Thank you for purchasing a Futaba digital proportional radio control set.
Please read this manual carefully before using your set.

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• FEATURES
The FP-7FGH was specially developed for model helicopters. Please read this manual carefully before using your new set.

Transmitter FP-T7FGH

• RF module systems allows one-touch changing of the frequency band.
• Aileron to rudder mixing is ideal for giant scale and quarter scale models and gliders.
• Servo reversing switch for each channel allows reversing of the servo direction by simply flipping a switch.
• Two kinds of dual rates on the aileron, elevator, and rudder channels. Aileron and elevator dual rate can be switched simultaneously or independently.
• Newly designed case and new open gimbal stick with adjustable tension and lever head.
• Pitch control -> rudder and throttle -> pitch control mixing.
• Throttle hold function for auto-rotation.
• High and Low pitch cab trimmer permits adjustment of the best pitch for hovering and maneuvering.
• Idle up functions used for static and dynamic aerobatics.
• Throttle High and Low ATL (Adjustable Throttle Limiter) allows simple, reliable throttle linkage hook-up.
• ATV (Adjustable Travel Volume) on AILERON, ELEVATOR & RUDDER channels allows independent adjustment of the servo left, right, up, and down throw.
• Trainer system offers an easy training of flight for beginners. FM systems are not compatible with AM systems.
• Highest quality aluminum case featuring sophisticated designs. The transmitter fits easily into your hand.
• Neck strap supplied as a standard accessory. This transmitter has numerous functions which can be easily operated when using the neck strap.

• Selective squelch circuit is unaffected by other transmitters on other bands during simultaneous multi-band flights.
• Futaba custom 1C and large capacity capacitor improve stability against power supply voltage fluctuations tremendously.
• Same antivibration metal plated pin connectors as the high-quality J Series.
• Throughhole printed circuit board is invulnerable to shock and vibration.

SERVO FP-S130

• Small, high-quality five-pole micromotor servo. High-torque 55.6 oz-in (4 kg-cm). high-speed (0.24 sec/60°), watertight.
• New indirect drive potentiometer improves vibration and shock resistance and neutral precision.
• Futaba low-power custom 1C provides high starting torque, narrow dead band, and superior trackability.
• Fiberglass reinforced PBT (polybutylene terephthalate) injection molded servo case is mechanically strong, and invulnerable to glow fuel.
• Strong polyacetel resin ultra-precision servo gear features smooth operation, precise neutral, and very little backlash.
• Thick film gold plated connector pins ensure positive contact and improved reliability against shock and vibration. The housing is polarized to prevent reverse insertion.
• Four special adjustable splined horns are available.

RECEIVER FP-R107M

• Pulse noise rejection circuit is invulnerable to noise.
• Small & high sensitivity 7 channel FM receiver using a specially developed high sensitivity monolithic 1C IF amplifier.
• CONTENTS AND RATINGS

Ratings and specifications are subject to change without prior notice.

<table>
<thead>
<tr>
<th>Model</th>
<th>FP-7FGH</th>
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<tbody>
<tr>
<td>Transmitter</td>
<td>FP-T7FGH x 1</td>
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<tr>
<td>Receiver</td>
<td>FP-R107M x 1</td>
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<tr>
<td>Servo</td>
<td>FP-S130x4</td>
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<tr>
<td>Switch</td>
<td>SWH-5 (R4-SWJ)</td>
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<tr>
<td>Ni-cd battery</td>
<td>NR-4Jx 1</td>
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<tr>
<td>Accessories</td>
<td>Charger, extension cord, frequency flag, spare horn, neck strap, mounting screws</td>
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</table>

**Transmitter FP-T7FGH**

- **Operating system**: Two-stick, 7 channels for F3C helicopter
- **Transmitting frequency**: 72MHz band 27, 29, 35, 40, 72 & 53 MHz band switching possible by changing RF module.
- **Modulation**: FM
- **Power requirement**: 9.6V, 8/500mAH internal ni-cd battery.
- **Current drain**: 150mA

**Receiver FP-R107M**

- **Receiving frequency**: 27, 29, 35, 40, 72 & 53MHz.
- **Crystal change system**: Precision crystal that permits frequency change within the same band.
- **Intermediate frequency**: 455kHz
- **Power supply**: 4.8V, Ni-Cad battery, shared with receiver.
- **Current drain**: 15mA
- **Dimensions**: 1.69 x 2.72 x 0.79in. (43 x 69 x 20mm)
- **Weight**: 1.9oz (54g)
- **Receiving range**: 500m on the ground, 1000m or greater in the air when used with the FP-T7FGH.

**Servo FP-S130**

- **Control system**: + pulse width control 1520uS.N
- **Operating angle**: One side 45° or more (including trim)
- **Power requirement**: 4.8V (shared with receiver)
- **Current drain**: 6.0V/8mA (at idle)
- **Output torque**: 55.6 oz.in (4 kg-cm)
- **Operating speed**: 0.24 sec/60°
- **Dimensions**: 1.52 x 0.77 x 1.36in. (38.5 x 19.5 x 34.5mm)
- **Weight**: 1.48 oz (42g)

**Charger FBC-2 (A)**

- **Input voltage**: 120VAC, 50/60Hz.
- **Output**: Tx side 9.6V, 45mA, Rx side 4.8V, 45mA

**Receiver and servo Ni-Cad battery NR-4J**

- **Voltage**: 4.8V, 4/500mAH
- **Dimensions**: 2.01 x 2.28 x 0.59in. (51 x 58 x 15mm)
- **Weight**: 3.35oz (95g)
•TRANSMITTER CONTROLS
Names and functions of transmitter controls

17 Idle-up trim control
16 Idle-up ON-OFF switch
18 Throttle hold switch
19 Rudder dual-rate or VTR on/off switch
5 CH5 landing gear switch (rate gyro output switch)
(3) Throttle
4 Rudder stick
10 Throttle trim with ATL (Adjustable Throttle Limiter)
11 Rudder trim
(7 CH7 lever
12 Aileron dual-rate or VTR on/off switch
13 Elevator dual-rate or VTR on/off switch
15 Throttle-rudder mixing knob
14 Trainer switch
21 Square level meter
25 Hook for neck strap
1 Aileron
2 Elevator stick
24 Handle/stand
8 Aileron trim
23 Antenna storage
6 Pitch trim/CH6 lever
9 Elevator trim
20 Power switch

Fig.1
Inside Rear Trimmer Panel

1. Aileron ATV left-side trimmer
2. Aileron ATV right-side trimmer
5. Aileron -> rudder mixing left-side trimmer
6. Aileron -> rudder mixing right-side trimmer
8. Elevator ATV down-side trimmer
9. Elevator ATV up-side trimmer
12. Throttle hold point trimmer
15. Rudder ATV left-side trimmer
16. Rudder ATV right-side trimmer
19. Pitch control low-side trimmer
20. Pitch control high-side trimmer
22. Servo reversing switches
21. Throttle -> Pitch control mixing ON-OFF switch
18. DR->VTR switch
17. Rudder dual rate trimmer
14. Throttle -> rudder mixing ON-OFF switch
13. Throttle high-side ATL trimmer
11. DR->VTR switch
10. Elevator dual rate trimmer
7. Aileron <-> rudder mixing ON-OFF switch
4. DDR <-> VTR switch
3. Aileron dual rate trimmer
• OPERATION

This section explains the operation of the transmitter controls when the servo reversing switches are in the normal position. When the reversing switches are in the reverse position, operation is the opposite of that described here.

CD Aileron stick Controls the ailerons.
2 Elevator stick Controls the elevators.
3 Throttle Stick Controls the throttle.
4 Rudder Stick Controls the rudders.
5 CH5 switch Switches the rate gyro output.
6 Pitch trimmer/CH6 lever Trims the propeller pitch control independently from the throttle.
(7)CH7 lever Spare channel.
8 Aileron trim lever Aileron trimmer.
9 Elevator trim lever Elevator trimmer.
10 Throttle trim lever w/ATL Adjustable travel trim lever. This lever acts as a trimmer only when the throttle stick is at the low side as shown in Fig. 6. It is very convenient because the high side of the throttle position remains unchanged even when the low side is adjusted.

11 Rudder trim lever Rudder trimmer.

12 Aileron dual rate switch Aileron dual rate ON-OFF switch. When set to the upper position, dual rate is turned on, and when set to the lower position, dual rate is turned off. At dual ON, the deflection can be set as shown in Fig. 7 with the 3 aileron dual rate trimmer located on the trimmer panel at the back of the transmitter. At dual OFF, the operating linearity can be switched as shown in Fig. 8 with the 4 VTR (Variable Trace Ratio) switch also located on the trimmer panel.

*Trim lever is used for fine adjustment.
The trim lever is used for neutral position adjustment or correction of the posture of the aircraft after installation is completed. However, after test flight, try to keep the neutral position as they are making necessary corrections with the rod adjusters, etc.
13 Elevator dual rate switch • Elevator dual rate ON-OFF switch. Similar to aileron dual rate, (dual rate ON) the elevator deflection can be adjusted with the elevator dual rate trimmer 10 and the servo operating linearity can be switched with the DR <-> VTR switch 11.

14 Trainer switch Pull on/self-off switch. The transmitter connected by the trainer cord (M-TC) operates and when it is OFF, your-own transmitter only operates.

15 Throttle-rudder mixing knob Ratchet knob that sets the throttle to rudder mixing amount and direction. Mixing amount is 0 — 50%.

16 Idle-up ON-OFF switch This switch is turned ON when pushed forward.

17 Idle-up trim control Sets the idling speed when the 16 idle-up switch is ON.

18 Throttle hold switch When this switch is set to ON, the throttle servo stops at the position set at the 12 trimmer and only the pitch servo operates. This switch is used in auto-rotation dives. Both throttle and pitch servos mixing is performed when this switch if OFF. It is ON when pushed forward.

19 Rudder dual rate switch Rudder dual rate ON-OFF switch. Similar to aileron dual rate, at dual rate ON, the rudder deflection can be adjusted with the rudder dual rate trimmer 17 and the servo operating linearity can be switched with the DR <-> VTR switch 18. Other functions are the same as those of the aileron dual rate switch.

20 Power switch

21 Square level meter Level meter indicates the transmitter output power and indirectly shows power supply voltage.

22 Antenna

23 Antenna storage The opening is used for storage of the antenna while carrying the transmitter. It is located at the bottom right side of the transmitter.

24 Handle/stand

25 Hook for neck strap

26 Transmitter Ni-Cad battery charging jack

27 Trainer cord socket

28 Transmitter RF module

29 Trimmer panel

Non-slip adjustable lever head

The length of the lever head is adjusted to suit the operator.

Unlock lever head (A) and (B), by turning them in the arrow direction, set head (A) to the desired length, then relock the heads.

Inside rear trimmer panel

1,2 Aileron ATV (Adjustable Travel volume) trimmer [2] RIGHT is for the right aileron and 1 LEFT is for the left aileron.

The servo travel volume is independently adjustable to the left and right from the neutral position. Travel adjustment ranges 0 to 100%.
3 Aileron dual-rate trimmer adjusts the aileron travel when the 12 aileron dual-rate or VTR switch ON. Travel adjustment ranges 40 to 100%.

4 DR (dual-rate) ↔ VTR (Variable Trace Ratio) switch

5 6 Aileron-rudder MIX trimmer (From aileron to rudder) Adjust the mixing volume and the mixingdirection of rudder. After linkage is completed adjust the MIX direction and amount with trimmers. MIX amount adjustment ranges 0—100% each, the same adjustment can be done even if the servo is reversed.

7 Aileron -> rudder mixing ON-OFF switch

8 9 Elevator ATV trimmer 9 UP is for up and 8 DOWN is for down. The adjustment range is same as the aileron ATV.

10 Elevator dual-rate trimmer adjusts the elevator travel when the 13 elevator dual-rate or VTR on/off switch is ON.

11 DR ↔ VTR switch

12 Throttle hold point trimmer This trimmer sets the throttle servo stop point when the throttle hold switch 18 is set to ON. When the trimmer is turned counterclockwise, the throttle servo moves to the stow side.

13 Throttle high side ATL trimmer This trimmer adjusts only the high side of the throttle stick. It is extremely convenient when connecting the linkage, since the low side remains unchanged even when the throttle high side is adjusted with this trimmer.

14 Throttle -> Rudder mixing ON-OFF Switch This switch turns mixing from the throttle control (channel 3) to the rudder (channel 4) ON and OFF.

15 16 Rudder ATV trimmer. The adjustment range is same as the aileron ATV.

17 Rudder dual-rate trimmer Rudder dual-rate or VTR trimmer adjusts the rudder travel when the 19 rudder dual-rate or VTR on/off switch is ON.

18 DR ↔ VTR switch

19,20 Pitch control trimmer The servo throw can be varied from 0 to 100% of the total. Set for optimum pitch during normal flight.

21 Throttle -> Pitch control mixing ON-OFF switch This switch turns mixing from the throttle control (channel 3) to the pitch control (channel 6) ON and OFF.
22 **Servo-reversing switches** These switches reverse the direction of the servos. It is very convenient when connecting the linkage.

37 Aileron
38 Elevator
39 Throttle

![Servo-reversing switch diagram](image)

40 Rudder

**Fig. 14**

**41 CH5 switch channel**

**42 CH6 pitch control**

**43 CH7 lever channel**

**Fig. 15**

**Transmitter RF module**

Change this module to switch to any frequency among 27, 29, 35, 40, 53, & 72 MHz bands.

**Fig. 16**

**CHARGING OF TRANSMITTER AND RECEIVER Ni-Cad BATTERIES:**

Recharge the receiver and transmitter Ni-Cad batteries as shown in Fig. 16

- Connect the charging plug of the FBC-2 charger to the transmitter charging jack, connect the 3P connector of the FBC-2 to the receiver Ni-Cad battery NR-4J, and plug the FBC-2 to a 110VAC (220V, 240V) outlet as shown in this figure. The TX and RX charging LED light; indicating that the batteries are being charged.
- The Receiver battery can be used about 10 times at 10 minutes per flight between recharging.
- Charge the batteries for about 15 hours. When the set is not in use for some time, repeat discharge and charge, two to three times before use. (If the batteries are not used for a long time, their capacity will go down).
- FBC-2 charges transmitter and receiver Ni-Cad batteries independently or simultaneously.
TRAINER

Connect the transmitters with the trainer cord (M-TC, purchased separately) as shown in Fig. When the switch is in the ON (pull) position, the student’s transmitter operates and when the switch is in the OFF position, the instructor’s transmitter operates. The transmitter at which the trainer switch is operated on-off becomes the instructor’s.

STICK MECHANISM AND ITS ADJUSTMENT

- The new gimbal is open. This one has been used only for the most expensive radio controls. It also has the built-in tension adjustment mechanism on open gimbal for the first time. You can adjust tension of spring for your best stick feeling.

- CP variable resistor improved the neutral characteristics and resolution tremendously.

- All molded parts made of high-grade polycarbonate that virtually eliminates the effects of temperature and humidity.

1. To adjust spring tension, remove case back. Loosen and remove screw 1 & 2. Lift off case back from bottom side first.
• RECEIVER, SERVO, SWITCHES, AND Ni-Cad BATTERY CONNECTIONS AND USAGE PRECAUTIONS

Pay careful attention to the polarity of the connector.

Fig. 19

The parts inside the dotted lines are sold separately.

CH7 servo
Pitch control servo
(Landing gear servo)
(Landing gear servo)

The parts inside the dotted lines are sold separately.

CH7 servo
Pitch control servo
(Landing gear servo)
(Landing gear servo)

When a rate gyro is used, this servo connects to the receiver through the rate gyro.

Rudder servo
Throttle servo
Elevator servo
Aileron servo

FP-R107M 7 channel FM receiver
Received crystal
Antenna
Extension cord
R4-SWJ
Charging plug

Fig. 20
• Connect the servos and switches firmly as shown in Fig. 20. Then extend the transmitter and receiver antennas fully.

• Set the transmitter power switch to ON, then set the receiver power switch to ON. The servos stop near the neutral position. Operate the transmitter sticks and check if the corresponding servos faithfully follow operation of the sticks.

• After setting the pushrods at the servo horns, check that the direction of operation of the transmitter sticks and the direction of operation of the rudders are the same.

• Operate each servo horn over its entire operating range and check if the pushrod binds, or is too loose. Applying unreasonable force to the servo horn will adversely affect the servo and quickly drain the batteries. Always make the operating width of each rudder somewhat larger than the full stroke (including trim) of the servo horn. Adjust the servo horns so that operate smoothly even when the trim lever and stick lever are operated simultaneously in the same direction.

• Be alert for noise.

If engine vibration causes metal parts to touch, noise will be produced and the receiver and servos may operate incorrectly. We recommend the use of noiseless parts.

• When installing the switch, cut a rectangular hole somewhat larger than the full stroke of the switch and install the switch so it moves smoothly from ON to OFF. When the switch is mounted inside the fuselage and is turned ON-OFF with wire, install the switch mount as described above. Install the switch where it will not come into direct contact with engine oil, dust, etc.

• Even though the receiver antenna is long, do not cut or bundle it.

• The servos, Ni-Cad battery, switches, extension cords, and crystals of FP-7FGH are the same as those of the high-quality J Series. The crystals are extremely precise and are identified by color (red and green). Use Tx and Rx crystals of the same color.

• A spare horn is supplied. Use it as needed.

• Wrap the receiver in sponge rubber. Place the receiver in a plastic bag and wrap a rubber band around the open end of the bag to waterproof and dustproof the receiver. Do the same with the receiver/servo battery.

• Use the rubber bands wrapped around the receiver to hold the servo and switch leads.

• After mounting is complete, recheck each part, then make the transmitter antenna as short as possible, extend the receiver antenna fully, and operate the set from a distance of 20m to 30m. The movement of each rudder (servo) should faithfully follow the operation of each stick of the transmitter.
SPLINED HORN

This horn permits shifting of the servo neutral position at the servo horn. Setting and shifting the neutral position:

a) Angle divisions

1) The splined horn has 25 segments. The amount of change per segment is: \(360° \div 25 = 14.4°\)

2) The minimum adjustable angle is determined by the number of arms or number of the holes. For four arms, the minimum adjustable angle is:

\[\frac{25 \times 14.4°}{4} = 3.6°\]

b) Effect

To shift the holes center line to the right (clockwise) relative to baseline A, shift arm 2 to the position of arm 1 and set it to the position closest to baseline A.

[Example] For a four arm horn, the angular shift per segment is 14.4°. The shift to the right is 90° - (14.4 \times 6) = 3.6°. To shift by the same angle in the opposite direction, use the opposite arm number.  

\[\text{Fig. 23}\]

12

Futaba Digital Proportional Frequencies (FOR U.S.A.)

- The frequency of Futaba digital proportional sets can be changed among bands (1)~(6) on the 27MHz band only.
- However, a 27MHz band set cannot be changed to 72MHz band, and vice versa.
- Therefore, always attach the correct frequency flag to the end of the transmitter antenna. Each frequency band has its own designated color, as stated above. The frequency flag is intended for identification purposes.
- Also change the frequency flag when frequency is changed.
- Futaba paired crystals are precisely matched. Always use a Futaba crystal set (transmitter, receiver) when changing the frequency.
- It is illegal to change crystals of transmitter on the 72-75MHz bands in the U.S.A.

### Frequency Channel No. Flag Color

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<th>Flag Color</th>
<th>License Required</th>
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</thead>
<tbody>
<tr>
<td>26-27MHz - Aircraft/Car/Boat</td>
<td>Brown, Red, Orange, Yellow, Blue</td>
<td>Not generally in use</td>
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### 53MHz - Aircraft/Car/Boat - FCC Amateur

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<th>License Required</th>
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</thead>
<tbody>
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<td>Black/Brown</td>
<td>Not generally in use</td>
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<tr>
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<td>52.250</td>
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<td>52.800</td>
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<td>Black/Blue</td>
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</table>
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 function of the servo on each servo.
6. Be sure to include your full address and tel, Mo., 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 your equipment at the Futaba factory, an estimate of the cost of repair (over $25.00 only) will be sent to you. Your equipment will then be repaired and returned to you upon receipt of payment or C.O.D. (cash).

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