

CPK
J. S. V. / 1/10

**OPERATION AND MAINTENANCE
TERMINAL STATION
1 X N FREQUENCY DIVERSITY
DR 6/11-135A AND 135EC
REPLACEMENT PROCEDURES**

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The procedures in this section are used to replace plug-in units in the line terminal bay. Any test, adjustment, or operation required after replacement is not provided in these replacement procedures. To determine if a test, adjustment, or operation is required, return to the alarm-clearing procedure that called for the unit replacement. For replacement of shelves or backplane pin connectors, refer to the Maintenance Support manual.

To prevent personal injury, service interruption, and/or equipment damage, follow the instructions and admonishments in the order that they are presented. Read and become familiar with the "Admonishments" in the "Maintenance" tab before starting any of these procedures.

Before replacing a unit, verify that service is properly protected. Remember that an automatic switch ***must*** be reinforced with a manual switch.

This practice is reissued to include the error correction option. The practice is used in binders 421-102-001, 421-102-080, 421-102-090, 421-102-100, 421-102-001AC, 421-102-002AC, 421-102-003AC, and 421-102-004AC.

GENERAL PLUG-IN UNIT REPLACEMENT

This procedure is used to replace plug-in units in the line terminal bay.

Caution: IMPROPER REPLACEMENT OF A PLUG-IN UNIT CAN CAUSE SERVICE INTERRUPTION.

STEP	PROCEDURE
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Removal

1. Verify that service is protected. (Refer to the appropriate shelf procedure that the unit to be replaced is located in.)
2. **Warning: To prevent ESD damage to a plug-in unit, keep the replacement plug-in unit in its protective wrapping until ready to install it.**

Obtain replacement unit.
3. Connect ESD wrist strap to ESD GRD.
4. On the plug-in unit to be removed, release the latch catch and pull the latch lever out and down until plug-in unit is disengaged from its backplane connector (Fig. 1).

Note: When the latch lever is released from the latch catch on a POWER UNIT plug-in, the ALM/OFF LED should light indicating that the POWER UNIT has been de-energized. When the power unit is disengaged from the backplane connector, the ALM/OFF LED will go off after approximately 6 seconds.
5. **DANGER: Some components may be hot enough to cause burns. Let them cool before placing them in the protective wrapping.**

Hold the plug-in unit at the top and bottom, and slide it out of the shelf.
6. Remove the replacement plug-in unit from its protective wrapping and put the defective unit in its place.

Installation

7. On the replacement plug-in unit, release the catch and pull the latch lever out.
8. **Carefully** align the replacement plug-in unit in the top and bottom shelf guides to prevent backplane connector damage.

STEP	PROCEDURE
9.	With the latch lever pulled out, slide the replacement plug-in unit into the shelf until the latch lever is positioned over the groove in the bottom front shelf bracket (Fig. 1).
10.	Seat the plug-in unit by applying light pressure at the top of the unit and pushing up on the latch lever until the latch catch has engaged the latch lever.
Note: When inserting a power unit plug-in, the ALM/OFF LED will light when the latch lever is pushed up. The LED will go off when the latch lever has engaged the latch catch, indicating that the power unit is energized.	
11.	This completes the procedure. Return to the instruction that referenced this procedure.

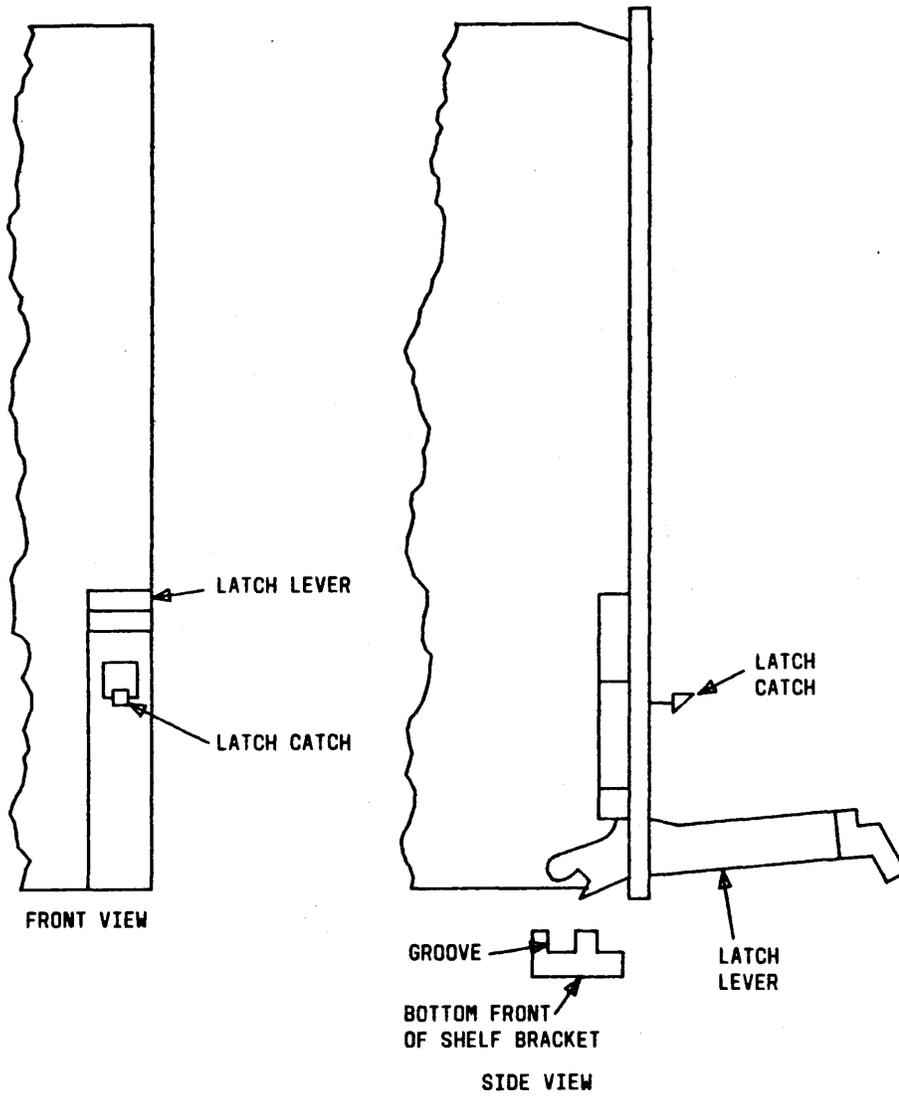


Fig. 1—Front and Side View of Typical Plug-In Unit

REGULAR DIGITAL TERMINAL SHELF UNIT REPLACEMENT

This procedure is used to replace plug-in units in the regular digital terminal shelf.

Caution: IMPROPER REPLACEMENT OF A PLUG-IN UNIT CAN CAUSE SERVICE INTERRUPTION.

Warning: To prevent ESD (electrostatic discharge) damage, ensure that all ESD precautions are followed when removing, replacing, handling, and storing plug-in units.

STEP	PROCEDURE
1.	Protect service as follows: <ul style="list-style-type: none"><li data-bbox="438 703 1370 766">• To replace CHAN CONTR unit: Perform a manual SPAN switch for the receiving direction of transmission.<li data-bbox="438 787 1370 850">• To replace any other unit: Perform a manual SPAN switch for <i>both</i> directions of transmission.
2.	Replace desired unit(s). Refer to General Plug-In Unit Replacement procedure.
3.	This completes the procedure. Return to the instruction that referenced this procedure.

PROTECTION DIGITAL TERMINAL SHELF UNIT REPLACEMENT

This procedure is used to replace plug-in units in the protection digital terminal shelf.

Caution: IMPROPER REPLACEMENT OF A PLUG-IN UNIT CAN CAUSE SERVICE INTERRUPTION.

Warning: To prevent ESD (electrostatic discharge) damage, ensure that all ESD precautions are followed when removing, replacing, handling, and storing plug-in units.

STEP	PROCEDURE
1.	Protect service by performing a manual protection lockout for <i>both</i> directions of transmission.
2.	Replace desired unit(s). Refer to General Plug-In Unit Replacement procedure.
3.	This completes the procedure. Return to the instruction that referenced this procedure.

GROWTH SHELF UNIT REPLACEMENT

This procedure is used to replace plug-in units in the growth shelf.

Caution: IMPROPER REPLACEMENT OF A PLUG-IN UNIT CAN CAUSE SERVICE INTERRUPTION.

Warning: To prevent ESD (electrostatic discharge) damage, ensure that all ESD precautions are followed when removing, replacing, handling, and storing plug-in units.

STEP	PROCEDURE
1.	Protect service by performing a manual protection lockout for both directions of transmission.
2.	If necessary, label all cables connected to the plug-in unit(s) to be replaced to ensure proper reinstallation.
3.	Remove cables from plug-in unit faceplate(s).
4.	Replace desired unit(s). Refer to General Plug-In Unit Replacement procedure.
5.	Reconnect cables to their proper connectors on the plug-in unit faceplate(s).
6.	This completes the procedure. Return to the instruction that referenced this procedure.

CONTROL AND SERVICE CHANNEL SHELF UNIT REPLACEMENT

This procedure is used to replace plug-in units in the control and service channel shelf.

Caution: Before removing any control or logic plug-in unit or the POWER UNIT, ensure that the system is in a normal, nonswitched state. If the system is in a switched state, attempt to clear the trouble that caused the switch before changing any control and service channel plug-in units. Otherwise, a SERVICE FAILURE may result since a switch will normally be taken down upon removal of control or logic circuits.

Caution: IMPROPER REPLACEMENT OF A PLUG-IN UNIT CAN CAUSE SERVICE INTERRUPTION.

Warning: To prevent ESD (electrostatic discharge) damage, ensure that all ESD precautions are followed when removing, replacing, handling, and storing plug-in units.

STEP	PROCEDURE
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TERM CONTR, SC MULDM, SC EXPN, or TERM OW Unit Replacement

1. **Caution:** If the SC MULDM unit is removed, service channel communication will be disrupted. This includes order-wire operation and any other service channel uses at this station. If the SC EXPN unit is removed, only the service channel communication it is providing will be disrupted.

Replace desired unit(s). Refer to General Plug-In Unit Replacement procedure.

Note: If replacing the SC MULDM or SC EXPN unit, remove the 210-type module from the defective unit and reinstall it on the replacement unit. If replacing a defective 210-type module, install the replacement module on the removed SC MULDM (Fig. 2) or the removed SC EXPN unit (Fig. 3). If necessary, update the faceplate label.

2. If TERM CONTR unit was replaced, depress the CONTR RESET switch until the CONTR FAIL indicator lights.

Note: The indicator will go out if the repair was successful.

3. If unit replacement is complete, return to the instruction that referenced this procedure.

STEP	PROCEDURE
POWER UNIT Replacement	
4.	Unplug (and partially remove) <i>in order</i> the TERM CONTR, PROT STAT, all equipped CHAN STAT, and TRMT STAT units.
5.	Replace the power unit. Refer to General Plug-In Unit Replacement procedure.
6.	Reinsert the unplugged units in the reverse order.
7.	On the TERM CONTR unit, depress the CONTR RESET switch until the CONTR FAIL indicator lights; then release the control. <i>Note:</i> The indicator will go out if the repair was successful.
8.	If unit replacement is complete, return to the instruction that referenced this procedure.
Any Other Control or Logic Unit Replacement	
9.	Unplug (and partially remove) the TERM CONTR unit.
10.	Replace desired unit. Refer to General Plug-In Unit Replacement procedure.
11.	Reinsert the TERM CONTR unit.
12.	On the TERM CONTR unit, depress the CONTR RESET switch until the CONTR FAIL indicator lights; then release the control. <i>Note:</i> The indicator will go out if the repair was successful.
13.	If unit replacement is complete, return to the instruction that referenced this procedure.

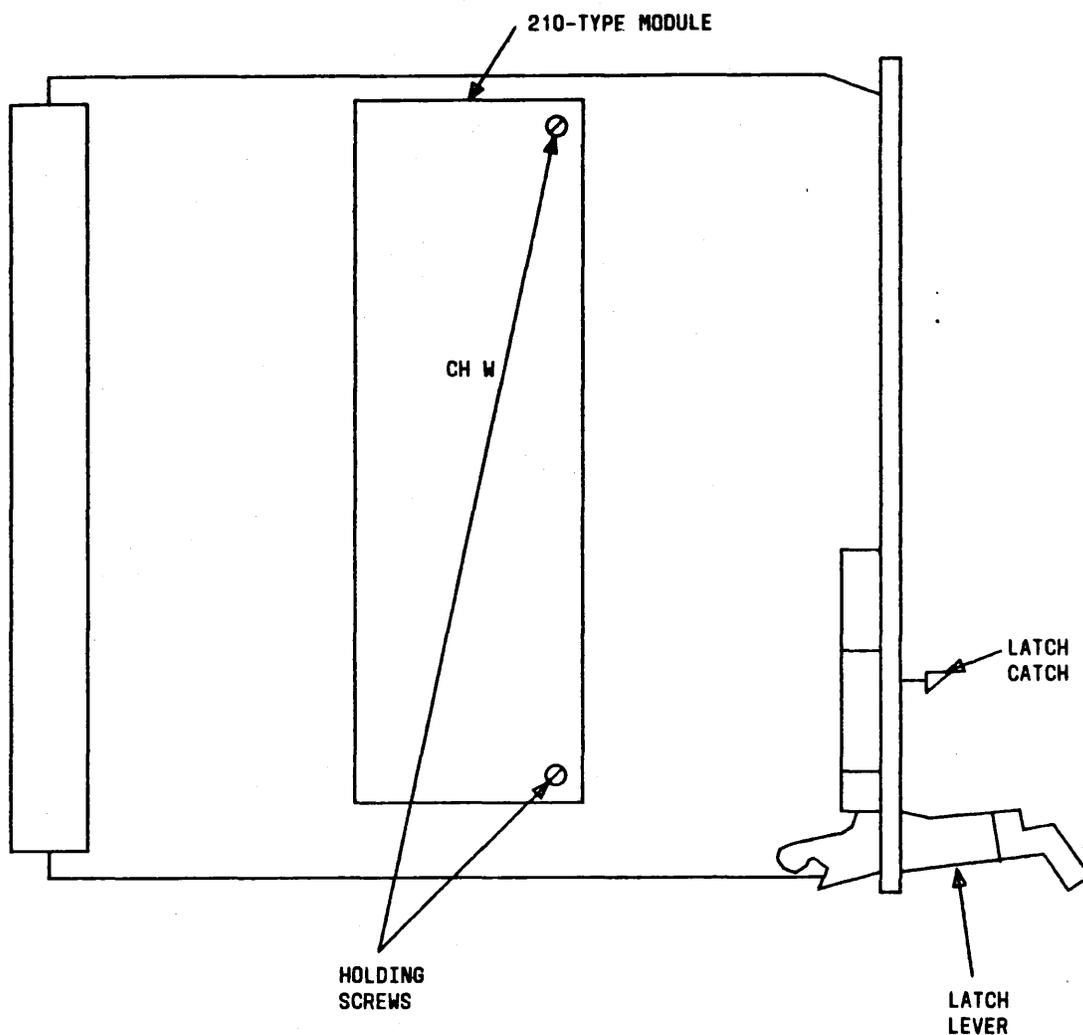


Fig. 2—210-Type Module Location on SC MULDM Unit

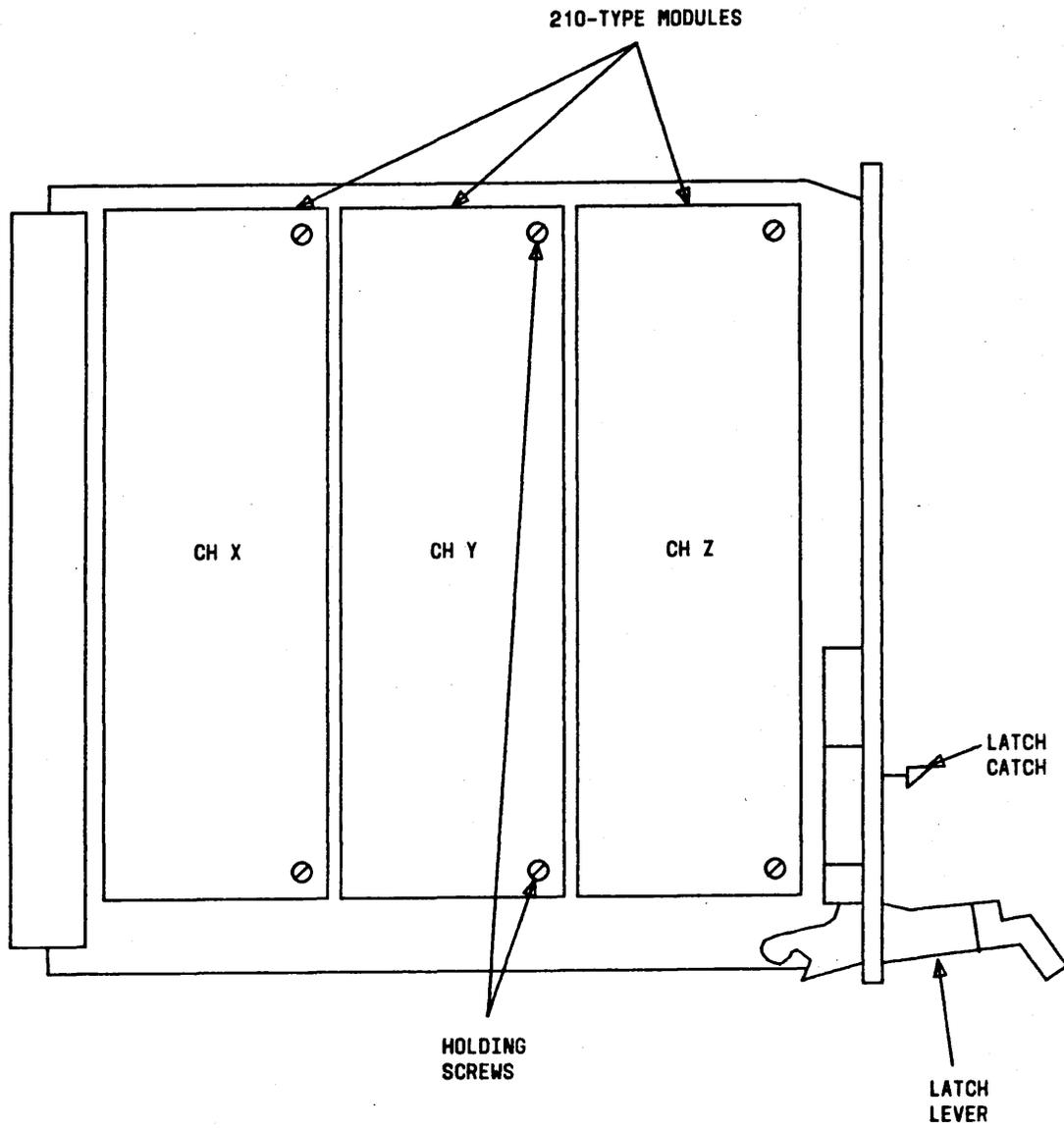


Fig. 3—210-Type Module Location on SC EXPN Unit

FAN AND FAN CONTROL PWB (PRINTED WIRING BOARD) REPLACEMENT

This procedure is used for replacing a fan unit or the fan control PWB (printed wiring board) in a line terminal bay.

If desired, fan operation can be verified after the mounting screws are removed by leaving the power connected and carefully sliding the fan shelf forward.

Note: No service protection activity is required for this procedure.

The following tools are required to perform this procedure:

- 1 - Screwdriver (to remove and install bay side covers) (Item C11)
- 1 - Screwdriver (to replace fan or control PWB) (Item C6).

For recommended test equipment, see the "Test Equipment and Accessories" tab.

Warning: To prevent ESD (electrostatic discharge) damage to the unit when replacing a fan control PWB, ensure that all ESD precautions are followed.

STEP	PROCEDURE
1.	Remove the bay side covers (if equipped) to gain access to the fan shelf mounting screws.
2.	Disconnect the power connector on the right side of the fan shelf by simultaneously pushing on the plastic latch release tabs at top and bottom of connector. Note: Removal of the power connector will also disable the telephone jack on the front of the fan shelf.
3.	Remove the fan shelf from the bay by removing the four mounting screws and sliding the shelf forward.
4.	If replacing a fan control PWB, go to Step 10. If replacing fan, go to Step 5.

Fan Replacement

- 5. Note the polarity stamped on the power plug of the fan to be replaced, and then remove the power plug from the fan.
- 6. Remove the fan by removing the four mounting screws on the underside of the fan.

Note: FAN 1 is associated with FAN FAIL 1 LED; FAN 2 with FAN FAIL 2 LED, etc.

STEP	PROCEDURE
7.	Install the replacement fan, with the air direction arrow pointing up, using the four mounting screws, nuts, and lock washers previously removed in Step 6.
8.	Connect power plug to fan. <i>Note:</i> Ensure that the plug is connected with the polarity as noted in Step 5.
9.	Fan installation is complete. Go to Step 17.

Fan Control PWB Replacement

10. **Warning:** To prevent ESD damage to the fan control PWB, wear an ESD wrist strap connected to a suitable ground (i.e., ESD jack).

Remove the *five* mounting screws on the fan control PWB (Fig. 4).

11. Remove the fan control PWB by moving the unit to the left so that the power connector will clear the shelf frame and then back until the LEDs and fuses clear the front panel.
12. Obtain the replacement PWB.
13. Remove and transfer to replacement PWB the six wiring leads located at the bottom left of unit.
14. Transfer the telephone wire connector E9, if equipped.
15. Install the replacement unit by aligning front panel LEDs and fuse and then moving the unit to the right so that the power connector extends through hole in shelf frame.
16. Align and reinstall five screws removed in Step 10.

Fan Shelf Reinstallation

17. Carefully slide the fan shelf into the bay.

Note: If desired, fan operation can be verified by reconnecting the shelf power plug and carefully sliding the fan shelf forward.
18. Secure the fan shelf in the bay using the four mounting screws removed in Step 3.
19. Reconnect power connector on the right side of the fan shelf. Ensure connector locking bracket is properly engaged.

STEP	PROCEDURE
20.	Remount the bay side covers (if equipped).
21.	This completes the procedure. Return to instruction that referenced this procedure.

ISSUING ORGANIZATION

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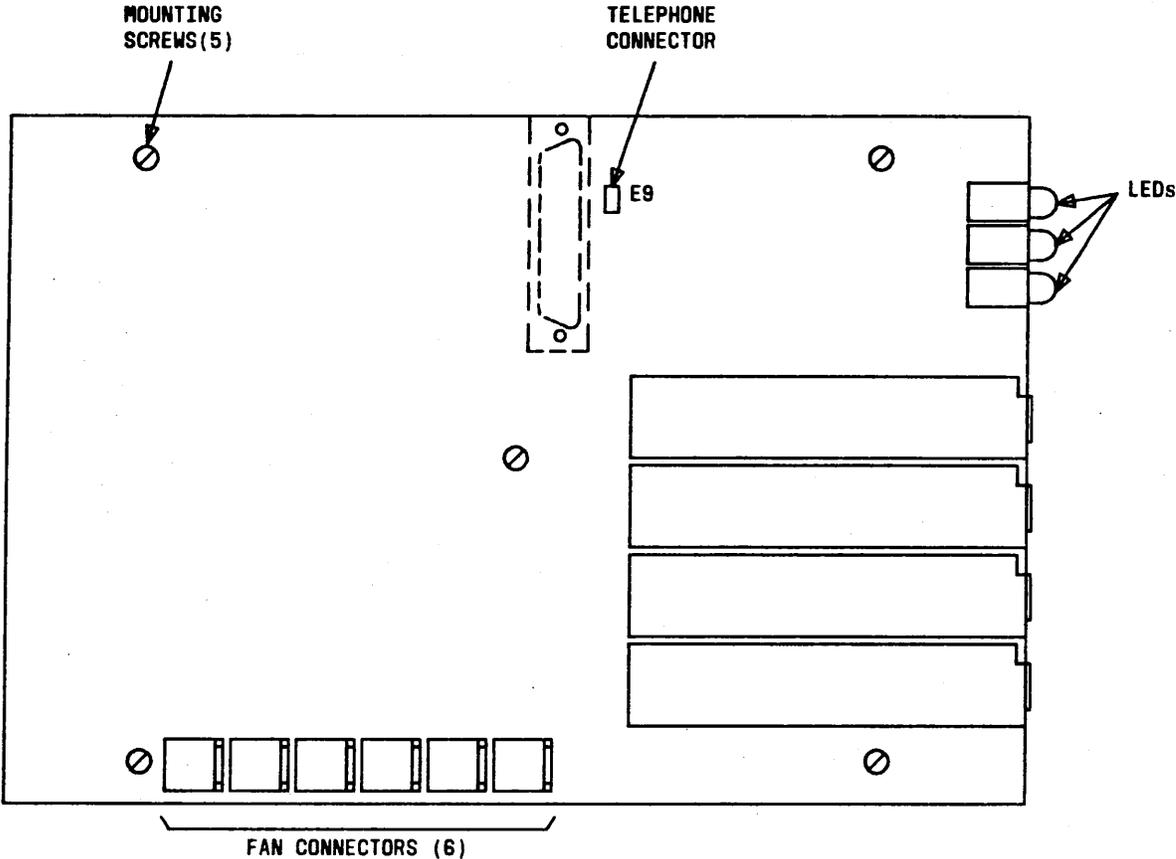


Fig. 4—Fan Control PWB—Side View