

INSTRUCTION MANUAL

Thank you for purchasing the Accu-Cycle Elite[™] battery conditioner from Hobbico[®]! Accu-Cycle Elite is a high performance computerized battery charger, discharger, and cycler for R/C radio system batteries. Accu-Cycle Elite is flexible enough to handle NiCd, NiMH, Li-Po and Li-Ion batteries, and offers a large variety of adjustable functions, yet is very easy to program and understand its numerous display screens. Quick reference flowcharts are included to help understand the overall programming structure of Accu-Cycle Elite. It is strongly recommended to read this manual in its entirety, and to fully understand exactly what types of batteries you have and how to care for them. Damage resulting from misuse or modification of this charger will void your warranty.

2-YEAR LIMITED WARRANTY *USA and Canada Only

Hobbico warrants this product to be free from defects in materials and workmanship for a period of two (2) years from the date of purchase. During that period, Hobbico will, at its option, repair or replace without service charge any product deemed defective due to those causes. You will be required to provide proof of purchase (invoice or receipt). This warranty does not cover damage caused by abuse, misuse, alteration or accident. If there is damage stemming from these causes within the stated warranty period, Hobbico will, at its option, repair or replace it for a service charge not greater than 50% of its then current retail list price. Be sure to include your daytime telephone number in case we need to contact you about your repair. This warranty gives you specific rights. You may also have other rights, which vary from state to state.

For service on your Hobbico product, warranty or non-warranty, send it post-paid and insured to:

HOBBY SERVICES 3002 N. Apollo Drive, Suite 1 Champaign, IL 61822 (217) 398-0007 www.hobbyservices.com

*For warranty and service information if purchased outside the USA or Canada, see the additional warranty information insert (if applicable) or ask your retailer for more information.

SPECIFICATIONS

Input Voltage:	11-14.5V DC
AC Power Supply:	110VAC 60Hz input, 14.5VDC 2.5A output
Number of Output Ports:	two
For BOTH Outputs:	
Battery Types:	Nickel-Cadmium (NiCd), Nickel-Metal Hydride (NiMH)
	Lithium-Polymer (Li-Po), Lithium-Ion (Li-Ion)
Number Cells:	1-10 NiCd or NiMH (1.2-12.0V),
	1-3 Li-Po or Li-Ion (3.6-11.1V)
Fast Charge Current:	* 50-2000mA
Fast Charge Termination:	NiCd/MH – "negative deltaV" peak detection,
-	Li-Po's – "constant-current/constant-voltage" (4.20V/cell max.)
	Li-Ion's – "constant-current/constant-voltage" (4.10V/cell max.)
Peak Detection Sensitivity:	3-15mV per cell adjustable
Fast Chg Safety Timer:	* automatically calculated
Trickle Charge Current:	* 0-200mA
Peak Detection Delay:	3 minutes
Discharge Current:	50-2000mA
Discharge Cutoff Voltage:	* 0.8-1.2V per cell adjustable for NiCd & NiMH
	3.0V per cell fixed for Li-Ion and Li-Po
Cycle Count:	1 to 5 (NiCd and NiMH only)
Cycle Delay – chg/dsch:	10 minutes
Status Indicators:	two tri-color LEDs (red/amber/green)
Optional Temp. Cutoff:	** 60-130°F (15-54°C)
Output Connectors:	banana jacks
Battery Memories:	ten
Display Type:	2-line, 16 character LCD
Case Size:	3.7 x 6.1 x 1.2 in. (94 x 30.5 x 155mm)
Weight:	13.23 oz. (375g, not including power supply)

* Auto Smart Set feature, can be manually overridden except for fast charge safety timer ** Requires optional Temperature Sensor - HCAP0281

SPECIAL FEATURES

- Designed for Tx and Rx radio batteries. Also good for single cell glow igniters and even lithium-based park flyer batteries!
- The Auto Smart Set feature automatically calculates and sets charge current, trickle charge current, fast charge safety timer, and discharge cutoff voltage based on battery type, rated voltage and capacity entered. No need to determine what values to set!
- Very simple menu structure with programming flowchart included.
- 12V DC input for portability can be used at the flight line! 110V AC power supply included for in-home use.
- Optional battery temperature protection (temp. sensor available separately). Stops fast charge, and suspends discharge when battery reaches temperature setting.

- Configure up to 10 batteries in memory for instant, easy re-call and charger setup
- Recall data for 5 full cycles on a two-line, 16 character LCD.
- LCD shows full descriptions for all data for clear understanding no cryptic abbreviations.
- Displays output voltage, peak and average battery voltages, charge and discharge capacity, current, elapsed time, and battery temperature
- Visual and audible warning indicators for improper input voltage, poor connections, unsuitable battery conditions, short-circuits, reverse polarity on output, and more.
- A touchpad faceplate eliminates the need for conventional switches or dials. Provides rugged durability, and is sealed to keep out dirt and debris.
- Optional sound cues.
- Safety features include cool-off time delay between cycles, fast charge safety timer, maximum charge voltage per cell, internal heat protection, battery temperature monitoring, current overload and reverse polarity protection.

IMPORTANT PRECAUTIONS

- Do not attempt to charge incompatible types of rechargeable batteries as permanent damage to the battery and charger could result.
- Do not use automotive type battery chargers to power the charger.
- Do not allow water, moisture or foreign objects into the charger.
- Do not block the air intake holes, which could cause the charger to overheat.
- Do not attempt to use batteries with more cells or total voltage than listed in the specifications
- Do not leave the charger unattended while in use.
- Disconnect the battery and remove input power from charger immediately if the charger becomes hot!! Allow the charger or battery to cool down before reconnecting.
- Do not place the charger or any battery on a flammable surface or near a combustible material while in use. Do not charge or discharge on a carpet, cluttered workbench, paper, plastic, vinyl, leather, wood, inside an R/C model or full sized automobile!
- Always turn off the power switch or disconnect from power source when not in use.
- Do not overcharge batteries as permanent damage could result. Do not use a charge or discharge current rate which exceeds the safe level of the battery.
- Keep out of reach of children.

CHARGER CONTROLS & CONNECTIONS



POWER: the ON/OFF power switch is located on the top-right corner of the charger.

OUTPUTS: Two separate outputs are available, with Output 1 being on the left and Output 2 being on the right. Connect only a single battery, or two at once as Elite will control each output completely independently of the other. *The LCD does NOT show data for both outputs at the same time.* The OUTPUT SELECT button (bottom-center) switches control of the LCD screen and keypad between Outputs 1 and 2. Anytime this button is pressed an amber LED will flash momentarily to show which output is now active.

BATTERY CONNECTIONS: It is strongly recommended to connect batteries using preassembled charge leads which are widely available from any hobby retailer. Hand made charge leads can be unreliable, providing poor physical and/or electrical connections and result in erratic performance of the cycler. Find a charge lead that best matches the type of battery or radio that you are charging. Hobbico offers a variety of charge leads to match any radio system you may have. These items may be purchased through your local hobby shop.

Part #	Item Description
HCAP0101	Futaba J Tx and Rx charge leads, except 9VAP
HCAP0102	Futaba J Tx and Rx charge leads, 9VAP only
HCAP0104	Airtronics/Sanwa Tx and Rx charge leads
HCAP0105	JR Tx and Rx charge leads
HCAP0106	Hitec Tx and Rx charge leads
HCAP0108	Charge leads, banana plugs to alligator clips
HCAP0110	9V-style Tx connector, Futaba-J Rx charge lead
HCAP0310	Banana Plugs (3 pair)
HCAP0320	Heavy Duty Banana Plugs (2 pair)



For each output first connect the charge lead to the cycler, and then the battery to the charge lead. The battery's red, positive (+) lead must always be connected to the cycler's red, positive (+) jack, and the battery's black, negative (-) lead to the cycler's black, negative (-) jack. WARNING! Never allow a battery's positive and negative leads to accidentally touch each other. This will result in a short circuit and cause permanent damage to your battery and or cycler.

TEMPERATURE SENSOR CONNECTION: Each output also has a separate jack for connecting a sensor to monitor the temperature of the battery that is connected to the banana jacks. Each sensor jack is located on the front side of the charger below the banana jacks. Use of a temperature sensor is optional, but recommended especially for lithium batteries. Hobbico's Accu-Cycle Elite Temperature Sensor

(HCAP0281) and the Triton Temperature Probe from Great Planes (GPMM3151) are directly compatible with Accu-Cycle Elite, both of which can be found at local retailers. When properly connected to the jack, the sensor's white wire will be on the left and the black wire will be on the right.

TOUCHPAD: Instead of conventional switches and pushbuttons, the entire face of Accu-Cycle Elite is covered by a touchpad, with all pushbuttons being physically sealed inside. This durable sealed touchpad prevents moisture, dirt and debris from entering the controls.

The CYCLE, DSCH and CHARGE buttons (below LCD) are referred to as the "Jump Start" buttons. These buttons are designed for quickly, conveniently accessing the most commonly used functions in Elite's programming. **IMPORTANT:** Before using the Jump Start buttons it is crucial to first set the proper battery type, its exact rated voltage and capacity in Elite's programming. Otherwise, Elite will charge at the factory default current and voltage rates which may not be suitable for your battery. Please read this manual in its entirety before attempting to use the Jump Start buttons!!

The UP, DOWN, ENTER and CHANGE/BATTERY TYPE buttons (upper-right) are for scrolling through the programming menus and activating certain functions. The shape of these buttons match the direction that they scroll through the flowcharts. CHANGE and BATTERY TYPE are on the same button which has multiple functions. Pressing ENTER after any charge, discharge or cycle function has ended will return the screen back to the main battery menu screen.

DETERMINING BATTERY TYPE & SPECIFICATIONS

It is always very important to know your battery's exact type, rated voltage and *capacity!!* Failure to know these points is one of the biggest reasons why batteries are improperly cared for and fail. A few short minutes learning the basics of battery care can easily prevent unnecessary crashes (and lost money!). Carefully read your battery's label and/or instruction sheet or consult your battery supplier and determine:

- 1. Is the battery *type* Nickel-Cadmium (NiCd), Nickel-Metal Hydride (NiMH), Lithium-Ion (Li-Ion), or Lithium-Polymer (Li-Po)?
- 2. What is the battery's *total rated capacity*? This number indicates how much charge energy or "capacity" the battery can store, and should always be listed on the battery's label as "mAh" ("milli-amp hours"). Capacity is also referred to as the "C" rating. Charge and discharge currents are also expressed as a function of this "C" rating. For example, a 750mAh battery would have a "1C" charge or discharge current rate of 750mA. This battery's 2C rating would be (750 x 2) 1500mA, etc.
- 3. What is the battery's *nominal rated voltage*? If not printed on the battery's outer label, consult your battery supplier or determine pack voltage as follows:
 - a. NiCd and NiMH batteries: multiply the total number of cells in the pack by 1.20. A 7-cell pack will have a nominal voltage of 8.40 volts (7 x 1.20). A 4-cell pack will have a nominal voltage of 4.80 volts (4 x 1.20), etc.

- b. Li-Po batteries: multiply the total number of cells in the pack which are wired in series by 3.70. A 3-cell pack will have a nominal voltage of 11.1 volts (3 x 3.70), etc.
- c. Li-Ion batteries: multiply the total number of cells in the pack which are wired in series by 3.60. A 2-cell pack will have a nominal voltage of 7.20 volts (2 x 3.60), etc.

INPUT POWER

AC INPUT: connect the included AC power supply into a 110V 60Hz wall outlet. Then, locate the input lead along the top edge of Elite near the ON/OFF power switch and connect its banana plugs to the jacks located on the end of the AC transformer. Make sure to connect the red plug to the red, positive (+) jack on the power supply and the black plug to the black, negative (-) jack on the power supply. **Note:** The AC power supply has a maximum power rating of 15 watts. It can allow the cycler to deliver a full 2.0 amps of charge current to any single output. However, maximum charge current is limited for EACH OUTPUT when BOTH outputs are trying to charge at high currents, as shown in the chart at right:

DC INPUT: to achieve Elite's maximum potential when using a DC input the power source must be capable of delivering at least 5 amps of current while maintaining 12 volts DC. Here, the maximum charge current which can be delivered to both outputs simultaneously is 2.0A each. There are two ways to connect the cycler to 12V DC input power:

1. Connect the banana plugs on Elite's input cord directly to banana jacks on a separate DC power supply. Or, for use at the flying field, connect the input lead to the starter jacks on a field box power panel. Always connect the cycler's red lead to the power source's positive (+) terminal and the cycler's black lead to the negative (-) terminal.

AC Pow current PE o	ver Supply: M R OUTPUT w utputs are use	aximum hen BOTH d
# NiCd/MH Cells	Max. Charge Current	Max. Dsch Current
1-4	2.0A	2.0A
5	2.0A	1.65A
6	1.65A	1.40A
7	1.40A	1.20A
8	1.25A	1.00A
9	1.10A	0.90A
10	1.00A	0.80A
# Li-Po/lon Cells		
1	2.0A	2.0A
2	2.0A	1.35A
3	1.35A	0.90A

2. A unique set of alligator clip adapters are included for connecting the input leads to DC power sources which do not have banana jacks. Inside the handle of each alligator clip is a female banana jack. Securely slide the input lead's banana plugs into the female jacks on the alligator clips. Attach each alligator clip onto the terminals of a 12V battery or power supply noting proper polarities.

WARNING! Never accidentally short together the positive (+) and negative (-) input connections when connected to 12V DC power. Failure to do so could result in permanent damage to the power source and the charger. It's recommended to disconnect the charger from input power when not in use.

Accu-Cycle Elite's maximum power dissipation during discharge is 10 watts (regardless if input power is from AC or DC). Elite can discharge at the maximum 2.0A when only one output is being used. However, maximum discharge current is limited for EACH

OUTPUT when BOTH outputs are trying to discharge at high currents, also as shown in the table above.

GETTING STARTED

Locate the flowcharts which are included that show Elite's entire programming menu. It is highly recommended to have these flowcharts handy while learning to operate this cycler.

There are two main ways in which to configure Accu-Cycle Elite. (1) A memory bank is available for setting and storing pertinent information for up to 10 different batteries. Once a battery's information is stored into a memory it will be retained until changed again manually. Recalling a battery's memory number makes Elite instantly ready to go! (2) If you do not wish to use the battery memories, Accu-Cycle Elite can be manually configured before each use.

Connect Accu-Cycle Elite to input power and turn the power switch on.

PROGRAMMING A BATTERY INTO MEMORY/SELECTING A MEMORY

Skip this section if you do not wish to use the memories.

A memory bank is available for storing pertinent information for up to ten different batteries. BOTH outputs share the same memory bank. **It is not possible to have one output use one memory location and have the other output use a different memory location at the same time.** The only way to use the memory bank for both outputs is if batteries having the exact same specifications are being used on each output. Otherwise, it will only be possible to use a battery memory for one output (described in this section) and to manually configure the other output (described in the next sections).

- 1. The first screen displayed when power is applied will be the MEMORY screen.
- Press the OUTPUT SELECT button until the LCD shows the output number where the battery will be connected. The output number is always shown onscreen in reverse-type, such as or . An amber LED will also flash briefly to indicate which output has been selected.
- 3. Connect the battery to the output selected above.
- 4. Determine which memory number to store information for the battery (#0 through 9). Each memory location comes pre-programmed from the factory with different settings as shown in the chart that follows, but can be adjusted as desired. Press ENTER, then UP or DOWN to find the desired memory number. Press ENTER to confirm selection. To customize a memory proceed to step 5. If no adjustment to the selected memory is needed skip to the next section.

Memory	0	1	2	3	4	5	6	7	8	9
Batt Type	NiCd/MH	NiCd/MH	NiCd/MH	NiCd/MH	NiCd/MH	NiCd/MH	Li-Ion/Po	Li-Ion/Po	Li-Ion/Po	Li-Ion/Po
Batt Volts	9.6V	9.6V	8.4V	8.4V	7.2V	4.8V	3.7V	7.4V	7.4V	11.1V
Capacity mAh	650	350	1200	650	650	400	300	650	1050	1500
Chg Current	0.25A	0.10A	0.45A	0.25A	0.25A	0.15A	0.05A	0.15A	0.20A	0.30A
Trickle mA	10mA	10mA	20mA	10mA	10mA	10mA	х	х	х	x
Peak Sensitivity	8mV	8mV	8mV	8mV	8mV	8mV	х	х	х	X
Dsch Current	0.3A	0.3A	0.3A	0.3A	0.3A	0.3 A	0.3A	0.3A	0.3A	0.3A
Dsch Cutoff	1.1V	1.1V	1.1V	1.1V	1.1V	1.1V	x	X	х	х
# Cycles	1	1	1	1	1	1	х	x	х	х

- 5. Press DOWN to find the BATTERY TYPE screen. Press CHANGE, then UP or DOWN to find the desired battery type that exactly matches your battery (NiCd/NiMH or Li-Ion/Polymer). Press CHANGE to confirm selection.
- 6. Press DOWN to find the NUMBER OF CELLS/BATTERY VOLTAGE screen. Press CHANGE, then UP or DOWN to find the proper number of cells/voltage that exactly matches the rating of your battery. Press CHANGE to confirm selection.
- 7. Press DOWN to find the CAPACITY screen. Press CHANGE, then UP or DOWN to find the capacity which matches the rating of your battery (should be marked as "mAh"). If the battery's exact rated capacity cannot be found, select the capacity which most closely matches the capacity of the battery. Press CHANGE to confirm selection.
- 8. Press DOWN to find the CHARGE CURRENT screen. **If the proper battery type and capacity values were entered above the Auto Smart Set feature will have already calculated and set a safe charge current for your battery.** To manually adjust press CHANGE, then UP or DOWN to find the new charge current. Press CHANGE to confirm selection. NOTE: current values are shown in amps ("A"), not milli-amps. If you know the desired current in milli-amps, divide that number by 1000 to get the equivalent charge current in amps. For example: a charge current of 500mA would be entered as "0.50A" (500 divided by 1000). A charge current of 1200mA would be entered as "1.20A," etc. Lower charge currents are more safe and gentle on batteries.
- 9. If the selected battery type is Li-Ion/Poly, skip to step 12. Otherwise, press DOWN to find the TRICKLE CURRENT screen. If the NiCd/MH battery type and capacity values were set above the Auto Smart Set feature will have already calculated and set the appropriate trickle charge current for your battery. To manually adjust press CHANGE, then UP or DOWN to find the new trickle charge current. Press CHANGE to confirm selection.
- 10. Press DOWN to find the PEAK SENSITIVITY screen. This value determines the sensitivity/accuracy of the peak detection circuit. The factory default value of 8mV is acceptable for NiCd and NiMH batteries. Adjustment of this value can help match the characteristics of your battery to the charger for better peak charges. The recommended settings are 5-15mV for NiCd batteries, and 3-10mV for NiMH batteries. A lower number means the cycler will try to be more precise in finding peak charge too quickly, in which case it may be necessary to increase this number to 8mV or greater (especially if using AC input power). Press CHANGE, then UP or DOWN to find the desired peak sensitivity value. Press CHANGE to confirm selection.

- 11. Press DOWN to find the DISCHARGE CURRENT screen. The factory default value of 0.30A (300mA) is very similar to the average currents that are drained from R/C transmitter and flight pack batteries during use. It is best to use this value when trying to determine the expected run-time of the battery during normal use. To adjust press CHANGE, then UP or DOWN to find the new current. Press CHANGE to confirm selection. **Note:** As above, current values are shown in amps ("A"), not milli-amps. If you know the desired current in milli-amps, divide that number by 1000 to get the equivalent discharge current in amps.
- 12. Press DOWN to find the DISCHARGE CUTOFF VOLTAGE screen. If the proper battery type and voltage values were entered above, the Auto Smart Set feature will have already calculated and set the proper discharge cutoff voltage for your battery.
 - a. For NiCd and NiMH batteries, the value shown is volts PER CELL in the pack (not total pack voltage). Some NiCd and NiMH battery manufacturers rate the *capacity* (mAh) of their batteries based on a discharge cutoff voltage of 0.9V per cell. So, to see if the battery is supplying *the amount of capacity as rated by the manufacturer*, set the discharge cutoff voltage to 0.9V. However, to determine *the battery's useful run-time* (in minutes) for R/C applications, leave the discharge cutoff voltage at the factory default value of 1.1V per cell. Most R/C receivers are not capable of sustaining operation with a 4-cell NiCd/MH battery that is discharged below 1.1V per cell. Press CHANGE to confirm selection.
 - b. For Li-Ion/Poly batteries, the discharge cutoff voltage is FIXED at 3.0V per cell and cannot be adjusted. This screen will show the total Li-Ion/Po pack voltage where discharge will stop.
- 13. If the selected battery type is Li-Ion/Poly skip to step 14. Otherwise, the NUMBER OF CYCLES screen will show. Press CHANGE, then UP or DOWN to set the number of times the cycler will perform discharge-to-charge cycles consecutively. Press CHANGE to confirm selection.
- 14. Press DOWN to return to the main MEMORY screen, at which time all data entered into the above memory screens will be saved. To alter data in any memory, return to point #4 above. Any charge, discharge or cycle function can be started at this time by using the CYCLE, DSCH or CHARGE buttons (see the STARTING CHARGE, DISCHARGE or CYCLE section on page 19).
- 15. On back of the charge/discharge chart included with this manual, find a blank chart to record the settings which have been stored into memory. This can be used repeatedly as a quick reference chart for recalling programmed memories.

CARE AND HANDLING OF NIMH BATTERIES

- Do not to allow NiMH batteries to overheat! If overheated, disconnect the battery from the charger immediately and allow to cool.
- Do not deep cycle NiMH batteries as permanent damage could result.
- Do not attempt to use Elite's Li-Po/Ion functions with NiMH batteries.
- NiMH cells do not exhibit the "memory effect" like NiCd cells, so little cycling is needed.
- Store NiMH packs with some voltage remaining on the cells (refer to battery supplier).

• NiMH cells have a self-discharge rate of approximately 20-25% (compared to 15% for NiCd batteries). It is important to recharge NiMH batteries immediately prior to use.

NICD & NIMH BATTERY CHARGE PROCESSES & FIXED VALUES

PEAK DETECTION METHOD: The "negative deltaV" peak detection method is used to charge NiCd and NiMH batteries using linear current. This can result in a battery safely receiving 95-98% full charge, which is followed by a gentle trickle charge current to help the battery safely reach its 100% charge capacity. Trickle charge will be applied only after an individual peak charge (not after discharge or cycle) and will remain on until a new command is directed for this battery or until it is disconnected from the charger.

MAXIMUM CELL VOLTAGE: If the battery voltage setting is set improperly or the battery does not achieve a true peak, the peak charge process will shut down automatically if the battery reaches approx. 1.9V per cell. This is a safety feature designed to protect the battery.

PEAK DETECTION DELAY TIMER: The peak detection circuitry is temporarily disabled during the first 3 minutes of every peak charge process. Sometimes during the early stages of peak charge a battery's voltage can be unstable and cause the peak detector to accidentally stop peak charge. This delay timer will prevent such an accidental shut-down from happening. After 3 minutes most batteries become stabilized and Elite's peak detection circuit will again begin to look for a legitimate peak charge.

PEAK CHARGE SAFETY TIMER: A safety timer is designed to stop the charge process if peak charge is not detected (which can happen with batteries that are old or have reached the end of their cycle life). The safety time is automatically calculated by the charger based on the peak charge current and capacity values entered for the battery pack.

CYCLING: Cycling is the process of fully discharging then charging a battery. There are three main benefits of battery cycling:

- A. If only partially discharged on a regular basis a NiCd can develop a condition where it will begin to have difficulty storing its maximum rated capacity. It can be difficult to reverse this condition and battery replacement is sometimes necessary. Cycling NiCds once monthly can help reduce this threat. NiMH batteries benefit little from such maintenance as they typically do not suffer from such a condition.
- B. To determine if a battery is still capable of storing its maximum rated capacity. If a battery can only supply a small fraction of its rated capacity, it's likely reaching the end of its useful life and may need to be replaced.
- C. New batteries, or older batteries which have not been used or cycled frequently may need to be broken-in before they will perform to their rated capacity.

During both discharge and charge, Elite will calculate the amount of capacity that is delivered to and from the battery. *Charge* capacity measurements indicate how much energy the battery accepted from the charger. *Discharge* capacity measurements tell how much energy the battery was able to store and deliver on its own.

Comparing a battery's measured discharge capacity to its rated capacity is an indication of the battery's general condition. If a battery provides less than 70% of its rated capacity it may no longer be safe to use. Additional cycles can be attempted to try and increase the battery's storage capacity to near 100%, but if repeated attempts fail to improve performance the batteries should be replaced.

CYCLE DELAY: All cycling operations will automatically stop for 10 minutes inbetween discharge and charge routines to allow batteries to cool if they become heated. If the discharge process lasted less than 1 minute, however, the length of this delay will only be 1 minute.

MANUAL SETTING OF NICD & NIMH BATTERIES (NOT USING A MEMORY)

Follow these steps to manually configure Elite for NiCd or NiMH batteries without using a battery memory:

- 1. With the opening MEMORY screen showing, press BATTERY TYPE once to find the NiCd AND NiMH BATTERIES menu.
- 2. Press the OUTPUT SELECT button until the LCD shows the output number where the battery will be connected. The output number is always shown on-screen in reverse-type, such as **1** or **2**. An amber LED will flash briefly to indicate which output has been selected.
- 3. Connect the battery to the output selected above.
- 4. Press DOWN to find the NUMBER OF CELLS screen. Press CHANGE, then UP or DOWN to find the proper number of cells/voltage that exactly matches the rating of the battery. Press CHANGE to confirm selection.
- 5. Press DOWN to find the CAPACITY screen. Press CHANGE, then UP or DOWN to find the capacity which matches the rating of your battery (marked as "mAh"). If the battery's exact rated capacity cannot be found, select the capacity which *most closely* matches the capacity of the battery. Press CHANGE to confirm selection.
- 6. Press DOWN to find the START NiCd/MH PEAK CHARGE screen. <u>THIS IS THE</u> <u>MAIN SCREEN FOR STARTING NiCd/MH PEAK CHARGE AND ADJUSTING</u> <u>ALL CHARGE SETTINGS.</u> If the proper battery type and capacity values were entered above, the Auto Smart Set feature will have already calculated and set safe charge and trickle charge currents for the battery. To start peak charge, press and hold the CHARGE BUTTON for 2 seconds while this screen is shown. The LED for this respective output will show green during peak charge, and will flash green during trickle charge. To manually adjust the charge or trickle charge currents or the peak sensitivity value before starting charge:

- a. Press CHANGE to find the PEAK CHARGE CURRENT screen. As explained earlier, charge currents are shown in amps ("A"), not milli-amps, and low charge currents are gentler on batteries. "N," "AAA," "AA" and "A" size radio batteries can safely be peak charged at currents up to 1.5C to 2C (battery capacity x 1.5 or 2.0). High charge currents can overheat batteries and thus reduce service life, and is especially more true for smaller size cells. Press UP or DOWN to adjust the current, and press CHANGE to confirm selection.
- b. The TRICKLE CURRENT screen will appear. Trickle charge current is listed in milli-amps ("mA") and not in amps. Press UP or DOWN to adjust the trickle charge current, and press CHANGE to confirm. **Note:** If the peak charge current value is later changed to a different value, the trickle charge current value will also change automatically, as it is calculated as a fraction of the peak charge current setting.
- c. The PEAK SENSITIVITY screen will appear. This value determines the sensitivity/accuracy of the peak detection circuit. The factory default value of 8mV is acceptable for NiCd and NiMH batteries. Adjustment of this value might help match the characteristics of your battery to the charger for better peak charges. The recommended settings are 5-15mV for NiCd batteries, and 3-10mV for NiMH batteries. A lower number means the cycler will try to be more precise in finding peak charge too quickly, in which case it may be necessary to increase this number to 8mV or greater (especially if using AC input power). Press UP or DOWN to find the desired peak sensitivity value. Press CHANGE to confirm and return to the main PEAK CHARGE screen.
- 7. Press DOWN to find the START NiCd/MH DISCHARGE screen. <u>THIS IS THE</u> MAIN SCREEN FOR STARTING NiCd/MH DISCHARGE AND ADJUSTING ALL DISCHARGE SETTINGS. If the proper battery type and voltage values were entered above, the Auto Smart Set feature will have already calculated and set a safe discharge cutoff voltage for the entire battery pack which will be shown on the bottom line of this screen. To start discharge, press and hold the DSCH button for 2 seconds while this screen is being shown. The LED for the respective output will show red during discharge. To manually adjust discharge current or cutoff voltage values before starting discharge:
 - a. Press CHANGE to find the DISCHARGE CURRENT screen. Discharge currents are shown in amps ("A"), not milli-amps. The factory default value of 0.30A (300mA) is very similar to the average currents that are drained from R/C transmitter and flight pack batteries during use. It is best to use this value when trying to determine the expected run-time of the battery during normal use. As above, if you know the desired discharge current in milli-amps, divide that number by 1000 to find the proper current in amps. Press UP or DOWN to adjust the current, and CHANGE to confirm.
 - b. The DISCHARGE CUTOFF VOLTAGE screen will appear. This is the voltage level that the charger will stop discharging the battery, and is shown as volts **PER CELL** in the pack (not total pack voltage). Press UP or DOWN to adjust the voltage per cell. Press CHANGE to confirm selection and return to the main DISCHARGE screen. **Note:** Some NiCd and NiMH battery manufacturers rate the capacity (mAh) of their batteries based on a discharge cutoff voltage of 0.9V per cell. So, to see if the battery is supplying

the amount of capacity as rated by the manufacturer set the discharge cutoff voltage to 0.9V. However, to determine the battery's useful run-time (in minutes) for R/C applications leave the discharge cutoff voltage at the factory default value of 1.1V per cell. Most R/C receivers are not capable of sustaining operation with a 4-cell NiCd/MH battery that is discharged to below 1.1V per cell.

- 8. Press DOWN to find the CYCLING screen. <u>THIS IS THE MAIN SCREEN TO</u> <u>START NiCd/MH CYCLING AND FOR ADJUSTING ALL CYCLE SETTINGS</u>. If the battery voltage and capacity values were properly entered above, the Auto Smart Set feature will have already calculated and set a safe charge current and discharge cutoff voltage for your battery while cycling. To start a cycle, press and hold the CYCLE button for 2 seconds while this screen is shown. The LED for the respective output will show red during discharge and green during charge, and flash green during trickle charge. When the cycler is in cycle delay mode inbetween charge and discharge the LED will turn off. The LED will flash amber 10 times. To adjust any of the settings before starting a cycle:
 - a. Press CHANGE to find the CYCLING CHARGE current screen. Press UP or DOWN to adjust the peak charge current value that will be used during cycling. Charge current is shown in amps ("A"), not milli-amps. Press CHANGE to confirm.
 - b. The CYCLING DISCHARGE current screen will appear. The factory default value for discharge current during cycling is 0.30A (300mA) for the same reasons as explained above. To adjust, press UP or DOWN. Discharge current is shown in amps ("A"), not milli-amps. Press CHANGE to confirm.
 - c. The CYCLING DSCH CUTOFF voltage screen will appear. This screen is for setting the voltage level where discharge will stop during cycles, and is shown as volts PER CELL in the pack (not total pack voltage). Press UP or DOWN to adjust the voltage level. As noted above, a cutoff voltage of 0.9V should be used when testing the battery against the manufacturer's *capacity* rating, and a cutoff voltage of 1.1V should be used when checking the battery's useful *run-time*. Press CHANGE to confirm.
 - d. The NUMBER OF CYCLES screen will appear. Press CHANGE, then UP or DOWN to set the number of times the cycler will perform discharge-tocharge cycles consecutively. Press CHANGE to confirm the selection and return to the main CYCLING screen.
- 9. Press DOWN to find the ADJUST BUZZER AND THERMAL screen. To change the audible buzzer or temperature monitoring systems:
 - a. Press CHANGE to find the BUZZER screen. Press UP or DOWN to turn the buzzer on or off. Press CHANGE to confirm the selection.
 - b. The TEMPERATURE CUTOFF screen is used in conjunction with an optional temperature sensor. Hobbico's Accu-Cycle Elite Temperature Sensor (HCAP0281) and the Triton Temperature Probe from Great Planes (GPMM3151) are directly compatible. If it is not desired to measure the temperature of a battery, make sure the temperature sensor is *disconnected* from the cycler. To change the temperature scale from Fahrenheit to Celsius, press and hold ENTER for 3 seconds. Refer to the following tips for setting the maximum allowable battery temperature for charge and discharge. To

adjust the temperature setting, press UP or DOWN, then CHANGE to confirm the setting and return to the main ADJUST BUZZER AND THERMAL screen.

- i. The recommended maximum temperature for NiCd batteries is 113-130°F (45-55°C). The recommended maximum temperature for NiMH batteries is 110-125°F (43-52°C). NiCd and NiMH cells which are "AAA" size or smaller should use lower values. Start with lower temperatures first and if necessary adjust the temperature setting as needed in small increments and closely monitor the charge progress.
- ii. During charge, if the battery reaches the temperature setting shown the charge process will *completely stop*, the "END" message will show and charge will not re-start. Setting the temperature value too low may cause Elite to stop charging the battery before it reaches full charge. In this case, increase the temperature setting by a small amount, making sure not to allow the battery to overheat. Setting the temperature value too high may cause the battery to overheat before full charge has been reached. In this case, decrease the temperature setting.
- iii. During discharge, if the battery reaches the temperature that is set in this screen the discharge process will *temporarily pause* to allow the battery to cool down to a safe temperature. The discharge process will automatically resume when the battery's temperature drops by 2°C.
- 10. Press DOWN to return to the main NiCd AND NiMH BATTERIES screen. Any NiCd/NiMH charge, discharge or cycle function can be started at this time by using the CYCLE, DSCH or CHARGE buttons (see the STARTING CHARGE, DISCHARGE or CYCLE section on page 19).

CARE & HANDLING OF LITHIUM-POLYMER & LITHIUM-ION BATTERIES

Never attempt to care for lithium-polymer (Li-Po) or lithium-ion (Li-Ion) cells in the same way as other battery types! Li-Po and Li-Ion characteristics greatly differ from NiCd and NiMH batteries and therefore require different care and handling. Always read the instructions that are included with your lithium batteries carefully before use. Failure to follow these care and handling instructions can quickly result in severe, permanent damage to the batteries and its surroundings and even start a **FIRE**!

- **ALWAYS** charge lithium batteries in a fireproof location, which could be a container made of metal or ceramic tile. Monitor the area with a smoke or fire alarm, and have a lithium approved "ABC type" fire extinguisher available at all times.
- **ALWAYS** provide adequate ventilation around Li-Po/Ion batteries during charge, discharge, while in use, and during storage.
- **DO NOT** allow Li-Po or Li-Ion cells to overheat at any time, as they can and usually will become physically damaged and could possibly **EXPLODE** or catch **FIRE**!! If a battery becomes overheated, disconnect it from the charger **IMMEDIATELY**!

- **DO NOT** continue to charge Li-Po or Li-Ion batteries if the charger fails to recognize full charge. Swelling of Li-Po cells is an indication that they are in an overcharge condition and they should be disconnected from the charger immediately.
- **DO NOT** set Elite's "Li-Ion/Poly battery voltage" setting to a voltage that is greater than the nominal rating of the Li-Po or Li-Ion battery, as such cells cannot handle overcharging in any way.
- **DO NOT** charge Li-Po or Li-Ion batteries at currents greater than the "1C" rating of the battery ("C" equals the rated capacity of the battery).
- **DO NOT** trickle charge or cycle Li-Po or Li-Ion batteries, as they have a very low self-discharge rate and do not have a "memory."
- **DO NOT** discharge Li-Po or Li-Ion batteries at currents which exceed the discharge current rating of the battery, as this can often cause a cell to overheat.
- **DO NOT** discharge Li-Po or Li-Ion cells lower than 3.0V **per cell**.
- **DO NOT** allow Li-Po cells to come in contact with moisture or water at any time.
- **DO NOT** allow the internal electrolyte from Li-Po or Li-Ion batteries to get in the eyes or on skin wash affected areas immediately if they come in contact with the electrolyte and contact your physician!
- **DO NOT** attempt to use Elite's NiCd and NiMH functions for Li-Po or Li-Ion batteries.
- **ALWAYS** store Li-Po cells/packs in a secure location away from children.

LI-PO & LI-ION BATTERY CHARGE PROCESSES & FIXED VALUES

CC/CV CHARGE METHOD: Li-Po and Li-Ion batteries are charged using the "constant-current/constant-voltage" process (cc/cv). It is important to understand how this process functions as it's entirely different from peak detection type charging that is used on other battery types.

During the beginning stages of cc/cv charge, the charger forces constant current into the battery at the rate which is set in the "Li-Ion/Po Charge Current" screen. When Li-Po batteries reach 4.20 volts per cell, and Li-Ion's reach 4.10 volts per cell, the charger automatically *stops delivering constant current and starts applying constant voltage* to the battery. Here, the charger is no longer forcing current to the battery. Instead, the battery is only draining the amount of current from the charger that it can take naturally. As Li-Ion/Po batteries become more fully charged their internal resistance gradually increases, meaning they will begin to take less and less current from the charger. Here, the actual current coming from the charger will gradually drop below the value that was set in the "Li-Ion/Po Charge Current" screen. *THIS IS NORMAL!* Finally, when current to the battery drops to approx. 80-100mA, the charger will recognize this to mean that the battery is full and the charge process will stop. NO trickle charge is applied to Li-Po or Li-Ion batteries.

MAXIMUM CHARGE CAPACITY SHUTOFF: If Elite does not properly recognize the cc/cv point for a Li-Ion/Po battery, the fast charge process will automatically stop when the amount of capacity that has been delivered to the battery equals 105% of the capacity value that is set in the "LiPo/Ion Rated Capacity" screen. If the 105% capacity level is reached before the cc/cv point, the display will show a "Check the

batt. – time limit over" warning. So, if a 1200mAh battery is being charged this warning will show when the amount of charge capacity delivered to the battery reaches (1200 x 1.05) 1260mAh. This overcharge safety feature helps to protect the battery from an overcharge condition.

MANUAL SETTING OF LI-PO & LI-ION BATTERIES (NOT USING A MEMORY)

Follow these steps to manually configure Elite for your Li-Ion/Po batteries without using the battery memories:

- 1. With the opening MEMORY screen showing, press BATTERY TYPE twice to find the LITH-POLYMER OR ION screen.
- 2. Press the OUTPUT SELECT button until the LCD shows the output number where the battery will be connected. The output number is always shown on-screen in reverse-type, such as **1** or **2**. An amber LED will flash briefly to indicate which output has been selected.
- 3. Connect battery to the output selected above.
- 4. Press DOWN to find the BATTERY VOLTAGE screen. Press CHANGE, then UP or DOWN to find the total voltage that exactly matches the nominal rating of your battery. WARNING!! NEVER set this voltage to a level that is higher than the battery's rated voltage as Li-Ion/Po cells cannot handle overcharging in any way!! Press CHANGE to confirm selection.
- 5. Press DOWN to find the CAPACITY screen. Press CHANGE, then UP or DOWN to find the capacity which matches the rating of your battery (marked as "mAh"). If the battery's exact rated capacity cannot be found on-screen, select the capacity which most closely matches the capacity of the battery. Press CHANGE to confirm selection.
- 6. Press DOWN to find the START Li-Ion/Po FULL CHARGE screen. <u>THIS IS THE</u> <u>MAIN SCREEN FOR STARTING Li-Ion/Po CHARGE AND ADJUSTING CHARGE</u> <u>CURRENT</u>. If the proper battery type and capacity values were entered above, the Auto Smart Set feature will have already calculated and set a safe charge current for your battery. To start full charge, press and hold the CHARGE button for 2 seconds while this screen is shown. The LED for this respective output will show green during charge. The LED will flash amber 10 times when charge is done.

To manually adjust the charge current, press CHANGE to find the CHARGE CURRENT screen. Charge currents are shown in amps ("A"), not milli-amps. It is NOT RECOMMENDED to charge Li-Po/Ion batteries at currents *greater than the "1C" rating of the battery*. "C" equals the rated capacity of the battery in mA. So, a battery rated at 550mAh has a 1C rating of 550mA. A battery rated at 1200mAh has a 1C rating of 1.2A, etc. Press UP or DOWN to adjust the current, and press CHANGE to confirm selection and return to the main FULL CHARGE screen.

Note: If the charge current was adjusted to greater than the "1C rating" of the battery the display will show the warning statement "Charge current too high! Start?" If you believe the selected charge current *will safely charge the battery* press CHARGE.

Otherwise, press ENTER to return to the main START Li-Ion/Po FULL CHARGE screen and reset the current level.

- 7. Press DOWN to find the DISCHARGE screen. <u>THIS IS THE MAIN SCREEN FOR STARTING LI-ION/PO DISCHARGE AND ADJUSTING ALL DISCHARGE SETTINGS</u>. If the proper battery type and voltage values were entered above, the Auto Smart Set feature will have already calculated and set a safe discharge cutoff voltage for the battery pack which will be shown on the bottom line of this screen. To start discharge, press and hold the DSCH button for 2 seconds while this screen is being shown. The LED for the respective output will show red during discharge. The LED will flash amber 10 times when discharge is done. To manually adjust the discharge current before starting discharge:
 - a. Press CHANGE to find the DISCHARGE CURRENT screen. The factory default value of 0.30A (300mA) is very similar to the average currents that are drained from R/C flight pack batteries during use. It is best to use this value when trying to determine the expected run-time of the battery during normal use. Discharge currents are shown in amps ("A"), not milli-amps. **DO NOT** discharge Li-Po or Li-Ion batteries at currents which exceed the discharge current rating of the battery, as this can often cause a cell to overheat. Press UP or DOWN to adjust the current, and CHANGE to confirm.
 - b. The DISCHARGE CUT VOLTAGE screen will appear. This is the voltage level that the charger will stop discharging the battery, and is shown as *volts per cell* (not total pack voltage). This screen is for information purposes only. The cutoff voltage is NOT adjustable as Li-Ion/Po batteries can be permanently damaged if discharged to a voltage that is too low. Press CHANGE to return to the main DISCHARGE screen.
- 8. Press DOWN to find the ADJUST BUZZER AND THERMAL screen. To change the audible buzzer or temperature monitoring systems:
 - a. Press CHANGE to find the BUZZER screen. Press UP or DOWN to turn the buzzer on or off. Press CHANGE to confirm the selection.
 - b. The TEMPERATURE CUTOFF screen is used in conjunction with an optional temperature sensor. Hobbico's Accu-Cycle Elite Temperature Sensor (HCAP0281) and the Triton Temperature Probe from Great Planes (GPMM3151) are directly compatible. Monitoring a battery's temperature in addition to its voltage can result in the most accurate full charges without damaging the battery and is highly recommended for use with Li-Ion/Po batteries! If it is not desired to measure the temperature of a battery, make sure the temperature sensor is *disconnected* from the cycler. To change the temperature scale from Fahrenheit to Celsius, press and hold ENTER for 3 seconds. Refer to the following tips for setting the maximum allowable battery temperature for charge and discharge. To adjust the temperature setting, press UP or DOWN, then CHANGE to confirm the setting and return to the main ADJUST BUZZER AND THERMAL screen.
 - i. The maximum temperature for Li-Ion/Po batteries varies by cell manufacturer, but as a general recommendation the maximum temperature should not exceed 90-95°F (32-35°C). For Li-Ion/Po

batteries, it is better to be safe than sorry! Start with lower temperatures first and if necessary adjust the temperature setting as needed in small increments and closely monitor the charge progress.

- ii. During charge, if the battery reaches the temperature setting shown the charge process will *completely stop*, *the "END" message will show and will not re-start*. Setting the temperature value too low may cause Elite to stop charging the battery before it reaches full charge. In this case, increase the temperature setting by a small amount, making sure not to allow the battery to overheat. Setting the temperature value too high may cause the battery to overheat before full charge has been reached. In this case, decrease the temperature setting.
- iii. During discharge, if the battery reaches the temperature that is set in this screen the discharge process will *temporarily pause* to allow the battery to cool down to a safe temperature. The discharge process will automatically resume when the battery's temperature drops by 2°C.
- 9. Press DOWN to return to the main LITH-POLYMER OR ION screen. Any Li-Ion/Po charge or discharge function can be started at this time by using the DSCH or CHARGE buttons (but not CYCLE, see the STARTING CHARGE, DISCHARGE or CYCLE section below).

STARTING CHARGE, DISCHARGE OR CYCLE

There are 3 main buttons which control the charge, discharge and cycle functions. The CYCLE, DSCH and CHARGE pushbuttons are the "Jump Start" controls, which provide a very quick and easy way to access and start these functions. These buttons function as follows:

- 1. Pressing the CHARGE button will cause the LCD to automatically jump to the "Start NiCd/MH Peak Charge" or "Start Li-Ion/Po Full Charge" screen depending on which battery type is currently selected in the main menu or battery memory. When either screen is shown, re-pressing and holding the CHARGE button will start the charge process.
- 2. Pressing the DSCH button will cause the LCD to automatically jump to the "Start NiCd/MH Discharge" or "Start Li-Ion/Po Discharge" screen, depending on which battery type is current selected. When either screen is shown, re-pressing and holding the DSCH button will start the discharge process.
- 3. Pressing the CYCLE button will cause the LCD to automatically jump to the "Start NiCd/MH Cycling" screen. Re-pressing and holding the CYCLE button will start the cycle process. The CYCLE button is not functional for Li-Ion/Po batteries.

CHARGE, DISCHARGE & CYCLE DISPLAYS

Accu-Cycle Elite's display is covered by a clear window to protect the LCD from dirt, debris and accidental breakage. Take extra care not to scratch this window. If the window becomes dirty, use a soft, 100% cotton cloth to clean the window. Do not

apply pressure on the window when cleaning. Do not use off-the-shelf cleaning solutions on any part of the window or touchpad, as it could cause permanent damage. Lightly dampen the cotton cloth to clean the panel, and immediately remove any moisture afterward with a dry cotton cloth. Make sure Elite is removed from the input power source when cleaning the display.

Various types of information relating to charge, discharge and cycling functions can be viewed on the LCD while the function is in progress. Information on these screens is active and updated constantly until the function has ended.



CHARGE and DISCHARGE: Data accumulated during charge and discharge will be shown on twin screens as shown at right. These screens will automatically alternate in order to provide as much information as possible, yet be easy to understand.



CYCLE DATA: Data gathered during a cycle is also shown on twin alternating screens as shown at right. One screen (left) will show which cycle is being performed (CYCLE 1-5). Another screen (right) will show the function in progress (CHG or DSCH). The "Cycle Delay" screen will show in-between discharge and charge functions.



BATTERY TEMPERATURE: Pressing CHANGE while charge or discharge is in progress will cause the display to show the battery temperature screen (sensor must be connected to proper output and battery). Every 3 seconds, the screen will show a "Peak" temperature. Note, this is NOT necessarily the temperature of the battery when at peak voltage, but the maximum temperature recorded. Press CHANGE to return to the charge/discharge screen as shown above.



END OF PROCEDURE: When a function has ended the display will show "END." This display will also alternate between two separate screens as shown at right. The trickle current and output voltage will be constantly updated as long as the battery is still connected unless charge ended because the battery becomes too hot. The measured capacity and stop time data is the final data recorded when the charge or discharge procedure ended.

FINAL DATA SET: When all charge, discharge or cycling functions have ended, a series of screens are available that show various types of data about the battery and the function just completed. When the "END" screen is being shown, pressing CHANGE will scroll the cycler through the screens shown as follows:

- 1. Battery temperature screens: Same as previously explained.
- 2. "Peak Volts and Ave Volts" screen: The maximum voltage the battery achieved during *charge* is the "Peak Volts." The calculated average voltage of the battery measured over the course of an entire *discharge* period is the "Ave Volts." Keeping track of both of these measurements every time a cycle is performed can help to evaluate the overall condition of the battery as it ages. A battery's peak and average voltage levels should decrease gradually as it reaches the end of its useful life.
- 3. Cycle Data: Charge and discharge capacity data for all cycles (1-5) can be viewed in this screen. Press UP or DOWN while this screen is shown to view data for any of the 5 cycles.
- 4. Back to the "END" screen.



Pressing ENTER will take the cycler back to the opening MEMORY screen. Once ENTER is pressed, all data in the screens explained above will be reset, and cannot be recovered.

ERROR MESSAGES & TROUBLESHOOTING GUIDE

Accu-Cycle Elite includes solid-state circuitry to protect against damage which could be caused by short-circuit or reverse polarity conditions. A number of error messages are also included to help identify improper operations or connections. If a problem exists with any output, it will not be possible to change output ports with the OUTPUT SELECT button until the problem is corrected. See below for a list of possible error messages which might show on-screen, which will be accompanied by an audible alarm and flashing red LED on the output port with the error.

Message on LCD	Problem and Solution
"Check the input voltage x.xV"	Input voltage is below 10V or above 22V DC. Re- check input power supply voltage.
"Output battery reverse polarity"	Battery is connected backwards to an output. Re- check connection, press ENTER to reset and try again.
"Output battery short-circuit"	The charge lead or battery connected to an output is short circuited. Re-check output, press ENTER to reset and try again.
"Connect battery – check	Make sure battery is connected to the output, and
connection"	check lead for possible problems. Press ENTER to reset and try again.
"Re-connect batt – Circuit is open"	Battery or lead became disconnected during a function. Re-connect, press ENTER to reset and try again.
"Check the batt. – Time limit over"	For NiCd/MH batteries the peak charge safety timer expired before battery reached full charge. For Li- Ion/Po batteries the 105% maximum capacity safety
	feature was reached before the cc/cv point was reached.
"Voltage too low – Battery is x.xV"	The voltage of the battery on the output is too high for the battery voltage setting in the cycler. Either Elite's voltage setting is incorrect, or the battery's rated voltage exceeds the setting. For lithium batteries, the "END" screen will show instead.
"Voltage too high – Battery is x.xV"	The voltage of the battery on the output is too low for the battery voltage setting selected in the cycler. Either Elite's voltage setting is incorrect, or the battery is in poor condition.
"Check the temperature sensor"	Temperature sensor connected to jack backwards. Re-connect sensor properly.
"Battery temperature too low"	The temperature of the battery is below 32° F (0°C). Allow battery to warm before proceeding.
"Wait a moment – batt temp high"	Will show during discharge only if the battery temp. exceeds the entered setting. Discharge will resume automatically when the battery's temperature drops 35° F (2°C).

"Wait a moment – charger too hot" Will show if Elite's own internal temperature exceeds 176°F. Operations will resume automatically when internal temp. returns to below 140°F. This protects Elite's electronics from damage due to excess heat.

PROBLEM: Display does not work when unit is connected. **SOLUTION:**

- 1) Check power supply for improper power.
- 2) Check input connections for proper contact.
- 3) Make sure power switch is ON.
- 4) DC input power is connected backwards. Reverse input connection.

PROBLEM: LCD or LEDs do not seem to function according to commands given to charger.

SOLUTION:

- 1) Battery possibly connected backwards. Connect battery leads properly.
- 2) OUTPUT SELECT button needs to be pressed to make sure the output being controlled is the one which the battery is connected to.
- 3) Contact Hobby Services for further details.

PROBLEM: Charger doesn't recognize battery.

SOLUTION:

- 1) Check for faulty connection or wiring. Correct or replace charge lead.
- 2) Defective cell in the pack. Replace battery pack or cell.

PROBLEM: Battery voltage low after charge (below 1.2V per cell for NiCd/MH, or below 3.6V or 3.7V for Li-Ion/Po batteries).

SOLUTION:

- 1) NiCd/MH peak sensitivity setting too low or too high. Re-adjust setting.
- 2) Li-Ion/Po battery capacity setting doesn't match battery rating. Reset setting.
- 3) Poor quality charge leads. Replace with new.

PROBLEM: Will not lock into discharge mode.

SOLUTION:

- 1) Battery's rated voltage set improperly. Set battery voltage to exactly match that of the battery.
- 2) Tx has diode in charge circuit. Remove battery and connect directly to charger, or contact your radio manufacturer for details.
- 3) Battery is already discharged.
- 4) Defective cell in pack. Replace battery.

PROBLEM: Low mAh/time readings after discharge.

SOLUTION:

Battery not fully charged prior to discharge. Fully charge batteries prior to discharge.
Old or unused batteries. Cycle again to see if capacity improves.

- 3) Defective battery, needs to be replaced.
- 4) Discharge rate too high. Change discharge rate to 0.30A for better accuracy.
- 5) Battery's rated voltage set improperly. Set battery voltage to exactly match that of the battery.
- 6) Possible internal problem with charger. Contact Hobby Services for further details

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Memory Menu



NiCd & NiMH Menu



For NiCd and NiMH batteries:

* Peak detection monitor delay timer fixed at 3 minutes.

* Cooloff time delay between charge and discharge during cycles fixed at 10 minutes.

* Auto Smart Set feature pre-calculates peak charge safety timer.

Ассо-Сусје Lithium Menu Memory #0 8C 1 Lith-Polymer or BATTERY TYPE RO SERIE 1 NiCd/MH 650mAh Ion (LiPo/Ion) UP/DOWN To change, press CHANGE, then UP or DOWN. Press CHANGE to confirm. For Li-Ion batteries, select from 3.6, 7.2 or 10.8V. For Li-Po Li-Ion/Polv batt batteries, select from 3.7, 7.4 or 11.1V. 1 volts: 3.7V (1C) UP/DOWN To change the rated battery capacity, press CHANGE, then UP or DOWN. Press CHANGE to confirm. NOTE: if the exact rated 1 LiPo/lon rated capacity of the battery is not shown, find the capacity value that is closest to the rating of the pack. capacity: 650mAh UP/DOWN The Auto Smart Set feature will have already set charge current based on the capacity value set above. To adjust press UP or DOWN, then CHANGE to advance to next screen. * Jump Start CHARGE screen* CHANGE CHANGE Li-Ion/Po charge START Li-Ion/Po 1 current: 0.15A 1 FULL CHARGE UP/DOWN Adjust discharge current if desired, or press CHANGE to advance. The Auto Smart Set feature will have already set a discharge cutoff voltage for the pack based on the battery voltage value set above, which is not adjustable. * Jump Start DISCHARGE CHANGE CHANGE CHANGE LiPo/Ion dischg 3.0V dsch cut START Li-Ion/Po 1 1 1 voltage (fixed) current: 0.30A DISCHARGE 3.0V UP/DOWN Adjust if desired, or press CHANGE to advance to next screen. Buzzer turns on or off. To change temperature scale from 'F to 'C press and hold ENTER for 3 seconds. CHANGE CHANGE CHANGE Temperature Buzzer 1 Adjust buzzer 1 cutoff: 120'F 1 ON and thermal UP

For Li-Ion and Li-Po batteries:

screen*

* Maximum charge volts per cell fixed at 4.20V for Li-Po, 4.10V for Li-Ion

* If the cc/cv point is not recognized the charge process will end when charge input energy reaches 105% of the battery's rated capacity

	ACCU-CYCLE ELITE CHARGE/DISCHARGE CHART FOR R/C SYSTEM BATTERIES									
BAT	TERY	SPECS		CHARGING		DISCH	IARGING			
	I		Std Charge Quick Charge		Peak Detection	Discharge	Discharge			
Туре	Size	Capacity	rate at 1C	rate (1.5C)	Sensitivity	current	cutoff voltage			
NiCd	N/AAA	50mAh	0.05A	0.10A	-					
		110mAh	0.15A	0.15A						
		150mAh	0.15A	0.25A						
		250mAh	0.25A	0.40A						
		300mAh	0.30A	0.45A						
	AA	500mAh	0.50A	0.75A						
		600mAh	0.60A	0.90A			1 1 vielte men cell			
		700mAh	0.70A	1.00A		0.30A when checking the battery for	when testing batteries			
		800mAh	0.80A	1.20A		useful flight time	for useful flight time			
	А	1000mAh	1.00A	1.50A	Q 1EmV non coll					
		1100mAh	1.10A	1.65A	8-15mv per cen					
		1200mAh	1.20A	1.80A		1.50 . 90 fer	0.0 welte non cell			
		1300mAh	1.30A	1.95A		quick discharges	when checking the			
		1400mAh	1.40A	2.00A			battery's capacity against the manufacturer's rating			
	Sub-C	1400mAh	1.40A	2.00A						
		1500mAh	1.50A	2.00A						
		1800mAh	1.80A	2.00A						
		1900mAh	1.90A	2.00A						
		2000mAh	2.00A	2.00A						
		2400mAh	2.00A	2.00A						
NiMH	N/AAA	300mAh	0.30A	0.45A						
		500mAh	0.50A	0.75A						
		600mAh	0.60A	0.90A						
		700mAh	0.70A	1.00A						
	AA	1200mAh	1.20A	1.80A						
		1300mAh	1.30A	1.95A						
		1400mAh	1.40A	2.00A						
		1500mAh	1.50A	2.00A	2 10mV non coll					
		1600mAh	1.60A	2.00A	5-10mv per cen	same as above	same as above			
	А	1500mAh	1.60A	2.00A						
		1700mAh	1.70A	2.00A						
		1800mAh	1.80A	2.00A						
		1900mAh	1.90A	2.00A						
		2000mAh	2.00A	2.00A						
	Sub-C	3000mAh	2.00A	2.00A						
		3300mAh	2.00A	2.00A						

BATTERY SPECS C		CHARGING		DISCHARGING			
		Standard Charge	Quick charge		Discharge	Discharge	
Туре	Capacity	rate at 0.2C	rate at 0.7C		current	cutoff volatge	
Lithium-Ion	350mAh	0.05A	0.25A		0.30A		
or Lithium-	720mAh	0.15A	0.50A		0.30A		
Polymer	1200mAh	0.25A	0.85A		0.30A	3.0 volts per cell	
	1500mAh	0.30A	1.00A		0.30A		
1							

BATTERY MEMORY CHART

Memory	0	1	2	3	4	5	6	7	8	9
Batt Description										
Batt Type										
Batt Volts										
Capacity mAh										
Chg Current										
Trickle mA										
Peak Sensitivity										
Dsch Current										
Dsch Cutoff										
# Cycles										