

SPECIFICATIONS:

SIZE:	6.50"L X 3.50"W X 2.00"H
WEIGHT:	1.5 POUNDS.
FUNCTION:	THREE CHANNEL, NICAD BATTERY RAPID CHARGER / MAINTENANCE CHARGER
INPUTS / CONNECTIONS:	+12V D.C. VIA ALLIGATOR CLIPS RCVR / XMTR VIA SPRING ACTIVATED, QUICK WIRE CONNECTIONS GLOW BOOSTER VIA PANEL MOUNTED DUMMY GLOW PLUG
OUTPUT CAPABILITIES:	1 RCVR PACK: 4 TO 7 CELLS, VARIABLE CHARGE RATE (0.5A TO 4A) FOLLOWED BY TRICKLE CHARGE (15% OF SET CHARGE CURRENT), PEAK DETECTION CUT-OFF 1 XMTR PACK: 6 TO 10 CELLS, FIXED CHARGE RATE (1.0A) FOLLOWED BY TRICKLE CHARGE (80 mA), PEAK DETECTION CUT-OFF 1 GLOW BOOSTER: 1 CELL, FIXED CHARGE RATE (1.2A), TIMED CHARGE 20 MINUTES
READOUT:	CHANNEL SELECTABLE, 0 TO 6A, D.C. AMPERE METER LED POWER, CHARGE, AND TRICKLE INDICATORS
POWER SUPPLY:	DESIGNED FOR USE WITH EXTERNAL +12V D.C. POWER SUPPLY CAPABLE OF 10A CURRENT CONSUMPTION (MINIMUM) OR +12V LEAD ACID AUTOMOTIVE BATTERY
VOLTAGE REGULATION:	STEP UP/STEP DOWN DC/DC CONVERTER
PROTECTION:	10A AUTO FUSE AND REVERSE POLARITY PROTECTION
INTERCONNECTION:	2.5mm-TO-BARE WIRE BARREL CABLE INCLUDED AS STANDARD EQUIPMENT

FMA LIMITED WARRANTY ON RAPID CHARGER PRODUCTS

THE WARRANTY

FMA, Inc. warrants this charger to be free of manufacturing defects for the term of one year from the date of purchase. Should any defects covered by this warranty occur, the charger shall be repaired or replaced with a unit of equal performance by FMA, Inc., or an authorized FMA service station.

LIMITS AND EXCLUSIONS

This warranty may be enforced only by the original purchaser, who uses this charger in its original condition as purchased, in strict accordance with the CHARGEALL owner's manual and battery manufacturer's guidelines for charge rates applicable to any batteries connected to the unit. Chargers returned for warranty service to an FMA service center will be accepted for service when shipped post-paid, with a copy of the original sales slip or warranty registration form, to the service station advised by FMA, Inc.

THIS WARRANTY DOES NOT APPLY TO

1. Consequential or incidental losses resulting from the use of this charger.
2. Damage resulting from accident, misuse, abuse, neglect, electrical surges, reversed polarity on connectors, lightning or other acts of God.
3. Damage from failure to follow instructions supplied with the product.
4. Damage occurring during shipment of the product either to the customer or from the customer for service (claims must be presented to the carrier).
5. Damage resulting from repair, adjustment, or any alteration to product by any one other than an authorized FMA technician.
6. Installation or removal charges, or damage caused by improper installation or removal.

CALL (301) 668-4280 FOR INFORMATION ABOUT SERVICE AND WARRANTY REPAIRS.



CHARGEALL

MODEL FC100 THREE CHANNEL SIMULTANEOUS RAPID CHARGER

OWNER'S MANUAL

NOTE: PLEASE READ MANUAL COMPLETELY BEFORE OPERATION

INTRODUCTION:

Thank you for purchasing the FMA Direct / RCLine CHARGEALL rapid charger. The CHARGEALL is one product in a family of quality battery management devices from FMA, Inc. Designed to offer the utmost in nicad charging flexibility, the CHARGEALL is capable of charging a receiver battery, a transmitter battery and a glow booster simultaneously. The CHARGEALL operates using a separate, +12V D.C. power source (not supplied), and includes a step-up / step-down, DC / DC converter for superior voltage regulation during charging. Featuring Delta-Peak technology cut-off circuitry on transmitter and receiver outputs and timed charge on the glow booster output, the CHARGEALL is the perfect fast-field-charger for the radio control enthusiast. The CHARGEALL is packaged in a super-heavy-duty, extruded aluminum chassis and incorporates spring activated quick wire connections for the charging outputs. Featuring fuse and reverse polarity protection, this charger is quite possibly the **ONLY CHARGER YOU MAY EVER NEED!**

OPERATION:

● OVERVIEW

A vast array of different nicad battery manufacturers and cell configurations are available to the modeling community today. One must pay special attention to the type of batteries he will be charging using your CHARGEALL rapid charger. Typically, most modern nicad 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. 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. Rapid charging batteries utilizing peak detection circuitry is an extremely 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. For the same reason, rapid charging batteries does shorten the overall life span of a battery by a small fraction. Because of the multitude of various battery configurations on the market today, it is impossible for FMA, Inc. to verify whether or not your particular battery brand / cell type is capable of accepting the charge rates supplied by the CHARGEALL. This being the case, it is very important that you consult your battery manufacturer's guidelines for charging the battery type(s) that you have. FMA, Inc. will not accept any liability for failure to

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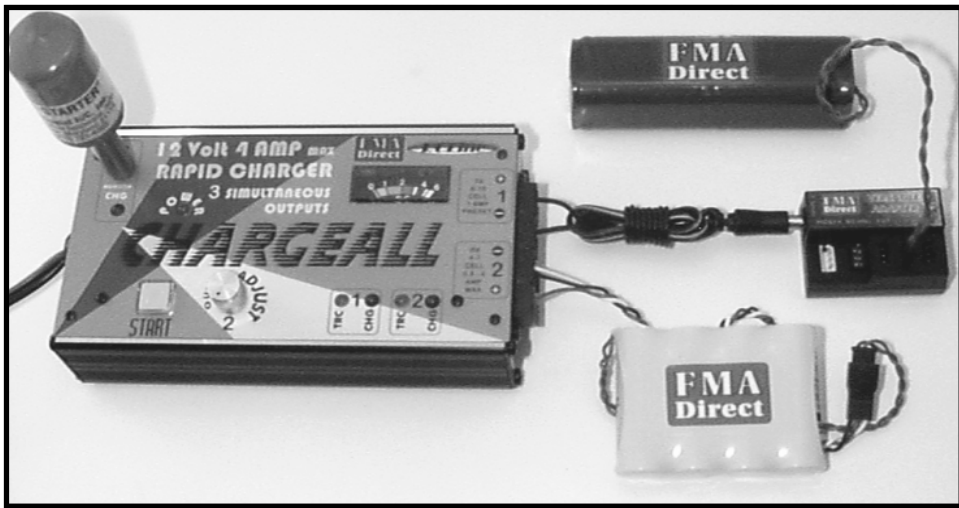


Figure 1 - Battery Connections

comply with your battery manufacturer's guidelines when charging using any FMA Direct rapid charging products.

CAUTION: When using the CHARGEALL, always set it on a stable, non-flammable surface along with the batteries connected to the unit. When the CHARGEALL 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 nicad batteries. As current flows through the battery, exciting electrons, excess energy as a result of certain inefficiencies in the battery charging process, will cause heat to escape from the interior of the batteries. Should the batteries connected ever become "too hot to touch", remove them from the charger immediately to prevent the possibility of fire or explosion. Re-check your battery manufacturer's guidelines for charging this battery pack. If the problem continues, call FMA Direct at (301) 831-8980 for service information.

- **CONNECTING THE CHARGEALL TO +12V POWER SOURCE**

Connect the CHARGEALL to a +12V power source capable of at least 10A consumption by using the supplied alligator clips. Automotive batteries or field box batteries work quite well as a power source. The RED cable is +Volts and the BLACK cable is ground. The yellow POWER indicator LED will glow.

- **CHARGING A TRANSMITTER BATTERY PACK**

Verify that your transmitter battery pack is nicad and contains from 6 to 10 cells. Consult your battery manufacturer's guidelines concerning charge rates for your battery type. Make certain that your battery is designed to handle a rapid charge rate of 1A. Remember, for a 500 mAh pack, this is a 2C charge rate. Connect the bare wire ends of the supplied 2.5mm-to-bare wire connector to the spring activated quick wire connections on the right side of the unit at the output marked TX on the front face. Typically, the RED wire goes to the RED connector and the BLACK wire to the BLACK connector; however, this may not be the case for your transmitter. **CAUTION:** If you are unsure about the polarity of your transmitter charging jack, consult your transmitter manufacturer's literature. Standard convention is to make tip positive, and sleeve negative. Most JR transmitters are the reverse of this standard! Insert the barrel connector end of this cable into the charge input on your transmitter. Make certain the transmitter power switch is turned off. An alternate method of connecting your transmitter pack to the CHARGEALL is illustrated in Figure 1. Note that the transmitter battery pack is removed from the transmitter and attached to the FMA Direct "Versatile Adapter" (PN 501MC). The barrel cable is then plugged into the Versatile Adapter. The Versatile Adapter enables one to interface any of the popular connectors to FMA Direct battery chargers and can be purchased separately at a local FMA Direct dealer or direct from FMA. Press and hold the START button for three seconds. The red CHG indicator LED for channel one will glow. When

the battery has reached full charge, the peak detection circuit will automatically switch the unit from rapid charge to trickle charge. The red CHG indicator LED will go out and the green TRC indicator LED for channel one will glow. The unit will remain in trickle mode until the battery is disconnected. To monitor the charge current on the ampere meter, adjust the METER SELECT switch (located on the left side of the unit) to TX. The meter will read 1A in rapid charge mode.

- **CHARGING A RECEIVER BATTERY PACK**

Verify that your receiver battery pack is nicad and contains from 4 to 7 cells. Consult your battery manufacturer's guidelines concerning charge rates for your battery type. Make certain that your battery is designed to handle rapid charging. At this point, you will need to calculate the amperage required to rapid charge your battery at the charge rate recommended for your battery type. Remember, for a 500 mAh pack, a 1C charge rate is 500 mA and will charge a fully discharged pack in one hour. Connect the bare ends of a charge pigtail to the spring activated quick wire connections on the right side of the unit at the output marked RX on the front face. If you do not have a charge pigtail, you may purchase one separately from FMA Direct as PN 212. Make sure you order the correct version for your brand of equipment. Make certain the RED or + wire goes to the RED connector and the BLACK or ground wire to the BLACK connector. Plug the battery to be charged into the other end of the charge pigtail. An alternate method of connecting your receiver pack to the CHARGEALL is via the FMA Direct "Versatile Adapter" (PN 501MC) in combination with the 2.5mm-to-bare wire barrel cable (PN 302BC) supplied with the unit. The Versatile Adapter enables one to interface any of the popular connectors to FMA Direct battery chargers and can be purchased separately at a local FMA Direct dealer or direct from FMA. Turn the OUTPUT ADJUST knob to the fully counter-clockwise position. Adjust the METER SELECT switch (located on the left side of the unit) to RX so that you will be able to monitor the charge current on the ampere meter. Press and hold the START button for three seconds. The red CHG indicator LED for channel two will glow. Now slowly adjust the OUTPUT ADJUST knob by turning it in the clockwise direction while reading out the charge current on the ampere meter. Stop when the meter reads the proper charge rate in amperes. When the battery has reached full charge, the peak detection circuit will automatically switch the unit from rapid charge to trickle charge. The red CHG indicator LED for channel two will go out and the green TRC indicator LED for channel two will glow. The unit will remain in trickle mode until the battery is disconnected.

- **CHARGING A GLOW BOOSTER**

Plug your glow booster into the dummy, panel mounted, glow plug on the face of the unit as illustrated in Figure 1. The CHARGEALL will immediately begin to charge the glow booster at 1.2A and the red CHG LED for BOOSTER will glow. After approximately 20 minutes, this charge cycle will be completed and the red CHG LED for BOOSTER will go out. One glow booster charge cycle corresponds to a total charge of about 400 mAh. Depending on the capacity of your glow booster and its initial charge state, it may require more than one pass to completely charge the battery. You can determine the state of the battery by touching it with your hand. If the battery is warm, remove it from the CHARGEALL. **NOTE: IF YOU DECIDE TO INITIATE A SECOND CHARGE CYCLE ON THE GLOW BOOSTER, YOU MUST DISCONNECT THE BATTERY FROM THE DUMMY GLOW PLUG AND RECONNECT IT AFTER TWO MINUTES. TWO MINUTES IS REQUIRED FOR THE GLOW BOOSTER CIRCUITRY TO RE-SET.** To monitor the charge current on the ampere meter, adjust the METER SELECT switch (located on the left side of the unit) to BO. The meter will read 1.2A during charge mode.

- **CHARGING A POWER PACK:**

Although the CHARGEALL is ideally suited for use as a field charger for transmitter and receiver battery packs, it is not limited to these tasks alone. The CHARGEALL is capable of charging any nicad battery pack with a cell count that conforms to those specified in this manual, provided that the battery manufacturer's guidelines allow for rapid charging of the battery in question. For instance, the CHARGEALL will properly charge any 4 to 7 cell power pack at the 0.5A to 4A adjustable charge rate when connected to the RX output and any 6 to 10 cell power pack at the fixed 1A charge rate when connected to the TX output. Never exceed the maximum cell count limits of the CHARGEALL or damage could result to the unit not covered by warranty.

- **ACCESSORIES:**

Various adapter cables, the Versatile Adapter, power cables, and numerous other accessories as well as a full line of batteries, other chargers and cyclers are available for use