

SECTION IV. THEORY OF OPERATION

12.4.1 INTRODUCTION

This section provides a detailed description of the manner in which the GTA radio interfaces with the ACU and other components in the cabinet.

12.4.2 SIMPLIFIED BLOCK DIAGRAM

The simplified block diagram (figure 12.4.1) illustrates the basic system components and their functional relationships. The GTA radio receives serial data for self-test and setup information from an available RS-232 port (SIO boards 4 through 8). The GTA radio also receives ANALOG VOICE data from the voice recorder/playback board. The GTA radio amplifies the input voice signal and sends it through its connector J4 via coaxial cable to ACU I/O panel connector J43. The GTA radio antenna is connected via coaxial cable W9 to I/O panel connector J43.

12.4.3 DETAILED BLOCK DIAGRAM

This section contains a description and detailed block diagram (figure 12.4.2) of the GTA radio configuration. Power distribution and control is described using detailed block diagrams of the distribution of ac voltage to the GTA radio.

12.4.3.1 SIO Board. The SIO board transmits data from the VMEBUS through its connector P1, processes the information, then transmits the information from its connector P2 via the RS-232 DATA line to cable assembly W076 connector P2 to GTA radio pin P1 to jack J5. (Chapter 2, Section IV, provides detailed information on the SIO board.)

12.4.3.2 Voice Recorder/Playback Board. The voice recorder/playback board receives power interface logic from the VMEBUS on connector P1 to connector P2. Digitized voice information is supplied from Voice Processor Board A20. This information is transmitted via connector P2 to connector P67 of the ring/tip to connector P3 of cable W076 to the GTA radio from connector P1 to jack J5. (Chapter 2, Section IV, provides additional information on the voice recorder/playback board.)

12.4.3.3 Power Distribution Assembly. The power distribution assembly receives ac power from the facility main power line and distributes ac power to the GTA radio on jack J1 via cable assembly W79.

12.4.3.4 I/O Panel. The I/O panel is used as the master connection point for all inputs to and outputs from the ACU. The output signal from connector J4 on the GTA radio is fed via coaxial cable to connector J43 on the I/O panel. Connector J43 also contains a surge suppressor. From connector J43, the signal is fed via coaxial cable W9 to the antenna.

12.4.4 GTA RADIO SELF-TEST

The GTA radio self-test is performed when the ACU requests data from the radio. The SIO board is connected to the GTA radio by the RS-232 cable and cable W076. The ACU sends a data request to the SIO board, which, in turn, sends it to the GTA radio. The GTA radio replies, sending the response back through the RS-232 cable to the SIO board, which sends the response to the ACU. The ACU then polls the radio every 15 minutes to verify that all systems are operating correctly. If there is a problem detected by the ACU, a fault is displayed on the OID screen. RADIO ID NUMBER, TRANSMIT FREQUENCY, POWER LEVEL

SETTING, and MAX POWER SETTING are displays of the values that have already been entered into the system. The RADIO ID NUMBER is the designator specific to each radio. TRANSMIT FREQUENCY is the value equal to the command frequency (117.975 to 136.975 in increments of 0.025). The POWER LEVEL SETTING value is equal to the commanded power level of 0 to the maximum power setting for a specific radio. MAX POWER SETTING displays the maximum power setting for the radio actually installed in the ACU. The power setting is different for each radio and is between 0 and the maximum power setting for a specific radio. The POWER SUPPLY STATUS test consists of four individual tests. The +5V test indicates that the internal measured operating voltage is within 3V and 7V. The +12V test indicates that the internal measured operating voltage is within 9.6V and 14.4V. The -12V test indicates that the internal measured operating voltage is within -14.4V and -9.6V, and the -80V test indicates that the internal measured operating voltage is within -96V and -64V. If the test results on the POWER SUPPLY STATUS test are outside the tolerances, the test fails. The VFWD and VRFD values are digital representations of the forward and reflected voltages, respectively, as measured by the GTA radio. These digital values may range from 0 to the maximum power setting and do not represent actual voltage values. The ASOS continuous self-test (CST) performs a comparison calculation of these values. As long as the VRFD value is less than 75 percent of the VFWD value, a pass indication is displayed for both the VFWD and VRFD field. If the VRFD value is greater than or equal to 75 percent of the VFWD value, the test failure indicator (F) is displayed for both fields. The RADIO RESPONSE test indicates if the ACU is capable of communicating with the GTA radio.

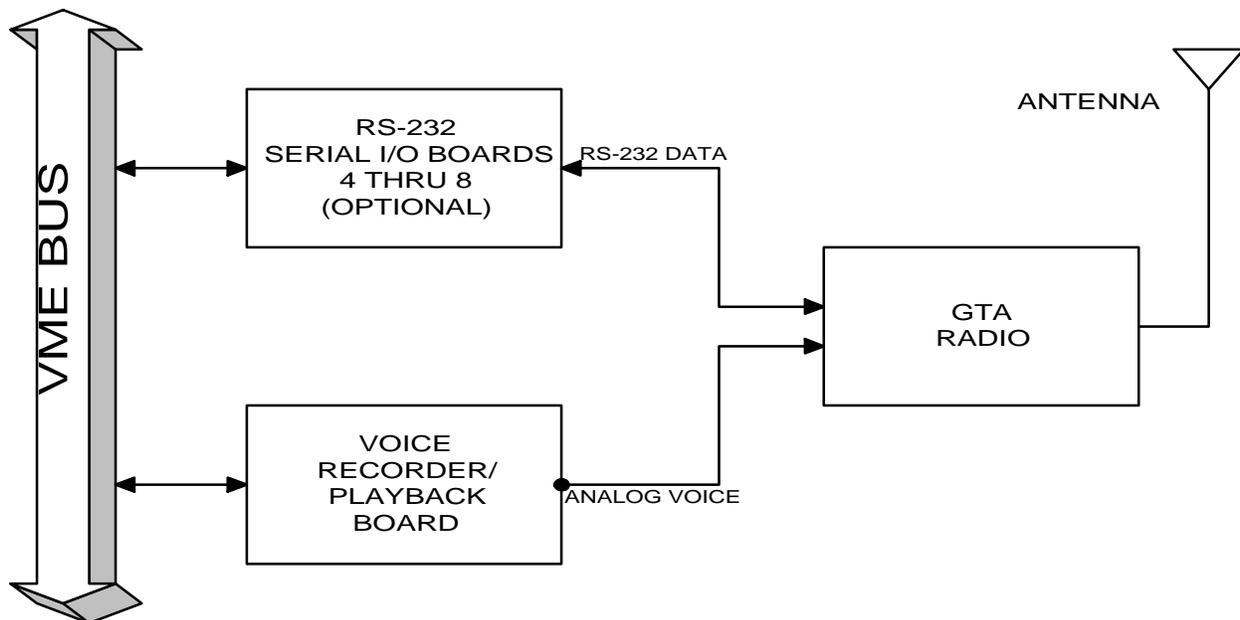
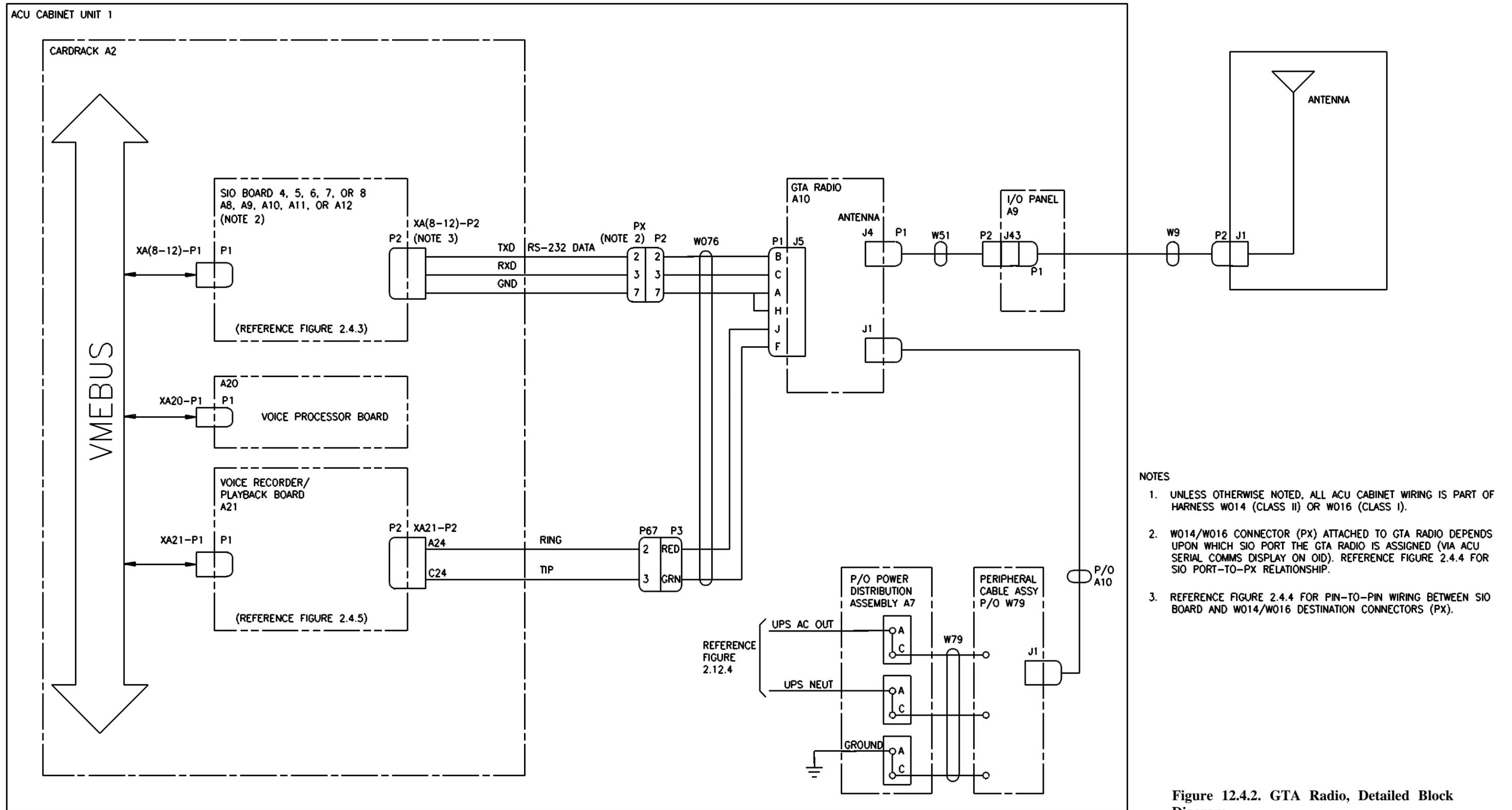


Figure 12.4.1. GTA Radio Simplified Block Diagram



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Figure 12.4.2. GTA Radio, Detailed Block Diagram