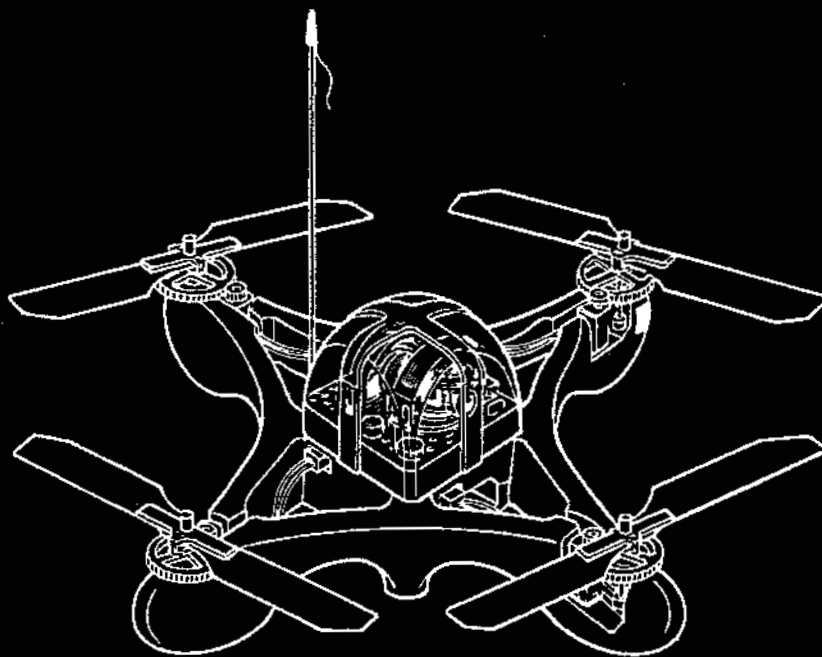


GYRO SAUCER

GYROSAUCER II
E-570

Operating Instructions



KEYENCE
KEYENCE CORPORATION

Preface

GYROSAUCER II E-570 is a 4-propeller type radio-controlled flying saucer. With novel design incorporated bringing up the image of a vital organic body, and a unique gyrosensor mounted, it hovers in the air, turns round, and flies vertically or in any horizontal directions according to the control from the ground.

Users may select either one of two control modes. Even a beginner can enjoy playing it. It is also fit for educating helicopter trainees. Various option parts, such as Full Face Kit (for propeller guard), Biaxial Rate Gyro (for higher kinetic performance), Crystal Set (for flying more than one unit simultaneously), etc., help you play the GYROSAUCER in many ways.

Though it is controllable by anybody, we advise you to get used to its operation before playing it variously.

Please read this instruction book carefully and make the best of it to increase the pleasure of your hobby life.

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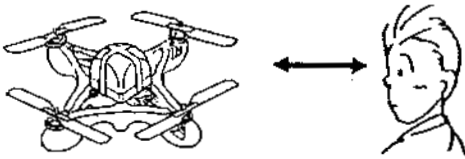
A complete set

Main body assembly	1
Transmitter	1
Propeller set × 3	1
Wire cable	1
Power Supply	1

Other parts to be purchased
NI-Cd battery for main body
Battery charger for specified use
U-3 dry cell × 6 (for transmitter)

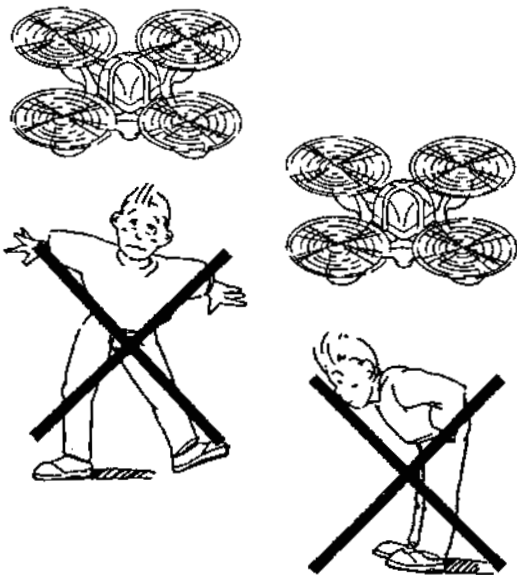
The following precautions are very important for safety's sake. When using your GYROSAUCER, be sure to observe each item given below:

- During and after connection of the battery, you should keep your eyes from getting near the propellers that may start to rotate.

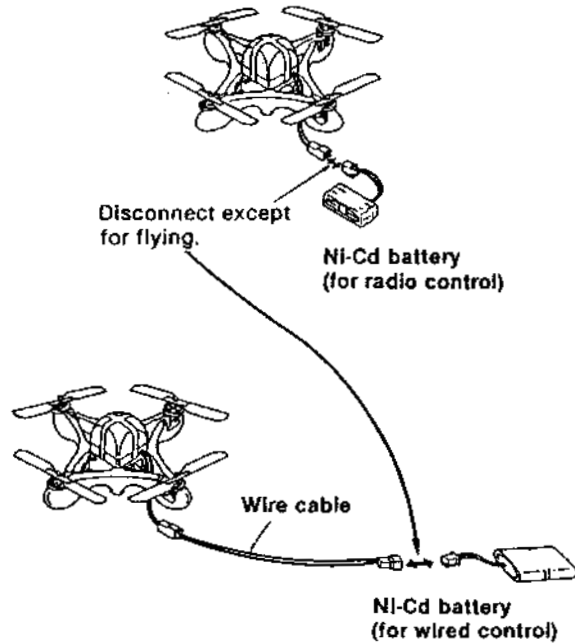


Even when the propeller is at a stop, you ought to know it may start to rotate suddenly.

- During its flight, you should exercise precaution so that any propeller will not hit against your eyes. Always keep yourself more than 1m away from it. Absolutely avoid peeping in or having it fly above the heads of other people.

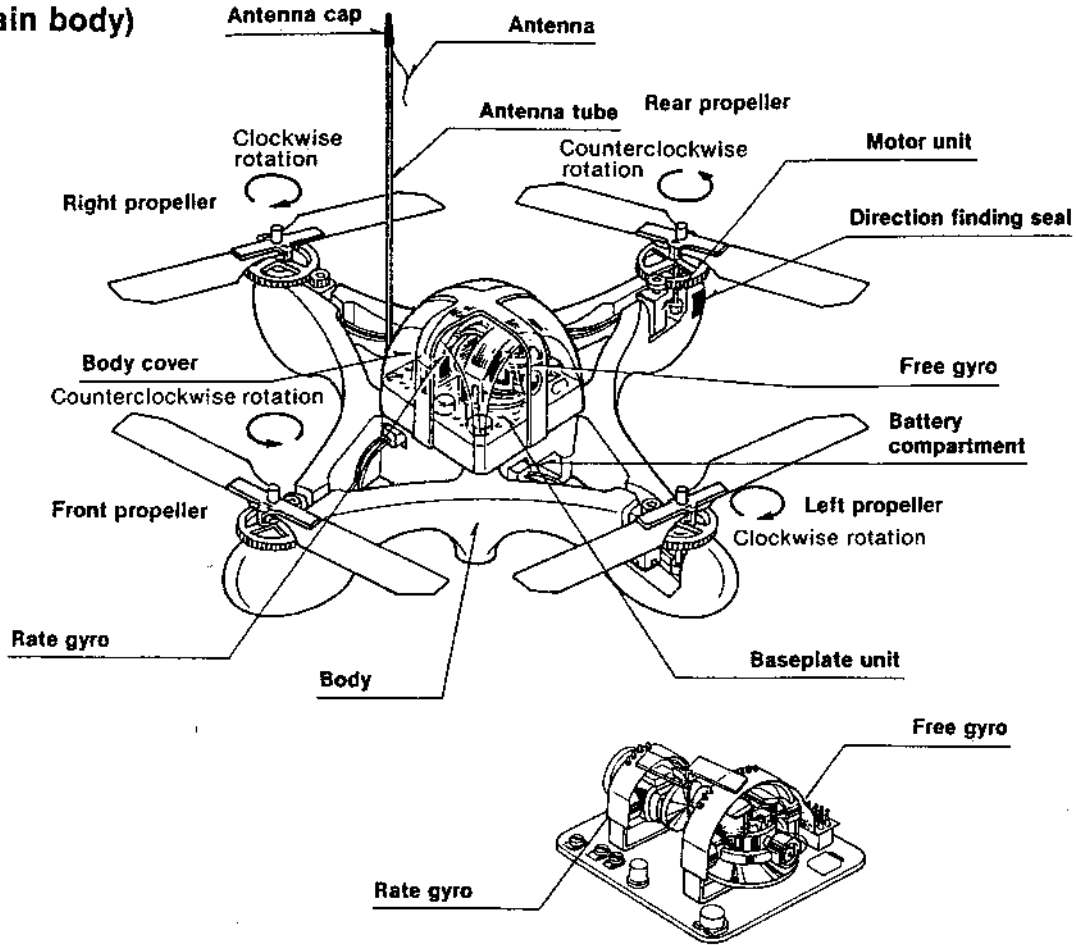


- As the Ni-Cd battery can apply high-powered current, it may cause such an unexpected accident as emission of smoke, fire, etc. In order to prevent any accident by it, remove the Ni-Cd battery from the main body and keep it in a safe place where it will never short with a wire, etc. when it is not in use.

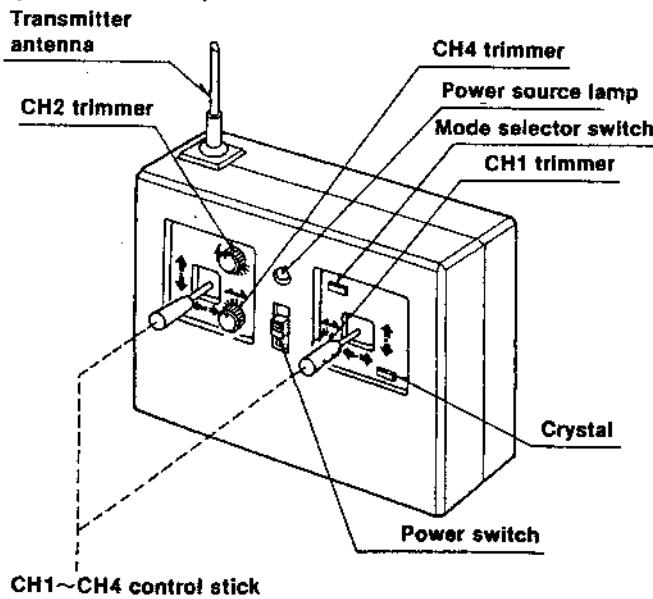


1 Parts identification

(Main body)



(Transmitter)



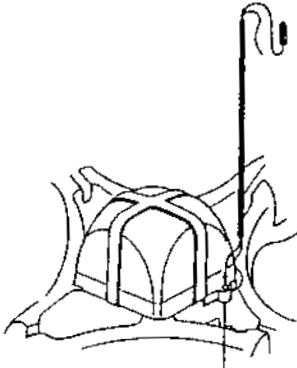
Flight mechanism

Front and rear propellers A rotate counterclockwise, whereas right and left propellers B rotate clockwise. Each propeller gives rise to a torque in the direction opposite to the rotation. The GYROSAUCER body can, therefore, be turned to right with no inducement toward up or down movement when the front and rear propellers A are increased in power and the right and left propellers B reduced in power. Turning to right or left is controlled by the rate gyro.

When the front propeller A is increased in power and the rear propeller A reduced in power, the GYROSAUCER body can be inclined with its rear side down and made to move with no inducement toward up/down or turning movement. This inclination of the GYROSAUCER body is controlled by the free gyro.

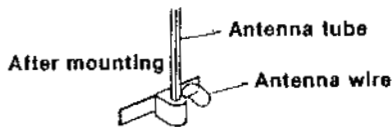
2 Setting the main body

1. Set the antenna.



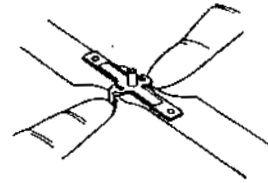
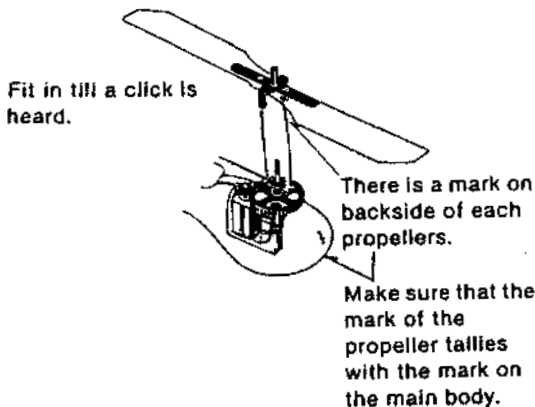
Antenna mounting section

Insert the antenna tube in the antenna mounting section securely while keeping the antenna wire from loosening conspicuously.



Next, mount the antenna cap to the antenna tube end.

2. Mount the propellers.
Propellers are classifiable into two: normal pitch A and reverse pitch B. Making sure of marks on the main body, mount the propellers correctly.

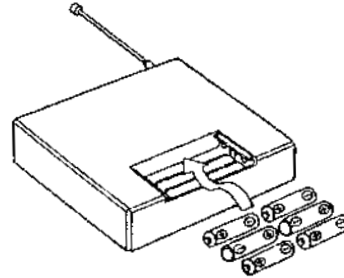


When removing a propeller, use forefingers of both hands, and opening the pawls of the propeller with the forefinger nails as pictured above, lift the propeller.

3 Setting the batteries

(Transmitter)

After making sure that the power switch is at the OFF position, remove the battery compartment lid and set 6 U-3 dry cells.



Used in the main body are two types of batteries: one is for wired control and the other is for radio (wireless) control.

In the case of wired control, a large-capacity battery is placed on the floor and power is supplied through the cable to the main body for flying the GYROSAUCER. In the case of radio control, a battery is built in the main body and flight of the GYROSAUCER is operated by perfectly wireless control. As wired control permits a longer flight, those who are not accustomed to 4-channel control had better practice by wired control first.

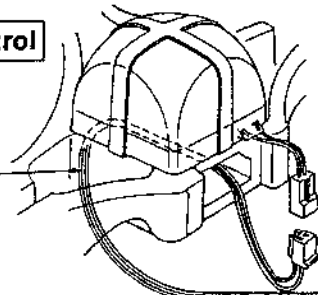
When connecting the battery to the main body, it is imperative to make sure the transmitter switch is at the OFF position.

The main body is equipped with no switch. Connecting by use of a connector supplies power to the circuit. The propellers and both gyros are then kept from rotating as long as the transmitter power switch is kept at the OFF position.

(Main body)

For wired control

Pass the cable through the hole of the Ni-Cd battery mounting section.



Wire cable attached

Ni-Cd battery

Ni-Cd battery (OP-90611)
7.2V 290mAh

Charge the Ni-Cd battery in compliance with the instructions stated in the instruction book of the charger.

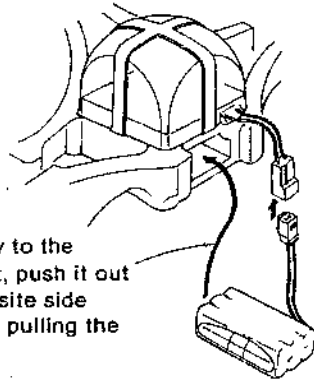
Connect the connector of the main body with the connector of the wire cable, and the connector of the wire cable with the connector of the Ni-Cd battery

respectively. At this time, use care to have the red lines meet.

Absolutely avoid using unnecessarily strong force or connecting inversely.

For radio control

Insert the battery securely to the depth. When removing it, push it out by a finger from the opposite side hole. Never remove it by pulling the wire.



Ni-Cd battery (OP-8952)
7.2V 120mAh

Charge the Ni-Cd battery in compliance with the instructions stated in the instruction book of the charger.

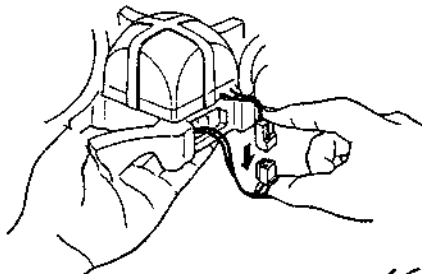
Caution

Whether for radio control or for wired control, hold the bottom of the main body by one hand and connect the connector by the other hand so that the propellers may not hit against the face or hands even though they may start to rotate suddenly.

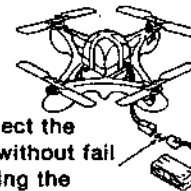
Connect the connector of the main body with the connector of the battery so that the red lines meet.

Absolutely avoid using unnecessarily strong force or connecting inversely.

After a flight, be sure to disconnect the battery from the connector of the main body and keep it separately.



For radio control



Disconnect the battery without fail after flying the GYROSAUCER.

For wired control



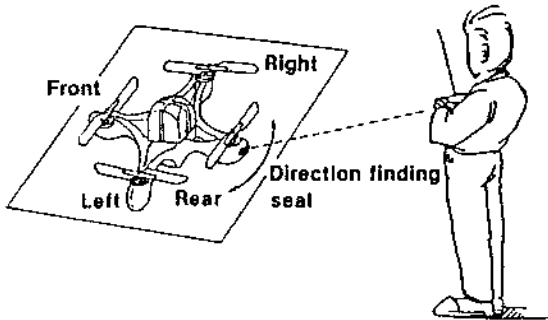
Disconnect the battery without fail after flying the GYROSAUCER.

When connecting the battery, keep your eyes distant from the propellers.

4 Procedure for flight

Given below is a common procedure for flight. Flight practice will be detailed later.

1. Place the main body on a flat floor, taking care to have the red seal (used for finding the direction of it) in front of the operator.



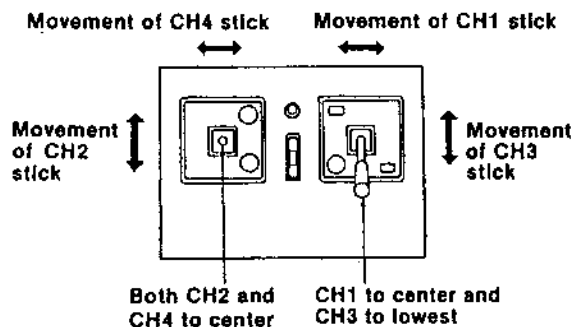
Caution

The GYROSAUCER cannot always take off from a slanting floor. Let it take off from as horizontal a floor as possible.

2. Make sure that the free gyro is at a standstill. Set the power switch to the ON position without touching any stick of the transmitter.

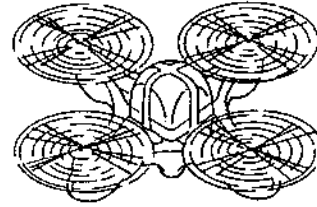
Caution

It will fail to start normally if the free gyro is rocking. After the free gyro comes to a complete stop, set the transmitter power switch to ON.



Rate gyro) Start rotation
 Free gyro) Stop
 Propellers Stop

3. Both gyros start rotating, and about 8 seconds later, propellers start rotating.



Rate gyro Rotates
 Free gyro Rotates
 Propellers Starts rotation

Caution

Propellers are so programmed as to rotate after the free gyro gets stabilized in rotation.

After setting the transmitter power switch to ON, use care not to bring the face and hands near the propellers.

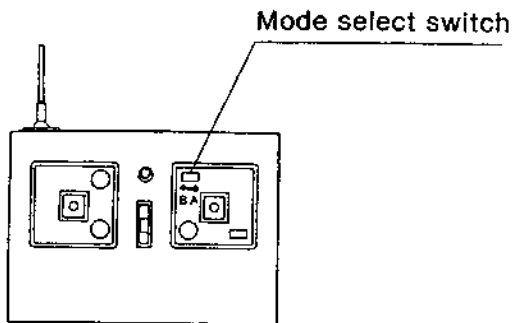
- ✘ When the CH3 control stick is at the lowest position, the propellers are rotating at very low and different speeds. Though at this time the four propellers are not all rotating, no trouble is meant therefrom.

Now the GYROSAUCER is ready for flight.

● Cautions

- The length of flight is about 1 minute by radio control, or 3 minutes by wired control. (It may be shorter depending upon the conditions of the battery in use.)
- Model E-570 has been intended for indoor use. No flight can be made outdoors if the wind blows even a little.
- Refrain from flying it above people or near them. Please note that we are not responsible for any accident arising from a flight made in disregard of these cautions.
- When taking the GYROSAUCER in your hands, hold the body cover.

5 Transmitter operation



The mode select switch is used to change the movement of the GYROSAUCER sequent on operation of the control stick.

Mode A

It is used for radicon helicopter operation in Japan. We, therefore, recommend you to practice in this mode if you intend to operate a radicon helicopter for the future.

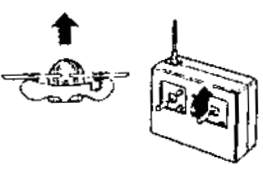
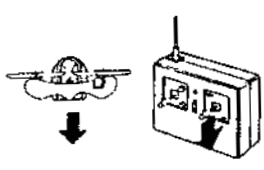
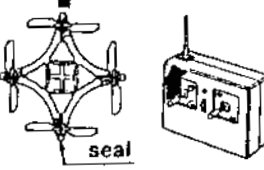
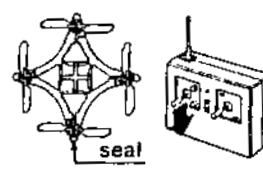
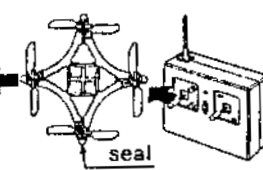
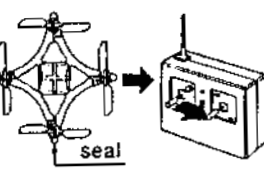
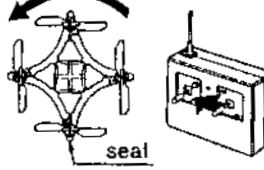
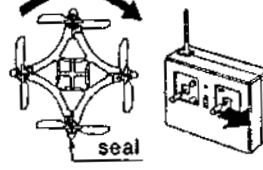
Mode B

This mode enables operators to easily find forward, backward, rightward and leftward movements of the GYROSAUCER. It is, therefore, fit for use by a person inexperienced in 4-channel control.

Mode A How to hold the transmitter

<p>Upward</p> <p>CH3 stick UP</p>	<p>Downward</p> <p>CH3 stick DOWN</p>	<p>Forward</p> <p>CH2 stick UP</p>	<p>Backward</p> <p>CH2 stick DOWN</p>
<p>Leftward</p> <p>CH1 stick LEFT</p>	<p>Rightward</p> <p>CH1 stick RIGHT</p>	<p>Turning to left</p> <p>CH4 stick LEFT</p>	<p>Turning to right</p> <p>CH4 stick RIGHT</p>

Mode B

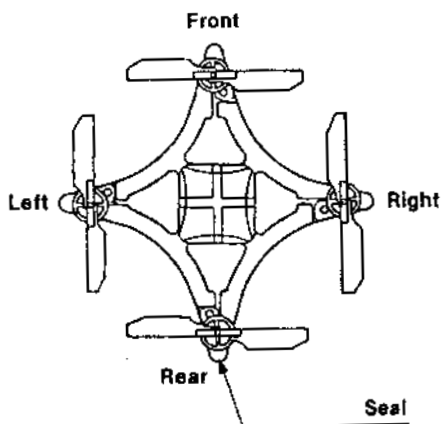
<p>Upward</p>  <p>CH3 stick UP</p>	<p>Downward</p>  <p>CH3 stick DOWN</p>	<p>Forward</p>  <p>CH2 stick UP</p>	<p>Backward</p>  <p>CH2 stick DOWN</p>
<p>Leftward</p>  <p>CH4 stick LEFT</p>	<p>Rightward</p>  <p>CH4 stick RIGHT</p>	<p>Turning to left</p>  <p>CH1 stick LEFT</p>	<p>Turning to right</p>  <p>CH1 stick RIGHT</p>

As shown in the table above, in mode B the sticks to control rightward, leftward movements and rightward, leftward turning

movements have been replaced with each other.

6 Flight practice

In flying the GYROSAUCER, it is very important to find the direction of it. The position of the GYROSAUCER (front, rear, right, and left) can be found by watching the direction finding seal.



The following explains mode A. Those who are going to practice in mode B are requested to read by replacing CH4 and CH1 of both the sticks and trimmers. As for the method of practice, there is no difference between wire-controlled flight and radio-controlled flight.

Trimmer adjustment

The trimmer adjustment is so made as to have the GYROSAUCER body straight up when only the CH3 stick is raised gradually (CH1, 2, and 4 kept intact in their middle positions). This adjustment is requisite for making a flight. It is also necessary when the mode is changed.

1. Make preparations for flight by taking steps stated in 4 Procedure for flight.
2. Next, keeping CH1, 2, and 4 intact in their middle positions, raise the CH3 stick gradually till the GYROSAUCER body rises to about 30~50cm.

3. In order to let the GYROSAUCER go up straight without turning at this time, carry out the trimmer adjustment.

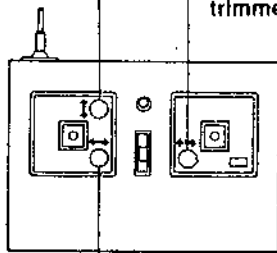
The adjustment should be made after landing the GYROSAUCER and then setting the power switch to OFF. To have the GYROSAUCER rise up, be sure to let it up 30~50cm. If the height is about 10cm from the floor, the GYROSAUCER body is not stable on account of the wind blowing against the floor from above.

CH2 trimmer

When the GYROSAUCER body shifts forward, turn the trimmer to left, and when it shifts rearward, turn the trimmer to right.

CH1 trimmer

When the GYROSAUCER body shifts rightward, turn the trimmer to left, and when it shifts leftward, turn the trimmer to right.



CH4 trimmer

When the GYROSAUCER body turns to right, turn the trimmer to left, and when it turns to left, turn the trimmer to right.

4. After adjusting the trimmers, make sure the free gyro is at a standstill, then set the power switch of the transmitter to ON, and making the GYROSAUCER body rise up, check the result of the adjustment.

Caution

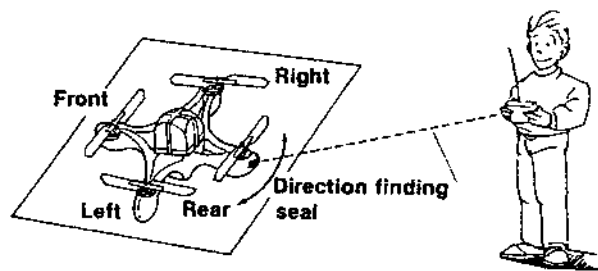
It is impossible to attain perfect stationariness of the GYROSAUCER in the air (hovering) by only adjusting the trimmers. The adjustment is all right if the GYROSAUCER body is made to rise up nearly straight.

Flight practice

Step 1

(Controlling the turn)

1. Make preparations for flight by taking steps stated in Procedure for flight.
2. Place the GYROSAUCER on a smooth floor, and pushing down the CH4 stick to right and left, catch the sense of causing the GYROSAUCER to turn (not letting it rise up).
3. Practice control to have the direction finding seal on your side. When it is on your side, you are in position of operating from the rear side of the GYROSAUCER body. It is very important to constantly control to keep the GYROSAUCER body in this state, because, otherwise, you cannot know how to operate the front, rear, right, and left sticks.



Practice till you can control the turning of the GYROSAUCER keeping the read direction finding seal always on your side.

Step 2

(Controlling the turn while keeping the height of it constant.)

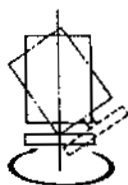
1. Gradually raise the CH3 stick and make the GYROSAUCER body about 30~50cm up. Then, by operating the CH4 stick as you practiced in step 1, control the turning of the GYROSAUCER body, while keeping the direction finding seal always on your side without fail.

- The method of controlling forward, back, right, and left by operating CH1 and CH2 has not been practiced yet. After a while (2~3 seconds), therefore, the GYROSAUCER body flows forward, back, right, or left. Immediately push down the CH3 stick and let the GYROSAUCER body down.

Master the procedure up to step 2 completely. Otherwise, you will never be able to control forward, back, right, and left movements of the GYROSAUCER.

Notes:

- After landing the GYROSAUCER, be sure to turn off the transmitter. To make the GYROSAUCER take off again, wait for about 15 seconds and make sure that the free gyro is completely at a stop. If not, the next flight may become uncontrollable due to a precession of the free gyro resulting from the landing shock.
- In case that the GYROSAUCER is on the point of hitting against a wall by shifting sideways, make the CH3 stick minimum and switch off the transmitter. Letting it fall down to the floor will cause less damage than a smash into a wall.
- To have the GYROSAUCER rise up, be sure to let it up 30~50cm. If the height is about 10cm from the floor, the GYROSAUCER body is unstable on account of the wind blowing against the floor from above.



Precession

Precession in this case, is oscillation of the gyro caused by rapid sideway acceleration.

Step 3

(Controlling the GYROSAUCER forward, back, right, and left)

- Have the GYROSAUCER rise up about 30~50cm while controlling it so as not to turn.
- If the GYROSAUCER shifts leftward, turn the CH1 stick to right, and if it shifts rightward, turn the stick to left. If the GYROSAUCER shifts forward, push the CH2 sticker down, and if it shifts backward, push the stick up.

Upon mastering the procedure up to step 3, you can attain stationariness of the GYROSAUCER (hovering) completely.

It takes you about a week for you to master the procedure up to step 3. Although you may think it difficult, this procedure is much easier than the method of controlling a radicon helicopter. We hope you will carry it to success.

Notes:

- The free gyro built in this GYROSAUCER is a simple type designed for a model plane. A rapid sideway movement will bring the gyro into precession making it uncontrollable. Controllable movement speed is 20cm/sec. If it is made to move at a speed higher than 20cm/sec., precession occurring with the gyro may cause the GYROSAUCER to overturn. Land the GYROSAUCER promptly.
- The reach of radio waves is about 10m. At a distance of 10m, however, the movement of the GYROSAUCER is hard to catch and control is almost impossible. Even at a distance within 10m, the GYROSAUCER may vibrate up and down due to uneven rotations of propellers, or in the worst case, the GYROSAUCER may fall. This is caused by emaciation of radio wave intensity which depends on the building interior conditions. In such a case, set up the transmitter and operate it, or change the place of flight.

- The GYROSAUCER (model E-570) comes down as the battery is used up even though the CH3 stick is at the topmost position. In such a case, the GYROSAUCER is hard to control. If it is used in a gym or a high-ceiling building interior, land it in good time or a little earlier.
- The motors immediately after flight are fairly hot. Before flying the GYROSAUCER again, cool them till no heat is felt.

7 Other cautions

- The wire cable attached to the GYROSAUCER body should never be remodeled.
- Do not attempt flight by supplying the GYROSAUCER with power from the option charger to be used for the Ni-Cd battery of the GYROSAUCER, since the charger will never be enough in terms of power capacity for the GYROSAUCER to fly.
- Do not feed oil to the propeller motors and gyro motors. Oiling any of these motors will have a reverse effect on their performances.

8 Main body trimmer adjustment

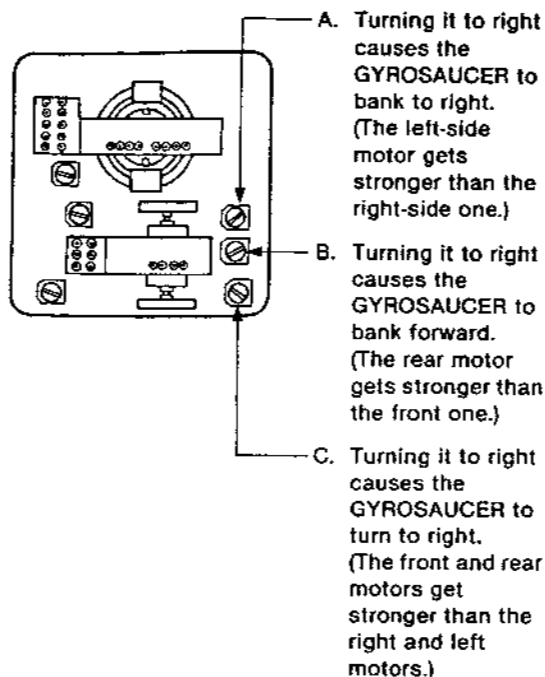
The main body trimmers, having been adjusted completely before the delivery of the GYROSAUCER, should never be touched except for replacement of gyros. In such a case that no adjustment can be made with the transmitter trimmers upon replacement of gyros, adjust the trimmers on the baseplate at the topmost position of the GYROSAUCER (visible) complying with the following instructions.

When adjusting, put a mark (by use of a marker pen, etc.) to show the former position. If the adjustment results in bad performance, return it to the former position according to the mark.



Before adjusting, put a mark without fail.

Method of adjustment



- Uncover the GYROSAUCER body and mount only the baseplate unit to the body. When uncovering, refer to 9 Repair.
- Set the transmitter sticks at positions where they can return by spring. (CH3...lowest, CH1, 2, 4...middle) Set all the transmitter trimmers to their middle positions.
- Next, set the transmitter power switch to ON and make the propellers rotate at low speed.
- Adjust trimmer A to make the right and left motors rotate at nearly equal speed.
- Adjust trimmer B to make the front and rear motors rotate at nearly equal speed. If motors come to a stop in steps 4 and 5 above, raise the CH3 stick to such an extent as will keep the GYROSAUCER from rising up.
- Adjust trimmer C to make the front and rear motors rotate at the same speed as the right and left motors.

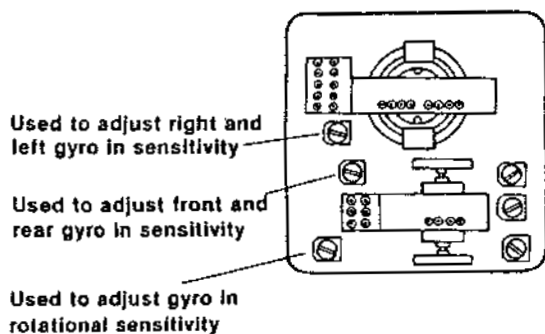
Now the adjustment is complete

The three trimmers shown below are used to adjust gyros in sensitivity. Increasing gyros in sensitivity causes transmitter sticks to reduce in workability, whereas reducing the former causes the latter to increase. These have already been adjusted to optimum positions and should never be touched.

For instance, reducing the front, rear, right and left in sensitivity to increase the transmitter sticks in workability may cause the GYROSAUCER to overturn.

Caution

Besides the above-mentioned six trimmers, there are some trimmers used. They should never be touched. Touching them will result in failure of the GYROSAUCER to fly.



(Each of them, when turned to right, will make sensitivity higher.)

Repair

Replacement parts can be purchased at the store where you purchased the GYROSAUCER. Our company does not sell products to end-users directly.

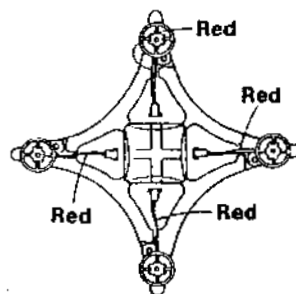
< GYROSAUCER body >

Use adhesives generally sold in the market and used for foamed styrol, or 5-minutes epoxy system bonding agent, in repair of your GYROSAUCER body. In some cases, taping by use of cellophane tape may suffice for the purpose.

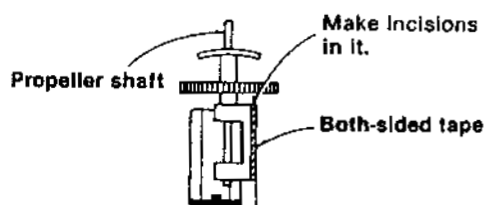
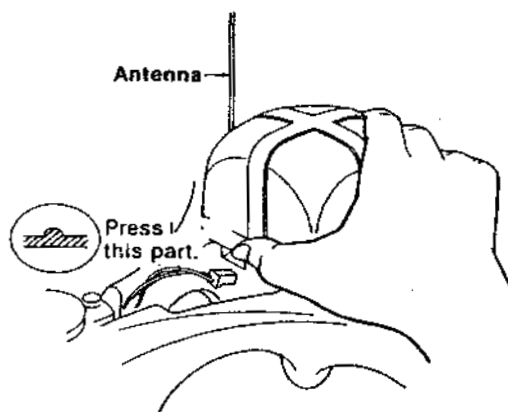
In case that the GYROSAUCER body has got unbalanced though repeated repair, replace the GYROSAUCER body with a new one.

< Replacement of GYROSAUCER body >

- (1) Remove the motor connectors and demount motors from the GYROSAUCER body. When removing each of them, hold the propeller shaft, and adding force carefully and gradually, unstick the both-sided tape. If it is hard to remove, use a cutter and make incisions in it.

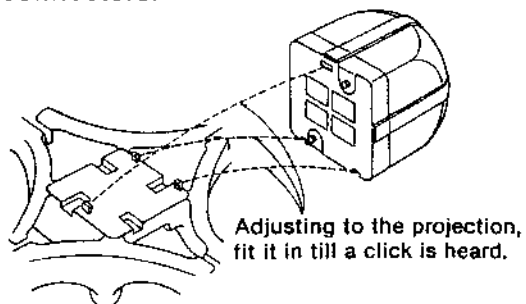


Pressing the part shown, lift it. The baseplate unit can be removed easily from the body.



- (2) Using both-sided tape provided, mount motors vertically in the new body. The motors should be mounted in the same positions as former ones.
 - ※ There are two types of motors, A and B. Mount them according to the marks on the backside of the GYROSAUCER body.

- (3) Mount the baseplate unit to the GYROSAUCER body and wire the motor connectors.

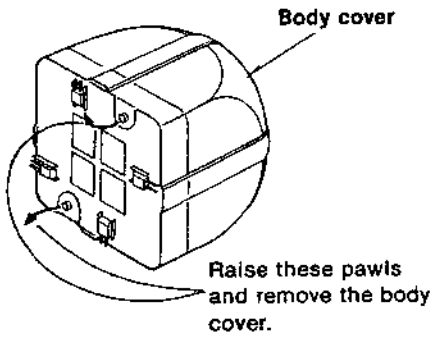


< Replacement of propellers >

Purchase option propellers, and referring to **2** Setting the main body (instructions for mounting the propellers), mount the propellers. For flight by wired control, repair by use of cellophane tape will mostly suffice. Please try.

< Replacement of gyro >

- (1) Remove the baseplate unit from the GYROSAUCER body.
- (2) Remove the body cover.



- (3) Remove the connectors from the baseplate. Each gyro, fixed with both-sided tape only, should be removed from the baseplate without strong force applied to it.
- (4) Mount new gyros to former positions by use of both-sided tape, and insert connectors.

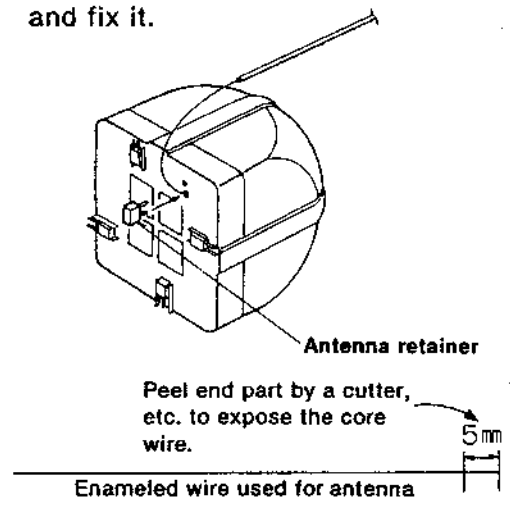
< Replacement of motor units >

Should it occur that the GYROSAUCER gets uncontrollable by the transmitter sticks for such a trouble as stated in the troubleshooting guide (Page 14), purchase

option motor units and mount them in former positions by using both-sided tape provided. There are two types of motors, A and B. When purchasing, specify either A or B.

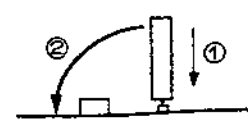
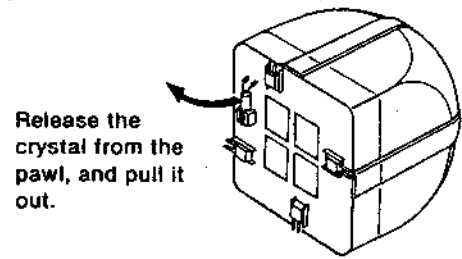
< Mounting the antenna >

- (1) Remove the baseplate unit, and uncover the main body.
- (2) Using a cutter, etc., remove film about 5mm from the end of the enameled wire (used for the antenna) to expose it. Insert the enamel wire in the pin hole, put on the antenna retainer from above and fix it.



< Replacement of crystals >

The GYROSAUCER uses crystals of 27 MHz band. To change for option crystals of different band or when crystals are out of place by a fall, etc., replace them with new ones referring to the following illustration. (Replace the transmitter crystals, too.)



First thrust the crystal foot into the pin (1), and then fix it with the pawl making a click (2).

Option parts

<Wire cable for 1200mAh>

The wire cable provided permits flight of about 3 minutes at one time. In order to satisfy those people who want to enjoy longer flight, another type of wire cable (for Ni-Cd battery, 1200mAh) is also available. The total time of flight with it is about 30 minutes. In this case, however, after flying the GYROSAUCER for 3 minutes, it has to take a rest for about 3 minutes with the battery disconnected from the battery connector. Flying it longer than 3 minutes will cause the propeller motors and gyro motors to get deteriorated heavily.

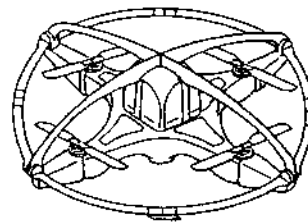
<Biaxial rate gyro>

This gyro is used replacing the free gyro. The free gyro, which is subject to precession, is unfit for such rough movement as in the case of a radicon helicopter. If the biaxial rate gyro is used in place of the free gyro, the GYROSAUCER will fairly better in kinetic performance and the operator can enjoy unrestricted flight of the GYROSAUCER without any anxiety about the precession.

But, in this case, the method of controlling the GYROSAUCER body is considerably difficult. After mastering control with the free gyro, please make a challenge for control with the biaxial rate gyro.

<Full face kit>

This is a propeller protecting cover used in wire-controlled flight. Though not enough for perfect protection of the propeller, the cover can protect it from sustaining damage if impact given is not so heavy.



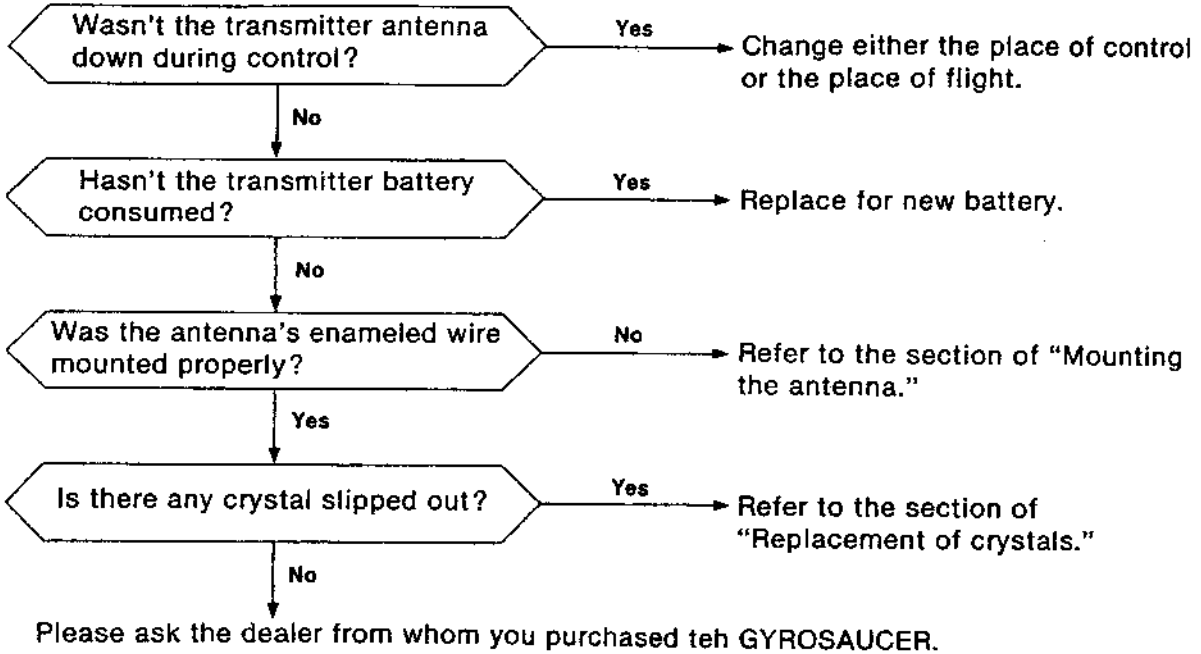
(Please understand that our company does not sell our products to end-users directly. Purchase them at a selling agent.)

LIST OF OPTION PARTS

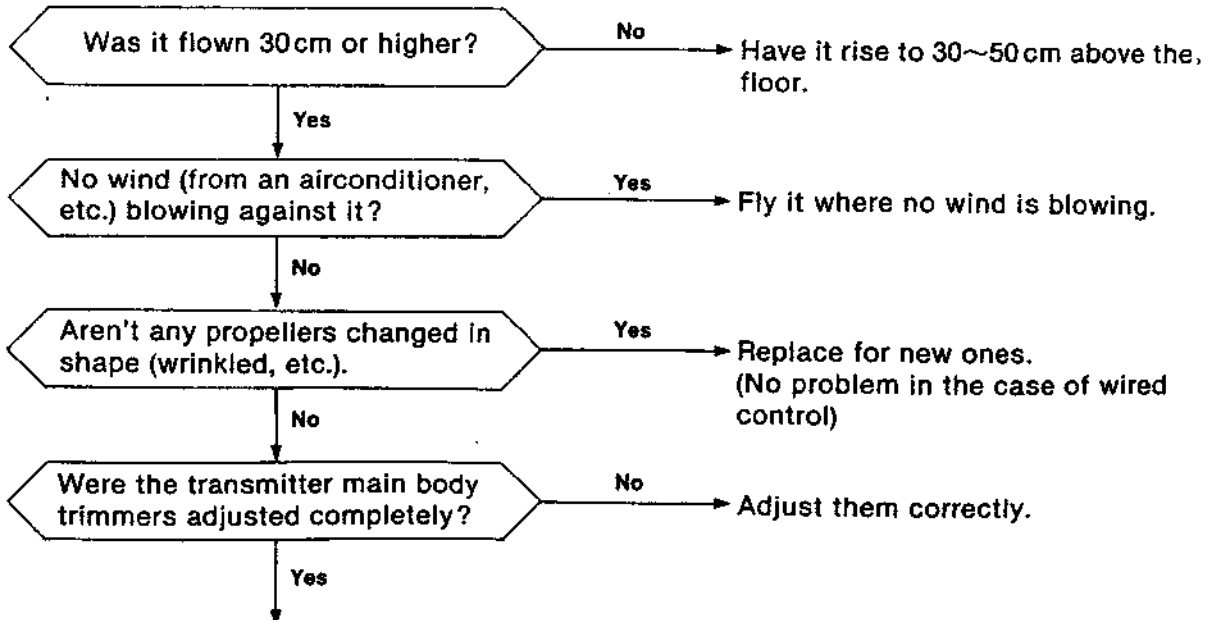
ITEM	PARTS NO.
PROPELLER	OP-8949
REPLACEMENT BODY	OP-92732
Ni-MH BATTERY (7.2V 300mAh)	OP-35461
RAPID CHARGER (7.2V 300mAh)	OP-35462
POWER SUPPLY SET	OP-35404
FULL FACE KIT	OP-92733
MOTOR UNIT A	OP-92940
MOTOR UNIT B	OP-92941
CRYSTAL SET	OP-92728

III Troubleshooting

1. Sometimes during flight the propellers stop and the GYROSAUCER falls or gets liable to fall. Or both the gyros and propellers fail to rotate.

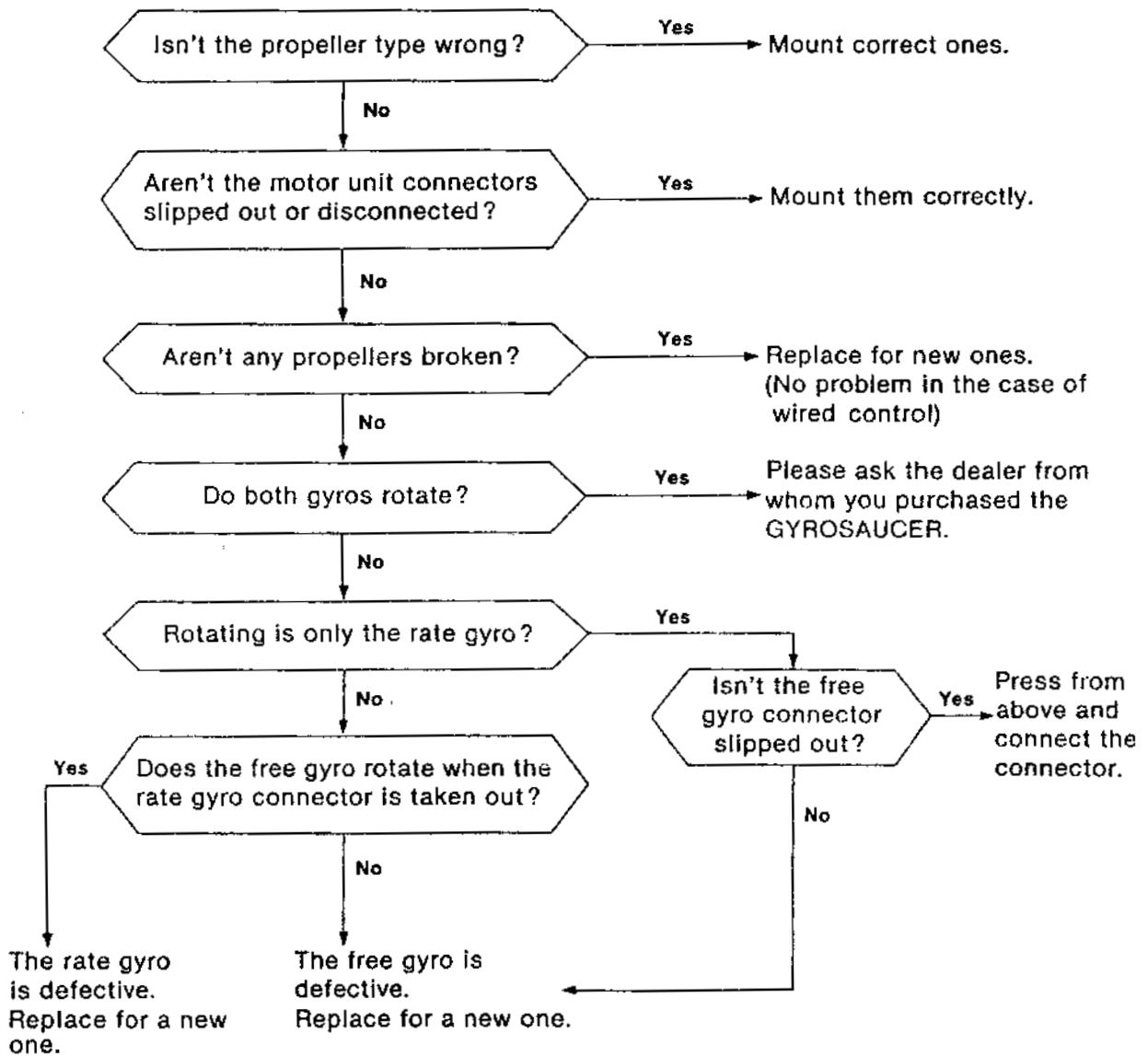


2. The GYROSAUCER flows sideways and cannot be stationary in the air (hovering).



The cause is deterioration in the motor. Replace the motor of the flowing side for a new one. (Do not forget to specify either A or B.)

3. The GYROSAUCER body vibrates up and down, or overturns.



4. The GYROSAUCER body fails to stop rotating.

