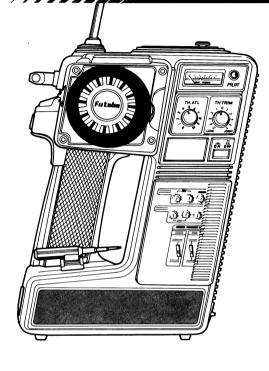




D60462



FP-2PD FP-2PDF

•	FP-2PD is a high performance AM2 channels
	digital proportional R/C set and has built-
	in • BEC(Battery Eliminator Circuitry) system.
	Since the power of receiver and servo is
	suppled from the running Nicd battery,
	there is no troublesome wiring and the
	vehicle can be made lighter.

- ●FP-2PDF is a high performance FM2 channels digital proportional R/C set.
- ●This digital proportional R/C set is for land (motor car, engine car) and water (motor boat, engine boat) use.

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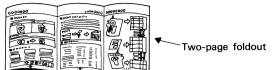
Thank you for purchasing a Futaba digital proportional R/C set.

Please read this manual carefully before using your set.

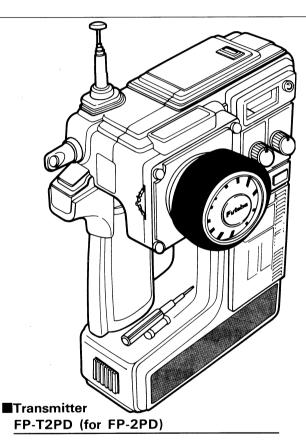
The last page of this manual is a two-page foldout showing the name of

each part of the transmitter.

Unfold this page when reading this manual.



FEATURES



FP-T2PDF (for FP-2PDF)

Functions which meet all conditions.

- Sub trim, ATV, and reverse functions (on each channel) convenient when connecting the linkage.
- Steering D/R and ATL functions convenient when running.
- Operation feel is changed.

Wheel tension adjuster throttle neutral adjuster wheel angle adjuster.

ABBREVIATIONS

ATV: Adjustable travel volume

D/R: Dual rate

ATL: Adjustable throttle limitter

■Reciver FP-R102JE (for FP-2PD)

High performance AM2 channels receiver with BEC. Miniature size and light weight.



FP-R103F (for FP-2PDF)

Ultra light weight and miniature FM3 channels receiver.

■Servos

FP-S9301 (for FP-2PD)

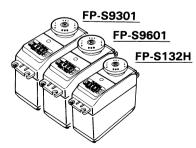
High torque (Engine buggy etc.)

FP-S9601 (for FP-2PD)

Miniature high speed (Motor racing etc.)

FP-S132H (for FP-2PD)

High speed (Motor racing etc.)



FP-S148 (for FP-2PDF)

Low profiled strong servo.

■FET amp

FP-MC112B (for FP-2PDF)

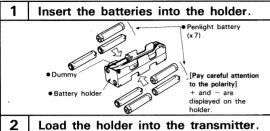
FET motor control amp w/back.

CONTENTS AND RATINGS

*Specifications are subject to change without prior notice.

	*Specifications are subject to change without prior notice					
	FP-2PD for motor car	FP-2PD for engir	ne car	Ratings		
Transmitter	●FP-T2PD(for FP-2PD) (×1) or FP-T2PDF (for FP-2PDF) (×1)		Pistol grip 2-channel fransmitting frequency Modulation : AM (T2Pl Power requirement : P (10.5V) or 9.6V Ni Current drain : 200mA	y: 27 or 75 MHz band (T2PD), 27 or 40 MHz band (T2PDF) D), FM(T2PDF) enlight battery × 7 cd battery pack		
Receiver	●FP-R102JE (for FP-2PD) (×1) or FP-R103F (for FP-2PDF) (×1)	Futaba (III)	Intermediate frequency Power requirement: 4. 4. Current drain: 8.4V/1 13mA(r Dimensions: 33×47.4 (R103F) Weight: 25g (R102JE) Receiving range: 300m	Receiving frequency: 27 or 75 MHz band (R102JE), 27 or 40 MHz band (R103F) Intermediate frequency: 455kHz Power requirement: 4.8V to 8.4V (Built-in BEC) (R102JE), 4.8 or 6V(R103F) Current drain: 8.4V/12mA, 4.8V/33mA (no signal) (102JE), 13mA (no signal) (R103F) Dimensions: 33×47.4×19.8mm (R102JE), 42.7×28.7×16.0 (R103F) Weight: 25g (R102JE), 19g (R103F) Receiving range: 300m on the ground when FP-T2PD (or FP-T2PDF) used (differs with the surrounding conditions)		
Servo and FET amp	●FP-S132H (×2)	●FP-S9301 (×2) (for FP- or FP-S148 (×2) (for FP-2	-2PD) Operating angle: One Power requirement: 4 Current drain: 12mA a 8mA at Output Ope torque spee (kg·cm) (S/FP-S132H 1.8 0.FP-S9601 2.4 0.FP-S9301 5.0 0.FP-S148 3.0 0.	blinensions Weight 60°) (mm) (g) 13 37×18×30.5 32 15 31×16×30.2 31 22 40.5×20×35.5 50 22 40.4×19.8×36.0 44.4 2~8.4V '2A (MAX)		
Crystal	Transmitter and receiver 75MHz Band 27MHz Band			●Transmitter and receiver FM crystal sets. FM 27MHz band crystal sets or FM 40MHz band crystal sets.		
Accessories	• Receiver switch (×1) (for FP-2PD for engine car or FP-2PDF only) • Transmitter battery holde (w/dummy) (×1)	(for FP-engine FP-2PI	r battery holder (×1) 2PD for car or DF only	Servo horn bag Ribbon bag or Flag bag Mini screwdriver for adjustment		
Options	*The set does not include Transmitter Nicd battery Receiver Nicd battery Charger	-				

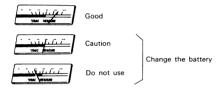
■Loading the transmitter battery (penlight battery ×7)



2 | Load the holder into the transmitter.

Battery cover

*Before using the set, cheek the remaining battery capacity by checking the level meter.

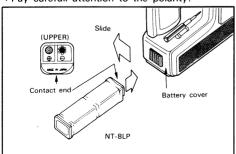


Conversion to Nicd system (Optional)

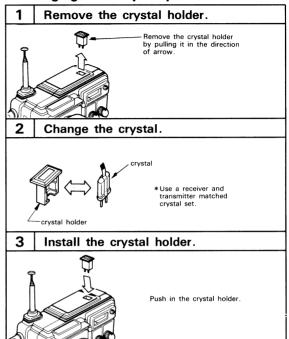
- ●Use the NT-8LP (Trans mitter).
- Use the Futaba charger as the charger.
- Charging time; 15 hours.

However, when the battery pack has not been used for sometime, it may be necessary to charge and discharge two or three times, before you gain a full charge even if charged for the specified time (15 hours) or longer.

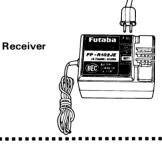
*Pay carefull attention to the polarity

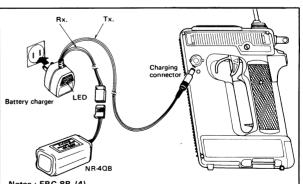


■Changing the frequency band



*Change the receiver crystal at the same time. Use a transmitter and receiver crystal pair.





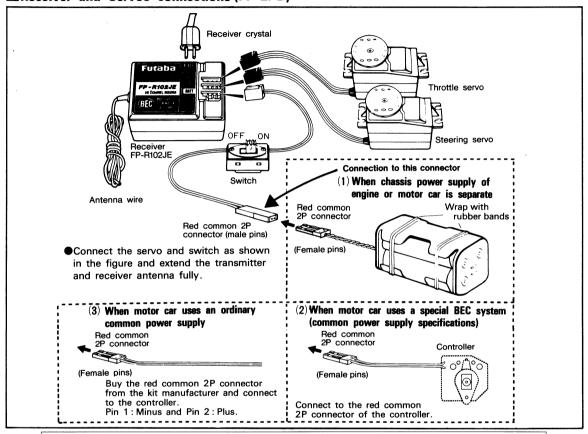
Notes: FBC-8B (4)

- (1) First, connect to TX Nicd and red lamp goes on.
- (2) Then, connect to RX Nicd after connecting, L.E.D. changes color from red to greenish red (orange) which indicates that both TX and RX Nicds are being charged.
- (3) In case of separate chaing, L.E.D. color will be: RX Nicd Green, TX Nicd-Red.



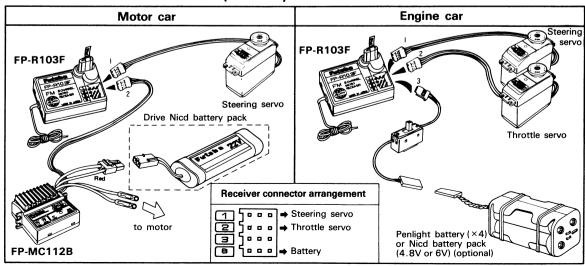
The **BEC** mark is displayed on the front of the receiver of BEC system sets with a receiver with shared power supply regulator.

Receiver and Servos connections (FP-2PD)



The **Futaba** BEC system can be used with the conventional (separate power supply) four penlight batteries system or a common power supply.

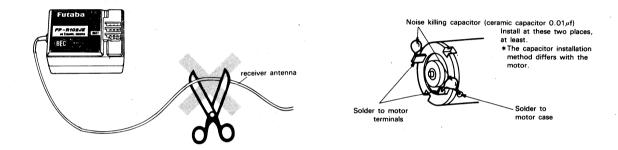
■ Receiver and servos connections (FP-2PDF)



Receiver and servo precautions

- Operate each servo to its full stroke and check if the pushrod binds or is loose. Unreasonable force applied to the servo horns is bad for the servos and will also cause the battery to run down quickly. Be especially careful when using 8.4V.
- Make the stroke of each control mechanism somewhat larger than the full stroke (including the trim component) of the servo horn. Adjust the servo horns so they move smoothly even when the trim levers and wheel or trigger are operated simultaneously in the same direction.
- Be alert for noise.
 - Always solder noise killing capacitors to the running motor. Otherwise, the receiving range may be shortened or there may be numerous dead points. If vibration causes metal parts to touch, noise will be produced and the receiver and servos may operate incorrectly. We recommed the use of noiseless parts.
- Just because the receiver antenna may seem long, do not cut it off or fold it back on itself.

 The receiving range will be shortened.



- When using a commercial motor checker, always disconnect the motor from the FET amp and radio. If it is not disconnected, the amp may be destroyed.
- If the heat sink of the FET amp touch the chassis made of aluminum, carbon, or other conductive material, the FET may be destroyed. When installing the FET amp, be sure that it does not touch such materials.
- A spare horn is provided. Use it as required.
- Use double-side adhesive tape so that the receiver is not exposed to direct vibration. Also, install the receiver so that it does not directly touch the frame or other parts and does not move.
- •When the receiver is installed on a boat or is used where it may be splashed with mud and water, place it in a plastic bag and wrap a rubber band around the open end of the bag. After use remove the receiver from the bag to prevent condensation.
- After mounting is complete, recheck each part, then check the transmitting range by making the transmitter a antenna as short as possible and extending the receiver antenna fully and operating the set from a distance of 20m to 30m. The movement of each servo should follow the movement of the transmitter sticks. At this time, place the vehicle on a stand, etc. so that it does not move.
- The crystal can change from the outside of the receiver case. Always use a Futaba transmitter and receiver crystal pair as the replacement crystals.

■IMPORTANT: Receiver Antenna Routing

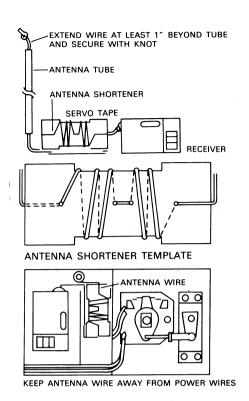
To obtain the best possible range (car to transmitter distance) and reduce the possibility of interference, please observe these antenna routing instructions.

Failure to follow these guidelines can result in loss of control or limited range.

- NEVER cut your receiver's antenna wire.
 Your system has been precisely tuned to the full length of the stock antenna.
- 2) Excess antenna wire should NOT be tightly coiled. To safely store the excess wire make an antenna shortener from a small piece of stiff cardboard. This will provide maximum reception and prevent tangling and breakage of the wire.
- When routing the antenna wire to the antenna tube keep the wire away from battery and speed control wiring. The high power of the NiCd battery creates electrical "noise" which can cause interference.

SNOW IS WATER

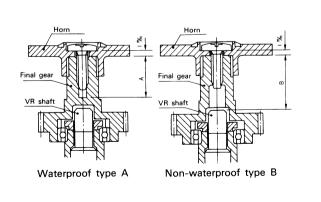
Remember that operating your FX10 on snow or in wet areas is not recommended. Melted snow becomes water which will damage or short out your system's electronics.



SERVO HORN MOUNTING SCREW PRECAUTIONS

Horn mounting screws table

Horn mounting screw dimensions	Applicable servo	Туре	Dimensions (m/m)
2.6×6	S133, S143 series	В	5.7
	S129 series	Α	7.9
	S130 series, S9101, S5101	Α	7.9
	S128 series	В	11.9
2.6×8	S132 series	В	7.3
	S135 series, S9601	В	8.7
	S138 series	В	9.9
	S148 series	В	10.5
2.67.10	S131S series, S9201, S9301, S9401	Α	9.0
2.6×10	S136G	Α	9.0
2.6×12	S134 series, S3301	Α	11.3



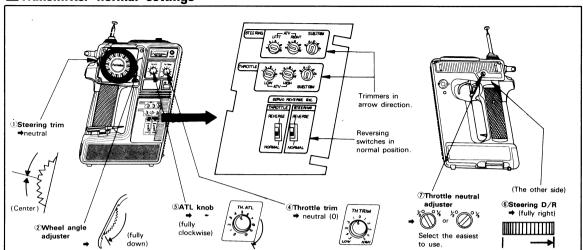
Note

- Use 2.7 m/m tapping screw.
- If screws longer than necessary are used, the final gear may be destroyed or the potentiometer may be destroyed or may fall out.

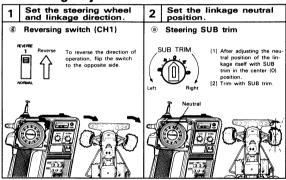
BASIC SETTINGS

[Note] The (symbol) function names in the figures correspond to the name of each part (foldout).

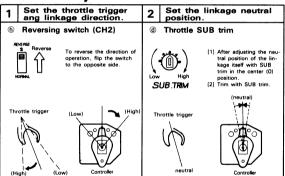
■Transmitter normal settings



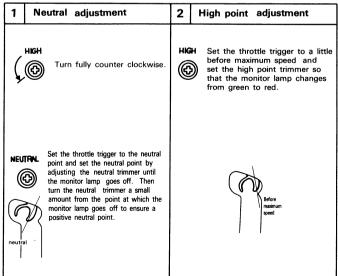
■ Steering adjustment

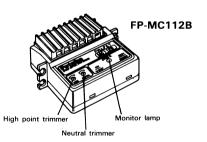


■Throttle adjustment



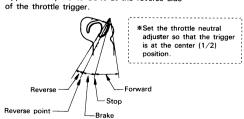
■Throttle adjustment (FET amp FP-MC112B)





Reverse point (fixed)

Approximately 70 to 80 % at the reverse side of the throttle trigger.



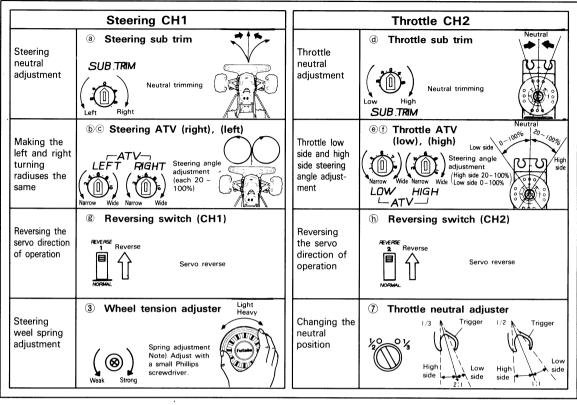
■With the adjustments made up to this point, now run the vehicle slowly and trim as described on the next page.

FUNCTIONS AND SETTING METHOD

[Note] The (symbol) function names in the figures correspond to the name of each part (foldout).

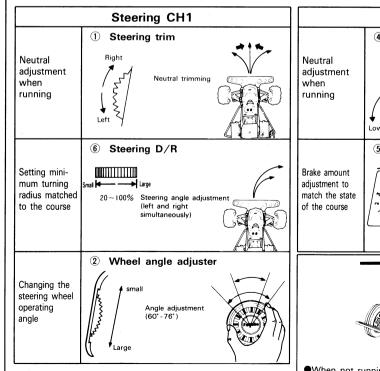
Functions convenient at linkage adjustment

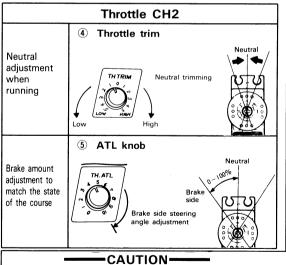
*Make adjustments with the adjustment screwdriver supplied.

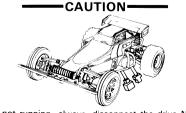


Functions convenient when running

(functions corresponding to the conditions of the course and machine which change periodically during a race)





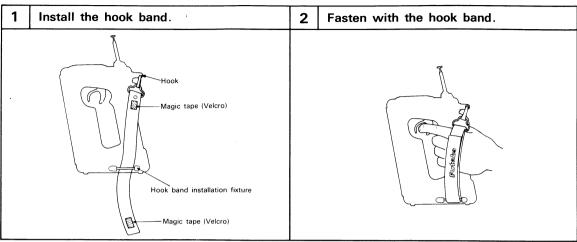


•When not running, always disconnect the drive Nicd battery pack.

USING THE ACCESSORIES

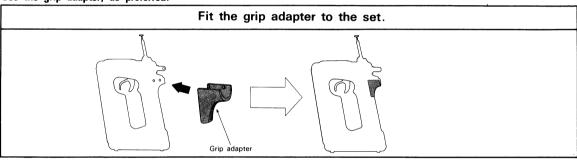
Hook band

When the hook band is used, grip is stable and operation is easier.



■Grip adapter

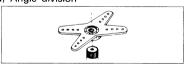
Use the grip adapter, as preferred.



SPLINED HORN

This horn permifting of the servo neutral position at the servo horn side.

Setting and shifting the neutral position.
a) Angle division

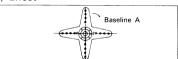


1) The number of segments per spline is 25. The amount of change per segment is $360 \div 25 = 14.4^{+}$.

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

$$360^{\circ} \div \frac{(25 \times 4)}{\text{Number of divisions}} = 3.6^{\circ}$$

b) Effect



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

[Example] For a four srm horn, the angular shift per segment is 14.4° . The shift to the right is $90^{\circ} - (14.4^{\circ} \times 6) = 3.6^{\circ}$

To shift by the same angle in the opposite direction, use the opposite arm number.

For a six arm horn, to shift the holes

center line to the right (clockwise) relative to baseline A. turn the arm



counterclockwise and set arm 2 to the position of arm 1. The adjustable angle is

 $60^{\circ} - (14.4^{\circ} \times 4) = 2.4^{\circ}$

Arm 3 shifts 4.8° to the right, and 6 shifts 2.4° to the left, and arm 4 shifts 7.2° to the right and left.



• SPLINED SERVO HORNS



HORN B







HORN E

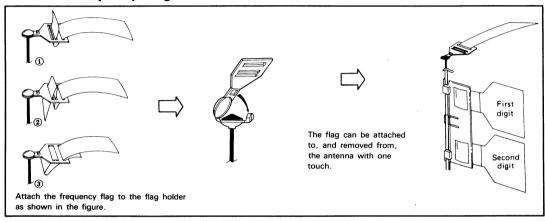




■ Digital Proportional Frequencies (FOR U.S.A.)

- The frequency of Futaba digital proportional sets can be changed within their own band. There are 2 different bands for you to choose from (27 MHz and 75 MHz.) Please see chart listed below for specific frequency and its intended use. Please note there are specific frequencies allocated for aircraft only and surface only use.
- The frequency can be changed within the same BAND by using a precisely matched pair of Futaba crystals. However, Futaba recommends that you return your system to our factory service department for frequency changing, as tuning may be necessary for proper operation. Changing frequency from one band to another is NOT possible.
- Always change frequency flag when frequency is changed. The frequency flag is to be attached to the top of antenna and the channel designation to the base. (See Drawing)
- It is illegal to change crystals on 75 MHz bands in the U.S.A.

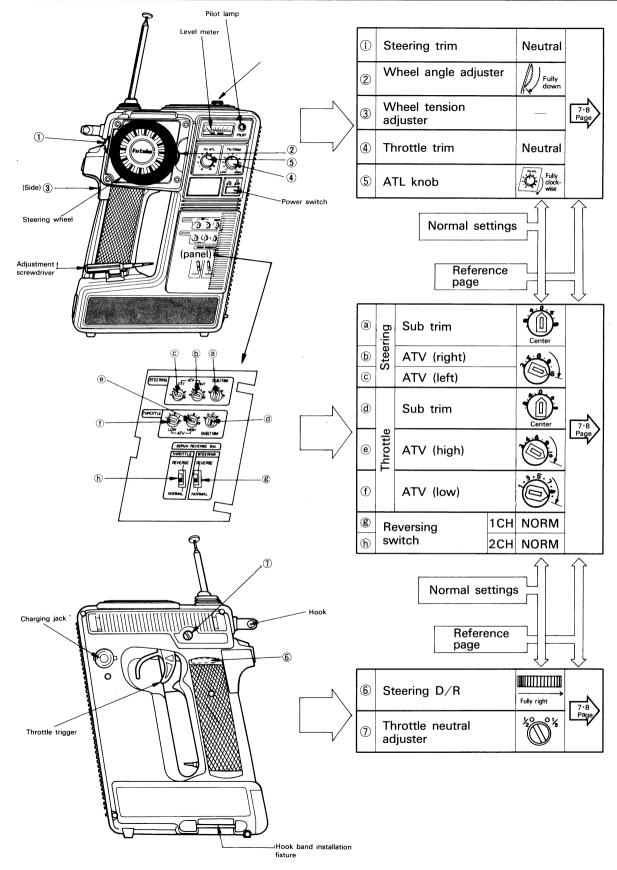
■ Antenna Frequency Flag



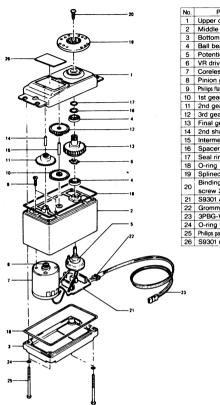
■ Frequency Channel No. Flag Color (FOR U.S.A.)

26-27 MHz-A	ircraft/car/boat	72 MHz-Airc	raft only		
	Color	72.030	12	*72.470	34
00.005		* 72.070	14	72.550	38
26.995	Brown	*72.110	16	72.590	40
27.045	Red	*72.150	18	72.630	42
27.095	Orange	* 72.190	20	72.670	44
27.145	Yellow	*72.230	22	72.710	46
27.195	Green	*72.270	24	72.750	48
27.255	Blue	* 72.310	26	72.790	50
		*72.350	28	72.830	52
0/50 8411		*72.390	30	72.870	54
	ircraft/car boat —	*72.430	32	72.910	56
	icense required				
	nels not produced o				
n these frequ	encies.)	75 MHz—Car	Boat only	•	
	Channel No.	75.430	62	75.750	78
50.800	RC00	75.470	64	75.790	80
50.840	RCO2	75.510	66	75.830	82
50.880	RC04	75.550	68	75.870	84
50.920	RC06	75.590	70	* 75.910	86
50.960	RC08	* 75.630	72	* 75.950	88
	Calan	75.670	74	* 75.990	90
F2 100	Color	75.710	76		
53.100	Black-Brown				
53.200	Black-Red				
53.300	Black-Orange				
53.400	Black-Yellow				
53.500	Black—Green				
53.600	Black-Blue				
53.700	Black-Violet			4 4000	
53.800	Black—Gray		* Effective	e JAN 1. 1988	

NOMENCLATURE

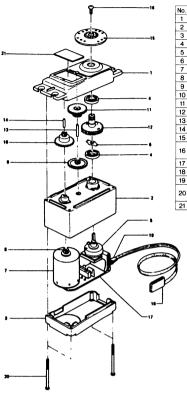


FP-S9301 EXPLODED VIEW



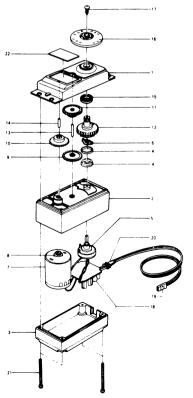
No.	Part name	Part No.
1	Upper case	S05770
2	Middle case	S05780
3	Bottom case	S05790
4	Ball bearing L1060	S04130
5	Potentiometer	139995
6	VR drive plate	S02753
7	Coreless motor	S91267
8	Pinion gear	S05530
9	Phillips flat head screw 1.6 × 2.5	J51008
10	1st gear	S02751
11	2nd gear	S02471
12	3rd gear	S0807
13	Final gear	S02809
14	2nd shaft	S01351
15	Intermediate shaft	S04287
16	Spacer washer	S02486
17	Seal ring	S09415
18	O-ring	S90417
19	Splined horn D	S01239
20	Binding head tapping	J55204
	screw 2.6×10 blask	355204
21	S9301 AMP. S150	AS1339
22	Grommet	S90045
23	3PBG-WRB-300	AT2238
24	O-ring for 1.6 ¢ screw	S90410
25	Phillips pan head screw 2×27.5	J50085
26	S9301 nameplate	S60191

FP-S9601 EXPLODED VIEW



No.	Part name	Part No.
1	Upper case	S05970
2	Middle case	S05980
3	Bottom case	S05990
4	Bearing L1060	S04130
5	Potentiometer	i39665
6	VR drive plate	S05625
7	Motor	S91266
8	Motor pinion	S05532
9	1st gear	S02761
10	2nd gear	S02762
11	3rd gear	S02761
12	Final gear	S02763
13	Intermediate shaft	S02764
14	2nd shaft	S04285
15	Splined horn D	S02767
16	Binding head tapping screw 2.6×8	J55178
17	S9601 AMP.	AS1317
18	3PD-WRB-17OB	AL0705
19	Grommet	S90045
20	No. 0 type 3 pan head screw M1.7×24	J40070
21	S9601 nameplate	S60193

FP-S132H EXPLODED VIEW



No.	Part name	Part No.
1	Upper case	S05820
2	Middle case	S05830
3	Bottom case	S05840
4	Metal bearing, outer	S04136
4	Metal bearing, inner	S04137
5	TR-133VR	139995
6	VR drive plate	S05626
7	Motor	S91249
8	Motor pinion	S02788
9	1st gear	S02787
10	2nd gear	S03250
11	3rd gear	S03252
12	Final gear	S03254
13	Intermediate gear	S02480
14	Two-stage shaft	S02481
15	Ball bearing	S04130
16	Splined horn D	S01239
17	Horn set screw	J55178
18	S132H printed wiring board	AS1271
19	S132H 3PB WRB-300	AT2165
20	Grommet	S90045
21	Pan head truss screw 2x25	J50083
22	S132H nameplate	S60128

FP-S148) EXPLODED	V	/IEW	
	No.	Part name	Part No.
₽18	1.	Upper case	FCS-48
Ĭ	2.	Middle case	FCS-48
	3.	Bottom case	FCS-48
(**************************************	4.	Metal bearing	S04137
	5.	Metal bearing	S04137
23—————————————————————————————————————	6.	Potentiometer	139668
	7.	Potentiometer drive plate	S02753
	8.	Motor	S91239
	9.	Motor pinion	S02461
		Screw	J50002
		1st gear	FGS-48
13		2nd gear	FGS-48
		3rd gear	FGS-48
" (C)	14.		FGS-48
15		Intermediate shaft	S02495
12		2nd shaft	S02494
,,	17.	Servo horn D	FSH-6W
10	18.	Binding head tapping screw 2.6×8	FSH-41
, S	19.	Printed wiring board	AS1157
	20.	3PB-WRB300G	AT2453
	21.	w/gum bush	S90045
)/	22.	Pan head truss screw	J50360
	23.	Nameplate	S60099
22			

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. No., 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.



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