



AC/DC 1–14 Cell Variable Rate Peak Prediction Charger Instructions



E-fliteTM

Thank you for purchasing the E-fliteTM Pinnacle+TM AC/DC Peak Prediction Charger. The Pinnacle+ can be powered from either a 110V AC or 12V DC power source, and will peak charge and discharge 1–14 cell (1.2–16.8V) Ni-Cd and Ni-MH battery packs. It features a 16-bit microchip CPU controller with a large LCD display indicating capacity, voltage and charge rate.

The Pinnacle+ has unique peak prediction circuitry that ensures your batteries receive an accurate charge every time, and protects your Ni-Cd and Ni-MH batteries from the dangers of overcharging. The Pinnacle+ does this by continuously monitoring the battery's voltage curve and calculates (predicts) when the peak (100% charge) will occur.

When the batteries have peaked, the Pinnacle+ stops fast charging at exactly that point and then advances to trickle mode. This is essential in order to avoid damaging Ni-Cd and especially Ni-MH cells that are sensitive to overcharging. This circuitry is superior to conventional peak detection circuitry, which continues to fast charge even after the batteries are fully charged, and can cause damage to Ni-Cd and Ni-MH cells.

Features

- Superior peak prediction circuitry ensures maximum battery life
- High-efficiency direct current/rising voltage exchange mode minimizes heat output
- Large LCD display indicates mAh, voltmeter, and ammeter
- DC fan for efficient cooling
- LED display with three-color functions indicates charge, discharge and trickle modes
- Reverse polarity protection
- Push-button Start
- Charge beeper indicates when charge is complete
- Banana plugs with alligator clips adapter included
- Receiver, transmitter, BEC- and Tamiya-style charge leads included

Specifications

- 12V DC-powered or 110V AC-powered
- Charges, trickle charges and discharges 1–14 cell packs
- Ni-Cd and Ni-MH compatible
- Voltage booster to DC 28V
- 7.5 amp fuse safety circuit
- Variable charge rates: 200mA–5A (13- and 14-cell packs may not reach 5A)
- 16-bit processor with high-resolution displays features

Functions/LCD Screen Readings

| <i>Operation</i> | <i>LED Condition/Beep</i> | <i>Function</i> |
|---------------------------------|---------------------------|--------------------------------|
| Push Once | Red/Beep Once | Fast Charge |
| Push Twice | Orange & Red/Beep Twice | Cycle (Charge After Discharge) |
| Push Three Times | Orange/Beep Three Times | Discharge |
| Connect Battery Without Pushing | Green | Trickle Charge (150 mA) |
| Push One More Time After Action | Green | Return to Trickle Charge |

Error Modes

The Pinnacle+ features a self-diagnostic mode with the following error codes:

- “ERR1” A short circuit or the safety fuse is burned out
- “ERR2” An error has occurred in the charging process (loose connection, contacts or current is adjusted after the initial 30-second start up mode)
- “ERR6” The peak charge is abnormal because the voltage is too low
- “ERR” The power supply is insufficient (below 10V)

Note: “ERR6” and “ERR” will only occur when using a 12V power source. To cancel error modes, disconnect the batteries from the charger.

Supplying DC Power to the Pinnacle+

The Pinnacle+ is powered by connecting it to a 12V DC power source, such as a 12V sealed battery (HAN102), a 12V automobile battery (car must be not be running) or through your field box power panel. The battery capacity must be over 5Ah.

The Pinnacle+ can also be powered from a standard 110V AC outlet.

12V DC connections:

Step 1. Attach the red (positive) banana plug to the red (positive) terminal on your 12V battery or power panel.

Step 2. Attach the black (negative) banana plug to the black (negative) terminal. Alligator clips have been included to power your charger with a 12V hobby battery. Once your charger is given power, it will beep once and the LCD will show 28V when voltmeter is selected, which is normal.

110V AC connections:

Step 1: Locate the power cord supplied with your Pinnacle+™ charger. Plug the cord into a 110V AC outlet.

Step 2: Plug the opposite end of the cord into the receptacle in the back of the charger. Note that the plug will only fit in one direction. Once your charger is given power, it will beep once and the LCD will show 28V when voltmeter is selected, which is normal.

Choosing Charge Leads:

The Pinnacle+ includes several charge lead options to best suit your application.

- A BEC-style charge lead is included for charging slow and park flyer packs with a BEC (JST) connector.
- A Tamiya-style charge lead is also included to charge those packs that have this connector, popular on electric gliders, cars and boats.
- A universal receiver charge lead is included for charging all of the major brands of receiver battery packs.
- A transmitter charge lead is included to charge transmitters without removing the battery from the unit. Follow the procedure noted below in Step 1 and Step 2, except when charging JR® transmitters.

Note: When charging JR transmitters, it will be necessary to reverse the polarity of the charge jack by plugging the end of the red lead into the black charger hook-up and plug the end of the black lead into the red charger hook-up. (Think red-to-black, black-to red.) *Failure to do so may result in damage to your transmitter.*

Step 1. Hook up the ends of the leads to the terminal of the charger, making sure that you attach the red of the lead wire to the red of the charger hook-up.

Step 2. Next, attach the black of the lead wire to the black of the charger hook-up.

Step 3. Plug the connector of the charge lead into the connector of the battery pack. The beeper will sound once and the LED light will flash green, indicating the charger is in trickle mode. *Please observe polarity when attaching the leads to the charge output.*

Charging Process

Step 1. Push the Start/Select button once. You will here a beep and the red light will quickly flash to indicate fast charge condition.

Step 2. Use the Charge Rate adjustment knob to select the appropriate charge rate for your battery pack.

Note: Refer to the chart below for recommended charge rates.

The LCD readout will correspond to the current/voltage. After 30 seconds the red light will stay on and no longer flash.

Note: Do not adjust the Charge Rate knob in this state. If it is adjusted, the charging process will stop and shut down. The error code "ERR2" will display.

Step 3. While charging, the red light will remain on.

Note: During the charge cycle the display will show a low charge current on a regular interval. This is a charger self-test which is done to optimize charging.

Step 4. When charging is complete, the charger will beep ten times and the LED flashes green. The charger is now in trickle charge. The beeper will sound once every few minutes until the battery is disconnected.

Step 5. Push the Start/Select button to process any further charge function if necessary.

Step 6. To re-peak the pack, simply push the Start/Select button. This must be done without disconnecting the battery pack. The beeper will sound once, and the pack will charge until it peaks. It will then return to trickle charge.

| Battery Capacity | Charge Rate | Typical charge time |
|------------------|-------------|---------------------|
| 150–270 mAh | 0.5 amps | 18–32 minutes |
| 350–500 mAh | 1.0 amps | 21–30 minutes |
| 550–800 mAh | 1.5 amps | 22–32 minutes |
| 850–1200 mAh | 2.5 amps | 20–31 minutes |
| 1500–2000 mAh | 4.0 amps | 22–30 minutes |
| 2400 and above | 5.0 amps | 28 minutes + |

Note: Due to variables such as internal resistance of certain cells and power supply, some 13- and 14-cell packs may not charge at 5 amps.

Note: When charging 8-cell transmitter batteries in the transmitter, the current must be set at 1 amp or less to avoid damage to the transmitter or blowing the fuse.

Cycle Process (Charge After Discharge)

- Step 1. Push the Start/Select button twice and the Pinnacle+ will beep twice, and will begin discharging the battery. The orange LED will remain on and the red LED will flash. This means the unit has begun the cycle mode—charge after discharge.
- Step 2. After the battery packs are discharged under constant voltage, the charger will beep once and advance to trickle mode for a short period of time. The orange LED will shut off and the green and red LED will flash.
- Step 3. The charger will beep again and advance into a fast charge mode, and only the red LED will remain on during charging mode.
- Step 4. After charging is complete, re-peak once to check charging.

Discharge Process

The discharge on the Pinnacle+™ can be varied depending on the battery being discharged. For safe discharge, the discharge rate should be between 1C and 2C, depending on the battery.

Note: For safety reasons, the discharge rate of the charger has been limited so it will not exceed 2.2A

- Step 1. Push the Start/Select button three times and the unit will beep three times, indicating discharge mode. Select the discharge rate using the charge rate knob. The orange LED will remain on.
- Step 2. The battery will start discharging at this point and the discharge current is dependent on the number of cells (6–7 cells should be discharged at 2 amps).
- Step 3. When the voltage drops below .9 volts per cell, the discharge process is complete and the unit will beep once, and advance into trickle charge mode.

Safety Precautions

- Do not leave the battery and charger unattended while in use.
- When charging, constantly monitor the temperature of the battery pack. If the battery becomes hot to the touch, discontinue the charging operation immediately by disconnecting the battery pack.
- Do not allow children to charge battery packs unless supervised by a responsible adult.
- The charger can become hot during charging. Use care when selecting where you will charge the battery packs, choosing heat-resistant surfaces only.
- The Pinnacle+ is designed to charge and discharge Ni-Cd or Ni-MH battery packs only.
Do not use the charger for any other types of batteries.

Warranty and Repair Policy

The Pinnacle+ charger is guaranteed against workmanship and manufacturing defects for a period of 2 years from the original date of purchase. This warranty is limited to the original purchaser of the charger and is not transferable. Warranty repair will not cover units that have been modified, misused or serviced by an unauthorized service center. To speak to a service technician, call (877) 504-0233.

If your charger needs to be repaired, ship the charger in its original box (freight prepaid) to:

Horizon Service Center
Attn: E-flite Service Center
4105 Fieldstone Rd.
Champaign, IL 61822

Include your complete name and address information inside the carton, as well as clearly writing it on the outer label/return address area. Include a brief summary of the difficulty. Date your correspondence and be sure that your name and address appear on this enclosure. Also, please include a phone number where you can be reached during the business day.

Warranty Repairs

To receive warranty service, you must include your original sales receipt verifying the proof-of-purchase date. Providing that warranty conditions have been met, your charger will be repaired free of charge.

Non-Warranty Repairs

Should the repair cost exceed 50% of the retail purchase cost, you will be provided with an estimate advising you of your options. Any return freight for non-warranty repairs will be billed to you. For non-warranty repairs, please advise us of the credit card you prefer to use. Horizon Service Center accepts Visa or MasterCard (must include your card number and the expiration date), and also accepts money orders.