

TURBOMATCHER

OPERATING INSTRUCTIONS

WARNING

Use only high-rate rechargeable nickel cadmium batteries with the TurboMatcher. Any other type battery may burst during testing and cause personal injury.

The TurboMatcher is designed to provide data about high rate rechargeable nickel cadmium batteries used in R/C car racing. In order to simulate the discharge rates obtained during racing, the TurboMatcher is designed to discharge at high currents. While the methods used in the TurboMatcher are common in selecting cells, excessive cell heat generated during the process may cause damage to the cells or cause them to vent battery acids. To reduce the risk of injury, ALWAYS WEAR SAFETY GLASSES when operating the TurboMatcher.

CAUTION

Static electricity can damage sensitive electronic circuitry in the TurboMatcher. We recommend not operating the TurboMatcher in a carpeted area, especially if it is nylon carpet. It is a good idea to get into the habit of touching the case of the TurboMatcher first, before loading cells. This will dissipate any static charge buildup.

GENERAL DESCRIPTION

The TurboMatcher is designed to rate 6 individual cells at a time at actual racing current draw. It will provide a charge/repeak/discharge or discharge only cycles. It has settable charge amp rates from 2 to 10 amps. The settable discharge amp rates are from 5 to 20 amps standard, A 5 to 30 amp version is also available. It provides information such as discharge time, discharge average voltage, charge time, charge peak voltage, and a discharge graph of each cell. It has two printer ports to connect to user provided printers that produce labels and graphs for each cell. The TurboMatcher has a 32 character display to display all the data on each cell and screens to set operating parameters. A 6 button key pad is provided for operation of the TurboMatcher. Six individual battery holders with separate current and voltage contacts are provided to give accurate results.

SUPPLY VOLTS

The TurboMatcher operates from a 15 volt DC supply at the maximum charge current required. (Suggested minimum of 5 amps). More than one TurboMatcher may be run off one supply providing that the power supply can furnish the required charge amps on all the TurboMatchers. Ie:two TurboMatchers charging at a maximum of 3 amps each would require a 6 amp supply.

If charging above 8 amps is required, the power cord provided may have to be shortened to reduce the voltage drop from the power supply to the TurboMatcher. Otherwise, the charging current will drop off to 8 amps at the end of the charge.

LOADING THE CELLS

The cells must be positioned with the positive terminal towards the display. The cells are numbered from left to right. After the cells are loaded, rotate the cells one quarter to one half turn to clean the

contact area on the battery and on the battery holder.

GENERAL OPERATION

There are 6 push buttons that control the TurboMatcher and set the operating parameters. The INCREMENT FUNCTION push button advances the cursor from one screen to the next and from one settable digit to the next. The DECREMENT FUNCTION push button moves the cursor from the present screen to the previous one and from the present digit to the previous one. The START push button will initiate the charge/peak/discharge cycle. The OFF/SET push button will also increment any settable digit the cursor is positioned under. To set any parameter, push the INCREMENT FUNCTION push button until the desired screen is reached and the cursor is positioned under the desired digit to be set. Push the OFF/SET push button until the desired value is reached. To start a charge/peak/discharge cycle, simply push the START push button at any time. To start a peak/discharge only cycle, depress the INCREMENT FUNCTION push button and hold it down while you press the START push button. Then release both buttons. To start a discharge only cycle, depress the DECREMENT FUNCTION push button and hold it down while you press the START push button. Then release both buttons. Upon completion of any cycle, the Power On LED on the face of the unit will flash and the beeper will sound. Pushing any button will stop the beeper, but do not push the start button since this will start a new cycle and erase your readings. The TurboMatcher has 8 basic screens while it is in the idle mode and 3 of the 8 basic screens are available while it is in the run mode. The basic screens are as follows:

- v All cell status
- v Supply volts and actual charge amps
- v Individual cell data (one screen for each of the 6 cells)
- v Charge amps set
- v Discharge amps set
- v Discharge end volts
- v Discharge end time
- v Serial number

ALL CELL STATUS SCREEN

This screen shows the cell number along with the individual status of each cell. The different statuses are ready(RDY), off(OFF), charging(CHG), reeking(RPK), discharging(DIS), and done(DN). This screen is shown during idle and running.

SUPPLY VOLTS AND ACTUAL CHARGE AMPS SCREEN

This screen shows the supply volts at the TurboMatcher. The voltage at the TurboMatcher will be lower than at the supply due to the voltage drop across the power cord while charging. Also shown on the screen are the actual charge amps during charging. This type of screen is shown during idle and running.

INDIVIDUAL CELL DATA

Each cell has its own data screen. On each screen is shown the charge time in seconds, present cell voltage, discharge time in seconds, cell status, cell number and discharge average voltage. This type of screen is shown during idle and running.

CHARGE AMPS SET SCREEN

This screen shows the present charge amps setting. Each digit may be set by positioning the cursor under the desired digit with the INCREMENT FUNCTION or the DECREMENT FUNCTION push button and then depressing the OFF/SET push button until the desired value is reached. Default setting is 3.00 amps.

DISCHARGE AMPS SET SCREEN

This screen shows the present discharge amps setting. It is set in the same manner as the charge amps. Default setting is 10.0 amps.

DISCHARGE END VOLTS

This screen shows the present voltage setting for all cells to stop the discharge time clock for each cell. Default setting is 0.9 volts DC. The TurboMatcher will continue discharging until the battery voltage reaches .1 volts. This assures that the cell is completely discharged.

DISCHARGE AVERAGE END TIME

This screen will show the time that the discharge average volts will stop being averaged. This is useful for finding the discharge average end volts for shorter run times than the full capacity of the cell. It is set in the same manner as the previous screens. The default time is 5000 seconds.

SERIAL NUMBER SCREEN

The starting serial number can be set at this screen. We suggest using the first three lower digits for the starting number and use the upper digits for a date code. For example, 01012001. The left most digit would be the year of the decade. Ie:0 for 1990. The next two digits could be the month. ie: 10 for October. The next two digits would stand for the 12th day of the month. The serial number will increment automatically upon completion of the cycle. It will only increment the amount of cells that actually completed the cycle.

CONTACTS

If the contacts become dirty and won't conduct, the message "BAD CONTACT" will be displayed along with the sound of a pulsing beep.

The contacts used are tin plated brass contacts. The contacts can be cleaned using a model train rack cleaner for brass tracks such as "RAIL ZIP". This cleans the contacts without wearing them and leaves a film to retard oxidation of the contacts. If sandpaper is used, the contacts will wear down quickly and oxidize immediately providing a poor contact.

The TurboMatcher employs two contacts on each end of the battery. The large contacts carry the current while the smaller contact is used to measure the voltage. By using a separate set of contacts for voltage measurements, the voltage drop across current carrying contacts is eliminated. The voltage measured in this manner is always accurate.

PRINTERS

The printers supplied by the user must be a Centronics parallel compatible type. Most printers used today are of this type. If the printer is not turned on or not connected, the TurboMatcher will give the

error message "PRINTER OFF LINE" when a print push button is depressed. There shouldn't be any switches that need to be set on the printer for normal operation.

LABELS

The labels used by the TurboMatcher are available from Competition Electronics or NEBS. Their phone number is 1-800-225-9550. The product number for the labels is 9865. These are 1" x 15/16" white labels. The labels we sell come in white or yellow. Call for pricing 815-874-8001.

The information printed on the labels is discharge time, discharge average volts, charge amps, discharge amps, charge time, charge peak voltage, discharge time cutoff volts and serial number.

OPTIONS

Relative resistance number developed by Jeff Pack is available for printing out on the label. It shows up as the last number on the second line. The cost of the IC is \$50.00 each plus shipping. It comes with installation instructions. Custom name printing on the labels is also available. You have various choices of 1,2 or 3 lines of 9 characters each. Call for more specifics. The cost of this option is \$25.00 for each IC. It comes in the same IC as the Relative Resistance so only one IC is installed.

GRAPHS

The TurboMatcher will graph the discharge curve of any of the six cells. This will be a graph of the cell voltage from .8 to 1.5 volts versus the discharge time in seconds, Connect your printer onto the port market "GRAPHS". Next push either the INCREMENT FUNCTION or the DECREMENT FUNCTION button until the desired cell data screen is on the display. Then push the PRINT GRAPH button for a printout. If you are on any other type of screen, nothing will be printed. We suggest setting up your printer for 17 characters per inch for the best looking graph. Most newer printers can be set up with the number of characters per inch from the front panel on the printer.

WHEN IS DOESN'T WORK

1. Check the fuse to make sure that it isn't blown. It is a 15 amp fuse.
2. Check the supply volts to make sure that it is at least 14.5 volts.
3. Please call us before you send the unit back. We may be able to tell you if the unit is malfunctioning or if there is some operating consideration that needs further explanation.
815-874-8001
4. The turn around time for repairs is 5 working days. Include a daytime phone number and we will call you with the repair charges.

REPAIR RETURN ADDRESS

Competition Electronics
3469 Precision Dr.
Rockford, IL 61109
815-874-8001

