

**P1 CARRIER TELEPHONE SYSTEM**  
**SYSTEM LINE-UP AND MAINTENANCE**  
**HOW TO LOCATE TROUBLE**

**1.00 GENERAL**

**1.01** When a P1 carrier customer reports trouble, the test desk should analyze the report. See the section entitled Rural Carrier Telephone Systems, Testing Methods.

**1.02** This section describes the procedure used to isolate the trouble to a particular terminal, repeater, line section, or other equipment of a system. Trouble locating procedures for isolating trouble to a particular network board in a terminal are contained in Section 363-101-509 and in a repeater are contained in Section 363-102-506.

**1.03** When all channels of a system are in trouble, the trouble could be:

- a. Signaling tone oscillators.
- b. Line transformer and secondary protection.
- c. Central office wiring.
- d. Carrier line, carrier line equipment, and primary protection.
- e. Repeaters.
- f. Power sources (ac or dc) for repeaters.
- g. Common power sources for terminals.

**1.04** To isolate system trouble to a particular item of equipment or line section, the general procedure is:

- 1. Check the central office equipment and wiring common to the system. This includes items a, b, c, and g of 1.03.

- 2. Check the repeaters and repeater line sections. Start at the central office and work toward the remote terminals. This includes items d, e, and f of 1.03.

- 3. Check the line section between the repeater farthest from the central office and the remote terminal nearest this repeater. This checks item d of 1.03.

**1.05** Charts showing the proper sequence of tests to be made in isolating and clearing channel or system trouble are attached. Table I gives the chart number to be used for the specific trouble condition.

**TABLE I**  
**CHARTS TO BE USED**  
**FOR TROUBLE LOCATING**

Number of Channels in Trouble	Type of System	Chart
One	All	I
All	Nonrepeated	II
All	Nonregulated Repeated	III
All	Regulated Repeated	IV

**1.06** The first thing to do at a repeater or terminal in-service location is to measure the dc voltage applied to that repeater or terminal.

**1.07** If the system in trouble contains both regulated and nonregulated repeaters, follow the trouble locating procedure given in Chart IV; then test the individual repeaters using Chart IIIa for nonregulated repeaters; Chart IVa for regulated repeaters when pilot power is not received at central office; or Chart IVb for regulated repeaters when pilot power is received at central office.

## **2.00 REPEATER OUTPUT POWER**

To measure repeater output power, remove the carrier line from the output binding posts on the 386A apparatus case (7 and 8 for HG, 9 and 10 for LG output). Connect the receive cord to binding posts 12 (LGT LINE) and 13 (GRD) for low group frequencies and 14 (HGT LINE) and 13 (GRD) for high group frequencies. Turn the REC switch of the 7F test set to DET 600Ω position and read the output power. If power is supplied over the cable, do not remove the line toward the source of power for this measurement because power would be removed from the repeater. For this measurement at the HGT or LGT LINE test point, the line terminates the repeater. Turn the REC switch of the 7F test set to DET HI-IMP position and read the output power.

## **3.00 REPEATER INPUT POWER**

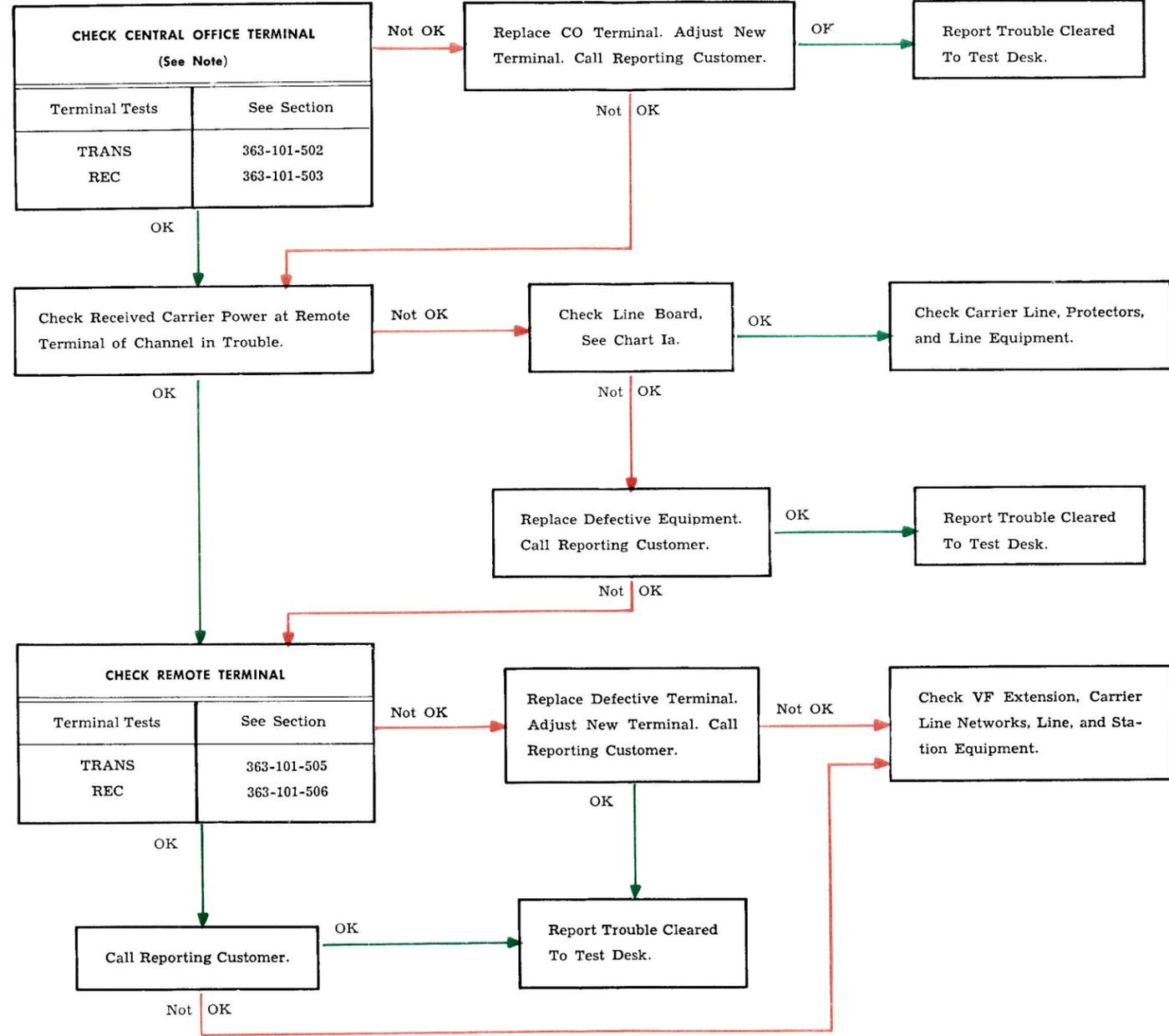
To measure repeater input power, remove the carrier line from the output binding posts on the 386A apparatus case (7 and 8 for HG, or 9 and 10 for LG output). Connect a 600-ohm resistor between binding posts 14 and 13 for HG frequencies or 12 and 13 for LG frequencies. Turn the REC switch of the 7F test set to DET HI-IMP position. Connect the receive cord to binding posts 12 (LGT LINE) and 13 (GRD) for HG frequencies and 14 (HGT LINE) and 13 (GRD) for LG frequencies and read the input power. If power is supplied over the cable, do not remove the line toward the source of power for this measurement because power would be removed from the repeater. For detailed procedure for this case, see Section 363-103-503 or 363-103-504.

**Note:** Compare the measured input power with the value shown on the Repeater Information Card. Differences of more than 6 db may indicate line trouble; differences of less than 6 db may be ignored.

## **4.00 TERMINAL LINE BOARD AND RECEIVING FILTER**

- 4.01** To check the line board and receiving filter of a remote terminal at the in-service location, see Chart Ia.
- 4.02** When a defective repeater or terminal has been located, replace it. Adjust the new terminal or repeater and connect it to the line.

**CHART I**  
**TROUBLE LOCATING PROCEDURE**  
**ONE CHANNEL OF SYSTEM IN TROUBLE**



**Note:** A check of the central office wiring and the P1 terminal line boards can be made by measuring the transmitted carrier power at the MDF protectors.

**CHART Ia**  
**PROCEDURE FOR CHECKING**  
**LINE BOARD AND RECEIVING FILTER**  
**OF A REMOTE TERMINAL AT IN-SERVICE LOCATION**

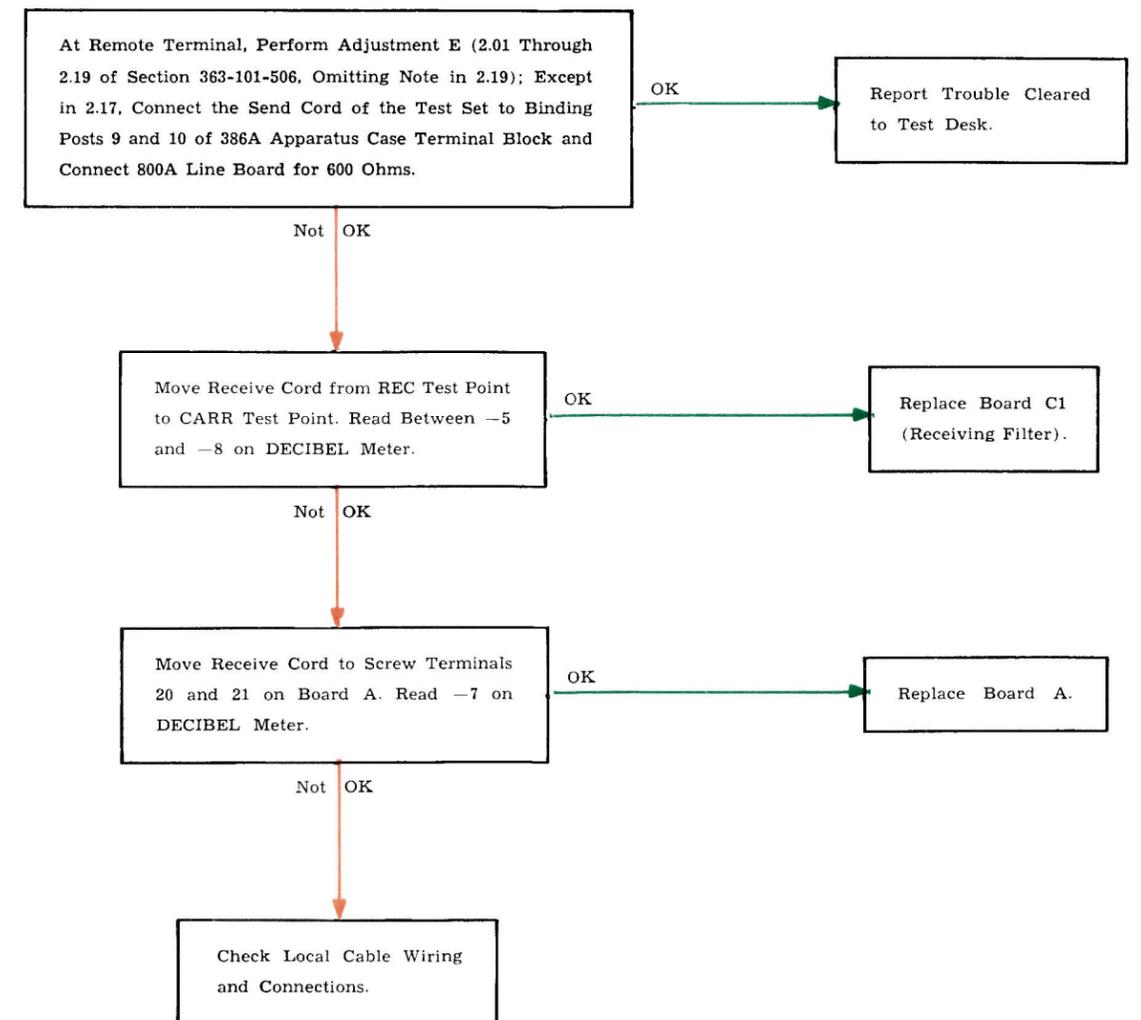
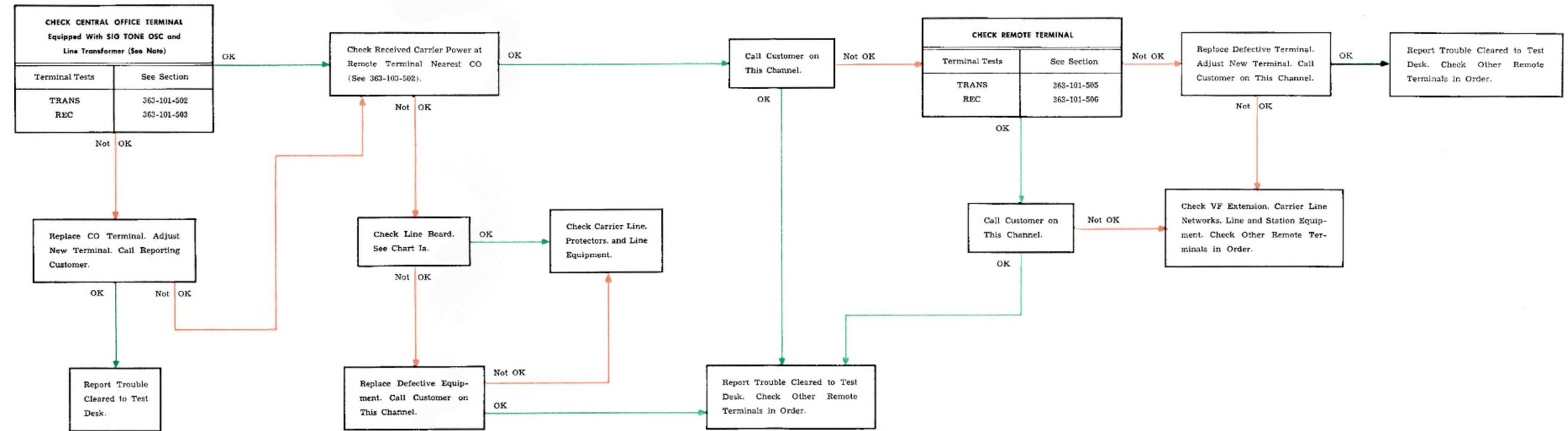
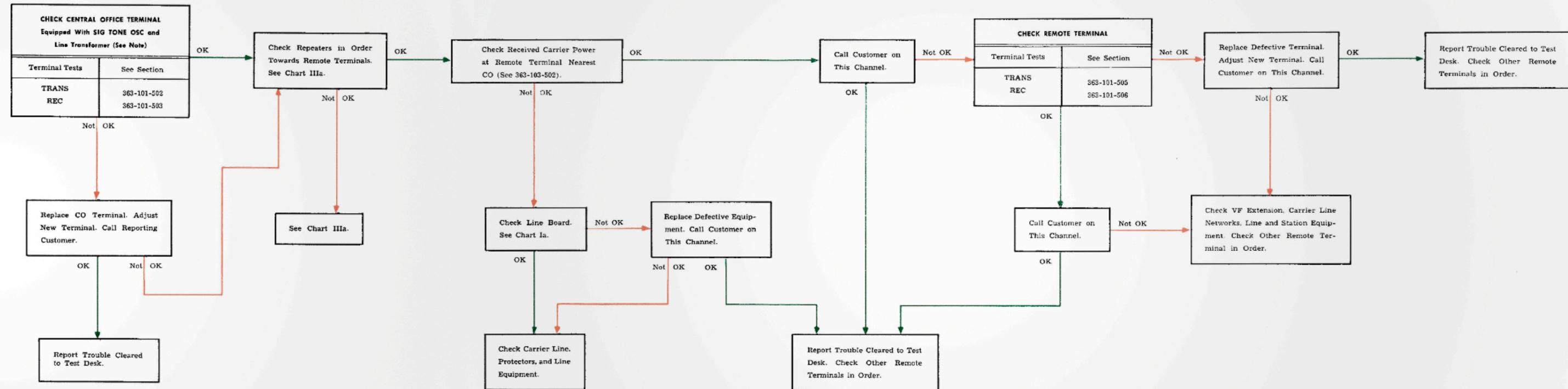


CHART II  
TROUBLE LOCATING PROCEDURE  
NONREPEATERED SYSTEM  
ALL CHANNELS IN TROUBLE



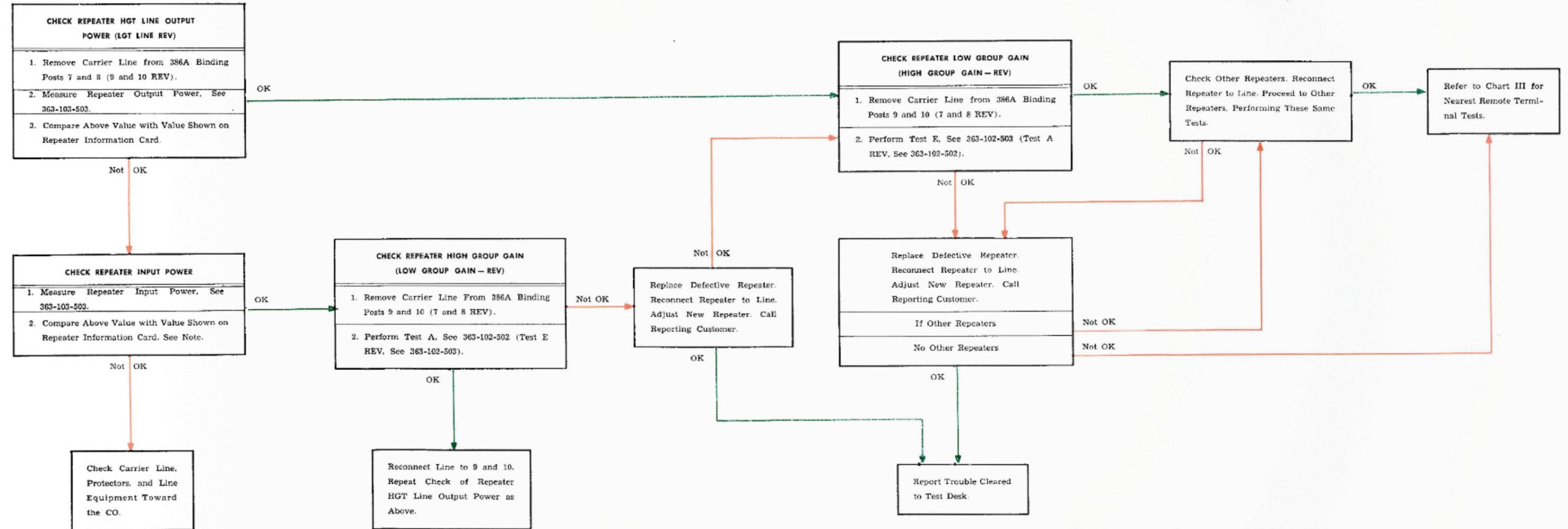
Note: A check of the central office wiring and the P1 terminal line boards can be made by measuring the transmitted carrier power at the MDF protectors.

**CHART III**  
**TROUBLE LOCATING PROCEDURE**  
**NONREGULATED REPEATERED SYSTEM**  
**ALL CHANNELS IN TROUBLE**



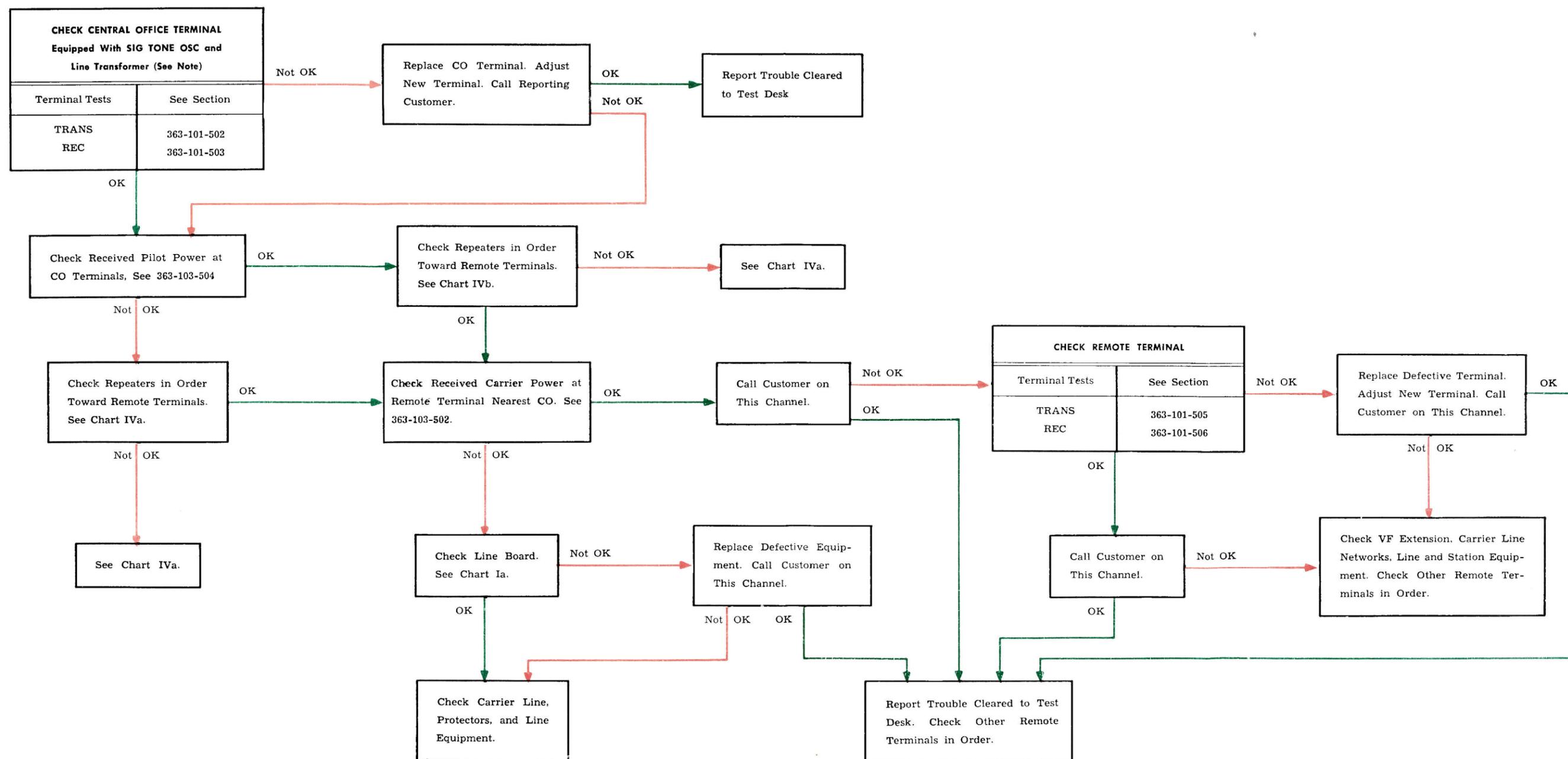
**Note:** A check of the central office wiring and the P1 terminal line boards can be made by measuring the transmitted carrier power at the MDF protectors.

**CHART IIIa**  
**TROUBLE LOCATING PROCEDURE**  
**FOR REPEATER TESTS**  
**NONREGULATED REPEATERED SYSTEM**



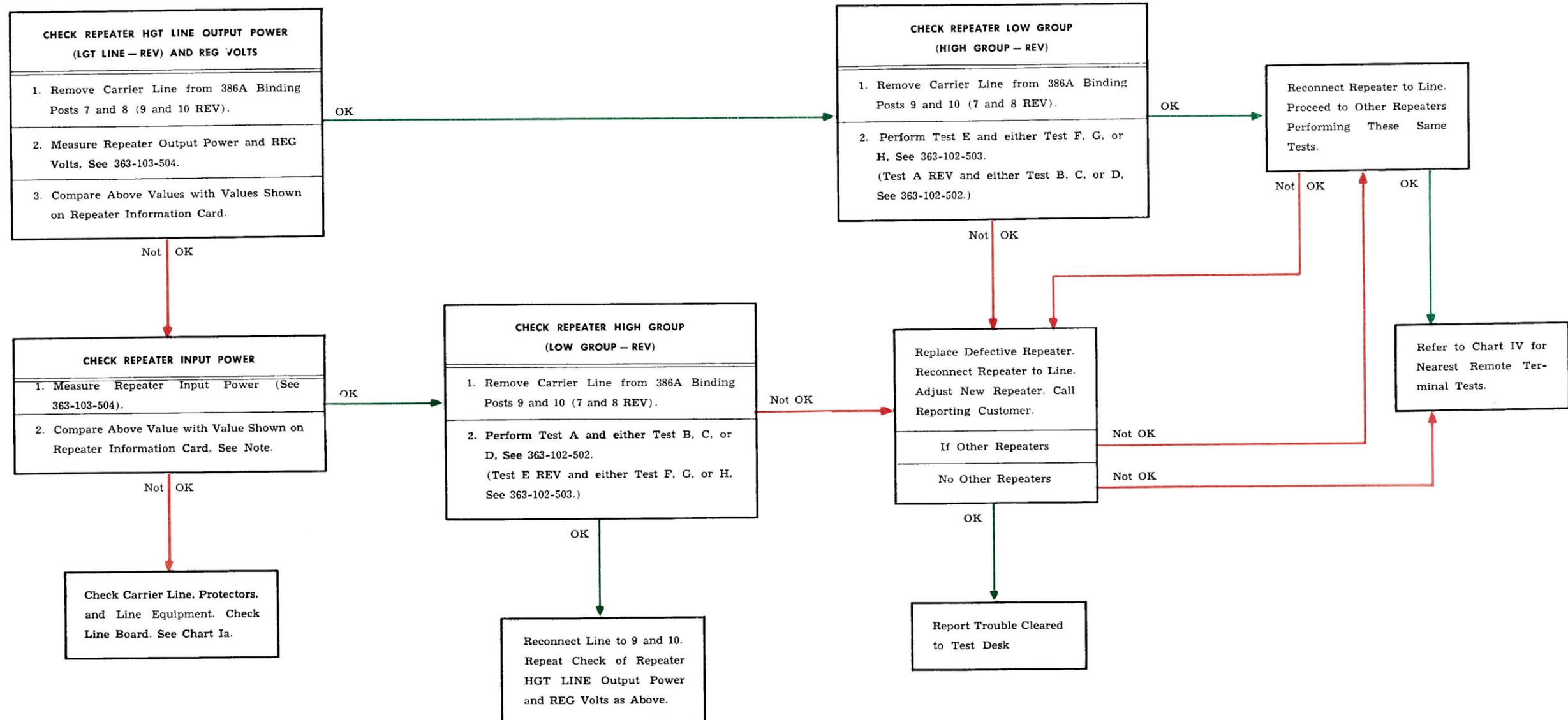
**Note:** Compare the measured input power with the value shown on the Repeater Information Card. Differences of more than 6 db may indicate line trouble. Differences of less than 6 db may be ignored.

**CHART IV  
TROUBLE LOCATING PROCEDURE  
REGULATED REPEATERED SYSTEM**



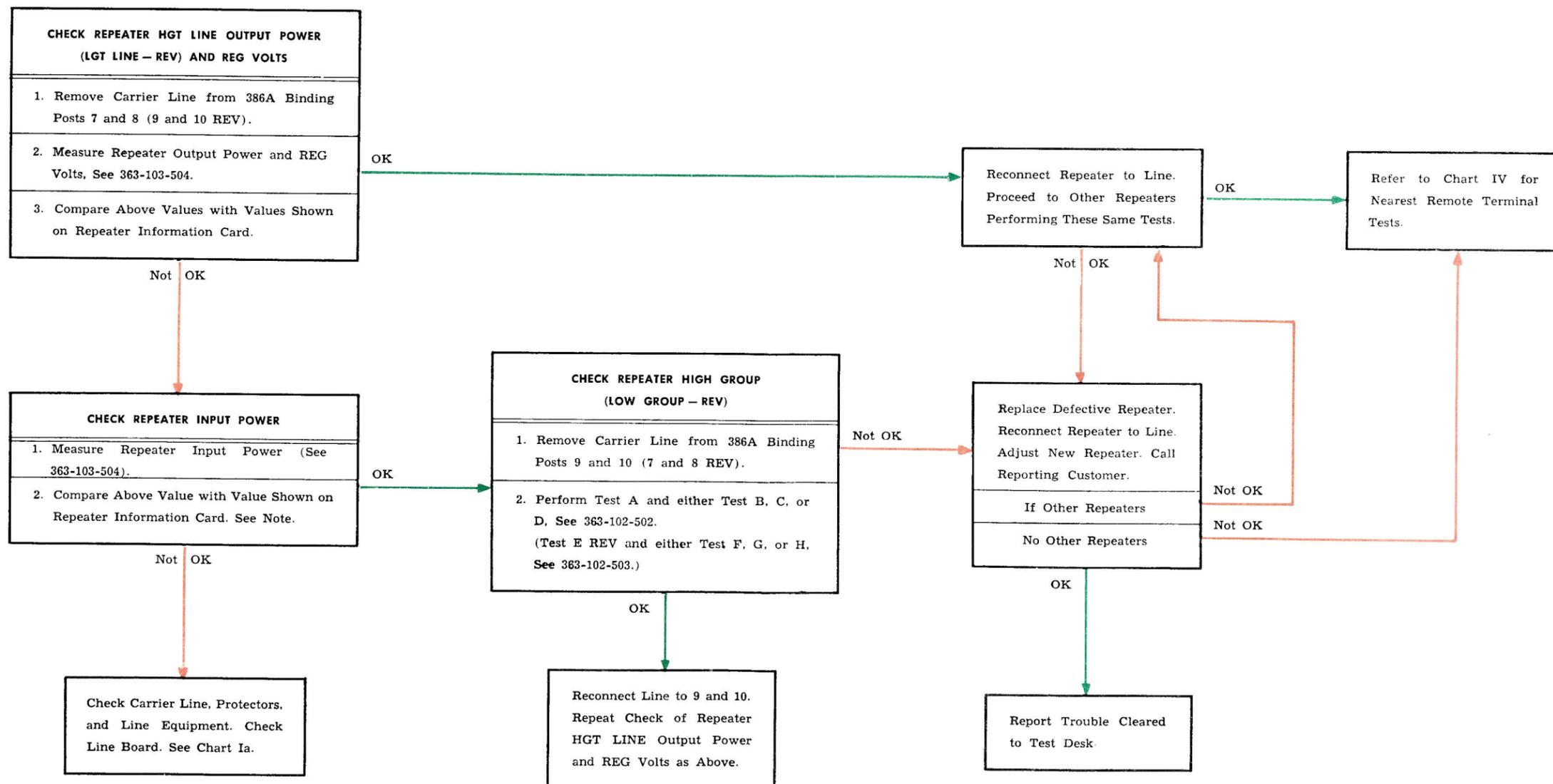
**Note:** A check of the central office wiring and the P1 terminal line boards can be made by measuring the transmitted carrier power at the MDF protectors.

**CHART IVa**  
**TROUBLE LOCATING PROCEDURE**  
**FOR REPEATER TESTS**  
**REGULATED REPEATERED SYSTEM**  
**PILOT POWER NOT RECEIVED AT CO**



**Note:** Compare the measured input power with the value shown on the Repeater Information Card. Differences of more than 6 db may indicate line trouble. Differences of less than 6 db may be ignored.

**CHART IVb**  
**TROUBLE LOCATING PROCEDURE**  
**FOR REPEATER TESTS**  
**REGULATED REPEATERED SYSTEM**  
**PILOT POWER RECEIVED AT CO**



**Note:** Compare the measured input power with the value shown on the Repeater Information Card. Differences of more than 6 db may indicate line trouble. Differences of less than 6 db may be ignored.