OPERATION AND MAINTENANCE
1×N FREQUENCY DIVERSITY
DR 6/11-135A AND 135EC
RADIO RECEIVER TROUBLE ISOLATION

CONTENTS PAGE

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1. GENERAL

All radio receiver trouble-clearing begins with the Radio Receiver Trouble Isolation flowchart. All radio receiver alarms (except a DC power fail) are centralized on the ALARM/ALARM AND METER unit located on the radio transmitter shelf. The resulting office alarm can be silenced by depressing the aiarm cutoff (ACO) pushbutton located on the right side of the radio frame (if equipped). However, DC power failures cannot be silenced by the ACO pushbutton.

Power unit troubles can result in false and misleading alarms. The power unit voltages should always be checked before proceeding to clear any alarm. Check the voltages by setting the selector switch on the ALARM AND METER unit (if equipped) to the power unit voltage positions or by measuring at the test points of the power unit. If an output voltage does not meet the requirement, the trouble is either a faulty power unit or an abnormal current demand by one or more of the units supplied by the power unit.

The meter unit also has positions that indicate the operational status of the receiver. An automatic gain control (AGC) circuit in the receiver IF amplifier unit maintains a constant radio receiver IF output power level. The AGC V position on the meter unit monitors this voltage. The AGC circuit has a dynamic range of approximately 80 dB. A lower than normal AGC voltage (less negative) indicates that the input power level of the amplifier is higher than normal. A higher than normal AGC voltage (more negative) indicates that the input power level is lower than normal. The AGC voltage is useful when monitoring fading activity in a hop. If a 4400 Series receiver down-converter is installed, its AGC voltage is available at a set of AGC V test jacks on the faceplate (but not on the ALARM AND METER unit) and may be used in the same manner as the IF amplifier AGC voltage.

When using the meter to verify voltage requirements and the indications received are not correct, check the meter. Do this by rotating the meter control to various positions and comparing the meter indications with the expected requirements that can be found on the RADIO DATA CARD located to the left of the meter unit. If multiple indications appear to be off, replace the meter.

1.1 UPDATE INFORMATION

This practice is reissued to revise the Radio Receiver Trouble Isolation flowchart. This practice is used in all frequency diversity terminal and regenerator binders.

2. RADIO RECEIVER TROUBLE ISOLATION FLOWCHART

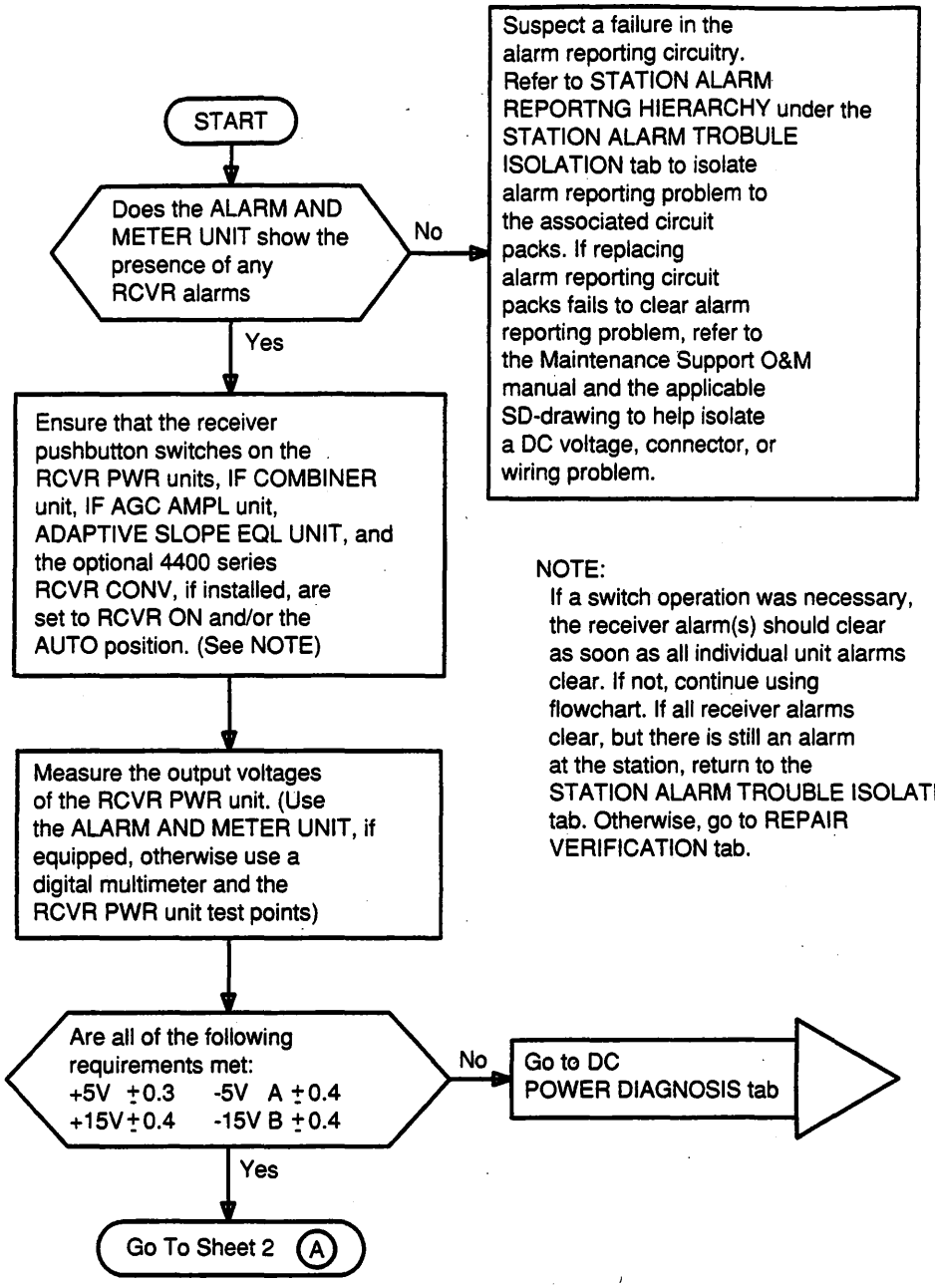
The following flowchart is the starting point for isolating and clearing alarmed conditions in a radio receiver and should be entered when directed by the STATION ALARM TROUBLE ISOLATION tab or when referenced from one of the detailed radio receiver alarm-clearing flowcharts. The detailed alarm-clearing flowcharts are not specifically designed to clear multiple failures or to take into account faulty spare units. However, if the alarm indicators are functioning properly and the flowchart instructions and recommendations are followed, any multiple failure should ultimately be cleared.

A record of power levels and voltages that appear at various key points in the receiver are provided by the RADIO DATA CARD plug-in. The data will initially be recorded during turnup and should be updated, as necessary, after any repair is made. During repair, the technician can compare measured data with the previously recorded data for any variations that might point to trouble.

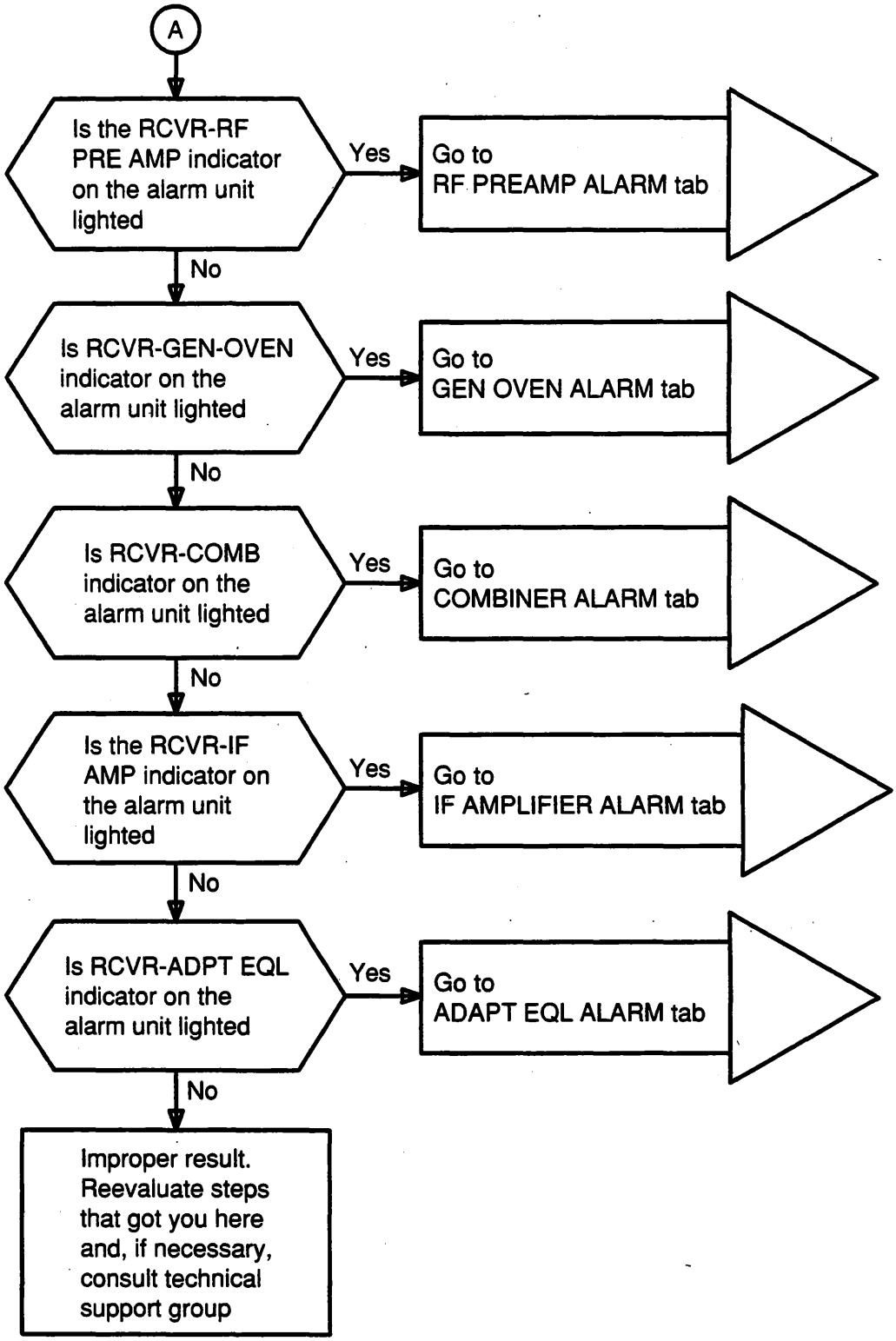
The flowchart should be followed if some or all of the following indicators on the ALARM AND METER unit are lighted: RCVR GEN OVEN, IF AMP, ADPT EQL, COMB, and RF PREAMP LED. The flowchart is used to determine what detailed alarm-clearing flowchart should be followed to clear the above indicator(s).

3. RADIO RECEIVER FUNCTIONAL BLOCK DIAGRAMS

A functional block diagram of a frequency diversity radio receiver is shown in Figure 1. A functional block diagram of a radio receiver equipped for space diversity operation is shown in Figure 2. The major units are identified by their abbreviated names, and nominal power levels are shown in the functional block diagrams.



Flowchart 1–Radio Receiver Trouble Isolation (Sheet 1 of 2)



Flowchart 1–Radio Receiver Trouble Isolation (Sheet 2 of 2)

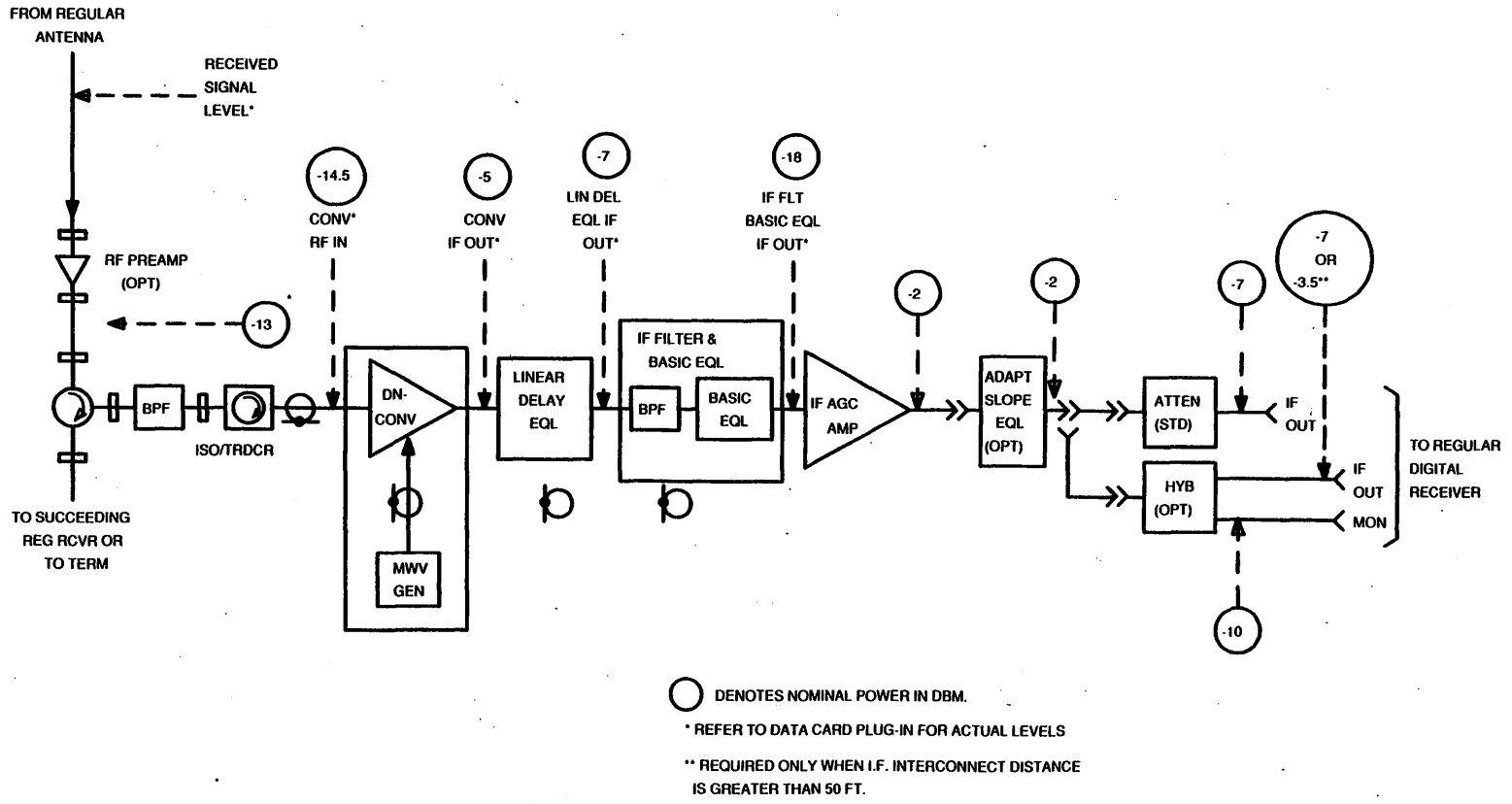


Figure 1–Frequency Diversity Radio Receiver Block Diagram

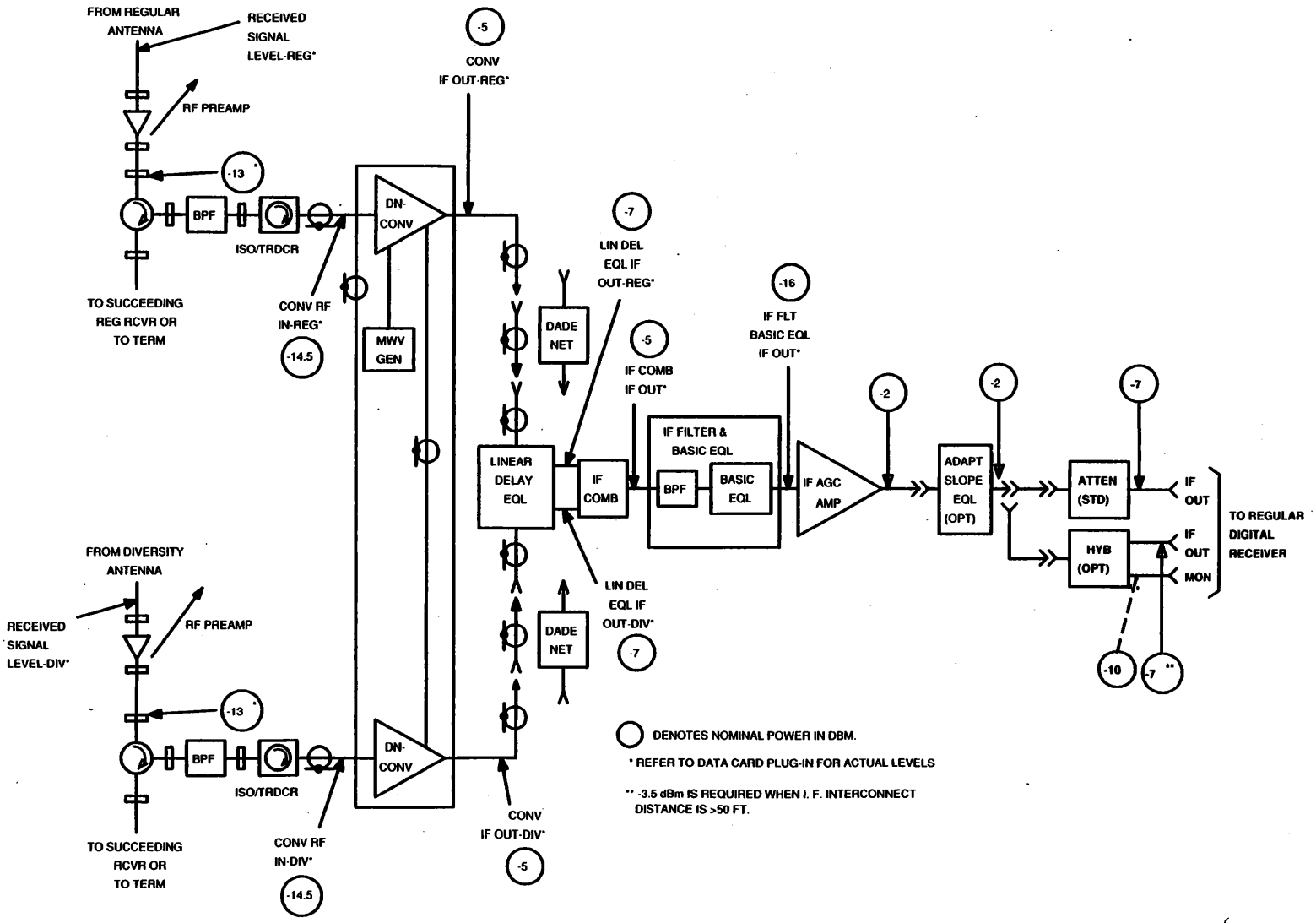


Figure 2–Space Diversity Radio Receiver Block Diagram