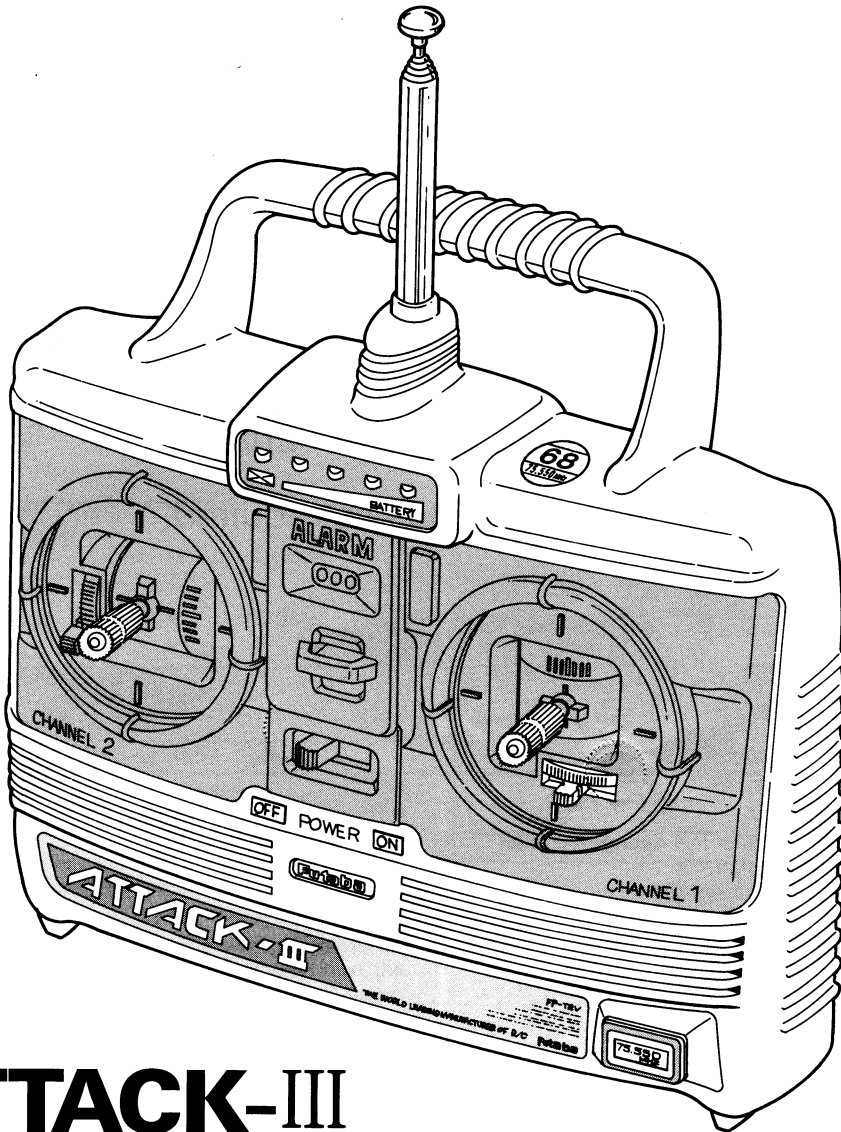


## INSTRUCTION MANUAL



# ATTACK-III



Thank you for purchasing a Futaba digital proportional radio control set.

Please read this manual carefully before using your set to ensure you use your set correctly.

### CONTENTS

FEATURES .....	1
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PRECAUTIONS WHEN MOUNTING INTO THE MODEL .....	7
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The contents of this manual are described in sequence from "Precautions" to "Adjustment Before Mounting into the Model" and "Precautions When Mounting into the Model".

Please read these items before using your set.

Read "Using Option Parts"  
and other sections as required.

## FEATURES

---

### 1. TRANSMITTER FP-T2V

- Solid construction with a natural feel during operation due to the balanced case design.
- Remaining battery capacity display. (P4→)  
Five-step 3-color LED display shows the remaining battery capacity at a glance.
- Battery alarm function. (P4→)  
Reliable audible alarm function. (buzzer & LED)
- Hook (Optional neck strap can be used)

- Throttle stick's neutral position can be selected in two steps. (P4→)
- Throttle stick can also be changed to a ratchet system. (Optional ratchet necessary) (P9→)

### 2. RECEIVER FP-R112JE

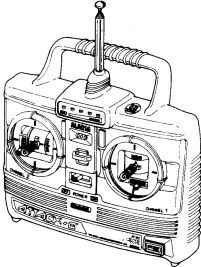
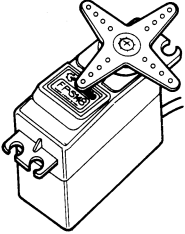
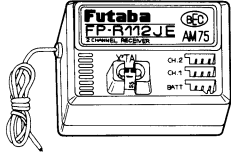
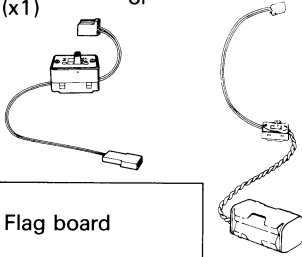
- Thin and lightweight.
- 50 cm type antenna mounts easily in the vehicle.
- Built in BEC allows a power supply of up to 8.4V.
- Only 15.7 mm thick.

### 3. SERVO FP-S148

- Small and rugged.
-

# SET CONTENTS

This digital proportional R/C set has the following contents. Check them first.

<b>ATTACK-III</b>			
<b>TRANSMITTER</b>	<ul style="list-style-type: none"> <li>● FP-T2V (x1)</li> </ul> 	<b>SERVO</b>	<ul style="list-style-type: none"> <li>● FP-S148 (x2)</li> </ul> 
<b>RECEIVER</b>	<ul style="list-style-type: none"> <li>● FP-R112JE (x1)</li> </ul> 	<b>ACCESSORIES</b>	<ul style="list-style-type: none"> <li>● CSW-BN Switch (x1) or ● SSW-BSSA Switch (x1)</li> <li>● Flag board</li> </ul> 

## RATINGS

### ■ Transmitter

Operating system	2 Stick
Transmitting frequency	72,75MHz
Modulation	AM
Power requirement	12.0V
Current drain	160mA

### ■ Receiver

Receiving frequency	72,75MHz
Intermediate frequency	455kHz
Power supply voltage	4.8~8.4V (BEC)
Current drain	8.4V/10mA, 4.8V/30mA (no signal)
Dimensions	47.6×31.5×15.7mm
Weight	20.5g
Receiving range	>300m

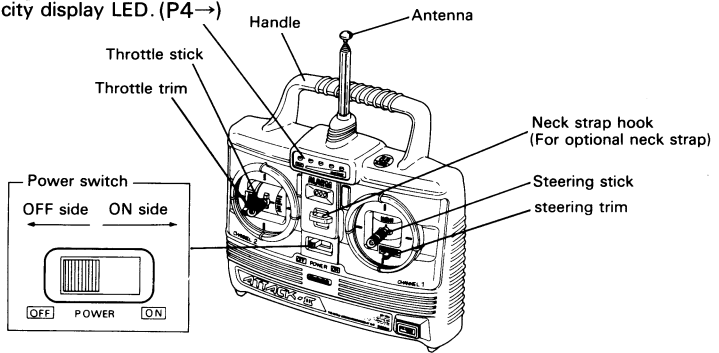
### ■ Servo

Control system	Pulse width control
Operating angle	45° or more each side of centre (including trim)
Power requirement	4.8V~6.0V (shared with receiver)
Power consumption	6.0V, 8mA at idle
Output torque	3kg·cm
Operating speed	0.22sec/60°
Dimensions	40.4×19.8×36mm
Weight	44.4g

# USING DIGITAL PROPORTIONAL R/C

This page explains the relationship between digital proportional operation and model movement. Gain an understanding of operation before using your system.

Remaining battery capacity display LED. (P4→)



## Transmitter operation

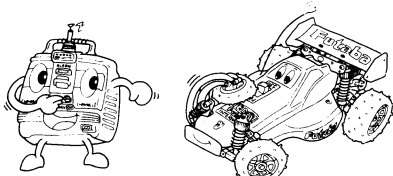
### Stick and trim operation and vehicle movement

Steering			
Throttle			
*1 Trim			
Stick			
Stick			

\* 1. Adjust the throttle trim so that vehicle does not run when the stick is in the neutral position.

\* 2. Adjust the steering trim so that the vehicle does not turn when the stick is in the neutral position.

## Power switch ON order

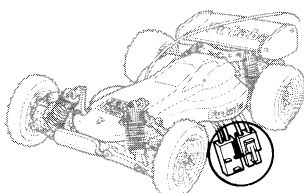


Turn on	ON first	➔	ON last
Turn off	OFF last	➜	OFF first

Always turn the transmitter and receiver power switches on and off in the following order.

If only the receiver power is turned on, the vehicle may runaway.

## When the vehicle is not in use



Disconnect the connectors.

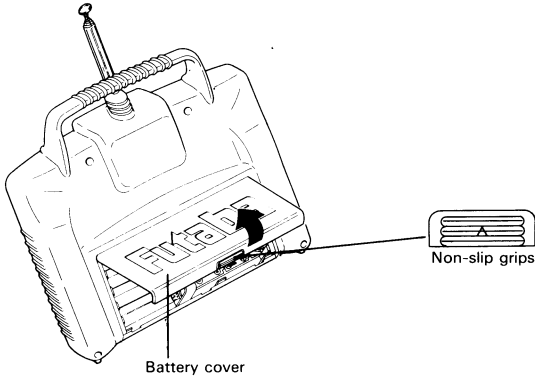
When not in use and when going to and from the track, storing the vehicle, etc. always disconnect the Nicd battery connectors. The motor suddenly running is dangerous. Current drain by the FET amp, etc. is also prevented.

# PREPARATION

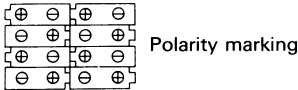
Before operating this digital proportional R/C set, make the following preparations.

This page describes how to load the transmitter batteries, the remaining battery capacity display, and how to change the throttle stick neutral position.

## ■ Loading the batteries



- (1) Open the battery cover in the direction of the arrow while pressing the non-slip cover grips.
- (2) Load the batteries in accordance with the battery holder polarity marking.

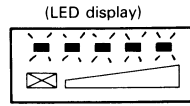


Polarity marking

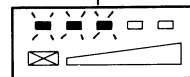
- (3) Re-fit the battery cover in the opposite order to the above.

\* Turn on the power switch and check if all the battery capacity LEDs light. If they do not light, check the battery polarity and contacts.

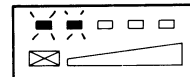
## ■ Remaining battery capacity/alarm display



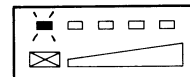
When batteries replaced with new batteries → All LEDs light.



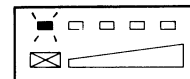
When two green LEDs goes off → Approximately 140 minutes remaining (Mn.) 120 minutes remaining (NiCd).



When all green LEDs goes off → Approximately 70 minutes remaining (Mn.) 1 minutes remaining (NiCd).



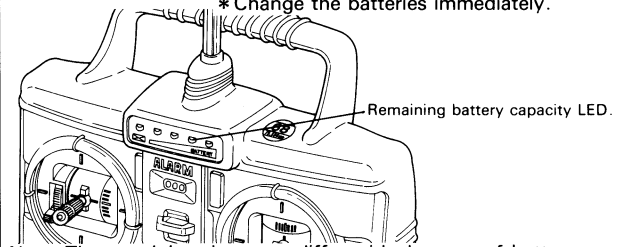
When orange LED goes off → Approximately 20 minutes remaining (Mn.) 0.5 minutes remaining (NiCd).



### Battery alarm

Indicated by the red LED flashing and the simultaneous sounding of the alarm buzzer (sounds for several seconds).

\* Change the batteries immediately.

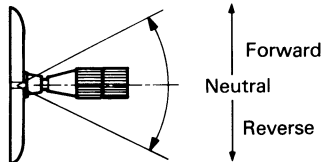


Note: The remaining time may differ with the type of battery, environment, etc.

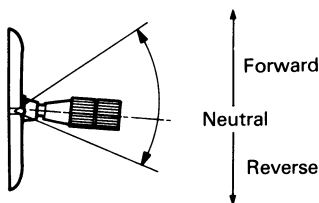
## ■ Throttle stick neutral position modification

The throttle stick neutral position is changed as described below only when you require a large throttle stick forward movement for extra control for engine car and when using an FET amp, etc. (The neutral position is set to center at the factory.)

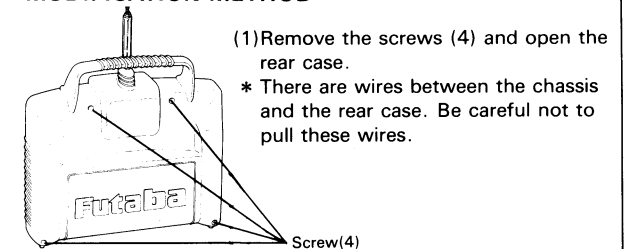
Forward : reverse = 1 : 1 (factory setting)



Forward : reverse = 2 : 1 (after modification)

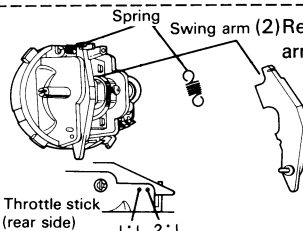


## MODIFICATION METHOD



- (1) Remove the screws (4) and open the rear case.

\* There are wires between the chassis and the rear case. Be careful not to pull these wires.



- (2) Remove the stick spring and swing arm.

- (3) Install the swing arm to the "2:1" side (outside) hole.

- (4) Reinstall the spring.

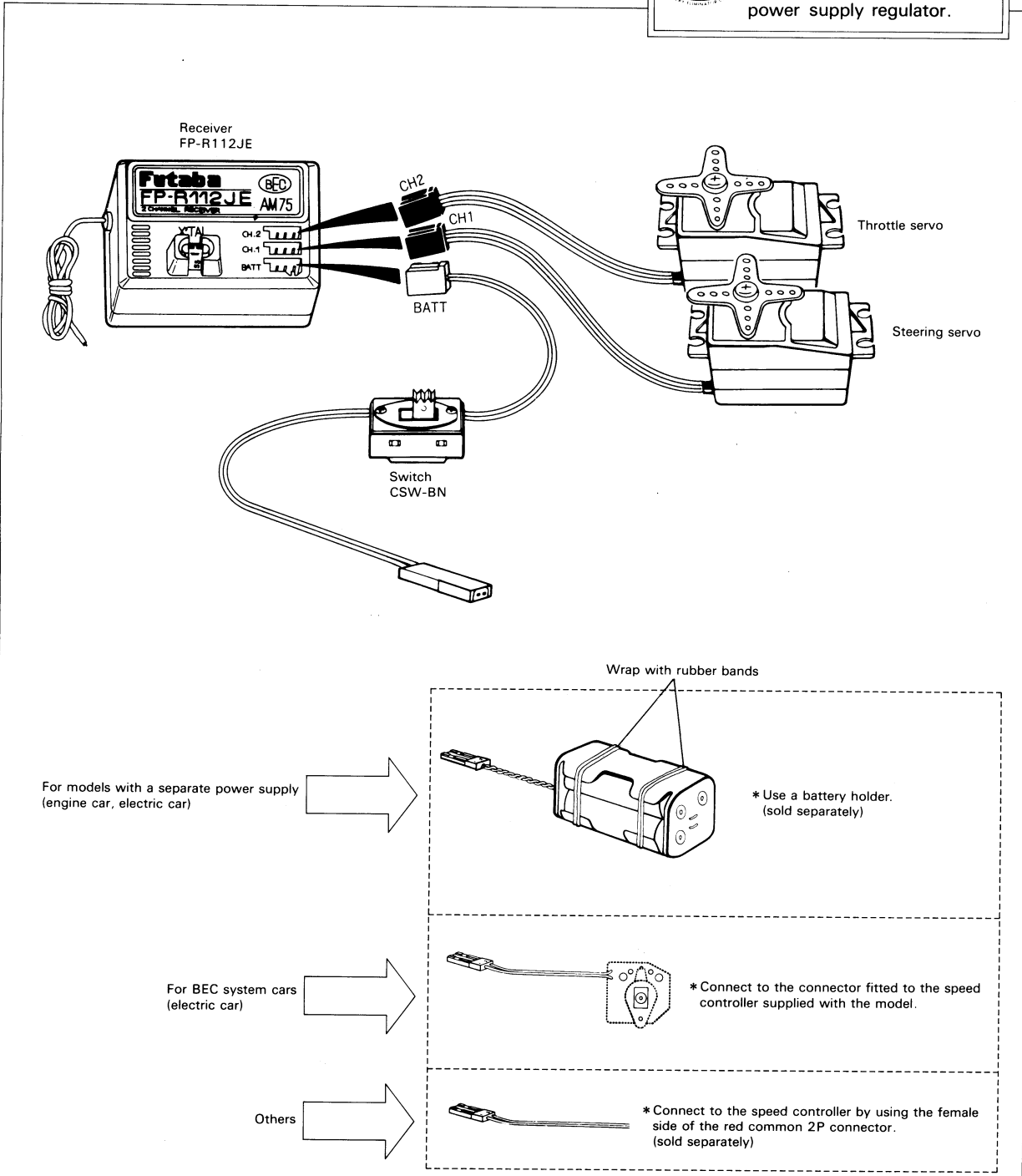
- (5) Install the rear case with the screws.

# PREPARATION

This page describes the connection of the receiver and servo installation into the model.  
Connect the receiver and servo as shown below to check the operation before assembling the model.

## Receiver and servo connection

The BEC mark is displayed on the back of the receiver of BEC system sets containing a receiver with built-in common power supply regulator.



\* There may be a common power supply regulator and diode on the speed controller, depending on the car kit. Always disconnect them because they cause a large voltage drop.

# DIGITAL PROPORTIONAL R/C ADJUSTMENT BEFORE MOUNTING INTO THE MODEL

The adjustments to your digital proportional R/C set necessary before installation in the model are described below. This page describes the steering and throttle servo horn installation and direction. The adjustments described on this page are always necessary when installing the radio in a new model.

## ■ Servo horn installation.

\* When setting, do not connect the drive motor.

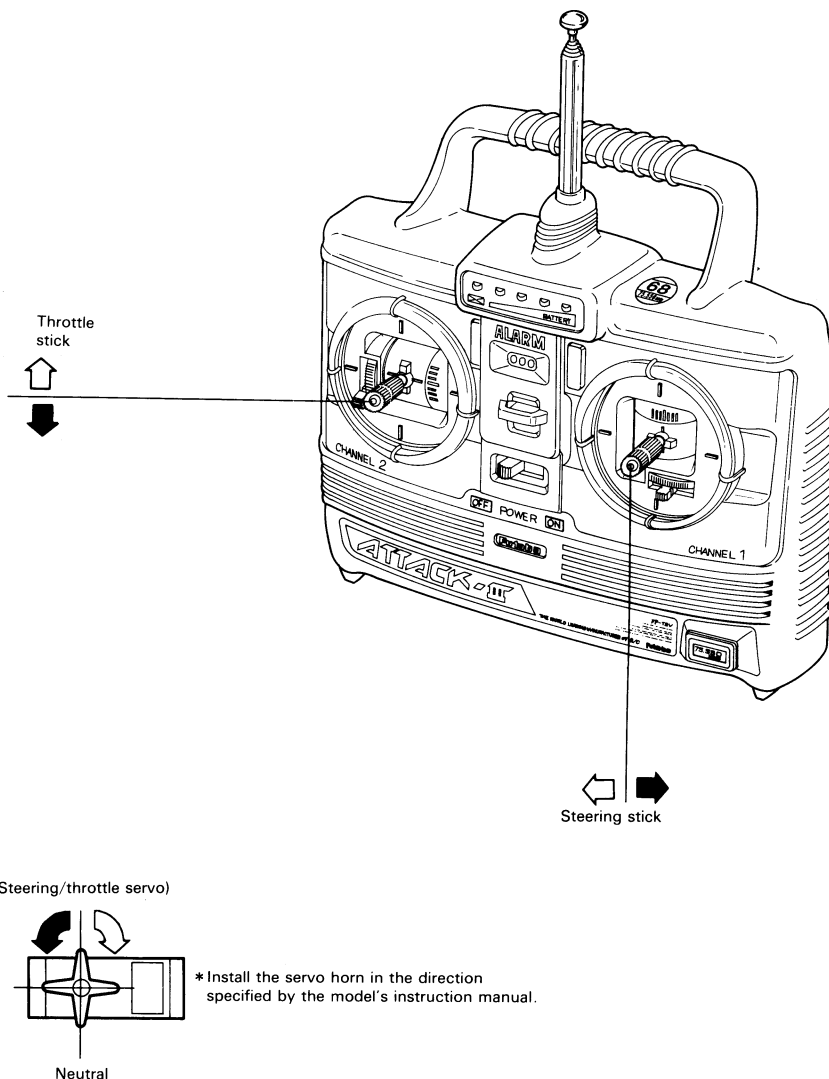
### The servo is set to its neutral position.

With the receiver and servo connected.

- (1) Turn on the transmitter power switch.
- (2) Turn on the receiver power switch.
- (3) Set each trim lever to its center position.
- (4) When the stick is in the neutral position, the position at which the servo stops is the servo's neutral position.

Make the following adjustments in this state.

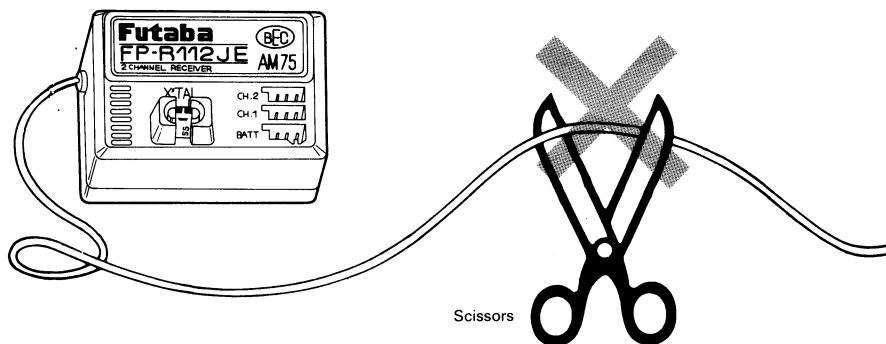
Adjust the direction and position of the servo horn



# PRECAUTIONS WHEN MOUNTING INTO THE MODEL

Precautions when installing in the model, this page describes the precautions when actually installing the receiver and servo in the model.

## (Receiver)



- Use rubber, etc. to install the receiver so that it is not directly exposed to vibration, does not touch the chassis and does not move.
- When the receiver is installed in a boat or used where it may be splashed with mud and water, place it in a plastic bag, etc. and wrap a rubber band around the open end of the bag to waterproof and dustproof the receiver. After use, remove the receiver to prevent condensation.

## (Servo)

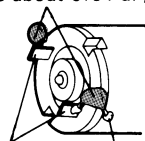
- When changing the servo horn, use the specified servo horn screws. If screws longer than necessary are used, the servo may be damaged.
- Be sure that the pushrod does not bind or bend when each servo is operated over its full travel. Applying unreasonable force to the servo horn is bad for the servo. It will also quickly drain the battery. Be especially careful when using 8.4V.

## (Others)

- Be careful of noise.  
Always solder a noise suppression capacitor to the drive motor. Otherwise the receiving range may become shorter or the dead point will increase. If vibration causes metal parts to touch, noise will be generated and cause the receiver and servos to operate erratically. The use of noiseless parts is recommended.
- Do not bundle the motor wiring together with the receiver and servo wiring.

Noise suppression capacitor.  
(ceramic about 0.01 uF)

\* Install at these two points at least.



Solder to motor terminals. Solder to case.

\* The capacitor installation method differs with the motor.

## (Check)

- After mounting is complete, retract the transmitter antenna to its minimum length and extend the receiving antenna its full length and operate the set from a distance of 20 m to 30 m. The movement of each servo should follow the movement of the transmitter sticks. At this time, place the chassis on a stand so that vehicle does not move. Ensure the wheels can spin freely without interference.

# PRECAUTIONS WHEN MOUNTING INTO THE MODEL

## ■ IMPORTANT : Receiver Antenna Routing

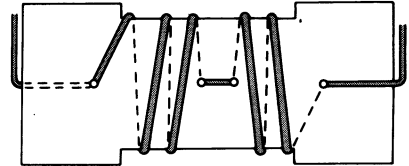
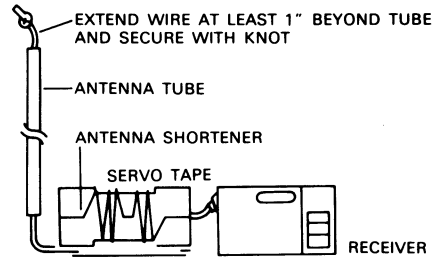
To obtain the best possible range (car to transmitter distance) and reduce the possibility of interference, please observe these antenna routing instructions.

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

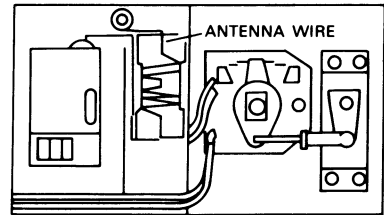
- 1) NEVER cut your receiver's antenna wire. Your system has been precisely tuned to the full length of the stock antenna.
- 2) Excess antenna wire should NOT be tightly coiled. To safely store the excess wire make an antenna shortener from a small piece of stiff cardboard. This will provide maximum reception and prevent tangling and breakage of the wire.
- 3) 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.



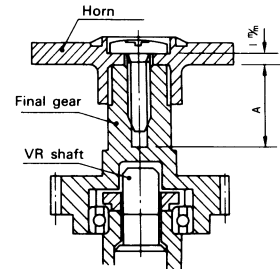
ANTENNA SHORTENER TEMPLATE



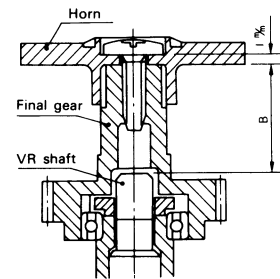
KEEP ANTENNA WIRE AWAY FROM POWER WIRES

## SERVO HORN MOUNTING SCREW PRECAUTIONS

Horn mounting screw		Applicable servo	Type	Dimensions
Dimensions	Screw type			
2.6x6	tapping	S133, S143 series	B	5.7
2.6x8	tapping	S129 series	A	7.9
		S130 series, S9101, S5101		
		S128 series	B	11.9
		S132 series	B	7.3
		S135 series, S9601	B	8.7
		S138 series	B	9.9
2.6x10	tapping	S148 series	B	10.5
		S131S series, S136G	A	9.0
		S9201, S9301, S9401		
2.6x12	tapping	S134 series, S3301	A	11.3
2.6x5	screw	S3002	B	10.0
		S3302	A	5.0
		S5102	A	5.5
		S9302	A	9.0



type A



type B

#### Note

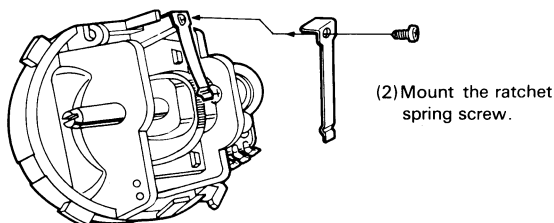
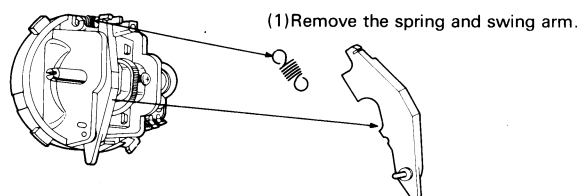
- If screws longer than necessary are used, the final gear may be broken or the potentiometer may be damaged or may fall out.

## USING OPTION PARTS

This page describes how to use the option parts (sold separately). Changing the throttle stick to a ratchet type if desired. Read this page when necessary.

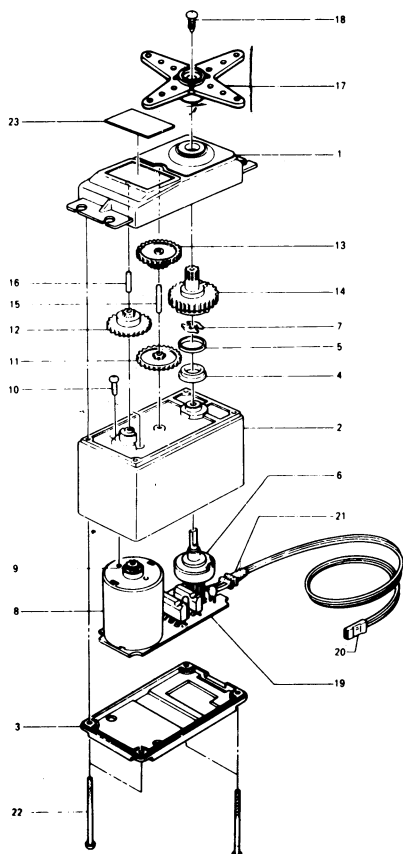
### ■ Changing throttle stick from self-neutral type to ratchet type.

Open the transmitter rear case and modify the throttle stick.  
(For the method of opening the transmitter rear case, see P4)



## SERVO EXPLODED VIEW

FP-S148

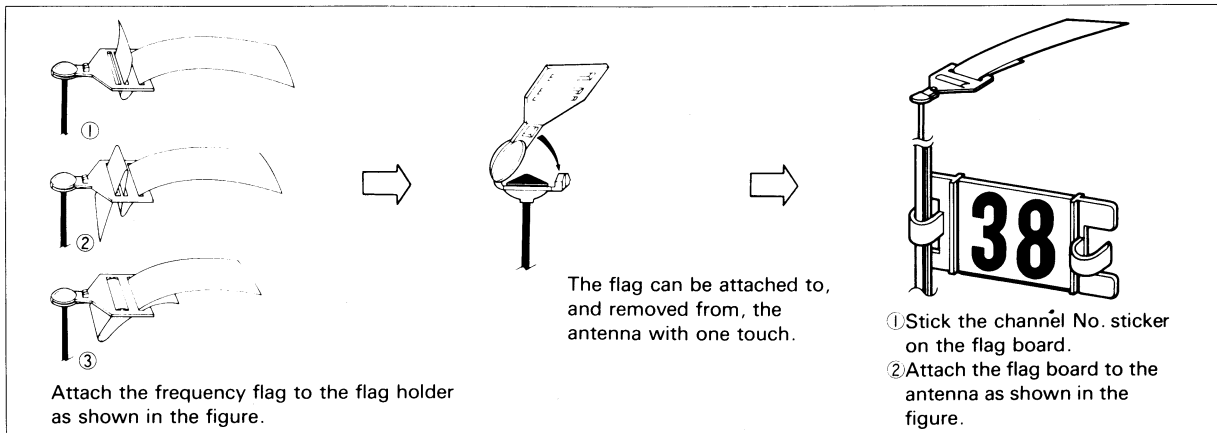


No.	Part name	Part No.
1	Upper case	FCS-48
2	Middle case	FCS-48
3	Bottom case	FCS-48
4	Metal bearing	S04137
5	Metal bearing	S04136
6	Potentiometer	I 39668
7	Potentiometer drive plate	S02753
8	Motor	S91239
9	Motor pinion	S02461
10	Screw	J50002
11	1st gear	FGS-48
12	2nd gear	FGS-48
13	3rd gear	FGS-48
14	Final gear	FGS-48
15	Intermediate shaft	S02495
16	2nd shaft	S02494
17	Servo horn A	FSH-6X
18	Binding head tapping screw 2.6x8	FSH-4I
19	Printed wiring board S148	AS1157
20	S148 3PB-WRB300G	AT2453
21	W gum bush	S90045
22	Pan head truss screw	S50360
23	Nameplate S148	S60099

## ■ 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 72-75 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 72-75 MHz bands in the U.S.A. unless performed by a licensed technician.

## ■ Antenna Frequency Flag



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

26-27MHz-Aircraft/car/boat		72MHz-Aircraft only			
	Color				
26.995	Brown	* 72.010	11	* 72.410	31
27.045	Red	72.030	12	72.430	32
27.095	Orange	* 72.050	13	* 72.450	33
27.145	Yellow	72.070	14	72.470	34
27.195	Green	* 72.090	15	* 72.490	35
27.255	Blue	72.110	16	* 72.510	36
		* 72.130	17	* 72.530	37
		72.150	18	72.550	38
		* 72.170	19	* 72.570	39
		72.190	20	72.590	40
	Channel No.	* 72.210	21	* 72.610	41
50.800	RC00	72.230	22	72.630	42
* 50.820	RC01	* 72.250	23	* 72.650	43
50.840	RC02	72.270	24	72.670	44
* 50.860	RC03	* 72.290	25	* 72.690	45
50.880	RC04	72.310	26	72.710	46
* 50.900	RC05	* 72.330	27	* 72.730	47
50.920	RC06	72.350	28	72.750	48
* 50.940	RC07	* 72.370	29	* 72.770	49
50.960	RC08	72.390	30	72.790	50
* 50.980	RC09				
	Color	75MHz-Car/boat only			
53.100	Black-Brown	* 75.410	61	* 75.610	71
53.200	Black-Red	75.430	62	75.630	72
53.300	Black-Orange	* 75.450	63	* 75.650	73
53.400	Black-Yellow	75.470	64	75.670	74
53.500	Black-Green	* 75.490	65	* 75.690	75
53.600	Black-Blue	75.510	66	75.710	76
53.700	Black-Violet	* 75.530	67	* 75.730	77
53.800	Black-Gray	75.550	68	75.750	78
		* 75.570	69	* 75.770	79
		75.590	70	75.790	80
				* 72.810	51
				72.830	52
				* 72.850	53
				72.870	54
				* 72.890	55
				72.910	56
				* 72.930	57
				* 72.950	58
				* 72.970	59
				* 72.990	60
				* 75.810	81
				75.830	82
				* 75.850	83
				75.870	84
				* 75.890	85
				75.910	86
				* 75.930	87
				75.950	88
				* 75.970	89
				75.990	90

\* Effective JAN 1. 1991