SKYSPORT

ss2/ss3

Digital Proportional R/C System

Single Stick

ss2/ss3

Digital Proportional R/C System

Single Stick

2/3 CHANNELS FOR AIRCRAFT

2FR/3FR

INSTRUCTION MANUAL

1M23N09002

CE

Futaba®

Futaba® *Digital Proportional R/C System*

Thank you for purchasing a Futaba SKYSPORT SS2/SS3.
Before using your SKYSPORT SS2/SS3, read this manual carefully and use your R/C set safely.
After reading this manual, store it in a safe place.

See the glossary page 16 for a definition of the special terms used in this manual.

APPLICATION, EXPORT, AND RECONSTRUCTION

1. This product may be used for model airplane use if on the correct frequency.
   The product described in this manual is subject to regulations of the Ministry of Radio/Telecommunications and is restricted under Japanese law to such purposes.
2. Exportation precautions
   (a) When this product is exported from Japan, its use is to be approved by the Radio Law of the country of destination.
   (b) Use of this product with other than models may be restricted by Export and Trade Control Regulations. An application for export approval must be submitted.
3. Modification, adjustment, and replacement of parts
   Futaba is not responsible for unauthorized modification, adjustment, and replacement of parts of this product.

COMPLIANCE INFORMATION STATEMENT (FOR U.S.A.)

This device, trade name Futaba Corporation of America, model number R132JE, R114H, and R114F comply with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

The responsible party of this device compliance is;
Futaba Corporation of America
2865 Wall Triana Highway, Huntsville, Alabama 35824, U.S.A.
TEL (256) 461 - 7348

THE RBRC™ SEAL (FOR U.S.A.)

The RBRC™ SEAL on the (easily removable) nickel-cadmium battery contained in Futaba products indicates that Futaba Corporation of America is voluntarily participating in an industry program to collect and recycle these batteries at the end of their useful lives, when taken out of service within the United States. The RBRC™ program provides a convenient alternative to placing used nickel-cadmium batteries into the trash or municipal waste which is illegal in some areas.

Futaba Corporation of America's payments to RBRC™ makes it easy for you to return the spent battery to Futaba for recycling purposes. You may also contact your local recycling center for information on where to return the spent battery. Please call 1-800-8-BATTERY for information on Ni-Cd battery recycling in your area. Futaba Corporation of America's involvement in this program is part of its commitment to protecting our environment and conserving natural resources.

NOTE: Our instruction manuals need to encourage our customers to return spent batteries to Futaba or a local recycling center in order to keep a healthy environment.

RBRC™ is a trademark of the Rechargeable Battery Recycling Corporation.

Warning: This product contains a chemical known to cause cancer and birth defects (or other reproductive harm).

SKYSPORT SS2&3

TABLE OF CONTENTS

FOR SAFETY

To ensure safe use, observe the following precautions.

MEANING OF SPECIAL MARKINGS

Pay special attention to the safety at the parts of this manual that are indicated by the following marks.

Mark	Meaning
⚠ DANGER	Procedures which may lead to a dangerous condition and cause death or serious injury to the user if not carried out properly.
⚠ WARNING	Procedures which may lead to a dangerous condition or cause death or serious injury to the user if not carried out properly, or procedures where the probability of superficial injury or physical damage is high.
⚠ CAUTION	Procedures where the possibility of serious injury to the user is small, but there is a danger of injury, or physical damage, if not carried out properly.

Symbol: ⃠ ;Prohibited ❗ ;Mandatory

PRECAUTIONS DURING FLIGHT

⚠WARNING

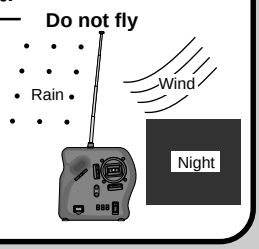
⃠ Do not fly simultaneously on the same frequency.

Interference may cause a crash.

*Use of the same frequency will cause interference even if the modulation method (AM, FM, PCM) is different.

⃠ Do not fly on rainy or windy days, or at night.

Water will penetrate into the transmitter and cause faulty operation, or loss of control, and cause a crash.



⃠ Do not fly in the following places:

- -Near other R/C flying fields (within about 3km)
- -Near people on the ground, or objects in the air
- -Near homes, schools, hospitals, or other places where there is a lot of people
- -Near high tension lines, high structures, or communication facilities

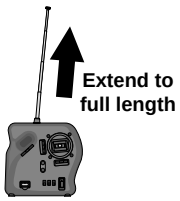
Radiowave interference and obstructions may cause a crash. A crash caused by trouble in the R/C set, or the model itself, may cause death or property damage.

⃠ Do not fly when you are tired, sick, or intoxicated.

Fatigue, illness, or intoxication will cause a loss of concentration or normal judgment and result in operation errors and a crash.

Extend the antenna to its full length.

If the antenna is collapsed, the effective range of the radiowaves will become shorter.



Always test the digital proportional R/C set before use.

Any abnormality in the digital proportional R/C set, or model, may cause a crash.

*Before starting the engine, check that the direction of operation of each servo matches the operation of its control stick. If a servo does not move in the proper direction, or operation is abnormal, do not fly the plane.

Check that the transmitter antenna is not loose.

If the transmitter antenna comes off during use, control will be lost and the model will crash.

⚠ CAUTION

Do not touch the engine, motor, and speed control during and immediately after use.

They are hot and will cause a burn.

When turning on the power switch

After setting the transmitter throttle lever to maximum slow,

1. Turn on the transmitter power switch,
2. Then turn on the receiver power switch.

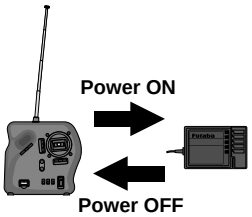
When turning off the power switch

After stopping the engine,

1. Turn off the receiver power switch,
2. Then turn off the transmitter power switch.

If the power switch is turned off in the opposite order, the engine may go to full throttle unexpectedly and cause an injury.

*Maximum slow: Direction in which the engine or motor runs at the slowest speed.



When adjusting the digital proportional R/C set, always stop the engine, except when necessary.

If the engine suddenly goes to high speed, it may cause an injury.

(In case of a set w/ frequency board)

When flying, always install the frequency board to the transmitter antenna.

When the frequency was changed, also change the frequency board.

NI-CD BATTERY CHARGING PRECAUTIONS

(If using a Ni-cd battery)

⚠WARNING

❗ Always charge the nicd battery before each flight.

If the battery goes dead during flight, the plane may crash.

❗ Charge the digital proportional R/C nicd battery with the special charger, or digital proportional R/C quick charger, sold separately.

Overcharging may cause burns, fire, injury, blindness, etc. due to overheating, breakage, electrolyte leakage, etc.

Use the special charger

⚠ CAUTION

⃠ Do not use commercial nicd penlight batteries.

During quick charging, the battery holder contacts may overheat and damage the equipment, or prevent charging.

Use prohibited

⃠ Do not short the nicd battery connector terminals.

Shorting the terminals may cause sparking and overheating and result in burns or fire.

⃠ Do not drop or apply strong shock to nicd battery.

The battery may be shorted and cause overheating or breakage and electrolyte leakage and result in burns or damage by chemical mater.

Shock prohibited

STORAGE AND DISPOSAL PRECAUTIONS

⚠WARNING

⃠ Do not leave the digital proportional R/C set, battery, model airplane, etc. within the reach of small children.

Touching and operating the digital proportional R/C set, or licking the battery, may cause injury or damage due to chemical matter.

⃠ Do not throw the nicd battery into a fire or heat the nicd battery. Also, do not disassemble or rebuild the nicd battery. (If using a Nicd battery)

Breakage, overheating, and electrolyte leakage may cause injury, burns, or blindness.

! When not flying the model, store the digital proportional R/C set with the nicd battery in the discharged state. Recharge the nicd battery before the next flight. (If using a Nicd battery)

If a partially discharged nicd battery is recharged many times, its memory effect will reduce the flight time substantially and may cause a crash, even if the battery is recharged.

Nicd battery electrolyte

The electrolyte in the nicd battery is a strong alkali and can cause blindness if it gets in the eyes. If you get the electrolyte in your eyes, immediately wash your eyes with water and see a doctor. If you get the electrolyte on your skin or clothes, it may cause a burn. Immediately wash it off with water. (If using a Nicd battery)

⚠CAUTION

⃠ Do not store the digital proportional R/C set in the following places:
- -Where it is very hot (40C/104F or more) or very cold (-10C/-14F or less).
- -Where the set will be exposed to direct sunlight.
- -Where the humidity is high.
- -Where there is strong vibration.
- -Where it is dusty.
- -Where there is steam and heat.

Storing the digital proportional R/C set in the places above may cause distortion and trouble.

! If the digital proportional R/C set will not be used for a long time, remove the batteries from the transmitter and the model and store them in a dry place.

If the batteries are left in the transmitter and model, the battery electrolyte may leak out and degrade the performance and shorten the life of the transmitter and model.

Nicd battery recycling

Used nicd batteries are an important resource. Stick tape over the terminals and take the used batteries to a nicd battery recycling center. (If using a Nicd battery)

OTHER PRECAUTIONS

⚠CAUTIONS

⃠ Do not get fuel, waste oil, etc. on plastic parts.

The plastic may melt and fail to function.

! Always use Genuine Futaba transmitter, receiver, servos, FET amp, nicd battery, and other optional parts.

Futaba is not responsible for damage, etc. caused by the use of parts other than Genuine Futaba parts. Use the parts described in the instruction manual and catalogs.

BEFORE USE

SET CONTENTS

After opening the carton, first check if the following items are provided. The set contents depend on the type of set.

	SS2 (AM)	SS3 (AM)	SS3 (FM)	
Transmitter	T2FR-AM	T3FR-AM	T3FR-FM	
Receiver	R132JE	R114H	R114F (*1)	
Servo	S3003 (x2)	S3003 (x2) or S3106 (x2)	S3003 (x2)	S3106 (x2)
Receiver Battery				NR-4K
Others	Switch harness, Servo horn			
	Receiver battery holder			Charger

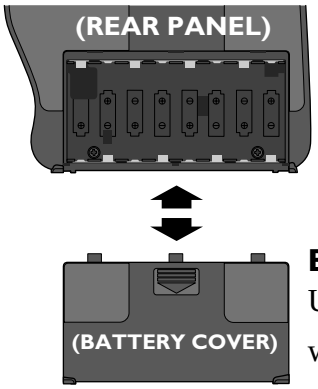
(*1)

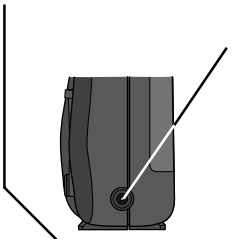
⚠WARNING The R-114F receiver is designed to be used only for Park Flyers and Slow Fly models.

Due to the special design of the R-114F we cannot recommend its use in other types of models that are flown at longer distances.

NAME AND HANDLING OF EACH PART

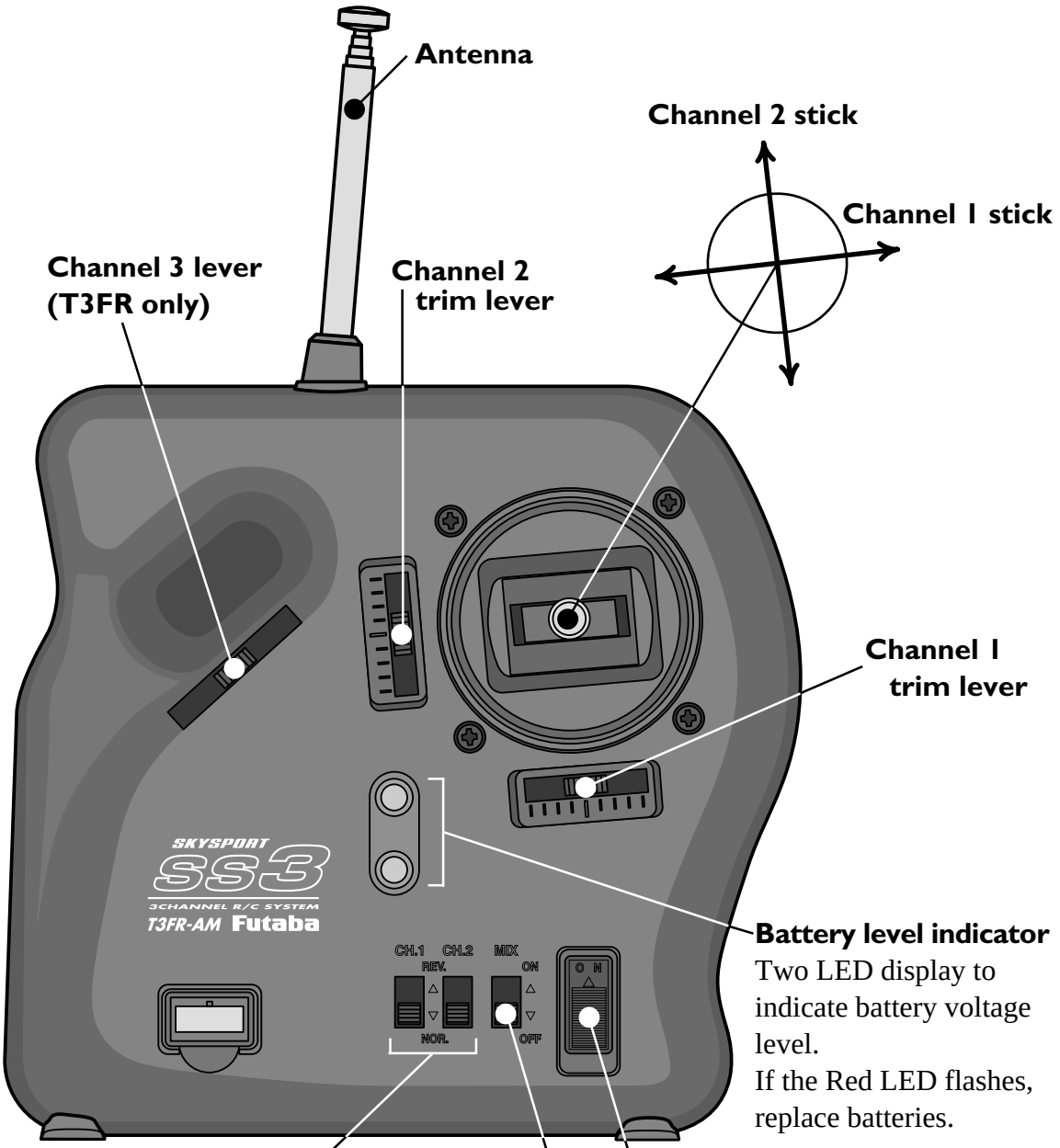
TRANSMITTER T2FR/T3FR





Charging jack
Charging jack when the transmitter was converted to nicd battery system.
(See page 13 for a description of the charging method.)

Battery cover
Use when replacing the battery . Slide the cover downward while pressing the part marked "  ".



Battery level indicator
Two LED display to indicate battery voltage level.
If the Red LED flashes, replace batteries.

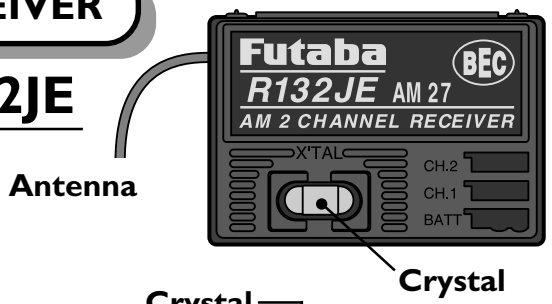
Power switch
In the upper position, the power is turned on.

Servo reversing switches (CH.1, CH.2)
Switches that reverse the direction of operation of the servos. The lower position (NOR) is the normal side and the upper position (REV) is the reverse side.

Mixing switch (for V-tail or Elevons)
In the upper position (ON), the mixing is enabled.

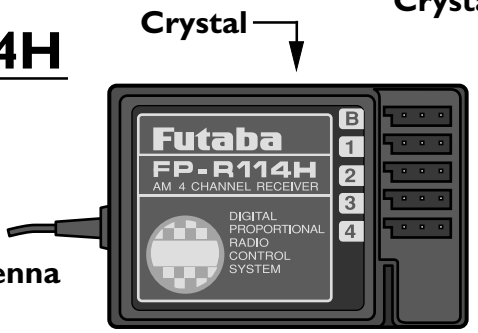
RECEIVER

R132JE



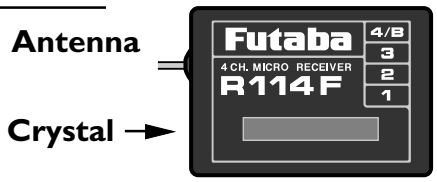
Output / Battery connector
- "CH.2": Channel 2 connector
- "CH.1": Channel 1 connector
- "BATT": Battery connector

R114H



Output / battery connector
- "B": Battery connector
- "1": Channel 1 connector
- "2": Channel 2 connector
- "3": Channel 3 connector
- "4": (Channel 4 connector)

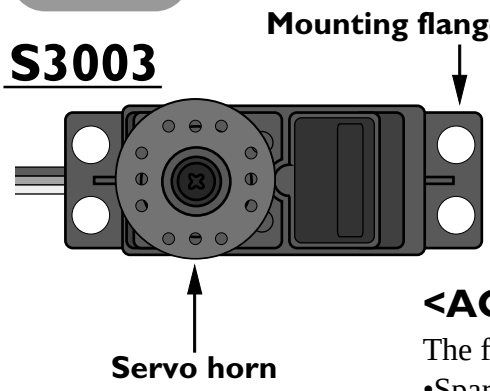
R114F



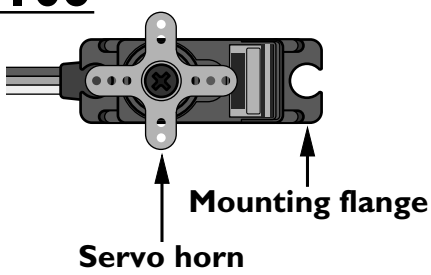
Output / battery connector
- "4/B": Channel 4 connector / Battery connector
- "3": Channel 3 connector
- "2": Channel 2 connector
- "1": Channel 1 connector

SERVO

S3003



S3106



<ACCESSORIES>

The following items are supplies with the set:
- Spare servo horn: Use to match the application.
- Servo mounting parts: Grommet, Brass eyelet, Screw

⚠ CAUTION

❗ Use the horn set screw supplied with the servo.	If a long screw is used, the interior of the servo may be damaged.

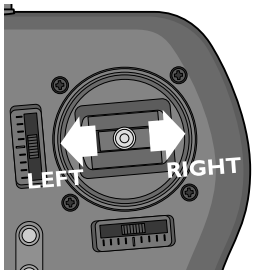
TRANSMITTER OPERATION AND MOVEMENT OF EACH SERVO

Before making any adjustments, learn the operation of the transmitter and the movement of each servo.

CHANNEL 1

RUDDER OPERATION

When the rudder stick is moved to the right, the rudder moves to the right and the nose points to the right, relative to the direction of flight. When the rudder stick is moved to the left, the rudder moves to the left and the nose points to the left and the direction of travel of the plane changes.



AILERON OPERATION

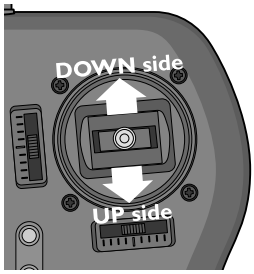
When the aileron stick is moved to the right, the right aileron is raised and the left aileron is lowered, relative to the direction of flight, and the plane turns to the right. When the aileron stick is moved to the left, the ailerons move in the opposite direction.

To level the plane, the aileron stick must be moved in the opposite direction. When the aileron stick is tilted and held, the plane will roll.

CHANNEL 2

ELEVATOR OPERATION

When the elevator stick is pulled back, the tail elevator is raised and the tail of the plane is forced down, the air flow applied to the wings is changed, the lifting force is increased, and the plane climbs (UP operation). When the elevator stick is pushed forward, the elevator is lowered, the tail of the plane is forced up, the air flow applied to the wings is changed, the lifting force is decreased, and the plane dives (DOWN operation).

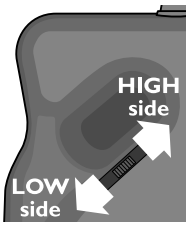


CHANNEL 3 (only T3FR)

THROTTLE/FLAP/SPOILER OPERATION

The channel 3 can be used for engine control, electronic speed control, flap, or spoilers.

When the throttle lever is pulled back (low side), the motor is stopped. When the throttle lever is pushed forward (high side), the motor turns.



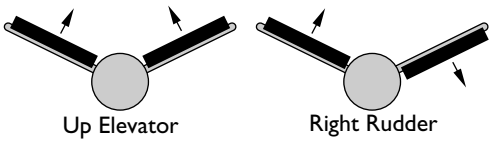
Adaptation for some speed controls so that the direction of operation is opposite (i.e. MC114, MC117):

- Request the adaptation to the Futaba Service Center.

MIXING OPERATION

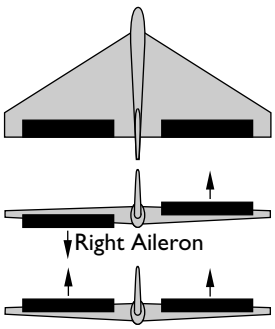
(when MIX function is turned on)

This mixing is used with V-tail aircraft, delta wings, etc. so that both channel 1 and channel 2 functions are combined for the two surfaces.



V-TAIL OPERATION

(view from rear)



ELEVON OPERATION

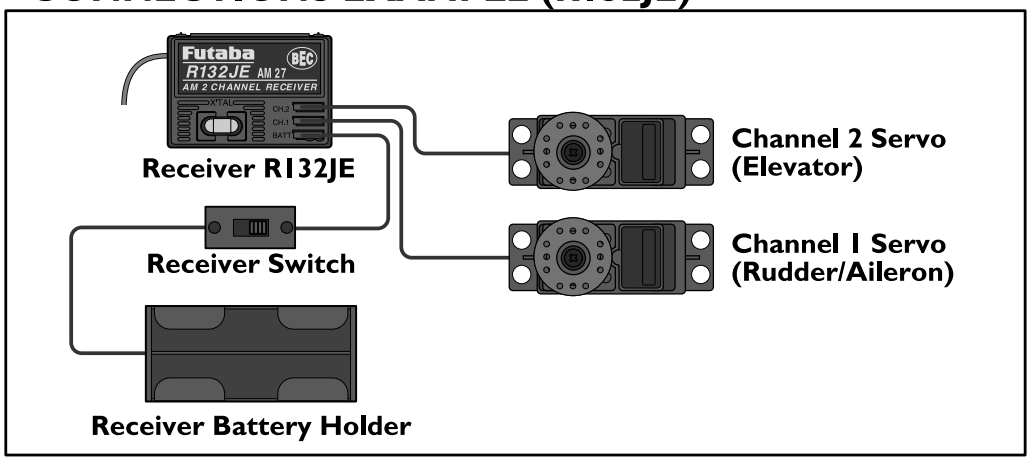
INSTALLATION AND ADJUSTMENT

This section describes the installation method and adjustment method after installation when installing the receiver, servos, etc. to the plane.

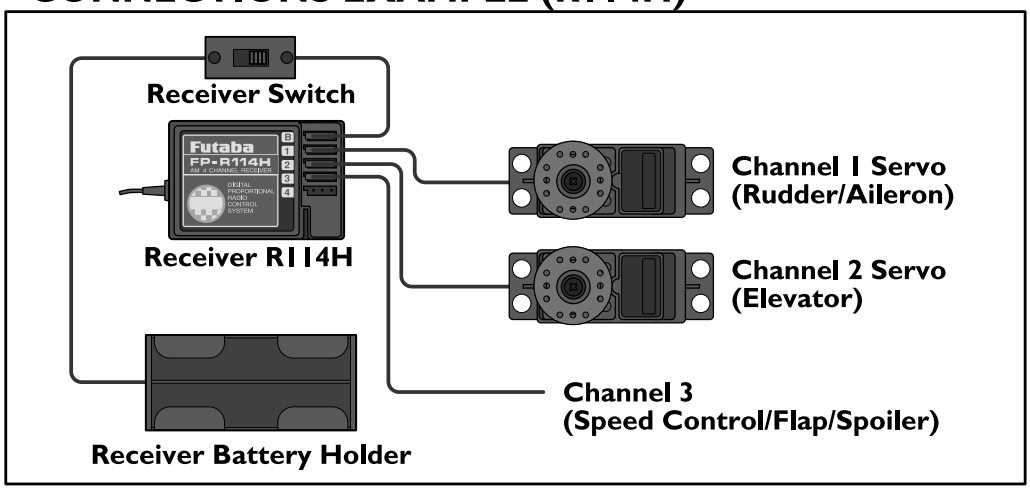
CONNECTIONS

Connection example is shown below.

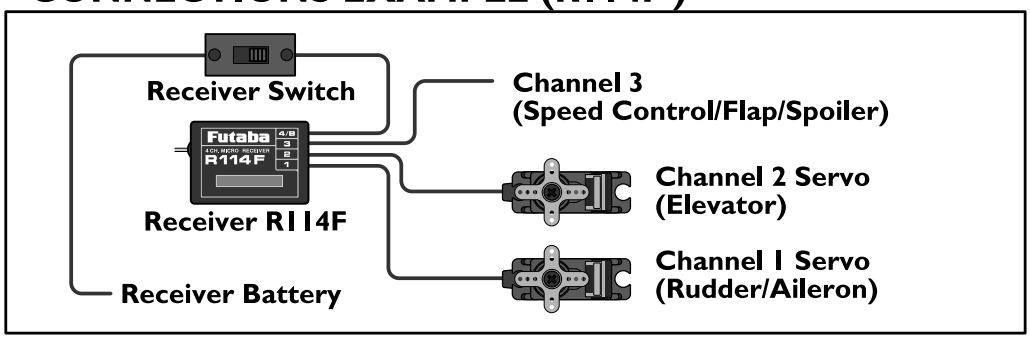
CONNECTIONS EXAMPLE (R132JE)



CONNECTIONS EXAMPLE (R114H)



CONNECTIONS EXAMPLE (R114F)



⚠WARNING

CONNECTOR CONNECTION

❗ Insert the receiver, servo, and battery connectors fully and firmly.

If vibration, etc. causes a connector to work loose during flight, the plane may crash.

RECEIVER VIBRATIONPROOFING / WATERPROOFING

❗ Vibrationproof the receiver by wrapping it in sponge rubber or some such material. If the receiver may get wet, waterproof it by placing it in a plastic bag.

If the receiver is subjected to strong vibration and shock, or gets wet, it may operate erroneously and cause a crash.

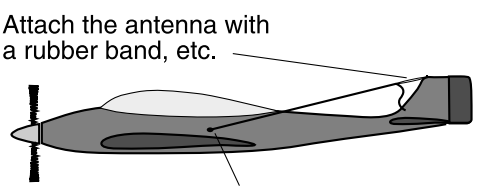
RECEIVER ANTENNA

🚫 Do not cut or bundle the receiver antenna. Also, do not bundle the antenna together with the servo lead wires.

Cutting or bundling the receiver antenna will lower the receiver sensitivity and shorten the flight range and cause a crash.

<Antenna installation>

For aircraft, attach the antenna to the top of the tail.



Use a rubber grommet, etc. at the part at which the antenna comes out of the fuselage so that it will not break. Also tie a knot in the antenna wire inside the fuselage so that the antenna cannot be pulled out.

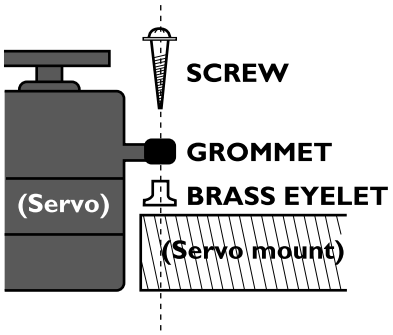
SERVO THROW

❗ Operate each servo horn over its full stroke and adjust so that the pushrod does not bind or is not too loose.

Unreasonable force applied to the servo horn will adversely affect the servo and drain the battery quickly.

SERVO INSTALLATION

❗ Install the servos to the servo mount, etc. through a rubber grommet. Also install the servos so that the servo case does not directly touch the servo mount or other parts of the fuselage.



POWER SWITCH INSTALLATION

When installing a receiver power switch to the fuselage, cut a rectangular hole somewhat larger than the full stroke of the switch knob and install the switch so it moves smoothly from ON to OFF.
Also install the switch where it will not come into direct contact with engine oil, dust, etc. Generally, install the switch to the fuselage at the side opposite the muffler exhaust.

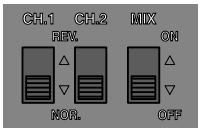
ADJUSTMENTS

The operating direction, neutral position, and steering angle of each servo are adjusted.

⚠CAUTION

The basic linkage and adjustments of the fuselage conform to the fuselage design drawings and kit instruction manual. Be sure that the center of gravity is at the prescribed position.

ADJUSTMENT PROCEDURE



Before making any adjustments, set the channel 1 and 2 Servo Reversing switches and MIX switch on the front of the transmitter to the lower (NOR/OFF) position.

However, when using the V-tail or Elevon mixing, set the MIX switch to the upper (ON) position.

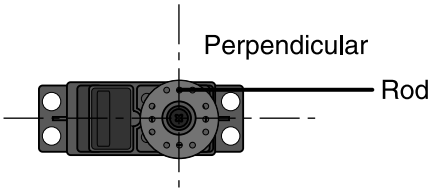
Turn on the transmitter and receiver power switches and make the following adjustments:

1 Check the direction of operation of each servo.

If a servo operates in the wrong direction, switch its Servo Reversing switch. (The direction of operation can be changed without changing the linkage.)
*Note that the direction of the aileron, V-ail, or Elevon servo is easily mistaken. (Page 9)

2 Check the rudder/aileron and elevator neutral adjustment and left-right (up-down) throw.

Check that when trimmed to the center, the servo horn is perpendicular to the



servo and check the neutral position of the fuselage control surfaces (rudder/aileron, elevator, etc.). If the neutral position has changed, reset it by adjusting the length of the rod with the linkage rod adjuster.
When the throw is unsuitable (different from steering angle specified by the kit instruction manual), adjust it by changing the servo horn and each control surface horn rod .

3 If necessary,

- Adjust the speed control in accordance with its instruction manual.
- Check the flap or spoiler linkage.

4 After all the linkages have been connected, recheck the operating direction, throw, etc.

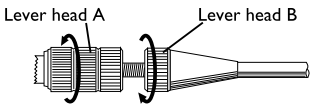
*Before flight, adjust the aircraft in accordance with the kit instruction manuals.

5 Fly the plane and trim each servo.

USING OTHER FUNCTIONS

NON-SLIP ADJUSTABLE LEVER HEAD

The length of the stick lever head can be adjusted.



1 Unlock lever heads A and B by turning them in the arrow directions.

2 Set the stick to the most comfortable length and lock the lever heads by turning them in the opposite direction of the arrows.

CHARGING THE NI-CD BATTERY

(If using a Ni-cd battery)

⚠WARNING

❗ Use the special charger, or digital proportional R/C quick charger, sold separately to charge the digital proportional R/C ni-cd battery.

Overcharging will cause burns, fire, injury, or blindness due to overheating, breakage, electrolyte leakage, etc.

🚫 Never plug the special charger into an AC outlet other than specified.

If the charger is plugged into an AC outlet other than specified, overheating, sparking, etc, may cause burns, fire, etc.

⚠CAUTION

❗ When not using the ni-cd battery charger, disconnect it from the AC outlet.

CHARGING THE NI-CD BATTERY

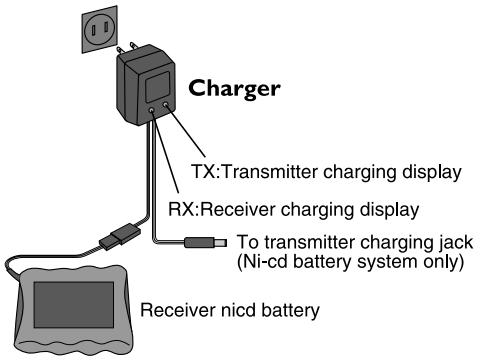
The transmitter and receiver ni-cd batteries can be charged simultaneously or independently.

1 Connect the charger transmitter connector to the transmitter charging jack and the charger receiver connector to the receiver servo ni-cd battery.

2 Connect the charger to an AC outlet.

3 Check that the charging LED light.

4 At the end of charging, disconnect the charger from the AC outlet.



REFERENCE

RATINGS

*Specifications and ratings are subject to change without prior notice.

TRANSMITTER *T2FR/T3FR*

(1 stick, 2/3 channels)
- •Transmitting frequency: 27, 35, 40, 41, 72 MHz
- •Modulation method: AM or FM
- •Power requirement: 12V (penlight battery x8) or 9.6V ni-cd battery (NT8F600B)
- •Current drain: 180mA

RECEIVER *R114F*

(4 channels, FM micro receiver)
- •Receiving frequency: 27, 29, 35, 40, 41, 72 MHz
- •Intermediate frequency: 455kHz
- •Power requirement: 4.8V (common with servo)
- •Current drain: 6mA
- •Size: 21.8x31.7x13.5mm
- •Weight: 10.9g

RECEIVER *R132JE*

(2 channels, AM receiver)
- •Receiving frequency: 27, 29, 40, 41, 50, 72, 75 MHz
- •Intermediate frequency: 455kHz
- •Power requirement: 4.8 - 8.4V
- •Current drain: 30mA (4.8V, No signal)
- •Size: 47.2x33.3x17.3mm
- •Weight: 16.6g

SERVO *S3003*

(standard servo)
- •Power requirement: 4.8V or 6V (common with receiver)
- •Output torque: 3.2kg-cm (4.8V)
- •Operating speed: 0.23sec/60˚ (4.8V)
- •Size: 40.4x19.8x36mm
- •Weight: 37.2g

RECEIVER *R114H*

(4 channels, AM receiver)
- •Receiving frequency: 27, 29, 40, 41, 50, 72, 75 MHz
- •Intermediate frequency: 455kHz
- •Power requirement: 6V (penlight battery x4) or 4.8V nicd battery (common with servo)
- •Current drain: 18mA
- •Size: 33x47.4x19.8mm
- •Weight: 27.5g

SERVO *S3106*

(Micro servo)
- •Power requirement: 4.8V (common with receiver)
- •Output torque: 1.2kg-cm (4.8V)
- •Operating speed: 0.11sec/60˚ (4.8V)
- •Size: 21.8x11x19.8mm
- •Weight: 9.5g

TROUBLESHOOTING

If your digital proportional R/C set does not operate, its range is short, it intermittently stops operating, or it operates erroneously, take the action shown in the table below. If this does not correct the trouble, please contact a Futaba dealer.

Check point	Check item	Action
Transmitter/receiver battery	Dead battery.	Replace the battery. Charge the nicd battery.
	Incorrect loading.	Reload the batteries in the correct polarity.
	Faulty contact connection.	If the contact spring is deformed, correct it.
	Dirty contacts.	Wipe with a dry cloth.
Transmitter antenna	Loose.	Screw in.
	Not extended to full length.	Extend fully.
Crystal	Disconnected.	Push in.
	Wrong band.	Match transmitter/receiver band.
	Different from specification.	Replace with specified crystal.
Connector connection	Incorrect wiring.	Reinsert.
	Disconnection.	Push in.
Receiver antenna	Close to other wiring.	Separate from other wiring.
	Not cut?	Request repair.
	Not bundled?	Install in accordance with instruction manual.
Servo linkage	Binding or looseness	Adjust at the fuselage side.
Motor (electric motor plane)	Noise countermeasures.	Install a noise absorbing capacitor.

GLOSSARY

The following defines the symbols and terms used in this instruction manual.

Aileron
Control surface at the left and right sides of the main wing of an aircraft. It usually controls turning of the aircraft.

Channel
Represents the number of control systems. It can also represent the number of servos that are operated.

Down
Means down elevator. It is the direction in which the trailing edge of the elevator is pointing down.

Elevator
Control surface that moves up and down on the horizontal stabilizer of an aircraft. It usually controls up and down.

Linkage
Mechanism that connects the servos and the fuselage control surfaces.

MIX
Means the mixing function. V-tail mixing, Elevon mixing, etc..

Modulation method
Two modulation methods are used with radio control: AM (Amplitude Modulation) and FM (Frequency Modulation). Another method that encodes and transmits the modulated signals is called "PCM".

Neutral
Means the neutral position. It is the state in which a transmitter stick returns to the center when not operated.

Normal (NOR)
For the servo reversing function, it is the normal side. The opposite side is the reverse side.

Proportional
Because today's radio control sets control servos in proportion to stick operation, radio control equipment is called proportional.

Reverse (REV)
With the servo reversing function, this is used to mean the reverse side. The opposite side is the normal side.

Rod
A bar that connects the servos and the fuselage control surfaces.

Rudder
Tail control surface that controls the direction of the aircraft.

Servo horn
A part that is installed to the shaft of a servo and changes the rotating motion of the servo to linear motion and transmits the linear motion to a rod. Servo horns come in various shapes.

Servo mount
Fuselage base for installing a servo to the fuselage.

Stick
Rod for operating the transmitter.

Throttle
Part that controls the air mixture at the engine intake. When opened (throttle high side), a large air mixture is sucked in and the engine speed increases. When closed (throttle low side), the engine speed decreases.

Trim
A device that fine adjusts the neutral point of each servo for safe flying. It is a mechanism that corrects bad tendencies of the aircraft.

Up
Means up elevator. Direction in which the trailing edge of the elevator is pointing up.

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