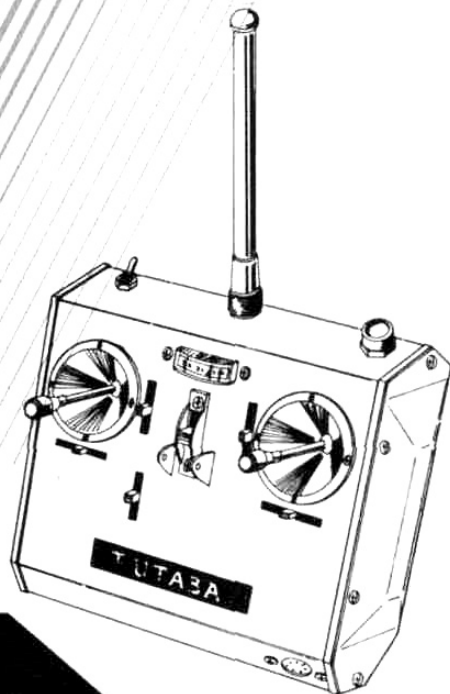


# Futaba

DIGITAL PROPORTIONAL  
RADIO CONTROL

FP-6FN 6ch. FP-5FN 5ch.  
FP-4FN 4ch. FP-3FN 3ch.



FUTABA CORPORATION OF AMERICA  
FUTABA CORPORATION

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# FEATURES OF THE NEW FUTABA PROPORTIONAL RADIO CONTROL SYSTEM

## **TRANSMITTER (FP—T6FN, FP—T5FN, FP—T4FN, FP—T3FN)**

1. Since all Futaba New Proportional Models are designed and manufactured to identical standards, maximum performance is displayed even when used with other receivers and servos.
2. Position of throttle control can be easily changed (to left or right).
3. Hook band permits hanging the transmitter from your neck for extremely easy handling.
4. Training system provided as standard makes training of beginners easy.
5. Equipped with a stand.

## **RECEIVER (FP—R6F, FP—R4F, FP—R3F)**

1. Newly developed receiver use FUTABA CUSTOM 1C (IR-014, or BA-633) is extremely stable against power supply voltage fluctuations.
2. Eight-bit CMOS 1C has complete 6-channel operation functions and reduces power consumption to a minimum.
3. Resistance against interference has been strengthened considerably through the adoption of a RF amplifier **circuit** and ceramic filter.

## **SERVO (FP—S7, FP—S12, FP—S16, FP—S16L, FP—S17, and FP—S8, FP—S16G [retractable landing gear servo])**

1. Since the FP-S7, FP-S12, FP-S16, FP-S16L, FP-S17, and FP-S8, FP-S16G (retractable landing gear servo) are designed and manufactured to the same standards, top performance is displayed when used with any NEW FUTABA PROPORTIONAL transmitter and receiver.
2. Three-wire, compact, lightweight, rugged, high-output torque servoamps have been realized through the use of Futaba BA-607 and BA-606 custom monolithic 1C.
3. The BA-607 monolithic 1C is a 12-pin single-end-line 1C containing 73 transistors, 13 diodes, and 79 resistors (total of 165 components). Its low current drain, high resolution, temperature compensation and built-in voltage regulator assure stable operation over the 4V—6.6V power supply voltage range without any mutual interference between servos.

4. The BA-606 monolithic 1C is a 9-pin single-end-line 1C incorporating 2 high output current (500mA) PNP transistors, 2 NPN transistors, 4 diodes, and 4 resistors for a total of 12 components on a single chip.
5. High output torque: FP-S7; 3 kg-cm, FP-S12; 2.8kg-cm, FP-S16 (S16L); 2kg-cm, FP-S17; 2.6kg-cm, and FP-S8, FP-S16G (retractable landing gear servo); 8kg-cm, 2.6kg-cm.
6. Compact, lightweight: FP-S7; 48g, FP-S12; 52g, FP-S16 (S16L); 41 g, FP-S17; 44g, and FP-S8; 50g, FP-S16G; 41g.
7. The 20mm (dia.) motor of the FP-S7 servo provides power torque. Thus making it ideal for boat and automobile use. Waterproof case also makes it perfect for use in both fresh water and salt water areas.
8. FP-S12 is a low cost servo and powerful torque of 2.8kg-cm or greater permits use not only in large buggies, but also in Class 60 boats, etc.
9. The potentiometer drive section of the FP-S16 (S16L) is separately driven through a one-stage gear. The life of the element is almost permanent.
10. FP-S17 is a lightweight, rugged, high output, and low cost servo.
11. The high gear ratio and powerful torque of the FP-S8 make it the perfect retractable landing gear servo.
12. FP-S16G is a highest class miniature landing gear servo.

## COMPOSITION AND SPECIFICATIONS

### • COMPOSITION:

|                    | Transmitter/receiver nickel-cadmium battery |                       |                       |   |
|--------------------|---|-----------------------|-----------------------|---|
| Model              | PP-6FN                                      | FP-5FN                | FP-4FN                | FP-3PN  |
| Number of channels | 6CH   | 5CH                   | 4CH                   | 3CH   |
| Transmitter        | FP-T6FN                                     | FP-T5FN               | FP-T4FN               | FP-T3FN   |
| Receiver           | FP-R6F                                      |                       | FP-R4F                | FP-R3F  |
| Servo              | FP-S16 x 3<br>FP-S16Lx1                     | FP-S16x3<br>FP-S16Lx1 | FP-S16x3<br>FP-S16Lx1 | FP-S16 x 2<br>(FP-S7 x 2<br>FP-S12x2<br>FP-S17 x 2) |
| Battery charger    | Nickel-cadmium charger FBC—2(F)             |                       |                       |   |

- **SPECIFICATIONS:** (All specifications are subject to change without prior notice.)

### TRANSMITTER

|                          |   |
|--------------------------|---|
| Operating system.....    | CH1—4, 2-stick system, CH5 snap switch, CH6 trim lever system                             |
| Operating frequencies... | 27MHz band 72MHz band<br>40 MHz band  |
| Antenna output.....      | 500mW   |
| Modulation system .....  | AM (amplitude modulation)<br>Pulse position modulation:<br>1310uS neutral (Pulse spacing) |
| Power requirement.....   | 9.6V 8/450mAH nickel-cadmium battery  |
| Current drain.....       | 140mA   |

### RECEIVER

|                           |  |
|---------------------------|--|
| Receiving frequencies...  | 27MHz band 72MHz band<br>40MHz band                  |
| IF amplifier frequency... | 455kHz   |
| Selectivity .....         | 3kHz/-3dB  |
| Range .....               | 500m on the ground, 1000m in the air                 |
| Power requirement.....    | 4.8V 4/450mAH nickel-cadmium battery                 |
| Current drain.....        | 4.8V 10mA  |
| Dimensions .....          | FP-R6F: 40 x69 x19mm<br>FP-R4F, R3F: 40.2x58.5 x19mm |
| Weight.....               | FP-R6F: 52g<br>FP-R4F, R3F: 46g                      |

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### SERVO (FP-S7, FP-S12, FP-S16, FP-S16L, FP-S17, FP-S8, FP-S16G)

---

|                        |  |
|------------------------|--|
| Control system .....   | 3-wire, + pulse width control<br>650uS~ 1900uS   |
| Operating angle.....   | Rotary system one side 45° min<br>(including trim) FP-S7, FP-S12, FP-S16, FP-S17<br>Rotary system one side 80° min FP-S8, FP-S16G (retractable landing gear servo)         |
| Power requirement..... | 4.8V 4/450mAH nickel-cadmium battery<br>(used in conjunction with receiver)  |
| Current drain.....     | 4.8V 8mA (when stopped)  |
| Output torque .....    | FP-S7; 3kg-cm, FP-S12: 2.8 kg-cm,<br>FP-S16; 2kg-cm, FP-S17: 2.6kg-cm,<br>FP-S8: 8 kg-cm, FP-S16G: 2.6 kg-cm.  |
| Dimensions.....        | FP-S7: 23 x 44 x 41 mm.<br>FP-S12: 23 x 44.5 x 42.5 mm,<br>FP-S16:19.5x41.5x35.5mm,<br>FP-S17: 20 x 39.6 x 40 mm,<br>FP-S8; 23x44x41 mm,<br>FP-S16G: 19.5 x 41.5 x 35.5 mm |
| Weight.....            | FP-S7: 48g, FP-S12; 52g, FP-S16; 41g,<br>FP-S17; 44g, FP-S8: 50g, FP-S16G; 41g.  |

### BATTERY CHARGER (Nickel-cadmium charger)

|                       |                   |
|-----------------------|-------------------|
| Input voltage .....   | 115V (220V, 240V) |
| Frequency .....       | 50/60Hz           |
| Power consumption ... | 2.0/3.5VA         |
| Output Tx. ....       | 9.6V, 45mA        |
| Output Rx.....        | 4.8V, 45mA        |

#### NOTE:

Power consumption is for no load/load. Since the transformer may be burned up or the performances of the battery will deteriorate due to an overcurrent if the NR-4C nickel-cadmium battery is connected to the Tx output terminals, always be sure that connections are correct.

# TRANSMITTER HANDLING INSTRUCTIONS



FP T6FN  
(for FP -6FN)  
6 CHANNEL

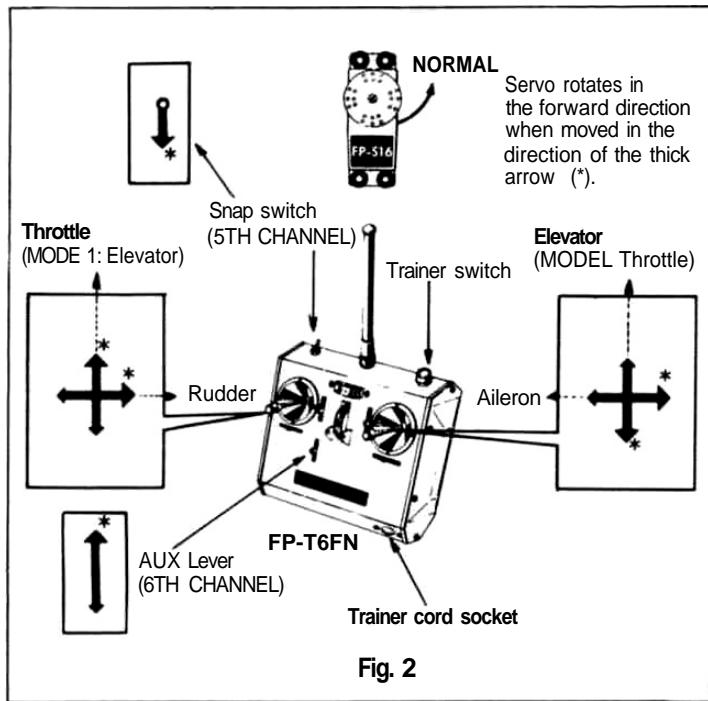
FP-T5FN  
(for FP-5FN)  
5-CHANNEL

FP-T4FN  
(for FP 4FN)  
4-CHANNEL

FP-T3FN  
(for FP-3FN)  
3-CHANNEL

Fig. 1

The controls on the front panel of the transmitter are shown in Fig. 2. The manipulation of these controls should be thoroughly mastered.



### FP-T4FN (FP-T3FN)

The (1) engine, (2) ailerons, (3) elevator, and (4)\* rudder can be controlled with the sticks at the left and right.

Transfer between transmitters is possible with (5) trainer switch by connecting to another transmitter with the trainer cord.

\* FP-T3FN doesn't have (4) rudder above.

### FP-T5FN

The landing gear or other suitable operations can be performed by means of the snap switch, in addition to the 4 operations mentioned above.

### PP-T6FN

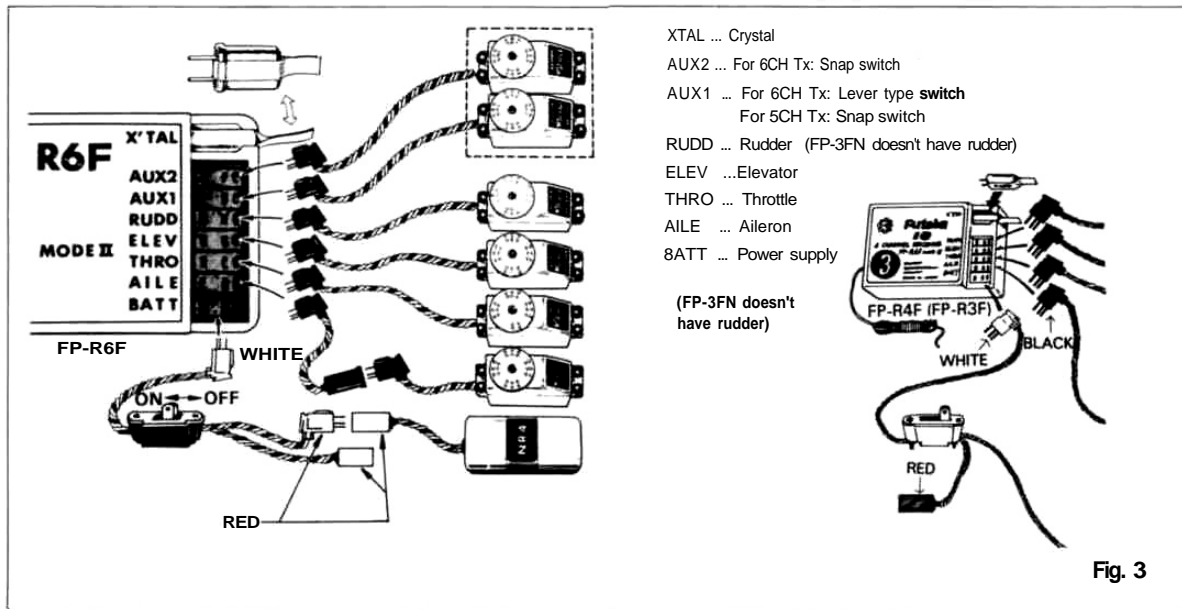
The flaps, etc. can be operated by means of a potentiometer, in addition to the 5 operations described above.

- Select either the long or short left and right stick knob, whichever is the easiest to use.  
The knob can be replaced by merely pulling off the black knob.
- Hook the neckstrap to the hook and hang the transmitter from your neck.

1. The FP-3FN, FP-4FN, FP-5FN, FP-6FN each use a built-in nickel-cadmium battery (8/450 mAH) as the transmitter power source.
2. Mount the antenna securely and set the power switch to the ON position . The pointer of the meter will deflect to within the green zone. This indicates that the radio waves are being radiated. If the meter pointer fails to deflect, check for a faulty connection in the power supply.
3. If the meter pointer deflects to within the red zone, the nickel-cadmium battery is low and must be re-charged. A special charger is provided.
4. Note that the range of the radio waves will become shorter when the meter pointer deflects to within red zone.
5. The "trim" lever of each stick is used for fine adjustment. These levers are used for neutral adjustment of each rudder and to adjust the flying posture after mounting in the fuselage.
6. Open the stand at the rear cover when setting up the transmitter. This stand can be used as a handle by raising it to the topmost position. This is extremely convenient when carrying the transmitter.



# RECEIVER AND SERVO HANDLING INSTRUCTIONS



1. The FP-R6F receiver employs an 8 bit 1C and has been especially designed for 6 channel use. (Combined 5 channel, 6 channel use.)
2. The block connectors which connect the receiver to each servo form a single unit with the receiver.
3. Connect to the servos by verifying the block connector connection positions stamped on the receiver case. Use the white relay connector for the ailerons. Be sure to use the 3P white connector from the switch harness for the power supply (BATT).

4. Since all the servos are manufactured to the same standards, any servo can be used for any purpose.
5. The FP-S6L (reversible servo, red label) in the set can be conveniently used for throttle control with high wing and middle wing airframes.
6. Connection methods are illustrated in Figure 3. Be sure that each connector is plugged in fully and that the power supply switch harness, aileron section, etc. are connected correctly.
7. After verifying that all connections are correct by checking them against the connections given in Figure 3, turn the transmitter power switch on. Then turn the receiver switch on. At this time, each servo will stop at the neutral position.
8. Operate sticks and trim levers and verify that respective servos operate positively.
9. When testing each section, be sure that the transmitter and receiver antennas are fully extended. If the transmitter antenna is short and the power switch is left on for more than 5 minutes, the transistors inside the transmitter will be damaged.
10. If the system fails to operate after the transmitter, receiver, servos, switch harness, and batteries have been properly installed, the problem may be due to damage during shipment. Do not attempt to open any of the unit, but return them for replacement.

## FUTABA TRAINER SYSTEM

- The NEW FUTABA PROPORTIONAL Transmitters FP-T4FN, FP-T5FN, and FP-T6FN are equipped with the newly developed FUTABA Trainer System as standard. This system prevents damaging of valuable aircraft by beginners. Use this system with a veteran as your teacher. A special trainer cord is available as an option.
- The FUTABA Trainer System can be used without regard to frequency (27MHz, 40MHz, 72MHz) or number of channels of the instructor's transmitter and students transmitter. For instance, the 27MHz FP-T6FN can be used with the 72 MHz FP-T4FN. However, in this case, use the 27MHz FP-T6FN as the instructor's transmitter if the frequency of the receiver is 27MHz and use the 72MHz FP-T4FN as the instructor's transmitter **if** the frequency of the receiver is 72MHz. Naturally, the number of operable channels corresponds to that of the transmitter. The above is an example of 4 channel operation.

## OPERATING INSTRUCTIONS

1. When conducting training, connect the two transmitters together with the special cord\*as illustrated in Figure 4.  
\*Similar cords are on sale, but since these cannot be used, always use the special FUTABA shielded trainer cord.
2. The instructor must use a transmitter of the same band as the receiver. (The instructor's transmitter is designated Tx1 and the student's transmitter is designated Tx2.)  
Since the radio waves are always radiated from the Tx1 side (transmitter whose power has been turned on), extend the antenna of Tx1 fully. The position of the antenna of Tx2 doesn't matter, since the radio waves are radiated from Tx1 even when operation is performed from Tx2.
3. Turn on the power of Tx1 only. The meter pointer will deflect, the same as for the case of independent operation. The meter pointer of Tx2 will also deflect simultaneously.

NOTE: Never turn the power switch of Tx2 on, regardless of whether the bands coincide or not.

4. When the trainer button of Tx1 is depressed, radio waves will be directly radiated from Tx1, but the control operation is shifted to Tx2. Consequently, the student can exercise control only during the period the instructor is depressing the trainer button. When the instructor releases the button, he can exercise direct control over all operations.
5. Perform neutral adjustment of the other transmitter on the ground before beginning actual flight. Adjust the trim of both transmitters so that the rudder servos are not operated when the trainer button is depressed.
6. Since power is supplied from Tx1 even when the student is operating, the current drain of Tx1 will be about 10% greater than when used independently.
7. Deflection of the meter will become small when the trainer cord is connected, but this is normal.

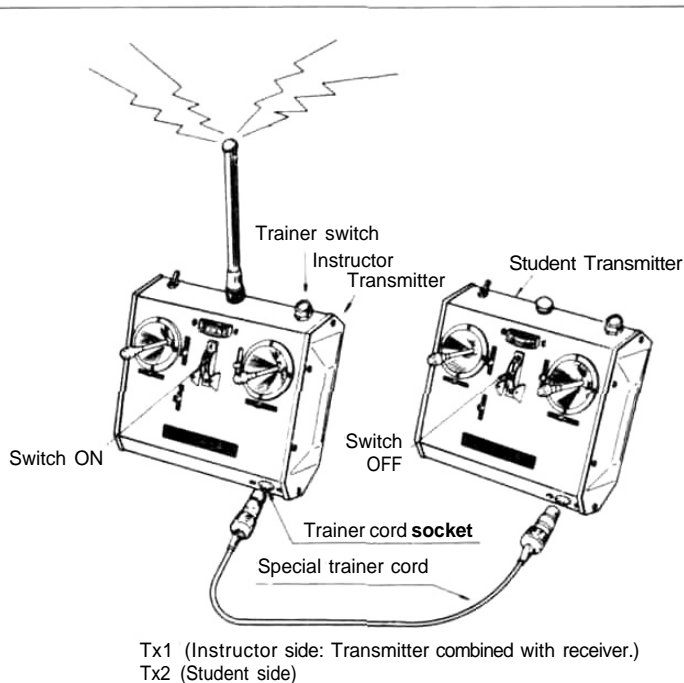
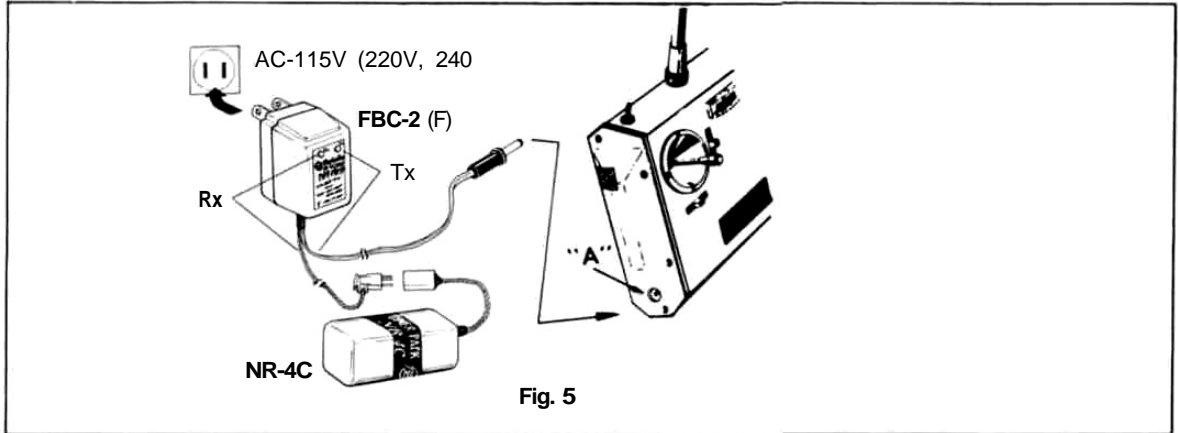


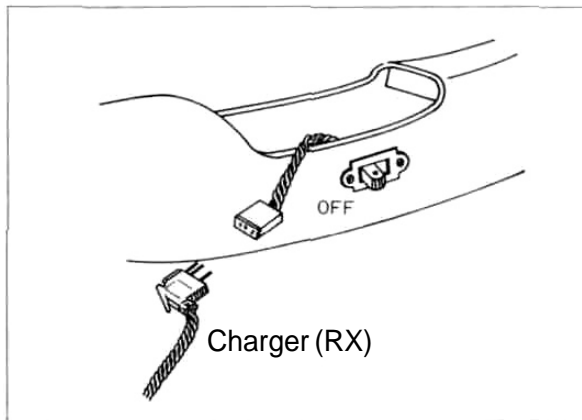
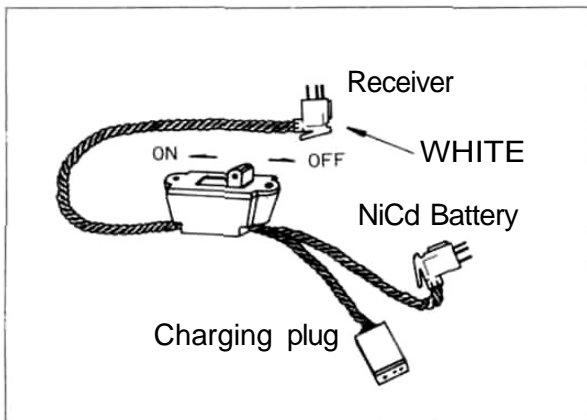
Fig. 4

# NICKEL-CADMIUM BATTERY AND CHARGING METHODS

- The FP-T3FN, FP-T4FN, FP-T5FN, and FP-T6FN transmitters are each equipped with a built-in nickel-cadmium battery (8/450 mAH) power supply.
- Use a nickel-cadmium penlight cell (4/450mAH) as the receiver and servo power supply.
- Charge the nickel-cadmium battery for 12~15 hours before normal use. Charge the battery for 20 hours when it has not be used for an extended period of time. Slight overcharging will cause no harm to the battery.
- A fully charged nickel-cadmium battery can normally be used about 10 times at a 10 minutes/time rate.
- The nickel-cadmium battery will supply a uniform voltage for a certain period of time, but pay careful attention to the voltage after being used 7~8 times.

Connect the battery charger supplied with the FP-3FN, FP-4FN, FP-5FN, and FP-6FN as illustrated in Figure 5.





The 3P red female connector of the switch harness is used to charge the NR-4C (receiver and servo use NiCd battery) without removing it from the model.

To charge the NR-4C (receiver and servo NiCd battery) without removing it from the model, set the switch to the OFF position and connect the 3P red male connector from the charger to the 3P red female connector of the switch harness.

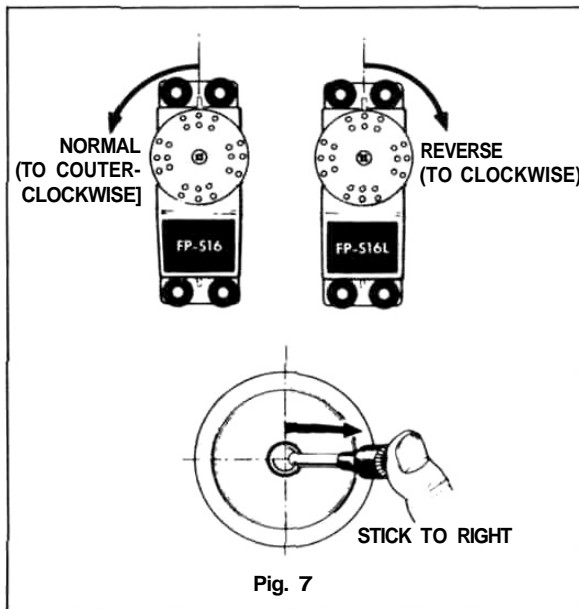
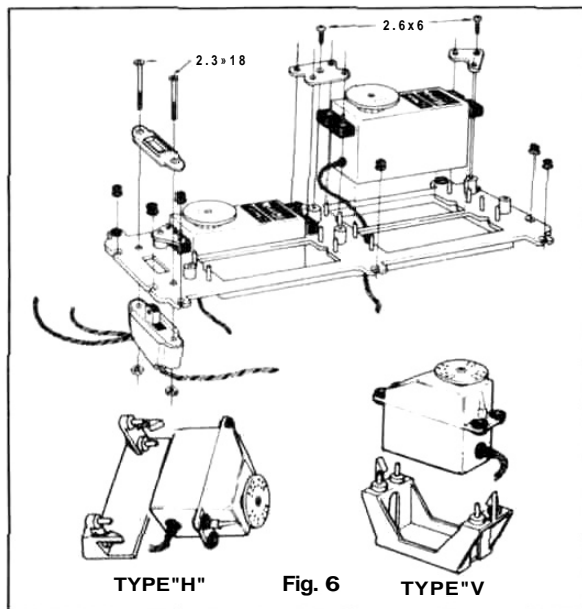
1. The cord with the power plug at both ends is the Tx charging use cord. To charge the transmitter, connect this cord to Tx of the charger and "A" of the transmitter.
2. The cord with the power plug at one end and the 3P connector at the other end is the RX charging use cord. When charging the NR-4C receiver use nickel-cadmium battery, connect the power plug end of this cord to RX of the charger and the 3P connector end to the NR-4C.
3. Plug the charger plug into an AC line receptacle (AC 115V, 220V, 240V).
4. Charging is performed with the above operations. At this time, the LED of the charger will be illuminated to indicate that charging is being performed.
5. Be absolutely sure that all the connections are correct. If the NR-4C receiver use nickel-cadmium battery is connected to Tx, the battery may be damaged by overcharging.
6. The special charger can charge the transmitter battery and receiver battery simultaneously or independently.

## **PERFORMANCE TEST AND MOUNTING PRECAUTIONS**

1. Verify that the receiver and servos are connected in accordance with Figure 3. Then, make the transmitter antenna as short as possible and extend the receiver antenna and attempt operation from a distance of 20m~30m. Operation is normal if all the controls are functioning properly. Perform this test within a maximum of 5 minutes time. Never perform this test when the transmitter antenna is not mounted to the transmitter. Otherwise the transmitter will be adversely effected.
2. Be careful that the receiver does not directly touch other mechanisms of the aircraft itself. Moreover, wrap the receiver in sponge rubber so that it is not subjected directly to engine vibrations. (In the case of boat use, cover the sponge wrapping with a vinyl bag and tie securely at the point at which the cord enters so that no water can enter the receiver.)

3. The use of a servo tray is extremely convenient when installing the servos. The method of installation is illustrated in the figure. (Insert each connector fully.) Don't forget to confirm that the motion of the servo horns and rods matches the direction of operation of the transmitter sticks. Use the reversible servo (L servo) as a shoulder wing throttle servo or for rudder and nose gear operation.

- NOTE; The L servo cannot be used for aileron control. (The operation of the stick and rudder are opposite.)





4. After setting the push rod at each servo, operate each servo fully left and right at least once. If the rod catches or sticks at this time, the servo has been damaged by an overcurrent. Therefore verify that the rods are functioning perfectly.
5. Be especially careful of noise signals. For instance, noise signals will be generated by the contact of metal against metal due to engine vibration. If these noise signals are received at the receiver, the receiver may operate erroneously. Therefore cover one of the metal surfaces with insulating material.
6. After installation is complete, ask a nearby radio control expert or the dealer where the equipment was purchased to instruct you on the proper handling techniques and other items which may require special attention. Also have your installation thoroughly checked at this time.  
 Strict observance of safety rules and adherence to the advise of experts will make radio control more enjoyable.

## FUTABA PROPORTIONAL FREQUENCIES

(Available in MHz. Available Futaba pair crystal Tx/Rx)

| 27 MHz Areas   | 72 MHz Areas   |
|--|--|
| 26.995 (Brown)<br>27.045 (Red)<br>27.095 (Orange)<br>27.145 (Yellow)<br>27.195 (Green) | <ul style="list-style-type: none"> <li>• 72.080 (Brown/White)</li> <li>72.160 (Blue/White)</li> <li>• 72.240 (Red/White)</li> <li>72.320 (Violet/White)</li> <li>• 72.400 (Orange/White)</li> <li>72.960 (Yellow/White)</li> <li>• 75.640 (Green/White)</li> </ul> |

Remarks: Mark \* — Model Aircraft use only.



## 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.

## FACTORY REPAIR SERVICE

To insure prompt service, please follow the instructions given below.

1. Charge the batteries for at least 18 hours prior to shipment.
2. Return the system, only. Not your complete installation. Remove the servos from their mounts and remove the foam padding from the receiver.
3. Plugs or other modifications which interfere with factory test procedures will be returned to factory standard at your expense.
4. Carefully pack all components individually, using sufficient packing material to prevent damage during shipment.
5. Include a brief but thorough explanation of all problems and service required and tape it to the back of the transmitter. Place a label describing the functions of the servo on each servo.
6. Be sure to include your full address and zip code inside the box as well as on the outside.
7. Include a packing list of all items being returned, and double check to make sure that all items are packed.
8. Upon receipt of damaged equipment at the FUTABA factory, an estimate of the cost of repair will be sent to you. Your equipment will then be repaired and returned to you upon receipt of payment.

This factory repair service applies only to the continental U.S.A., Hawaii, and Alaska.

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