



# Multi Charger CR-2500

## Instruction Manual

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- The contents of this manual are subject to change without prior notice.
- The contents of this manual should be complete, but if you find any errors or omission, please contact us.
- Futaba is not responsible for the results of use of this product by the customer.

Thank you for purchasing a CR-2500. The CR-2500 is a DC charger for the lithium ion battery LT2F2200 used in Futaba radio control transmitters, and for the nickel cadmium and nickel metal hydride batteries used in receivers and glow boosters. This battery charger has a function of discharging the battery for the receivers, and can find the most suitable condition to charge batteries. But there are things that you must be aware of.

To fully enjoy the performance of the charger and to use the charger safely, please read this instruction manual thoroughly before use.

### CAUTION

- ❗ Do not leave the side while charging. If you notice any abnormality of the charger or battery during charging, immediately stop charging. If the battery temperature rises to 60°C or higher, it is extremely dangerous. If the battery suddenly becomes hot, immediately stop charging.
- Due to the characteristics of NiCd battery and nickel metal hydride battery, some of them are very hard to detect their delta-peak. If the charger cannot detect the delta-peak and continues charging, the battery would be overcharged and become abnormally hot and extremely dangerous.

### Features of CR-2500

- CR-2500 can charge the lithium ion battery LT2F2200 used in Futaba radio control transmitters, and the nickel cadmium and nickel metal hydride battery used in receivers and glow boosters.
- CR-2500 is employing the so-called AUTO-CUT by constant current and constant voltage to manage charging batteries of the transmitter. It is also employing the so-called AUTO-CUT by the delta voltage peak detection to manage charging batteries of the receivers and glow boosters.
- CR-2500 can charge simultaneously two batteries, such as a battery for the transmitter and a battery for receiver or a battery for the transmitter and a battery for the glow lamp booster.
- Charging current for receiver and glow booster is adjustable.  
Transmitter: AUTO, Receiver: 0.05A - 2.0A (0.05A step), Glow lamp booster: 1A - 2.5A (0.5A step)
- The input voltage, output voltage, charging current, peak voltage, charging time and charging amount can be monitored on the LCD screen.
- \* Each battery voltage shown on the screen is the voltage that is measured at its corresponding output connector.
- \* The capacity to be charged varies depending on the environmental temperature and the condition of the battery itself. Please use the capacity shown on the screen only as a rough idea.

### Input power supply (12VDC power supply)

Use a 12V car battery or a power supply having an output capacity of 6A or more at DC11~15V as the input power supply.

### CR-2500 Ratings

- Input voltage: DC11V~15V (Error will be displayed when the battery voltage is 10.5V or less.)
- Corresponding batteries: TX: 2,000mAh (LT2F2200)  
RX: 50~2,000mAh (4~6 cells)  
GLOW: 1,000~2,500mAh (1 cell)
- Charging current range: TX: 0.1~1.5A AUTO  
RX: 0.05~2A, GLOW: 1.0~2.5A
- Case size: 151x85x35mm (Excluding projecting parts and cord compartment.)
- Weight: 365g

(Specifications and ratings are subject to change without notice accompanying technical developments.)

### Description of CR-2500 Parts

#### SELECT dial

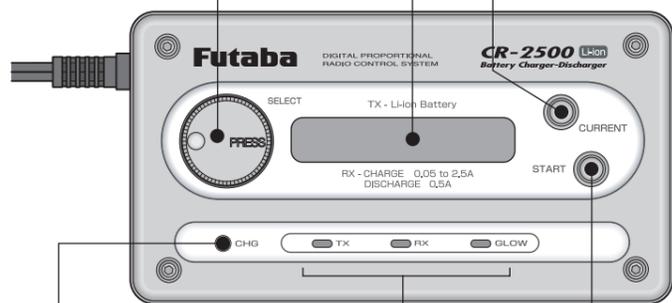
Turn the dial to set the charging current on the current setting screen (except TX). Push the SELECT button to change the mode. Every time you push the SELECT button, the mode changes to TX->RX-CHG->RX-DISCHG->RX-CYCLECHG->GLOW->TX.

#### LCD display

This display shows various information such as charging current setting, data of each mode, input voltage and error messages.

#### CURRENT button

Calls the charging current setting screen.



**CHG LED display**  
It turns on while charging. (It blinks on and off while discharging.)

**TX/RX/GLOW LED display**  
The output data corresponding to the lit LED is displayed on the LCD display. (TX: Red, RX: Red/Blue/Red-Blue, GLOW: Orange)

**START button**  
Charging start/stop button

#### TX output connector

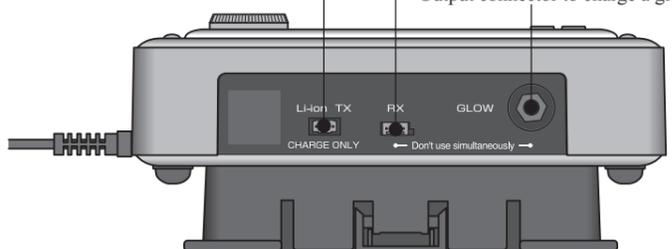
Output connector to charge a transmitter battery

#### RX output connector

Output connector to charge a receiver

#### GLOW output connector

Output connector to charge a glow booster battery



- \* TX and RX or TX and GLOW can be charged simultaneously.
- \* RX output and GLOW output cannot be used simultaneously. Only the GLOW side is effective even if a battery is connected to both outputs.

### Usage precautions

#### DANGER

- ⊘ Do not use RX/GLOW terminal to charge batteries other than nickel cadmium and nickel hydride batteries.
- Charging a noncompliance battery will cause the battery to overheat or give off sparks.

#### WARNING

- ⊘ Do not use the charger near materials that may ignite.
- There is a danger of ignition by sparking when the battery is connected or disconnected.

#### CAUTION

- ⊘ Never connect the battery in reverse.
- Reverse connection will cause the battery to overheat or will damage the inside of the charger.
- ⊘ Do not add an additional charge after charging.
- AUTO-CUT will not function and the battery will be overcharged, overheated and become extremely dangerous.
- ⊘ Never get the charger wet.
- The interior of the charger is a precision electronic circuit and entry of water will cause erroneous operation. If the charger gets wet, always have it repaired.
- ⊘ Do not charge a warm battery.
- Otherwise, the specified charging amount cannot be obtained and the battery performance will not be fully achieved. Be sure to charge the battery after it has cooled.
- ⊘ Never charge with a current exceeding the nominal capacity (IC) of the rechargeable battery.
- If a battery is charged with a current exceeding 1C, the battery will overheat and deteriorate.
- ⊘ Do not connect two battery packs or more to one output terminal.
- It is extremely dangerous because the batteries will short circuit and AUTO-CUT will not function normally.
- ⊘ When taking power from a car, do not operate the ignition key during charging. Also, do not charge while the car is in motion.
- Otherwise, it may cause input voltage fluctuations and malfunctions due to vibration, etc. If an abnormality occurs while the car is running, it won't be coped with and would cause serious accidents.
- ⊘ Do not perform charging with the charger on vinyl, plastic or other materials that melt easily, on a car seat, or other flammable articles.
- The charger itself builds up heat during charging. Also, batteries could also overheat for some reason.
- ❗ Avoid extremely cold and hot places and the direct sunlight when you charge batteries. It is recommended to perform charging within the 10 ~ 30°C range.
- Otherwise, it may cause abnormal charging and overheat.
- ❗ When charging a new battery or a battery that has not been used for a long time, AUTO-CUT may not function. If the battery becomes abnormally hot, stop charging.
- When a nickel cadmium or nickel metal hydride battery is new or has not been used for a long time, the delta peak, which is the criterion for the end of charging, will be difficult to obtain and may not be detected. If charging is continued, the battery will be overcharged and become abnormally hot and is extremely dangerous. When the delta peak is not detected and AUTO-CUT does not function, it may be possible to detect the delta peak by discharging and charging the battery 2~3 times using a standard charging current charger.
- ❗ Charge a battery that has been appropriately discharged. (Except Lithium-ion LT2F2200)
- If the batteries such as nickel cadmium battery for RX/GLOW and nickel metal hydride battery are repeatedly charged with a charge remaining, they may not return to their original performances. On the contrary, if the batteries are completely discharged, they may also not return to their original performances. The criterion for the charge remaining is 0.9V/cell.
- ❗ Be careful that the cable is not pinched or shorted.
- If the cable is shorted, the battery may heat up and give off sparks.
- ❗ During charging, check the charging amount on the data screen. When the charging amount becomes extremely large, stop charging.
- AUTO-CUT may not function for some reason.
- ❗ Do not let the metal parts of a glow booster touch other conductive parts during charging.
- Shorting is extremely dangerous.
- ❗ After the end of charging, disconnect the battery from the charger.

### Meaning of Special Markings

Pay special attention to safety where indicated by the following marks:

#### DANGER

Procedures which may lead to dangerous conditions and cause death/serious injury 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.

- ⊘ : Prohibited
- ❗ : Mandatory

### Input cable (cigarette socket/clip)

Use the cigarette socket or clip appropriately. CR-2500 does not have a power switch. When the power cable is connected, CR-2500 automatically turns on. Connect the red clip to the positive side of the input power supply and the black clip to the negative side.

Input clip (red)      Input clip (black)



Cigarette socket



(While pressing the side wall)

#### [Cord storage]

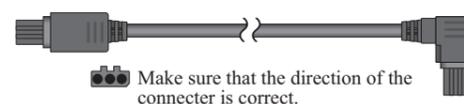
The photograph shows an example of storing cable. To open and close the cover, push the arrow part in the photograph. If the cover is forced open, the lock claw could break off.

### [Accessories]

The following charging cables (2 types) are supplied with the CR-2500 set. Use these cables when charging a battery mounted in the fuselage and when charging the battery by connecting the charger to the charging jack of a transmitter.

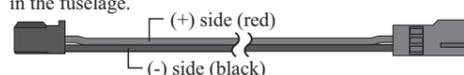
#### TX charging adapter (70cm)

Use this adapter to charge the battery of the transmitter. You can use either end of the TX Charge Adapter to connect to the transmitter or the charger.



#### Charging adapter (200cm)

Use when connecting the charger to a battery, etc. mounted in the fuselage.



### CAUTION

- ⊘ This extension cable is designed only for the use of Futaba transmitters embedded with Li-ion LT2F2200. Do not use this extension cable for other purposes.
- ⊘ Keep the power of the transmitter turned off while you are charging. (Emitting radio may cause malfunctions.)
- ⊘ Do not modify the charging adapter (extension cable).
- If shorted or connected in reverse, CR-2500 or the battery will be abnormally heated and damaged.

## Charging method

### CAUTION

❗ Avoid extremely cold and hot places and the direct sunlight when you charge batteries. It is recommended to perform charging within the 10 ~ 30°C range.  
• Otherwise, it may cause abnormal charging and overheat.

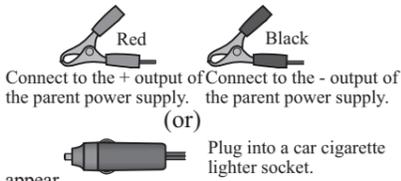
## 1 Power supply connection

When the input cable is connected to the 12VDC power supply and the power is turned on, the CR-2500 automatically starts and the opening screen will pop up.

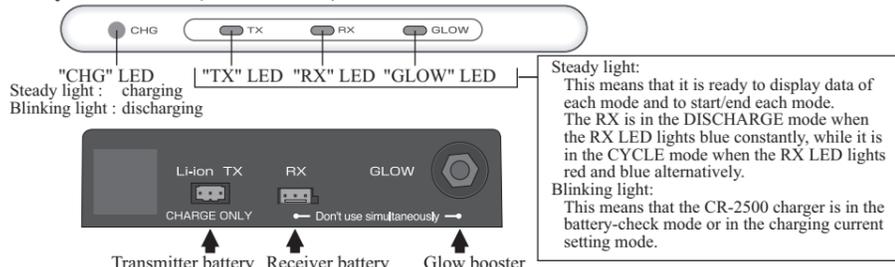
(For about 2 seconds indication)

Futaba  
CR-2500 V\*. \*

\*After the opening screen being displayed, the TX data screen will appear.



## 2 Battery connection (TX/RX/GLOW)

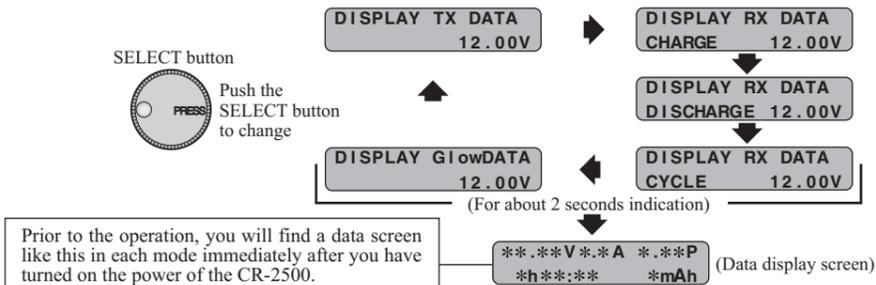


Choose the adequate type of connector and connect the battery, then the corresponding LED in the "TX", "RX", and "GLOW" LEDs will turn on constantly after blinking as the battery check goes on. The charging current setting screen will automatically pop up when you connect the battery to RX or GLOW.

When an over-discharged battery was connected, the charger may not be able to detect the battery and the LED lamp will not light. Wait 2 ~ 3 minutes in the connected state. If the LED lamp lights, charging is possible. If the LED lamp does not light, charge the battery with the standard charging current (0.1 C).

## 3 Changing operational mode and its data screen (TX/RX/GLOW)

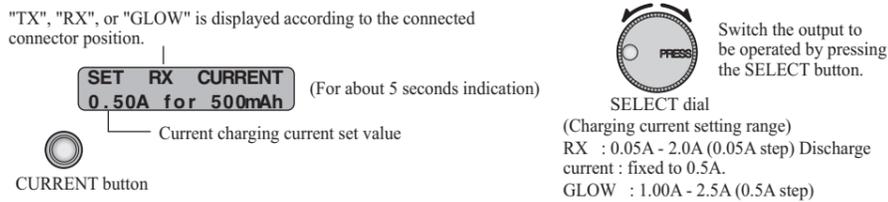
When a battery is connected to any one of the TX, RX and GLOW terminals, the CR-2500 charger automatically detects its mode and displays the data of the battery. And each button will become operational. But if you want to change the mode while one or two outputs are connected, you can change the mode manually by pushing SELECT button. Every time you push the SELECT button, the mode changes to TX->RX-CHG->RX-DISCHG->RX-CYCLECHG->GLOW->TX.



Prior to the operation, you will find a data screen like this in each mode immediately after you have turned on the power of the CR-2500.

## 4 Charging Current Setting (RX/GLOW)

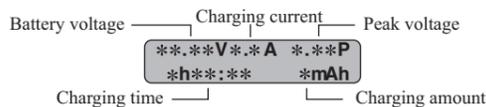
Check the charging current on the current setting screen first. If necessary to change the charging current, turn the SELECT dial while this screen is being displayed. Even if the current setting screen is closed, you can recall it by pushing the CURRENT button.



### CAUTION

❗ Never charge with a current exceeding the nominal capacity (1C) of the rechargeable battery.  
• If a battery is charged with a current exceeding 1C, the battery will overheat and deteriorate.

The current setting screen closes and the data screen opens. Each data is displayed during charging.



## 5 Start and end each mode (TX/RX/GLOW)

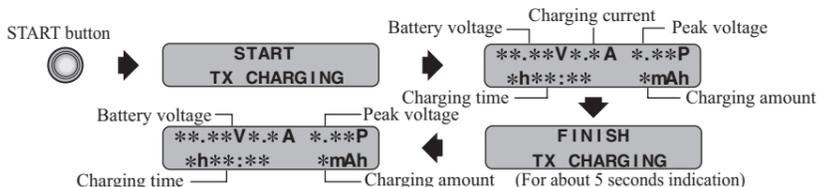
### CAUTION

- ❗ Do not leave the side while charging. If you notice any abnormality of the charger or battery during charging, immediately stop charging.  
• If the battery temperature rises to 60°C or higher, it is extremely dangerous. If the battery suddenly becomes hot, immediately stop charging.
- ❗ When taking power from a car, do not operate the ignition key during charging. Also, do not charge while the car is in motion.  
• Otherwise, it may cause input voltage fluctuations and malfunctions due to vibration, etc. If an abnormality occurs while the car is running, it won't be coped with and would cause serious accidents.
- ❗ When charging has been completed, disconnect the battery from the CR-2500 after confirming that the battery has been properly charged. In order to do so, check data such as peak voltage and charged capacity and whether the battery has become as warm as human body.

The followings are descriptions about how to start or end each mode. RX has three modes, which are Charging, Discharging and Cycle modes. In order to change from the mode currently under operation to another mode, stop the current mode by pushing the START button and then change the mode.

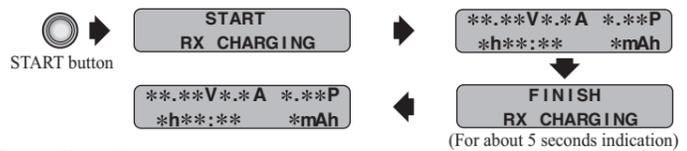
### TX CHARGE MODE

While TX LED is lit red, the charger is in TX charge mode. Charging current is automatically set and cannot be changed. When you push the START button, the "CHG" LED turns on and the charging starts automatically. You can monitor the charging status on the data screen after about 5 seconds of START screen. The charging current will gradually decrease as the charging progresses. When the charging reaches 90% of the capacity, the end-alarm beeps and one-hour charging timer starts. Then, LCD display starts showing "TIMER CHARGING" screen and normal data screen alternatively. (The display shows the remaining time and the accumulated time alternatively during the timer charging.) As the timer-charging is a sort of very tiny current charging, and more than 90% of the battery capacity has been charged, the battery can be said to be ready for use. CHG LED is off during timer charging.



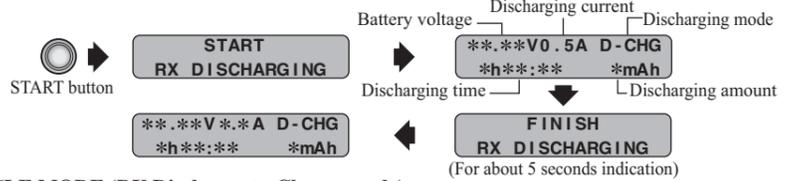
### RX CHARGE MODE

While RX LED is lit red, the charger is in RX charge mode. After confirming the charging current on the current setting screen, push the START button, then the "CHG" LED turns on and the charging starts. You can monitor the charging status on the data screen after about 5 seconds of START screen. When charging is completed, the end screen appears with the alarm sound (beep-beep-beep-beep, beep-beep-beep-beep, beep-beep-beep-beep). Then, the end screen switches to the data screen 5 seconds later. The "CHG" LED is off.



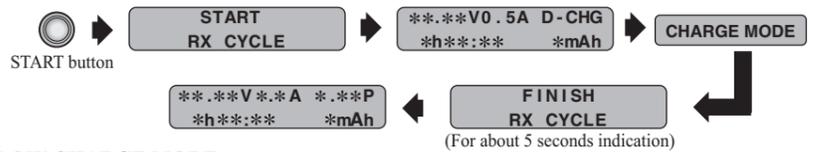
### RX DISCHARGE MODE

While RX LED lit blue, the charger is in RX discharge mode. The charging current is fixed to 0.5A, and it cannot be changed. Push the START button, then the "CHG" LED blinks and starts discharging. You can monitor the discharging status on the data screen after about 5 seconds of START screen. When discharging is completed, the end screen appears with the alarm sound (beep-beep-beep-beep, beep-beep-beep-beep, beep-beep-beep-beep). Then, the end screen switches to the data screen 5 seconds later. The "CHG" LED is off.



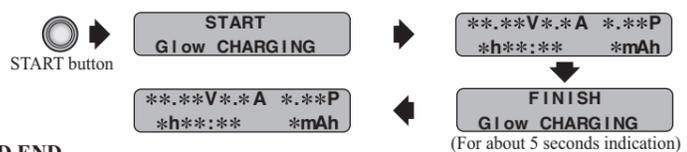
### RX CYCLE MODE (RX Discharge-to-Charge mode)

When the RX LED is showing blue and red alternatively, the charger is in the Discharge-to-Charge mode. The charging current is fixed to 0.5A, and it cannot be changed. Push START button, then the "CHG" LED blinks and starts discharging. You can monitor the discharging status on the data screen after about 5 seconds of START screen. The discharging ends with the alarm sound (beep-beep-beep-beep, beep-beep-beep-beep, beep-beep-beep-beep). Immediately after discharging is completed, charging starts with the charging current set by this mode. Setting of the charging current is the same as RX CHARG MODE. The "CHG" LED is on during the charging. When charging is completed, the end screen appears with the alarm sound (beep-beep-beep-beep, beep-beep-beep-beep, beep-beep-beep-beep). Then, the end screen switches to the data screen 5 seconds later. The "CHG" LED is off.



### GLOW CHARGE MODE

When GLOW LED is lit orange, the charger is in the GLOW charge mode. Check the charging current on the current setting screen, then push START button to start charging. The "CHG" LED turns on and the charging starts. You can monitor the charging status on the data screen after about 5 seconds of START screen. When charging is completed, the end screen appears with the alarm sound (beep-beep-beep-beep, beep-beep-beep-beep, beep-beep-beep-beep). Then, the end screen switches to the data screen 5 seconds later. The "CHG" LED is off.



### FORCED END

When you want to forcibly end charging or discharging midway, push the START button, then charging will stop. At this time, the display switches to the data screen about 5 seconds after an audible alarm sounds (beep-beep-beep-beep, beep-beep-beep-beep, beep-beep-beep-beep) and the FORCED END screen appears. "CHG" LED is off.



### [Before you start charging]

When a battery is connected, the charger automatically checks the battery. When the START button is pushed immediately after the connection, an error may be displayed, depending on the state of the battery. In such a case, reset the error by pushing the CURRENT button. Wait until the output voltage on the screen has stabilized and then start charging or discharging by pushing the START button. Always check the charging current on the current setting screen before starting charging. Set the charging current to the nominal capacity (1C) or less of the battery. For example, for a 600mAh battery set the charging current to 0.6A or less.

### [Data screen]

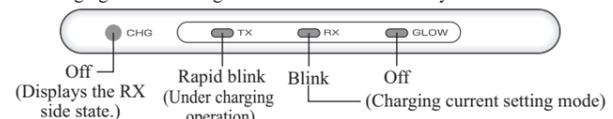
Every data except battery data will remain on the screen until you connect the next battery even if you disconnect the battery after charging.

## LED indications for the simultaneous 2 modes

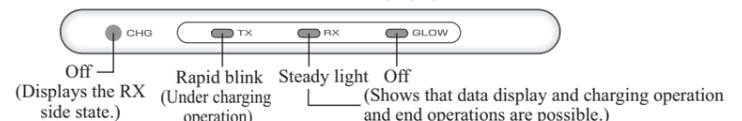
When charging 2 modes simultaneously, the LED indications are not completely as same as those shown in the "Battery connection (TX/RX/GLOW)". Perform charging by referring to the examples shown below.

### [Connection examples]

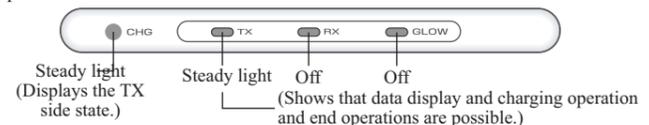
When a receiver battery is connected while a transmitter battery is being charged, the LEDs will light as shown below and the charger enters the charging current setting mode for the receiver battery.



After the charging current setting screen being closed, the LEDs will light as below. Then you will see the transmitter battery data on the screen and will become able to start or end charging operation.



When you push the SELECT button four times to switch the screen display mode to the "TX" side, you will see the LEDs being displayed as shown below. Then you will see the transmitter battery data on the screen and will become able to start or end charging operation.



\*Means that data screen is active and charging start/end operations are possible.

When RX LED is lit blue, the charger is in DISCHARGE mode.

When the RX LED is showing the mixed color of blue and red, the transmitter is in CYCLE mode.

## Error messages, etc

### If you disconnect the battery during charging;

If the battery is disconnected while charging, the alarm will beep and the error message on the right will appear. The "CHG" LED goes off.

NO CONNECT  
\*\* BATTERY

### If input voltage drops;

If the input voltage drops, the error message on the right will appear. Check the 12VDC power supply.

Error: INPUT  
LOW BATTERY

### If outputs are shorted;

If the outputs of the charger are shorted, the error message on the right will appear. Remove the short circuit.

Error: OUTPUT  
SHORT OR REVERSE

### If output voltage rises abnormally;

If the output voltage of the charger rises abnormally, the error message on the right will be displayed and the charger will automatically stop charging. Check the battery.

Error: OUTPUT  
HIGH PEAK

### <When requesting repair>

Before requesting repair, read this instruction manual again and check the charger. When there is an abnormality, request repair to your local Futaba dealer.

### <Recycling nickel batteries>

Used nickel batteries are a valuable resource. Tape or other wise process the terminals so that are not shorted and take the used battery to your local recycling center.