OPERATION AND MAINTENANCE
MAINTENANCE SUPPORT
1 X N FREQUENCY DIVERSITY
DR 6/11-135A
DESCRIPTION
REGENERATOR

CONTENTS PAGE

The 135A regenerator bays are located at stations between the two terminal stations in a switching section. The regenerator bay is available as an initial bay or growth bay. The initial bay contains one protection channel regenerator shelf and one regular channel regenerator shelf for two directions of transmission. The growth bay contains up to three additional regular channel regenerator shelves for two directions of transmission. Therefore, a fully equipped DR 6 system requires one initial bay and two growth bays. A fully equipped DR 11 system requires one initial bay and three growth bays.

If only an initial bay is equipped at a station, the system is defined as a 1 x 1 arrangement (one protection regenerator shelf to protect one regular regenerator shelf). If there is an initial bay and one or more growth bays at a station, the system is defined as a 1 x N arrangement (one protection regenerator shelf to protect two or more regular regenerator shelves).

As shown in the " Equipment Identification" tab, the initial regenerator bay contains (from top to bottom) an installer interface panel, a control and service shelf, a fan shelf, two identical regenerator shelves, and an equalizer panel (optional). The top regenerator shelf serves as the protection channel, and the bottom regenerator shelf serves as regular channel 1. A growth bay contains an installer interface panel, a fan shelf, up to three regular channel regenerator shelves, and an equalizer panel (optional).

This practice describes the functions of the regenerator bay in terms of transmission, control and service channel, temperature control (fans), and per shelf dc power distribution.

This practice is reissued to provide information on the equalizer panel. The practice is used in binder 421-101-001.

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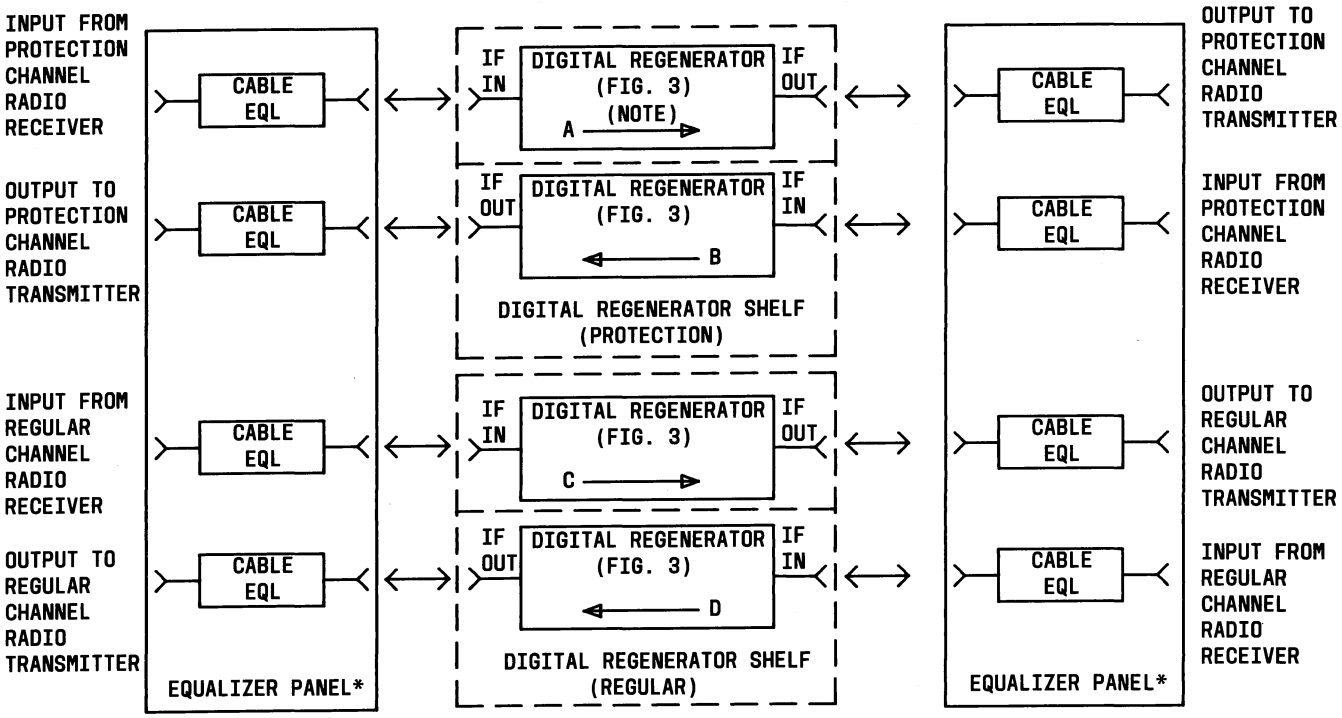
TRANSMISSION

Each two-way regenerator shelf is equipped on a per-channel basis. The IF input and output of each separate regenerator is connected by cabling to the associated radio equipment. The equalizer panel provides passive equalizer circuits that compensate for long (greater than 50 feet) IF interconnecting cables to and from the radio bays. No transmission protection switching takes place at a regenerator location. Transmission is switched on an end-to-end basis at the line terminal locations. The digital regenerator demodulates the 70-MHz signal from the radio receiver, regenerates the digital signal, and then modulates the signal back to 70 MHz for connection to the radio transmitter. Block diagrams are used to show the signal path and interconnections between units.

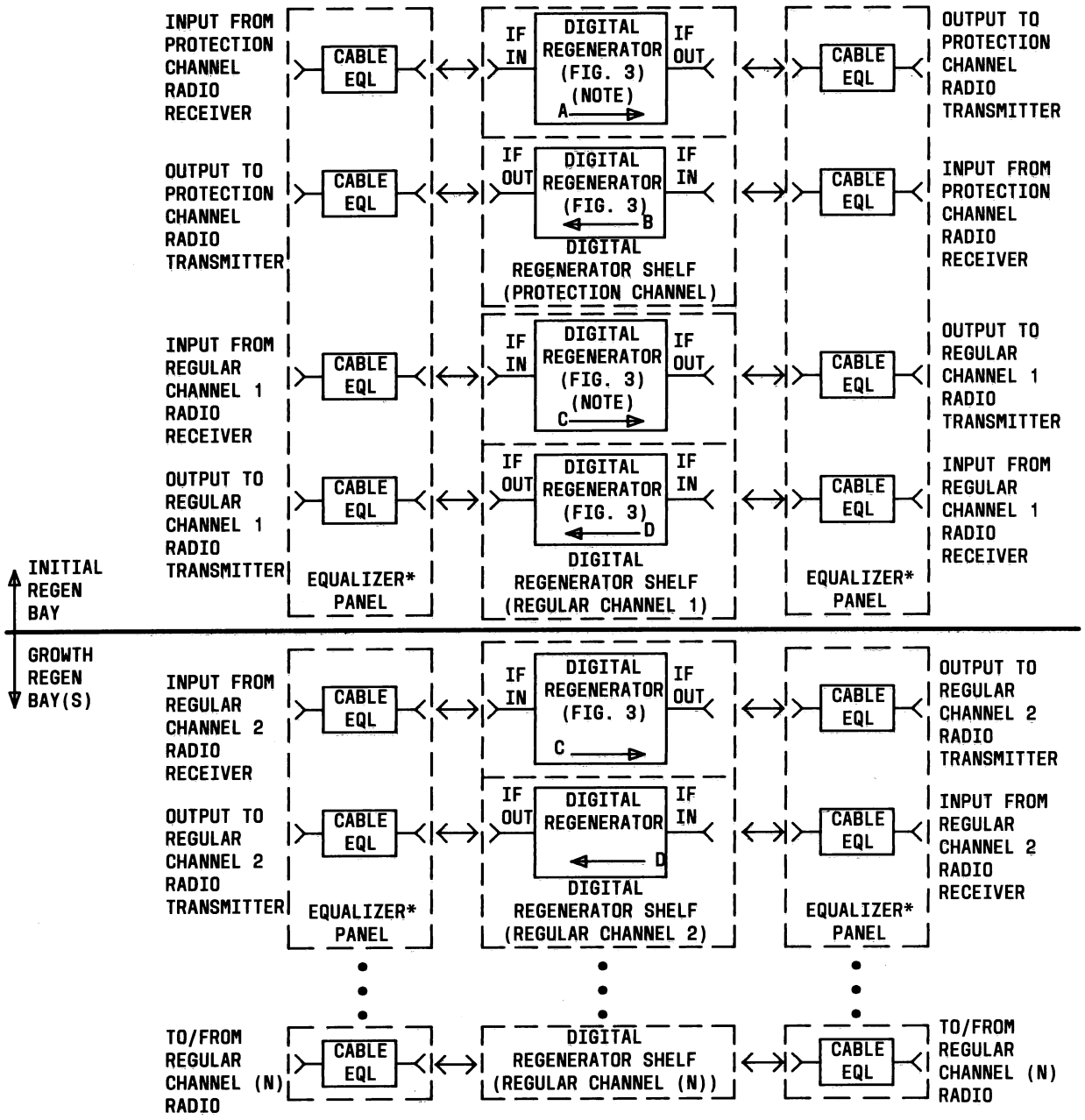
Figure 1 shows the transmission flow of a 1 x 1 arrangement at a regenerator station. Figure 2 shows the transmission flow of a 1 x N arrangement at a regenerator station. Figure 3 shows a detailed block diagram of a digital regenerator in one direction of transmission.



NOTE: ARROW INDICATES TYPICAL DIRECTION OF TRANSMISSION AND DESIGNATION OF REGENERATOR

* REQUIRED ONLY WHEN I.F. INTERCONNECT CABLE IS LONGER THAN 50 FEET

Fig. 1—1 x 1 Regenerator Bay, Transmission



NOTE: ARROW INDICATES TYPICAL DIRECTION OF TRANSMISSION AND DESIGNATION OF REGENERATOR.

* REQUIRED ONLY WHEN I.F. INTERCONNECT CABLE IS LONGER THAN 50 FEET

Fig. 2—1 x N Regenerator Bay(s), Transmission

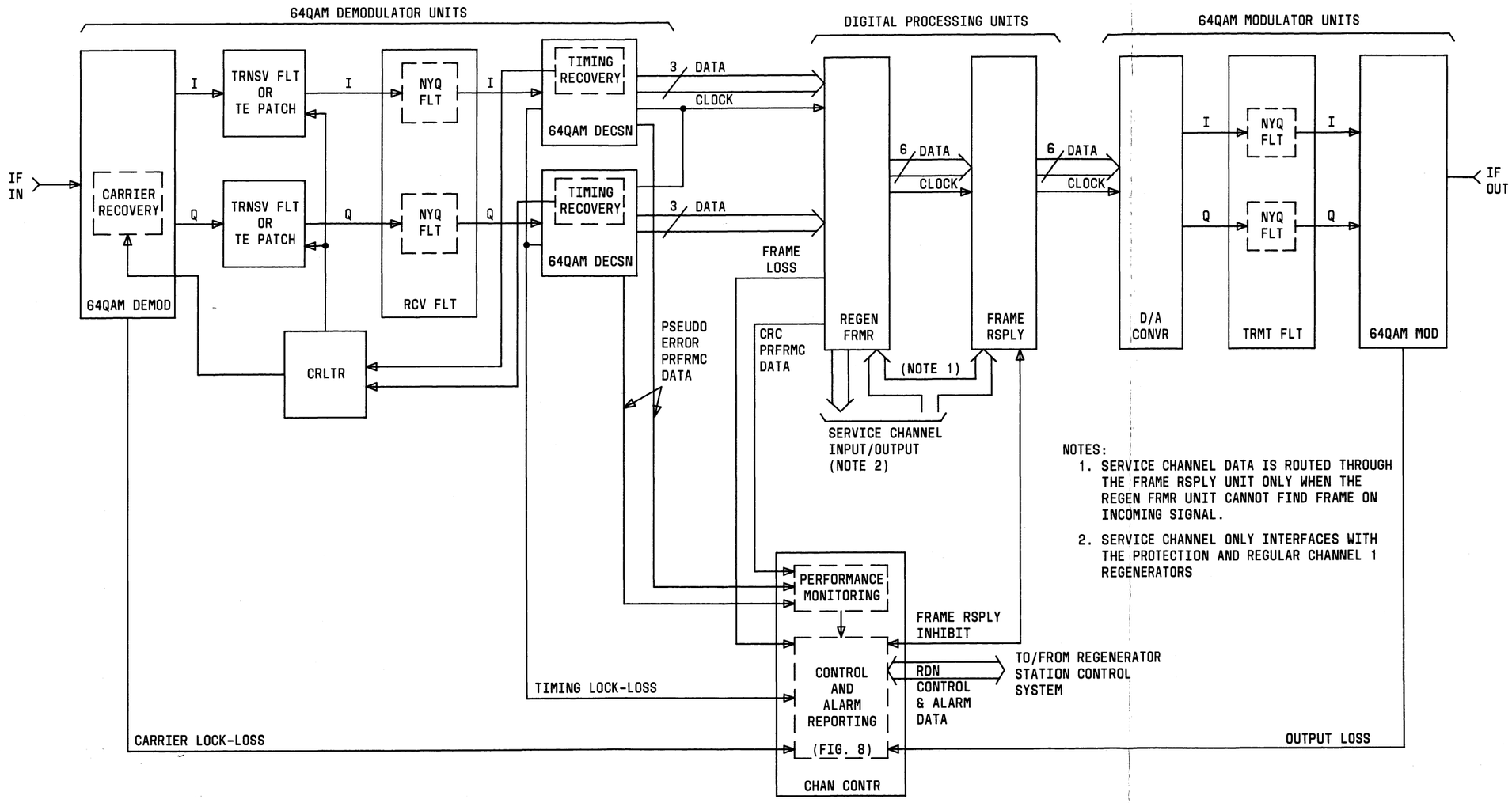


Fig. 3—Digital Regenerator, Regular or Protection

CONTROL AND SERVICE CHANNEL

This part contains information about the control and service channel functions of the regenerator bay. Figure 4 shows the Regenerator Station Control System that is made up of up to 22 CHAN CONTR units and the regenerator station control units. Figure 5 shows a functional block diagram of the regenerator station control units.

Figure 6 shows a functional block diagram of the regenerator station service channel in one direction of transmission. Figure 7 shows the service channel switching arrangement for both directions of transmission. Figure 8 shows the regenerator station alarm reporting signal path.

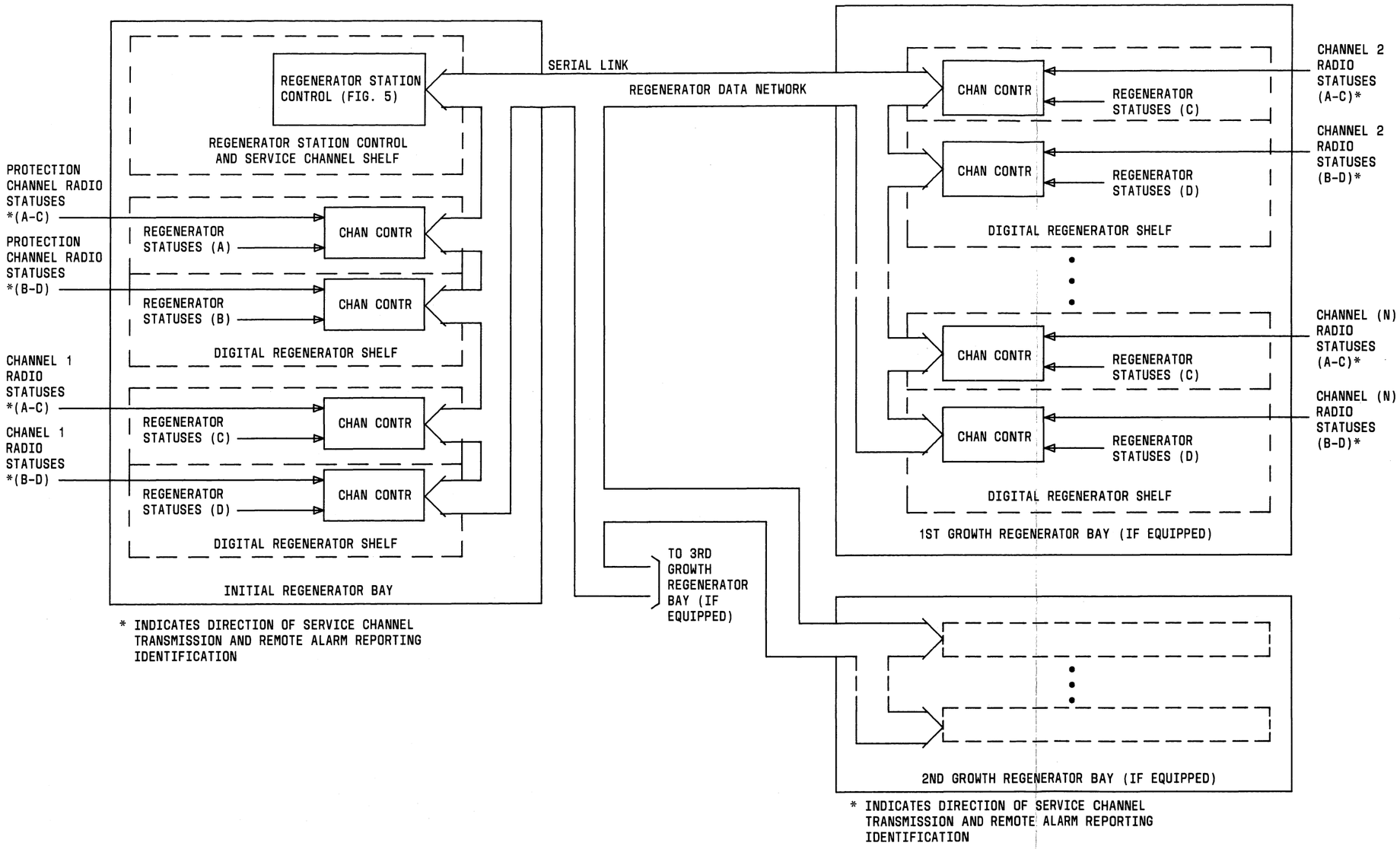


Fig. 4—Regenerator Station Control System

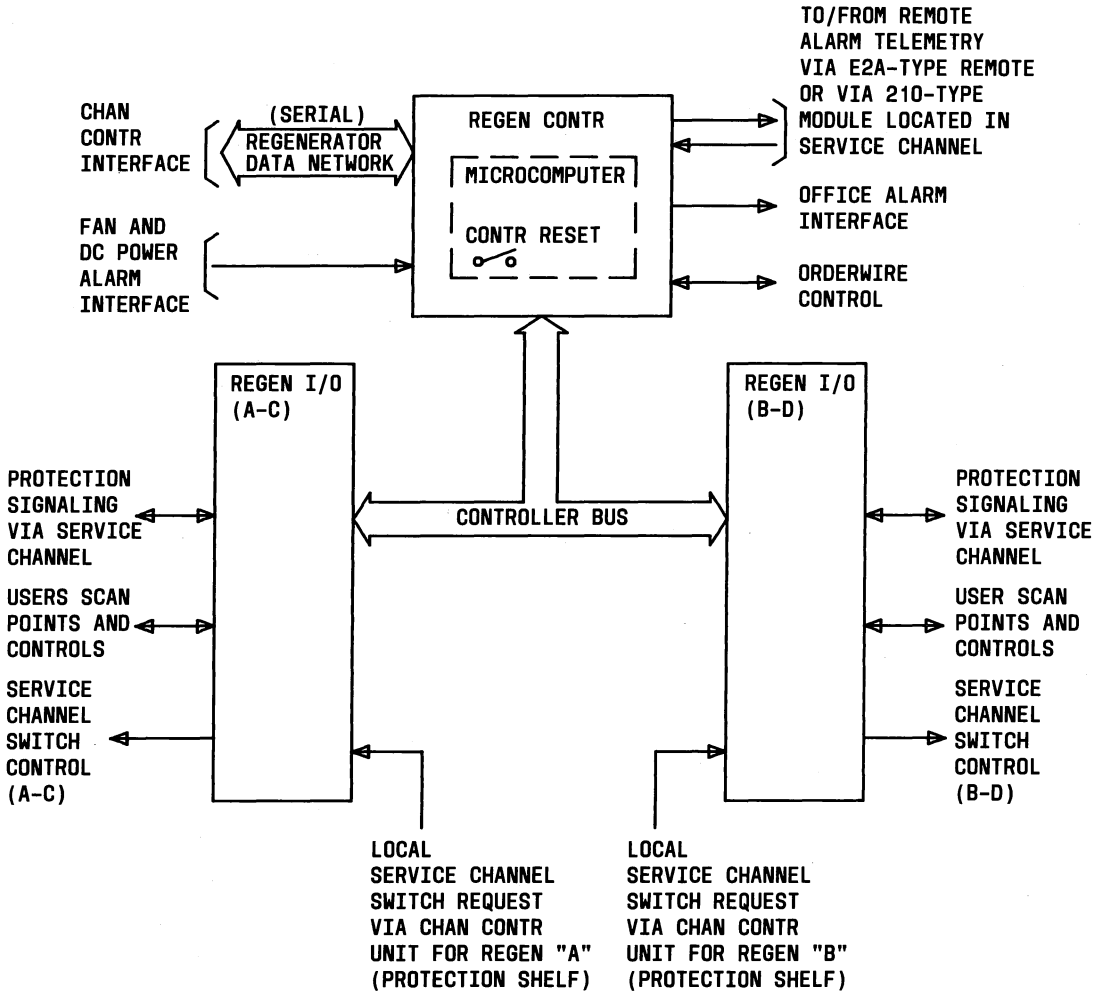


Fig. 5—Regenerator Station Control Functional Block Diagram

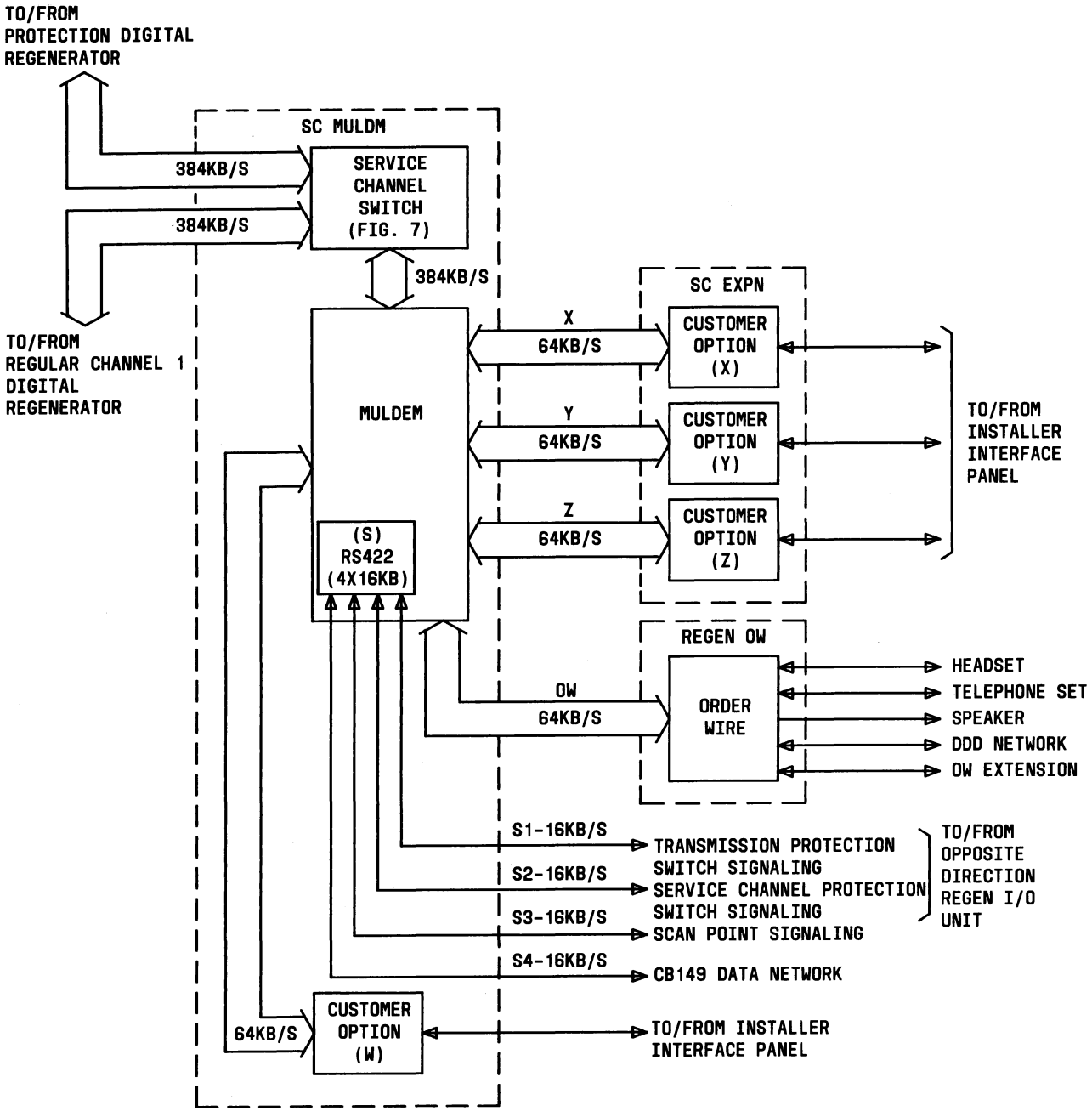


Fig. 6—Regenerator Station Service Channel Functional Block Diagram (One Direction of Transmission Only)

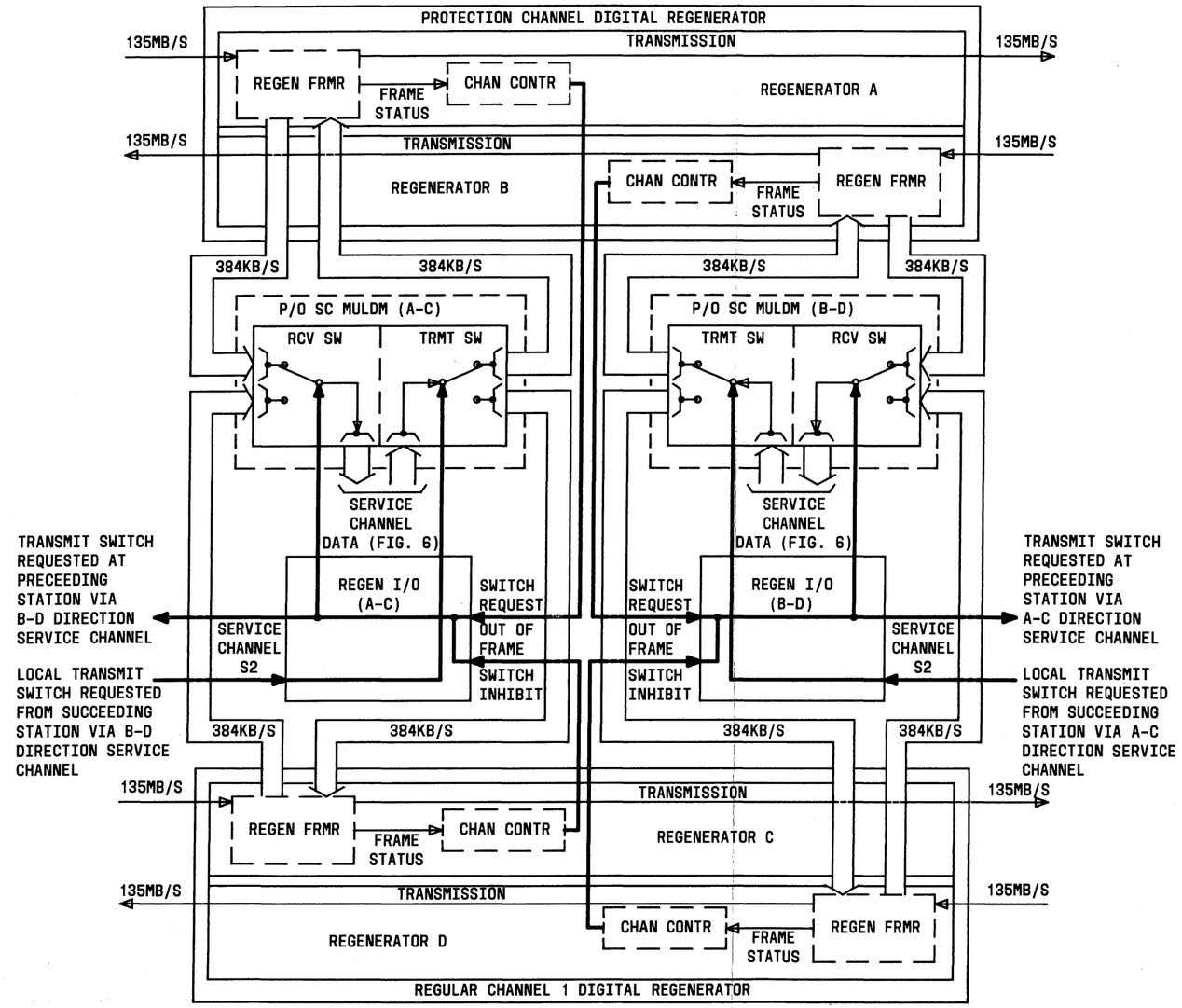


Fig. 7—Regenerator Station Service Channel Switching

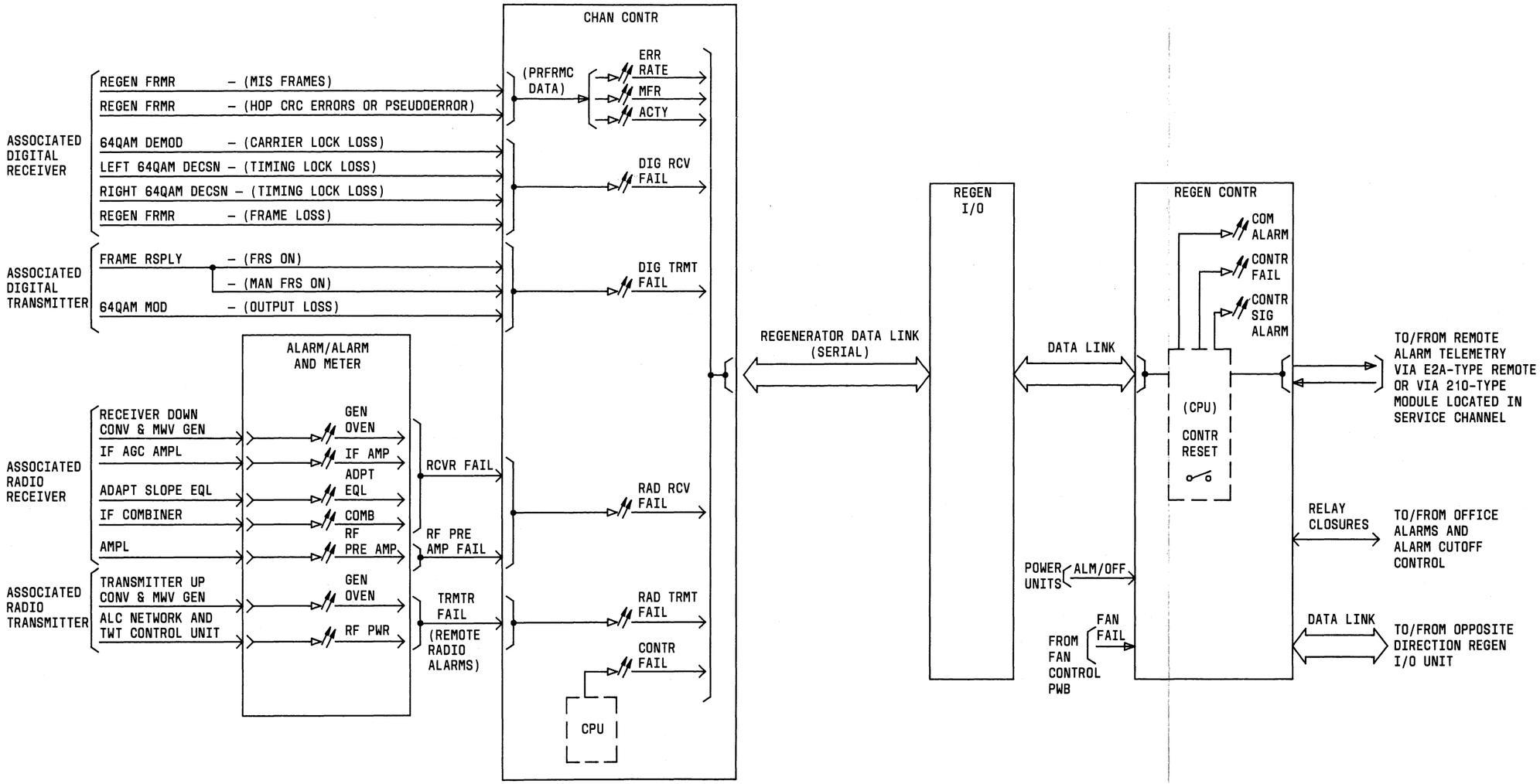


Fig. 8—Regenerator Alarm Reporting Signal Path

TEMPERATURE CONTROL

A fan shelf is available, when necessary, to remove the heat dissipated by the regenerator equipment. Figure 9 shows a functional block diagram of the fan shelf.

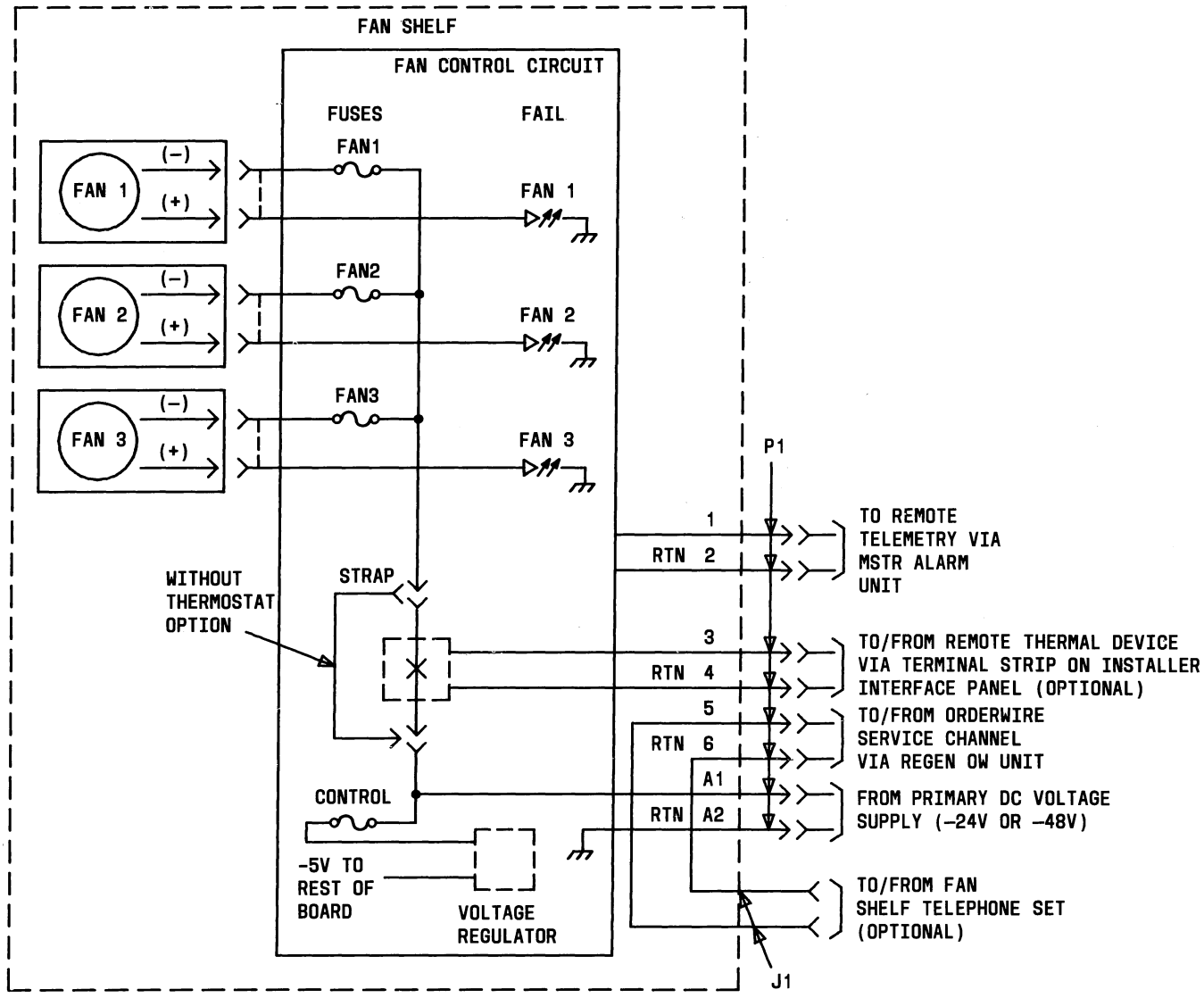


Fig. 9—Regenerator Fan Shelf Functional Block Diagram

POWER DISTRIBUTION

Each shelf in a regenerator bay is equipped with the necessary power conditioning units to provide the appropriate dc voltages to the circuit packs. Block diagrams are provided as follows:

- Figure 10—Regenerator Control and Service Channel Shelf Power Distribution
- Figure 11—Digital Regenerator Shelf Power Distribution Without Transversal Equalizer Option

- Figure 12—Digital Regenerator Shelf Power Distribution With Transversal Equalizer Option.

ISSUING ORGANIZATION

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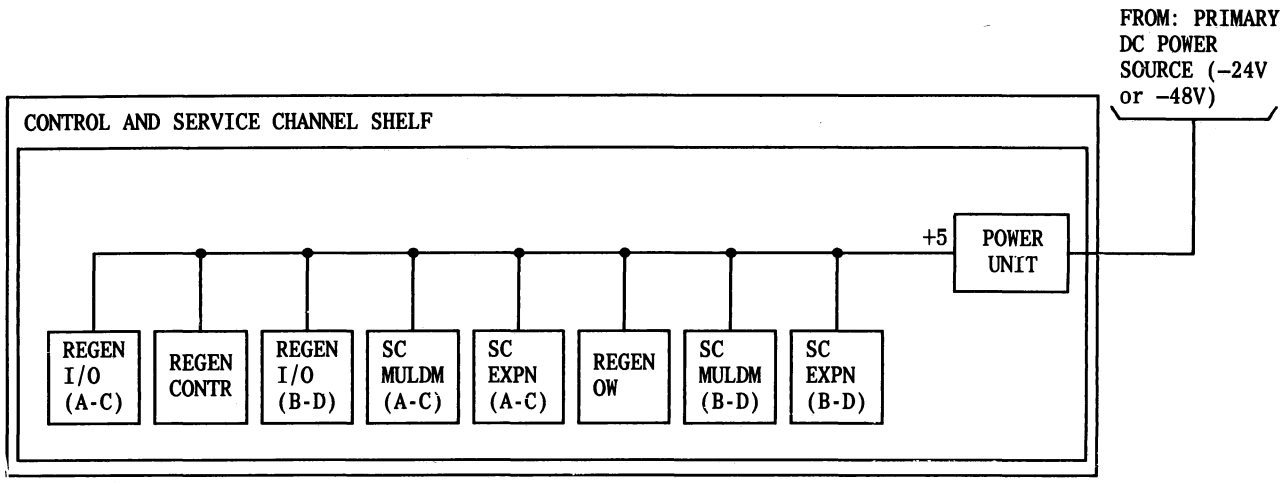

Fig. 10—Regenerator Control and Service Channel Shelf Power Distribution

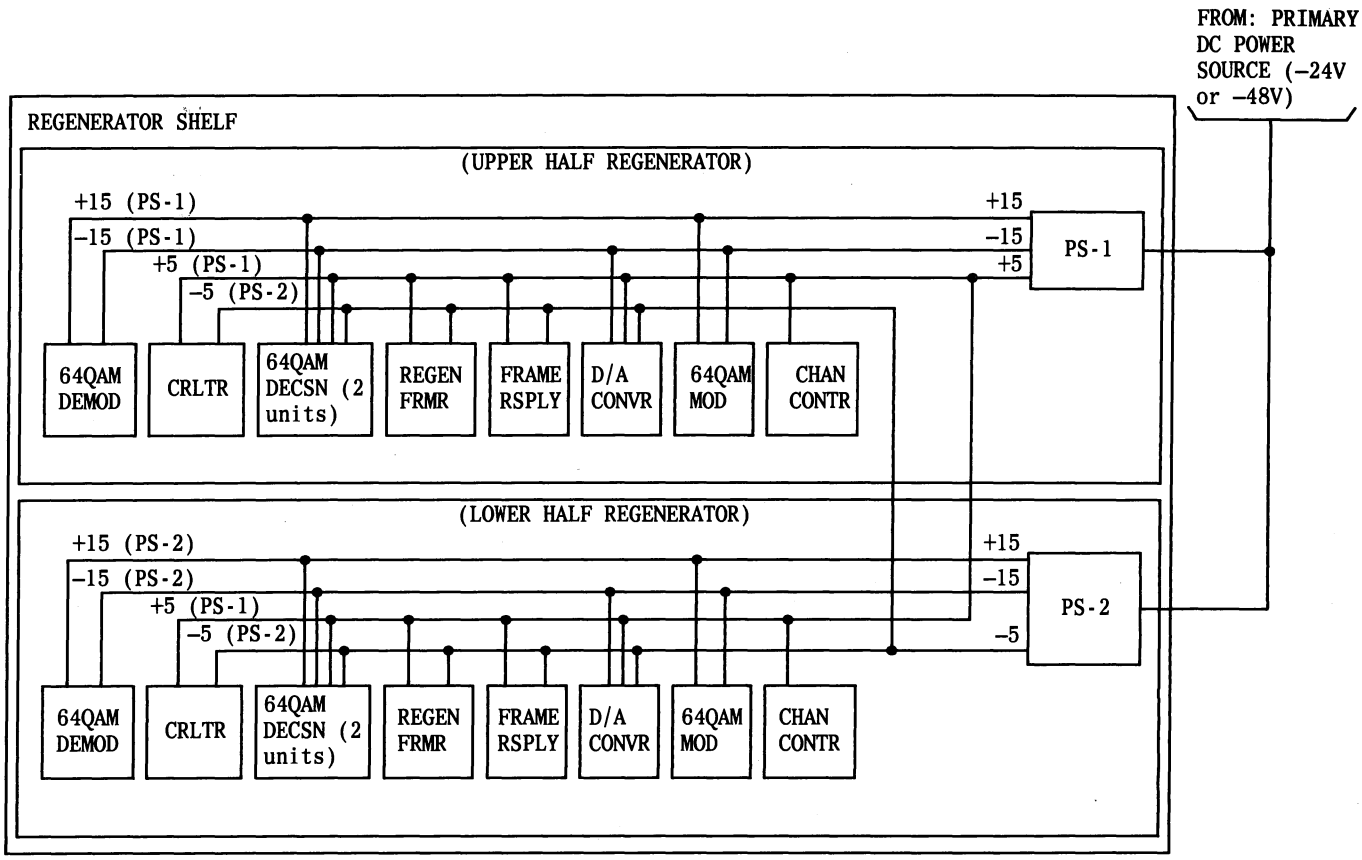

Fig. 11—Digital Regenerator Shelf Power Distribution Without Transversal Equalizer Option

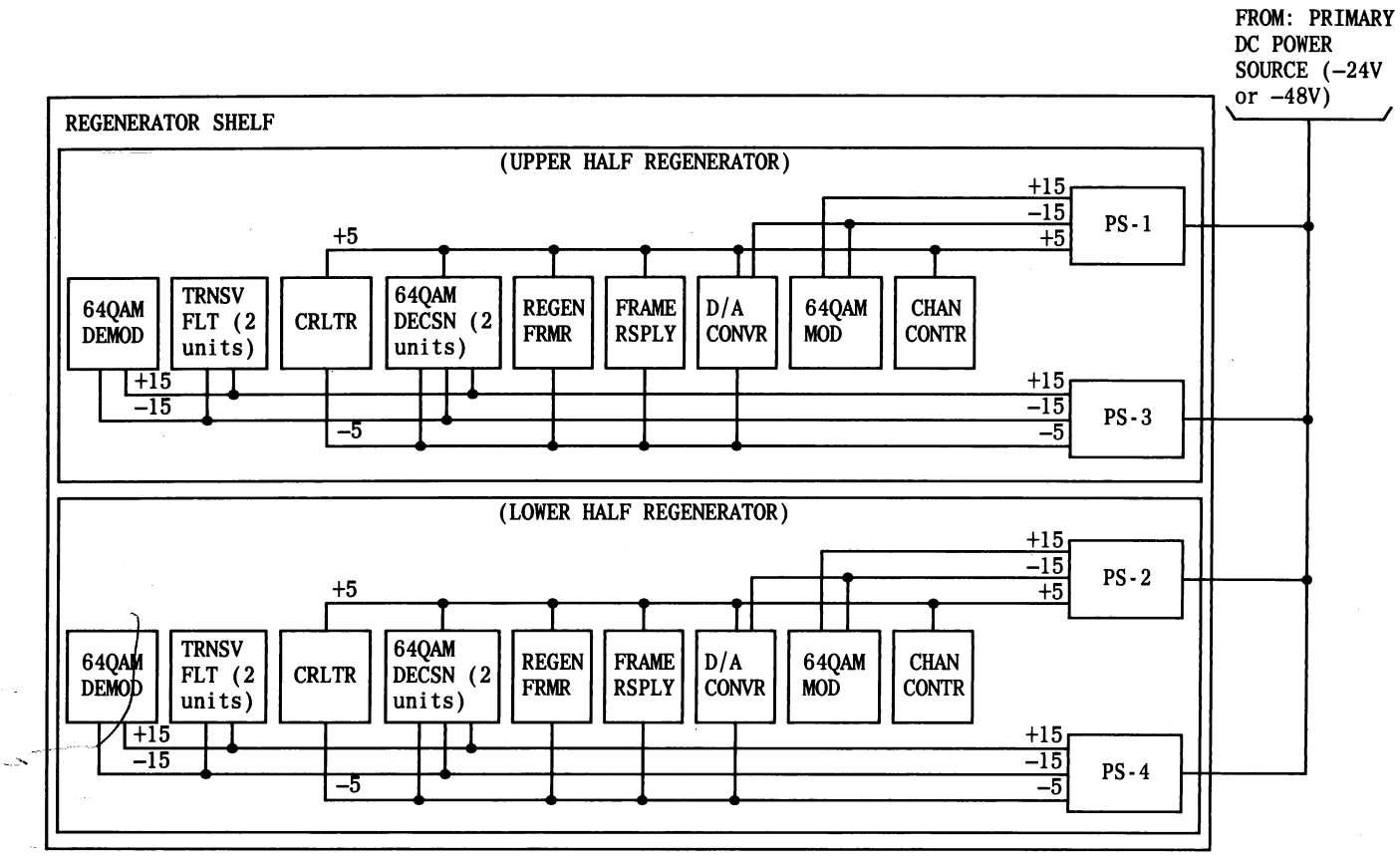

Fig. 12—Digital Regenerator Shelf Power Distribution With Transversal Equalizer Option