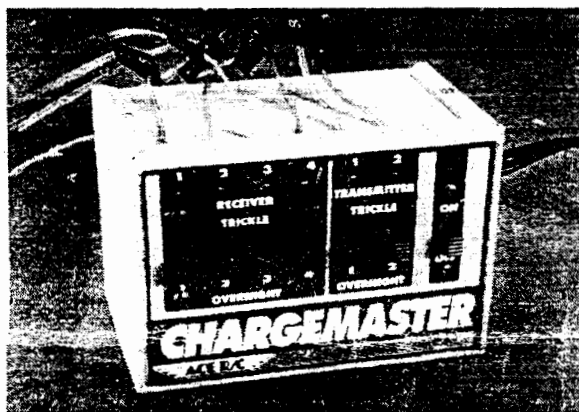


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34K55C Chargemaster, Assembled



I. INTRODUCTION

The Chargemaster was created to do away with the mess and tangle of wires and the octopus of outlets around most R/C modeler's charging areas. Not only does it consolidate six chargers into one, but it also can provide various charge rates to accommodate almost any size ni-cd batteries used today. These rates include 50 or 90 ma for the transmitter outputs and 25, 50, 90, or 120 ma for the receiver outputs. It also has the unique ability to be switched into a "Trickle" mode so the batteries can be left on charge all the time without damage and always be peaked and ready for a flying, boating, or car racing session.

Housed in an attractive, rugged, vinyl clad aluminum case, its state-of-the-art solid state circuitry will provide many years of dependable charging.

Wire in connectors as indicated in the following section and follow the procedures in the Operation section for proper use of your Chargemaster.

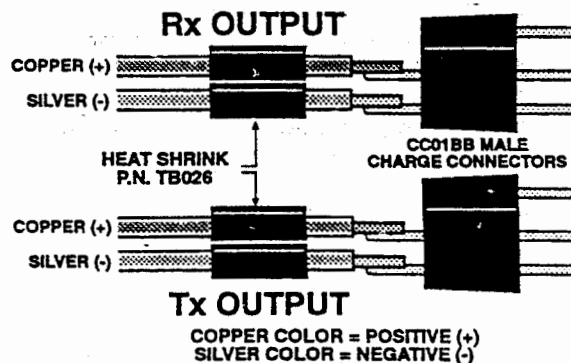
II. CONNECTOR WIRING

CAUTION: Proper polarity **MUST** be maintained at all times. If it is reversed at the batteries being charged, severe damage can result to the Chargemaster and/or the batteries.

COPPER COLORED WIRES = POSITIVE (+, RED)
SILVER COLORED WIRES = NEGATIVE (-, BLACK)

If your situation requires longer wires than furnished with the unit, use wire at least as heavy as the cables used on the Chargemaster.

Figure 1 Connector Wiring



A. Receiver Connector Hookup (Fig. 1)

CAUTION: Connector wiring shown is Deans connector. Check your receiver and transmitter wiring before installing the connectors so proper polarity is maintained. Ace part numbers are shown for the charge connectors illustrated. We also have charge connectors available for other manufacturers' radios. Write or call for details.

Solder the appropriate male charge connector to mate with your receiver charge receptacle onto each of the Receiver Output Cables. If the connector is not the solderable type, it will be necessary to splice it on. **ALWAYS MAKE SURE PROPER POLARITY IS MAINTAINED.** Check the joints to make sure they are secure and well insulated. Heat shrink tubing is provided to insulate the connections.

COPPER COLORED WIRE = POSITIVE (+, RED)
SILVER COLORED WIRE = NEGATIVE (-, BLACK)

B. Transmitter Connector Hookup (9.6 V Transmitters Only) Fig. 1

As with the receiver, solder the appropriate male charge connectors to mate with your transmitter's charge receptacle. Watch for proper polarity and solid, well insulated joints.

NOTE: If your transmitter has a built-in internal charger, it must be by-passed so the Chargemaster hooks directly to the 9.6V pack. Use of a Deans Charge Connector is recommended if this is necessary (Ace No. 19K55).

III. OPERATION

A. The Overnight Charge Rate

The Chargemaster is designed to charge at the overnight (14-16 hrs.) charge rate. This rate is determined by dividing the capacity of the batteries being charged by 10. So, for a 500 mah pack, the rate would be 50 ma; for 900 mah, it would be 90 ma; 1200 mah, 120ma; etc.

If you have a stock assembled Chargemaster, three of the receiver and both of the transmitter outputs are set at 50 ma, the charge rate for 450-550 mah batteries. The fourth receiver output is set at 120 ma (for 100-1400 mah batteries). These rates are indicated by the sticker on the end of each output cable. If you need to change this charge rate, it will be necessary to go into the unit and change the appropriate resistors. Refer to the section on Reprogramming the Charge Rate. Give some serious thought to your present and future charge needs before you go in and change resistors. Although it's not difficult to do, it is time consuming and should only be done if necessary. The resistors for making a second 120 ma receiver output have been included.

NOTE: It is recommended that you have no more than two receiver outputs set at 120 ma to prevent exceeding the operational limits of the unit.

B. The Trickle Charge Rate

Each output has a Trickle (Float) Rate that can be switched in which is a slow enough rate that the batteries can be left on indefinitely without damage to the cells and will keep them 100% charged. This rate is C/50, or the capacity of the batteries divided by 50. It is determined by the Overnight Charge Rate that has been selected for each output.

C. Reprogramming the Charge Rate

If you require a charge rate different from the way your Chargemaster is programmed, it will be necessary to change some resistors in your unit. First, make sure the unit is unplugged and remove the back. Remove the four bolts on the switches plus the bolt and nut holding the voltage regulator in place. Also, remove the nuts and bolts that are holding the transformer. Pull out the PC board far enough to clear the case while working the AC line cord through the grommet.

Following is a chart (Fig. 2) which provides the resistor values and sizes required for each of the various outputs to give the desired charge rate. Each output has four different resistors which affect the normal/trickle rate. Where it indicates "NONE (OPEN)", no resistor is installed and the spot is left open.

NOTE: Resistors to reprogram the charge rates are not furnished. The Ace Part number is provided for ordering purposes or they can be obtained from an electronics parts store such as Radio Shack. Be sure to ask for the proper value (220 ohm, 43 ohm, etc.) as well as the proper size (1/4 watt, 2 watt, etc.)

Referring to the Overlay drawing (Fig. 3), determine the location of the appropriate resistors controlling the output which is to be reprogrammed. Desolder and remove the resistors that need to be changed. Solder wick or a solder bulb is useful for this.

Install and solder the appropriate resistors into place. Make sure the solder joints are secure and don't bridge over to adjacent lands. Use a resin core solder, not acid core. Clip off the excess leads when finished.

Put the appropriate small label on the sticker at the end of the cable to identify the new charge rate on that output. No labels are provided for 25 ma, so just pull off the existing one and leave it blank so you know that that output is 25 ma.

D. Using the ChargeMaster

The Chargemaster works similar to any standard charger supplied with your radio except for the Trickle Charge feature. Plug the unit into a wall outlet and operate in the following sequence.

Figure 2 Resistor Chart

	25ma NORMAL (5ma TRICKLE)	50ma NORMAL (10ma TRICKLE)	90ma NORMAL (18ma TRICKLE)	120ma NORMAL (25ma TRICKLE)	
TX #1	R2	220 ohm 1/4W (R4-221) Red, Red, Brown	150 ohm 1/4W (R4-151) Brown, Green, Brown	NOT APPLICABLE	
	R3	68 ohm 1/4W (R4-680) Blue, Grey, Black	75 ohm 1/4W (R4-750) Violet, Green, Black		
	R4	33 ohm 1/4W (R4-330) Orange, Orange, Black	18 ohm 1/4W (R4-180) Brown, Grey, Black		
	R5	120 ohm 1/4W (R4-121) Brown, Red, Brown	68 ohm 1/4W (R4-680) Blue, Grey, Black		
TX #2	R6	220 ohm 1/4W (R4-221) Red, Red, Brown	150 ohm 1/4W (R4-151) Brown, Green, Brown	NOT APPLICABLE	
	R7	68 ohm 1/4W (R4-680) Blue, Grey, Black	75 ohm 1/4W (R4-750) Violet, Green, Black		
	R8	33 ohm 1/4W (R4-330) Orange, Orange, Black	18 ohm 1/4W (R4-180) Brown, Grey, Black		
	R9	120 ohm 1/4W (R4-121) Brown, Red, Brown	68 ohm 1/4W (R4-680) Blue, Grey, Black		
RX #1	R10	430 ohm 1/2W (R2-431) Yellow, Orange, Brown	200 ohm 2W (RO-201) Red, Black, Brown	120 ohm 2W (RO-121) Brown, Red, Brown	82 ohm 2W (RO-820) Grey, Red, Black
	R11	1.5K 1/4W (R4-152) Brown, Green, Red	820 ohm 1/2W (R2-821) Grey, Red, Brown	470 ohm 1/2W (R2-471) Yellow, Violet, Brown	330 ohm 1W (R1-331) Orange, Orange, Brown
	R12	None (Open)	68 ohm 1/4W (R4-680) Blue, Grey, Black	56 ohm 1/4W (R4-560) Green, Blue, Black	43 ohm 1/4W (R4-430) Yellow, Orange, Black
	R13	None (Open)	None (Open)	56 ohm 1/4W (R4-560) Green, Blue, Black	43 ohm 1/4W (R4-430) Yellow, Orange, Black
RX #2	R14	430 ohm 1/2W (R2-431) Yellow, Orange, Brown	200 ohm 2W (RO-201) Red, Black, Brown	120 ohm 2W (RO-121) Brown, Red, Brown	82 ohm 2W (RO-820) Grey, Red, Black
	R15	1.5K 1/4W (R4-152) Brown, Green, Red	820 ohm 1/2W (R2-821) Grey, Red, Brown	470 ohm 1/2W (R2-471) Yellow, Violet, Brown	330 ohm 1W (R1-331) Orange, Orange, Brown
	R16	None (Open)	68 ohm 1/4W (R4-680) Blue, Grey, Black	56 ohm 1/4W (R4-560) Green, Blue, Black	43 ohm 1/4W (R4-430) Yellow, Orange, Black
	R17	None (Open)	None (Open)	56 ohm 1/4W (R4-560) Green, Blue, Black	43 ohm 1/4W (R4-430) Yellow, Orange, Black
RX #3	R18	430 ohm 1/2W (R2-431) Yellow, Orange, Brown	200 ohm 2W (RO-201) Red, Black, Brown	120 ohm 2W (RO-121) Brown, Red, Brown	82 ohm 2W (RO-820) Grey, Red, Black
	R19	1.5K 1/4W (R4-152) Brown, Green, Red	820 ohm 1/2W (R2-821) Grey, Red, Brown	470 ohm 1/2W (R2-471) Yellow, Violet, Brown	330 ohm 1W (R1-331) Orange, Orange, Brown
	R20	None (Open)	68 ohm 1/4W (R4-680) Blue, Grey, Black	56 ohm 1/4W (R4-560) Green, Blue, Black	43 ohm 1/4W (R4-430) Yellow, Orange, Black
	R21	None (Open)	None (Open)	56 ohm 1/4W (R4-560) Green, Blue, Black	43 ohm 1/4W (R4-430) Yellow, Orange, Black
RX #4	R22	430 ohm 1/2W (R2-431) Yellow, Orange, Brown	200 ohm 2W (RO-201) Red, Black, Brown	120 ohm 2W (RO-121) Brown, Red, Brown	82 ohm 2W (RO-820) Grey, Red, Black
	R23	1.5K 1/4W (R4-152) Brown, Green, Red	820 ohm 1/2W (R2-821) Grey, Red, Brown	470 ohm 1/2W (R2-471) Yellow, Violet, Brown	330 ohm 1W (R1-331) Orange, Orange, Brown
	R24	None (Open)	68 ohm 1/4W (R4-680) Blue, Grey, Black	56 ohm 1/4W (R4-560) Green, Blue, Black	43 ohm 1/4W (R4-430) Yellow, Orange, Black
	R25	None (Open)	None (Open)	56 ohm 1/4W (R4-560) Green, Blue, Black	43 ohm 1/4W (R4-430) Yellow, Orange, Black

1. Turn the unit on. Note the "ON" LED lights.
2. Plug any or all of the battery packs in, noting the appropriate LED lights. Make sure the switch is in the "Normal" mode.
3. After charging 14-16 hours, either unplug the battery or flip the switch for the appropriate output to "Trickle" mode. (The LED's may or may not dim.) While in the Trickle mode, the packs can be left on indefinitely without damage.
4. If all the packs are disconnected, turn the unit off. The "ON" LED will slowly go out. Do not turn the unit off unless all packs are unplugged.

If this sequence isn't followed, it may be confusing and unintentional discharging may occur due to the nature of the circuit. For example, if the unit is off and a transmitter is plugged in, the "ON" LED will light because the transmitter is discharging through the LED. This is normal and is no problem as long as proper procedure is followed.

Do not leave any battery packs hooked up to the Chrgemaster with the unit off. If you do so, they will eventually discharge.

It is normal for the unit to run warm while in use, especially if all six outputs are being used.

A couple of comments on ni-cd batteries in general. The 14-16 hour overnight charge time is not super critical. The batteries will be fully charged in that amount of time, but it's not going to hurt them if they're left on longer, even up to a couple of days. So, if you forget to either take them off or flip the switch to trickle right away, don't worry. Also, if the batteries have been sitting unused or on trickle for an extended period of time, it is healthy to cycle them every few months. This can be done with a commercially available cyler such as the Ace Digipace II or by turning the radio on and wiggling the servos for 30 minutes to an hour. Don't let the batteries run completely down; they can be damaged by doing so. **After discharging** the batteries, be sure to charge them back up.

The Chrgemaster is a dependable, solid-state device that can provide most R/C'ers charging needs for years to come. We'd appreciate your comments and suggestions on this product.

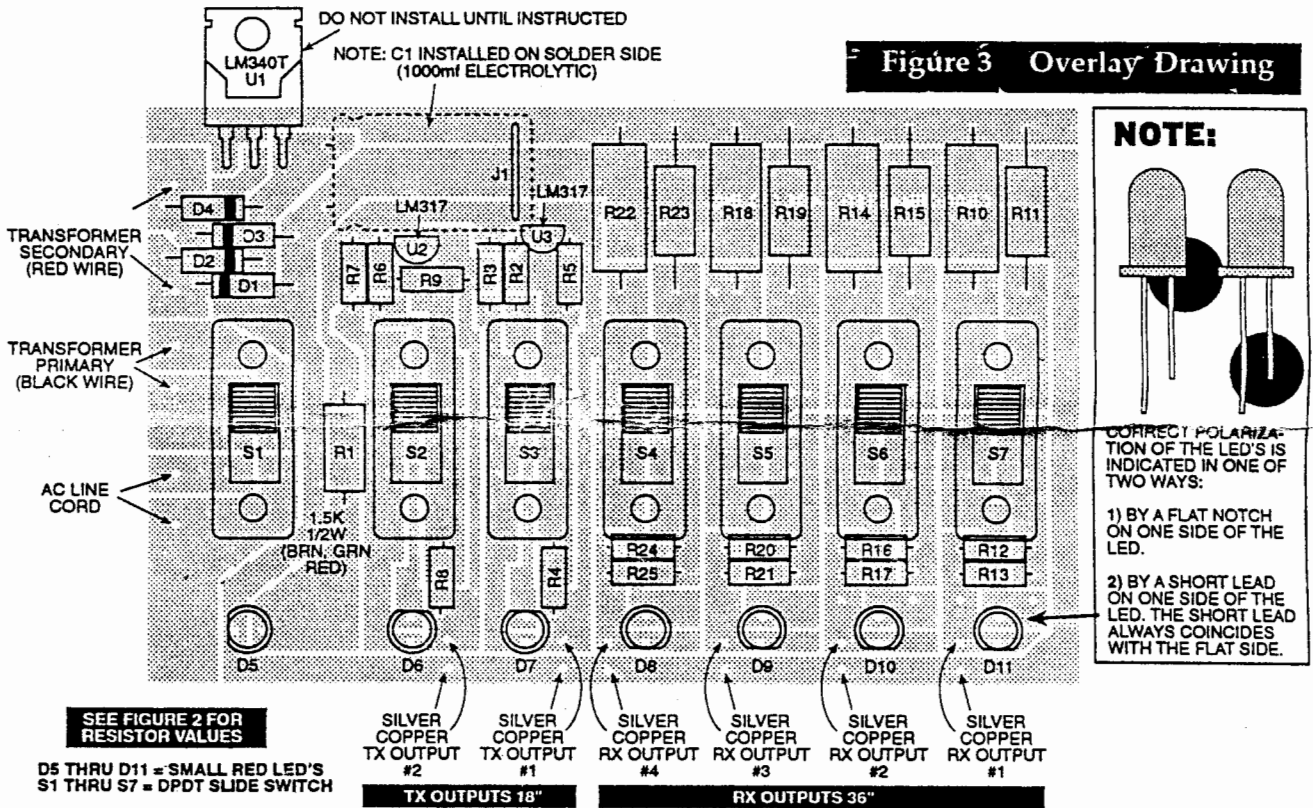


Figure 3 Overlay Drawing

NOTE:

CORRECT POLARIZATION OF THE LED'S IS INDICATED IN ONE OF TWO WAYS:

- 1) BY A FLAT NOTCH ON ONE SIDE OF THE LED.
- 2) BY A SHORT LEAD ON ONE SIDE OF THE LED. THE SHORT LEAD ALWAYS COINCIDES WITH THE FLAT SIDE.

SEE FIGURE 2 FOR RESISTOR VALUES
 D5 THRU D11 = SMALL RED LED'S
 S1 THRU S7 = DPDT SLIDE SWITCH

TX OUTPUTS 18" RX OUTPUTS 36"

IV. PARTS LIST

Resistors

- () 1 R0-820 82 ohm 2W (gry, red, blk)
- () 3 R0-201 200 ohm 2W (red, blk, brn)
- () 1 R1-331 330 ohm 1W (orn, orn, brn)
- () 1 R2-152 1.5K 1/2W (brn, grn, red)
- () 3 R2-821 820 ohm 1/2W (gry, red, brn)
- () 2 R4-121 120 ohm 1/4W (brn, red, brn)
- () 2 R4-221 220 ohm 1/4W (red, red, brn)
- () 2 R4-330 33 ohm 1/4W (orn, orn, blk)
- () 2 R4-430 43 ohm 1/4W (yel, orn, blk)
- () 5 R4-680 68 ohm 1/4W (blu, gry, blk)

Parts for a second 120 ma receiver output.

- () 1 R0-820 82 ohm 2W (blk, red, gry)
- () 1 R1-331 330 ohm 1W (orn, orn, brn)
- () 2 R4-430 43 ohm 1/4W (yel, orn, blk)

Capacitors

- () 1 CE108PI 1000 mf Electrolytic

Semiconductors

- () 1 SS106 LM340T Regulator
- () 2 SS046 LM317LZ Regulator
- () 7 SS074 Small Red LED
- () 4 SS120 1N4001/4005 Diode

Switches

- () 7 SW001 Noble DPDT Slide

Hardware and Misc.

- () 1 TT018 Transformer
- () 1 PC159 Chgmstr PC Board
- () 1 SM197A Chgmstr Case
- () 1 LB104B Chgmstr Cable Labels
- () 1 RP016A #3A Grommet 5/16" I.D.
- () 4 RP025 Black Rubber Feet
- () 2 HW002 4-40 Nut
- () 1 HW010B 3mm Hex Nut

- () 5 HW010EE 3mm x 6mm Button Head Cap Screws
- () 2 HW011E No. 4 Lockwasher
- () 4 HW112B Phillips Head Screws
- () 2 HW083B 4-40 x 3/8 PH Bolts
- () 1 HW171 No. 6 Solder Lug
- () 1 WW073 Three Conductor AC Line Cord
- () 3 TB026 3/32 x 3 Heat Shrink
- () 15 ft. Two Conductor Cable
- () 36 in. Solder

V. CIRCUIT DESCRIPTION

The circuit consists of a power transformer, diodebridge, 1000 mf filter cap, and a 15V regulator to maintain constant voltage on all charge circuits.

Due to low voltage differentials involved in the transmitter charge circuits and to avoid wide current changes due to this, these two circuits are constant current regulated. This is accomplished using LM317LZ voltage regulators. It is not recommended that any resistor values other than those shown in the chart be used.

The four remaining receiver charge circuits are very straightforward in design and are controlled by the resistors selected.

All outputs have LED indicators and it will be noted in switching from normal charging to trickle charging that these may dim and act as an indication that all is functioning properly.

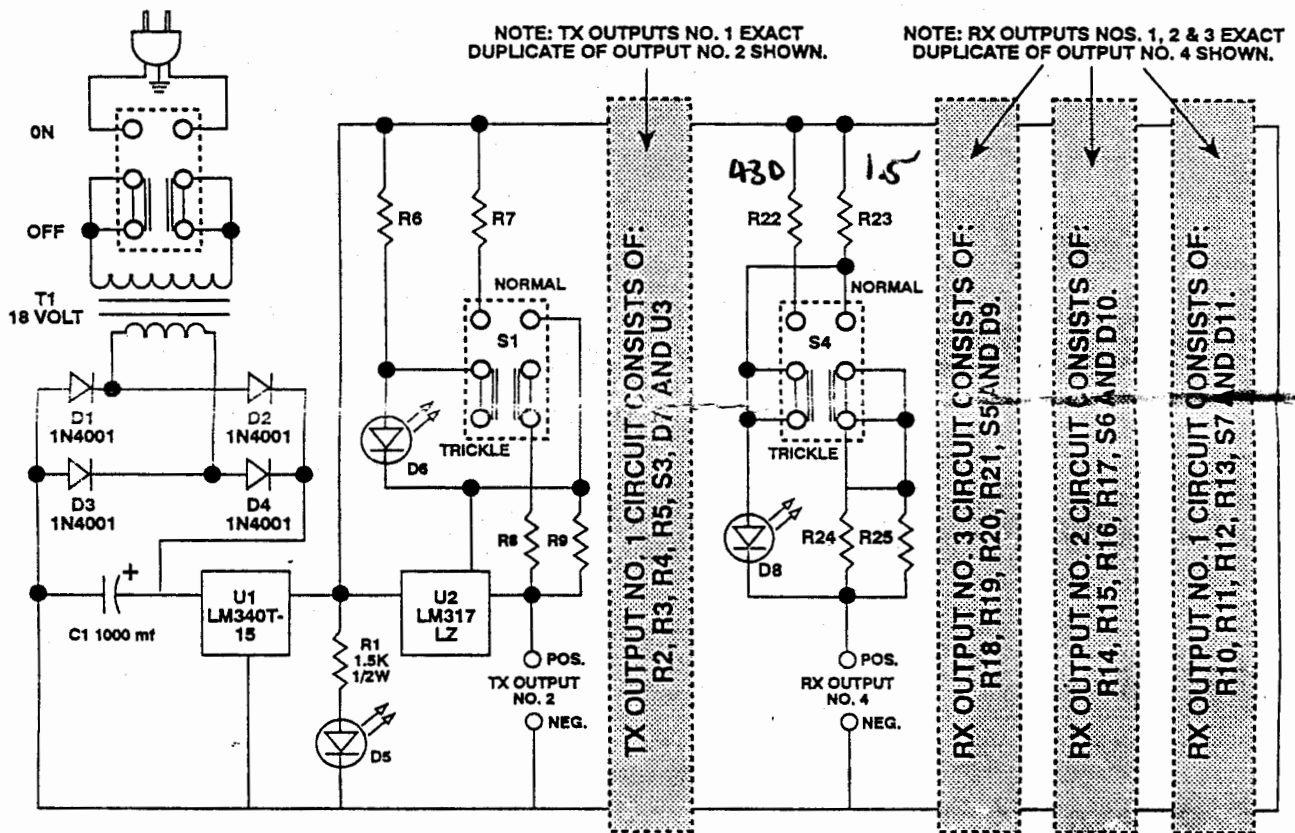


Figure 4 Schematic



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