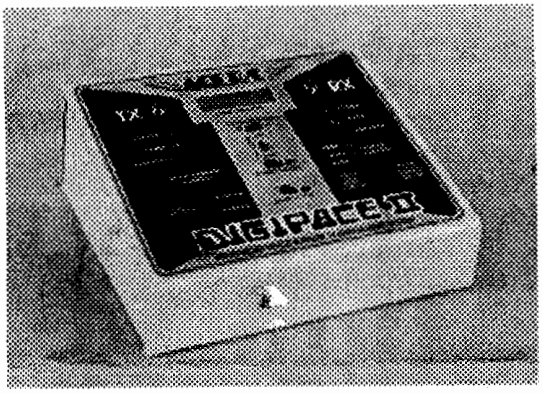
DIGIPACE II

OPERATION manual

Ace R/C, Inc., 116 W 19 ST, POB 472, Higginsville MO 64037-0472 • 816.584.7121

34G200C Digipace II, Asbld.
34G200AC Digipace II, Asbld. - 220V/50Hz



I. INTRODUCTION

A. What the Digipace II Does

The Digipace II is a sophisticated piece of laboratory quality equipment that discharges transmitter and/or receiver nickel cadmium batteries at a fixed discharge rate, down to a predetermined voltage cut-off level, while recording the time it takes to perform the task. After discharging, the Digipace II automatically switches into the overnight charge mode, then automatically switches to trickle charge approximately 20 to 25 hours later so you can leave the batteries on indefinitely, confident they will be safely at 100% charge.

B. Why the Digipace II?

1. Safe flying time from any given set of batteries can be determined from the time it takes to discharge the batteries under known load conditions.

2. The operational capacity of any given pack can be computed and compared to the rated capacity to determine if a cell or pack is losing capacity.

3. Peak capacity is maintained because certain internal failures within the cell that cause a decrease in battery capacity can be eliminated.

4. Accurate, controlled cycling of ni-cd batteries is the only way to determine the "goodness" of any given pack and determine if failure is impending, making the Digipace II the most effective insurance against failure.

5. Automatically switching to the trickle charge mode lets the batteries be maintained at 100% charge indefinitely!

All of these functions will be covered in depth in the following instructions. Please read the instructions thoroughly before doing anything with your Digipace II.

C. Hookup

Hookup to the Digipace II is done by means of readily available 0.10" pin power plugs. Adapter cables are available for a variety of systems, or you can easily make up your own for whatever your application requires. Two power plugs are furnished with the unit to use with your existing connectors.

WARNING AND DISCLAIMER: Improper use of this unit may cause serious personal injury to yourself, to others, or result in property damage. The user is urged to read and understand the information contained before operation of the equipment. Prudent and reasonable conduct when operating this charger is requested by the manufacturer.

Ace R/C assumes no responsibility for accident, injury, or property damage incurred as a result of any use of this equipment whatsoever. The user accepts the responsibility to comply with all safety requirements, including, but not limited to, those established by all federal, state, and local governmental agencies, and to abide by the rules and recommendation of all non-governmental bodies related to the use of this equipment, including, but not limited to, those set forth by the Academy of Model Aeronautics.

WARRANTY: This unit is warranteed for 90 days from the date of purchase against defects in parts or workmanship. The warranty extends to the Digipace II only and does not include batteries or anything else beyond the unit itself. It does not include misuse or abuse. A $5.00 handling fee is required for units sent in under warranty.

If the Digipace II is out of the warranty period or has suffered damage as a result of abuse or misuse, a labor fee plus parts and postage is charged to repair the unit.

II. SPECIFICATIONS

Discharge Current:

Transmitter - Constant 300 MA throughout the discharge cycle.

Receiver - select either 300 MA throughout the discharge cycle or 500 MA throughout the discharge cycle (for heavier capacity battery packs).

YIME200122794

Cut-off Voltages:

Transmitter • 8.0V - 8.8V for 8 Cell (9.6V nominal)
9.0V - 9.9V for 9 Cell (10.4V nominal)

Receiver • 4.0V - 4.4V for 4 Cell (4.8V nominal)
5.0V - 5.5V for 5 Cell (6.0V nominal)

All cut-off voltages are temperature stable.
Note: For special applications, the cut-off voltage can be adjusted for any number of cells. Contact the factory for details. You will need an accurate voltmeter to perform the adjustment.

Charge Rates:

Transmitter • Constant 50 MA. (Can be reprogrammed to 85 MA.)
Receiver • Constant 25, 50, or 120 MA. (25 MA setting can be reprogrammed to 85 MA.)
Trickle • 10 MA transmitter and receiver.

Time Readout:

Four-Digit LCD reads minutes down to 1/10 minute and up to 999.9 minutes.

Power Requirements:

34G200C - 120 Volt, 60 Hz, AC Power
34G200AC - 220 Volt, 50Hz, AC Power

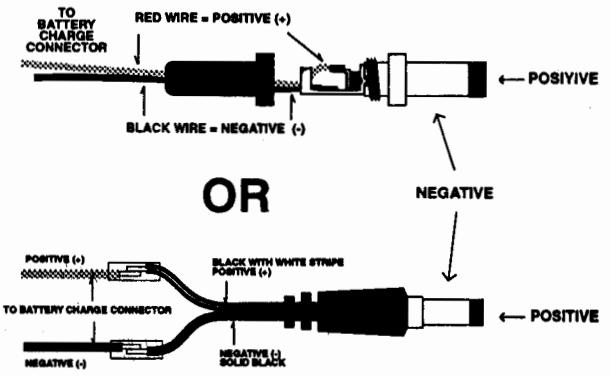
III. HOOKING THE BATTERIES TO THE DIGIPACE II

Two major considerations must be observed when interfacing the Digipace II to your radio system. One, the Digipace II must electrically connect directly to the transmitter and receiver batteries and, two, proper polarity must be maintained at all times: positive to positive and negative to negative. It is highly recommended to use a scheme of connectors that would be physically impossible to plug in backwards, (reverse polarity).

Realize that some systems have a diode in the transmitter charge circuit to prevent reverse charging. This diode must be bypassed in order to discharge the pack. It can either be shorted out, or the transmitter pack can be unplugged and accessed directly.

> **CAUTION:** If the Digipace II is improperly hooked up to either receiver or transmitter causing reverse polarity, the Digipace II won't work properly and the batteries can be damaged! If you are not absolutely sure of your wiring, check with someone who has the ability to be absolutely positive.

Two 0.10" pin power plugs are furnished to hookup to your existing charge connectors. Refer to the above



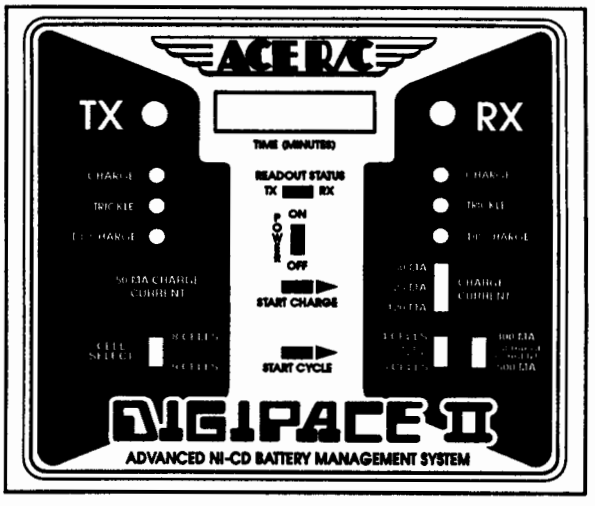
figure, making sure you maintain proper polarity when soldering these connections. Heat shrink tubing is provided to insulate the solder connections.

Additional power plugs (Ace P/N **CC084** - 0.10" Power Plug Only) may be purchased from Ace R/C to make adapters for all of your systems or ready made adapters are available.

Digipace II Adapter Cables:

19K101 Ace Silver 7 Tx or Rx
19K102 Ace Micro Series Tx and Futaba Std. Tx
19K103 Futaba 5 Pin Tx
19K104 Futaba G Rx
19K105 Futaba J Rx
19K106 Airtronics Tx
19K107 Airtronics Rx
19K108 JR Tx
19K109 JR Rx

IV. THE DIGIPACE II'S FRONT PANEL



A. *"Power"* Switch

When plugged into 110V AC, the Power Switch turns the Digipace II on and off as indicated.

B. *"Start Charge"* Switch

When the Digipace II is turned on, it comes up in the Trickle Charge mode. If you want to **charge** the batteries at the overnight rate for the 20 to 25 hour period, move this spring loaded switch to the right and release.

C. *"Start Cycle"* Switch

If, after turning on your Digipace II, you want to perform the complete discharge/recharge/trickle charge cycle, move this spring loaded switch to the right and release.

D. *"Readout Status"* Switch

The LCD readout will display the TX discharge time if this switch is in the "TX" position and will show the RX discharge time if it is in the "RX" position.

E. *"TX Cell Select"* Switch

This switch determines the discharge cutoff voltage for the transmitter side of the Digipace II, either for 8 Cell packs (9.6V nominal) or 9 Cell packs (10.8V nominal).

F. *"RX Cell Select"* Switch

This switch determines the discharge cutoff voltage for the receiver side of the Digipace II, either for 4 Cell packs (4.8V nominal) or 5 Cell packs (6.0V nominal).

G. *"RX Charge Current"* Switch

The setting of this switch determines the overnight charge current for the receiver side. Use the following settings for the appropriate capacity packs being charged:

Charge Rate (MA)	Battery Capacity (MAH)
25	100 - 350
50	350 - 750
*85	750 - 950
120	950 - 1500

*Optional: See "Reprogramming the Charge Rates", Section X of instructions.

H. *"RX Discharge Current"* Switch

This switch determines the amount of current the receiver side of the Digipace II discharges from the battery pack.

Up to 1300 MAH capacity battery packs should be discharged at the 300 MA setting and over 1300 MAH capacity packs should use the 500 MA setting. This allows a more accurate monitoring of the operational capacity and the safe flying time for larger packs.

I. LED Indicator Lamps

There are six LED indicators on the front of the Digipace II, three each on the TX and RX sides. They indicate the mode or status of the Digipace II.

Green indicates the overnight charge rate, Yellow indicates the trickle charge rate, and Red indicates that the Digipace II is in the discharge mode.

J. LCD Readout

The Liquid Crystal Display shows the time that it took (or is taking) to perform the discharge portion of the cycle. That time is displayed in minutes and tenths of a minute, so it is accurate to within 6 seconds.

V. OPERATION

A. Preparation

Put the "TX Cell Select" switch to the proper position, depending on whether you have an 8 Cell (9.6V) or a 9 Cell (10.8V) transmitter pack.

Put the "RX Cell Select" switch to the proper position, depending on whether you have a 4 Cell (4.8V) or a 5 Cell (6.0V) receiver pack.

CAUTION: If this switch is set for an 8 cell (9.6 volt) pack, but you are discharging a 9 Cell (10.8 volt) pack, the Digipace II can discharge your 10.8 volt batteries to a lower voltage level and damage to the pack can result. The same goes for discharging a 5 Cell receiver pack at the 4 Cell setting.

Put the "Receiver Charge" rate switch in the proper position. One position is 50 MA (for 350-750 MAH packs); the second will be 25 MA (for 100-350 MAH packs)*, and position three is 120 MA (for 950-1500 MAH packs).

Place the "Receiver Discharge Rate" on 300 MA for receiver packs with the capacity of 50 to 1300 MAH. Larger packs may be discharged at the 500 MA rate to shorten the process.

Plug the Digipace II into an AC outlet (110V - 34G200C; 220V - 34G200AC) and turn it "ON".

The readout should indicate 000.0. Make sure the transmitter and receiver power switches are off and plug the appropriate adapter cables into the Digipace II and the transmitter and receiver charge jacks.

B. Start the Cycle

To initiate the discharge cycle, move the spring loaded "Start Cycle" switch to the right and release. Red "Discharge" lights should come on and the yellow trickle charge lights go out. The readout will start recording the time in 1/10 minute intervals.

When the selected voltage cutoff level is reached, the readout will display the time it took for the discharge cycle and the Digipace II will automatically switch to the charge mode. Depending on the location of the "Readout Status" switch, the readout will display either the receiver time or the transmitter time. It will continue to display the time until either

the unit is unplugged, turned off, power is lost, or the "Start Cycle" switch is actuated again. If a power outage occurs at any point during the cycle, the readout will clear to 000.0 and the unit will "fail safe" to the trickle charge mode.

At the completion of the discharge cycle, the unit switches to the selected charge rate and the green light(s) comes on. When discharge was initiated by actuating the "Start Cycle" switch, a trickle charge timer began which operates for 20 to 25 hours. At the end of this time, the Digipace II switches to trickle charge to maintain batteries at full charge, ready for use when you return from, say, a vacation. The yellow lights indicate trickle charge.

During the discharge cycle the unit will radiate some heat from an internally located heat sink. This is normal - the unit is dissipating the energy it is taking out of the batteries in the form of heat. The circuitry is completely temperature stable, so this rise in ambient temperature will not affect the discharge rate or the cutoff voltage.

Transmitter and receiver batteries can be cycled simultaneously or independently. If you want to cycle one battery pack, leave the other output unoccupied. Remember, when you actuate the "Start Cycle" switch, the readout will always clear to 000.0 and the trickle charge timer is reset. So, if you want to cycle just one battery but charge the other one, simply hook up the pack that you only want to charge after the discharge cycle has been initiated.

If the unit doesn't stay in the discharge mode when the cycle is started, check for proper hookup and that the Receiver and Transmitter voltage cutoff (i.e., number of cells) switches are set to the proper position for your battery packs. If the unit still doesn't stay in the discharge mode, you have an uncharged pack or a problem. See Section IX for solutions to battery problems.

C. Overnight Charge Only

When you wish to charge batteries without first discharging them, connect the pack as usual. The "Trickle Charge Lights" will come on. Actuate the "Start Charge" switch to start the overnight charge rate. The trickle charge lights will go off and the charge lights go on until 20 to 25 hours later when the unit automatically switches to Trickle Charge.

Because of the nature and quality of modern ni-cds, it doesn't hurt the batteries to perform the overnight charge cycle on them repeatedly, even if you've only used them for a flight or two. When in doubt, charge!

D. Trickle Charge Only

If you simply want to trickle charge the pack(s), connect them to the Digipace II and observe that the trickle charge lights come on.

VI. DETERMINATION OF SAFE FLYING TIME

Under normal circumstances, the time indicated on the Digipace II will tell you how much safe flying time remains for the particular battery packs being analyzed. If no servos stall out or buzz and there is no other electrical problem, the average current consumption on the flight pack batteries is under 300 MA. By the same token, transmitters generally consume well under 300 MA so there is a considerable safety margin involved.

A closer analysis of safe flying time can be made. Perform two or three cycles on a given set of batteries and note the discharge times - say 90 minutes. Now go out for a normal flying session, noting how long you fly; for example, 1-1/2 hours. When you get home and before you recharge the batteries, hook them to the Digipace II and discharge them. Say they went for another 45 minutes. This would indicate that you only used 1/2 the battery capacity. Always allow plenty of safety margin, though. The Digipace II is designed to be a battery maintenance system, not something to make you overconfident about your battery capacity and go beyond normal safety limits!

VII. MEASURING BATTERY CAPACITY

Capacity of any given nickel cadmium battery is the amount of electrical energy that can be delivered over a period of time. Energy is measured in amperes or milliamperes (MA) and time is measured in hours. So, capacity (C) is measured in ampere-hours, or more commonly for our use, milliampere-hours (MAH).

One can compute the actual operational capacity of a fully charged battery pack by converting the time it took to discharge the pack to hours (divide by 60) and multiplying the result by the discharge current (300 MA or 500 MA).

$$\frac{\text{Number of Minutes}}{60} \times \text{Discharge Rate} = \text{Capacity in MAH}$$

For example, pack "A " took 90 minutes to discharge. The discharge rate select switch was set at 300 MA.

90 ÷ 60 = 1.5 hrs. X 300 MA = 450 MAH.

When the receiver Discharge Rate is set for 500 MA, use 500 MA as the multiplier in the above equation.

VIII. COMPARING MEASURED CAPACITY TO RATED CAPACITY

Every ni-cad battery pack has a rated capacity (350 MAH, 500 MAH, 600 MAH, 1300 MAH, etc). If the operational capacity equals or exceeds the rated

capacity of the pack, everything is fine. If the operational capacity turns out to be lower than the rated capacity, a closer look needs to be taken; your pack may or may not need attention.

Assuming one started with a fully charged battery, the capacity of nickel cadmium batteries is dependent on four variables:

1. Discharge rate and uniformity of that rate; generally, the lower the rate, the higher the capacity achieved.
2. Cell voltage at the end of discharge; generally the lower the voltage, the higher the capacity indicated.
3. Cell temperature; ambient temperature higher or lower than 20 degrees C will decrease capacity.
4. History of cell's activity; improper use can lower capacity.

When various battery manufacturers rate their batteries, most all of them do it in different ways, particularly changing the first variable to either a one hour, five hour, or ten hour rate. This means that the rate of discharge is equal to the capacity of the battery divided by one, five, or ten hours. When a battery's capacity is rated at the one hour rate, the discharge rate for a 500 MAH battery would be 500 MAH/1 hour or 500 MA. Similarly, a 500 MAH battery rated at the five hour rate would be discharged at 500 MAH/5 hours or 100 MA. For the ten hour rate, 500 MAH/10 hour or 50 MA.

Ni-cad batteries will produce more capacity when discharged at slower rates. As a matter of fact, there can be as much as 50% difference in capacity in a given cell dependent on whether it was discharged slowly or quickly! So, we see that each cell should actually produce more than 500 MAH capacity by a few percent. By the same token, if a 500 MAH/10 hr. rate battery is discharged at 300 MA, it will actually produce about 15% less than its rated capacity. For hard data on definite percentages of uprating or derating battery capacity due to deviation from the rated discharge rate, one would have to obtain specifications from the battery manufacturer. Basically, if a battery pack is new and deviates from the rated capacity by 15 or 20%, it still could be up to spec according to the way the rated battery capacity was determined.

The second and third variables are generally consistent from manufacturer to manufacturer when rating batteries. They will discharge the batteries down to 1.0V per cell when determining capacity; the Digipace II discharges to 1.0V - 1.1V per cell in order to prevent cell reversal, a phenomenon discussed later. So here again, one may see 2-5% lower capacity than the rated capacity when using the Digipace II and everything may still be OK.

Cell temperature when determining battery capacity is kept at room temperature (20 degrees C) and, since you use your Digipace II indoors, we are keeping this variable constant.

The fourth variable in ni-cd capacity is the history of the cell's activity. When batteries are rated, they use new cells so they have no history. We will cover how a cell's history can affect capacity later.

In summary, when analyzing a new battery pack, and the Digipace II shows that it has a capacity lower than the rated capacity, don't panic and send the pack back for replacement. As stated earlier, there are two variables (discharge rate and cutoff voltage) that can be different in the Digipace II set up, causing 15-20% variation in the actual operational capacity versus the rated capacity.

All of the first three variables in determining ni-cd capacity (discharge rate, cutoff voltage, cell temperature) can be called functional variables and only affect the current discharge cycle. The fourth variable, the history of the cell's activity, can degrade the capacity of the battery pack over a period of time; it is of utmost importance in determining battery life and condition, and can cause a significant variation in operational capacity as measured by the Digipace II versus the rated capacity of the pack. Loss of capacity can be temporary or permanent. What we are able to do with the Digipace II is reverse the temporary loss of capacity, prevent any permanent loss of capacity and, if permanent loss of capacity has occurred, detect it, and take appropriate action.

A ni-cad battery subjected to continuous overcharge, programmed cyclic charges and discharges of a repetitious nature, or any other long-term constant sets of functioning conditions, will cause a gradual loss of capacity via the "memory" effect. Fortunately, this loss of capacity is a temporary loss and can be regained by one or two "deep discharge"/charge cycles using the Digipace II.

Over time, permanent loss of capacity is seen; the battery is getting old. We want to detect and measure this permanent loss so a cell or complete pack can be replaced before total failure causes a crash. Battery manufacturers don't consider a cell as failed until its capacity has degraded by 50%; it loses the remaining half at a considerably faster rate. Of course, one would want to terminate a battery's life well before it reaches 50% of capacity, however.

Several factors cause permanent loss and should be avoided during the battery's life; the biggest killer is high temperature. A ni-cad being used in a high temperature environment has increased self-discharge rate, reduced charge acceptance, and lower charge voltage. The most important effect of temperature is the reduction of the physical life of the battery; the separators and seals will decompose, eventually causing internal shorts and loss of electrolyte. Brief, periodic excursions to high temperatures will not cause problems but repeated long exposures will decrease life expectancy. Very low temperatures cause similar problems. So, avoid exposure to temperature extremes. Keep the plane and

transmitter in the shade; avoid leaving the radio in a hot (or cold) car trunk. Charge and store the batteries in a cool place.

Store batteries with a full charge because ni-cads stored with a low state of charge have a much higher probability of developing a permanent internal short. This is due to the fact that the internal energy of a fully charged cell is enough to "clear" or vaporize a short that is forming, but there isn't enough energy in either a low charged cell or the charging circuit to do so, causing the short to be permanent. This is why sometimes apparently permanent internal shorts in cells can be "cleared" with a momentary high burst of energy through the cell.

If a short does develop, which is caused by two internal plates of opposite polarity making electrical contact, it may be either high resistance or low resistance. A low resistance short will show up immediately as a "dead" cell. A high resistance shorted cell will accept a charge but after a few hours or days at rest, the capacity will be dissipated through the short and the cell will become self-discharged. Of course, its capacity will be significantly affected and the Digipace II will detect it. The main reason for this discussion is that a short can be intermittent; it will show up only under vibration conditions. To detect this condition, subject the batteries to a vibration condition (tap or bang on the table, etc.) while it is in the discharge mode; if a vibration problem exists, the Digipace II's sensitive circuitry will immediately switch to the charge mode because the voltage of the defective cell momentarily dropped while the short was effective.

Discharging a multiple cell battery pack too deeply can cause one or more cells to go into "reversal" because they have less capacity than the other cells, discharge more quickly and, as a result, accept current in the opposite direction from the other cells. During reversal, hydrogen gas builds up in the cell and can cause the cell to "vent" or release gas out the safety vent which can't be replaced. Repeated venting causes loss of battery life.

Excessive overcharging beyond the design capability of the battery can cause a permanent loss also. Two things can happen when the cell is overcharged: temperature rises too high causing the problems mentioned earlier and/or the cell will vent, permanently losing electrolyte. Mainly, charge the batteries at the recomended rate for the recommended time at room temperature. This is why the Digipace II's recharge rate is the overnight rate or C/10 and not a "quick" charge rate (C/3 for 4-6 hrs) or a " fast" charge rate (3 or 4C for 15 min.) so that overcharging is prevented.

The last cause of permanent loss of battery capacity is simply use; i.e., the number of charge/discharge cycles in a battery's life. One can expect more life from a battery that has shallow charge/discharge cycles than a battery that has deep discharge cycles. Since the Digipace II is a device to deep discharge the batteries, it is recommended that it be used on a periodic basis (once a month or so) to check battery condition and clear any "memory" effect.

IX. SOLUTIONS TO BATTERY PROBLEMS

If after several discharge/charge cycles, a significant deviation from the rated capacity of the batteries is encountered, something must be done; complete battery failure is around the corner.

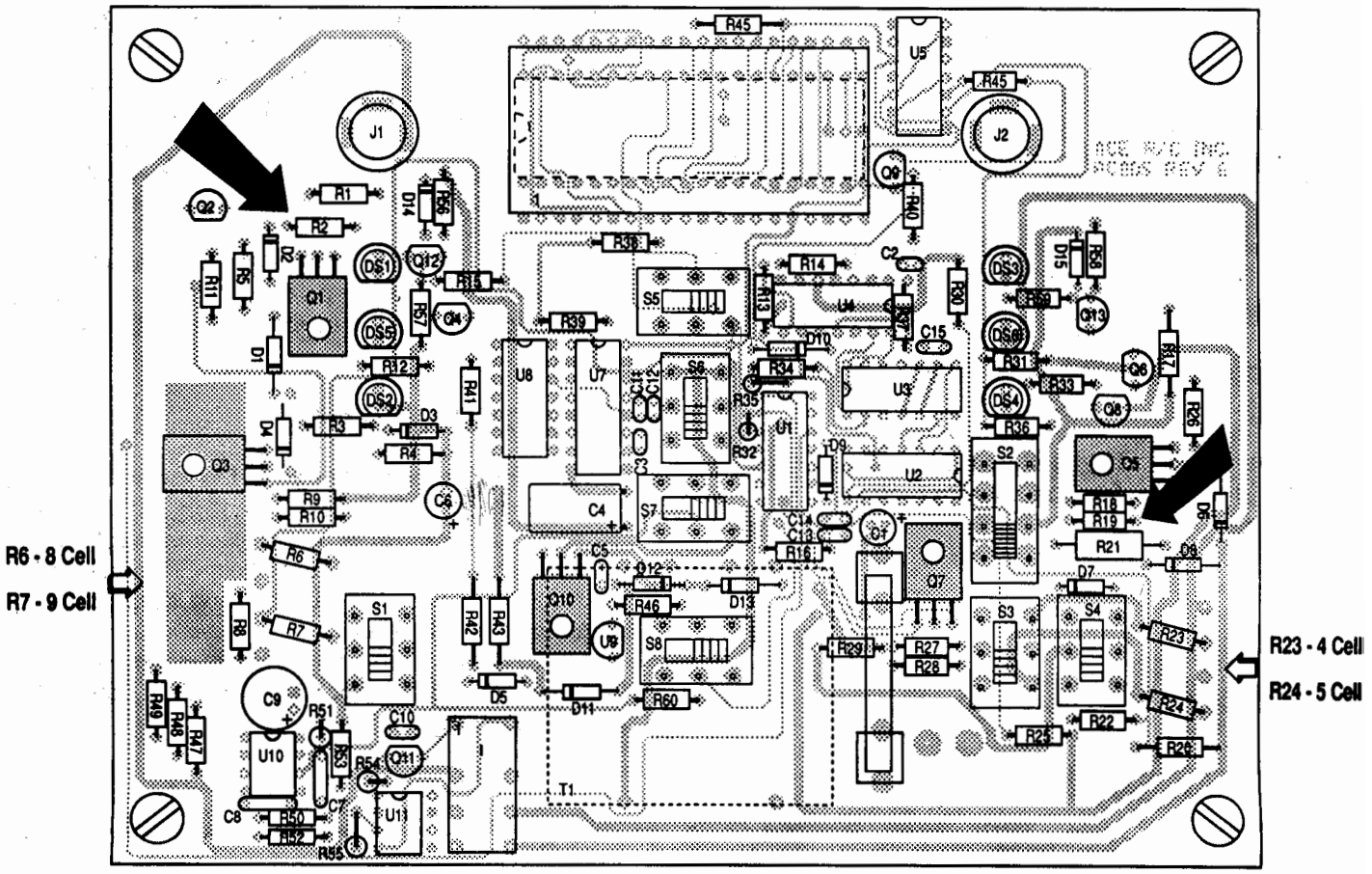
If the pack is fairly new; i.e., just a couple years old, replacement of a whole pack is not always necessary; most of the time only one or two cells are weak and if they are replaced, the capacity of the whole pack will come up to par. Use common sense here; if the pack is old, don't try to fix it.

In order to determine which cell is defective, discharge the pack with the Digipace II. Remove the battery pack case and, using a good voltmeter, check the voltage of each individual cell while actuating the "Start Cycle" switch. There will probably be one or more cells that are lower in voltage than the rest; if so, they are lower in capacity than the rest and need to be replaced. Replacement batteries have to be of the same capacity and type as the rest of the pack and, if possible, they should be from the same manufacturer so the cells in the pack are as closely matched as possible. Solder in the new cell carefully and securely; do NOT use acid core solder!

If all cells in a weak pack read the same voltage when in a discharged state, or if the pack is more than a couple years old, replace the whole pack.

On occasion, a certain pack may be so weak that it doesn't allow the Digipace II to stay in the discharge mode for any time at all; it just switches to the charge mode immediately after the "Start Cycle" switch is released. Usually, this indicates a "dead," shorted, or open cell. A voltmeter check will indicate the bad cell. If all cells are of equal voltage, it would be an indication that the pack is not receiving a proper charge. Check the charge hookup.

While you have the battery pack apart, give the batteries and wiring a good physical inspection, looking for bad solder joints or welds, frayed wires, or dented batteries. If a white, powdery substance appears at any of the positive terminals, it indicates that venting has occurred. Although a ni-cad can stand some venting, repeated loss of electrolyte will cause loss of capacity and eventual battery failure; keep your eye on that cell and double check your battery treatment procedures to prevent any more venting.



X. REPROGRAMMING THE CHARGE RATES

An option of the Digipace II is to reprogram the charge rate for the transmitter side from 50 MA to 85 MA and/or the receiver side when the Charge Current switch is in the middle position from 25 MA to 85 MA. You would want to do this if you are using 750 to 950 MAH batteries. 85 MAH would be the ideal recharge rate for these size cells.

You can do it for either the TX side or the RX side, or you can do it for both sides. Following are the instructions.

[ ] Turn the unit off, unplug it from the wall, and unplug all batteries.

[ ] Remove the four screws that hold the back in place and remove the back.

[ ] Remove the two nuts and washers on the Tx and Rx output jacks, as well as the two nuts, bolts, lockwashers, and spacers that hold the PC board in place and ease the board assembly out of the case front. You may need to wiggle it a bit.

[ ] Refer to the parts overlay drawing and locate R2 and R19. Note that they are installed by means of plug-in sockets so they can be removed and replaced without soldering.

R2 controls the **TX** charge rate and **R19** controls the **RX** charge rate when the Charge Current switch is in the center position.

Unplug the resistor that is installed; cut and form the leads on the furnished optional resistor to make it the same as the resistor you just removed; then, plug it in, making sure it is securely seated. Refer to the following chart for guidance.

Resistor	Standard Value	Optional Value
R2 (**TX** Side)	43 Ohm (**50** MA) (Yel,Orn,Blk,Gld)	26.7 Ohm (**85** MA) (Red,Blu,Vio,Gld,Brn)
R19 (**RX** Side)	91 Ohm (**25** MA) (Wht,Brn,Blk,Gld)	26.7 Ohm (**85** MA) (Red,Blu,Vio,Gld,Brn)

[ ] After you have installed the optional resistor(s), reassemble the Digipace II.

[ ] We have furnished you new stickers to apply to the faceplate to indicate the new charge rates. Peel and stick where needed.

XI. REPROGRAMMING DISCHARGE CUT-OFF VOLTAGES

If you want to change the number of cells for any of these settings, the following nstructions will aid you in making this modification.

Decide which switch setting you want to change. Refering to the overlay drawing on Page 7, locate the R number that controls that setting.

R-23 controls the "4 cell" setting on the receiver side.
R-24 controls the "5 cell" setting on the receiver side.
R-6 controls the "8 cell" setting on the transmitter side.
R-7 controls the "9 cell" setting on the transmitter side.

Refer to the chart following to select the resistor value required for the number of cells you have selected.

2 cells = 523 ohm 1%	Do Not Stock
3 cells = 845 ohm 1%	Do Not Stock
4 cells = 1.21K 1%	Ace P/N = R4-122B
5 cells = 1.58K 1%	Ace P/N = R4-1581B
6 cells = 1.87K 1%	Ace P/N = R4-182B
7 cells = 2.4K 1%	Do Not Stock
8 cells = 2.94K1%	Ace P/N = R4-292B
9 cells = 3.48K 1%	Ace P/N = R4-342B
10 cells = 3.92K 1%	Ace P/N = R4-392B

Refer to Section X REPROGRAMMING THE CHARGE RATES and follow the step by step instructions for disassembling your Digipace II.

XII. CONCLUSION

We hope that you find your Digipace II an important addition to your R/C inventory. If it saves one airplane or more importantly, prevents injury due to an accident, it has earned its keep. The piece of mind knowing your batteries are in good shape makes the Digipace II worthwhile.

Ace R/C has been in the R/C business since 1953 because you give us your input and we listen. Let us hear from you!

Ace R/C, Inc., 116 W 19 ST, POB 472, Higginsville MO 64037-0472 • 816.584.7121