



**PEAK CHARGER • DEEP CONDITIONER • ANALYZER**  
for R/C system batteries



## INSTRUCTIONS

### QUICK REFERENCE GUIDE

If you are using a 4.8V 500-750mAh receiver (Rx) battery, and/or a 9.6V 500-750mAh transmitter (Tx) battery, follow this Quick Reference Guide for quick and easy cycling of NiCd batteries with your Accu-Cycle Plus. **We strongly recommend that you read this entire instruction book for all applications.**

- ✓ 1. Turn power switch ON.
- ✓ 2. Connect Rx and Tx batteries using proper connectors.  
**WARNING: NOTE POLARITIES!**
- ✓ 3. Place both the Rx and Tx DISCHARGE RATE switches in 250mA positions.
- ✓ 4. Place Rx CELL SELECTOR in 4-cell position, Tx CELL SELECTOR in 8-cell position.

- ✓ 5. Place both the Rx and Tx PEAK CHARGE RATE switches in the 500mA positions.
- ✓ 6. Press both the Rx and Tx PEAK CHARGE buttons. Peak charge will begin. Both green PEAK CHARGE LED's will flash when both batteries become fully charged.
- ✓ 7. Press both DISCHARGE & AUTO-PEAK CHG buttons. Both batteries will discharge. Display will indicate the remaining charge your batteries had prior to connection to the Accu-Cycle Plus.
- ✓ 8. Accu-Cycle Plus will automatically switch batteries to peak detection charge mode when discharge is done.
- ✓ 9. When both charge LEDs flash, repeat step 6 above. Accu-Cycle Plus will again discharge batteries and display complete cycle information when finished.
- ✓ 10. Refer to "Display Data" section to determine the condition of your batteries.

### INTRODUCTION

Accu-Cycle Plus is a high performance digital battery charger/conditioner/analyzer designed for nickel-cadmium (NiCd) radio control transmitter and receiver packs and single-cell batteries. Accu-Cycle Plus is two completely separate analyzers in one package. It can independently peak charge, discharge, or cycle receiver and/or transmitter batteries at the same time. Accu-Cycle Plus provides valuable information about the condition of each battery through two easy-to-read liquid crystal displays (LCD), including battery voltage, charge time, discharge time, and discharge capacity. It is very user-friendly and uses standard banana jacks for easy connection to charge leads (not included; see rear of manual for complete list of Hobbico charge leads).

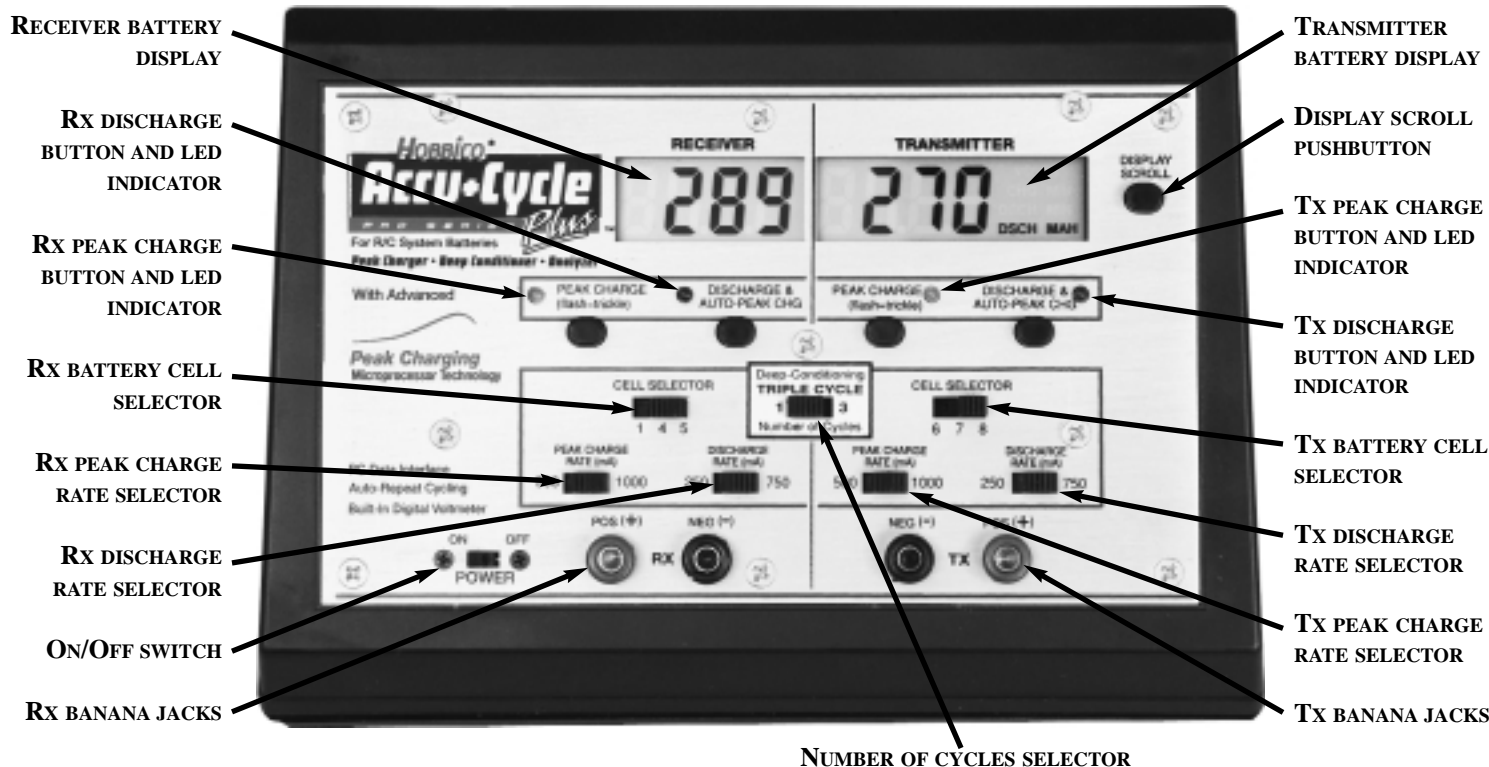
Accu-Cycle Plus provides two peak charge rate selections, 500 and 1000mA, for quick-charging transmitter and receiver batteries. It uses an intelligent fast charge termination method known as "delta V" to detect when a battery's voltage has reached peak charge, and automatically switches down to trickle charge after peak has been detected, so your batteries always receive a full charge.

Accu-Cycle Plus provides two discharge rate selections, 250 and 750mA, for transmitter and receiver batteries, and automatically terminates discharge when your battery voltage drops to a

predetermined value. After discharge is complete, Accu-Cycle Plus will automatically switch back to peak charge mode, again charging your batteries so they are ready for use. Your battery's discharge data will remain on the display after discharge is complete for your convenience.

Accu-Cycle Plus provides two options for cycling your batteries. You can set the cyclor to perform just one complete cycle, as is normally done when evaluating regularly used batteries. Or, you can choose to use the Deep-Conditioning Triple Cycle feature, whereby the unit will automatically cycle your batteries 3 times in succession, displaying on-screen the data from the last cycle. This is helpful for reviving old batteries or breaking-in new ones, as they can sometimes require multiple cycles to increase storage capacity to come back up to safe operating condition.

Optional features for Accu-Cycle Plus (not included) are a DC Power Converter, which allows for portable operation when AC power is not available. Also, a PC Data Interface kit is available, to download Accu-Cycle Plus' cycling data to your personal computer, for advanced tracking and analysis of your batteries. Accu-Cycle Plus comes with Hobbico's 2-year limited warranty (U.S.A. and Canada only) to cover any defects in material and workmanship. **Please read this entire instruction manual prior to operation. Damage resulting from misuse or modification will void your warranty.**



## CYCLING BATTERIES

Cycling is the process of charging and discharging batteries to precise specifications, to gain maximum effectiveness out of your batteries. Cycling NiCd batteries at least once a month can help them achieve their maximum rated capacity and life span. If unused for a long period of time, rechargeable batteries may develop a condition where they will not adequately accept or hold a charge. Occasionally, a battery with this condition may be revived after several cycles, but not always. New batteries often require a short break-in period prior to use before they will perform to their rated capacity. This is not unusual. Cycling is the best way to break-in or revive a battery pack. Accu-Cycle Plus allows you to select whether you want to perform just one complete cycle (for regularly used packs), or three successive cycles using the Deep-Conditioning Triple Cycle feature (for break-in of new or unused packs).

### Follow these basic steps to properly cycle your NiCd radio batteries.

1. Choose either the "1" or "3" cycle selection on the DEEP-CONDITIONING TRIPLE CYCLE switch located in the center of the cyclor.
2. Make sure all other charge and discharge switches are in their proper settings (read further for details).
3. To remove and evaluate any charge that may remain on your batteries, place them on discharge (see "Discharging Batteries" for details). After discharge is complete, your batteries will be switched automatically to the quick-rate peak charge mode, and become fully charged.
4. After charge mode ends:

If you chose to do only a single cycle, you will have to manually place your batteries back in discharge again by pressing the corresponding DISCHARGE & AUTO-PEAK CHG button.

If you chose to use the deep conditioning triple cycle feature, Accu-Cycle Plus will handle all operations automatically.

5. After discharge ends, the complete cycle data for your batteries will be displayed on the LCDs. Accu-Cycle Plus will then automatically repeak-charge your batteries, so they are ready for use.
6. Refer to "Display Data" to evaluate the condition of your batteries.

## DISPLAY DATA

Accu-Cycle Plus will display data at all times during operation and hold the data on-screen after cycling is complete. When the TRIPLE CYCLE switch is in the "3" position, however, data gathered during each cycle will be displayed during each respective cycle, but only data from the final cycle will be held on the display after cycling is complete. Accu-Cycle Plus' display is split into two screens, the left side for receiver batteries, the right for transmitter batteries. The displays allow you to monitor your battery's voltage, charge time, discharge time, and discharge capacity. Pressing the DISPLAY SCROLL button anytime allows you to view any one of the four available display selections on the LCDs:

**Voltage:** Active when "VOLTS" is visible on the LCD. Two on-board digital voltmeters, one each for the Rx and Tx sides, display the voltage of each battery. When connected to the banana jacks, the voltage of each battery is constantly being measured. No other connections are required for this function. **Note:** When in peak charge mode, the voltage values on the display will be slightly higher than the actual voltage of the batteries, due to excess loading in the circuitry which is needed for peak charge. This is normal.

**Charge minutes:** Active when “CHG MIN” is visible on the LCD. Accu-Cycle Plus will track the time in minutes in which your battery is in fast charge mode (to tenths-of-minutes). The up-timer begins when the respective PEAK CHARGE button is pressed, and ends when peak charge is detected and charge is terminated. This feature can allow you to get a feel for how long it normally takes to fast charge your batteries after normal use. If, during any subsequent fast charge operation, the charge time is substantially different than normal, you should be alerted that perhaps something unusual is occurring with your battery or something prevented it from receiving a full charge. Further cycling may be required to verify its condition prior to use. The “CHG MIN” data will remain unchanged, until the PEAK CHARGE command is given again or until the POWER switch is turned off. **NOTE:** If left connected to the cycler in trickle charge mode for an extended period of time, you may notice the data on the display reads “999.9”. To return the proper data to the LCD simply disconnect the red (+) battery lead from the cycler, then reconnect it. All data should return as normal.

**Discharge minutes:** A count-up timer is used to track how many minutes it took to discharge your battery, active when “DSCH MIN” is visible on the LCD (to tenths-of-minutes). Once the respective DISCHARGE & AUTO-PEAK CHG button has been pressed, the timer will begin to track the time until the proper discharge cutoff value has been reached, where discharge will terminate and the timer will cease count. This data will remain unchanged until another discharge command is given or until the POWER switch has been turned off.

After a full charge has been given to your batteries, followed by a discharge, you can use the “DSCH MIN” data to determine the total number of minutes that your batteries can supply power during typical applications. Many transmitters and receivers will discharge batteries at approximately 250mA (PCM radios may be slightly higher). Therefore, using the 250mA discharge rate selection will provide the most realistic length of time your batteries may power your equipment during normal operation. Also, after batteries have been partially used in your transmitter or receiver, you can determine the operational time remaining in your battery by discharging them at 250mA and noting the “DSCH MIN” displayed after discharge is complete. This can help you get a feel for how much energy your batteries use during operation at the field during the day.

The 750mA discharge rates are designed to simply provide a faster method for discharging your batteries, for convenience purposes and NOT for highest accuracy. Very few transmitters will discharge at such a high rate, and only 1/4 or giant scale aircraft might cause such a high drain from your flight battery. But, the exact rate at which your aircraft drains your battery is highly dependent on many variables in your particular situation, so it is difficult to generalize what a high-rate discharge may be with any accuracy. So, discharging at 750mA will cause the “DSCH MIN” time to be much lower than what you will likely see with your radio. Therefore, it is not recommended you use the 750mA “DSCH MIN” time by which to judge the actual discharge **time** of your batteries in actual use. Your “DSCH MAH” readings may be slightly lower than those seen when discharging at 250mA because a higher discharge rate will ultimately mean lower accuracy. This is normal. Regardless of your specific usage, once you use this feature you will become familiar with what is normal for your particular application. And, you should become alerted any time you notice the “DSCH MIN” time for any given discharge is drastically different than the normal readings.

If, at any time while a battery is in discharge mode, you change the DISCHARGE RATE (mA) selector switch to the opposite position, the “DSCH MIN” data on the LCD will flash. This is to alert you that your discharge time data will no longer be reliable information, as it is now a combination of two different rates. It is best to not change this discharge rate selection while the battery is in discharge.

**IMPORTANT!** After NiCd batteries become discharged to their rated minimum voltage, battery power will decrease very rapidly. Therefore, during actual use it is highly recommended that you cease to operate your radio equipment at a safe distance short of the “DSCH MIN” time displayed by Accu-Cycle Plus. You can never be sure exactly how rapidly your battery will “dump”, so to err on the side of caution is highly recommended.

**Discharge mAh:** Active when “DSCH MAH” is visible on the LCD. Accu-Cycle Plus can show the actual discharge capacity in milli-Amp-hours (mAh) supplied by your battery. Once the respective DISCHARGE & AUTO-PEAK CHG button is pressed, Accu-Cycle Plus will track the discharge capacity provided by your battery. Once the pre-set discharge cutoff voltage for your battery is achieved, discharge will terminate and the discharge mAh data will remain on-screen.

All batteries are rated by their manufacturer for the amount of charge they can hold, rated in mAh. You can compare the “DSCH MAH” data displayed by Accu-Cycle Plus to the mAh rating of your battery (usually printed on the battery) to determine the condition of your battery. If the LCD shows your battery provided less than 70% of its rated capacity after a complete cycle, a problem may exist with that battery. To determine the 70% capacity mark for your battery, simply multiply its rated capacity by 0.7. A battery with poor capacity (under 70%) will not provide adequate power for your application, and in fact could place your equipment in jeopardy if used. If Accu-Cycle Plus shows your battery did not deliver at least 70% of its rated capacity you may wish to cycle your battery again, as occasionally an old or unused battery may need multiple cycles to come to life. However, if your battery again fails to exceed the 70% mark, replacement is recommended.

## INITIAL SETUP

1. Accu-Cycle Plus uses an external 110V AC power adapter. Connect one end of the adapter to a common 110 volt wall outlet, and plug the plastic connector on the opposite end to the rear of Accu-Cycle Plus. Turn the POWER switch to the "ON" position.

2. Using the following chart, determine the number of cells in your pack.

1.2V battery = 1 cell	7.2V battery = 6 cells
4.8V battery = 4 cells	8.4V battery = 7 cells
6.0V battery = 5 cells	9.6V battery = 8 cells

3. For the transmitter pack you wish to cycle, place the Tx CELL SELECTOR in the appropriate position, either 6, 7, or 8 cells. For the receiver pack or individual cell you wish to cycle, place the Rx CELL SELECTOR switch in the appropriate position, either 1, 4 or 5 cells. Incorrect setting of these switches can cause erroneous readings on the LCD, and may damage your batteries.

4. Connect your Tx charge lead's banana plugs to the TX jacks, and the opposite end to your Tx (or directly to the battery). Connect the Rx charge lead's banana plugs to the RX jacks and the opposite end to the Rx battery or individual cell. The corresponding green PEAK CHARGE LED will flash when proper battery connection is made, indicating trickle charge is in progress.

**WARNING!** Always match polarities properly when connecting your batteries to the cyclers; red (+) to red, black (-) to black. When the Rx CELL SELECTOR is in the 1-cell position, the Rx output jacks are not protected against improper connection. Do not connect the battery in reverse or short the charge leads while in this setting. If the LEDs do not respond according to your commands, an improper connection is the problem and should be corrected immediately! Failing to obey this warning may damage your battery and/or your Accu-Cycle Plus, and void your warranty.

## DISCHARGING BATTERIES

Accu-Cycle Plus' discharge circuits will discharge your batteries down until a voltage equivalent to 1.05 volts PER CELL is reached. This corresponds to cutoff values established by many major NiCd cell manufacturers. **NOTE:** Some transmitters may contain a diode in their charge circuitry which will not allow you to discharge the batteries while they are connected to the transmitter. In such case, when connected to Accu-Cycle Plus you will not be able to place these batteries into discharge mode. If such a situation occurs, the best option is to remove the battery from the transmitter and connect it directly to Accu-Cycle Plus, using one of Hobbico's pre-assembled charge leads (see rear of manual for a complete list).

1. Place the respective Rx or Tx DISCHARGE RATE (mA) selector in the desired position. For best accuracy select the 250mA position. For speed and convenience cycling, select the 750mA position (see the "Display Data: Discharge Minutes" section for details).
2. Press the transmitter DISCHARGE & AUTO-PEAK CHG button to begin discharging your transmitter battery. The corresponding red LED should illuminate, indicating Tx discharge is in progress.
3. Press the receiver DISCHARGE & AUTO-PEAK CHG button to begin discharging your receiver battery. The corresponding red LED should illuminate, indicating Rx discharge is in progress.
4. Once discharge is complete, Accu-Cycle Plus will automatically switch your batteries over to peak charge mode. Therefore, make sure the Tx and Rx PEAK CHARGE RATE (mA) selector switches are in the proper positions at this time (see "Charging Batteries").

When discharge is complete, your battery's discharge data will remain on-screen until you initiate another discharge command, or turn off the POWER switch. Pressing the discharge button while your battery is already in discharge mode will not effect the cycler in any way. Refer to "Display Data" to understand how to properly evaluate the data provided by Accu-Cycle Plus. Refer to the Troubleshooting Guide in the rear of this manual if you experience difficulties with your batteries or your Accu-Cycle Plus.

## COOLDOWN MODE

Due to the higher discharge and charge rates used by Accu-Cycle Plus, your batteries may become slightly warmer than usual while being cycled. For this reason, a short cool down period has been designed into Accu-Cycle Plus' software, to help keep your batteries as cool as possible. This cool down time of 10 minutes will occur between discharge and peak charge periods, beginning precisely when discharge has terminated, and Accu-Cycle Plus will indicate when this function is operational by flashing "COOL" on the LCD. For convenience reasons, you can force Accu-Cycle Plus out of this cool down period if you so choose by pressing the respective PEAK CHARGE button. However, if your packs are warm it may be best to let them remain in the cool down mode for the duration of the 10 minutes. Accu-Cycle Plus will automatically proceed to peak charge mode after the cool down period has terminated.

## CHARGING BATTERIES

Accu-Cycle Plus utilizes the "-deltaV" method for detecting peak charge. By this method, the cycler monitors battery voltage during charge, specifically noting when the maximum battery voltage occurs and then terminates fast charge. In fact, once a NiCd battery has reached peak charge, or maximum total voltage, the voltage will then begin to DECREASE if left in charge mode. The "-deltaV" method of detecting peak charge notes when this decrease in voltage occurs and terminates peak charge when the voltage PER CELL decreases by 32mV. If a condition exists causing peak charge to be undetectable (perhaps caused by a defective battery pack), Accu-Cycle Plus has two safety features which should terminate fast charge:

1. If the voltage of the battery reaches the equivalent of 1.74V PER CELL, fast charge will terminate.
2. If after 120 minutes peak charge has not been detected, fast charge will terminate.

Generally it is a good idea to discharge your batteries on Accu-Cycle Plus before charging (see "Discharging Batteries"). **Note:** A NiCd battery will typically reach 100% full charge when using lower charge rates, such as those provided by the charger supplied with your radio system, but that usually takes many hours to complete. Accu-Cycle Plus' charge rates are higher than those provided by your radio's charger, to provide you the advantage of charging your batteries more rapidly so they are ready for use in a much shorter amount of time. As a result of these faster charge rates, the peak detection circuitry may terminate fast charge just short of the 100% full capacity mark, but typically no earlier than 95% of the full charge level. For this reason, you may want to leave your batteries connected to Accu-Cycle Plus for a few minutes after peak charge has terminated to "top-off" your battery while in trickle charge mode.

When connected and in peak charge mode, it is best to leave your batteries and charge connectors untouched. The peak detection circuitry inside Accu-Cycle Plus is very sensitive and manipulation of the batteries or connectors could cause erratic operation.

1. Select the charge rates at which you would like to fast charge both your transmitter and/or receiver NiCd battery. The 500mA rate is recommended for batteries which are rated less than having 750mAh capacity. Use the 1000mA rate for batteries which are greater in capacity than 750mAh. Select these rates with the corresponding Rx or Tx PEAK CHARGE RATE (mA) selector switches. **Note:** In actual use, you may notice the amount of current actually being delivered to your batteries may fluctuate from the setting you have chosen. This is normal. Many variables exist which can effect the actual charge rate being delivered to the battery. As opposed to timed chargers, the peak detection circuitry in Accu-Cycle Plus will make sure your battery receives full charge, regardless of the level of current being delivered. If each battery is properly connected, its corresponding green LED will flash, indicating the batteries are in trickle charge mode.

2. Press the receiver PEAK CHARGE button to begin peak charging the receiver battery. The corresponding green LED will illuminate constantly during fast charge mode.

3. Press the transmitter PEAK CHARGE button to begin peak charging the transmitter battery. The corresponding green LED will illuminate constantly during fast charge mode.

**WARNING!** It is not unusual for a battery to become warm to the touch during charge or discharge. If a battery becomes HOT at any time while connected to Accu-Cycle Plus, a problem may exist with the battery, cyclor, or your connectors. **DISCONNECT BATTERIES IMMEDIATELY** and refer to the troubleshooting guide.

4. When each battery has reached peak charge, Accu-Cycle Plus will automatically switch each battery from the fast charge mode to trickle charge mode, indicated by the flashing green LED. Accu-Cycle Plus has two trickle charge modes:

After peak charge has terminated, a trickle charge rate equaling 5% of the peak charge rate selection (25mA or 50mA) will be supplied for the first 24 hours. This will help “top-off” your batteries for maximum effectiveness.

After 24 hours, the trickle charge rates will decrease to 2% of the peak charge rate selection (10mA or 20mA). This gentle rate will help your batteries maintain full charge when not in use, but is low enough that it will not harm your batteries. Batteries can be left connected to Accu-Cycle Plus indefinitely while in this state.

5. The maximum charge Accu-Cycle Plus will deliver to a battery at the end of the maximum 120 minute charge time (if peak charge is not detected) is either 1000mA if the charge rate switch is set at 500mA or 2000mA when the rate is set at 1000mA. If you notice the cyclor terminates fast charge at the 120 minute mark, instead of terminating due to peak detection of the battery, your battery may not have reached peak charge. This may occur if your battery pack has an abnormally high capacity rating (greater than 2000mA), if the charge rate switch is in the wrong position in respect to your battery’s rating or if your pack simply is capable of storing much more capacity than its rating. As such, you may need to repeat the charge sequence to

make sure your battery reaches peak charge. Simply press PEAK CHARGE again and your battery should reach peak in a very short amount of time during this second charge period.

6. It is always a good idea to check your battery's total voltage before disconnecting it from Accu-Cycle Plus, to confirm that a charge was accepted and it is now safe for use. If after a full charge your battery voltage is low (less than 1.2V per cell), be alerted that your battery may not be in suitable condition for use, and refer to the “Troubleshooting Guide” for further details.

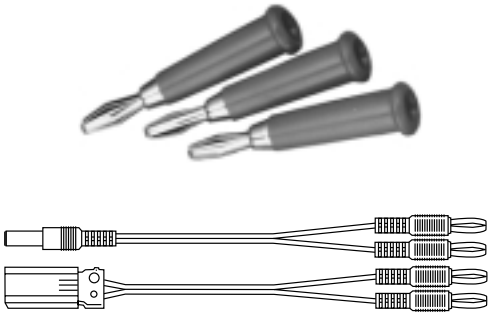
Refer to the Troubleshooting Guide on the next page if you experience any difficulties with your batteries or your Accu-Cycle Plus.

## OPTIONAL DC POWER CONVERTER

For use at the field or where AC power is not available, Accu-Cycle Plus can become portable when used with Hobbico’s DC Power Converter. When connected to a 12V DC power source, such as a car battery, lead-acid battery, or DC power supply, capable of delivering 3A of current, the DC Power Adapter will convert the 12V input voltage to a level sufficient for Accu-Cycle Plus to handle all of your cycling needs. See your local dealer for details.

## CHARGE LEADS

Hobbico Ready-To-Use Charge Leads

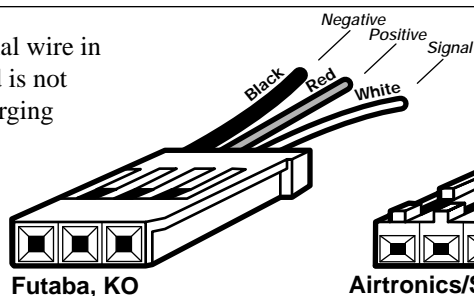


Hobbico offers a variety of charge leads to match any radio system you may have. These charge leads plug directly into charging outlets, eliminating the need for soldering, crimping, or splicing banana plugs onto wires. The one meter wire length maximizes the user’s convenience, with no extra wires necessary. Charge lead packages including both transmitter and receiver leads are available with Airtronics, JR, HiTec, and Futaba J, G, and 9VAP connectors. Leads are also available for glow starters, equipped with banana plugs or alligator clips.

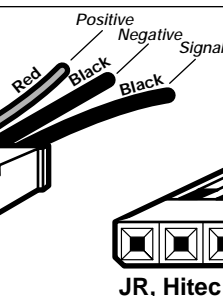
These items may be purchased through your local hobby shop.

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)

**Note:** The signal wire in the charge lead is not used when charging receiver packs.



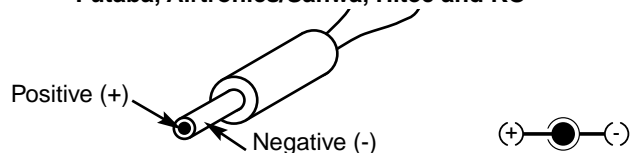
**Airtronsics/Sanwa**



**JR, Hitec**

**Warning:** Be very cautious of reverse polarity when using JR charge leads.

#### Futaba, Airtronsics/Sanwa, Hitec and KO



#### ACCU-CYCLE PLUS CYCLER SPECIFICATIONS

Physical dimensions = 8.0 x 5.0 x 3.4"

Compatible battery chemistries = nickel-cadmium only (NiCd)

Number of Rx cells = 1, 4 or 5

Number of Tx cells = 6, 7 or 8

Battery Capacity range = 250-2000mAh

Primary charge termination method = "-delta V" peak detection

Secondary charge termination methods = maximum 1.74volts per cell,  
maximum 120 min. peak  
charge time

Peak charge current rates = 500 or 1000mA

24 hour trickle charge rate = 5% of peak charge currents

Extended trickle charge (after 24 hours) = 2% of peak charge currents

Cool-off between discharge & charge = 10 minutes

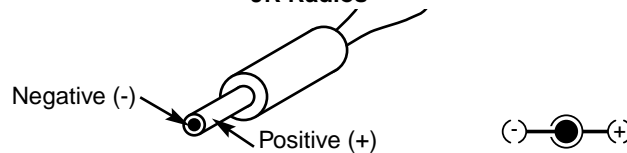
Discharge current rates = 250 or 750mA

Display type = 2 x 4 digital custom LCDs

Digital voltmeter resolution = 00.05V

Fuse type = 5A automotive/spade type

#### JR Radios



#### ACCU-CYCLE PLUS 110V AC ADAPTER SPECIFICATIONS

Input = 120V AC ~ 60Hz

Output = 16V AC ~ 3000mA

Physical dimensions = 4.5 x 3.2 x 2.7"

Output cord length = 6 feet

Approvals = Meets UL specs, not UL listed

In cooperation with the Rechargeable Battery Recycling Corporation, Hobbico encourages proper disposal of environmentally hazardous materials. Once NiCd batteries no longer perform adequately, they should be discarded at your local recycling center. Or, call 1-800-8-BATTERY for information. It may be illegal in your state to dispose of NiCd batteries with common waste.



## TROUBLESHOOTING GUIDE

PROBLEM	CAUSE AND CURE
Display does not work when unit is connected to AC power.	Power switch in the "off" position. Turn the power switch to the "on" position.
Charge LED does not flash or illuminate when batteries are connected.	1) Battery may be connected backwards. Connect battery leads properly. 2) Faulty connection or wiring. Correct or replace charge lead. 3) Defective cell in the pack. Replace battery pack or cell. 4) Cell selector in improper position. Choose correct setting.
Does not automatically terminate peak charge after 120 minutes.	Internal problem with Accu-Cycle. Disconnect battery immediately and contact Hobby Services for further details.
Battery voltage low after peak charge (below 1.2V per cell).	1) Charge rate setting too low. See "Charging Batteries". 2) Battery connected in reverse. Connect battery leads properly. 3) Defective battery, needs to be replaced.
Will not lock into discharge mode.	1) Battery connected in reverse. Connect battery leads properly. 2) Cell selector in wrong position. Adjust cell selector to match the number of cells in the pack. 3) Tx has diode in charge circuit. Remove battery and connect directly to Accu-Cycle Plus, or contact your radio mfg. for details. 4) Defective cell in pack. Replace battery 5) Battery already discharged.
Low mAh/time readings after discharge.	1) Batteries not fully charged prior to discharge. Fully charge batteries prior to discharge. 2) 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 250mAh for better accuracy. 5) Possible internal problem with Accu-Cycle Plus. Contact Hobby Services for further details
LEDs and controls do not function properly.	Battery possibly connected backwards. Connect battery leads properly, or contact Hobby Services for further details.

**Cut-out or photocopy and then cut-out these labels for your batteries.**

Cycle Date		Cycle Date		Cycle Date		Cycle Date		Cycle Date		Cycle Date	
End Voltage		End Voltage		End Voltage		End Voltage		End Voltage		End Voltage	
Capacity		Capacity		Capacity		Capacity		Capacity		Capacity	

Cycle Date		Cycle Date		Cycle Date		Cycle Date		Cycle Date		Cycle Date	
End Voltage		End Voltage		End Voltage		End Voltage		End Voltage		End Voltage	
Capacity		Capacity		Capacity		Capacity		Capacity		Capacity	

Cycle Date		Cycle Date		Cycle Date		Cycle Date		Cycle Date		Cycle Date	
End Voltage		End Voltage		End Voltage		End Voltage		End Voltage		End Voltage	
Capacity		Capacity		Capacity		Capacity		Capacity		Capacity	

Cycle Date		Cycle Date		Cycle Date		Cycle Date		Cycle Date		Cycle Date	
End Voltage		End Voltage		End Voltage		End Voltage		End Voltage		End Voltage	
Capacity		Capacity		Capacity		Capacity		Capacity		Capacity	

Cycle Date		Cycle Date		Cycle Date		Cycle Date		Cycle Date		Cycle Date	
End Voltage		End Voltage		End Voltage		End Voltage		End Voltage		End Voltage	
Capacity		Capacity		Capacity		Capacity		Capacity		Capacity	

Cycle Date		Cycle Date		Cycle Date		Cycle Date		Cycle Date		Cycle Date	
End Voltage		End Voltage		End Voltage		End Voltage		End Voltage		End Voltage	
Capacity		Capacity		Capacity		Capacity		Capacity		Capacity	

<b>ACCU-CYCLE PLUS CYCLING DATA CHART</b>	Cycle Date	Cycle Date	Cycle Date	Cycle Date	Cycle Date	Cycle Date
	Rx Tx	Rx Tx	Rx Tx	Rx Tx	Rx Tx	Rx Tx
Charge rate selection (mA)						
Discharge rate selection (mA)						
Battery being cycled						
# of cells						
rated mAh						
Battery voltage reading – VOLTS						
Peak charge minutes reading – CHG MIN						
Discharge minutes reading – DSCH MIN						
Discharge capacity reading – DSCH MAH						
Battery efficiency after cycle = ("DSCH MAH"/battery rated mAh) X 100						

<b>ACCU-CYCLE PLUS CYCLING DATA CHART</b>	Cycle Date	Cycle Date	Cycle Date	Cycle Date	Cycle Date	Cycle Date
	Rx Tx	Rx Tx	Rx Tx	Rx Tx	Rx Tx	Rx Tx
Charge rate selection (mA)						
Discharge rate selection (mA)						
Battery being cycled						
# of cells						
rated mAh						
Battery voltage reading – VOLTS						
Peak charge minutes reading – CHG MIN						
Discharge minutes reading – DSCH MIN						
Discharge capacity reading – DSCH MAH						
Battery efficiency after cycle = ("DSCH MAH"/battery rated mAh) X 100						

## HydriMax™ Nickel-Metal Hydride Batteries



For the same size and weight, nickel-metal hydride (NiMH) HydriMax batteries offer twice the capacity of NiCd's—perfect for weight-sensitive applications and power-hungry computer radios! HydriMax packs are also environmentally friendly, so you can enjoy twice the convenience and capacity with none of the disposal hazards of NiCd cells and packs!

Available in ready-made packs to fit all popular transmitters, in common receiver pack sizes and shapes, and individual cells in A & AA sizes.

## Hobbico® Digital LCD Voltmeter



Tiny NiCd, NiMH or huge 12V lead-acid batteries—Hobbico's Digital DC Voltmeter reads voltage on any 0.00-19.99V battery with 0.01V accuracy...and shows the results in big, 1/2" high characters. A load switch allows you to use the DVM as either a true voltmeter, or a loaded voltmeter simulating a 300mA load for realistic testing of your Tx or Rx batteries—and backs it up with glowing red (for recharge) or Green (for "Go Flying") LEDs.

**Stock# HCAP0355**

## Hobbico® Accu-Glo™ Power Panel



Hobbico's "Pro Series" Accu-Glo handles all the jobs of a 12V power panel, powering all of your electric field gear. It delivers the necessary glow plug heat automatically, regardless of whether the plug is flooded, the weather is cold, or the field battery is powering other equipment. An LED indicates when the field battery needs recharging. The Fuel Pump Switch is spring-loaded and cannot lock into the "Fill" position, helping to prevent fuel spills.

**Stock # HCAP0305**

## Hobbico® DC Quick Field Charger



Hobbico's "Pro Series" Quick Field Charger fast-charges 9.6V Tx and 4.8V or 6.0V Rx NiCd's to peak at the field, using any 12V DC input. Advanced Negative Delta Peak sensing technology prevents overcharging by automatically switching to trickle once batteries are fully charged. Unique voltage boost circuitry peaks Tx NiCd's even in diode-equipped radios.

**Stock # HCAM3000**

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

HOBBY SERVICES  
1610 Interstate Drive  
Champaign, IL 61821

(217) 398-0007

[www.hobbico.com](http://www.hobbico.com)

### 2-YEAR LIMITED WARRANTY - \*U.S.A 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 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.