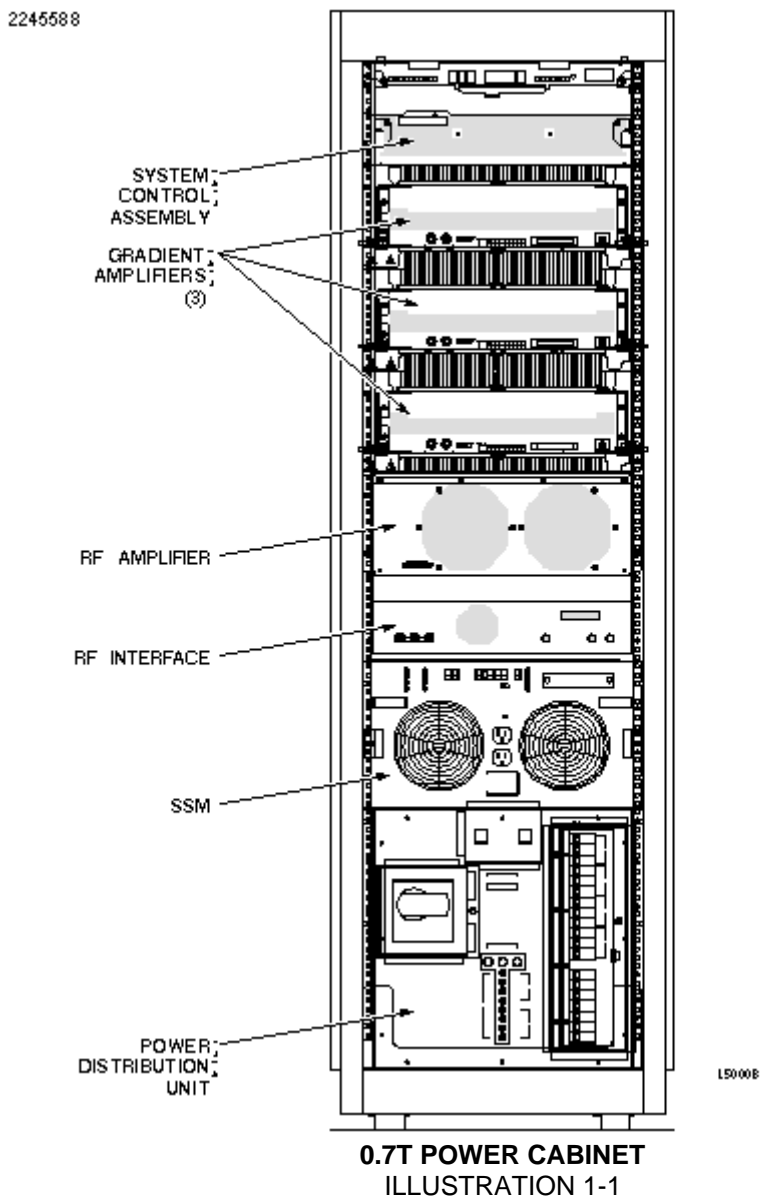


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1- OVERVIEW AND TOOLS REQUIRED

This procedure describes the removal and replacement of the system support module (SSM) and its components. This includes the analog processor module (APM), the communications pin driver (CPD), the front panel display, the integrated power supply (IPS), and the rear panel assembly.



Tools Required

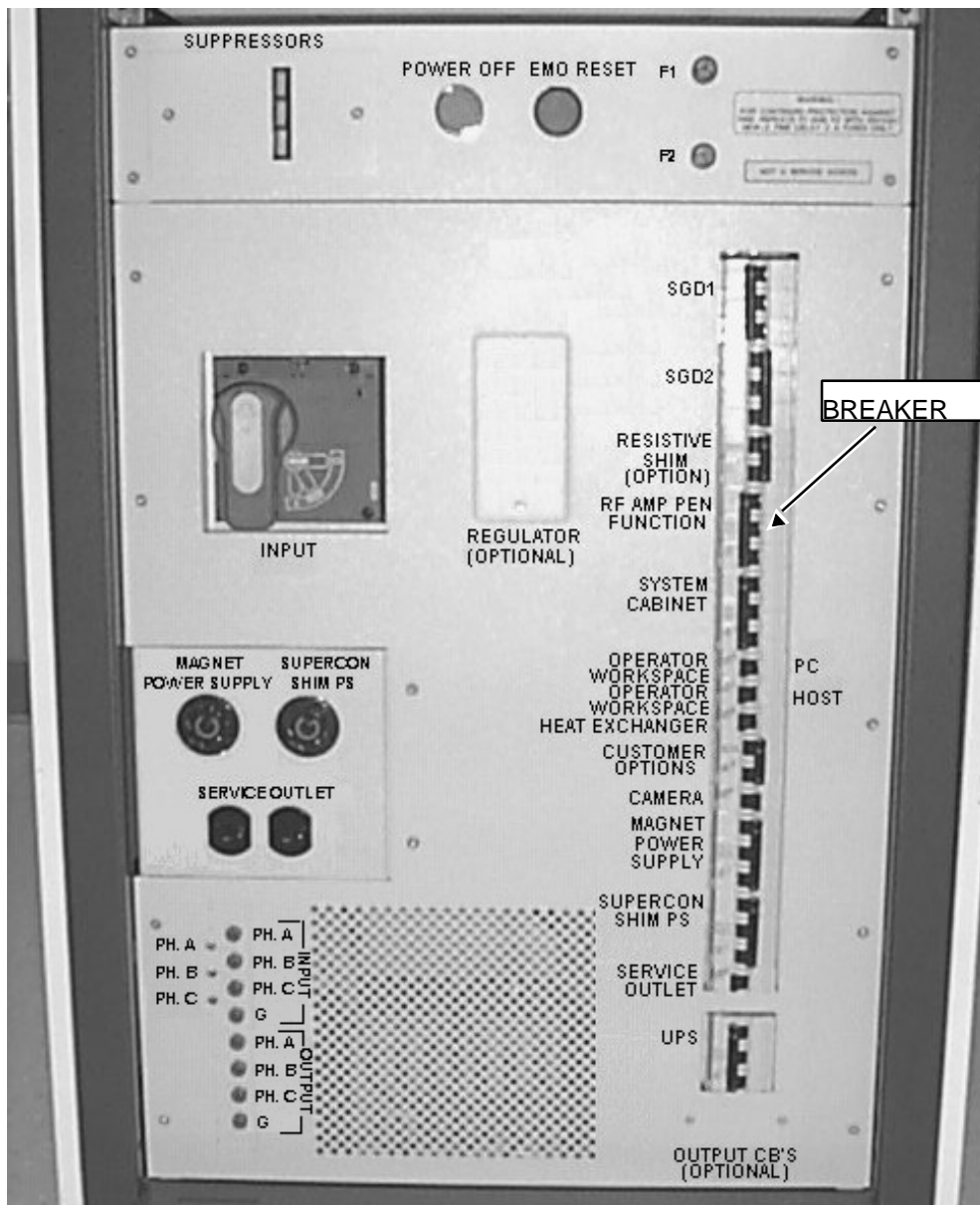
- #2 Phillips screwdriver
- #1 Phillips screwdriver
- 3/16" nut driver

2- LOCK OUT / TAG OUT PROCESS

1. Remove the 0.7T Power Cabinet front cover, switch OFF the SSM circuit breaker, and tag out. See **Illustration** 2-1. (Refer to CD-ROM *Dir. 2250758-3 [or -2], MR Signa OpenSpeed Service Methods, Renewal Parts and Service Tools, Safety, Section 6, OSHA LOCKOUT/TAGOUT REQUIREMENTS.*)

WARNING!

POSSIBLE PERSONAL INJURY! REMOVE POWER FROM THE CABINET BEFORE REMOVING ANY COMPONENTS FROM THE SYSTEM SUPPORT MODULE.



BREAKER LOCATION
ILLUSTRATION 2-1

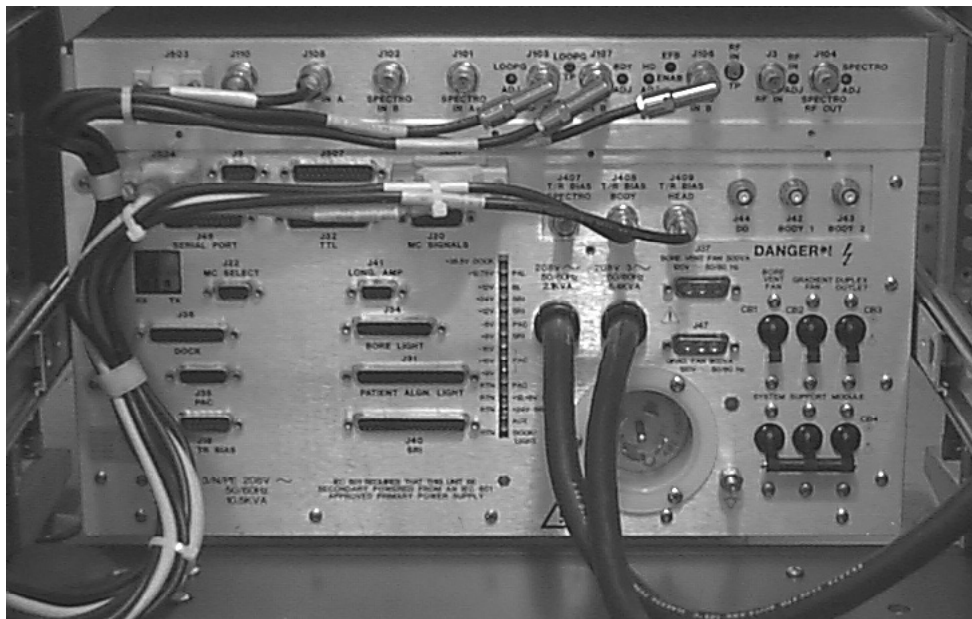
- Remove rear cabinet door and turn OFF the cabinet power circuit breakers on the rear of the SSM (see Illustration 2-2) and tag.

WARNING!

POSSIBLE PERSONAL INJURY! REMOVE POWER FROM THE CABINET BEFORE REMOVING ANY COMPONENTS FROM THE SYSTEM SUPPORT MODULE. VERIFY THAT ALL BREAKERS IN THE REAR OF THE CABINET ARE OFF, AND DISCONNECT THE MAIN POWER FEED CORD BEFORE OPENING THE CHASSIS FOR SERVICE. SERIOUS INJURY OR DEATH BY ELECTROCUTION MAY OTHERWISE OCCUR. LOCK OUT AND TAG OUT THE CABINET.

- Remove the P1 humboldt connector on rear of SSM. See Illustration 2-2 for location.

SSM power at Power Supply Unit should be OFF. CB1, CB2, CB3, CB4 to OFF at rear of SSM. Remove P1 Humbolt Power Connector at rear of SSM.

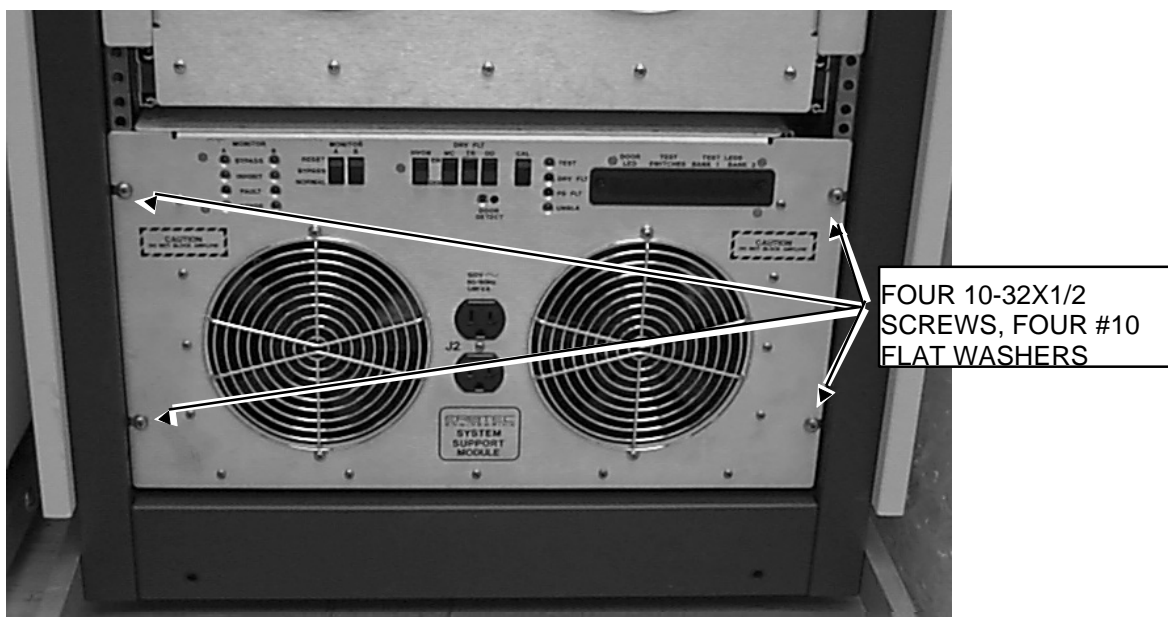


REAR CABINET CIRCUIT BREAKER LOCATIONS
ILLUSTRATION 2-2

- Verify that power to the RF Amp and PEN functions are OFF by making sure the fans and LEDs on the RFI, RF Amp, and SSM (System Support Module) are OFF.

3- REMOVAL OF ENTIRE SSM

1. Verify that the power is OFF, and that the cabinet is locked out and tagged out per the instructions in Section 2. (Refer to CD-ROM *Dir. 2250758-3 [or -2], MR Signa OpenSpeed Service Methods, Renewal Parts and Service Tools, Safety, Section 6, OSHA LOCKOUT/TAGOUT REQUIREMENTS.*)
2. Remove the front door from the cabinet.
3. Remove the four 10-32x1/2 screws and four #10 flat washers that secure the SSM chassis to the cabinet (see Illustration 3-1).

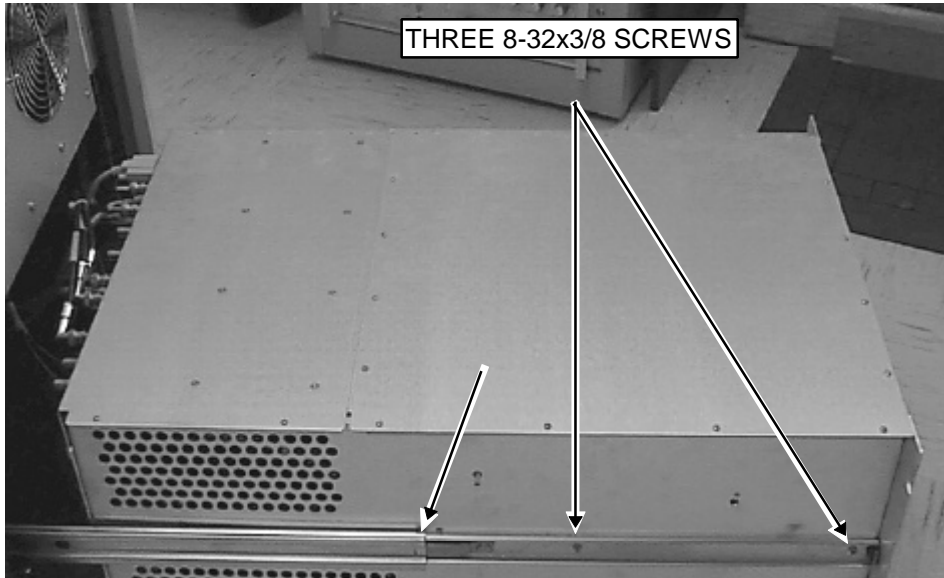


REMOVAL OF SYSTEM SUPPORT MODULE
ILLUSTRATION 3-1

4. Remove all external cabling to the SSM.
5. Slide out the SSM from the cabinet.
6. Support the module from beneath to alleviate pressure on the slides.

3- REMOVAL OF ENTIRE SSM (continued)

7. Remove the six 8-32x3/8 screws (three per slide) that secure the rack slides to the module. This enables you to completely remove the unit. See Illustration 3-2.



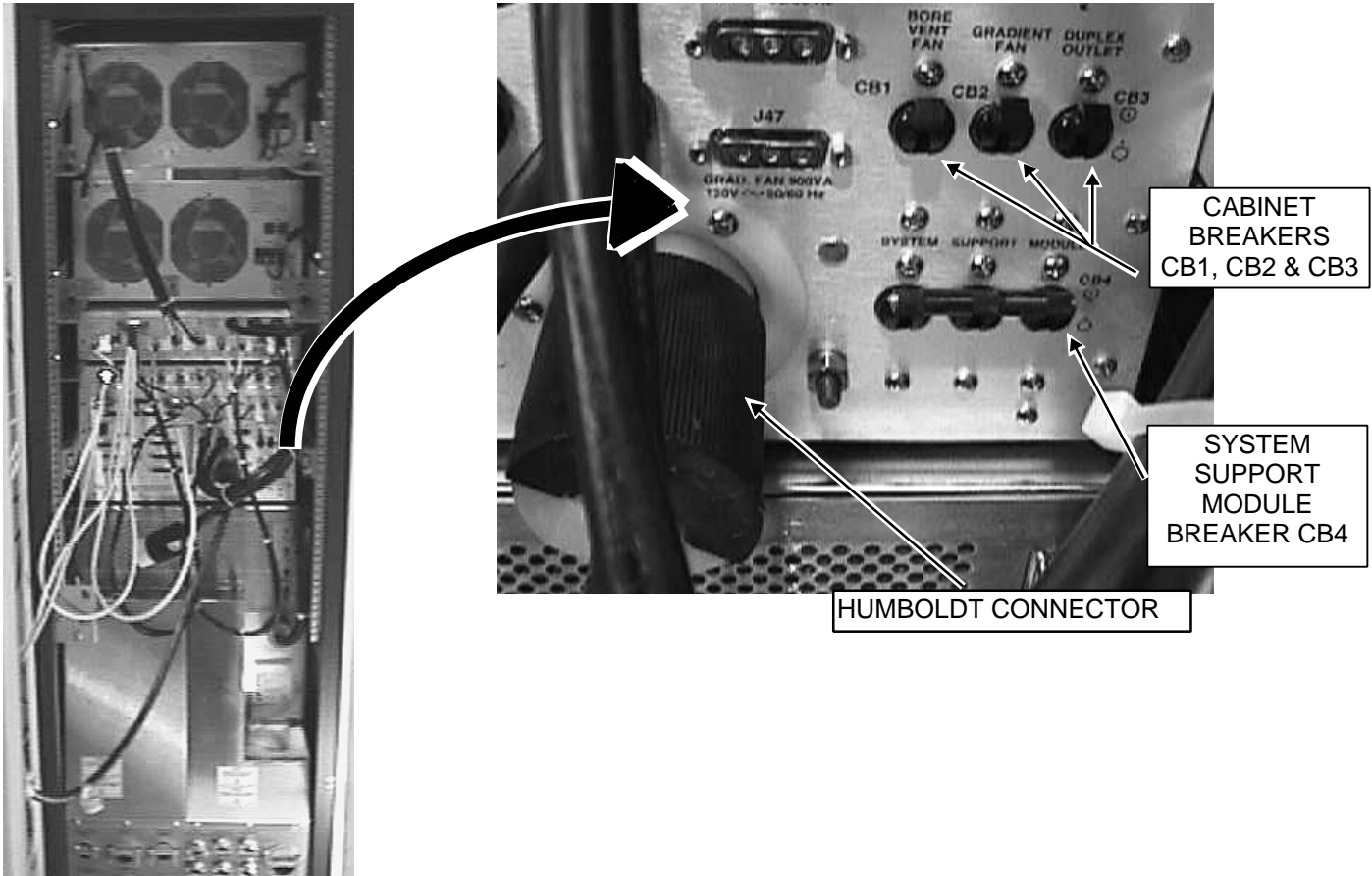
RACK SLIDE SCREW LOCATIONS
ILLUSTRATION 3-2

4- INSTALLATION OF NEW SSM

1. Support the SSM from beneath to alleviate pressure on the slides.
2. Install the six 8-32x3/8 screws (three per slide) that secure the rack slides to the module.
3. Carefully slide the SSM back into the cabinet. (Press the slide locks to enable the module to slide completely into the cabinet.)
4. Install the four 10-32x1/2 screws and four #10 flat washers that secure the SSM to the cabinet (see Illustration 3-1).
5. Replace all external connections.
6. Install front door.

4- INSTALLATION OF NEW SSM (continued)

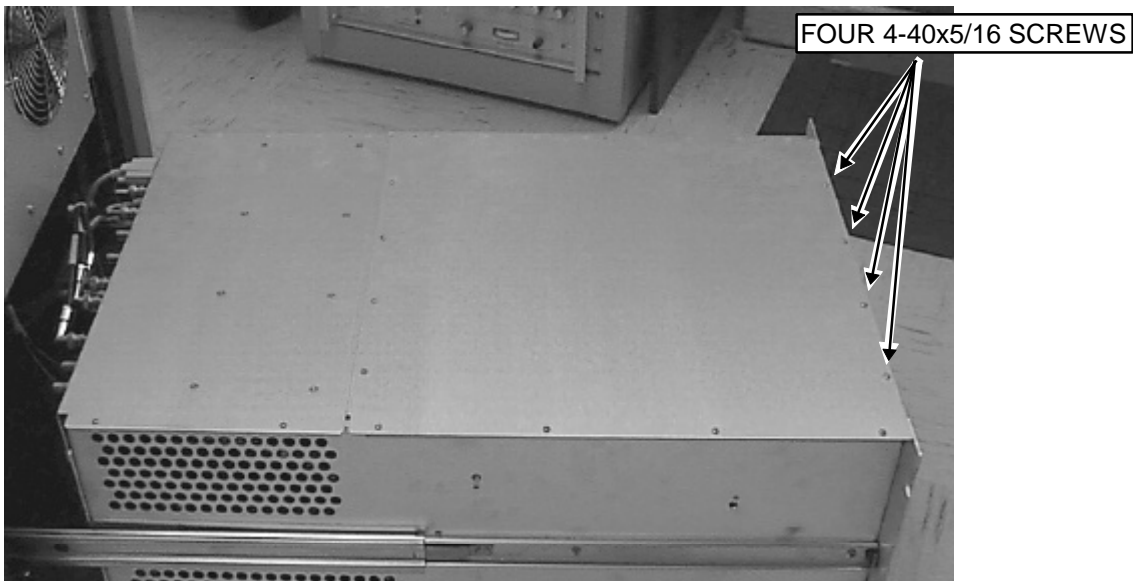
7. Remove lock out and tag out, and restore power to the cabinet (see Illustration 4-2).



REMOVING LOCK OUT, TAGOUT
ILLUSTRATION 4-2

5- REMOVING LID FROM SSM CHASSIS

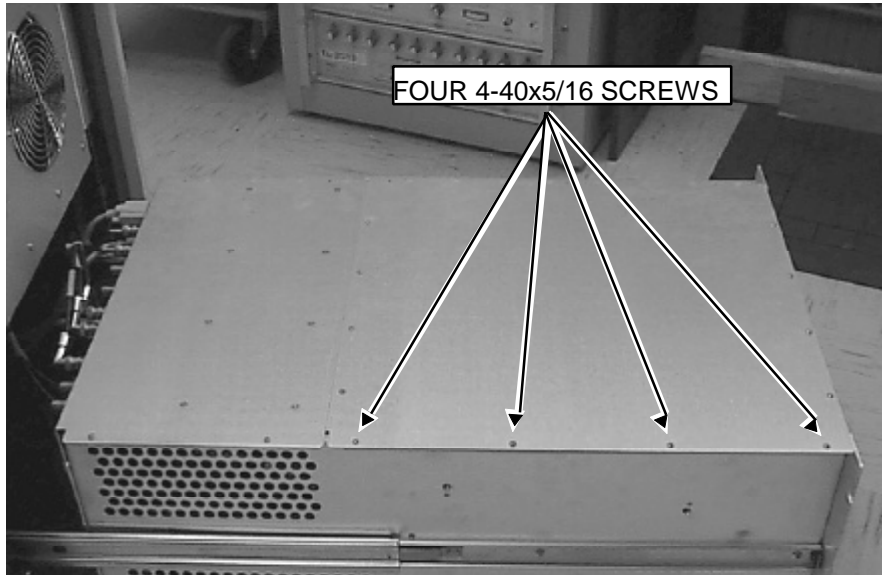
1. Verify that the power is OFF, and that the cabinet is locked out and tagged out per the instructions in Section 2. (Refer to CD-ROM *Dir. 2250758-3 [or -2], MR Signa OpenSpeed Service Methods, Renewal Parts and Service Tools, Safety, Section 6, OSHA LOCKOUT/TAGOUT REQUIREMENTS.*)
2. Remove SSM from cabinet per instructions in Section 3.
3. Remove the four 4-40x5/16 panhead screws that secure the front lid to the front panel (see Illustration 5-1).



REMOVAL OF SYSTEM SUPPORT MODULE LID FROM FRONT PANEL
ILLUSTRATION 5-1

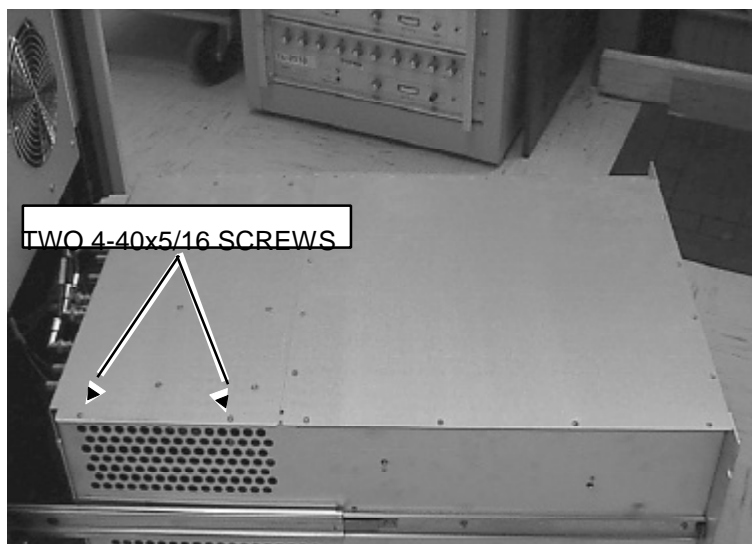
5- REMOVING LID FROM SSM CHASSIS (continued)

4. Remove the four 4-40x5/16 panhead screws that secure the front lid to the chassis (see Illustration 5-2).



REMOVAL OF SYSTEM SUPPORT MODULE LID FROM CHASSIS
ILLUSTRATION 5-2

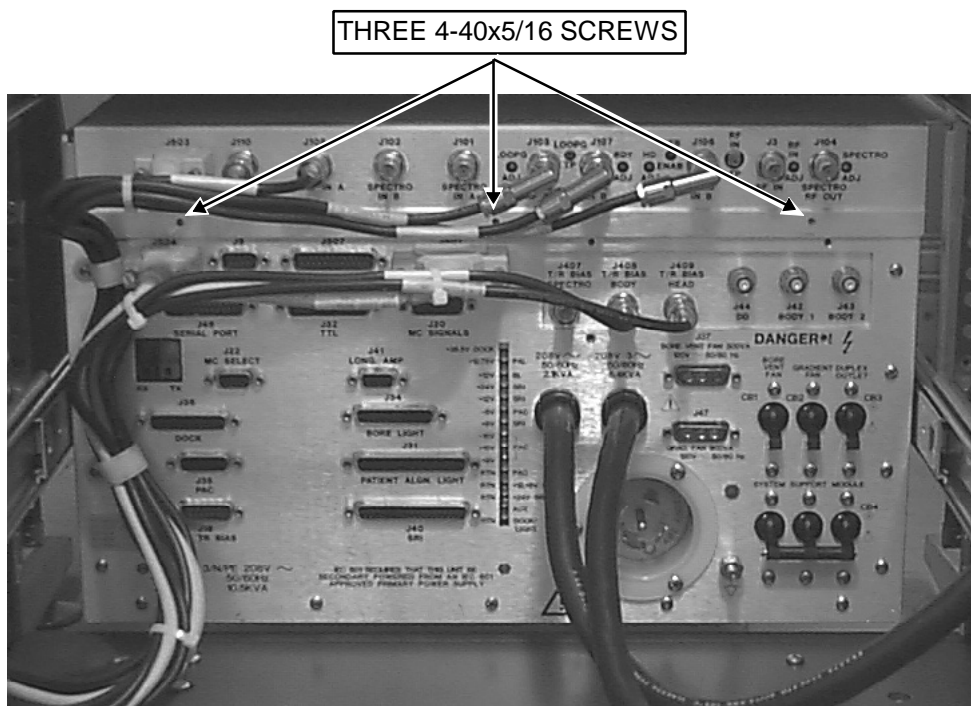
5. Remove the two 4-40x5/16 panhead screws that secure the APM lid to the chassis (see Illustration 5-3).



REMOVAL OF ANALOG PROCESSOR MODULE LID FROM CHASSIS
ILLUSTRATION 5-3

5- REMOVING LID FROM SSM CHASSIS (continued)

6. Remove the three 4-40x5/16 panhead screws that secure the APM lid to the rear panel (see Illustration 5-4). A few cables may need to be disconnected first.



REMOVAL OF ANALOG PROCESSOR MODULE LID FROM REAR PANEL
ILLUSTRATION 5-4

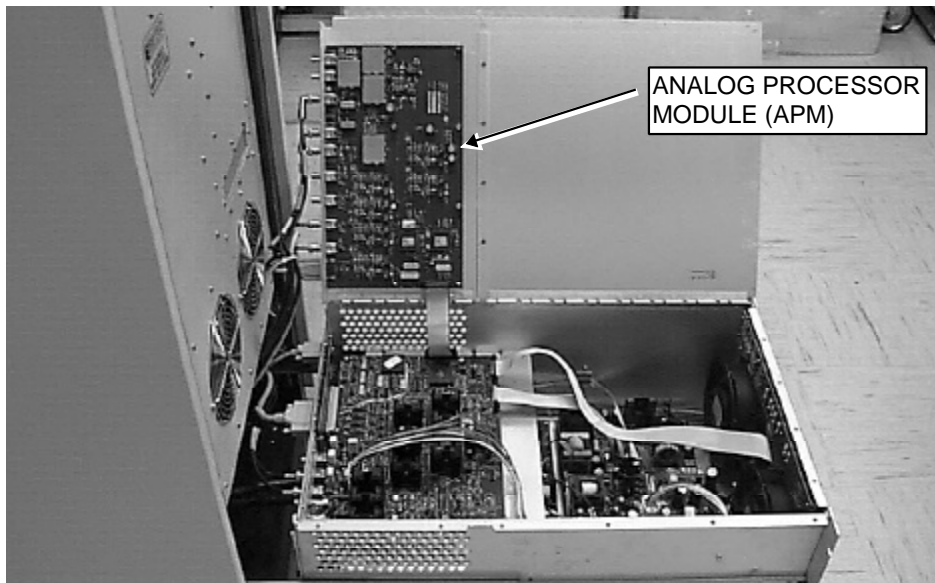
7. Grasp the edge of the module lid where the APM lid meets the front lid, and lift the lid to a vertical position. Use care to ensure that the APM cables do not catch on the bottom of the RF amplifier and that there is sufficient slack.

Go to the appropriate section to continue the remove and replace procedure:

- See section 6- Removal of Failed APM Module
- See section 8- Removal of Failed CPD Module
- See section 10- Removal of Failed Front Panel Display Board
- See section 12- Removal of Failed IPS Module
- See section 14- Removal of Failed Rear Panel Assembly

6- REMOVAL OF FAILED APM MODULE

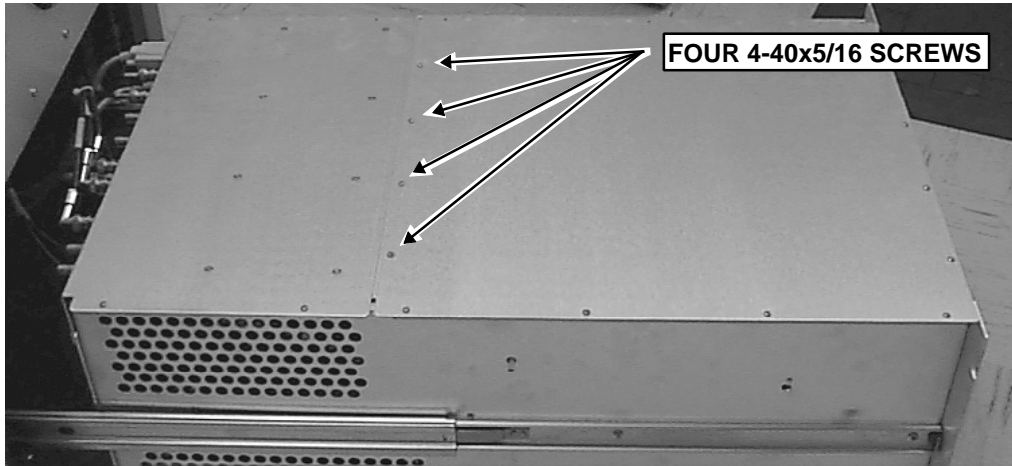
1. Verify that the power is OFF, and that the cabinet is locked out and tagged out per the instructions in Section 2. (Refer to CD-ROM *Dir. 2250758-3 [or -2], MR Signa OpenSpeed Service Methods, Renewal Parts and Service Tools, Safety, Section 6, OSHA LOCKOUT/TAGOUT REQUIREMENTS.*)
2. Remove SSM from cabinet per instructions in Section 3.
3. Remove lid from SSM chassis per instructions in Section 5.
4. The APM module is the lid assembly near the rear of the SSM (see Illustration 6-1).



ANALOG PROCESSOR MODULE LOCATION
ILLUSTRATION 6-1

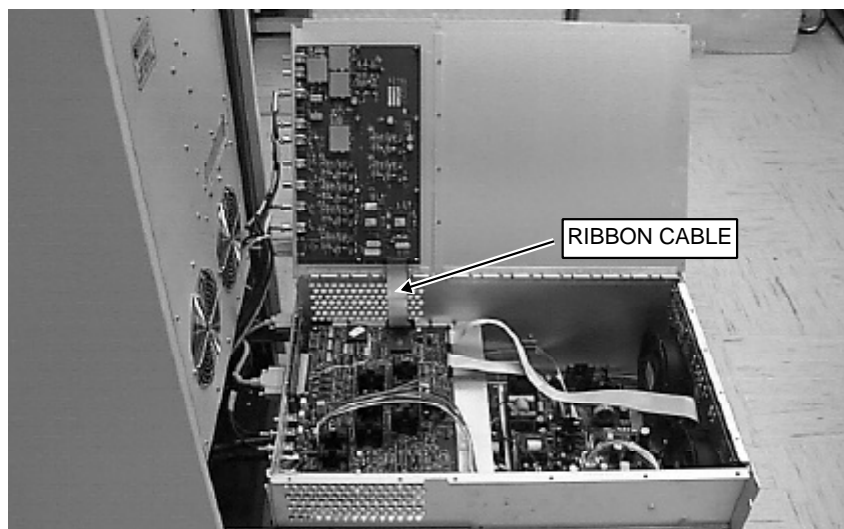
6- REMOVAL OF FAILED APM MODULE (continued)

5. Remove the four 4-40 x 5/16 panhead screws that secure the front lid to the APM lid (see Illustration 6-2)



REMOVAL OF ANALOG PROCESSOR MODULE LID FROM FRONT LID
ILLUSTRATION 6-2

3. Disconnect the cables attached to the rear of the APM module and the ribbon cable attached to the APM board. See Illustration 6-3.

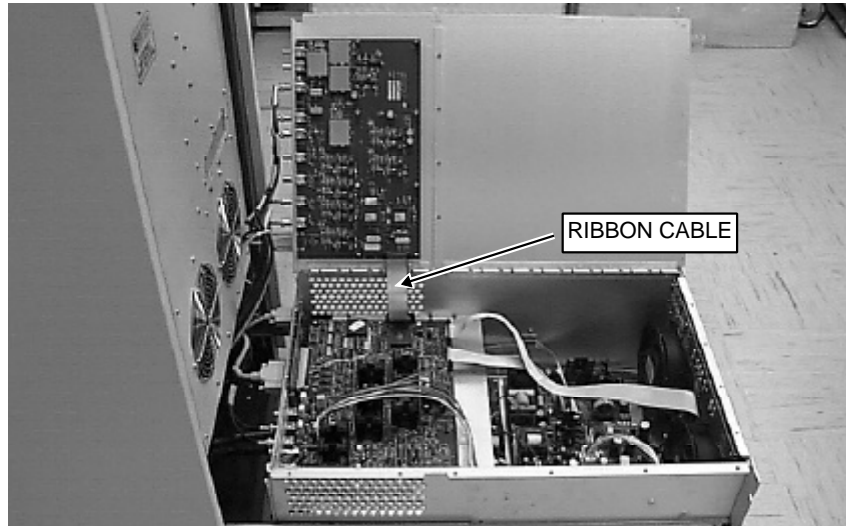


RIBBON CABLE FROM APM BOARD TO CPD BOARD
ILLUSTRATION 6-3

4. Remove the failed APM module by sliding lid forward in the upright position to disengage hinge.

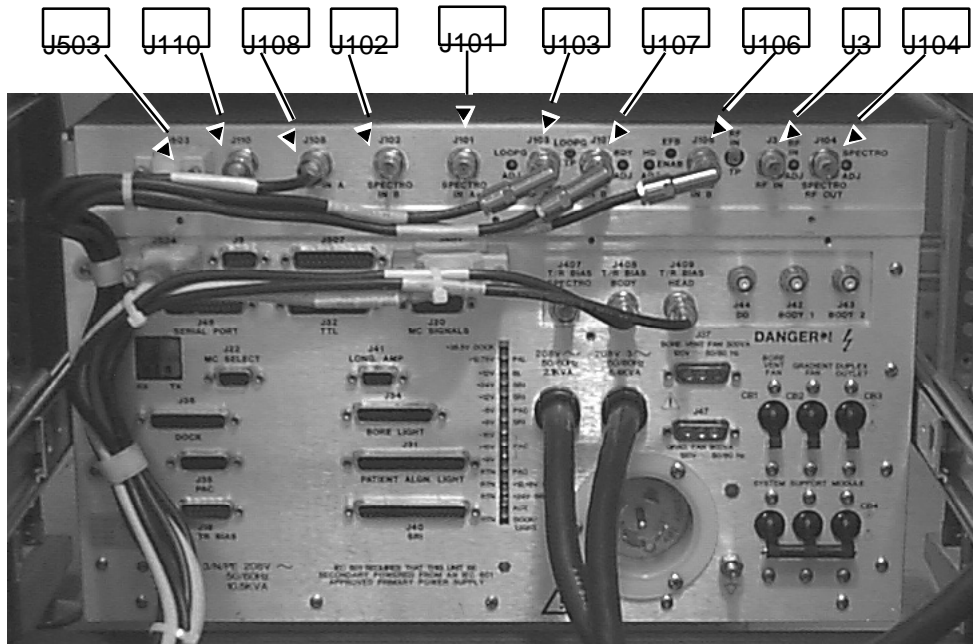
7- INSTALLATION OF NEW APM MODULE

1. In the upright position, place the APM module on the hinges and slide to the back to attach.
2. Attach the ribbon cable from the CPD board to the APM board. Close APM lid. See Illustration 7-1.



RIBBON CABLE FROM APM BOARD TO CPD BOARD
 ILLUSTRATION 7-1

3. Attach the cables to the APM board (see Illustration 7-2). Be sure to match the label designators on the cables to the APM connectors.



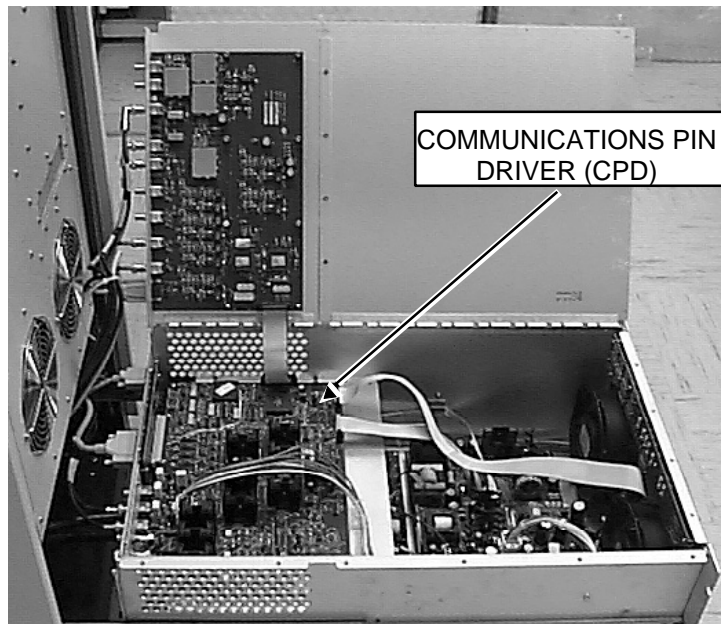
ANALOG PROCESSOR MODULE CABLE CONNECTIONS
 ILLUSTRATION 7-2

7- INSTALLATION OF NEW APM MODULE (continued)

4. Install three 4-40x5/16 panhead screws that secure the APM lid to the rear panel.
5. Close the front lid. Install eight 4-40 x 5/16 panhead screws: four to the APM lid, and four to the front panel.
6. Attach six 4-40x5/16 panhead screws that secure both lids to chassis. Tighten all screws in steps 4, 5, and 6.
7. Slide the module back into the cabinet. (Press the slide locks to enable the module to slide completely into the cabinet.) Secure with four 10-32x1/2 panhead screws and four #10 flat washers.
8. Replace front door.
9. Remove lock out and tag out, and restore power to the cabinet.

8- REMOVAL OF FAILED CPD MODULE

1. Verify that the power is OFF, and that the cabinet is locked out and tagged out per the instructions in Section 2. (Refer to CD-ROM *Dir. 2250758-3 [or -2], MR Signa OpenSpeed Service Methods, Renewal Parts and Service Tools, Safety, Section 6, OSHA LOCKOUT/TAGOUT REQUIREMENTS.*)
2. Remove SSM from cabinet per instructions in Section 3.
3. Remove lid from SSM chassis per instructions in Section 5.
4. The CPD module is located at the rear of the SSM (see Illustration 8-1).

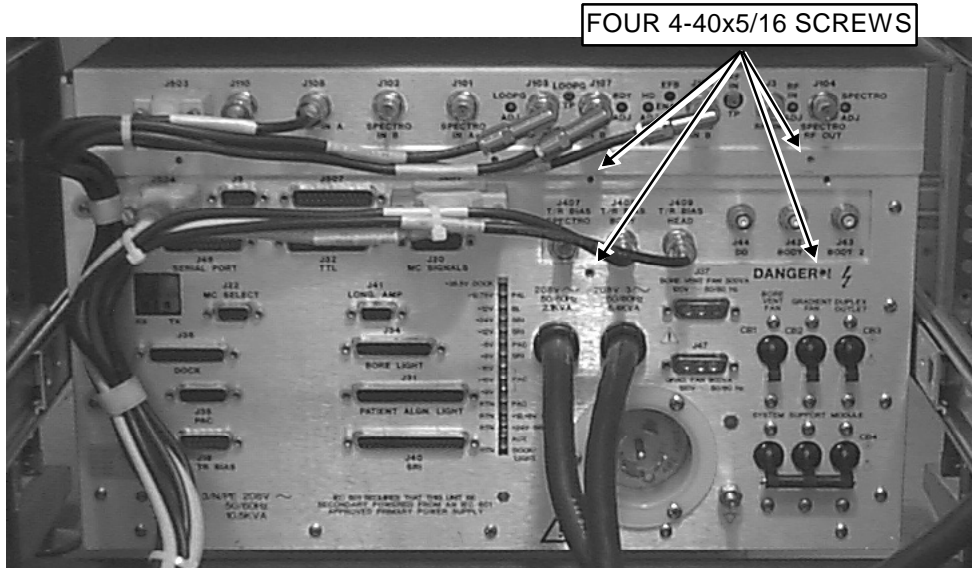


COMMUNICATIONS PIN DRIVER LOCATION
ILLUSTRATION 8-1

5. Disconnect all connectors attached to the CPD board and to the rear of the CPD module.

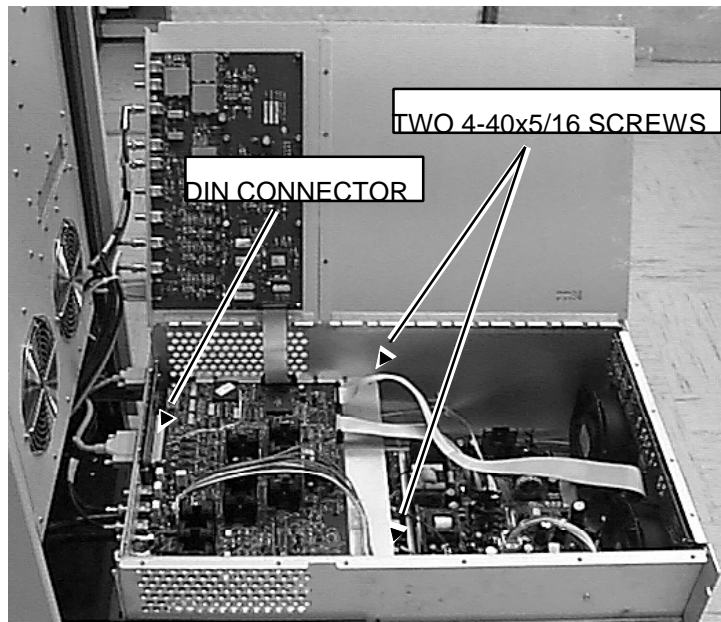
8- REMOVAL OF FAILED CPD MODULE(continued)

6. Remove four 4-40x5/16 panhead screws that secure the CPD module to the rear panel (see Illustration 7-2).



REMOVAL OF COMMUNICATIONS PIN DRIVER FROM REAR PANEL
ILLUSTRATION 8-2

7. Remove the two 4-40x5/16 panhead screws that secure the module to the side brackets (see Illustration 8-3).

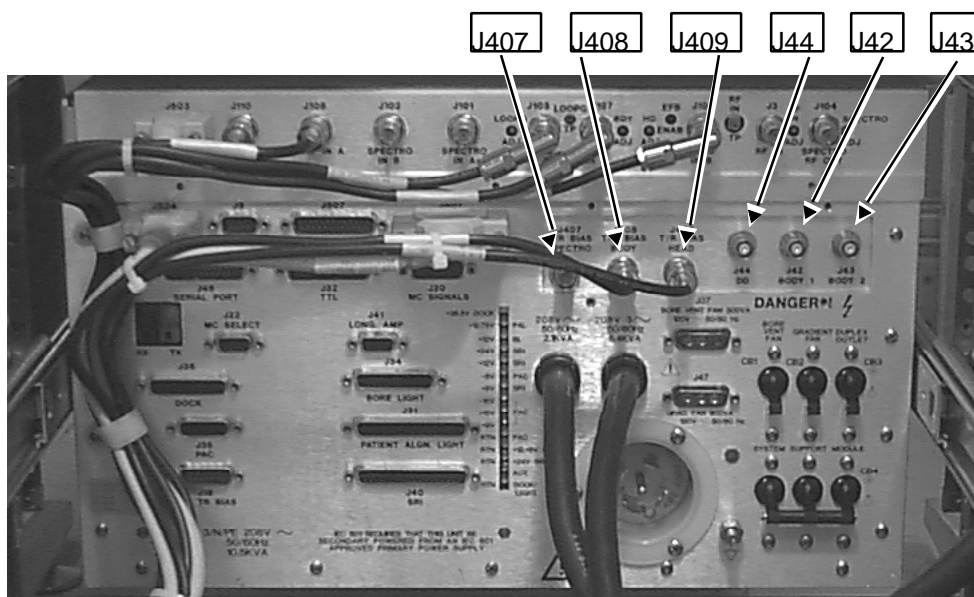


REMOVAL OF COMMUNICATIONS PIN DRIVER FROM SIDE BRACKETS
ILLUSTRATION 8-3

8. Slide CPD module toward the front of the SSM, carefully detaching DIN connector; lift and remove failed CPD module.

9- INSTALLATION OF NEW CPD MODULE

1. Place the CPD module on the brackets, align the slots, and slide toward the rear panel, carefully attaching the DIN connector to the rear panel.
2. Install four 4-40x5/16 screws through the outside of the rear panel into the CPD module. Do not fully tighten screws.
3. Install two 4-40x5/16 panhead screws that secure the module to the side brackets. Tighten all screws in steps 2 and 3.
4. Attach all connections to the CPD board and to the rear of the CPD module (see Illustration 9-1).

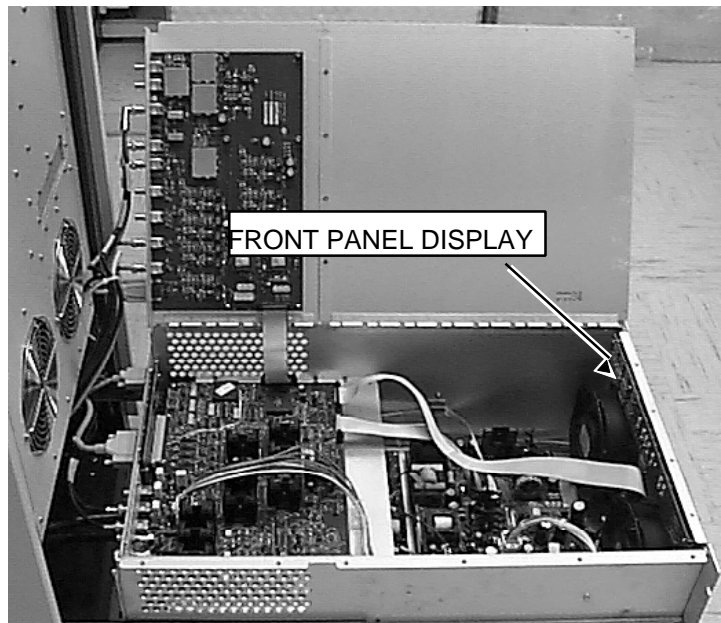


COMMUNICATIONS PIN DRIVER CABLE CONNECTIONS
ILLUSTRATION 9-1

5. Close the module lids.
6. Install three 4-40x5/16 panhead screws that secure the APM lid to the rear panel. Do not fully tighten screws.
7. Install four 4-40x5/16 panhead screws that secure the front lid to the front panel. Do not fully tighten screws.
8. Install six 4-40x5/16 panhead screws that secure both lids to the chassis. Tighten all screws in steps 6, 7, and 8.
9. Slide the module back into the cabinet. (Press the slide locks to enable the module to slide completely into the cabinet.) Secure with four 10-32x1/2 panhead screws and four #10 flat washers.
10. Replace the front door.
11. Remove lock out and tag out, and restore power to the cabinet.

10- REMOVAL OF FAILED FRONT PANEL DISPLAY BOARD

1. Verify that the power is OFF, and that the cabinet is locked out and tagged out per the instructions in Section 2. (Refer to CD-ROM *Dir. 2250758-3 [or -2], MR Signa OpenSpeed Service Methods, Renewal Parts and Service Tools, Safety, Section 6, OSHA LOCKOUT/TAGOUT REQUIREMENTS.*)
2. Remove SSM from cabinet per instructions in Section 3.
3. Remove lid from SSM chassis per instructions in Section 5.
4. The front panel display board is located on the front panel (see Illustration 10-1).

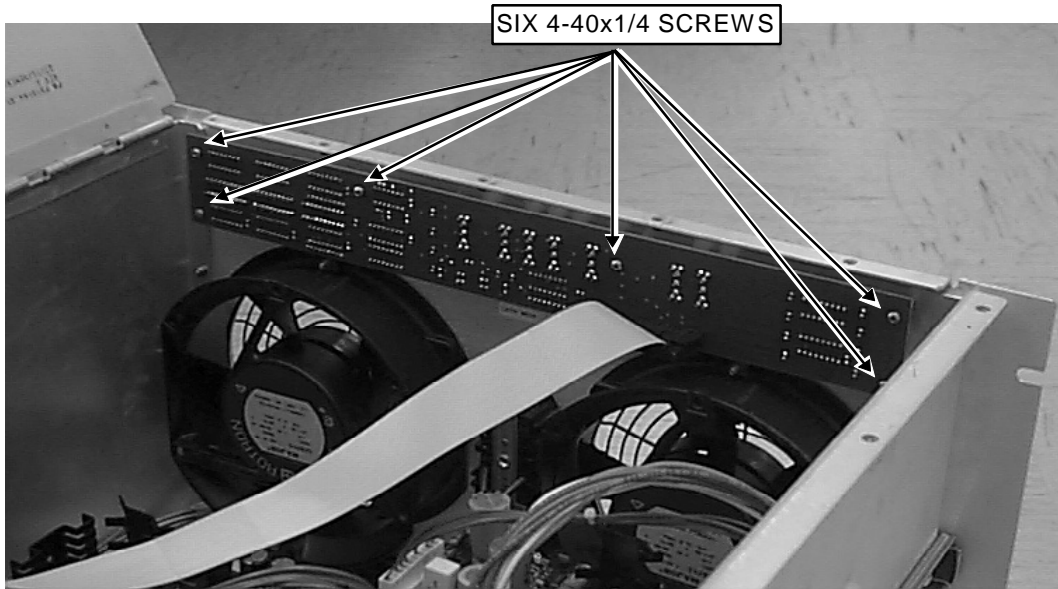


FRONT PANEL DISPLAY LOCATION
ILLUSTRATION 10-1

5. Disconnect the connector attached to the front panel display board.

10- REMOVAL OF FAILED FRONT PANEL DISPLAY BOARD (continued)

6. Remove six 4-40x1/4 panhead screws that attach the front panel display board to front panel (see Illustration 10-2).



REMOVAL OF FRONT PANEL DISPLAY
ILLUSTRATION 10-2

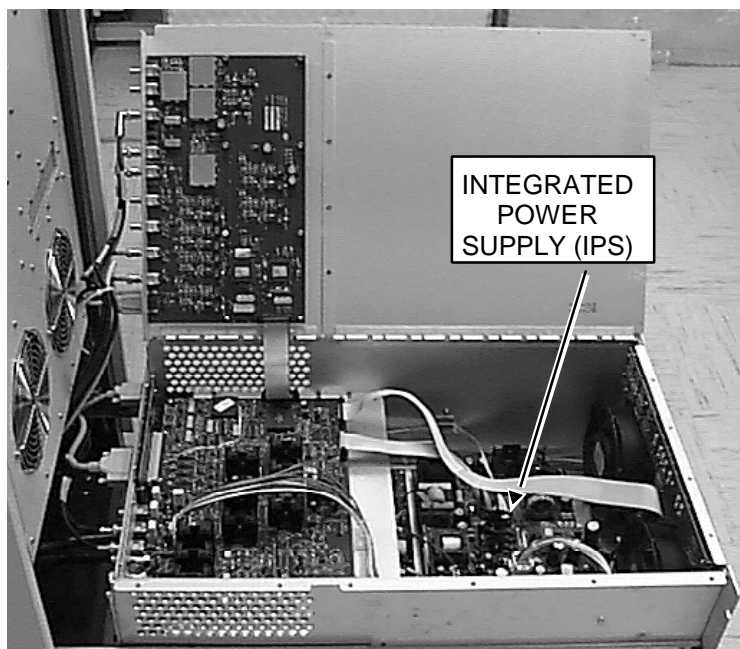
7. Remove the failed front panel display board.

11- INSTALLATION OF NEW FRONT PANEL DISPLAY BOARD

1. Install the front panel display board on front panel.
2. Install and tighten six 4-40x1/4 panhead screws that secure the board to the front panel.
3. Attach the connector from the CPD board to the front panel display board. Close lids.
4. Install three 4-40x5/16 panhead screws that secure the APM lid to the rear panel.
5. Install four 4-40x5/16 panhead screws that secure the front lid to the front panel.
6. Install six 4-40x5/16 panhead screws that secure both lids to chassis. Tighten all screws in steps 4, 5, and 6.
7. Slide the module back into the cabinet. (Press the slide locks to enable the module to slide completely into the cabinet.) Secure with four 10-32x1/2 panhead screws and four #10 flat washers.
8. Replace front door.
9. Remove lock out and tag out, and restore power to the cabinet.

12- REMOVAL OF FAILED IPS MODULE

1. Verify that the power is OFF, and that the cabinet is locked out and tagged out per the instructions in Section 2. (Refer to CD-ROM *Dir. 2250758-3 [or -2], MR Signa OpenSpeed Service Methods, Renewal Parts and Service Tools, Safety, Section 6, OSHA LOCKOUT/TAGOUT REQUIREMENTS.*)
2. Remove SSM from cabinet per instructions in Section 3.
3. Remove lid from SSM chassis per instructions in Section 5.
4. The IPS module is located on the bottom of the SSM (see Illustration 12-1).

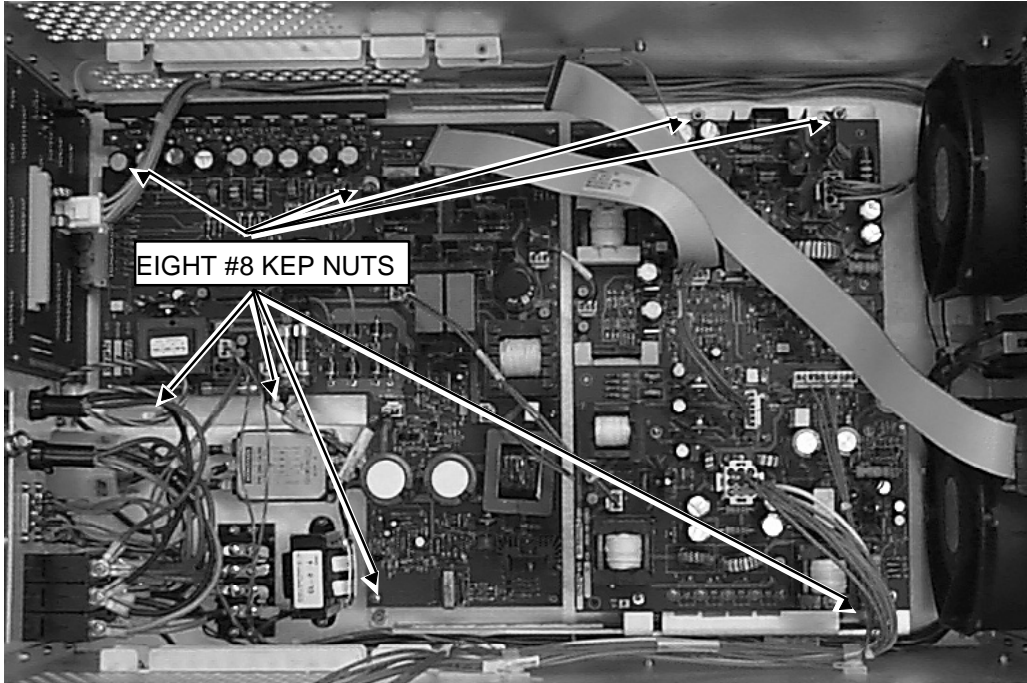


INTEGRATED POWER SUPPLY LOCATION
ILLUSTRATION 12-1

5. The CPD Board will have to be removed before the IPS can be removed. See section 8- Removal of Failed CPD Board for instructions on removing the CPD.
6. Disconnect all cables attached to the IPS boards, except those that are internal to the IPS assembly.

12- REMOVAL OF FAILED IPS MODULE (continued)

7. Using a nut driver, remove the eight #8 KEP nuts that secure the IPS bulkhead to the bottom of the chassis (see Illustration 12-2).



REMOVAL OF INTEGRATED POWER SUPPLY
ILLUSTRATION 12-2

8. Gently pull the tray up and toward the front in order to disengage the DIN connector on the rear panel while clearing the alignment pins.
9. Lift the entire IPS module out of the chassis.

13- INSTALLATION OF NEW IPS MODULE

1. Make sure the CPD module has been removed before trying to replace the IPS module.
2. Carefully lower the IPS module into the chassis, aligning the bulkhead slots with the chassis standoffs, and engaging the DIN connector on the rear panel.
3. Secure the module to the chassis with eight #8 KEP nuts.
4. Connect all cabling to the IPS module.

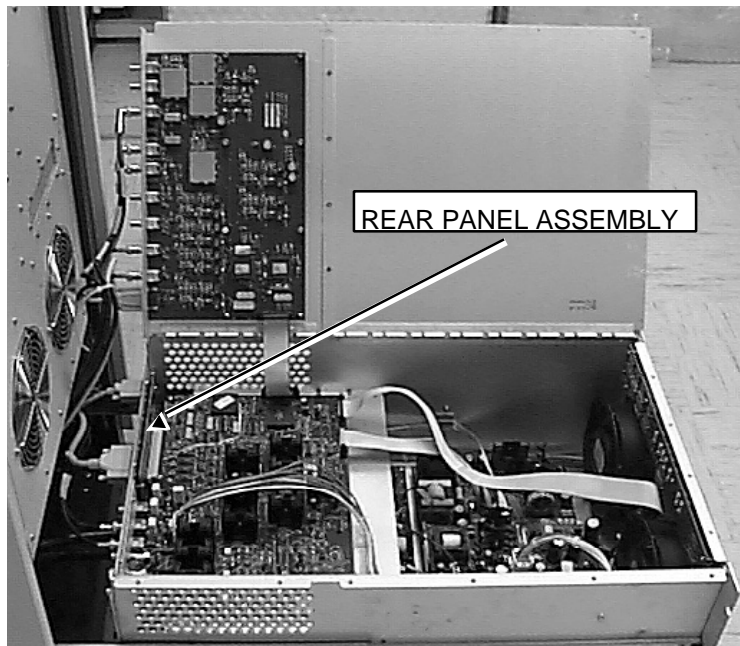
Note

0.7T systems: the JP1 jumper must be placed in the 1000 Volt position.

5. Replace the CPD module as in section 9.
6. Close the module lids.
7. Install three 4-40x5/16 panhead screws that secure the APM lid to the rear panel. Do not fully tighten screws.
8. Install four 4-40x5/16 panhead screws that secure the front lid to the front panel. Do not fully tighten screws.
9. Install six 4-40x5/16 panhead screws that secure both lids to the chassis. Tighten all screws in steps 7, 8, and 9.
10. Slide the module back into the cabinet. (Press the slide locks to enable the module to slide completely into the cabinet.) Secure with four 10-32x1/2 panhead screws and four #10 flat washers.
11. Replace the front door.
12. Remove lock out and tag out, and restore power to the cabinet.

14- REMOVAL OF FAILED REAR PANEL ASSEMBLY

1. Verify that the power is OFF, and that the cabinet is locked out and tagged out per the instructions in Section 2. (Refer to CD-ROM *Dir. 2250758-3 [or -2], MR Signa OpenSpeed Service Methods, Renewal Parts and Service Tools, Safety, Section 6, OSHA LOCKOUT/TAGOUT REQUIREMENTS.*)
2. Remove SSM from cabinet per instructions in Section 3.
3. Remove lid from SSM chassis per instructions in Section 5.
4. The rear panel assembly is located on the rear of the SSM (see Illustration 14-1).

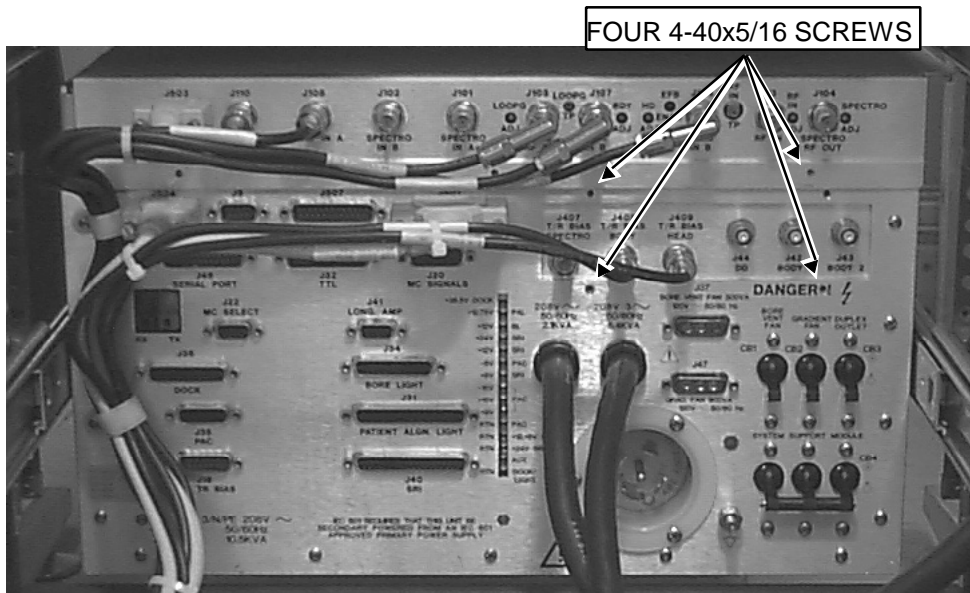


REAR PANEL ASSEMBLY LOCATION
ILLUSTRATION 14-1

5. Disconnect all cables on the outside of the rear panel, except for those connected to the APM.

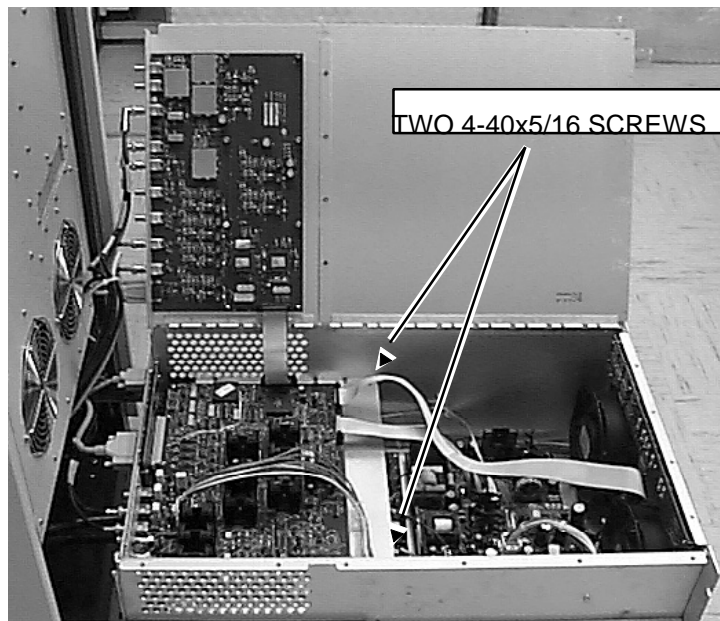
14- REMOVAL OF FAILED REAR PANEL ASSEMBLY (continued)

6. Remove four 4-40x5/16 panhead screws that secure the CPD module to the rear panel (see Illustration 14-2).



REMOVAL OF COMMUNICATIONS PIN DRIVER FROM REAR PANEL
ILLUSTRATION 14-2

7. Remove the two 4-40x5/16 panhead screws that secure the CPD module to the side brackets (see Illustration 14-3).

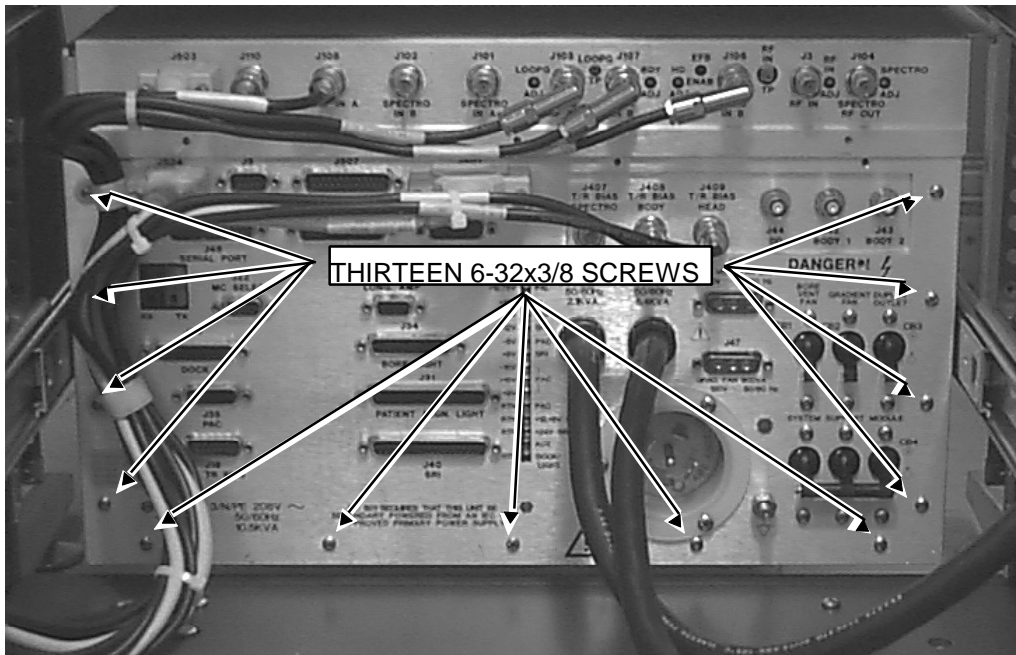


REMOVAL OF COMMUNICATIONS PIN DRIVER FROM SIDE BRACKETS
ILLUSTRATION 14-3

8. Slide the CPD module toward the front of the SSM, carefully detaching the DIN connector.

14- REMOVAL OF FAILED REAR PANEL ASSEMBLY (continued)

9. Disconnect all internal cables to the rear interface board, including the DIN connector on the IPS module.
10. Remove thirteen 6-32x3/8 panhead screws that secure the rear panel to the chassis (see Illustration 14-4).

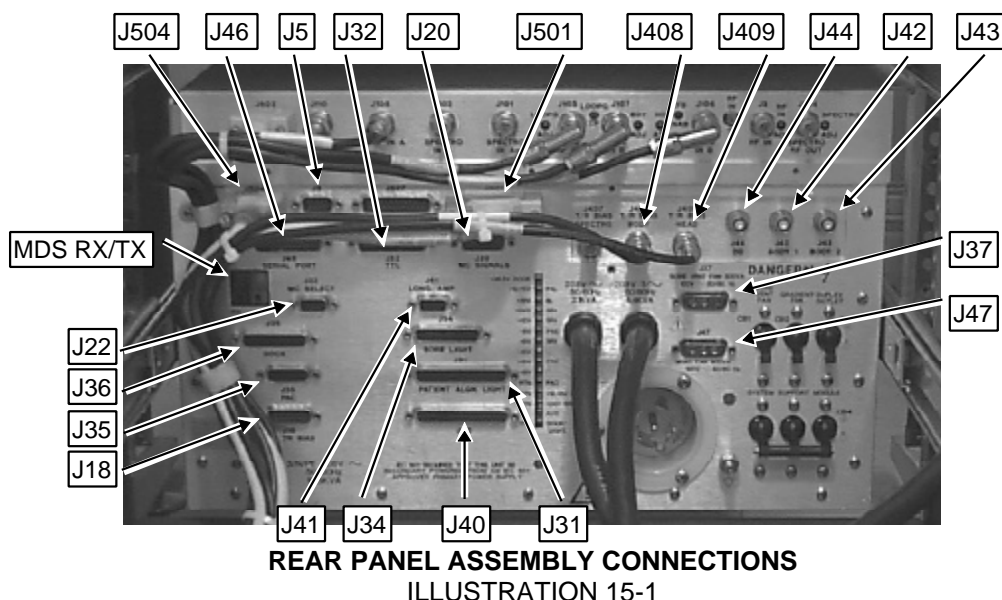


REMOVAL OF REAR PANEL ASSEMBLY
ILLUSTRATION 14-4

11. Remove one 4-40x5/16 panhead screw on the front panel that secures the duplex connector, and disconnect power to the fans. Release the harness from all cable clamps.
12. Remove the failed rear panel assembly and the associated cable harnesses.

15- INSTALLATION OF NEW REAR PANEL ASSEMBLY

1. Install thirteen 6-32x3/8 panhead screws that secure the rear panel to the chassis.
2. Install one 4-40x5/16 panhead screw on the front panel that secures the duplex connector, and connect power to the fans. Attach all cable clamps to the harness.
3. Connect all internal cables to the rear interface board, including the DIN connector on the IPS module.
4. Slide the CPD board toward the rear panel, and plug in the DIN connector. Attach four 4-40x5/16 panhead screws that secure the CPD board to the rear panel. Attach two 4-40x5/16 panhead screws that secure the CPD module to the side brackets.
5. Attach all external connections (see Illustration 15-1).



6. Close the module lids.
7. Install three 4-40x5/16 panhead screws that secure the APM lid to the rear panel. Do not fully tighten screws.
8. Install four 4-40x5/16 panhead screws that secure the front lid to the front panel. Do not fully tighten screws.
9. Install six 4-40x5/16 panhead screws that secure both lids to the chassis. Tighten all screws in steps 6, 7, and 8.
10. Slide the module back into the cabinet. (Press the slide locks to enable the module to slide completely into the cabinet.) Secure with four 10-32x1/2 panhead screws and four #10 flat washers.
11. Replace front door.
12. Remove lock out and tag out, and restore power to the cabinet.

REVISION HISTORY

REV	DATE	AUTHOR	PRIMARY REASONS FOR CHANGE
A	December 6, 1999	Resa Lambert	Initial version.
B	June 22, 2000	Don Thome'	Added Overview comments.
0			Initial release.
1			