SECTION V. MAINTENANCE

3.5.1 INTRODUCTION

This section contains the preventive and corrective maintenance procedures for the data collection package (DCP). Preventive maintenance identifies the periodic tasks required to maintain the DCP in peak operational condition. Corrective maintenance procedures are provided for performance of appropriate diagnostic routines, fault isolation procedures, and the removal and installation of faulty DCP field replaceable units (FRU's).

3.5.2 PREVENTIVE MAINTENANCE

Preventive maintenance consists of those procedures that are performed on a scheduled basis. All preventive maintenance tasks for the DCP and auxiliary DCP are identified in table 3.5.1. If the performance of any preventive maintenance tasks indicates a malfunction, corrective maintenance must be performed as described in paragraph 3.5.3.

Table 3.5.1. DCP Preventive Maintenance Schedule

Interval	What To Do	How To Do It
90 days	Clean and inspect cabinets.	Paragraph 3.5.2.1
Semiannually	Check/clean batteries.	Paragraph 3.5.2.2

3.5.2.1 **Cabinet Cleaning and Inspection**. Cleaning of the DCP equipment cabinet is required to remove dust and dirt that accumulates on the external surface and to remove any internal debris. At selected sites where pressure sensors are installed in the DCP, the desiccant is inspected. The DCP equipment cabinet cleaning and inspection procedure is provided in table 3.5.2.

3.5.2.2 **Check/Clean Batteries**. For Class II systems, there are three types of battery packs in Battery Box A2. $
Battery pack 62828-40062-10 contains five batteries and is used with SOLA UPS 62828-90057. Battery pack $
62828-40062-30 (4 batteries) or 62828-90360-10 (5 batteries) are used with either of the Deltek UPS, 62828- $
90038-10 or 62828-90338-20. The batteries should be checked and cleaned semiannually or whenever the CST $
indicates that the batteries have failed or are low. The individual batteries should be removed from the battery box per the battery removal procedure of table 3.5.17. The batteries should be checked for leakage or corrosion on the terminals and replaced according to the installation procedure of table 3.5.17. If a battery is found to be leaking, it should be replaced. If battery terminals are corroded, they should be cleaned with a terminal brush or other wire brush before the battery is reinstalled.

Table 3.5.2. DCP Equipment Cabinet Cleaning

Step	Procedure
	Tools and material required: Hand-held vacuum cleaner Mild detergent and water Lint-free cloths **WARNING** Death or severe injury may result if power is not removed from DCP equipment cabinet prior to performing maintenance activities inside the cabinet. Ensure that UPS POWER switch is set to 0 (off) and DCP primary circuit breaker module is set to off and that facility power is removed. **NOTE** Wring out cloth before washing surfaces.
1	Set UPS POWER switch S1 to off (0) position.
2	Set primary Circuit Breaker Module A1A3A1 to OFF position.

Table 3.5.2. DCP Equipment Cabinet Cleaning -CONT

Step	Procedure
3	Remove facility power from the DCP by setting DCP circuit breaker in ac junction box to off.
4	Clean external surfaces using lint-free cloth dampened with a mixture of mild detergent and water.
5	Dry surfaces using lint-free cloth.
6	Using hand-held vacuum cleaner, remove any loose debris inside DCP equipment cabinet.
6.1	Inspect desiccant in desiccant dryer (Dryer, figure 3.1.3 sheet 2). If indicated by color, remove and replace desiccant (refer to table 3.5.2A).
7	Apply facility power to DCP by setting DCP circuit breaker in ac junction box to on position.
8	Set primary Circuit Breaker Module A1A3A1 to on position.
9	Set UPS POWER switch on UPS status panel to 1 (on) position.

Table 3.5.2A. Dessicant Replacement Procedure

Step	Procedure
	Tools and material required: Hand-held vacuum cleaner Mild detergent and water Lint-free cloth(s). **CAUTION** Before handling the desiccant, the Material Safety Data Sheet (MSDS) for Davidson Blue Indicating Gel issued by W.R. Grace & Co., P.O. Box 2117, Baltimore, MD 21203 (telephone: 410-659-9000) or the current supplier should be obtained from the supervisor and read. **NOTE** Wring out cloth before washing screens.
1	At DCP cabinet, loosen dryer clamp ring, slide off metal bowl guard, and unscrew bowl from top housing.
2	Pour out used desiccant into plastic bag and seal bag for proper disposal.
3	Open new container and refill bowl, shaking or tapping bowl to settle desiccant to 1/2 inch from top of bowl. **CAUTION** Do not install the bowl without installing the metal bowl guard.
4	Replace bowl and bowl guard and clamp ring onto unit. Ensure that clamp ring is securely in place.

3.5.3 CORRECTIVE MAINTENANCE

3.5.3.1 **Introduction**. Corrective maintenance involves the isolation, removal, and replacement of faulty FRU's. The ASOS is equipped with a powerful automatic self-test program that is designed to isolate most faults to a single FRU. However, because of the system hardware configuration, there will be instances when the diagnostics can only isolate to a group of FRU's, such as a sensor or an I/O channel. The troubleshooting approach for single FRU and group FRU types of conditions is different.

When the FRU is specifically called out, the technician need only replace the faulty unit. When a group of FRU's is called out, the technician must isolate the failed FRU by referencing the theory of operation and associated drawings and following two basic procedures. The first procedure involves connector checks, which ensure that all boards, cables, and connectors are present and properly connected. The second procedure involves ac and dc power supply tests. Although the system monitors all critical power supply voltages in the ACU, DCP, and sensors, failure of a power supply may result in a loss of communications between the circuit powered by that supply and the rest of the system.

Power supplies are tested through both visual and mechanical inspection. Before measuring any voltages, the technician should visually inspect the suspected area for obvious signs of power supply failure. During this inspection, the technician should pay particular attention to circuit breakers, panel lights, and light emitting diode (LED) indicators on the units to ensure that they are functioning normally. The physical checks involve checking fuses and the power supply voltages using a digital multimeter (DMM). In most cases, these tests will isolate the fault.

After an FRU has been replaced, the technician must allow the ASOS to automatically initialize upon the application of primary power to the ACU and verify that the CST diagnostics run without failure. The technician should also display the corresponding maintenance page and the OID and ensure that the FRU passes its CST. Table 3.5.3 provides corrective maintenance symptom analysis information.

3.5.3.2 **UPS Checks**. In a Class II system with serial number 438 and below, the UPS provides ac power for all electronics in the DCP and associated sensors, but not for the heaters in the DCP and sensors. If power is not applied to the DCP when the UPS POWER switch on the UPS is set to ON (1) but the heaters still operate, there could be a failure in the UPS. During operation, there are a number of tools available to fault isolate the UPS. The CST continually checks the status of the UPS and provides status information on the DCP UPS page of the OID. Error messages are printed on the printer and entered into the maintenance log. Also, the status LED's on the UPS status panel provide valuable information for analyzing UPS problems. Table 3.5.4 provides methods for troubleshooting the UPS based on observed symptoms. Table 3.5.5 provides a procedure to prepare the UPS for maintenance and to return the UPS to operation following service.

In a Class II system with serial number 439 and above, the UPS provides the same functions except the troubleshooting procedures are conducted primarily from the OID page. Table 3.5.6 provides procedures for troubleshooting the UPS based on observed symptoms.

3.5.3.3 **VME Card Rack Check**. The DCP VME cards page displays the overall status of the DCP card rack boards. In a Class II system, the DCP is configured with redundant hardware for increased system availability. The technician must examine the maintenance log periodically to replace redundant faulty units to reduce the possibility of redundant malfunctions. When the CST identifies a single board as a faulty FRU, it must be replaced. Failure of all or multiple boards indicates that a failure on any board tied to VMEbus could exist. This is a catastrophic failure and requires the technician to isolate the malfunctioning board through board removal and replacement. Table 3.5.7 provides procedures to isolate the faulty FRU.

Table 3.5.3. Corrective Maintenance Symptom Analysis

Symptom	What to Do	How to Do It
System is completely dead	Check ac and dc power.	Reference DCP ac/dc power distribution diagram figure 3.4.8 and verify presence of ac and dc voltages. Check fuses on DC Power Distribution Assembly A4A1.
Loss of communication with ACU	Check ACU/DCP rf communications link.	Table 2.5.7
Problem with DCP uninterruptible power supply (UPS) in Class II system	Check UPS.	Paragraph 3.5.3.2
DCP computer does not initialize	Check VME card rack.	Paragraph 3.5.3.3
Loss of communication with a sensor	Check circuit breaker module.	Inspect Circuit Breaker Rack A1A3 for tripped sensor module.
	Check DCP/sensor fiberoptic link.	Paragraph 1.5.4.3
	Check DCP SIO board.	Paragraph 3.5.3.4
DCP equipment cabinet overheats or becomes too cold.	Check DCP heater circuit.	Paragraph 3.5.3.5

Table 3.5.4. DCP UPS Fault Isolation (62828-90057)

Step	Symptom	Checks/Corrective Actions
$ 1	UPS will not turn on. Indicators on Status Panel Board A1A7 are all extinguished.	Ensure that facility power is applied to DCP, UPS bypass, and UPS. Check Circuit Breaker Module A1A3A1. If tripped, reset A1A3A1 and cycle OUTPUT POWER switch on status panel off and back on. Remove power from UPS and remove UPS cover per table 3.5.5. Visually inspect 1.5 KVA Filter Board A1A6 for damage. Replace filter board if damaged. Loosen screw at top of Circuit Breaker Rack A1A3 and swing rack down on hinges to access AC Power Distribution Assembly A1A4. Apply facility power to DCP by setting DCP circuit breaker in ac junction box to ON. Using DMM, verify 120 ±10% vac between terminals 1A and 9A of AC Power Distribution Assembly A1A4. If voltage is not present, replace Circuit Breaker CB1 on circuit breaker Module A1A3A1. Verify 120 ±10% vac between WHT/BLK and BLK/RED terminals of 1.5 KVA Filter Board A1A6. If voltage is not present, replace A1A6. Replace 1.5 KVA Inverter Board A5. If problem, persists, replace transformer A1T1.
2	UPS will not turn on. BATTERY indicator on status panel is on or blinking but OUTPUT indicator is off.	This is normal situation with OUTPUT POWER switch set to off (0). Therefore, ensure that OUTPUT POWER switch on Status Panel Board A1A7 is set to on (1) position. Remove power from UPS and remove UPS cover per table 3.5.5. Inspect ribbon cable on Status Panel Board A1A7 for damage or loose connections. Set OUTPUT POWER switch to on (1) position. Using DMM, ensure continuity across terminals of switch. Replace switch if no continuity. Set OUTPUT POWER switch to off (0) position. Install UPS cover per table 3.5.5. To ensure that problem was not due to cable connections, set OUTPUT POWER switch to on (1) position and attempt to operate UPS again. If problem is not corrected, Replace Status Panel Board A1A7. If problem persists, replace 1.5 KVA Inverter Board A5.

Table 3.5.4. DCP UPS Fault Isolation (62828-90057) - CONT

Step	Symptom	Checks/Corrective Actions
3	UPS operates, but CPU cannot communicate with RS-232 Interface Board A1A8. Failure indicated for TIMEOUT test or RS-232 test on DCP UPS page at OID.	Select DCP #1 SIO page on OID. From DCP #1 SIO page, press TEST key to run CST on this SIO board. If port #1 (the UPS port) fails LOOPBACK test or XMIT ERRORS test, replace SIO board #1 (A1A2A4). If both tests pass, continue. Loosen screw on top of Circuit Breaker Rack A1A3 and swing rack down on hinges to access UPS RS-232 connector. Disconnect W015 connector P22 from J20 of RS-232 Interface Board A1A8. Insert RS-232 test box between W015-P22 and J20 of RS-232 Interface Board A1A8. Select DCP UPS page at OID. From DCP UPS page, press TEST key to run CST on UPS. On RS-232 tester, ensure that transmit (TxD) and receive (RxD) signals are being passed between the UPS and the SIO board (at least once per minute). If both signals are active, replace one of the following (in order) and retry UPS. a. SIO board #1 (A1A2A4) b. UPS RS-232 Interface Board A1A8 If transmit signal is missing, replace SIO board #1 (A1A2A4). If receive signal is missing, continue. Remove power from UPS and remove UPS cover per table 3.5.5. Inspect ribbon cable between RS-232 Interface Board A1A8 and 1.5 KVA Inverter Board A5. Ensure that ribbon cable is not twisted or damaged. Reseat connectors to ensure proper connection. After checking ribbon cable, replace cover per table 3.5.5 and operate system again. If problem is not corrected, replace RS-232 Interface Board A1A8. If problem persists, replace 1.5 KVA Inverter Board A5.

Table 3.5.4. DCP UPS Fault Isolation (62828-90057) - CONT

Step	Symptom	Checks/Corrective Actions
4	ALARM indicator on Status Panel Board A1A7 is illuminated.	Overheat condition is likely. On UPS Status Panel Board A1A7, set OUTPUT POWER switch to off (0). Inspect inside of DCP equipment cabinet to ensure proper ventilation around UPS. Ensure that connector W031-P1 is securely attached to connector J1 on Battery Box A2. Allow UPS to cool. Set UPS OUTPUT POWER switch to on (1) position. If UPS operates after allowing to cool, check operation of UPS fan A1B1 by setting Circuit Breaker Module A1A3A1 to OFF. AC FAIL indicator on Status Panel Board A1A7 illuminates and UPS enters inverter mode to provide battery backup power. While UPS is operating in inverter mode, ensure that UPS fan A1B1 is operating. If not, proceed to step 11. If, after cooling, UPS fails to turn on and ALARM indicator remains illuminated, proceed to step 5.
5	With UPS cool, ALARM indicator on UPS Status Panel Board A1A7 is illuminated.	Set UPS OUTPUT POWER switch to off (0) position. Ensure connector W031-P1 is securely attached to connector J1 on Battery Box A2. Attempt to operate UPS by setting OUTPUT POWER switch to on (1) position. Remove power from UPS and remove UPS cover per table 3.5.5. **WARNING** Ensure that W031-P1 connector is disconnected from Battery Box A2 before attempting to test fuse A1F1 for continuity. Failure to disconnect battery box may result in injury to personnel or damage to equipment. Ensure that connector W031-P1 is disconnected from Battery Box A2. Inspect UPS fuse A1F1 and test for continuity using DMM. If fuse is good, proceed to next step. If fuse is open, replace fuse. If, after replacing fuse, problem persists and fuse again opens, replace 1.5 KVA Inverter Board A5. **WARNING** Exercise extreme caution when connecting UPS battery and taking measurements with UPS cover off. Death or severe injury may result if contact is made with battery terminals or wires. Connect battery cable W031-P1 to connector J1 on Battery Box A2. Using DMM, measure dc voltage at battery terminals (RED + and BLK -) of 1.5 KVA Inverter Board A5. Disconnect battery cable W031-P1 from connector J1 on Battery Box A2.

Table 3.5.4. DCP UPS Fault Isolation (62828-90057) - CONT

Step	Symptom	Checks/Corrective Actions
		If indication was less than 55 vdc, replace batteries BT1 through BT5 in Battery Box A2. If problem persists, replace 1.5 KVA Inverter Board A5. If battery voltage is above 55 vdc, replace 1.5 KVA Inverter Board A5.
6	After 24 hours of continuous charging (UPS has operated continually on facility power), BATTERY indicator on UPS Status Panel Board A1A7 blinks, indicating a low battery.	Remove power from UPS and remove UPS cover per table 3.5.5. **WARNING** Ensure that W031-P1 connector is disconnected from Battery Box A2 before attempting to test fuse A1F1 for continuity. Failure to disconnect battery box may result in injury to personnel or damage to equipment. Inspect UPS fuse A1F1 and test for continuity using DMM. If fuse is good, proceed to next step. If fuse is open, replace fuse. If, after replacing fuse, problem persists and fuse again opens, replace 1.5 KVA Inverter Board A5. Replace batteries BT1 through BT5 in Battery Box A2. If problem persists, replace 1.5 KVA Inverter Board A5. If problem persists, replace transformer A1T1.
7	One or more indicators on Status Panel Board A1A7 do not illuminate.	Remove power from UPS and remove UPS cover per table 3.5.5. Inspect ribbon cable on Status Panel Board A1A7 for damage or loose connections. After checking ribbon cable, install UPS cover per Table 3.5.5 and operate system again. If problem persists, replace Status Panel Board A1A7. If problem persists, replace 1.5 KVA Inverter Board A5.
8	UPS beeps when OUTPUT POWER switch is set to on (1) position.	Replace 1.5 KVA Inverter Board A5. **NOTE** Failure may be the result of Circuit Breaker Module A1A3A1 tripping below its rated value. If problem persists after performing the following corrective actions, A1A3A1 may be faulty.

Table 3.5.4. DCP UPS Fault Isolation (62828-90057) - CONT

Step	Symptom	Checks/Corrective Actions
9	Primary Circuit Breaker Module A1A3A1 continually trips when power is applied to DCP equipment cabinet from ac junction box.	With primary Circuit Breaker Module A1A3A1 set to off, remove Circuit Breaker Modules A1A3A2 through A9. Apply power to DCP and set Circuit Breaker Module A1A3A1 to on. If breaker does not trip, then there is a short circuit in circuit breaker modules or in associated sensors. If breaker still trips, problem is in UPS; continue. Remove power from UPS and remove UPS cover per Table 3.5.5. Inspect 1.5 KVA Filter Board A1A6 and 1.5 KVA Inverter Board A5 for signs of damage. Replace if necessary. On 1.5 KVA Filter Board A1A6, disconnect Circuit Breaker Module A1A3A1 load wire from BLK terminal. Reset Circuit Breaker Module A1A3A1. Apply facility power to DCP by setting DCP circuit breaker in ac junction box to ON. If Circuit Breaker Module A1A3A1 trips, replace circuit breaker CB1 on module. Remove facility power from DCP by setting DCP circuit breaker in ac junction box to off. Reconnect wire to BLK terminal of 1.5 KVA Filter Board A1A6. On 1.5 KVA Inverter Board A5, disconnect input wires from WHT/BLK and BLK/RED terminals. Apply facility power to DCP by setting DCP circuit breaker in ac junction box to ON. If Circuit Breaker Module A1A3A1 trips, replace 1.5 KVA Filter Board A1A6. Remove facility power from DCP by setting DCP circuit breaker in ac junction box to off. Reconnect wires to WHT/BLK and BLK/RED terminals of 1.5 KVA Inverter Board A5. On 1.5 KVA Filter Board A1A6, disconnect connector from J10. **WARNING** Ensure that W031-P1 connector is disconnected from Battery Box A2 before attempting to disconnect transformer T1. Failure to disconnect battery box may result in injury to personnel or damage to equipment. On 1.5 KVA Inverter Board A5, tag and disconnect 10 transformer T1 wires from their terminals.

Table 3.5.4. DCP UPS Fault Isolation (62828-90057) - CONT

Step	Symptom	Checks/Corrective Actions
		Apply facility power to DCP by setting DCP circuit breaker in ac junction box to on. If Circuit Breaker Module A1A3A1 trips, replace 1.5 KVA Inverter Board A5. Remove facility power from DCP by setting DCP circuit breaker in ac junction box to off. Reconnect 10 transformer wires to respective connectors on 1.5 KVA Inverter Board A5. Apply facility power to DCP by setting DCP circuit breaker in ac junction box to on. If Circuit Breaker Module A1A3A1 trips, replace transformer T1. Remove facility power from DCP by setting DCP circuit breaker in ac junction box to off. Reconnect connector to J10 on 1.5 KVA Filter Board A1A6. Disconnect W015 connector P13 from connector J7 on 1.5 KVA Filter Board A1A6. Apply facility power to DCP by setting DCP circuit breaker in ac junction box to on. If Circuit Breaker Module A1A3A1 trips, replace 1.5 KVA Filter Board A1A6. If not, problem is not in UPS components, but a short circuit probably exists in the DCP equipment cabinet wiring.
10	Failure indicated for TRIAC test on DCP UPS page at the OID.	Replace 1.5 KVA Inverter Board A5. If problem persists, replace transformer T1.
11	UPS fan A1B1 does not turn on when UPS is in inverter mode.	Replace fan A1B1. If problem persists, replace 1.5 KVA Inverter Board A5.
12	UPS fan A1B1 does not turn off when UPS is not in inverter mode.	Replace 1.5 KVA Inverter Board A5.

Table 3.5.5. DCP UPS (62828-90057) Pre-Service and Post-Service Procedures

Step	Procedure
	PRE-SERVICE: REMOVING UPS POWER AND REMOVING COVER
	Tools required: Small flat-tipped screwdriver No. 2 Phillips screwdriver **WARNING** Ensure that power is completely removed from UPS by performing the following steps. Death or severe injury may result if power is not completely removed from UPS prior to removing the cover in front of UPS components and performing maintenance on UPS subassemblies.
1	Set UPS POWER switch to off (0) position.
2	Set primary Circuit Breaker Module A1A3A1 to OFF position.

Table 3.5.5. DCP UPS (62828-90057) Pre-Service and Post-Service Procedures - CONT

Step	Procedure
3	Remove facility power from DCP equipment cabinet by setting DCP circuit breaker in ac junction box to off.
4	**WARNING** Sparks are generated when battery box connector J1 is connected or disconnected. Explosive fumes from battery box may be present when DCP cabinet is opened. Ensure that DCP cabinet is ventilated for at least 5 minutes before connecting or disconnecting J1. On Battery Box A2, disconnect cable connector W031-P1 from battery box connector J1. To remove cable connector, squeeze tabs on side of connector inward while rocking the connector free.
5	Wait at least 30 seconds while UPS capacitors discharge through bleeders and other drains.
6	**CAUTION** Be sure to hold UPS cover in place while removing screws and flat washers that secure cover to cabinet. Damage to UPS equipment may result if cover falls while being removed. While holding DCP cover in place, remove eight screws, lockwashers, and flat washers securing UPS cover to DCP.
7	**CAUTION** Status panel ribbon cable is delicate. Use caution when lifting cover and disconnecting cable to prevent damage to status panel cable. Carefully pull cover approximately 6 inches from DCP and disconnect status panel ribbon cable from connector J4 on 1.5 KVA Inverter Board A5.
8	Remove cover from DCP.
POST-SERVICE: INSTALLING UPS COVER AND APPLYING POWER TO UPS	
	Tools required: Small flat-tipped screwdriver No. 2 Phillips screwdriver **WARNING** Ensure that facility power is removed from DCP and that cable W031-P1 is disconnected from Battery Box A2 before performing maintenance on UPS. Death or severe injury may result if power is not completely removed from UPS prior to maintenance activities. **CAUTION** Status panel ribbon cable is delicate. Use caution when connecting cable and lowering cover to prevent damage to status panel cable. Ribbon connector is not keyed. Ensure that pin 1 on cable mates with pin 1 on board.
1	While holding cover approximately 6 inches in front of its normal position, carefully connect status panel ribbon cable to connector J4 on 1.5 KVA Inverter Board A5. Pin 1 on ribbon connector is marked with ink dot or other marking. Ensure that mark mates with pin 1 of inverter board.
2	Position cover in front of UPS components, taking care not to disturb or pinch status panel ribbon cable.

Table 3.5.5. DCP UPS (62828-90057) Pre-Service and Post-Service Procedures - CONT

Step	Procedure
	CAUTION Be sure to hold UPS cover in place while installing screws and flat washers. Damage to UPS equipment may result if cover falls while being installed.
3	While holding cover in position, install eight screws, lockwashers, and flat washers securing cover.
4	Ensure that UPS POWER switch is set to off (0) position.
	WARNING Sparks are generated when battery box connector J1 is connected or disconnected. Explosive fumes from battery box may be present when DCP cabinet is opened. Ensure DCP cabinet is ventilated for at least 5 minutes before connecting or disconnecting J1.
5	Connect battery cable W031-P1 to connector J1 on Battery Box A2.
6	Apply facility power to DCP equipment cabinet by setting DCP circuit breaker in ac junction box to on position.
7	Set Circuit Breaker Module A1A3A1 to ON position.

Table 3.5.6. UPS Fault Isolation (62828-90338-10 or 62828-90338-20) $

Step	Symptom	Checks/Corrective Actions
1	UPS will not start.	Line cord is not connected. Connect line cord. UPS power switch is OFF. Turn switch ON. Input power is missing or incorrect. Using multimeter, check input voltage and set DIP switches (UPS 62828-90338-10 only) properly: DIP Switch Settings (UPS 62828-90338-10 only) Voltage / S1 / S2 127 / ON / OFF 120 / OFF / OFF (Default) 110 / OFF / ON Battery fuse or circuit is open. Turn UPS power switch to OFF. Replace battery fuse or set circuit breaker to ON. Turn UPS power switch to ON.
2	Alarm continues after ALARM SILENCE button is pushed.	Overheat condition likely. On UPS, set power switch to off position. Inspect inside of DCP cabinet to ensure proper ventilation around UPS and that DCP fan is working properly. Replace if necessary. Allow UPS to cool. Set power switch to on position. If UPS fails to turn on and alarm continues, set UPS power switch to off position and proceed to step 3.

Table 3.5.6. UPS Fault Isolation (62828-90338-10 or 62828-90338-20) - CONT $

Step	Symptom	Checks/Corrective Actions
3	With UPS cool, ALARM continues when power is applied to DCP. UPS does not output power.	Ensure that connector P1 is securely attached to UPS. Attempt to operate UPS again by setting UPS power switch to on position.
4	Battery service LED is red.	Replace batteries. If problem persists, replace UPS.
5	Top LED above load symbol is solid red.	Determine if load(s) is defective or too many loads are connected to the UPS. Overload condition because of excessive current.
6	All LED's above load symbol are on.	High dc charging voltage. Turn UPS off and disconnect all loads connected to UPS. Connect loads one at a time back into UPS and turn power back on after each one is plugged in until problem returns. If problem persists, remove and replace UPS.
7	Red LED (top or bottom) above ac input voltage symbol is lit.	Line voltage is either too high or too low. UPS in battery operation. Correct input voltage if possible or be prepared to lose power to load in approximately 2 to 5 minutes after impending low battery LED turns on.
8	Red LED (top or bottom) above ac input symbol is flashing.	Line voltage has returned to normal, but RESET was not pushed. Wait until power returns to normal, then press RESET.

Table 3.5.7. DCP Card Rack Assembly Fault Isolation Procedures

Step	Procedure
1	Remove power from system by setting OUTPUT POWER switch on UPS status panel to off (0) position and setting Circuit Breaker Module A1A3A1 to OFF. Visually inspect Card Rack Assembly A1A2 for damage, loose power connections, etc. **NOTE** Reference paragraph 3.5.4 for the proper removal and installation procedures for the card rack circuit boards.
2	Replace CPU A (A1A2A1). Apply power to system by setting OUTPUT POWER switch and Circuit Breaker Module A1A3A1 to ON. If system initializes properly, CPU A is bad. If system does not initialize, proceed to step 3.
3	Replace Memory Board A1A2A3. Apply power to system by setting OUTPUT POWER switch and Circuit Breaker Module A1A3A1 to ON. If system initializes, Memory Board A1A2A3 is bad. If system does not initialize, proceed to step 4.
4	If DCP is Class II, replace CPU B (A1A2A2). Apply power to system by setting OUTPUT POWER switch and Circuit Breaker Module A1A3A1 to ON. If system initializes, CPU B is bad. If system does not initialize, proceed to step 5.
5	One at a time, replace each of the boards in slots A4 through A12 and apply power to the system. If the system initializes, board most recently replaced is bad. If system fails to initialize, card rack itself is bad.

3.5.3.4 **Serial I/O Board Checks**. The DCP CST checks the operation of the SIO boards once per minute. A LOOPBACK test and a TRANSMIT ERROR test is performed on each of the four ports of each SIO board. When a failure is discovered, an error message is printed on the printer and entered into the maintenance log. The error message identifies the SIO board and port, identifies the type of test failed, and gives instructions to replace the board. Also, an F indication is displayed on the appropriate DCP SIO page at the OID. For this type of SIO board failure, the technician need only replace the identified board to repair the system.

In addition to the definitive SIO board failures described above, general communications failures may occur between the DCP and one of its sensors. In these cases, the problem is either the fault of the sensor, an SIO port in the DCP, or in the fiberoptic link between the DCP and the sensor.

When such a loss in sensor communication occurs, the technician should first refer to the DCP fiberoptic modules detailed block diagram (Figure 3.4.6) to determine which SIO board is connected to the fiberoptic link for the failing sensor. The technician should then inspect all cable connections associated with the SIO board and the failing sensor.

If all cable connections appear to be good and the port is still not operating, an RS-232 test box can be used to check communication between the SIO board and the fiberoptic module or UPS that it communicates with. Paragraph 1.3.5.3 describes testing RS-232 signals for the fiberoptic modules. The DCP UPS fault isolation procedure of Table 3.5.4 does the same for UPS communications. The RS-232 test box is inserted in line with connector P1 on the fiberoptic module.

When using the RS-232 test box, the technician must verify the activity of the applicable RS-232 signals. For the sensor and UPS communications, these signals are the transmit data (TxD) and receive data (RxD) signals. Handshaking signals are not used for sensor communications and therefore need not be checked. However, the technician should check the 5 vdc and signal ground signals applied to the fiberoptic module being tested.

3.5.3.5 **DCP Equipment Cabinet Heater Troubleshooting**. Failures involving the DCP equipment cabinet heaters may be quite subtle in nature and may not become immediately evident. Basically, heater malfunctions present themselves in one of two possible symptoms. If the heaters do not come on as they are supposed to, then the cabinet temperature becomes too low. If the heaters come on and do not shut off as they are supposed to, then the cabinet becomes too hot. The difficulty in recognizing the fault symptoms is due to the fact that the symptoms are dependent on the ambient temperature at the installation site. For example, if the temperature at the site is quite cold and the heaters malfunction such that they are always on, the malfunction will not be noticeable until the temperature rises to the point where the heaters should turn off. Troubleshooting the DCP heating is performed using the DCP power distribution detailed block diagram and its accompanying text. The heaters are controlled by thermal switches and solid state relays. The ac power for the heaters should be verified at the inputs to solid state relays. The state (open or closed) of the thermal switches should then be checked. If the cabinet is overheating, then the heaters are stuck on and the thermal switches and the solid state relays are closed (they should be open). If the cabinet temperature is too low, then the heaters are not coming on and the thermal switches and solid-state relays are open (they should be closed). The proper operation of the heaters themselves is checked by feeling the heat output by each of the heater strips.

3.5.3.6 **Diagnostics**. The diagnostics on the DCP equipment cabinet run continuously in the background of the ASOS operating software as described in Chapter 1. The diagnostics complete a check of the system every 7 minutes. The test data received via the diagnostic program are displayed on the technician interface display pages, which are described in Chapter 1, Section III. If the diagnostics detect a failure, on-demand diagnostics of the affected unit are performed immediately and are repeated three times. If the unit fails at least two of the three tests, the unit is tagged as faulty and a message is entered into the maintenance log. Where redundant hardware is present (i.e., CPU's, rf modems, and line drivers), the faulty FRU is removed from the system and replaced with the operational unit via software. The technician must examine the maintenance log periodically, even if the system is up in operation, to replace redundant faulty units.

3.5.4 REMOVAL AND INSTALLATION PROCEDURES

The following chart is provided to facilitate safe and efficient removal and installation procedures for those assemblies and subassemblies found to be defective as a result of preventive maintenance and troubleshooting. This section does not include any obvious replacement procedures. Prior to the removal and installation of the assemblies as described in the following paragraphs, maintenance personnel should ensure that electrical power is removed from the DCP by setting the UPS OUTPUT POWER switch to off, setting the primary Circuit Breaker Module A1A3A1 to OFF, and setting the DCP breaker in the ac junction box (mounted beside the DCP) to off, as specified in the individual procedures. Procedures that are provided for the replacement of duplicate assemblies, such as VME cards and dc power supplies, are sufficient for maintenance of all similar units and are described for one assembly only. Removal/installation sequences of attaching hardware (screws, washers, nuts, etc) are reflected by the relative order of their presentation in the applicable step. Removal and installation of assemblies in the auxiliary DCP can be accomplished by substituting auxiliary DCP for DCP in the applicable procedural steps of the DCP removal and installation tables and by setting the circuit breaker located in slot A10 of the power control module rack to the off position.

	Unit to Be Replaced	Removal/Installation/ table Reference
	VME card rack circuit board	3.5.8
	DCP UPS filter board	3.5.9
	DCP UPS transformer	3.5.10
	DCP UPS fuse	3.5.11
	DCP UPS RS-232 interface board	3.5.12
	DCP UPS 1.5 KVA inverter	3.5.13
	DCP UPS fan	3.5.14
	DCP UPS status panel board	3.5.15
	DCP UPS OUTPUT POWER switch	3.5.16
	Battery box and battery	3.5.17
	DC power supply (+5 and +12)	3.5.18
	RF modem	3.5.19
	RF switch	3.5.20
	RF antenna	3.5.21
	Fiberoptic module	3.5.22
	Power control module A1A3A2-A9 and A11-A18	3.5.23
	Solid state relay	3.5.24
	Heater HR1	3.5.25
	DCP heater HR2	3.5.26
	DCP thermostat switch	3.5.27
	DCP fan	3.5.28
	Primary and secondary circuit breakers A1A3A1CB1 and A1A3A10CB1	3.5.29
	Power supply assembly diodes A4CR2-CR6	3.5.30
$	Uninterruptible power supply	3.5.31
$	Line Driver	3.5.32

Table 3.5.8. VME Card Rack Circuit Board Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: Small flat-tipped screwdriver **CAUTION** Damage to equipment may result if power is not removed prior to removal or installation. Ensure that UPS POWER switch is set to off (0) position and primary Circuit Breaker Module A1A3A1 is set to OFF.
1	Set UPS POWER switch to off (0) position.
2	Set primary Circuit Breaker Module A1A3A1 to OFF.
3	Referring to figure 3.1.4, locate the slot containing board to be removed.
	CAUTION To avoid damage to circuit boards, use proper ESD handling procedures to include the use of a grounding strap when performing the following procedures.
4	Disconnect any cables that may be attached to front of board by pulling cable connector straight out of circuit board connector.
5	Using small flat-tipped screwdriver, loosen two captive screws located at top and bottom of board front.
	CAUTION When removing a CPU board from rack, exert even force on both board handles. Failure to apply even force to both handles may result in board hitting bottom of card rack.
6	If board is equipped with extractor handles, press handles in opposite directions to release the board. If board does not have extractor handles, gently rock board vertically while gently pulling board from rack.
	CAUTION Jumper J34 on DCP Memory Board A1A2A3 must be moved to storage position (J34-A) prior to storing or shipping board. Failure to comply may result in discharge of battery.
7	If board removed is DCP Memory Board A1A2A3, move battery jumper from operational position (J34-B) to storage position (J34-A).
	INSTALLATION
	Tools required: Small flat-tipped screwdriver **CAUTION** Damage to equipment may result if power is not removed prior to removal or installation. Ensure that UPS POWER switch is set to off (0) position and primary Circuit Breaker Module A1A3A1 is set to OFF. To avoid damage to circuit boards, use proper ESD handling procedures to include the use of a grounding strap when performing the following procedures.
1	Ensure that UPS POWER switch is set to off (0) position.
2	Ensure that primary Circuit Breaker Module A1A3A1 is set to OFF.
3	If board being installed is CPU A or B (A1A2A1 or A2) or SIO board #1 through #5 (A1A2A4 through A8), configure board jumpers for slot into which it is being installed (described in paragraph 3.5.5).
	NOTE Jumper J34 on DCP Memory Board A1A2A3 must be moved to operational position (J34-B) to enable battery backup circuit.
4	If board installed is DCP Memory Board A1A2A3, move battery jumper from storage position (J34-A) to operational position (J34-B).

Table 3.5.8. VME Card Rack Circuit Board Removal and Installation - CONT

Step	Procedure
5	Using two handles located at top and bottom of board, position board with component side facing right and carefully slide board into rack card guides. Align card with rack connector and press into place.
6	Using small flat-tipped screwdriver, tighten captive screws located at top and bottom of board.
7	If installing CPU A or CPU B, connect RS-232 cable to connector JK1 on front of CPU board.
8	Set primary Circuit Breaker Module A1A3A1 to ON.
9	Set UPS POWER switch to on (1) position.

Table 3.5.9. DCP UPS Filter Board Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: No. 2 Phillips screwdriver No. 1 offset Phillips screwdriver **WARNING** Ensure that power is completely removed from UPS by performing procedure in table 3.5.5. Death or severe injury may result if power is not completely removed from UPS prior to removing cover in front of UPS components and performing maintenance on UPS subassemblies.
1	Remove DCP UPS cover in accordance with table 3.5.5.
2	At 1.5 KVA Filter Board A1A6, remove harness connectors from board connectors J5 and J10.
3	Tag and remove five single wires from 1.5 KVA Filter Board A1A6.
4	Using Phillips screwdrivers, remove four screws, flat washers, and lockwashers securing 1.5 KVA Filter Board A1A6 to standoffs.
5	Remove filter board from DCP.
	INSTALLATION
	Tools required: No. 2 Phillips screwdriver No. 1 offset Phillips screwdriver **WARNING** Ensure that power is completely removed from UPS by performing the procedure in table 3.5.5. Death or severe injury may result if power is not completely removed from UPS prior to removing cover in front of UPS components and performing maintenance on UPS subassemblies.
1	Verify that DCP UPS cover is removed in accordance with table 3.5.5.
2	Position 1.5 KVA Filter Board A1A6 on standoffs with connectors J5 and J10 positioned to the right.
3	Using Phillips screwdriver, install four screws, flat washers, and lockwashers securing filter board to standoffs.
4	Using tags as a guide, install five wires on filter board.
5	Install harness connectors on board connectors J5 and J10.
6	Install DCP UPS cover in accordance with table 3.5.5.

Table 3.5.10. DCP UPS Transformer Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: No. 2 Phillips screwdriver 3/8-inch socket with ratchet 9/16-inch socket with ratchet **WARNING** Ensure that power is completely removed from UPS by performing the procedure in table 3.5.5. Death or severe injury may result if power is not completely removed from UPS prior to removing the cover in front of UPS components and performing maintenance on UPS subassemblies.
1	Remove DCP UPS cover in accordance with table 3.5.5.
2	On 1.5 KVA Inverter Board A5, tag and remove seven transformer wires with solderless (spade) connectors from spade connectors on inverter board.
3	Using 3/8-inch socket with ratchet, tag and remove three transformer wires from standoffs on 1.5 KVA Inverter Board A5.
	WARNING Transformer is heavy equipment (weighs approximately 45 pounds) and requires a two-man or mechanical lift. Failure to comply may result in injury to personnel or damage to equipment. **CAUTION** Hold transformer in place while removing nuts and flat washers securing it to mounting plate. Damage to equipment may result if transformer falls while being removed.
4	Using 9/16-inch socket with ratchet, remove four nuts and flat washers securing transformer to Mounting Plate Assembly A1.
5	Remove transformer from DCP.
	INSTALLATION
	Tools required: No. 2 Phillips screwdriver 3/8-inch socket with ratchet 9/16-inch socket with ratchet **WARNING** Ensure that power is completely removed from UPS by performing the procedure in table 3.5.5. Death or severe injury may result if power is not completely removed from UPS prior to removing cover in front of UPS components and performing maintenance on UPS subassemblies. **NOTE** This procedure applies to part number 62828-90057 only (installed in DCP's with serial numbers 438 and below).
1	Verify that DCP UPS cover is removed in accordance with table 3.5.5.

Table 3.5.10. DCP UPS Transformer Removal and Installation -CONT

Step	Procedure
	WARNING Transformer is heavy equipment (weighs approximately 45 pounds) and requires a two-man or mechanical lift. Failure to comply may result in injury to personnel or damage to equipment. **CAUTION** Hold transformer in place while installing nuts and washers securing it to mounting plate. Damage to equipment may result if transformer falls while being installed.
2	Position transformer on mounting plate assembly studs with three heavy gauge wires on bottom.
3	Using 9/16-inch socket with ratchet, install four nuts and washers securing transformer to mounting plate assembly.
4	Using 3/8-inch socket with ratchet and using tags as a guide, connect three transformer wires to standoffs on 1.5 KVA Inverter Board A5.
5	On 1.5 KVA Inverter Board A5 using tags as a guide, connect seven transformer wires to spade connectors on inverter board.
6	Install DCP UPS cover in accordance with table 3.5.5.

Table 3.5.11. DCP UPS Fuse Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: Fuse puller **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Ensure that UPS POWER switch is set to 0 (off) position, facility power is removed from DCP, and battery box connector is disconnected.
1	Set UPS POWER switch to off (0) position.
2	Set primary Circuit Breaker Module A1A3A1 to off position.
3	Remove facility power from DCP equipment cabinet by setting DCP circuit breaker in ac junction box to off.
	WARNING Sparks are generated when battery box connector J1 is connected or disconnected. Explosive fumes from battery box may be present when DCP cabinet is opened. Ensure DCP cabinet is ventilated for at least 5 minutes before connecting or disconnecting J1.
4	At DCP battery box, disconnect W031-P1 from J1.
5	Wait at least 30 seconds while UPS capacitors discharge through bleeders and other drains.
6	Using fuse puller, remove fuse F1 from fuse holder A1XF1.

Table 3.5.11. DCP UPS Fuse Removal and Installation -CONT

Step	Procedure
	INSTALLATION
	WARNING Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Ensure that OUTPUT POWER switch is set to 0 (off) position, facility power is removed from DCP, and battery box connector is disconnected.
1	Ensure that UPS POWER switch is set to off (0) position.
2	Ensure that primary Circuit Breaker Module A1A3A1 is set to off position.
3	Ensure that DCP circuit breaker in ac junction box is set to off position.
4	**WARNING** Sparks are generated when battery box connector J1 is connected or disconnected. Explosive fumes from battery box may be present when DCP cabinet is opened. Ensure DCP cabinet is ventilated for at least 5 minutes before connecting or disconnecting J1. Ensure that battery box connector W031-P1 is disconnected from battery box.
5	Install replacement fuse F1 in fuse holder A1XF1.
6	**WARNING** Sparks are generated when battery box connector J1 is connected or disconnected. Explosive fumes from battery box may be present when DCP cabinet is opened. Ensure that DCP cabinet is ventilated for at least 5 minutes before connecting or disconnecting J1. At the DCP battery box, connect W031-P1 to J1.
7	Apply facility power to DCP equipment cabinet by setting DCP circuit breaker in ac junction box to on position.
8	Set primary Circuit Breaker Module A1A3A1 to on position.
9	Set UPS POWER switch to 1 (on) position.

Table 3.5.12. DCP UPS RS-232 Interface Board Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: Large flat-tipped screwdriver Small flat-tipped screwdriver 3/16-inch nut driver **WARNING** Ensure that power is completely removed from UPS by performing the procedure in table 3.5.5. Death or severe injury may result if power is not completely removed from UPS prior to removing cover in front of UPS components and performing maintenance on UPS subassemblies. **NOTE** This procedure applies to part number 62828-90057 only (installed in DCP's with serial numbers 438 and below).
1	Remove DCP UPS cover in accordance with table 3.5.5.
2	Disconnect RS-232 interface board ribbon connector A1A8-P1 from connector J2 on 1.5 KVA Inverter Board A5 by grasping connector with thumb and index finger and executing upward force on connector.
3	Using large flat-tipped screwdriver, loosen captive screw and lower circuit breaker module rack.
4	Using small flat-tipped screwdriver, loosen retaining screws and remove connector W015-P22 from RS-232 interface board.
5	Using 3/16-inch nut driver, remove two lugs (standoffs) and flat washers securing RS-232 interface board to mounting bracket.
6	Remove RS-232 interface board from DCP.
	INSTALLATION
	Tools required: Large flat-tipped screwdriver Small flat-tipped screwdriver 3/16-inch nut driver **WARNING** Ensure that power is completely removed from UPS by performing the procedure in table 3.5.5. Death or severe injury may result if power is not completely removed from UPS prior to removing cover in front of UPS components and performing maintenance on UPS subassemblies.
1	Verify that DCP UPS cover is removed in accordance with table 3.5.5.
2	Carefully position RS-232 interface board in mounting bracket.
3	Using 3/16-inch nut driver, install two lugs (standoffs) and flat washers securing RS-232 interface board to mounting bracket.
4	Using small flat-tipped screwdriver, install connector W015-P22 to RS-232 interface board.
5	Connect RS-232 interface board ribbon connector A1A8-P1 to connector J2 on 1.5 KVA Inverter Board A5. Ensure that pin 1 on ribbon connector (marked with ink dot or other marking) mates with pin 1 of inverter board.
6	Raise circuit breaker module rack and secure captive screw.
7	Install DCP UPS cover in accordance with table 3.5.5.

Table 3.5.13. DCP UPS 1.5 KVA Inverter Board Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: No. 2 Phillips screwdriver 3/8-inch nut driver 7/16-inch nut driver **WARNING** Ensure that power is completely removed from UPS by performing the procedure in table 3.5.5. Death or severe injury may result if power is not completely removed from UPS prior to removing cover in front of UPS components and performing maintenance on UPS subassemblies.
1	Remove DCP UPS cover in accordance with table 3.5.5.
2	Remove RS-232 ribbon cable connector A1A8-P1 from 1.5 KVA inverter board connector J2.
3	Remove blower cable connector A1B1-P3 from 1.5 KVA inverter board connector J11.
4	Tag and remove 10 wires with solderless (spade) connectors from 1.5 KVA inverter board.
5	Tag seven wires connected to four 1.5 KVA inverter board standoffs.
6	Using 3/8-inch nut driver, remove four nuts, four flat washers, four lockwashers, and seven wires from four 1.5 KVA inverter board standoffs.
7	Remove two screws, lockwashers, and flat washers securing mounting bracket to back of cabinet.
8	If cabinet is type with left door support blocking inverter board removal, using 7/16-inch nut driver, remove nut from door support and lower support out of the way.
9	Using Phillips screwdriver, remove three screws securing 1.5 KVA inverter board to mounting plate.
10	Carefully slide 1.5 KVA inverter board forward and remove from DCP.
11	Using Phillips screwdriver, remove four screws, flat washers, lockwashers, and nuts securing mounting bracket to insulator on top of inverter board heat sinks.
	INSTALLATION
	Tools required: No. 2 Phillips screwdriver 3/8-inch nut driver 7/16-inch nut driver **WARNING** Ensure that power is completely removed from UPS by performing the procedure in table 3.5.5. Death or severe injury may result if power is not completely removed from UPS prior to removing cover in front of UPS components and performing maintenance on UPS subassemblies.
1	Verify that DCP UPS cover is removed in accordance with table 3.5.5.
2	Using Phillips screwdriver, install four screws, flat washers, lockwashers, and nuts securing mounting bracket to insulator on top of inverter board heat sinks.
3	Carefully install 1.5 KVA inverter board into card guides.
4	Using Phillips screwdriver, install three screws and flat washers securing 1.5 KVA inverter board to mounting plate.
5	If cabinet left door support was disconnected and lowered during removal, using 7/16-inch nut driver, install nut securing support to cabinet door.
6	Using Phillips screwdriver, install two screws, lockwashers, and flat washers securing mounting bracket to back of cabinet.

Table 3.5.13. DCP UPS 1.5 KVA Inverter Board Removal and Installation - CONT

Step	Procedure
7	Using 3/8-inch nut driver and using tags as a guide, install four nuts, four flat washers, four lockwashers, and seven wires to four 1.5 KVA inverter board standoffs.
8	Using tags as a guide, install 10 wires with solderless (spade) connectors to 1.5 KVA inverter board terminals.
9	Install connectors A1A8-P1 and A1B1-P3 on 1.5 KVA inverter board connectors J2 and J11, respectively. Ensure that pin 1 of ribbon connector A1A8-P1 (marked with ink dot or other marking) mates with pin 1 of inverter board.
10	Install DCP UPS cover in accordance with table 3.5.5.

Table 3.5.14. DCP UPS Fan Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: No. 2 Phillips screwdriver **WARNING** Ensure that power is completely removed from UPS by performing the procedure in table 3.5.5. Death or severe injury may result if power is not completely removed from UPS prior to removing cover in front of UPS components and performing maintenance on UPS subassemblies.
1	Remove 1.5 KVA Inverter Board A5 in accordance with table 3.5.13.
2	Using Phillips screwdriver, remove four screws, lockwashers, and flat washers securing fan to mounting plate assembly.
3	Remove fan from DCP.
	INSTALLATION
	Tools required: No. 2 Phillips screwdriver **WARNING** Ensure that power is completely removed from UPS by performing the procedure in table 3.5.5. Death or severe injury may result if power is not completely removed from UPS prior to removing cover in front of UPS components and performing maintenance on UPS subassemblies. **NOTE** This procedure applies to part number 62828-90057 only (installed in DCP's with serial numbers 438 and below).
1	Verify that DCP UPS cover is removed in accordance with table 3.5.5.
2	Verify that 1.5 KVA Inverter Board A5 is removed in accordance with table 3.5.13.
3	Orient fan so that airflow will be toward front of cabinet (across UPS components). Install fan on mounting plate assembly. Install four screws, lockwashers, and flat washers securing fan.
4	Install 1.5 KVA Inverter Board A5 in accordance with table 3.5.13.

Table 3.5.15. DCP UPS Status Panel Board Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: 5/16-inch nut driver **WARNING** Ensure that power is completely removed from UPS by performing the procedure in table 3.5.5. Death or severe injury may result if power is not completely removed from UPS prior to removing cover in front of UPS components and performing maintenance on UPS subassemblies. **NOTE** This procedure applies to part number 62828-90057 only (installed in DCP's with serial numbers 438 and below).
1	Remove DCP UPS cover in accordance with table 3.5.5.
2	Tag and disconnect two wires from UPS POWER switch.
3	Using 5/16-inch nut driver, remove two nylon nuts and spacers securing status panel board to DCP UPS cover.
4	Remove status panel board from DCP UPS cover.
	INSTALLATION
	Tools required: 5/16-inch nut driver **WARNING** Ensure that power is completely removed from UPS by performing the procedure in table 3.5.5. Death or severe injury may result if power is not completely removed from UPS prior to removing cover in front of UPS components and performing maintenance on UPS subassemblies.
1	Verify that DCP UPS cover is removed in accordance with table 3.5.5.
2	Position status panel board on mounting screws.
3	Using 5/16-inch nut driver, install two nylon nuts and spacers securing status panel board to DCP UPS cover.
4	Using tags as a guide, connect two wires to UPS POWER switch.
5	Install DCP UPS cover in accordance with table 3.5.5.

Table 3.5.16. DCP UPS OUTPUT POWER Switch Removal and Installation

Step	Procedure
	REMOVAL
	WARNING Ensure that power is completely removed from UPS by performing the procedure in table 3.5.5. Death or severe injury may result if power is not completely removed from UPS prior to removing cover in front of UPS components and performing maintenance on UPS subassemblies. **NOTE** This procedure applies to part number 62828-90057 only (installed in DCP's with serial numbers 438 and below).
1	Remove DCP UPS cover in accordance with table 3.5.5.
2	Press plastic tabs on both sides of switch while pushing switch out front of panel.

Table 3.5.16. DCP UPS OUTPUT POWER Switch Removal and Installation -CONT

Step	Procedure
	INSTALLATION
	WARNING Ensure that power is completely removed from UPS by performing the procedure in table 3.5.5. Death or severe injury may result if power is not completely removed from UPS prior to removing cover in front of UPS components and performing maintenance on UPS subassemblies. **NOTE** This procedure applies to part number 62828-90057 only (installed in DCP's with serial numbers 438 and below).
1	Verify that DCP UPS cover is removed in accordance with table 3.5.5.
2	Push switch through front of status panel until plastic tabs lock switch into place.
3	At rear of switch, using tags as a guide, connect two wires to switch.
4	Install DCP UPS cover in accordance with 3.5.5.

Table 3.5.17. Battery Box and Battery Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: Medium flat-tipped screwdriver Two 5/16-inch box wrenches 5/8-inch nut driver 3/8-inch nut driver No. 2 Phillips screwdriver **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Severe injury may result if the negative and positive battery terminals are shorted together. Exercise caution while removing batteries. **NOTE** This procedure applies to part number 62828-90057 only (installed in DCP's with serial numbers 438 and below).
1	Set UPS POWER switch to off (0) position.
2	Set primary Circuit Breaker Module A1A3A1 to OFF position.
3	Remove facility power from the DCP equipment cabinet by setting DCP circuit breaker in ac junction box to off.

Table 3.5.17. Battery Box and Battery Removal and Installation - CONT

Step	Procedure
	WARNING Sparks are generated when battery box connector J1 is connected or disconnected. Explosive fumes from battery box may be present when DCP cabinet is opened. Ensure DCP cabinet is ventilated for at least 5 minutes before connecting or disconnecting J1.
4	Disconnect Battery Box A2. a. For battery box part number 62828-40062-10, squeeze tabs on side of connector J1 inward while rocking connector free. b. For battery box part number 62828-40062-30 or 62828-90360-10, pull battery box connector P1 out of UPS PRA BATTERY BOX connector.
5	Loosen hose clamp on battery box vent tube and remove tubing from top of battery box.
6	Wait at least 30 seconds while UPS capacitors discharge through bleeders and other drains.
7	Slide battery box forward as far as possible so that rear of box rests on front edge of DCP cabinet while box is retained by lanyards on either side.
8	Slide retaining straps off of left and right top of battery box.
	CAUTION When lifting top of battery box, do not pull the attached wires off the connector.
9	Carefully lift top of battery box and position top to gain access to battery terminals.
	WARNING Batteries contain corrosive fluid. Do not tip batteries during removal.
10	Using two 5/16-inch wrenches, remove bolt, flat washers, lockwasher, and nut from negative terminal of battery BT1 (connected to top of battery box via black wires). Remove black wires from negative terminal.
11	Using two 5/16-inch box wrenches, remove bolt, flat washers, lockwasher, and nut from positive terminal of battery (connected to top of battery box via red wires). Remove red wires from positive terminal, and remove top of battery box.
12	Using two 5/16-inch box wrenches, remove bolt, lockwasher, flat washers, and nuts from battery terminals. Remove all jumper wires.
13	Using strap tied around battery BT5 or packing material, remove battery from battery box.
14	Remove strap from battery and retain strap.
15	Remove additional batteries.
16	If battery box itself is to be replaced, remove two lanyards from battery box by using Phillips screwdriver and 3/8-inch nut driver to remove screws, two flat washers, and nut (four places).
17	If battery box itself is to be replaced, remove retaining straps by using Phillips screwdriver and 3/8-inch nut driver to remove screws, two flat washers, and nut securing straps to box.

Table 3.5.17. Battery Box and Battery Removal and Installation - CONT

Step	Procedure
	INSTALLATION
	Tools required: Medium flat-tipped screwdriver Two 5/16-inch box wrenches No. 2 Phillips screwdriver 3/8-inch nut driver 5/8-inch nut driver **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Severe injury may result if the negative and positive battery terminals are shorted together. Exercise caution while removing batteries.
1	Ensure that UPS POWER switch is set to off (0) position.
2	Ensure that primary Circuit Breaker Module A1A3A1 is set to OFF position.
3	Ensure that DCP circuit breaker in ac junction box is set to off position.
4	If battery box itself is to be replaced, install retaining straps on new box using Phillips screwdriver and 3/8-inch nut driver to install screws, two flat washers, and nut securing straps to box. Ensure that screw heads are inside box and nuts are outside.
5	If battery box itself is to be replaced, install two lanyards on new box using Phillips screwdriver and 3/8-inch nut driver to install screws, two flat washers, and nut (four places). Ensure that screw heads are inside box and nuts are outside.
6	Slide empty battery box forward as far as possible so that rear of box rests on front edge of DCP cabinet while box is retained by lanyards on either side.
7	Using figure 2.1.1, install batteries in battery box.
8	Tie previously removed strap around battery BT5 or packing material to facilitate future removal. Leave slack in strap to allow approximately 2 inches of clearance between the top of battery and strap.
9	Using strap around battery BT5 or packing material, install in battery box.
10	**NOTE** Refer to figure 3.4.8 (sheet 3) for wiring diagram of battery box. Using markers as a guide and two 5/16-inch box wrenches, install jumpers on battery terminals, securing with bolt, flat washers, and nut.
11	Position top of battery box to allow connection of red wires to positive terminal and black wires to negative terminal.
12	Using markers as a guide and two 5/16-inch box wrenches, install bolts, flat washers, lockwashers, and nuts securing wires to their respective terminals.
13	Install top on battery box and press into place.
14	Pull two retaining straps over top of battery box to secure top.
15	Using flat-tipped screwdriver, install battery box vent tube.

Table 3.5.17. Battery Box and Battery Removal and Installation - CONT

Step	Procedure
	WARNING Sparks are generated when battery box connector J1 is connected or disconnected. Explosive fumes from battery box may be present when DCP cabinet is opened. Ensure that DCP cabinet is ventilated for at least 5 minutes before connecting or disconnecting J1. **NOTE** Ensure that battery cable connector is fully seated and locked in place.
16	Connect Battery Box A2. a. For battery box part number 62828-40062-10, position cable W030 connector P1 on top of battery box connector J1 and press connector into place. b. For battery box part number 62828-40062-30 or 62828-90360-10, insert battery box connector into UPS PRA BATTERY BOX connector.
17	Apply facility power to DCP equipment cabinet by setting DCP circuit breaker in ac junction box to on position.
18	Set primary Circuit Breaker Module A1A3A1 to ON position.
19	Set UPS POWER switch to 1 (on) position.

Table 3.5.18. DC Power Supply (+5 and ±12 VDC) Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: Small flat-tipped screwdriver No. 2 Phillips screwdriver 3/8-inch socket and ratchet **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities.
1	Set UPS POWER switch to off (0) position.
2	Set primary Circuit Breaker Module A1A3A1 to OFF position.
3	Remove facility power from the DCP equipment cabinet by setting DCP circuit breaker in ac junction box to off.
	WARNING Sparks are generated when battery box connector J1 is connected or disconnected. Explosive fumes from battery box may be present when DCP cabinet is opened. Ensure that DCP cabinet is ventilated for at least 5 minutes before connecting or disconnecting J1.
4	At DCP battery box, disconnect connector W031-P1 from J1.

Table 3.5.18. DC Power Supply (+5 and ±12 VDC) Removal and Installation -CONT

Step	Procedure
5	Referring to figure 3.1.3, locate power supply to be removed.
6	Disconnect cable connectors W024-P1 through W024-P4.
7	Using 3/8-inch socket and ratchet, remove six nuts, lockwashers, and flat washers securing Power Supply Assembly A4 to DCP equipment cabinet.
8	Carefully remove Power Supply Assembly A4 from DCP equipment cabinet.
9	Using No. 2 Phillips screwdriver, remove four countersunk screws securing power supply to mounting plate.
10	If +5 vdc power supply, remove terminal strip cover.
11	Using small flat-tipped screwdriver, tag and disconnect wires from power supply terminal strip.
12	If +5 vdc power supply, tag and remove wires from terminal studs using 3/8-inch socket and ratchet.
INSTALLATION	
	Tools required: Small flat-tipped screwdriver No. 2 Phillips screwdriver 3/8-inch socket and ratchet **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities.
1	Ensure that UPS POWER switch is set to off (0) position.
2	Ensure that primary Circuit Breaker Module A1A3A1 is set to OFF position.
3	Ensure that DCP circuit breaker in ac junction box is set to off position.
4	**WARNING** Sparks are generated when battery box connector J1 is connected or disconnected. Explosive fumes from battery box may be present when DCP cabinet is opened. Ensure that DCP cabinet is ventilated for at least 5 minutes before connecting or disconnecting J1. At DCP battery box, ensure that connector W031-P1 is disconnected from J1.
5	If +5 vdc power supply, using wire tags/markers as a guide, connect wires to terminal studs using 3/8-inch socket and ratchet and install terminal strip cover.
6	Using small flat-tipped screwdriver and using wire tags/ markers as a guide, connect wires to power supply terminal strip.
7	Using No. 2 Phillips screwdriver, install four countersunk screws securing power supply to mounting plate.
8	Carefully position Power Supply Assembly A4 back in DCP equipment cabinet, ensuring that bottom of A4 plate rests on mounting support on bottom of right wall.
9	Using 3/8-inch socket, install six nuts, lockwashers, and flat washers securing power supply mounting plate assembly.
10	Connect cables to connectors W024-P1 through W024-P4.

Table 3.5.18. DC Power Supply (+5 and ±12 VDC) Removal and Installation -CONT

Step	Procedure
	WARNING Sparks are generated when battery box connector J1 is connected or disconnected. Explosive fumes from battery box may be present when DCP cabinet is opened. Ensure that DCP cabinet is ventilated for at least 5 minutes before connecting or disconnecting J1.
11	At DCP battery box, connect connector W031-P1 to J1.
12	Apply facility power to DCP equipment cabinet by setting DCP circuit breaker in ac junction box to on position.
13	Set primary Circuit Breaker Module A1A3A1 to ON position.
14	Set UPS POWER switch to 1 (on) position.

Table 3.5.19. RF Modem Removal and Installation

Step	Procedure	
	REMOVAL	
	Tools required: Small flat-tipped screwdriver Short No. 2 Phillips screwdriver **CAUTION** Damage to rf modems may result if power is not removed from DCP prior to removal or installation. Ensure that UPS POWER switch is set to 0 (off) position and DCP primary circuit breaker module is set to off.	
1	Set UPS POWER switch to off (0) position.	
2	Set primary Circuit Breaker Module A1A3A1 to OFF position.	
3	Remove facility power from the DCP equipment cabinet by setting DCP circuit breaker in ac junction box to off.	
4	Using Phillips screwdriver, remove two screws, flat washers, and lockwashers securing rf modem mounting plate to mounting bracket.	
5	Slide rf modem mounting plate forward to access rf modem connectors.	$
6	Disconnect BNC connectors from rf modems. If modem being removed is Johnson Data model then remove SMAM-to-BNCF adapter.	$ $
7	Using small flat-tipped screwdriver, remove D connectors (two for AAI model, one for Motorola model) from rf modems and Johnson Data models) .	$ $
8	Remove rf modem mounting plate from guides.	$
9	Remove two mounting screws, lockwashers, and flat washers securing rf modem to mounting plate.	$

Step	Procedure
10	Remove rf modem. NOTE: A common anomaly with ACU/DCP communications is a failed DCP Radio B (or Line Driver B) after a completed download. The workaround for this specific failure is to deconfigure and then reconfigure Radio B (or Line Driver B). Proceed to the Hardware Configuration page (REVUE-SITE-CONFG-HDWE), sequence the DCP CPU to 1, press EXIT, then repeat this procedure and sequence the DCP CPU to 2. NOTE: When an AAI modem (62828-90013-XX) fails, and a replacement AAI modem is not available, ASN S100-FMK18886 must be ordered to replace the modem with the Motorola modem (62828-90315-XX). AAI modems cannot be replaced with the Johnson Data modems (62828-40506-X). When a Motorola modem (62828-90315-XX) fails and spare Motorola modems are not available, a Johnson Data modem (62828-40506-X), an adapter cable (62828-42110-10), and a SMAM-to-BNCF adapter must be ordered to replace the failing rf modem.

INSTALLATION	
	Tools required: Small flat-tipped screwdriver Short No. 2 Phillips screwdriver **CAUTION** Damage to rf modems may result if power is not removed from DCP prior to removal or installation. Ensure that UPS POWER switch is set to 0 (off) position and DCP primary circuit breaker module is set to off.
1	Ensure that UPS POWER switch is set to off (0) position.
2	Ensure that primary Circuit Breaker Module A1A3A1 is set to OFF position.
3	Ensure that DCP circuit breaker in ac junction box is set to off position.
4	Using Phillips screwdriver, install two mounting screws, lockwashers, and flat washers securing rf modem to mounting plate.
5	Slide rf modem mounting plate partway into guides to hold it in place for cable connection.
6	Using small flat-tipped screwdriver, install D connectors (two for AAI model, one for Motorola model) to rf modems.
7	Connect BNC connectors to rf modems.
8	Slide rf modem mounting plate fully into guides.
9	Using Phillips screwdriver, install two screws, flat washers, and lockwashers securing rf modem mounting plate to mounting bracket.
10	Apply facility power to DCP equipment cabinet by setting DCP circuit breaker in ac junction box to on position.
11	Set primary Circuit Breaker Module A1A3A1 to ON position.
12	Set UPS POWER switch to 1 (on) position.

Table 3.5.20. RF Switch Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: No. 1 Phillips screwdriver **CAUTION** Damage to rf modems may result if power is not removed from DCP prior to removal or installation. Ensure that UPS POWER switch is set to 0 (off) position and DCP primary circuit breaker module is set to off.
1	Set UPS POWER switch to off (0) position.
2	Set primary Circuit Breaker Module A1A3A1 to OFF position.
3	Remove facility power from DCP equipment cabinet by setting DCP circuit breaker in ac junction box to off.
4	At rf switch, tag and remove three BNC connectors.
5	Disconnect rf switch in-line connector (A1A5-P1) from DCP harness connector P43.
6	Using Phillips screwdriver, remove two screws, flat washers, and lockwashers securing rf switch to standoffs.
	INSTALLATION
	Tools required: No. 1 Phillips screwdriver **CAUTION** Damage to rf modems may result if power is not removed from DCP prior to removal or installation. Ensure that UPS POWER switch is set to 0 (off) position and DCP primary circuit breaker module is set to off.
1	Ensure that UPS POWER switch is set to off (0) position.
2	Ensure that primary Circuit Breaker Module A1A3A1 is set to OFF position.
3	Ensure that DCP circuit breaker in ac junction box is set to off position.
4	Using Phillips screwdriver, install two screws, flat washers, and lockwashers securing rf switch to standoffs.
5	Connect rf switch in-line connector (A1A5-P1) to DCP harness connector P43.
6	Install three BNC connectors on rf switch.
7	Apply facility power to DCP equipment cabinet by setting DCP circuit breaker in ac junction box to on.
8	Set primary Circuit Breaker Module A1A3A1 to ON position.
9	Set UPS POWER switch to 1 (on) position.

Table 3.5.21. RF Antenna Removal and Installation

	Step	Procedure
		REMOVAL
		Tools required: Flat-tipped screwdriver **CAUTION** Damage to rf modems may result if power is not removed from DCP prior to removal or installation. Ensure that UPS POWER switch is set to 0 (off) position and DCP primary circuit breaker module is set to off.
	1	Set UPS POWER switch to off (0) position.
	2	Set primary Circuit Breaker Module A1A3A1 to OFF position.
	3	Remove facility power from DCP equipment cabinet by setting DCP circuit breaker in ac junction box to off.
$ $	4	Disconnect coaxial cable from rf antenna. If yagi antenna, observe antenna polarization relative to ground (vertical or horizontal) and note antenna orientation towards ACU or DCP rf modem antenna.
$	5	Using flat-tipped screwdriver and 3/8-inch nut driver, remove screw, two flat washers, lockwasher, and nut (two places) securing antenna to mounting bracket. Remove antenna.
		INSTALLATION
		Tools required: Flat-tipped screwdriver **CAUTION** Damage to rf modems may result if power is not removed from DCP prior to removal or installation. Ensure that UPS POWER switch is set to 0 (off) position and DCP primary circuit breaker module is set to off.
	1	Ensure that UPS POWER switch is set to off (0) position.
	2	Ensure that primary Circuit Breaker Module A1A3A1 is set to OFF position.

Table 3.5.21. RF Antenna Removal and Installation -CONT

	Step	Procedure
$	2.1	Install replacement antenna. If yagi, orient vertically or horizontally as observed in removal step 4.
	3	Using flat-tipped screwdriver and 3/8-inch nut driver, install screw, two flat washers, lockwasher, and nut (two places) securing antenna to mounting bracket. Ensure that one flat washer is installed under screw head on top side and one under lockwasher on underside of mounting bracket.
	4	Connect coaxial cable to rf antenna.
$ $	4.1	Ensure that antenna orientation is pointed towards the ACU or DCP rf modem antenna (±10°) as noted in removal step 4
	5	Apply facility power to DCP equipment cabinet by setting DCP circuit breaker in ac junction box to on position.
	6	Set primary Circuit Breaker Module A1A3A1 to ON position.
	7	Set UPS POWER switch to 1 (on) position.

Table 3.5.22. Fiberoptic Module Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: Small flat-tipped screwdriver No. 1 Phillips screwdriver **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Ensure that UPS POWER switch is set to 0 (off) position and facility power is removed from DCP.
1	Set UPS POWER switch to off (0) position.
2	Set primary Circuit Breaker Module A1A3A1 to OFF position.
3	Remove facility power from DCP equipment cabinet by setting DCP circuit breaker in ac junction box to off.
4	Using Phillips screwdriver, remove 22 screws and flat washers securing shielded cover assembly to Faraday box. Lower Faraday box cover.
5	Using flat-tipped screwdriver, loosen two integral screws securing connector to top of fiberoptic module. Remove connector from receptacle on fiberoptic module.
6	Accessing underside of faulty fiberoptic module through Faraday box, tag and disconnect fiberoptic transmit (TX) and receive (RX) cables.
7	Using small flat-tipped screwdriver, remove four screws and washers securing fiberoptic module to top of Faraday box.
8	Remove faulty fiberoptic module.
	INSTALLATION
	Tools required: Small flat-tipped screwdriver No. 1 Phillips screwdriver **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Ensure that UPS POWER switch is set to 0 (off) position and facility power is removed from DCP.
1	Ensure that UPS POWER switch is set to off (0) position.
2	Ensure that primary Circuit Breaker Module A1A3A1 is set to OFF position.
3	Ensure that DCP circuit breaker in ac junction box is set to off position.
4	Orient new fiberoptic module to match previously mounted assemblies and align over mounting holes in top of Faraday box.
5	Using small flat-tipped screwdriver, install four screws and washers securing fiberoptic module to top of Faraday box.
6	Using tags as a guide, connect fiberoptic TX and RX cables to appropriate module connector though opened Faraday box.
7	Install connector into receptacle on top of fiberoptic module and secure two integral screws using flat-tipped screwdriver.
8	Using Phillips screwdriver, install 22 screws and flat washers securing shielded cover assembly to Faraday box.
9	Apply facility power to DCP equipment cabinet by setting DCP circuit breaker in ac junction box to on position.
10	Set primary Circuit Breaker Module A1A3A1 to ON position.
11	Set UPS POWER switch to 1 (on) position.

Table 3.5.23. Power Control Module A1A3A1A2-A8 and A9-A18 Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: Large flat-tipped screwdriver **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Ensure that UPS POWER switch is set to 0 (off) position, facility power is removed from DCP, and battery box connector is disconnected.
1	Set UPS POWER switch to off (0) position.
2	Set primary Circuit Breaker Module A1A3A1 to OFF position.
3	Remove facility power from DCP equipment cabinet by setting DCP circuit breaker in ac junction box to off.
4	**WARNING** Sparks are generated when battery box connector J1 is connected or disconnected. Explosive fumes from battery box may be present when DCP cabinet is opened. Ensure that DCP cabinet is ventilated for at least 5 minutes before connecting or disconnecting J1. At DCP battery box, disconnect connector W031-P1 from J1.
5	Using flat-tipped screwdriver, loosen two captive screws securing module retaining strip to power control module rack.
6	Remove module retaining strip from assembly.
7	Release module from connector by placing fingers behind module faceplate and pressing outward. Remove module from rack.
	INSTALLATION
	Tools required: Large flat-tipped screwdriver **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Ensure that UPS POWER switch is set to 0 (off) position, facility power is removed from DCP, and battery box connector is disconnected.
1	Ensure that UPS POWER switch is set to off (0) position.
2	Ensure that primary Circuit Breaker Module A1A3A1 is set to OFF position.
3	Ensure that DCP circuit breaker in ac junction box is set to off position.
$ 4	**WARNING** Sparks are generated when battery box connector J1 is connected or disconnected. Explosive fumes from battery box may be present when DCP cabinet is opened. Ensure that DCP cabinet is ventilated for at least 5 minutes before connecting or disconnecting J1. Ensure that battery box connector W031-P1 is disconnected from battery box.
$ 5	Align module with rack-mounted guides. Carefully push module into rack until firmly seated in rack-mounted connector.
6	Hand-tighten two captive screws securing module retaining strip to power control module rack.

Table 3.5.23. Power Control Module A1A3A1A2-A8 and A9-A18 Removal and Installation

Step	Procedure
7	**WARNING** Sparks are generated when battery box connector J1 is connected or disconnected. Explosive fumes from battery box may be present when DCP cabinet is opened. Ensure that DCP cabinet is ventilated for at least 5 minutes before connecting or disconnecting J1. At DCP battery box, connect connector W031-P1 to J1.
8	Apply facility power to DCP equipment cabinet by setting DCP circuit breaker in ac junction box to on position.
9	Set primary Circuit Breaker Module A1A3A1 to ON position.
10	Set UPS POWER switch to 1 (on) position.

Table 3.5.24. Solid State Relay Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: Small flat-tipped screwdriver No. 2 Phillips screwdriver **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Ensure that UPS POWER switch is set to 0 (off) position and facility power is removed from DCP.
1	Set UPS POWER switch to off (0) position.
2	Set primary Circuit Breaker Module A1A3A1 to OFF position.
3	Remove facility power from DCP equipment cabinet by setting DCP circuit breaker in ac junction box to off.
4	Loosen captive screw in upper center of power control module rack and lower rack assembly.
5	Using flat-tipped screwdriver, remove wires from relay module connectors 1 through 4.
6	Using Phillips screwdriver, remove two screws, lockwashers, and flat washers securing relay module to Mounting Plate Assembly A1.
	INSTALLATION
	Tools required: Small flat-tipped screwdriver No. 2 Phillips screwdriver **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Ensure that OUTPUT POWER switch is set to 0 (off) position and facility power is removed from DCP.
1	Ensure that UPS POWER switch is set to off (0) position.
2	Ensure that primary Circuit Breaker Module A1A3A1 is set to OFF position.
3	Ensure that DCP circuit breaker in ac junction box is set to off position.
4	Using Phillips screwdriver, install two screws, lockwashers, and flat washers securing relay module to DCP.
5	Using flat-tipped screwdriver and wire markers as a guide, install wires on relay module connectors 1 through 4.
6	Raise circuit breaker module rack and secure captive screw.

Table 3.5.24. Solid State Relay Removal and Installation - CONT

Step	Procedure
7	Apply facility power to DCP equipment cabinet by setting DCP circuit breaker in ac junction box to on position.
8	Set primary Circuit Breaker Module A1A3A1 to ON position.
9	Set UPS POWER switch to 1 (on) position.

Table 3.5.25. Heater HR1 Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: No. 2 Phillips screwdriver 3/8-inch nut driver 7/16-inch nut driver
	WARNING Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Ensure that UPS POWER switch is set to 0 (off) position and facility power is removed from DCP.
1	Set UPS POWER switch to off (0) position.
2	Set primary Circuit Breaker Module A1A3A1 to OFF position.
3	Remove facility power from DCP equipment cabinet by setting DCP circuit breaker in ac junction box to off.
4	Using Phillips screwdriver, remove three screws, lockwashers, and flat washers securing heat grill to mounting plate.
5	Using 3/8-inch nut driver, remove three wires from heater.
6	Using Phillips screwdriver, remove six screws and flat washers securing three heater mounting brackets.
7	Using 7/16-inch nut driver, remove two nuts, flat washers, and lockwashers securing heater to mounting plate.
8	Remove heater from DCP.
	INSTALLATION
	Tools required: No. 2 Phillips screwdriver 3/8-inch nut driver 7/16-inch nut driver
	WARNING Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Ensure that UPS POWER switch is set to 0 (off) position and facility power is removed from DCP.
1	Ensure that UPS POWER switch is set to off (0) position.
2	Ensure that primary Circuit Breaker Module A1A3A1 is set to OFF position.
3	Ensure that DCP circuit breaker in ac junction box is set to off position.
4	Position heater in DCP over mounting holes.
5	Using 7/16-inch nut driver, install two nuts, lockwashers, and flat washers securing heater to mounting plate.
6	Using Phillips screwdriver, install six screws and flat washers securing three heater mounting brackets.
7	Using 3/8-inch nut driver and using markers as a guide, install wiring to heater.
8	Using Phillips screwdriver, install three screws, lockwashers, and flat washers securing heater grill to mounting plate.

Table 3.5.25. Heater HR1 Removal and Installation - CONT

Step	Procedure
9	Apply facility power to DCP equipment cabinet by setting DCP circuit breaker in ac junction box to on position.
10	Set primary Circuit Breaker Module A1A3A1 to ON position.
11	Set UPS POWER switch to 1 (on) position.

Table 3.5.26. DCP Heater HR2 Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: No. 2 Phillips screwdriver Diagonal cutting pliers
1	Remove Battery Box A2 from DCP equipment cabinet in accordance with table 3.5.17.
2	Disconnect heater HR2 in-line connector (A1-P1) from DCP harness connector P44.
3	Using Phillips screwdriver, remove three screws, flat washers, and lockwashers securing heater to mounting plate assembly.
4	Remove heater from DCP.
	INSTALLATION
	Tools required: No. 2 Phillips screwdriver Wire stripper Crimping tool Butt splice connectors - M7928/5-3 **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Ensure that UPS POWER switch is set to 0 (off) position and facility power is removed from DCP.
1	Ensure that UPS POWER switch is set to off (0) position.
2	Ensure that primary Circuit Breaker Module A1A3A1 is set to OFF position.
3	Ensure that DCP circuit breaker in ac junction box is set to off position.
4	Ensure that Battery Box A2 is removed from DCP in accordance with table 3.5.17.
5	Position heater in DCP. Using Phillips screwdriver, install three screws, flat washers, and lockwashers securing heater to mounting plate assembly.
6	Connect heater HR2 in-line connector (A1-P1) to DCP harness connector P44.
7	Install DCP battery in accordance with table 3.5.17.

Table 3.5.27. DCP Thermostat Switch Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: Small flat-tipped screwdriver Solder iron **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Ensure that UPS POWER switch is set to 0 (off) position and facility power is removed from DCP.
1	Set UPS POWER switch to off (0) position.
2	Set primary Circuit Breaker Module A1A3A1 to OFF position.
3	Remove facility power from DCP equipment cabinet by setting DCP circuit breaker in ac junction box to off.
4	Loosen captive screw in top of circuit breaker rack and lower rack to facilitate thermostat removal.
5	Tag wires to be removed from faulty thermostat.
6	Using solder iron, remove wires from faulty thermostat.
7	Using flat-tipped screwdriver, remove two screws, flat washers, lockwashers, and nuts securing thermostat to mounting bracket.
8	Remove thermostat from DCP.
	INSTALLATION
	Tools required: Small flat-tipped screwdriver Solder iron **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Ensure that UPS POWER switch is set to 0 (off) position and facility power is removed from DCP.
1	Ensure that UPS POWER switch is set to off (0) position.
2	Ensure that primary Circuit Breaker Module A1A3A1 is set to OFF position.
3	Ensure that DCP circuit breaker in ac junction box is set to off position.
4	Position thermostat in mounting bracket.
5	Using flat-tipped screwdriver, install two screws, flat washers, lockwashers, and nuts securing thermostat to mounting bracket.
6	Using solder iron, install wires on thermostat.
7	Raise circuit breaker module rack and secure captive screw.
8	Apply facility power to DCP equipment cabinet by setting DCP circuit breaker in ac junction box to on position.
9	Set primary Circuit Breaker Module A1A3A1 to ON position.
10	Set UPS POWER switch to 1 (on) position.

Table 3.5.28. DCP Fan Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: No. 1 Phillips screwdriver No. 2 Phillips screwdriver Small flat-tipped screwdriver 5/16-inch open-end wrench **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Ensure that UPS POWER switch is set to 0 (off) position and facility power is removed from DCP.
1	Set UPS POWER switch to off (0) position.
2	Set primary Circuit Breaker Module A1A3A1 to OFF position.
3	Remove facility power from DCP equipment cabinet by setting DCP circuit breaker in ac junction box to off.
4	Loosen captive screw in top of circuit breaker rack and lower rack to facilitate fan removal.
5	Remove rf modem mounting plate (with modem(s) attached) in accordance with table 3.5.19.
6	Using flat-tipped screwdriver, remove fan wiring (four wires) from ac power distribution assembly.
7	Using Phillips screwdriver, remove screw and flat washer securing two ground wires to fan A2B2.
8	Using Phillips screwdriver, remove four screws, nuts, flat washers, and lockwashers securing fan assembly to card rack assembly.
9	Remove fan assembly from DCP.
10	Using Phillips screwdriver, remove four screws, nuts, flat washers, and lockwashers securing fan to mounting plate.
11	Remove fan from mounting plate.
	INSTALLATION
	Tools required: No. 1 Phillips screwdriver No. 2 Phillips screwdriver Small flat-tipped screwdriver **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Ensure that UPS POWER switch is set to 0 (off) position and facility power is removed from DCP.
1	Ensure that UPS POWER switch is set to off (0) position.
2	Ensure that primary Circuit Breaker Module A1A3A1 is set to off position.
3	Ensure that DCP circuit breaker in ac junction box is set to off position.
4	Ensure that Circuit Breaker Rack A1A3 is lowered.
5	Ensure that rf modem mounting plate is removed.
6	Position fan on mounting plate.
7	Using Phillips screwdriver, install four screws, flat washers, lockwashers, and nuts securing fan and guard to mounting plate.
8	Position fan assembly in DCP under card rack assembly.
9	Using Phillips screwdriver, install four screws, nuts, flat washers, and lockwashers securing fan assembly to card rack assembly.
10	Using Phillips screwdriver, install screw and flat washer securing two ground wires to fan A2B2.
11	Using flat-tipped screwdriver, install fan wiring (four wires) to ac power distribution assembly.

Table 3.5.28. DCP Fan Removal and Installation

Step	Procedure
12	Raise circuit breaker module rack and secure captive screw.
13	Install rf modem mounting plate (with modem(s) attached) in rf mounting bracket in accordance with table 3.5.19.
14	Apply facility power to DCP equipment cabinet by setting DCP circuit breaker in ac junction box to on position.
15	Set primary Circuit Breaker Module A1A3A1 to ON position.
16	Set UPS POWER switch to 1 (on) position.

Table 3.5.29. Primary and Secondary Circuit Breakers A1A3A1CB1 and A10CB1 Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: Large flat-tipped screwdriver No. 1 Phillips screwdriver **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Ensure that UPS POWER switch is set to 0 (off) position, facility power is removed from DCP, and battery box connector is disconnected.
1	Set UPS POWER switch to OFF (0) position.
2	Set primary Circuit Breaker Module A1A3A1 to OFF position.
3	Remove facility power from DCP equipment cabinet by setting DCP circuit breaker in ac junction box to off.
4	**WARNING** Sparks are generated when battery box connector J1 is connected or disconnected. Explosive fumes from battery box may be present when DCP cabinet is opened. Ensure DCP cabinet is ventilated for at least 5 minutes before connecting or disconnecting J1. At DCP battery box, disconnect connector W031-P1 from J1.
5	Using flat-tipped screwdriver, loosen two captive screws securing module retaining strip to rack.
6	Remove module retaining strip from assembly.
7	Slide primary module A1A3A1 or secondary module A1A3A10 forward to gain access to solderless (spade) connectors behind circuit breaker CB1.
8	Disconnect spade connectors from circuit breaker CB1 and slide module out of rack.
9	Using Phillips screwdriver, remove two screws, lockwashers, and flat washers securing circuit breaker CB1 to module faceplate.

Table 3.5.29. Primary and Secondary Circuit Breakers A1A3A1CB1 and A10CB1 Removal and Installation

Step	Procedure
	INSTALLATION
	Tools required: Large flat-tipped screwdriver No. 1 Phillips screwdriver **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Ensure that UPS POWER switch is set to 0 (off) position, facility power is removed from DCP, and battery box connector is disconnected.
1	Ensure that UPS POWER switch is set to OFF (0) position.
2	Ensure that DCP circuit breaker in ac junction box is set to off position.
	WARNING Sparks are generated when battery box connector J1 is connected or disconnected. Explosive fumes from battery box may be present when DCP cabinet is opened. Ensure DCP cabinet is ventilated for at least 5 minutes before connecting or disconnecting J1.
3	Ensure that battery box connector W031-P1 is disconnected from battery box.
	WARNING Circuit breaker must be oriented so that power is removed from DCP when switch is in right position. Death or severe injury may result if circuit breaker is not properly oriented.
4	Position circuit breaker CB1 on module faceplate. Ensure that breaker is oriented so that breaker turns off to right position (looking toward faceplate). In this position, LOAD connector of circuit breaker CB1 is on right and LINE connector is on left.
5	Using Phillips screwdriver, install two screws, lockwashers, and flat washers securing circuit breaker CB1 to module faceplate.
6	Slide module into position in Circuit Breaker Rack A1A3 far enough to connect wires to back of circuit breaker CB1.
7	Using markers as a guide, connect solderless (spade) connectors to LINE and LOAD terminals of circuit breaker CB1.
8	Slide module fully into circuit breaker rack.
9	Hand-tighten two captive screws securing module retaining strip to rack.
	WARNING Sparks are generated when battery box connector J1 is connected or disconnected. Explosive fumes from battery box may be present when DCP cabinet is opened. Ensure that DCP cabinet is ventilated for at least 5 minutes before connecting or disconnecting J1.
10	At DCP battery box, connect connector W031-P1 to J1.
11	Apply facility power to DCP equipment cabinet by setting DCP circuit breaker in ac junction box to on position.
12	Set primary Circuit Breaker Module A1A3A1 to ON position.
13	Set UPS POWER switch on UPS status panel to 1 (on) position.

Table 3.5.30. Power Supply Assembly Diodes A4CR1 Through A4CR6 Removal and Installation

Step	Procedure
	REMOVAL
	Tools required: 3/8-inch socket and ratchet 3/8-inch open end wrench Diagonal cutting pliers **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities.
1	Set UPS POWER switch to off (0) position.
2	Set primary Circuit Breaker Module A1A3A1 to off position.
3	Remove facility power from the DCP equipment cabinet by setting circuit breaker in ac junction box to off.
4	At DCP battery box, disconnect connector W031-P1 from J1.
5	At Power Supply Assembly A4, disconnect harness connectors W024-P1 through W024-P4.
6	Using 3/8-inch socket and ratchet, remove six nuts, lockwashers, and flat washers securing Power Supply Assembly A4 to DCP equipment cabinet.
7	Carefully remove Power Supply Assembly A4 from DCP equipment cabinet.
8	Lay Power Supply Assembly A4 flat on a suiTable work surface at a location where soldering can be performed.
9	Locate diode to be removed (CR1 through CR6).
10	**NOTE** Anode of diode is canister end. Cathode is end with threaded shaft. Using diagonal cutting pliers, cut wire soldered to anode of diode (cut as close to anode terminal as possible).
11	**CAUTION** Diode is mounted to bracket using two film washers, one plastic insulator ring, one flat washer, and one 3/8-inch nut. Throughout this procedure, care must be taken not to damage or lose these parts. Using 3/8-inch open end wrench, remove nut from cathode of diode.
12	Carefully slide wire with terminal lug from threaded cathode shaft.
13	Carefully remove diode from mounting bracket, retaining flat washer, two film washers, and plastic insulator ring.
	INSTALLATION
	Tools required: 3/8-inch socket and ratchet 3/8-inch open end wrench Wire stripping tool Digital multimeter Soldering iron Solder, tin/lead alloy (specification QQ-S-571) **NOTE** Diode mounting hardware (two film washers, plastic insulator ring, metal flat washer, and 3/8-inch nut) is part of diode mounting kit 62828-90167-1. If hardware is damaged or lost, a new mounting kit must be obtained.
1	Place one film washer over diode-threaded shaft and seat against base of canister.

Table 3.5.30. Power Supply Assembly Diodes A4CR1 Through A4CR6 Removal and Installation - CONT

Step	Procedure
2	Insert diode (with film washer) into position in mounting bracket and hold in position (threaded cathode shaft faces center of Power Supply Assembly A4).
3	While holding diode in position, slide plastic insulator ring over threaded shaft and seat into position between threaded shaft and surrounding mounting bracket.
4	Slide second film washer over threaded shaft and seat flat against mounting bracket.
5	Slide metal flat washer over threaded shaft and seat flat against second film washer.
6	Slide terminal lug of cathode wire over threaded shaft and seat flat against metal flat washer.
7	Using 3/8-inch open end wrench, install nut onto threaded shaft to secure diode to mounting bracket.
8	Using digital multimeter, verify that diode is properly insulated from mounting bracket by verifying no continuity between anode terminal and bracket and between cathode shaft and bracket.
9	Using wire stripping tool, strip approximately ½ inch of insulation from anode wire that was previously cut from diode.
10	Using soldering iron and solder, tin exposed end of anode wire.
11	Using soldering iron and solder, solder anode wire to anode terminal of diode.
12	**WARNING** Death or severe injury may result if power is not removed from DCP prior to performing maintenance activities. Ensure that OUTPUT POWER switch S1 on UPS status panel is set to off (0) position and OUTPUT indicator is extinguished.
13	Ensure that primary Circuit Breaker Module A1A3A1 is set to OFF position.
14	Ensure that DCP circuit breaker in ac junction box is set to off position.
15	At DCP battery box, ensure that connector W031-P1 is disconnected from J1.
16	Carefully position Power Supply Assembly A4 in DCP equipment cabinet, ensuring that bottom of A4 plate rests on mounting support at bottom of right wall.
17	Using 3/8-inch socket and ratchet, install six nuts, lockwashers, and flat washers securing power supply mounting plate assembly.
18	Connect cables to connectors W024-P1 through W024-P4.
19	At DCP battery box, connect connector W031-P1 to J1.
20	Apply facility power to DCP equipment cabinet by setting DCP circuit breaker in ac junction box to on position.
21	Set primary Circuit Breaker Module A1A3A1 to ON position.
22	Set UPS POWER switch to 1 (on) position.

Table 3.5.31. Uninterruptible Power Supply Removal and Installation

	Step	Procedure
		REMOVAL
		Tools required: Phillips screwdriver
$ $ $		**WARNING** Death or severe injury may result if power is not removed from the DCP prior to performing maintenance activities. Ensure that UPS POWER switch is set to off position and that facility power is removed from the DCP. Severe injury may result if the negative and positive battery terminals are shorted together. Exercise caution while removing batteries.
$	1	Set UPS power switch to off position.
$	2	Remove facility power from DCP cabinet.
	3	Disconnect UPS from wiring harness by removing connectors P45, P1, and P33.
	4	Using screwdriver, disconnect COMM PORT connector P2 by removing two screws.
	5	Unstrap UPS from backplate.
	6	Lift and pull UPS off of backplate.
		INSTALLATION
		Tools required: Phillips screwdriver
$ $ $		**WARNING** Death or severe injury may result if power is not removed from the DCP prior to performing maintenance activities. Ensure that UPS POWER switch is set to off position and that facility power is removed from the DCP.
$	1	Verify that UPS power switch is set to off position.
$	2	Verify that facility power is removed from DCP.
	3	Place UPS on backplane.
	4	Secure UPS onto backplane with strap.
	5	Using screwdriver, connect COMM PORT connector P2 by securing two screws.
	6	Connect UPS to wiring harness by connecting connectors P45, P1, and P33.
	7	Apply facility power.
$	8	Set UPS power switch to on position.

3.5.5 DCP CPU AND SIO (RS-232) BOARD JUMPER CONFIGURATIONS

When replacing a DCP CPU board, the technician must configure jumpers on a basic XVME-601/6 CPU board (manufacturer's P/N 70601-006) for the slot in which it is to be installed. This changes the CPU part number to 62828-47006-XX, where XX is determined by the slot number. Similarly, when replacing a DCP-RS-232 SIO board, the technician must configure jumpers on a basic XVME-490/1 board (manufacturer's P/N 70490-001) to create the 62828-47014-XX part that corresponds to the slot in which it is to be installed. Altered item drawings for selected DCP circuit boards, which define the jumper configurations, are located at the end of Chapter 2, Section V (paragraph 2.5.8).

3.5.6 SETTING UP LINE DRIVER MODEMS

The model D19.2 line drivers are obsolete and are replaced by the model DDS/MR64. If a D19.2 line driver fails at a site and spare D19.2 line drivers are not available, then all the D19.2 line drivers must be replaced with the DDS/MR64 line drivers. After installation, the DDS/MR64 line drivers must be manually programmed to operate with the ASOS parameters by using the LCD display and the YES and NO pushbutton switches on the front panel of the modem (same as rack-mounted modems shown on figure 2.3.4). The LCD display presents main menus, submenus, and configuration options to the technician. The YES/NO pushbuttons are used to sequence through the main menus and submenus and to select appropriate options. The Installation and Operation Manual for the stand-alone line driver provides detailed information on all menus, submenus, and options available with the modem and provides instructions on their use. Table 3.5.33 $
identifies the settings that must be manually made for the model DDS/MR64 line driver. This table addresses $
only the settings that must be checked or changed by the technician. The table does not address options that are automatically set by the factory or are not required for ASOS operation. The actual menu and option titles that appear on the modem LCD display may vary, depending on the modem's internal firmware.

3.5.7 JOHNSON DATA RF MODEM SETUP $

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Johnson Data rf modem frequencies are assigned and setup at the depot. Order rf modem part number $
62828-40506-1 for 410.075 MHz or 62828-40506-2 for 410.950 MHz. $

$

$ **Table 3.5.32. Line Driver Removal and Installation**

Step	Procedure
	REMOVAL
	Tools required: Small flat-tipped screwdriver No. 2 Phillips screwdriver **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Ensure that UPS POWER switch is set to 0 (off) position and facility power is removed from DCP.
1	Set UPS POWER switch to off (0) position.
2	Set primary Circuit Breaker Module A1A3A1 to OFF position.
3	Remove facility power from DCP equipment cabinet by setting DCP circuit breaker in ac junction box to off.
4	At DCP line driver, remove cables from line driver DDS and DDE connectors.
5	At AC Power Distribution Assembly A1A4, remove line driver power connections as follows: LD #1 (2A1A5A1) A1A4-12D (115VAC) A1A4-17D (NEUT) A1A4-23C (GND) LD#2 (2A1A5A2) A1A2-13D (115VAC) A1A4-18D (NEUT) A1A4-23D (GND)
6	Remove and retain hardware securing line driver from 2A1A5 bracket. Remove line driver.
	INSTALLATION
	Tools required: Small flat-tipped screwdriver No. 2 Phillips screwdriver **WARNING** Death or severe injury may result if power is not removed from DCP prior to maintenance activities. Ensure that OUTPUT POWER switch is set to 0 (off) position and facility power is removed from DCP.
1	Ensure that UPS POWER switch is set to off (0) position.
2	Ensure that primary Circuit Breaker Module A1A3A1 is set to OFF position.
3	Ensure that DCP circuit breaker in ac junction box is set to off position.
4	Remove cover from Line Driver and set switches and install jumpers per table 3.5.32. Replace cover.
5	At DCP, use hardware retained from removal step 6 to secure line driver to 2A1A5 bracket.
6	Install cables to line driver DDS and DDE connectors.
7	At AC Power Distribution Assembly A1A4, connect line driver power connections as follows: LD #1 (2A1A5A1) A1A4-12D (115VAC) A1A4-17D (NEUT) A1A4-23C (GND) LD#2 (2A1A5A2) A1A2-13D (115VAC) A1A4-18D (NEUT) A1A4-23D (GND)
8	Apply facility power to DCP equipment cabinet by setting DCP circuit breaker in ac junction box to on position.
9	Set primary Circuit Breaker Module A1A3A1 to ON position.
10	Set UPS POWER switch to 1 (on) position.

Table 3.5.33. Model DDS/MR64 Stand Alone Line Driver Setup $

Step	Procedure		
	NOTE D19.2 line drivers and DDS/MR64 line drivers are not compatible. If a D19.2 line driver fails and the failed line driver must be replaced with a DDS/MR64 line driver, all D19.2 installed in the system must be replaced with DDS/MR64 line drivers. Ensure that the line driver LCD does not display "ERROR", if "ERROR" cannot be cleared the line driver may be defective. The line driver is configured by using the front panel push buttons. Use the NO push button to cycle through the menu options and the YES push button to select the submenus. Configuration options are selected by pressing YES or NO push buttons when prompted by LCD display with "CHANGE?". Pressing YES activates the configuration option.		
1	Use front panel push buttons to configure the DDS/MR64 line driver as follows:		
	Display	**Press**	**Configures Option**
	"NO SIGNAL ASYNC DTE RATE" or "ASYNC RA 1200 2.4K BPS LINE"	HOME	(start configuration process)
	TEST	NO	N/A
	"SYNC DTE CHANGE?"	YES	ASYNC DTE
	"RATE ADAPTER DISABLED - CHANGE?"	NO	DISABLE
	"CHANGE TIMING ?"	YES	**DDS**
	"CHG LINE RATE?"	YES	2400 BPS
	"BITS PER WORD=09 CHANGE?"	YES	10
	"CHANGE CONTROL OPTIONS?"	YES	N/A
	"CHANGE RTS CONTROL?"	YES	NORMAL RTS
	"CHANGE SYNC BUFFER OPT?:"	YES	SYNC BUFFER DIS
	"CHANGE REMOTE LB OPT?"	YES	RMT LB ENABLED
	"CHANGE DSR OPTION?"	YES	DSR OPT ENABLED
	"CHANGE SYS STATUS OPT?"	YES	SS OPT DISABLED
	"CHANGE CA OTP?"	YES	CA OPT DISABLED
	"CHANGE RTS-CTS DELAY?"	YES	RTS-CTS NORMAL
	"CHANGE DTE RL OPT?"	YES	DTE RL DISABLED
	"CHANGE DTE LL OPT?"	YES	DTE LL DISABLED
	"CHANGE DTE TP OPT?"	YES	DTE TP DISABLED
	"CHANGE DTE RT OPT?"	YES	DTE RT DISABLED
	"CHANGE 64K SCRAM OPT?	YES	SCRAMBLER DIS
	"LOAD FACTORY OPTION SET?	NO	N/A
	"SAVE NEW CONFIGURATION?"	YES	N/A
2	Remove power from line driver.		

$ **Table 3.5.33. Model DDS/MR64 Stand Alone Line Driver Setup -CONT**

Step	Procedure
	NOTE In order to set internal jumpers, the line driver must be removed from the DCP and the line driver cover must be removed.
3	Remove cover from line driver as follows: a. Place line driver on its side on a flat surface and place small screwdriver blade in one of the rear latch slots. b. Gently push screwdriver while lightly twisting srewdriver back and forth to release lock prong from lock clip. Assist removal by using fingers to pry cover from chassis. c. Repeat steps a and b for remaining three latches.
4	Set line driver internal jumpers as follows (refer to figure 2.5.1A): SW1- RS232 Enable JP1 EN JP2 CH GND SW2- V.35 Enable SW3-1 OFF SW3-2 ON SW3-3 OFF SW3-4 OFF SW3-5 OFF SW3-6 OFF SW3-7 OFF SW3-8 OFF SW4-1 OFF SW4-2 OFF SW4-3 ON SW4-4 ON
5	Replace line driver cover by aligning rear panel slot guides and front panel lock tabs then pressing cover to the chassis until the lock prongs engage the lock clips.
6	Reinstall line driver, connect power and signal cables, and apply power to the line driver.