HP Series and HK Series Battery Backup Operation

The HP-2000, HP-3000, HP-4000, HKCR and HKII products use an internal switching regulator to obtain internal operational power. They accept input voltages from 12 to 24 VDC or 12 to 24 VAC at 50 to 60 Hz. An optional powerfail protection PCB can be attached to the main PCB to provide and control battery backup. The design of the internal power supply is such that any range of the above input voltages may be used and still provide proper battery charge voltage and battery backup operation. Switchover to battery power is automatic and occurs when the input voltage falls to approximately 10.5 volts. At that time, the internal battery charger is disabled to save power, and uninterrupted operation continues on battery power. When input power is restored, the unit switches off of battery operation and the battery charger is re-enabled to recharge the battery. Battery charge voltage is set at approximately 13.65 volts, and battery charge current is limited to approximately 50 mA. A fully discharged battery requires approximately 12 hours of charge to fully recover. Additional options installed and specific configurations within the unit make it difficult to predict precisely how long battery support will last, but in general two hours of battery operation is not unreasonable. While operating on battery backup due to loss of main input power, the battery output voltage is constantly monitored by internal circuitry. If the battery voltage reaches approximately 9.5 volts the unit will automatically shut down. This is done to prevent full exhaustion of the battery. A yellow indicator on the top panel illuminates to indicate that the unit is running off battery power. This indicator extinguishes when main input power is restored.

Shunt J7 which is located immediately in front of the DIP switches on the main logic board enables or disables battery operation on those units equipped with optional battery backup. If a unit does not have the optional battery backup package installed, J7 is not used. On units equipped with the battery backup option, J7 allows service personnel a mechanism for disabling battery backup operation before removal of main input power. To fully power down a unit equipped with battery backup, remove or reposition shunt J7 so that the two pins protruding up from the main logic board are not connected to each other. This effectively open circuits the battery from any internal circuitry. Main input power can then be removed and the unit will fully shut down. Once the unit has fully shut down, shunt J7 may be reinstalled. The design of the power supply is such that main input power must be reapplied to re-enable the battery protection mechanism. If shunt J7 is not properly installed, the internal backup battery will not be charged, and in the event of a main input power loss, the unit will shut down.

All HP and HK series of products with the battery backup option use a 12 volt 800 ma/hour sealed lead acid battery to provide battery power.

Periodically, enhancements to the HandKey or HandPunch are introduced that offer added functionality and performance. Should it be necessary to incorporate the enhancements into the "F" series circuit board (HP2000, 3000, 4000, HandKey2 and HandKey CR), use the following procedures.

PROCEDURE

***CAUTION:* This procedure requires erasing the existing hand templates. Save the existing hand templates before proceeding.**

1. Unlock the reader and open the unit. See figure 12 on the last page of this tech note.

2. Disconnect the power supply from the power source.

3. Remove and tag all external connections to make correct re-attachment.

4. Remove hand reader from wall by loosening the three screws that secure the hinge assembly to the wall mounting plate. Then slide the reader upwards until the screws can pass through the slotted holes in the hinge assembly. See figure 1 below.

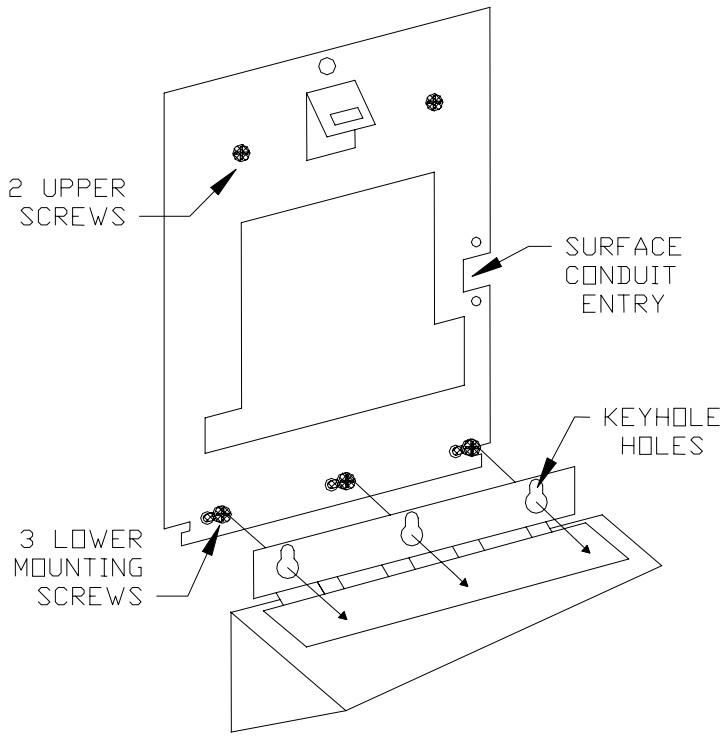

Figure 1.

***CAUTION:* Do not allow the rear panel ground lug to contact any components on the Main Logic Board.**

5. Set the unit on a firm surface such as a table. Remove the four screws that secure the rear panel to the HandReader. See figure 2 below.

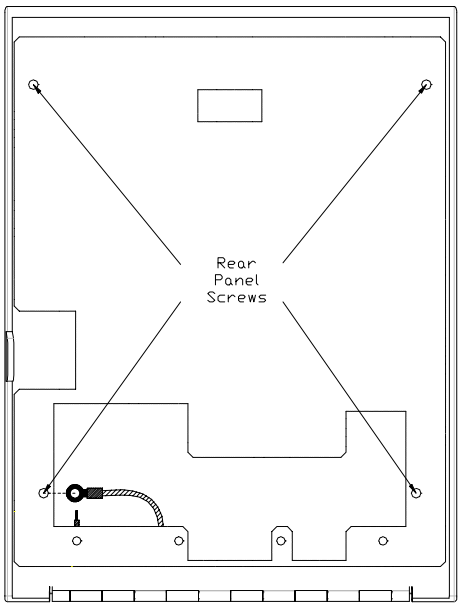

Figure 2.

6. Remove the rear panel.

7. If installed, remove and discard the three foam inserts placed over the camera assembly. See figure 3 on the following page.

8. Locate the cable that runs from the top panel PCB to the main logic PCB. Disconnect this cable from J9 on the Main Logic PCB. To remove the J9 connector depress the retaining clip on the connector and pull upwards. See figure 3 and 4 on the following page.

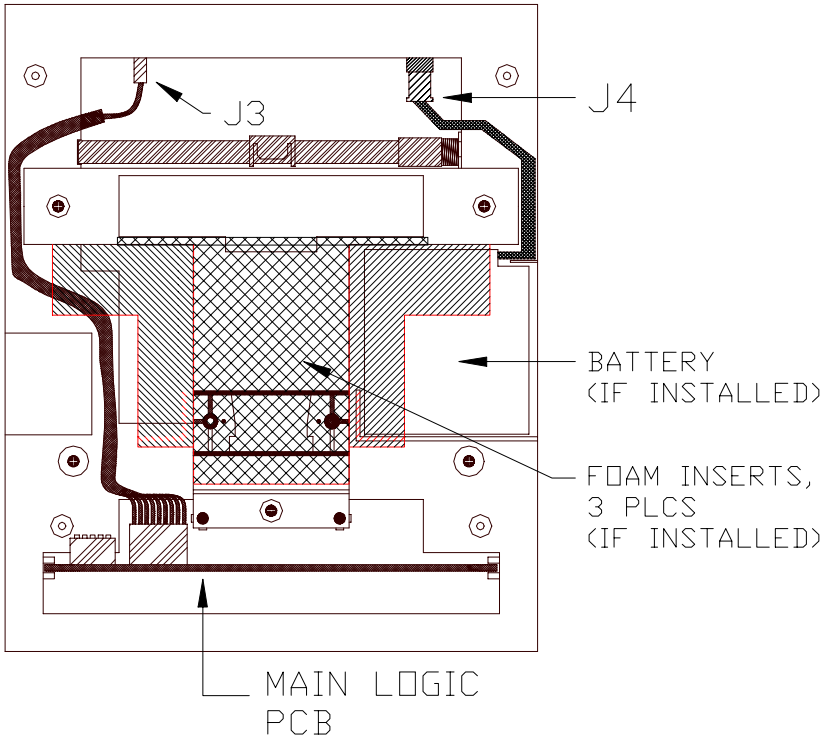

Figure 3.

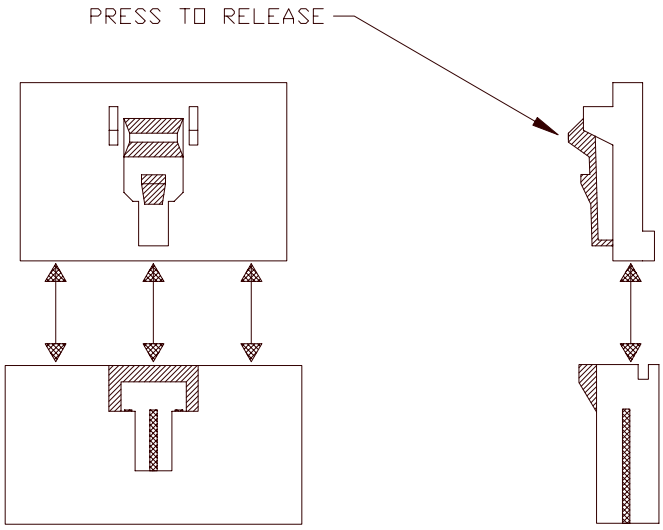

Figure 4.

9. Carefully slide the main circuit board out until the ribbon cable between the camera assembly and J2 on the main circuit board can be detached from J2. Gently pull up on the IDC connector, being careful not to pull on the ribbon cable as damage to the camera assembly may occur. Slide the main logic PCB free from the chassis. See figure 5 below.

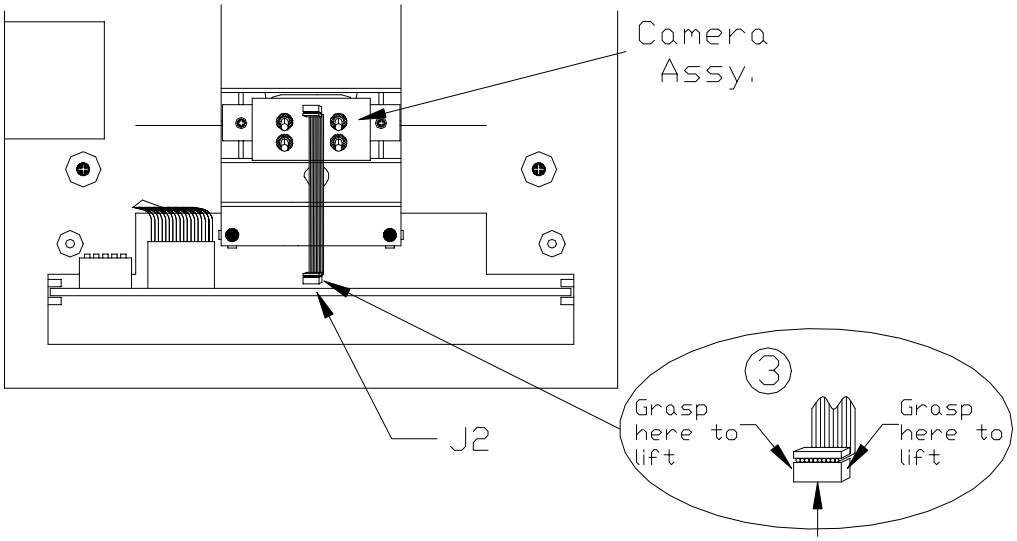

Figure 5.

10. Install the powerfail module in the main logic PCB. See figure 6 and 7 on the next page.
    a. Align P8 on the powerfail module with J8 on the underside of the main logic PCB.
    b. Insert the P8 pins into the J8 socket. If done correctly the two standoffs on the powerfail PCB will insert through the mounting holes in the main logic PCB.
    c. Turn the PCBs over so that the main logic PCB is on top of the powerfail PCB. Secure the powerfail module to the main logic PCB by installing the #4 flat and split washers, and 4-40 small footprint nuts on the standoffs. Tighten the nuts with a 3/16 nutdriver.

CAUTION: Torque the 4-40 nuts to 4.5 – 5.5 in. lbs. (.51 - .62 Nm). Excessive Torque may damage the circuit boards.

(Cont.)

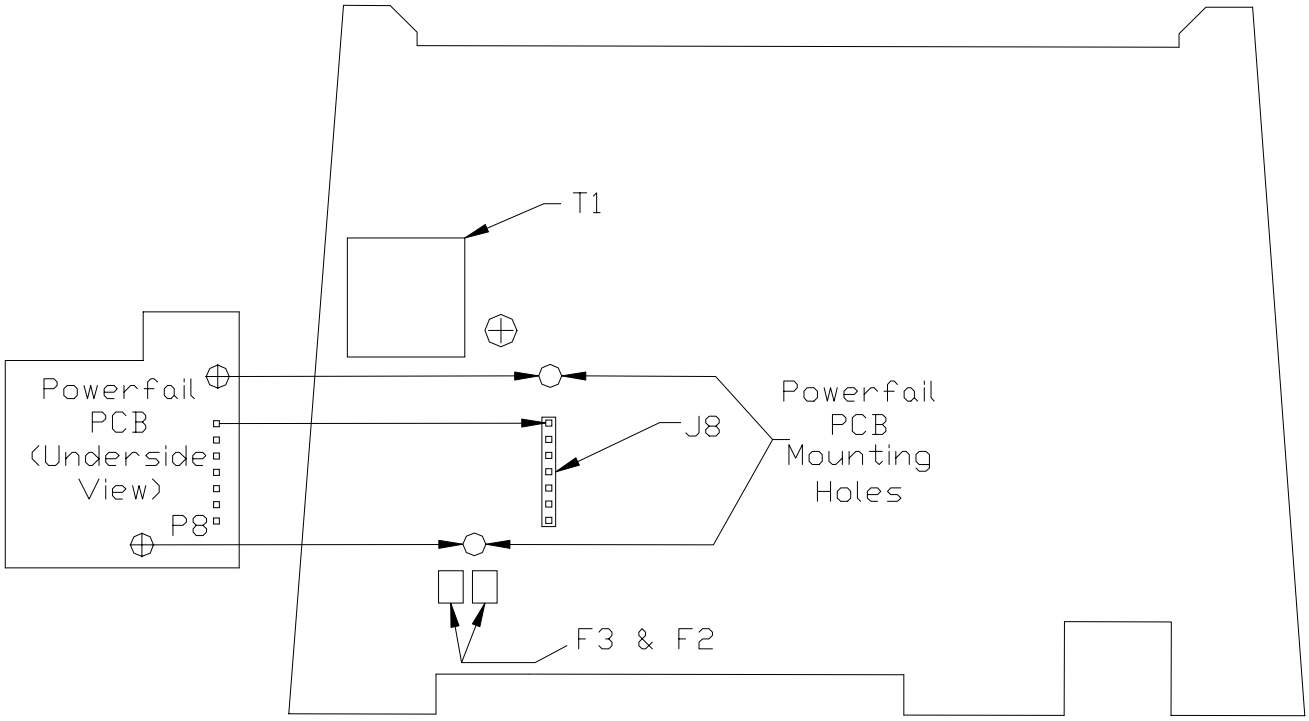

Figure 6.

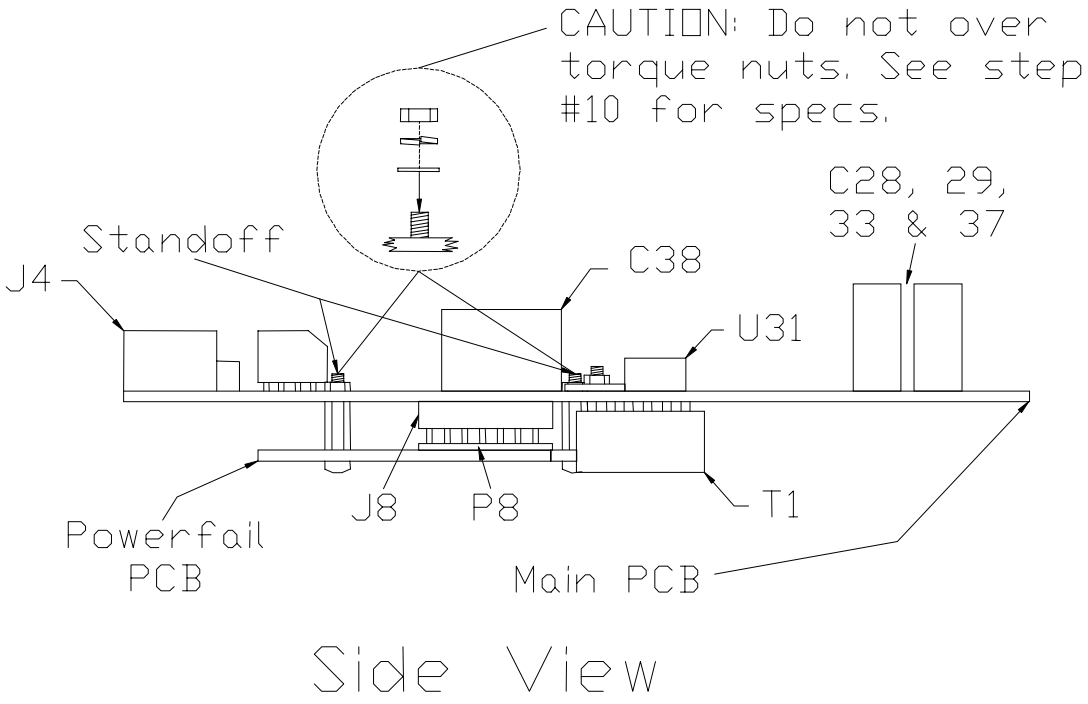

Figure 7.

11. Carefully slide circuit board back into the chassis, using the circuit board guides to locate the circuit board correctly, until the camera's ribbon cable can be inserted. See figure 8 below.

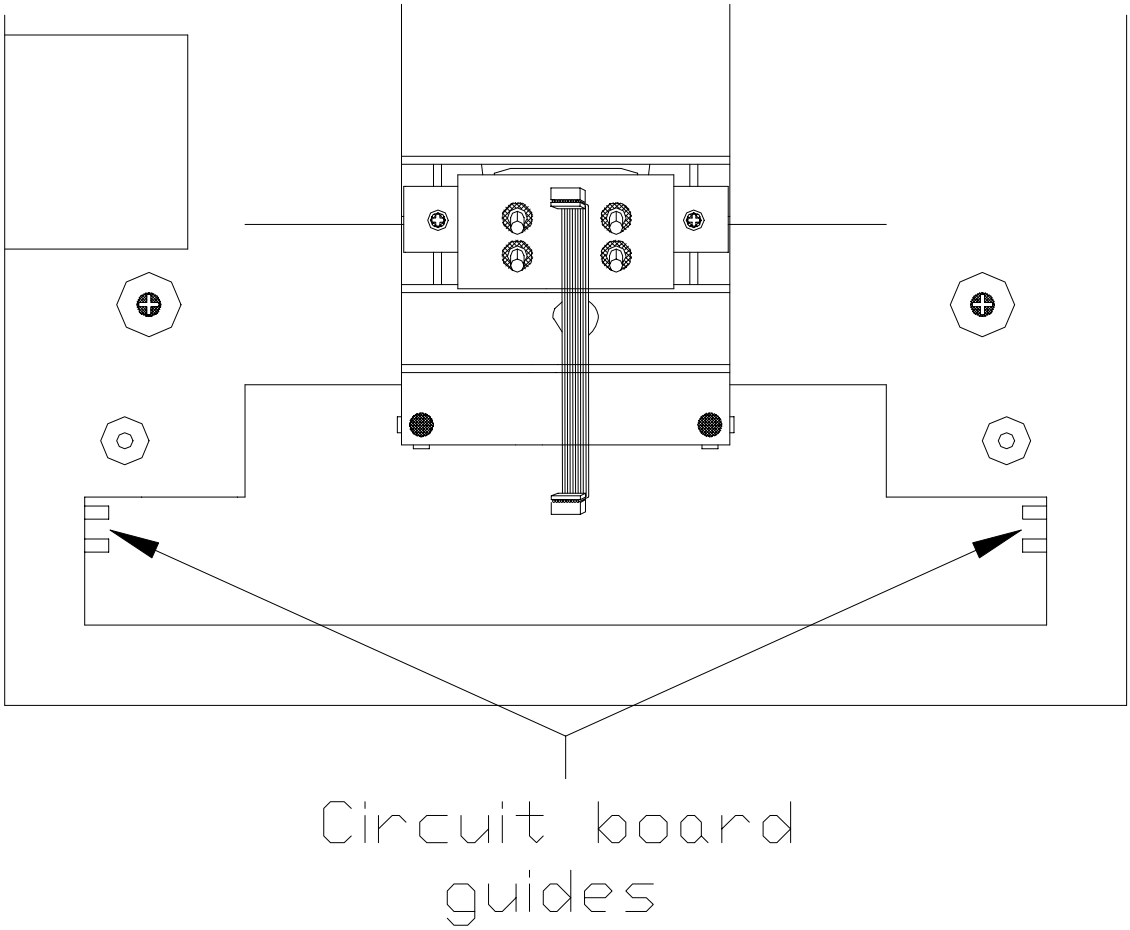

Figure 8.

12. Being careful to align all pins, attach the camera cable to J2 on the main circuit board.

13. Locate the cable that runs from the top panel PCB to the main circuit board. Connect this cable to J9 on the main circuit board. Make sure the connector 'snaps' into J9. See figure 3.

CAUTION: **If not already installed, install the J7 jumper located directly in front of the dip switch bank (S1) on the main logic PCB. Be sure that both pins of J7 are shorted by the jumper. See figure 9 on the following page.**

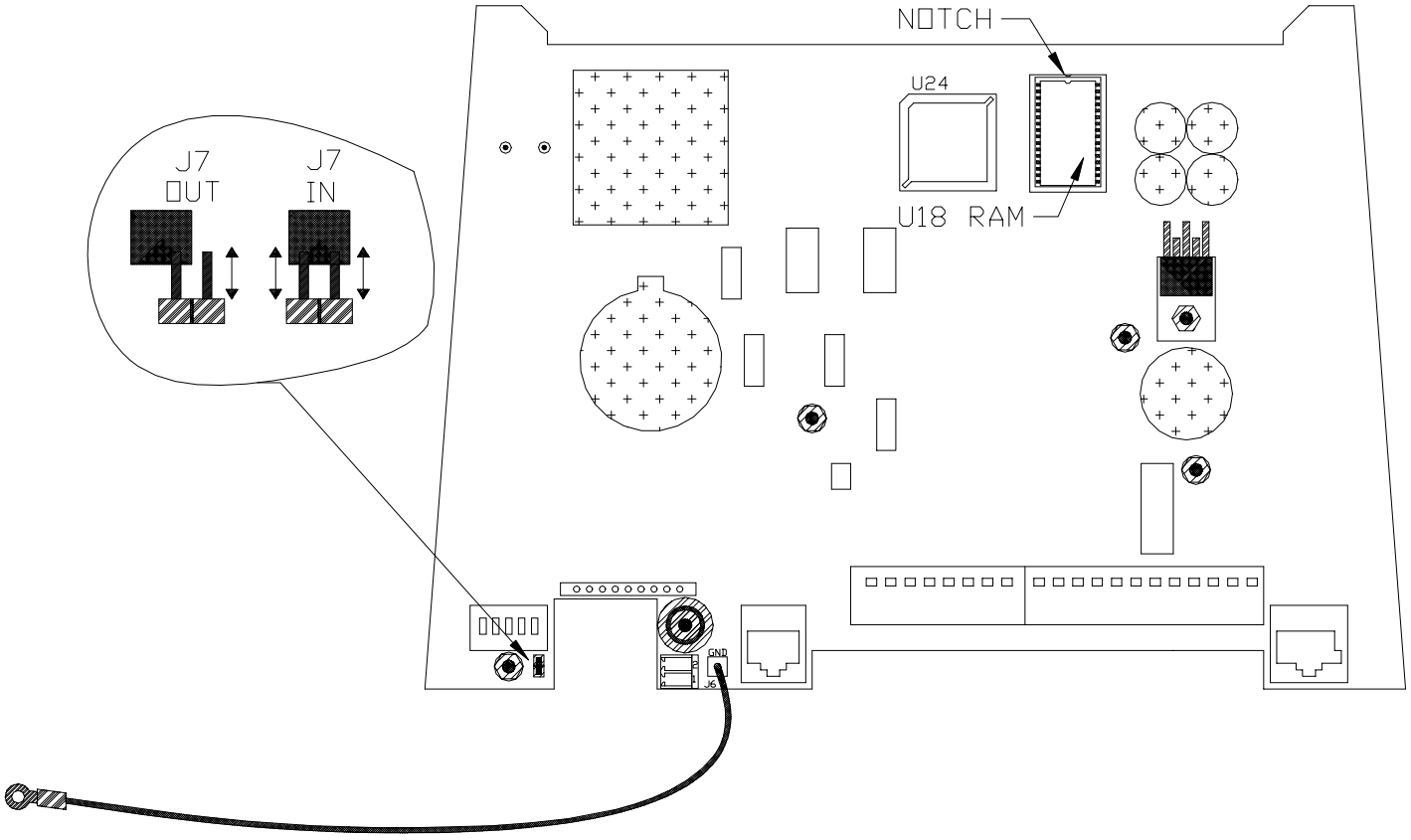

Figure 9.

CAUTION: ***Do not allow the ground strap attached to the main PCB to touch the J7 jumper. Failure to do so will cause permanent damage to the main circuit board and will not be considered a warranty repair.***

14. Install the battery into the chassis. Route the cable and attach to J4 on the top panel PCB. See figure 10 on the following page.

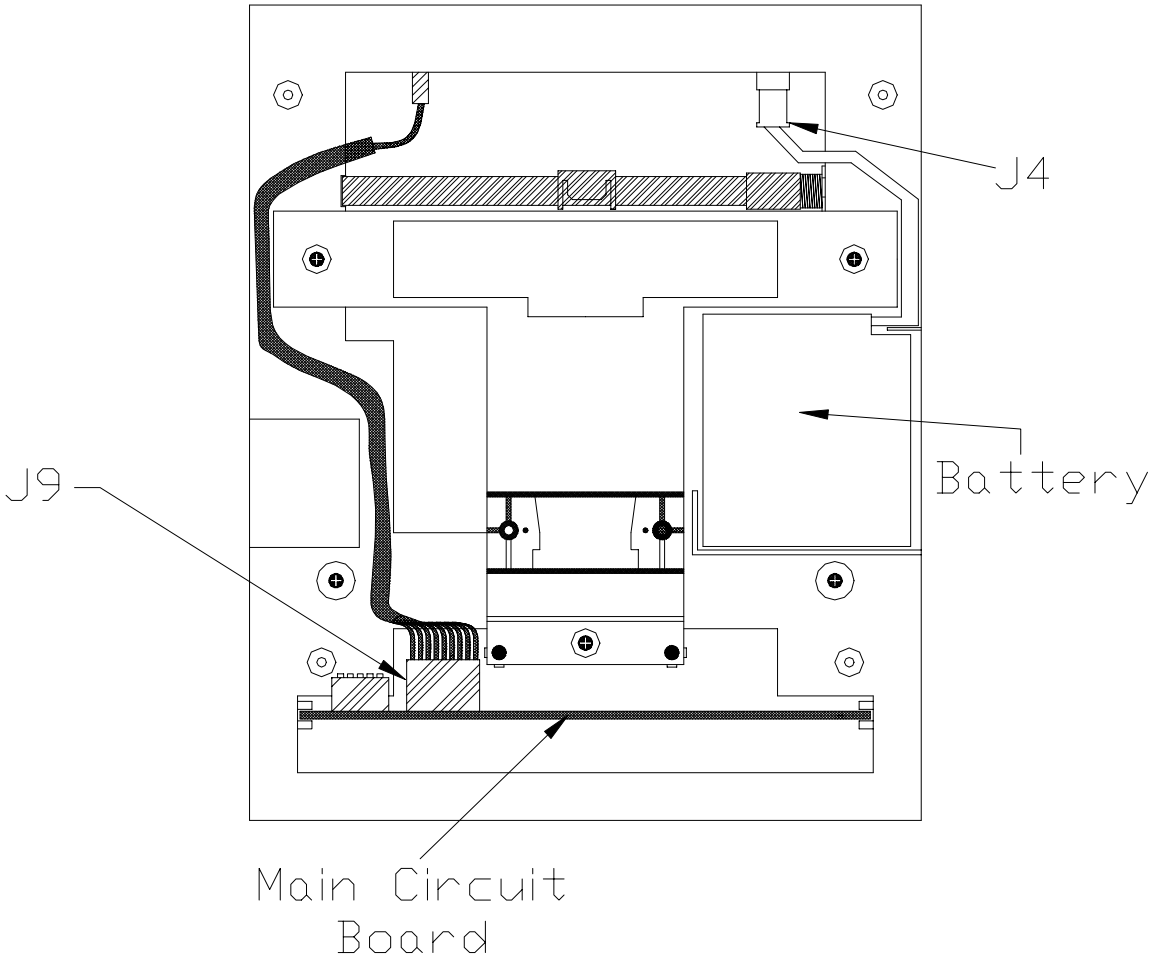

Figure 10.

15. Replace the rear panel (attach the ground lug on the main logic PCB to the lower left rear panel screw). Do not allow the ground strap to come into contact with J7. Secure the rear panel with the four screws removed in step 5.

16. To re-install the HandReader, reverse steps 1 – 4.

17. Place dip switch #4 and #5 in the "On" position. This will cause a full reset when powered up.

18. Once the unit has booted up move dip switches #4 and #5 to "Off" position.

19. Reconnect all external connections removed in step 2 and 3.

CAUTION: ***Do not force the HandReader onto the wall mount latch when the latch is in the locked position.***

20. With the key in the unlocked position, rotate the HandReader back upright. Turn the key counter-clockwise to lock the HandReader into place. See figure 11 below.

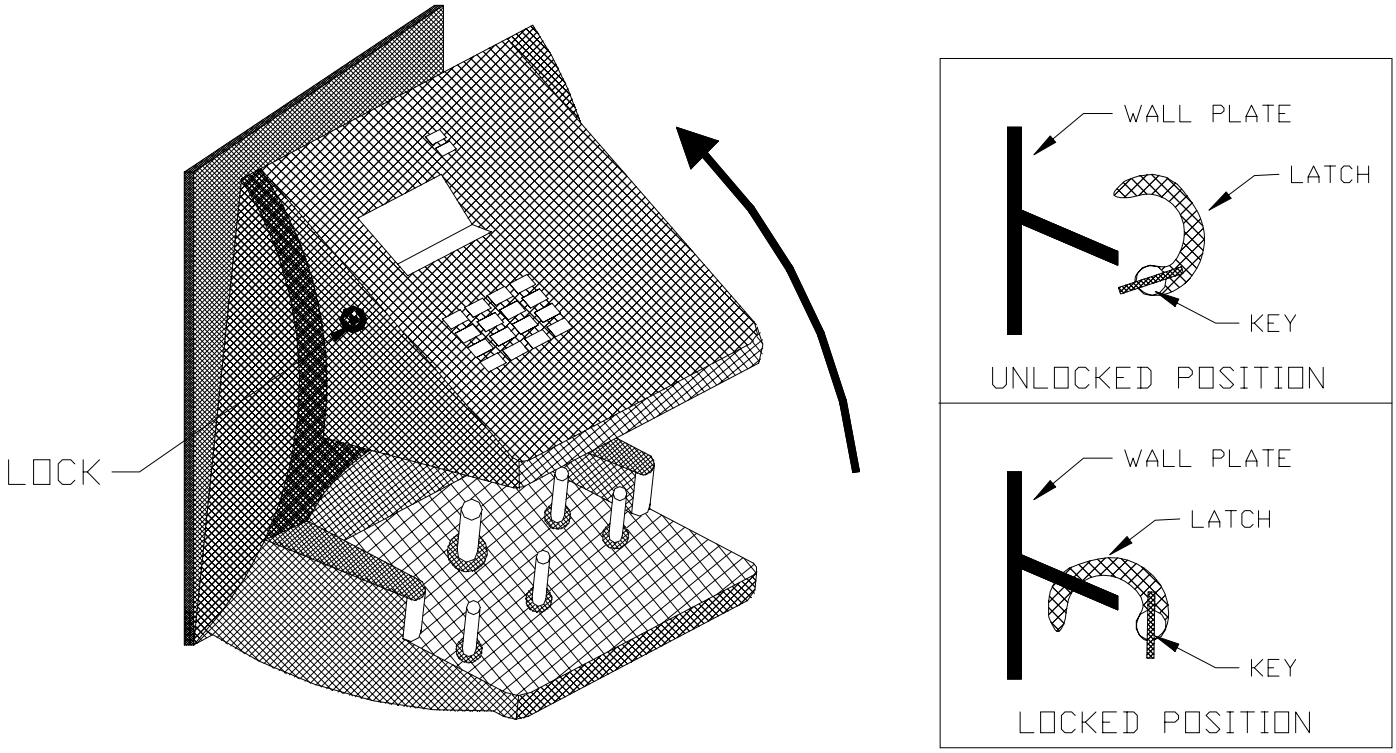

Figure 11.