



SUPERNOVA 250S

MODEL FC700 microcomputer fast charger OPERATIONS MANUAL

NOTE: PLEASE READ MANUAL COMPLETELY BEFORE OPERATION

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INTRODUCTION & FEATURES

The FC700 Super Nova charger is an innovative, multi-function charger vastly superior to existing chargers costing far more. The FC700 is designed to maximize charge efficiency using a unique microprocessor algorithm. The 2-line, 16 character LCD display presents information showing the operating modes and adjustment parameters, as well as key functional commands such as battery charge state and the percentage capacity remaining during discharge. Super Nova is designed to be user-friendly. Nonetheless, you are urged to study the manual carefully before you operate the charger. The unit ships with 10 preset battery pack configurations stored in memory. Parameters controlling battery type, number of cells, battery capacity, charge current, and discharge current can be edited, and the values stored over top of the ten "presets". Once stored in memory, customized presets can easily be recalled for use each time you charge or cycle the same battery type, thus ensuring safe and efficient battery management.

FEATURES:

- ◆ The FC700 is designed for rapid charging and discharging of NiCd and NiMH battery packs from 1 to 25 cells and for charging 1 to 6 cell, lead acid (Pb-acid) batteries. Super Nova will refuse to discharge Pb-acid batteries since they will not recover from deep discharge.
- ◆ The FC700 is fully programmable for three different battery types (NiCd; NiMH; and charge of Pb-acid), as well as for the following parameters: number of cells; specified battery capacity; charge current; and discharge current. The resulting modified "presets" can then be stored in 10 (0-9) memory locations for subsequent use.
- ◆ Charge current and discharge current are automatically limited to protect the charger.
- ◆ Microprocessor controlled for safety, end of charge is designated as 0.9V per cell to conform to worldwide manufacturers current designation of end point.
- ◆ Provides analysis of current battery state by displaying the actual percentage of remaining charge capacity.
- ◆ Performs zero current voltage check between charge pulses to prevent incorrect delta-peak cut-off. This problem, found in many chargers, is due to high resistance connectors or worn-out, high resistance batteries. Super Nova is more than just another charger; it is an analytical tool that will tell you much about the health of your batteries.
- ◆ Low and Over-limit, input voltage warning. Any applied input voltage below +9.5V D.C. or above +15.5 V D.C. will cause Super Nova to issue an audible warning.
- ◆ If DC input is connected backward, the charger won't operate, but it won't be damaged.
- ◆ Automatic initial check of current battery condition. If the battery condition is not suitable for charging, Super Nova initiates a warning message "Output Battery" "Connect Error" on the display.
- ◆ In case of battery disconnection, a warning message "Connect Error" is automatically displayed.
- ◆ Accidental reverse polarity protection on charger outputs keeps the charger from harm and alerts the user via the display. The display will read "Output Battery" "Reverse Polarity".

SPECIFICATIONS

SIZE:	5.70" X 3.62" X 1.60"
WEIGHT:	1.24 lb.
FUNCTION:	SINGLE CHANNEL, PROGRAMMABLE RAPID CHARGER/CYCLER FOR NiCd, NiMH, and Pb BATTERIES
INPUT / CONNECTIONS:	+10 TO +15V D.C. OR LEAD ACID BATTERY VIA ALLIGATOR CLIPS
OUTPUT CAPABILITIES:	1 TO 25 CELLS, PROGRAMMABLE, VARIABLE CHARGE RATE (0.10 TO 5.0 AMPS), PROGRAMMABLE, VARIABLE DISCHARGE RATE (0.5A TO 3.0 AMPS) TRICKLE CHARGE CURRENT: Pb BATTERY 100 mA, NiCd / NiMH 0 mA
PROTECTION:	COOLING FAN, OVERLOAD, SHORT CIRCUIT, REVERSE POLARITY
DISPLAY:	2 X 16 CHARACTER DOT MATRIX LIQUID CRYSTAL DISPLAY
SPECIAL FEATURES:	MICROPROCESSOR CONTROLLED, PROGRAMMABLE CHARGE/DISCHARGE, 10 BATTERY CONFIGURATION MEMORY

OPERATION



PROGRAMMING BUTTON DEFINITIONS:

BUTTON	LABELED	FUNCTIONS
	SET STOP	ENTER AND EXIT PROGRAMMING MODE / SELECT FLASHING MENU ITEM / STOP CHARGING OR DISCHARGING
DISCHARGE	DOWN	START DISCHARGING MODE / SCROLL BACKWARDS THROUGH MENU ITEMS / DECREASE VALUES
CHARGE	UP	START CHARGING MODE / SCROLL FORWARDS THROUGH MENU ITEMS / INCREASE VALUES
DISCHARGE/CHARGE SAME TIME	DATA	DISPLAY DATA REFERENCES DURING CHARGE OR DISCHARGE MODE, I.E. INPUT VOLTAGE, OUTPUT VOLTAGE, CHARGE OR DISCHARGE TIME, ETC.

- **OVERVIEW**

A vast array of different battery manufacturers and cell configurations are available to the model builder today. The Super Nova is capable of safely rapid charging *most* NiCd, NiMH, and Pb-Acid batteries. Using delta peak detection circuitry, the Super Nova will safely monitor and cutoff high-rate charging when the peak, or maximum charge voltage, is detected for the battery being charged. However, the Super Nova does not utilize peak detection when charging Pb-Acid batteries. **WARNING: Super Nova IS NOT DESIGNED OR INTENDED FOR CHARGING LITHIUM CELLS OF ANY TYPE.** Super Nova will safely charge the single cell used in glow drivers as it is made to work down to 1 cell. Typically, most modern NiCd batteries are capable of withstanding a moderate 1C charge rate. Some will handle 2C, and fewer will accept up to 4C. A 1C charge rate is defined as 1 times the mAh capacity of your battery pack. As an example, at a 1C charge rate, a 500 mAh battery pack charges at 500 mA (0.5A). This equates to a 1 hour charge time on a battery that is completely dead at start of charge. A 2C charge rate for this same 500 mAh pack would be 1000 mA (or 1A) and the battery would be fully charged in 1/2 hour from a completely dead state. It is generally good practice to charge a pack at no more than the minimum rate that will have it ready when you need it. Please also recognize that rapid charging inevitably shortens pack life, even if just a little bit as compared to normal charging (C/10). Rapid charging with peak detector cutoff is an efficient method of putting a full charge into a battery without overcharging it because the electrons within the battery become more active with greater current flow. **CAUTION:** It is the responsibility of the user to determine that the pack intended for charging be capable of accepting rapid charge at the rate you set. There are far too many battery types on the market for FMA to verify whether or not your particular brand/cell type is capable of accepting the charge rates supplied by Super Nova. That being the case, it is important that you consult your battery manufacturers' guidelines for charging the battery types that you have. FMA, Inc. will not accept any liability for failure to comply with your battery manufacturers' guidelines when charging batteries using any FMA Direct rapid charge products.

SAFETY PRECAUTIONS: 1) When using Super Nova, always set it on a stable, non-flammable surface along with the batteries connected to the unit. When Super Nova has completed rapid charging, fully charged batteries will feel warm to the touch. Do not be alarmed; this is a normal outcome of rapid charging batteries. As current flows through the battery, exciting electrons, excess energy as a result of certain inefficiencies in the charging process, will cause heat to be emitted from the interior of the battery. Should the batteries being charged ever become uncomfortably warm to the touch, remove them from the charger immediately to preclude the possibility of explosion. Re-check the battery manufacturer's guidelines for charging your battery pack. If the problem recurs, call FMA Direct at (301) 831-8980 for service information. 2) Do not mix old and new cells or cells from different manufacturers. 3) Always ensure the charger and batteries have adequate ventilation. Do not charge in a closed space and never charge in a car with the windows closed in summer heat. Charging is always safest when the charger and pack are in a cool location, such as in the shade. Never charge a battery pack in the model or where it is insulated from full release of heat. 4) Before fast charging, when possible, charge the battery on SLOW CHARGE to equalize the cells. This helps ensure longer life for the battery, especially if the battery pack has been in storage for a long time without use. 5) Most batteries will develop considerable internal heat during periods of rapid *discharge*. 6) Always follow the charging instructions from the manufacturer of your pack. 7) Never charge two packs in parallel. 8) Never charge two packs in series unless both are the same cell type from the same manufacturer and are of the same capacity. 9) Do not attempt to open the case or service the Super Nova under any conditions. Your warranty will be automatically voided. Service or repair of the Super Nova should only be carried out by FMA authorized service persons. Contact your dealer or FMA Direct for service or repair information.

- **CONNECTING THE Super Nova TO DC POWER SOURCE**

Connect Super Nova to a +10V to +13.5V DC source capable of at least 10A consumption by using the alligator clips provided. 12V automotive batteries or field box batteries work well as a power source. The RED cable is + Volts and the BLACK cable is - Volts, or "ground". When



connected properly, the initial display will appear as below and will remain there until you begin to press the programming buttons.

- **OUTPUT CONNECTIONS**

Super Nova has one set of + (RED) and - (BLACK) output banana type jacks mounted on the right side of the charger. This arrangement allows for flexibility in the connectors that you connect to Super Nova and to your battery. To connect a battery to the Super Nova, plug mating banana type plugs into these outlets and attach your mating car, radio, or boat connectors to the other ends of the cable. Please recognize that light charge wire may heat up when putting up to 5.0 amps through the wire. #14 black and red hook up wire soldered to your favorite Tamiya, Deans, SERMOS, Astroflite or other charge connector will do the job. For charge rates up to 5.0 amps, an FMA Direct P/N 302BC or 402BC power cable and the FMA Direct Versatile Adapter (P/N 501MC) make an ideal charge connection to mate with all popular radio packs. Although the FC700 is protected from reverse polarity, be sure to maintain proper polarity between the charger outputs and battery pack when making these connections.

- **CHARGING MOST BATTERY PACKS**

Please review the SAFETY PRECAUTIONS section listed under OVERVIEW, above before connecting a battery pack to Super Nova for charging. Consult your battery manufacturer's guidelines concerning charge rates for your battery type. Make certain that the battery is designed to handle the rapid charge rate (from 0.1 to 5.0 Amps) or discharge rate (0.5 to 3.0 Amps) you plan to set. Keep in mind that 2C is two times the capacity, e.g., 1A for a 500 mAh pack, etc. Make certain the battery polarity matches the charge leads. **WARNING: Transmitter batteries must be removed from the transmitter enclosure to fast charge them.** That is, you must remove the pack from the transmitter and connect it to Super Nova via an adapter cable or by using the FMA Versatile Adapter, P/N 501MC. The reasons are: 1) while in the enclosure, heat from the battery will be contained and the pack may overheat causing damage to your transmitter case. 2) most transmitters have a blocking diode to protect the battery from reverse charging. That diode will act just like a fuse if high current is passed through it by fast charging. 3) the blocking diode may prevent the charger from sensing the voltage of the pack properly and peak cut off may not occur.

- **SPECIAL CHARGING NEEDS**

Super Nova can be set for rapid charge rates as low as 0.1 Amps making it the ideal charger for fast charging the small 110 mAh to 350 mAh battery packs that are rapidly becoming more and more popular. **WARNING:** We all have a tendency to "pop the start button" a second time just to "be sure we have a full charge", BAD PRACTICE, especially with the smaller packs.

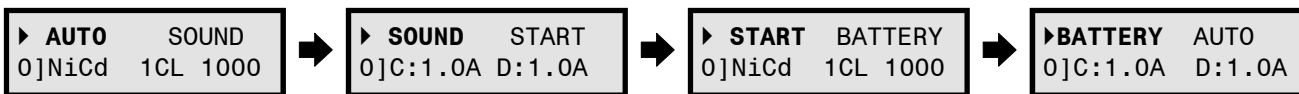
- **USING THE SUPER NOVA**

The Super Nova is a computer controlled device. Like any computer, successful operation is dependant upon how well one understands the interface. The interface is composed of 1) the LCD display and 2) the three programming buttons located on the face of the unit. The multi-function programming buttons are the key to adjusting all parameters and modes of operation throughout the interface to start and stop

charging, enter or exit programming mode, scroll through menu options, increase or decrease parameters, etc. A summary of the multiple functions served by the three control buttons is listed at the beginning of the OPERATION section of the manual.

SUPER NOVA TOP LEVEL MENU

The Super Nova top level menu is composed of four menu options; AUTO (Automatic Mode), SOUND (Sound Control), START (Manual Start Charge/Cycle Mode), and BATTERY (Battery Selection and Custom Configuration). The top level menu options are illustrated below as you will



see them on the Super Nova display. To move from the opening display, AUTOMATIC START, press the SET/STOP key. The display will read **AUTO SOUND**. Press the DISCHARGE - DOWN or CHARGE - UP programming buttons to scroll through the top level menu.

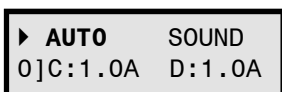
As you begin to familiarize yourself with the operation of the Super Nova, please note the following conventions:

- 1) All menus are "scrolling" menus. On the top line of the display, each menu screen lists not only the menu option available for selection, but also the next available menu option, e.g., AUTO with SOUND, etc.
- 2) While viewing menus, line two of the display will alternately flash between 1) the preset number selected, followed by the battery type stored for the selected preset, the number of cells stored and the battery pack capacity stored or 2) the preset number selected, followed by the charge rate (C) stored for the selected preset and then the discharge rate (D) stored. This method supplies you with much information about the battery pack you are working on and ensures you have the correct preset selected.
- 3) In this manual, illustrations of the LCD display will usually have one word highlighted in bold text. The bold text indicates that this menu option is flashing on the LCD display. You may select a flashing menu option at any point by pressing the SET/STOP key.
- 4) In this manual, illustrations of the LCD display contain examples of data that indicate where you are in the program. Depending on your selections, the actual parameter values may vary from what your display shows at any given point during operation of the Super Nova.
- 5) When you select a menu option by pressing the SET/STOP key, you will enter a new sub level menu for that option. The sub level menu may be composed of one or several sub level options or parameters.
- 6) If a sub level menu is composed of only one option, you may "back out" of that sub level by pressing the SET/STOP key without changing any parameters on that screen.
- 7) If a sub level menu is composed of several options, one of those options will be EXIT. To back out of multiple-option sub levels, use the DISCHARGE - DOWN or CHARGE - UP key to scroll through the sub level menu until the EXIT option is flashing, then press the SET/STOP key.
- 8) The flashing "back and forth" arrow located before any menu options or parameters indicates that there are additional menu options or parameter values from which to select. Use the DISCHARGE - DOWN or CHARGE - UP buttons to scroll through the available options. Press the SET/STOP key to select the option and enter the next sub level.

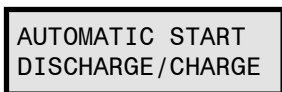
AUTOMATIC MODE

Menu option AUTO, which stands for Automatic Mode is a powerful, yet intuitive charging utility available for use with NiCd batteries *only!* In the Automatic Mode, Super Nova will automatically analyze and select the optimum charge or discharge current for any 1 to 25 cell, NiCd battery pack connected. In this mode the battery status is monitored once each minute and the charge or discharge rate is modified as necessary for optimum efficiency. Because the majority of charging applications are for NiCd batteries in the modeling community, and because the Automatic Mode is such an easy way to charge these batteries, the Super Nova has been designed to "boot up" into the Automatic Mode at power up.

To enter the Automatic Mode, perform one of the following:

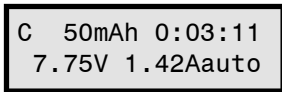


From the top level menu, use the DISCHARGE-DOWN or CHARGE-UP program buttons to scroll through the options until AUTO is flashing, then press the SET/STOP key to enter sub level AUTO.



The display will appear as illustrated indicating you are in Automatic Mode. To exit the Automatic Mode, press the SET/STOP key.

Power up the Super Nova by connecting it to the power supply as described on page 3 under the sections, CONNECTING THE Super Nova TO DC POWER SOURCE. The display will read as illustrated on page 3, *OR...*



While in the Automatic Mode, the Super Nova display will appear as illustrated. While charging, the letter C will flash indicating the battery is charging. The display also indicates the battery capacity (in mAh) restored to the pack, the time elapsed since charge was initiated, the charge voltage and the optimum charge current selected by the system for this battery pack. While discharging, the letter D will flash indicating the battery is discharging. The display also indicates the battery capacity (in mAh) removed from the pack, the time elapsed since discharge was initiated, the discharge voltage and the optimum discharge current selected by the system for this battery pack. At completion of cycle, the letter C or D will change to F for finished.

WARNING: DO NOT ATTEMPT TO CHARGE OR DISCHARGE NICKEL METAL HYDRIDE (NiMH) OR LEAD ACID (Pb) BATTERIES WHILE IN THE AUTOMATIC MODE! THE AUTOMATIC MODE IS DESIGNED FOR USE WITH NICAD (NiCd) BATTERIES ONLY!

To begin charging using the Automatic Mode, make certain you have a 1 to 25 cell NiCd battery pack connected to the Super Nova charge output banana jacks as described under the section OUTPUT CONNECTIONS, then press the CHARGE-UP program button. The unit will immediately begin to charge the battery pack. To initiate discharge using the Automatic Mode, press the DISCHARGE-DOWN program button.

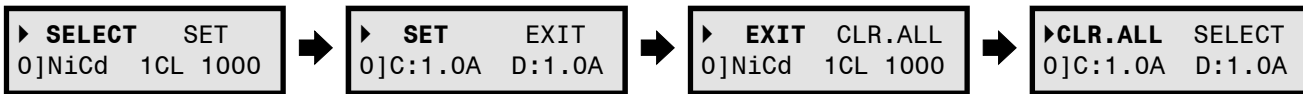
MANUAL MODE AND PRESET CONFIGURATION OVERVIEW

As you have seen, the Automatic Mode is an extremely powerful and intuitive method for charging and discharging NiCd batteries. However, the Super Nova capabilities extend far beyond this facet of battery management to include charging and discharging NiMH batteries and

charging Pb (Lead Acid) batteries. In addition, the manual method of charging and discharging using the Super Nova enables one to carefully select, tailor and store up to 10 (0 through 9) different battery configurations in memory and recall them each time the same battery type is to be maintained. In order to assure that you make use of the full capabilities of Super Nova, you are challenged to use manual mode and not to rely on the Automatic Mode only. Manual Mode charging involves two of the four top level menu items, BATTERY and START, as well as their related sub level options and parameters. In the BATTERY menu option, battery pack presets can be recalled from memory for use and for editing. Once the proper battery pack preset has been recalled, Manual Mode charging or discharging may be initiated through the START menu option. In Manual Mode, Super Nova will use the parameters for battery type, number of cells, charge rate and discharge rate stored for the recalled preset to control charging/discharging.

BATTERY SUB LEVEL MENU

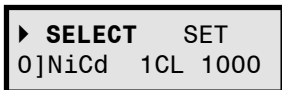
The BATTERY sub level menu is composed of four menu options; SELECT (Selecting a Battery Configuration Preset), SET (Setting up Battery Parameter Options), EXIT (Exit to Top Level Menu), and CLR.ALL (Clear Memory and Restore Super Nova Default Parameters for all Presets). The BATTERY sub level menu options are illustrated below as you will see them on the Super Nova display. To move from the top level menu to the BATTERY sub level menu, use the DISCHARGE - DOWN or CHARGE - UP programming buttons to scroll through the top level menu



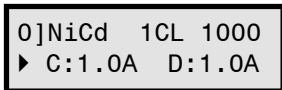
until **BATTERY AUTO** is displayed, then press the SET/STOP key. The display will read **SELECT SET**. Press the DISCHARGE - DOWN or CHARGE - UP programming buttons to scroll through the BATTERY sub level menu. Remember, to return to the top level menu, scroll through the BATTERY sub level menu until the EXIT option is flashing, then press SET/STOP.



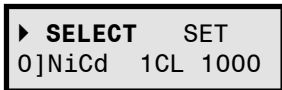
From the top level menu, use the DISCHARGE-DOWN or CHARGE-UP program buttons to scroll through the menu until the BATTERY option is flashing, then press the SET/STOP key to enter BATTERY sub level.



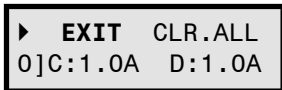
The display will appear as illustrated indicating you are in the BATTERY sub level menu. Press the SET/STOP key to enable you to recall a stored preset.



The display now lists the current preset number (0 shown), followed by the battery type stored (NiCd shown), number of cells (1CL = 1 Cell shown), battery pack capacity (1000 mAh shown), charge rate "C" (1.0A shown) and discharge rate "D" (1.0A shown). Use the DISCHARGE-DOWN or CHARGE-UP program buttons to scroll through the stored presets. To select the preset displayed, press the SET/STOP key.



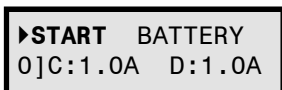
Once you have selected the preset you want, you will be returned to the BATTERY sub level menu at **SELECT SET**.



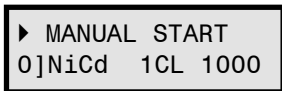
To exit the BATTERY sub level menu and return to the top level menu, use the DISCHARGE-DOWN or CHARGE-UP programming buttons to scroll through the menu until the EXIT option is flashing, then press SET/STOP key.

RECALLING A PRESET

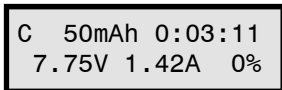
Before you can charge or discharge a battery pack using the Manual Charge Mode, you must first identify and recall the correct battery preset from memory. Super Nova ships with 10 default presets as listed in the SUPER NOVA DEFAULT PRESET PARAMETERS table on page 6. Once you locate and recall the preset you wish to use for charging and/or discharging your battery, proceed to the section INITIATING MANUAL MODE. If none of the 10 presets meet your requirements exactly, choose the closest match or any other preset that you wish to



From the top level menu, use the DISCHARGE-DOWN or CHARGE-UP program buttons to scroll through the menu until the START option is flashing, then press the SET/STOP key to enter the Manual Mode.



MANUAL START will appear on the top line of the display. Line two of the display will alternately flash between battery preset information as usual and the words DISCHARGE/CHARGE. To begin charging, press the CHARGE-UP key. To begin discharging, press the DISCHARGE-DOWN key. To exit without initiating charging or to cancel charging or discharging procedure, press SET/STOP key at any time.



While in the Manual Mode, the Super Nova display will appear as illustrated. While charging, the letter C will flash indicating the battery is charging. The display also indicates the battery capacity (in mAh) restored to the pack, the time elapsed since charge was initiated, the charge voltage and the charge current programmed for the preset selected. While discharging, the letter D will flash indicating the battery is discharging. The display

also indicates the battery capacity (in mAh) removed from the pack, the time that has elapsed since discharge was initiated, the discharge voltage, the discharge current programmed for the preset selected, and the battery pack capacity in percentage. At completion of cycle, the letter C or D will change to F for finished.

At the completion of discharge (approximately 0.9V per cell), the Super Nova will automatically initiate charge of the battery pack. When the battery pack is completely charged, the advanced peak detection circuit will turn high-rate charging off and the Super Nova will enter trickle mode. In trickle mode, the amount of charge current delivered to the battery is dependent on the stored preset parameters relating to battery type and number of cells.

ADJUSTING CHARGE/DISCHARGE CURRENT WHILE IN THE MANUAL MODE

CHARGE CURRENT ADJUST

C 50mAh 0:03:11
7.75V 1.42A 0%

At any time while in the Manual Mode during charging, press the DISCHARGE-DOWN or CHARGE-UP programming button.

CHARGE CURRENT
▶1.0A

Use the CHARGE-UP or DISCHARGE-DOWN programming buttons respectively to increase or decrease the charge current.

DISCHARGE CURRENT ADJUST

D 50mAh 0:03:11
7.75V 1.42A 0%

At any time while in the Manual Mode during discharging, press the DISCHARGE-DOWN or CHARGE-UP programming button.

DISCHARGE CUR.
▶1.0A

Use the CHARGE-UP or DISCHARGE-DOWN programming buttons respectively to increase or decrease the discharge current.

PLEASE NOTE: YOU CANNOT ADJUST THE CHARGE OR DISCHARGE RATE WHILE IN AUTOMATIC MODE AS THE SUPER NOVA CAREFULLY MONITORS THESE SETTINGS AND ADJUSTS THE RATES ACCORDING TO THE BATTERY PACK BEING MAINTAINED.

SUPER NOVA DEFAULT PRESET PARAMETERS

MODIFYING AND STORING A PRESET

By programming the Super Nova through the SET option of the BATTERY sub level menu, you may tailor the preset battery parameters to meet your exact requirements. You may wish to use the following table, "SUPER NOVA DEFAULT PRESET PARAMETERS" to help you identify a preset closest to meeting your needs and use that as a starting point for programming in your battery pack parameters. The column headings in this table include the preset number, followed by the parameters that are adjustable within each preset. Please note, once you establish a battery type of Pb (Lead Acid), you are precluded from selecting a discharge current because Super Nova refuses to discharge Pb batteries since they will not recover from deep discharge! Using the procedure outlined in the section RECALLING A PRESET, load the preset number you wish to edit into memory.

PRESET NO.	BATTERY TYPE	NO. CELLS	BATTERY CAPACITY (mAh)	CHARGE CURRENT (A)	DISCHARGE CURRENT (-A)
0	NiCd	1	1000	1.0	1.0
1	NiCd	4	500	0.5	0.5
2	NiCd	6	2000	4.0	2.0
3	NiCd	7	1700	3.4	1.2
4	NiCd	8	1700	3.4	1.2
5	NiCd	10	1200	1.2	1.2
6	NiCd	12	1200	1.2	1.2
7	NiCd	20	1700	3.4	0.5
8	NiCd	24	1700	3.0	0.5
9	Pb	12V	7.00Ah	1.5	N/A

▶BATTERY AUTO
0]C:1.0A D:1.0A

From the top level menu, use the DISCHARGE-DOWN or CHARGE-UP program buttons to scroll through the menu until the BATTERY option is flashing, then press the SET/STOP key to enter BATTERY sub level at the SET EXIT option.

▶ SET EXIT
0]NiCd 1CL 1000

The display will appear as illustrated indicating you are in the BATTERY sub level menu. Use the DISCHARGE-DOWN or CHARGE-UP program buttons to scroll through the menu until the SET option is flashing, then press the SET/STOP key to enter the Set Parameters function for the selected preset.

NEXT PAGE PLEASE

BATTERY TYPE:
▶ NiCd

Using the DISCHARGE-DOWN or CHARGE-UP programming buttons, scroll through the available battery types and match to the type of battery you will be maintaining (NiCd, NiMH, Pb). When the display reads the proper battery type, press the SET/STOP key. Battery type selected is now stored to current preset.

BATTERY CELLS:
▶ 1CELL

Using the DISCHARGE-DOWN or CHARGE-UP programming buttons, decrease or increase the number of cells on the display to match the number of cells in the battery pack you will be maintaining. Press the SET/STOP key. Battery cell count selected is now stored to current preset.

BATT. CAPACITY:
▶ 1000mAh

Using the DISCHARGE-DOWN or CHARGE-UP programming buttons, decrease or increase the battery capacity on the display to match the capacity of the battery pack you will be maintaining. Press the SET/STOP key. Battery capacity selected is now stored to current preset.

CHARGE CURRENT:
▶ 1.0A

Using the DISCHARGE-DOWN or CHARGE-UP programming buttons, decrease or increase the battery charge rate on the display to match the manufacturer's specifications for the battery pack you will be maintaining. Press the SET/STOP key. Battery charge rate selected is now stored to current preset.

DISCH. CURRENT:
▶ 1.0A

Using the DISCHARGE-DOWN or CHARGE-UP programming buttons, decrease or increase the battery discharge rate on the display to match the manufacturer's specifications for the battery pack you will be maintaining. Press the SET/STOP key. Battery discharge rate selected is now stored to current preset.

Reminder: once you establish a battery type of Pb, you are precluded from selecting a discharge current.

▶ SET EXIT
0]NiCd 1CL 1000

Once you have completed the above entries, you will automatically be returned to the BATTERY sub level menu.

▶ EXIT CLR.ALL
0]C:1.0A D:1.0A

To exit the BATTERY sub level menu and return to the top level menu, use the DISCHARGE-DOWN or CHARGE-UP programming buttons to scroll through the menu until the EXIT option is flashing, then press SET/STOP key.

You may now proceed to use your new preset by entering the Manual Mode and initiating either a discharge or a charge as described in the section INITIATING MANUAL MODE on page 5.

SOUND CONTROL

▶ SOUND START
0]NiCd 1CL 1000

From the top level menu, use the DISCHARGE-DOWN or CHARGE-UP program buttons to scroll through the menu until the SOUND option is flashing, then press the SET/STOP key to enter Sound Control.

SOUND VOLUME
▶ ON OFF

Using the DISCHARGE-DOWN or CHARGE-UP programming buttons, toggle the abbreviations ON or OFF until the option you desire is flashing. ON volume activates the internal beeper, OFF de-activates this circuit completely. To store the new setting and exit to top level menu, press SET/STOP key.

RESTORING FACTORY DEFAULT PRESET PARAMETERS (ALL PRESETS AT ONE TIME)

▶ BATTERY AUTO
0]C:1.0A D:1.0A

From the top level menu, use the DISCHARGE-DOWN or CHARGE-UP program buttons to scroll through the menu until the BATTERY option is flashing, then press the SET/STOP key to enter BATTERY sub level.

▶ SELECT SET
0]NiCd 1CL 1000

The display will appear as illustrated indicating you are in the BATTERY sub level menu.

▶ CLR.ALL SELECT
0]NiCd 1CL 1000

Use the DISCHARGE-DOWN or CHARGE-UP program buttons to scroll through the menu until the CLR.ALL option is flashing, then press the SET/STOP key to enter the Clear All Memory function.

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MEMORY ALL CLEAR
▶ NO

Use the DISCHARGE-DOWN or CHARGE-UP program buttons to toggle the YES/NO option to YES if you wish to proceed. *SEE WARNING BELOW BEFORE PROCEEDING!* Press the SET/STOP programming button to erase all changes to factory presets and restore factory defaults.



▶ CLR.ALL SELECT
0]NiCd 1CL 1000

NOTE: There is no method available for clearing only one preset at a time.

Once you have completed the Clear All Memory procedure, you will automatically be returned to the BATTERY sub level menu.



▶ EXIT CLR.ALL
0]C:1.0A D:1.0A

To exit the BATTERY sub level menu and return to the top level menu, use the DISCHARGE-DOWN or CHARGE-UP programming buttons to scroll through the menu until the EXIT option is flashing, then press SET/STOP key.

WARNING: THE CLEAR ALL MEMORY PROCEDURE ERASES CHANGES MADE TO ALL SUPER NOVA PRESETS AND RESTORES FACTORY DEFAULT INFORMATION. IF YOU DO NOT WANT TO DELETE CHANGES MADE TO FACTORY PRESETS, MAKE SURE THE YES/NO OPTION IS TOGGLED TO "NO" BEFORE YOU PRESS THE MODE-SET/STOP KEY TO RESTORE FACTORY DEFAULTS!

DATA REFERENCE DURING CHARGING/DISCHARGING

As described in the sections AUTOMATIC MODE and INITIATING MANUAL MODE, during charging and discharging, the Super Nova displays basic information relating to battery capacity, time elapsed, discharge/charge voltage, discharge/charge current, and % capacity (Manual Mode Only). However, for more in-depth diagnostics of battery performance during battery maintenance, Super Nova can provide much more detailed data as described below.

To display REFERENCE DATA from either the AUTOMATIC or MANUAL MODES:

C 50mAh 0:03:11
7.75V 1.42Aauto

While charging or discharging, press both the DISCHARGE-DOWN and CHARGE-UP keys simultaneously.



0]NiCd 1CL 1000
▶ C:1.0A D:1.0A

The display will appear similar to this but with all of the basic preset information for the current charge/discharge procedure. Press the CHARGE-UP programming button to cycle through the following screens and display the information listed and described below.



▶ IN/OUT VOLTAGE
11.685Vi 7.782Vo

Vi = Input Voltage - The voltage being delivered by your DC power supply.
Vo = Output Voltage - the charge/discharge voltage at the battery being maintained.



▶ CHARGE VOLTAGE
6.947Vp 6.942Va

Vp = Peak Voltage measurement
Va = Average Voltage measurement
* measurements updated over time (measurements recorded only during charging)



▶ DISCH. VOLTAGE
6.947Vs 6.514Vc

Vs = Discharge start voltage
Vc = Discharge cut-off voltage



▶ CHAR. 159mAh
DISC. 0mAh

Battery capacity readings



▶ CHAR. 0:07:30
DISC. 0:00:00

Battery Charge/Discharge time elapsed

To exit back to main charge display at any time in this process, press SET/STOP key.