PASSPORT™ ULTRA DUO 200W

x2 Multi-Chemistry AC/DC Battery Charger

INSTRUCTION MANUAL | BEDIENUNGSANLEITUNG | MANUEL D'UTILISATION | MANUALE DI ISTRUZIONI

(DYN4300)

NOTICE

All instructions, warranties and other collateral documents are subject to change at the sole discretion of Horizon Inc. For up-to-date product literature, visit horizonhobby.com and click on the support tab for this product.

Meaning of Special Language

The following terms are used throughout the product literature to indicate various levels of potential harm when operating this product:

NOTICE: Procedures, which if not properly followed, create a possibility of physical property damage AND a little or no possibility of injury.

CAUTION: Procedures, which if not properly followed, create the probability of physical property damage AND a possibility of serious injury.

WARNING: Procedures, which if not properly followed, create the probability of property damage, collateral damage, and serious injury OR create a high probability of superficial injury.

⚠️ **WARNING:** Read the ENTIRE instruction manual to become familiar with the features of the product before operating. Failure to operate the product correctly can result in damage to the product, personal property and cause serious injury.

This is a sophisticated hobby product. It must be operated with caution and common sense and requires some basic mechanical ability. Failure to operate this Product in a safe and responsible manner could result in injury or damage to the product or other property. This product is not intended for use by children without direct adult supervision. Do not attempt disassembly, use with incompatible components or augment product in any way without the approval of Horizon Hobby, Inc. This manual contains instructions for safety, operation and maintenance. It is essential to read and follow all the instructions and warnings in the manual, prior to assembly, setup or use, in order to operate correctly and avoid damage or serious injury.

Age Recommendation: Not for children under 14 years. This is not a toy.

SAFETY PRECAUTIONS AND WARNINGS

⚠️ **WARNING:** Failure to exercise caution while using this product and comply with the following warnings could result in product malfunction, electrical issues, excessive heat, FIRE, and ultimately injury and property damage.

• Never leave the power supply, charger and battery unattended during use.
• Never attempt to charge dead, damaged or wet battery packs.

✓ **Included Items**
JST_XH Balance adapter (2)
Banana plug to EC3™ battery connector (2)
AC power cord (one region-US, EU, AU or Uk)

OPTIONAL ACCESSORIES
DYN4012 - DC Power Cord
DYN5031 - Insulated Charge Adapter, Banana to EC3 Device
DYN5022 - Balancing Adapter Board
DYN5033 - Temperature Sensor: DYN4103, DYN4300

Minimum requirements for use of included software: Microsoft® Windows XP®, Windows 7® or Windows Vista® operating system, Compact disk (CD) reader capable of reading a mini-CD and USB 2.0 port.

FEATURES

• Two charging ports to charge two batteries at once. Batteries can be different capacities and cell counts
• 1A USB charge port compatible with iPhone®, iPod® or similar products
• 100–240V AC (50/60Hz) or 11–18V DC input voltage
• Li-Ion/Li-Po/Li-Fe battery cell count of 1 to 6 series cells
• Ni-Cd/Ni-MH battery cell count of 1 to 15 cells
• Pb battery voltage of 2 to 20V
• Built-in 50W discharger
• Built-in balance circuit
• Short-circuit, over-current, reverse polarity, low input voltage and over-temperature protection
• Storage and Fast Charge mode
• User battery data, store and load up to 10 battery profiles
• (2) 2x16 backlit, blue LCD
• Insulated, color coded, banana jack, power output terminals (Red = Positive (+), Black = Common or Negative (–))
• Internal cooling fans with grill covers
• Operating temperature range of 0°C to +50°C
• Meets IP33CW, IK07 environmental specs
• Rugged industrial plastic case

SPECIFICATIONS

AC Input Voltage	100–240V AC (50/60Hz)
DC Input Voltage	11–18V DC
Charge Current	0.10 to 10.0A per channel in 0.1A increments/200W maximum per channel/400W Total
Discharge Current	0.10 to 5.0A per channel (in 0.1A increments/25W maximum per channel/50W Total)
Operating temperature	0°C to +50°C
Balance Current Drain	300mA per cell
Trickle Charge Current	50 to 200mA
Charging Mode	Peak (Ni-Cd/Ni-MH), CC/CV (Li-Po/Li-Ion/Li-Fe/Pb)

• Never attempt to charge a battery pack containing different types of batteries.
• Never allow children under 14 years of age to charge battery packs.
• Never charge batteries in extremely hot or cold places or place in direct sunlight.
• Never charge a battery if the cable has been pinched or shorted.
• Never connect the charger if the power cable has been pinched or shorted.
• Never connect the charger to an automobile 12V battery while the vehicle is running.
• Never attempt to dismantle the charger or use a damaged charger.
• Never attach your charger to both an AC and a DC power source at the same time.
• Never connect the input jack (DC input) to AC power.
• Always use only rechargeable batteries designed for use with this type of charger.
• Always inspect the battery before charging.
• Always keep the battery away from any material that could be affected by heat.
• Always monitor the charging area and have a fire extinguisher available at all times.
• Always end the charging process if the battery becomes hot to the touch or starts to change form (swell) during the charge process.
• Always connect the charge cable to the charger first, then connect the battery to avoid short circuit between the charge leads. Reverse the sequence when disconnecting.
• Always connect the positive red leads (+) and negative black leads (–) correctly.
• Always disconnect the battery after charging, and let the charger cool between charges.
• Always charge in a well-ventilated area.
• Always terminate all processes and contact Horizon Hobby if the product malfunctions.

⚠️ **WARNING:** Never leave charge unattended, exceed maximum charge rate, charge with non-approved batteries or charge batteries in the wrong mode. Failure to comply may result in excessive heat, fire and serious injury.

⚠️ **CAUTION:** Always ensure the battery are charging meets the specifications of this charger and that the charger settings are correct. Not doing so can result in excessive heat and other related product malfunctions, which can lead to user injury or property damage. Please contact Horizon Hobby or an authorized retailer with compatibility questions.

GETTING STARTED

⚠️ **CAUTION:** Never connect the AC and DC input cords to an active power source at the same time. This will void the warranty, cause product damage and possibly injure the user.

When Using an External DC Power Source:
1. Connect the DC power cord to the charger DC power input port.
2. Connect the DC alligator clips to the DC power source.
3. Power ON the charger with the power switch.
4. When the charger is powered ON, a message will appear on the LCD screen.

NOTICE: Always connect cable polarities correctly.

NOTICE: Always consult 12V battery collateral materials or Horizon Hobby before using with sources other than a standard AC wall outlet.

When Using an External AC Power Source:
1. Connect the AC power cord to the charger AC power input port.
2. Connect the DC power cord to the AC power source.
3. Power ON the charger with the power switch.
4. When the charger is powered ON, a message will appear on the LCD screen.

⚠️ **CAUTION:** Always power ON the charger before connecting a battery, or damage to the charger and the battery can result.

1. Connect the charger to the power source.
2. Power ON the charger.
3. Make program selections in the charger for battery charging.
4. Connect the charger adapters to the charger.
5. Connect the battery to the charger adapters (connect main charging connectors before connecting cell-balancing connectors, where used).
6. Start battery charging.

Not to scale.
Not all wiring shown.
Not all connectors shown.

A. Power Output Red (+)
B. Power Output Black (–)
C. Balance Circuit Adapter Board Connector
D. Temperature Probe Connection
E. Mode/Stop Key
F. USB Communications Port
G. 1A USB Charge Port
H. Jog Dial
I. LCD Screen
J. AC Power Input Port
K. Power Switch
L. DC Power Input/ APP Connectors

PROGRAMMING QUICK GUIDE

Press the **Mode key (G)** to get to the 9 main menus from any submenu screen.
Press the **Jog Dial (H)** to get to the submenus for adjusting operating parameters, to save value changes or to start chosen battery charging actions.
Rotate the **Jog Dial (H)** to change between submenu screens or to change screen values.

LITHIUM BATTERIES (Li-Fe)
PROGRAM SELECT LiFe BATT
- LiFe BALANCE 2.0A 19.8V(6S)
- LiFe CHARGE 2.0A 19.8V(6S)
- LiFe FAST CHG 2.0A 19.8V(6S)
- LiFe STORAGE 2.0A 19.8V(6S)
- LiFe DISCHARGE 2.0A 19.8V(6S)

LITHIUM BATTERIES (Li-Po)
PROGRAM SELECT LiPo BATT
- LiPo BALANCE 2.0A 22.2V(6S)
- LiPo CHARGE 2.0A 22.2V(6S)
- LiPo FAST CHG 2.0A 22.2V(6S)
- LiPo STORAGE 2.0A 22.2V(6S)
- LiPo DISCHARGE 2.0A 22.2V(6S)

Ni-MH BATTERIES
PROGRAM SELECT NiMH BATT
- NiMH CHARGE CURRENT 2.0A
- NiMH Auto CHARGE CURRENT 2.0A
- NiMH DISCHARGE 0.1A CUT:1.0V
- NiMH RE-PEAK 2
- NiMH CYCLE DCHG>CHG 2

Ni-Cd BATTERIES
PROGRAM SELECT NiCd BATT
- NiCd CHARGE CURRENT 2.0A
- NiCd Auto CHARGE CURRENT 2.0A
- NiCd DISCHARGE 0.1A CUT:1.0V
- NiCd RE-PEAK 2
- NiCd CYCLE DCHG>CHG 2

Pb BATTERIES
PROGRAM SELECT Pb BATT
- Pb CHARGE 2.0A 2.0V(1P)
- Pb DISCHARGE 2.0A 2.0V(1P)

LITHIUM BATTERIES (Li-Ion)
PROGRAM SELECT LiIo BATT
- LiIo BALANCE 2.0A 21.6V(6S)
- LiIo CHARGE 2.0A 21.6V(6S)
- LiIo FAST CHG 2.0A 21.6V(6S)
- LiIo STORAGE 2.0A 21.6V(6S)
- LiIo DISCHARGE 2.0A 21.6V(6S)

BATTERY MEMORY
PROGRAM SELECT BATT MEMORY
- [BATT MEMORY 1] ENTER SET →
- BATT TYPE LiPo
- BATT VOLTS 7.4V(2S)
- CHARGE CURRENT 2.2A
- DSCH CURRENT 1.0A
- DSCH VOLTAGE 3.0V/CELL
- TVC=YOUR RISK! 4.20V
- TEMPERATURE CUT-OFF 50C
- SAVE PROGRAM ENTER

SYSTEM SET
PROGRAM SELECT SYSTEM SET→
- Rest Time CHG>DCHG 10min
- SAFETY TIMER ON 120min
- Capacity Cut-Off ON 5000mAh
- Key Beep Buzzer ON
- Input Power Low Cut-Off 11.0V
- Ext. Temp 0C Int. Temp 32C
- LOAD FACTORY SET ENTER
- VERSION 1.00

LITHIUM BATTERY METER
PROGRAM SELECT LI BATT METER
- 0.00 0.00 0.00 V 0.00 0.00 0.00 V
- MAIN 00.00V H0.000V L0.000V

OPERATING YOUR CHARGER

TABLE OF CONTENTS

1 SELF TEST AND PROGRAM SELECT SCREENS

When the charger is powered ON, there is a series of self tests and the screen will show the charger brand name and model number.

LiPo BALANCE
2.0A   7.4V(2S)

DYNAMITE
DYN4300

After the self tests, the charger will show another screen. The information on this screen will vary but will look similar to this:

From any screen, press the **Mode key** to go back to the main screen.

2 LI-FE BATTERIES

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT LiFe BATT screen. Press the **Jog Dial** to select Life.

Correctly connect your lithium battery to the charge (charging connector first and balancing connector second). Press the **Jog Dial** and adjust the charging parameters as needed. Press and hold the **Jog Dial** (approximately 3 seconds) until the screen changes to start the battery check/charge sequence.

When the charge cycle starts, the charger compares the battery to the charger settings. The screen will show the battery and your settings information. If the information after R: (charger) and S: (settings) (A) does not match, press the **Mode key** and change the lithium battery charging parameters as needed. If the R: information matches S:, press the **Jog Dial** to confirm. After confirmation, charging starts and information will show on the LCD screen (information may vary).

Rotate the **Jog Dial** clockwise to show the charge voltages for each cell. Press the **Jog Dial** at any time to return to the Charge Monitor screen. The charger signals when the charging (or discharging) process is complete (if Buzzer is set to ON).

⚠️ **CAUTION:** The Li-Fe program menus are to be used ONLY for the charging and discharging of Li-Fe battery packs. The charging of other battery types using these programs will result in damage to the battery or charger.

⚠️ **CAUTION:** Using a charge rate that is not compatible with the battery capacities may result in damage or malfunction of the charger or batteries.

LI 3S 2.0A 12.59V
BAL 022:43 01082

R: 3SER S: 3SER
CONFIRM (ENTER)

A. A Li-Fe battery pack is balance charging
B. Battery pack has 3 cells in series
C. Charging rate is 2.0A (2000mAh)
D. Voltage being applied to the battery is currently 12.59V
E. Present charge level of the battery is 1082mAh
F. Time elapsed since the charge process started is 22:43 (22 minutes and 43 seconds)

3 LI-FE BALANCE CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT LiFe BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the LiFe BALANCE screen and set charging parameters. The charging amperage (A) can be set between 0.1 and 10.0A. Voltage (B) is dependent on the number of cells in series. For example, with Li-Fe batteries these values can be from 3.3V (for 1S batteries) to 19.8V (for 6S batteries).

LiFe BALANCE
5.5A   19.8V(6S)
    A   B   C

To select values other than the existing parameters:
• Press the **Jog Dial** so the charge current value (A) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the charge current value
• Press the **Jog Dial** to save the value and the voltage value (B) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the voltage (and # of cells in series (C))
• Press the **Jog Dial** to save the voltage value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, FAST CHG, STORAGE or DISCHARGE.

To start charging, press and hold the **Jog Dial** for 3 seconds.

4 LI-FE CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT LiFe BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the LiFe CHARGE screen and set charging parameters. The charging amperage (A) can be set between 0.1 and 10.0A. Voltage (B) is dependent on the number of cells in series. For example, with Li-Fe batteries these values can be from 3.3V (for 1S batteries) to 19.8V (for 6S batteries).

LiFe CHARGE
4.6A   19.8V(6S)
    A   B   C

To select values other than the existing parameters:
• Press the **Jog Dial** so the charge current value (A) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the charge current value
• Press the **Jog Dial** to save the value and the voltage value (B) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the voltage (and # of cells in series (C))
• Press the **Jog Dial** to save the voltage value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as BALANCE, FAST CHG, STORAGE or DISCHARGE.

To start charging, press and hold the **Jog Dial** for 3 seconds.

⚠️ **CAUTION:** If at any time during the charge process the battery pack becomes hot or begins to puff, disconnect the battery immediately and discontinue the charge process as batteries can cause fire, collateral damage and injuries.

5 LI-FE FAST CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT LiFe BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the LiFe FAST CHG screen and set charging parameters. The charging amperage (A) can be set between 0.1 and 10.0A. Voltage (B) is dependent on the number of cells in series. For example, with Li-Fe batteries these values can be from 3.3V (for 1S batteries) to 19.8V (for 6S batteries).

Near the end of a standard charging cycle, the charger switches from Constant Current (CC) mode to Constant Voltage (CV) mode to slowly "top off" the current in the battery as close as possible to the maximum capacity.

In Fast Charge, the CV mode is eliminated in order to greatly shorten the charging time; however, the final capacity of the battery will be less than what you would get using the standard charge method.

LiFe FAST CHG
0.1A   19.8V(6S)
    A   B   C

To select values other than the existing parameters:
• Press the **Jog Dial** so the charge current value (A) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the charge current value
• Press the **Jog Dial** to save the value and the voltage value (B) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the voltage (and # of cells in series (C))
• Press the **Jog Dial** to save the voltage value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as BALANCE, CHARGE, STORAGE or DISCHARGE.

To start charging, press and hold the **Jog Dial** for 3 seconds.

6 LI-FE STORAGE CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT LiFe BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the LiFe STORAGE screen and set charging parameters. The charging amperage (A) can be set between 0.1 and 10.0A. Voltage (B) is dependent on the number of cells in series. For example, with Li-Fe batteries these values can be from 3.3V (for 1S batteries) to 19.8V (for 6S batteries).

If you don't plan on using your battery for a long time, it is best to charge (or discharge) the battery to its optimal storage voltage and capacity.

LiFe STORAGE
2.5A   19.8V(6S)
    A   B   C

To select values other than the existing parameters:
• Press the **Jog Dial** so the charge current value (A) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the charge current value
• Press the **Jog Dial** to save the value and the voltage value (B) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the voltage (and # of cells in series (C))
• Press the **Jog Dial** to save the voltage value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, BALANCE, FAST CHG or DISCHARGE.

To start charging, press and hold the **Jog Dial** for 3 seconds.

7 LI-FE DISCHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT LiFe BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the LiFe DISCHARGE screen and set discharging parameters. The discharging amperage (A) can be set between 0.1 and 5.0A. Voltage (B) is dependent on the number of cells in series. For example, with Li-Fe batteries these values can be from 3.3V (for 1S batteries) to 19.8V (for 6S batteries).

A battery's capacity can be verified by discharging it to its minimum voltage level and measuring the current as the battery is discharged.

LiFe DISCHARGE
2.0A   19.8V(6S)
    A   B   C

To select values other than the existing parameters:
• Press the **Jog Dial** so the discharge current value (A) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the discharge current value
• Press the **Jog Dial** to save the value and the voltage value (B) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the voltage (and # of cells in series (C))
• Press the **Jog Dial** to save the voltage value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, FAST CHG or STORAGE.

To start discharging, press and hold the **Jog Dial** for 3 seconds.

8 LI-IO BATTERIES

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT LiIo BATT screen. Press the **Jog Dial** to select LiIo.

Rotate the **Jog Dial** to go to one of the control screens (BALANCE, CHARGE, FAST CHG, STORAGE or DISCHARGE) to do what your battery needs.

Correctly connect your lithium battery to the charger (charging connector first and balancing connector second). Press the **Jog Dial** and adjust the charging parameters as needed. Press and hold the **Jog Dial** (approximately 3 seconds) until the screen changes to start the battery check/charge sequence.

When the charge cycle starts, the charger compares the battery to the charger settings. The screen will show information. If the information after R: (charger) and S: (settings) (A) does not match, press the **Mode key** and change the lithium battery charging parameters as needed. If the R: information matches S:, press the **Jog Dial** to confirm.

Rotate the **Jog Dial** clockwise to show the charge voltages for each cell. Press the **Jog Dial** at any time to return to the Charge Monitor screen. The charger signals when the charging (or discharging) process is complete (if Buzzer is set to ON).

⚠️ **CAUTION:** The LiIo program menus are to be used ONLY for the charging and discharging of LiIo battery packs. The charging of other battery types using these programs will result in damage to the battery or charger.

⚠️ **CAUTION:** Using a charge rate that is not compatible with the battery capacities may result in damage or malfunction of the charger or batteries.

LI 3S 2.0A 12.59V
BAL 022:43 01082

R: 3SER S: 3SER
CONFIRM (ENTER)

A. A Li-Io battery pack is balance charging
B. Battery pack has 3 cells in series
C. Charging rate is 2.0A (2000mAh)
D. Voltage being applied to the battery is currently 12.59V
E. Present charge level of the battery is 1082mAh
F. Time elapsed since the charge process started is 22:43

9 LI-IO BALANCE CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT LiIo BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the LiIo BALANCE screen and set charging parameters. The charging amperage (A) can be set between 0.1 and 10.0A. Voltage (B) is dependent on the number of cells in series. For example, with Li-Io batteries these values can be from 3.6V (for 1S batteries) to 21.6V (for 6S batteries).

LiIo BALANCE
5.5A   21.6V(6S)
    A   B   C

To select values other than the existing parameters:
• Press the **Jog Dial** so the charge current value (A) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the charge current value
• Press the **Jog Dial** to save the value and the voltage value (B) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the voltage (and # of cells in series (C))
• Press the **Jog Dial** to save the voltage value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, FAST CHG or STORAGE.

To start charging, press and hold the **Jog Dial** for 3 seconds.

10 LI-IO CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT LiIo BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the LiIo CHARGE screen and set charging parameters. The charging amperage (A) can be set between 0.1 and 10.0A. Voltage (B) is dependent on the number of cells in series. For example, with Li-Io batteries these values can be from 3.6V (for 1S batteries) to 21.6V (for 6S batteries).

LiIo CHARGE
4.6A   21.6V(6S)
    A   B   C

To select values other than the existing parameters:
• Press the **Jog Dial** so the charge current value (A) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the charge current value
• Press the **Jog Dial** to save the value and the voltage value (B) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the voltage (and # of cells in series (C))
• Press the **Jog Dial** to save the voltage value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, FAST CHG or STORAGE.

To start charging, press and hold the **Jog Dial** for 3 seconds.

⚠️ **CAUTION:** If at any time during the charge process the battery pack becomes hot or begins to puff, disconnect the battery immediately and discontinue the charge process as batteries can cause fire, collateral damage and injuries.

11 LI-IO FAST CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT LiIo FAST CHG screen and set charging parameters. The charging amperage (A) can be set between 0.1 and 10.0A. Voltage (B) is dependent on the number of cells in series. For example, with Li-Io batteries these values can be from 3.6V (for 1S batteries) to 21.6V (for 6S batteries).

Near the end of a standard charging cycle, the charger switches from Constant Current (CC) mode to Constant Voltage (CV) mode to slowly "top off" the current in the battery as close as possible to the maximum capacity.

In Fast Charge, the CV mode is eliminated in order to greatly shorten the charging time; however, the final capacity of the battery will be less than what you would get using the standard charge method.

LiIo FAST CHG
5.0A   21.6V(6S)
    A   B   C

To select values other than the existing parameters:
• Press the **Jog Dial** so the charge current value (A) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the charge current value
• Press the **Jog Dial** to save the value and the voltage value (B) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the voltage (and # of cells in series (C))
• Press the **Jog Dial** to save the voltage value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, BALANCE, STORAGE or DISCHARGE.

To start charging, press and hold the **Jog Dial** for 3 seconds.

12 LI-IO STORAGE CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT LiIo BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the LiIo STORAGE screen and set charging parameters. The charging amperage (A) can be set between 0.1 and 10.0A. Voltage (B) is dependent on the number of cells in series. For example, with Li-Io batteries these values can be from 3.6V (for 1S batteries) to 21.6V (for 6S batteries).

If you don't plan on using your battery for a long time, it is best to charge (or discharge) the battery to its optimal storage voltage and capacity.

LiIo STORAGE
2.5A   21.6V(6S)
    A   B   C

To select values other than the existing parameters:
• Press the **Jog Dial** so the charge current value (A) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the charge current value
• Press the **Jog Dial** to save the value and the voltage value (B) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the voltage (and # of cells in series (C))
• Press the **Jog Dial** to save the voltage value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, BALANCE, FAST CHG or DISCHARGE.

To start charging, press and hold the **Jog Dial** for 3 seconds.

13 LI-IO DISCHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT LiIo BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the LiIo DISCHARGE screen and set charging parameters. The discharging amperage (A) can be set between 0.1 and 5.0A. Voltage (B) is dependent on the number of cells in series. For example, with Li-Io batteries these values can be from 3.6V (for 1S batteries) to 21.6V (for 6S batteries).

A battery's capacity can be verified by discharging it to its minimum voltage level and measuring the current as the battery is discharged.

LiIo DISCHARGE
2.0A   21.6V(6S)
    A   B   C

To select values other than the existing parameters:
• Press the **Jog Dial** so the discharge current value (A) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the discharge current value
• Press the **Jog Dial** to save the value and the voltage value (B) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the voltage (and # of cells in series (C))
• Press the **Jog Dial** to save the voltage value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, BALANCE, FAST CHG or STORAGE.

To start discharging, press and hold the **Jog Dial** for 3 seconds.

14 LI-PO BATTERIES

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT LiPo BATT screen. Press the **Jog Dial** to select LiPo.

Rotate the **Jog Dial** to go to one of the control screens (BALANCE, CHARGE, FAST CHG, STORAGE or DISCHARGE) to do what your battery needs.

Correctly connect your lithium battery to the charger (charging connector first and balancing connector second). Press the **Jog Dial** and adjust the charging parameters as needed. Press and hold the **Jog Dial** (approximately 3 seconds) until the screen changes to start the battery check/charge sequence.

When the charge cycle starts, the charger compares the battery to the charger settings. The screen will show several parameter messages on the LCD screen, including: End Voltage, Input Power Voltage, External & Internal Temperature, Temperature Cutoff, Safety Timer Status and Capacity Cutoff.

Rotate the **Jog Dial** clockwise to show the charge voltages for each cell. Press the **Jog Dial** at any time to return to the Charge Monitor screen. The charger signals when the charging (or discharging) process is complete (if Buzzer is set to ON).

⚠️ **CAUTION:** The Li-Po program menus are to be used ONLY for the charging and discharging of Li-Po battery packs. The charging of other battery types using these programs will result in damage to the battery or charger.

⚠️ **CAUTION:** Using a charge rate that is not compatible with the battery capacities may result in damage or malfunction of the charger or batteries.

LI 3S 2.0A 12.59V
BAL 022:43 01082

R: 3SER S: 3SER
CONFIRM (ENTER)

A. A Li-Po battery pack is balance charging
B. Battery pack has 3 cells in series
C. Charging rate is 2.0A (2000mAh)
D. Voltage being applied to the battery is currently 12.59V
E. Present charge level of the battery is 1082mAh
F. Time elapsed since the charge process started is 22:43

15 LI-PO BALANCE CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT LiPo BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the LiPo BALANCE screen and set charging parameters. The charging amperage (A) can be set between 0.1 and 10.0A. Voltage (B) is dependent on the number of cells in series. For example, with Li-Po batteries these values can be from 3.7V (for 1S batteries) to 22.2V (for 6S batteries).

LiPo BALANCE
5.5A   22.2V(6S)
    A   B   C

To select values other than the existing parameters:
• Press the **Jog Dial** so the charge current value (A) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the charge current value
• Press the **Jog Dial** to save the value and the voltage value (B) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the voltage (and # of cells in series (C))
• Press the **Jog Dial** to save the voltage value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, FAST CHG, STORAGE or DISCHARGE.

To start charging, press and hold the **Jog Dial** for 3 seconds.

16 LI-PO CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT LiPo BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the LiPo CHARGE screen and set charging parameters. The charging amperage (A) can be set between 0.1 and 10.0A. Voltage (B) is dependent on the number of cells in series. For example, with Li-Po batteries these values can be from 3.7V (for 1S batteries) to 22.2V (for 6S batteries).

LiPo CHARGE
4.6A   22.2V(6S)
    A   B   C

To select values other than the existing parameters:
• Press the **Jog Dial** so the charge current value (A) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the charge current value
• Press the **Jog Dial** to save the value and the voltage value (B) flashes
• Rotate the **Jog Dial** to INCREASE OR DECREASE the voltage (and # of cells in series (C))
• Press the **Jog Dial** to save the voltage value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as BALANCE, FAST CHG, STORAGE or DISCHARGE.

To start charging, press and hold the **Jog Dial** for 3 seconds.

⚠️ **CAUTION:** If at any time during the charge process the battery pack becomes hot or begins to puff, disconnect the battery immediately and discontinue the charge process as batteries can cause fire, collateral damage and injuries.

17 LI-PO FAST CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT LiPo BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the LiPo FAST CHG screen and set charging parameters. The charging amperage **(A)** can be set between 0.1 and 10.0A. Voltage **(B)** is dependent on the number of cells in series. For example, with Li-Po batteries these values can be from 3.7V (for 1S batteries) to 22.2V (for 6S batteries).

Near the end of a standard charging cycle, the charger switches from Constant Current (CC) mode to Constant Voltage (CV) mode to slowly "top off" the current in the battery as close as possible to the maximum capacity.

In Fast Charge, the CV mode is eliminated in order to greatly shorten the charging time; however, the final capacity of the battery will be less than what you would get using the standard charge method.

```
LiPo FAST CHG
4.0A      7.4V(2S)
    A         B    C
```

To select values other than the existing parameters:
- Press the **Jog Dial** so the charge current value **(A)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the charge current value
- Press the **Jog Dial** to save the value and the voltage value **(B)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the voltage (and # of cells in series **(C)**)
- Press the **Jog Dial** again to save the voltage value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, BALANCE, STORAGE or DISCHARGE.

To start charging, press and hold the **Jog Dial** for 3 seconds.

18 LI-PO STORAGE CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT LiPo BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the LiPo STORAGE screen and set charging parameters. The charging amperage **(A)** can be set between 0.1 and 10.0A. Voltage **(B)** is dependent on the number of cells in series. For example, with Li-Po batteries these values can be from 3.7V (for 1S batteries) to 22.2V (for 6S batteries).

If you don't plan on using your battery for a long time, it is best to charge (or discharge) the battery to its optimal storage voltage and capacity.

```
LiPo STORAGE
2.5A     11.1V(3S)
   A        B     C
```

To select values other than the existing parameters:
- Press the **Jog Dial** so the charge current value **(A)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the charge current value
- Press the **Jog Dial** to save the value and the voltage value **(B)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the voltage (and # of cells in series **(C)**)
- Press the **Jog Dial** to save the voltage value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, BALANCE, FAST CHG or DISCHARGE.

To start charging, press and hold the **Jog Dial** for 3 seconds.

19 LI-PO DISCHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT LiPo BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the LiPo DISCHARGE screen and set discharging parameters. The discharging amperage **(A)** can be set between 0.1 and 5.0A. Voltage **(B)** is dependent on the number of cells in series. For example, with Li-Po batteries these values can be from 3.7V (for 1S batteries) to 22.2V (for 6S batteries).

A battery's capacity can be verified by discharging it to its minimum voltage level and measuring the current as the battery is discharged.

```
LiPo DISCHARGE
2.0A      22.2V(6S)
   A         B    C
```

To select values other than the existing parameters:
- Press the **Jog Dial** so the discharge current value **(A)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the discharge current value
- Press the **Jog Dial** to save the value and the voltage value **(B)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the voltage (and # of cells in series **(C)**)
- Press the **Jog Dial** to save the voltage value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, BALANCE, FAST CHG or STORAGE.

To start discharging, press and hold the **Jog Dial** for 3 seconds.

20 NI-MH BATTERIES

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT NIMH BATT screen. Press the **Jog Dial** to select NiMH.

Rotate the **Jog Dial** to go to one of the control screens (CHARGE, Auto CHARGE, DISCHARGE, RE-PEAK or CYCLE) to do what your battery needs.

Correctly connect your Ni-MH battery to the charger. Press the **Jog Dial** and adjust the charging parameters as needed. Press and hold the **Jog Dial** (approximately 3 seconds) until the screen changes to start the battery check/charge sequence.

After confirmation, charging starts and information will show on the LCD screen (information may vary).

```
     B    C
NiMH 2.0A 7.59V
CHG 022:43 01082
A
       E       D
```

A. A Ni-MH battery pack is charging
B. Charging rate is 2.0A (2000mAh)
C. Voltage being applied to the battery is currently 7.59V
D. Present charge level of the battery is 1082 mAh
E. Time elapsed since the charge process started is 22:43

During charging, the **Jog Dial** can be rotated counterclockwise to show several parameter messages on the LCD screen, including: Ni-MH Sensitivity, Input Power Voltage, External & Internal Temperature, Temperature Cutoff, Safety Timer Status and Capacity Cutoff. The charger signals when the charging (or discharging) process is complete (if Buzzer is set to ON).

⚠ **CAUTION:** The Ni-MH program menus are to be used ONLY for the charging and discharging of Ni-MH battery packs. The charging of other battery types using these programs will result in damage to the battery or charger.

⚠ **CAUTION:** Using a charge rate that is not compatible with the battery capacities may result in damage or malfunction of the charger or batteries.

21 NI-MH CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT NIMH BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the NiMH CHARGE screen and set charging parameters. The charging amperage **(A)** can be set between 0.1 and 10.0A.

```
NiMH CHARGE
CURRENT      1.0A
                A
```

To select a value other than the existing parameter:
- Press the **Jog Dial** so the charge current value **(A)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the charge current value
- Press the **Jog Dial** to save the value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as Auto CHARGE, DISCHARGE, RE-PEAK or CYCLE.

To start charging, press and hold the **Jog Dial** for 3 seconds.

22 NI-MH AUTO CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT NIMH BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the NiMH Auto CHARGE screen and set charging parameters. The charging amperage **(A)** can be set between 0.1 and 10.0A.

```
NiMH Auto CHARGE
CURRENT      1.0A
                A
```

To select a value other than the existing parameter:
- Press the **Jog Dial** so the charge current value **(A)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the charge current value
- Press the **Jog Dial** to save the value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, DISCHARGE, RE-PEAK or CYCLE.

To start charging, press and hold the **Jog Dial** for 3 seconds.

23 NI-MH DISCHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT NIMH BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the NiMH DISCHARGE screen and set discharging parameters. The discharging amperage **(A)** can be set between 0.1 and 5.0A.

A battery's capacity can be verified by discharging it to its minimum voltage level and measuring the current as the battery is discharged. The discharge level can be set from 0.1 to 25.2V.

```
NiMH DISCHARGE
0.1A     CUT: 1.0V
   A            B
```

To select a value other than the existing parameter:
- Press the **Jog Dial** so the discharge current value **(A)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the discharge current value
- Press the **Jog Dial** to save the value and the cutoff voltage value **(B)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the cutoff voltage
- Press the **Jog Dial** to save the voltage value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, Auto CHARGE, RE-PEAK or CYCLE.

To start discharging, press and hold the **Jog Dial** for 3 seconds

24 NI-MH RE-PEAK CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT NIMH BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the NiMH RE-PEAK screen and set re-peak parameters to a value of between 1 and 3.

```
NiMH RE-PEAK
              1
```

To select a value other than the existing parameter:
- Press the **Jog Dial** so the re-peak value **(A)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the value
- Press the **Jog Dial** to save the value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, Auto CHARGE, DISCHARGE or CYCLE.

Press the **Jog Dial** to go to the next menu.

25 NI-MH CYCLE CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT NIMH BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the NiMH CYCLE screen and set charge/discharge cycle count parameters.

The battery can be put through a series of charge/discharge cycles using this program. Cycling Ni-MH batteries can increase capacity and rejuvenate neglected batteries. Discharge capacity and average battery voltage help you compare batteries for the best run time and power.

```
NiMH CYCLE
CHG>DCHG        5
     A          B
```

To select values other than the existing parameter:
- Press the **Jog Dial** so the cycle type **(A)** flashes
- Rotate the **Jog Dial** to set the cycle type as CHG>DCHG or DCHG>CHG
- Press the **Jog Dial** to save your choice and the number of cycles **(B)** flashes
- Rotate the **Jog Dial** to set the cycle count from 1 to 5
- Press the **Jog Dial** to save the cycle count value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, Auto CHARGE, DISCHARGE or RE-PEAK.

To start cycling, press and hold the **Jog Dial** for 3 seconds.

26 NI-CD BATTERIES

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT NICD BATT screen. Press the **Jog Dial** to select NiCd.

Rotate the **Jog Dial** to go to one of the control screens (CHARGE, Auto CHARGE, DISCHARGE, RE-PEAK or CYCLE) to do what your battery needs.

Correctly connect your Ni-Cd battery to the charger. Press the **Jog Dial** and adjust the charging parameters as needed. Press and hold the **Jog Dial** (approximately 3 seconds) until the screen changes to start the battery check/charge sequence.

After confirmation, charging starts and information will show on the LCD screen (information may vary).

```
     B     C
NiCd 2.0A 7.59V
CHG 022:43 01082
A
       E       D
```

A. A Ni-Cd battery pack is charging
B. Charging rate is 2.0A (2000mAh)
C. Voltage being applied to the battery is currently 7.59V
D. Present charge level of the battery is 1082 mAh
E. Time elapsed since the charge process started is 22:43

During charging, the **Jog Dial** can be rotated counterclockwise to show several parameter messages on the LCD screen, including: Ni-Cd Sensitivity, Input Power Voltage, External & Internal Temperature, Temperature Cutoff, Safety Timer Status and Capacity Cutoff. The charger signals when the charging (or discharging) process is complete (if Buzzer is set to ON).

⚠ **CAUTION:** The Ni-Cd program menus are to be used ONLY for the charging and discharging of Ni-Cd battery packs. The charging of other battery types using these programs will result in damage to the battery or charger.

⚠ **CAUTION:** Using a charge rate that is not compatible with the battery capacities may result in damage or malfunction of the charger or batteries.

27 NI-CD CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT NiCd BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the NiCd CHARGE screen and set charging parameters. The charging amperage **(A)** can be set between 0.1 and 10.0A.

```
NiCd CHARGE
CURRENT      1.0A
                A
```

To select a value other than the existing parameter:
- Press the **Jog Dial** so the charge current value **(A)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the charge current value
- Press the **Jog Dial** to save the value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as Auto CHARGE, DISCHARGE, RE-PEAK or CYCLE.

To start charging, press and hold the **Jog Dial** for 3 seconds.

28 NI-CD AUTO CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT NiCd BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the NiCd Auto CHARGE screen and set charging parameters. The charging amperage **(A)** can be set between 0.1 and 10.0A.

```
NiCd Auto CHARGE
CURRENT      1.0A
                A
```

To select a value other than the existing parameter:
- Press the **Jog Dial** so the charge current value **(A)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the charge current value
- Press the **Jog Dial** to save the value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, DISCHARGE, RE-PEAK or CYCLE.

To start charging, press and hold the **Jog Dial** for 3 seconds.

29 NI-CD DISCHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT NiCd BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the NiCd DISCHARGE screen and set discharging parameters. The discharging amperage **(A)** can be set between 0.1 and 5.0A.

A battery's capacity can be verified by discharging it to its minimum voltage level and measuring the current as the battery is discharged. The discharge level can be set from 0.1 to 25.2V.

```
NiCd DISCHARGE
0.1A     CUT: 1.0V
   A            B
```

To select a value other than the existing parameter:
- Press the **Jog Dial** so the discharge current value **(A)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the discharge current value
- Press the **Jog Dial** to save the value and the cutoff voltage value **(B)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the cutoff voltage
- Press the **Jog Dial** to save the voltage value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, Auto CHARGE, RE-PEAK or CYCLE.

To start discharging, press and hold the **Jog Dial** for 3 seconds

30 NI-CD RE-PEAK CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT NiCd BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the NiCd RE-PEAK screen and set re-peak parameters to a value of between 1 and 3.

```
NiCd RE-PEAK
              1
```

To select a value other than the existing parameter:
- Press the **Jog Dial** so the re-peak value **(A)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the value
- Press the **Jog Dial** to save the value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, Auto CHARGE, DISCHARGE or CYCLE.

Press the **Jog Dial** to go to the next menu.

31 NI-CD CYCLE CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT NiCd BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the NiCd CYCLE screen and set charge/discharge cycle count parameters.

The battery can be put through a series of charge/discharge cycles using this program. Cycling Ni-Cd batteries can increase capacity and rejuvenate neglected batteries. Discharge capacity and average battery voltage help you compare batteries for the best run time and power.

```
NiCd CYCLE
CHG>DCHG        5
     A          B
```

To select values other than the existing parameter:
- Press the **Jog Dial** so the cycle type **(A)** flashes
- Rotate the **Jog Dial** to set the cycle type as CHG>DCHG or DCHG>CHG
- Press the **Jog Dial** to save your choice and the number of cycles **(B)** flashes
- Rotate the **Jog Dial** to set the cycle count between 1 to 5
- Press the **Jog Dial** to save the cycle count value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE, Auto CHARGE, DISCHARGE or RE-PEAK.

To start cycling, press and hold the **Jog Dial** for 3 seconds.

32 PB BATTERIES

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT Pb BATT screen. Press the **Jog Dial** to select Pb.

Rotate the **Jog Dial** to go to one of the control screens (CHARGE or DISCHARGE) to do what your battery needs.

The nature of a Lead Acid or Sealed Lead Acid battery is very different from that of Lithium, Ni-MH or Ni-Cd batteries. The output current of a Pb battery is lower than other batteries relative to their capacities. Furthermore, lead acid batteries can't be charged at a level greater than 1/10 their capacity.

For example, a 5000mAh lead acid battery can't be charged at a rate greater than 0.5A. For more details on the charge and discharge capabilities of your battery, please refer to the charging data supplied by the battery manufacturer.

Correctly connect your Pb battery to the charger. Press the **Jog Dial** and adjust the charging parameters as needed. Press and hold the **Jog Dial** (approximately 3 seconds) until the screen changes to start the battery check/charge sequence.

After confirmation, charging starts and information will show on the LCD screen (information may vary).

```
      B   C    D
Pb-6 0.4A 12.39V
CHG 022:43 01082
A
      F    E    F
```

A. A Lead Acid battery pack is charging
B. Battery pack has 6 cells in series
C. Charging at a rate of 0.4A (400mAh)
D. Voltage being applied to the battery is currently 12.39V
E. Present charge level of the battery is 1082mAh
F. Time elapsed since the charge process started is 22:43

During charging, the **Jog Dial** can be rotated counterclockwise to show several parameter messages on the LCD screen, including: End Voltage, Capacity Cutoff, Safety Timer Status, Temperature Cutoff and Input Power Voltage. The charger signals when the charging (or discharging) process is complete (if Buzzer is set to ON).

⚠ **CAUTION:** The Pb program menus are to be used ONLY for the charging and discharging of Pb battery packs. The charging of other battery types using these programs will result in damage to the battery or charger.

⚠ **CAUTION:** Using a charge rate that is not compatible with the battery capacities may result in damage or malfunction of the charger or batteries.

33 PB CHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT Pb CHARGE screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the Pb CHARGE screen and set charging parameters. The charging amperage **(A)** can be set between 0.1 and 10.0A.

```
Pb CHARGE
0.1A     2.0V (1P)
   A        B
```

To select values other than the existing parameters:
- Press the **Jog Dial** so the charge current value **(A)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the charge current value
- Press the **Jog Dial** to save the current value and the battery voltage value **(B)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the battery voltage/cell count value (Pb batteries are 2.0V per cell, for a 6 cell battery this would be 2.0V x 6 cell = 12.0V)
- Press the **Jog Dial** to save the voltage

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as DISCHARGE.

To start charging, press and hold the **Jog Dial** for 3 seconds.

34 PB DISCHARGING

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT Pb BATT screen. Press the **Jog Dial** to go into this menu.

Rotate the **Jog Dial** to go to the Pb DISCHARGE screen and set discharging parameters. The discharging amperage **(A)** can be set between 0.1 and 5.0A.

A battery's capacity can be verified by discharging it to its minimum voltage level and measuring the current as the battery is discharged. The discharge level can be set from 2 to 20V.

```
Pb DISCHARGE
0.1A     2.0V (1P)
   A        B
```

To select values other than the existing parameters:
- Press the **Jog Dial** so the discharge current value **(A)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the discharge current value
- Press the **Jog Dial** to save the value and the cutoff voltage value **(B)** flashes
- Rotate the **Jog Dial** to INCREASE OR DECREASE the cutoff voltage
- Press the **Jog Dial** to save the voltage value

If no parameters are flashing, you can rotate the **Jog Dial** to select another program such as CHARGE.

To start discharging, press and hold the **Jog Dial** for 3 seconds

35 BATTERY MEMORY

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT BATT MEMORY screen. Press the **Jog Dial** to select BATT MEMORY.

Use this menu to create a battery profile. To reduce the time required to initiate a charging or discharging cycle on a battery you regularly use, this charger has been designed with the capability of storing up to 10 battery profiles that can be quickly accessed and run at a later time.

- Rotate the **Jog Dial** to identify a battery profile, 1 through 10
- Press the **Jog Dial** to select battery profile 1
- Press the **Jog Dial** so battery type flashes
- Rotate the **Jog Dial** to select a battery type
- Press the **Jog Dial** to save the battery type

Follow this process using the **Jog Dial** to select, change, then save each parameter (battery voltage, charge current, discharge current, discharge voltage, Terminal Voltage Control (TVC) and temperature cutoff). Then save the battery profile.

- Rotate the **Jog Dial** to select SAVE PROGRAM
- Press the **Jog Dial** to save the program
- Repeat this process to enter additional battery profiles
- Press the **Mode key** until you reach the 9 main menus

⚠ **CAUTION:** Increasing the TVC value beyond the default settings may result in a shorter battery life and/or damage to the battery. Do not change the TVC value unless you fully understand the effects TVC will have on your battery.

To Charge or Discharge a battery using the saved profile:

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT BATT MEMORY screen. Press the **Jog Dial** to select BATT MEMORY.

- Rotate the **Jog Dial** to identify the battery profile, 1 through 10.
- Press and hold the **Jog Dial** for 3 seconds
- Rotate the **Jog Dial** to choose the type of charge function you wish to perform
- Press and hold the **Jog Dial** for 3 seconds to start

36 SYSTEM SET

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT SYSTEM SET screen. Press the **Jog Dial** to select SYSTEM SET.

Use this menu to set the "behind the scenes" operating parameters for this charger such as; Rest Time, Safety Timer, Capacity Cutoff, Key Beep/Buzzer, Input Power Low Cutoff, External and Internal Temperatures, Load Factory Settings and Version.

a REST TIME

Use this menu to set the Rest time during each step in a cycle. When a Ni-MH or Ni-Cd battery is cycled (charged, discharged and charged again) it will get hot, therefore it is necessary to set a rest time interval during each step of the process to make sure the battery and charger are completely cooled before moving on to the next part of the cycle. Default time is 10 minutes, but this can be set between 1 and 60 minutes. To select a value other than the default parameter:
- Press the **Jog Dial** to select Rest Time
- Press the **Jog Dial** so the Rest Time value flashes
- Rotate the **Jog Dial** to select Rest Time in Minutes
- Press the **Jog Dial** to save the Rest Time value
- Rotate the **Jog Dial** to select SAFETY TIMER

b SAFETY TIMER

Use this menu to set a time limit for charging a battery. When a charge cycle is started, a clock inside the charger will begin recording the elapsed charge time. If the SAFETY TIMER function has been turned ON, the charger will stop the charging process once this time limit has been reached to avoid damage caused by over-charging the battery. This time value can be set between 1 and 720 minutes.

To select values other than the default parameters:
- Press the **Jog Dial** so the ON/OFF value flashes
- Rotate the **Jog Dial** to select ON or OFF
- Press the **Jog Dial** to save the value
- Rotate the **Jog Dial** to select the value for time
- Press the **Jog Dial** to save the value
- Rotate the **Jog Dial** to select Capacity Cutoff

C CAPACITY CUTOFF

Use this menu to set a capacity limit at which the charger will stop charging a battery. When a charge cycle starts, the charger records the battery capacity. When the Capacity Cutoff function is set at ON, the charger will stop charging at the capacity limit to prevent battery damage. Capacity can be adjusted between 100 and 50,000mAh.
- Press the **Jog Dial** so the ON/OFF value flashes
- Rotate the **Jog Dial** to select ON or OFF
- Press the **Jog Dial** to save the value
- Rotate the **Jog Dial** to select the Capacity Cutoff value
- Press the **Jog Dial** to save the value
- Rotate the **Jog Dial** to select Key Beep/Buzzer

d KEY BEEP/BUZZER

Use this menu to set the key beep and charger alarm buzzer at ON or OFF as needed. We recommend that you keep the alarm ON so the alarm will sound when charging is complete or if there is cause for alarm during charging.
To select values other than the default parameters:
- Press the **Jog Dial** so the Key Beep ON/OFF value flashes
- Rotate the **Jog Dial** to select ON or OFF
- Press the **Jog Dial** to save the value
- Press the **Jog Dial** so the Buzzer ON/OFF value flashes
- Rotate the **Jog Dial** to select ON or OFF
- Press the **Jog Dial** to save the value
- Rotate the **Jog Dial** to select Input Power Low Cutoff

e INPUT POWER LOW CUTOFF

Use this menu to set the input voltage limit so an alarm will sound if the voltage goes below the cutoff value. The voltage alarm value can be set anywhere from 10.0 to 11.0V.
To select a value other than the default parameter:
- Press the **Jog Dial** so the voltage value flashes
- Rotate the **Jog Dial** to select the voltage value
- Press the **Jog Dial** to save the value
- Rotate the **Jog Dial** to select External and Internal Temperatures

f EXTERNAL AND INTERNAL TEMPERATURES

By selecting the External and Internal Temperatures Screen you can view the current temperatures of both the battery (external) and the charger (internal). The optional temperature sensor (DYN5033) is required for external temperature measurement.

g RESET FACTORY SETTINGS
- Press the **Jog Dial** to reset the charger to factory settings
- Press the **Jog Dial** to select VERSION

h VERSION

By selecting the Version Screen you can view the version (revision number) of the software on your charger.

You may exit this menu at any time by pressing the **Mode key** to return to the main menus.

37 LI BATTERY VOLTAGE CHECKER OPERATION - USING THE BALANCE ADAPTER PORT

The Passport Ultra Duo charger has the capability to read and display the individual cell voltages of a Li-Po, Li-Fe or Li-Io battery. This voltage checking function can only be used when the charger is powered ON and not charging a battery.

To use the voltage checker, connect the balance port connector of your Li-Po, Li-Fe or Li-Io battery to the balance adapter board connected to the Balance Circuit Adapter Board Connector **(C)**.

Press the **Mode key** until you reach the 9 main menus, then rotate the **Jog Dial** to locate the PROGRAM SELECT LI BATT METER screen. Press the **Jog Dial** to select LI BATT METER.

In a few moments, the charger will begin to display the cell voltages of the battery in the following format:

```
MAIN          08.20V
H4.104V       L4098V
```

This example is for a 2S battery, so only the voltages for these two cells are displayed. The data is presented in this format:

```
1-1    1-2    1-3 V
1-4    1-5    1-6 V
```

At this point, you can rotate the **Jog Dial** to see a display of the overall battery voltage as well as the individual high- and low-cell voltage values.

```
3.70 3.70 0.00 V
0.00 0.00 0.00 V
```

You may exit this menu at any time by pressing the **Mode key** to return to the main menus.

38 USB ACCESSORY CHARGER OPERATION (COMPATIBLE WITH iPhone AND iPod DEVICES)

The Passport Ultra Duo charger has the capability to charge your iPhone, iPod or USB compatible device with the 1A USB charge port **(E)**. To use the charging function, simply connect a compatible charging device or cord into the charge port while the charger is powered ON. The internal USB charge port will provide up to 1A current at 5V DC.

39 TROUBLESHOOTING GUIDE

LCD Screen Warning and Error messages shown below.

During charger operation, circuits monitor battery and charger functions. If the following messages show on the charger's LCD screen, make the recommended responses. If the message continues after you respond as recommended, contact your nearest Horizon Hobby customer service center for assistance.

REVERSE POLARITY	Make sure each connection polarity is correct between the power source and the charger, then between the charger and the battery
CONNECTION BREAK	Make sure the power connections are correct for charging
SHORT ERR	Make sure there are no short circuits between the poles of the battery or the battery and the charger. Replace damaged wires.
INPUT VOL ERR	Input voltage to the charger fell below the default or adjusted input voltage setting. Make sure the power source for the charger provides correct input voltage.
VOL SELECT ERR	Incorrect setting for cell in series count (pack voltage) of a lithium battery. Make charger settings match the battery pack label cell in series count to replace the battery.
BREAK DOWN	Charger electronics require repair.
BATTERY CHECK LOW VOLTAGE	Battery voltage is lower than the value setting in the charger. Adjust settings, then make sure the battery is not damaged or replace the battery.
BATTERY CHECK HIGH VOLTAGE	Battery voltage is higher than the value setting in the charger. Adjust settings, then make sure the battery is not damaged or replace the battery.

Battery Type	Li-Po	Li-Io	Li-Fe	Ni-MH	Ni-Cd	Pb
Standard voltage (Volts per cell)	3.70	3.60	3.30	1.20	1.20	2.00
Max. voltage (Volts per cell)	4.20	4.10	3.60	1.60	1.60	2.45
Min. voltage (Volts per cell)	3.00	3.00	2.00	1.00	0.85	1.75