

# Mobile Printer Chargers

## User's Manual

**MP Series, RP Series  
Encore Series,  
Cameo Series,  
QL Series**



**Zebra Technologies Corporation**

Mobile Printer Center of Excellence

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# Introduction

This manual covers the use of all chargers currently offered by Zebra for use with MP, RP, Encore, Cameo and QL series mobile printers.

## MP and RP Series Printers

The MP series (MP5022, MP5030, MP5033 and MP5044) and the RP3 use NiCad batteries, which require periodic “conditioning” to maintain their maximum capacity. The UC and NCxx04 series chargers designed for these batteries are equipped with a “Condition” cycle, which first discharges then charges the battery. It is recommended NiCad battery packs be conditioned once a week.

## Cameo and Encore Series

The Encore and Cameo series printers use NiMH (Nickel-Metal Hydride) battery technology. NiMH batteries must be initially “cycled” several times before maximum capacity is realized.

A NiMH battery is “cycled” by fully charging it, then fully discharging it through normal use. This process should be done when the batteries are new.

## QL Series

QL series printers use Lithium Ion (Llon) batteries to achieve maximum power output in a minimum volume. Llon batteries don’t need to be conditioned or cycled, however they can only be safely charged in a charger designed for this battery type. Use of an unauthorized charger with a Llon battery could damage a battery beyond use.



## Safety Warnings

*Avoid accidental short circuiting of any battery. Allowing battery terminals to contact conductive material will create a short circuit which could cause burns and other injuries or could start a fire.*

*Use of any charger not approved specifically by Zebra for use with its batteries could cause damage to the battery pack or the printer and will void the warranty.*

# UCL172-4 Quad Charger

## Description

The UCL172-4 Quad Charger is designed to charge up to four Lithium-Ion (Lion) QL series Mobile Printer battery packs simultaneously. The unit is supplied with an external 110/220 VAC power supply and a line cord compatible with its country of use.

## Setting up the Charger

Place the Quad Charger on a surface near an A.C. outlet. There are four mounting holes in the bottom of the charger which allow it to be secured to a table or shelf to help ensure the charging process will not be interrupted by someone inadvertently moving or unplugging either the charger or the battery packs under charge.

Plug the circular four pin plug from the power supply into the back of the charger. Plug one end of the AC cord into the Power Supply and the other into the A.C. power source. The power indicator on the front panel should come on, indicating the Quad Charger is ready for use. Please refer to Figure 2.

## Charging Batteries

Ensure that the power indicator on the front panel is on.

Plug a battery pack into any one of the four charging bays as shown.

*continued on next page*

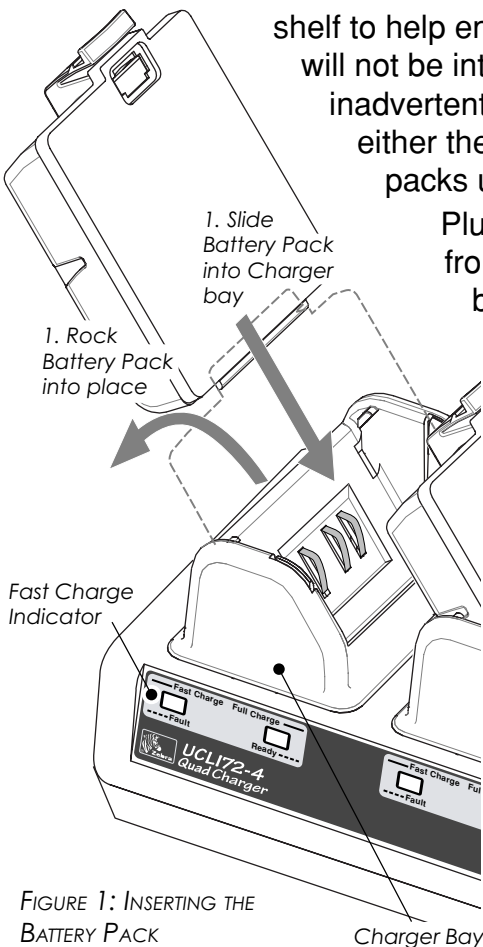


FIGURE 1: INSERTING THE BATTERY PACK

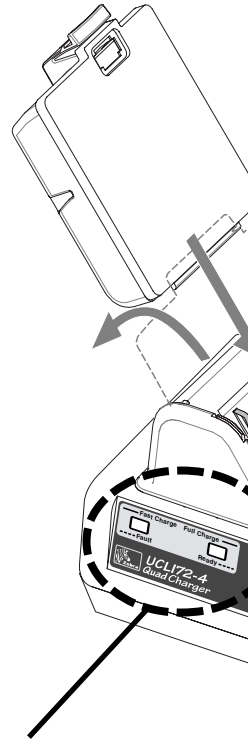
Note the orientation of the battery pack. Slide the battery pack into the charging bay until it stops. Then rock the battery pack back until it snaps into place. The amber indicator directly under the battery being charged will turn on if the battery is properly inserted.

The charger will perform an automatic charging cycle on inserted battery packs. First it will perform a “Fast Charge” to bring the batteries up to a usable voltage as quickly as possible. Once 80% of the charge voltage has been reached, the charger switches over to a slower rate to finish charging the battery.

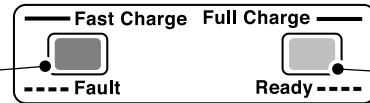
The Amber indicator reports the status of the battery under charge. It can either be on steadily, indicating the battery is undergoing a “Fast Charge”; or be off, indicating that the battery is fully charged. If the Amber and Green indicators are both flashing, there is a problem with the battery pack and it will not be charged.

The Green indicator reports the charging status. If it is flashing, and the Amber indicator is lit steadily, it reports that the charger has completed the fast charge part of the charging cycle and is now “topping off” the battery at a slower charge rate. The battery pack is usable at this point although it would be more desirable to wait until the battery is full charged.

If the green indicator is lit steadily, and the Amber indicator is off, the battery pack is fully charged.



*Amber Indicator*



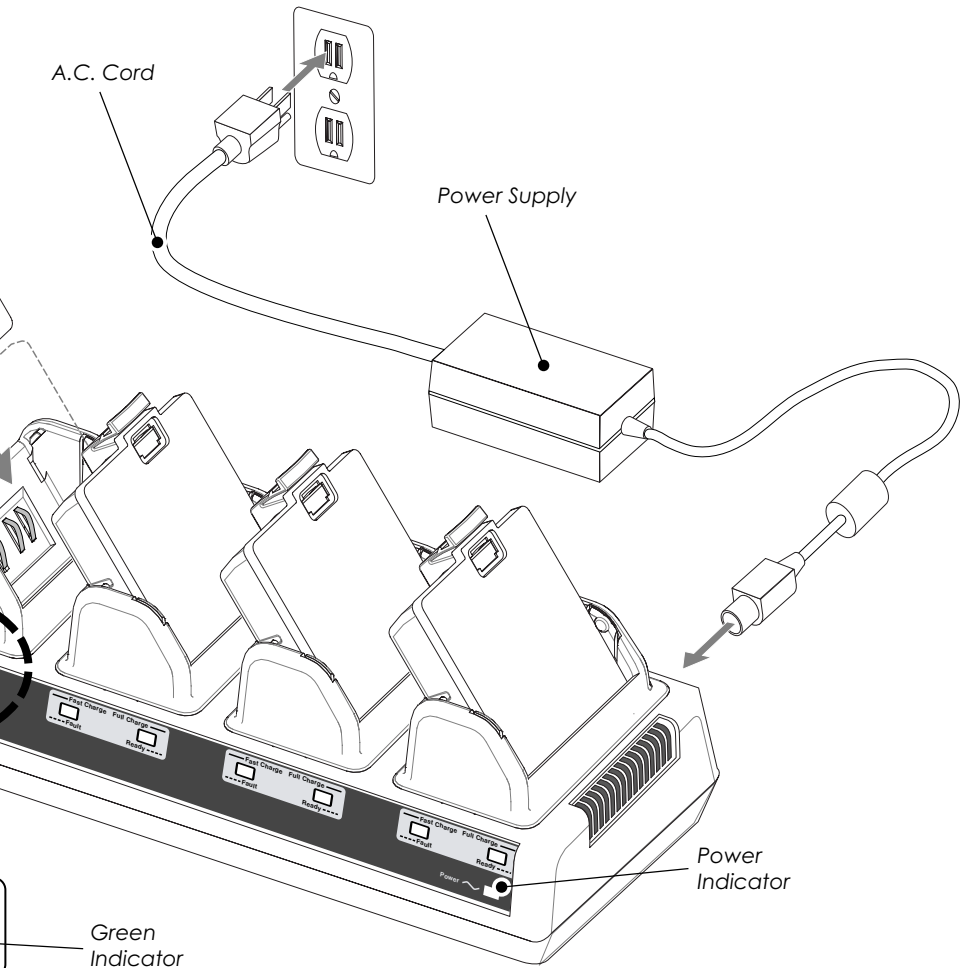


FIGURE 2: THE UCLI72-4  
QUAD CHARGER SYSTEM

Refer to the chart below for a quick reference:

Amber	Green	Battery Status
On	Off	Charging
On	Flashing	O.K. (80% charged)
Off	On	Completely Charged
Flashing	Flashing	Faulty Battery

continued on next page

## Charging Times

	QL220/320 (AT16004-1)	QL 420 (AT16293-1)
80% charge	1.25 hrs	2.5 Hrs.
Full Charge	2.5 hrs	5 hrs.

These times are for completely discharged batteries. Battery packs which are still partially charged will take less time.

The Quad Charger has a safety feature which stops charging a battery after six hours regardless of its charge state.

### **Safety Precautions**

#### **Battery Safety**

Avoid accidental short circuiting of any battery. Allowing battery terminals to contact conductive material will create a short circuit which could cause burns and other injuries or could start a fire.

Use of any charger not approved specifically by Zebra for use with its batteries could cause damage to the battery pack or the printer and will void the warranty.

#### **Charger Safety**

Use care in locating the Quad Charger. Do not place it in locations where liquids or metallic objects may be dropped into the charging bays. Do not block the ventilating slots on the top and bottom covers. Insure that the Charger is plugged into a power source which won't accidentally be turned off if you will be charging batteries overnight.

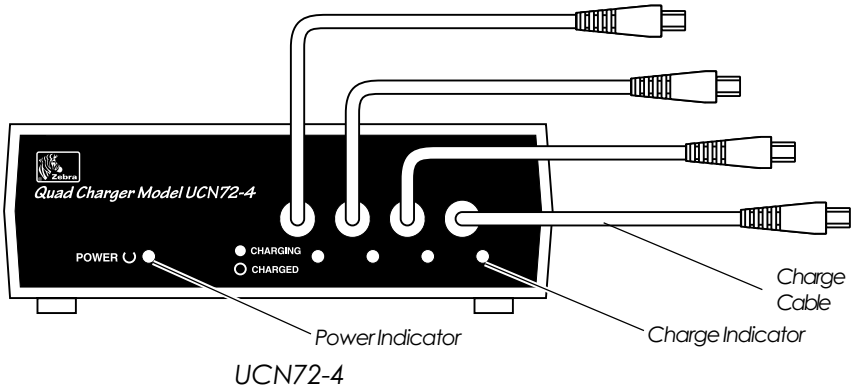
Use of any batteries not approved specifically by Zebra for use with this charger could cause damage to the battery or the charger and will void the warranty.



# UCN72-4 Quad Charger

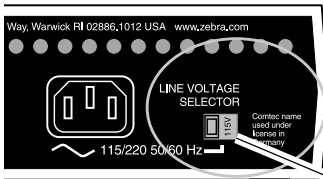
## Description

The UCN72-4 Quad Charger is designed to charge up to four NiMH Encore and/or Cameo series batteries simultaneously. Battery packs may be charged externally or while plugged into the printer. The unit has switch selectable 110/220 V.A.C. input voltage and is supplied with a line cord compatible with its country of use.

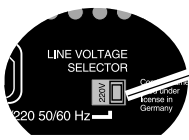


## Charging Batteries

Set the voltage selection switch on the unit's rear panel to agree with the supplied A.C. voltage. Refer to diagram below and to table.



To charge batteries: Plug the line cord into the charger and then into the A.C. supply receptacle. The power indicator on the front panel will light.



Voltage set to 115 V.A.C.

Voltage set to 220 V.A.C.

Plug a charge cable into the charger jack on

SETTING THE VOLTAGE SWITCH

continued on next page

the battery pack to be charged. The charge indicator near the cable will either light steadily, or start to blink. On a fully charged battery, the indicator will go out after a few minutes, indicating a fully charged condition.

On batteries in need of charging, the indicator will stop blinking after a period of time determined by the charge level of the battery and then stay lit continuously. This indicates that the charger is now operating in fast charge mode. When the light goes out, the battery has been completely charged.

Maximum charge time for a battery is 180 minutes. Four batteries may be charged at the same time with the UCN72-4 charger.

### UCN72-4 Part Numbers

<i>Part Number (Country)</i>	<i>Line cord p/n</i>	<i>V.A.C. Setting</i>
AC15482-1(U.S.)	TLCMXX03	110
AC15482-2 (U.K.)	TLCEBS1310	220
AC15482-3 (Euro)	TLCE12013	220
AC15482-4 (Aust.)	TLCE15012	220

*Do not charge batteries while printing. Attempting to print while charging batteries with the UCN72-4 Charger can result in unreliable charging.*

# NCxx04 Series Quad Charger/Conditioners

## Description

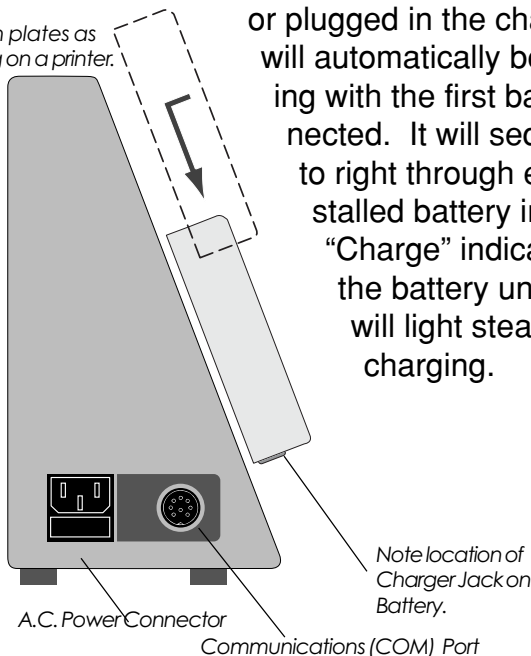
NC series Quad Chargers sequentially charge and/or condition up to 4 batteries. Charge time is approximately one hour per battery depending on battery's state of charge. Condition cycle times vary with both the battery's state of charge and with each model.

## Charging Batteries

Plug the A.C. line of the charger into an A.C. receptacle. For MP series printers, connect batteries by sliding them downward onto battery contact plate as though mounting them on a printer. (See illustration below.)

Other printer series use individual cables to charge the battery packs. Plug the cables into either the charge jack on the battery pack, or, in the case of the RP3 printer, the printer's charging jack.

*Slide Batteries on plates as though mounting on a printer.*



Once the batteries are installed or plugged in the charge cycle will automatically begin, starting with the first battery connected. It will sequence left to right through each installed battery in turn. The "Charge" indicator above the battery under charge will light steadily during charging.

LOADING BATTERIES (MP SERIES ONLY)

*continued on next page*

## Conditioning Battery Packs

In order to extend battery life, battery packs should be conditioned periodically. The NC series Quad Chargers are equipped with a "Condition" mode, which fully discharges a battery pack followed by a full charge cycle. Conditioning NiCad battery packs once a week is recommended for optimum performance of batteries.

### Condition Light:

*FLASHING* light indicates pending operation. When the battery is next in the charger's sequence, it will be conditioned.

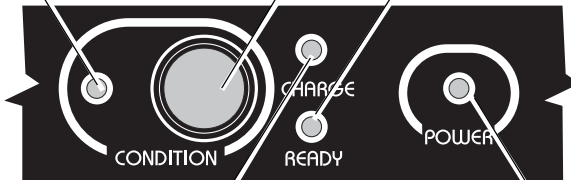
*STEADY* light indicates conditioning is in progress. Only one condition light will be on continuously at any time.

### Condition Button

Pressing this switch will start the Condition cycle for the battery directly below it. The Condition Light will turn on.

### Ready Light

Charging/Conditioning cycle is completed for this battery.



### Charge Light:

*FLASHING* light indicates pending operation. When the battery is next in the charger's sequence, it will be charged.

*STEADY* light indicates battery is being charged. Only one charge light will be on continuously at any time.

### Power Light:

*STEADY* light indicates normal operation. *FLASHING* light indicates a problem with the charger.

NCxx04 QUAD CHARGER CONTROL PANEL

Start the condition cycle by pressing the condition button above the battery just connected. Refer to illustration above for details on the NCxx04 control panel

## Communications Port

The NCxx04 Quad chargers are equipped with a COM port which allows communication between the charger and a P.C.

The communications port should only be used by factory authorized personnel.

### NCxx04 Part Numbers

Part Number*	Used On	Charge Method
DC12127-1x	MP5020/22	Battery Drop-In
DC12255-1x	MP5030/33	Battery Drop-In
DC12363-1x	MP5030,RP3	Cable
DC12248-1x	MP5044	Battery Drop-In
DC12464-2x	RP3	Battery Drop-In
DC12363-5x	Encore 4 <sup>†</sup>	Cable
DC12363-6x	Encore 2,3 <sup>†</sup>	Cable

*\* Last digit in part number Indicates model:*

-X0 = North American model

-X1 = U.K. model

-X2 = Continental European model

-X3 = Australian model

*† These models use NiMH type battery packs. Conditioning is not necessary once batteries have been cycled several times. A NiMH battery is "cycled" by fully charging it, then fully discharging it through normal use. The "Condition" cycle on NCxx04 series chargers can also be used for this purpose.*

# LI72 Wall Charger

## Description

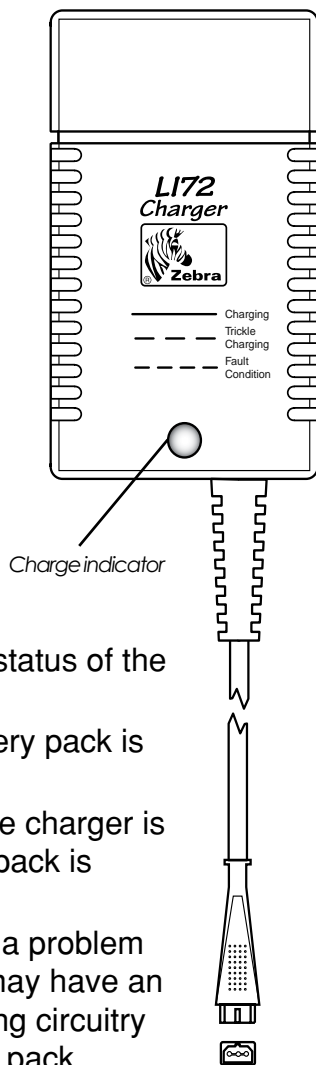
The LI72 is a wall mounted fast charger with universal 110 to 230, 50-60 Hz. VAC input. Multiple A.C. plug configurations comply with most international standards. This charger is used with the QL series printers (QL 220, QL 320, QL 420) equipped with Lithium Ion (Lilon) batteries. The LI72 will charge a battery pack as fast as its charge level will allow, and then switch over to a maintenance charge to keep the charge at its maximum. Refer to the table below for part numbers.

## Charging Battery Packs

Plug the LI72 into the appropriate A.C. wall receptacle, then insert the charge cable into the battery pack charger jack.

The charger LED will indicate the status of the charger as follows:

- A steady light indicates the battery pack is undergoing a fast charge.
- A slow blinking light indicates the charger is in maintenance mode. The battery pack is ready for use.
- A rapidly blinking light indicates a problem with the battery pack. The battery may have an internal short, or its charge monitoring circuitry may be malfunctioning. The battery pack should not be used any further.





Do not attempt to charge batteries with the LI72 while printing. Attempting to print while charging can result in improperly charged batteries.

### **LI72 Models**

<i>Model number</i>	<i>Country of use</i>	<i>V.A.C.</i>
AT15759-1	U.S. & Japan	110
AT15759-2	U.K.	220
AT15759-3	Euro	220
AT15759-4	Aust	220
AT15759-6*	(varies w/line cord supplied)	varies

\*This model is supplied with an IEC socket to allow use as an in-line charger. Connection to A.C. supply is via a line cord configured with an A.C. plug for the country of intended use.

# UCN72 Wall Charger

## Description

The UCN72 is a wall mounted fast charger with universal 110 to 230, 50-60 Hz. VAC input. Multiple A.C. plug configurations comply with most international standards. This charger is used with the Encore and Cameo series printers equipped with NiMH batteries. The UCN72 will charge a battery pack as fast as its charge level will allow, and then switch over to a trickle mode to maintain the charge at its maximum. Refer to the table below for part numbers.

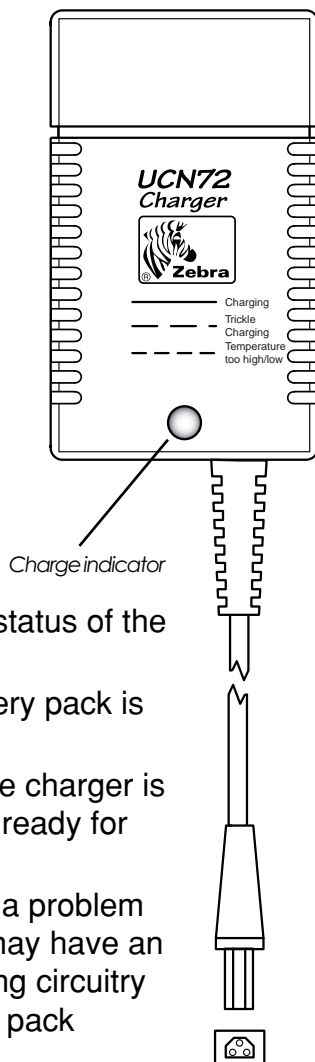
## Charging Battery Packs

Plug the UCN72 into the appropriate A.C. wall receptacle, then insert the charge cable into the battery pack charger jack.

The charger LED will indicate the status of the charger as follows:

- A steady light indicates the battery pack is undergoing a fast charge.
- A slow blinking light indicates the charger is in trickle mode. The battery pack is ready for use.
- A rapidly blinking light indicates a problem with the battery pack. The battery may have an internal short, or its charge monitoring circuitry may be malfunctioning. The battery pack should not be used any further.

*Do not attempt to charge batteries with the UCN72 while printing. Attempting to print while charging can result in improperly charged batteries.*





## UCN72 Models

<i>Model number</i>	<i>Country of use</i>	<i>V.A.C.</i>
AT15244-1	U.S. & Japan	110
AT15244-2	U.K.	220
AT15244-3	Euro	220
AT15244-4	Aust	220
AT15244-6*	(varies w/line cord supplied)	varies

\*This model is supplied with an IEC socket to allow use as an in-line charger. Connection to A.C. supply is via a line cord configured with an A.C. plug for the country of intended use.

# UC Series Charger/Conditioner

*IMPORTANT: Never charge or condition battery packs while attempting to run the printer.*

## Description

The UC series of Charger/Conditioners is designed to charge and condition individual battery packs used on the MP, RP, Encore and Cameo series of portable printers. Battery packs may be charged off-unit or while connected to the printer. Typical charge time is 60 to 90 minutes.

## Charging Battery Packs

Plug the A.C. line cord into an A.C. receptacle, then plug the charge cable into the battery pack's charger jack. The "Power" light will come on, followed by the "Charge" light. When the Battery Pack has been fully charged, the "Charge OK" indicator will light.

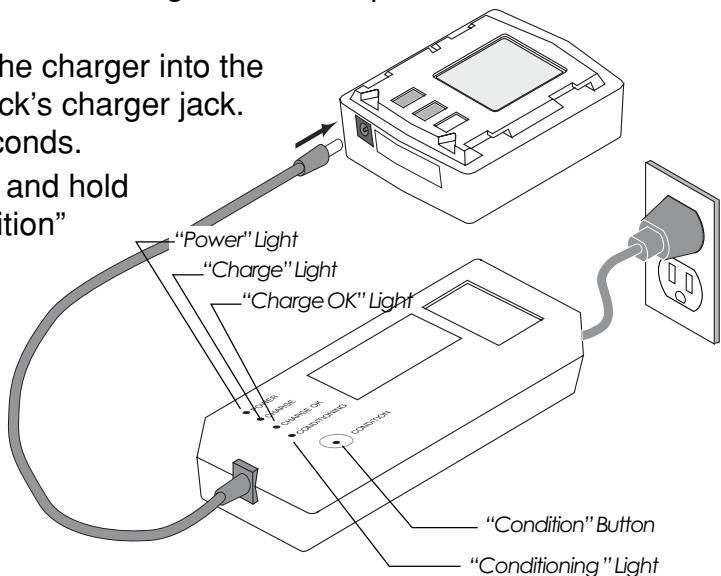
## Conditioning Battery Packs

NiCad type battery packs used on a daily basis should be "conditioned" once a week to insure they keep their maximum charge life. This is especially important with batteries that are usually recharged with the Trickle Charger.

1. Connect the Charger to an A.C. power source.

2. Plug the charger into the battery pack's charger jack. Wait 5 seconds.

3. Press and hold the "Condition" button for 1 second until the red "Conditioning" indicator lights .



The condition cycle for a fully charged battery is approximately 90 minutes.

If the “Charge OK” indicator blinks, disconnect the battery pack and wait until all the lights except the “Power “ light go out. Reconnect the battery and repeat step 3.

### UC Series Charger Models

<i>Base Part Number*</i>	<i>Used on</i>	<i>Charge Method</i>
CC12708-1x	MP5020/22	Cable
CC12708-2x	MP5030	Cable
CC12708-3x	MP5044	Cable
CC12708-5x	RP3	Cable to Printer
CC12891-1x	RP3	Battery Drop-In
CC12708-7x	Encore 2,3, Cameo <sup>†</sup>	Cable
CC12708-8x	Encore 4 <sup>†</sup>	Cable

*\* Last digit in part number Indicates model:*

- X0 = North American model
- X1 = U.K. model
- X2 = Continental European model
- X3 = Australian model

*† These models use NiMH type battery packs. Conditioning is not necessary once batteries have been cycled several times. A NiMH battery is “cycled” by fully charging it, then fully discharging it through normal use. The “Condition” cycle on UC series chargers can also be used for this purpose.*

# Trickle Chargers

## Description

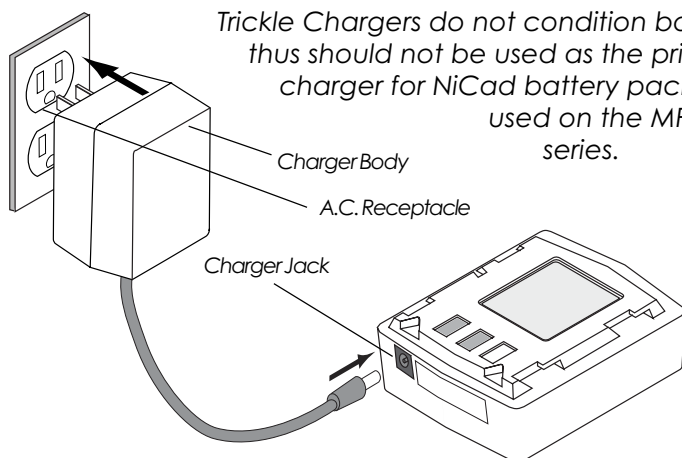
These compact, cost effective chargers are designed to charge individual battery packs. Typical charge time is 12 to 16 hours.

## Charging Batteries

Plug the charge cable into the battery pack charger jack, and the Charger body into the appropriate A.C. wall receptacle. Trickle Chargers will charge the battery overnight, typically in 12 to 16 hours. While they can be used when the printer is running, charging time will be lengthened.

## Trickle Charger Models

<i>Part No</i>	<i>V.A.C./Hz (Country)</i>	<i>Batt. Voltage/Model</i>
AT852	110/60 (U.S.)	7.2 V/ MP503x Series
AT855	110/60 (U.S.)	6.0 V/ MP502x Series
AT856	110/60 (U.S.)	12 V/ MP5044
AT12478-1	220/50 (Euro)	6/7.2V/MP502x/3x Series
AT12479-1	220/50 (Euro)	6/7.2V/Encore, Cameo Series
AT12699-1	220/50 (U.K.)	6-7.2V/MP Series
AT12700-1	220/50 (U.K.)	12V/MP5044
AT13797-1	110/60 (U.S.)	7.2V/Encore, Cameo



*Trickle Chargers do not condition batteries, and thus should not be used as the principal charger for NiCad battery packs such as used on the MP and RP series.*

## Product Support

Contact the Product Support Help Desk at:

Zebra Technologies Corporation  
30 Plan Way  
Warwick, Rhode Island 02886.1012 USA  
Telephone: +1 401.739.5800  
Fax: +1 401.732.7808  
e-mail: risupport@zebra.com

Ask for the Help Desk

In Europe:  
Zebra Technologies Europe, Ltd.  
Zebra House  
The Valley Centre, Gordon Road  
High Wycombe  
Buckinghamshire HP13 6EQ, United Kingdom  
Telephone: +44 1494 768298  
Fax: +44 1494 768210  
e-mail: tseurope@zebra.com

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