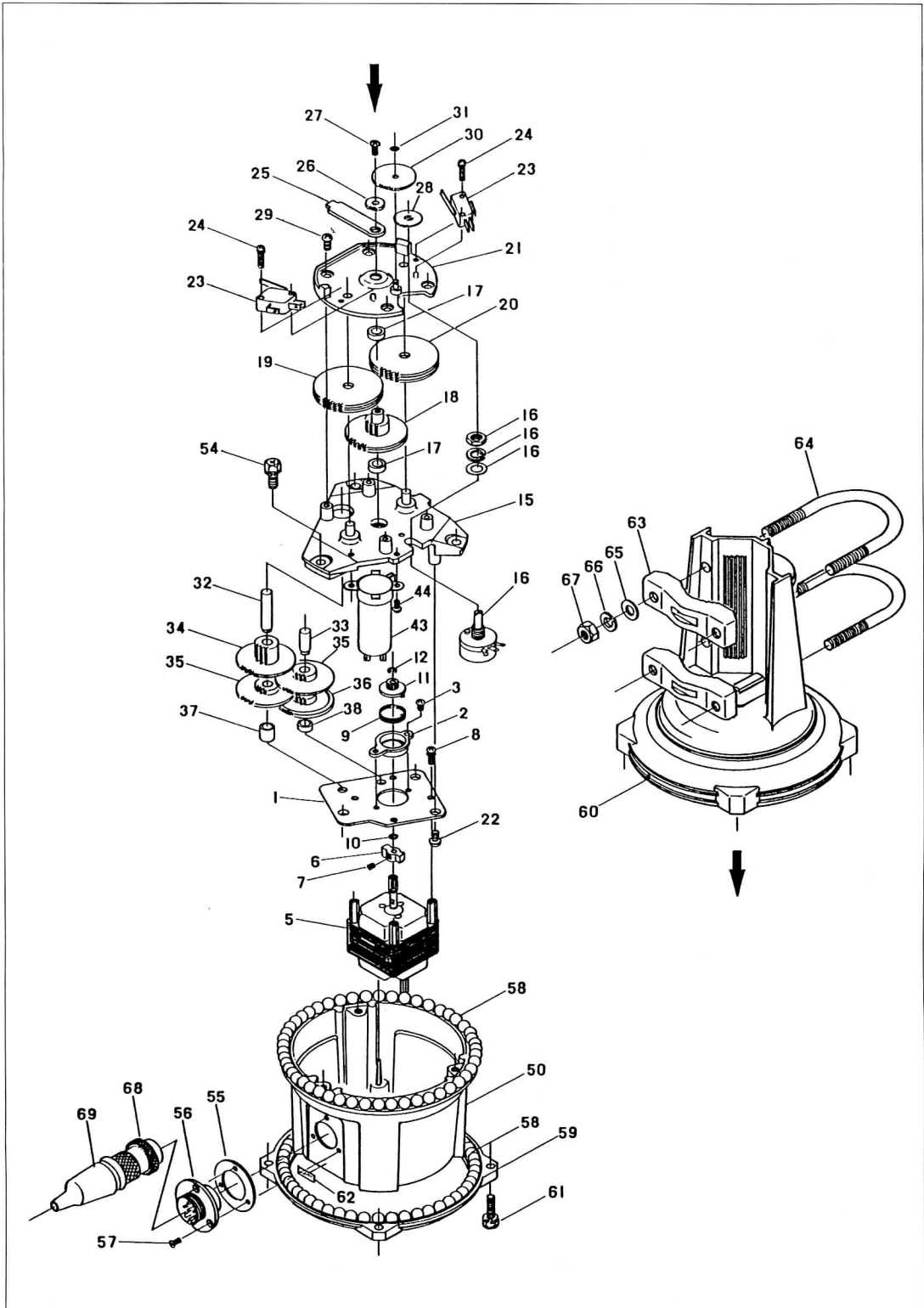
Antenna Rotator Model G-450XL

Rotater

No.	DESCRIPTION	Yaesu P/N	QTY
1	LOWER PLATE	S8001255	1
2	BRAKE DRUM	S8001174	1
3	BINDING SCREW	S8000369	2
4	Not Used	—	—
5	MOTOR (U-129)	S8100440	1
6	BRAKE SPRING WINDER	S8000952	1
7	M3x3 SET SCREW	S8000953	1
8	M3x8 SCREW	S8001256	4
9	COIL SPRING	S8001257	1
10	"O" RING 4x6	S8001258	1
11	MOTOR PINION GEAR	S8000947	1
12	"E" RING RETAINER	S8000946	1
:	:	:	:
15	GEAR BASE	S8001259	1
16	VR (AZIMUTH) ROTATOR	S8100317	1
17	BEARING	S8001260	2
18	GEAR ASSY	S8001261	1
19	GEAR	S8001262	3
20	Not Used	—	—
21	UPPER PLATE	S8001264	1
22	4x8 SCREW	S8001265	3
:	:	:	:
25	STOPPER	S8001266	1
26	VR GEAR	S8001267	1
27	M4x8 SCREW	S8001268	1
28	VR GEAR	S8001269	1
29	4x10 SCREW	S8001270	4
30	CONTROL GEAR #1	S8000457	1
31	RETAINER RING	S8000393	1
32	GEAR SHAFT #3B	S8001271	1
33	GEAR SHAFT #3A	S8001272	1
34	GEAR ASSY	S8001273	1
35	GEAR ASSY	S8001213	2
36	GEAR	S8001274	1
37	COLLAR L=10	S8001275	1
38	COLLAR L=4	S8001276	1
:	:	:	:
43	CAPACITOR 60V AC/100 μ F	Q9000477	1
44	3x6 SCREW	S8000369	2
:	:	:	:
50	LOWER HOUSING	S8000360	1
:	:	:	:
54	M6x16 BOLT	S8001277	3
55	SOCKET GASKET	S8000943	1
56	6-PIN SOCKET	S8100313	1
57	3x10 SCREW	S8001228	3
58	BALL BEARING	S8000364	98
59	RING HOUSING	S8001173	1
60	COVER	S8001278	1
61	M6x20 BOLT	S8001279	4
62	NAME PLATE	S8001280	1
63	PIPE CLAMP	S8000224	2
64	M8 U-BOLT	S8001282	2
65	M8 WASHER	S8001283	4
66	M8 SPRING WASHER	S8001284	8
67	M8 NUT	S8001285	4
68	6-PIN PLUG	S8100321	1
69	CONNECTOR BOOT	S8001014	1
70	Not Used	—	—

Antenna Rotator Model G-450XL

Rotater Unit Exploded View



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Performance without compromise.SM

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