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## Apple MessagePad 110/120: Battery Recharging Explanation (5/95)

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### TOPIC -----

Is there a difference between the way the Rechargeable Battery Packs are recharged in the Apple MessagePad 110 and Apple MessagePad 120 while connected to the AC Power Supply verses being left in the MessagePad Charging Station? Also, is there a difference between the two previous methods and putting the battery packs into the charging station?

### DISCUSSION -----

The Rechargeable Battery Packs charge in the same manner whether they are recharged in the Apple MessagePad 110 or Apple MessagePad 120 connected to the AC Power Supply, left in the MessagePad Charging Station, or if the battery packs themselves are put into the Charging Station.

The Charging Station, MessagePad 110, and MessagePad 120 have a smart charging circuitry that limits the damage of the fast charge cycle so the battery can last a long time. This means that if the batteries are recharged using either method, this circuitry is protecting the batteries. This lets you place batteries back on the recharger with more than a 50% charge without affecting the overall battery life.

The manual states that the Rechargeable Battery Pack should be 50% discharged before a recharge. While this is still important, the statement is misleading. The charging technology used in the current circuitry lets you charge the batteries at any time. Current information on NiCad and recharging technology, memory effect, and life problems of NiCad batteries, is the basis for this statement.

#### Memory Effect

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NiCad rechargeable batteries suffer from an effect commonly called "memory", where if the battery is partially discharged, then recharged, it reaches a point

where the perceived capacity of the battery is that level to which it has been draining to. If the battery is fully drained periodically, this effect can be minimized or eliminated.

#### Batteries Used In Apple MessagePad

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The batteries used with the Apple MessagePad 110 and MessagePad 120 are of a higher quality than commercial NiCad batteries you can purchase. Quality is measured with a "C" value. The "C" refers to the amount of time and current a battery needs for a "fast charge." The more times a battery has to go through the fast charge, the shorter its life before it needs replacing. The batteries used for the original MessagePad and MessagePad 100 were a C10, and the new batteries are a C20. The batteries used in the MessagePad 110 and MessagePad 120 can sustain a faster "fast" charge than the older batteries. This lets the new batteries charge faster even under a trickle charge.

The Charging Station and MessagePad 110/120 will trickle charge, or adjust the amount it charges, as the battery comes close to full. Most commercial NiCad batteries last 9-12 months if you recharge them when they still have 50% or more charge. The MessagePad 110/120 batteries typically last 12-16 months. These batteries last longer if you recharge them with 50% or more life left. This is because the Charging Station and the MessagePad 110/120 do a full fast charge once the batteries are over 50% full, which prolongs their life. In addition, you can get additional battery life by occasionally letting the batteries drain all the way, then recharging them.

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