

acomms

FM DIGITAL PROPORTIONAL RADIO CONTROL SYSTEM

AP-440FM / **AP-540FM**
5 CHANNEL SYSTEM / **4 CHANNEL SYSTEM**



This picture shows transmitter of AP-540FM

INSTRUCTION MANUAL

ACOMS RADIO CONTROL SET AP-440FM/540FM

Dear Radio Control Hobby Friend,

Congratulations on buying this ACOMS AP-440FM or AP-540FM which has been manufactured and assembled with the greatest care.

We are confident that by following our simple instructions you will be delighted with your purchase. Please read the instructions for use of this set thoroughly, noting all points, in order to avoid mistakes in handling and operation.

Should you carry out your own repairs or modifications to the apparatus or to any part of it, we cannot accept responsibility and the guarantee becomes null and void.

It is advisable to check your AP-440FM/540FM before installing it into your model.

If the set has been damaged through misuse, a charge will be made for repair, the amount of which will be dependent on the damage. If you wish to have a quotation before the repair is carried out, please make your request known.

We wish you a lot of pleasure with our ACOMS AP-440FM/540FM.

TO HELP OBTAIN THE BEST RESULTS FROM YOUR NEW ACOMS SET, IT IS RECOMMENDED THAT YOU OBSERVE THE FOLLOWING : WHEN STARTING UP, SWITCH ON THE TRANSMITTER BEFORE THE RECEIVER. WHEN FINISHING, SWITCH OFF THE RECEIVER BEFORE THE TRANSMITTER.

AS A SAFETY PRECAUTION, ALWAYS CHECK THAT YOUR RADIO WORKS PERFECTLY BEFORE OPERATING YOUR MODEL.

THIS INSTRUCTION MANUAL SHOWS OPERATION OF BOTH ACOMS AP-440FM AND AP-540FM.

CONTENTS OF ACOMS AP-440FM/540FM



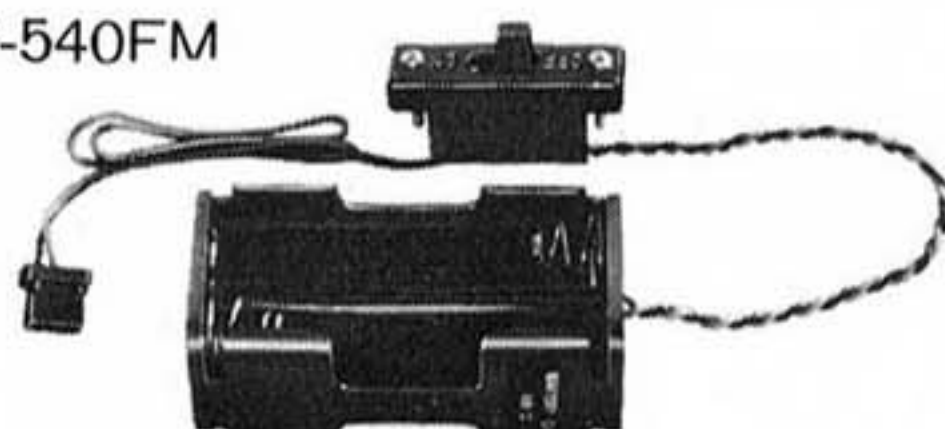
Ⓐ TRANSMITTER
ATA-440FM for AP-440FM
ATA-540FM for AP-540FM



Ⓑ RECEIVER ARA-540FM



Ⓒ SERVOS AS-2/AS-3



BATTERY BOX AB-2



SWITCH UNIT ASW-1



ACOMS CRYSTALS FOR FM (fitted on transmitter and receiver)



FREQUENCY FLAG SET
(Plastic plate, Ribbon, Number label sheet)

123456677890
123456677890



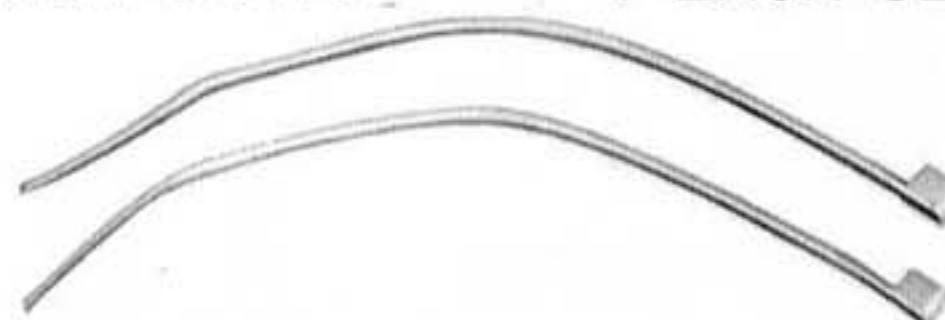
4 SERVO MOUNTING GROMMETS FOR EACH SERVO



1 EACH SERVO HORN FOR EACH SERVO



4 SERVO MOUNTING EYELETS FOR EACH SERVO



2 PLASTIC TIES FOR EACH SERVO



4 SERVO MOUNTING SCREWS FOR EACH SERVO



1 SCREW FOR EACH SERVO



4 PLAIN WASHERS FOR EACH SERVO

FOR USE WITH THIS RADIO WE RECOMMEND YOU USE RECHARGEABLE BATTERIES OF THE PEN-LIGHT CELL SIZE. ORDINARY DRY CELLS OF UM3, C3, HP-7 MN1500 OR EQUIVALENT MAY BE USED. YOU WILL REQUIRE 8 FOR THE TRANSMITTER, 4 FOR THE RECEIVER.

FEATURES OF ACOMS AP-440FM/540FM

① TRANSMITTER ACOMS ATA-440FM/540FM

- * ACOMS AP-440FM and AP-540FM have 10 KHz separation. However, for maximum safety it is advisable to allow 20 KHz between sets operating in the same area.
- * The extra long aerial (1.5m) provided, gives maximum transmission efficiency.
The aerial is telescopic and retracts into case for ease of handling, and is easily replaceable.
- * The frequency bands are precise and conform to internationally recognised standards. They are free from spurious radiation and therefore do not interfere with adjacent bands. For your guidance the bands are displayed on the front of the case.
- * Interchangeable plug-in crystals enable a rapid change of frequency by simply unplugging from the front of the case. The use of crystals, other than ACOMS, can damage the radio and invalidates our guarantee.
- * The transmitter is equipped with a voltage indicator so that the voltage of batteries can be checked easily.
If this meter indicates red, you may need to change batteries.
- * NI-CD batteries can be used and recharged in position in the transmitter by means of charging through the charger jack, using an ACOMS charger, which is available as a separate item. (Before charging the NI-CD batteries, please read the instructions carefully, which are provided with the ACOMS charger.)
- * Sticks are fitted with trim levers for fine adjustment. The trim levers are on a ratchet which holds them in position.
- * The ratchet can be changed from the left hand stick to the right hand stick, should you require it. When changing the ratchet, please refer to the drawing on page 7.
- * A carrying handle makes for easier and more efficient handling.
- * The case is made of ABS for extra strength and protection.

② RECEIVER ACOMS ARA-540FM

- * ACOMS ARA-540FM is a compact, light-weight design and can be installed into model made throughout the world. It is designed to be water resistant, but on no account should it be immersed.
- * The basic efficiency of this receiver, multi-signal intensified input jamming ratio, cross talk jamming ratio, practical sensitivity, and stability, is highly efficient through the adoption of special semi-conductor and the ACOMS unique circuit system.
- * The interchangeable frequency crystal is plugged into the top to enable easy and rapid change.
- * ACOMS ARA-540FM can be used for both AP-440FM and AP-540FM.

© SERVO ACOMS AS-2/AS-3 (Reverse Servo)

- * The ACOMS servo is designed to be light and compact. It may be used to control electrically powered machines.
- * The sturdy (replaceable) gears have been designed to stand up to considerable shocks and loads during reasonable manoeuvres; and are highly efficient.
- * A three-wire large scale integrated (LSI) monolithic IC is used. Constant quality control checks ensure minimum variation of characteristics so that there is full compatibility between servos manufactured by ACOMS.
- * Three types of servo horns, (small circular disc, big disc and cross shaped horns) are available. select and use the servo horns to meet the purpose required the servo horns can be fitted at angle of 15 degrees, so the angle of the horns can be adjusted easily.

A VERY STRICT CHECK OF ALL MATERIALS USED AND A CONTINUOUS INSPECTION USING SPECIALLY DEVELOPED SOPHISTICATED MEASURING DEVICES, AT ALL STAGES OF PRODUCTION, ENSURES THE COMPATIBILITY OF ALL ACOMS EQUIPMENT.

REMARKS :

- 1) ACOMS AP-440FM/540FM may be sold in various forms, namely with 2, 3 or 4 servos.
- 2) Please check your set carefully before installation into your model, to ensure you have the correct servos.
- 3) If you wish to use ACOMS servo AS-1 with AP-440FM/540FM, you will require an adaptor cable available as a separate item which provides the correct plug between the servo and receiver socket.

TECHNICAL DATA OF ACOMS AP-440FM/540FM

	<u>Transmitter</u> <u>ATA-440FM/540FM</u>	<u>Receiver</u> <u>ARA-540FM</u>	<u>Servo</u> <u>AS-2/AS-3</u>
Antenna Output	500mW		
Modulation System	FM		
Impulse Tolerance	1.4mS \pm 0.4mS		
Length of Cycle	18mS		
Power Supply	DC 12V/9.6V (8X Penlight) (8X NI-CD)	DC 6V/4.8V (4X Penlight) (NI-CD Pack)	From Receiver
Intermediate Frequency		455KHz	
Channel Width		4KHz / -6dB	
Torque			3.0 Kg/cm or more
Current Consumption	150mA	30mA	10mA/6V Stopped
Dimension (mm)	180 \times 59 \times 53	40 \times 61 \times 20.5	40 \times 42 \times 20
Weight (gms)	630	44	45

It is the policy of ACOMS continually strive to improve and update their equipment.
ACOMS therefore reserve the right to alter these specifications at any time without notice.

OPERATION OF ACOMS AP-440FM/540FM

FIG. 1 ACOMS TRANSMITTER

ATA-440FM/540FM

**① RETRACTABLE 9 SECTION AERIAL
(ROD ANTENNA)**

Use fully extended except when testing indoors.

**② CONTROL STICK FOR CHANNEL 1 AND CHANNEL 2
(RIGHT HAND STICK)**

CHANNEL 1:

This stick is self-centering and operates up or down. Pushing the stick up, the AS-2 servo horn rotates clockwise. Pushing the stick down, AS-2 servo horn rotates anti-clockwise.

The AS-3 reverse servo always rotates in the opposite direction to the AS-2 servo. Always make sure that the servos rotate properly before installation into the model and prior to every flight.

CHANNEL 2:

This stick is self-centering and operates left or right. Pushing this stick left, the AS-2 servo horn rotates clockwise. Pushing the stick right, the AS-2 servo horn rotates anti-clockwise.

**③ CONTROL STICK FOR CHANNEL 3 AND CHANNEL 4
(LEFT HAND STICK)**

CHANNEL 3:

This stick is on a ratchet and operates up or down. Pushing this stick up, the AS-2 servo horn rotates clockwise. Pushing the stick down, the AS-2 servo horn rotates anti-clockwise.

CHANNEL 4:

This stick is self-centering and operates left or right. Pushing this stick left, the AS-2 servo horn rotates clockwise. Pushing the stick right, the AS-2 servo horn rotates anti-clockwise.

**④ SNAP-SWITCH FOR CHANNEL 5
(only for AP-540FM)**

This channel can be used for operation of retracting gear of airplane or other operation.

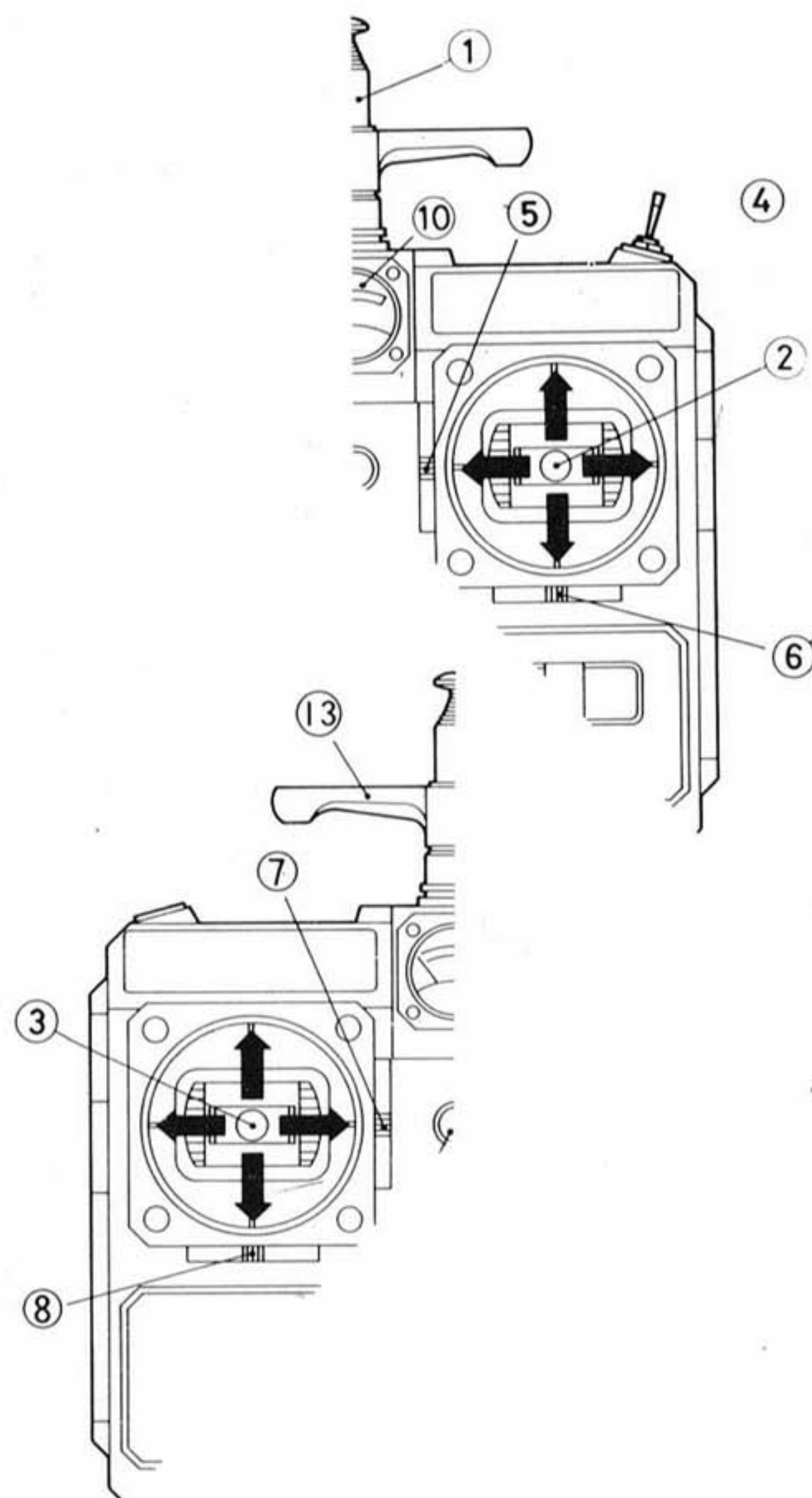
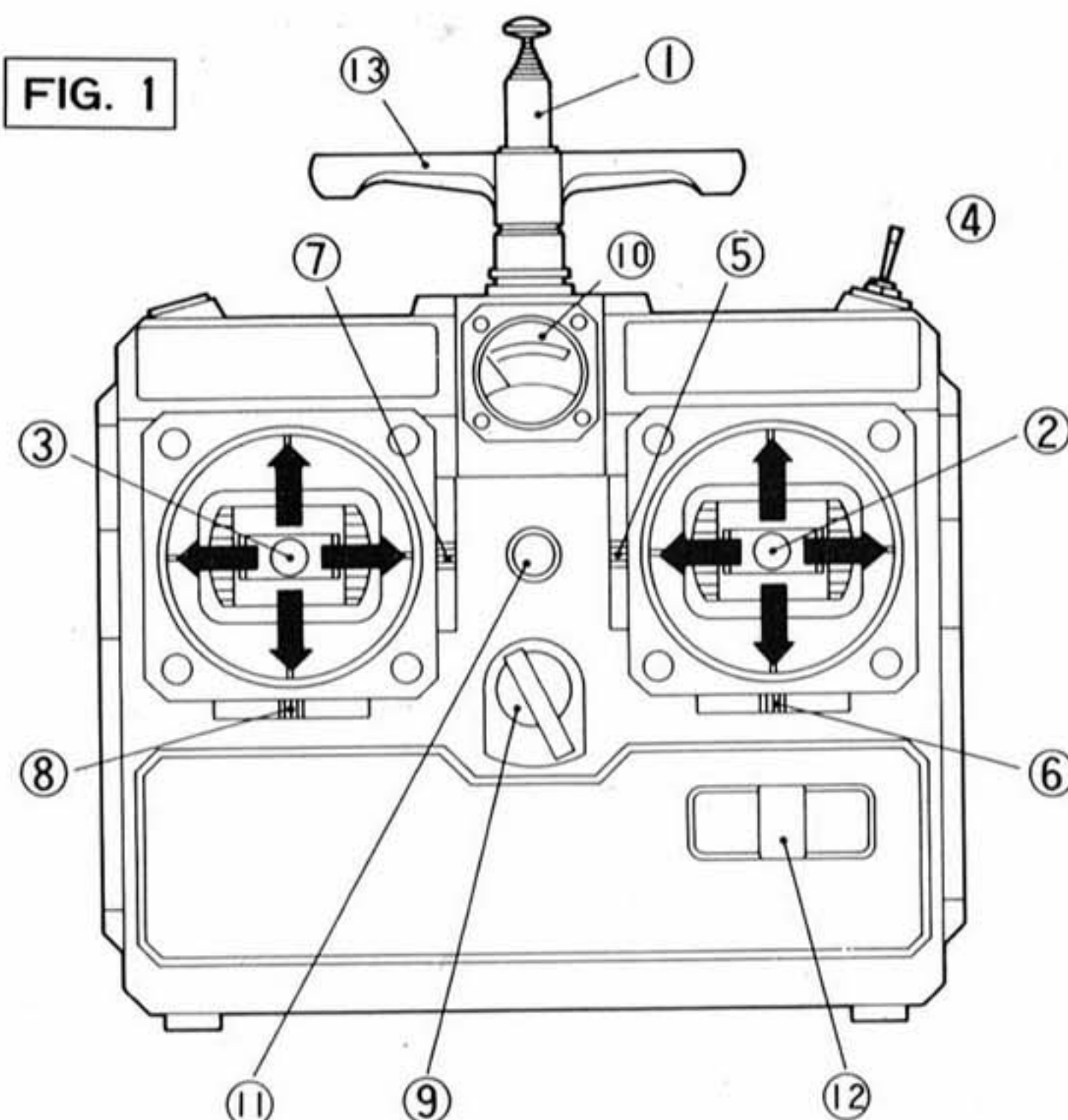
⑤ TRIM TAB FOR CHANNEL 1

⑥ TRIM TAB FOR CHANNEL 2

⑦ TRIM TAB FOR CHANNEL 3

⑧ TRIM TAB FOR CHANNEL 4

FIG. 1



This usefull device enables you to trim the control and obtain true neutral, allowing for various unforeseen variations in the performance characteristics of your model. The ACOMS trim tabs are on ratchets which means you are able to make a fine adjustments and hold them.

⑨ ON/OFF SWITCH

Move the switch to the "ON" position and the battery level indicator will register.

It is recommended that when using your ACOMS system, you always first switch on the transmitter and then switch on the receiver. When switching off, always switch off the receiver before switching off the transmitter.

⑩ TRANSMITTER VOLTAGE INDICATOR

If the meter indicates green, the voltage of the batteries is approximately about full strength.

If the meter indicates yellow, it is a warning that batteries are not giving full power.

If the meter indicates red, the batteries are weak and may need changing.

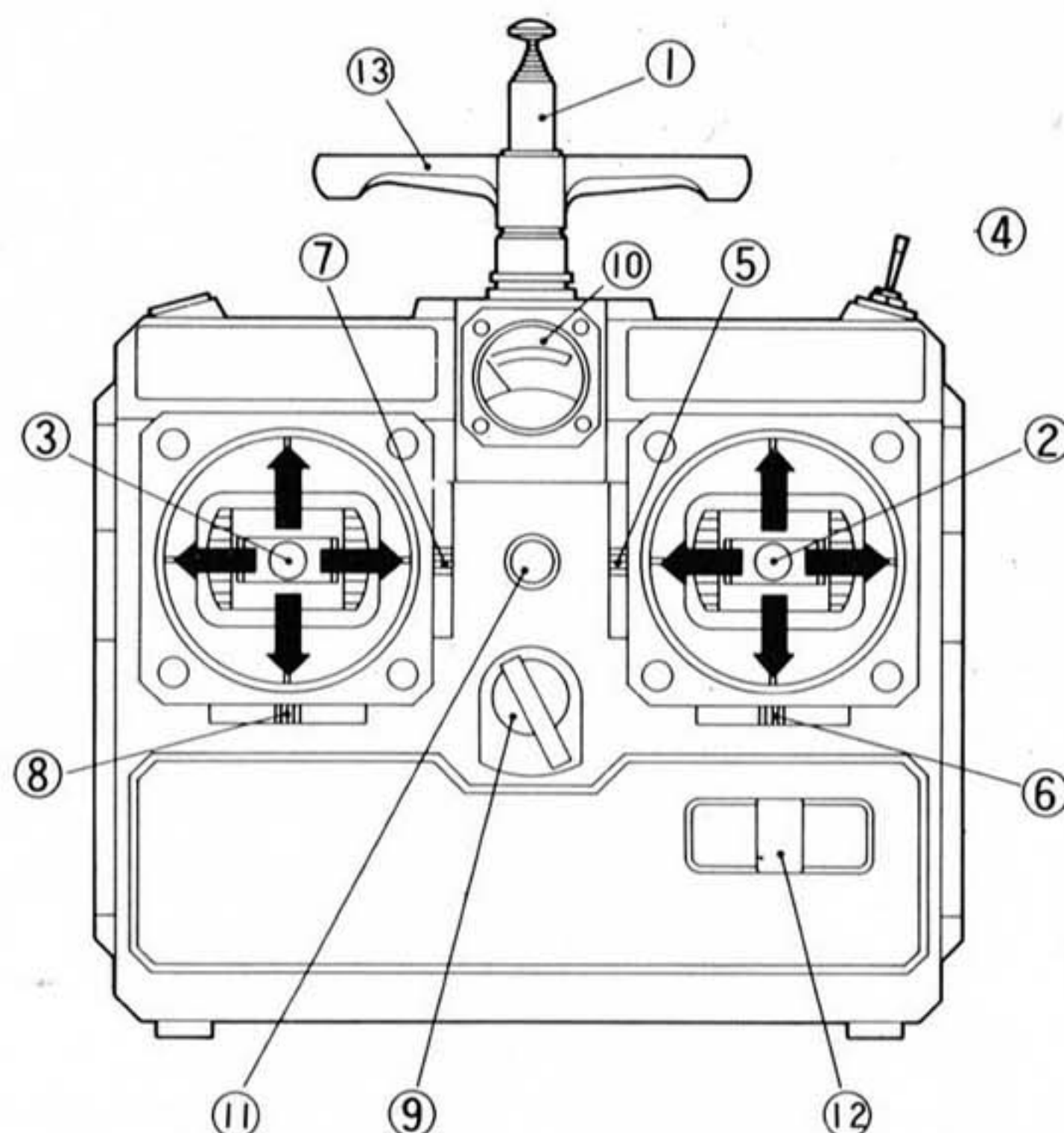
⑪ CARRYING STRAP HOLDER

A built in plastic loop is provided for fixing a carrying strap which is available as a seperate item.

⑫ FREQUENCY CRYSTAL

To remove the crystal, grip the holder as shown and pull straight from the case. To locate, fit the two pins on the crystal into the two holes in the case and push gently home. If the crystal is not properly seated or "floats" this will affect the transmitter operation. Check the fit of the crystal regularly. The crystals enable you to control your model on twenty different frequencies. Remember if you change your transmitter frequency, you must also change your receiver frequency. Always use ACOMS crystals for FM which are available as separate items. The use of other crystals can damage your radio and affect its performance. It also invalidates our guarantee.

⑬ CARRYING HANDLE



⑭ BATTERY COVER

To remove, slide in the direction of the arrow (downward) whilst lightly pushing the fingermark.

When inserting batteries always insert the negative end first and to the correct polarity as stamped in the battery case. If the transmitter voltage indicator fails to register check the contacts, especially the negative and recheck the batteries are fitted correctly.

Also make sure the batteries are fresh and not run down.

⑮ CHARGER JACK

This charger jack is only suitable for an ACOMS charger which is available as a separate item. Never charge alkaline or dry cell batteries (UM-3, C-3, HP-7 or equivalent), as it is extremely dangerous.

REMARK: CHANGING RATCHET

Channel 3 is fitted with a ratchet, but the ratchet can be removed to allow channel 3 to self-center. By the same system, you can put the ratchet system onto channel 1. Refer to the drawing. Make sure that the springs are changed as indicated by the arrows.

FIG. 2 ACOMS RECEIVER ARA-540FM

⑯ BATTERY SOCKET

Insert the plug from the battery box to the socket marked "BATT"

⑰ SERVO SOCKET FOR CHANNEL 1

⑱ SERVO SOCKET FOR CHANNEL 2

⑲ SERVO SOCKET FOR CHANNEL 3

⑳ SERVO SOCKET FOR CHANNEL 4

㉑ SERVO SOCKET FOR CHANNEL 5

(only for AP-540FM)

REMARK:

ALWAYS USE A SCREWDRIVER (—) TO GENTLY EASE OUT THE SERVO PLUGS FROM THE RECEIVER. DO NOT PULL THE PLUGS OUT BY PULLING THE WIRE, OTHERWISE YOU MAY CAUSE A LOOSE CONNECTION WHICH COULD GIVE YOU PROBLEMS THE NEXT TIME YOU OPERATE YOUR MODEL.

㉒ CRYSTAL & RUBBER CRYSTAL COVER

To change the crystal, remove the rubber crystal cover. When changing crystals always be sure that the TX crystal and RX crystal are on the same frequency band.

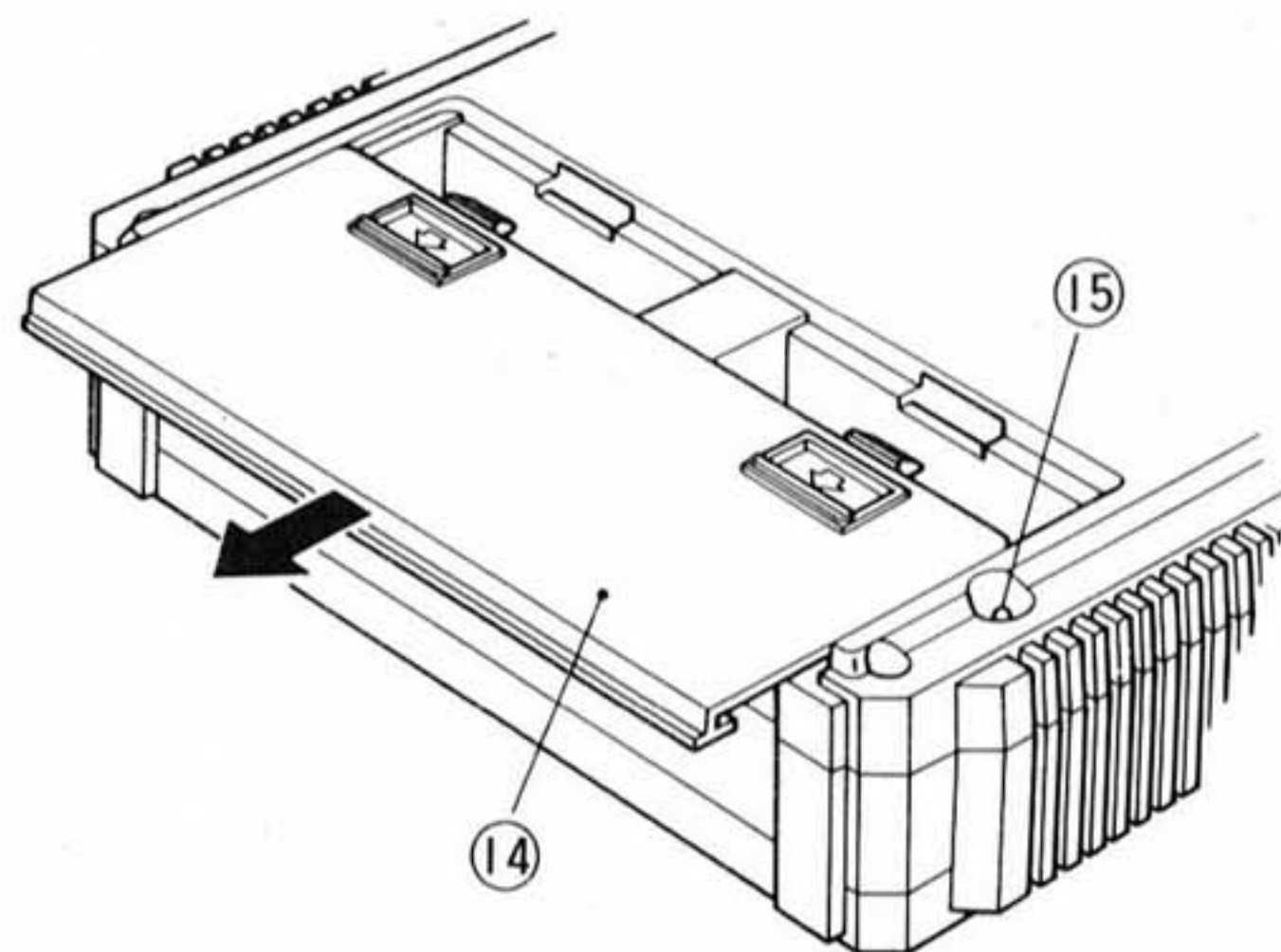
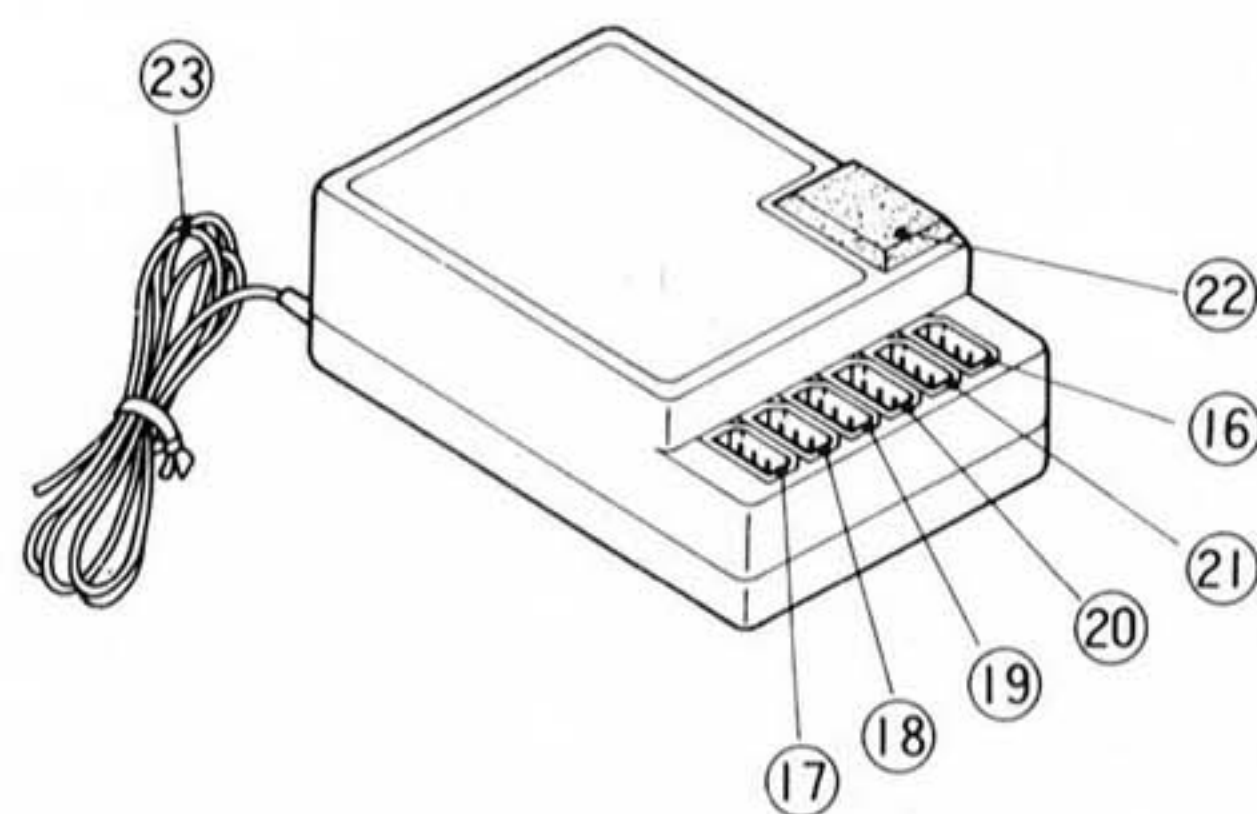
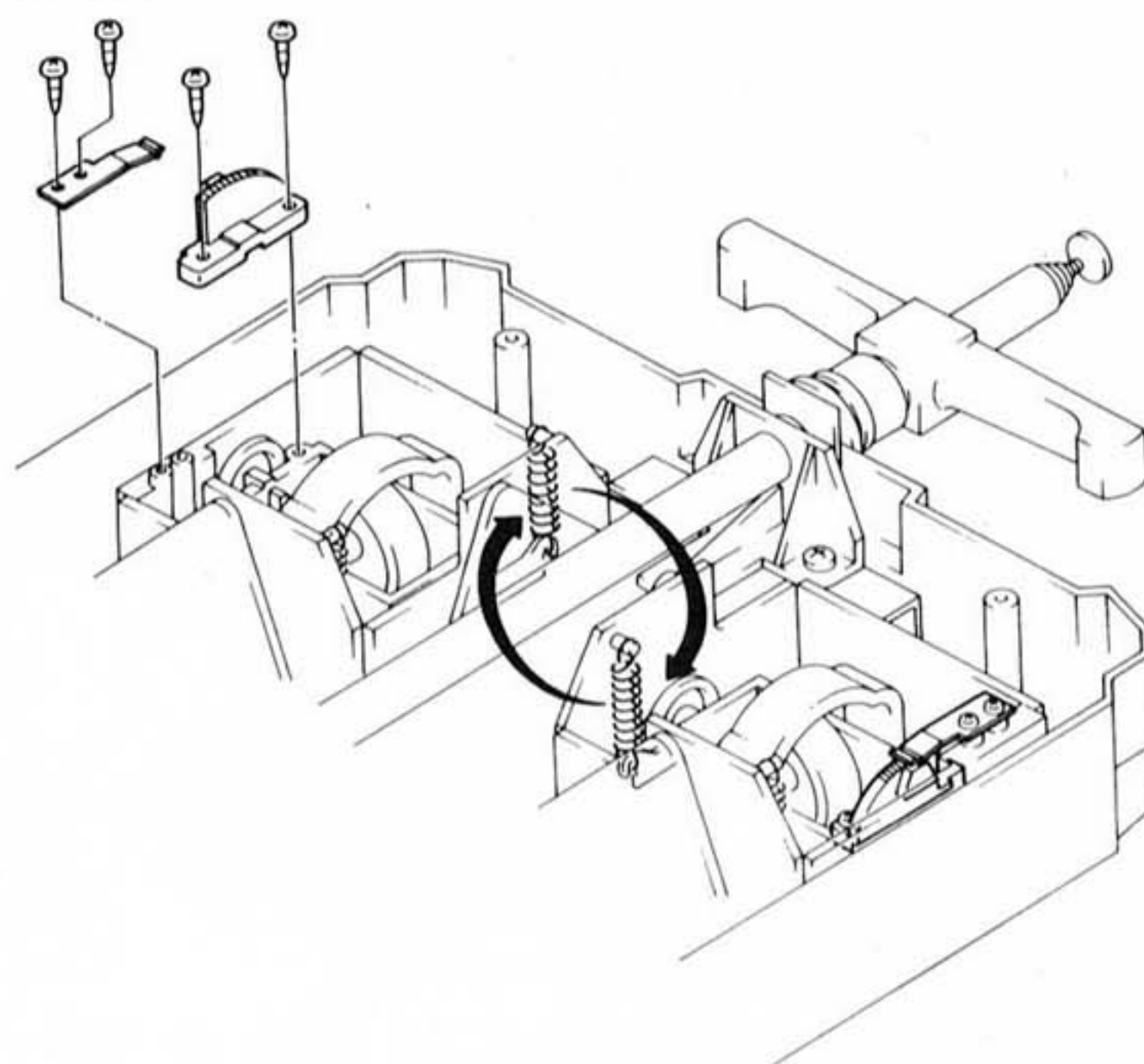


FIG. 2



②③ AERIAL WIRE (antenna)

Follow the instructions for your model when installing this. Normally the wire must be mounted in a line away from the receiver and power source. This reduces any risk of electrical noise and interference.

Do not cut or curl up the aerial wire on the receiver, as you will inhibit its sensitivity.

FIG. 3 ACOMS SERVO AS-2/AS-3

②④ SERVO CONNECTING CABLE AND PLUG

Should be connected and disconnected carefully.

②⑤ SERVO OUTPUT DISC (Servo Horn)

3 different types of servo horns are provided with this set so that you can select the ideal type to suit your model.

FIG. 4 ACOMS BATTERY BOX

②⑥ BATTERY HOLDER

4 batteries of pen-light size are needed. (UM3, C3, MN1500, HP7. Alkaline batteries are recommended.). Insert the batteries negative first. Make sure the polarity is correct as shown on the battery case. After inserting and checking hold in, hold with rubber bands or similar.

If the servos chatter uncontrollably, it usually signifies flat or faulty batteries in the battery holder.

②⑦ SWITCH UNIT

This is used for both receiver and servos. Remember when starting, switch on the transmitter first then switch on the receiver. When finishing, switch off the receiver first then the transmitter.

REMARKS:

Always exhibit the frequency number on which you are operating your model for your own protection and the protection of others operating nearby. A flag and an assortment of numbers are provided with the set.

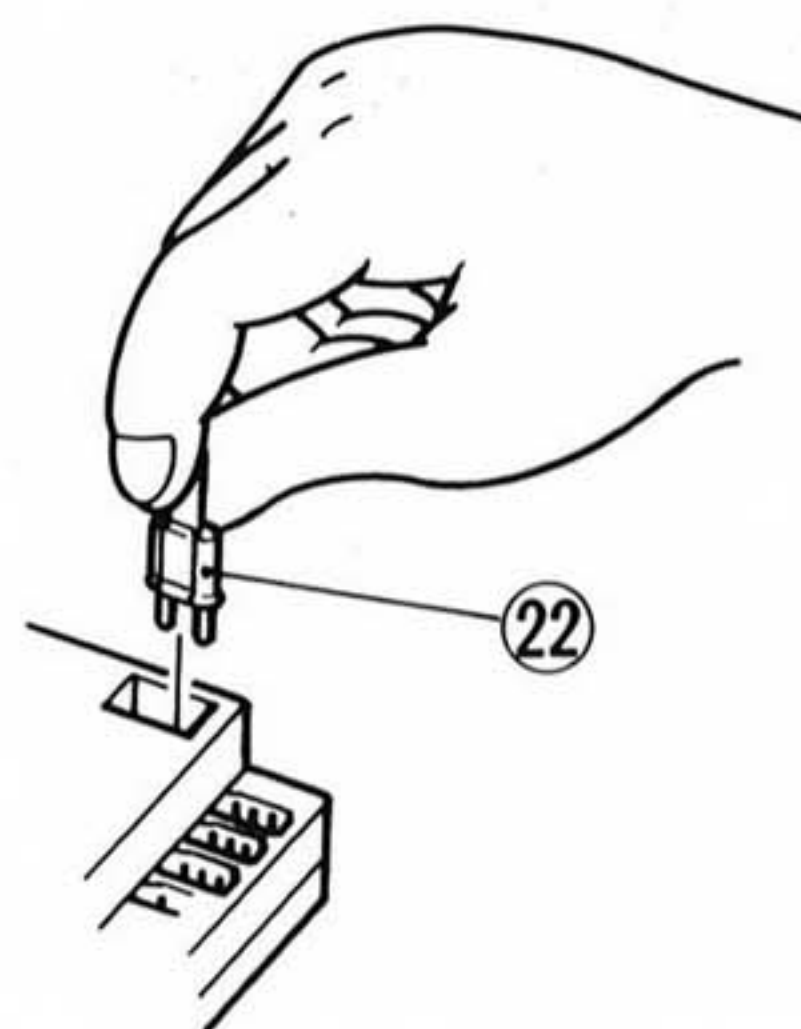


FIG. 3

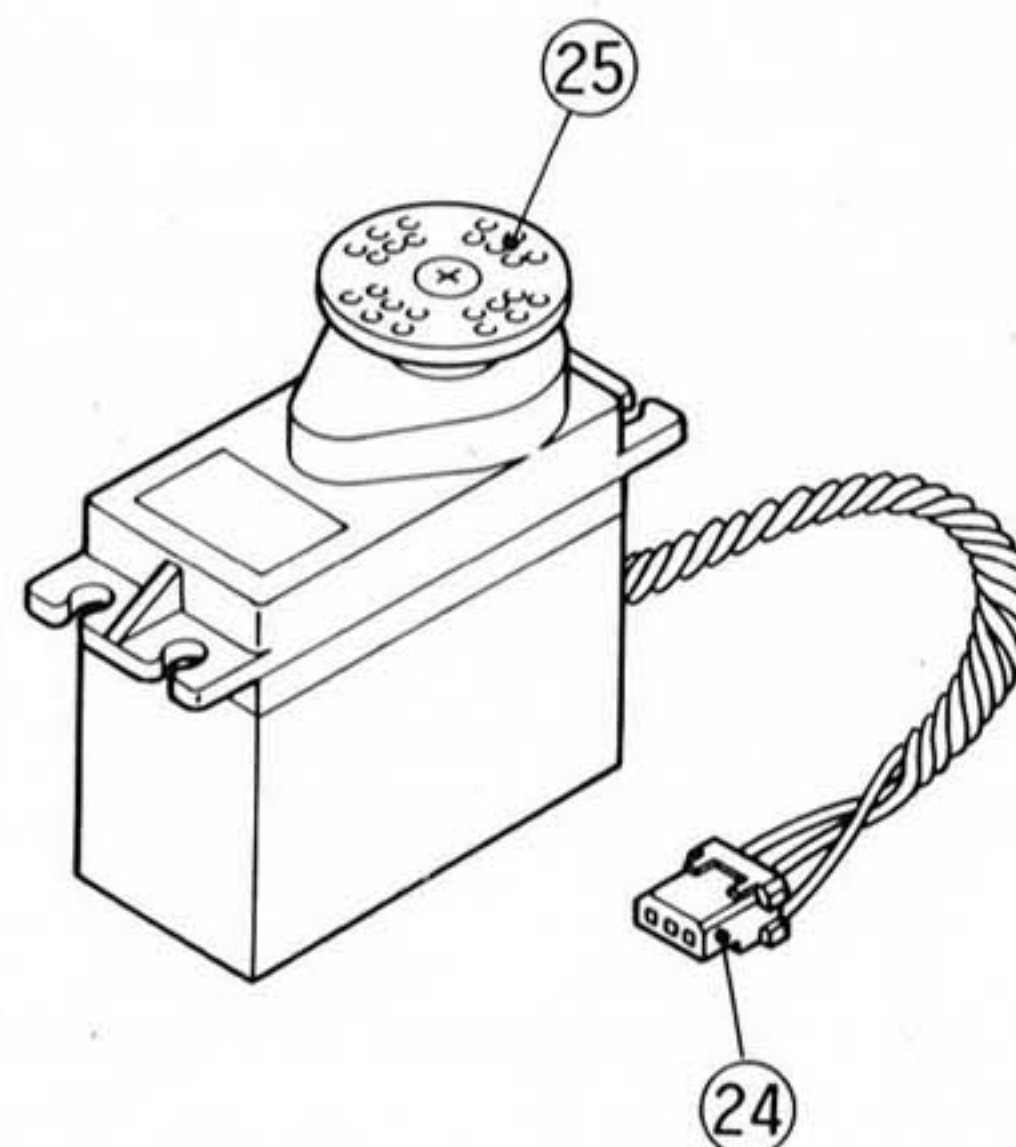
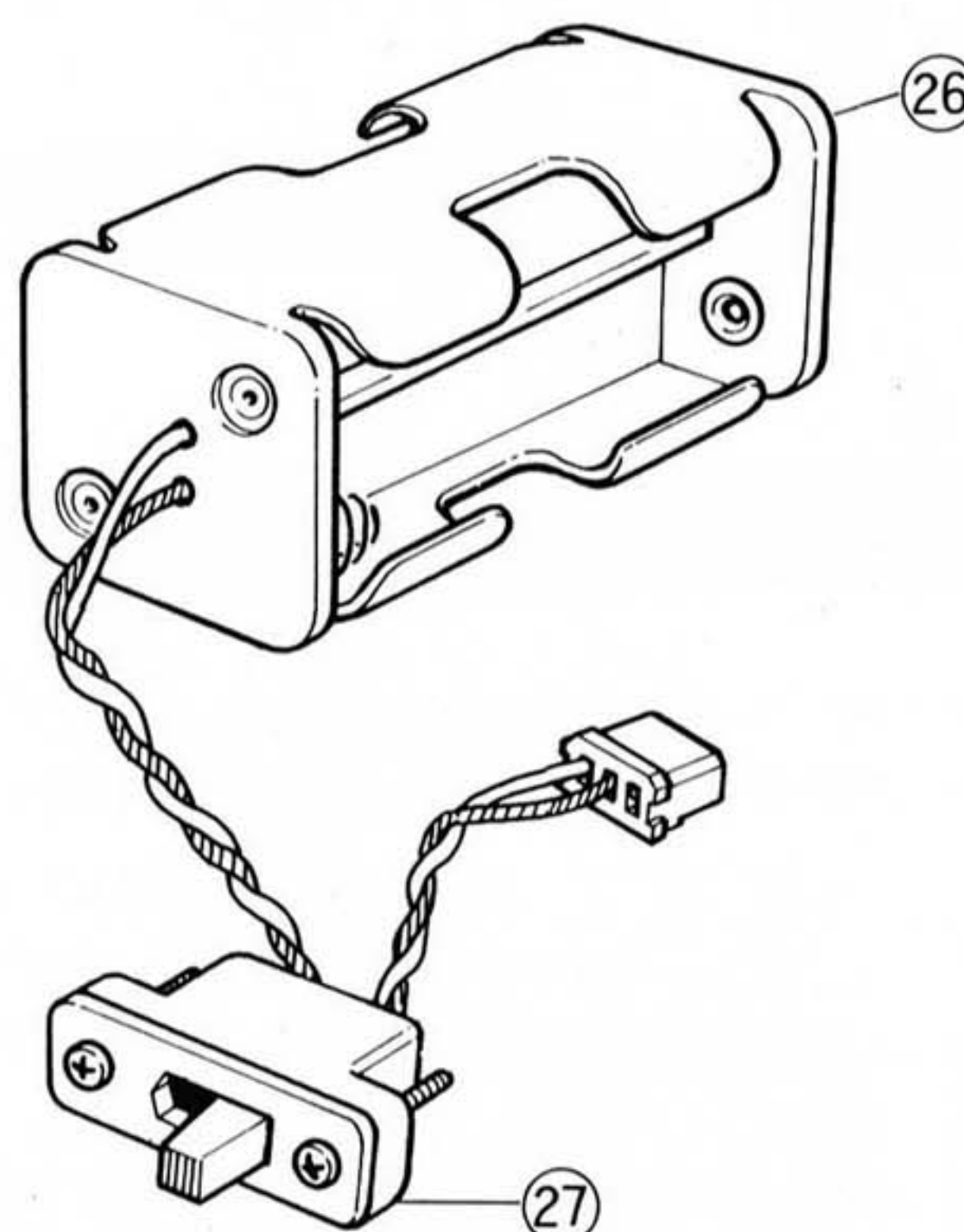


FIG. 4



CHARGING NI-CD BATTERIES

When using NI-CD batteries, follow below instructions. We recommend you to use switch unit "ASW-1", "ACOMS", charger and NI-CD battery pack "ASP-48" (4.8V. 500mAH) for receiver. They are available at shops as separate items.

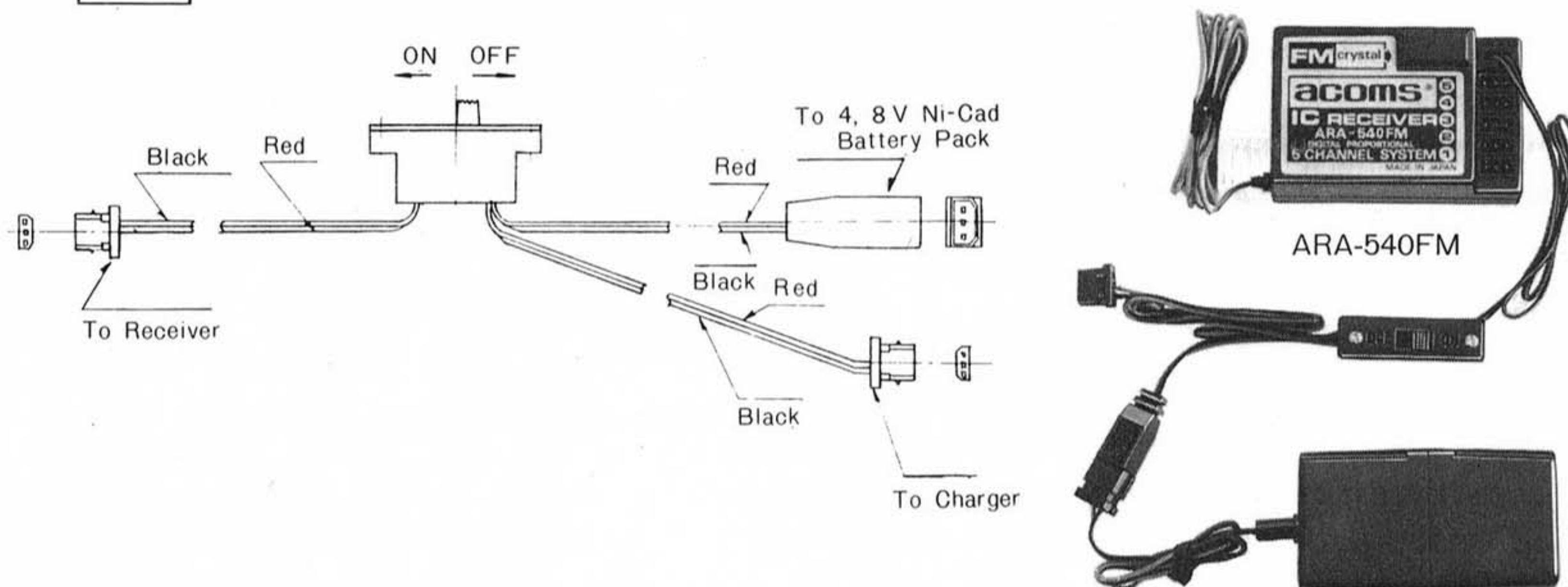
1. TRANSMITTER

Put eight NI-CD batteries of pen-light size (1.2V, 125mAH per piece) into the transmitter. Connect "ACOMS" charger to the charger jack on back of the transmitter. Make sure that "ON/OFF SWITCH" of the transmitter is at OFF position. (The transmitter should be switched off.)

2. RECEIVER

Connect switch unit ASW-1 (included) to "ACOMS" charger, receiver and NI-CD battery pack "ASP-48" as shown on FIG. 5. When charging, "ON/OFF SWITCH" of ASW-1 should be at OFF position. NI-CD batteries in the transmitter and "ASP-48" can be charged with "ACOMS" charger at the same time.

FIG. 5



FREQUENCY FLAG

According to your frequency-band on 40 MHz, stick number labels onto plastic plate. The ribbon attached to the plastic plate gives a useful guide to the wind direction.

INTERNATIONALLY RECOGNIZED FREQUENCY BAND-40 MHz

Band	Frequency	Band	Frequency	Band	Frequency	Band	Frequency
50	40.665	56	40.735	83	40.835	89	40.935
51	40.675	57	40.765	84	40.865	90	40.965
52	40.685	58	40.775	85	40.875	91	40.975
53	40.695	59	40.785	86	40.885	92	40.985
54	40.715	81	40.815	87	40.915		
55	40.725	82	40.825	88	40.925		

COLOR : Green

INSTALLING YOUR ACOMS EQUIPMENT

The receiver should be completely encased in foam rubber or other soft material to avoid contact with other parts and to avoid damage caused through accidents.

The servos must be rigidly and firmly installed. If it is impossible to secure them with the screws and grommets provided use strong double sided tape sold as servo tape.

The installation of the control wires or rods to the servos must allow the servos to move freely to their maximum play left and right. Any fouling of the control wires or rods will cause excessive current consumption and will damage the servos. If any moving metallic parts are in contact with each other this will set up sound waves which must be avoided. Excessive vibration also will create similar waves. These waves will affect the receiver and may cause sudden uncontrolled movements.

GOOD INSULATION IS THEREFORE ESSENTIAL

TESTING YOUR ACOMS AP-440FM/540FM

Many quality control checks have been made on your new ACOMS set. Your retailer may well have shown you that this equipment is working before you leave his premises. It is still wise to check out the function of each component as you install it into your model. Do this with fully charged batteries. Extend the aerial and operate the transmitter 3 metres away from the receiver with the receiver aerial extended.

Check carefully that the movement of each control surface is normal and make sure that the controls return to neutral. Should you be in any doubt about any function of your ACOMS equipment or your model, do not be afraid to seek expert advice.

Warning - Flat or faulty batteries are very often responsible for the malfunction of radio control equipment.

Checking your batteries carefully before use will save you time, money and aggravation.

Before flying always check that everything is working perfectly.

MODES FOR 4-6 CHANNEL TRANSMITTER

Refer to 3 different modes for control sticks as below :

MODE 1	RIGHT HAND STICK	
	CHANNEL 1(UP OR DOWN)	THROTTLE
	CHANNEL 2(LEFT OR RIGHT)	AILERONS
	LEFT HAND STICK	
MODE 2	CHANNEL 3(UP OR DOWN)	ELEVATOR
	CHANNEL 4(LEFT OR RIGHT)	RUDDER
	RIGHT HAND STICK	
	CHANNEL 1(UP OR DOWN)	ELEVATOR
MODE 3	CHANNEL 2(LEFT OR RIGHT)	AILERONS
	LEFT HAND STICK	
	CHANNEL 3(UP OR DOWN)	THROTTLE
	CHANNEL 4(LEFT OR RIGHT)	RUDDER
	RIGHT HAND STICK	
	CHANNEL 1(UP OR DOWN)	ELEVATOR
	CHANNEL 2(LEFT OR RIGHT)	RUDDER
	LEFT HAND STICK	
	CHANNEL 3(UP OR DOWN)	THROTTLE
	CHANNEL 4(LEFT OR RIGHT)	AILERONS



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