The Tower Hobbies Digital Peak Charger is designed for peak charging of nickel-cadmium (NiCd) and nickel-metal hydride (NiMH) batteries, with programming flexibility and a custom 2x8 LCD that is normally found in more expensive chargers. Please carefully read this instruction manual, and reference the included programming flowchart for a quick and easy understanding of all of this charger’s capabilities.

### SPECIFICATIONS

- **Input voltage:** 110V AC 60Hz, 11-15V DC
- **Compatible cell types:** nickel-cadmium (NiCd), nickel-metal hydride (NiMH)
- **Cell counts:** 1 to 8 cells
- **Peak charge rate:** 0.1 to 5.0A (3A max. w/AC input)
- **Fast charge termination:** peak detection
- **Trickle charge rate:** 0, 100mA, 200mA selectable
- **Peak Sensitivity:** 3 to 20mV adjustable
- **Display type:** 2x8 LCD
- **Sound cues:** individual tones and pre-set melodies
- **Battery memories:** 10
- **Output connectors:** spring loaded terminals
- **Case size:** 5" x 3.4" x 5.5" [127 x 86 x 140mm]
- **Weight:** 2.94 lb. [1335g]

### SPECIAL FEATURES

- AC/DC convenience is great for use at home or at the track!
- Peak charges 1 to 8 NiCd or NiMH cells.
- Charge current ranges from 0.1 to 5.0 amps (3.0A maximum with AC input).
- A custom 2x8 LCD makes for easy programming and use, showing battery volts, peak sensitivity, charge time, current, and capacity, various error indications, and more!
- Adjustable peak sensitivity from 3mV to 20mV, to custom match the charger to specific batteries.
- Automatic charge mode automatically sets charge parameters based on the operating condition of the battery.
- Adjustable trickle charge rates from 0, 100mA, 200mA.
- Store pre-set charge parameters for up to 10 batteries in memory.
- Multiple sound cues and tunes.
- Solid-state reverse polarity and short circuit protection on input and output.

### IMPORTANT PRECAUTIONS

- Do not attempt to charge batteries at currents higher than rated by the battery manufacturer.
- Do not use automotive type battery chargers to power the charger.
- Do not leave the charger unattended while charging. 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 allow water, moisture or foreign objects into the charger.
- Do not place the battery or charger on or near a flammable object while in use. Keep away from carpets, cluttered workbenches, etc.
- Do not cover the air intake holes on the charger as this could cause the charger to overheat.
- Always disconnect charger from power source when not in use.
- Adult supervision required when used by a child.

NiMH cells are slightly different than NiCd batteries. Pay attention to the following points when handling NiMH batteries:

- Do not allow NiMH batteries to overheat during charge, as it can adversely affect their performance and lifespan.
- Do not deep cycle NiMH batteries as permanent damage could result.
- Little cycling of NiMH cells is needed, but can be done occasionally to check pack condition.
- Store NiMH packs with some voltage remaining on the cells.
- NiMH cells have a self-discharge rate of approximately 20 to 25% (compared to 15% for NiCd batteries). Thus, if NiMH batteries have been inactive for more than a few days it is important to recharge them immediately prior to use.

### INPUT POWER

When using 12V DC input power, attach the charger’s red alligator clip to the positive (+) terminal on the battery or power supply, and the black alligator clip to the negative (-) terminal. It’s best to use a “clean” DC power source whose output is filtered to remove unwanted electrical noise. To achieve the charger’s maximum potential, the DC power source must be capable of delivering at least 6 amps of current while maintaining 12V DC.

To use 110V AC for input power, connect the black AC plug to a regular 110V wall outlet.

**WARNING!** Do not connect the charger’s AC and DC input leads to power sources at the same time, as permanent damage may result!

Once power is applied, if the “Input V Error” message shows you should check the input power source to make sure it’s voltage is not
too high or low. Double-check the power source to make sure it is providing adequate voltage to the charger.

### SELECTING A MEMORY SETTING

This charger includes 10 memories (numbered from 0 to 9) for storing setup parameters for different batteries. This feature is very convenient, making it very easy to switch from one battery type to another in just moments – without having to re-configure the charger each time.

When power is applied the LCD will show the LAST memory used. The memory number will show between the arrows on the top line of the display like 0 0. All settings for this memory will automatically scroll on the bottom line of the LCD. If the settings in this memory are not suitable for the battery to be charged you can either re-configure the settings in this memory or check another memory. To select another memory:

1. Push the middle button marked ENTER. The memory number on the LCD will begin to flash.
2. Scroll up or down through the memories (0-9) by pressing + or -.
3. When the desired memory is found, press ENTER. The memory number will stop flashing, and this memory will now be active.

### CONFIGURING EACH MEMORY SETTING

To re-configure the settings in any memory:

1. Press the + button to access the “BATT SETUP” menu.
2. Press + to find the “BAT. TYPE” screen. Press + or – to select either “NiCd” or “NiMH” to match the battery.
3. Press + to find the “CAPACITY” screen. Press + or – to set the value to match the capacity rating marked on the battery (ranges from 50 to 5000mAh). If the battery’s rated capacity is not known or listed, consult your supplier to get the exact specifications for the battery. If this value is set below the battery’s rated capacity the battery might not receive full charge. If this value is set too high, it might not provide ample protection in the event of an accidental overcharge. To effectively de-activate this feature, set the value to some percentage of the battery’s rated capacity.
4. Press + to find the charge “CURRENT” screen. Press + or – to find the desired fast charge current value, ranging from 0.1A (100mA) to 5.0 amps.

**WARNING!** Do not set the charge current too high, as overheating and permanent damage to the battery could result.

If unsure of the proper charge current setting for your battery consult your battery supplier, or refer to the chart below for a recommended setting. Locate the rated capacity value for your battery in the left column. For a one hour charge, set the current to the value shown in the middle column (minimum charge time depends on how much charge existed in the battery prior to being placed on charge). For a quick charge, set the current to the value in the right column.

<table>
<thead>
<tr>
<th>Battery’s rated capacity (mAh)</th>
<th>1 hour charge current</th>
<th>Quick charge current</th>
</tr>
</thead>
<tbody>
<tr>
<td>700</td>
<td>0.7A</td>
<td>1.4A</td>
</tr>
<tr>
<td>1000</td>
<td>1.0A</td>
<td>2.0A</td>
</tr>
<tr>
<td>1100</td>
<td>1.1A</td>
<td>2.2A</td>
</tr>
<tr>
<td>1200</td>
<td>1.2A</td>
<td>2.4A</td>
</tr>
<tr>
<td>1500</td>
<td>1.5A</td>
<td>3.0A</td>
</tr>
<tr>
<td>1600</td>
<td>1.6A</td>
<td>3.2A</td>
</tr>
<tr>
<td>1700</td>
<td>1.7A</td>
<td>3.4A</td>
</tr>
<tr>
<td>1800</td>
<td>1.8A</td>
<td>3.6A</td>
</tr>
<tr>
<td>1900</td>
<td>1.9A</td>
<td>3.8A</td>
</tr>
<tr>
<td>2000</td>
<td>2.0A</td>
<td>4.0A</td>
</tr>
<tr>
<td>2100</td>
<td>2.1A</td>
<td>4.2A</td>
</tr>
<tr>
<td>2500</td>
<td>2.5A</td>
<td>5.0A</td>
</tr>
<tr>
<td>3000</td>
<td>3.0A</td>
<td>5.0A</td>
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<tr>
<td>3300</td>
<td>3.3A</td>
<td>5.0A</td>
</tr>
<tr>
<td>3600</td>
<td>3.6A</td>
<td>5.0A</td>
</tr>
<tr>
<td>3800</td>
<td>3.8A</td>
<td>5.0A</td>
</tr>
<tr>
<td>4200</td>
<td>4.2A</td>
<td>5.0A</td>
</tr>
<tr>
<td>4600</td>
<td>4.6A</td>
<td>5.0A</td>
</tr>
<tr>
<td>5000</td>
<td>5.0A</td>
<td>5.0A</td>
</tr>
</tbody>
</table>

Scrolling past the 5.0A selection you will find the “Auto” setting. Selecting “Auto” allows the charger itself to check the condition of the battery every minute during charge, and automatically adjust the charge current to a safe level for the battery. If using the “Auto” feature, the charger will automatically set the peak sensitivity value (described below)…3mV if the battery type selected is “NiCd”, and 5mV if the “NiMH” battery type is selected.

**Note:** The maximum charge current is limited to approximately 3.0A when using 110V AC input power.

5. Press + to find the peak sensitivity screen, marked “△ PEAK”. This feature sets how precise the charger should be for detecting the battery’s peak voltage. Press + or – to select the desired peak sensitivity value, ranging from 3mV (per cell in the pack) to 20mV/C.

For more precise peak detection, set this value to a LOWER number. However, note that (a) if the condition of the battery is sub-standard, (b) if the power source is electrically noisy, or (c) if the charge current setting is high, the charger might stop charge too soon – or too late. If you suspect this might be happening, adjust this setting to a slightly higher number.

Setting the peak sensitivity value to a HIGHER number allows the charger more room for error when trying to detect peak. However, if set too high this could result in less full charges, or the battery generating excess heat. If you suspect this is happening, reduce the number to a lower value.

A peak sensitivity setting of 6mV is recommended for NiCd batteries, and 8mV for NiMH batteries.

Once the peak sensitivity value is selected, press ENTER. The LCD will return to the opening screen.
TRICKLE CHARGE & AUDIBLE TUNES

The Tower Hobbies Digital Charger includes the option to select either 200mA, 100mA, or no trickle charge current to be applied automatically after peak charge. And, you can select from one of five different audible tunes to sound automatically as the charger completes different functions. To adjust either of these settings:

1. While the “START” screen is showing, press twice to find the “USER SETUP” screen.

2. Press to find the “TRICKLE” screen. Trickle charge current can automatically be applied to the battery after peak charge ends, at the rate set in this screen. Press or to select from 200mA or 100mA trickle current. If you do not wish to apply a trickle charge, select the “0mA” setting.

3. Press to find the “MELODY” screen. Selecting one of any five different audible tunes is done in this screen. As the charger finishes different functions, it will sound the tune as selected in this screen. Press or to hear any of the five tunes. If you do not wish for any tunes to sound, select “OFF”. Press ENTER to confirm the melody selection.

4. Press twice to return to the “START” screen.

BATTERY CONNECTION

The two spring-loaded output terminals are located on the front of the charger, which offer a convenient way to connect a variety of different charge connectors. A standard battery connector is included with this charger. Press the red spring lever on the right (positive polarity), then carefully insert the exposed wires of the adapter’s red (positive) wire inside the terminal. Release the red lever, and ensure a good connection is present. Press the black spring lever on the left (negative polarity), then carefully insert the exposed wires of the adapter’s black (negative) wire inside the terminal. Again ensure that a solid physical connection exists.

WARNING! Do not connect the battery to the charger in reverse polarity. Failure to do so could result in permanent damage to your battery and the charger. ALWAYS connect the adapter to the charger BEFORE connecting the adapter to the battery. Connecting the battery to the adapter before connecting the adapter to the charger could cause the battery to accidentally short-circuit, causing severe and permanent damage to the battery. Make sure no stray strands of wire accidentally make contact with both the positive and negative terminals or battery connections.

STARTING PEAK CHARGE

Choose the proper memory selection to match the battery to be charged. Review all charge parameters along the bottom of the LCD before proceeding. Re-select the proper memory selection if necessary.

Once the proper memory has been chosen, or the proper charge parameters have been entered, press and hold ENTER for 3 seconds. Peak charge will begin, accompanied by an audible tone and the “Charge Start...” message on the display.

Several conditions could prevent the charger from starting or completing peak charge, which would be accompanied by an error message on the LCD, as follows:

“No Battery” will show if a battery is not detected on the charger’s output. Re-check for solid connections on both spring terminals.

“Wrong Polarity” will show if the battery is connected backwards to the charger. Disconnect the battery from the adapter. Make sure the adapter is connected properly to the spring terminals. Then reconnect the battery to the adapter.

“Open Circuit” will show anytime the battery becomes disconnected from the charger during peak charge mode. Re-check for solid connections for each the black and red connections.

After making the necessary error correction, return to step 1 in this section to re-start the peak charge process.

CHARGE DATA

Once charge begins, the charger will automatically start showing data regarding the charge process on two separate screens. Press or anytime to alternate between the two screens, as follows:

| Parameter               | Value
|-------------------------|-------
| Current in amp          | 3.6   |
| Voltage                | 7.613 |
| Energy delivered to bat | 3800  |
| Time in minutes         | 042:21|
| Input voltage to charger| 12.83 |

FINAL CHARGE DATA

When peak charge is finished the LCD will flash “Charge Complete” for 10 seconds accompanied by audible tunes, and the charger will automatically switch to trickle charge which will be applied until the battery is disconnected. The LCD will then change to show final charge data on two alternating screens. Data will stay on the screens until another command is given to the charger.

Final charge energy: This can help to determine how well the battery accepts a charge. Compare this number to the battery’s rated capacity. If the displayed value is much lower than the capacity rating on the battery it could mean (a) the battery is in poor condition and may need to be replaced, (b) the charger’s peak sensitivity setting might need to be adjusted, (c) the charge current setting may need to be adjusted down, or (d) there might be a poor connection between the battery and charger.
**Final data:** At any time after peak charge has ended, pressing the + and – buttons simultaneously will temporarily show the final measured peak voltage and charge input capacity delivered to the battery. After 3 seconds, the charger will revert back to the default display.

The peak voltage data can help to determine the overall condition of the battery. This is the HIGHEST voltage measured during charge. Typically, a battery in good condition will exhibit a higher peak voltage than a battery of poorer condition, and can often result in the battery being able to deliver more output power. It is normal for the peak voltage value of a battery to gradually decrease over the useful lifetime of the battery.

**TROUBLESHOOTING GUIDE**

**PROBLEM:** Display does not work when unit is connected. Check power supply for improper power. Check input connections for proper contact. Internal problem – contact Hobby Services for details.

**PROBLEM:** Charger doesn’t recognize battery. Battery may be connected backwards. Connect battery leads properly. Faulty connection or wiring. Correct or replace charge lead. Defective cell in the pack. Replace battery pack or cell.

**PROBLEM:** Does not automatically terminate peak charge properly. Check all connections for proper contacts. Bad battery pack. Replace battery. Internal problem with charger. Disconnect battery immediately and contact Hobby Services for further details.

**PROBLEM:** Battery voltage low after peak charge (below 1.2V per cell). Charge rate setting too low. See “Configure Each Memory Setting” to reset charge current. Battery connected in reverse. Connect battery leads properly. Defective battery, needs to be replaced.

**PROBLEM:** LCD shows the “Input V error” message. Check the voltage for the power source to make sure it is within the 11 to 15V DC specification.

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**1-YEAR LIMITED WARRANTY – USA and Canada Only**

Tower Hobbies warrants this product to be free from defects in materials and workmanship for a period of one (1) years from the date of purchase. During that period, Tower Hobbies 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, Tower Hobbies 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 Tower Hobbies product, warranty or non-warranty, send it post-paid and insured to:

**HOBBY SERVICES**
3002 N. Apollo Drive, Suite #1
Champaign, Illinois 61822

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

[www.towerhobbies.com](http://www.towerhobbies.com)
Toll free: 1-800-637-7303

*For warranty and service information if purchased outside the USA or Canada, see the additional warranty information insert (if applicable) or contact Tower Hobbies Customer Service for more information.*