

Futaba

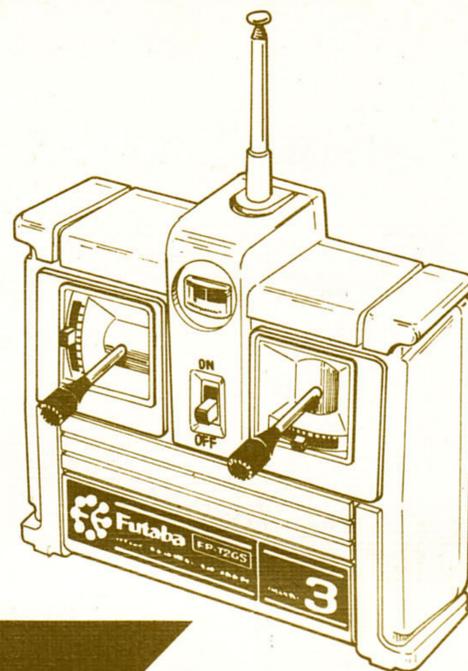
DIGITAL PROPORTIONAL
RADIO CONTROL

INSTRUCTION MANUAL

FP-2GS, FP-2GSB, FP-2GSC



FUTABA CORPORATION OF AMERICA
FUTABA CORPORATION



*THANK YOU for purchasing a Futaba digital
proportional radio control set.*

*Please read this manual thoroughly and use your
new set accordingly.*



FUTABA CORPORATION OF AMERICA
555 West Victoria Street, Compton, Calif. 90220, U.S.A.
Phone: 213-537-9610 Telex: 23-0691227 Facsimile: 213-637-8529

FUTABA CORPORATION
Tokyo Office: Daido Bldg., 3-1-16, Sotokanda, Chiyoda-ku, Tokyo, Japan.
Phone: (03) 255-5881 Telex: J26532

Printed in Japan/800960

SPECIAL FEATURES:

TRANSMITTER FP-T2GS

- Contemporary styling with smooth operating gimbals for superior control.
- 500mW output.
- Battery level meter indicates the state of the battery voltage at a glance.
- Built-in antenna.

RECEIVER FP-R2G

- Compact, lightweight, rugged.
- 3P mini connectors permit interchanging with existing Futaba products.

SERVO FP-S23, FP-S12, FP-S22

- FP-S23 is a miniature servo ideal for small aircraft, vehicles, and gliders. This servo is supplied with the FP-2GS system.
- FP-S12 (FP-S22) has a torque of 2.8 kg.cm or greater, and is perfect for buggies and boats. It is supplied with the FP-2GSB (FP-2GSC) system.

SET CONTENTS AND RATINGS

(Specifications are subject to change without prior notice.)

Model number	FP-2GS	FP-2GSB	FP-2GSC
Transmitter	FP-T2GS x1	FP-T2GS x1	FP-T2GS x1
Receiver	FP-R2G x1	FP-R2G x1	FP-R2G x1
Servo	FP-S23 x2	FP-S12 x2	FP-S22 x2
Switch battery holder	R2-BSS x1	R2-BSS x1	R2-BSS x1
	1 set miscellaneous hardware	1 set miscellaneous hardware	1 set miscellaneous hardware

TRANSMITTER FP-T2GS

Operating method 2 stick system
 Transmitting frequency 27MHz band, 72MHz band
 Modulation system AM (amplitude modulation)
 Power requirement 12V, round penlight battery x 8
 Current drain 100mA

RECEIVER FP-R2G

Receiving frequency 27MHz band, 72MHz band
 Intermediate-frequency 455kHz
 Selectivity 3kHz/3dB
 Receiving range 500m on the ground, 1000m in the air, with FP-T2GS.
 Power requirement 4.0 ~ 6.6V, round penlight battery x 4, used in common with servo.
 Current drain 6V, 10mA
 Dimensions 34.5 x 53.6 x 19mm
 Weight 35g

SERVO FP-S23, FP-S12, FP-S22

Control system + pulse width control
 Operating angle 45° or greater to one side (including trim)
 Power requirement 4.0 ~ 6.6V, round penlight battery x 4, used in common with receiver
 Current drain 6.0V 8mA (when idling)

	FP-S23	FP-S12	FP-S22
Output torque	2.6kg.cm (27.8oz./in)	2.8kg.cm (38.9oz./in)	2.6kg.cm
Dimensions	20x40.5x40.5mm	23x44.5x42.5mm	23x44.5x42.5mm
Weight	47g	52g	52g

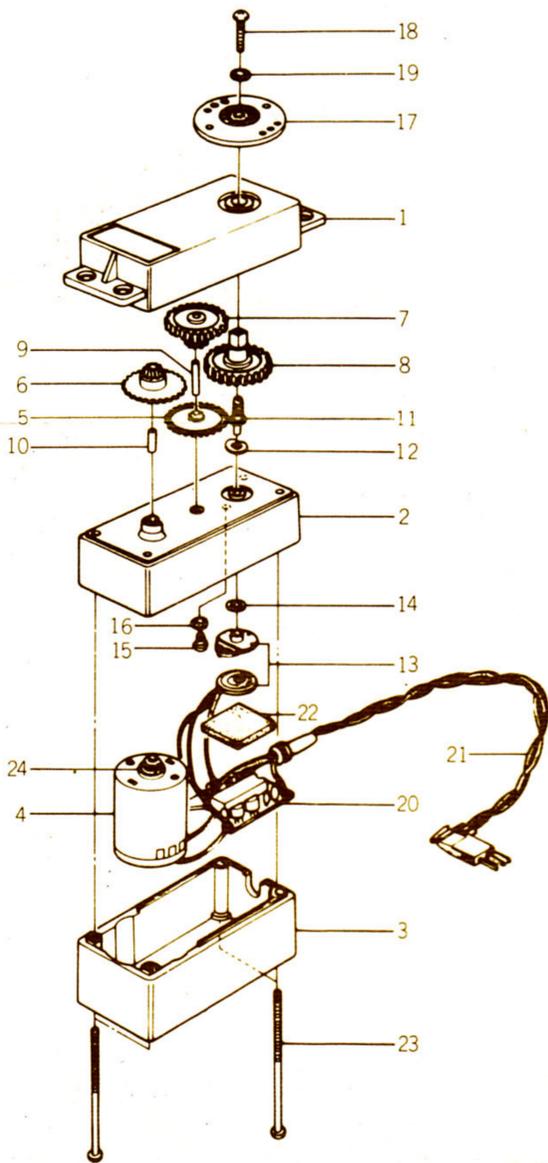
Futaba DIGITAL PROPORTIONAL FREQUENCIES

Band (1)	26.995MHz	Brown
Band (2)	27.045MHz	Red
Band (3)	27.095MHz	Orange
Band (4)	27.145MHz	Yellow
Band (5)	27.195MHz	Green

- * 72.080MHz Brown/White
- 72.160MHz Blue/White
- * 72.240MHz Red/White
- 72.320MHz Violet/White
- * 72.400MHz Orange/White
- 72.960MHz Yellow/White
- * 75.640MHz Green/White
- * Aircraft use only.

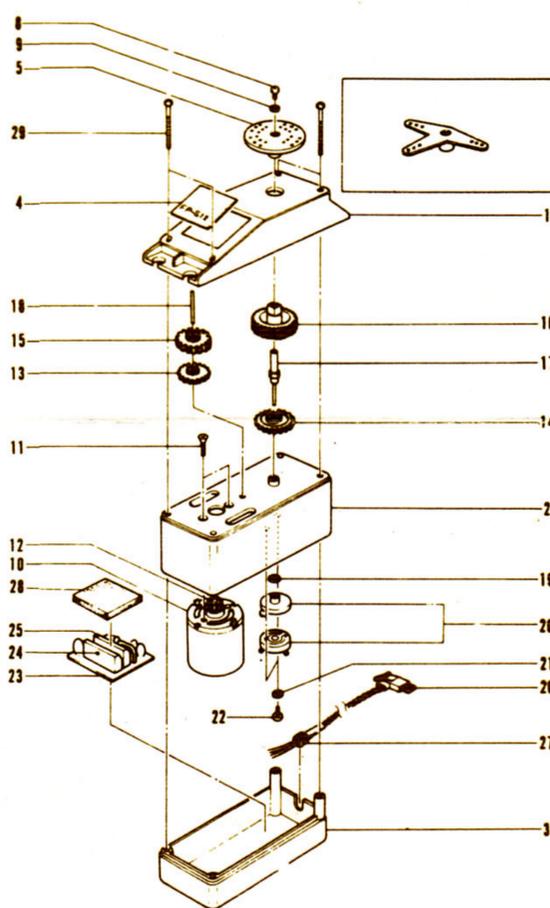
- The frequency of Futaba digital proportional sets can be changed among bands (1) - (5) in the 27MHz band by simply replacing the receiver and transmitter crystal.
- However, a 27MHz set cannot be changed to the 72MHz band, and vice versa.
- The color given for each band is the color of its frequency identification ribbon. Always attach the correct ribbon to the end of the transmitter antenna.
- Also change the ribbon when changing the crystal.
- Futaba digital proportional crystals are the ideal transmitter and receiver combination. Always use a Futaba crystal set (transmitter, receiver) when changing the crystals. CAUTION: FREQUENCY CHANGE HAS TO BE DONE UNDER THE SUPERVISION OF FCC LICENSED PERSONNEL.

FP-S23



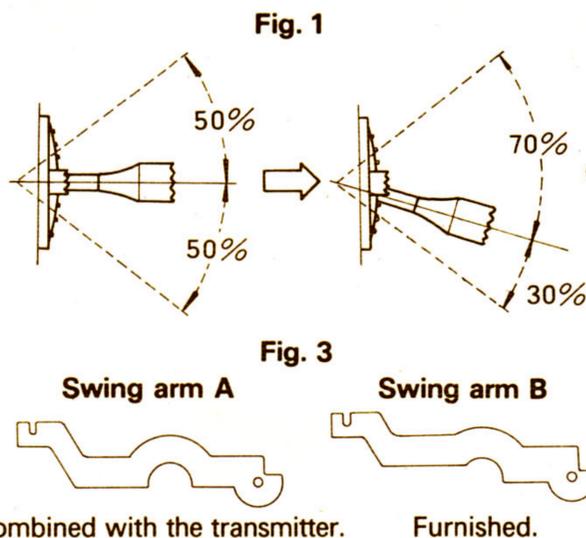
No.	Part name
1	Upper case
2	Middle case
3	Bottom case
4	Motor
5	1st gear
6	2nd gear
7	3rd gear
8	Final gear
9	Intermediate shaft
10	2nd shaft
11	Output shaft
12	Bent washer
13	Potentiometer
14	Push nut
15	Truss screw M2×5
16	Fiber washer
17	Servo horn(G)
18	Bind tapping screw M2×8
19	Toothed washer M2
20	Amp
21	SX cord
22	Neosel sponge
23	Pan head screw M2×32
24	Motor pinion

FP-S12



1	Upper case
2	Middle case
3	Bottom case
4	Nameplate
5	Horn
8	Horn mounting screw
9	Toothed washer
10	Motor
11	Motor mounting screw
12	Pinion gear
13	1st gear
14	2nd gear
15	3rd gear
16	Final gear
17	Output shaft
18	Intermediate shaft
19	Push nut
20	Potentiometer slider set
21	Mylar washer
22	Truss screw
23	S12 wired board
26	Triple lead wire
27	Lead wire packing
28	Neosel sponge
29	Case mounting screw

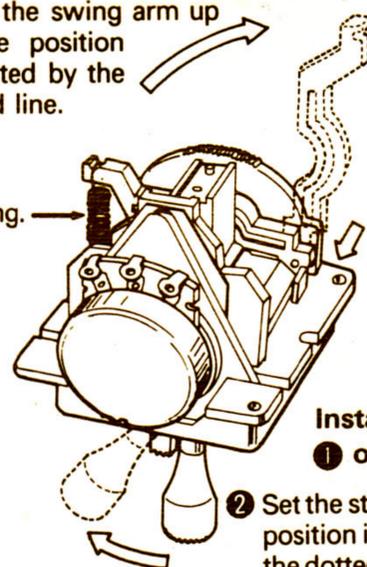
- Furnished swing arm B is convenient when the neutral position of the swing lever is shifted approximately 1/3 as shown in Fig. 1.
- Open the rear cover of the transmitter, and replace as shown in Fig. 2.



- ③ Raise the swing arm up to the position indicated by the dotted line.

Fig. 2

- ① Remove the spring.



- ④ Pull the swing arm in the direction of the arrow, and remove the arm.

Install in ④ ③ ② ① order.

- ② Set the stick lever to the position indicated by the dotted line.

- Be sure that each servo horn is operated over its full operating width, and that it does not get caught on the pushrod and is not bent. Too much force exerted on the servo horn will adversely affect the servo. Moreover, it may also cause rapid discharging of the batteries. Always make the operating width of each rudder larger than the full stroke (including the trim component) of the servo horn, and adjust so that the servo horn is operated smoothly even if the trim lever and stick lever are operated in the same direction simultaneously.

- Pay careful attention to noise
Contact between metal parts caused by engine vibration, etc. will generate noise, resulting in erroneous operation of the receiver. The use of noiseless parts is recommended.

- When installing the switch harness, cut out a rectangular hole somewhat larger than the full stroke of the switch knob so that the switch is turned ON and OFF smoothly and dependably. This also applies to the switch mount when the switch is installed inside the fuselage and turned ON and OFF from the outside with piano wire, etc. Install the switch where it will not come into direct contact with oil or dust.

- Do not cut the receiver antenna wire, or tie it into a bundle, even if it is too long.

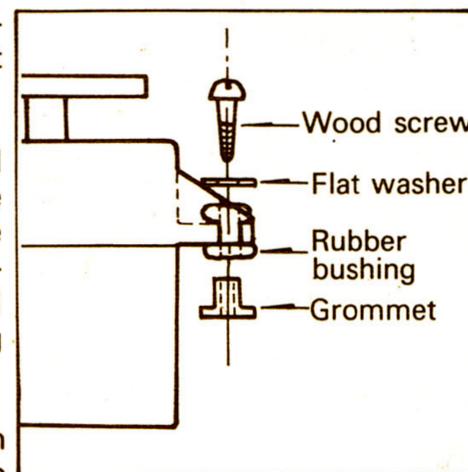
- When the receiver is installed in a boat or vehicle, make the radio box water- and dust-proof. Always open the radio box chamber after use.

- After checking each part upon completion of installation, telescope the transmitter antenna fully, extend the receiver antenna fully, and test operate at a distance of 20m-30m. Operation is normal if movement of each rudder (servo) follows operation of the transmitter faithfully.

- Open the receiver case and change the crystal. Always use a replacement crystal paired with the Futaba transmitters.

- Install the servos securely. Use of the optional servo tray is convenient. Install the servo to a square rod, etc. as

shown in the figure, using a grommet and flat washer.



- A spare horn is supplied as an accessory. Use the horn best suited for the application. Do not forget to install the toothed washer when changing the horn.

- Pack the receiver in sponge rubber and wrap it with rubber bands. Then install the receiver so that it does not directly contact the frame and does not move within the frame so that the engine vibrations are not transmitted directly to the receiver.

- When used in boats and seaplanes, or when used where there is the possibility that the model may unexpectedly fall into a lake, river, or other body of water, waterproof the receiver by placing it in a leakproof vinyl bag and securing the top of the bag with a rubber band. Immediately remove the receiver from the bag after use to prevent condensation.

- Also pack the receiver and servo batteries in sponge rubber. When used in an aircraft, the center of gravity of the aircraft will change if the batteries move. Therefore, always install the batteries securely after positioning. Waterproof the connectors in the same manner as the receiver.

- Fasten the servo and switch lead wires with the same rubber bands used to wrap the receiver.

- Futaba three-wire servos can be used with any Futaba transmitter or receiver.

- After mounting and checking the receiver, servos and batteries, ask the dealer from whom you purchased the set, or an experienced radio control enthusiast, to inspect your installation and for instructions on the correct use of the set.

Model	Torque	Weight	Dimensions	Applications
FP-S6	2 kg·cm	39g	19×39×37.5 mm	Small models
FP-S7	3 kg·cm	48g	23×44×41 mm	Waterproof type, all models
FP-S8	8 kg·cm	50g	23×44×41 mm	Retractable landing gear
FP-S10	8 kg·cm	250g	37×53×76 mm	Sail winch (Yacht)
FP-S11	2.3 kg·cm	40g	20×38×45 mm	Small linear operation models
FP-S12	2.8 kg·cm	52g	23×44.5×42.5 mm	All low cost models
FP-S14	13 kg·cm	250g	37×53×76 mm	Powerful type, all large models
FP-S15	3 kg·cm	60g	23×36×48.2 mm	With bearing, contest 7 use
FP-S15G	4 kg·cm	60g	23×36×48.2 mm	With bearing, retractable landing gear use
FP-S15M	3 kg·cm	60g	23×36×48.2 mm	With bearing, all models
FP-S15MG	4 kg·cm	60g	23×36×48.2 mm	With bearing, retractable landing gear use
FP-S16	2 kg·cm	41g	20×35.5×41.4 mm	Small models
FP-S16G	2.6 kg·cm	41g	20×35.5×41.4 mm	Small retractable landing gear
FP-S17	2.6 kg·cm	44g	20×40×39.6 mm	Small, low cost models
FP-S18	2.6 kg·cm	44g	20×40×39.6 mm	Small, low cost models
FP-S20	1.6 kg·cm	24g	30.4×16.0×28.0 mm	Ultra-small models

REPAIR SERVICE

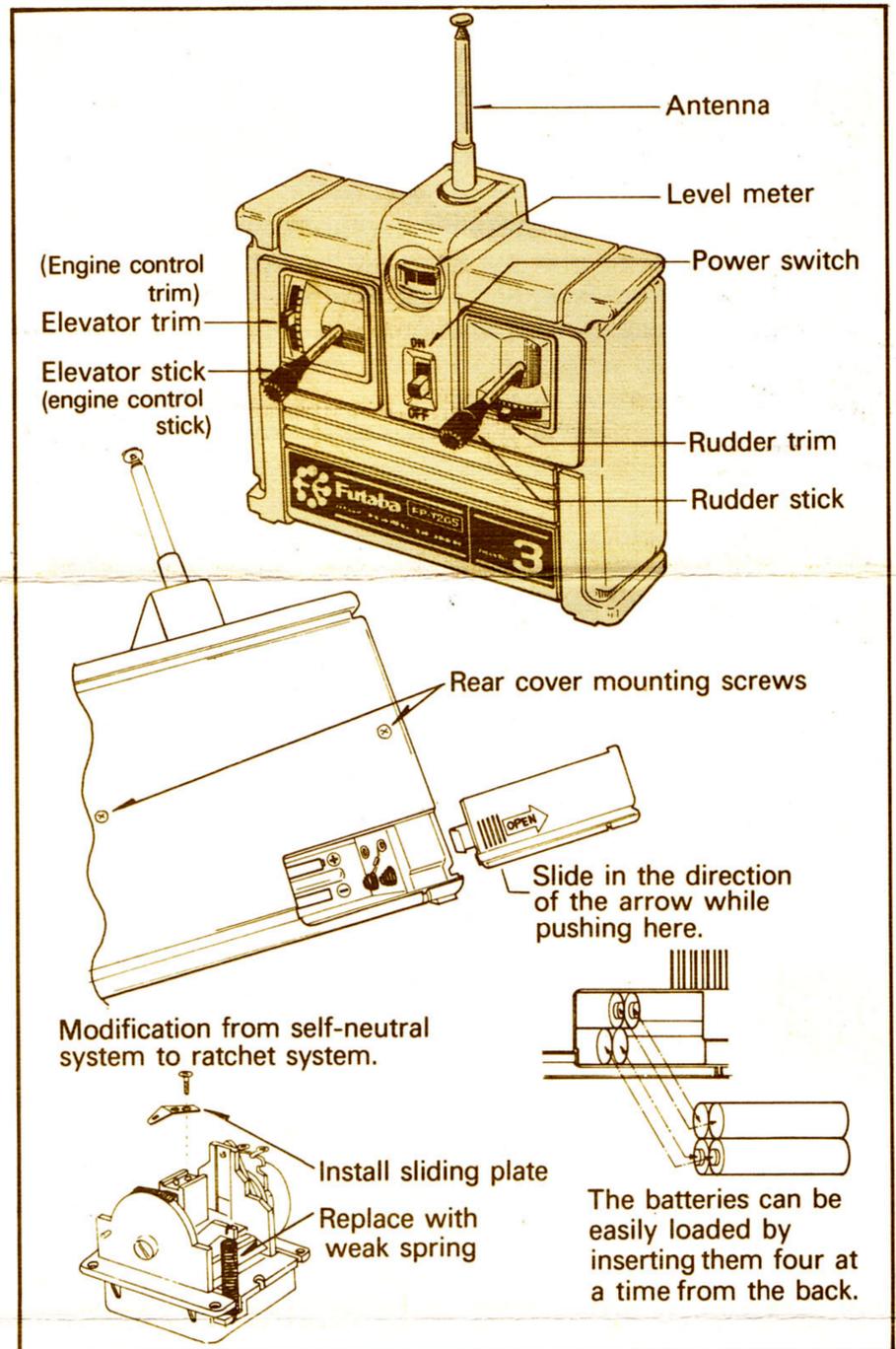
- When requesting repair of trouble that has occurred suddenly or from long use, describe the trouble symptoms in as much detail as possible. This will facilitate detection of the trouble point and shorten the repair period greatly.

- Defects caused by faulty materials or workmanship will be corrected free of charge.

- This limited warranty is null and void if the set has been tampered with or disassembled. Refer to the warranty statement for details.

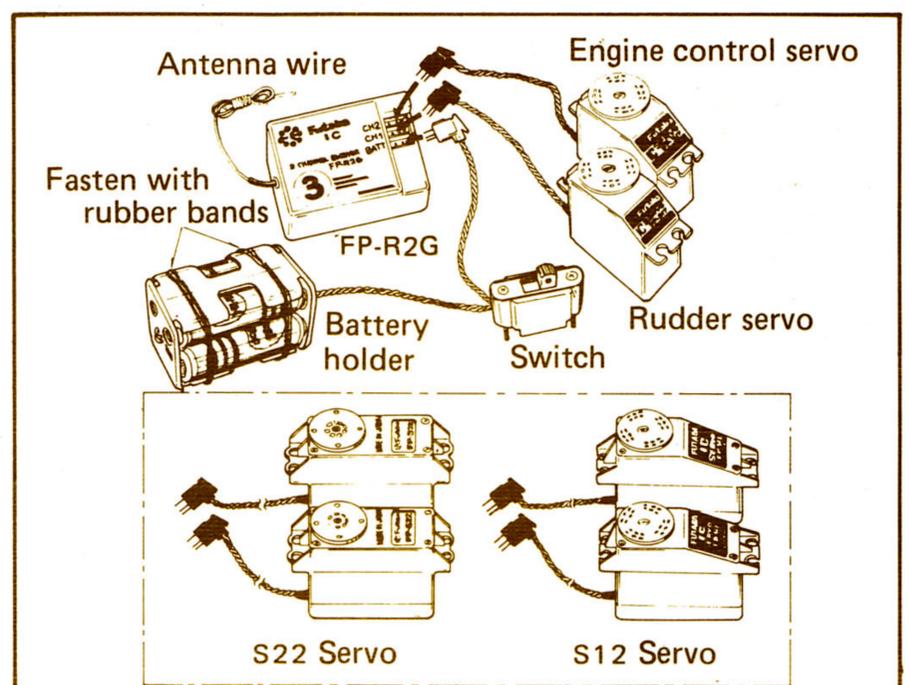
HANDLING THE TRANSMITTER

- The name of each part of the transmitter is given in the figure. Familiarize yourself with their operation.
- Remove the battery cover on the rear of the transmitter as illustrated in the figure, and insert 8 round penlight batteries, paying careful attention to their polarity.
- Extend the antenna fully, and set the power switch to the ON position. The pointer of the level meter should deflect to the green zone. If it fails to deflect, or deflects slowly, the polarity of the batteries is incorrect, or the batteries are faulty.
- Since the range of the radio waves will become short when the pointer of the level meter deflects to the red zone, replace the batteries when the pointer only deflects to the boundary between the green and red zones.
- The trim lever is used to fine adjust each channel. Use it for neutral adjustment and to correct the flying posture after the mechanism has been installed. After test flight, operate with the trim lever in the neutral position, as far as possible, by correcting with the rod adjuster, etc.
- Since the elevator stick employs a self-neutral system, install the sliding plate as shown in the figure when changing it to a ratchet system. Then remove the strong spring attached to the hook and replace it with the spring supplied as an accessory.
- When the transmitter is used with a tank, the direction of the stick can be changed 90 degrees by removing the four rudder stick mounting screws.
- To change the crystals, loosen the rear cover mounting screws, remove the rear cover, and then replace the crystal. The transmitter crystal is marked (T) and the receiver crystal is marked (R). CAUTION: Frequency change has to be done under the supervision of FCC licensed personnel.



HANDLING THE RECEIVER FP-R2G AND SERVO FP-S23, FP-S12, FP-S22

- Insert four round penlight batteries into the battery holder, being sure that their polarities are correct, and fasten with rubber bands as illustrated in the figure.
- Connect the servo and switch securely as shown in the figure. Then extend the antenna of the transmitter and receiver fully.
- Set the transmitter power switch to the ON position, and then set the receiver power switch to the ON position. The servo will stop near the neutral position. Operate each stick of the transmitter, and confirm that the pertinent servo is operated accordingly.
- After setting the pushrod at each servo horn, check the transmitter operation and operating direction of each rudder.



GUARANTEE

Your NEW FUTABA Digital Proportional R/C system is guaranteed against defects in workmanship and material for 180 days from the date of purchase when the attached registration card is returned to us within ten days of purchase.

This Guarantee is null and void if the R/C system has been improperly handled, damaged in a crash, or tampered with and does not cover the replacement of plastic housings or electronic components damaged due to the use of improper voltages.

When service is required, please take your equipment to your local authorized service station or ship it directly to us. All postage, shipping, and insurance charges must be paid by the user.

This guarantee only applies to the continental U.S.A., Hawaii, and Alaska.