

## **Astro Model 110 Deluxe Digital Peak Charger/Discharger**

Congratulations! You have just purchased one of the finest digital **Charger/Dischargers** available. With proper care it should give you many years of service. **Before using this unit, please read these instructions over carefully.** The Model 110 Deluxe is designed to charge and discharge both Nicad and Nickel Metal Hydride battery packs. This charger can handle any pack containing from one cell up to twenty four cells. Cell sizes can range from 50 mahr to 5000 mahr. All cells in a single battery pack must be of the same capacity and in the same state of charge.

The Model 110 Deluxe uses a proprietary 8 bit microprocessor to perform all of the necessary mathematical computations required to insure foolproof peak charging and discharging of both Nicad and Nickle Metal Hydride battery packs. A two line digital display indicates the status of the charging sequence and tells you the charge current, the battery voltage, the duration of the charge, and the actual number of milliamp hours of charge put into the battery pack. A built in voltage converter boosts the input from 12 volts to 40 volts so that battery packs containing up to 24 cells can be charged. This charger is designed to be powered from a 12 volt regulated power supply, like our Astro Model 120, or a 12 volt automobile battery. **Never use an automobile battery charger as a power source, for it could damage your new Model 110 Deluxe charger.**

There are two power cords on the **charger/discharger**. The four foot long cord with the alligator clips is the **input cord** and should be connected to the 12 volt power source. The short cord is the **output cord** and is fitted with an Astro Zero Loss Connector #526. Connect the **output cord** to the NiCad or hydride battery being charged or discharged. Astro Flight Zero Loss Connectors (p/n #525, 526 and 527) may be purchased from Astro Flight or from your local hobby dealer.

The charger has a current adjust knob on the front panel. Charging current can then be adjusted between 50 milliamps and 8 Amps. Discharging current is electronically limited to 1.25 amps.

### **Four messages are displayed during the charging sequence.**

1. The amount of charging current flowing into the Nicad or Nimh battery pack.
2. The voltage of the battery being charged.
3. The duration of charge in hours, minutes and seconds.
4. The number of milliamp-hours of charge put into the battery pack.

When the charger software detects a peak condition, charging will stop. The display will indicate the peak voltage reached, the duration of charging and the milliamp hours of charge delivered to the battery. The buzzer will then beep 3 xs.

### **Three messages will be displayed during the discharging sequence.**

1. The voltage of the battery packs being discharged.
2. The duration of the discharge in hours, minutes and seconds.
3. The total number of milliamp hours delivered to the load.

When the NiCad has been discharged to a voltage of approximately 0.9 volts per cell, the discharging will automatically stop.

### **Charging your Nicad or Hydride Battery**

**Connect the alligator cords** to a 12 volt regulated power supply, like our Astro Model 120, or a 12 volt automobile battery. The display should come on and say Astro Flight Model 110 Deluxe, **“waiting for battery”**.

**Wait for the display** to say **“waiting for battery”** then connect the short output cord to the Nicad or Nimh battery you wish to charge. Charging will automatically begin. If your battery is not connected, has a loose connection, is connected backwards, or is drained to less than 1/2 volt, the microprocessor will not detect the battery and **“waiting for battery”** will still be displayed. If your battery is properly connected, the display will begin indicating the charge current, the battery voltage, the duration of the charge and the milliamp hours delivered to the battery. Turn the current adjust knob on the front panel to the desired charging rate. We recommend charging **nicads at a 2 to 3C rate** (two or three times mahr the rating of the cell). For example, we recommend charging a 500 mahr NiCad pack at 1 to 1.5 amps. We recommend charging **Nickle Metal Hydride cells at a 1 to 1.2 C rate**. For example we recommend charging a 3000 mahr Nickle Metal Hydride pack at 3 to 3.6 amps. During the first minute of charging, the charging current may decrease slightly as the battery voltage rises. After 30 seconds you may want to re-adjust the rate.

**After a one minute grace period, the peak detection phase begins.** If the voltage of the battery being charged decreases, the charging will stop. If you turn the current adjust knob to decrease the charging current after the one minute grace period, the battery voltage will decrease. The computer will think that the battery has peaked and charging will stop. If this happens, just remove the battery and then reconnect it to resume charging.

**After charging is complete,** the digital display will indicate that the battery has peaked and it will display the peak voltage reached and the number of milliamp hours of charge put into the battery.

### **Discharging your Nicad or Nimh Battery**

To prevent your NiCad and hydride battery packs from becoming unbalanced they should always be discharged after use and stored in a discharged state.

**To Discharge** your Nicad or Nimh battery, first connect the battery then connect the alligators to your 12 volt power source. Discharging will automatically begin.

**During Discharge** the digital display will indicate battery voltage, duration of discharge in hours, minutes and seconds, and the milliamp hours delivered from the NiCad or hydride battery to the electronic load in the unit.

**When Discharge** is complete the discharging will automatically stop. As long as the Nicad or Nimh pack is connected, the display will be frozen with the values of final discharge voltage and the number of milliamp hours taken from the pack.

**To go back to charging,** remove the battery pack, wait for the display to say **“waiting for battery”** and then connect the next battery.

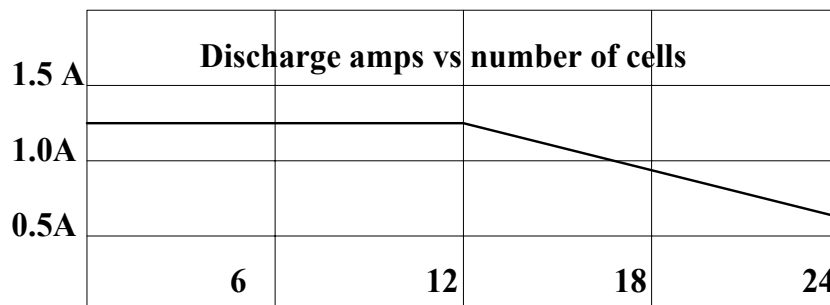
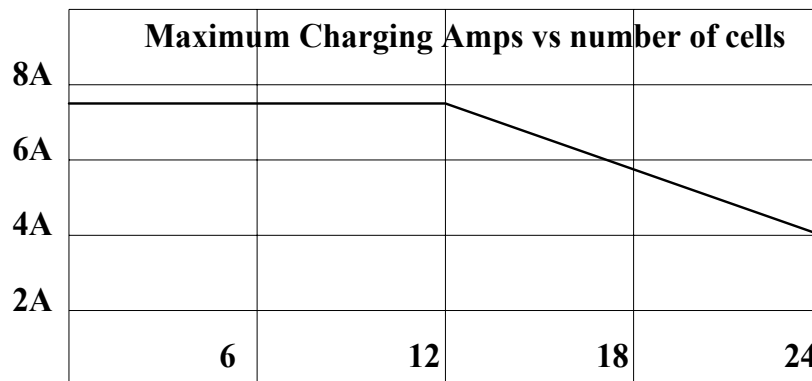
### Messages

**Over voltage error** This message is displayed if a battery pack of more than 24 cells is connected to the charger or if during charge the NiCad is disconnected. If you see “**Overvoltage error**”, remove the NiCad or hydride pack and disconnect the alligator clips from the 12 volt power source. Set the Charge current to minimum. Then reconnect the NiCad or Nimh battery. If you have changed the Astro connector, please check to make sure that the polarity of your other connector is correct and that you have done a good solder job.

**Waiting for Battery this** message occurs when the computer does not detect a positive voltage of 1/2 volt or more at the output cord. Make sure there are no loose connections and that the polarity of the Nicad or Nickle Metal Hydride packs is correct. If your battery is totally drained, you must first put a charged battery on the charger and set the charge current for 100 mas. Then disconnect the Charged battery and substitute the drained battery. Then adjust for desired charging rate.

**Shorted Output** This message occurs if the Nicad or Hydride battery is removed during the first minute of charging. Remove the 12 Volt source and then re-connect the 12 Volt source to reset microprocessor in the charger.

I hope that you will enjoy my latest charger design, and I would like to thank Doug Ingraham for designing the computer software.  
Bob Boucher



**Other Astro Products you may wish to Purchase**

<b>Stock No</b>	<b>Item Description</b>	<b>Price</b>
100	Micro Meter up 10 A and 15 V	\$59.95
101	Whattmeter up to 75 A and 80 V	\$59.95
102	6/7 Cell Discharger	\$19.95
103	10/12 Cell Discharger	\$19.95
104	4/8 Cell Discharger for Rec. and Trans.	\$19.95
105	Servo Tester	\$19.95
523	Silicone Wire 16 Gage, 3 ft Red and 3 ft Black	\$4.95
524	Silicone Wire 16 Gage, 10 ft Red and 10 ft Blk	\$9.95
525	Astro Zero Loss Connectors, 1 pair	\$6.95
526	Astro Zero Loss Connectors, 2 motor side	\$5.95
527	Astro Zero Loss Connectors, 2 nicad side	\$7.95
528	Silicone Wire 13 Gage 3ft Red and 3 ft black	\$4.95
529	Silicone Wire 13 Gage, 10 ft Red and 10 ft Blk	\$11.95
544	Charger patch cord Astro to Tamiya	\$7.50
545	Charger patch cord Astro to Deans Ultra	\$7.50
546	Charger patch cord Astro to Deans Micro	\$7.50
547	Charger patch cord Astro to Receiver Nicad	\$7.50
548	Charger patch cord Astro to Transmitter	\$7.50

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