MULTI-NET® II VOTER SYSTEM

Second Printing
March 2000

Part No. 001-3139-502 3-00mwp Printed in U.S.A.

MULTI-NET® II VOTER SYSTEM

The E.F. Johnson Company designs and manufactures two-way radio equipment to serve a wide variety of communications needs. Johnson produces equipment for the mobile telephone and land mobile radio services which include business, industrial, government, public safety, and personal users.

LAND MOBILE PRODUCT WARRANTY

The manufacturer's warranty statement for this product is available from your product supplier or from the E.F. Johnson Company, 299 Johnson Avenue, Box 1249, Waseca, MN 56093-0514. Phone (507) 835-6222.

WARNING

This device complies with Part 15 of the FCC rules. Operation is subject to the condition that this device does not cause harmful interference. In addition, changes or modification to this equipment not expressly approved by E. F. Johnson could void the user's authority to operate this equipment (FCC rules, 47CFR Part 15.19).

DO NOT allow the antenna to come close to or touch, the eyes, face, or any exposed body parts while the radio is transmitting.

DO NOT operate the radio near electrical blasting caps or in an explosive atmosphere.

DO NOT operate the radio unless all the radio frequency connectors are secure and any open connectors are properly terminated.

DO NOT allow children to operate transmitter equipped radio equipment.

SAFETY INFORMATION

Proper operation of this radio will result in user exposure below the Occupational Safety and Health Act and Federal Communication Commission limits.

The information in this document is subject to change without notice.

E.F. Johnson Company will not be liable for any misunderstanding due to misinformation or errors found in this document.

TABLE OF CONTENTS

TABLE OF CONTENTS (CONT.)

3 2000 SERIES RECEIVER DECODER MODULE (RDM)

TABLE OF CONTENTS (CONT.)

TABLE OF CONTENTS (CONT.)

TABLE OF CONTENTS (CONT.)

LIST OF FIGURES

TABLE OF CONTENTS (CONT.)

TABLE OF CONTENTS (CONT.)

LIST OF TABLES

TABLE OF CONTENTS (CONT.)

SECTION 1 INTRODUCTION

1.1 DESCRIPTION

The Voter System is an additional feature of the Multi-Net System that allows receiver voting. The voter system is used in Wide Area systems that require simultaneous RF coverage over an area not capable of coverage by a single repeater site. The Voter System is also used to assist the RF coverage of a system using portables where a single receiver cannot cover the area, but a single transmitter site is sufficient for outgoing coverage.

1.2 MAIN COMPONENTS

The Voter System consists of at least one or more of the following modules. See Figures 1-1 and 1-3 for a Local Site and Figures 1-2 and 1-4 for a Remote Site and Figure 1-6 for a 5-channel voter system block diagram.

1.2.1 RECEIVER DECODER MODULE

See Section 2 (8000/8900) or Section 3 (2008/2009).

The 800 or 900 MHz Receiver Decoder Module (RDM) is the Receiver and Interface board. The RDM decodes the subaudible data and four levels of Received Signal Strength Indication (RSSI) plus the condition of the squelch line, open or closed, from the receiver. In the Remote site information is then passed from the RDM, to the RMM, to the Local Site CDM and then to the RVM. In the Local Site, the RDMs are hard wired to the RVM.

The Multi-Net System is capable of handling 30 channels and the Voter System is capable of handling 32 voted receiver sites, the maximum number of RDMs is 960.

1.2.2 RECEIVER MULTIPLEXER MODULE

The Receive Multiplexer Module (RMM), in the Remote Site, receives RSSI data from multiple RDMs and multiplexes the information onto a single line to be transmitted to a CDM at the Local Site.

Each RMM is capable of handling 10 RDMs, with 3 RMMs required per 30 channel site. With 3 RMMs per site (maximum) and 32 voted receiver sites, the maximum number of RMMs is 3 x 32 = 96 (see Section 4).

1.2.3 CENTRAL DE-MULTIPLEXER MODULE

The Central De-Multiplexer Module (CDM), in the Local Site, receives the multiplexed data from the Remote Site RMM or directly from the RDM at the Local Site and de-multiplexes the information to the appropriate line to send to the RVMs (see Section 5).

A CDM is connected to each Remote Site RMM, therefore, 96 CDMs are the maximum number for a Voter System. A CDM is not required for the Local Site RDMs, these are hard wired to the RVM.

1.2.4 CHANNEL RECEIVER VOTER MODULE

The Channel Receiver Voter Module (cRVM), at the Local Site, receives audio directly from the RDMs at both the Local and the Remote Sites. The cRVM receives the RSSI level directly from the Local Site RDMs and through the CDMs for Remote Sites. The cRVM compares the different sites and selects the audio from RDM with the best RSSI value. The cRVM connects the selected audio to the Repeater (see Section 6).

Each cRVM can handle the audio from 4-RDMs and the RSSI level information from 1-Local RDM and 3-CDMs (or 4-CDMs). There can be 32 possible Voter Sites; divide this by 4 and 8 is the maximum number of RVMs required (1-cRVM and 7-slave RVMs) per channel. For a 30 channel system with 32 Voter Sites, the maximum number of RVMs required is 240 (30-cRVMs and 210-slave RVMs).

As stated above, a cRVM can have 4 audio/data inputs (channels). If a fifth site is added, a slave RVM is added to each cRVM to accommodate the fifth site.

1.2.5 VOTER DIAGNOSTICS MODULE

The Voter Diagnostics Module (VDM), in the Switch, is the data communication buffer between the SMM and the Voting System (see Section 7). The type of data exchanges between the Voting System and the VDM pertains to: Memory Read of the voters; Receiver Site Enable/Disable; and Alarm/Control Information.

1.2.6 VOTER SHELF

Each Voter Shelf (VSH) contains 13 slots for cRVM, RVM and CDM modules (see Section 8). The maximum total of cRVMs/RVMs is 240, divide this by 13 slots and the total number of VSHs needed for cRVMs/RVMs is 19. The maximum total of CDMs is 96, divide this by 13 slots and the total number of VSHs needed for CDMs is 8. The maximum possible total number of VSHs is 27.

1.2.7 VOTER POWER SUPPLY

Each Voter Power Supply (VPS) has the capacity to handle two VSHs (see Section 9). The maximum total of VSHs is 27, divide this by 2 and the total number of VPSs needed is 14. There are two VPSs per power shelf, therefore, 7 power shelves are the maximum number per system.

1.2.8 COMPONENTS OF A VOTER SYSTEM

Component	Part Number	Section
800 MHz RDM	023-3039-580	2
900 MHz RDM	023-3039-590	2
800 MHz RDM	023-3008-231	3
900 MHz RDM	023-2009-231	3
RMM	023-3039-530	4
CDM	023-3039-540	5
RVM	023-3039-520	6
VDM	023-3039-570	7
VSH	023-3039-550	8
VSH Redundant Plate	250-3039-553	9
VSH PS 4-Shelf	250-3039-554	9
VSH PS 2-Shelf	250-3039-555	9

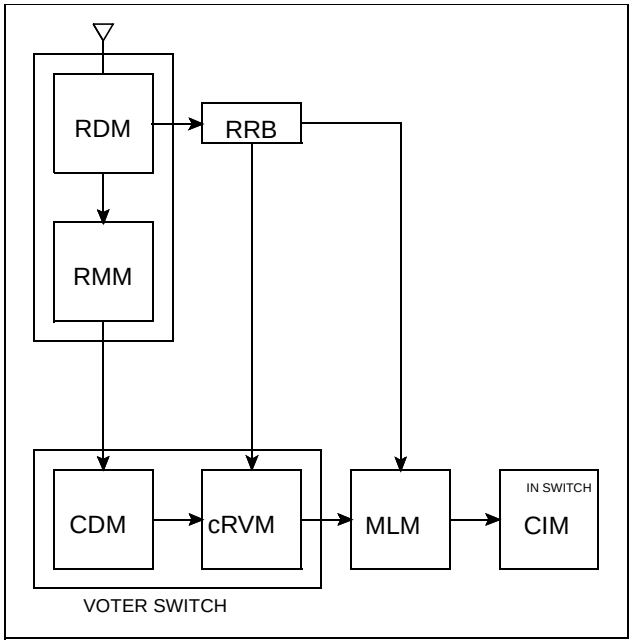


Figure 1-1 LOCAL SITE BLOCK DIAGRAM

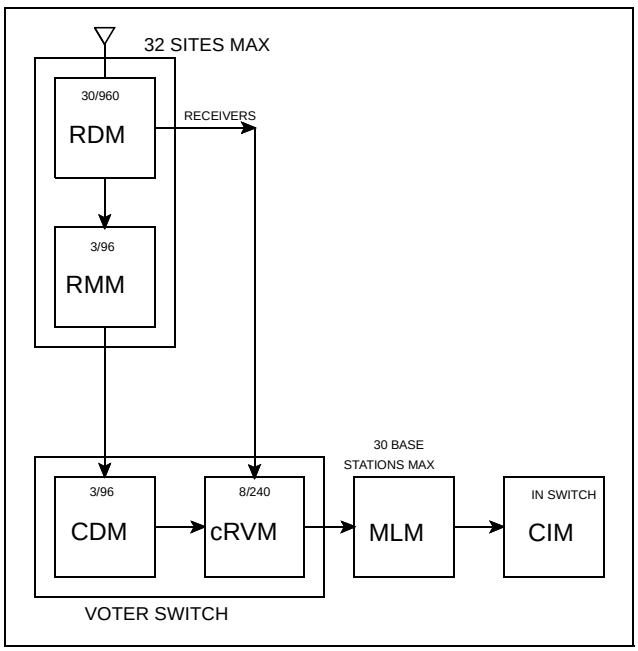


Figure 1-2 REMOTE VOTER SYSTEM

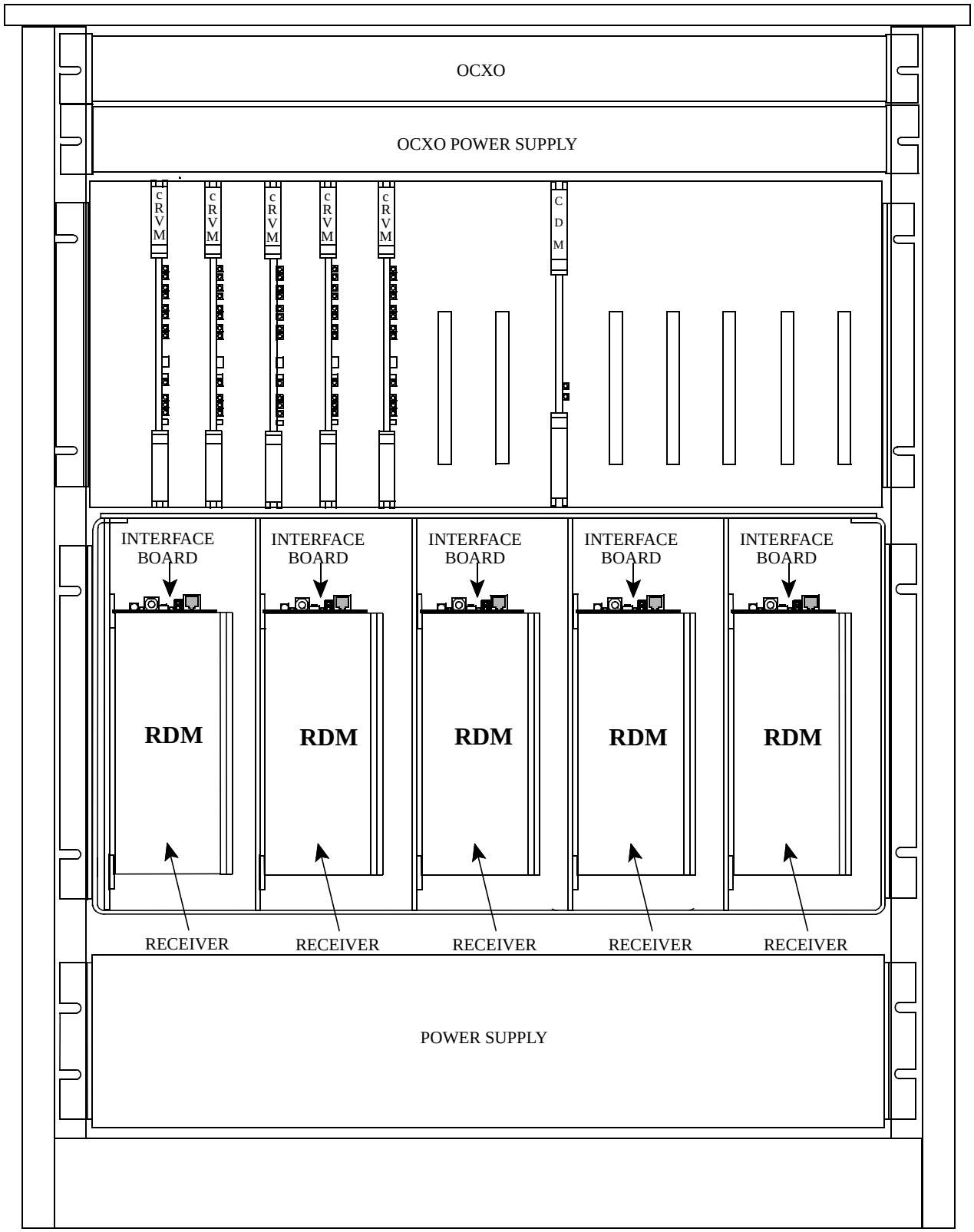


Figure 1-3 5-CHANNEL LOCAL SITE (with 1 REMOTE SITE)

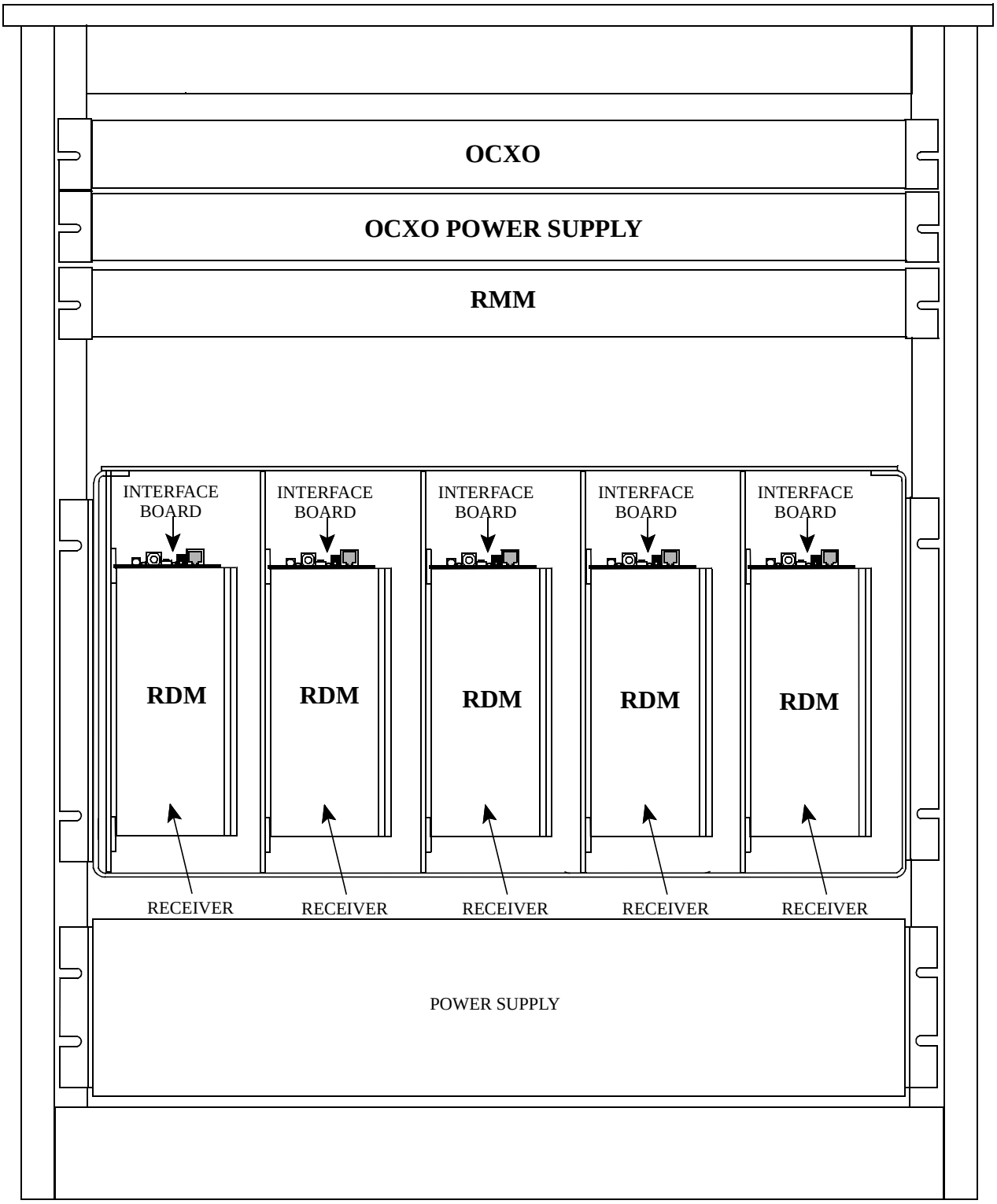


Figure 1-4 5-CHANNEL REMOTE SITE

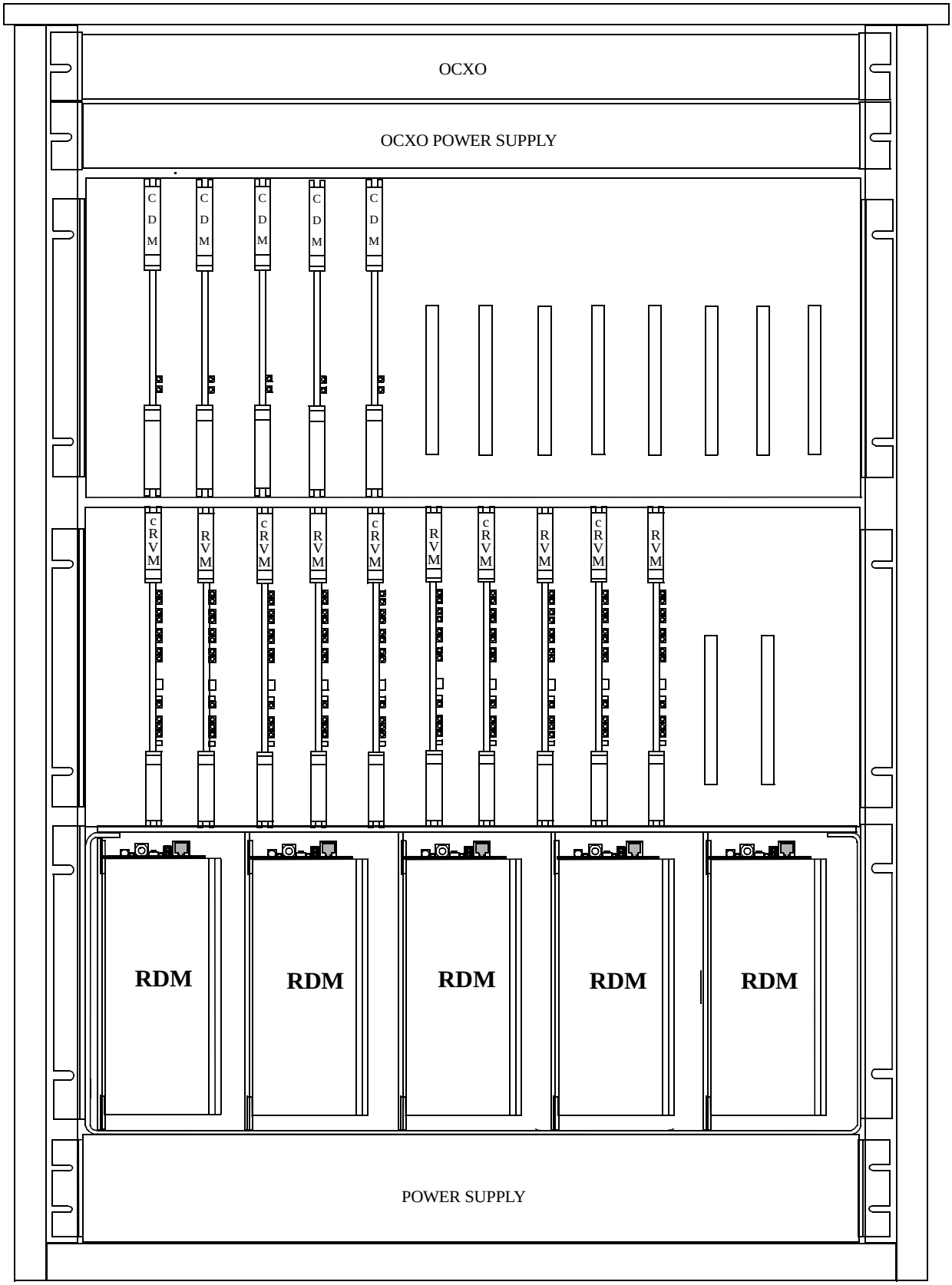


Figure 1-5 5-CHANNEL LOCAL SITE (with 5 REMOTE SITES)

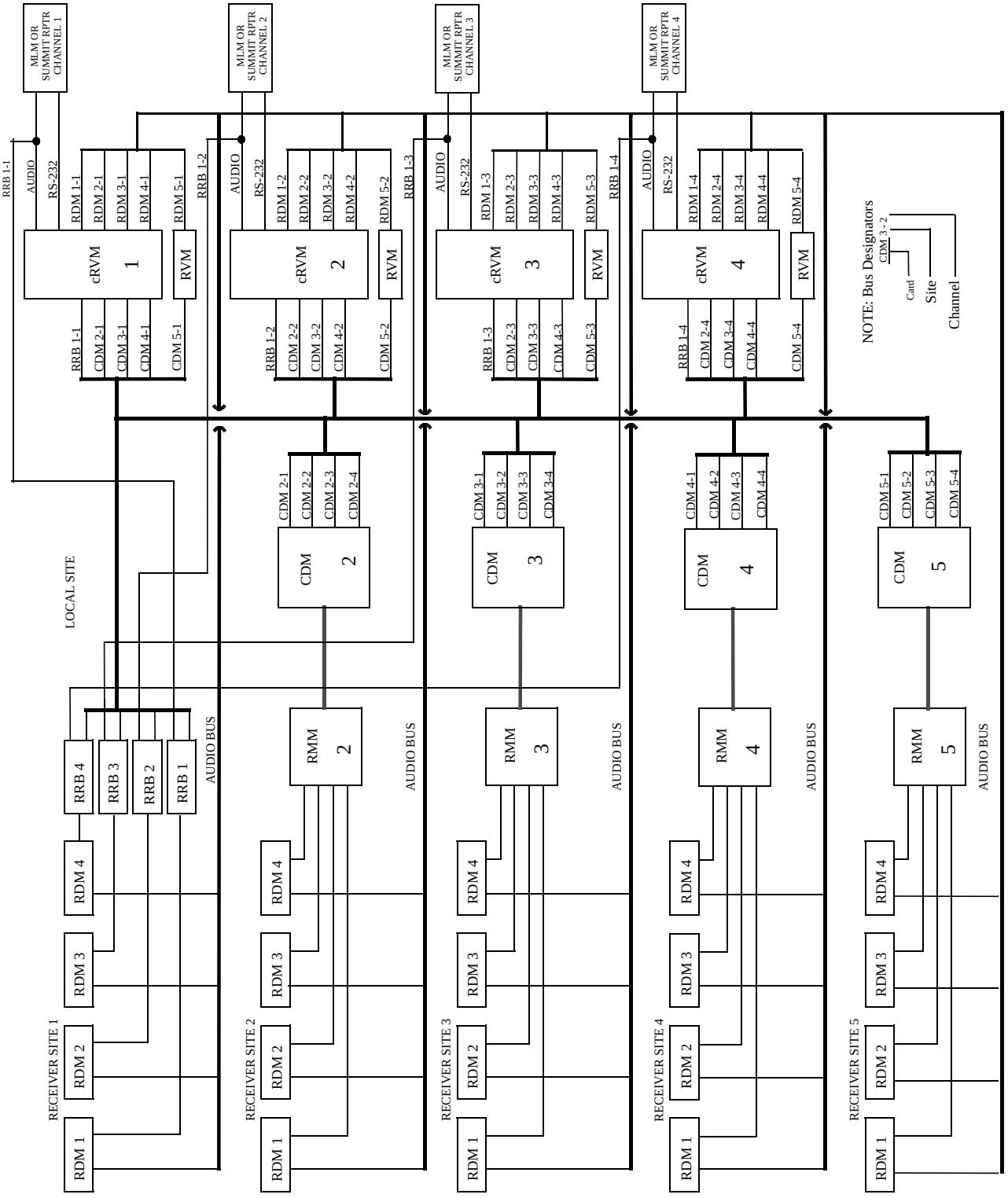


Figure 1-6 5-SITE 4-CHANNEL VOTER SYSTEM BLOCK DIAGRAM

1.3 VOTER SYSTEM ALIGNMENT

Note: See Section 3.11 for 2000 RDM alignment.

1.3.1 PRELIMINARY

1. Verify that S3, section 5 in the MLM is set for the proper mode (see Figure 1-23). For a Voter system the switch should be "up" or "On" indicating Voter Mode. For a Non-Voter system, the switch should be "down" or "Off" indicating Non-Voter Mode.

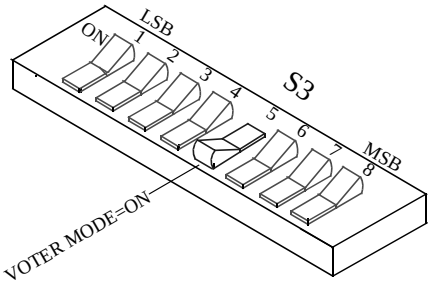


Figure 1-7 MLM S3 SWITCH SETTINGS

2. Record the settings of S9 in the MLM drawer.
   1 _____ 2 _____ 3 _____ 4 _____

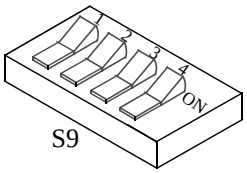


Figure 1-8 MLM S9 SWITCH

3. Put S9 into Test Mode by setting the switch as shown in Figure 1-9. Reset switch S8 (see Figure 1-23) which must be pressed after changing the switches to actually enter the selected mode.

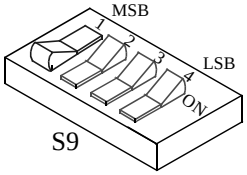


Figure 1-9 MLM S9 TEST MODE

4. Record the settings of S2 in the MLM drawer.
   1 _____ 2 _____ 3 _____ 4 _____
   5 _____ 6 _____ 7 _____ 8 _____

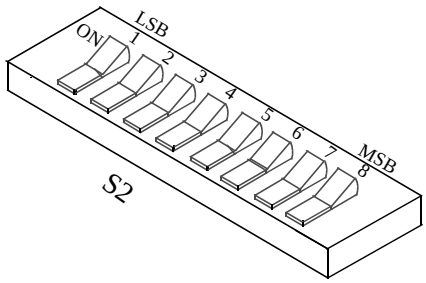


Figure 1-10 MLM S2 SWITCH

5. Set the MLM drawer S2 switches as shown in Figure 1-11. This enables the repeat gate, logic squelch gate and the transmitter.

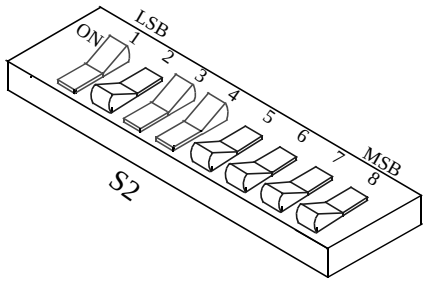


Figure 1-11 MLM S2 SWITCH SETTING

NOTE: Either of the following two procedures can be used to setup the RDM and RVM alignment. Procedure 1 may not work in some systems due to specific installation issues. Procedure 2 will provide repeatable and consistent results when using properly calibrated test equipment and is the preferred procedure.

NOTE: Refer to Simulcast System Alignment manual (Part No. 004-0690-300) for the alignment procedure in a Simulcast System.

1.3.2 8000 SERIES RDM AND RVM ALIGNMENT

1. Connect an RF Signal Generator to Receiver Ant 1, set S1 to “ANT1”. (See Figures 2-3 or 2-5.)

2. Set the signal generator to the receive channel frequency at an output level of 100 µV modulated with a 1 kHz tone at ±1.5 kHz deviation (±750 Hz for 900 MHz).

3. **On the RDM**, set S1 sections 1-3 as shown in Figure 1-12 and reset the RDM. This disables the FSK gate and enables the Audio gate. (See Figure 2-8.)

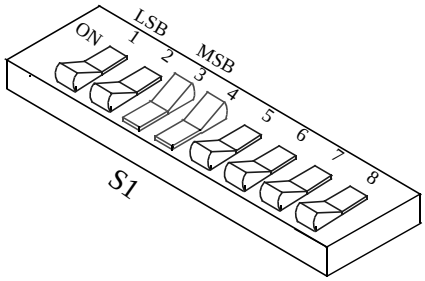


Figure 1-12 RDM S1 AUDIO GATE ENABLE

4. **On the RDM** connect a Transmission Test Set to TP3 and adjust R29 for a meter reading of -20 dBm. If signal level is required to be reduced, do so evenly for the level settings of Steps 4 through 7 (see Figure 2-8.)

5. Connect a Transmission Test Set to TP4 on the RDM and adjust R35 for -12 dBm.

6. **On the RDM** set S1, sections 1=Off, 2-3=On and reset the RDM by pressing S3 momentarily. This enables the FSK gate and disables the Audio gate.

7. Connect a Transmission Test Set to TP4 on the RDM and adjust R46 for -20 dBm.

8. **On the RDM** set S1, sections 1-3 On and reset the RDM by pressing S3 momentarily.

9. **On the RVM** connect a Transmission Test Set to the TP associated with the input port being used (see Section 6.8 and Figure 6-4.) Verify that this TP is self-adjusted in approximately 3 minutes to -20 dBm.

   Port 1 - TP2
   Port 2 - TP3
   Port 3 - TP4
   Port 4 - TP5

10. **On the RVM** connect a Transmission Test Set to P1, pin 21 (on the back of the RVM) and adjust U44 for approximately -17 dBm (see Note below). Record the settings of S2 in the RVM.
    1 ___ 2 ___ 3 ___ 4 ___

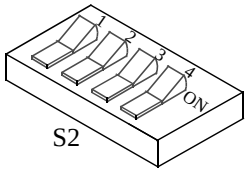


Figure 1-13 RVM S2 SWITCH

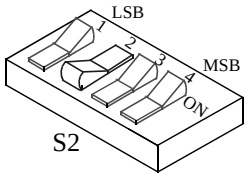


Figure 1-14 U44 LEVEL ADJUST

*NOTE: **On the RVM** adjust U44 by setting S2, sections 1-3 as shown in Figure 1-18. To decrease the level set S2, section 4 “On” and to increase the level set to “Off”. Press S1 repeatedly until approximately -17 dBm level is reached. Refer to NOTE 2 on next page concerning U44.*

11. Disable or shut off the Signal Generator RF output. Disconnect the Signal Generator from the RDM. Connect the antenna cable coax to the Antenna 1 input on the RDM (S1 should still be set to "ANT1").

NOTE 1: Two procedures are detailed for RDM and RVM alignment. Procedure 1 requires a communications service monitor with signal generator and spectrum analyzer capabilities, a Transmission Test Set, and a Multi-Net portable radio. Procedure 2 requires an RF Signal Source capable of simultaneous internal (frequency range of 10 Hz to 10 kHz) and external modulation, two personnel, a Multi-Net/LTR Signaling Encoder-Decoder (PN 023-3039-360), i.e. MED box, two RF Signal Analyzers capable of measuring deviation of an RF signal, and a Transmission Test Set.

NOTE 2: This audio deviation adjustment procedure should be done first at the Main Receiver Site. The main receiver site is typically the site that is collocated at the transmitter site and would have the Revert option installed. Once the levels are set at the Main Site, ***NO*** *further adjustment of U44 should be done. (See Procedure 1 Step 9 or Procedure 2 Step 12.) The remaining RVM inputs will self-align using the 1200 Hz pilot tone that is generated from the RDM as a reference. It is* ***critical*** *that the pilot tone level leaving the RDM is set properly since the RVM uses this level to make up for losses through the links. If the RDM-Audio Link-RVM path at the remaining receiver sites is functioning properly, audio deviation tests done from these sites should be within 0.2 to 0.3 kHz of the Main Receiver Site. Deviation levels outside of this range may be caused by improper setup of the RDM or RVM or poor audio response of the remote site links.*

PROCEDURE 1

Necessary equipment:

- RF Signal Source capable of internal modulation of 1 kHz tone.
- RF Signal Analyzer capable of measuring deviation of an RF signal.
- Transmission Test Setup
- Multi-Net portable equipped with a DTMF keypad.

This test procedure can be used to verify system performance, but is not recommended for system setup.

1. Bring up a dispatch call using a Multi-Net portable equipped with a DTMF keypad.
2. Adjust a communications service monitor to the RDM receiver frequency (transmit frequency of the portable). Verify that the Low Speed Data Deviation is approximately 1 kHz (800 Hz for 900 MHz systems).

NOTE: This assumes that no audio or background noise is being transmitted by the portable. Adjust the portable per the product service manual if the deviation is not correct.

3. Press and hold the "5" key on the portable. Verify on the communications service monitor that the measured deviation of the portable is now approximately 2.5 kHz (1.6 kHz for 900 MHz). Adjust the portable per the product service manual if the deviation is not correct. Release the "5" key on the portable and take down the call.

NOTE: 800 MHz radios - 1 kHz Low Speed Data and 1.5 kHz for the DTMF tone. 900 MHz systems - 800 Hz Low Speed Data and 800 Hz for the DTMF tone.

4. Adjust the communications service monitor to the transmitter site frequency (receive frequency of the portable).
5. Bring up a dispatch call using a Multi-Net portable equipped with a DTMF keypad.
6. Verify that the Low Speed Data deviation from the transmitter site is approximately 1 kHz (800 Hz for 900 MHz).

NOTE: This assumes that no audio or background noise from the portable is being received and then retransmitted.

7. If the Low Speed Data is not at 1 kHz (800 Hz for 900 MHz) of deviation, refer to the repeater service manual for proper adjustment.
8. Press and hold the “5” key on the portable. Verify on the communications service monitor that the measured deviation of the transmit site signal is now approximately 2.5 kHz (1.6 kHz for 900 MHz). Release the “5” key on the portable and take down the call.

NOTE: 800 MHz systems - 1 kHz Low Speed Data and 1.5 kHz for the DTMF tone. 900 MHz systems - 800 Hz Low Speed Data and 800 Hz for the DTMF tone.

9. **On the RVM,** if the composite deviation is not 2.5 kHz (1.6 kHz for 900 MHz), adjust U44 (see Step 10) to attain 2.5 kHz (1.6 kHz for 900 MHz). Refer to *NOTE 2* on Page 1-9.

10. **On the MLM** drawer connect a Transmitter Test Set to W6 of J701 and record this meter reading for Voice Level from Switch alignment. (Voice Level is _____)

PROCEDURE 2

Necessary equipment:

- Two personnel will generally be required to perform this setup.
- Multi-Net/LTR Signaling Encoder-Decoder (PN023-3039-360), i.e. MED box.
- RF Signal Source capable of simultaneous internal and external modulation. Internal modulation source frequency range of 10 Hz to 10 kHz.
- RF Signal Analyzer capable of measuring deviation of an RF signal.

1. **Transmitter Site** - Disconnect the transmit antenna from the repeater and connect to a Signal Analyzer (with the appropriate pads). Adjust the signal analyzer to the transmit frequency and setup for a deviation measurement.

2. **RDM Site** - Connect the MED box to the Signal Source as described in the MED box operation and service manual. Set the MED box parameters to the desired system (choose a Group ID that is not currently active by other system users).

3. **RDM Site** - Connect the Signal Source to the Signal Analyzer (monitor function for a communications service monitor). Adjust the output level of the Signal Source to the required input level of the Signal Analyzer. Enable the internal modulation source and set the modulation frequency to 1 kHz at 1.5 kHz deviation (800 Hz for 900 MHz) and verify with the Signal Analyzer that the deviation is correct.

4. **RDM Site** - Disable the internal modulation source without changing the deviation setting. Enable the external modulation port. Adjust the MED box to encode the Multi-Net data. Adjust the data out level of the MED box to achieve 1 kHz (800 Hz for 900 MHz) of deviation as measured on the Signal Analyzer.

5. **RDM Site** - Enable the internal modulation source with a 1 kHz tone. The composite deviation will now measure 2.5 kHz (1.6 kHz for 900 MHz) on the Signal Analyzer.

NOTE: 800 MHz systems - 1 kHz Low Speed Data and 1.5 kHz for the 1 kHz tone. 900 MHz systems - 800 Hz Low Speed Data and 800 Hz for the 1 kHz tone.

6. **RDM Site** - Adjust the Signal Source to 100 µV of RF level. Connect the Signal Source to the RDM "ANT1" antenna port (S1 should still be set to "ANT1").

7. **RDM Site** - A dispatch call should now be set up. If not, check the MED box to be sure that the Multi-Net data is being encoded and the correct Multi-Net parameters are being sent.

8. **Transmitter Site** - Record the deviation of the transmitted signal (it should be 2.5 kHz for 800 MHz systems and 1.6 kHz for 900 MHz systems).

9. **RDM Site** - Disable the 1 kHz tone on the internal modulation source of the Signal Source (the external port must remain active). The dispatch call should still be complete.

10. **Transmitter Site** - At the transmit site record the deviation of the transmitted signal (it should be 1 kHz of Low Speed Data for 800 MHz and 800 Hz of Low Speed Data for 900 MHz systems). If the deviation is not correct, adjust the level to the correct setting as described in the repeater service manual.

11. **RDM Site** - Enable the 1 kHz tone on the internal modulation source of the Signal Source (the external port must remain active). The dispatch call should still be complete.

12. **Transmitter Site** - At the transmit site record the deviation of the transmitted signal (it should be 2.5 kHz for 800 MHz systems and 1.6 kHz for 900 MHz systems). If the deviation is not correct, adjust U44 in the RVM (see Step 10) to attain 2.5 kHz deviation for 800 MHz systems and 1.6 kHz deviation for 900 MHz systems. Refer to *NOTE 2* on Page 1-9.

13. **Voter Site** - **On the MLM** drawer connect a Transmitter Test Set to W6 of J701 and record this meter reading for Voice Level from Switch alignment. (Voice Level _____)

NOTE: Either of the following two procedures can be used to setup the RDM and RVM alignment. Procedure 1 may not work in some systems due to specific installation issues. Procedure 2 will provide repeatable and consistent results when using properly calibrated test equipment and is the <u>preferred</u> procedure.

1.3.3 2000 SERIES RDM AND RVM ALIGNMENT

1. Refer to Section 3 of this manual for receiver alignment and Section 3.13.3 Voter Interface for RDM Audio and FSK level Adjustment.

2. **On the RVM** connect a Transmission Test Set to P1, pin 21 (on the back of the RVM) and adjust U44 for approximately -17 dBm. Record the settings of S2 in the RVM. Refer to *NOTE 2* on this page.

On the RVM adjust U44, by setting S2, sections 1-3 as shown in Figure 1-16. To decrease the level set S2, section 4 to “On” and to increase the level set to “Off”. Press S1 repeatedly until approximately -17 dBm level is reached.

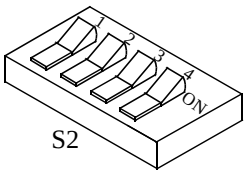


Figure 1-15 RVM S2 SWITCH

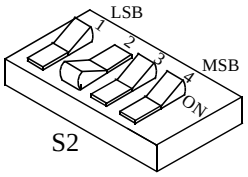


Figure 1-16 U44 LEVEL ADJUST

3. Disable or shut off the Signal Generator RF output. Disconnect the Signal Generator from the RDM. Connect the antenna cable coax to the Antenna 1 input on the RDM (S1 should still be set to "ANT1").

NOTE 1: Two procedures are detailed for RDM and RVM alignment. Procedure 1 requires a communications service monitor with signal generator and spectrum analyzer capabilities, a Transmission Test Set, and a Multi-Net portable radio. Procedure 2 requires an RF Signal Source capable of simultaneous internal (frequency range of 10 Hz to 10 kHz) and external modulation, two personnel, a Multi-Net/LTR Signaling Encoder-Decoder (PN 023-3039-360), i.e. MED box, two RF Signal Analyzers capable of measuring deviation of an RF signal, and a Transmission Test Set.

*NOTE 2: This audio deviation adjustment procedure should be done first at the <u>Main Receiver Site</u>. The main receiver site is typically the site that is collocated at the transmitter site and would have the Revert option installed. Once the levels are set at the Main Site, **NO** further adjustment of U44 should be done. (See Procedure 1 Step 9 or Procedure 2 Step 12.) The remaining RVM inputs will self-align using the 1200 Hz pilot tone that is generated from the RDM as a reference. It is **<u>critical</u>** that the pilot tone level leaving the RDM is set properly since the RVM uses this level to make up for losses through the links. If the RDM-Audio Link-RVM path at the remaining receiver sites is functioning properly, audio deviation tests done from these sites should be within 0.2 to 0.3 kHz of the Main Receiver Site. Deviation levels outside of this range may be caused by improper setup of the RDM or RVM or poor audio response of the remote site links.*

PROCEDURE 1

Necessary equipment:

- RF Signal Source capable of internal modulation of 1 kHz tone.
- RF Signal Analyzer capable of measuring deviation of an RF signal.
- Transmission Test Setup
- Multi-Net portable equipped with a DTMF keypad.

This test procedure can be used to verify system performance, but is not recommended for system setup.

1. Bring up a dispatch call using a Multi-Net portable equipped with a DTMF keypad.

2. Adjust a communications service monitor to the RDM receiver frequency (transmit frequency of the portable). Verify that the Low Speed Data Deviation is approximately 1 kHz (800 Hz for 900 MHz systems).

NOTE: This assumes that no audio or background noise is being transmitted by the portable. Adjust the portable per the product service manual if the deviation is not correct.

3. Press and hold the "5" key on the portable. Verify on the communications service monitor that the measured deviation of the portable is now approximately 2.5 kHz (1.6 kHz for 900 MHz). Adjust the portable per the product service manual if the deviation is not correct. Release the "5" key on the portable and take down the call.

NOTE: 800 MHz radios - 1 kHz Low Speed Data and 1.5 kHz for the DTMF tone. 900 MHz systems - 800 Hz Low Speed Data and 800 Hz for the DTMF tone.

4. Adjust the communications service monitor to the transmitter site frequency (receive frequency of the portable).

5. Bring up a dispatch call using a Multi-Net portable equipped with a DTMF keypad.

6. Verify that the Low Speed Data deviation from the transmitter site is approximately 1 kHz (800 Hz for 900 MHz).

NOTE: This assumes that no audio or background noise from the portable is being received and then re-transmitted.

7. If the Low Speed Data is not at 1 kHz (800 Hz for 900 MHz) of deviation, refer to the repeater service manual for proper adjustment.

8. Press and hold the "5" key on the portable. Verify on the communications service monitor that the measured deviation of the transmit site signal is now approximately 2.5 kHz (1.6 kHz for 900 MHz). Release the "5" key on the portable and take down the call.

NOTE: 800 MHz systems - 1 kHz Low Speed Data and 1.5 kHz for the DTMF tone. 900 MHz systems - 800 Hz Low Speed Data and 800 Hz for the DTMF tone.

9. If the composite deviation is not 2.5 kHz (1.6 kHz for 900 MHz), adjust U44 on the RVM (see Step 10) to attain 2.5 kHz (1.6 kHz for 900 MHz). Refer to *NOTE 2* on page 1-11.

10. Connect a Transmitter Test Set to W6 of J701 on the MLM drawer and record this meter reading for Voice Level from Switch alignment.
(Voice Level is _____)

PROCEDURE 2

Necessary equipment:

- Two personnel will generally be required to perform this setup.
- Multi-Net/LTR Signaling Encoder-Decoder (PN023-3039-360), i.e. MED box.
- RF Signal Source capable of simultaneous internal and external modulation. Internal modulation source frequency range of 10 Hz to 10 kHz.
- RF Signal Analyzer capable of measuring deviation of an RF signal.

1. **Transmitter Site** - Disconnect the transmit antenna from the repeater and connect to a Signal Analyzer (with the appropriate pads). Adjust the signal analyzer to the transmit frequency and set up for a deviation measurement.

2. **RDM Site** - Connect the MED box to the Signal Source as described in the MED box operation and service manual. Set the MED box parameters to the desired system (choose a Group ID that is not currently active by other system users).

3. **RDM Site** - Connect the Signal Source to the Signal Analyzer (monitor function for a communications service monitor). Adjust the output level of the Signal Source to the required input level of the Signal Analyzer. Enable the internal modulation source and set the modulation frequency to 1 kHz at 1.5 kHz deviation (800 Hz for 900 MHz) and verify with the Signal Analyzer that the deviation is correct.

4. **RDM Site** - Disable the internal modulation source without changing the deviation setting. Enable the external modulation port. Adjust the MED box to encode the Multi-Net data. Adjust the data out level of the MED box to achieve 1 kHz (800 Hz for 900 MHz) of deviation as measured on the Signal Analyzer.

5. **RDM Site** - Enable the internal modulation source with a 1 kHz tone. The composite deviation will now measure 2.5 kHz (1.6 kHz for 900 MHz) on the Signal Analyzer.

NOTE: 800 MHz systems - 1 kHz Low Speed Data and 1.5 kHz for the 1 kHz tone. 900 MHz systems - 800 Hz Low Speed Data and 800 Hz for the 1 kHz tone.

6. **RDM Site** - Adjust the Signal Source to 100 µV of RF level. Connect the Signal Source to the RDM antenna port.

7. **RDM Site** - A dispatch call should now be set up. If not, check the MED box to be sure that the Multi-Net data is being encoded and the correct Multi-Net parameters are being sent.

8. **Transmitter Site** - Record the deviation of the transmitted signal (it should be 2.5 kHz for 800 MHz systems and 1.6 kHz for 900 MHz systems).

9. **RDM Site** - Disable the 1 kHz tone on the internal modulation source of the Signal Source (the external port must remain active). The dispatch call should still be complete.

10. **Transmitter Site** - At the transmit site record the deviation of the transmitted signal (it should be 1 kHz of Low Speed Data for 800 MHz and 800 Hz of Low Speed Data for 900 MHz systems). If the deviation is not correct, adjust the level to the correct setting as described in the repeater service manual.

11. **RDM Site** - Enable the 1 kHz tone on the internal modulation source of the Signal Source (the external port must remain active). The dispatch call should still be complete.

12. **Transmitter Site** - At the transmit site record the deviation of the transmitted signal (it should be 2.5 kHz for 800 MHz systems and 1.6 kHz for 900 MHz systems). If the deviation is not correct, adjust U44 in the RVM (see Step 10) to attain 2.5 kHz deviation for 800 MHz systems and 1.6 kHz deviation for 900 MHz systems. Refer to *NOTE 2* on page 1-11.

13. **Voter Site** - **On the MLM** drawer connect a Transmitter Test Set to W6 of J701 and record this meter reading for Voice Level from Switch alignment. (Voice Level _____)

1.3.4 VOICE LEVEL TO SWITCH ALIGNMENT

1. Set S2 switches in the MLM drawers as shown in Figure 1-17 and reset the MLM. This enables the Receive Audio Gate and Logic Squelch Gate.

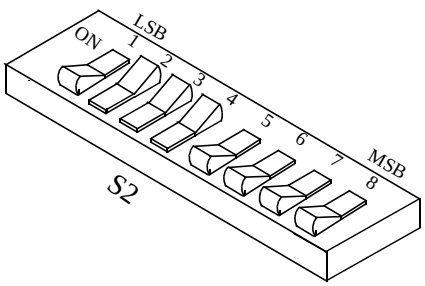


Figure 1-17 MLM S2 GATE SETTINGS

2. **On the MLM** drawer connect a Transmission Test Set to TP2 and adjust R202 for a meter reading of -12 dBm. (See Figure 1-23.)

3. **On the MLM** drawer connect a Transmission Test Set to TP3 and adjust R19 for a meter reading of -12 dBm for LL/DC links or -28 dBm for MW/T1 links.

4. **On the associated CIM** connect a Transmission Test Set to J11 and adjust R41 for a meter reading of -6 dBm.

1.3.5 FSK RECEIVE DATA LEVEL FROM SWITCH

1. **In the MLM** drawers set S2 switch as shown in Figure 1-18 and reset the MLM. This enables MODEM U9 and the FSK gate.

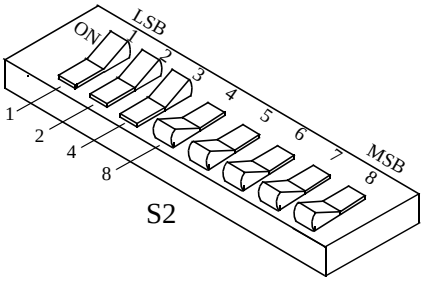


Figure 1-18 MLM S2 MODEM/FSK GATES

2. Proceed according to the type of data path that was selected:

   Separate RS-232 Data Path
   Separate 4-Wire FSK Data Path
   FSK Data Over Voice Path

Separate RS-232 Data Path

If an RS-232 link is used, alignment is not required. Reselect the normal operating mode in the MLM drawer.

Separate 4-Wire FSK Data Path

1. **In the CIM** set S5 as shown in Figure 1-19 to generate the FSK alignment tone over the data path. At the Switch, this tone will be at the average voice level of -12 dBm with LL/DC links or -28 dBm with MW/T1 links. (See Figure 1-24.)

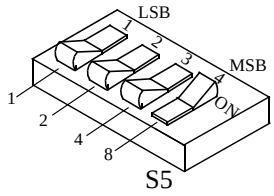


Figure 1-19 CIM S5 FSK ALIGNMENT TONE

2. **On the MLM** drawer connect a Transmission Test Set to TP6 and adjust R47 for a meter reading of -12 dBm for LL/DC links or -28 dBm for MW//T1 links.

3. **In the MLM** drawers set S2 as shown in Figure 1-20 and reset the MLM by pressing S8 momentarily. This enables the transmitter.

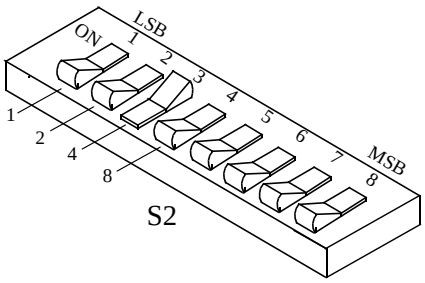


Figure 1-20 MLM S2 TRANSMIT ENABLE

4. **On the MLM** drawer connect a Transmission Test Set to TP1 and adjust R38 for a meter reading of -12 dBm for LL/DC links or -28 dBm for MW/T1 links.

5. **On the associated CIM** connect a Transmission Test Set to TP8 and adjust R102 for a meter reading of -12 dBm. This adjusts the Secondary Receive level on the CIM.

1.3.6 FSK DATA OVER VOICE PATH

1. **In the CIM** set S5 as shown in Figure 1-21 to generate the alignment tone.

2. Connect a Transmission Test Set to J12 and adjust R44 for a meter reading of -12 dBm for LL/DC links or -28 dBm for MW/T1 links.

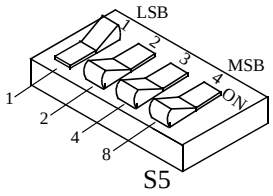


Figure 1-21 CIM S5 ALIGNMENT TONE

3. **In the CIM** set S5 as shown in Figure 1-19 to generate a 1200 Hz alignment tone over the voice path.

4. Connect a Transmission Test Set to J12 and adjust R86 for a level of
   -20 dBm with LL/DC links or
   -36 dBm with MW/T1 links.

5. **On the MLM** drawer connect a Transmission Test Set to TP6 and adjust R47 for a meter reading of -12 dBm.

6. **In the MLM** drawers set S2 as shown in Figure 1-20 and reset the MLM by pressing S8 momentarily. This enables the transmitter. (See Figure 1-23.)

7. **On the MLM** drawer connect a Transmission Test Set to TP3 and adjust R38 for a meter reading of
   -20 dBm for LL/DC links or
   -36 dBm for MW/T1 links.

8. **On the CIM** connect a Transmission Test Set to TP8 and adjust R102 for a meter reading of -12 dBm. This adjusts the Secondary Receive level on the CIM. (See Figure 1-24.)

1.3.7 VOICE LEVEL FROM SWITCH ALIGNMENT

1. **In the MLM** drawers set S2 as shown in Figure 1-22 and reset the MLM by pressing S8 momentarily. This enables the Repeat gate, Logic Squelch gate and the Transmitter.

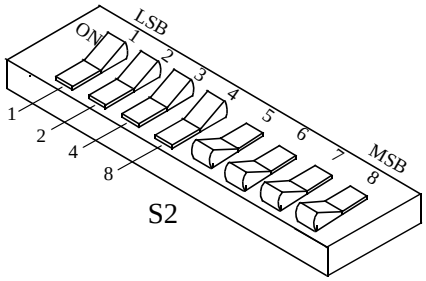


Figure 1-22 MLM S2 GATE AND TRANSMIT

2. **In the CIM** set S5 as shown in Figure 1-21 to generate an alignment tone.

3. **In the CIM** connect a transmission Test Set to J12 and adjust R44 for an average voice level of
   -12 dBm with LL/DC links or
   -28 dBm with MW/T1 links.

4. **On the MLM** connect a Transmission Test Set to TP5 and adjust R32 for the level recorded in Section 1.3.2, Step 20. This is for 1.5 kHz of deviation out of the transmitter.

Alignment is complete. Reselect the normal operating mode of all the cards involved in the alignment.

1.4 VOTER ERROR MESSAGES

Table 1-1 ERROR MESSAGES

Error Displayed	Error Description
CRVM MSG - Chnl: 1 Failed CDMs: 1.2	CRVM for Channel 1 Failed to Receive from CDMs 1 and 2.
CRVMSTAT - Chnl: 2 RVM: 1 Fail	CRVM for Channel 2 Failed to Communicate with the VDM
CRVM Msg - Chnl: 2 Data: 21 Failed RVMs: 6	CRVM for Channel 2 failed to Receive from RVM 6 - The Data: 21 (00100001) indicates RVMs 1 and 6 are enabled.
CRVM Msg - Chnl: 1 Failed RDMs: 1	CRVM for Channel 1 failed to Receive from RDM 1

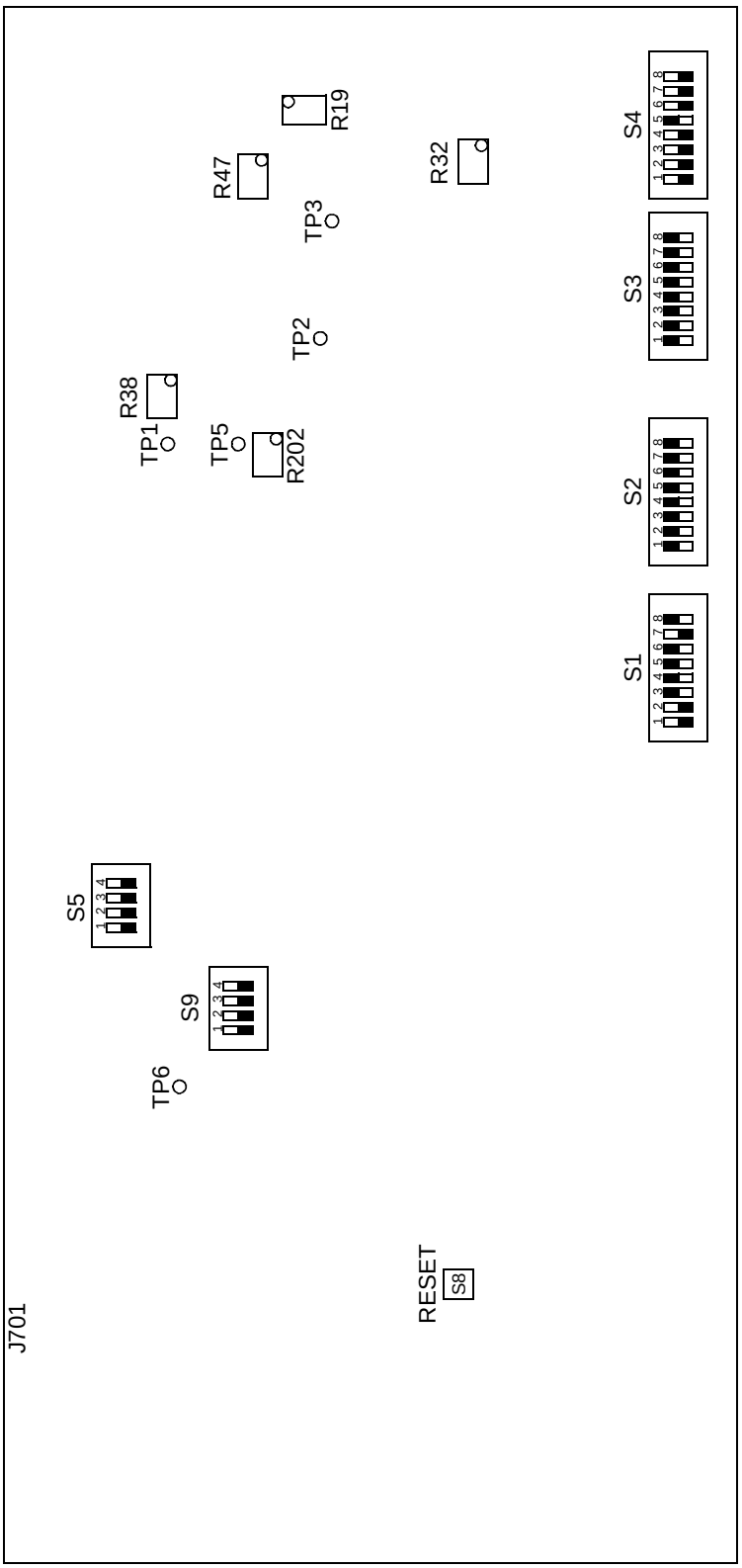


Figure 1-23 MLM ALIGNMENT POINTS DIAGRAM

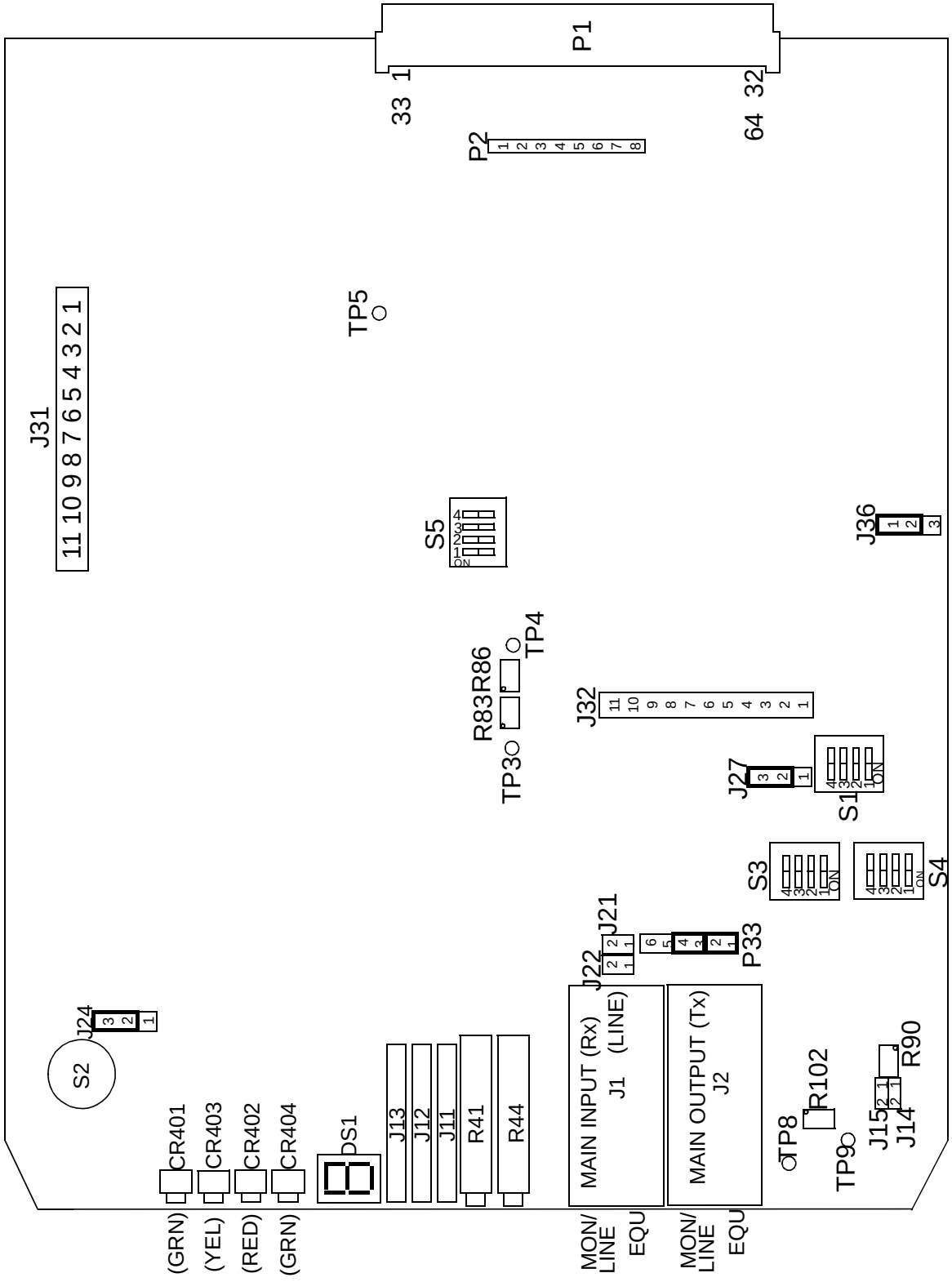


Figure 1-24 CIM ALIGNMENT POINTS DIAGRAM

SPECIFICATIONS

VOTER SHELF

Dimensions	21.4" W x 12.5" D x 8.2" H
Environment	-30°C to +60°C (-22°F to +142°F) at 20% to 80% humidity (noncondensing)
Average Power	26 modules x 6.1W ÷ 0.7 (efficiency) = 227W
Average Heat	227W x 3.6 = 817 BTU per hour

MODULES

CDM and RVM

Dimensions	11.5" W x 8" H (8.6" including extractors)
Weight	0.95 lbs.
Environment	-30°C to +60°C (-22°F to +142°F) at 20% to 80% humidity (noncondensing)
Average Power and Current	+5V DC at 0.8A = 4.0W +12V DC at 0.08A = 0.96W -12V DC at 0.06A = 0.7W -5V DC at 0.07A = 0.35W Total Average Power = 6.1W Total Maximum Power = 8.0W

RDM

Dimensions	14.5" W x 17.625" D x 3.5" H
Average Power and Current	+13.8V DC at 0.5A = 6.9W
Environment	-30°C to +60°C (-22°F to +142°F) at 20% to 80% humidity (noncondensing)

RMM

Dimensions	14.5" W x 17.625" D x 3.5" H
Average Power and Current	+13.8V DC at 0.8A = 11W
Environment	-30°C to +60°C (-22°F to +142°F) at 20% to 80% humidity (noncondensing)

SECTION 2 8000 SERIES RECEIVER DECODER MODULE (RDM)

2.1 GENERAL

The Receiver Decoder Module (RDM) is designed for either operation with the 800 MHz or 900 MHz receivers and is located in the receiver drawer. Refer to the Multi-Net 8000 Repeater Service Manual, Part No. 001-8000-377 or Multi-Net 8900 Repeater Service Manual, Part No. 001-8900-379 for detailed information on the circuit description and alignment. The RDM is powered from 13.8V DC. The RDM operates in the temperature range of -30°C to +60°C (-22°F to +140°F) with 10%-90% humidity.

The RDM decodes the subaudible data and four levels of Received Signal Strength Indication (RSSI) plus the condition of the squelch line, open or closed, from the receiver. In the Remote Site, information is then passed to the RDM, to the RMM, to the Local Site CDM and then to the RVM. In the Local Site, the RDMs are hard wired to the RVM.

The Multi-Net System is capable of handling 30 channels and the Voter System is capable of handling 32 voted receiver sites, the maximum number of RDMs is 960.

2.2 INITIAL RECEPTION

The RDM RSSI is squelch plus four additional levels to the squelch settings. The opening squelch setting is 6 dB SINAD plus four squelch settings at 10 dB, 15 dB, 20 dB and 25 dB, ± 2 dB.

The initial RSSI level is determined by averaging the RSSI during the initial decode time. The averaging is done by sampling during the subaudible "WORD" transmitted continuously from the mobile. The "WORD" is 225 milliseconds in length, the RSSI is sampled every 10 milliseconds during this "WORD" period. The initial reception will be sent directly to the Receiver Voter Module (RVM) via a 1200 baud FSK blank and burst signaling on the main audio line. This also indicates what Home, Group ID, Unique ID, priority and status has been received.

2.3 RSSI UPDATES

The RDM continues to sample the RSSI every 10 milliseconds and averages the RSSI for each "Word". When this average has been determined, the RDM sends the updated RSSI information to the RMM. The upper 4-bits of the byte are unused or 0. The lower 4-bits of the byte are the RSSI information, see Table 2-1.

The updated RSSI information is sent via a secondary RS-232 line (refer to Figure 2-1). The path is the RSSI update path where the RDM connects to a Receiver Multiplexer Module (RMM). This path is a 1200 baud, RS-232 line.

The audio line is a direct connect path between the RDM and RVM. This line is also an audio 1200 baud line with FSK blank and burst data on initial decode.

Table 2-1 RDM RSSI INFORMATION

Hex Value	DESCRIPTION
7 6 5 4	Strongest RSSI signal level Weakest RSSI signal level a call will be started at
3	Weakest RSSI level before a call will be dropped.
2*	Time-Out no update received
1	No Data received from RDM (generated by RMM only)
0*	Turn-off Code received from mobile
* Idle state.	

2.4 DISCONNECT

Disconnect by the Mobile can occur one of two ways. One way is when the RDM is no longer decoding the subaudible "Word" from the Mobile. The RDM sends a Receive Time-Out byte by the RS-232 to the RMM. The second way is when the RDM decodes the Turn-off Code from the Mobile. The RDM sends a Receive Turn-Off Byte by the RS-232 to the RMM, see Figure 2-1.

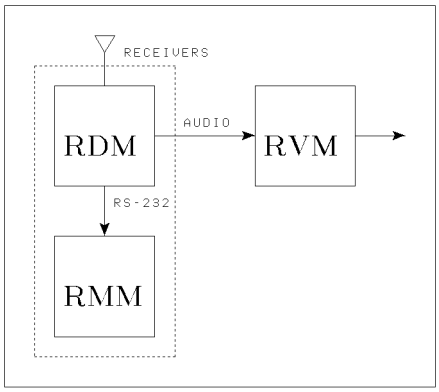


Figure 2-1 RDM BLOCK DIAGRAM

2.5 SWITCH SETTINGS

Table 2-2 RDM SWITCH SETTINGS

Switch	Section	Description
S1	1 2 3	Any one section OFF sends the RDM into board test.
S1	4	Off - Normal On - Extended RVM operation
S1	5	ON - 9600 Baud for Revert link to Remoted MLM. OFF - 2400 Baud for Revert link to MLM.
S1	6	ON - Receiver Revert Disable OFF - Receiver Revert Enable
S2	1-10	FCC channel number 1 (MSB), 10 (LSB).

NOTE: Refer to Appendix A and B for frequencies.

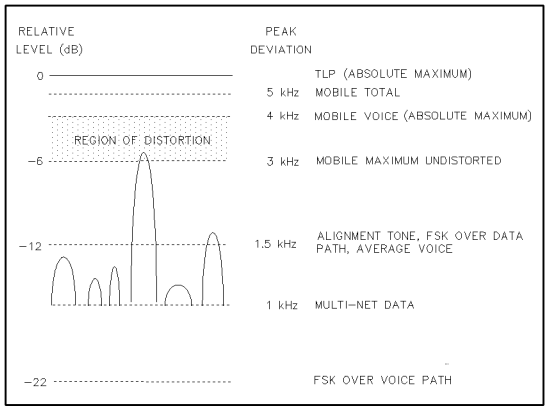


Figure 2-2 TEST TONE RELATIONSHIP

2.6 800 MHz RECEIVER DRAWER ALIGNMENT

Refer to the alignment points and test setup diagram in Figure 2-3 and proceed as follows:
(Refer to Appendix A for frequencies.)

2.6.1 FIRST OSCILLATOR FREQUENCY ADJUSTMENT

1. Set the frequency monitor to the first oscillator frequency (Rx Freq + 45 MHz) and monitor the first oscillator signal with a pickup loop.

2. Adjust C59 for the correct frequency.

NOTE: C60 can be changed to one of the values in Table 2-3 to change the adjustment range of C59. Increasing the capacitor value decreases the adjustment range and vice versa.

Table 2-3 C60 REPLACEMENT VALUES

Description	Part Number
27 pF ±5% 50V NPO ceramic	510-3113-270
30 pF ±5% 50V NPO ceramic	510-3113-300
33 pF ±5% 50V NPO ceramic	510-3113-330
36 pF ±5% 50V NPO ceramic	510-3113-360
39 pF ±5% 50V NPO ceramic	510-3113-390

2.6.2 SECOND OSCILLATOR FREQUENCY ADJUSTMENT

1. Set the frequency monitor to 55.7000 MHz. Monitor the signal by inserting the pickup loop through the opening in the shield over the second oscillator stage.

2. Adjust L16 for the correct frequency ± 100 Hz.

2.6.3 MULTIPLIER TUNE UP

1. Connect a DC voltmeter to TP4 and adjust L20 and L21 for a maximum meter reading (typically 0.6 V).

2. Connect a DC voltmeter to TP5 and adjust L22 and L23 for a maximum meter reading (typically 0.7 V).

3. Connect a DC voltmeter to TP6 and adjust L24, L25, and L26 for a maximum meter reading. Adjust L27 for a minimum meter reading (typically 0.8-1.0 V).

2.6.4 FRONT END AND IF ALIGNMENT

1. Preset L6, L7, L8, L9, and L10 so that the adjusting screws are approximately 1/4 inch above the casting. Preset L11 3/4 inch above casting.

2. Set the signal generator to the receive channel frequency and set the modulation for 1 kHz at ± 3 kHz deviation. Connect the generator to Antenna 1 (J2) and set S1 on the receiver board to "ANT 1" if required. Adjust R87 fully clockwise.

NOTE: S1 may need to be switched again when adjusting audio deviation in Logic alignment.

3. Connect an AC voltmeter and SINAD meter to the AUDIO TEST jack on the front panel. The audio level at this jack is not adjustable. Connect a DC voltmeter to TP1. Increase the generator output level until SINAD can be measured.

4. Adjust L12, L13, L14, T1, T2, T3, and T4 for maximum DC voltage at TP1 (reduce the generator output as required to keep TP1 voltage below 1.7 volts).

5. Tune L6, L7, L8, L9, L10, and L11 for maximum DC voltage at TP1 (reduce the generator output as in the preceding step).

6. Repeat the adjustments in step d, tuning for maximum DC voltage. Also repeat step e, tuning for best SINAD. Continue until no further improvement is achieved.

7. Connect the positive lead of a DC voltmeter to TP2 and the negative lead to TP3 (both voltmeter inputs must be floating). Set the generator output for 100 microvolts and adjust T5 for 0.0 volts DC. (T5 is readjusted in Logic drawer adjustments.)

8. Check 12 dB SINAD sensitivity with 1 kHz modulation at ± 3 kHz deviation. It should be 0.35 microvolt or better. If not, repeat the preceding adjustments.

2.6.5 DIVERSITY AND SQUELCH ADJUSTMENT

1. Preset R87 fully clockwise and set S1 to the antenna jack being used (ANT 1 or ANT 2). Connect an AC voltmeter to the front panel AUDIO TEST jack.

2. With no signal input, note the meter reading to establish a 0 dB reference.

3. Move S1 to the center "DIV" position and increase the unmodulated signal generator output to obtain 6-7 dB quieting.

4. While listening to the audio from the speaker, (adjust the LOCAL VOL control as required), turn R87 counterclockwise until the audio just squelches.

2.7 800 MHz RECEIVER PERFORMANCE TESTS

2.7.1 SINAD SENSITIVITY

1. Set the RF signal generator to the channel frequency with an output modulated with 1 kHz at ± 3 kHz deviation. Connect the generator to the appropriate antenna jack on the back panel of the receiver drawer.

2. Connect a SINAD meter to the AUDIO TEST jack on the receiver drawer front panel.

3. Increase the generator output to obtain a SINAD reading of -12 dB. The generator output should be 0.35 microvolt or less.

4. If using diversity antennas, connect the generator to the other antenna jack and sensitivity should be the same.

2.7.2 DIVERSITY AND SQUELCH THRESHOLD LEVEL

1. Connect the generator to the receive antenna jack as described in the preceding section. Connect an AC voltmeter to the AUDIO TEST jack.

2. With no RF generator output signal, note the reading on the AC voltmeter. This is the 0 dB reference. Adjust the LOCAL AUDIO control so that audio can be heard from the speaker when the audio unsquelches.

3. Switch diversity control switch S1 on the receiver board to the center "DIV" position. Increase the unmodulated generator output so that the audio unsquelches.

4. Decrease the generator output and the audio should unsquelch when the meter reading is 6-7 dB below the 0 dB reference. If not, refer to Service Manual (see Section 2.1).

2.7.3 RECEIVE DATA LEVEL

1. Connect an RF signal generator to the appropriate receive antenna jack. Set the generator for the receive channel frequency with an output level of 100 microvolts, modulated with 100 Hz at ± 1 kHz deviation.

2. The data signal at TP8 on the logic board should be 0.56 volt P-P or 0.34 volt RMS. If not, refer to Service Manual (see Section 2.1).

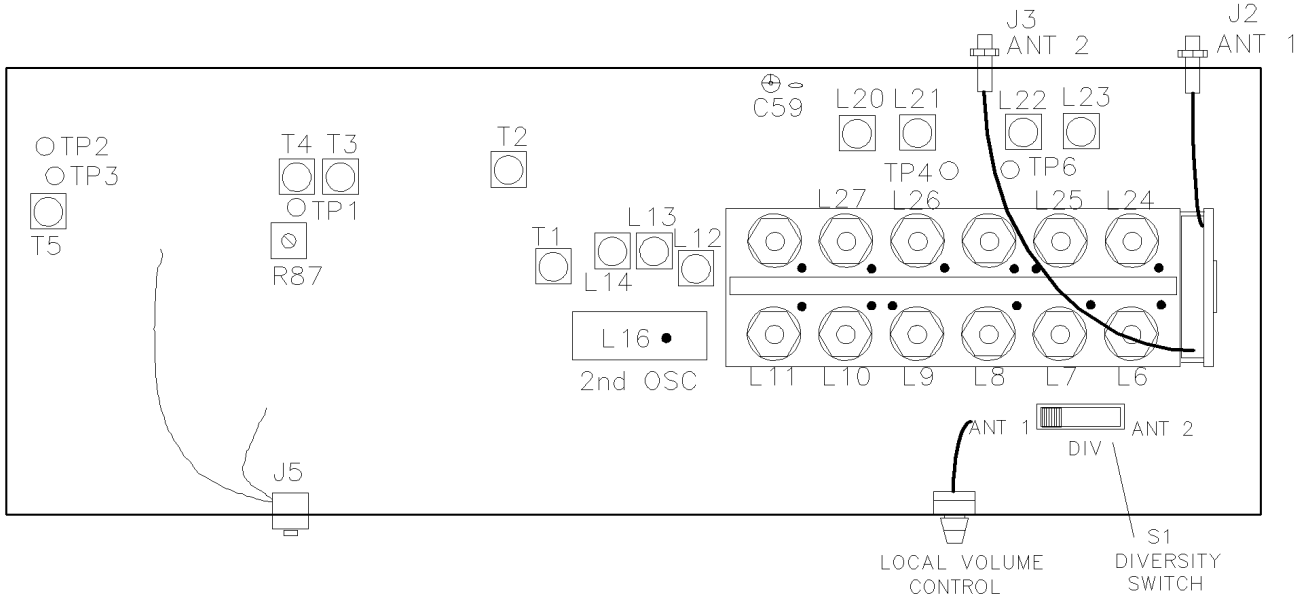


Figure 2-3 800 MHz RECEIVER ALIGNMENT POINTS DIAGRAM

2.8 900 MHz RECEIVER DRAWER ALIGNMENT

2.8.1 INTRODUCTION

This alignment procedure should be performed with the drawer installed in the repeater because a reference signal from the local oscillator drawer is required for proper operation of the receiver drawer.

2.8.2 TEST EQUIPMENT FREQUENCY STABILITY

The receiver frequency is locked to the 1.250000 MHz reference frequency from the local oscillator drawer. This frequency is stable to within ±0.1 PPM from -30° to +60° C as required by the FCC. To properly align the IF sections of the receiver, the signal generator must have similar stability. Since most test equipment is not this stable, a separate reference oscillator that is stable to ±0.05 or ±0.01 PPM may be needed to clock the signal generator.

Adjustment of the 1.250000 MHz reference frequency probably should not be attempted for the same reason, unless the communications monitor has a stability of ±0.01 PPM or better. If it is certain that one or both oscillators in the local oscillator drawer are off frequency, there is an adjusting screw on the oscillators that is used to change the frequency slightly. Adjustment should only be performed when the ambient temperature is near the calibration reference of 25° C (77° F).

If power is removed from the local oscillator drawer, the oscillators require a restabilization period that is related to the length of time power is removed. No frequency-critical adjustments should be attempted until the oscillator frequency has stabilized. Sample restabilization times are listed below. Do not place a repeater in service until the oscillators have had time to stabilize. Battery backup is recommended on at least the repeater or repeaters containing the local oscillator drawer.

Length of Time Power Was Removed	**Restabilization Time**
24 hours	24 hours
1 month	48 hours
3 months	4 weeks

2.8.3 SYNTHESIZER ADJUSTMENT

Refer to the alignment points and test setup diagram in Figure 2-5 and proceed as follows: (Refer to Appendix B for frequencies.)

1. Connect a DC voltmeter to TP201 on the synthesizer board. While depressing S204, adjust L201 for a meter reading of 3.50V. If L201 adjusts properly and out-of-lock LED CR205 is off, proceed to Section 2.8.4.

2. If CR205 is on or if L201 does not adjust properly, the multiplier stages which provide feedback to the synthesizer may not be tuned properly. Perform the next step and Section 2.8.4 and then start again with Step 1.

3. Connect a DC voltmeter to TP4 in the Receiver and adjust L201 on the Synthesizer board for a maximum meter reading.

2.8.4 MULTIPLIER TUNE-UP

1. Connect a DC voltmeter to TP4 and adjust L25 for maximum (typically 0.14V).

2. Connect a DC voltmeter to TP5 and adjust L18 and L19 for maximum (typically 1.1V).

3. Connect a DC voltmeter to TP6 and adjust L20, L21 and L22 for maximum. Then adjust L23 for minimum (typically 1.0V).

4. Momentarily press S201 on the Synthesizer board and then press and hold S204 until LED CR205 turns off. Check the DC voltage at TP201 and readjust if necessary as described in Section 2.8.3, Step 1. Then repeat steps 1-3 of this Section.

2.8.5 SECOND OSCILLATOR ADJUSTMENT

1. Using a pickup loop connected to a communications monitor, monitor the second oscillator signal by inserting the loop through the opening in the shield over the second oscillator stage.

2. Adjust C55 for 34.3000 MHz.

2.8.6 FRONT END ALIGNMENT

Front end helicals L6-L11 are adjusted using the peak/dip method. Proceed as follows:

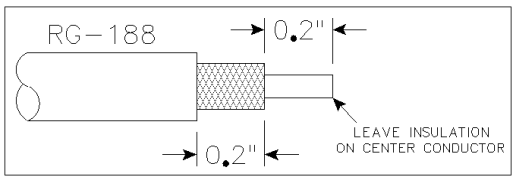


Figure 2-4 TEST PROBE DIAGRAM

1. Fabricate the probe shown in Figure 2-4 and connect it to an RF voltmeter or spectrum analyzer.

2. Set the signal generator on the channel frequency and connect it to either antenna jack on the back of the drawer. Set diversity control switch S1 to the antenna being used (ANT 1 or ANT 2).

3. Insert the probe in the hole adjacent to the L6 helical. Increase the signal generator output (unmodulated) to obtain a reading on the RF voltmeter. (A 250 mV input signal produces about 10 mV at the test probe.)

4. Insert a shorting rod (heavy piece of bare wire) into the hole adjacent to the L7 helical and lightly touch the helical coil.

5. Adjust L6 for a peak on the RF voltmeter.

6. Move the shorting rod to L8 and adjust L7 for a dip on the RF voltmeter (the probe remains in the L6 cavity).

7. Move the shorting rod to L9 and adjust L8 for a peak on the RF voltmeter.

8. Move the shorting rod to L10 and adjust L9 for a dip on the RF voltmeter.

9. Move the shorting rod to L11 and adjust L10 for a peak on the RF voltmeter.

10. Remove the shorting rod and adjust L11 for a dip on the RF voltmeter. Remove the probe from L6.

2.8.7 IF ALIGNMENT

NOTE: A signal generator stable to ±0.1 PPM or better is required to properly tune the IF stages. Refer to Section 2.8.2 for more information.

1. Connect a DC voltmeter to TP1. Preset the cores of L12, L13, L14, T1, T2, T3 and T4 near the top of the can.

2. Set the signal generator to the channel frequency, modulated with 1 kHz at ±1.5 kHz deviation. Adjust the output level for a meter reading of approximately 1.5V DC.

3. Adjust L12, L13, L14, T1, T2, T3 and T4 for maximum DC voltage (keep readjusting the signal generator output to keep the voltage at TP1 below 2.5V DC). Repeat this step.

4. Increase the signal generator output to -60 dBm (220 µV).

5. Connect a DC voltmeter across TP2 and TP3 (both voltmeter inputs must be floating). Adjust T5 for 0V across TP2 and TP3.

6. Connect a distortion analyzer to the front panel AUDIO TEST jack. Increase the generator output to -47 dBm (1 mV) and ±2.5 kHz deviation. Adjust T1, T2 and T5 for lowest distortion.

2.8.8 DIVERSITY AND SQUELCH ADJUSTMENT

1. Preset R87 fully clockwise and set S1 to the antenna jack being used (ANT 1 or ANT 2). Connect an AC voltmeter to the front panel AUDIO TEST jack.

2. With no RF signal input, note the meter reading to establish a 0 dB reference.

3. Switch S1 to the center "DIV" position and increase the unmodulated signal generator output to obtain 7 dB quieting.

4. While listening to the audio from the speaker (adjust the LOCAL VOL control as required), turn R87 counterclockwise until the audio just squelches.

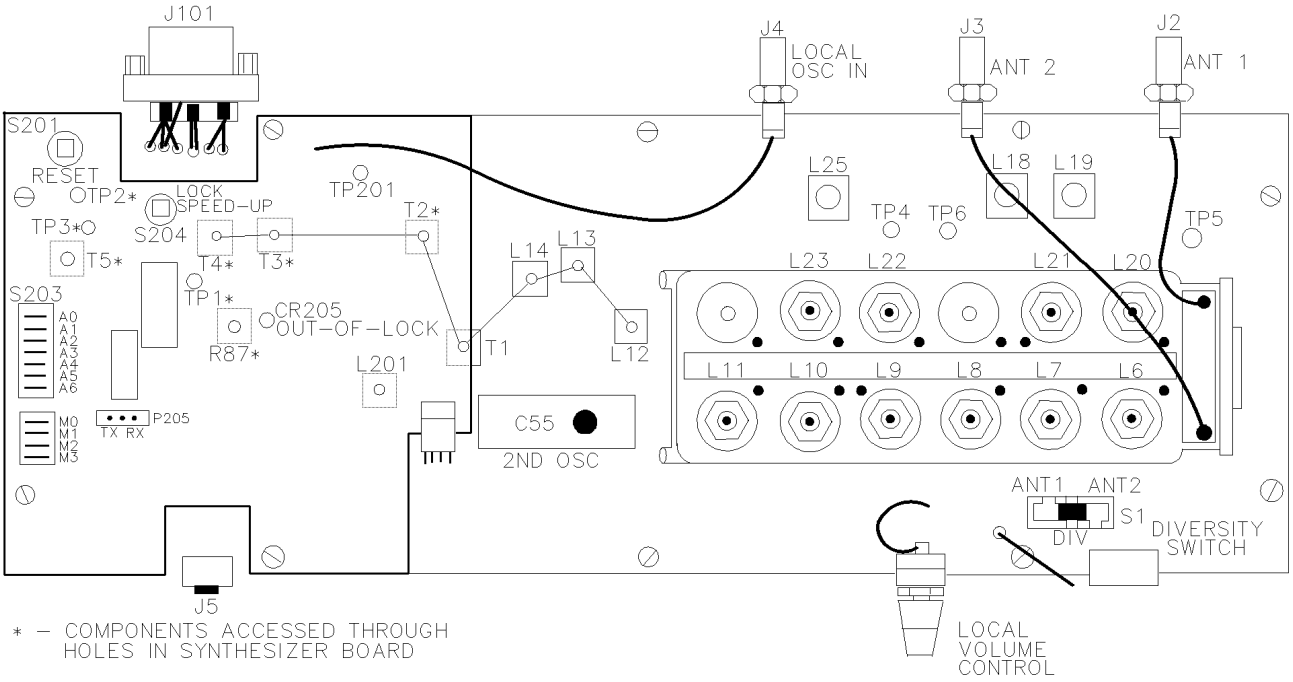


Figure 2-5 900 MHz RECEIVER ALIGNMENT POINTS DIAGRAM

2.9 900 MHz RECEIVE DATA LEVEL ADJUSTMENT

1. Connect a signal generator to the receiver antenna jack, see Section 2.8.6. Set the generator to the receive channel frequency with an output level of 100 µV, modulated with 150 Hz at ±800 Hz deviation.

2. On the Logic Drawer, connect an AC voltmeter or oscilloscope between TP8 and chassis ground. Adjust R81 for 0.56V P-P (±0.05V) or 0.20V RMS (±0.02V) at TP8.

3. Connect a DC voltmeter to TP8 on the Logic Drawer and adjust T5 on the Receiver Drawer for a meter reading of 4.0V DC ±0.2V.

4. Repeat Step 2.

2.10 900 MHz RECEIVER PERFORMANCE TESTS

2.10.1 SINAD SENSITIVITY

1. Set the RF signal generator to the channel frequency, modulated with 1 kHz at ±1.5 kHz deviation. Connect the generator to the receiver antenna jack.

2. Connect a SINAD meter to the AUDIO TEST jack on the front panel of the receiver.

3. Increase the generator output to obtain a SINAD of -12 dB. The generator output should be 0.35 µV or less.

4. If using diversity antennas, connect the generator to the other antenna jack and sensitivity should be the same.

2.10.2 DIVERSITY AND SQUELCH THRESHOLD LEVEL

1. Establish the 0 dB reference for quieting as described in Section 2.10.1. Adjust the LOCAL AUD control so that audio can be heard from the speaker when the receiver unsquelches.

2. Switch diversity control switch S1 on the receiver board to the enter "DIV" position.

3. Increase the unmodulated generator output so that the audio unsquelches. Then decrease the generator output and the audio should squelch when approximately 7 dB quieting is reached. If not, refer to Section 2.8.8.

2.10.3 RECEIVE DATA LEVEL

1. Connect a signal generator to the appropriate receive antenna jack. Set the generator output for the receive channel frequency with an output level of 100 μV, modulated with 150 Hz at ±800 Hz deviation.

2. The data signal at TP8 on the logic board should be 0.56V P-P or 0.20V RMS. If not, refer to Section 2.9.

2.11 RDM ALIGNMENT

2.11.1 EQUIPMENT REQUIRED

- Frequency counter with 10:1 probe.
- IFR signal generator (or equivalent).
- AC Voltmeter
- DC Voltmeter
- Distortion Analyzer
- Oscilloscope
- Transmission Test Set
- Multi-Net Encoder/Decoder Box

2.11.2 CLOCK ADJUSTMENT

Verify the clock frequency of the microprocessor.

1. Measure the frequency at U1, pin 19 with a frequency counter and 10:1 (10M ohm) probe.

2. Frequency should be 11.059 MHz ±500 Hz.

3. Adjust C5 if necessary.

2.11.3 RECEIVE AUDIO LEVEL

1. Set the IFR signal generator to the receive channel frequency with an output modulation set to 1 kHz at ±1.33 kHz deviation for 900 MHz or ±1.5 kHz deviation for 800 MHz at a level of -70 dBm.

2. Connect the generator to antenna 1 (J6).

3. Verify that S1 on the receiver board is set to "Ant 1".

4. On the Decoder board set S1, Sections 1/2 "On", 3 "Off" and reset the RDM.

5. Using a transmission test set verify that -20 dBm is measured at TP3.

6. Adjust R29 if necessary.

7. Verify that -12 dBm is measured at TP4.

8. Adjust R35 if necessary.

2.11.4 RECEIVE DATA DEVIATION

1. Set the IFR signal generator to the receive channel frequency with an output modulation set to 100 Hz at ±800 Hz deviation at a level of 100 μV.

2. Connect the generator to antenna 1 (J6).

3. On the Decoder board set S1, Sections 1/2 "On", 3 "Off" and reset the RDM.

4. Using an AC voltmeter, verify that 0.34V RMS or 0.56V P-P is measured at TP1.

5. Adjust R20 if necessary.

6. Using a DC voltmeter, verify that 4V ±.2V is measured at TP1.

7. Adjust T5 on the receiver board if necessary.

8. If T5 was adjusted, repeat Step 4.

2.11.5 FSK LEVEL

NOTE: Before this test can be performed, the Receive Audio Level test must be completed.

1. On the Decoder board set S1, Sections 1 "Off", 2/3 "On" and reset the RDM.

2. Using a transmission test set, verify that -20 dBm is measured at TP4.

3. Adjust R46 if necessary.

4. On the Decoder board, set S1, Sections 1-3 to "On" and reset the RDM.

2.11.6 RSSI LEVEL DETECTOR

1. Set the IFR signal generator to the receive channel frequency with an output modulation set to 1 kHz at ±1.5 kHz deviation for 900 MHz or ±3 kHz deviation for 800 MHz at a level of -70 dBm.

2. Connect the generator to antenna 1 (J6).

3. Verify that S1 on the receiver board is set to "Ant 1".

4. Connect the SINAD meter from the IFR to the Audio Output.

5. Adjust the generator until -10 dB is read on the SINAD meter.

6. Connect an Oscilloscope or DC voltmeter to TP8.

7. Verify that TP8 is toggling between 0 and 1.

NOTE: A low, 0, on TP8 is active, indicating SINAD is greater than the measured value. Toggling indicates SINAD is equal to the measured value.

8. Adjust R72 if necessary.

9. Adjust the generator until -15 dB is read on the SINAD meter.

10. Connect an Oscilloscope to TP7.

11. Verify TP7 is toggling between a 0 and 1.

12. Adjust R84 if necessary.

13. Adjust the generator until -20 dB is read on the SINAD meter.

14. Connect an oscilloscope to TP5.

15. Verify that it is toggling between a 0 and 1.

16. Adjust R96 if necessary.

17. Adjust the generator until -25 dB is read on the SINAD meter.

18. Connect an oscilloscope to TP6.

19. Verify that TP6 is toggling between a 0 and 1.

20. Adjust R108 if necessary.

2.11.7 RDM OPERATIONAL MODE

1. On the Decoder board set S1, Sections 1-3 "Off" and reset the RDM.

2.11.8 RDM FINAL ALIGNMENT

1. Set the IFR signal generator to the receive channel frequency with an output modulation set to 1 kHz at ±1.5 kHz deviation at a level of -70 dBm for 800 MHz RDM or 1.3 kHz for 900 MHz RDM.

2. Connect the generator to antenna 1 (J6).

3. Verify that S1 on the Receiver board is set to "Ant 1".

4. On the RDM, set S1, sections 1/2 "On", 3 "Off" and press the Reset (S3).

5. Using a transmission test set adjust R29 for -20 dBm at TP3.

6. Using a transmission test set adjust R35 for -12 dBm at TP4.

7. On the RDM, set S1, sections 1 "Off", 2/3 "On" and press the Reset (S3).

8. Using a transmission test set adjust R46 for -20 dBm at TP4.

9. On the RDM, set S1, sections 1-3 "On" and press the Reset (S3).

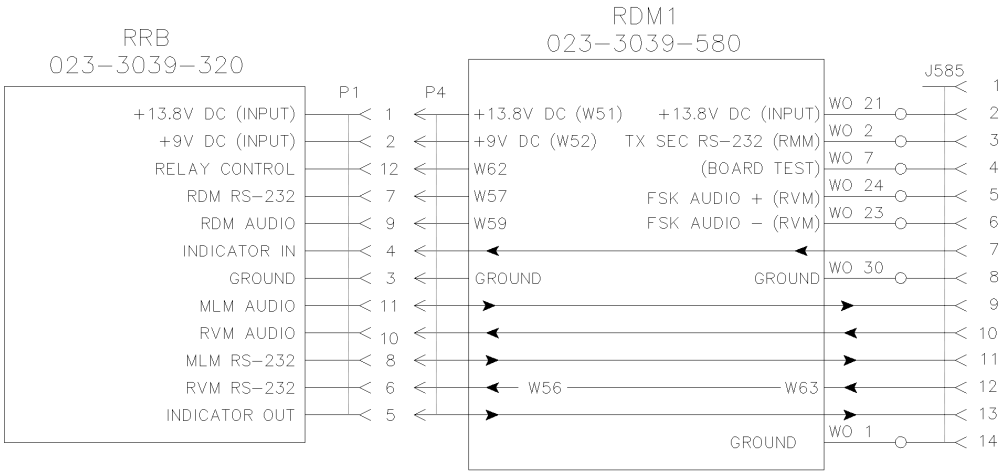


Figure 2-6 RRB TO RDM INTERCONNECT

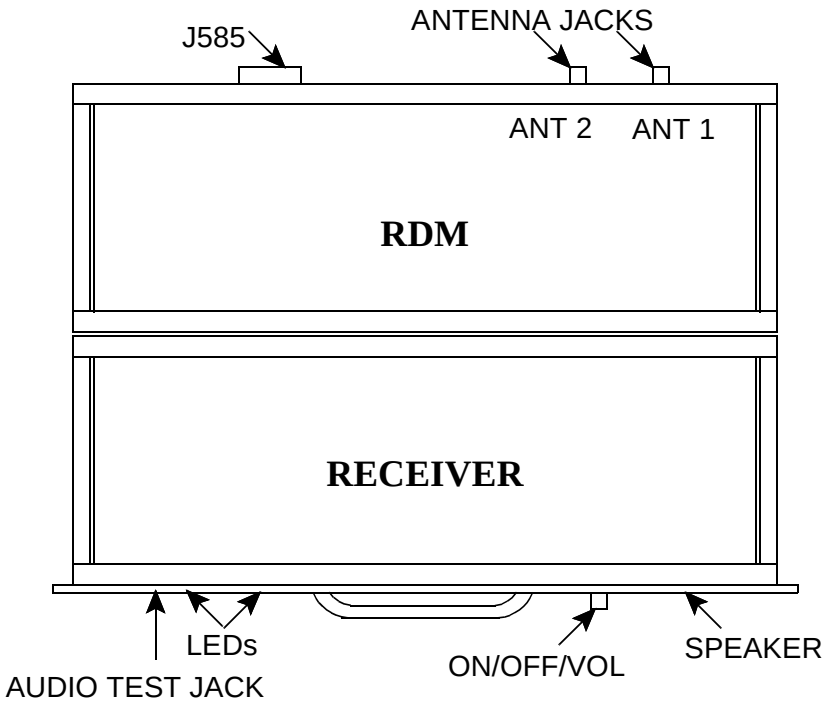


Figure 2-7 RDM DRAWER

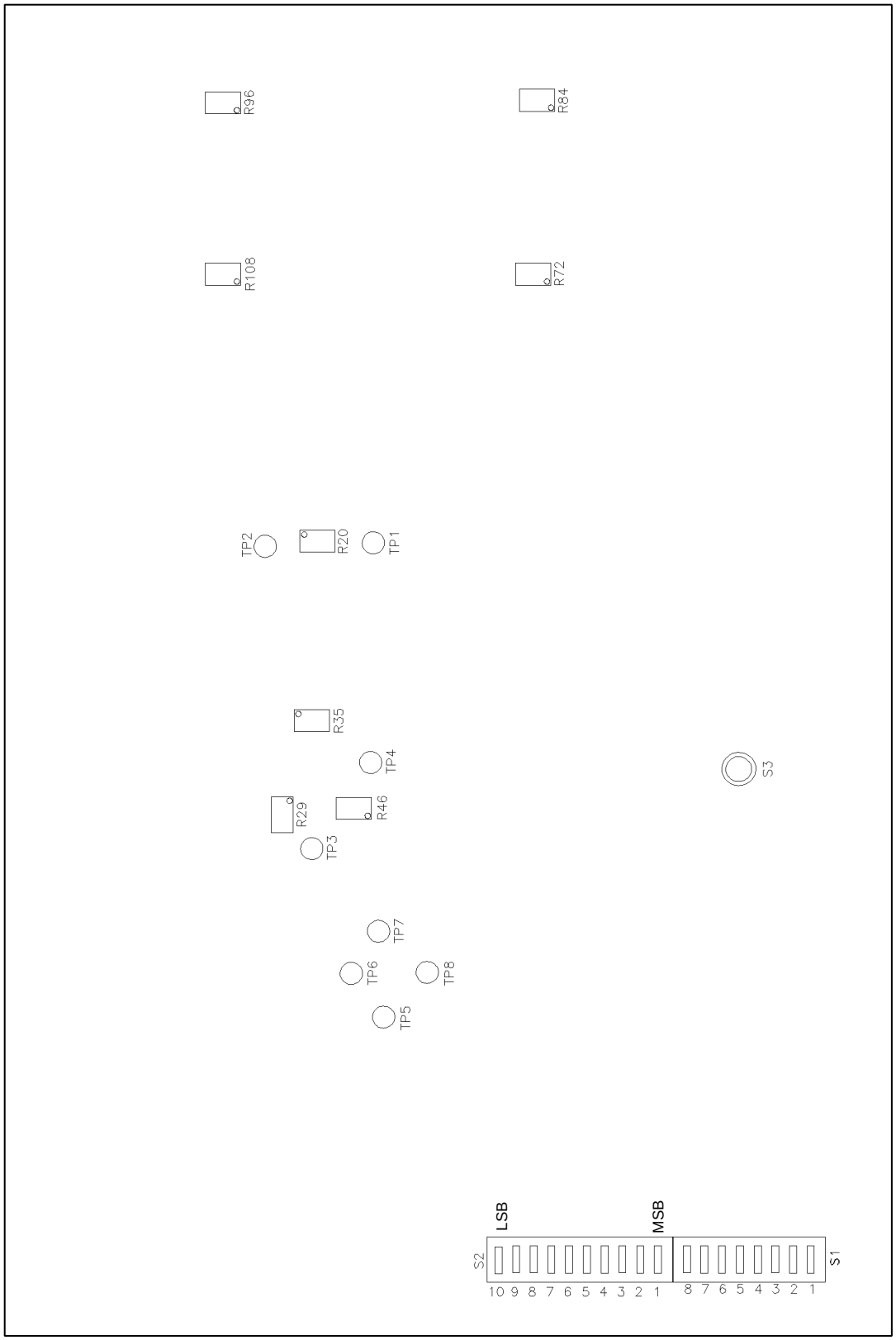


Figure 2-8 RDM ALIGNMENT POINTS DIAGRAM

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
	800 MHz RECEIVER DECODER MODULE PART NO. 023-3039-580	
A 321	RDM revert harness	023-3039-321
A 581	RDM board assembly	023-3039-581
A 583	800 MHz receiver	023-3039-583
A 585	Rear connector	023-3039-585
A 587	Drawer	023-3039-587
	RDM BOARD ASSEMBLY PART NO. 023-3039-581	
C 001	470 pF ±5% NPO 1206 chip	510-3602-471
C 002	470 pF ±5% NPO 1206 chip	510-3602-471
C 003	20 pF ±5% NPO 1206 chip	510-3602-220
C 004	20 pF ±5% NPO 1206 chip	510-3602-220
C 005	5-35 pF vert mono	512-1010-005
C 006	.1 µF X7R ±10% 1210	510-3607-104
C 007	10 µF 16V SMD TANT	510-2625-100
C 008	82 pF ±5% NPO 1206 chip	510-3602-820
C 009	15 µF 20V SMD TANT	510-2626-150
C 010	15 µF 20V SMD TANT	510-2626-150
C 011	.01 µF X7R ±10% chip	510-3606-103
C 012	.0068 µF X7R ±10% chip	510-3606-682
C 013	.022 µF X7R ±10% chip	510-3606-223
C 014	.047 µF X7R ±10% chip	510-3606-473
C 015	470 pF ±5% NPO 1206 chip	510-3602-471
C 016	10 µF 16V SMD TANT	510-2625-100
C 017	10 µF 16V SMD TANT	510-2625-100
C 018	1 µF 16V SMD TANT	510-2625-109
C 019	1 µF 16V SMD TANT	510-2625-109
C 020	1 µF 16V SMD TANT	510-2625-109
C 021	1 µF 16V SMD TANT	510-2625-109
C 022	1 µF 16V SMD TANT	510-2625-109
C 023	20 pF ±5% NPO 1206 chip	510-3602-200
C 024	20 pF ±5% NPO 1206 chip	510-3602-200
C 025	.0022 µF X7R ±10% chip	510-3606-222
C 026	.1 µF X7R ±10% 1210	510-3607-104
C 027	1 µF 16V SMD TANT	510-2625-109
C 028	1 µF 16V SMD TANT	510-2625-109
C 031	1 µF 16V SMD TANT	510-2625-109
C 032	1 µF 16V SMD TANT	510-2625-109
C 033	10 µF 16V SMD TANT	510-2625-100
C 034	10 µF 16V SMD TANT	510-2625-100
C 035	.01 µF X7R ±10% chip	510-3606-103
C 036	1 µF 16V SMD TANT	510-2625-109
C 037	470 pF ±5% NPO 1206 chip	510-3602-471
C 038	470 pF ±5% NPO 1206 chip	510-3602-471
C 039	10 µF 16V SMD TANT	510-2625-100
C 040	10 µF 16V SMD TANT	510-2625-100
C 041	.1 µF X7R ±10% 1210	510-3607-104
C 042	.1 µF X7R ±10% 1210	510-3607-104
C 043	.0022 µF X7R ±10% chip	510-3606-222
C 044	.01 µF X7R ±10% chip	510-3606-103
C 045	.01 µF X7R ±10% chip	510-3606-103
C 046	.1 µF X7R ±10% 1210	510-3607-104
C 047	.1 µF X7R ±10% 1210	510-3607-104
C 048	.0022 µF X7R ±10% chip	510-3606-222
C 049	.01 µF X7R ±10% chip	510-3606-103
C 050	.01 µF X7R ±10% chip	510-3606-103
C 051	.1 µF X7R ±10% 1210	510-3607-104
C 052	.1 µF X7R ±10% 1210	510-3607-104
C 053	.0022 µF X7R ±10% chip	510-3606-222
C 054	.01 µF X7R ±10% chip	510-3606-103
C 055	.01 µF X7R ±10% chip	510-3606-103
C 056	.1 µF X7R ±10% 1210	510-3607-104
C 057	.1 µF X7R ±10% 1210	510-3607-104
C 058	.0022 µF X7R ±10% chip	510-3606-222
C 059	.01 µF X7R ±10% chip	510-3606-103
C 060	.01 µF X7R ±10% chip	510-3606-103
C 061	12 pF ±5% NPO 1206 chip	510-3602-120
C 062	.1 µF X7R ±10% 1210	510-3607-104
C 063	.01 µF X7R ±10% chip	510-3606-103
C 064	.01 µF X7R ±10% chip	510-3606-103
C 065	.01 µF X7R ±10% chip	510-3606-103
C 066	.1 µF X7R ±10% 1210	510-3607-104
C 067	.1 µF X7R ±10% 1210	510-3607-104
C 068	.1 µF X7R ±10% 1210	510-3607-104
C 069	.01 µF X7R ±10% chip	510-3606-103
C 070	.01 µF X7R ±10% chip	510-3606-103
C 071	.01 µF X7R ±10% chip	510-3606-103
C 072	.01 µF X7R ±10% chip	510-3606-103
C 073	.01 µF X7R ±10% chip	510-3606-103
C 074	10 µF 16V SMD TANT	510-2625-100
CH001	Covers - top & bottom	017-2197-041
CR001	Red LED	549-4001-001
CR002	Green LED	549-4001-003
CR003	UHF/VHF band switch SOT	523-1504-012
CR004	UHF/VHF band switch SOT	523-1504-012
CR005	UHF/VHF band switch SOT	523-1504-012
CR006	UHF/VHF band switch SOT	523-1504-012
CR008	1N4448 SI diode	523-1500-883

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
CR009	1N4448 SI diode	523-1500-883
CR010	1N4448 SI diode	523-1500-883
CR011	1N4448 SI diode	523-1500-883
CR012	1N4448 SI diode	523-1500-883
CR013	1N4448 SI diode	523-1500-883
CR014	1N4448 SI diode	523-1500-883
CR015	1N4448 SI diode	523-1500-883
CR016	1N4448 SI diode	523-1500-883
CR017	1N4448 SI diode	523-1500-883
CR018	1N4448 SI diode	523-1500-883
CR019	1N4448 SI diode	523-1500-883
CR020	1N4448 SI diode	523-1500-883
CR021	1N4448 SI diode	523-1500-883
CR022	1N4448 SI diode	523-1500-883
CR023	1N4448 SI diode	523-1500-883
EP001	3/32" heat shrink tubing	042-0241-552
EP002	3/32" heat shrink tubing	042-0241-552
EP003	3/32" heat shrink tubing	042-0241-552
EP004	3/32" heat shrink tubing	042-0241-552
F 001	Fuse 2A AGC	534-0003-024
FH003	Fuse clip	534-1007-001
HW001	Nut 4-40 x .063 NPB	560-2104-006
HW002	4-40 mach panhead ZPS phil	575-1604-010
HW003	No 4 shakeproof washer	596-1104-008
HW001	6-32 panhead taptite 1/4"	575-0606-008
HW002	TT 4-40 x .250 panhead phil	575-0604-008
HW003	Lockwshr int 1/4 x .025 NPB	596-2114-013
HW004	Nut hex 1/4-32 x .094 NPB	560-9043-012
HW005	Nut 4-40 x .063 NPB	560-2104-006
HW006	Lockwasher int 4 x .063 NPB	596-2104-008
HW007	4-40 mach panhead ZPS phil	575-1604-016
HW008	Grill cloth	018-1111-001
HW009	Eyelet	031-0511-004
HW011	6-32 panhead taptite 1/4	575-0606-008
HW015	Washer ins 4 x 32 fiber	596-4404-009
HW016	Socket LED panel mount	550-0006-100
HW017	Socket LED panel mount	550-0006-100
HW020	No 4 shakeproof washer	596-1104-008
J 002	5-pin male connector	515-9031-035
L 001	6.8 µH ±10% RF choke	542-3504-035
LS001	Speaker	589-1012-002
MP001	Speaker mounting bracket	017-2197-061
MP002	Volume knob	547-0017-060
MP001	Heat sink TO-220	017-2221-034
MP002	Heat sink TO-220	017-2221-034
MP003	Shield mixer	017-2197-111
MP004	Shield receiver top	017-2197-121
MP005	Shield receiver bottom	017-2197-131
MP006	Shield cover	017-2197-141
MP007	Shield cover, mixer	017-2197-116
NP001	M-Net 800 MHz RDM label	559-9001-243
P 001	12-pin locking header	515-9031-211
P 004	BNC plug crimp RG-188	515-3006-003
PA001	M-Net Voter RDM software	023-9998-233
PC001	PC Bd rcvr/decoder module	035-3039-580
Q 002	SI NPN SOT-23	576-0003-658
R 001	220 ohm ±5% 1206 SMD	569-0115-221
R 002	100k ohm ±5% 1206 SMD	569-0115-104
R 003	100k ohm ±5% 1206 SMD	569-0115-104
R 004	10k ohm ±5% 1206 SMD	569-0115-103
R 005	10k ohm ±5% 1206 SMD	569-0115-103
R 006	43k ohm ±5% 1206 SMD	569-0115-433
R 007	10k ohm ±5% 1206 SMD	569-0115-103
R 008	47k ohm ±5% 1206 SMD	569-0115-473
R 009	10k ohm ±5% 1206 SMD	569-0115-103
R 010	8.2k ohm ±5% 1206 SMD	569-0115-822
R 011	10k ohm ±5% 1206 SMD	569-0115-103
R 012	100k ohm ±5% 1206 SMD	569-0115-104
R 013	100k ohm ±5% 1206 SMD	569-0115-104
R 014	47k ohm ±5% 1206 SMD	569-0115-473
R 015	10k ohm ±5% 1206 SMD	569-0115-103
R 016	12k ohm ±5% 1206 SMD	569-0115-123
R 017	56k ohm ±5% 1206 SMD	569-0115-563
R 018	56k ohm ±5% 1206 SMD	569-0115-563
R 019	12k ohm ±5% 1206 SMD	569-0115-123
R 020	50k ohm multi-turn pot	562-0110-503
R 021	12k ohm ±5% 1206 SMD	569-0115-123
R 022	10k ohm ±5% 1206 SMD	569-0115-103
R 023	47k ohm ±5% 1206 SMD	569-0115-473
R 024	100k ohm ±5% 1206 SMD	569-0115-104

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
R 025	100k ohm ±5% 1206 SMD	569-0115-104
R 026	2.2k ohm ±5% 1206 SMD	569-0115-222
R 027	2.2k ohm ±5% 1206 SMD	569-0115-222
R 028	10k ohm ±5% 1206 SMD	569-0115-103
R 029	100k ohm trim pot	562-0110-104
R 030	1k ohm ±5% 1206 SMD	569-0115-102
R 031	100k ohm ±5% 1206 SMD	569-0115-104
R 032	100k ohm ±5% 1206 SMD	569-0115-104
R 033	10k ohm ±5% 1206 SMD	569-0115-103
R 034	4.7k ohm ±5% 1206 SMD	569-0115-472
R 035	100k ohm trim pot	562-0110-104
R 036	1k ohm ±5% 1206 SMD	569-0115-102
R 037	10k ohm ±5% 1206 SMD	569-0115-103
R 038	100k ohm ±5% 1206 SMD	569-0115-104
R 039	100k ohm ±5% 1206 SMD	569-0115-104
R 040	100k ohm ±5% 1206 SMD	569-0115-104
R 041	100k ohm ±5% 1206 SMD	569-0115-104
R 042	300 ohm ±5% 1206 SMD	569-0115-301
R 043	300 ohm ±5% 1206 SMD	569-0115-301
R 044	910 ohm ±5% 1206 SMD	569-0115-911
R 045	4.3k ohm ±5% 1206 SMD	569-0115-432
R 046	100k ohm trim pot	562-0110-104
R 047	33k ohm ±5% 1206 SMD	569-0115-333
R 048	47k ohm ±5% 1206 SMD	569-0115-473
R 058	10k ohm ±5% 1206 SMD	569-0115-103
R 059	10k ohm ±5% 1206 SMD	569-0115-103
R 060	10k ohm ±5% 1206 SMD	569-0115-103
R 061	220 ohm ±5% 1206 SMD	569-0115-221
R 062	2.7k ohm ±5% 1206 SMD	569-0115-272
R 063	4.7k ohm ±5% 1206 SMD	569-0115-472
R 064	6.8k ohm ±5% 1206 SMD	569-0115-682
R 065	12k ohm ±5% 1206 SMD	569-0115-123
R 066	47k ohm ±5% 1206 SMD	569-0115-473
R 067	10k ohm ±5% 1206 SMD	569-0115-103
R 068	47k ohm ±5% 1206 SMD	569-0115-473
R 069	330k ohm ±5% 1206 SMD	569-0115-334
R 070	1M ohm ±5% 1206 SMD	569-0115-105
R 071	10k ohm ±5% 1206 SMD	569-0115-103
R 072	500k ohm multi-trim pot	562-0110-504
R 074	2.7k ohm ±5% 1206 SMD	569-0115-272
R 075	4.7k ohm ±5% 1206 SMD	569-0115-472
R 076	6.8k ohm ±5% 1206 SMD	569-0115-682
R 077	12k ohm ±5% 1206 SMD	569-0115-123
R 078	47k ohm ±5% 1206 SMD	569-0115-473
R 079	10k ohm ±5% 1206 SMD	569-0115-103
R 080	47k ohm ±5% 1206 SMD	569-0115-473
R 081	330k ohm ±5% 1206 SMD	569-0115-334
R 082	1M ohm ±5% 1206 SMD	569-0115-105
R 083	10k ohm ±5% 1206 SMD	569-0115-103
R 084	500k ohm multi-trim pot	562-0110-504
R 086	2.7k ohm ±5% 1206 SMD	569-0115-272
R 087	4.7k ohm ±5% 1206 SMD	569-0115-472
R 088	6.8k ohm ±5% 1206 SMD	569-0115-682
R 089	12k ohm ±5% 1206 SMD	569-0115-123
R 090	47k ohm ±5% 1206 SMD	569-0115-473
R 091	10k ohm ±5% 1206 SMD	569-0115-103
R 092	47k ohm ±5% 1206 SMD	569-0115-473
R 093	330k ohm ±5% 1206 SMD	569-0115-334
R 094	1M ohm ±5% 1206 SMD	569-0115-105
R 095	10k ohm ±5% 1206 SMD	569-0115-103
R 096	500k ohm multi-trim pot	562-0110-504
R 098	2.7k ohm ±5% 1206 SMD	569-0115-272
R 099	4.7k ohm ±5% 1206 SMD	569-0115-472
R 100	6.8k ohm ±5% 1206 SMD	569-0115-682
R 101	12k ohm ±5% 1206 SMD	569-0115-123
R 102	47k ohm ±5% 1206 SMD	569-0115-473
R 103	10k ohm ±5% 1206 SMD	569-0115-103
R 104	47k ohm ±5% 1206 SMD	569-0115-473
R 105	330k ohm ±5% 1206 SMD	569-0115-334
R 106	1M ohm ±5% 1206 SMD	569-0115-105
R 107	10k ohm ±5% 1206 SMD	569-0115-103
R 108	500k ohm multi-trim pot	562-0110-504
R 110	220 ohm ±5% 1206 SMD	569-0115-221
R 111	100 ohm ±5% 1206 SMD	569-0115-101
R 112	33k ohm ±5% 1206 SMD	569-0115-333
R 113	56k ohm ±5% 1206 SMD	569-0115-563
R 114	1k ohm ±5% 1206 SMD	569-0115-102
R 115	47 ohm ±5% 1206 SMD	569-0115-470
R 116	43k ohm ±5% 1206 SMD	569-0115-433
R 117	43k ohm ±5% 1206 SMD	569-0115-433
R 118	43k ohm ±5% 1206 SMD	569-0115-433
R 120	10k ohm ±5% 1206 SMD	569-0115-103
R 121	10k ohm ±5% 1206 SMD	569-0115-103
R 122	10k ohm ±5% 1206 SMD	569-0115-103
R 123	10k ohm ±5% 1206 SMD	569-0115-103
R 124	10k ohm ±5% 1206 SMD	569-0115-103
R 125	10k ohm ±5% 1206 SMD	569-0115-103
R 126	10k ohm ±5% 1206 SMD	569-0115-103
R 127	10k ohm ±5% 1206 SMD	569-0115-103
R 128	10k ohm ±5% 1206 SMD	569-0115-103
R 129	10k ohm ±5% 1206 SMD	569-0115-103
R 130	10k ohm ±5% 1206 SMD	569-0115-103
R 131	10k ohm ±5% 1206 SMD	569-0115-103
R 132	10k ohm ±5% 1206 SMD	569-0115-103

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
R 133	10k ohm ±5% 1206 SMD	569-0115-103
R 134	10k ohm ±5% 1206 SMD	569-0115-103
R 135	10k ohm ±5% 1206 SMD	569-0115-103
RT073	Thermistor	569-3001-001
RT085	Thermistor	569-3001-001
RT097	Thermistor	569-3001-001
RT109	Thermistor	569-3001-001
S 001	DIP switch 8-pos	583-5002-008
S 002	DIP switch 10-pos	583-5002-010
S 003	Momentary SPST	583-4005-002
TP001	Brown tip jack	105-2208-201
TP002	Red tip jack	105-2202-211
TP003	Orange tip jack	105-2206-201
TP004	Yellow tip jack	105-2207-201
TP005	Green tip jack	105-2204-201
TP006	Blue tip jack	105-2210-201
TP007	Violet tip jack	105-2212-201
TP008	Gray tip jack	105-2213-201
U 001	4k EPROM processor 8751	544-5010-499
U 002	Hex open drain buffer SOIC	544-3716-906
U 003	µP power reset 5V SO-8	544-2012-001
U 004	Quad OP-AMP SOIC	544-2020-008
U 005	Quad OP-AMP SOIC	544-2020-008
U 006	Quad OP-AMP SOIC	544-2020-008
U 007	Bilateral switch SW SOIC	544-3016-066
U 008	40668B bilat SW SOIC	544-3016-066
U 009	FSK modem DIP 7911	544-3988-004
U 010	4049 Hex inv-buf SOIC	544-3016-049
U 011	RS-232C/V.28 driver/receiver	544-2023-014
U 012	Voltage converter	544-2019-060
U 013	Volt reg TO-92 LM320L-5	544-2003-054
U 014	+9V volt reg TO-220	544-2003-059
U 015	Reg 5V TO-220 7805	544-2003-016
U 016	Quad OP-AMP SOIC	544-2020-008
U 017	Quad OP-AMP SOIC	544-2020-008
U 019	Quad OP-AMP SOIC	544-2020-008
U 021	Quad OP-AMP SOIC	544-2020-008
W 103	RG-188A/U coax cable	597-3002-003
W 104	RG-188A/U coax cable	597-3002-003
W 105	RG-188A/U coax cable	597-3002-003
W 106	RG-188A/U coax cable	597-3002-003
X 001	28-pin IC socket	515-5008-018
X 002	40-pin IC socket	515-5008-019
Y 001	11.0590 MHz crystal	521-0011-059
Y 002	2.4576 MHz crystal HC-18U	521-0002-458
Z 001	EMI suppression filter	532-3003-002

RDM REAR CONNECTOR
PART NO. 023-3039-585

C 502	470 pF ±5% NPO 1206 chip	510-3602-471
C 503	470 pF ±5% NPO 1206 chip	510-3602-471
C 504	470 pF ±5% NPO 1206 chip	510-3602-471
C 505	470 pF ±5% NPO 1206 chip	510-3602-471
C 506	470 pF ±5% NPO 1206 chip	510-3602-471
EP001	.138 x .241 ferrite bead	517-2002-002
HW585	Bail lock PC mount	537-9055-007
J 585	Ribbon receptacle 14-pin str	515-7141-101
PC585	PCB conn filter	035-1010-110

RDM DRAWER
PART NO. 023-3039-587

HW012	8-32 flathead phil BZPS TT	575-6208-010
HW013	Lockwshr int 10 x .032 NPB	596-2110-012
HW014	Nut 10-32 x .375 CPS	560-1110-021
HW018	Screw 8-32 panhead CPS phil	575-0608-012
HW019	Lockwasher int 8 x .020 NPB	596-1108-011
HW020	Self clinching fastener	537-9047-002
HW021	8-32 mach panhead ZPS phil	575-1608-008
HW022	8-32 x 0.125 nut CPS	560-1108-011
HW023	1/2" dia hole plug	537-9001-011
MP008	1/4 turn fastener bail type	537-4001-101
MP009	Retainer for MP008	537-4002-001
MP012	Drawer handle	017-2139-201
MP013	Drawer front	014-0783-325
MP014	Drawer middle	014-0783-330
MP015	Drawer rear	014-0783-335
MP016	Drawer right side	014-0783-320
MP017	Drawer left side	014-0783-315
MP018	Drawer slide	537-9057-001

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
MP019	Drawer bracket	017-2222-210
MP020	Flexible grommet	574-0001-025
MP050	Plastic wear washer	574-9019-050
	RDM 8000 RECEIVER PART NO. 023-3039-583	
A 004	TCXO In cable short	023-3039-588
A 006	Receive In cable long/ref osc	023-3039-599
A 007	Receive In cable short	023-3039-598
A 101	Connector	023-4406-503
A 584	RDM receiver harness	023-3039-584
C 001	11 pF ±5% 50V NPO submin	510-3113-110
C 002	3.6 pF ±5% 50V NPO submin	510-3113-369
C 003	11 pF ±5% 50V NPO submin	510-3113-110
C 004	3.6 pF ±5% 50V NPO submin	510-3113-369
C 005	11 pF ±5% 50V NPO submin	510-3113-110
C 006	11 pF ±5% 50V NPO submin	510-3113-110
C 007	11 pF ±5% 50V NPO submin	510-3113-110
C 008	11 pF ±5% 50V NPO submin	510-3113-110
C 009	11 pF ±5% 50V NPO submin	510-3113-110
C 010	11 pF ±5% 50V NPO submin	510-3113-110
C 011	2 pF ±5% 50V NPO submin	510-3113-209
C 012	11 pF ±5% 50V NPO submin	510-3113-110
C 014	2200 pF ±20% 50V Y5U disc	510-3204-222
C 015	11 pF ±5% 50V NPO submin	510-3113-110
C 016	2200 pF ±20% 50V Y5U disc	510-3204-222
C 017	11 pF ±5% 50V NPO submin	510-3113-110
C 018	2.2 pF ±5% 50V NPO disc	510-3213-229
C 019	2200 pF ±20% 50V Y5U disc	510-3204-222
C 021	56 pF ±5% NPO 1206 chip	510-3602-560
C 024	56 pF ±5% NPO 1206 chip	510-3602-560
C 025	10 pF ±5% 50V N150 disc	510-3216-100
C 026	12 pF ±5% 50V N150 disc	510-3216-120
C 027	.01 µF ±20% 16V Y5S disc	510-3210-103
C 028	8.2 pF ±5% 50V N150 disc	510-3216-829
C 029	.01 µF ±20% 16V Y5S disc	510-3210-103
C 030	20 pF ±5% 50V N150 disc	510-3216-200
C 032	.33 pF ±5% 500V comp	510-9502-338
C 033	1.8 pF ±5% 50V NPO disc	510-3213-189
C 034	.01 µF ±20% 16V Y5S disc	510-3210-103
C 035	2200 pF ±20% 50V Y5U disc	510-3204-222
C 036	47 pF ±5% 50V N150 disc	510-3216-470
C 037	.01 µF ±20% 16V Y5S disc	510-3210-103
C 038	.01 µF ±20% 16V Y5S disc	510-3210-103
C 039	82 pF ±5% 50V N150 disc	510-3216-820
C 042	.01 µF ±20% 16V Y5S disc	510-3210-103
C 043	.01 µF ±20% 16V Y5S disc	510-3210-103
C 044	.01 µF ±20% 16V Y5S disc	510-3210-103
C 045	12 pF ±5% 50V N150 disc	510-3216-120
C 046	.1 µF ±20% 16V Y5S disc	510-3210-104
C 047	.01 µF ±20% 16V Y5S disc	510-3210-103
C 048	2.7 pF ±5% 50V NPO disc	510-3213-279
C 049	.1 µF ±20% 16V Y5S disc	510-3210-104
C 050	33 pF ±5% 50V NPO submin	510-3113-330
C 051	100 pF ±5% 50V NPO submin	510-3113-101
C 053	1 pF ±5% 500V comp	510-9502-109
C 055	.01 µF ±20% 16V Y5S disc	510-3210-103
C 056	1 µF ±20% 35V dip prep	510-2245-109
C 057	.01 µF ±20% 16V Y5S disc	510-3210-103
C 058	.01 µF ±20% 16V Y5S disc	510-3210-103
C 059	1.9-15.7 pF variable vert mt	187-0109-005
C 060	33 pF ±5% 50V NPO submin	510-3113-330
C 061	100 pF ±5% 50V NPO submin	510-3113-101
C 062	300 pF ±5% 50V NPO submin	510-3113-301
C 063	39 pF ±5% 50V N150 disc	510-3216-390
C 064	.01 µF ±20% 16V Y5S disc	510-3210-103
C 065	.75 pF ±5% 500V comp	510-9502-758
C 066	1000 pF ±20% 50V Y5U disc	510-3204-102
C 067	68 pF ±5% 50V N150 disc	510-3216-680
C 068	68 pF ±5% 50V N150 disc	510-3216-680
C 069	4.7 pF ±10% NPO axial ceram	510-3514-479
C 070	1000 pF ±20% 50V Y5U disc	510-3204-102
C 071	22 pF ±5% 50V N150 disc	510-3216-220
C 072	22 pF ±5% 50V N150 disc	510-3216-220
C 073	1000 pF ±20% 50V Y5U disc	510-3204-102
C 074	.01 µF ±20% 16V Y5S disc	510-3210-103
C 075	100 pF ±5% 50V NPO submin	510-3113-101
C 076	.01 µF ±20% 16V Y5S disc	510-3210-103
C 077	11 pF ±5% 50V NPO submin	510-3113-110
C 078	.01 µF ±20% 16V Y5S disc	510-3210-103
C 079	12 pF ±5% 50V N150 disc	510-3216-120
C 080	470 pF ±20% 1kV Y5F ceram	510-3260-471
C 081	12 pF ±5% 50V N150 disc	510-3216-120
C 082	470 pF ±20% 1kV Y5F ceram	510-3260-471
C 083	39 pF ±5% 50V N750 disc	510-3220-390
C 084	62 pF ±5% 50V N750 disc	510-3220-620
C 085	2 pF ±5% 500V comp	510-9502-209
C 086	11 pF ±5% 50V NPO disc	510-3213-110
C 087	1000 pF ±20% 50V Y5U disc	510-3204-102
C 088	.01 µF ±20% 16V Y5S disc	510-3210-103
C 089	100 pF ±20% 50V Y5U disc	510-3202-101
C 090	10 pF ±5% 50V NPO submin	510-3113-100

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
C 091	3 pF ±5% 50V NPO submin	510-3113-309
C 092	39 pF ±5% 50V NPO submin	510-3113-390
C 093	10 pF ±5% 50V NPO submin	510-3113-100
C 094	1000 pF ±20% 50V Y5U disc	510-3204-102
C 095	.68 pF ±5% 50V NPO submin	510-3113-688
C 096	2 pF ±5% 50V NPO submin	510-3113-209
C 097	100 pF ±20% 50V Y5U disc	510-3202-101
C 098	6.8 µF ±20% 35V dip prep	510-2245-689
C 099	100 µF 10V aluminum	510-4003-005
C 100	6.8 µF ±20% 35V dip prep	510-2245-689
C 101	470 µF 16V aluminum	510-4116-471
C 102	.01 µF ±20% 16V Y5S disc	510-3210-103
C 103	.01 µF ±20% 16V Y5S disc	510-3210-103
C 104	.1 µF 10V Y5U ceram disc	510-3208-104
C 105	1000 pF ±20% 50V Y5U disc	510-3204-102
C 106	.1 µF 10V Y5U ceram disc	510-3208-104
C 107	1 µF ±20% 35V molded	510-2025-109
C 108	100 µF ±20% 6V dip prep	510-2241-101
C 109	.1 µF ±10% 250V flatfoil	510-1203-104
C 110	.0033 µF ±5% 63V poly mini	510-1033-332
C 111	820 pF ±5% 50V NPO submin	510-3113-821
C 112	.047 µF ±5% 63V poly mini	510-1033-473
C 113	.22 µF ±5% 63V poly mini	510-1033-224
C 114	.047 µF ±5% 63V poly mini	510-1033-473
C 115	.033 µF ±5% 63V poly mini	510-1033-333
C 116	.15 µF ±5% 63V poly mini	510-1033-154
C 117	.047 µF ±5% 63V poly mini	510-1033-473
C 118	.047 µF ±5% 63V poly mini	510-1033-473
C 119	.1 µF 10V Y5U ceram disc	510-3208-104
C 120	.01 µF ±10% 250V flatfoil	510-1203-103
C 121	10 µF 25V aluminum	510-4006-002
C 122	.01 µF ±20% 16V Y5S disc	510-3210-103
C 123	10 µF 25V radial aluminum	510-4125-100
C 125	10 µF 25V radial aluminum	510-4125-100
C 126	.0033 µF ±5% 63V poly mini	510-1033-332
C 127	.047 µF ±20% 16V Y5S disc	510-3210-473
C 128	220 µF 16V aluminum	510-4006-004
C 129	100 pF ±5% 50V NPO submin	510-3113-101
C 130	100 pF ±5% 50V NPO submin	510-3113-101
C 131	100 pF ±5% 50V NPO submin	510-3113-101
C 132	1000 pF ±5% 50V NPO subm	510-3113-102
C 133	.01 µF ±20% 16V Y5S disc	510-3210-103
C 134	.1 µF 10V Y5U ceram disc	510-3208-104
C 135	11 pF ±5% 50V NPO submin	510-3113-110
C 136	.01 µF ±10% 250V flatfoil	510-1203-103
C 137	11 pF ±5% 50V NPO submin	510-3113-110
C 138	.1 µF 10V Y5U ceram disc	510-3208-104
C 139	11 pF ±5% 50V NPO submin	510-3113-110
C 140	11 pF ±5% 50V NPO submin	510-3113-110
C 141	.1 µF 10V Y5U ceram disc	510-3208-104
C 142	.01 µF ±20% 16V Y5S disc	510-3210-103
C 143	.01 µF ±20% 16V Y5S disc	510-3210-103
C 144	.1 µF ±10% 250V flatfoil	510-1203-104
C 145	.1 µF ±10% 250V flatfoil	510-1203-104
C 146	1 µF ±20% 35V dip prep	510-2245-109
C 147	1 µF ±20% 35V dip prep	510-2245-109
C 148	.1 µF 10V Y5U ceram disc	510-3208-104
C 149	.01 µF ±20% 16V Y5S disc	510-3210-103
C 150	470 pF ±5% 50V NPO submin	510-3113-471
C 152	.33 pF ±5% 500V comp	510-9502-338
C 153	.33 pF ±5% 500V comp	510-9502-338
C 154	100 µF 10V aluminum	510-4003-005
C 155	.33 pF ±5% 500V comp	510-9502-338
C 156	.01 µF ±20% 16V Y5S disc	510-3210-103
C 157	100 pF ±20% 50V Y5U disc	510-3202-101
C 158	100 pF ±20% 50V Y5U disc	510-3202-101
C 159	.33 µF ±5% 63V poly mini	510-1033-334
C 160	1.8 pF ±5% 50V NPO disc	510-3213-189
C 170	.1 µF ±20% 16V Y5S disc	510-3210-104
C 190	33 pF ±5% 50V N150 disc	510-3216-330
C 191	.01 µF ±20% 16V Y5S disc	510-3210-103
C 192	.1 µF ±20% 25V Z5U axial	510-3546-104
C 193	1 µF ±10% 35V submin	510-2575-109
CR001	Pin diode MPN3404	523-1000-022
CR002	Pin diode MPN3404	523-1000-022
CR003	Voltage variable cap diode	523-0009-081
CR004	Si diode 1N4448	523-1500-883
CR005	Hot carrier diode 1N5711	523-1500-014
CR006	Hot carrier diode 1N5711	523-1500-014
CR008	5.1V ±5% 1W zener	523-2503-519
CR009	Si diode 1N4448	523-1500-883
CR010	Si diode 1N4448	523-1500-883
CR011	Si diode 1N4448	523-1500-883
CR012	Si diode 1N4448	523-1500-883
CR013	Si diode 1N4448	523-1500-883
CR014	Si diode 1N4448	523-1500-883
CR015	Si diode 1N4448	523-1500-883
CR016	Si diode 1N4448	523-1500-883
CR017	Si diode 1N4448	523-1500-883
CR018	Si diode 1N4448	523-1500-883
CR019	Si diode 1N4448	523-1500-883
CR020	Si diode 1N4448	523-1500-883
CR021	Si diode 1N448	523-1500-883

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
CH602	Top/bottom covers	017-2197-041
EP001	4-chnl board shield	017-2089-001
EP001	Helical coil form	013-1627-101
EP002	Crystal pin insulator	018-1080-008
EP003	Insulator washer TO-72	574-5005-009
EP004	3/8" coil shield	578-0002-001
EP010	1/8" heat shrink tubing	042-0241-553
EP011	0.055 ID x 0.015 Teflon tubing	058-0053-515
EP012	0.055 ID x 0.015 Teflon tubing	058-0053-515
HW001	Tension lock nut CPS	560-1810-022
HW002	Socket	515-5006-002
HW003	4-40 x 0.25 panhd phil taptite	575-0604-008
HW004	10-32 hex set screw NPB	575-9059-028
HW005	10-32 hex set screw NPB	575-9059-032
HW009	10-32 hex set screw NPB	575-9059-024
HW010	4-40 panhead slot nylon screw	575-4504-008
HW011	Eyelet	031-0511-004
HW001	6-32 panhead taptite 1/4"	575-0606-008
HW002	4-40 x 0.375 panhead phil	575-0604-012
HW003	1/4 x 0.025 int lockwshr NPB	596-2114-013
HW004	1/4-32 x 0.094 hex nut NPB	560-9043-012
HW005	4-40 x 0.063 nut NPB	560-2104-006
HW006	4 x 0.015 int lockwshr NPB	596-2104-008
HW007	4-40 panhead phil screw NPB	575-2604-016
HW008	Grill cloth	018-1111-001
HW009	Eyelet	031-0511-004
HW011	8-32 panhead phil screw CPS	575-0608-012
HW012	8-32 flathd taptite phil BZPS	575-6208-010
HW013	10 x 0.032 int lockwshr NPB	596-2110-012
HW014	10-32 x 0.375 nut CPS	560-1110-012
HW015	4 x 0.032 fiber insul washer	596-4404-009
J 002	BNC panel mount connector	515-3006-004
J 003	BNC panel mount connector	515-3006-004
J 005	3.6 mm jack enclosed	515-2001-011
L 001	3.5T coil 26 AWG	542-0001-035
L 002	5.5T coil 26 AWG	542-0001-055
L 003	3.5T coil 26 AWG	542-0001-035
L 004	3.5T coil 26 AWG	542-0001-035
L 005	3.5T coil 26 AWG	542-0001-035
L 006	Helical coil	016-2186-201
L 007	2.25T helical coil	016-2186-205
L 008	2.25T helical coil	016-2186-205
L 009	2.25T helical coil	016-2186-205
L 010	2.25T helical coil	016-2186-205
L 011	Coil	016-2186-202
L 012	0.66-1.2 µH variable inductor	542-1013-001
L 013	0.66-1.2 µH variable inductor	542-1013-001
L 014	0.66-1.2 µH variable inductor	542-1013-001
L 015	20 µH RF choke	542-4503-200
L 016	0.22-0.37 µH vari inductor vio	542-1006-117
L 019	1 µH RF choke	542-4503-109
L 020	0.22-0.37 µH vari inductor vio	542-1006-117
L 021	0.22-0.37 µH vari inductor vio	542-1006-117
L 022	RF coil Valox space wnd red	542-1012-112
L 023	RF coil Valox space wnd vio	542-1012-113
L 024	Helical coil	016-2186-212
L 025	Helical coil	016-2186-211
L 026	Helical coil	016-2186-204
L 027	Helical coil	016-2186-203
L 028	4.5T coil 22 AWG	542-0010-045
LS001	2" 8 ohm Mylar speaker	589-1012-007
MP001	Casting	015-0881-501
MP002	Crystal can	508-5100-004
MP001	Speaker mounting bracket	017-2197-061
MP002	Volume knob	547-0017-060
MP003	Mixer shield	017-2197-111
MP004	Top shield	017-2197-121
MP005	Bottom shield	017-2197-131
MP006	Cover shield	017-2197-141
MP007	Mixer cover shield	017-2197-116
MP008	1/4 turn bail type fastener	537-4001-101
MP009	Retainer for MP008	537-4002-001
MP010	Flexible grommet	574-0001-025
MP011	Drawer front	014-0783-021
MP012	Drawer handle	017-2139-202
MP013	Drawer rear panel	014-0783-031
MP014	Drawer left rail	017-2197-031
MP015	Guide pin	013-1627-001
MP016	Drawer right rail	017-2197-032
MP017	Drawer side member	014-0783-041
MP050	Plastic wear washer, black	574-9019-050
NP001	Receiver label	559-3059-003
NP002	800 MHz Receiver label	559-9001-260
PC001	PC board	035-0462-501

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
Q 001	1 GHz low noise	576-0003-052
Q 002	J-FET low noise RF TO-92	576-0006-014
Q 003	J-FET low noise RF TO-92	576-0006-009
Q 004	Si NPN FM osc/mul TO-92	576-0003-002
Q 005	Si NPN FM osc/mul TO-92	576-0003-002
Q 006	Si NPN FM osc/mul TO-92	576-0003-002
Q 007	Si PNP UHF high gain	576-0003-037
Q 008	Si PNP UHF high gain	576-0003-037
Q 009	Si NPN gen purp TO-92	576-0003-053
R 001	2.2k ohm ±5% 1/4W CF	569-0513-222
R 002	2.2k ohm ±5% 1/4W CF	569-0513-222
R 003	2.2k ohm ±5% 1/4W CF	569-0513-222
R 004	1.8k ohm ±5% 1/4W CF	569-0513-182
R 005	3.3k ohm ±5% 1/4W CF	569-0513-332
R 006	470 ohm ±5% 1/4W CF	569-0513-471
R 007	10k ohm ±5% 1/4W CF	569-0513-103
R 008	10 ohm ±5% 1/4W CF	569-0513-100
R 009	100k ohm ±5% 1/4W CF	569-0513-104
R 010	100 ohm ±5% 1/4W CF	569-0513-101
R 011	10k ohm ±5% 1/4W CF	569-0513-103
R 012	2.7k ohm ±5% 1/4W CF	569-0513-272
R 013	10k ohm ±5% 1/4W CF	569-0513-103
R 014	10 ohm ±5% 1/4W CF	569-0513-100
R 016	6.8k ohm ±5% 1/4W CF	569-0513-682
R 017	3.9k ohm ±5% 1/4W CF	569-0513-392
R 018	33k ohm ±5% 1/4W CF	569-0513-333
R 019	2.2k ohm ±5% 1/4W CF	569-0513-222
R 020	4.7k ohm ±5% 1/4W CF	569-0513-472
R 021	33 ohm ±5% 1/4W CF	569-0513-330
R 022	3.3k ohm ±5% 1/4W CF	569-0513-332
R 023	330 ohm ±5% 1/4W CF	569-0513-331
R 024	2.2k ohm ±5% 1/4W CF	569-0513-222
R 027	10k ohm ±5% 1/4W CF	569-0513-103
R 028	390 ohm ±5% 1/4W CF	569-0513-391
R 029	100k ohm ±5% 1/4W CF	569-0513-104
R 030	47k ohm ±5% 1/4W CF	569-0513-473
R 031	27k ohm ±5% 1/4W CF	569-0513-273
R 032	470 ohm ±5% 1/4W CF	569-0513-471
R 033	47 ohm ±5% 1/4W CF	569-0513-470
R 034	47k ohm ±5% 1/4W CF	569-0513-473
R 035	10k ohm ±5% 1/4W CF	569-0513-103
R 036	470 ohm ±5% 1/4W CF	569-0513-471
R 037	10k ohm ±5% 1/4W CF	569-0513-103
R 038	47 ohm ±5% 1/4W CF	569-0513-470
R 039	47k ohm ±5% 1/4W CF	569-0513-473
R 040	10k ohm ±5% 1/4W CF	569-0513-103
R 041	220 ohm ±5% 1/4W CF	569-0513-221
R 042	10 ohm ±5% 1/4W CF	569-0513-100
R 043	47 ohm ±5% 1/4W CF	569-0513-470
R 044	10k ohm ±5% 1/4W CF	569-0513-103
R 045	47k ohm ±5% 1/4W CF	569-0513-473
R 046	10k ohm ±5% 1/4W CF	569-0513-103
R 047	220 ohm ±5% 1/4W CF	569-0513-221
R 048	270 ohm ±5% 1/4W CF	569-0513-271
R 049	47 ohm ±5% 1/4W CF	569-0513-470
R 050	10k ohm ±5% 1/4W CF	569-0513-103
R 051	47k ohm ±5% 1/4W CF	569-0513-473
R 052	220 ohm ±5% 1/4W CF	569-0513-221
R 053	10k ohm ±5% 1/4W CF	569-0513-103
R 054	12k ohm ±5% 1/4W CF	569-0513-123
R 055	10k ohm ±5% 1/4W CF	569-0513-103
R 057	180 ohm ±10% 1/2W CC	569-1504-181
R 058	100k ohm ±5% 1/4W CF	569-0513-104
R 059	1k ohm ±5% 1/4W CF	569-0513-102
R 060	4.7k ohm ±5% 1/4W CF	569-0513-472
R 061	4.7k ohm ±5% 1/4W CF	569-0513-472
R 062	10k ohm ±5% 1/4W CF	569-0513-103
R 063	100k ohm ±5% 1/4W CF	569-0513-104
R 064	10k ohm ±5% 1/4W CF	569-0513-103
R 065	100k ohm ±5% 1/4W CF	569-0513-104
R 066	10k ohm ±5% 1/4W CF	569-0513-103
R 067	10k ohm ±5% 1/4W CF	569-0513-103
R 068	47k ohm ±5% 1/4W CF	569-0513-473
R 069	47k ohm ±5% 1/4W CF	569-0513-473
R 070	22k ohm ±5% 1/4W CF	569-0513-223
R 071	10k ohm ±5% 1/4W CF	569-0513-103
R 072	100 ohm ±5% 1/4W CF	569-0513-101
R 073	1M ohm ±5% 1/4W CF	569-0513-105
R 074	100 ohm ±5% 1/4W CF	569-0513-101
R 075	1M ohm ±5% 1/4W CF	569-0513-105
R 076	10k ohm ±5% 1/4W CF	569-0513-103
R 077	120k ohm ±5% 1/4W CF	569-0513-124
R 077	100k ohm ±5% 1/4W CF	569-0513-104
R 079	10k ohm ±5% 1/4W CF	569-0513-103
R 080	10k ohm ±5% 1/4W CF	569-0513-103
R 081	10k ohm volume pot	562-0016-005
R 082	18 ohm ±5% 1/4W CF	569-0513-180
R 083	39 ohm ±5% 1/4W CF	569-0513-390
R 084	150k ohm ±5% 1/4W CF	569-0513-154
R 085	18k ohm ±5% 1/4W CF	569-0513-183
R 086	5.1k ohm ±5% 1/4W CF	569-0513-512
R 087	200k ohm trimmer single turn	562-0112-204
R 088	10k ohm ±5% 1/4W CF	569-0513-103

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
R 089	10k ohm ±5% 1/4W CF	569-0513-103
R 090	47k ohm ±5% 1/4W CF	569-0513-473
R 091	47k ohm ±5% 1/4W CF	569-0513-473
R 092	100k ohm ±5% 1/4W CF	569-0513-104
R 093	100k ohm ±5% 1/4W CF	569-0513-104
R 094	68k ohm ±5% 1/4W CF	569-0513-683
R 095	10k ohm ±5% 1/4W CF	569-0513-103
R 096	10k ohm ±5% 1/4W CF	569-0513-103
R 097	4.7k ohm ±5% 1/4W CF	569-0513-472
R 098	12k ohm ±5% 1/4W CF	569-0513-123
R 099	10k ohm ±5% 1/4W CF	569-0513-103
R 100	10k ohm ±5% 1/4W CF	569-0513-103
R 101	47k ohm ±5% 1/4W CF	569-0513-473
R 102	47k ohm ±5% 1/4W CF	569-0513-473
R 103	330k ohm ±5% 1/4W CF	569-0513-334
R 104	1M ohm ±5% 1/4W CF	569-0513-105
R 105	100k ohm ±5% 1/4W CF	569-0513-104
R 106	100k ohm ±5% 1/4W CF	569-0513-104
R 107	2.2k ohm ±5% 1/4W CF	569-0513-222
R 108	470k ohm ±5% 1/4W CF	569-0513-474
R 109	2.2k ohm ±5% 1/4W CF	569-0513-222
R 110	6.8k ohm ±5% 1/4W CF	569-0513-682
R 111	22k ohm ±5% 1/4W CF	569-0513-223
R 115	1k ohm ±5% 1206 SMD	569-0115-102
R 116	390 ohm ±5% 1206 SMD	569-0115-391
R 117	51 ohm ±5% 1206 SMD	569-0115-510
R 190	2.7 ohm ±5% 1/4W CF	569-0513-279
R 191	Zero ohm resistor	569-0500-001
R 192	10 ohm ±5% 1/4W CF	569-0513-100
R 193	Zero ohm resistor	569-0500-001
R 194	20k ohm ±5% 1/4W CF	569-0513-203
R 195	100k ohm ±5% 1/4W CF	569-0513-104
RT001	Thermistor	569-3001-001
S 001	DP3T slide switch	583-3001-023
T 001	10 mm 10.7 MHz IF xformer	592-5013-012
T 002	10 mm 10.7 MHz IF xformer	592-5013-012
T 003	10 mm 10.7 MHz IF xformer	592-5013-012
T 004	10 mm 10.7 MHz IF xformer	592-5013-012
T 005	7.16 MHz ph mod xformer PC	592-5009-022
TP001	Red tip jack	105-2202-211
TP002	Red tip jack	105-2202-211
TP003	Red tip jack	105-2202-211
TP004	Red tip jack	105-2202-211
TP005	Red tip jack	105-2202-211
TP006	Red tip jack	105-2202-211
U 001	Linear amplifier CA3012	544-2002-003
U 002	FM IF system	544-2002-007
U 003	Dual 4-bit binary counter	544-3532-393
U 004	Phase comp/count 4568B	544-3014-568
U 005	Dual monostable multivibrator	544-3014-528
U 006	Quad op amp 3303	544-2020-003
U 007	Quad analog switch	544-3014-066
U 008	Quad op amp 3303	544-2020-003
U 009	Quad op amp 3303	544-2020-003
U 010	Dual D flip-flop	544-3014-013
U 011	8-pin audio amp TBA820M	544-2006-003
U 012	9V regulator ±5% TO-92	544-2003-014
W 001	Coaxial cable RG-188A/U	597-3002-003
W 002	Coaxial cable RG-188A/U	597-3002-003
W 103	Rx coax cable assembly	597-3003-274
W 999	Coaxial cable RG-188A/U	597-3002-003
X 001	Crystal socket	126-0110-014
Y 002	Second local oscillator crystal	520-0055-700
Z 001	45 MHz 4-pole filter	532-0009-001
Z 002	10.7 MHz 4-pole crystal filter	532-0006-003
Z 003	10.7 MHz 4-pole crystal filter	532-0006-003
Z 004	10.7 MHz 4-pole crystal filter	532-0006-003
Z 005	10.7 MHz 2-pole crystal disc	532-0010-001
Z 006	10.7 MHz 4-pole crystal filter	532-0006-003

900 MHz RECEIVER DECODER MODULE
PART NO. 023-3039-590

A 110	Synthesizer shield	023-8900-110
A 201	900 MHz synthesizer	023-8900-201
A 321	RDM revert harness	023-3039-321
A 581	RDM assembly	023-3039-581
A 585	Rear connector	023-3039-585
A 587	Drawer	023-3039-587
A 593	900 MHz receiver	023-3039-593
A 599	Receive In cable long/ref osc	023-3039-599

RDM 8900 RECEIVER
PART NO. 023-3039-593

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
A 002	Synthesizer RF cable short	023-8900-371
A 003	Synthesizer RF cable long	023-8900-372
A 004	Receive in cable short	023-3039-598
A 005	Receive in cable long/RF osc	023-3039-599
A 584	RDM Receiver harness	023-3039-584
C 001	9.1 pF ±5% NPO 50V submin	510-3113-919
C 002	3.6 pF ±5% NPO 50V submin	510-3113-369
C 003	9.1 pF ±5% NPO 50V submin	510-3113-919
C 004	3.6 pF ±5% NPO 50V submin	510-3113-369
C 005	9.1 pF ±5% NPO 50V submin	510-3113-919
C 006	9.1 pF ±5% NPO 50V submin	510-3113-919
C 007	9.1 pF ±5% NPO 50V submin	510-3113-919
C 008	9.1 pF ±5% NPO 50V submin	510-3113-919
C 009	9.1 pF ±5% NPO 50V submin	510-3113-919
C 010	9.1 pF ±5% NPO 50V submin	510-3113-919
C 011	3.3 pF ±5% NPO 50V submin	510-3113-339
C 012	9.1 pF ±5% NPO 50V submin	510-3113-919
C 014	.0022 µF ±20% Y5U disc	510-3204-222
C 015	12 pF ±5% NPO 50V submin	510-3113-120
C 017	9.1 pF ±5% NPO 50V submin	510-3113-919
C 018	1.5 pF ±5% 50V NPO disc	510-3213-159
C 019	.0022 µF ±20% Y5U disc	510-3204-222
C 021	56 pF ±5% NPO 1206 chip	510-3602-560
C 024	56 pF ±5% NPO 1206 chip	510-3602-560
C 025	15 pF ±5% 50V NPO disc	510-3213-150
C 026	7.5 pF ±5% 50V NPO disc	510-3213-759
C 027	.01 µF ±20% 16V Y5U disc	510-3210-103
C 028	2 pF ±5% 50V NPO disc	510-3213-209
C 029	.01 µF ±20% 16V Y5U disc	510-3210-103
C 030	20 pF ±5% 50V N150 disc	510-3216-200
C 031	.1 µF ±20% 16V Y5U disc	510-3210-104
C 033	4.7 pF ±5% 50V NPO disc	510-3213-479
C 034	.01 µF ±20% 16V Y5U disc	510-3210-103
C 035	.0022 µF ±20% Y5U disc	510-3204-222
C 036	47 pF ±5% 50V N150 disc	510-3216-470
C 037	.01 µF ±20% 16V Y5U disc	510-3210-103
C 038	.1 µF ±20% 16V Y5U disc	510-3210-104
C 039	82 pF ±5% 50V N150 disc	510-3216-820
C 040	.01 µF ±20% 16V Y5U disc	510-3210-103
C 041	.0022 µF ±20% Y5U disc	510-3204-222
C 042	.01 µF ±20% 16V Y5U disc	510-3210-103
C 043	.01 µF ±20% 16V Y5U disc	510-3210-103
C 044	.01 µF ±20% 16V Y5U disc	510-3210-103
C 045	12 pF ±5% 50V N150 disc	510-3216-120
C 046	.1 µF ±20% 16V Y5U disc	510-3210-104
C 047	.01 µF ±20% 16V Y5U disc	510-3210-103
C 048	2.7 pF ±5% 50V NPO disc	510-3213-279
C 049	.01 µF ±20% 16V Y5U disc	510-3210-103
C 050	91 pF ±5% NPO 50V submin	510-3113-910
C 051	300 pF ±5% NPO 50V submin	510-3113-301
C 052	75 pF ±5% NPO 50V submin	510-3113-750
C 053	4.7 pF ±5% 500V comp	510-9502-479
C 054	1.5 pF ±5% NPO 50V submin	510-3113-159
	2 pF ±5% NPO 50V submin	510-3113-209
	2.7 pF ±5% NPO 50V submin	510-3113-279
	3.3 pF ±5% NPO 50V submin	510-3113-339
	3.9 pF ±5% NPO 50V submin	510-3113-399
	4.7 pF ±5% NPO 50V submin	510-3113-479
	5.1 pF ±5% NPO 50V submin	510-3113-519
	5.6 pF ±5% NPO 50V submin	510-3113-569
	6.2 pF ±5% NPO 50V submin	510-3113-629
	6.8 pF ±5% NPO 50V submin	510-3113-689
	7.5 pF ±5% NPO 50V submin	510-3113-759
	8.2 pF ±5% NPO 50V submin	510-3113-829
	9.1 pF ±5% NPO 50V submin	510-3113-919
	10 pF ±5% NPO 50V submin	510-3113-100
	11 pF ±5% NPO 50V submin	510-3113-110
	12 pF ±5% NPO 50V submin	510-3113-120
C 055	3.5-20 pF vertical mon	512-1010-002
C 056	43 pF ±5% NPO 50V submin	510-3113-430
C 057	.0022 µF ±20% Y5U disc	510-3204-222
C 058	75 pF ±5% NPO 50V submin	510-3113-750
C 059	5.6 pF ±5% 500V comp	510-9502-569
C 060	100 pF ±20% 50V Y5U disc	510-3202-101
C 061	.001 µF ±20% Y5U disc	510-3204-102
C 062	.01 µF ±20% 16V Y5U disc	510-3210-103
C 063	68 pF ±5% 50V N150 disc	510-3216-680
C 064	68 pF ±5% 50V N150 disc	510-3216-680
C 065	4.7 pF ±10% NPO axial cerm	510-3514-479
C 066	.01 µF ±20% 16V Y5U disc	510-3210-103
C 070	.001 µF ±20% Y5U disc	510-3204-102
C 071	22 pF ±5% 50V N150 disc	510-3216-220
C 072	22 pF ±5% 50V N150 disc	510-3216-220
C 073	.001 µF ±20% Y5U disc	510-3204-102
C 077	10 pF ±5% NPO 50V submin	510-3113-100
C 078	.01 µF ±20% 16V Y5U disc	510-3210-103
C 079	12 pF ±5% 50V N150 disc	510-3216-120
C 080	470 pF ±20% 1kV Y5F ceram	510-3260-471
C 081	12 pF ±5% 50V N150 disc	510-3216-120
C 082	470 pF ±20% 1kV Y5F ceram	510-3260-471

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
C 083	39 pF ±5% 50V N750 disc	510-3220-390
C 084	62 pF ±5% 50V N750 disc	510-3220-620
C 085	2 pF ±5% 500V comp	510-9502-209
C 086	11 pF ±5% 50V NPO disc	510-3213-110
C 087	.001 µF ±20% Y5U disc	510-3204-102
C 088	.01 µF ±20% 16V Y5U disc	510-3210-103
C 089	100 pF ±20% Y5U disc	510-3202-101
C 090	10 pF ±5% NPO 50V submin	510-3113-100
C 091	3 pF ±5% NPO 50V submin	510-3113-309
C 092	39 pF ±5% NPO 50V submin	510-3113-390
C 093	10 pF ±5% NPO 50V submin	510-3113-100
C 094	.001 µF ±20% Y5U disc	510-3204-102
C 095	.68 µF ±5% 50V NPO disc	510-3113-688
C 096	2 pF ±5% 50V NPO disc	510-3213-209
C 097	100 pF ±20% Y5U disc	510-3202-101
C 098	6.8 µF ±20% 35V dip prep	510-2245-689
C 099	100 µF 25V electrolytic radial	510-4425-101
C 100	.33 pF µ% 500V comp	510-9502-338
C 101	470 µF 16V radial low temp	510-4216-471
C 102	1 µF ±10% 35V submin	510-2575-109
C 103	.1 µF 10V Y5U ceramic disc	510-3208-104
C 104	10 µF 35V radial low temp	510-4235-100
C 105	.01 µF ±20% 16V Y5U disc	510-3210-103
C 109	.1 µF ±10% polyester	510-1039-104
C 110	.0033 µF ±5% 63V poly mini	510-1033-332
C 111	220 pF ±5% NPO 50V submin	510-3113-221
C 111	.047 µF ±5% 63V poly mini	510-1033-473
C 113	.47 µF ±5% 63V poly mini	510-1033-474
C 114	.047 µF ±5% 63V poly mini	510-1033-473
C 115	.033 µF ±5% 63V poly mini	510-1033-333
C 116	.15 µF ±5% 63V poly mini	510-1033-154
C 117	.047 µF ±5% 63V poly mini	510-1033-473
C 118	.047 µF ±5% 63V poly mini	510-1033-473
C 119	.1 µF 10V Y5U ceramic disc	510-3208-104
C 120	.01 µF ±10% polyester	510-1039-103
C 121	10 µF 25V aluminum	510-4006-002
C 122	.1 µF ±20% 16V Y5U disc	510-3210-104
C 123	33 pF ±5% 50V N150 disc	510-3216-330
C 124	10 µF 35V radial low temp	510-4235-100
C 125	10 µF 35V radial low temp	510-4235-100
C 126	.0033 µF ±5% 63V poly mini	510-1033-332
C 127	.047 µF ±20% 16V Y5U disc	510-3210-473
C 128	220 µF 16V aluminum	510-4006-004
C 129	100 pF ±5% NPO 50V submin	510-3113-101
C 130	100 pF ±5% NPO 50V submin	510-3113-101
C 131	100 pF ±5% NPO 50V submin	510-3113-101
C 132	1800 pF ±5% NPO 50V subm	510-3113-182
C 133	.01 µF ±20% 16V Y5U disc	510-3210-103
C 134	.1 µF 10V Y5U ceramic disc	510-3208-104
C 135	9.1 pF ±5% NPO 50V submin	510-3113-919
C 136	.01 µF ±10% polyester	510-1039-103
C 137	10 pF ±5% NPO 50V submin	510-3113-100
C 138	.1 µF 10V Y5U ceramic disc	510-3208-104
C 139	9.1 pF ±5% NPO 50V submin	510-3113-919
C 140	9.1 pF ±5% NPO 50V submin	510-3113-919
C 141	.1 µF 10V Y5U ceramic disc	510-3208-104
C 142	.01 µF ±20% 16V Y5U disc	510-3210-103
C 143	.01 µF ±20% 16V Y5U disc	510-3210-103
C 144	.1 µF ±10% polyester	510-1039-104
C 145	.1 µF ±10% polyester	510-1039-104
C 146	1 µF ±10% 35V submin	510-2575-109
C 147	1 µF ±10% 35V submin	510-2575-109
C 148	.1 µF 10V Y5U ceramic disc	510-3208-104
C 149	.01 µF ±20% 16V Y5U disc	510-3210-103
C 150	470 pF ±5% NPO 50V submin	510-3113-471
C 151	.01 µF ±20% 16V Y5U disc	510-3210-103
C 154	100 µF 25V electrolytic radial	510-4425-101
C 157	100 pF ±5% NPO 50V submin	510-3113-101
C 158	100 pF ±5% NPO 50V submin	510-3113-101
CR001	Pin diode MPN3404	523-1000-022
CR002	Pin diode MPN3404	523-1000-022
CR003	Hot carrier diode 1N5711	523-1500-014
CR004	Hot carrier diode 1N5711	523-1500-014
CR005	Si diode 1N4448	523-1500-883
CR006	Si diode 1N4448	523-1500-883
CR007	Si diode 1N4448	523-1500-883
CR008	Si diode 1N4448	523-1500-883
CR009	Si diode 1N4448	523-1500-883
CR010	Si diode 1N4448	523-1500-883
CR011	Si diode 1N4448	523-1500-883
CR012	Si diode 1N4448	523-1500-883
CR013	Si diode 1N4448	523-1500-883
CR014	Si diode 1N4448	523-1500-883
CR015	Si diode 1N4448	523-1500-883
EP002	Crystal pin insulator	018-1080-008
EP003	Insulator washer TO-72	574-5005-009
EP004	3/8" coil shield	578-0002-001
EP005	Crystal pin insulator 2-hole	018-1080-001
EP006	0.03 Teflon tubing	058-0053-510
EP007	Helical coil form	013-1627-101
F 001	2A subminiature fuse	534-0009-020

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
HW001	Tension lock nut CPS	560-1810-022
HW002	Rubber grommet 0.118 ID	574-0002-003
HW003	4-40 panhead philips screw	575-0604-010
HW004	10-32 hex set screw NPB	575-9059-028
HW004	10-32 hex set screw NPB	575-9059-032
HW007	10-lead IC spacer	574-5002-001
HW009	10-32 hex set screw NPB	575-9059-024
HW010	4-40 panhead slot nylon scr	575-4504-008
HW011	Eyelet	031-0511-004
L 001	3.5T coil 26 AWG	542-0001-035
L 002	5.5T coil 26 AWG	542-0001-055
L 003	2.5T coil 26 AWG	542-0001-025
L 004	2.5T coil 26 AWG	542-0001-025
L 005	2.5T coil 26 AWG	542-0001-025
L 006	Helical coil	016-2186-204
L 007	2 1/8T helical coil	016-2186-206
L 008	2 1/8T helical coil	016-2186-206
L 009	2 1/8T helical coil	016-2186-206
L 010	2 1/8T helical coil	016-2186-206
L 011	Helical coil	016-2186-204
L 012	0.66-1.2 µH variable inductor	542-1013-001
L 013	0.66-1.2 µH variable inductor	542-1013-001
L 014	0.66-1.2 µH variable inductor	542-1013-001
L 015	20 µH RF choke	542-4503-200
L 016	12.5T coil 26 AWG	542-0001-125
L 017	12.5T coil 26 AWG	542-0001-125
L 018	RF coil red Valox space wnd	542-1012-112
L 019	RF coil vio Valox space wnd	542-1012-113
L 020	Helical coil	016-2186-212
L 021	Helical coil	016-2186-211
L 022	Helical coil	016-2186-204
L 023	Helical coil	016-2186-203
L 024	1.5T coil 26 AWG	542-0001-015
L 025	0.22-0.37 µH var ind vio	542-1006-117
L 026	7.5T coil 26 AWG	542-0001-075
L 027	10.5T coil 26 AWG	542-0001-105
L 028	3.6 µH RF choke	542-4503-369
MP001	Casting	015-0881-501
MP002	Spacer	312-0012-083
MP003	Helical coil form	013-1627-102
PC001	PC board	035-8900-100
Q 001	1 GHz low noise	576-0003-052
Q 002	Si NPN VHF/UHF amp/osc	576-0003-051
Q 003	J-FET low noise RF TO-92	576-0006-009
Q 004	Si NPN VHF/UHF amp/osc	576-0003-051
Q 005	Si NPN VHF/UHF amp/osc	576-0003-051
Q 006	Si PNP UHF high gain	576-0003-037
Q 007	Si PNP UHF high gain	576-0003-037
Q 008	Si NPN VHF/UHF amp/osc	576-0003-051
R 001	2.2k ohm ±5% 1/4W CF	569-0513-222
R 002	2.2k ohm ±5% 1/4W CF	569-0513-222
R 003	2.2k ohm ±5% 1/4W CF	569-0513-222
R 004	1.8k ohm ±5% 1/4W CF	569-0513-182
R 005	4.7k ohm ±5% 1/4W CF	569-0513-472
R 006	430 ohm ±5% 1/4W CF	569-0513-431
R 007	27k ohm ±5% 1/4W CF	569-0513-273
R 008	10 ohm ±5% 1/4W CF	569-0513-100
R 009	100k ohm ±5% 1/4W CF	569-0513-104
R 010	100 ohm ±5% 1/4W CF	569-0513-101
R 011	10k ohm ±5% 1/4W CF	569-0513-103
R 012	2.7k ohm ±5% 1/4W CF	569-0513-272
R 013	5.6k ohm ±5% 1/4W CF	569-0513-562
R 014	10 ohm ±5% 1/4W CF	569-0513-100
R 015	10 ohm ±5% 1/4W CF	569-0513-100
R 016	6.8k ohm ±5% 1/4W CF	569-0513-682
R 017	3.9k ohm ±5% 1/4W CF	569-0513-392
R 018	33k ohm ±5% 1/4W CF	569-0513-333
R 019	2.2k ohm ±5% 1/4W CF	569-0513-222
R 020	4.7k ohm ±5% 1/4W CF	569-0513-472
R 021	33 ohm ±5% 1/4W CF	569-0513-330
R 022	3.3k ohm ±5% 1/4W CF	569-0513-332
R 023	330 ohm ±5% 1/4W CF	569-0513-331
R 024	2.2k ohm ±5% 1/4W CF	569-0513-222
R 025	390 ohm ±5% 1/4W CF	569-0513-391
R 026	1k ohm ±5% 1/4W CF	569-0513-102
R 027	12k ohm ±5% 1/4W CF	569-0513-123
R 028	12k ohm ±5% 1/4W CF	569-0513-123
R 029	2.7k ohm ±5% 1/4W CF	569-0513-272
R 030	10k ohm ±5% 1/4W CF	569-0513-103
R 031	51 ohm ±5% 1/4W CF	569-0513-510
R 032	47k ohm ±5% 1/4W CF	569-0513-473
R 033	10k ohm ±5% 1/4W CF	569-0513-103
R 034	47k ohm ±5% 1/4W CF	569-0513-473
R 035	10k ohm ±5% 1/4W CF	569-0513-103
R 036	470 ohm ±5% 1/4W CF	569-0513-471
R 037	470 ohm ±5% 1/4W CF	569-0513-471
R 038	47 ohm ±5% 1/4W CF	569-0513-470
R 039	47k ohm ±5% 1/4W CF	569-0513-473
R 040	10k ohm ±5% 1/4W CF	569-0513-103

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
R 041	220 ohm ±5% 1/4W CF	569-0513-221
R 042	10 ohm ±5% 1/4W CF	569-0513-100
R 043	47 ohm ±5% 1/4W CF	569-0513-470
R 044	10k ohm ±5% 1/4W CF	569-0513-103
R 045	47k ohm ±5% 1/4W CF	569-0513-473
R 046	10k ohm ±5% 1/4W CF	569-0513-103
R 047	220 ohm ±5% 1/4W CF	569-0513-221
R 048	270 ohm ±5% 1/4W CF	569-0513-271
R 049	47 ohm ±5% 1/4W CF	569-0513-470
R 050	10k ohm ±5% 1/4W CF	569-0513-103
R 051	47k ohm ±5% 1/4W CF	569-0513-473
R 052	220 ohm ±5% 1/4W CF	569-0513-221
R 053	10k ohm ±5% 1/4W CF	569-0513-103
R 054	12k ohm ±5% 1/4W CF	569-0513-123
R 055	10k ohm ±5% 1/4W CF	569-0513-103
R 056	47 ohm ±5% 1/4W CF	569-0513-470
R 057	10k ohm ±5% 1/4W CF	569-0513-103
R 058	18 ohm ±5% 1/4W CF	569-0513-180
R 059	10 ohm ±5% 1/4W CF	569-0513-100
R 060	2.7 ohm ±5% 1/4W CF	569-0513-279
R 061	470 ohm ±5% 1/4W CF	569-0513-471
R 067	10 ohm ±5% 1/4W CF	569-0513-100
R 068	56k ohm ±5% 1/4W CF	569-0513-563
R 069	56k ohm ±5% 1/4W CF	569-0513-563
R 070	20k ohm ±5% 1/4W CF	569-0513-203
R 071	10k ohm ±5% 1/4W CF	569-0513-103
R 072	100 ohm ±5% 1/4W CF	569-0513-101
R 073	1M ohm ±5% 1/4W CF	569-0513-105
R 074	100 ohm ±5% 1/4W CF	569-0513-101
R 075	1M ohm ±5% 1/4W CF	569-0513-105
R 076	10k ohm ±5% 1/4W CF	569-0513-103
R 077	120k ohm ±5% 1/4W CF	569-0513-124
R 078	100k ohm ±5% 1/4W CF	569-0513-104
R 079	10k ohm ±5% 1/4W CF	569-0513-103
R 080	10k ohm ±5% 1/4W CF	569-0513-103
R 082	100k ohm ±5% 1/4W CF	569-0513-104
R 083	39 ohm ±5% 1/4W CF	569-0513-390
R 084	330k ohm ±5% 1/4W CF	569-0513-334
R 085	27k ohm ±5% 1/4W CF	569-0513-273
R 086	2.7k ohm ±5% 1/4W CF	569-0513-272
R 087	200k ohm trimmer single turn	562-0112-204
R 088	10k ohm ±5% 1/4W CF	569-0513-103
R 089	10k ohm ±5% 1/4W CF	569-0513-103
R 090	47k ohm ±5% 1/4W CF	569-0513-473
R 091	47k ohm ±5% 1/4W CF	569-0513-473
R 092	100k ohm ±5% 1/4W CF	569-0513-104
R 093	100k ohm ±5% 1/4W CF	569-0513-104
R 094	68k ohm ±5% 1/4W CF	569-0513-683
R 095	10k ohm ±5% 1/4W CF	569-0513-103
R 096	10k ohm ±5% 1/4W CF	569-0513-103
R 097	4.7k ohm ±5% 1/4W CF	569-0513-472
R 098	12k ohm ±5% 1/4W CF	569-0513-123
R 099	10k ohm ±5% 1/4W CF	569-0513-103
R 100	10k ohm ±5% 1/4W CF	569-0513-103
R 101	47k ohm ±5% 1/4W CF	569-0513-473
R 102	47k ohm ±5% 1/4W CF	569-0513-473
R 103	330k ohm ±5% 1/4W CF	569-0513-334
R 104	1M ohm ±5% 1/4W CF	569-0513-105
R 105	100k ohm ±5% 1/4W CF	569-0513-104
R 106	100k ohm ±5% 1/4W CF	569-0513-104
R 107	2.2k ohm ±5% 1/4W CF	569-0513-222
R 108	470k ohm ±5% 1/4W CF	569-0513-474
R 109	2.2k ohm ±5% 1/4W CF	569-0513-222
R 110	6.8k ohm ±5% 1/4W CF	569-0513-682
R 111	22k ohm ±5% 1/4W CF	569-0513-223
RT001	200 ohm thermistor	569-3001-003
RT002	Thermistor	569-3001-001
S 001	DP3T slide switch	583-3001-023
T 001	10 mm 10.7 MHz IF xformer	592-5013-012
T 002	10 mm 10.7 MHz IF xformer	592-5013-012
T 003	10 mm 10.7 MHz IF xformer	592-5013-012
T 004	10 mm 10.7 MHz IF xformer	592-5013-012
T 005	7.16 MHz ph mod xformer PC	592-5009-022
TP001	Red tip jack	105-2202-211
TP002	Red tip jack	105-2202-211
TP003	Red tip jack	105-2202-211
TP004	Red tip jack	105-2202-211
TP005	Red tip jack	105-2202-211
TP006	Red tip jack	105-2202-211
U 001	Linear amplifier CA3012	544-2002-003
U 002	FM IF system	544-2002-007
U 003	+9V regulator TO-220	544-2003-059
U 004	Quad op amp 3303	544-2020-003
U 005	Quad analog switch	544-3014-066
U 006	Quad op amp 3303	544-2020-003
U 007	Quad op amp 3303	544-2020-003
U 008	Dual D flip-flop	544-3014-013
U 009	8-pin audio amp TBA820M	544-2006-003

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
Y 002	17.15 MHz crystal	521-4017-150
Z 001	45 MHz 4-pole 10 kHz BW	532-0009-004
Z 002	10.7 MHz 4-pole 7.5 kHz BW	532-0006-004
Z 003	10.7 MHz 4-pole 10 kHz BW	532-0006-005
Z 005	10.7 MHz 2-pole	532-0010-001
	RDM RSSI CABLE PART NO. 023-3039-595	
HW001	25-pos round D-sub hood	515-6008-027
J 001	25-pin D-sub receptacle	515-0505-012
MP001	14-pos right angle hood	515-7140-071
P 001	14-pin ribbon contact plug	515-7140-051
W 001	3-cond 24 AWG stranded	597-4002-060
W 002	3-cond 24 AWG stranded	597-4002-060
	8900 SYNTHESIZER PART NO. 023-8900-201	
A 201	Ref Osc input cable assembly	023-1010-175
C 200	4.7 pF ±5% NPO 50V ceramic	510-3113-479
C 201	10 pF ±5% NPO 50V ceramic	510-3113-100
C 202	.01 µF ±30% 25V Y5R ceram	510-3528-103
C 203	47 pF ±5% 50V NPO ceramic	510-3113-470
C 204	51 pF ±5% 50V NPO ceramic	510-3113-510
C 206	39 pF ±5% 50V N750 ceramic	510-3521-390
C 207	.01 µF ±30% 25V Y5R ceram	510-3528-103
C 208	100 µF 10V aluminum electro	510-4110-101
C 209	.01 µF ±30% 25V Y5R ceram	510-3528-103
C 210	1 µF ±10% 35V tantalum	510-2575-109
C 211	15 µF ±10% 15V tantalum	510-2073-150
C 212	.01 µF ±30% 25V Y5R ceram	510-3528-103
C 213	1 µF ±10% 35V tantalum	510-2575-109
C 214	1 µF ±10% 35V tantalum	510-2575-109
C 215	1 µF ±10% 35V tantalum	510-2575-109
C 216	1 µF ±10% 35V tantalum	510-2575-109
C 217	1 µF ±10% 35V tantalum	510-2575-109
C 218	47 pF ±5% 50V N750 ceram	510-3521-470
C 219	47 pF ±5% 50V N750 ceram	510-3521-470
C 220	.001 µF ±10% 50V Y5P cer	510-3527-102
C 221	33 pF ±5% 50V N750 ceram	510-3521-330
C 222	47 µF ±20% 20V tantalum	510-2004-470
C 223	1 µF ±10% 35V tantalum	510-2575-109
C 224	47 µF ±20% 20V tantalum	510-2004-470
C 225	1 µF ±10% 35V tantalum	510-2575-109
C 226	39 pF ±5% 50V N750 ceram	510-3521-390
C 227	.001 µF ±10% 50V Y5P cer	510-3527-102
C 228	39 pF ±5% 50V N750 ceram	510-3521-390
C 230	.01 µF ±30% 25V Y5R ceram	510-3528-103
C 231	100 pF ±5% 50V P350 ceram	510-3512-101
C 232	39 pF ±5% 50V NPO ceramic	510-3113-390
C 233	39 pF ±5% 50V NPO ceramic	510-3113-390
C 234	10 pF ±5% 50V NPO ceramic	510-3113-100
C 235	39 pF ±5% 50V NPO ceramic	510-3113-390
C 241	.01 µF ±30% 25V Y5R ceram	510-3528-103
CR201	Varicap diode	523-0009-034
CR202	5.1V ±5% 1W zener	523-2503-519
CR203	Si diode 1N4448	523-1500-883
CR204	Si diode 1N4448	523-1500-883
CR205	Red LED	549-4001-002
CR290	Varicap diode	523-0009-034
EP001	3/8" coil shield	578-0003-002
EP002	Insulator washer	574-5005-009
EP201	0.025" square pin	515-7101-207
HW201	Socket for Y201	515-5006-055
J 004	BNC panel mount connector	515-3006-004
J 201	4-pin right angle connector	515-9035-004
J 202	JCM connector	142-0701-326
J 203	JCM connector	142-0701-326
J 402	BNC panel mount connector	515-3006-004
L 201	0.27-0.37 µH variable inductor	542-1006-118
L 203	3.5T coil 26 AWG	542-0001-035
L 204	1.5T coil 26 AWG	542-0001-015
L 205	3.5T coil 26 AWG	542-0001-035
MP000	Synthesizer shelf assembly	023-8900-110
P 205	Shorting socket	515-5010-001
PC001	PC board	035-8900-200
Q 201	N-Channel JFET amplifier	576-0006-014
Q 202	NPN general purpose	576-0003-053

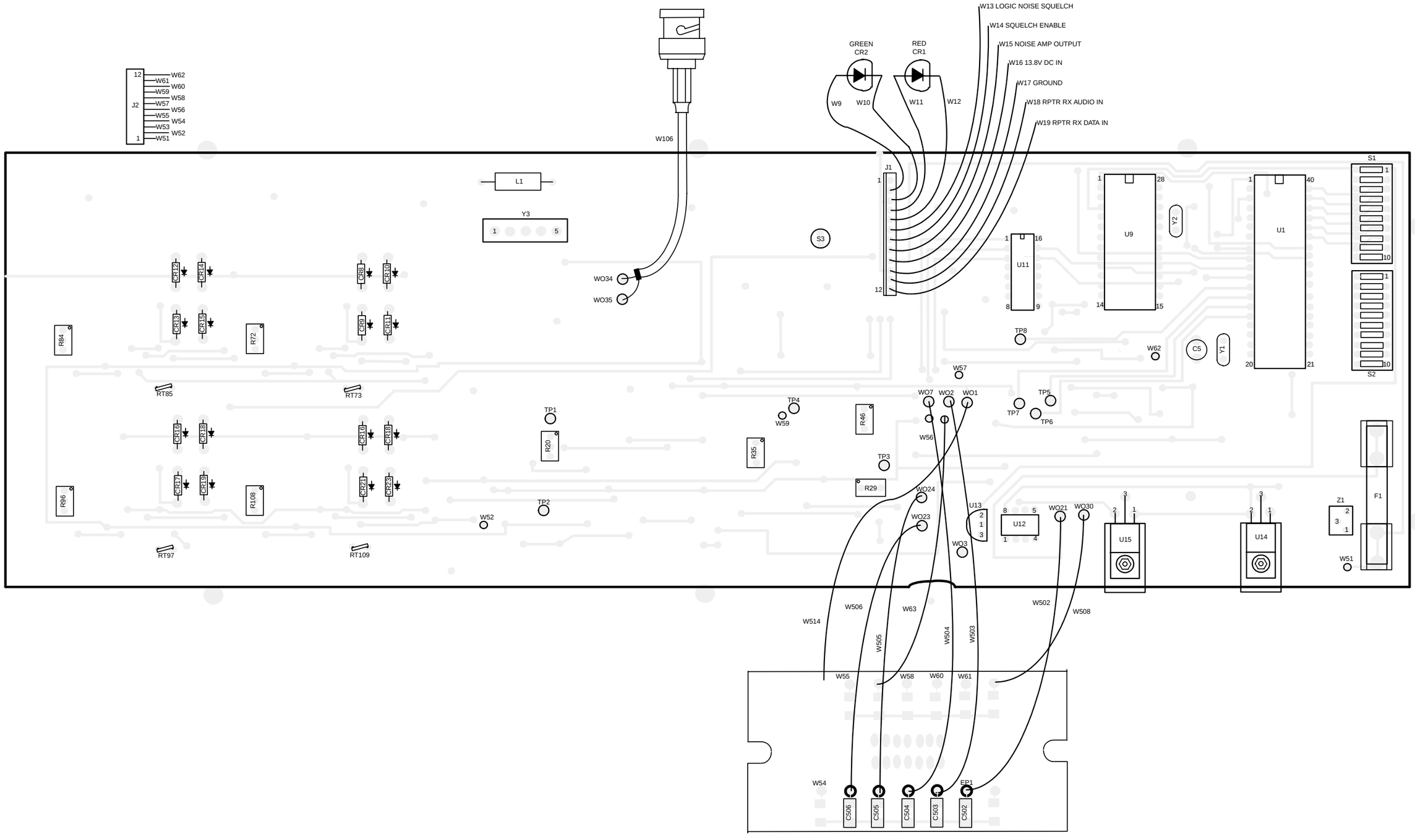
SYMBOL NUMBER	DESCRIPTION	PART NUMBER
Q 203	NPN 470 MHz amplifier	576-0003-027
Q 204	NPN 470 MHz amplifier	576-0003-027
Q 205	NPN general purpose	576-0003-053
R 200	51 ohm ±5% 1/4W CF	569-0513-510
R 201	180k ohm ±5% 1/4W CF	569-0513-184
R 202	390 ohm ±5% 1/4W CF	569-0513-391
R 203	27 ohm ±5% 1/4W CF	569-0513-270
R 204	100 ohm ±5% 1/4W CF	569-0513-100
R 205	10k ohm ±5% 1/4W CF	569-0513-103
R 206	10k ohm ±5% 1/4W CF	569-0513-103
R 207	10k ohm ±5% 1/4W CF	569-0513-103
R 208	10k ohm ±5% 1/4W CF	569-0513-103
R 209	10k ohm ±5% 1/4W CF	569-0513-103
R 210	10k ohm ±5% 1/4W CF	569-0513-103
R 211	10k ohm ±5% 1/4W CF	569-0513-103
R 212	10k ohm ±5% 1/4W CF	569-0513-103
R 213	10k ohm ±5% 1/4W CF	569-0513-103
R 214	10k ohm ±5% 1/4W CF	569-0513-103
R 215	10k ohm ±5% 1/4W CF	569-0513-103
R 216	10k ohm ±5% 1/4W CF	569-0513-103
R 217	10k ohm ±5% 1/4W CF	569-0513-103
R 221	10k ohm ±5% 1/4W CF	569-0513-103
R 222	10k ohm ±5% 1/4W CF	569-0513-103
R 223	47k ohm ±5% 1/4W CF	569-0513-473
R 224	1M ohm ±5% 1/4W CF	569-0513-105
R 225	47k ohm ±5% 1/4W CF	569-0513-473
R 226	330k ohm ±5% 1/4W CF	569-0513-334
R 227	51k ohm ±5% 1/4W CF	569-0513-513
R 228	100k ohm ±5% 1/4W CF	569-0513-104
R 229	100k ohm ±5% 1/4W CF	569-0513-104
R 230	10k ohm ±5% 1/4W CF	569-0513-103
R 231	10k ohm ±5% 1/4W CF	569-0513-103
R 232	22k ohm ±5% 1/4W CF	569-0513-223
R 233	1.8k ohm ±5% 1/4W CF	569-0513-182
R 234	10 ohm ±5% 1/4W CF	569-0513-100
R 235	390 ohm ±5% 1/4W CF	569-0513-391
R 236	51 ohm ±5% 1/4W CF	569-0513-510
R 237	270k ohm ±5% 1/4W CF	569-0513-271
R 238	3.3k ohm ±5% 1/4W CF	569-0513-332
R 239	3k ohm ±5% 1/4W CF	569-0513-302
R 240	2.2k ohm ±5% 1/4W CF	569-0513-222
R 241	10M ohm ±5% 1/4W CF	569-0513-106
R 242	10M ohm ±5% 1/4W CF	569-0513-106
R 243	10k ohm ±5% 1/4W CF	569-0513-103
R 244	22k ohm ±5% 1/4W CF	569-0513-223
R 245	1k ohm ±5% 1/4W CF	569-0513-102
R 246	100 ohm ±10% 1/2W CC	569-1004-101
R 247	82k ohm ±5% 1/4W CF	569-0513-823
R 248	270 ohm ±5% 1/4W CF	569-0513-271
R 290	100k ohm ±5% 1/4W CF	569-0513-104
R 291	47k ohm ±5% 1/4W CF	569-0513-473
R 292	1M ohm ±5% 1/8W SMD	569-0115-105
S 201	SPST push button switch	583-4012-001
S 202	4-position DIP switch	583-5002-104
S 203	7-position DIP switch	583-5002-107
S 204	SPST push button switch	583-4012-001
TP201	Brown test jack	105-2208-211
U 201	8-Channel analog multiplexer	544-3014-051
U 202	8-Channel analog multiplexer	544-3014-051
U 203	8-Channel analog multiplexer	544-3014-051
U 204	8-Channel analog multiplexer	544-3014-051
U 205	Frequency synthesizer 8820	544-3954-020
U 206	Dual JFET op amp TL-082	544-2018-003
U 207	Divide by 80/81 prescaler	544-3954-012

8900 LOCAL OSCILLATOR
PART NO. 0238900-300

A 002	OCXO pigtail wire assembly	023-8900-350
A 003	Drawer slide assembly	023-4406-701
A 004	Local Oscillator harness	023-8900-380
A 005	14-pin connector assembly	023-4406-503
A 006	RF output cable (to Rx)	023-1010-170
A 008	Coax cable assembly	023-8900-415
A 009	Battery backup assembly	023-8900-320
C 295	.01 µF ±20% 16V Y5S ceramic	510-3210-103
C 296	22 µF ±20% 15V tantalum	510-2243-220
C 297	150 pF ±10% 50V X7R cer	510-3607-151
C 298	150 pF ±10% 50V X7R cer	510-3607-151
C 299	220 µF 25V aluminum	510-4125-221
C 300	2.2 µF ±20% 35V tantalum	510-2245-229
C 301	.001 µF ±5% 63V polyester	510-1033-102
C 302	47 µF ±20% 20V tantalum	510-2044-470
C 303	.1 µF ±5% 63V polyester	510-1033-104
C 304	150 pF ±10% 50V Y5P cer	510-3527-151
C 305	.001 µF ±10% 50V Y5P cer	510-3527-102
C 306	150 pF ±10% 50V Y5P cer	510-3527-151
C 307	.047 µF ±5% 63V polyester	510-1033-473
C 308	1 µF 50V alum electrolytic	510-4150-109

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
C 315	3900 pF ±2% 50V NPO cer	510-3545-392
C 316	3900 pF ±2% 50V NPO cer	510-3545-392
CH001	Drawer cover, top/bottom	017-2197-041
CR301	Si diode 1N4448	523-1500-883
CR302	Si diode 1N4448	523-1500-883
CR303	Red LED	549-4001-002
CR304	Red LED	549-4001-002
CR305	Red LED	549-4001-002
CR306	Red LED	549-4001-002
CR307	Si diode 1N4448	523-1500-883
CR361	3A Si diode	523-0017-001
CR362	3A Si diode	523-0017-001
EP302	Terminal block	586-2004-005
F 300	4A subminiature fuse	534-0009-040
HW003	#4 shoulder washer	596-4504-008
HW004	1/2" hole plug	537-9001-011
HW007	#10 flat washer	596-9112-016
HW008	#10 U-type nut	560-1810-002
J 301	3-pin connector	515-9031-102
J 302	3-pin connector	515-9031-102
J 303	Red test jack	105-2202-201
J 304	Red test jack	105-2202-201
J 350	8-pin female connector	515-1005-108
K 300	5V reed relay	567-2002-001
L 300	3.6 µH RF choke	542-4503-369
L 301	15 µH RF choke	542-4503-150
L 302	3.6 µH RF choke	542-4503-369
MP003	Clip assembly for MP008	537-4003-001
MP004	Flexible grommet	574-0001-025
MP008	1/4 turn fastener	537-4001-001
MP009	Retainer for MP008	537-4002-001
MP011	Drawer front panel	014-0771-073
MP012	Drawer handle	017-2139-202
MP013	Drawer back	014-0783-083
MP014	Drawer left rail	017-2197-031
MP015	Guide pin	013-1627-001
MP016	Drawer right rail	017-2197-032
MP018	Drawer PC board support	014-0783-045
MP050	Plastic wear washer	574-9019-050
MP300	Heat sink TO-220	539-0009-100
MP300	OCXO bracket	017-2222-150
NP300	OCXO drawer label	559-9001-272
P 301	Shorting socket	515-5010-001
P 302	Shorting socket	515-5010-001
P 350	Cap with grommet (J350)	515-6002-007
PC300	OCXO PC board	035-8900-310
PC320	Battery back-up PC board	035-8900-320
Q 300	NPN general purpose	576-0003-053
Q 301	NPN general purpose	576-0003-053
Q 302	NPN general purpose	576-0003-053
Q 303	NPN general purpose	576-0003-053
Q 304	NPN general purpose	576-0003-053
Q 305	NPN general purpose	576-0003-053
Q 306	PNP general purpose	576-0003-057
R 299	100k ohm ±5% 1/4W CF	569-0513-104
R 300	27k ohm ±5% 1/4W CF	569-0513-273
R 301	10k ohm ±5% 1/4W CF	569-0513-103
R 302	1k ohm ±5% 1/4W CF	569-0513-102
R 304	200 ohm ±5% 1/4W CF	569-0513-201
R 305	10k ohm ±5% 1/4W CF	569-0513-103
R 306	1k ohm ±5% 1/4W CF	569-0513-102
R 307	200 ohm ±5% 1/4W CF	569-0513-201
R 308	10k ohm ±5% 1/4W CF	569-0513-103
R 309	1k ohm ±5% 1/4W CF	569-0513-102
R 310	200 ohm ±5% 1/4W CF	569-0513-201
R 311	3.3k ohm ±5% 1/4W CF	569-0513-332
R 312	10k ohm ±5% 1/4W CF	569-0513-103
R 313	4.7k ohm ±5% 1/4W CF	569-0513-472
R 314	10k ohm ±5% 1/4W CF	569-0513-103
R 315	5.1k ohm ±5% 1/4W CF	569-0513-512
R 318	270 ohm ±5% 1/4W CF	569-0513-271
R 319	10k ohm ±5% 1/4W CF	569-0513-103
R 320	10k ohm ±5% 1/4W CF	569-0513-103
R 321	1k ohm ±5% 1/4W CF	569-0513-102
R 322	200 ohm ±5% 1/4W CF	569-0513-201
R 323	1k ohm ±5% 1/4W CF	569-0513-102
R 324	270k ohm ±5% 1/4W CF	569-0513-274
R 325	10k ohm ±5% 1/4W CF	569-0513-103
R 326	470k ohm ±5% 1/4W CF	569-0513-474
R 327	39k ohm ±5% 1/4W CF	569-0513-393

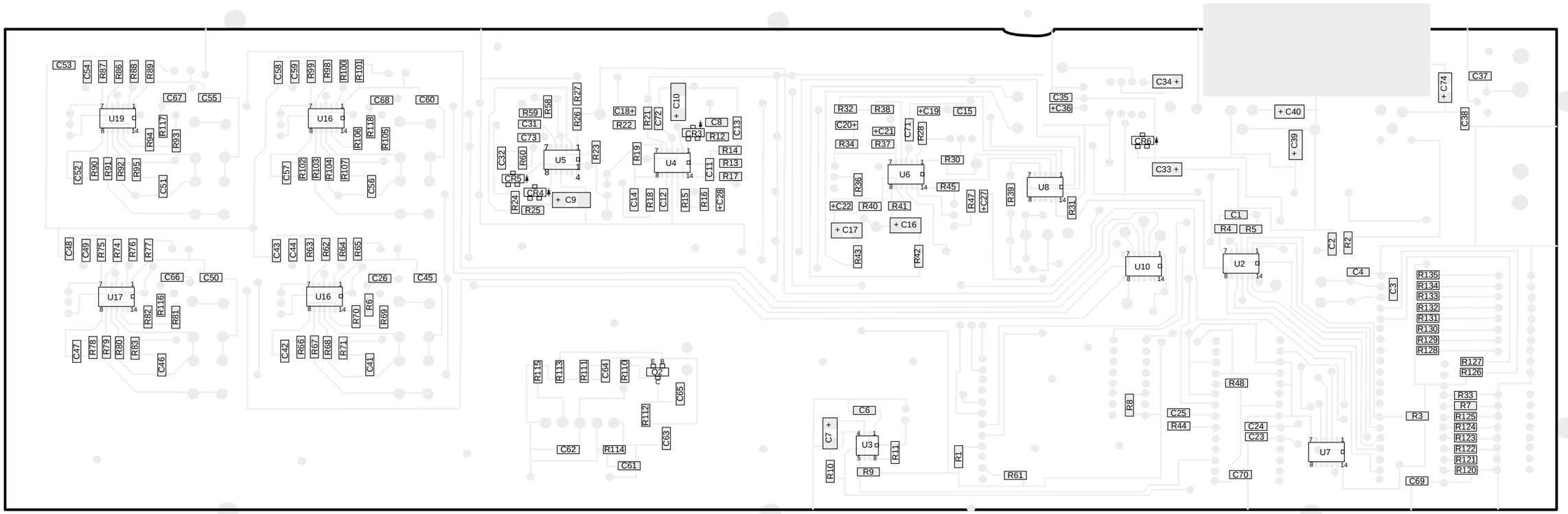
SYMBOL NUMBER	DESCRIPTION	PART NUMBER
R 328	270 ohm ±5% 1/4W CF	569-0513-271
R 332	51 ohm ±5% 1/4W CF	569-0513-510
R 333	1k ohm ±5% 1/4W CF	569-0513-102
R 334	1k ohm ±5% 1/4W CF	569-0513-102
R 339	10k ohm ±5% 1/4W CF	569-0513-103
R 340	1k ohm ±5% 1/4W CF	569-0513-102
R 341	1k ohm ±5% 1/4W CF	569-0513-102
R 342	10k ohm ±5% 1/4W CF	569-0513-103
R 343	10k ohm ±5% 1/4W CF	569-0513-103
R 361	3.3 ohm ±10% 5W WW	569-2006-339
S 300	SPST momentary (NC) switch	583-0006-010
U 299	Adjustable regulator 2931	544-2003-043
U 300	Retriggerable multi-vibrator	544-3764-123
U 302	Quad 2-input OR gate	544-3532-032
U 303	Retriggerable multi-vibrator	544-3764-123
U 305	Hex D flip-flop	544-3532-074
U 306	Phase lock loop	544-3014-046
U 311	Quad 2-input NAND gate	544-3532-000
U 312	4-bit binary counter	544-3532-393
U 313	Dual line driver 55121	544-2023-022
Y 300	5 MHz OCXO	561-0006-011
Y 301	5 MHz OCXO	561-0006-011



March 2000
Part No. 001-3139-502

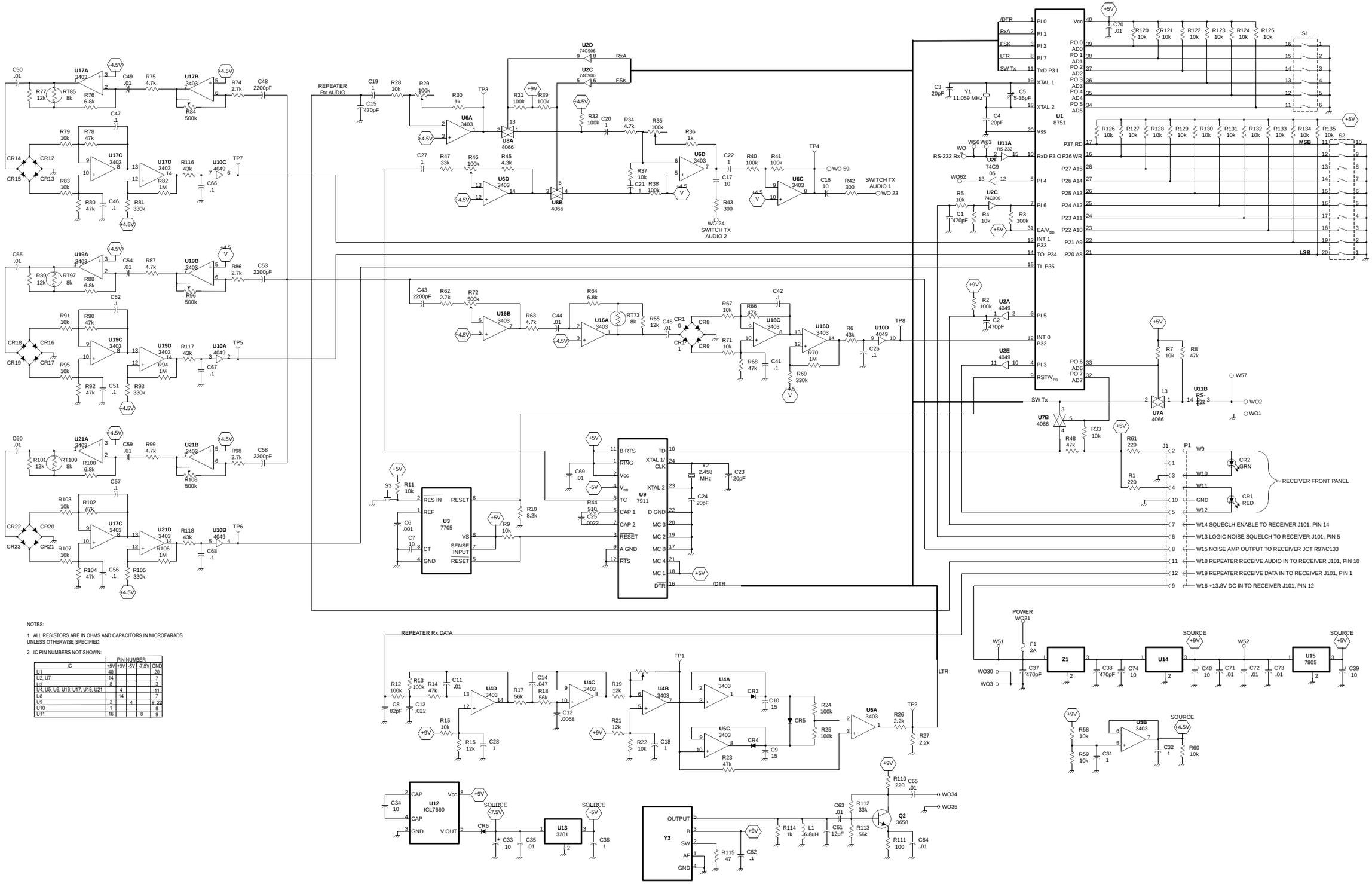
800 MHz RDM COMPONENT LAYOUT
(COMPONENT SIDE VIEW)
FIGURE 2-9

FOLDOUT



March 2000
Part No. 001-3139-502

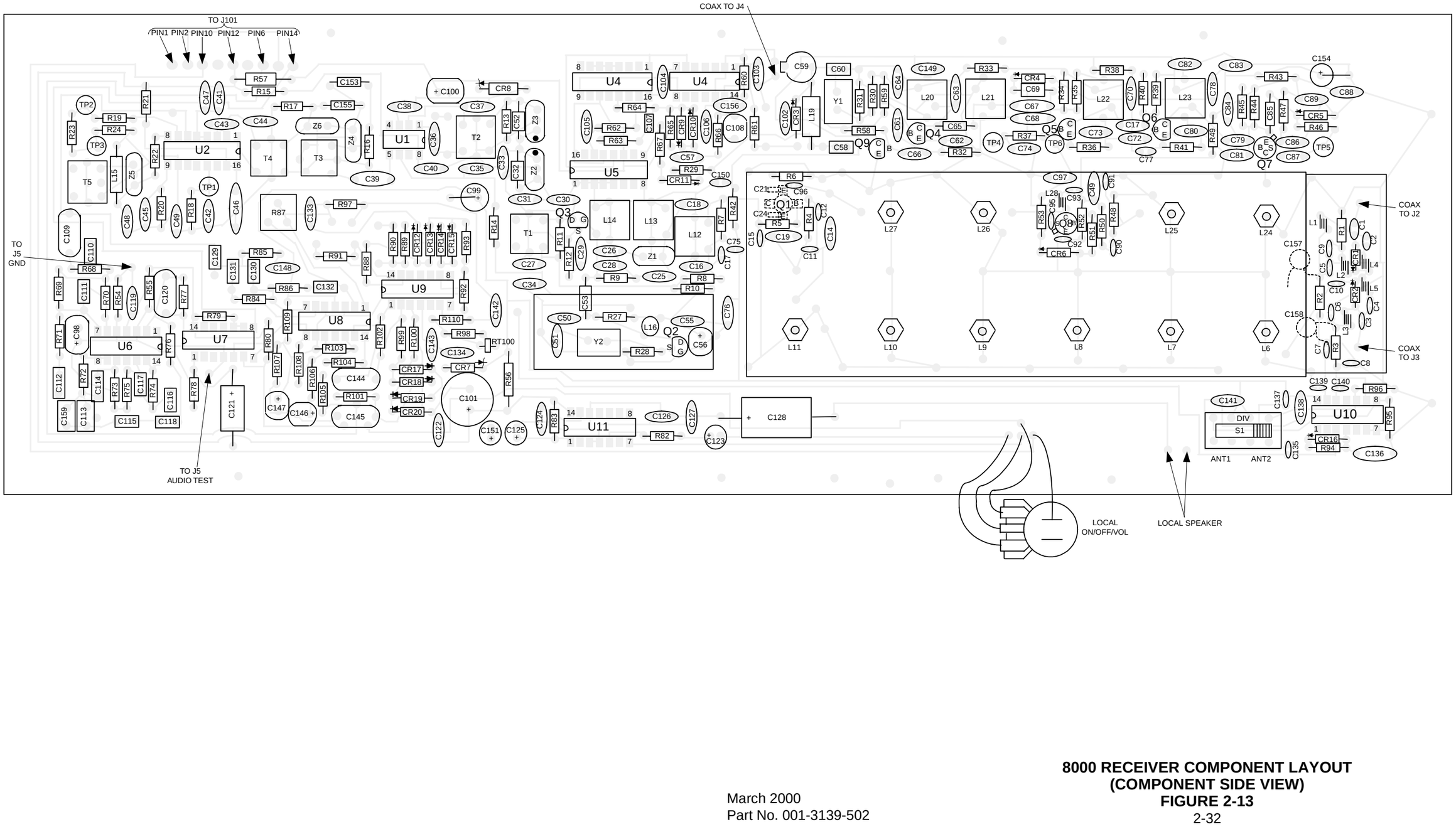
800 MHz RDM COMPONENT LAYOUT
(OPPOSITE COMPONENT SIDE VIEW)
FIGURE 2-10



March 2000
Part No. 001-3139-502

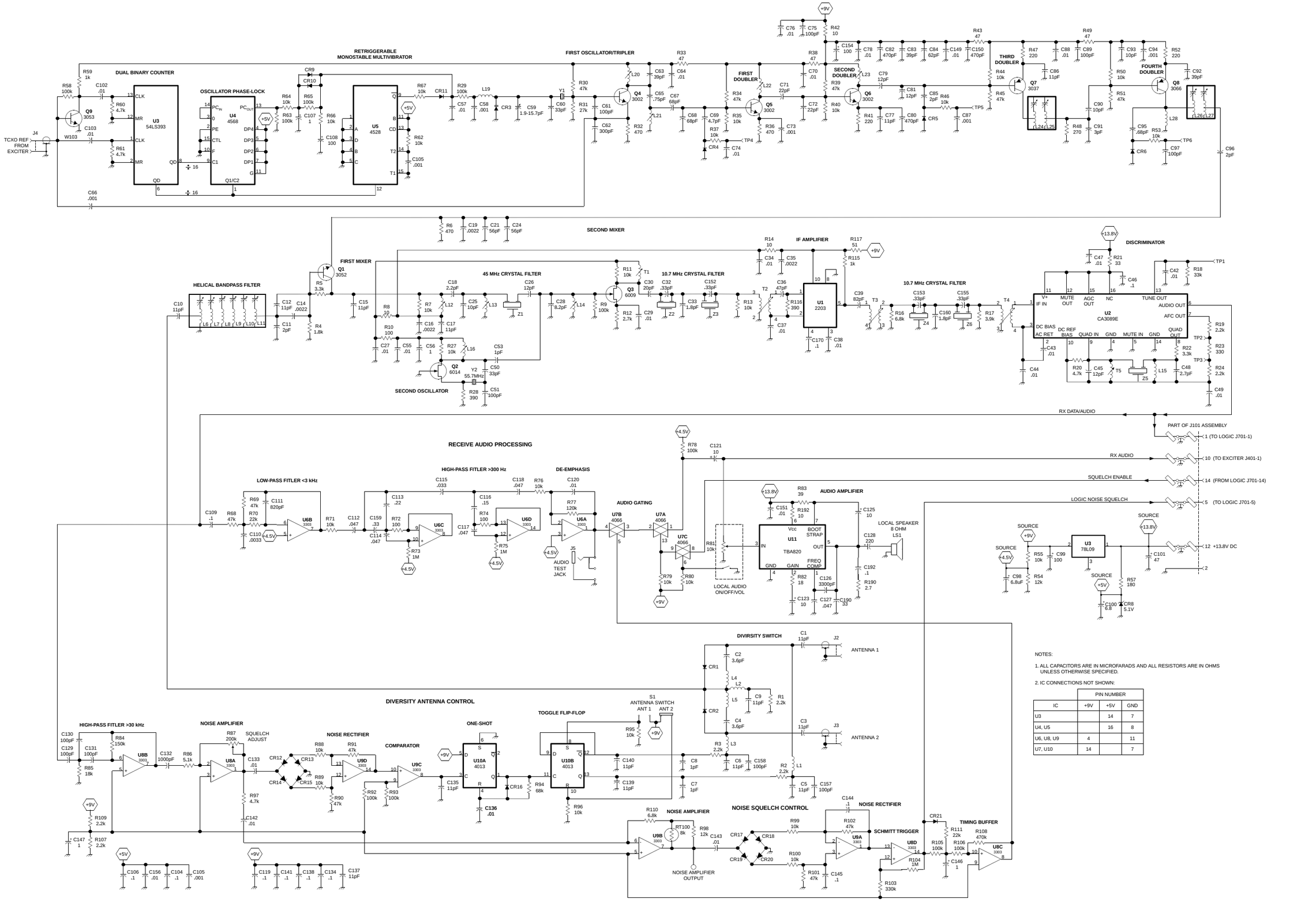
800 MHz RDM SCHEMATIC
FIGURE 2-11

FOLDOUT



March 2000
Part No. 001-3139-502

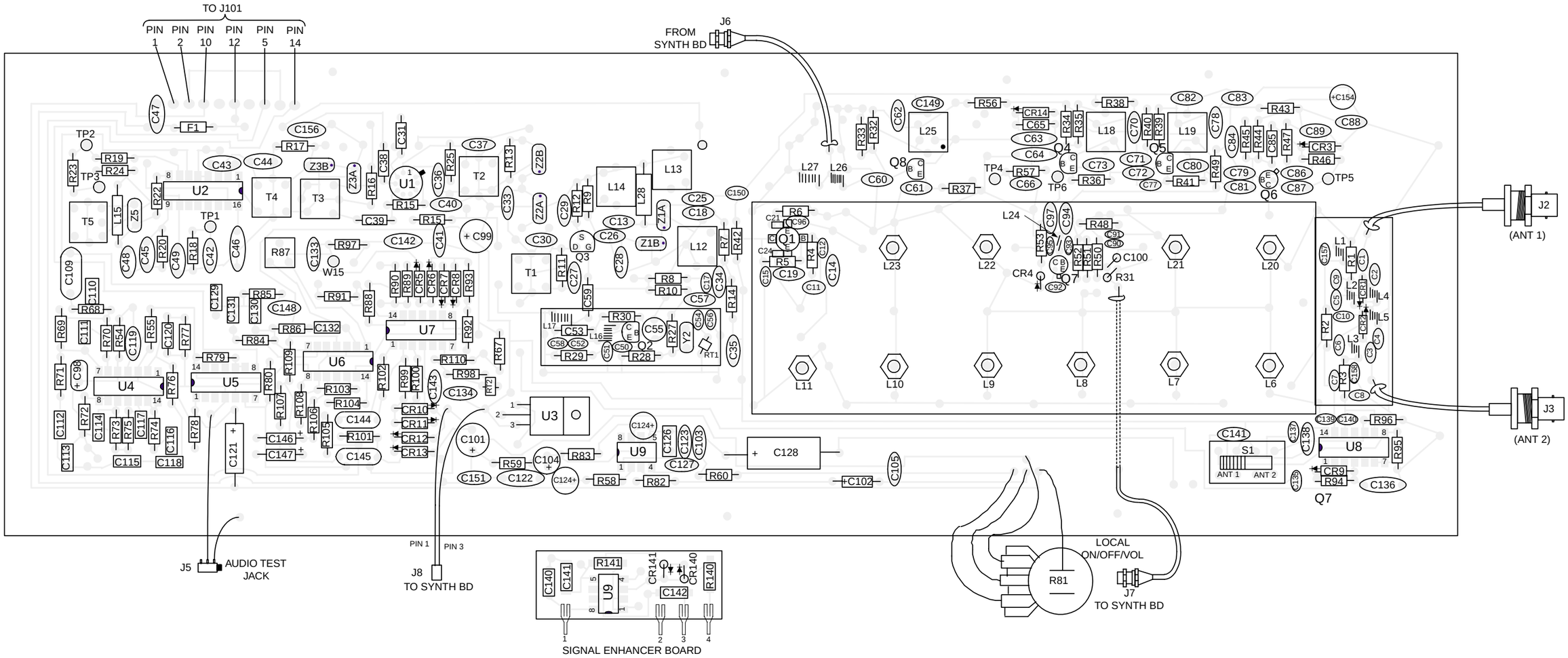
8000 RECEIVER COMPONENT LAYOUT
(COMPONENT SIDE VIEW)
FIGURE 2-13



March 2000
Part No. 001-3139-502

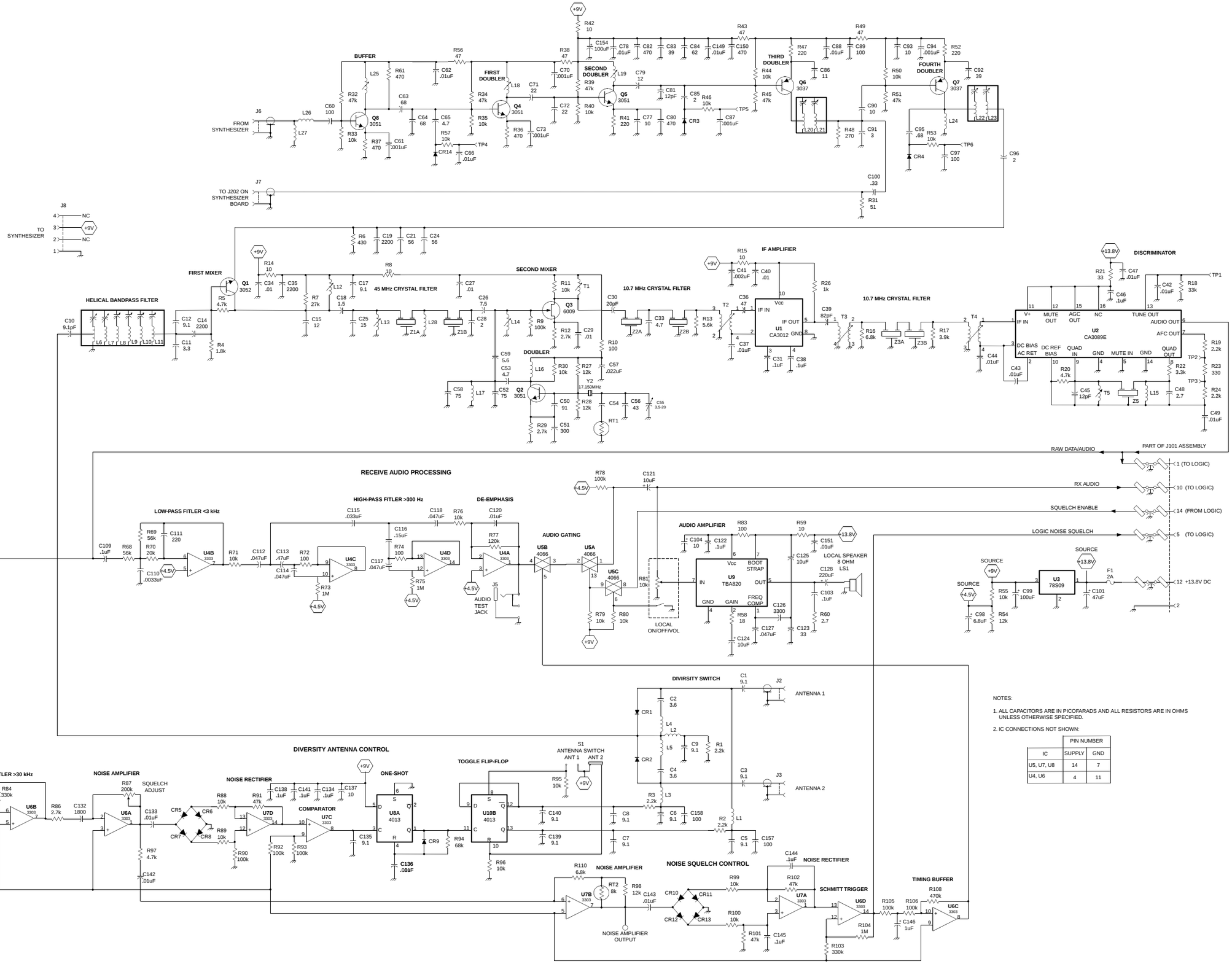
800 MHz RECEIVER SCHEMATIC
FIGURE 2-13

FOLDOUT



900 MHz RECEIVER COMPONENT LAYOUT
(COMPONENT SIDE VIEW)
FIGURE 2-14

March 2000
Part No. 001-3139-502



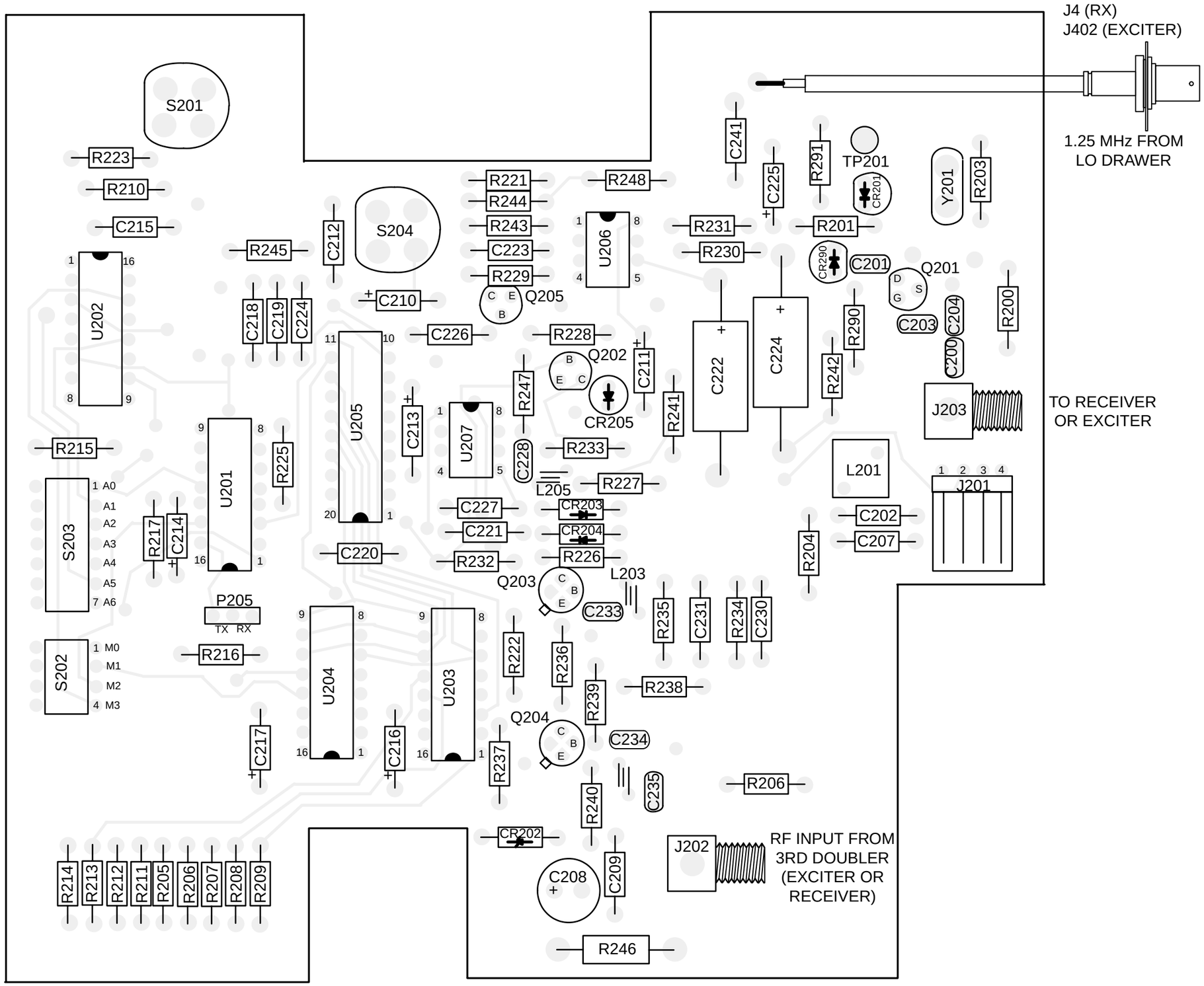
NOTES:

1. ALL CAPACITORS ARE IN PICOFARADS AND ALL RESISTORS ARE IN OHMS UNLESS OTHERWISE SPECIFIED.
2. IC CONNECTIONS NOT SHOWN:

	PIN NUMBER	
IC	SUPPLY	GND
U5, U7, U8	14	7
U4, U6	4	11

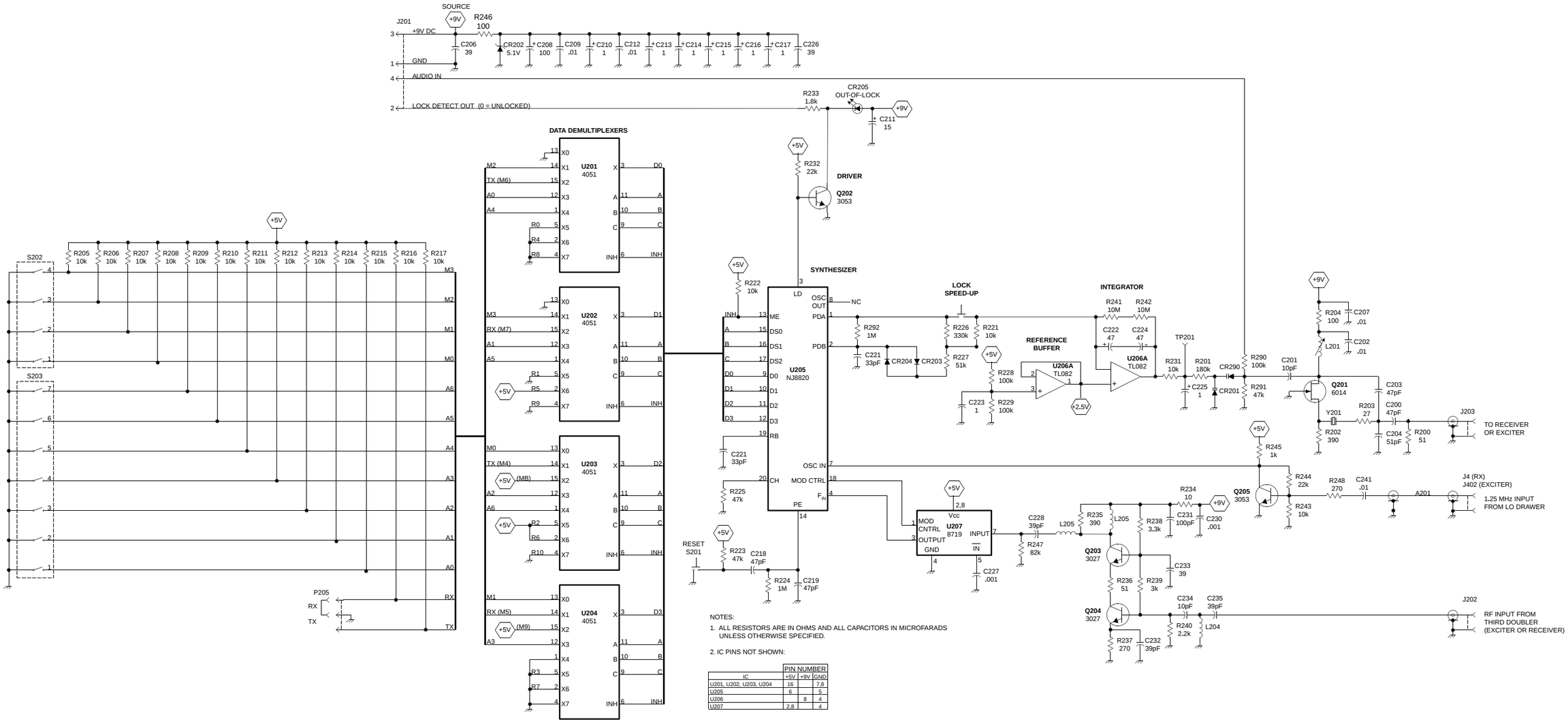
900 MHz RECEIVER SCHEMATIC
FIGURE 2-15

FOLDOUT



March 2000
Part No. 001-3139-502

900 MHz SYNTHESIZER BOARD COMPONENT LAYOUT
(COMPONENT SIDE VIEW)
FIGURE 2-16



NOTES:

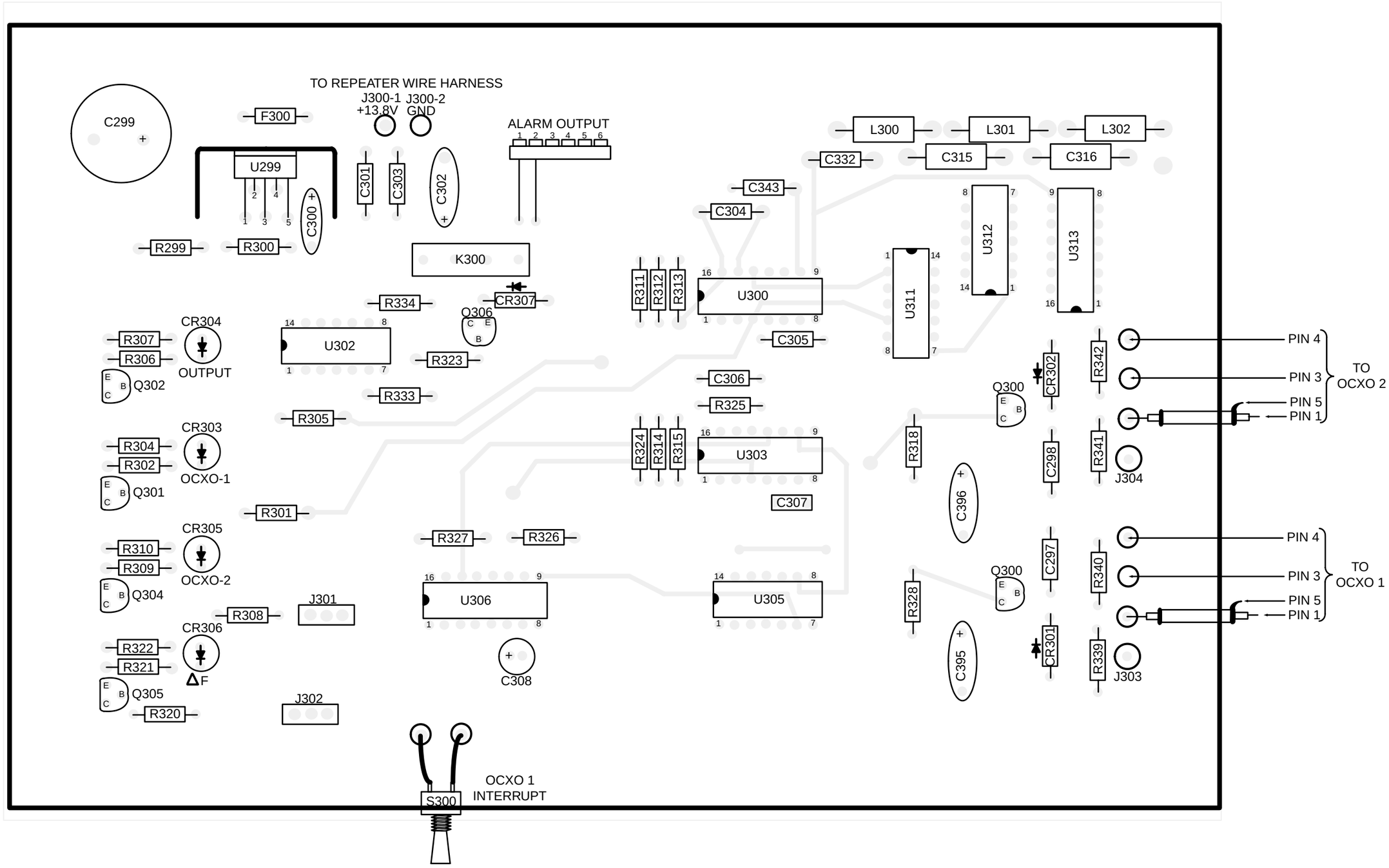
1. ALL RESISTORS ARE IN OHMS AND ALL CAPACITORS IN MICROFARADS UNLESS OTHERWISE SPECIFIED.

2. IC PINS NOT SHOWN:

	PIN NUMBER		
IC	+5V	+9V	GND
U201, U202, U203, U204	16		7,8
U205	6		5
U206		8	4
U207	2,8		4

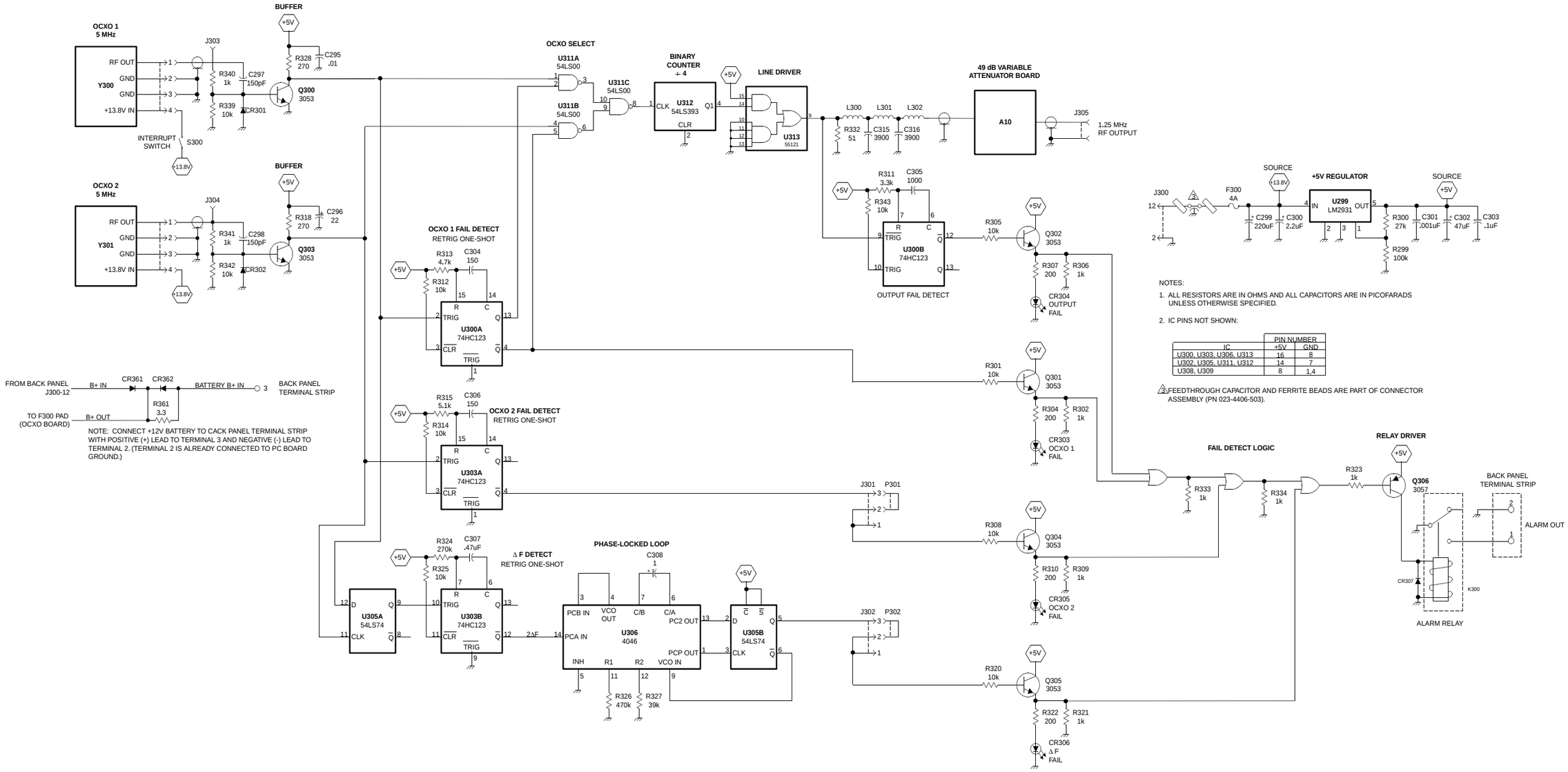
900 MHz SYNTHESIZER SCHEMATIC
FIGURE 2-17

FOLDOUT



March 2000
Part No. 001-3139-502

900 MHz LOCAL OSCILLATOR COMPONENT LAYOUT (COMPONENT SIDE VIEW)
FIGURE 2-18



March 2000
Part No. 001-3139-502

900 MHz LOCAL OSCILLATOR SCHEMATIC
FIGURE 2-19

FOLDOUT

SECTION 3 2000 SERIES RECEIVER DECODER MODULE (RDM)

3.1 GENERAL

The 2000 Series Receiver Decoder Module (RDM) is designed for either operation with the 800 MHz or 900 MHz receivers. Refer to the Summit® QX Repeater Service Manual, Part No. 001-2008-102 or Summit QX Repeater Service Manual, Part No. 001-2009-100 for detailed information on the circuit description. The RDM is powered from 15V DC and operates in the temperature range of -30°C to +60°C (-22°F to +140°F) with 10%-90% non-condensing humidity.

The RDM decodes the subaudible data and four levels of Received Signal Strength Indication (RSSI) plus the condition of the squelch line, open or closed, from the receiver. In the Remote site information is then passed from the RDM, to the RMM, to the Local Site CDM and then to the RVM. In the Local Site, the RDMs are hard wired to the RVM.

The Multi-Net System is capable of handling 30 channels and the Voter System is capable of handling 32 voted receiver sites, the maximum number of RDMs is 960.

3.2 INITIAL RECEPTION

The RDM RSSI is squelch plus four additional levels to the squelch settings. The opening squelch setting is 6 dB SINAD plus four squelch settings at 10 dB, 15 dB, 20 dB and 25 dB, ± 2 dB.

The initial RSSI level is determined by averaging the RSSI during the initial decode time. The averaging is done by sampling during the subaudible “Word” transmitted continuously from the mobile. The “Word” is 225 milliseconds in length, the RSSI is sampled every 10 milliseconds during this “Word” period. The initial reception will be sent directly to the Receiver Voter Module (RVM) via a 1200 baud FSK blank and burst signaling on the main audio line. This also indicates what Home, Group ID, Unique ID, Priority and Status has been received.

3.3 RSSI UPDATES

The RDM continues to sample the RSSI every 10 milliseconds and averages the RSSI for each "WORD". When this average has been determined, the RDM sends the updated RSSI information to the RMM. The upper 4 bits of the byte are unused or 0. The lower 4 bits of the byte are the RSSI information, see Table 3-1.

The updated RSSI information is sent via a secondary RS-232 line (Refer to Figure 3-1). The path is the RSSI update path where the RDM connects to a Receiver Multiplexer Module (RMM). This path is a 1200 baud, RS-232 line.

The audio line is a direct connect path between the RDM and RVM. This line is also an audio 1200 baud line with FSK blank and burst data on initial decode.

NOTE: See Appendix C and D for frequency chart.

Table 3-1 2000 RDM RSSI INFORMATION

Hex Value	DESCRIPTION
7	Strongest RSSI signal level
6	
5	
4	Weakest RSSI signal level a call will be started at
3	Weakest RSSI level before a call will be dropped.
2*	Time-Out no update received
1	No Data received from RDM (generated by RMM only)
0*	Turn-off Code received from mobile
* Idle state.	

3.4 DISCONNECT

Disconnect by the Mobile can occur one of two ways. One way is when the RDM is no longer decoding the subaudible "WORD" from the Mobile. The RDM sends a Receive Time-Out byte by the RS-232 to the RMM. The second way is when the RDM decodes the Turn-off Code from the Mobile. The RDM sends a Receive Turn-Off Byte by the RS-232 to the RMM. See Figure 3-1.

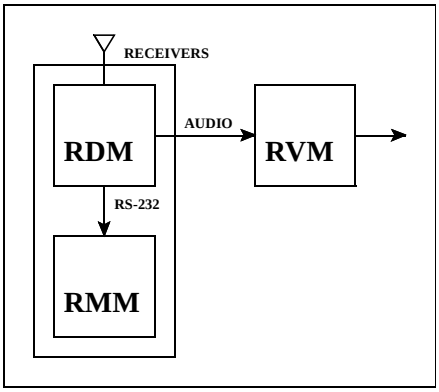


Figure 3-1 2000 RDM BLOCK DIAGRAM

3.5 INTRODUCTION

The Johnson 2000 Repeater Program on 3.5 inch disk, Part No. 023-9998-297, uses an IBM® personal computer to program the EEPROM Memory in the Receiver Decode Module (RDM) Interface Board. To lessen the chance of programming errors and simplify operation, the program uses yes/no questions or toggles through the available responses.

The computer is connected directly from the serial card to the RDM Interface Board. The interconnect cables used are shown in Figure 3-27. The DB-9 to 8-pin modular adapter is connected to the serial port of the computer and an interconnect cable connects the adapter to the Interface Board.

NOTE: These connections are for the IBM computer and may differ from an IBM compatible. In which case, consult the manuals for your computer for serial card outputs and connections.

3.5.1 HOW TO USE THIS SECTION

This Section introduces the program and illustrates how to use the features. This Section is organized to easily find programming information with the Table of Contents and Parameter Tables for the responses required for programming.

Graphic reproductions of the screens are shown for reference. Adjacent to the screens are tables to provide the parameters, available responses and a brief description of the parameter. It is not the intent of this Section to teach computer operation, but to allow the user to become familiar with the available screens and the responses without having to be at the computer.

3.5.2 GETTING STARTED

NOTE: Before starting you should already know how to start MS-DOS®, format and make backup copies of disks, copy and delete files, and run programs. If you are unfamiliar with any of these actions, refer to the MS-DOS manual for your computer for more information (see Section 3.10.8).

Follow the computer instructions for loading the disk. The MS-DOS Revision 2.0 or later operating system is needed to run the programs. The computer needs to have RS-232C capability, for example, the Serial Card in slot "COM1" or "COM2".

3.5.3 COMPUTER DESCRIPTION

The programming software is designed to run on an IBM PC or compatible computer that meets the following minimum requirements.

- One 3.5" high density disk drive
- 640K of memory
- MS-DOS version 2.0 or higher
- One serial port
- Monochrome or color monitor and video card

Although the program uses color to highlight certain areas on the screen, a monochrome (black and white) monitor or LCD laptop also provide satisfactory operation. Most video formats such as EGA and VGA are supported. A serial port is required to connect the Repeater to the computer. One or two serial ports are standard with most computers. One port may be used by the mouse.

The cables from the Repeater to the computer are not included. With most computers, the adapter-to-computer cable is a standard DB-25 M-F cable, PN 023-5800-017, (the male connector plugs into the adapter). If your computer requires a male connector, a male-to-male cable is also available, PN 023-5800-016. The cable from the adapter to the Repeater has a DB-9 to 8-pin connector (see Figure 3-27).

3.5.4 EEPROM DATA STORAGE

The data programmed into the MPC is stored by an EEPROM Memory. Since this type of device is nonvolatile, data is stored indefinitely without the need for a constant power supply. A repeater can be removed from the site or even stored indefinitely without affecting programming. Since EEPROM Memory is also reprogrammable, a new device is not needed if programming is changed.

3.5.5 MINIMUM FREE MEMORY REQUIRED

NOTE: With Windows 95 and NT, memory management is handled automatically and the following does not apply.

Approximately 535K of free conventional memory is required to run this program with help informaiton. If you have at least 640K of memory and not enough is available, there may be other programs that are also being loaded into conventional memory. To check the amount of memory avialable, use the DOS MEM command if available.

To make more memory available, the DOS MEMMAKER program can be run to automatically optimize your memory configuration. A DOS boot disk may also be used to start the computer without loading non-essential programs into memory. Refer to the documentation included with your computer for more information on how to make more memory available.

NOTE: Adequate memory space may not be available even if the computer is equipped iwth several megabytes of memory. This is because most DOS programs run in only the 640K block of conventional memory.

3.6 REPEATER PROGRAM SOFTWARE

3.6.1 INSTALLING THE SOFTWARE

Make a Backup Copy

When you receive the programming software, make a backup copy and store the master in a safe place. To make a copy the distribution disk with Windows 95 Explorer, right click the floppy drive icon and select Copy Disk. With Windows 3.1 file manager, select Copy Disk fromt he Disk menu. With DOS, use the DISKCOPY command. For example, type DISKCOPY A: A: with single floppy drive systems, or DISKCOPY A: B: with dual drive systems.

Create a Separate Directory

You may want to create a separate directory on your hard disk for programming. This can be done using Windows Explorer, File Manager, or DOS. For example, to create from DOS a directory called VOTERPGMR on drive C:, type C: (Enter) to make it the current directory if necessary. Then type MD \VOTERPGMR (Enter). To change to that directory, type CD \VOTERPGMR.

Copying Files to Hard Drive

The Personality and Tuning programs are not compressed. Therefore, they can be run directly without the need for any type of conversion. The name of the personality program is 2000PGMR.EXE and the associated help file is 2000PGMR.HLP. These files are approximately 480K and 42K in size, respectively.

The program can be run fromt he floppy disk, but you will probably want to copy these files to the programming directory of your hard disk. To do this, use Windows Explorer or File Manager or the DOS COPY command.

Creating a Windows Shortcut or Program Icon

If you want to try and run the program from Windows 95, a shortcut icon can be created that can then be double clicked to start the program. To create this shortcut icon, select Start -> Settings -> Taskbar. Then select the Start Menu Programs tab and click the Ass button. Inofrmation is then displayed to guide you through the process.

3.6.2 STARTING THE PROGRAM

If your computer is running the Windows operating system, double click the icon for the program. If the program des not run properly, Windows must be exited and the program run from the DOS prompt. When running it from the DOS prompt, make sure the current directory is the one containing the program and then type 2000PGMR to start the program.

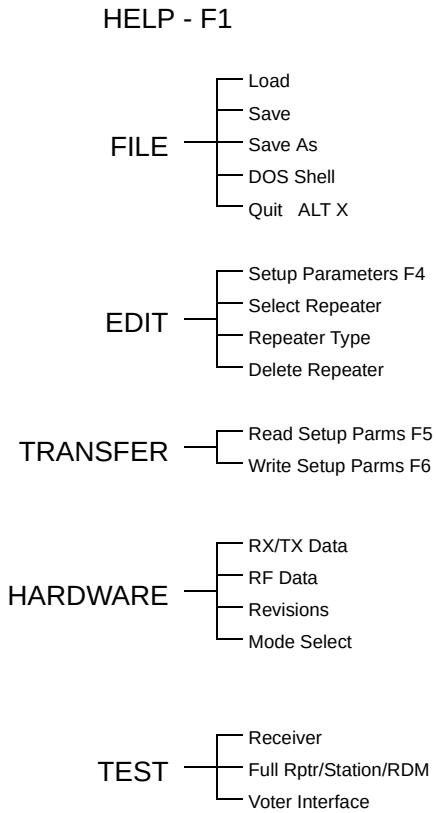


Figure 3-2 PROGRAMMING FLOWCHART

3.7 2000 RDM PROGRAMMER

When the program is loaded into the computer and executed, the menu shows the files available from the directory. The program is used to Create, Edit, Transfer and Receive the repeater and channel parameters described in Section 3.10.8.

I M P O R T A N T

The commands and displays referred to in this Section are for the IBM PC and may differ from IBM compatible. Refer to the computer's operating system manual for command explanations.

3.8 ALIGNMENT SOFTWARE

The software for the RDM programs the Interface Board to open and close the audio/data gates necessary for the alignment selected from the Test-Full Repeater menu. Under the menu heading Test are the alignment procedures for the 800 MHz Receiver (see Section 3.11), 900 MHz Receiver (see Section 3.12) and overall Full RDM (see Section 3.13) including the Interface Board (see Figure 3-3).

Refer to Section 3.11 for Alignment Procedures as shown in the program, alignment points diagrams and test setup diagrams.

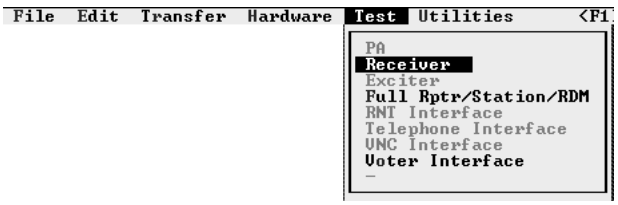


Figure 3-3 RDM TEST MENU

3.9 HELP F1

Help screens are available for most parameters and options in this program. Whenever a parameter or options clarification is needed, press F1 and if a help screen is available it will pop-up on the screen. Press Escape <ESC> to exit the pop-up screen.

3.10 PULL DOWN MENUS

3.10.1 MENU DISPLAYS

The menus available are listed at the top of the screen. Move the cursor with the arrow keys to highlight the menu name. Press Enter to view the menu and the arrow keys to scroll through the menu. Call up the highlighted selection by pressing Enter.

3.10.2 FILE MENU

This menu manipulates new or existing files into directories and saves files to be called up at another time.

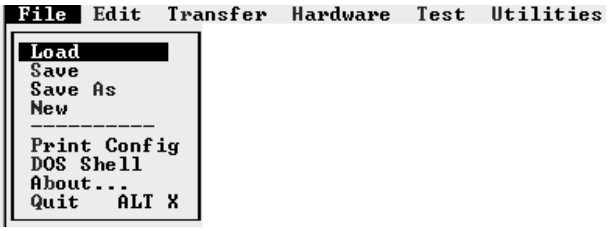


Figure 3-4 FILE MENU

Load

Load reads information from a stored file. The program requests the filename to be loaded into the buffer. The filename from a disk can be entered in the highlighted area. Then move the cursor down with the arrow key and highlight "Ok" and press Enter. To select an existing file, use the arrow keys to move down the menu list and press Enter when the highlighted filename is the file to load.

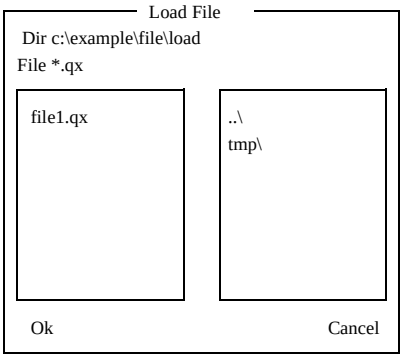


Figure 3-5 LOAD FILE

Save

This saves the edited version of an existing file loaded in the buffer under the same filename in the directory and deletes the old file. Loads a new file created in the Edit menu into the directory.

Save As

Use Save As to edited version of an existing file loaded in the buffer under a new filename or give a new file created in the Edit menu a filename.

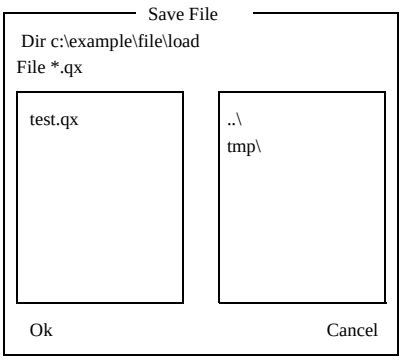


Figure 3-6 SAVE FILE

Print Repeater Configuration

Select the destination for the configurations.

Printer - Prints to printer connected to PC.
File - Writes printable test to selected filename.

Select which RDM data will be printed.

All RDMs - Prints the data for all valid RDMs.
Single RDM - Print the data for the entered RDM number.

NOTE: A list of valid RDMs can be seen under the Edit-Select Repeater menu selection.

DOS Shell

Temporarily suspends the program and returns to DOS. Directories and other DOS commands can be performed. To return to the program from DOS, type EXIT and press Enter.

Quit (ALT X)

Quit exits the RDM program and returns to DOS. Be sure all files are saved before exiting the program.

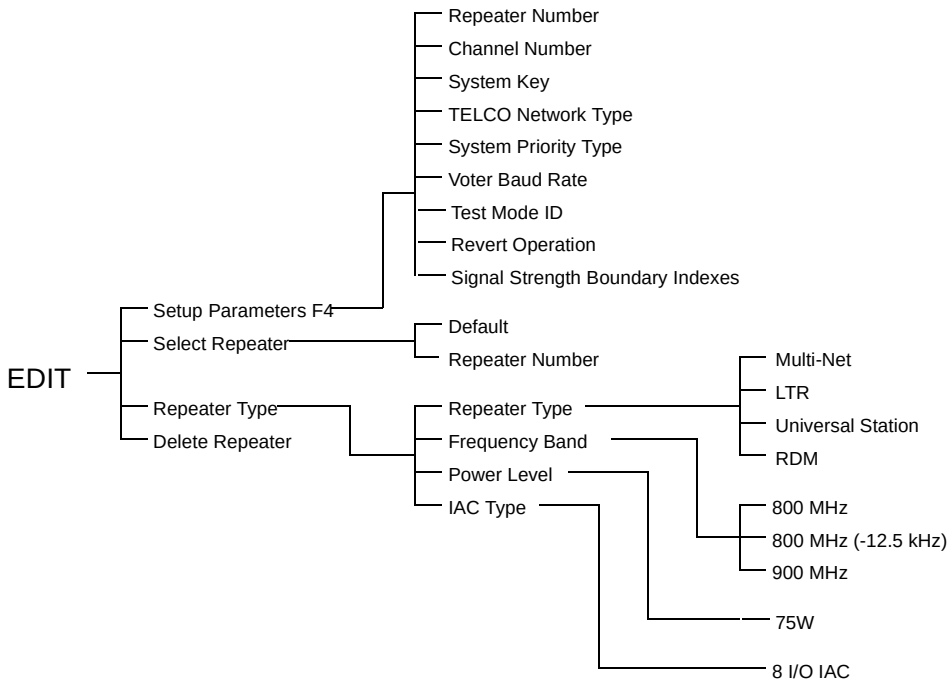


Figure 3-7 EDIT PROGRAMMING FLOWCHART

3.10.3 EDIT

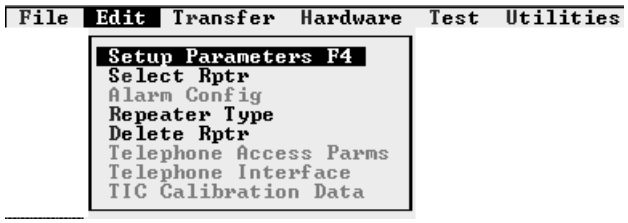


Figure 3-8 EDIT MENU

This menu is used to create new files and set or change the RDM operating parameters. The filename for the RDMs in this file is shown in the lower left corner of the screen.

RDM Setup Parameters

This programs the RDM parameters and options of each RDM at a Site. The following paragraphs explain the parameters that are set by this screen (see Figure 3-9) and give a brief description of each.

NOTE: The parameters are shown in the lower left of the pop-up screen for reference.

Repeater Number

Each RDM is programmed with a repeater number from 1-30 for Multi-Net or 1-20 for LTR. Number selection can be arbitrary as long as each RDM is assigned a different number. However, make sure that this number agrees with the Home repeater number programmed in the mobiles assigned to that Home repeater and also with the repeater number assigned in the Channel Interface Module (CIM) in the Switch.

Channel Number

Each RDM is programmed with a number of the channel that it is operating on (1-399 900 MHz Systems or 1-920 800 MHz Systems). If the operating frequency of a RDM is changed, this channel number must also be changed.

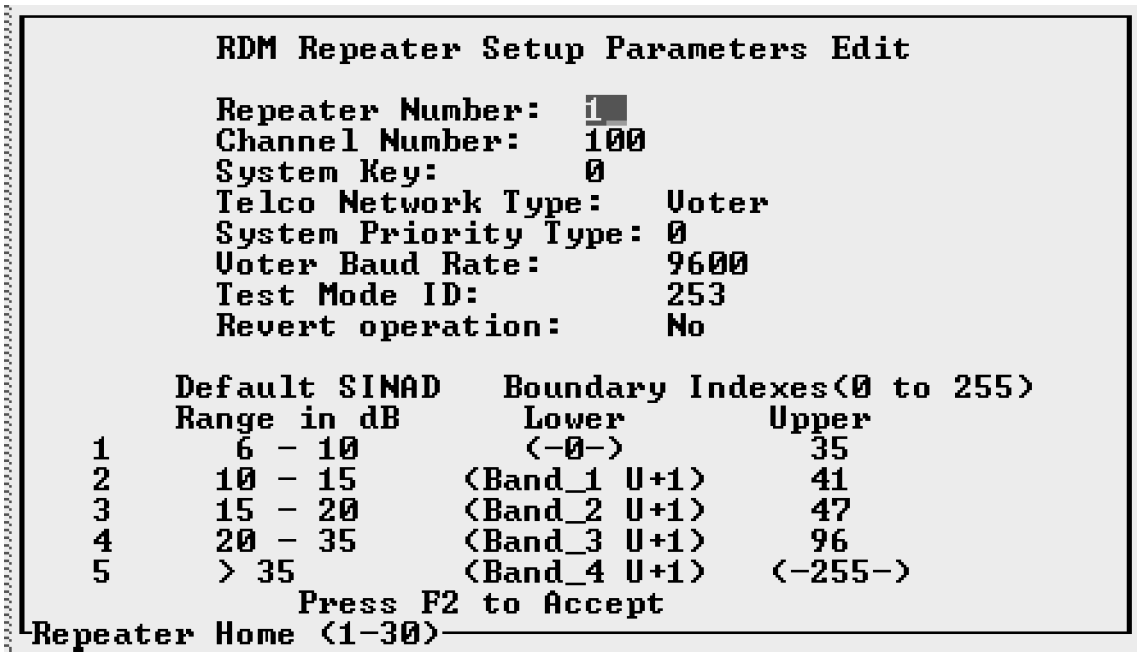


Figure 3-9 RDM REPEATER SETUP PARAMETERS SCREEN

System Key

The system RDMs and all mobiles are programmed with a unique System Key. The function of the System Key is to ensure that only authorized users can access a Multi-Net system. The RDM System Key is programmed at the factory, and the mobile system key is programmed into the transceiver by the system operator. The System Key is a number which is used by both the RDMs and the mobiles to encode the data stream. Unless both are programmed with the proper key, communication is not possible. The System Key is provided to the system operator by the E.F. Johnson Company.

Telco Network Type

CIM to RDM voter data signaling.

System Priority Type

Each RDM determines the current system priority on its channel. The current priority is then transmitted to its mobiles with other control information. The system priority received from the Home repeater and the access priority programmed into each mobile determines if a mobile can access the system at that time.

None. No priority is when all mobiles have equal preference in accessing the system because priority 5 is always transmitted by the repeater.

Reserved Channel. The last available channel is reserved for exclusive use by Priority 1 mobiles. Therefore, when only one channel is free, a system priority number of "1" is transmitted by the repeater.

Next Channel. This priority comes on line only when all channels in the system are busy. A timed sequence of access priority is stepped through when a channel does become available. Priority 1 mobiles are given immediate access, and then 0.5 second later, priority 2 mobiles are given access, and so on until 2 seconds later when priority 5 mobiles are given access. A mobile programmed with a priority number equal to or greater than the current priority status can always immediately access the system. If a second channel becomes available during the countdown sequence, all mobiles have immediate access.

Both Reserved and Next Channel. This is a combination of the Next Channel and Reserved Channel priority schemes. When only one repeater is free, it is reserved for exclusive use by Priority 1 mobiles. When two channels are free, immediate access is given to both Priority 1 and 2 mobiles. Then, if two repeaters remain free for 0.5 second, the stepped access begins. Priority 3 mobiles are given first access, followed by Priority 4 mobiles at the 1-second point, and Priority 5 mobiles at the 1.5-second point. If during this time, only one repeater is again free, stepped access halts and only Priority 1 mobiles have access. However, if a third repeater becomes available, all mobiles have immediate access.

Voter Baud Rate

This is the selectable data rate for voter data, 2400 or 9600 baud.

Test Mode ID

The Group ID that is transmitted when the Repeater is in the Test Mode. Mobiles with the same Group ID can communicate with the Repeater in the Test Mode. The Group IDs are from 1-225, 0 = disabled, the default for Test Mode is 253.

Revert Operation

The revert operation is selected if the RDM local site has a revert board.

Signal Strength Boundary Indexes

The signal strength boundary indexes define the boundary points of four contiguous bands in the range of possible signal strength values. Four indexes are entered to divide the 5 bands (the outside limits are fixed). The four values must be in ascending order in the range from 0-255. Default values are:

	Lower	Upper
1. Squelched	0	35
2. Weakest	36	41
3.	42	47
4.	48	96
5. Strongest	97	255

Select Repeater

Select the repeater number to be programmed or edited from the pop-up menu (see Figure 3-10). Move the cursor with the arrow keys to highlight the repeater number and press Enter.

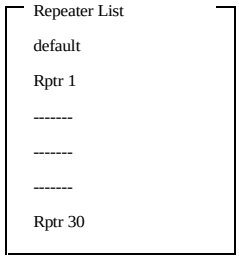


Figure 3-10 REPEATER LIST

Repeater Type Selection

This screen (see Figure 3-11) selects the repeater type (Multi-Net signaling protocol and features):

Frequency Band	800 MHz	
	800 MHz [-12.5 kHz]	
	900 MHz	
Power Level		75W
IAC Type		4 I/O IAC

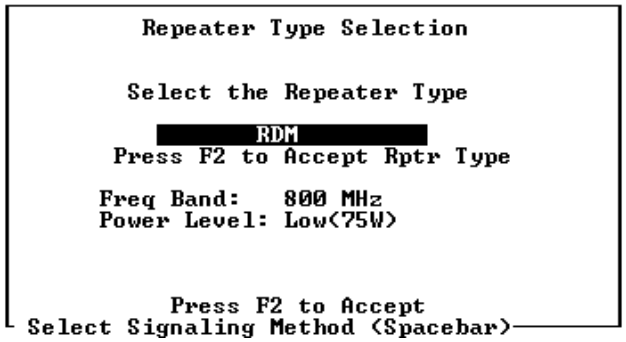


Figure 3-11 REPEATER TYPE SELECTION

Delete Repeater

Figure 3-12 DELETE REPEATER

3.10.4 TRANSFER

Figure 3-13 TRANSFER MENU

Write Setup Parameters

This command sends the contents of a file to the repeater and programs the EEPROM memory in the Main Processor Card (MPC).

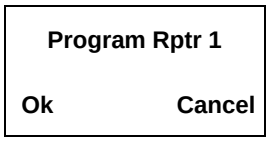


Figure 3-14 WRITE SETUP PARAMETERS

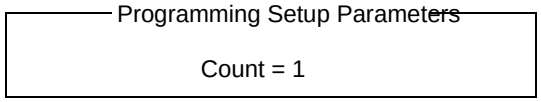


Figure 3-15 PROGRAM WRITE SETUP

Read Setup Parameters

This command reads the contents of the EEPROM memory of a repeater and loads it into a buffer. The contents of the buffer is then displayed to show the programming of the repeater.

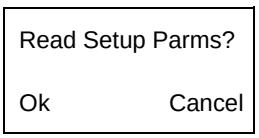


Figure 3-16 READ SETUP PARAMETERS

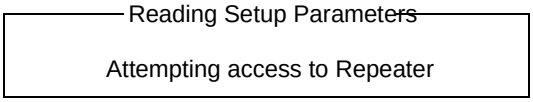


Figure 3-17 READING SETUP

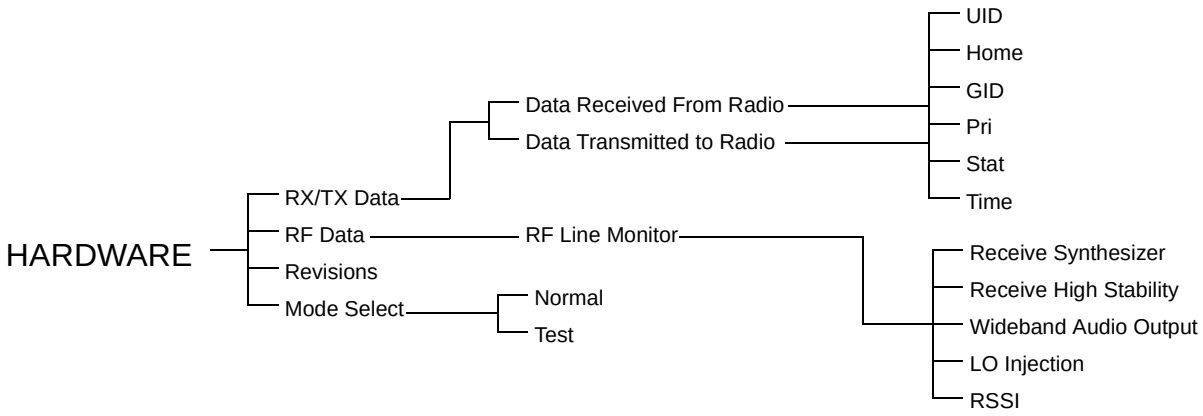


Figure 3-18 HARDWARE PROGRAMMING FLOWCHART

3.10.5 HARDWARE

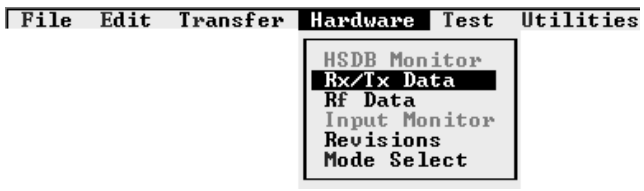


Figure 3-19 HARDWARE MENU

Receive/Transmit Data

This is an information screen used at the RDM site while the computer (laptop) is connected to the Interface Board of the RDM being monitored. This information is contained in the data message exchanged between the RDM and the destination user (mobile or Switch). The message contains data received from the destination and data sent to the mobile by the repeater. The repeater receives the destination's: Unique ID, Home Repeater Number, Group ID, Priority, Status and Time Stamp. This same information is sent to the destination in the update message from the repeater. The time stamp is included because messages are sent continually and this provides a reference for when a data exchange took place.

RF Data

The A/D Monitor Screen shows the state of the lines (see Figure 3-20). These lines are being monitored by the A to D converter on the RDM Interface board. The normal values for each line are defined as follows.

Synthesizer Lock Lines	Yes or No
Wideband Audio Output	approx 200
LO Injection	approx 250
RSSI	20-150

NOTE: For an 800 MHz RDM, the Receiver High Stability RF Line Monitor will indicate a Yes condition.

Values with no label are the actual A to D reading.

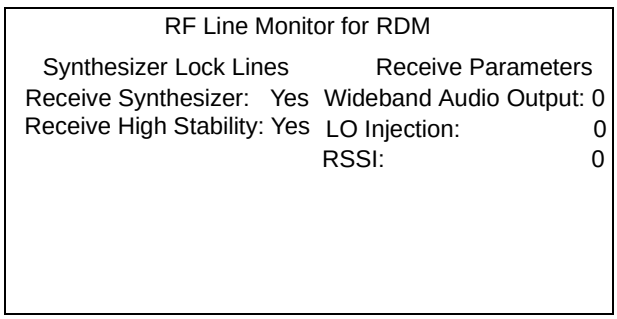


Figure 3-20 RF LINE MONITOR FOR RDM

Revision/Version

The Revision/Version is displayed for the repeater modules. The format for all modules is R.V. (revision.version). The MPC information also includes the software release date and the repeater serial number (see example in Figure 3-21).

Repeater Version Display

Repeater Number: 1

HSDB: 00.020 MAC: 0.00 TIC: 0.00

MPC/TPI/RDM: 1.0 02/15/96 21
Serial Number: 1234567891234567

Figure 3-21 REVISION/VERSION

Mode Select

The Mode Select screen places the repeater either in the normal mode or the test mode. In the Normal mode the repeater operates as a normal repeater.

In the Test mode the repeater transmits a test word. This test word is the Test Mode ID set up in the Setup Parameters (see Table 3-2). While in the test mode the repeater is "busy", therefore it is important to place the repeater in Normal mode when the test mode is no longer required.

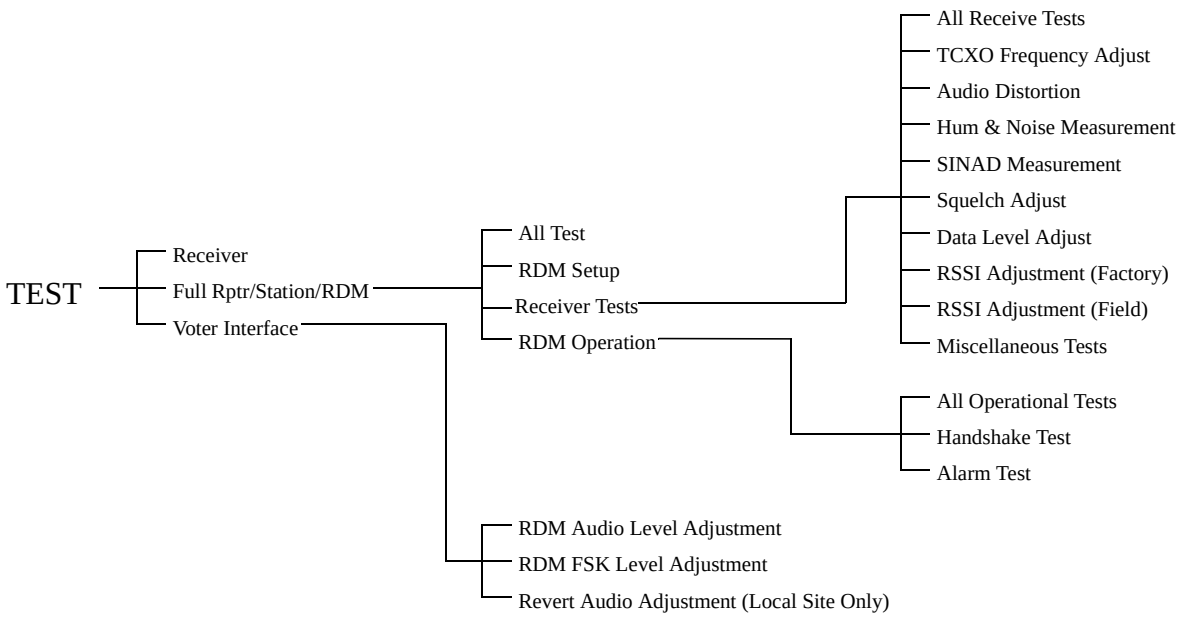


Figure 3-22 TEST PROGRAMMING FLOWCHART

3.10.6 TEST

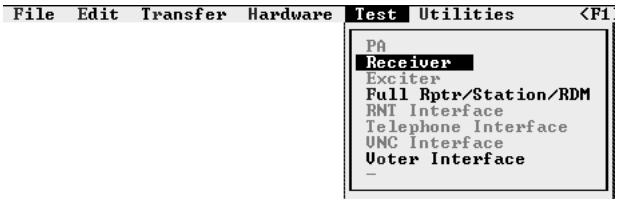


Figure 3-23 TEST MENU

Receiver

This menu selection walks through the alignment of the receiver on the computer screen. Refer to Sections 3.11 and 3.12 for the Receiver alignment in this manual and Figures 3-30, 3-31 and 3-32 for an alignment points diagram and Figures 3-36 and 3-37 for the Receiver Test Setup.

Full RDM

This menu selection walks through the alignment of the entire repeater. The Receiver and Exciter portions are performance tests and adjustments. The Audio and Data portions are level adjustments for the RDM Interface Board. Refer to Figure 3-35 for an alignment points diagram for the Interface Board.

RDM To Voter Interface

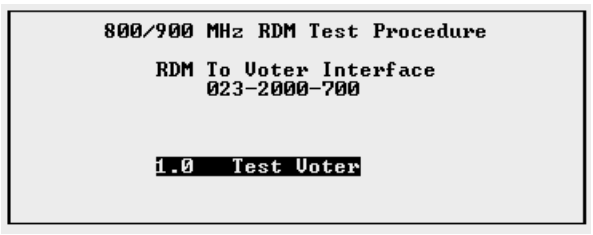


Figure 3-24 RDM TO VOTER INTERFACE

This menu selection walks through the alignment of the connection between the Repeater and the associated CIM in the Switch.

3.10.7 UTILITIES

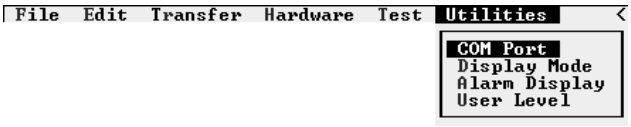


Figure 3-25 UTILITIES MENU

COM Port

This is the COM port used to send and receive data from the Repeater MPC. An interface cable connects the Repeater to the computer (see Figure 3-27).

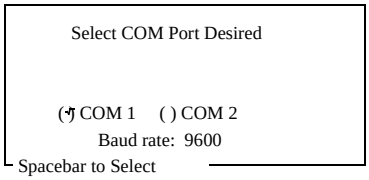


Figure 3-26 COM PORT SELECTION

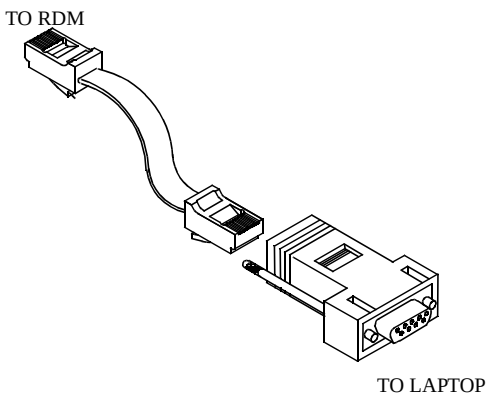


Figure 3-27 LAPTOP INTERCONNECT CABLE

Display Mode

This screen allows the color mode to be selected for color monitors. When using a laptop, monochrome is recommend for better resolution.

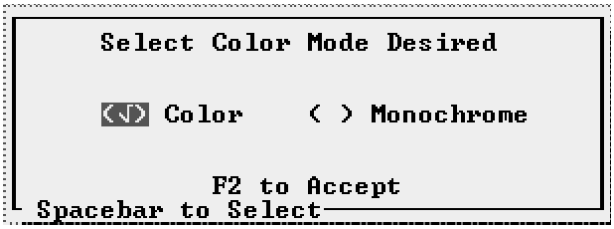


Figure 3-28 COLOR MODE SELECTION

Alarm Display

This screen displays a scrolling list of alarms generated by the repeater.

User Level

There are two levels to choose from, Novice and Advanced. The Novice uses prompts in the Edit-Parameters screens when Escape or F2 keys are pressed that ask "are you sure" before the task is executed. The Advanced selection performs the task without asking the question.

3.10.8 REPEATER PROGRAMMING

Creating A New File

An example will be used to show the programming for a new file created for Site 1.

NOTE: At any point in the programming sequence, if F1 is selected, a help screen appears to explain the menu selection highlighted at that point.

Select Repeater To Edit

A repeater is selected to program. When no file exists with programmed repeaters, the default is selected and edited.

1. Highlight EDIT, press Enter.
2. Highlight SELECT REPEATER, press Enter.
3. Default is the only repeater in this list, press Enter.
4. Highlight EDIT, press Enter.
5. Highlight SETUP PARAMETERS, press Enter.
6. The Setup Parameters screen appears (see Figure 3-29). Fill in the parameters for this repeater. A brief description of the parameters is in Table 3-2. Full descriptions are in Section 3.10.3.
7. Select parameters, press F2 to accept.
8. Highlight EDIT, press Enter.
9. Highlight FILES, press Enter.
10. Highlight SAVE, press Enter.
11. Type in a valid DOS filename. For this example site1.dat is used.
12. The file consists of default and repeater one under the filename of site1.dat.

Adding A Repeater To A File

The example used for Site 1 will again be used to add repeaters to the filename site1.dat.

1. Highlight EDIT, press Enter.
2. Highlight SELECT REPEATER, press Enter.
3. The repeater list shown for this file includes default and repeater one. These contain the same parameters with the exception that when selected for edit the programmed repeater can be overwritten and the data lost.
4. Highlight DEFAULT, press Enter.
5. Highlight EDIT, press Enter.
6. Highlight SETUP PARAMETERS, press Enter.
7. Change the Repeater number and other parameters as required for this repeater, press F2.
8. Highlight EDIT, press Enter.
9. Highlight FILES, press Enter.
10. Highlight SAVE, press Enter.
11. Repeater 2 is added to the Repeater List in file site1.dat.

Table 3-2 RDM SETUP PARAMETERS

Parameter	Response	Description
Repeater Number	1-30 Multi-Net	Each repeater is assigned a Home Repeater number from 1-30 for Multi-Net.
Channel Number	1-920 800 MHz 1-399 900 MHz	Each repeater is programmed with a number of the channel that it is operating on.
System Key	0-65535	The System Key number ensures only authorized users can access a Multi-Net system. Mobiles are programmed with the same System Key.
Telco Network Type	Voter	
System Priority Type	None Reserved Channel Next Channel Both	None - All mobiles have priority 5. Reserved Channel - Last available channel is reserved for Priority 1. Next Channel - Priority 1 is transmitted when all channels are busy. A timed sequence of access priority is stepped through when a channel becomes available. Both - Reserved Channel and Next Channel priority schemes. 1 Channel free reserved for Priority 1. 2 Channels free; timed sequence of access priority begins.
Voter Baud Rate	2400, 9600	Select the baud rate to use in the voter system.
Test Mode ID	0 = disabled 1-250, 253 (default)	Select the Group ID that will be transmitted when the repeater is in the test mode.
Revert Operation	Yes, No	Select this operation if RDM local site with revert board.
Signal Strength Boundary Indexes		The Signal Strength Boundary Indexes define the boundary points of four contiguous bands in the range of possible signal strength values. Four indexes are entered to divide the 5 bands (the outside limits are fixed). The four values must be in ascending order in the range from 0-255. Default values are: Lower Upper 0. Squelched 0 35 1. Weakest 36 41 2. 42 47 3. 48 96 4. Strongest 97 255

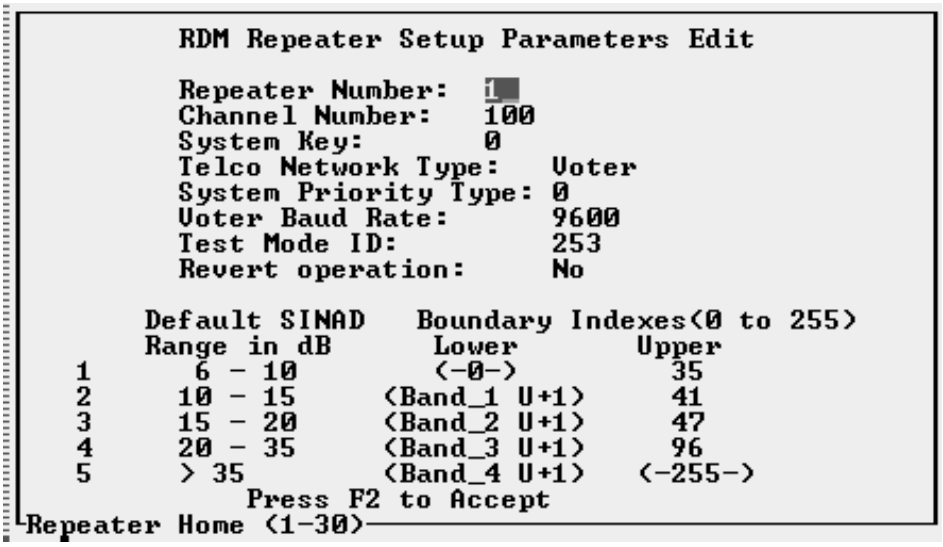


Figure 3-29 SETUP PARAMETERS

3.11 800 MHz RECEIVER ALIGNMENT

C R I T I C A L A D J U S T M E N T

The TCXO must be adjusted within 5 minutes of turning the power on to the RDM. Do not under any circumstances try to set frequency later on in any of the tests, as TCXO frequency stability cannot then be guaranteed.

Refer to Figure 3-30 or 3-31 for component locations. Refer to Figure 3-36 for equipment needed and setup diagram.

3.11.1 PRE-TEST

1. Preset L201, L203, L204, L206, L223 and L224 tuning screws about 1/4 inch above the top of the casting.

2. Preset L202 and L205 tuning screws just barely above the tightening lock nuts.

Apply power to the Receiver by plugging the 20-pin cable from the RF Interface Board into J201 (see Figure 3-30 or 3-31).

Measure the voltages at the following pins.

U206, pin 1 - +12V DC ±0.4V
U207, pin 1 - +12V DC ±0.4V
U208, pin 1 - +6V DC ±0.2V
R309/R310 junction - +3.5V DC ±0.1V

3.11.2 PROGRAM TUNE-UP CHANNEL

1. Using the PC and software, program the Synthesizer for the Receive channel number.

2. Tune the VCO helical L220 for +4.5V DC ±0.05V on U209, pin 6 or TP2.

3. Alternately tune L223 and L224 in 1/2-turn to 1-turn increments until a voltage is measured on J201, pin 13 or TP5. At that time, tune L223 for a peak, then L224 for a peak.

4. Retune L223 and L224 for a peak at TP5.

NOTE: The Channel Number, Channel Frequency and Synthesizer Frequency appear at the bottom of the screen.

3.11.3 TCXO FREQUENCY ADJUST

1. Place a pick-up loop (sniffer) or RF probe connected to a frequency counter near L210.

2. Set Y201 (TCXO) for the Injection Frequency ±50 Hz (Inj Freq = chnl freq - 52.95 MHz).

3.11.4 VCO TEST

1. The software programs the synthesizer for 3 MHz **above** the Receive Channel.

2. The voltage on TP2 should be < 7.5V.

3. Record the voltage on J201, pin 13 _____.

4. The software programs the synthesizer for 3 MHz **below** the Receive Channel.

5. The voltage on TP2 should be > 2V.

6. Record the voltage on J201, pin 13 _____.

7. If the voltages recorded in Steps 3 and 6 are not within ±0.2V, tune L224 as required to balance the voltage readings.

8. The software programs the synthesizer for the Receive Channel.

3.11.5 FRONT END ADJUSTMENTS (REV. 5)

REVISION 5 OR EARLIER BOARDS

1. Set the signal generator to the Receive Channel at a level sufficient to produce an output voltage on J201, pin 7 (RSSI Output).

2. Tune L204, L205, L206, L201, L202, L203 and L204 for a peak voltage on J201, pin 7. Decrease the generator output level to maintain a 2-3V reading at J201, pin 7.

3. Set the generator for 1000 µV into the receiver with a 1 kHz tone at ±3 kHz deviation (100 µV at the receive antenna with 20 dB pad at the generator).

4. Tune Z213 for 2V ±0.05V on TP4.

5. Tune R264 for 387 mV RMS, ±5 mV RMS, on TP4.

6. Repeat Steps 4 and 5.

7. Measure the distortion on TP4.

8. Tune L207, L209, L211 and L225 for minimum distortion <5%, (typically <3%).

9. Repeat Step 8 then Steps 4, 5 and 6.

3.11.6 FRONT END ADJUSTMENTS (REV. 6)

REVISION 6 BOARDS

1. Set the signal generator to the Receive Channel at a level sufficient to produce an output voltage on J201, pin 7 (RSSI Output).

2. Tune L204, L205, L206, L201, L202, L203 and L204 for a peak voltage on J201, pin 7. Decrease the generator output level to maintain a 2-3V reading at J201, pin 7.

3. Set the generator for 1000 µV into the receiver with a 1 kHz tone at ±3 kHz deviation (100 µV at the receive antenna with 20 dB pad at the generator).

4. Adjust the Quad Detector Coil Z213 for 2V DC on U202, pin 9.

5. Adjust R264 for 387 mV RMS on J201, pin 9 (TP4).

6. Adjust R282 for 2V DC ±0.05V on J201, pin 9 (TP4).

7. Measure the distortion on TP4.

8. Tune L207, L209, L211, L225, C373 and C375 for minimum distortion <5%, (typically <3%).

9. Repeat Step 8 then Steps 4, 5 and 6.

3.11.7 AUDIO DISTORTION

1. Plug a 16 ohm load at J204 on the RDM.

2. Connect a distortion analyzer to the 16 ohm load.

3. Measure the distortion of the receive audio at J204 on the RDM with the local volume control set to 2.8V RMS.

4. The reading should be < 3% (typically <1%).

5. Measure receive sensitivity at J204 on the RDM.

6. The reading should be < 0.35 µV (typ. 0.25 µV).

7. The software programs the synthesizer for 3 MHz **above** the Receive Channel.

8. Receive sensitivity should be less than 0.35 µV (typically less than 0.30 µV).

9. The software programs the synthesizer for 3 MHz **below** the Receive Channel.

10. Receive sensitivity should be less than 0.35 µV (typically less than 0.30 µV).

11. The software programs the synthesizer for the Receive Channel.

12. Set the generator to the Receive Channel and adjust the level for 15 dB SINAD.

13. Adjust R261 for 0.8V DC ±0.02V DC at TP3 (RSSI).

14. Repeat Steps 4 and 5.

15. Measure the distortion on TP4.

16. **On Revision 5 or earlier boards:** Tune L207, L209, L211 and L225 for minimum distortion <5%, (typically <3%).

    On Revision 6 boards: Tune L207, L209, L211, L225, C373 and C375 for minimum distortion <5%, (typically <3%).

17. Repeat Step 8 then Steps 4, 5 and 6.

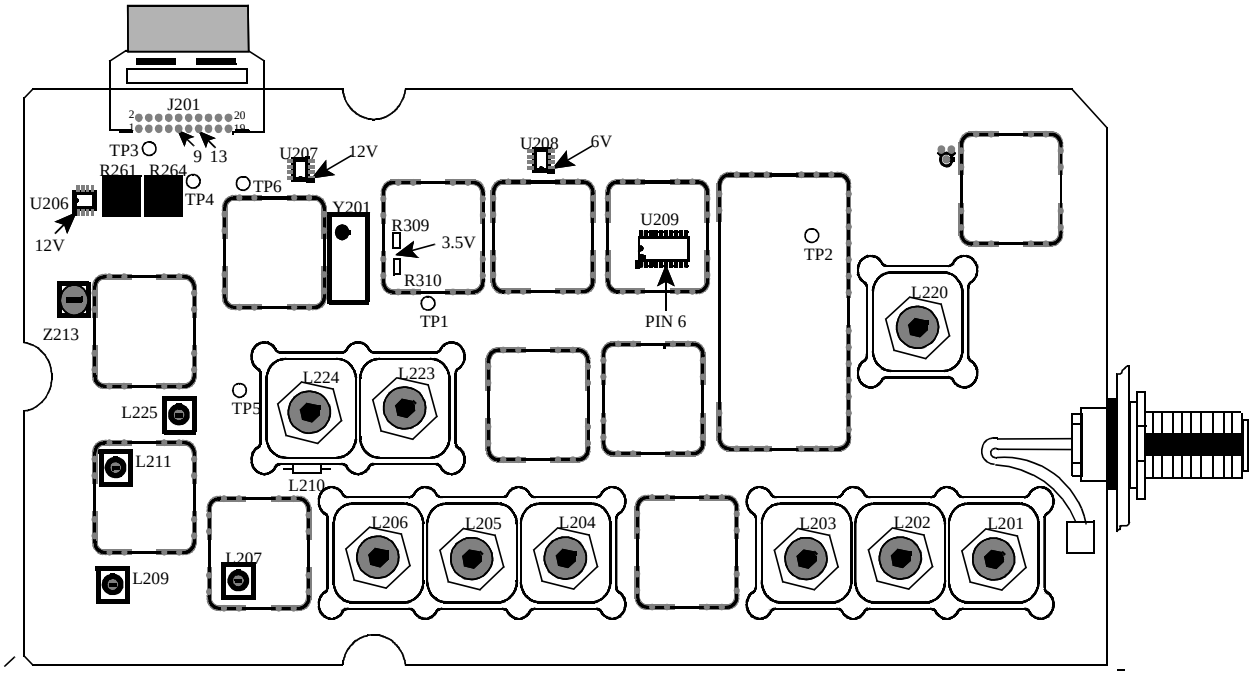


Figure 3-30 800 MHz RECEIVER ALIGNMENT POINTS (REVISION 5 OR EARLIER)

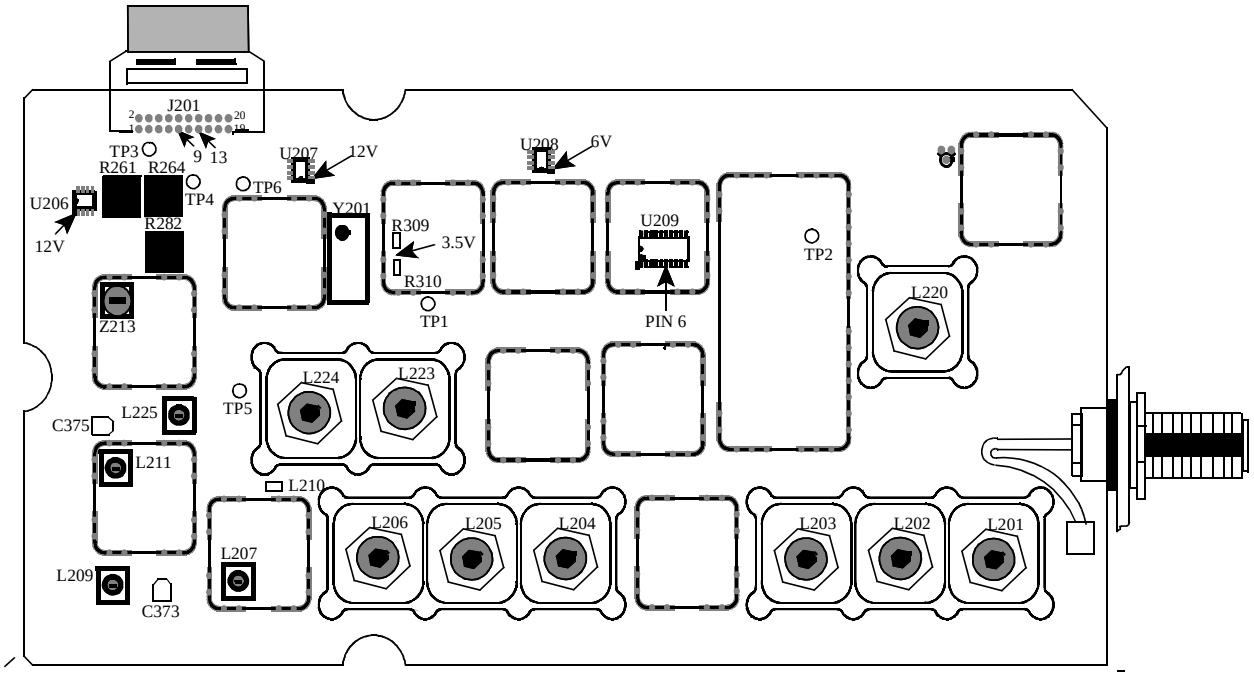


Figure 3-31 800 MHz RECEIVER ALIGNMENT POINTS (REVISION 6)

3.12 900 MHz RECEIVER ALIGNMENT

The receiver frequencies are locked to the 1.250000 MHz reference frequency from the local oscillator drawer. This frequency is stable to within ±0.1 PPM from -30°C to +60°C as required by the FCC. To properly align the IF sections of the receiver, the signal generator must have similar stability. Since most test equipment is not this stable, a separate reference oscillator that is stable to ±0.05 or ±0.01 PPM may be needed to clock the signal generator and frequency counter.

Adjustment of the 1.250000 MHz reference frequency probably should not be attempted for the same reason. Unless the communications monitor has a stability of ±0.01 PPM or better, the repeater frequency may be more correct than that of the monitor. If it is certain that one or both oscillators in the local oscillator drawer are off frequency, there is an adjusting screw on the oscillators that is used to change the frequency slightly. Adjustment should only be performed when the ambient temperature is near the calibration reference of 25°C (77°F).

If power is removed from the local oscillator drawer, the oscillators require a minimum restabilization period of 30 minutes. No frequency-critical adjustments should be attempted until the oscillator frequency has stabilized.

Refer to Figure 3-32 for component locations. Refer to Figure 3-37 for equipment needed and setup diagram.

3.12.1 PRE-TEST

1. Preset L201, L202, L203, L204, L206, L223 and L224 tuning screws about 1/4 inch above the top of the casting.

2. Preset L202 and L205 tuning screws so they are just barely above their tightening lock nuts.

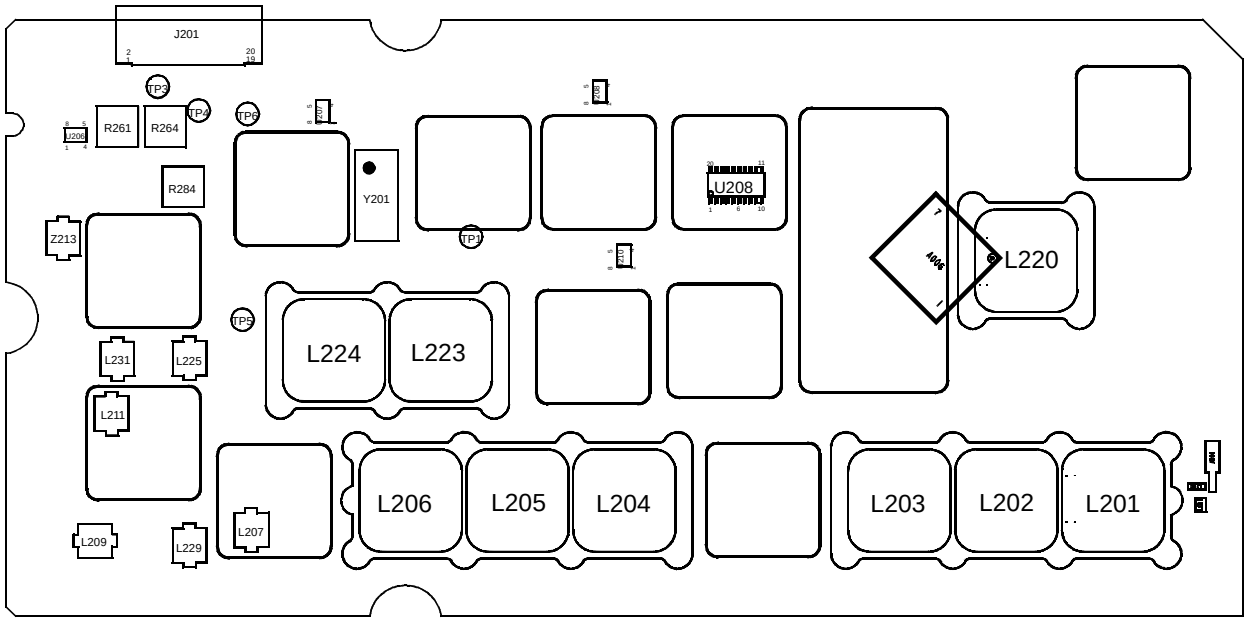


Figure 3-32 900 MHz RECEIVER ALIGNMENT POINTS

3.12.2 VOLTAGE MEASUREMENTS

Apply power to the Receiver by plugging the 20-pin cable from the RF Interface Board into J201 (see Figure 3-32).

Measure the voltages at the following pins.

U206, pin 1	+12V DC ±0.4V
U207, pin 1	+12V DC ±0.4V
U208, pin 1	+6V DC ±0.2V
U210, pin 1	+12V DC ±0.4V

3.12.3 PROGRAM TUNE-UP CHANNEL

1. Using the PC and software, program the Synthesizer for the Receive channel number.

2. Tune the VCO helical L220 for +4.5V DC ±0.05V on U209, pin 6 or TP2.

3. Alternately tune L223 and L224 in 1/2-turn to 1-turn increments until a voltage is measured on J201, pin 13 or TP5. At that time, tune L223 for a peak, then L224 for a peak.

4. Retune L223 and L224 for a peak at J201, pin 13.

NOTE: The Channel Number, Channel Frequency and Synthesizer Frequency appear at the bottom of the screen.

3.12.4 TCXO FREQUENCY ADJUST

1. Tune Y201 (TCXO) for 3.5V DC ±0.05V at TP1 (response time is very slow).

2. Place a pick-up loop (sniffer) or RF probe connected to a frequency counter near L210.

3. Verify the Injection Frequency ±90 Hz (Inj Freq = chnl freq - 52.95 MHz).

3.12.5 VCO TEST

1. The Synthesizer is programmed for 199 channels **above** the Receive Channel.

2. The voltage on U209, pin 6 (TP2) should be < 7.5V DC.

3. Record the voltage on J201, pin 13 (TP5) ____.

4. The Synthesizer is programmed for 199 channels **below** the Receive Channel.

5. The voltage on U209, pin 6 (TP2) should be > 2V DC.

6. Record the voltage on J201, pin 13 (TP5) ____.

7. If the voltages recorded in Steps 3 and 6 are not within ±0.2V, tune L224 as required to balance the voltage readings.

8. The Synthesizer is reprogrammed for the Receive Channel.

3.12.6 FRONT-END ADJUSTMENTS

1. Set the signal generator to the Receive Channel at a level sufficient to produce an output voltage on J201, pin 7 (TP3) (RSSI Output).

2. Tune L204, L205, L206, L201, L202, L203 and L204 for a peak voltage on J201, pin 7 (TP3). Decrease the generator output level to maintain a 2-3V reading at J201, pin 7.

3. Set the generator to 1000 µV with a 1 kHz tone at ±1.5 kHz deviation (100 µV at the Rx antenna with 20 dB pad on the generator).

4. Adjust the Quadrature detector coil (Z213) for 2V DC on U202, pin 9.

5. Adjust R264 for 387 mV RMS, ±5 mV RMS, on J201, pin 9.

6. Adjust R284 for 2V DC ±0.05V DC on J201, pin 9 (TP4).

7. Set generator to the channel frequency (±1.5 kHz deviation at 1 kHz tone) at a level that produces 2V DC on J201, pin 7 (TP3 RSSI).

8. Tune L207, L209, L211 and L225 (and C373/C375 if installed) for peak voltage on J201, pin 7 (TP3). Decrease the generator output level to maintain 2-3V DC. Distortion should be <5% (typically < 3%).

9. Repeat Steps 4, 5 and 6.

3.12.7 AUDIO DISTORTION

1. Plug a 16 ohm resistive load at J204 on the RFIB and connect a distortion analyzer to the load.

2. Measure the distortion of the receive audio at J204 on the MAC with the local volume control set to 2.8V RMS.

3. The reading should be less than 3% (typically < 1%).

4. Measure receive sensitivity at J204 on the Interface Board.

5. The reading should be < 0.35 µV (typically < 0.25 µV).

6. The Synthesizer is programmed for 199 channels **above** the Receive Channel.

7. The receive sensitivity should be < 0.35 µV (typically < 0.3 µV).

8. The Synthesizer is programmed for 199 channels **below** the Receive Channel.

9. The receive sensitivity should be < 0.35 µV (typically < 0.3 µV).

3.13 FULL RDM - ALL TEST

1. Select the TEST - FULL RDM - ALL TEST and press Enter.

NOTE: All audio generators and audio voltmeters are unbalanced unless specifically stated otherwise.

3.13.1 VOLTAGE MEASUREMENTS

Disconnect the receiver-to-interface cable (20-pin) from J201 of the interface board.

Measure the voltages at the following pins.

U221, pin 1 +12V DC ±0.4V
U223, pin 2 +9V DC ±0.4V
U224, pin 2 +5V DC ±0.2V
U204, pin 7 +1.25V DC ±0.06V
Junction of L202/C279 -0.5V DC ±0.4V

Apply power to the Receiver by plugging the 20-pin cable from the Interface Board into J201 (see Figure 3-32).

3.13.2 RECEIVER FREQUENCY CHECK

1. Check the receiver injection frequency with a "sniffer" pickup loop, or RF probe and a suitable frequency counter placed near L210.

2. TCXO Adjustment

   Standard 800 MHz: Adjust Y201 for the Injection frequency (chnl freq-52.95 MHz) ±50 Hz.

   900 MHz and High Stability 800 MHz: Adjust Y201 for 3.5V DC (±0.05V) at TP1 (response time is very slow).

Receiver Audio Distortion Measurement

1. Adjust the RF generator for 100 µV into the receiver with a 1 kHz tone at ±3 kHz dev (±1.5 kHz for 900 MHz).

2. Adjust R207 for 0 dBm (775 mV RMS) at J210.

3. Connect a 16 ohm load and distortion analyzer to J204 of the Interface Board.

4. Adjust R262 for 2.8V RMS and measure the distortion. Distortion should be < 3%.

Receiver Hum and Noise Measurement

1. Adjust the RF generator for 100 µV into the receiver with a 1 kHz tone at ±3 kHz (1.5 kHz at 900 MHz).

2. Connect a 16 ohm load and distortion analyzer to J204 of the Interface Board.

3. Adjust R262 for 2.8V RMS.

4. Remove modulation from the RF generator. The measured level must be ≤ -45 dB.

Receiver SINAD Measurement

1. Adjust the RF generator for 100 µV into the receiver with a 1 kHz tone at ±3 kHz (1.5 kHz at 900 MHz).

2. Connect a 16 ohm load and distortion analyzer to J204 of the Interface Board.

3. Adjust R262 for 2.8V RMS.

4. Re-adjust RF level for 12 dB SINAD.
   12 dB SINAD reading should be ≤ 0.35 µV.

Receiver Squelch Adjustment

1. Adjust the RF generator for 100 µV into the receiver with a 1 kHz tone at ±3 kHz (1.5 kHz at 900 MHz).

2. Connect a 16 ohm load and distortion analyzer to J204 of the Interface Board.

3. Adjust R262 for 2.8V RMS.

4. Set the RF generator output for 5 dB SINAD.

5. Adjust R222 on the Interface Board so the Receiver just squelches.

6. Increase the RF generator output until the Receiver unsquelches. Reading should be
   ≤ 10 dB SINAD.

Receiver Data Level Adjustment

1. Adjust the RF generator for 100 µV into the receiver with a 100 Hz tone at ±1 kHz
   (0.8 kHz at 900 MHz).

2. Insert voltmeter probes into J202 on the Interface Board and connect to an AC voltmeter.

3. Adjust R235 to achieve 340 mV RMS.

Receiver RSSI Adjustment

NOTE: Use this procedure only when an audio analyzer is unavailable.

1. Adjust the RF generator for 0.29 µV into the receiver with a 1 kHz tone at ±3 kHz (1.5 kHz at 900 MHz).

2. Adjust R261 in the receiver for 0.8V DC (±0.02V DC) at TP3 for 800 MHz Receivers and 0.7V DC for 900 MHz Receivers.

Receiver Miscellaneous Tests (Optional)

Several additional tests may be performed on the Receiver as listed below:

- Signal Displacement Bandwidth
- Adjacent Channel Rejection
- Offset Channel Selectivity
- Intermodulation Rejection
- Spurious Rejection
- Audio Response
- Audio Sensitivity

Perform the Test desired using the appropriate RF Generators, modulation frequencies, levels, RS-232 levels and test probes following the latest TIA document measurement procedures.

Handshake Test

1. Program a Multi-Net, portable or mobile for the following parameters.

   Multi-Net
   Home Repeater - Same as repeater number.
   System Key - Same as repeater.
   Status Channel - Same as repeater channel.
   Home Channel - Same as repeater channel.
   Encode ID - 1
   Decode ID - 1
   UID - 1
   Site - 1

2. The RDM is in Normal Operation mode.

3. Key the radio several times on the programmed System/Group. Display should indicate “4” every time. (Proper Tx/Rx antenna connections are assumed.)

Alarm Test

1. The RDM is now in Normal Operation mode.

2. Verify the front panel display does not indicate any alarms (see Table 3-3).

Table 3-3 ALARMS

Display No.	Definition
0	Test Mode
1	Not Used
2	Normal Operation
3	Revert Operation
4	Receiving Data
5	Not Used
6	Not Used
7	Receive Synthesizer Out of Lock
8	High Stability Synth Out of Lock
9	Data Processor Failure
A	Not Used
B	Not Used
C	Downloading Code
D	Not Used
E	Erasing Code
F	Failure

3.13.3 VOTER INTERFACE

RDM Audio Level Adjustment

1. Adjust the RF generator for 100 µV into the receiver with a 1 kHz tone at ±3 kHz (1.5 kHz 900 MHz).

2. Connect a **balanced** AC voltmeter between J205, pin 2 and J206, pin 2. Connect a 600 ohm termination to the meter terminals or across J101, pins 5/6.

3. Adjust R271 on the Interface Board for the type of line.

   Leased Line/Direct Connect (default)
   -12 dBm (194 mV RMS)

   Microwave/T1 (optional)
   -28 dBm (31 mV RMS)

FSK Level Adjustment

1. Connect a **balanced** AC voltmeter between J205, pin 2 and J206, pin 2. Connect a 600 ohm termination to the meter terminals or across J101, pins 5/6.

2. Adjust R282 on the Interface Board for the type of line.

   Leased Line/Direct Connect (default)
   -12 dBm (194 mV RMS)

   Microwave/T1 (optional)
   -28 dBm (31 mV RMS)

Revert Audio Adjustment (Local Site Only)

1. Adjust the RF generator for 100 µV into the receiver with a 1 kHz tone at ±3 kHz (1.5 kHz 900 MHz).

2. With RVM installed, bring up the channel.

3. Measure and record the level at C704 on the Audio Revert Board _____ (see Figure 3-33).

4. With RVM removed, bring up the channel.

5. Adjust R702 on the Audio Revert Board for the same level as recorded in Step 3.

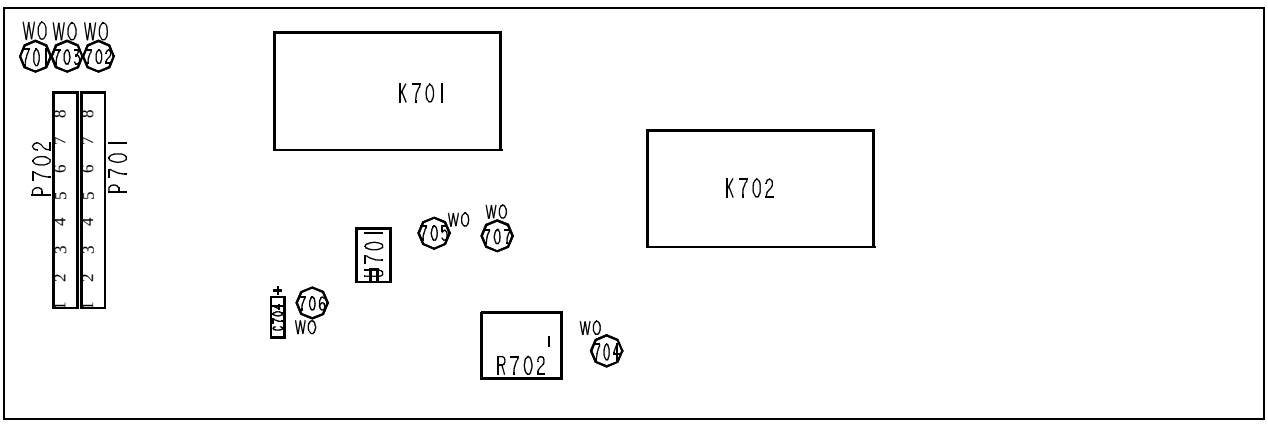


Figure 3-33 AUDIO REVERT BOARD ALIGNMENT POINTS

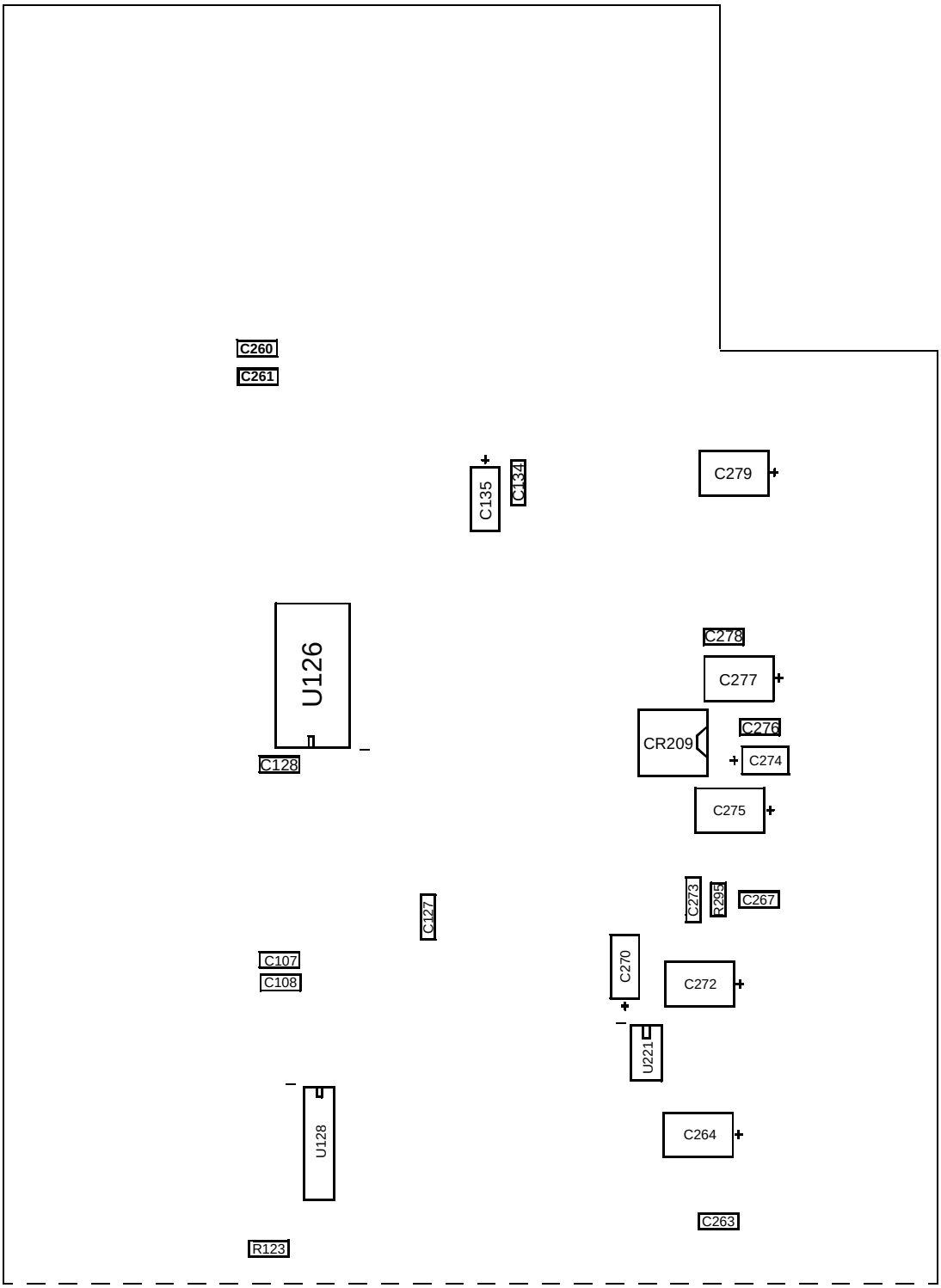


Figure 3-34 RDM ALIGNMENT POINTS (OPP COMP SIDE)

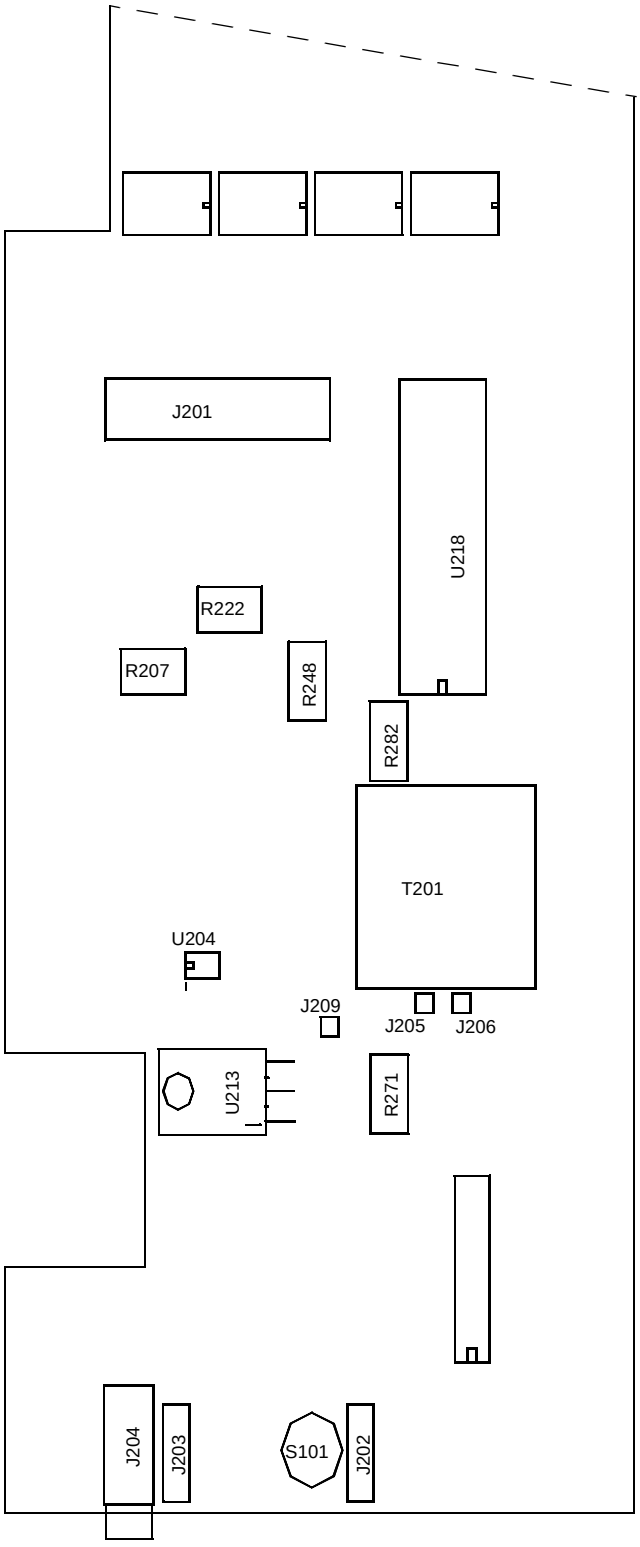


Figure 3-35 RDM ALIGNMENT POINTS (COMP SIDE)

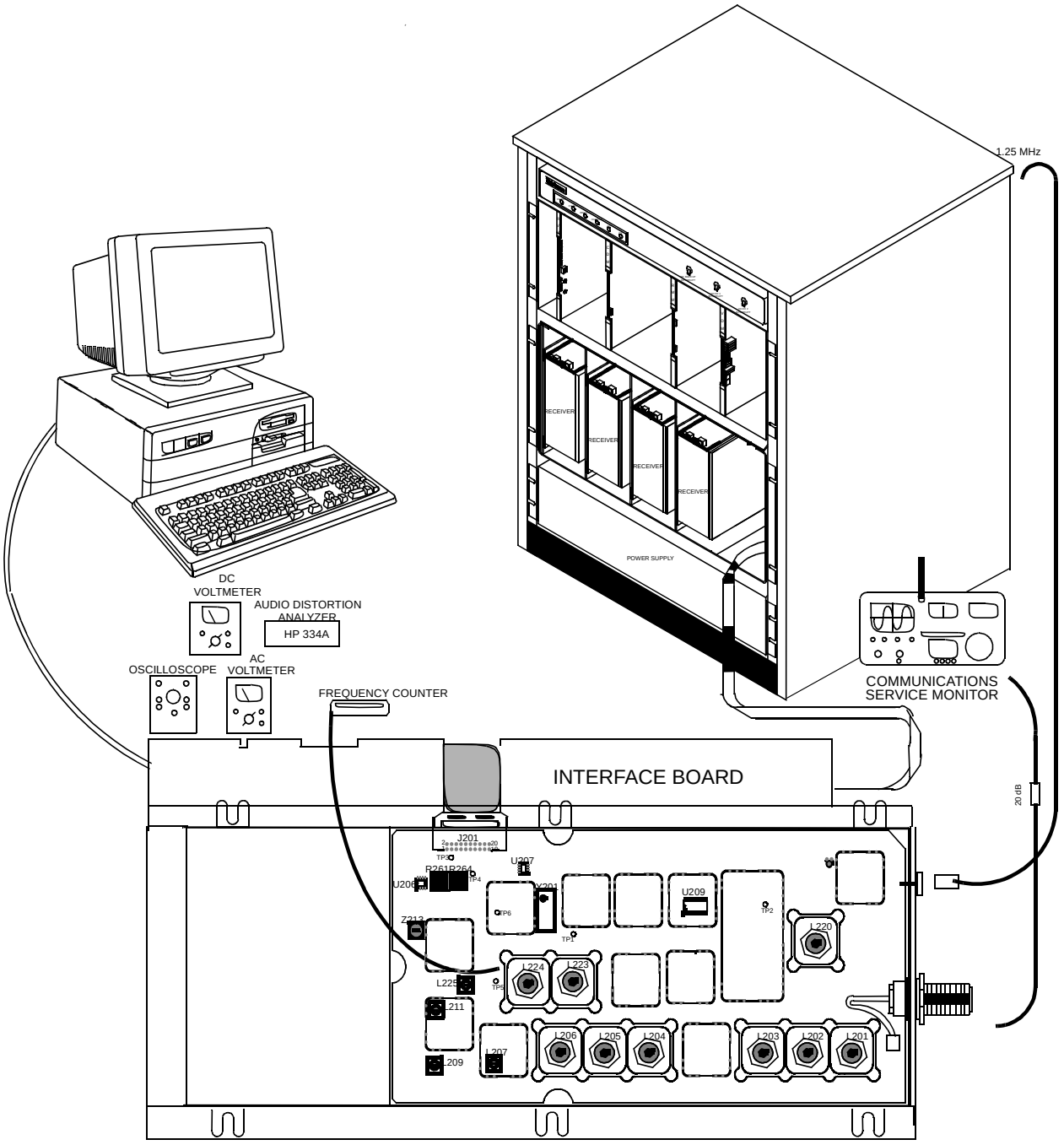


Figure 3-36 800 MHz RECEIVER TEST SETUP

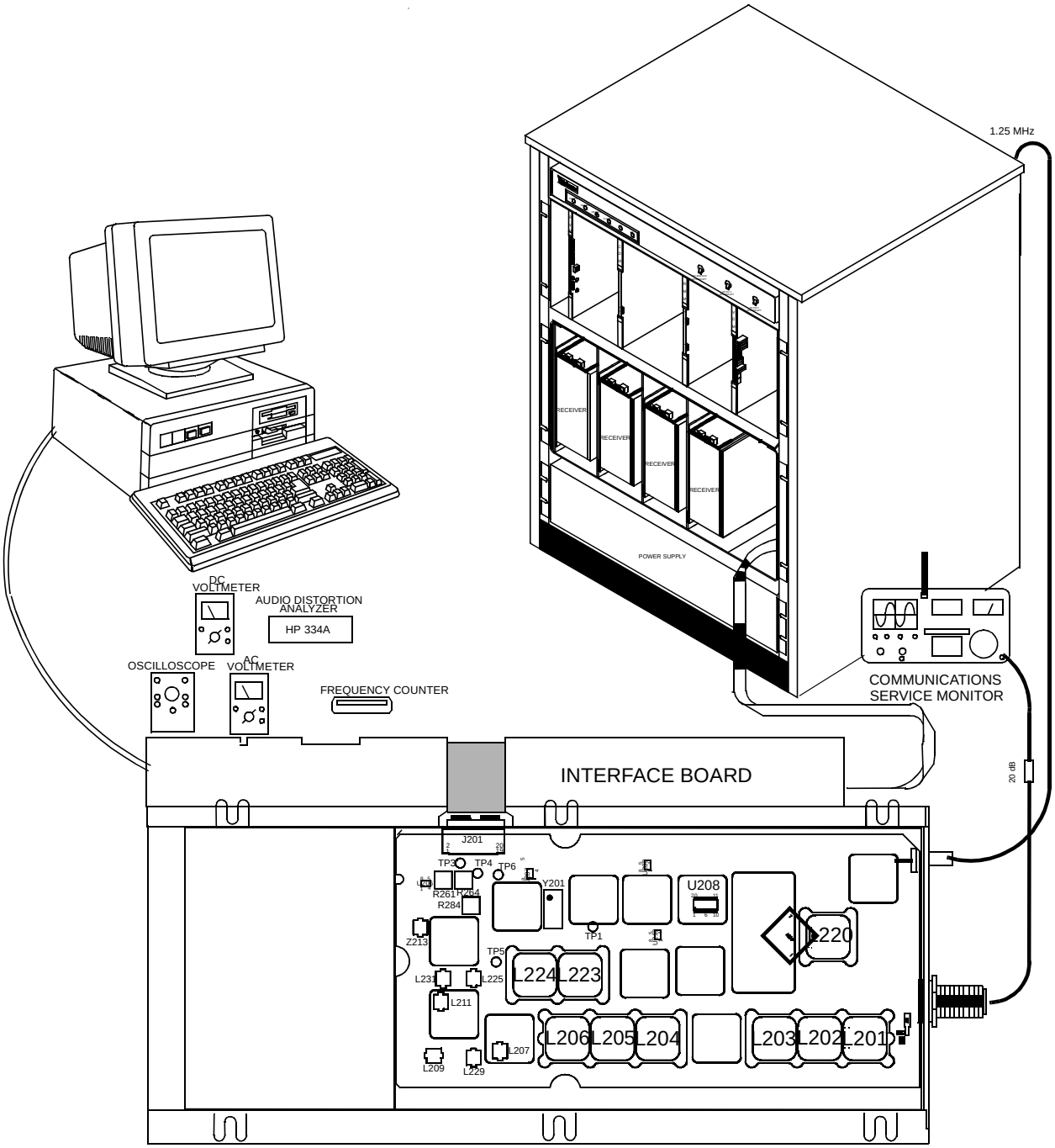


Figure 3-37 900 MHz RECEIVER TEST SETUP

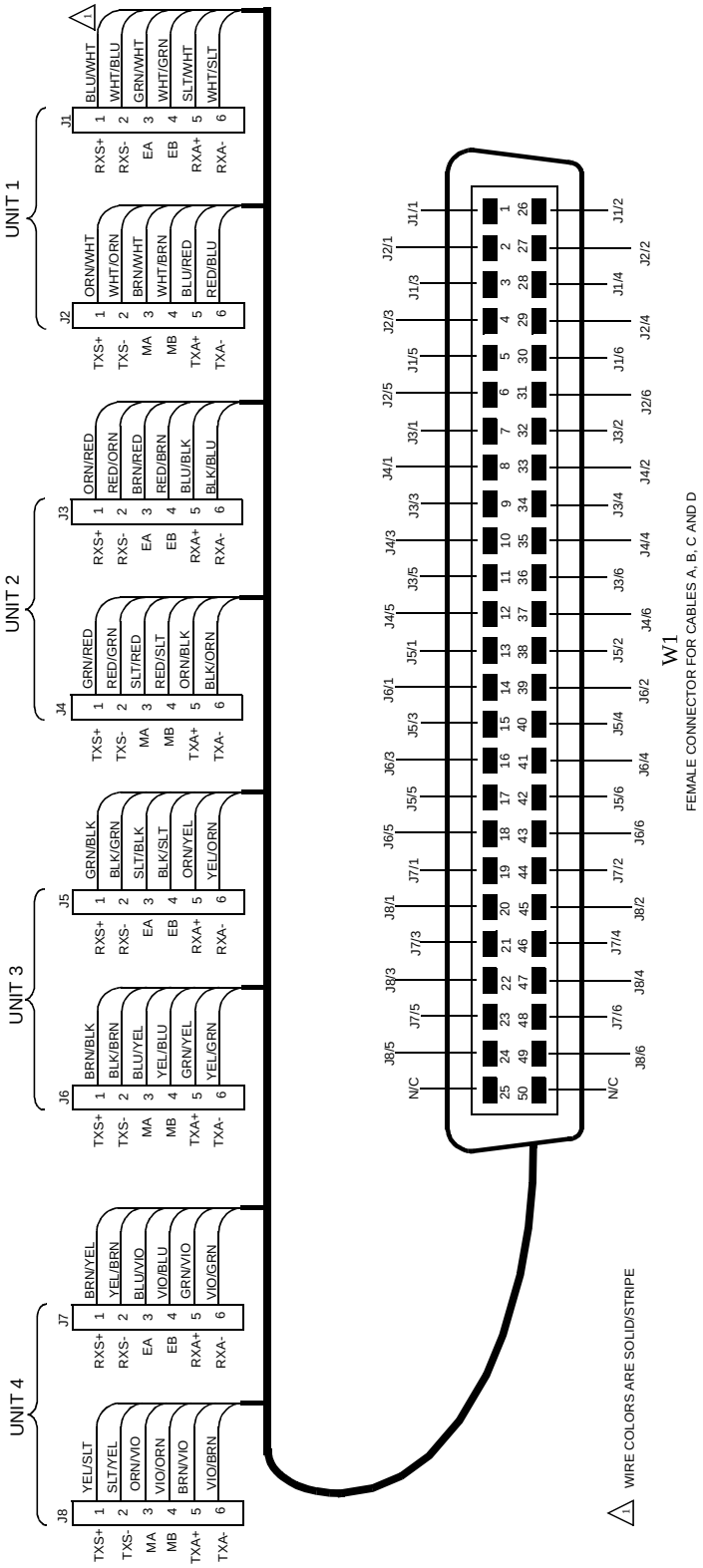


Figure 3-38 SWITCH BACKPLANE WIREHARNESS

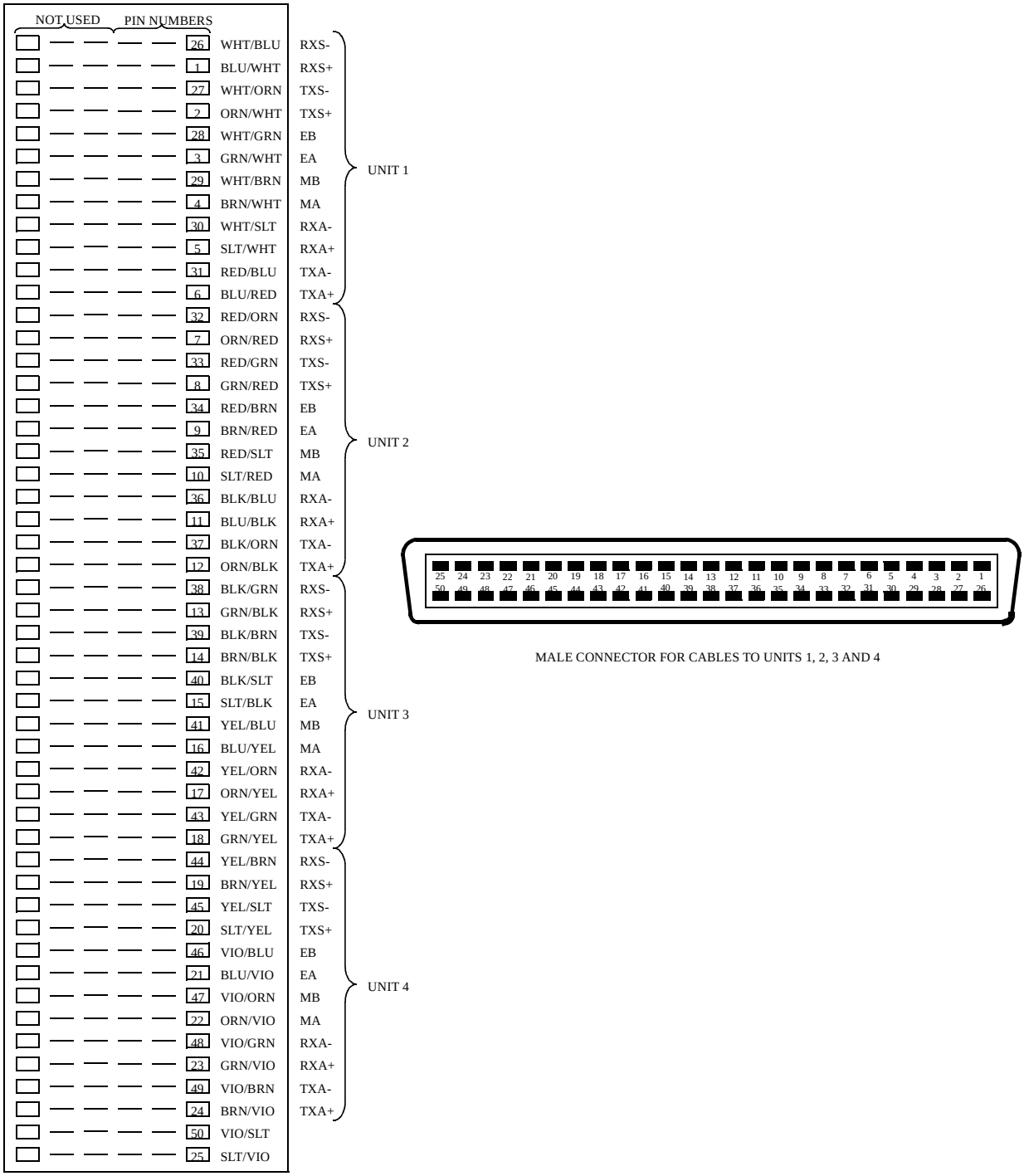


Figure 3-39 SWITCH PUNCH BLOCK

SPECIFICATIONS

VOTER SHELF

Dimensions	21.4" W x 12.5" D x 8.2" H
Environment	-30°C to +60°C (-22°F to +142°F) at 20% to 80% humidity (noncondensing)
Average Power	26 modules x 6.1W ÷ 0.7 (efficiency) = 227W
Average Heat	227W x 3.6 = 817 BTU per hour

MODULES

CDM and RVM

Dimensions	11.5" W x 8" H (8.6" including extractors)
Weight	0.95 lbs.
Environment	-30°C to +60°C (-22°F to +142°F) at 20% to 80% humidity (noncondensing)
Average Power and Current	+5V DC at 0.8A = 4.0W +12V DC at 0.08A = 0.96W -12V DC at 0.06A = 0.7W -5V DC at 0.07A = 0.35W Total Average Power = 6.1W Total Maximum Power = 8.0W

RDM

Dimensions	14.5" W x 17.625" D x 3.5" H
Average Power and Current	+13.8V DC at 0.5A = 6.9W
Environment	-30°C to +60°C (-22°F to +142°F) at 20% to 80% humidity (noncondensing)

RMM

Dimensions	14.5" W x 17.625" D x 3.5" H
Average Power and Current	+13.8V DC at 0.8A = 11W
Environment	-30°C to +60°C (-22°F to +142°F) at 20% to 80% humidity (noncondensing)

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
	800 MHz VOTER RDM PART NO. 023-2008-230	
A 200	Voting Receiver A/L Intfc Bd	023-2000-700
A 201	800 MHz Receiver	023-2008-200
A 202	20-pin ribbon cable	023-2000-703
EP200	0.156 OD RF shield gasket	574-3002-036
HW200	4-40 x 0.094 hex nut NPS	560-9005-008
HW201	10-32 x 0.375 nut CPS	560-1110-012
HW202	6-32 panhead torx ZPS	575-0006-010
HW203	6-32 mach panhead ZPS	575-1606-008
HW204	6-32 mach panhead ZPS	575-1606-016
HW205	No. 4 shakeproof washer	596-1104-008
HW206	6 x 0.018 int lockwasher	596-1106-009
HW207	No. 10 flat washer ZPS	596-1410-016
HW208	4-40 mach panhead ZPS	575-1604-012
MP200	Receiver housing	015-0902-011
MP201	Deck cover	015-0902-015
MP202	Receiver mounting plate	017-2210-152
MP203	1/4" hex brass M/F spacer	312-7483-008
MP204	1/4" hex brass M/F spacer	312-7483-008
	900 MHz VOTER RDM PART NO. 023-2008-230	
A 200	Voting Receiver A/L Intfc Bd	023-2000-700
A 201	900 MHz Receiver	023-2009-200
A 202	20-pin ribbon cable	023-2000-703
EP200	0.156 OD RF shield gasket	574-3002-036
HW200	4-40 x 0.094 hex nut NPS	560-9005-008
HW201	10-32 x 0.375 nut CPS	560-1110-012
HW202	6-32 panhead torx ZPS	575-0006-010
HW203	6-32 mach panhead ZPS	575-1606-008
HW204	6-32 mach panhead ZPS	575-1606-016
HW205	No. 4 shakeproof washer	596-1104-008
HW206	6 x 0.018 int lockwasher	596-1106-009
HW207	No. 10 flat washer ZPS	596-1410-016
HW208	4-40 mach panhead ZPS	575-1604-012
J 200	BNC panel mount no flange	515-3005-002
MP200	Receiver housing	015-0902-011
MP201	Deck cover	015-0902-015
MP202	Receiver mounting plate	017-2210-152
MP203	1/4" hex brass M/F spacer	312-7483-008
MP204	1/4" hex brass M/F spacer	312-7483-008
	RECEIVE VCO 800 MHz PART NO. 023-2008-800	
C 803	1 pF 150V chip	510-3656-109
C 804	2.7 pF 150V chip	510-3656-279
C 805	.47 µF 16V tantalum SMD	510-2625-478
C 806	4.7 µF 10V tantalum SMD	510-2624-479
C 807	27 pF ±5% NPO 0805 chip	510-3601-270
C 808	27 pF ±5% NPO 0805 chip	510-3601-270
C 809	15 µF 20V tantalum SMD	510-2626-150
C 810	27 pF ±5% NPO 0805 chip	510-3601-270
C 811	27 pF ±5% NPO 0805 chip	510-3601-270
C 812	4.7 pF 150V chip	510-3656-479
C 813	6.8 pF 150V chip	510-3656-689
CR802	Varactor	523-1504-915
L 803	.039 µH inductor SMD	542-9001-397
L 804	.039 µH inductor SMD	542-9001-397
L 805	.039 µH inductor SMD	542-9001-397
PC800	PC board	035-2008-800
Q 801	Si NPN gen purp switch/amp	576-0001-300
Q 802	NPN UHF low noise SOT-23	576-0003-636
R 801	10 ohm ±5% 0805 chip	569-0105-100
R 802	3.6k ohm ±5% 0805 chip	569-0105-362
R 803	10 ohm ±5% 0805 chip	569-0105-100
R 804	4.7k ohm ±5% 0805 chip	569-0105-472
R 805	5.1k ohm ±5% 0805 chip	569-0105-512
R 806	6.2k ohm ±5% 0805 chip	569-0105-622
R 807	180 ohm ±5% 0805 SMD	569-0115-181
	RECEIVER PART NO. 023-2008-200	
A 006	800 MHz VCO	023-2008-800
A 201	RF input coax	023-2000-161
A 203	Receiver board top shield	023-2000-199
C 201	6.8 pF ±5% NPO 1206 chip	510-3602-689

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
C 202	6.2 pF ±5% NPO 1206 chip	510-3602-629
C 203	4.7 µF 16V tantalum SMD	510-2625-479
C 204	56 pF ±5% NPO 1206 chip	510-3602-560
C 205	6.8 pF ±5% NPO 1206 chip	510-3602-689
C 206	56 pF ±5% NPO 1206 chip	510-3602-560
C 207	6.2 pF ±5% NPO 1206 chip	510-3602-629
C 208	24 pF ±5% NPO 1206 chip	510-3602-240
C 209	10 pF ±5% NPO 1206 chip	510-3602-100
C 210	10 pF ±5% NPO 1206 chip	510-3602-100
C 211	.01 µF ±10% X7R chip	510-3606-103
C 212	.01 µF ±10% X7R chip	510-3606-103
C 213	4.7 µF 16V tantalum SMD	510-2625-479
C 214	10 pF ±5% NPO 1206 chip	510-3602-100
C 215	6.8 pF ±5% NPO 1206 chip	510-3602-689
C 216	3.9 pF ±5% NPO 1206 chip	510-3602-399
C 217	.1 µF ±10% X7R 1210	510-3607-104
C 218	.001 µF ±5% NPO 1206 chip	510-3602-102
C 219	.1 µF ±10% X7R 1210	510-3606-104
C 220	.001 µF ±5% NPO 1206 chip	510-3602-102
C 221	.1 µF ±10% X7R 1210	510-3606-104
C 222	120 pF ±5% NPO 1206 chip	510-3602-121
C 231	100 pF ±5% NPO 1206 chip	510-3602-101
C 232	4.7 µF 16V tantalum SMD	510-2625-479
C 233	.01 µF ±10% X7R chip	510-3606-103
C 234	.01 µF ±10% X7R chip	510-3606-103
C 235	220 pF ±5% NPO 1206 chip	510-3602-221
C 236	220 pF ±5% NPO 1206 chip	510-3602-221
C 237	5.6 pF ±5% NPO 1206	510-3602-569
C 238	390 pF ±5% NPO 1206	510-3602-391
C 240	4.7 µF 16V tantalum SMD	510-2625-479
C 251	.01 µF ±10% X7R 1206 chip	510-3606-103
C 252	.001 µF ±5% NPO 1206 chip	510-3602-102
C 253	.01 µF ±10% X7R 1206 chip	510-3606-103
C 254	100 pF ±5% NPO 1206 chip	510-3602-101
C 255	.1 µF ±10% X7R 1210	510-3607-104
C 256	.1 µF ±10% X7R 1210	510-3607-104
C 257	.1 µF ±10% X7R 1210	510-3607-104
C 258	27 pF ±5% NPO 1206 chip	510-3602-270
C 259	27 pF ±5% NPO 1206 chip	510-3602-270
C 260	27 pF ±5% NPO 1206 chip	510-3602-270
C 261	3.3 pF ±5% NPO 1206 chip	510-3602-339
C 262	27 pF ±5% NPO 1206 chip	510-3602-270
C 263	5.6 pF ±5% NPO 1206 chip	510-3602-569
C 264	27 pF ±5% NPO 1206 chip	510-3602-270
C 266	4.7 µF 16V tantalum SMD	510-2625-479
C 267	39 pF ±5% NPO 1206 chip	510-3602-390
C 268	1.5 pF ±5% NPO 1206 chip	510-3602-159
C 269	27 pF ±5% NPO 1206 chip	510-3602-270
C 270	39 pF ±5% NPO 1206 chip	510-3602-390
C 272	27 pF ±5% NPO 1206 chip	510-3602-270
C 273	27 pF ±5% NPO 1206 chip	510-3602-270
C 274	27 pF ±5% NPO 1206 chip	510-3602-270
C 275	2.4 pF ±5% NPO 1206 chip	510-3602-249
C 276	6.8 pF ±5% NPO 1206 chip	510-3602-689
C 277	4.3 pF ±5% NPO 1206 chip	510-3602-439
C 278	27 pF ±5% NPO 1206 chip	510-3602-270
C 279	4.7 µF 16V tantalum SMD	510-2625-479
C 280	12 pF ±5% NPO 1206 chip	510-3602-120
C 281	4.7 µF 16V tantalum SMD	510-2625-479
C 282	27 pF ±5% NPO 1206 chip	510-3602-270
C 284	1.5 pF ±5% NPO 1206 chip	510-3602-159
C 285	.001 µF ±5% NPO 1206 chip	510-3602-102
C 286	.001 µF ±5% NPO 1206 chip	510-3602-102
C 287	1.5 µF 25V tantalum SMD	510-2627-159
C 288	10 pF ±5% NPO 1206 chip	510-3602-100
C 289	4.7 µF 16V tantalum SMD	510-2625-479
C 290	.001 µF ±5% NPO 1206 chip	510-3602-102
C 291	.001 µF ±5% NPO 1206 chip	510-3602-102
C 292	1.5 µF 25V tantalum SMD	510-2627-159
C 293	39 pF ±5% NPO 1206 chip	510-3602-390
C 294	4.7 µF 16V tantalum SMD	510-2625-479
C 295	.001 µF ±5% NPO 1206 chip	510-3602-102
C 296	.001 µF ±5% NPO 1206 chip	510-3602-102
C 297	1.5 µF 25V tantalum SMD	510-2627-159
C 298	4.7 µF 16V tantalum SMD	510-2625-479
C 299	4.7 µF 16V tantalum SMD	510-2625-479
C 300	.001 µF ±5% NPO 1206 chip	510-3602-102
C 301	39 pF ±5% NPO 1206 chip	510-3602-390
C 302	27 pF ±5% NPO 1206 chip	510-3602-270
C 303	.1 µF ±10% X7R 1206	510-3606-104
C 304	39 pF ±5% NPO 1206 chip	510-3602-390
C 307	100 pF ±5% NPO 1206	510-3602-101
C 308	4.7 µF 16V tantalum SMD	510-2625-479
C 309	1 pF ±5% NPO 1206 chip	510-3602-109
C 310	27 pF ±5% NPO 1206 chip	510-3602-270
C 311	.001 µF ±5% NPO 1206 chip	510-3602-102
C 312	.001 µF ±5% NPO 1206 chip	510-3602-102
C 315	.001 µF ±5% NPO 1206 chip	510-3602-102
C 316	.01 µF ±10% X7R 1206	510-3606-103
C 317	.001 µF ±5% NPO 1206 chip	510-3602-102
C 318	.001 µF ±10% X7R 1206	510-3606-102
C 319	.001 µF ±5% NPO 1206 chip	510-3602-102
C 320	.001 µF ±5% NPO 1206 chip	510-3602-102
C 321	.001 µF ±5% NPO 1206 chip	510-3602-102

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
C 323	.001 µF ±5% NPO 1206 chip	510-3602-102
C 325	100 pF ±5% NPO 1206 chip	510-3602-101
C 326	3 pF ±5% NPO 1206 chip	510-3602-309
C 328	820 pF ±5% NPO 1206 chip	510-3602-821
C 330	27 pF ±5% NPO 1206 chip	510-3602-270
C 331	27 pF ±5% NPO 1206 chip	510-3602-270
C 332	27 pF ±5% NPO 1206 chip	510-3602-270
C 333	27 pF ±5% NPO 1206 chip	510-3602-270
C 334	27 pF ±5% NPO 1206 chip	510-3602-270
C 335	27 pF ±5% NPO 1206 chip	510-3602-270
C 336	4.7 µF 16V tantalum SMD	510-2625-479
C 337	56 pF ±5% NPO 1206 chip	510-3602-560
C 338	.01 µF ±10% X7R 1206	510-3606-103
C 356	2 pF ±5% NPO 1206 chip	510-3602-209
C 357	1.5 pF ±5% NPO 1206 chip	510-3602-159
C 358	3.9 pF ±5% NPO 1206 chip	510-3602-399
C 359	2.4 pF ±5% NPO 1206 chip	510-3602-249
C 362	4.7 µF 16V tantalum SMD	510-2625-479
C 363	.001 µF ±5% NPO 1206 chip	510-3602-102
C 364	1.5 µF 25V tantalum SMD	510-2627-159
C 365	4.7 µF 16V tantalum SMD	510-2625-479
C 366	.001 µF ±5% NPO 1206 chip	510-3602-102
C 367	27 pF ±5% NPO 1206 chip	510-3602-270
C 373	1.5-15 pF ceramic SMD	512-1602-001
C 374	4.7 pF ±5% NPO 1206 chip	510-3602-479
C 375	1.5-15 pF ceramic SMD	512-1602-001
C 376	4.7 pF ±5% NPO 1206 chip	510-3602-479
CH200	3-cavity helical front end	015-0901-038
CH201	3-cavity helical front end	015-0901-038
CH202	2-cavity helical front end	015-0901-028
CH203	1-cavity helical front end	015-0901-010
CR201	Hot carrier diode SOT-23	523-1504-016
CR002	Switching diode SOT-23	523-1504-002
CR203	Switching diode SOT-23	523-1504-002
CR204	Si 9.1V zener SOT-23	523-2016-919
EP200	Crystal pin cer insulator mini	010-0345-280
EP201	Ferrite bead SMD 1206	517-2503-002
EP202	Ferrite bead SMD 1206	517-2503-010
EP203	Ferrite bead SMD 1206	517-2503-001
EP204	Ferrite bead SMD 1206	517-2503-010
EP205	Ferrite bead SMD 1206	517-2503-001
EP206	Ferrite bead SMD 1206	517-2503-002
HW200	10-32 hex set screw NPB	575-9059-032
HW201	10-32 hex set screw NPB	575-9059-024
HW202	Tension lock nut CPS	560-1810-022
HW203	6-32 panhead Torx ZPS	575-0006-008
HW204	4-40 panhead slot nylon	575-4504-008
HW205	Polarizing key box cnt	515-7109-010
J 201	20-pin right angle header	515-9031-375
L 201	Helical coil	016-2186-201
L 202	2.25T helical coil	016-2186-205
L 203	Helical coil	016-2186-201
L 204	Helical coil	016-2186-201
L 205	2.25T helical coil	016-2186-205
L 206	Helical coil	016-2186-201
L 207	0.9 µH variable inductor 7mm	542-1012-008
L 209	0.9 µH variable inductor 7mm	542-1012-008
L 210	1.5T coil 22 AWG	542-0010-015
L 211	0.9 µH variable inductor 7mm	542-1012-008
L 212	1.5T coil 22 AWG	542-0010-015
L 213	.82 µH inductor SMD	542-9001-828
L 214	.1 µH inductor SMD	542-9001-108
L 215	.1 µH inductor SMD	542-9001-108
L 216	.1 µH inductor SMD	542-9001-108
L 218	.1 µH inductor SMD	542-9001-108
L 219	.018 µH inductor SMD	542-9001-187
L 220	2 3/8 turn helical coil	016-2186-254
L 221	3T 22 AWG 0.05 ID SMD air	542-0015-003
L 222	2T 22 AWG 0.05 ID SMD air	542-0015-002
L 223	Helical coil	016-2186-201
L 224	Helical coil	016-2186-201
L 225	0.9 µH variable inductor 7mm	542-1012-008
L 226	3T 22 AWG 0.05 ID SMD air	542-0015-003
L 227	3T 22 AWG 0.05 ID SMD air	542-0015-003
L 228	3T 22 AWG 0.05 ID SMD air	542-0015-003
L 229	.82 µH inductor SMD	542-9001-828
MP200	Helical coil form	013-1627-100
MP201	Helical coil form	013-1627-110
MP203	Damped washer 0.125	018-1132-152
MP204	Bottom shield	017-2210-101
PC200	PC board	035-2008-200
Q 201	NPN UHF low noise SOT-23	576-0003-636
Q 202	Si NPN RF amp SOT-23	576-0003-602
Q 205	Si NPN amp	576-0003-658
Q 208	NPN UHF low noise SOT-23	576-0003-636

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
Q 209	NPN UHF low noise SOT-23	576-0003-636
Q 210	Si NPN amp SOT-23	576-0003-658
Q 211	Si NPN amp SOT-23	576-0003-658
Q 214	NPN UHF low noise SOT-23	576-0003-636
Q 215	NPN UHF low noise SOT-23	576-0003-636
Q 216	NPN .2-2 GHz SO-8 amp	576-0003-604
Q 217	NPN 750 mW UHF/800 MHz	576-0004-098
Q 218	Si PNP low noise SOT-23	576-0003-657
R 201	10k ohm ±5% 1206 SMD	569-0115-103
R 203	62 ohm ±5% 1206 SMD	569-0115-620
R 204	10k ohm ±5% 1206 SMD	569-0115-103
R 208	1.8k ohm ±5% 1206 SMD	569-0115-182
R 209	680 ohm ±5% 1206 SMD	569-0115-681
R 211	51 ohm ±5% 1206 SMD	569-0115-510
R 212	100k ohm ±5% 1206 SMD	569-0115-104
R 213	5.1k ohm ±5% 1206 SMD	569-0115-512
R 214	51k ohm ±5% 1206 SMD	569-0115-513
R 215	1.8k ohm ±5% 1206 SMD	569-0115-182
R 227	10k ohm ±5% 1206 SMD	569-0115-103
R 228	1k ohm ±5% 1206 SMD	569-0115-102
R 229	10 ohm ±5% 1206 SMD	569-0115-100
R 230	270 ohm ±5% 1206 SMD	569-0115-271
R 231	10k ohm ±5% 1206 SMD	569-0115-103
R 232	10k ohm ±5% 1206 SMD	569-0115-103
R 247	2.2k ohm ±5% 1206 SMD	569-0115-222
R 248	2.7k ohm ±5% 1206 SMD	569-0115-272
R 249	3.3k ohm ±5% 1206 SMD	569-0115-332
R 250	270 ohm ±5% 1206 SMD	569-0115-271
R 251	3.3k ohm ±5% 1206 SMD	569-0115-332
R 252	330k ohm ±5% 1206 SMD	569-0115-334
R 253	6.8k ohm ±5% 1206 SMD	569-0115-682
R 254	330k ohm ±5% 1206 SMD	569-0115-334
R 255	27k ohm ±5% 1206 SMD	569-0115-273
R 256	20k ohm ±5% 1206 SMD	569-0115-203
R 257	470 ohm ±5% 1206 SMD	569-0115-471
R 258	150 ohm ±5% 1206 SMD	569-0115-151
R 259	10k ohm ±5% 1206 SMD	569-0115-103
R 260	Zero ohm ±10% 1206 SMD	569-0115-001
R 261	5k ohm single turn trimmer	562-0112-502
R 262	7.5k ohm ±5% 1206 SMD	569-0115-752
R 263	120k ohm ±5% 1206 SMD	569-0115-124
R 264	5k ohm single turn trimmer	562-0112-502
R 265	1.8k ohm ±5% 1206 SMD	569-0115-182
R 266	470 ohm ±5% 1206 SMD	569-0115-471
R 267	294 ohm ±1% 1206 SMD	569-0111-246
R 268	1k ohm ±1% 1206 SMD	569-0111-301
R 269	1k ohm ±5% 1206 SMD	569-0115-102
R 270	1k ohm ±5% 1206 SMD	569-0115-102
R 271	910 ohm ±5% 1206 SMD	569-0115-911
R 272	240 ohm ±5% 1206 SMD	569-0115-241
R 273	100 ohm ±5% 1206 SMD	569-0115-101
R 274	10 ohm ±5% 1206 SMD	569-0115-100
R 275	6.8k ohm ±5% 1206 SMD	569-0115-682
R 276	47k ohm ±5% 1206 SMD	569-0115-473
R 277	150 ohm ±5% 1206 SMD	569-0115-151
R 278	1.6k ohm ±5% 1206 SMD	569-0115-162
R 279	1.6k ohm ±5% 1206 SMD	569-0115-162
R 280	100k ohm ±5% 1206 SMD	569-0115-104
R 282	5k ohm single turn trimmer	562-0112-502
R 283	150 ohm ±5% 1206 SMD	569-0115-151
R 290	1.5k ohm ±5% 1206 SMD	569-0115-152
R 291	1.3k ohm ±5% 1206 SMD	569-0115-132
R 292	75 ohm ±5% 1206 SMD	569-0115-750
R 293	51 ohm ±5% 1206 SMD	569-0115-510
R 294	10 ohm ±5% 1206 SMD	569-0115-100
R 295	470 ohm ±5% 1206 SMD	569-0115-471
R 296	1.8k ohm ±5% 1206 SMD	569-0115-182
R 297	100 ohm ±5% 1206 SMD	569-0115-101
R 299	36 ohm ±5% 1206 SMD	569-0115-360
R 300	36 ohm ±5% 1206 SMD	569-0115-360
R 301	220 ohm ±5% 1206 SMD	569-0115-221
R 302	220 ohm ±5% 1206 SMD	569-0115-221
R 303	43 ohm ±5% 1206 SMD	569-0115-430
R 304	240 ohm ±5% 1206 SMD	569-0115-241
R 306	51 ohm ±5% 1206 SMD	569-0115-510
R 308	22 ohm ±5% 1206 SMD	569-0115-220
R 309	12.1k ohm ±1% 1206 SMD	569-0111-409
R 310	4.99k ohm ±1% 1206 SMD	569-0111-368
R 311	4.3k ohm ±5% 1206 SMD	569-0115-432
R 312	100 ohm ±5% 1206 SMD	569-0115-101
R 313	220 ohm ±5% 1206 SMD	569-0115-221
R 314	220 ohm ±5% 1206 SMD	569-0115-221
R 315	270 ohm ±5% 1206 SMD	569-0115-271
R 319	10k ohm ±5% 1206 SMD	569-0115-103
R 320	10k ohm ±5% 1206 SMD	569-0115-103
R 322	560 ohm ±5% 1206 SMD	569-0115-561
R 323	1k ohm ±5% 1206 SMD	569-0115-102
RT202	1k ohm ±5% thermistor chip	569-3013-002
TP001	Red vertical tip jack 0.08	105-2202-211
TP003	Red vertical tip jack 0.08	105-2202-211
TP004	Red vertical tip jack 0.08	105-2202-211

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
TP005	Red vertical tip jack 0.08	105-2202-211
TP006	Red vertical tip jack 0.08	105-2202-211
U 201	Mixer LRMS-2H	544-0007-013
U 202	FM IF MC3371D SO-16	544-2002-031
U 203	Dual op amp SOIC MC33178	544-2019-018
U 204	Op amp SO-8 MC33172D	544-2019-017
U 206	+12V regulator 78L12 SO-8	544-2603-032
U 207	+12V regulator 78L12 SO-8	544-2603-032
U 208	+5V regulator 78L05 SO-8	544-2603-039
U 209	Synthesizer MC145190F SOIC	544-3954-026
U 210	+12V regulator 78L12 SO-8	544-2603-032
Y 201	17.5 MHz crystal 1 PPM	518-7117-500
Z 201	52.95 MHz 4-pole 15 kHz BW	532-0009-009
Z 203	52.95 MHz 4-pole 15 kHz BW	532-0009-009
Z 205	450 kHz cer filter 15 kHz BW	532-2006-032
Z 213	455 kHz var inductor w/cap	542-1012-010

900 MHz RECEIVE VCO
PART NO. 023-2009-800

C 803	1 pF ±0.1 pF 150V chip	510-3356-109
C 804	2.7 pF ±0.1 pF 150V chip	510-3656-279
C 805	.47 µF 16V tantalum SMD	510-2625-478
C 806	4.7 µF 10V tantalum SMD	510-2624-479
C 807	27 pF ±5% NPO 0805 chip	510-3601-270
C 808	27 pF ±5% NPO 0805 chip	510-3601-270
C 809	15 µF 20V tantalum SMD	510-2626-150
C 810	27 pF ±5% NPO 0805 chip	510-3601-270
C 811	27 pF ±5% NPO 0805 chip	510-3601-270
C 812	3.9 pF 150V chip	510-3656-399
C 813	5.6 pF 150V chip	510-3656-569
CR802	Varactor 105G SOT-23	523-1504-015
L 803	.039 µH inductor SMD	542-9001-397
L 804	.039 µH inductor SMD	542-9001-397
L 805	.039 µH inductor SMD	542-9001-397
PC800	PC board	035-2008-800
Q 801	Si NPN gen purp switch/amp	576-0001-300
Q 802	NPN UHF low noise SOT-23	576-0003-636
R 801	10 ohm ±5% 0805 chip	569-0105-100
R 802	3.6k ohm ±5% 0805 chip	569-0105-362
R 803	100 ohm ±5% 0805 chip	569-0105-101
R 804	4.7k ohm ±5% 0805 chip	569-0105-472
R 805	5.1k ohm ±5% 0805 chip	569-0105-512
R 806	6.2k ohm ±5% 0805 chip	569-0105-622
R 807	180 ohm ±5% 1206 SMD	569-0115-181

900 MHz HIGH STABILITY RECEIVER
PART NO. 023-2009-200

A 006	900 MHz VCO assembly	023-2009-800
A 201	RF input coax assembly	023-2000-161
A 202	OCXO coax cable assembly	597-3001-215
A 203	Top shield assembly	023-2000-199
C 201	5.6 pF ±5% NPO 1206 chip	510-3602-569
C 202	4.3 pF ±5% NPO 1206 chip	510-3602-439
C 204	33 pF ±5% NPO 1206 chip	510-3602-330
C 205	10 pF ±5% NPO 1206 chip	510-3602-100
C 206	27 pF ±5% NPO 1206 chip	510-3602-270
C 207	3 pF ±5% NPO 1206 chip	510-3602-309
C 208	33 pF ±5% NPO 1206 chip	510-3602-330
C 209	8.2 pF ±5% NPO 1206 chip	510-3602-829
C 210	6.8 pF ±5% NPO 1206 chip	510-3602-689
C 211	.01 µF ±10% X7R chip	510-3606-103
C 212	.01 µF ±10% X7R chip	510-3606-103
C 213	4.7 µF 16V tantalum SMD	510-2625-479
C 214	7.5 pF ±5% NPO 1206 chip	510-3602-759
C 215	5.6 pF ±5% NPO 1206 chip	510-3602-759
C 216	5.6 pF ±5% NPO 1206 chip	510-3602-759
C 217	.1 µF ±10% X7R chip	510-3606-104
C 218	.001 µF ±5% NPO 1206 chip	510-3602-102
C 220	.001 µF ±5% NPO 1206 chip	510-3602-102
C 222	120 pF ±5% NPO 1206 chip	510-3602-121
C 224	.01 µF ±10% X7R chip	510-3606-103
C 225	.01 µF ±10% X7R chip	510-3606-103
C 226	.01 µF ±10% X7R chip	510-3606-103
C 227	.01 µF ±10% X7R chip	510-3606-103
C 228	.01 µF ±10% X7R chip	510-3606-103
C 229	.01 µF ±10% X7R chip	510-3606-103
C 230	.01 µF ±10% X7R chip	510-3606-103
C 231	100 pF ±5% NPO 1206 chip	510-3602-101
C 232	4.7 µF 16V tantalum SMD	510-2625-479
C 233	.01 µF ±10% X7R chip	510-3606-103
C 234	.01 µF ±10% X7R chip	510-3606-103
C 235	220 pF ±5% NPO 1206 chip	510-3602-221

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
C 236	220 pF ±5% NPO 1206 chip	510-3602-221
C 237	5.6 pF ±5% NPO 1206	510-3602-569
C 238	390 pF ±5% NPO 1206	510-3602-391
C 240	4.7 µF 16V tantalum SMD	510-2625-479
C 244	.01 µF ±10% X7R chip	510-3606-103
C 245	33 µ f 10V tantalum SMD	510-2524-330
C 246	1 µF 16V tantalum SMD	510-2625-109
C 247	56 pF ±5% NPO 1206 chip	510-3602-560
C 248	.001 µF ±5% NPO 1206 chip	510-3602-102
C 249	.01 µF ±10% X7R 1206 chip	510-3606-103
C 250	100 pF ±5% NPO 1206 chip	510-3602-101
C 251	.01 µF ±10% X7R 1206 chip	510-3606-103
C 252	.001 µF ±5% NPO 1206 chip	510-3602-102
C 253	.01 µF ±10% X7R 1206 chip	510-3606-103
C 254	100 pF ±5% NPO 1206 chip	510-3602-101
C 258	27 pF ±5% NPO 1206 chip	510-3602-270
C 259	27 pF ±5% NPO 1206 chip	510-3602-270
C 260	27 pF ±5% NPO 1206 chip	510-3602-270
C 261	3.3 pF ±5% NPO 1206 chip	510-3602-339
C 262	4.3 pF ±5% NPO 1206 chip	510-3602-439
C 264	4.3 pF ±5% NPO 1206 chip	510-3602-439
C 265	27 pF ±5% NPO 1206 chip	510-3602-270
C 266	4.7 µF 16V tantalum SMD	510-2625-479
C 267	39 pF ±5% NPO 1206 chip	510-3602-390
C 268	1.5 pF ±5% NPO 1206 chip	510-3602-159
C 269	27 pF ±5% NPO 1206 chip	510-3602-270
C 270	100 pF ±5% NPO 1206 chip	510-3602-101
C 271	5.6 pF ±5% NPO 1206 chip	510-3602-569
C 272	18 pF ±5% NPO 1206 chip	510-3602-180
C 273	27 pF ±5% NPO 1206 chip	510-3602-270
C 274	27 pF ±5% NPO 1206 chip	510-3602-270
C 275	3.3 pF ±5% NPO 1206 chip	510-3602-339
C 277	6.8 pF ±5% NPO 1206 chip	510-3602-689
C 278	27 pF ±5% NPO 1206 chip	510-3602-270
C 279	4.7 µF 16V tantalum SMD	510-2625-479
C 280	5.6 pF ±5% NPO 1206 chip	510-3602-569
C 281	4.7 µF 16V tantalum SMD	510-2625-479
C 282	27 pF ±5% NPO 1206 chip	510-3602-270
C 284	1 pF ±5% NPO 1206 chip	510-3602-109
C 285	.001 µF ±5% NPO 1206 chip	510-3602-102
C 286	.001 µF ±5% NPO 1206 chip	510-3602-102
C 287	1.5 µF 25V tantalum SMD	510-2627-159
C 288	6.8 pF ±5% NPO 1206 chip	510-3602-689
C 289	4.7 µF 16V tantalum SMD	510-2625-479
C 290	.001 µF ±5% NPO 1206 chip	510-3602-102
C 291	.001 µF ±5% NPO 1206 chip	510-3602-102
C 292	1.5 µF 25V tantalum SMD	510-2627-159
C 293	.01 µF ±10% X7R 1206	510-3606-103
C 294	4.7 µF 16V tantalum SMD	510-2625-479
C 295	.001 µF ±5% NPO 1206 chip	510-3602-102
C 296	.001 µF ±5% NPO 1206 chip	510-3602-102
C 297	1.5 µF 25V tantalum SMD	510-2627-159
C 298	4.7 µF 16V tantalum SMD	510-2625-479
C 299	4.7 µF 16V tantalum SMD	510-2625-479
C 300	.001 µF ±5% NPO 1206 chip	510-3602-102
C 301	39 pF ±5% NPO 1206 chip	510-3602-390
C 302	27 pF ±5% NPO 1206 chip	510-3602-270
C 303	.1 µF ±10% X7R 1206	510-3606-104
C 304	27 pF ±5% NPO 1206 chip	510-3602-270
C 305	.01 µF ±10% X7R 1206	510-3606-103
C 306	18 pF ±5% NPO 1206	510-3602-180
C 307	100 pF ±5% NPO 1206	510-3602-101
C 308	4.7 µF 16V tantalum SMD	510-2625-479
C 309	1 pF ±5% NPO 1206 chip	510-3602-109
C 310	27 pF ±5% NPO 1206 chip	510-3602-270
C 311	.001 µF ±5% NPO 1206 chip	510-3602-102
C 312	.001 µF ±5% NPO 1206 chip	510-3602-102
C 313	.01 µF ±10% X7R 1206	510-3606-103
C 314	.01 µF ±10% X7R 1206	510-3606-103
C 315	.001 µF ±5% NPO 1206 chip	510-3602-102
C 316	.01 µF ±10% X7R 1206	510-3606-103
C 317	.001 µF ±5% NPO 1206 chip	510-3602-102
C 318	.001 µF ±10% X7R 1206	510-3606-102
C 319	.001 µF ±5% NPO 1206 chip	510-3602-102
C 320	.001 µF ±5% NPO 1206 chip	510-3602-102
C 321	.001 µF ±5% NPO 1206 chip	510-3602-102
C 322	.001 µF ±5% NPO 1206 chip	510-3602-102
C 323	.001 µF ±5% NPO 1206 chip	510-3602-102
C 324	100 pF ±5% NPO 1206	510-3602-101
C 325	100 pF ±5% NPO 1206	510-3602-101
C 326	3 pF ±5% NPO 1206 chip	510-3602-309
C 328	820 pF ±5% NPO 1206 chip	510-3602-821
C 330	27 pF ±5% NPO 1206 chip	510-3602-270
C 331	27 pF ±5% NPO 1206 chip	510-3602-270
C 332	27 pF ±5% NPO 1206 chip	510-3602-270
C 333	27 pF ±5% NPO 1206 chip	510-3602-270
C 334	27 pF ±5% NPO 1206 chip	510-3602-270
C 335	27 pF ±5% NPO 1206 chip	510-3602-270
C 336	4.7 µF 16V tantalum SMD	510-2625-479
C 337	33 pF ±5% NPO 1206 chip	510-3602-330
C 338	.01 µF ±10% X7R 1206	510-3606-103
C 356	2 pF ±5% NPO 1206 chip	510-3602-209
C 360	120 pF ±5% NPO 1206 chip	510-3602-121
C 363	.001 µF ±10% X7R 1206	510-3606-102

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
C 364	1.5 pF ±5% NPO 1206 chip	510-3602-159
C 365	4.7 µF 16V tantalum SMD	510-2625-479
C 366	.001 µF ±10% X7R 1206	510-3606-102
C 367	27 pF ±5% NPO 1206 chip	510-3602-270
C 368	27 pF ±5% NPO 1206 chip	510-3602-270
C 369	27 pF ±5% NPO 1206 chip	510-3602-270
C 370	27 pF ±5% NPO 1206 chip	510-3602-270
C 371	1.3 pF ±5% NPO 1206 chip	510-3602-139
C 372	1.3 pF ±5% NPO 1206 chip	510-3602-139
C 373	3.9 pF ±5% NPO 1206 chip	510-3602-399
C 374	1.5-5 pF ceramic SMD	512-1602-001
C 375	1.5-5 pF ceramic SMD	512-1602-001
CH200	3-cavity helical front end	015-0901-038
CH201	3-cavity helical front end	015-0901-038
CH202	2-cavity helical front end	015-0901-028
CH203	1-cavity helical front end	015-0901-010
CR201	Hot carrier diode SOT-23	523-1504-016
CR204	Si 9.1V zener SOT-23	523-2016-919
CR205	5.6V zener SOT-23	623-2016-569
CR206	5.6V zener SOT-23	623-2016-569
EP200	Cer crystal pin insulator mini	010-0345-280
EP202	Ferrite bead SMD 1206	517-2503-010
EP204	Ferrite bead SMD 1206	517-2503-010
EP206	Ferrite bead SMD 1206	517-2503-002
HW200	10-32 hex set screw NPB	575-9059-032
HW201	10-32 hex set screw NPB	575-9059-024
HW202	Tension lock nut CPS	560-1810-022
HW203	6-32 panhead torx	575-0006-008
HW204	4-40 panhead slot nylon screw	575-4504-008
HW205	Polarizing key box cnt	515-7109-010
HW206	6-32 panhead torx	575-0006-008
J 201	20-pin right angle header	515-9031-375
L 201	Helical coil 2 1/16 turns	016-2186-208
L 202	Helical coil 2 1/16 turns	016-2186-209
L 203	Helical coil 2 1/16 turns	016-2186-208
L 204	Helical coil 2 1/16 turns	016-2186-208
L 205	Helical coil 2 1/16 turns	016-2186-209
L 206	Helical coil 2 1/16 turns	016-2186-208
L 207	0.9 µH variable inductor 7mm	542-1012-008
L 209	0.9 µH variable inductor 7mm	542-1012-008
L 210	2.5T coil 22 AWG	542-0010-025
L 211	0.9 µH variable inductor 7mm	542-1012-008
L 212	1.5T coil 22 AWG	542-0010-015
L 213	0.82 µH inductor SMD	542-9001-828
L 214	.1 µH inductor SMD	542-9001-108
L 215	.1 µH inductor SMD	542-9001-108
L 216	.1 µH inductor SMD	542-9001-108
L 217	10 µH inductor SMD	542-9001-100
L 218	.1 µH inductor SMD	542-9001-108
L 219	.018 µH inductor SMD	542-9001-187
L 220	2 1/4 turn helical coil	016-2186-252
L 221	4T 22 AWG 0.05 ID SMD air	542-0015-004
L 222	2T 22 AWG 0.05 ID SMD air	542-0015-002
L 223	Helical coil	016-2186-204
L 224	Helical coil	016-2186-204
L 225	0.9 µH variable inductor 7mm	542-1012-008
L 226	3T 22 AWG 0.05 ID SMD air	542-0015-003
L 227	3T 22 AWG 0.05 ID SMD air	542-0015-003
L 228	4T 22 AWG 0.05 ID SMD air	542-0015-004
L 230	0.82 µH inductor SMD	542-9001-828
MP200	Helical coil form	013-1627-102
MP201	Helical core	013-1627-105
MP203	Damped washer 0.125	018-1132-152
MP204	Bottom shield	017-2210-101
MP206	Ground clip	537-5001-002
MP210	Receive shield	017-2210-019
PC201	PC board	035-2009-200
Q 201	NPN RF amp low noise	576-0003-610
Q 202	Si NPN RF amp SOT-23	576-0003-602
Q 203	Si NPN amp SOT-23	576-0003-658
Q 204	Si NPN amp SOT-23	576-0003-658
Q 205	Si NPN amp SOT-23	576-0003-658
Q 206	Si NPN amp SOT-23	576-0003-658
Q 207	Si NPN amp SOT-23	576-0003-658
Q 208	NPN UHF low noise SOT-23	576-0003-636
Q 209	NPN UHF low noise SOT-23	576-0003-636
Q 210	Si NPN amp SOT-23	576-0003-658
Q 211	Si NPN amp SOT-23	576-0003-658
Q 214	NPN UHF low noise SOT-23	576-0003-636
Q 215	NPN UHF low noise SOT-23	576-0003-636
Q 216	NPN .2-2 GHz SO-8 amp	576-0003-604
Q 217	NPN 750 mW UHF/800 MHz	576-0004-098
R 201	2.7k ohm ±5% 1206 SMD	569-0115-272
R 202	200 ohm ±5% 1206 SMD	569-0115-201

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
R 203	200 ohm ±5% 1206 SMD	569-0115-201
R 204	270 ohm ±5% 1206 SMD	569-0115-271
R 205	510 ohm ±5% 1206 SMD	569-0115-511
R 206	10 ohm ±5% 1206 SMD	569-0115-100
R 207	510 ohm ±5% 1206 SMD	569-0115-511
R 208	1.8k ohm ±5% 1206 SMD	569-0115-182
R 209	680 ohm ±5% 1206 SMD	569-0115-681
R 211	51 ohm ±5% 1206 SMD	569-0115-510
R 212	100k ohm ±5% 1206 SMD	569-0115-104
R 213	5.1k ohm ±5% 1206 SMD	569-0115-512
R 214	51k ohm ±5% 1206 SMD	569-0115-513
R 215	1.8k ohm ±5% 1206 SMD	569-0115-182
R 217	3.3k ohm ±5% 1206 SMD	569-0115-332
R 218	2.7k ohm ±5% 1206 SMD	569-0115-272
R 219	100 ohm ±5% 1206 SMD	569-0115-101
R 220	100 ohm ±5% 1206 SMD	569-0115-101
R 221	180 ohm ±5% 1206 SMD	569-0115-181
R 222	3.3k ohm ±5% 1206 SMD	569-0115-332
R 223	2.7k ohm ±5% 1206 SMD	569-0115-272
R 224	100 ohm ±5% 1206 SMD	569-0115-101
R 225	100 ohm ±5% 1206 SMD	569-0115-101
R 226	180 ohm ±5% 1206 SMD	569-0115-181
R 227	10k ohm ±5% 1206 SMD	569-0115-103
R 228	1k ohm ±5% 1206 SMD	569-0115-102
R 229	10 ohm ±5% 1206 SMD	569-0115-100
R 230	270 ohm ±5% 1206 SMD	569-0115-271
R 231	10k ohm ±5% 1206 SMD	569-0115-103
R 232	10k ohm ±5% 1206 SMD	569-0115-103
R 234	1k ohm ±5% 1206 SMD	569-0115-102
R 239	51 ohm ±5% 1206 SMD	569-0115-510
R 240	270 ohm ±5% 1206 SMD	569-0115-271
R 241	10 ohm ±5% 1206 SMD	569-0115-100
R 242	2.7k ohm ±5% 1206 SMD	569-0115-272
R 243	3.3k ohm ±5% 1206 SMD	569-0115-332
R 244	3.3k ohm ±5% 1206 SMD	569-0115-332
R 246	1k ohm ±5% 1206 SMD	569-0115-102
R 248	2.7k ohm ±5% 1206 SMD	569-0115-272
R 249	3.3k ohm ±5% 1206 SMD	569-0115-332
R 250	270 ohm ±5% 1206 SMD	569-0115-271
R 251	3.3k ohm ±5% 1206 SMD	569-0115-332
R 252	330k ohm ±5% 1206 SMD	569-0115-334
R 253	6.8k ohm ±5% 1206 SMD	569-0115-682
R 254	1k ohm ±5% 1206 SMD	569-0115-102
R 255	27k ohm ±5% 1206 SMD	569-0115-273
R 256	20k ohm ±5% 1206 SMD	569-0115-203
R 257	100 ohm ±5% 1206 SMD	569-0115-101
R 258	100 ohm ±5% 1206 SMD	569-0115-101

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
R 261	5k ohm single turn trimmer	562-0112-502
R 262	10k ohm ±5% 1206 SMD	569-0115-103
R 263	240k ohm ±5% 1206 SMD	569-0115-244
R 264	5k ohm single turn trimmer	562-0112-502
R 265	1k ohm ±5% 1206 SMD	569-0115-102
R 266	220 ohm ±5% 1206 SMD	569-0115-221
R 267	294 ohm ±1% 1206 SMD	569-0111-246
R 268	1k ohm ±1% 1206 SMD	569-0111-301
R 269	1k ohm ±5% 1206 SMD	569-0115-102
R 270	1k ohm ±5% 1206 SMD	569-0115-102
R 271	910 ohm ±5% 1206 SMD	569-0115-911
R 272	240 ohm ±5% 1206 SMD	569-0115-241
R 273	100 ohm ±5% 1206 SMD	569-0115-101
R 274	10 ohm ±5% 1206 SMD	569-0115-100
R 275	6.8k ohm ±5% 1206 SMD	569-0115-682
R 276	47k ohm ±5% 1206 SMD	569-0115-473
R 277	150 ohm ±5% 1206 SMD	569-0115-151
R 278	1.6k ohm ±5% 1206 SMD	569-0115-162
R 279	1.6k ohm ±5% 1206 SMD	569-0115-162
R 280	100k ohm ±5% 1206 SMD	569-0115-104
R 281	1k ohm ±5% 1206 SMD	569-0115-102
R 283	100 ohm ±5% 1206 SMD	569-0115-101
R 284	5k ohm single turn trimmer	562-0112-502
R 285	300 ohm ±5% 1206 SMD	569-0115-301
R 286	18 ohm ±5% 1206 SMD	569-0115-180
R 287	300 ohm ±5% 1206 SMD	569-0115-301
R 290	1.5k ohm ±5% 1206 SMD	569-0115-152
R 291	1.3k ohm ±5% 1206 SMD	569-0115-132
R 292	75 ohm ±5% 1206 SMD	569-0115-750
R 293	51 ohm ±5% 1206 SMD	569-0115-510
R 294	10 ohm ±5% 1206 SMD	569-0115-100
R 295	390 ohm ±5% 1206 SMD	569-0115-391
R 296	1k ohm ±5% 1206 SMD	569-0115-102
R 297	220 ohm ±5% 1206 SMD	569-0115-221
R 298	100 ohm ±5% 1206 SMD	569-0115-101
R 299	36 ohm ±5% 1206 SMD	569-0115-360
R 300	36 ohm ±5% 1206 SMD	569-0115-360
R 301	220 ohm ±5% 1206 SMD	569-0115-221
R 302	220 ohm ±5% 1206 SMD	569-0115-221
R 303	43 ohm ±5% 1206 SMD	569-0115-430
R 304	240 ohm ±5% 1206 SMD	569-0115-241
R 311	4.3k ohm ±5% 1206 SMD	569-0115-432
R 312	10 ohm ±5% 1206 SMD	569-0115-100
R 313	220 ohm ±5% 1206 SMD	569-0115-221
R 314	220 ohm ±5% 1206 SMD	569-0115-221
R 315	270 ohm ±5% 1206 SMD	569-0115-271
R 316	10k ohm ±5% 1206 SMD	569-0115-103

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
R 319	10k ohm ±5% 1206 SMD	569-0115-103
R 321	510 ohm ±5% 1206 SMD	569-0115-511
R 322	560 ohm ±5% 1206 SMD	569-0115-561
R 323	Zero ohm ±5% 1206 SMD	569-0115-001
R 324	10k ohm ±5% 1206 SMD	569-0115-103
RT101	1k ohm ±5% chip thermistor	569-3013-002
TP001	Red tip jack, vert. 0.08	105-2002-211
TP003	Red tip jack, vert. 0.08	105-2002-211
TP004	Red tip jack, vert. 0.08	105-2002-211
TP005	Red tip jack, vert. 0.08	105-2002-211
TP006	Red tip jack, vert. 0.08	105-2002-211
U 201	Mixer LRMS-2H	544-0007-013
U 202	FM IF MC3371D SO-16	544-2002-031
U 203	Dual op amp SO-8	544-2019-004
U 204	Op amp SO-8 MC33172D	544-2019-017
U 205	Parallel load PLL	544-2024-005
U 206	+12V regulator 78L12 SO-8	544-2603-032
U 207	+12V regulator 78L12 SO-8	544-2603-032
U 208	+5V regulator 78L05 SO-8	544-2603-039
U 209	Synthesizer MC145190F SOIC	544-3954-026
U 210	+12V regulator SOIC 78L12	544-2603-032
U 211	Single op amp LMC7101	544-2016-001
W 201	Cable assembly	597-3003-290
Y 201	17.5 MHz crystal 1 PPM	518-7117-500
Z 201	52.95 MHz 4-pole 8 kHz BW	532-0009-011
Z 203	52.95 MHz 4-pole 8 kHz BW	532-0009-011
Z 205	450 kHz cer filter 9 kHz BW	532-2006-034
Z 213	455 kHz var inductor w/cap	542-1012-010

AUDIO/LOGIC INTERCONNECT BOARD
PART NO. 023-2000-700

C 101	10 pF ±5% NPO 1206 chip	510-3602-100
C 102	10 pF ±5% NPO 1206 chip	510-3602-100
C 103	62 pF ±5% NPO 1206 chip	510-3602-620
C 104	62 pF ±5% NPO 1206 chip	510-3602-620
C 105	.1 µF ±10% X7R 1210	510-3607-104
C 106	150 pF ±5% NPO 1206 chip	510-3602-151
C 107	20 pF ±5% NPO 1206 chip	510-3602-200
C 108	20 pF ±5% NPO 1206 chip	510-3602-200
C 109	1.5 µF 25V SMD tantalum	510-2627-159
C 110	1 µF 16V SMD tantalum	510-2625-109
C 111	100 pF ±5% NPO 1206 chip	510-3602-101
C 113	.01 µF ±10% X7R chip	510-3606-103
C 114	.01 µF ±10% X7R chip	510-3606-103
C 115	.01 µF ±10% X7R chip	510-3606-103
C 116	.01 µF ±10% X7R chip	510-3606-103
C 117	.1 µF ±10% X7R chip	510-3606-104
C 118	.1 µF ±10% X7R chip	510-3606-104
C 119	.1 µF ±10% X7R chip	510-3606-104
C 120	.1 µF ±10% X7R chip	510-3606-104
C 121	.01 µF ±10% X7R chip	510-3606-103
C 122	.01 µF ±10% X7R chip	510-3606-103
C 123	.01 µF ±10% X7R chip	510-3606-103
C 124	.01 µF ±10% X7R chip	510-3606-103
C 125	.01 µF ±10% X7R chip	510-3606-103
C 126	.01 µF ±10% X7R chip	510-3606-103
C 127	.01 µF ±10% X7R chip	510-3606-103
C 128	.01 µF ±10% X7R chip	510-3606-103
C 129	10 µF 16V SMD tantalum	510-2625-100
C 130	10 µF 16V SMD tantalum	510-2625-100
C 131	10 µF 16V SMD tantalum	510-2625-100
C 133	.01 µF ±10% X7R chip	510-3606-103
C 134	.01 µF ±10% X7R chip	510-3606-103
C 135	10 µF 16V SMD tantalum	510-2625-100
C 136	.01 µF ±10% X7R chip	510-3606-103
C 137	10 µF 16V SMD tantalum	510-2625-100
C 201	.1 µF ±10% X7R chip	510-3606-104
C 202	.0022 µF ±10% X7R chip	510-3606-222
C 203	.001 µF ±2% NPO 1206	510-3616-102
C 204	820 pF ±2% NPO 1206	510-3616-821
C 205	.001 µF ±2% NPO 1206	510-3616-102
C 206	100 pF ±2% NPO 1206	510-3616-101
C 207	68 pF ±5% NPO 1206 chip	510-3602-680
C 208	.033 µF ±5% X7R 1210	510-3610-333
C 209	.022 µF ±5% X7R 1210	510-3610-224
C 210	.033 µF ±5% X7R 1210	510-3610-333
C 211	.068 µF ±5% X7R 1206	510-3609-683
C 212	.022 µF ±5% X7R 1210	510-3610-224
C 213	2200 pF ±2% NPO 1206	510-3616-222
C 214	4700 pF ±2% NPO 1206	510-3616-472
C 215	.047 µF ±5% X7R 1206	510-3609-473
C 216	.1 µF ±5% X7R 1206	510-3609-104
C 217	.022 µF ±5% X7R 1206	510-3609-223
C 218	6800 pF ±2% NPO 1210	510-3617-682
C 219	.068 µF ±5% X7R 1206	510-3609-683
C 220	.1 µF ±5% X7R 1206	510-3609-104
C 221	.022 µF ±5% X7R 1206	510-3609-223

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
C 222	.022 µF ±5% X7R 1206	510-3609-223
C 223	.01 µF ±5% X7R 1206	510-3609-103
C 224	100 pF ±5% NPO 1206 chip	510-3602-101
C 225	100 pF ±5% NPO 1206 chip	510-3602-101
C 226	100 pF ±5% NPO 1206 chip	510-3602-101
C 227	.001 µF ±5% NPO 1206 chip	510-3602-102
C 228	20 pF ±5% NPO 1206 chip	510-3602-200
C 229	.01 µF ±5% X7R 1206	510-3609-103
C 230	.01 µF ±5% X7R 1206	510-3609-103
C 231	.1 µF ±5% X7R 1206	510-3609-104
C 232	.1 µF ±5% X7R 1206	510-3609-104
C 233	1 µF 16V SMD tantalum	510-2625-109
C 234	.022 µF ±5% X7R 1206	510-3609-223
C 235	.01 µF ±5% X7R 1206	510-3609-103
C 236	.047 µF ±5% X7R 1206	510-3609-473
C 237	.0068 µF ±10% X7R chip	510-3606-682
C 238	15 µF 20V SMD tantalum	510-2626-150
C 239	15 µF 20V SMD tantalum	510-2626-150
C 240	.001 µF ±2% NPO 1206	510-3616-102
C 241	470 µF 16V radial low temp	510-4216-471
C 242	10 µF 16V SMD tantalum	510-2625-100
C 243	.01 µF ±10% X7R chip	510-3606-103
C 244	.1 µF ±5% X7R 1206	510-3609-104
C 245	15 µF 20V tantalum SMD	510-2626-150
C 246	.1 µF ±10% X7R chip	510-3606-104
C 247	.1 µF ±10% X7R chip	510-3606-104
C 248	470 µF 16V radial low temp	510-4216-471
C 249	470 µF 16V radial low temp	510-4216-471
C 250	300 pF ±5% NPO 1206	510-3602-301
C 251	300 pF ±5% NPO 1206	510-3602-301
C 252	4.7 µF 16V tantalum SMD	510-2625-479
C 253	4.7 µF 16V tantalum SMD	510-2625-479
C 254	1 µF 16V tantalum SMD	510-2625-109
C 255	10 µF 16V tantalum SMD	510-2625-100
C 256	2200 pF ±5% NPO 1206	510-3602-222
C 257	10 pF ±5% NPO 1206	510-3602-100
C 258	10 pF ±5% NPO 1206	510-3602-100
C 259	.047 µF ±10% X7R chip	510-3606-473
C 260	.01 µF ±10% X7R chip	510-3606-103
C 261	.01 µF ±10% X7R chip	510-3606-103
C 262	15 µF 20V tantalum SMD	510-2626-150
C 263	.01 µF ±10% X7R chip	510-3606-103
C 264	15 µF 20V tantalum SMD	510-2626-150
C 265	.01 µF ±10% X7R chip	510-3606-103
C 266	15 µF 20V tantalum SMD	510-2626-150
C 267	.01 µF ±10% X7R chip	510-3606-103
C 268	.001 µF ±5% NPO 1206 chip	510-3602-102
C 269	1.5 µF 25V tantalum SMD	510-2627-159
C 270	4.7 µF 16V tantalum SMD	510-2625-479
C 271	.001 µF ±5% NPO 1206	510-3602-102
C 272	15 µF 20V tantalum SMD	510-2626-150
C 273	82 pF ±5% NPO 1206	510-3602-820
C 275	15 µF 20V tantalum SMD	510-2626-150
C 276	.1 µF ±10% X7R chip	510-3606-104
C 277	47 µF 10V tantalum SMD	510-2624-470
C 278	.1 µF ±10% X7R chip	510-3606-104
C 279	47 µF 10V tantalum SMD	510-2624-470
C 280	47 µF 10V tantalum SMD	510-2624-470
C 281	.01 µF ±10% X7R chip	510-3606-103
C 282	.01 µF ±10% X7R chip	510-3606-103
C 283	.01 µF ±10% X7R chip	510-3606-103
C 284	.01 µF ±10% X7R chip	510-3606-103
C 285	.01 µF ±10% X7R chip	510-3606-103
C 286	.01 µF ±10% X7R chip	510-3606-103
C 287	47 µF 10V tantalum SMD	510-2624-470
C 288	.01 µF ±10% X7R chip	510-3606-103
C 289	.01 µF ±10% X7R chip	510-3606-103
C 290	.01 µF ±10% X7R chip	510-3606-103
C 291	.01 µF ±10% X7R chip	510-3606-103
C 292	.01 µF ±10% X7R chip	510-3606-103
C 293	.01 µF ±10% X7R chip	510-3606-103
C 295	47 µF 10V tantalum SMD	510-2624-470
C 296	.01 µF ±10% X7R chip	510-3606-103
C 297	.01 µF ±10% X7R chip	510-3606-103
C 298	.01 µF ±10% X7R chip	510-3606-103
C 299	.01 µF ±10% X7R chip	510-3606-103
C 300	.01 µF ±10% X7R chip	510-3606-103
C 301	.1 µF ±5% X7R 1206	510-3609-104
C 302	.01 µF ±10% X7R chip	510-3606-103
C 303	.01 µF ±10% X7R chip	510-3606-103
C 304	10 µF 63V axial low temp	510-4363-100
C 305	10 µF 63V axial low temp	510-4363-100
CR201	Dual switch diode SOT-23	523-1504-023
CR202	Dual switch diode SOT-23	523-1504-023
CR203	4.3V zener SOT-23	523-2016-439
CR204	Switching diode SOT-23	523-1504-002
CR205	UHF/VHF band sw SOT-23	523-1504-012
CR206	UHF/VHF band sw SOT-23	523-1504-012
CR207	UHF/VHF band sw SOT-23	523-1504-012
CR208	Switching diode SOT-23	523-1504-002
CR209	3A ultra-fast diode sw	523-1507-004
DS101	7-segment display green 0.3"	549-4002-020

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
EP101	2-hole crystal pin insulator	018-1080-001
F 201	2A/250V subminiature fuse	534-0017-017
FH201	PC board mount fuse holder	534-1017-001
HW101	4-40 mach panhead ZPS	575-1604-010
HW102	#4 shakeproof washer	596-1104-008
HW103	4-40 x 0.094 nut NPB	560-2104-008
HW104	0.142 dia snap rivet	574-9015-050
HW105	Jack screw	537-9016-020
J 101	15-pos D-sub rt angle PC mt	515-0506-102
J 102	8-con modular jack PC mt	515-2006-040
J 103	3-pin single inline header	515-7100-003
J 104	3-pin single inline header	515-7100-003
J 105	14-pin double row header	515-7101-407
J 106	Dual row receptacle	515-7110-008
J 107	2-pin single inline header	515-7100-002
J 108	2-pin single inline header	515-7100-002
J 201	20-pin straight header	515-9031-376
J 202	Horizontal tip jack	105-2204-105
J 203	Horizontal tip jack	105-2203-101
J 204	3.6mm enclosed jack	515-2001-011
J 205	2-pin single inline header	515-7100-002
J 206	2-pin single inline header	515-7100-002
J 207	1-pin single inline header	515-7100-001
J 208	1-pin single inline header	515-7100-001
J 209	1-pin single inline header	515-7100-001
J 210	1-pin single inline header	515-7100-001
J 211	1-pin single inline header	515-7100-001
J 212	1-pin single inline header	515-7100-001
L 201	20 µH 1A choke	542-5010-011
L 202	20 µH 1A choke	542-5010-011
MP101	Control know	032-0792-010
P 103	2-post shorting socket	515-5010-001
P 104	2-post shorting socket	515-5010-001
P 105	2-post shorting socket	515-5010-001
P 107	2-post shorting socket	515-5010-001
P 108	2-post shorting socket	515-5010-001
P 205	2-post shorting socket	515-5010-001
P 206	2-post shorting socket	515-5010-001
PC700	PC board	035-2000-700
Q 101	PNP switching transistor	576-0115-001
Q 102	Si NPN gen purp sw/amp	576-0001-300
R 101	Zero ohm ±5% 1206 SMD	569-0115-001
R 102	10k ohm ±5% 1206 SMD	569-0115-103
R 103	100k ohm ±5% 1206 SMD	569-0115-104
R 104	4.7k ohm ±5% 1206 SMD	569-0115-472
R 105	10k ohm ±5% 1206 SMD	569-0115-103
R 106	10k ohm ±5% 1206 SMD	569-0115-103
R 107	4.7k ohm ±5% 1206 SMD	569-0115-472
R 108	10k ohm ±5% 1206 SMD	569-0115-103
R 109	10k ohm ±5% 1206 SMD	569-0115-103
R 110	10k ohm ±5% 1206 SMD	569-0115-103
R 111	10k ohm ±5% 1206 SMD	569-0115-103
R 112	10k ohm ±5% 1206 SMD	569-0115-103
R 113	10k ohm ±5% 1206 SMD	569-0115-103
R 114	10k ohm ±5% 1206 SMD	569-0115-103
R 115	100k ohm ±5% 1206 SMD	569-0115-104
R 116	10M ohm ±5% 1206 SMD	569-0115-106
R 117	2k ohm ±5% 1206 SMD	569-0115-202
R 118	10k ohm ±5% 1206 SMD	569-0115-103
R 119	10k ohm ±5% 1206 SMD	569-0115-103
R 120	10k ohm ±1% 1206 SMD	569-0111-401
R 121	10k ohm ±1% 1206 SMD	569-0111-401
R 122	10k ohm ±5% 1206 SMD	569-0115-103
R 123	10k ohm ±5% 1206 SMD	569-0115-103
R 124	10k ohm ±5% 1206 SMD	569-0115-103
R 131	10k ohm ±5% 1206 SMD	569-0115-103
R 132	10k ohm ±5% 1206 SMD	569-0115-103
R 201	29.4k ohm ±1% 1206 SMD	569-0111-446
R 202	54.9k ohm ±1% 1206 SMD	569-0111-472
R 203	1M ohm ±5% 1206 SMD	569-0115-105
R 204	147k ohm ±1% 1206 SMD	569-0111-517
R 205	69.8k ohm ±1% 1206 SMD	569-0111-482
R 206	43k ohm ±5% 1206 SMD	569-0115-433
R 207	100k ohm trim pot	562-0110-104
R 208	390k ohm ±5% 1206 SMD	569-0115-394
R 209	15k ohm ±1% 1206 SMD	569-0111-418
R 210	100 ohm ±1% 1206 SMD	569-0111-201
R 211	1.07M ohm ±1% 1206 SMD	569-0111-604
R 212	110 ohm ±1% 1206 SMD	569-0111-205
R 213	1.07M ohm ±1% 1206 SMD	569-0111-604
R 214	110 ohm ±1% 1206 SMD	569-0111-205
R 215	1.07M ohm ±1% 1206 SMD	569-0111-604
R 216	18.2k ohm ±1% 1206 SMD	569-0111-426
R 217	47k ohm ±5% 1206 SMD	569-0115-473
R 218	10k ohm ±5% 1206 SMD	569-0115-103

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
R 219	18k ohm ±5% 1206 SMD	569-0115-183
R 220	150k ohm ±5% 1206 SMD	569-0115-154
R 221	5.1k ohm ±5% 1206 SMD	569-0115-512
R 222	100k ohm trim pot	562-0110-104
R 223	47k ohm ±5% 1206 SMD	569-0115-473
R 224	1.5k ohm ±5% 1206 SMD	569-0115-152
R 225	6.2k ohm ±5% 1206 SMD	569-0115-622
R 226	12k ohm ±5% 1206 SMD	569-0115-123
R 227	10k ohm ±5% 1206 SMD	569-0115-103
R 228	10k ohm ±5% 1206 SMD	569-0115-103
R 229	47k ohm ±5% 1206 SMD	569-0115-473
R 230	47k ohm ±5% 1206 SMD	569-0115-473
R 231	330k ohm ±5% 1206 SMD	569-0115-334
R 232	1M ohm ±5% 1206 SMD	569-0115-105
R 233	7.5k ohm ±5% 1206 SMD	569-0115-752
R 234	100k ohm ±5% 1206 SMD	569-0115-104
R 235	100k ohm ±5% 1206 SMD	569-0115-104
R 236	470k ohm ±5% 1206 SMD	569-0115-474
R 237	10k ohm ±5% 1206 SMD	569-0115-103
R 238	3.9k ohm ±5% 1206 SMD	569-0115-392
R 239	1k ohm ±5% 1206 SMD	569-0115-102
R 240	100k ohm ±5% 1206 SMD	569-0115-104
R 241	100k ohm ±5% 1206 SMD	569-0115-104
R 242	47k ohm ±5% 1206 SMD	569-0115-473
R 243	10k ohm ±5% 1206 SMD	569-0115-103
R 244	7.5k ohm ±5% 1206 SMD	569-0115-752
R 245	56k ohm ±5% 1206 SMD	569-0115-563
R 246	56k ohm ±5% 1206 SMD	569-0115-563
R 247	51k ohm ±5% 1206 SMD	569-0115-513
R 248	100k ohm trim pot	562-0110-104
R 249	270k ohm ±5% 1206 SMD	569-0115-274
R 250	100k ohm ±5% 1206 SMD	569-0115-104
R 251	100k ohm ±5% 1206 SMD	569-0115-104
R 252	47k ohm ±5% 1206 SMD	569-0115-473
R 253	10k ohm ±5% 1206 SMD	569-0115-103
R 254	18k ohm ±5% 1206 SMD	569-0115-183
R 255	5.1k ohm ±5% 1206 SMD	569-0115-512
R 256	1k ohm ±5% 1206 SMD	569-0115-102
R 257	10k ohm ±5% 1206 SMD	569-0115-103
R 258	5.1k ohm ±5% 1206 SMD	569-0115-512
R 259	1k ohm ±5% 1206 SMD	569-0115-102
R 260	10k ohm ±5% 1206 SMD	569-0115-103
R 261	47k ohm ±5% 1206 SMD	569-0115-473
R 262	10k ohm volume/audio switch	562-0018-044
R 263	1k ohm ±5% 1206 SMD	569-0115-102
R 264	39 ohm ±5% 1206 SMD	569-0115-390
R 265	1 ohm ±1% 1206 SMD	569-0115-109
R 266	2.2 ohm ±5% 1206 SMD	569-0115-229
R 267	220 ohm ±5% 1206 SMD	569-0115-221
R 268	51 ohm ±5% 2512 SMD	569-0175-510
R 270	10k ohm ±5% 1206 SMD	569-0115-103
R 271	100k ohm trim pot	562-0110-104
R 272	2.2k ohm ±5% 1206 SMD	569-0115-222
R 273	100k ohm ±5% 1206 SMD	569-0115-104
R 274	100k ohm ±5% 1206 SMD	569-0115-104
R 275	300 ohm ±5% 1206 SMD	569-0115-301
R 276	300 ohm ±5% 1206 SMD	569-0115-301
R 277	10k ohm ±5% 1206 SMD	569-0115-103
R 278	910 ohm ±5% 1206 SMD	569-0115-911
R 279	1M ohm ±5% 1206 SMD	569-0115-105
R 280	100k ohm ±5% 1206 SMD	569-0115-104
R 281	36k ohm ±5% 1206 SMD	569-0115-363
R 282	100k ohm trim pot	562-0110-104
R 283	36k ohm ±5% 1206 SMD	569-0115-363
R 284	10k ohm ±5% 1206 SMD	569-0115-103
R 285	43k ohm ±5% 1206 SMD	569-0115-433
R 486	10k ohm ±5% 1206 SMD	569-0115-103
R 487	43k ohm ±5% 1206 SMD	569-0115-433
R 288	10k ohm ±5% 1206 SMD	569-0115-103
R 289	22k ohm ±5% 1206 SMD	569-0115-223
R 290	22k ohm ±5% 1206 SMD	569-0115-223
R 291	22k ohm ±5% 1206 SMD	569-0115-223
R 292	6.2k ohm ±5% 1206 SMD	569-0115-622
R 293	1k ohm ±5% 1206 SMD	569-0115-102
R 294	130k ohm ±5% 1206 SMD	569-0115-134
R 295	300k ohm ±5% 1206 SMD	569-0115-304
RT201	10k ohm ±5% chip thermistor	569-3013-007
RV201	Varistor 250V V275LAY	523-2090-005
RV202	Varistor 250V V275LAY	523-2090-005
RV203	Varistor 250V V275LAY	523-2090-005
S 101	SPST momentary switch	583-4005-002
T 201	600 ohm modem transformer	592-1015-008
U 101	BCD-7 latch MC14495	544-3014-495
U 102	Micro monitor SO-8 SOIC	544-2003-085
U 103	+12V regulator 78L12 SOIC	544-2603-032
U 104	RDM boot code	023-9998-365
U 105	16-bit CMOS CPU ROMless	544-5002-016
U 106	32k x 8 SCRAM SO-28	544-5001-412
U 107	38V64 32 PLCC	544-5002-412

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
U 108	Quad 2-in NAND 74HC00	544-3766-000
U 109	Driver/Rcvr RS-232C/v.28	544-2023-014
U 110	Prog comm interface 82C5	544-5001-319
U 111	7-stage binary counter 4024	544-3016-024
U 112	Hex inverter 74HC04 SOIC	544-3766-004
U 113	1 of 16 demux 74HC154 SOIC	544-3766-154
U 114	D-flip-flop 74HC574 SOIC	544-3766-574
U 115	D-flip-flop 74HC574 SOIC	544-3766-574
U 116	D-flip-flop 74HC574 SOIC	544-3766-574
U 117	D-flip-flop 74HC574 SOIC	544-3766-574
U 118	8-bit A/D converter	544-2031-001
U 119	1 of 16 demux 74HC154 SOIC	544-3766-154
U 120	Quad 2-in NAND 74HC00	544-3766-000
U 121	Quad 2-in OR 74HC32	544-3766-032
U 122	Quad 2-in OR 74HC32	544-3766-032
U 123	9x64 FIFO 74HC7030	544-3764-703
U 124	9x64 FIFO 74HC7030	544-3764-703
U 125	87C52 CMOS	544-5011-948
U 126	Transparent latch 74HC573	544-3766-573
U 127	MAC LTR software	023-9998-291
U 128	1 of 8 demux 74HC138	544-3766-138
U 201	Dual op amp SO-8	544-2019-004
U 203	Quad op amp SOIC	544-2020-008
U 204	Dual op amp SO-8	544-2019-004
U 205	Dual op amp SO-8	544-2019-018
U 207	Quad op amp SOIC	544-2020-008
U 208	Dual op amp SO-8	544-2019-004
U 210	Quad op amp SOIC	544-2020-008
U 211	Quad analog sw SPST SOIC	544-3003-001
U 212	Quad analog sw SPST SOIC	544-3003-001
U 213	10W audio pentawatt IC	544-2006-013
U 215	Dual op amp SO-8	544-2019-018
U 216	Dual op amp SO-8	544-2019-004
U 217	Quad analog sw SPST SOIC	544-3003-001
U 218	FSK modem 7911 28-DIP	544-3988-004
U 219	Hex non-inverter buffer 4050	544-3016-050
U 220	8-channel mux/demux	544-3016-051
U 221	+12V regulator 78L12 SOIC	544-2603-032
U 222	-5V DC 175 mA supply	544-2003-096
U 223	+9V regulator TO-220	544-2003-059
U 224	+5V regulator LM2904T-5	544-2003-091
X 101	10-post right angle IC socket	515-5008-250
X 104	32-pin IC socket	515-5008-108
X 105	84-post PLCC socket	515-5020-100
X 110	28-pin IC socket	515-5008-018
X 125	40-pin IC socket	515-5008-019
X 127	28-pin IC socket	515-5008-018
X 218	28-pin IC socket	515-5008-018
Y 101	10 MHz crystal HC-18	521-0010-000
Y 102	2.4576 MHz crystal HC-18U	521-0002-458
Y 103	11.059 MHz crystal	521-0011-059
Y 201	2.4576 MHz HC-18U	521-0002-458
Z 201	EMI suppression filter	532-3003-002
	20-PIN RIBBON CABLE PART NO. 023-2000-703	
J 001	20-post open relief	515-7130-120
J 002	20-post open relief	515-7130-120
U 102	Micro monitor SO-8 DIP	544-2003-085
W 001	20-cond ribbon cable 28 AWG	597-7004-005
	VOTER TO REPEATER CABLE PART NO 023-2000-196	
EP001	Washer	016-2025-001
EP002	Contact female	016-1931-002
EP003	3/16" heat shrink tubing	042-0241-554
EP004	1/4" heat shrink tubing	042-0241-555
HW001	E-ring 0.073 groove	537-1001-004
HW002	4-20 panhead phil CPS screw	575-5604-016
MP001	Jack screw	013-1430-001
MP002	Cont housing female w/insert	117-0414-103
MP003	Hood female housing	117-0614-103
W 001	3-cond 24 AWG stranded	597-4002-060
	VOTER ENCLOSURE PART NO. 023-2000-207	
CH200	Voter enclosure	017-2210-155
HW200	0.75 OD x 0.437 high	574-1004-003
HW201	Adhesive lens	574-3002-115
HW202	6-32 mach panhead ZPS	575-1606-012
HW203	10-32 mach panhead ZPS	575-1610-016
HW204	6-32 mach flathead 82 phil	575-8206-016
HW205	#10 Flat washer ZPS	596-1410-016
MP200	Enclosure mounting ears	017-2210-085
MP201	Top cover	017-2210-150
MP202	Front door	032-0758-020

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
MP203	Front door lens	032-0758-025
MP204	Lock cam	537-9007-012
MP204	Card guide 6"	574-9015-007
NP200	Nameplate	559-5861-163
NP201	FCC bar code label	559-0220-003
NP202	FCC bar code label	559-0220-003
	OCXO DRAWER	
	PART NO. 023-2000-921 (w/1 OCXO)	
	023-2000-922 (w/2 OCXOs)	
A 001	Main board OCXO drawer	023-2000-920
A 002	Power supply board OCXO	023-2000-930
A 003	8-Way BNC RF splitter	585-0647-027
C 901	150 pF ±5% NPO 1206 chip	510-3602-151
C 902	.01 µF ±10% X7R chip	510-3606-103
C 903	.0039 µF ±5% X7R 1206	510-3609-392
C 904	.0039 µF ±5% X7R 1206	510-3609-392
C 905	.001 µF ±10% X7R chip	510-3606-102
C 906	150 pF ±5% NPO 1206 chip	510-3602-151
C 907	150 pF ±5% NPO 1206 chip	510-3602-151
C 908	.01 µF ±10% X7R chip	510-3606-103
C 909	22 µF 16V SMD tant SMD	510-2625-220
C 910	22 µF 16V SMD tant SMD	510-2625-220
C 911	150 pF ±5% NPO 1206 chip	510-3602-151
C 912	.047 µF ±10% X7R chip	510-3606-473
C 913	.01 µF ±10% X7R chip	510-3606-103
C 914	.01 µF ±10% X7R chip	510-3606-103
C 915	.01 µF ±10% X7R chip	510-3606-103
C 916	.01 µF ±10% X7R chip	510-3606-103
C 917	.1 µF ±10% X7R 1210 chip	510-3607-104
C 921	2.2 µF 16V tantalum SMD	510-2625-229
C 922	2.2 µF 16V tantalum SMD	510-2625-229
C 923	470 pF ±5% NPO 1206 chip	510-3602-471
C 924	470 pF ±5% NPO 1206 chip	510-3602-471
C 925	.01 µF ±10% X7R chip	510-3606-103
C 926	.01 µF ±10% X7R chip	510-3606-103
C 927	.01 µF ±10% X7R chip	510-3606-103
C 928	.01 µF ±10% X7R chip	510-3606-103
C 929	.01 µF ±10% X7R chip	510-3606-103
C 930	.01 µF ±10% X7R chip	510-3606-103
C 931	.01 µF ±10% X7R chip	510-3606-103
C 932	.01 µF ±10% X7R chip	510-3606-103
C 933	.01 µF ±10% X7R chip	510-3606-103
C 934	.01 µF ±10% X7R chip	510-3606-103
C 935	.01 µF ±10% X7R chip	510-3606-103
C 936	.01 µF ±10% X7R chip	510-3606-103
C 937	.01 µF ±10% X7R chip	510-3606-103
C 938	.01 µF ±10% X7R chip	510-3606-103
C 939	.01 µF ±10% X7R chip	510-3606-103
C 940	.01 µF ±10% X7R chip	510-3606-103
C 941	.01 µF ±10% X7R chip	510-3606-103
C 942	.01 µF ±10% X7R chip	510-3606-103
C 943	.01 µF ±10% X7R chip	510-3606-103
C 944	.01 µF ±10% X7R chip	510-3606-103
C 945	.01 µF ±10% X7R chip	510-3606-103
C 946	.01 µF ±10% X7R chip	510-3606-103
C 947	.01 µF ±10% X7R chip	510-3606-103
C 948	.01 µF ±10% X7R chip	510-3606-103
CR901	Switching diode SOT-23	523-1504-002
CR902	Dual switch diode SOT-23	523-1504-023
CR903	Dual switch diode SOT-23	523-1504-023
CR904	Dual switch diode SOT-23	523-1504-023
CR905	Dual switch diode SOT-23	523-1504-023
CR906	Switching diode SOT-23	523-1504-002
CR907	200V 1.5A rectifier 1N4818	523-0013-201
CR908	200V 1A rectifier 1N4003	523-0501-002
DS901	Red/Green LED right angle	549-4006-001
DS902	Red/Green LED right angle	549-4006-001
DS903	Red/Green LED right angle	549-4006-001
DS904	Red/Green LED right angle	549-4006-001
DS905	Red/Green LED right angle	549-4006-001
DS906	Red/Green LED right angle	549-4006-001
EP001	8 ft. AC cord 3-18	597-1001-011
F 901	2A 250V subminiature	534-0017-017
FH901	Fuse holder PC bd mount	534-1017-001
HW001	6-32 x 0.094 nut	560-1106-010
HW002	6-32 machine panhead ZPS	575-1610-008
HW003	10-32 machine panhead ZPS	575-1610-016
HW004	#6 flathead 82 taptite	575-6206-308
HW005	6 x 0.018 lockwasher int	596-1106-009
HW006	#10 flat washer ZPS	596-1410-016
HW007	6-32 flathead 82 philips	575-9086-012
HW008	Power supply board insulator	018-1007-048
HW009	LED lens cover	018-1007-049
HW010	Lens adhesive	574-3002-118
HW011	LED lens cover adhesive	574-3002-118

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
HW012	5/16" cable clamp	572-0001-004
HW901	0.025 x 0.037 pin receptacle	515-5006-255
HW902	Rubber feet	574-1008-002
J 901	18-pin block header	586-2006-010
J 902	3-pin single inline header	515-7100-003
J 903	3-pin single inline header	515-7100-003
J 904	3-pin single inline header	515-7100-003
J 905	3-pin single inline header	515-7100-003
J 906	3-pin single inline header	515-7100-003
J 907	3-pin single inline header	515-7100-003
J 908	3-pin single inline header	515-7100-003
J 909	3-pin single inline header	515-7100-003
J 910	3-pin single inline header	515-7100-003
J 911	3-pin single inline header	515-7100-003
J 912	Rear connector housing	515-9031-234
J 920	18-terminal block connector	586-2006-005
K 901	12V SPDT reed DIP	567-2002-021
K 902	12V SPDT reed DIP	567-2002-021
K 903	12V SPDT reed DIP	567-2002-021
K 904	12V SPDT reed DIP	567-2002-021
K 905	12V SPDT reed DIP	567-2002-021
K 906	12V SPDT reed DIP	567-2002-021
L 901	3.9 µH inductor SMD	542-9001-399
L 902	10 µH inductor SMD	542-9001-100
L 903	3.9 µH inductor SMD	542-9001-399
L 904	.39 µH inductor SMD	542-9001-398
L 905	1.2 µH inductor SMD	542-9001-129
L 906	.39 µH inductor SMD	542-9001-398
MP001	Power cord strain relief	016-2187-270
MP002	Front panel	017-2210-125
MP003	Lens	032-0758-035
MP004	Drawer	017-2210-129
MP005	Top cover	017-2210-127
MP006	Mounting ear	017-2210-132
MP007	Foam pad 0.312 thick	574-3001-016
P 902	2-pos shorting socket	515-5010-001
P 903	2-pos shorting socket	515-5010-001
P 904	2-pos shorting socket	515-5010-001
P 905	2-pos shorting socket	515-5010-001
P 906	2-pos shorting socket	515-5010-001
P 907	2-pos shorting socket	515-5010-001
P 908	2-pos shorting socket	515-5010-001
P 909	2-pos shorting socket	515-5010-001
P 910	2-pos shorting socket	515-5010-001
P 911	2-pos shorting socket	515-5010-001
P 912	2-pos shorting socket	515-5010-001
P 913	2-pos shorting socket	515-5010-001
Q 901	Si NPN SOT-23	576-0003-658
Q 902	Si NPN SOT-23	576-0003-658
Q 903	Si NPN SOT-23	576-0003-658
Q 904	Si NPN SOT-23	576-0003-658
Q 905	Si NPN SOT-23	576-0003-658
Q 906	Si NPN SOT-23	576-0003-658
Q 907	Si NPN SOT-23	576-0003-658
Q 908	Si NPN SOT-23	576-0003-658
Q 909	Si NPN SOT-23	576-0003-658
Q 910	Si NPN SOT-23	576-0003-658
Q 911	Si NPN SOT-23	576-0003-658
Q 912	Si NPN SOT-23	576-0003-658
Q 913	Si NPN SOT-23	576-0003-658
Q 914	Si NPN SOT-23	576-0003-658
Q 915	Si NPN SOT-23	576-0003-658
Q 916	Si PNP SOT-23	576-0003-657
Q 917	Si NPN SOT-23	576-0003-658
Q 918	Si PNP SOT-23	576-0003-657
Q 919	Si NPN SOT-23	576-0003-658
Q 920	Si NPN SOT-23	576-0003-658
Q 921	Si PNP SOT-23	576-0003-657
Q 922	Si NPN SOT-23	576-0003-658
Q 923	Si PNP SOT-23	576-0003-657
Q 924	Si NPN SOT-23	576-0003-658
Q 925	Si NPN SOT-23	576-0003-658
R 901	1k ohm ±5% 1206 SMD	569-0115-102
R 902	10k ohm ±5% 1206 SMD	569-0115-103
R 903	270 ohm ±5% 1206 SMD	569-0115-271
R 904	51 ohm ±5% 1206 SMD	569-0115-510
R 905	430 ohm ±5% 1206 SMD	569-0115-431
R 906	200 ohm ±5% 1206 SMD	569-0115-201
R 907	2.4k ohm ±5% 1206 SMD	569-0115-242
R 908	10k ohm ±5% 1206 SMD	569-0115-103
R 909	430 ohm ±5% 1206 SMD	569-0115-431
R 910	200 ohm ±5% 1206 SMD	569-0115-201
R 911	2.4k ohm ±5% 1206 SMD	569-0115-242
R 912	10k ohm ±5% 1206 SMD	569-0115-103
R 913	10k ohm ±5% 1206 SMD	569-0115-103
R 914	3.3k ohm ±5% 1206 SMD	569-0115-332
R 915	10k ohm ±5% 1206 SMD	569-0115-103

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
R 916	4.7k ohm ±5% 1206 SMD	569-0115-472
R 917	1k ohm ±5% 1206 SMD	569-0115-102
R 918	10k ohm ±5% 1206 SMD	569-0115-103
R 919	270 ohm ±5% 1206 SMD	569-0115-271
R 920	1M ohm ±5% 1206 SMD	569-0115-105
R 921	30k ohm ±5% 1206 SMD	569-0115-303
R 922	10k ohm ±5% 1206 SMD	569-0115-103
R 923	5.1k ohm ±5% 1206 SMD	569-0115-512
R 924	10k ohm ±5% 1206 SMD	569-0115-103
R 925	270k ohm ±5% 1206 SMD	569-0115-274
R 926	Zero ohm ±5% 1206 SMD	569-0115-001
R 927	100 ohm ±5% 1206 SMD	569-0115-101
R 928	150 ohm ±5% 1206 SMD	569-0115-151
R 929	Zero ohm ±5% 1206 SMD	569-0115-001
R 930	27k ohm ±5% 1206 SMD	569-0115-273
R 931	Zero ohm ±5% 1206 SMD	569-0115-001
R 932	100 ohm ±5% 1206 SMD	569-0115-101
R 933	150 ohm ±5% 1206 SMD	569-0115-151
R 934	Zero ohm ±5% 1206 SMD	569-0115-001
R 935	27k ohm ±5% 1206 SMD	569-0115-273
R 936	Zero ohm ±5% 1206 SMD	569-0115-001
R 937	100 ohm ±5% 1206 SMD	569-0115-101
R 938	150 ohm ±5% 1206 SMD	569-0115-151
R 939	Zero ohm ±5% 1206 SMD	569-0115-001
R 940	27k ohm ±5% 1206 SMD	569-0115-273
R 941	Zero ohm ±5% 1206 SMD	569-0115-001
R 942	100 ohm ±5% 1206 SMD	569-0115-101
R 943	150 ohm ±5% 1206 SMD	569-0115-151
R 944	Zero ohm ±5% 1206 SMD	569-0115-001
R 945	27k ohm ±5% 1206 SMD	569-0115-273
R 946	15k ohm ±5% 1206 SMD	569-0115-153
R 948	30k ohm ±5% 1206 SMD	569-0115-303
R 949	30k ohm ±5% 1206 SMD	569-0115-303
R 950	15k ohm ±5% 1206 SMD	569-0115-153
R 951	Zero ohm ±5% 1206 SMD	569-0115-001
R 952	Zero ohm ±5% 1206 SMD	569-0115-001
R 953	1k ohm ±5% 1206 SMD	569-0115-102
R 954	150 ohm ±5% 1206 SMD	569-0115-151
R 955	1.3k ohm ±5% 1206 SMD	569-0115-132
R 956	1.3k ohm ±5% 1206 SMD	569-0115-132
R 957	30k ohm ±5% 1206 SMD	569-0115-303
R 958	15k ohm ±5% 1206 SMD	569-0115-153
R 959	10k ohm ±5% 1206 SMD	569-0115-103
R 960	36k ohm ±5% 1206 SMD	569-0115-363
R 961	30k ohm ±5% 1206 SMD	569-0115-303
R 962	36k ohm ±5% 1206 SMD	569-0115-363
R 963	Zero ohm ±5% 1206 SMD	569-0115-001
R 964	1k ohm ±5% 1206 SMD	569-0115-102
R 965	150 ohm ±5% 1206 SMD	569-0115-151
R 966	1.3k ohm ±5% 1206 SMD	569-0115-132
R 967	1.3k ohm ±5% 1206 SMD	569-0115-132
R 968	30k ohm ±5% 1206 SMD	569-0115-303
R 969	15k ohm ±5% 1206 SMD	569-0115-153
R 970	10k ohm ±5% 1206 SMD	569-0115-103
R 971	36k ohm ±5% 1206 SMD	569-0115-363
R 972	30k ohm ±5% 1206 SMD	569-0115-303
R 973	470k ohm ±5% 1206 SMD	569-0115-474
R 974	39k ohm ±5% 1206 SMD	569-0115-393
R 975	51 ohm ±5% 1206 SMD	569-0115-510
R 976	15k ohm ±5% 1206 SMD	569-0115-153
R 977	15k ohm ±5% 1206 SMD	569-0115-153
S 901	Toggle switch on-none-mom	583-0006-010
S 902	Toggle switch on-none-mom	583-0006-010
S 903	Toggle switch on-none-mom	583-0006-010
S 904	4-pos recessed DIP switch	583-5002-104
S 905	4-pos recessed DIP switch	583-5002-104
U 901	Quad 2-in NAND 74HC00	544-3766-000
U 902	Quad 2-in AND 74HC08	544-3766-008
U 903	Quad 2-in AND 74HC08	544-3766-008
U 904	Hex inverter SOIC 74HC04	544-3766-004
U 905	Dual 4-bit bi ripple counter	544-3766-393
U 906	Dual differential line driver	544-2023-026
U 907	Dual monostable multivibrator	544-3766-123
U 908	Opto isolation NPN out	544-2010-001
U 909	Opto isolation NPN out	544-2010-001
U 910	Dual D-flip-flop 74HC74	544-3766-074
U 911	Dual monostable multivibrator	544-3766-123
U 912	Quad 2-in OR gate 74HC32	544-3766-032
U 913	Phase locked loop 4046 SOIC	544-3016-046
U 914	Quad 2-in AND 74HC08	544-3766-008
W 902	Coax BNC panel 14.5"	597-3003-250
W 903	Coax BNC	597-3003-252
W 904	Coax BNC panel 14.5"	597-3003-250
Y 901	10 MHz OCXO ±0.03 PPM	561-0006-012
Y 901	10 MHz OCXO ±0.03 PPM	561-0006-012

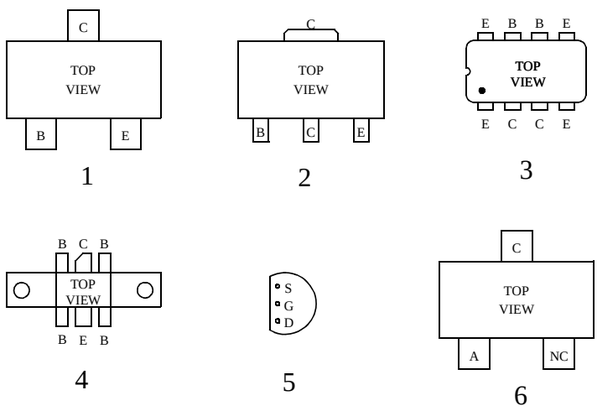
OCXO DRAWER POWER SUPPLY
PART NO. 023-2000-930

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
C 101	1000 µF 50V axial low temp	510-4350-102
C 102	6.8 µF 35V SMD tantalum	510-2635-689
C 103	.001 µF ±5% NPO 1206 chip	510-3602-102
C 104	220 µF 25V aluminum axial	510-4325-221
C 105	15 µF 20V SMD tantalum	510-2626-150
C 106	15 µF 20V SMD tantalum	510-2633-150
C 107	.001 µF ±5% NPO 1206	510-3602-102
C 108	2200 µF 25V aluminum axial	510-4325-222
C 109	15 µF 20V tantalum SMD	510-2633-150
C 110	.001 µF ±5% NPO 1206	510-3602-102
C 111	.001 µF ±5% NPO 1206	510-3602-102
C 112	4.7 µF 16V SMD tantalum	510-2625-479
CR101	200V 1.5A 1N4818	523-0013-201
CR102	200V 1.5A 1N4818	523-0013-201
CR103	200V 1.5A 1N4818	523-0013-201
CR104	200V 1.5A 1N4818	523-0013-201
CR105	200V 1.5A 1N4818	523-0013-201
EP101	Therma-film washer TO-3	574-5005-001
F 101	1A 250V subminiature	534-0017-014
FH101	Fuse holder PC board mount	534-1017-001
HW101	4-40 machine panhead ZPS	575-1604-012
HW102	#4 shakeproof washer	596-1104-008
HW103	4-40 x 0.094 nut NPB	560-2104-008
HW104	4-40 x 0.25 panhead taptite	575-0604-008
HW105	6-32 panhead taptite 5/16	575-0606-010
HW106	#4 x 0.046 shoulder washer	596-4504-008
HW107	Grafoil TO-220	018-1007-043
HW108	Grafoil pad	018-1007-044
HW109	6 x 7/16 flathead philips CPS	575-0606-014
J 101	PC board mt AC power cord	515-0028-008
J 102	4-cond #22 conn housing	515-9031-233
MP101	OCXO drawer heat sink	017-2210-130
MP102	OCXO drwr finned heat sink	014-0771-126
PC100	Power supply board	035-2000-930
R 101	2.49k ohm ±1% 1206 SMD	569-0111-339
R 102	220 ohm ±1% 1206 SMD	569-0111-234
S 101	115/230V select switch	583-3008-002
T 101	Low profile PC bd mt xfmr	592-3001-030
U 101	Voltage reg TO-3 LM117	544-2003-092
U 102	5V regulator LM2940T-5	544-2003-091

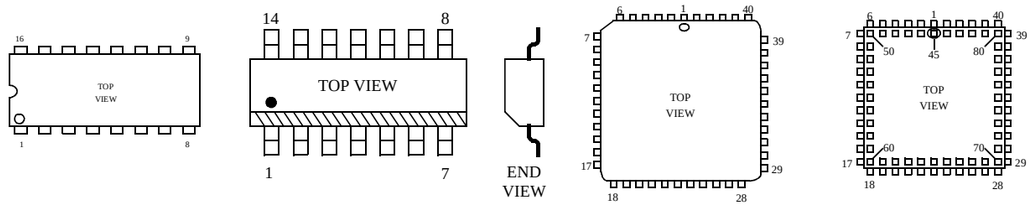
3.14 SCHEMATIC DIAGRAMS AND COMPONENT LAYOUTS

TRANSISTORS		
Part Number	Basing Diagram	Identification
576-0001-300	1	1R
576-0002-603	2	
576-0003-600	1	2X
576-0003-602	1	R2/R3
576-0003-604	3	3604
576-0003-612	1	2T
576-0003-636	1	R25
576-0003-657	1	2A
576-0003-658	1	1A
576-0004-098	3	
576-0004-820	4	
576-0004-821	4	
576-0006-109	5	
DIODES		
523-1504-002	6	5A
523-1504-012	6	2A
523-1504-015	6	4E
523-1504-016	6	5H
523-1504-023	-	A7
523-2016-180	6	Y7
523-2016-479	6	8E/Z1
523-2016-519	6	8F/Z2
523-2016-629	6	8J/Z4
523-2016-919	6	8P/Z8
523-5004-002		

BASING DIAGRAMS

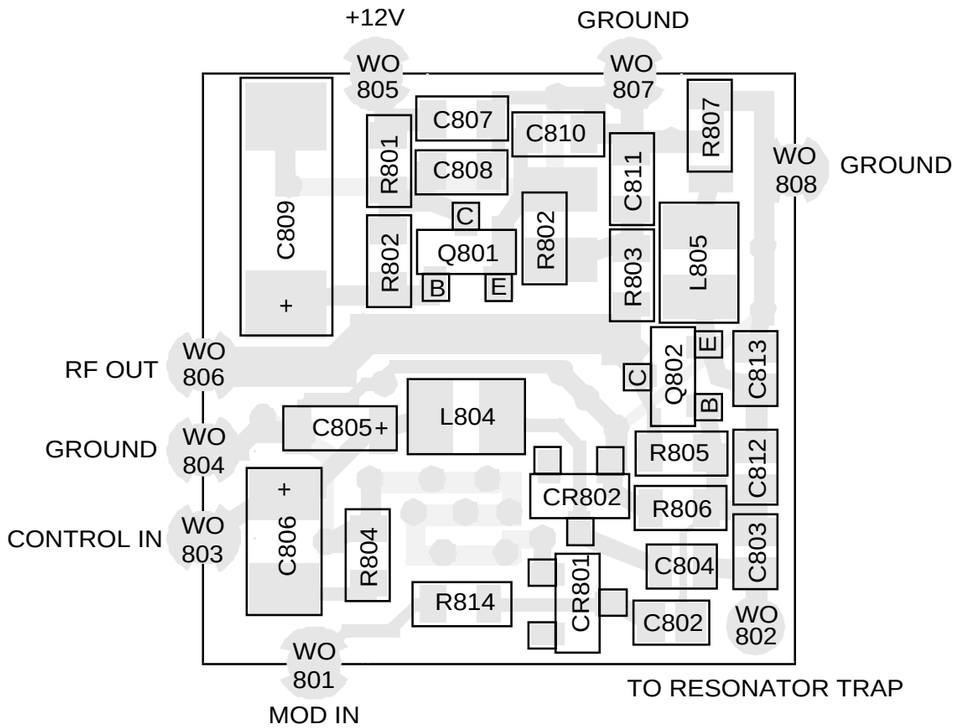


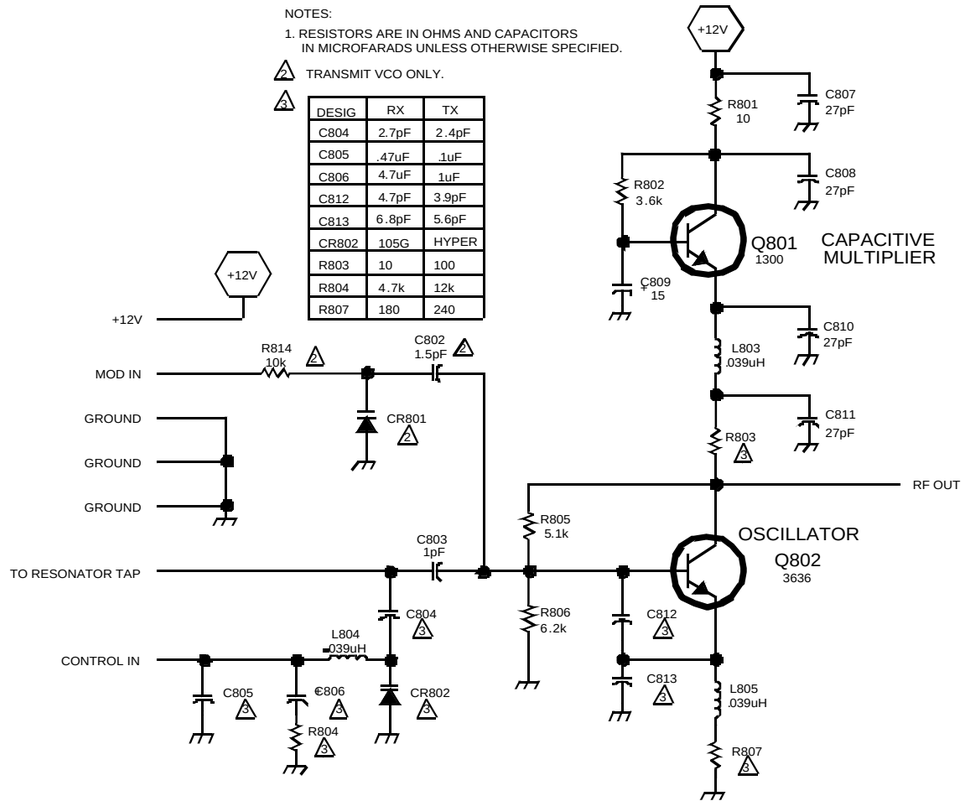
INTEGRATED CIRCUITS

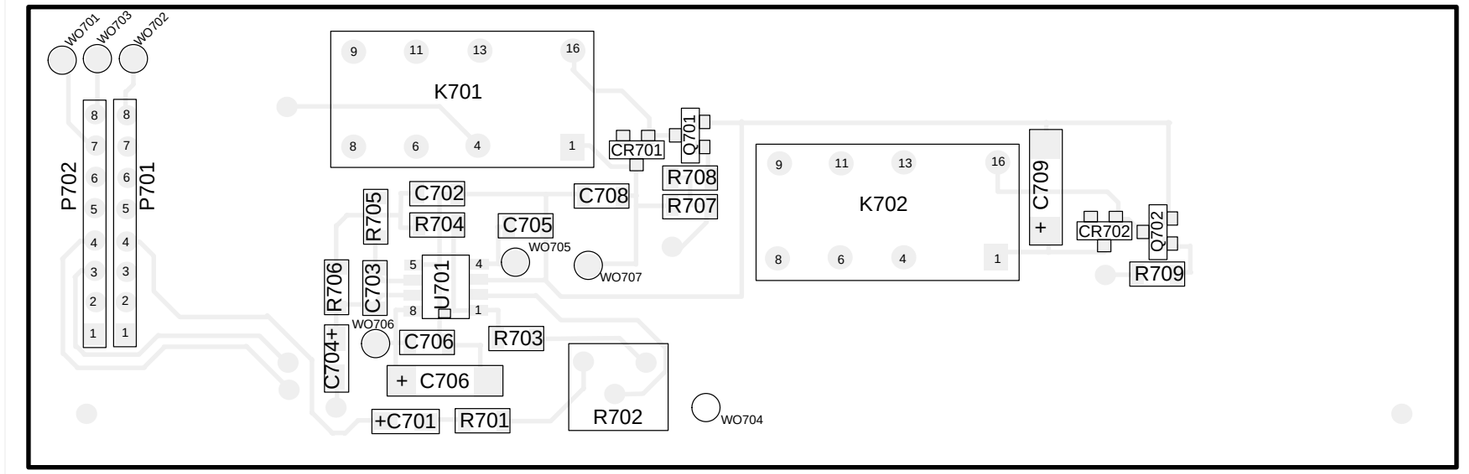


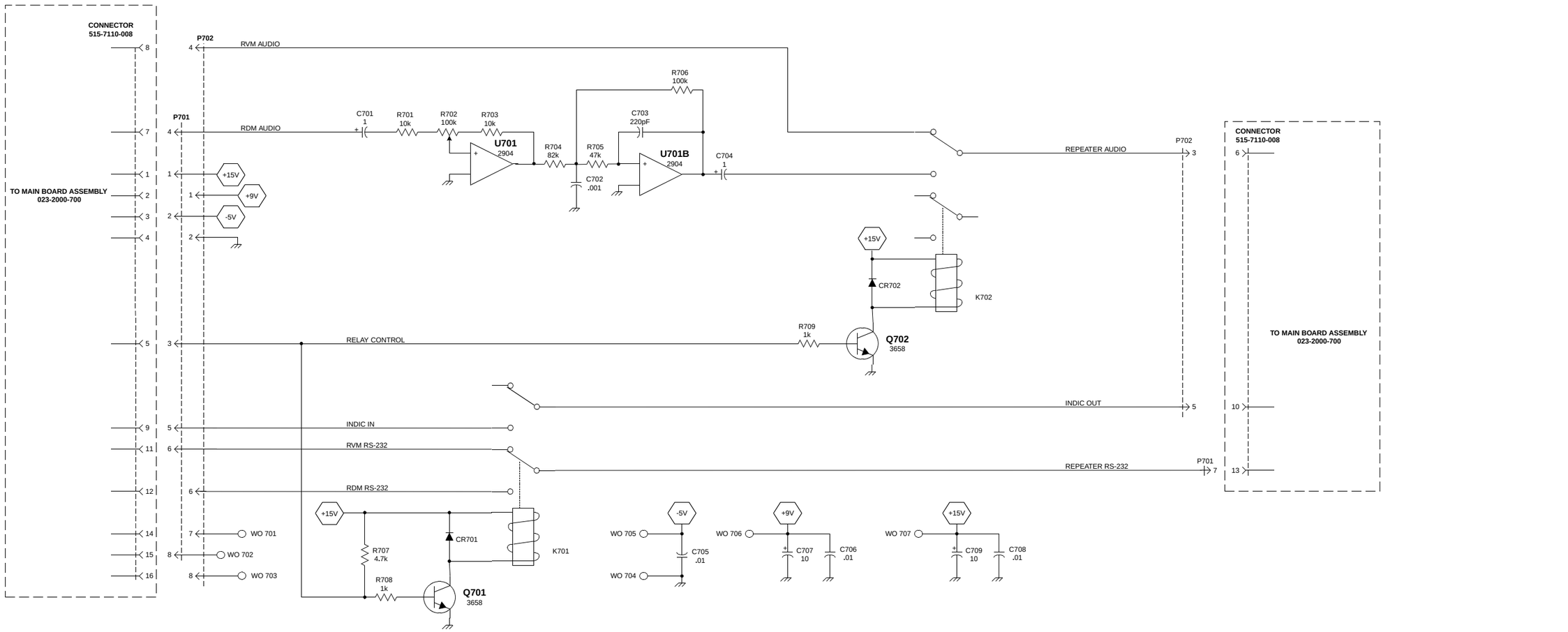
March 2000
Part No. 001-3139-502

FOLDOUT


+12V
GROUND
WO 805
WO 807
WO 808
GROUND
C809
+
R801
C807
C810
C808
R807
C811
C
Q801
B
E
R802
R802
R803
L805
C
Q802
E
B
C813
RF OUT
WO 806
GROUND
WO 804
C805+
L804
R805
CR802
R806
CONTROL IN
WO 803
C806
+
R804
R814
CR801
C804
C802
C803
C812
WO 802
WO 801
MOD IN
TO RESONATOR TRAP

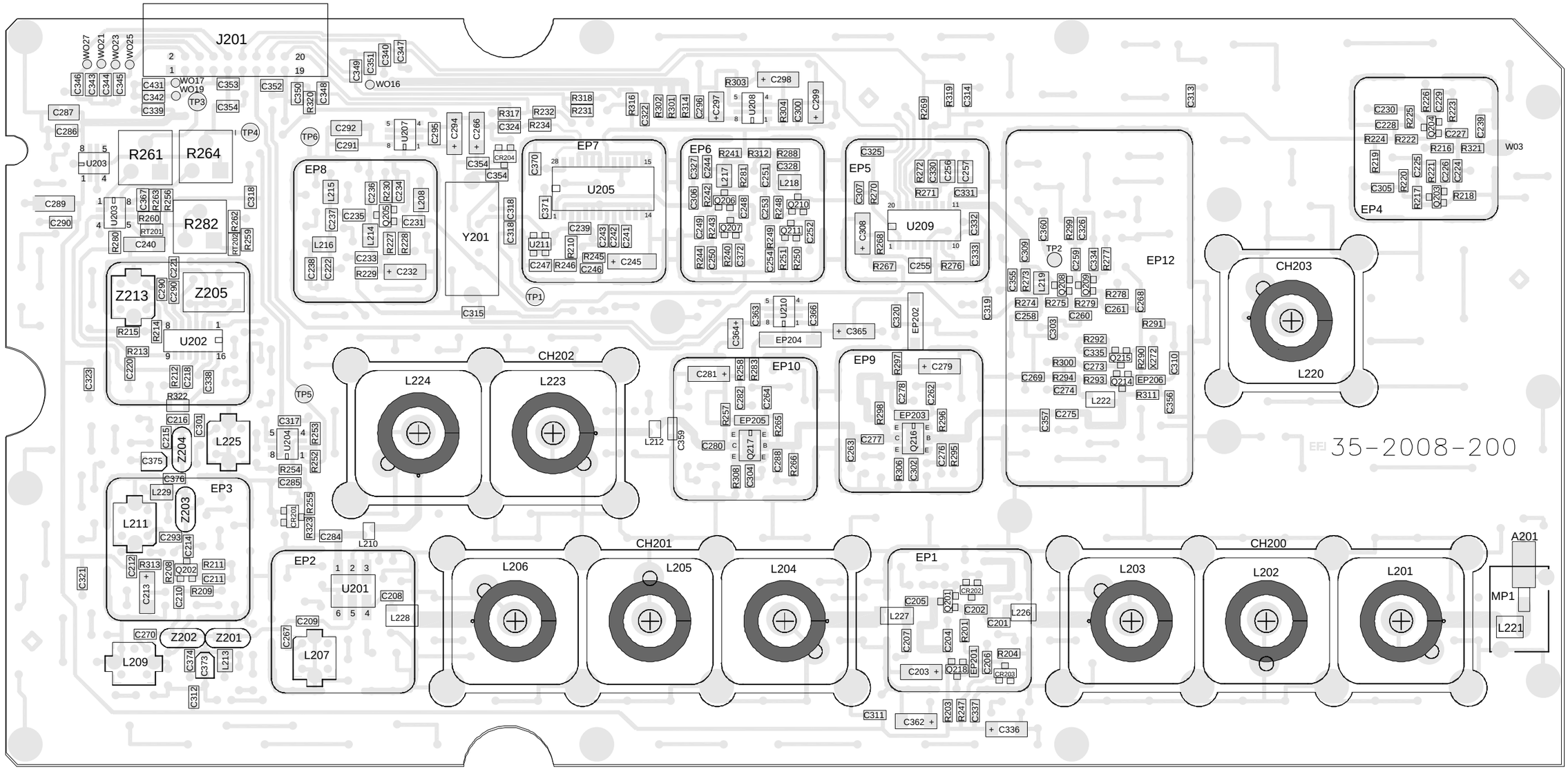

NOTES:
1. RESISTORS ARE IN OHMS AND CAPACITORS IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
2 TRANSMIT VCO ONLY.
3
DESIG | RX | TX
C804 | 2.7pF | 2.4pF
C805 | .47uF | .1uF
C806 | 4.7uF | 1uF
C812 | 4.7pF | 3.9pF
C813 | 6.8pF | 5.6pF
CR802 | 105G | HYPER
R803 | 10 | 100
R804 | 4.7k | 12k
R807 | 180 | 240
+12V
+12V
MOD IN
GROUND
GROUND
GROUND
TO RESONATOR TAP
CONTROL IN
R814 10k
C802 1.5pF
CR801
C803 1pF
L804 .039uH
C804
C805
C806
CR802
R804
R805 5.1k
R806 6.2k
C812
C813
+12V
R801 10
C807 27pF
R802 3.6k
C808 27pF
Q801 1300
CAPACITIVE MULTIPLIER
C809 15
C810 27pF
L803 .039uH
C811 27pF
R803
RF OUT
OSCILLATOR
Q802
3636
L805 .039uH
R807





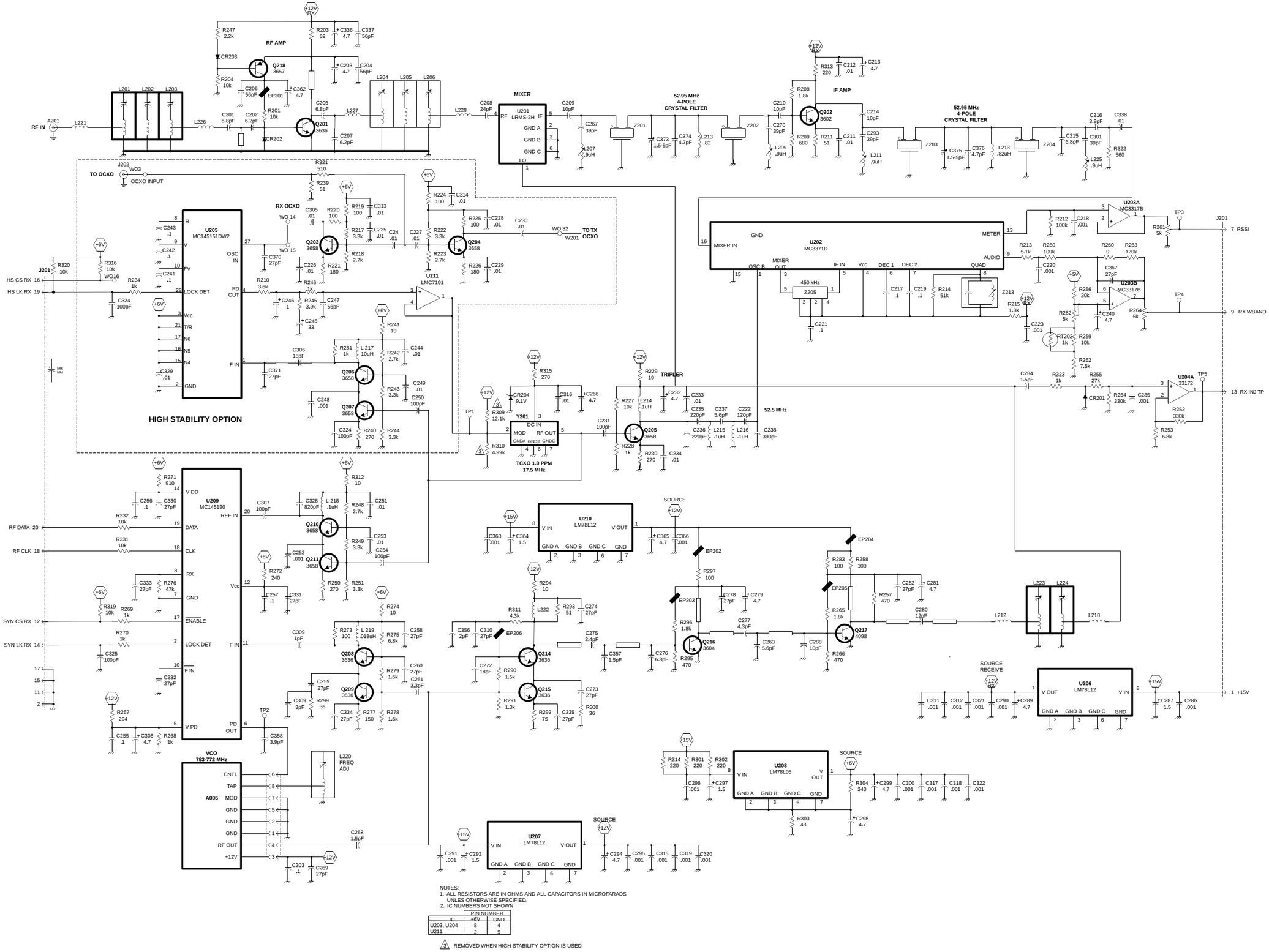
RDM AUDIO REVERT OPTION
FIGURE 3-41

FOLDOUT



March 2000
Part No. 001-3139-502

800 MHz RECEIVER COMPONENT LAYOUT
FIGURE 3-42



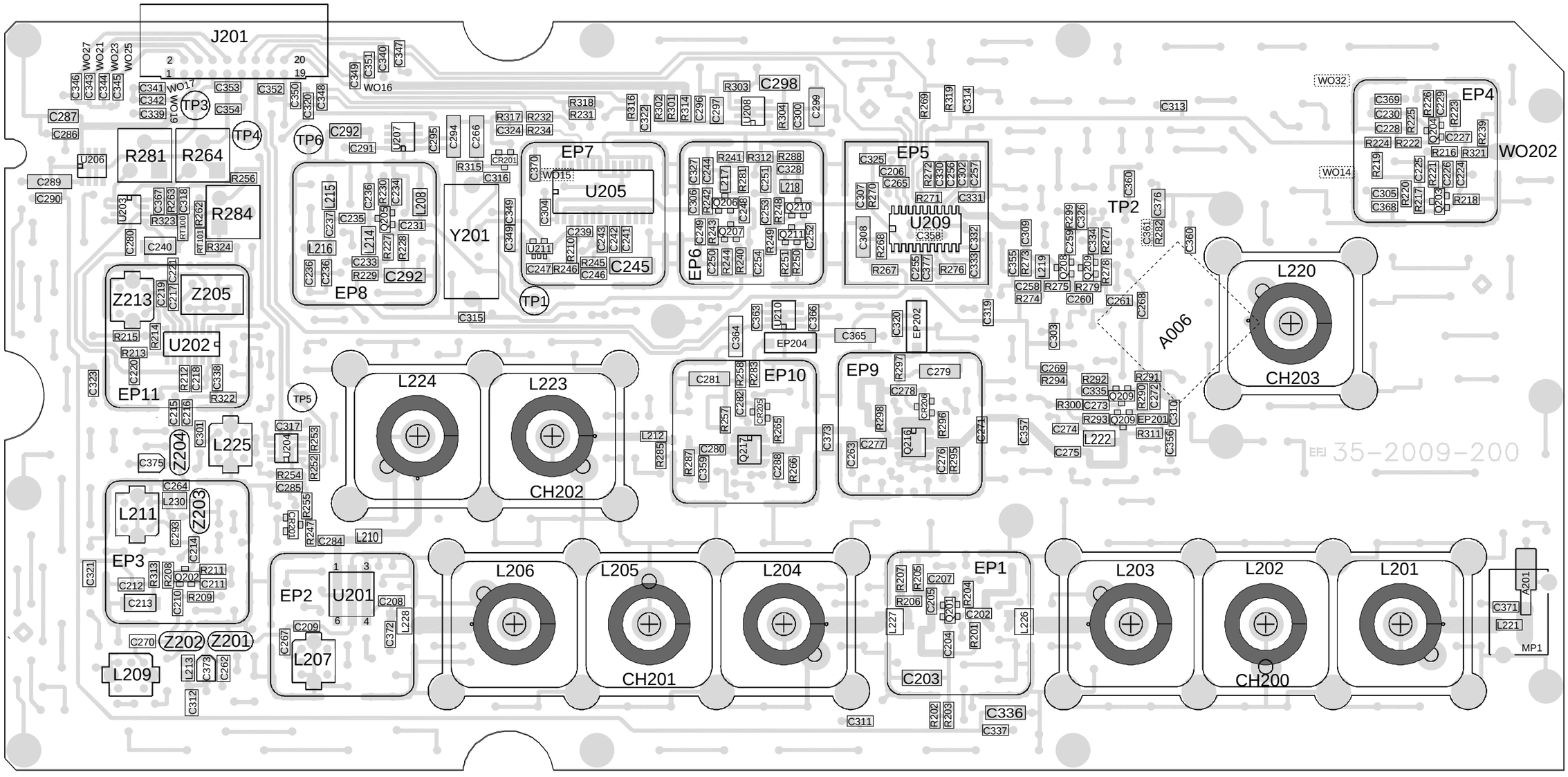
NOTES:
1. ALL RESISTORS ARE IN OHMS AND ALL CAPACITORS IN MICROFARADS UNLES OTHERWISE SPECIFIED.
2. IC NUMBERS NOT SHOWN

IC	PIN NUMBER +6V	PIN NUMBER GND
U203, U204	8	4
U211	2	5

3 REMOVED WHEN HIGH STABILITY OPTION IS USED.

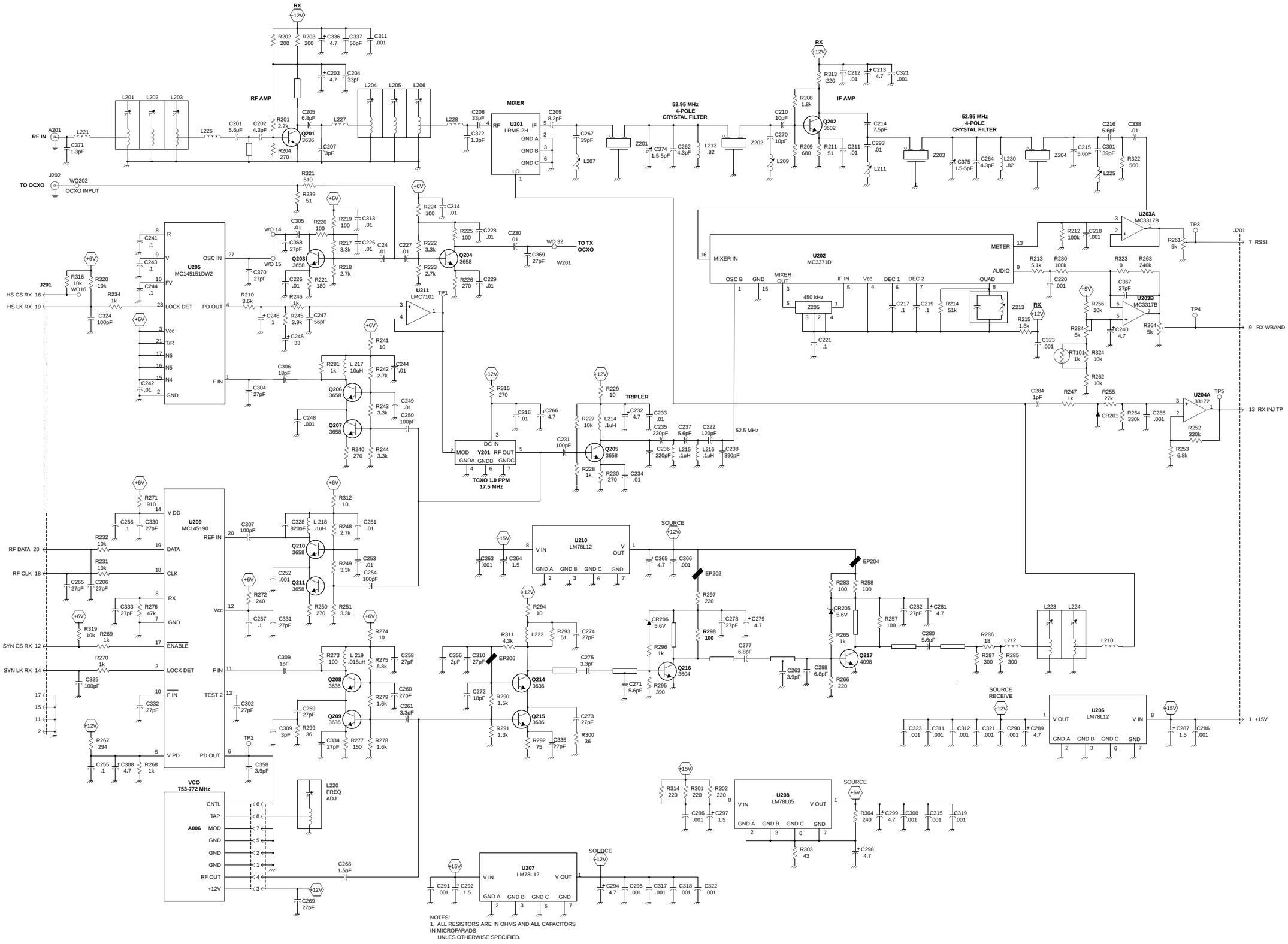
800 MHz RECEIVER SCHEMATIC
FIGURE 3-43

FOLDOUT



March 2000
Part No. 001-3139-502

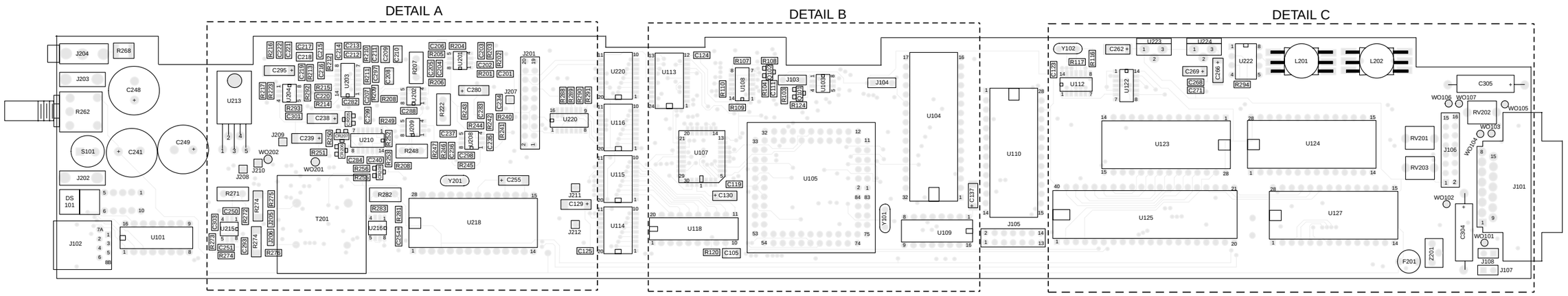
900 MHz RECEIVER COMPONENT LAYOUT
(COMPONENT SIDE VIEW)
FIGURE 3-44

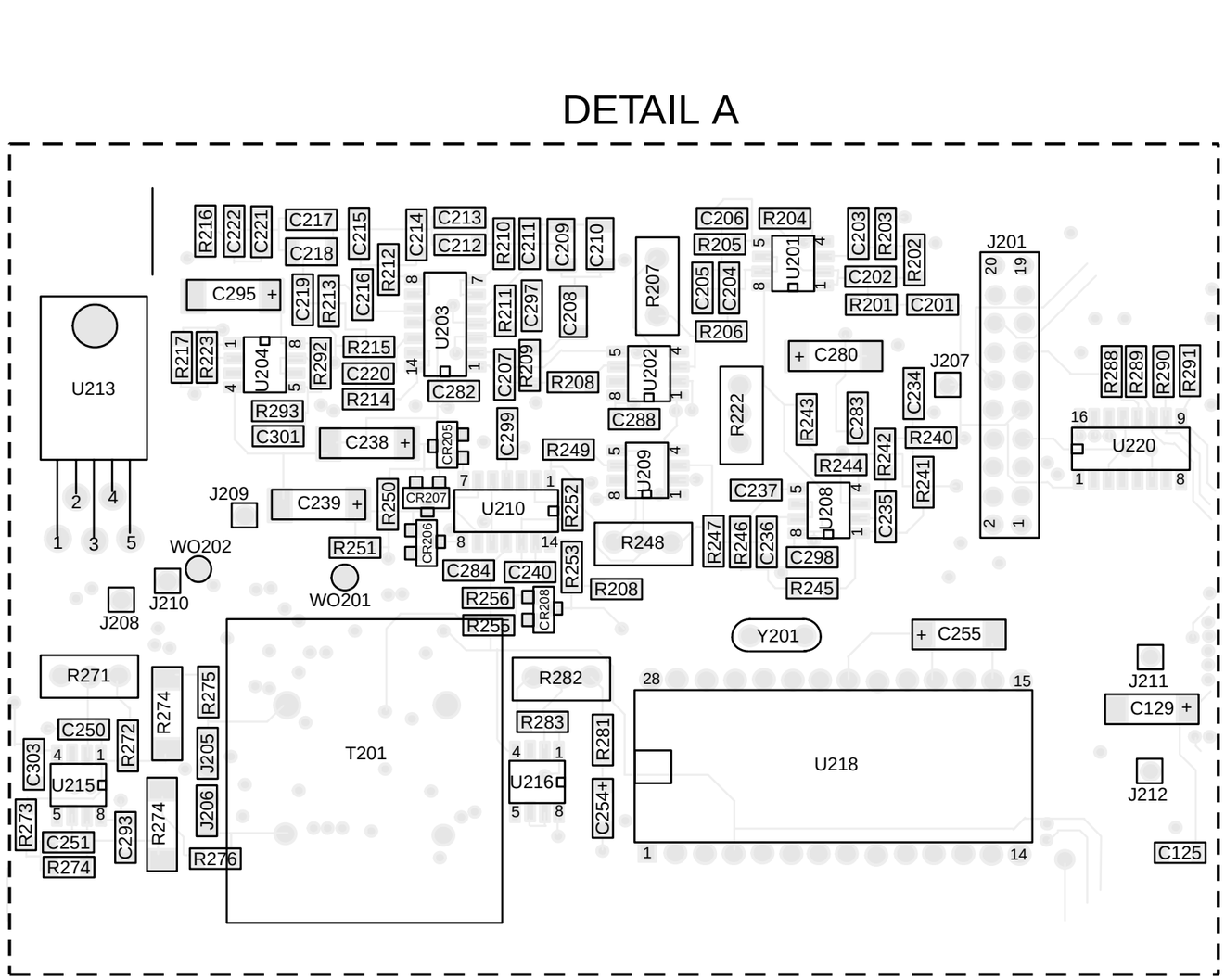


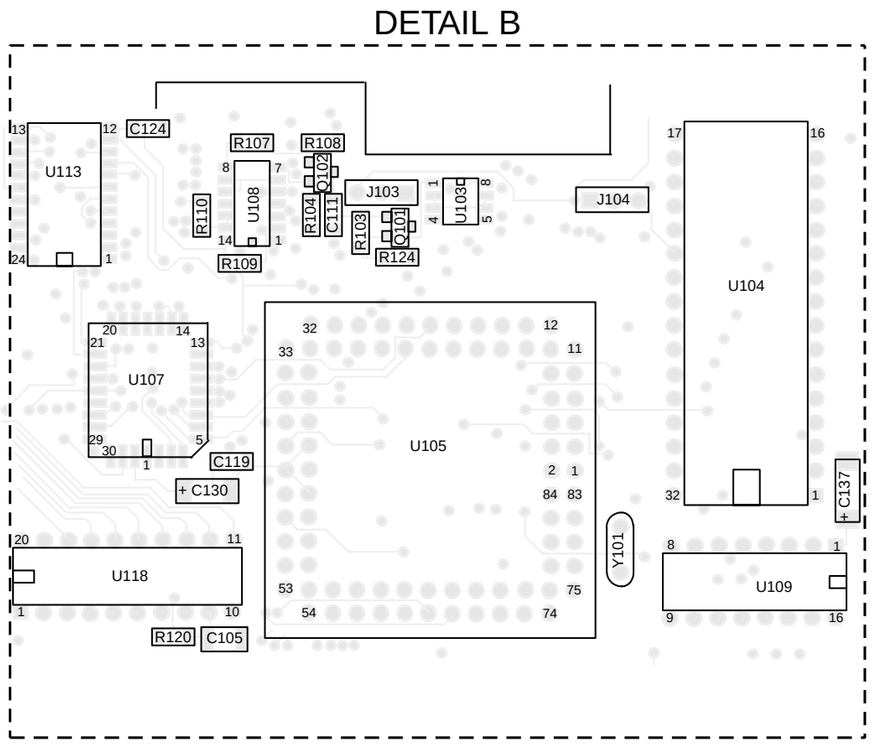
March 2000
Part No. 001-3139-502

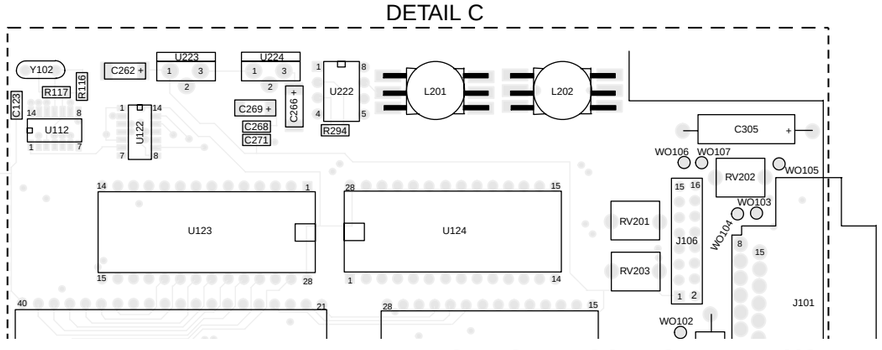
900 MHz RECEIVER SCHEMATIC
FIGURE 3-45

FOLDOUT

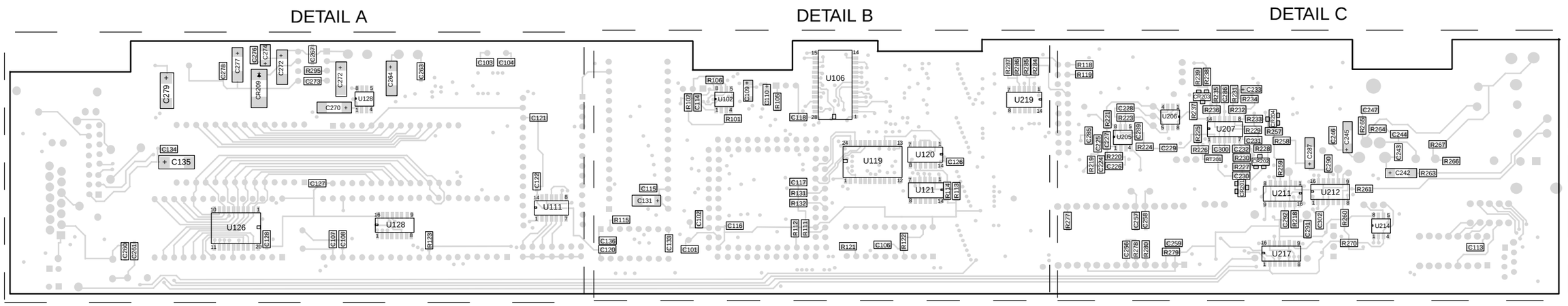




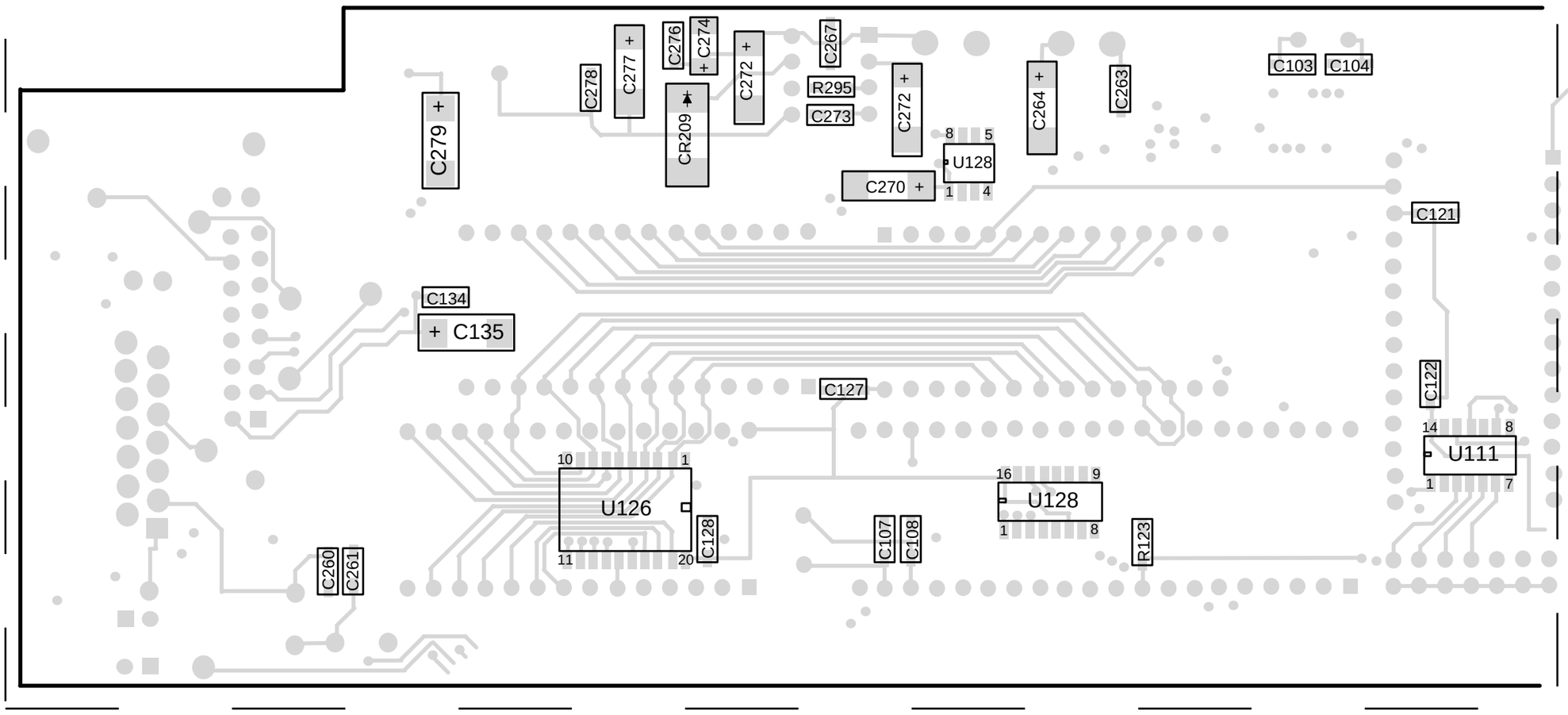




RDM INTERFACE BOARD COMPONENT LAYOUT
(COMPONENT SIDE)
FIGURE 3-46



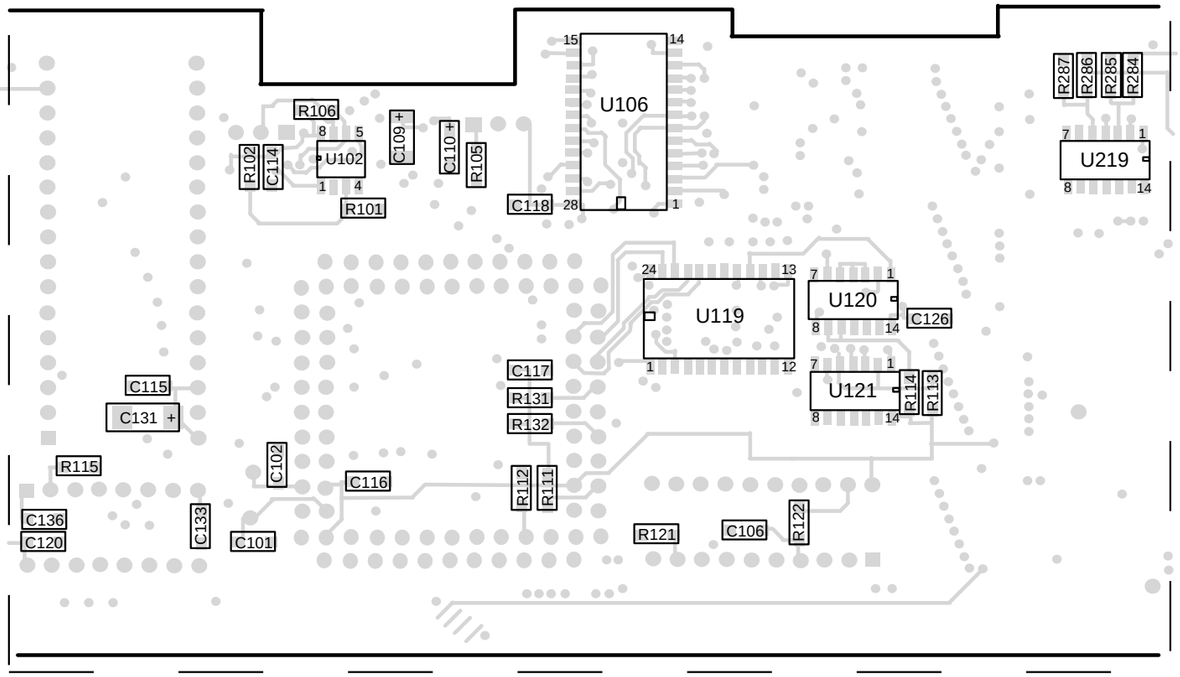
DETAIL A



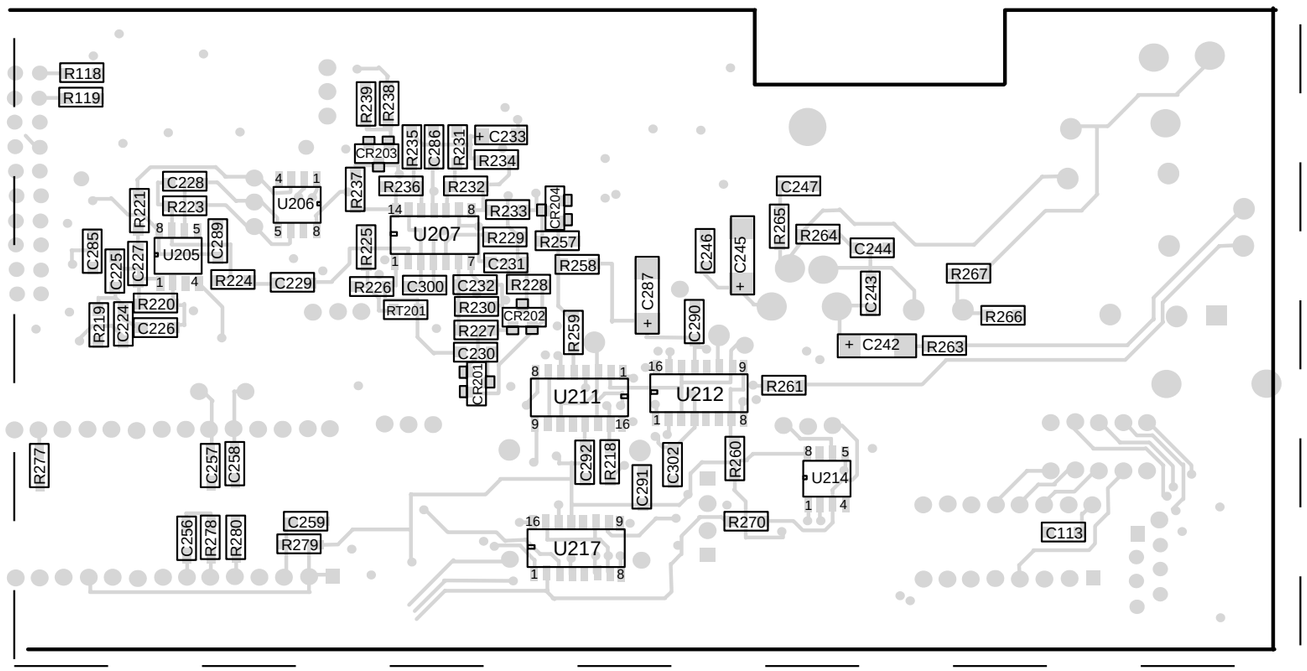
RDM INTERFACE BOARD COMPONENT LAYOUT
(OPPOSITE COMPONENT SIDE)
FIGURE 3-47

FOLDOUT

DETAIL B

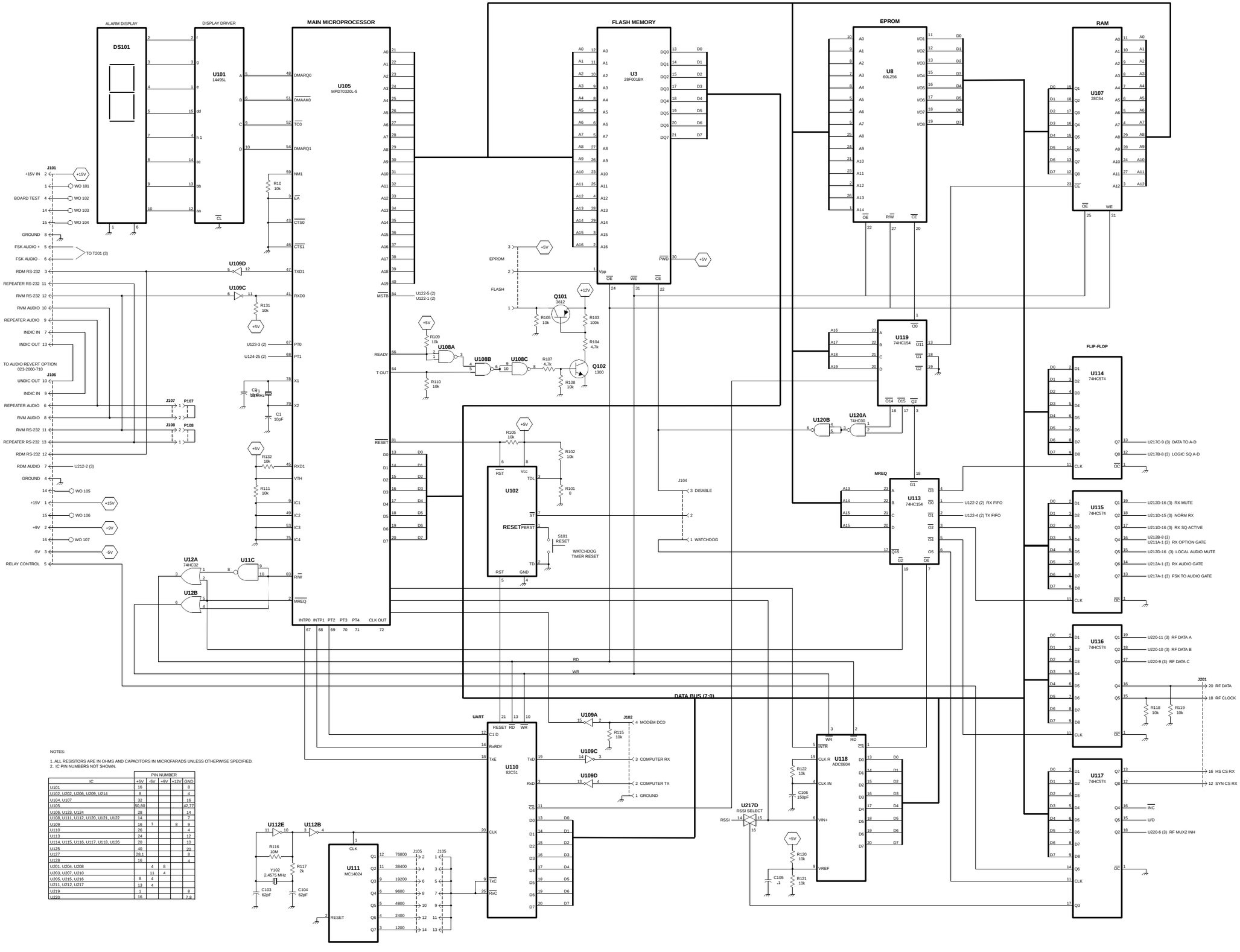


DETAIL C



March 2000
Part No. 001-3139-502

RDM INTERFACE BOARD COMPONENT LAYOUT
(OPPOSITE COMPONENT SIDE)



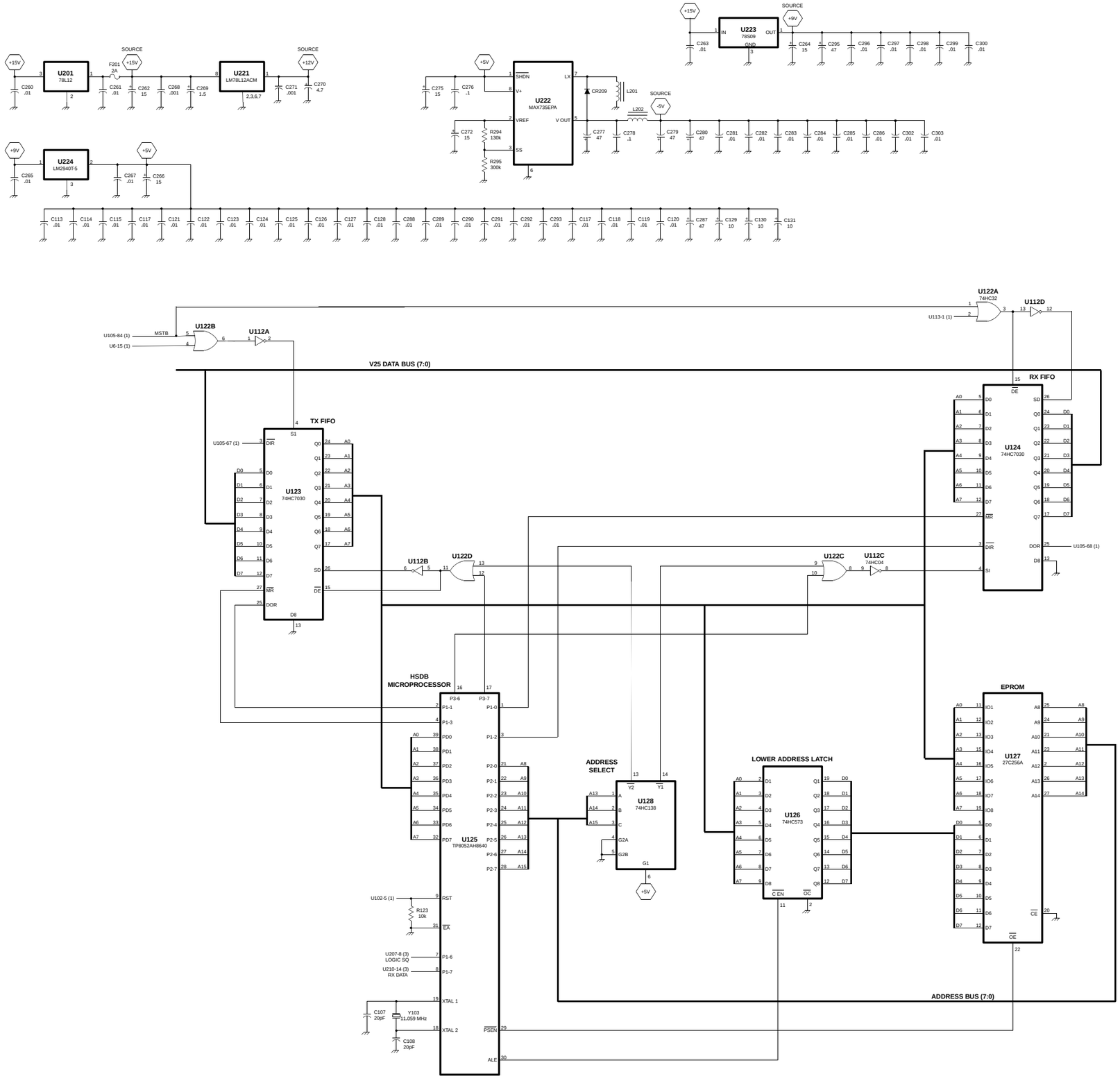
NOTES:

1. ALL RESISTORS ARE IN OHMS AND CAPACITORS IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
2. IC PIN NUMBERS NOT SHOWN.

IC	PIN NUMBER				
	+5V	-5V	+9V	+12V	GND
U101	16				8
U102, U202, U206, U209, U214	8				4
U104, U107	32				16
U105	50,80				42,77
U106, U123, U124	28				14
U108, U111, U112, U120, U121, U122	14				7
U109	16	1		8	9
U110	26				4
U113	24				12
U114, U115, U116, U117, U118, U126	20				10
U125	40				20
U127	28,1				8
U128	16				4
U201, U204, U208		4	8		
U203, U207, U210		11	4		
U205, U215, U216	8	4			
U211, U212, U217	13	4			
U219	1				8
U220	16				7,8

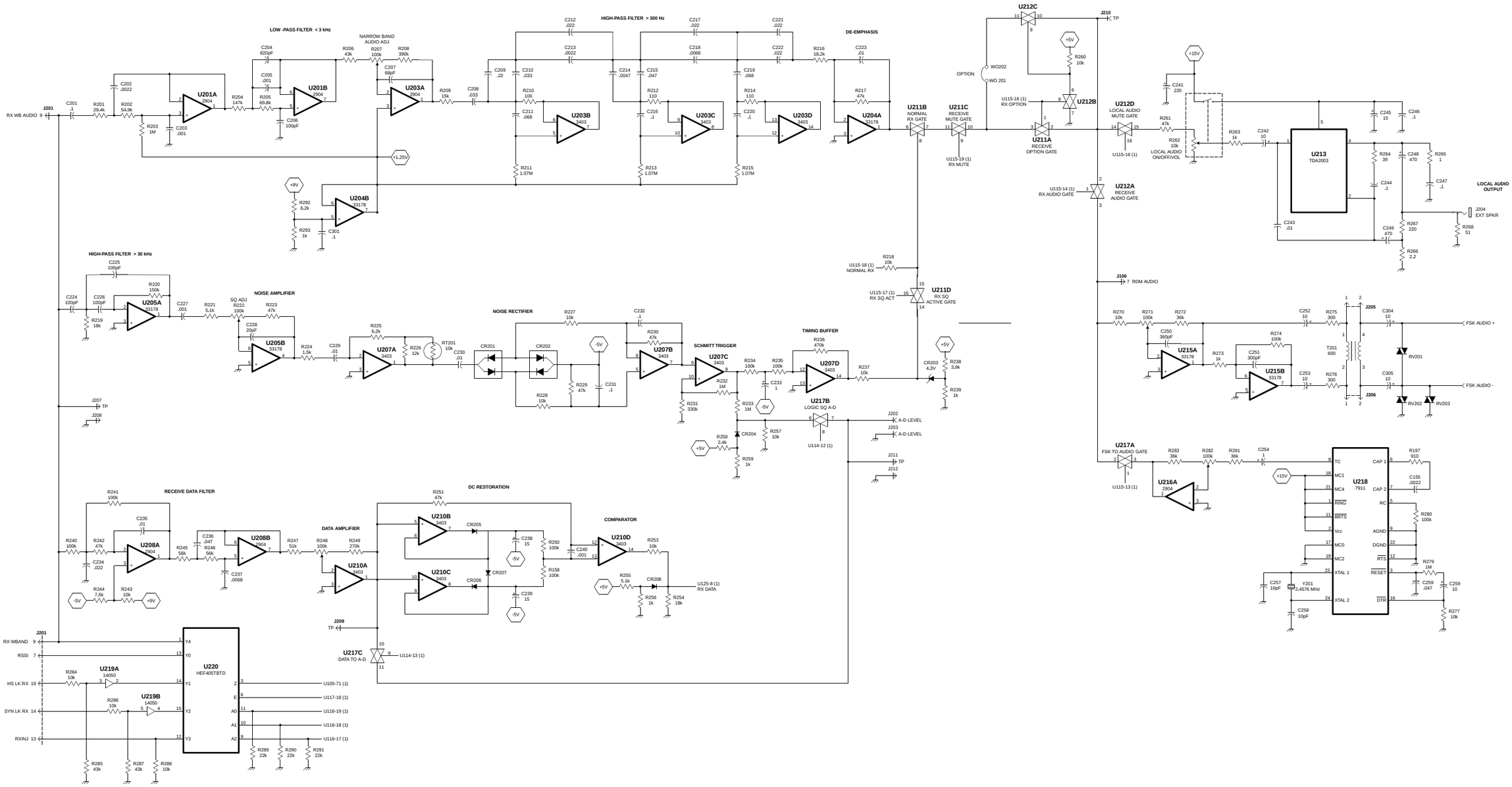
March 2000
Part No. 001-3139-502

RDM INTERFACE BOARD SCHEMATIC (1 OF 3) **FOLDOUT**
FIGURE 3-48



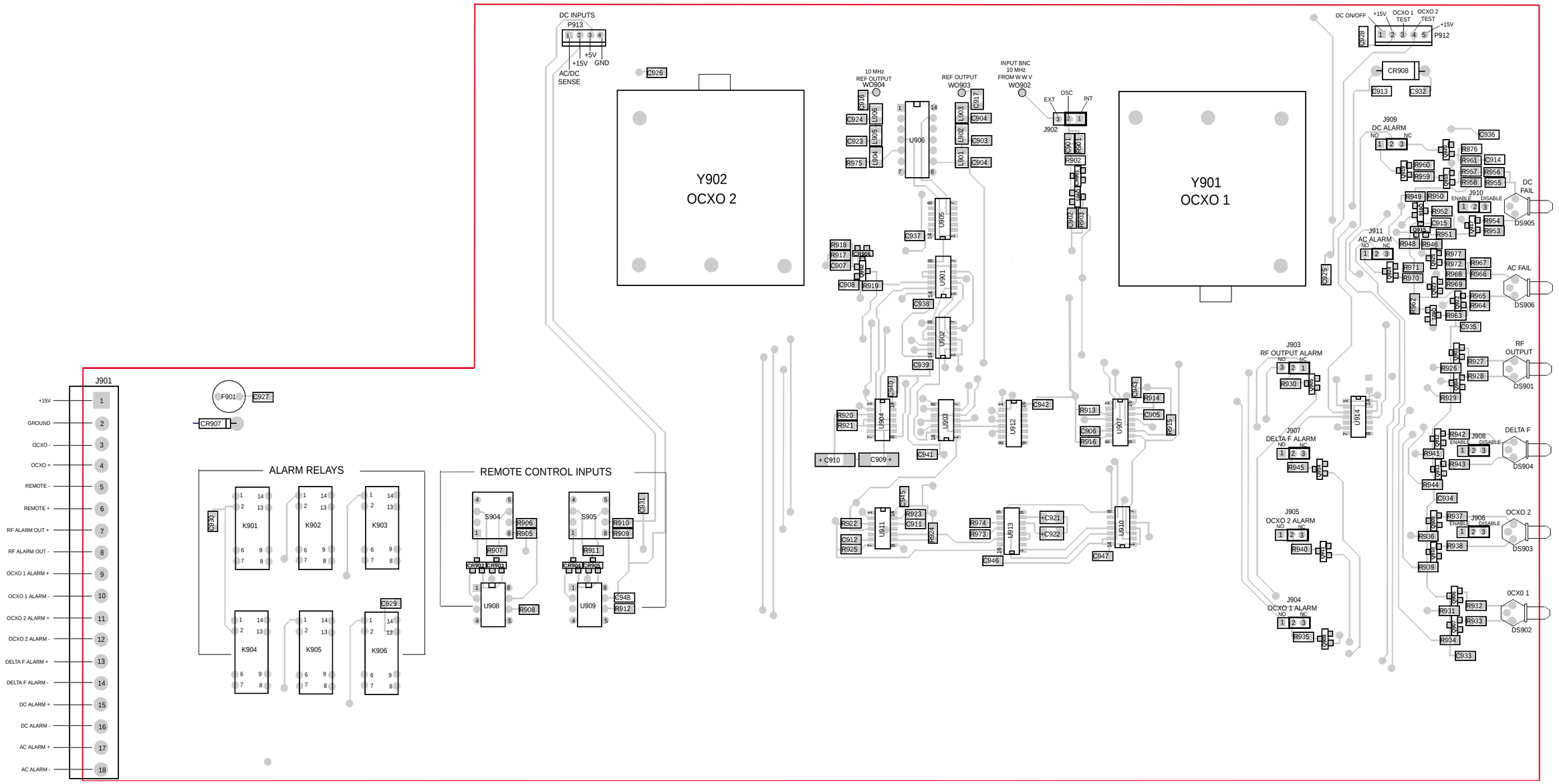
March 2000
Part No. 001-3139-502

RDM INTERFACE BOARD SCHEMATIC (2 OF 3)
FIGURE3-49



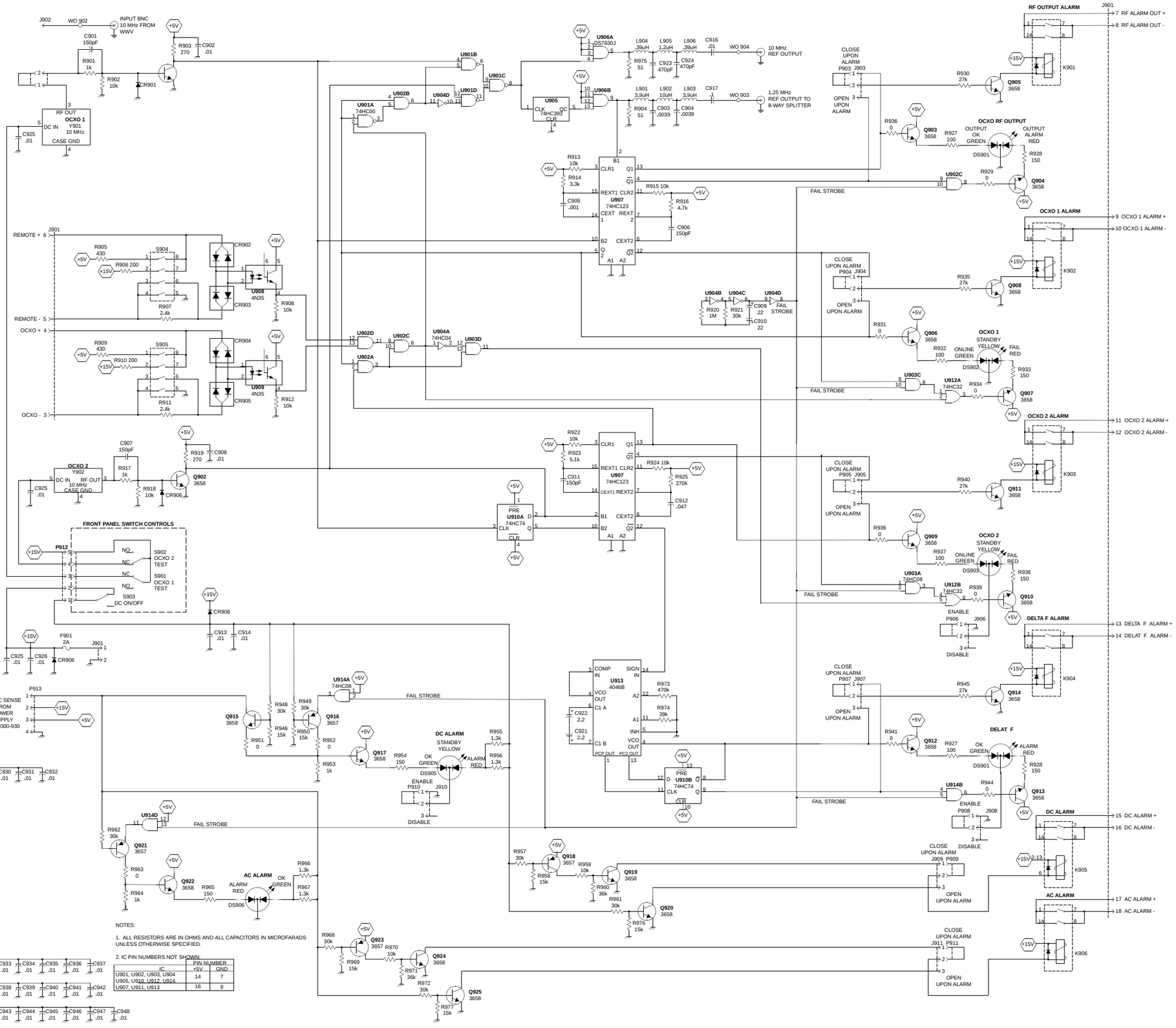
March 2000
Part No. 001-3139-502

RDM INTERFACE BOARD SCHEMATIC (3 OF 3) **FOLDOUT**
FIGURE 3-50



March 2000
Part No. 001-3139-502

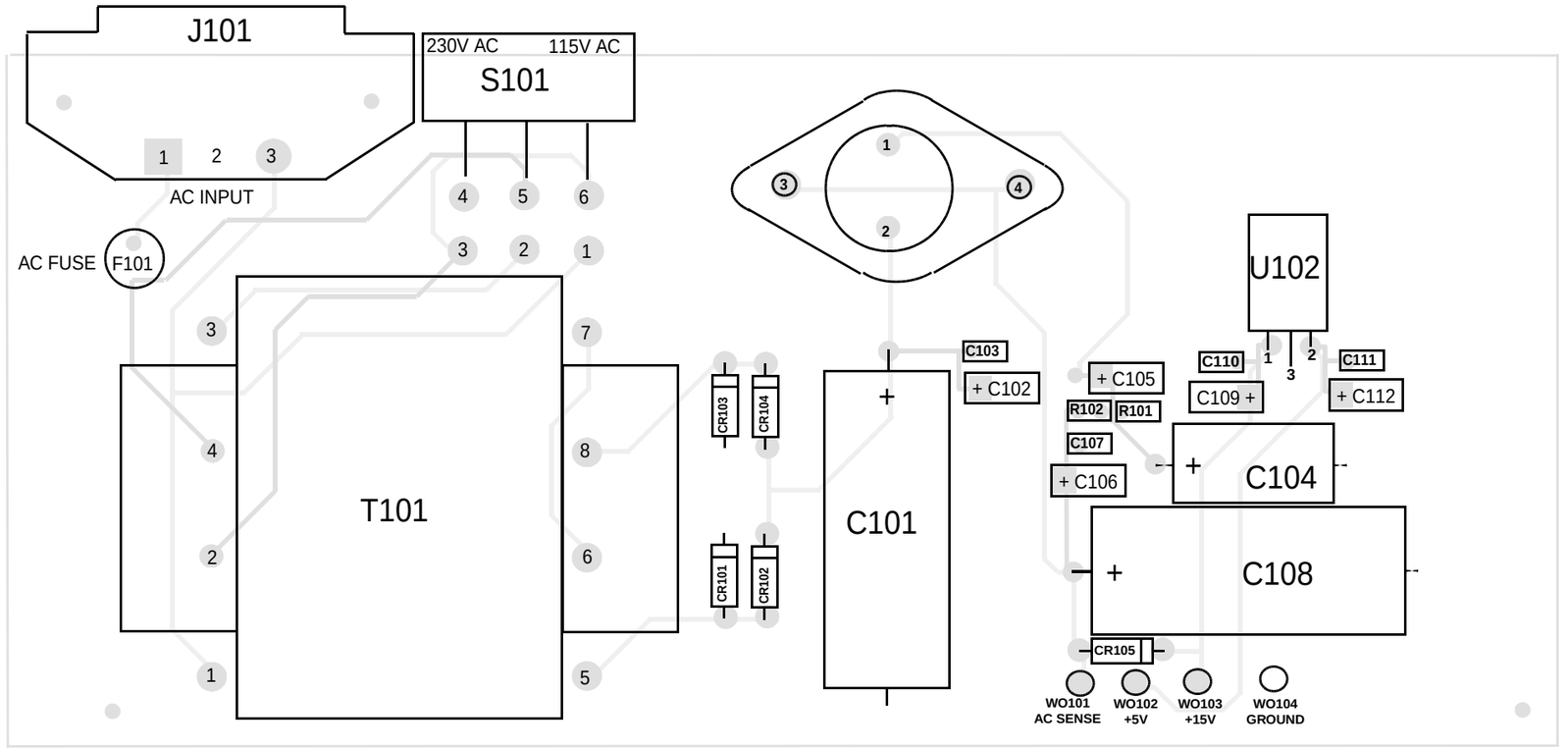
OCXO COMPONENT LAYOUT
FIGURE 3-51

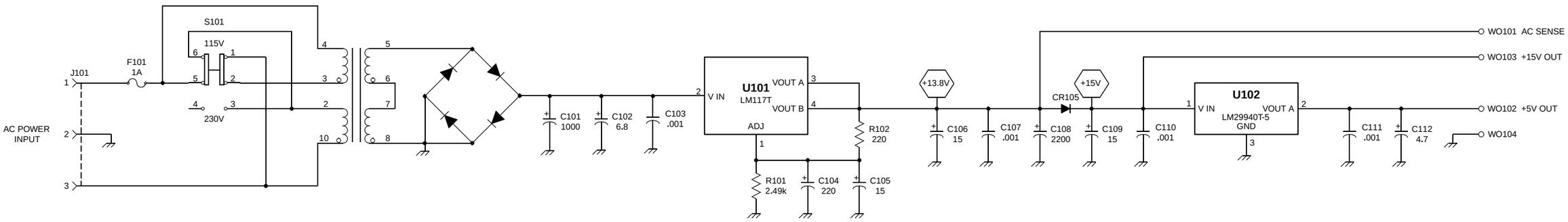


March 2000
Part No. 001-3139-502

OCXO SCHEMATIC
FIGURE 3-52

FOLDOUT





March 2000
Part No. 001-3139-502

OCXO POWER SUPPLY
FIGURE 3-53

SECTION 4 RECEIVER MULTIPLEXER MODULE (RMM)

4.1 GENERAL

The Receive Multiplexer Module (RMM), in the Remote Site, receives RSSI data from multiple RDMs and multiplexes the information onto a single line to be transmitted to a CDM at the Local Site.

The RMM is installed in a drawer located at each of the Remote Receiver Sites (see Figure 1-4). The RMM is powered from +12-16V DC (average +13.8V DC) and operates in the temperature range of -30°C to + 60°C (-22°F to +140°F) with 10% to 90% humidity.

Each RMM is capable of handling 10-RDMs, with 3-RMMs required per 30 channel Site. With 3-RMMs per Site (maximum) and 32 voted receiver Sites, the maximum number of RMMs is 3 x 32 = 96.

4.2 RECEIVE CALL ORDER OR RSSI DATA

The RMM receives the RSSI information from the Receiver Decoder Module (RDM) on the RS-232 input. The RS-232 input is set to 1200 baud (refer to Figure 4-1).

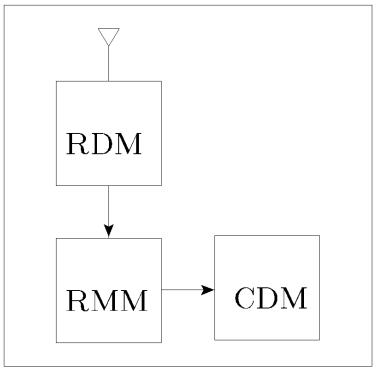


Figure 4-1 RMM BLOCK DIAGRAM

4.3 DATA PACKET

The RMM creates a Data Packet to be sent to the Central De-Multiplexer Module (CDM) at the Local Site. The RMM multiplexes the information received from a maximum of 10-RDMs.

The RSSI packet consists of 8-bits of information for each of the 10 possible channels. The first 4-bits define the channel and second 4-bits indicate the RSSI level.

The RSSI operation communicates at 1200 baud to the CDM via an FSK audio line.

Table 4-1 RMM RSSI INFORMATION

Hex Value	DESCRIPTION
7 6 5 4	Strongest RSSI signal level Weakest RSSI signal level a call will be started at
3	Weakest RSSI level before a call will be dropped.
2*	Time-Out no update received
1	No Data received from RDM (generated by RMM only)
0*	Turn-off Code received from mobile
* Idle state.	

4.4 SWITCH SETTINGS

Table 4-2 RMM SWITCH SETTINGS

Switch	Sect.	Description
S1	1	Off Not used on RMM
	2	Off
	3	Off
	4	Off
S2	1-2	On -RMM output (enabled)
	3-4	Off
S3	1	Off Not used on RMM
	2	Off
	3	Off
	4	Off
S4	1	Off - RMM Mux
	2	On - 1200 baud FSK (Normal)
	2	Off - 9600 baud RS-232
	3	Off Not used on RMM
	4	Off Not used on RMM
S100	1	Off-Test, On-Normal
	2	Off-Test, On-Normal
	3	Off-Test, On-Normal
	4	Off-Test, On-Normal

4.5 ALIGNMENT

NOTE: If the RMM is set for Digital Operation, alignment is not required.

4.5.1 RMM ANALOG FSK OPERATION

1. Adjust R27 for -12 dBm at TP100.

4.5.2 RMM FINAL ALIGNMENT

1. Adjust R27 for -12 dBm (±2 dBm) at TP100 for Leased Lines (LL).

2. Adjust R27 for -28 dBm (±2 dBm) at TP100 for T1 links.

NOTE: The absolute level for Leased Lines with 0 dBm maximum input would be -12 dBm. The absolute level for T1 Link with -16 dBm maximum input would be -28 dBm.

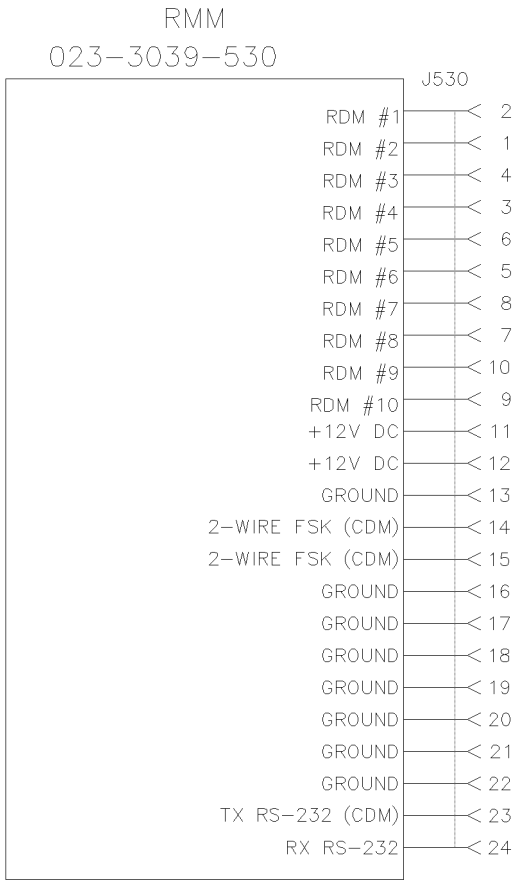


Figure 4-2 RMM PINOUT

NOTE: RMM output comes out of the Repeater connector on pins 14 and 15.

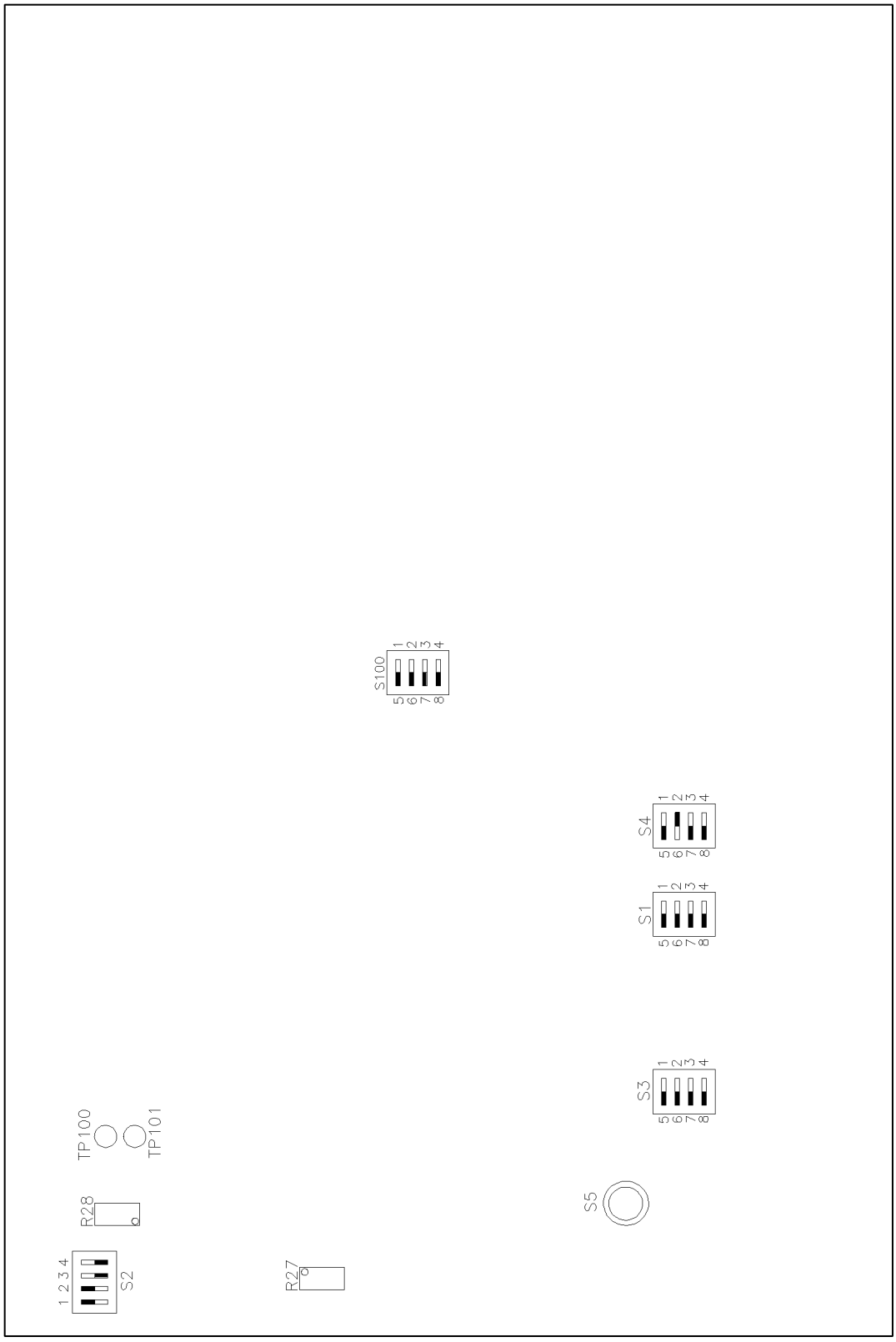


Figure 4-3 RMM ALIGNMENT POINTS DIAGRAM

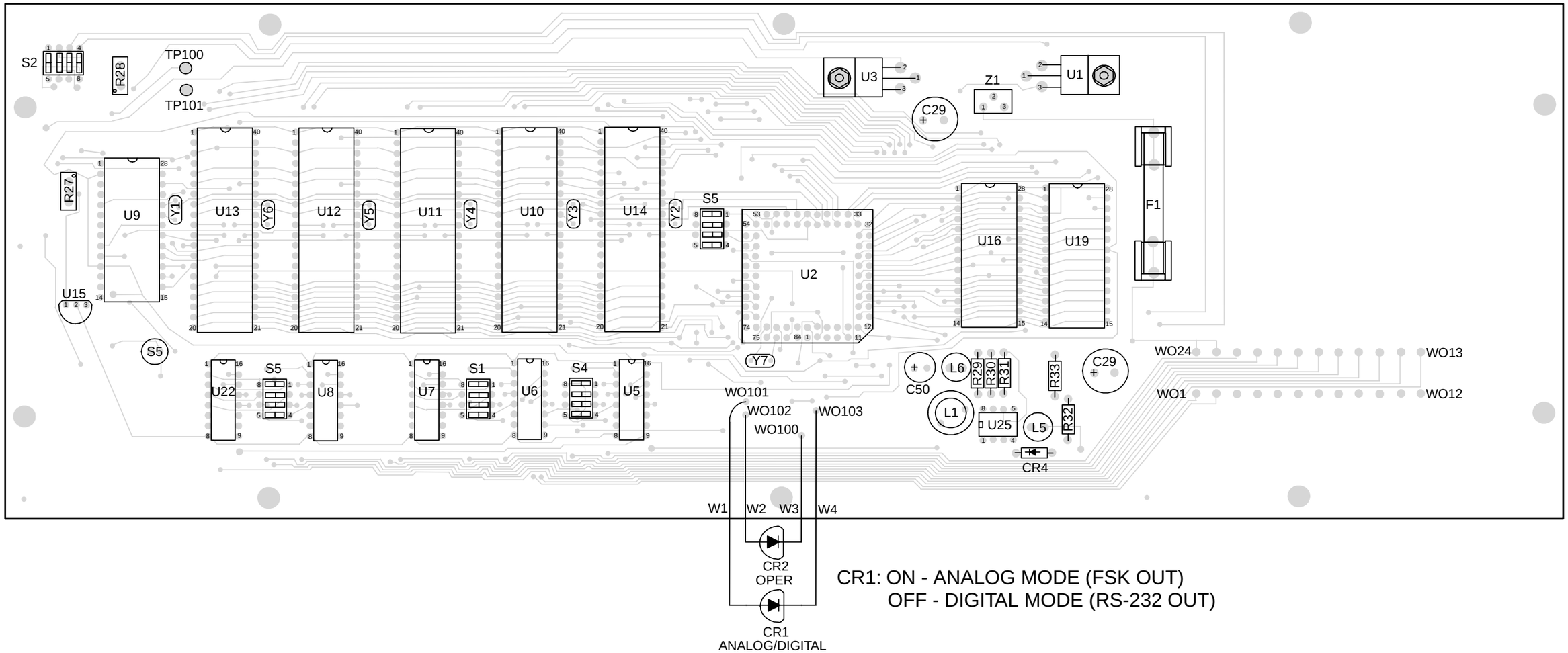
RECEIVER MULTIPLEXER MODULE
PART NO. 023-3039-530

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
A 001	Rear connector assembly	023-3039-533
A 002	Drawer assembly	023-3039-535
C 001	.1 µF ±10% X7R 1210	510-3607-104
C 002	.1 µF ±10% X7R 1210	510-3607-104
C 003	1 µF 16V SMD tantalum	510-2625-109
C 004	.1 µF ±10% X7R 1210	510-3607-104
C 005	10 µF 16V SMD tantalum	510-2625-100
C 006	10 µF 16V SMD tantalum	510-2625-100
C 007	.1 µF X7R ±10% 1210	510-3607-104
C 008	1 µF 16V SMD TANT	510-2625-109
C 009	.1 µF ±10% X7R 1210	510-3607-104
C 010	20 pF ±5% NPO 1206 chip	510-3602-200
C 011	10 pF ±5% NPO 1206 chip	510-3602-100
C 012	10 pF ±5% NPO 1206 chip	510-3602-100
C 013	10 pF ±5% NPO 1206 chip	510-3602-100
C 014	10 pF ±5% NPO 1206 chip	510-3602-100
C 015	5.1 pF ±5% NPO 1206 chip	510-3602-519
C 016	10 pF ±5% NPO 1206 chip	510-3602-100
C 017	5.1 pF ±5% NPO 1206 chip	510-3602-519
C 018	10 pF ±5% NPO 1206 chip	510-3602-100
C 019	5.1 pF ±5% NPO 1206 chip	510-3602-519
C 020	10 pF ±5% NPO 1206 chip	510-3602-100
C 021	5.1 pF ±5% NPO 1206 chip	510-3602-519
C 022	10 pF ±5% NPO 1206 chip	510-3602-100
C 023	5.1 pF ±5% NPO 1206 chip	510-3602-519
C 024	.01 µF ±10% X7R chip	510-3606-103
C 025	.0022 µF ±10% X7R chip	510-3606-222
C 026	.01 µF ±10% X7R chip	510-3606-103
C 027	.01 µF ±10% X7R chip	510-3606-103
C 028	.01 µF ±10% X7R chip	510-3606-103
C 029	47 µF 25V aluminum radial	510-4225-470
C 030	.1 µF ±10% X7R chip	510-3606-104
C 031	.1 µF ±10% X7R chip	510-3606-104
C 032	.01 µF ±10% X7R chip	510-3606-103
C 033	.01 µF ±10% X7R chip	510-3606-103
C 034	.01 µF ±10% X7R chip	510-3606-103
C 035	.01 µF ±10% X7R chip	510-3606-103
C 036	.1 µF ±10% X7R1210	510-3607-104
C 037	10 µF 16V SMD TANT	510-2625-100
C 038	10 µF 16V SMD TANT	510-2625-100
C 039	10 µF 16V SMD TANT	510-2625-100
C 040	.01 µF ±10% X7R chip	510-3606-103
C 041	.01 µF ±10% X7R chip	510-3606-103
C 042	.01 µF ±10% X7R chip	510-3606-103
C 043	2.2 µF ±10% X7R chip	510-2625-229
C 044	10 µF 16V SMD TANT	510-2625-100
C 048	22 µF 16V SMD TANT	510-2625-220
C 049	22 µF 16V SMD TANT	510-2625-220
C 050	6.8 µF ±20% 35V DIP	510-2245-689
C 051	470 pF ±5% NPO 1206 chip	510-3602-471
C 052	.1 µF ±10% X7R chip	510-3606-104
C 053	24 pF ±5% NPO 1206 chip	510-3602-240
C 054	220 µF 25V aluminum radial	510-4225-221
C 055	47 µF 10V SMD TANT	510-2624-470
C 056	.01 µF ±10% X7R chip	510-3606-103
C 057	24 pF ±5% NPO 1206 chip	510-3602-240
C 581	470 pF ±5% NPO 1206 chip	510-3602-471
C 582	470 pF ±5% NPO 1206 chip	510-3602-471
C 583	470 pF ±5% NPO 1206 chip	510-3602-471
C 584	470 pF ±5% NPO 1206 chip	510-3602-471
C 585	470 pF ±5% NPO 1206 chip	510-3602-471
C 586	470 pF ±5% NPO 1206 chip	510-3602-471
C 587	470 pF ±5% NPO 1206 chip	510-3602-471
C 588	470 pF ±5% NPO 1206 chip	510-3602-471
C 589	470 pF ±5% NPO 1206 chip	510-3602-471
C 590	470 pF ±5% NPO 1206 chip	510-3602-471
C 591	470 pF ±5% NPO 1206 chip	510-3602-471
C 592	470 pF ±5% NPO 1206 chip	510-3602-471
C 594	470 pF ±5% NPO 1206 chip	510-3602-471
C 595	470 pF ±5% NPO 1206 chip	510-3602-471
C 603	470 pF ±5% NPO 1206 chip	510-3602-471
C 604	470 pF ±5% NPO 1206 chip	510-3602-471
CH001	Covers - top & bottom	017-2197-041
CR001	Red LED	549-4001-001
CR002	Green LED	549-4001-003
CR004	SI diode 1N4448	523-1500-883
EP001	2-hole crystal pin insulator	018-1080-001
EP002	2-hole crystal pin insulator	018-1080-001
EP003	2-hole crystal pin insulator	018-1080-001
EP004	2-hole crystal pin insulator	018-1080-001
EP005	2-hole crystal pin insulator	018-1080-001
EP006	2-hole crystal pin insulator	018-1080-001
EP010	Heat sink insulator TO-220	574-5005-060
EP001	.138 x .241 ferrite bead	517-2002-002
EP001	3/32 heat shrink tubing	042-0241-552

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
EP002	3/32 heat shrink tubing	042-0241-552
EP003	3/32 heat shrink tubing	042-0241-552
EP004	3/32 heat shrink tubing	042-0241-552
F 001	Fuse 2A AGC	534-0003-024
FH003	Fuse clip	534-1007-001
HW001	Nut 4-40 x .063 NPB	560-2104-006
HW002	4-40 mach panhead phil ZPS	575-1604-010
HW003	No 4 shake-proof washer	596-1104-008
HW580	Hdwr kit baillock PC mount	537-9055-007
HW001	6-32 panhead taptite 1/4	575-0606-008
HW002	TT 4-40 x 250 panhead phil	575-0604-008
HW011	6-32 panhead taptite 1/4	575-0606-008
HW012	8-32 flathead phil BZPS TT	575-6208-010
HW013	Lockwasher int 10 x .032 NPB	596-2110-012
HW014	Nut 10-32 x .375 CPS	560-1110-012
HW016	Socket LED panel mount	550-0006-100
HW017	Socket LED panel mount	550-0006-100
HW018	Screw 8-32 panhead CPS phil	575-0608-012
HW019	Lockwasher int 8 X .020 CPS	596-1108-011
HW020	No 4 shake-proof washer	596-1104-008
HW021	8-32 mach panhead ZPS phil	575-1608-008
HW022	8-32 x 0.125 nut CPS	560-1108-011
HW023	1/2" dia hole plug	537-9001-011
J 580	Ribbon receptacle 24-pin str	515-7141-102
L 001	Toriod 100-200 µH	542-8016-001
L 005	3-T ferrite choke	517-2005-006
L 006	3-T ferrite choke	517-2005-006
MP001	Heat sink (U 003)	017-2221-034
MP002	Double sided foam tape	574-3002-013
MP008	1/4 turn fastener bail type	537-4001-101
MP009	Retainer for MP008	537-4002-001
MP012	Drawer handle	017-2139-201
MP013	Drawer front	014-0783-345
MP014	Drawer middle	014-0783-330
MP016	Drawer right side	014-0783-320
MP017	Drawer left side	014-0783-315
MP018	Drawer slide	537-9057-001
MP019	Drawer bracket	017-2222-210
MP020	Grommet, flexible	574-0001-025
MP050	Plastic wear washer black	574-9019-050

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
NP001	RMM label	559-9001-242
NP002	Voter ID RMM label	559-3059-018
PC001	PCB RSSI multiplex module	035-3039-530
PC500	PCB log rear connector	035-1010-780
R 001	300 ohm ±5% 1206 SMD	569-0115-301
R 002	300 ohm ±5% 1206 SMD	569-0115-301
R 003	47k ohm ±5% 1206 SMD	569-0115-473
R 004	47k ohm ±5% 1206 SMD	569-0115-473
R 005	10k ohm ±5% 1206 SMD	569-0115-103
R 006	10k ohm ±5% 1206 SMD	569-0115-103
R 007	200k ohm ±5% 1206 SMD	569-0115-204
R 008	100k ohm ±5% 1206 SMD	569-0115-104
R 009	200k ohm ±5% 1206 SMD	569-0115-204
R 010	10k ohm ±5% 1206 SMD	569-0115-103
R 011	10k ohm ±5% 1206 SMD	569-0115-103
R 012	620 ohm ±5% 1206 SMD	569-0115-621
R 013	100k ohm ±5% 1206 SMD	569-0115-104
R 014	910 ohm ±5% 1206 SMD	569-0115-911
R 015	10k ohm ±5% 1206 SMD	569-0115-103
R 016	10k ohm ±5% 1206 SMD	569-0115-103
R 017	10k ohm ±5% 1206 SMD	569-0115-103
R 018	10k ohm ±5% 1206 SMD	569-0115-103
R 019	10k ohm ±5% 1206 SMD	569-0115-103
R 020	10k ohm ±5% 1206 SMD	569-0115-103
R 021	2.2k ohm ±5% 1206 SMD	569-0115-222
R 022	2.2k ohm ±5% 1206 SMD	569-0115-222
R 023	620 ohm ±5% 1206 SMD	569-0115-621
R 024	10k ohm ±5% 1206 SMD	569-0115-103
R 025	10k ohm ±5% 1206 SMD	569-0115-103
R 026	10k ohm ±5% 1206 SMD	569-0115-103
R 027	100k ohm trim pot	562-0110-104
R 028	100k ohm trim pot	562-0110-104
R 029	1 ohm ±5% 1/4W CF	569-0513-109
R 030	1 ohm ±5% 1/4W CF	569-0513-109
R 031	1 ohm ±5% 1/4W CF	569-0513-109
R 032	1k ohm ±1% 1/8W MF	569-0520-301
R 033	5.49k ohm ±1% 1/8W MF	569-0520-372
R 034	10k ohm ±5% 1206 SMD	569-0115-103
R 035	10k ohm ±5% 1206 SMD	569-0115-103
R 036	10k ohm ±5% 1206 SMD	569-0115-103
R 037	10k ohm ±5% 1206 SMD	569-0115-103
R 038	10k ohm ±5% 1206 SMD	569-0115-103
R 039	10k ohm ±5% 1206 SMD	569-0115-103
R 040	10k ohm ±5% 1206 SMD	569-0115-103
R 100	10k ohm ±5% 1206 SMD	569-0115-103

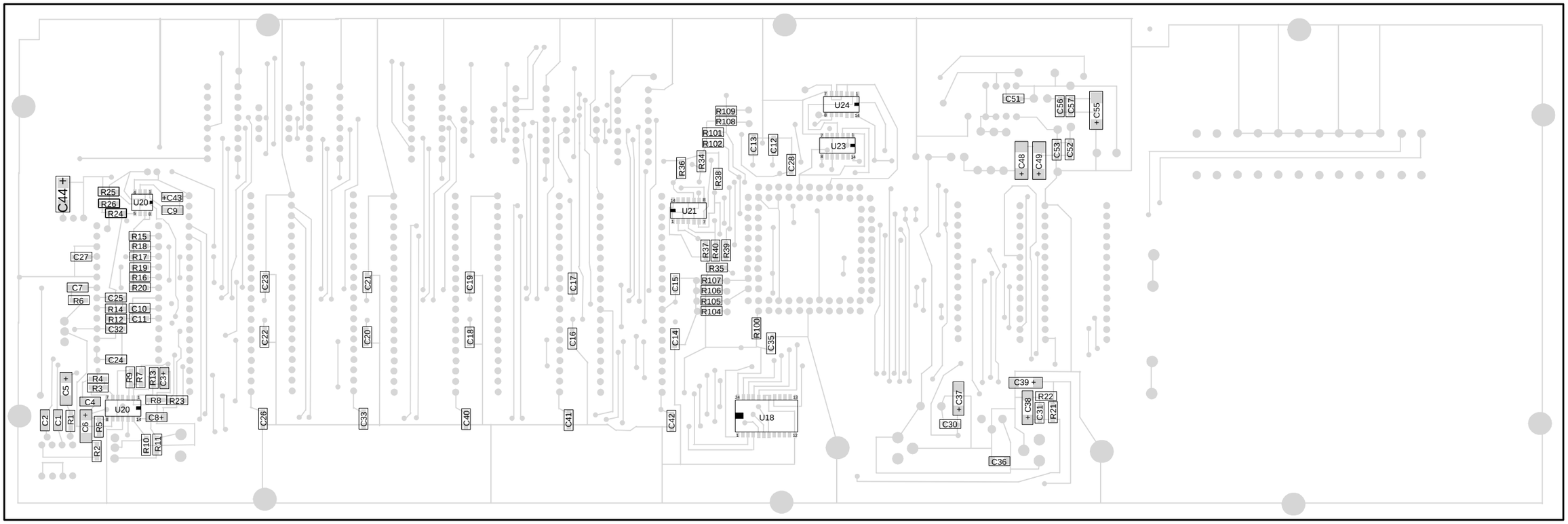
SYMBOL NUMBER	DESCRIPTION	PART NUMBER
R 101	10k ohm ±5% 1206 SMD	569-0115-103
R 102	10k ohm ±5% 1206 SMD	569-0115-103
R 104	10k ohm ±5% 1206 SMD	569-0115-103
R 105	10k ohm ±5% 1206 SMD	569-0115-103
R 106	10k ohm ±5% 1206 SMD	569-0115-103
R 107	10k ohm ±5% 1206 SMD	569-0115-103
R 108	300 ohm ±5% 1206 SMD	569-0115-301
R 109	300 ohm ±5% 1206 SMD	569-0115-301
S 001	DIP switch 4PST	583-5002-004
S 002	DIP switch 4PST	583-5002-004
S 003	DIP switch 4PST	583-5002-004
S 004	DIP switch 4PST	583-5002-004
S 005	Momentary SPST	583-4005-002
S 100	DIP switch 4PST	583-5002-004
TP100	Black tip jack	105-2203-211
TP101	Brown tip jack	105-2208-201
U 001	Regulator 5V T0-220 7805	544-2003-016
U 002	16-bit CMOS CPU ROMless	544-5002-016
U 003	+9V volt regulator TO-220	544-2003-059
U 004	Quad OP-AMP SOIC	544-2020-008
U 005	RS-232C/V.28 driver/receiver	544-2023-014
U 006	RS-232C/V.28 driver/receiver	544-2023-014
U 007	RS-232C/V.28 driver/receiver	544-2023-014
U 008	RS-232C/V.28 driver/receiver	544-2023-014
U 009	FSK modem DIP 7911	544-3988-004
U 010	CMOS DUART 88C681J	544-5002-326
U 011	CMOS DUART 88C681J	544-5002-326
U 012	CMOS DUART 88C681J	544-5002-326
U 013	CMOS DUART 88C681J	544-5002-326
U 014	CMOS DUART 88C681J	544-5002-326
U 015	-5 volt reg TO-92 LM320L	544-2003-054
U 016	8k x 8 SRAM 28-DIP	544-5002-116
U 018	1 of 16 demux SOIC 74HC154	544-3766-154
U 019	Multi-Net RMM/CDM Voter	023-9998-231
U 020	µP power reset 5V SO-8	544-2012-001
U 021	Hex open drain buffer SOIC	544-3716-906
U 022	RS-232C/V.28 driver/receiver	544-2023-014
U 023	Quad 2-IN OR 74HC32	544-3766-032
U 024	Hex inverter SOIC 74HC04	544-3766-004
U 025	DC-DC converter control	544-4006-004
W 005	30 AWG green Kynar	597-7042-634
X 001	84-pin PLCC socket	515-5020-100
X 002	28-pin IC socket	515-5008-018
X 003	28-pin IC socket	515-5008-018
Y 001	2.4576 MHz crystal HC-18U	521-0002-458
Y 002	3.686 MHz crystal HC-18	521-0003-686
Y 003	3.686 MHz crystal HC-18	521-0003-686
Y 004	3.686 MHz crystal HC-18	521-0003-686
Y 005	3.686 MHz crystal HC-18	521-0003-686
Y 006	3.686 MHz crystal HC-18	521-0003-686
Y 007	15.000 MHz crystal HC-18	521-0015-000
Z 001	EMI suppression filter	532-3003-002



CR1: ON - ANALOG MODE (FSK OUT)
OFF - DIGITAL MODE (RS-232 OUT)

RMM COMPONENT LAYOUT
(COMPONENT SIDE VIEW)
FIGURE 4-4

FOLDOUT



March 2000
Part No. 001-3139-502

RMM COMPONENT LAYOUT
(OPPOSITE COMPONENT SIDE)
FIGURE 4-5

NOTES:

1. ALL CAPACITORS ARE IN MICROFARADS AND RESISTORS IN OHMS UNLESS OTHERWISE SPECIFIED.

2. IC PIN NUMBERS NOT SHOWN:

IC	PIN NUMBERS			
	+5	+9	-8	GND
U2	50,80			77,42
U4		4		11
U5, U6, U7, U8, U22	16	1	8	9
U9	2			22
U10, U11, U12, U13, U14	40			20
U16, U19	28			14
U18	24			12
U21, U23, U24	14			7

March 2000
Part No. 001-3139-502

RMM SCHEMATIC
FIGURE 4-6

FOLDOUT

SECTION 5 CENTRAL DE-MULTIPLEXER MODULE (CDM)

5.1 GENERAL

The Central De-Multiplexer Module (CDM), in the Local Site, receives the multiplexed data from the Remote Site RMM or directly from the RDM at the Local Site and de-multiplexes the information to the appropriate line to send to the RVMs.

A CDM is connected to each Remote Site RMM, therefore, 96 CDMs are the maximum number for a Voter System. A CDM is not required for the Local Site RDMs, these are hard wired to the RVM.

The CDM is installed in a card rack located near the Voter. The CDM is powered by +5V DC, -5V DC, +12V DC and -12V DC. The CDM operates in the -30°C to + 60°C (-22°F to +140°F) temperature range with 10 to 90% humidity.

Table 5-1 CDM RSSI INFORMATION

Hex Value	DESCRIPTION
7 6 5 4	Strongest RSSI signal level Weakest RSSI signal level a call will be started at
3 2* 1 0*	Weakest RSSI level before a call will be dropped. Receive Time-Out from RDM No Data received from RMM or RDM Turn-off Code from mobile was received
* Idle state.	

5.2 INPUT DATA

The CDM receives the Data Packet from the Remote Site Receiver Multiplexer Module (RMM). The input is 1200 baud RSSI with FSK audio data.

The CDM can only de-multiplex the Data Packet received from one RMM. The packet contains information for each of the 10 possible output lines. The information for the RSSI has the first 4-bits to define the line number and the second 4-bits to indicate the RSSI level, see Table 5-1.

5.3 OUTPUT DATA

The CDM sends the RSSI information to the RVMs via the RS-232 output ports at 1200 baud.

The data is routed to the appropriate output port according to the received line number associated with the data.

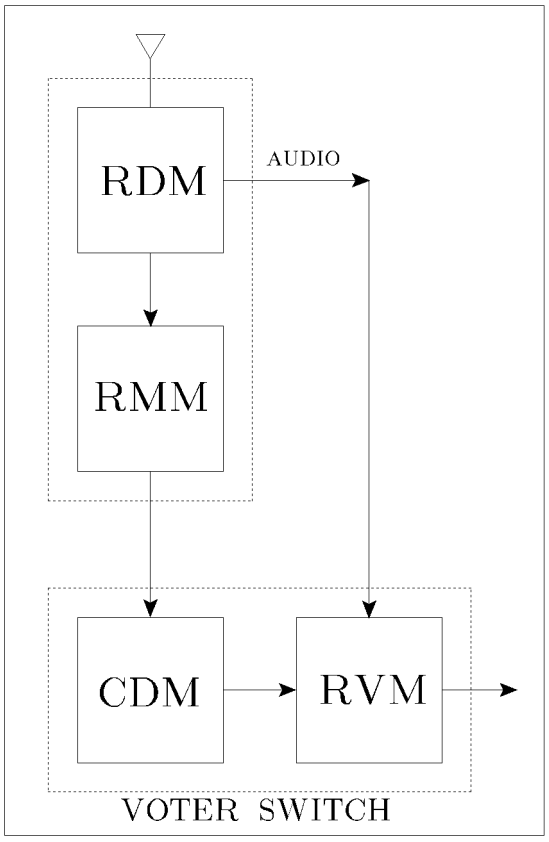


Figure 5-1 CDM BLOCK DIAGRAM

5.4 SWITCH SETTINGS

Table 5-2 CDM SWITCH SETTINGS

SWITCH	SEC.	DESCRIPTION
S1	1	On - CDM output for CH6
	2	On - CDM output for CH5
	3	On - CDM output for CH8
	4	On - CDM output for CH7
S2	1-2	Off
	3-4	On - CDM input enabled
S3	1	On - CDM output for CH2
	2	On - CDM output for CH1
	3	On - CDM output for CH4
	4	On - CDM output for CH3
S4	1	On - CDM Demux
	2	On - 1200 Baud FSK (Normal)
	2	Off - 9600 Baud RS-232
	3	On - CDM output for CH10
	4	On - CDM output for CH9
S100	1	Off - Test, On - Normal
	2	Off - Test, On - Normal
	3	Off - Test, On - Normal
	4	Off - Test, On - Normal

NOTE: CDM input goes in on CDM P1, pins 1 and 2 (right connector).

5.5 ALIGNMENT

NOTE: If the CDM is set for Digital Operation, alignment is not required.

5.5.1 CDM ANALOG FSK OPERATION

1. Inject a 1200 Hz signal at -12 dBm to P1, pin 22.

2. Adjust R28 for -12 dBm at TP101.

5.5.2 CDM FINAL ALIGNMENT

1. The maximum level is being received from the transmission line (RMM link).

2. Adjust R28 for 0 dBm (±2 dBm) at TP101.

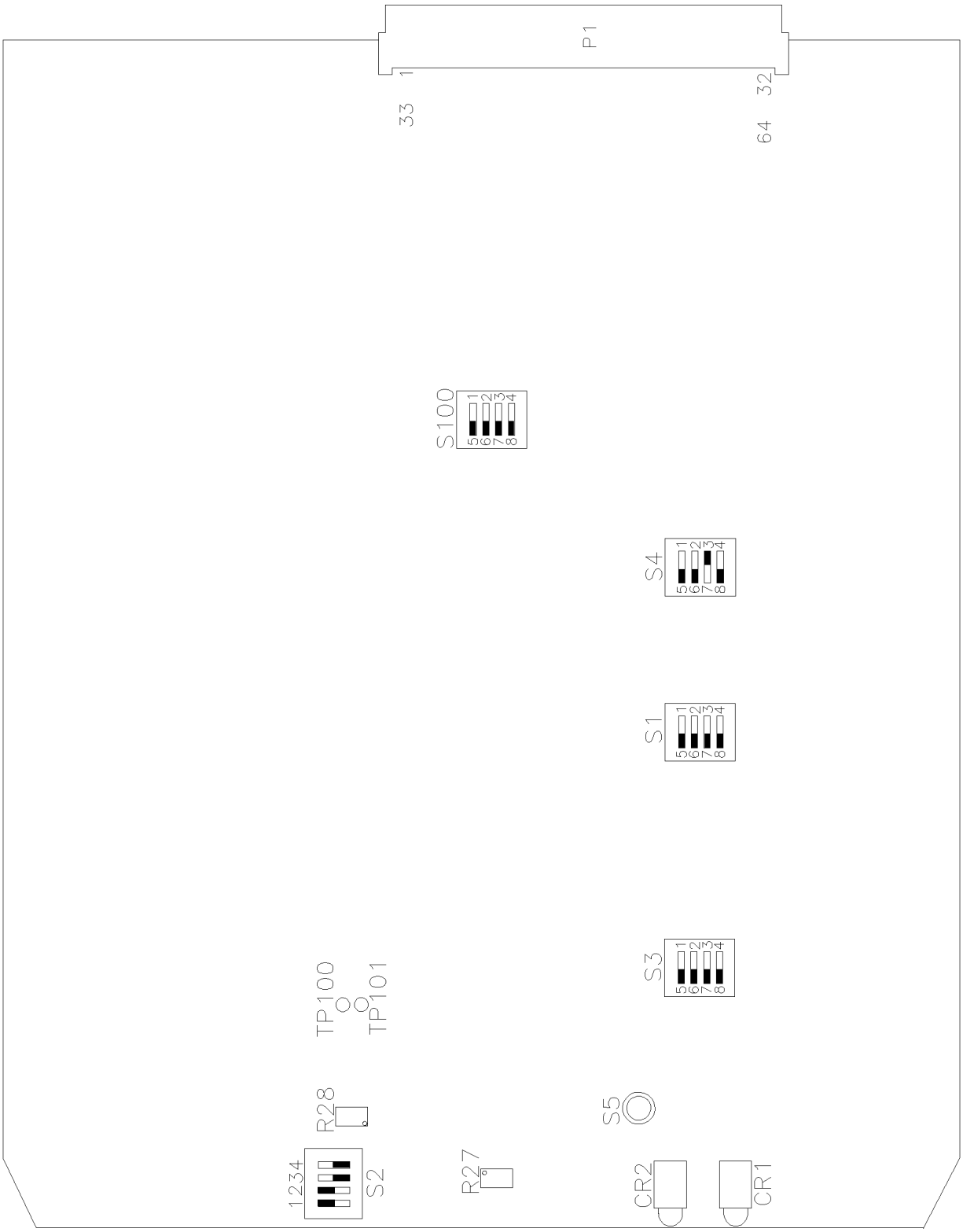


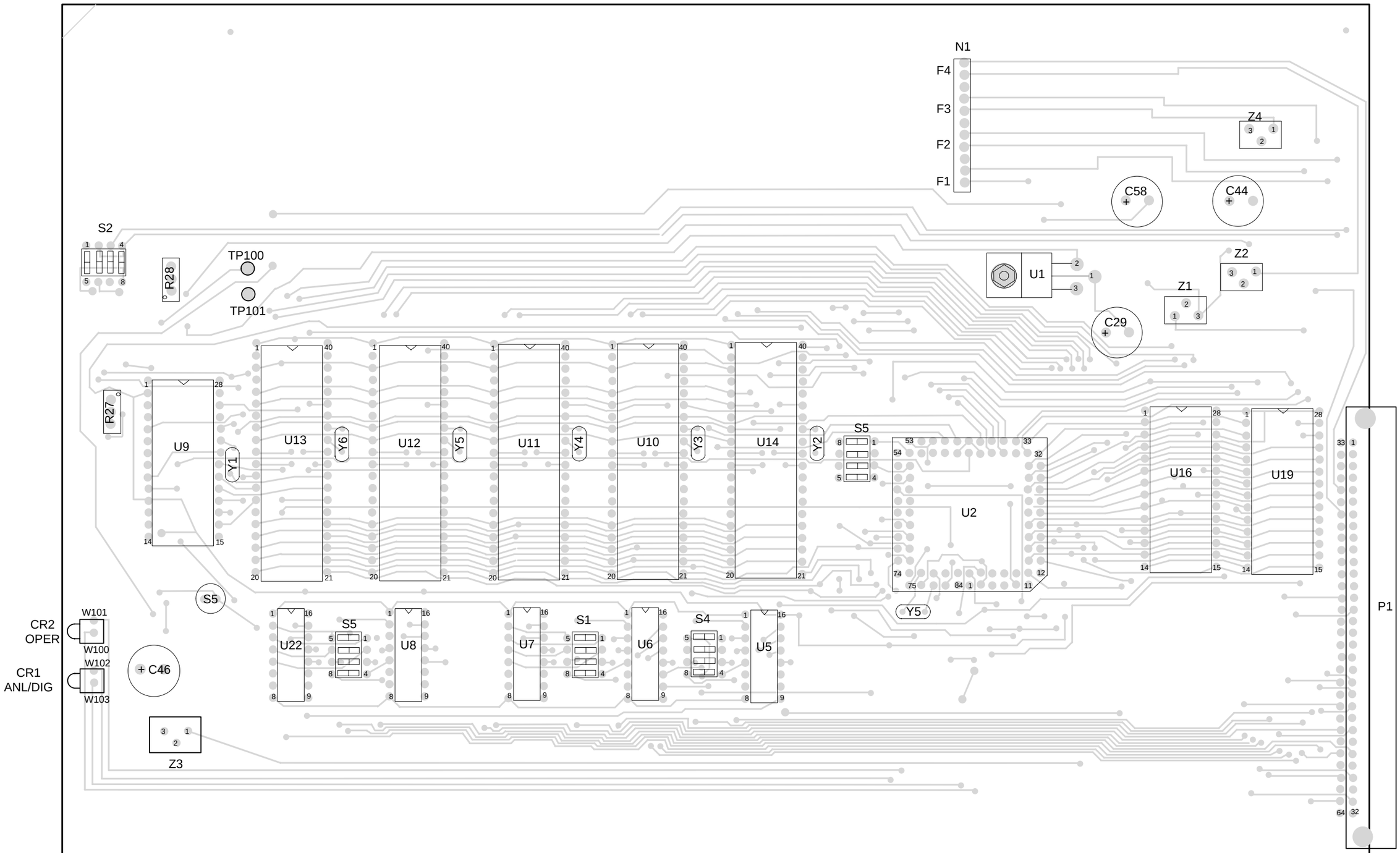
Figure 5-2 CDM ALIGNMENT POINTS DIAGRAM

CENTRAL DE-MULTIPLEXER MODULE
PART NO. 023-3039-540

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
C 001	.1 µF X7R ±10% 1210	510-3607-104
C 002	.1 µF X7R ±10% 1210	510-3607-104
C 003	1 µF 16V SMD TANT	510-2625-109
C 004	.1 µF X7R ±10% 1210	510-3607-104
C 005	10 µF 16V SMD TANT	510-2625-100
C 006	10 µF 16V SMD TANT	510-2625-100
C 007	.1 µF X7R ±10% 1210	510-3607-104
C 008	1 µF 16V SMD TANT	510-2625-109
C 009	.1 µF X7R ±10% 1210	510-3607-104
C 010	20 pF ±5% NPO 1206 chip	510-3602-200
C 011	10 pF ±5% NPO 1206 chip	510-3602-100
C 012	10 pF ±5% NPO 1205 chip	510-3602-100
C 013	10 pF ±5% NPO 1206 chip	510-3602-100
C 014	10 pF ±5% NPO 1206 chip	510-3602-100
C 015	5.1 pF ±5% NPO 1206 chip	510-3602-519
C 016	10 pF ±5% NPO 1206 chip	510-3602-100
C 017	5.1 pF ±5% NPO 1206 chip	510-3602-519
C 018	10 pF ±5% NPO 1206 chip	510-3602-100
C 019	5.1 pF ±5% NPO 1206 chip	510-3602-519
C 020	10 pF ±5% NPO 1206 chip	510-3602-100
C 021	5.1 pF ±5% NPO 1206 chip	510-3602-519
C 022	10 pF ±5% NPO 1206 chip	510-3602-100
C 023	5.1 pF ±5% NPO 1206 chip	510-3602-519
C 024	.01 µF X7R ±10% chip	510-3606-103
C 025	.0022 µF X7R ±10% chip	510-3606-222
C 026	.01 µF X7R ±10% chip	510-3606-103
C 027	.01 µF X7R ±10% chip	510-3606-103
C 028	.01 µF X7R ±10% chip	510-3606-103
C 029	47 µF 25V aluminum radial	510-4225-470
C 030	.1 µF X7R ±10% chip	510-3606-104
C 031	.1 µF X7R ±10% chip	510-3606-104
C 032	.01 µF X7R ±10% chip	510-3606-103
C 033	.01 µF X7R ±10% chip	510-3606-103
C 034	.01 µF X7R ±10% chip	510-3606-103
C 035	.01 µF X7R ±10% chip	510-3606-103
C 036	.1 µF X7R ±10% 1210	510-3607-104
C 038	10 µF 16V SMD TANT	510-2625-100
C 039	10 µF 16V SMD TANT	510-2625-100
C 040	.01 µF X7R ±10% chip	510-3606-10
C 041	.01 µF X7R ±10% chip	510-3606-103
C 042	.01 µF X7R ±10% chip	510-3606-103
C 043	2.2 µF 16V SMD TANT	510-2625-229
C 044	47 µF 25V aluminum radial	510-4225-470
C 045	.1 µF X7R ±10% 1210	510-3607-104
C 046	47 µF 25V aluminum radial	510-4225-470
C 047	.1 µF X7R ±10% 1210	510-3607-104
C 058	47 µF 25V aluminum radial	510-4225-470
CR001	LED red right angle PCB	549-4001-035
CR002	LED green right angle	549-4001-037
EP001	2-hole crystal pin insulator	018-1080-001
EP002	2-hole crystal pin insulator	018-1080-001
EP003	2-hole crystal pin insulator	018-1080-001
EP004	2-hole crystal pin insulator	018-1080-001
EP005	2-hole crystal pin insulator	018-1080-001
EP006	2-hole crystal pin insulator	018-1080-001
EP010	Heat sink insul TO-220 SL	574-5005-060
F 001	Fuse 1A hirel pigtail	534-0014-100
F 002	Fuse 1A hirel pigtail	534-0014-100
F 003	Fuse 1A hirel pigtail	534-0014-100
F 004	Fuse 1A hirel pigtail	534-0014-100
HW001	Nut 4-40 x .063 NPB	560-2104-006
HW002	4-40 mach panhead ZPS phil	575-1604-010
HW004	Nut 2-56 NPB	560-2101-006
HW005	Lockwasher int NPB	596-2102-006
HW006	Screws 2-56 panhead phil NPB	575-2602-014
HW007	Card inj/ext nylon W/2P	537-9057-020
J 001	11-pin single row receptacle	515-7110-211
MP002	Double sided foam tape	574-3002-013
P 001	DIN 64-pin male right angle	515-7082-101
PC 001	PC board	035-3039-540
R 001	300 ohm ±5% 1206 SMD	569-0115-301
R 002	300 ohm ±5% 1206 SMD	569-0115-301
R 003	47k ohm ±5% 1206 SMD	569-0115-473
R 004	47k ohm ±5% 1206 SMD	569-0115-473
R 005	10k ohm ±5% 1206 SMD	569-0115-103
R 006	10k ohm ±5% 1206 SMD	569-0115-103
R 007	200k ohm ±5% 1206 SMD	569-0115-204
R 008	100k ohm ±5% 1206 SMD	569-0115-104
R 009	200k ohm ±5% 1206 SMD	569-0115-204
R 010	10k ohm ±5% 1206 SMD	569-0115-103
R 011	10k ohm ±5% 1206 SMD	569-0115-103
R 012	620 ohm ±5% 1206 SMD	569-0115-621

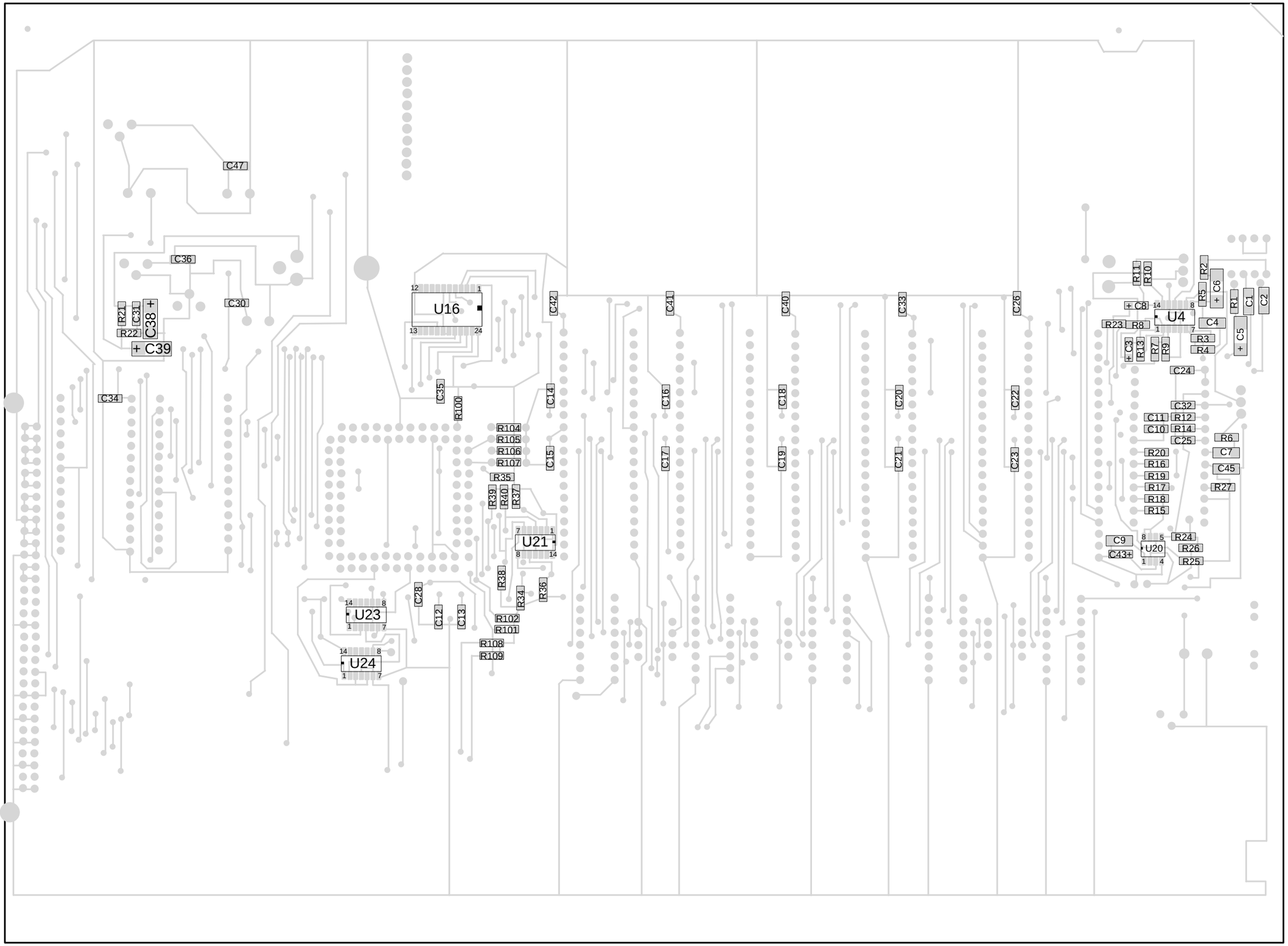
SYMBOL NUMBER	DESCRIPTION	PART NUMBER
R 013	100k ohm ±5% 1206 SMD	569-0115-104
R 014	910 ohm ±5% 1206 SMD	569-0115-911
R 015	10k ohm ±5% 1206 SMD	569-0115-103
R 016	10k ohm ±5% 1206 SMD	569-0115-103
R 017	10k ohm ±5% 1206 SMD	569-0115-103
R 018	10k ohm ±5% 1206 SMD	569-0115-103
R 019	10k ohm ±5% 1206 SMD	569-0115-103
R 020	10k ohm ±5% 1206 SMD	569-0115-103
R 021	2.2k ohm ±5% 1206 SMD	569-0115-222
R 022	2.2k ohm ±5% 1206 SMD	569-0115-222
R 023	620 ohm ±5% 1206 SMD	569-0115-621
R 024	10k ohm ±5% 1206 SMD	569-0115-103
R 025	10k ohm ±5% 1206 SMD	569-0115-103
R 026	10k ohm ±5% 1206 SMD	569-0115-103
R 027	100k ohm trim pot	562-0110-104
R 028	100k ohm trim pot	562-0110-104
R 034	10k ohm ±5% 1206 SMD	569-0115-103
R 035	10k ohm ±5% 1206 SMD	569-0115-103
R 036	10k ohm ±5% 1206 SMD	569-0115-103
R 037	10k ohm ±5% 1206 SMD	569-0115-103
R 038	10k ohm ±5% 1206 SMD	569-0115-103
R 039	10k ohm ±5% 1206 SMD	569-0115-103
R 040	10k ohm ±5% 1206 SMD	569-0115-103
R 100	10k ohm ±5% 1206 SMD	569-0115-103
R 101	10k ohm ±5% 1206 SMD	569-0115-103
R 102	10k ohm ±5% 1206 SMD	569-0115-103
R 104	10k ohm ±5% 1206 SMD	569-0115-103
R 105	10k ohm ±5% 1206 SMD	569-0115-103
R 106	10k ohm ±5% 1206 SMD	569-0115-103
R 107	10k ohm ±5% 1206 SMD	569-0115-103
R 108	10k ohm ±5% 1206 SMD	569-0115-103
R 109	10k ohm ±5% 1206 SMD	569-0115-103
S 001	DIP switch 4PST	583-5002-004
S 002	DIP switch 4PST	583-5002-004
S 003	DIP switch 4PST	583-5002-004
S 004	DIP switch 4PST	583-5002-004
S 005	Momentary SPST	583-4005-002
S 100	DIP switch 4PST	583-5002-004
TP100	Black tip jack	105-2203-211
TP101	Brown tip jack	105-2208-201
U 001	+9V volt regulator TO-220	544-2003-059
U 002	16-bit CMOS CPU ROMless	544-5002-016
U 004	Quad OP-AMP SOIC	544-2020-008
U 005	RS-232 C/V.28 driver/receiver	544-2023-014

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
U 006	RS-232 C/V.28 driver/receiver	544-2023-014
U 007	RS-232 C/V.28 driver/receiver	544-2023-014
U 008	RS-232 C/V.28 driver/receiver	544-2023-014
U 009	FSK modem DIP 7911	544-3988-004
U 010	CMOS DUART 88C681J	544-5002-326
U 011	CMOS DUART 88C681J	544-5002-326
U 012	CMOS DUART 88C681J	544-5002-326
U 013	CMOS DUART 88C681J	544-5002-326
U 014	CMOS DUART 88C681J	544-5002-326
U 016	8k x 8 SRAM 28-DIP	544-5002-116
U 018	1 of 16 demux SOIC 74HC154	544-3766-154
U 019	Multi-Net RMM/CDM Voter	023-9998-231
U 020	µP power reset 5V SO-8	544-2012-001
U 021	Hex open drain buffer SOIC	544-3716-906
U 022	RS-232 C/V.28 driver/receiver	544-2023-014
U 023	Quad 2-IN OR 74HC32	544-3766-032
U 024	Hex inverter SOIC 74HC04	544-3766-004
W 002	30 AWG green Kynar	597-7042-634
X 001	84-pos PLCC socket	515-5020-100
X 002	28-pin IC socket	515-5008-018
X 003	28-pin IC socket	515-5008-018
Y 001	2.4576 MHz crystal HC-18U	521-0002-458
Y 002	3.686 MHz crystal HC-18	521-0003-686
Y 003	3.686 MHz crystal HC-18	521-0003-686
Y 004	3.686 MHz crystal HC-18	521-0003-686
Y 005	3.686 MHz crystal HC-18	521-0003-686
Y 006	3.686 MHz crystal HC-18	521-0003-686
Y 007	15.000 MHz crystal HC-18	521-0015-000
Z 001	EMI suppression filter	532-3003-002
Z 002	EMI suppression filter	532-3003-002
Z 003	EMI suppression filter	532-3003-002
Z 004	EMI suppression filter	532-3003-002

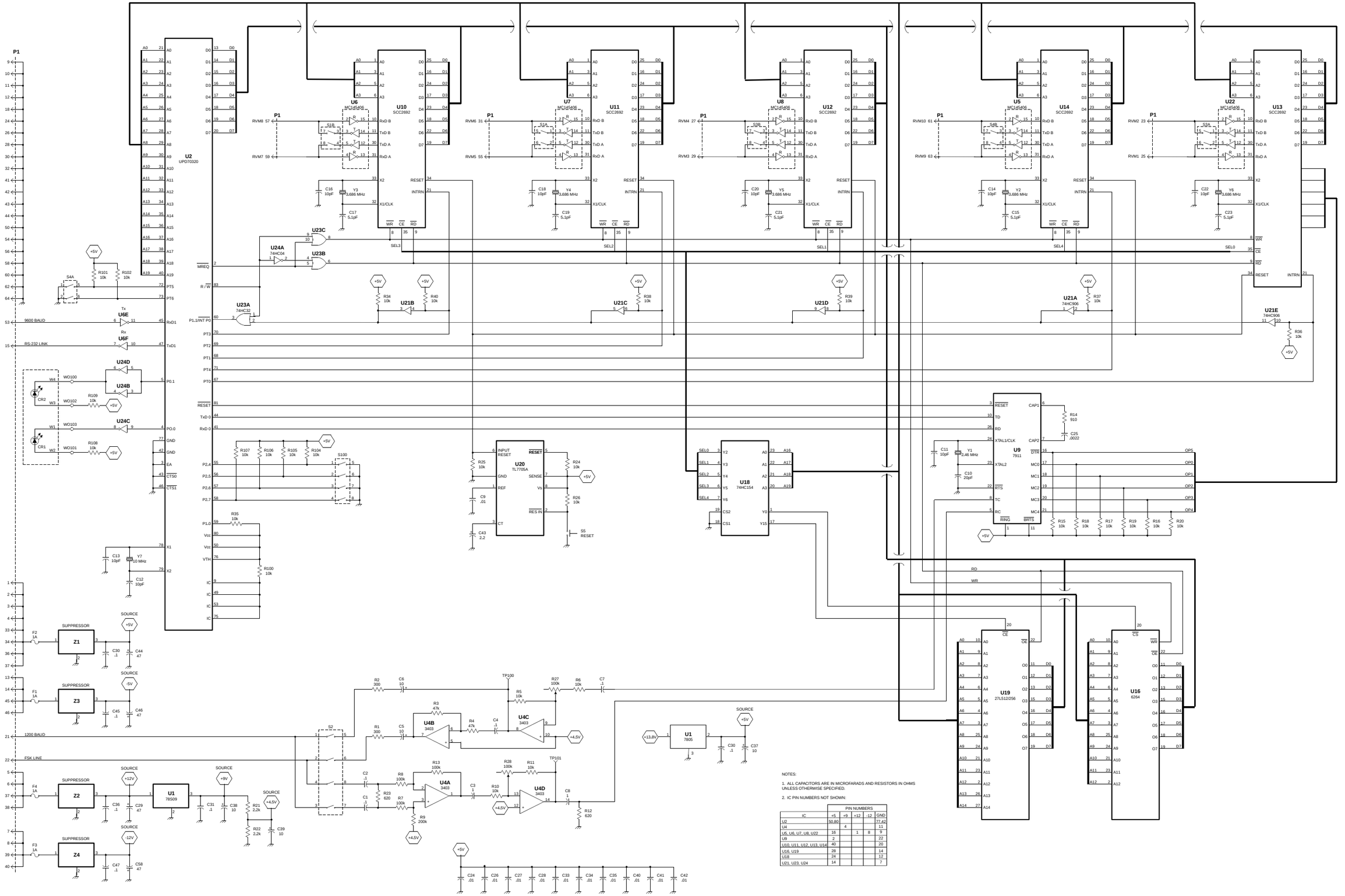


March 2000
Part No. 001-3139-502

CDM COMPONENT LAYOUT (COMPONENT SIDE) FOLDOUT
FIGURE 5-3



CDM COMPONENT LAYOUT (OPP COMPONENT SIDE)
FIGURE 5-4



March 2000
Part No. 001-3139-502

CDM SCHEMATIC
FIGURE 5-5

FOLDOUT

SECTION 6 CHANNEL RECEIVER VOTER MODULE (cRVM)

6.1 GENERAL

The Channel Receiver Voter Module (cRVM), at the Local Site, receives audio directly from the RDMs at both the Local and the Remote Sites. The cRVM receives the RSSI level directly from the Local Site RDMs and through the CDMs for Remote Sites. The cRVM compares the different Sites and selects the audio from RDM with the best RSSI value. The cRVM connects the selected audio to the Repeater.

Each cRVM can handle the audio from 4-RDMs and the RSSI level information from 1-Local RDM and 3-CDMs (or 4-CDMs). There can be 32 possible Voter Sites, divide this by 4 and 8 is the maximum number of RVMs required (1-cRVM and 7-slave RVMs) per channel. For a 30 channel system with 32 Voter Sites, the maximum number of RVMs required is 240 (30-cRVMs and 210-slave RVMs).

As stated above, a cRVM can have 4 audio/data inputs (channels). If a fifth Site is added, a slave RVM is added to each cRVM to accommodate the fifth Site.

The RVM is powered by +5V DC, -5V DC, +12V DC and -12V DC. The RVM operates in the -30°C to + 60°C (-22°F to +140°F) temperature range with 10% to 90% humidity.

6.2 cRVM TO RVM

The cRVM and RVMs associated with a channel need to be installed as a group in consecutive slots within the Voter shelf (see Figure 1-5). This group of RVMs are independent from the group of RVMs associated with another channel. The switches located on the backplane need to be properly selected to group cRVMs and RVMs together as required (see Figure 8-3).

The cRVM and RVMs communicate to each other via the cRVM to RVM bus at 19.2k baud. This bus needs to be connected between the cards. Connect the bus by closing section 3 of the switch located on the backplane between the cards. The proper loading for this bus is done by closing section 2 of the switch associated with the cRVM. This loading needs to be done only to the cRVM or one of the RVMs.

The cRVM or RVMs can connect any one of the 4 possible audio's it might be receiving to the Receive Audio path. The cRVM then can connect this Receive Audio path to the destination card. The Receive Audio path needs to be connected between the cRVM and RVMs. This path is connected by closing section 4 of the switch located on the backplane between the cards.

Refer to Section 8 for the location of the backplane switches.

6.3 RECEIVE ORDERS

The RVM receives the initial Receive Call Orders via a 1200 baud FSK blank and burst signaling on the main audio line (Refer to Figure 6-1). The RVM receives the update RSSI information from the Receiver Decoder Module (RDM) via the RMM and CDM on the RS-232 input. The RVM handles a maximum of 4-RDMs and/or 4-CDMs.

The initial Receive Call Orders requires an RSSI level of "4" to start a call. After the call has been received, an RSSI level of "3" is required to keep the call.

The 1200 baud RS-232 input from the CDM contains only the RSSI Level.

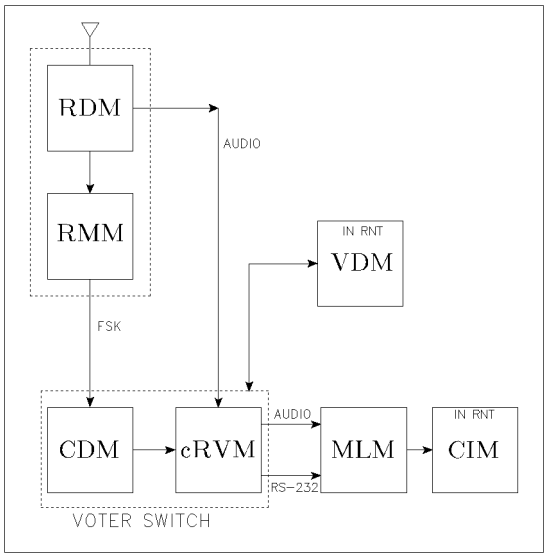


Figure 6-1 RVM BLOCK DIAGRAM

6.4 RSSI

The RVM evaluates the RSSI levels from the different receiver Sites and selects the receiver with the best RSSI level. If the RVM is a Slave RVM (sRVM) it creates a Status Message and passes on the RDM with the best RSSI level. This message is sent to the Channel RVM (cRVM). A cRVM is capable of handling up to 7-sRVMs and the cRVM option is switch selectable (see 6-5). The cRVM evaluates the RSSI levels from the different receiver Sites and selects the receiver with the best RSSI level. This level is then evaluated with the RSSI levels received from sRVMs. The cRVM creates and sends a Receive Call Order with the best receiver to the Multi-Net Logic Module (MLM) via a separate 9600 baud or 2400 baud RS-232 line depending on the setting of S5, section 6 (see Table 6-1). The RVM passes the best selected RDM audio to the MLM.

When the receiver with the best RSSI level is from a sRVM, the cRVM sends a System Order to this sRVM. The System Order contains the necessary information to connect the audio properly.

The time to receive the information from the different RDMs, decode the data, vote for the best RDM and pass the information to the MLM is less than 120 milliseconds.

The RVM continues to evaluate the updated RSSI levels received. The cRVM selects a better RDM if there is an RDM that has a better RSSI level than the one selected.

6.5 PRIORITY OF SITES

The RVM can be programmed from the SMM to give a priority to each of the RDMs connected to it. The priority is a two-level priority, normal (0) or low (1), which is written to EEPROM address 0. The upper 4-bits are unused.

Assuming a mobile transmits and the call is received by two Sites with the same RSSI value, if one Site has a low priority and the other a normal priority, the RVM chooses the normal priority for the call.

6.5.1 PRIORITY PROGRAMMING

To program the priority of the Sites, go into the SMM under Manual Device Control (F2). In the Manual Device Control menu select the Receiver Voter Control (F6). In the Receiver Voter Control menu select RVM Memory Management (F1). Select write mode and go to EEPROM location. Enter location “0” and the hex (0xh) value of the priority byte. The priority byte consists of 8-bits with only the lower four bits being used. See Figure 6-2.

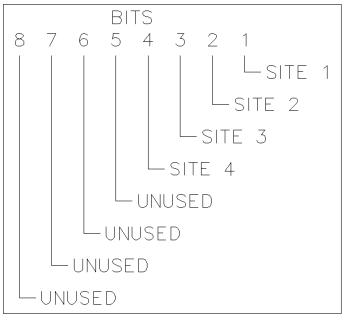


Figure 6-2 PRIORITY BYTE CONFIGURATION

6.6 SWITCH SETTINGS

Refer to the RVM board alignment points diagram (Figure 6-4) and cRVM board alignment points diagram (Figure 6-5) for the location of switches and sections.

NOTE: See Appendix A to D for frequencies and Figure 6-3 for an example of switch settings for 800 MHz Channel 100.

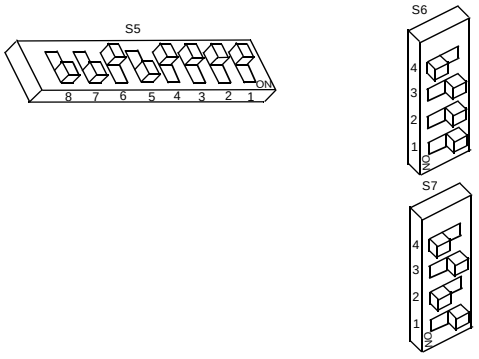


Figure 6-3 CHANNEL 100 SWITCH SETTINGS

Table 6-1 cRVM OPERATION

Switch	Section	Description
S3	1	On - RVM1 enabled Off - RVM1 closed
	2	On - RVM2 enabled Off - RVM2 closed
	3	On - RVM3 enabled Off - RVM3 closed
	4	On - RVM4 enabled Off - RVM4 closed
	5	On - RVM5 enabled Off - RVM5 closed
	6	On - RVM6 enabled Off - RVM6 closed
	7	On - RVM7 enabled Off - RVM7 closed
S5	1-5	cRVM Address**
	6	Off - 2400 Baud link to Normal MLM
	6	On - 9600 baud link to Remote MLM
	7	Bit 8*
	8	Bit 9*
S6	1-4	Bits 0-3*
S7	1-4	Bits 4-7*
* Bits of Go To FCC Channel Number. ** Only used for VDM recognition.		

Table 6-2 RVM OPERATION

SWITCH	SECTION	DESCRIPTION
S3	1-3	RVM Address (1-7)
	4-7	Not used
	8	On - RVM Off - cRVM
S5	1-5	cRVM Address (1-30)

Table 6-3 RVM ADJUST EE-POTS

Switch	Section	Description
S2	4	Off- Pulse EE-pots up On- Pulse EE-pots down
S2	1-3	EE-pot select (CS1-CS6)
S1		Press for one pulse to EE-pot
S8		Reset

6.7 LED DEFINITION

The 4-pairs of Green and Yellow LEDs represent Sites 1 through 4 (see Table 6-4). The Green LED just below S4 is the power indicator LED. The two Yellow LEDs define whether the RVM is a cRVM or RVM (see Table 6-5). The bottom Green LED is the Call LED (see Table 6-6).

6.7.1 SITE LED DEFINITION

Table 6-4 SITE LEDs

Green LED	Yellow LED	Definition
Off	Off	Site Disabled
On	Off	Link Good
Blinking	Off	Link Open
Off	On	Not Used
Off	Blinking	Link Noisy
On	On	Active Call
On	Blinking	Chosen Active Call
Blinking	On	Not Used
Blinking	Blinking	CDM Error

6.7.2 RVM LEDS

Table 6-5 RVM LEDs

Top Yellow LED	Bottom Yellow LED	Definition
Off	Off	Not Used
On	Off	RVM Only
Off	On	cRVM Only
On	On	Not Used

6.7.3 CALL LED

Table 6-6 CALL LED

Green LED	Definition
Off	No Active Call
On	Active Call

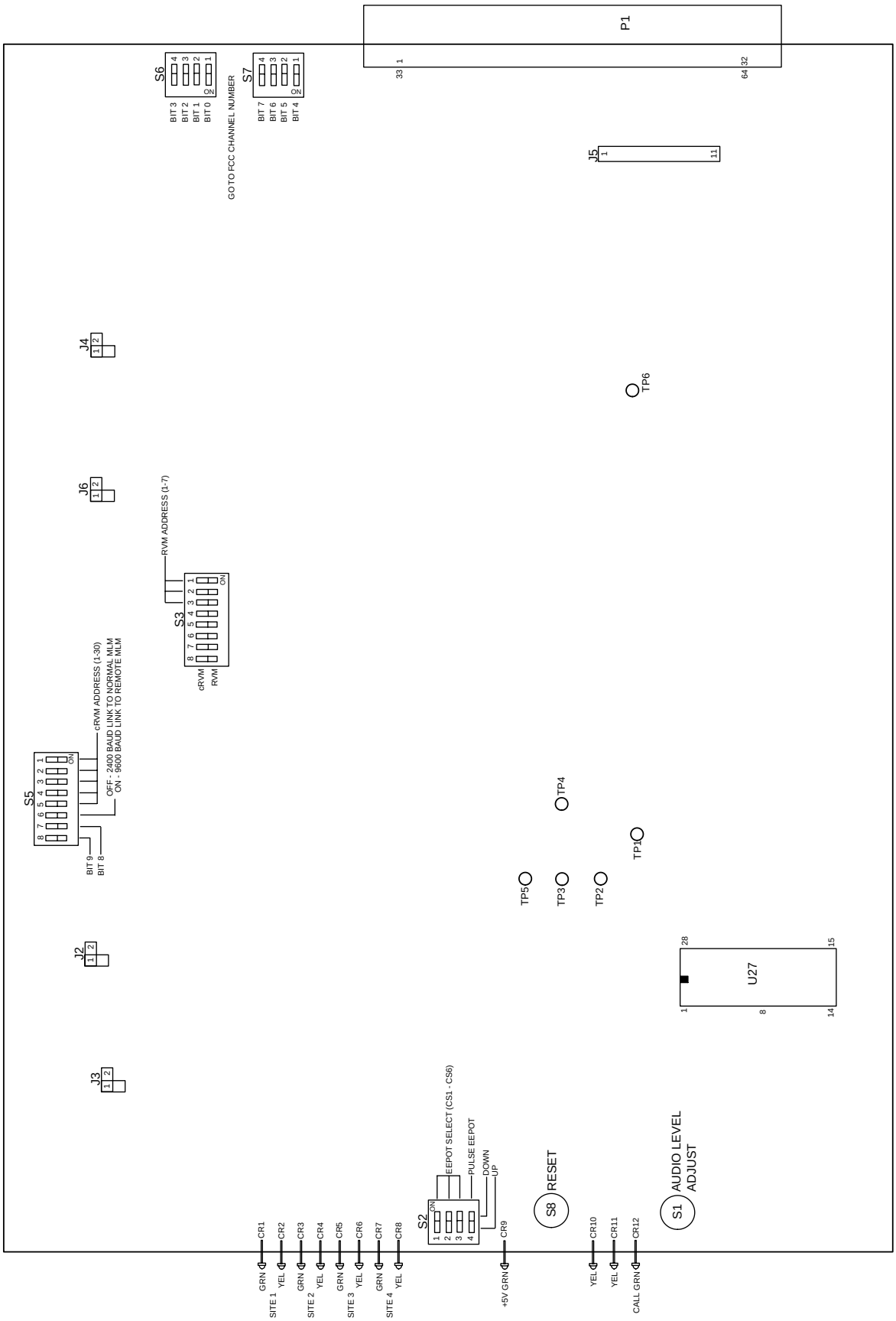


Figure 6-4 RVM ALIGNMENT POINTS

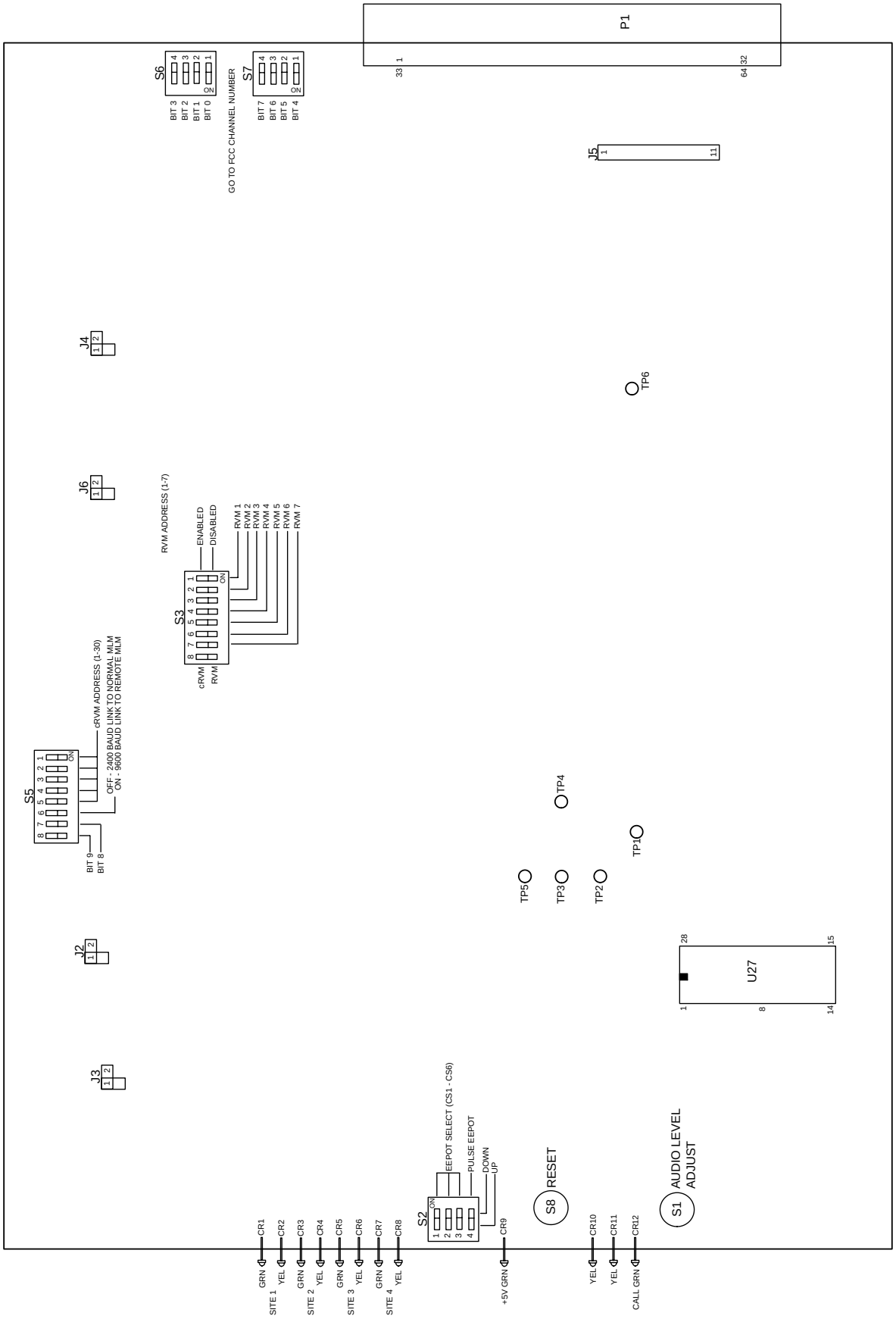


Figure 6-5 cRVM ALIGNMENT POINTS

6.8 AUDIO ALIGNMENT

NOTE: This is a pre-installation procedure, intended for use in a "bench" alignment of an RVM. It is not intended for alignment of an operational voter system.

6.8.1 RVM REMOVAL

Remove all external connections to the RVM to be aligned (i.e. clips from punch blocks or backplane connectors).

6.8.2 RVM AND CHANNEL SELECTION

On the SMM, select the desired RVM to be aligned and enable each of the channels.

1. Remove RVM from the Voter shelf and place it into an Extender Card.

2. Place jumpers on J2, J3, J4 and J6 to enable alignment task (see Figure 6-4).

3. Inject 1200 Hz at -20 dB into P1, pins 25/26.

4. Reset RVM.

6.8.3 CHANNEL 1 AUDIO OUTPUT LEVEL

The RVM will be self-aligning Channel 1 to the on-board reference tone (1200 Hz) generated at FSK chip U29, pin 8. The self-alignment will take approximately 5 minutes.

When the self-alignment of U40 is complete its associated LEDs CR1 and CR2 will start flashing.

1. Connect the transmission test set to TP2 and verify U40 is -20 dBm ±2 dBm.

2. Connect the transmission test set to P1, pin 21, measured output should be -25 dBm.

3. If adjustment is necessary, note setting and select U44 by setting S2 sections 1/3 Off, 2 On.

4. To decrease the audio output level set S2, section 4 "On".

5. To increase the audio output level set S2, section 4 "Off".

6. Adjust the audio output level by pressing S1 repeatedly until -25 dBm is measured.

6.8.4 CHANNEL 2 AUDIO OUTPUT LEVEL

Remove the 1200 Hz from P1, pins 25 and 26 and connect 1200 Hz to P1, pins 27 and 28. Remove the jumper from J6 and place it onto just one of the pins. The LEDs CR1 and CR2 will turn off and the RVM will be self-aligning Channel 2 to the on-board reference 1200 Hz tone. The self-alignment will take approximately 10 seconds.

When the self-alignment of U41 is complete its associated LEDs CR3 and CR4 will start flashing.

1. Connect the transmission test set to TP3 and verify that U41 has been aligned to -20 dBm ±2 dBm.

2. Connect the transmission test set to P1, pin 21.

3. Verify the audio output level measures -25 dBm.

6.8.5 CHANNEL 3 AUDIO OUTPUT LEVEL

Remove the 1200 Hz tone from P1, pins 27 and 28. Connect the 1200 Hz tone to P1, pins 29 and 30. Remove the jumper from J2 and place it onto just one of the pins. LEDs CR3 and CR4 will turn off and the RVM will be self-aligning Channel 3 to the on-board reference tone. The self-alignment will take approximately 10 seconds.

When the self-alignment of U42 is complete its associated LEDs CR5 and CR6 will start flashing.

1. Connect the transmission test set to TP4 and verify that U42 is -20 dBm ±2 dBm.

2. Connect the transmission test set to P1 pin 21, measured output should be -25 dBm.

6.8.6 CHANNEL 4 AUDIO OUTPUT LEVEL

Remove the 1200 Hz tone from P1, pins 29 and 30. Connect the 1200 Hz tone to P1, pins 31 and 32. Remove the jumper from J3 and place it onto just one of the pins. LEDs CR5 and CR6 will turn off and the RVM will be self-aligning Channel 4 to the on-board reference tone. The self-alignment will take approximately 10 seconds.

When the self-alignment of U43 is complete, its associated LEDs CR7 and CR8 will start flashing.

1. Connect the transmission test set to TP5 and verify that U43 is -20 dBm ±2 dBm.

2. Connect the transmission test set to P1 pin 21, measured output should be -25 dBm.

6.9 RVM REPLACEMENT

The RVM alignment is complete.

1. Remove the RVM from the Extender Board and remove the 1200 Hz from P1, pins 31 and 32.

2. Remove the jumper from J4 and place it onto just one of the pins. (Removal of jumpers J6, J2-J4 places the RVM into normal operation.)

3. The LEDs CR7 and CR8 will turn off.

4. Return S2 to noted setting (Section 6.8.3, Step 3).

5. Set all other switches for the desired mode of operation.

6. Replace the RVM in the Voter shelf.

7. Replace all external connections.

8. On the SMM, select the RVM and disable the unused channel.

NOTE: To check output on pin 21, tear down the call and let RVM adjust for two to three minutes before setting (will not adjust during a call).

NOTE: To engage Sites on RVM, on the SMM use Device Number of VDM connected to the shelf of the RVM. Use cRVM number (S5, 1-5) for channel number, RVM number is 0 (zero) if all are cRVMs.

6.10 INSTALLED SYSTEM ADJUSTMENTS

6.10.1 PRELIMINARY

This procedure is for a installed System that is properly aligned and the audio levels from the Receiver to the Voter are set:

- 800 MHz Repeaters:
  -12 dBm at 1.5 kHz audio deviation less data

- 900 MHz Repeaters:
  -12 dBm at 1.33 kHz audio deviation less data

NOTE: Personnel performing this alignment should be familiar with the System wiring and Audio I/O connections.

- The levels set in this procedure should be set on one input channel for each cRVM output, all of the other inputs self-align to the -20 dBm Pilot Tone.

- If more than 4 Sites are used per channel, this alignment must be performed on one input channel for each cRVM and RVM.

- The level should be set from a "Master" Site or the most accessible Site.

- Verify audio levels from the other Sites are set properly at the input to the cRVM. The output should not vary more than a few tenths of a dB from each associated Site.

6.10.2 ESTABLISH A MULTI-NET CALL

1. If the repeater is off, turn it on and wait 1-2 minutes for the cRVM in the Voter to self-align before bringing up a Multi-Net call.

2. Set an IFR to Transmit a Multi-Net call.

a. Connect a SED box to the Ext. Mod SINAD Port of the IFR.

b. Power the SED box from the repeater IAC.

c. Set Parameters as follows:
Display Entry/Encode Data = **Encode Data**
Repeater/Mobile = **Mobile**
Digital/Analog = **Analog**
Normal/Inverted = **Normal**
Encode/Decode = **Encode**
Enter the data as: **System Key**
UID HOME GID GOTO STA PRI R

d. Connect the IFR to the Repeater's receive port.

e. Set the frequency to the Receive frequency.

f. Position the IFR to generate.

g. Check that the Data Level coming from the SED is at 1 kHz deviation. (If the level is low or high, adjust Data Out POT on the SED box.)

h. Set the IFR to generate a 1 kHz tone at:
1.5 kHz deviation at 800 MHz
1.33 kHz deviation at 900 MHz
1.2 kHz deviation NPSPAC.

6.10.3 RVM LEVEL ADJUSTMENTS

NOTE: The cRVM can compensate for some line loss/gain discrepancies, however excessive line losses must be considered. Leased line circuits may have loss/gain that is not controllable at the Site and must be dealt with by the carrier. The circuits should have been previously measured and tolerances taken into account.

1. Verify a -12 dBm audio level from the Receiver to the Voter.

2. If the measured level is incorrect the cRVM EEPOT must be adjusted (see Figure 6-5).

3. Set S2, sections 1 and 3 OFF, section 2 ON.
Set S2, section 4:
OFF to increase the output when pressing S1
ON to decrease the output when pressing S1

4. Press S1 to change the output level as close to -12 dBm as possible.

5. Set S2, sections 1-4 OFF when the alignment is completed.

NOTE: The cRVM should not be measured or adjusted for 2-3 minutes after power up, if the receiver has been turned off, or if levels have been changed on the receiver or circuits. This allows time for the cRVM to self-align to the Pilot Tone.

6. Continue with the above steps for ALL channels at the first Site before continuing to other Sites.

RECEIVER VOTER MODULE
PART NO. 023-3039-520

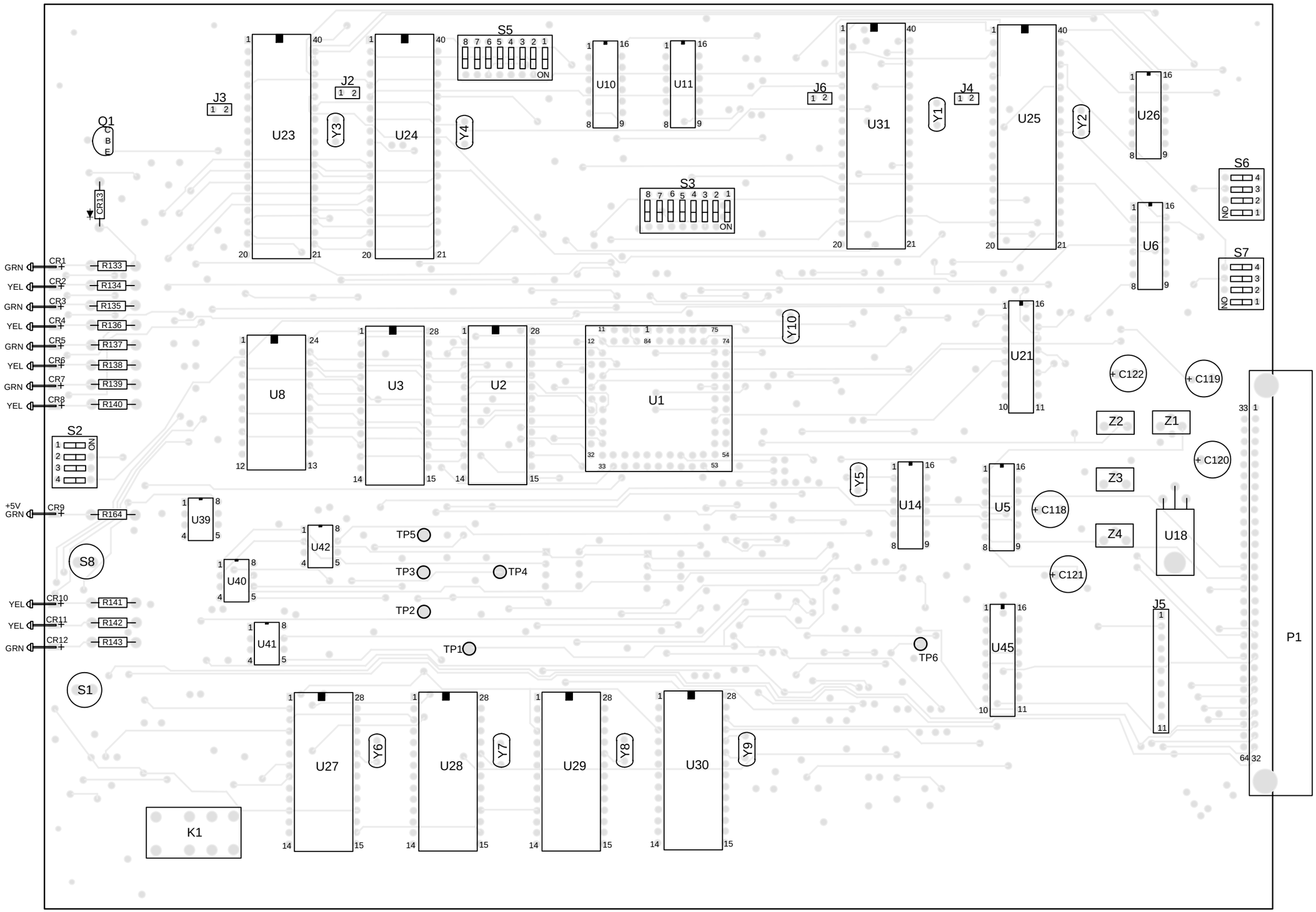
SYMBOL NUMBER	DESCRIPTION	PART NUMBER
C 001	20 pF ±5% NPO 1206	510-3602-200
C 002	.1 µF ±10% X7R 1210	510-3607-104
C 003	.1 µF ±10% X7R 1210	510-3607-104
C 004	.1 µF ±10% X7R 1210	510-3607-104
C 005	.0022 µF ±10% X7R chip	510-3606-222
C 006	20 pF ±5% NPO 1206	510-3602-200
C 007	10 pF ±5% NPO 1206	510-3602-100
C 008	20 pF ±5% NPO 1206	510-3602-200
C 009	.1 µF ±10% X7R 1210	510-3607-104
C 010	.1 µF X7R ±10% 1210	510-3607-104
C 011	10 pF ±5% NPO 1206 chip	510-3602-100
C 012	.0022 µF ±10% X7R chip	510-3606-222
C 013	20 pF ±5% NPO 1206	510-3602-200
C 014	.1 µF ±10% X7R 1210	510-3607-104
C 015	.1 µF ±10% X7R 1210	510-3607-104
C 016	10 pF ±5% NPO 1206 chip	510-3602-100
C 017	.0022 µF ±10% X7R chip	510-3606-222
C 018	.1 µF ±10% X7R 1210	510-3607-104
C 019	.1 µF ±10% X7R 1210	510-3607-104
C 020	10 pF ±5% NPO 1206 chip	510-3602-100
C 021	.0022 µF ±10% X7R chip	510-3606-222
C 022	.001 µF X7R ±10% chip	510-3606-102
C 023	220 pF ±5% NPO 1206 chip	510-3602-221
C 024	.015 µF X7R ±10% chip	510-3606-153
C 025	.1 µF X7R ±10% chip	510-3606-104
C 026	220 pF ±5% NPO 1206 chip	510-3602-221
C 027	.001 µF X7R ±10% chip	510-3606-102
C 028	.01 µF X7R ±10% chip	510-3606-103
C 029	.01 µF X7R ±10% chip	510-3606-103
C 030	.01 µF X7R ±10% chip	510-3606-103
C 031	.01 µF X7R ±10% chip	510-3606-103
C 032	.01 µF X7R ±10% chip	510-3606-103
C 033	10 pF ±5% NPO 1206 chip	510-3602-100
C 034	.01 µF X7R ±10% chip	510-3606-103
C 035	4.7 pF ±5% N470 SMD	510-3624-479
C 036	.01 µF X7R ±10% chip	510-3606-103
C 037	.01 µF X7R ±10% chip	510-3606-103
C 038	.01 µF X7R ±10% chip	510-3606-103
C 039	.01 µF X7R ±10% chip	510-3606-103
C 040	.01 µF X7R ±10% chip	510-3606-103
C 041	.01 µF X7R ±10% chip	510-3606-103
C 042	.01 µF X7R ±10% chip	510-3606-103
C 043	.01 µF X7R ±10% chip	510-3606-103
C 044	.01 µF X7R ±10% chip	510-3606-103
C 045	.01 µF X7R ±10% chip	510-3606-103
C 046	.01 µF X7R ±10% chip	510-3606-103
C 047	.01 µF X7R ±10% chip	510-3606-103
C 048	.01 µF X7R ±10% chip	510-3606-103
C 049	.01 µF X7R ±10% chip	510-3606-103
C 050	.01 µF X7R ±10% chip	510-3606-103
C 051	.01 µF X7R ±10% chip	510-3606-103
C 052	.01 µF X7R ±10% chip	510-3606-103
C 053	.01 µF X7R ±10% chip	510-3606-103
C 054	.01 µF X7R ±10% chip	510-3606-103
C 055	.01 µF X7R ±10% chip	510-3606-103
C 056	10 pF ±5% NPO 1206 chip	510-3602-100
C 057	150 pF ±5% NPO 1206 chip	510-3602-151
C 058	.01 µF X7R ±10% chip	510-3606-103
C 059	4.7 pF ±5% N470 SMD	510-3624-479
C 060	.01 µF X7R ±10% chip	510-3606-103
C 061	.01 µF X7R ±10% chip	510-3606-103
C 062	.1 µF X7R ±10% 1210	510-3607-104
C 063	.01 µF X7R ±10% chip	510-3606-103
C 064	.01 µF X7R ±10% chip	510-3606-103
C 065	.01 µF X7R ±10% chip	510-3606-103
C 066	.1 µF X7R ±10% 1210	510-3607-104
C 067	22 pF ±5% NPO 1206 chip	510-3602-220
C 068	.1 µF X7R ±10% 1210	510-3607-104
C 069	22 pF ±5% NPO 1206 chip	510-3602-220
C 070	.01 µF X7R ±10% chip	510-3606-103
C 071	.01 µF X7R ±10% chip	510-3606-103
C 072	.01 µF X7R ±10% chip	510-3606-103
C 073	.01 µF X7R ±10% chip	510-3606-103
C 074	.01 µF X7R ±10% chip	510-3606-103
C 075	.01 µF X7R ±10% chip	510-3606-103
C 076	10 pF ±5% NPO 1206 chip	510-3602-100
C 077	.01 µF X7R ±10% chip	510-3606-103
C 078	10 pF ±5% NPO 1206 chip	510-3602-100
C 079	10 pF ±5% NPO 1206 chip	510-3602-100
C 080	.01 µF X7R ±10% chip	510-3606-103
C 081	4.7 pF ±5% N470 SMD	510-3624-479
C 082	.1 µF X7R ±10% 1210	510-3607-104
C 083	.01 µF X7R ±10% chip	510-3606-103
C 084	.01 µF X7R ±10% chip	510-3606-103
C 085	10 pF ±5% NPO 1206 chip	510-3602-100
C 086	4.7 pF ±5% N470 SMD	510-3624-479
C 087	.01 µF X7R ±10% chip	510-3606-103
C 089	2.2 µF 20V SMD TANT	510-2626-229
C 090	10 µF 16V SMD TANT	510-2625-100
C 091	10 µF 16V SMD TANT	510-2625-100
C 092	10 µF 16V SMD TANT	510-2625-100

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
C 093	2.2 µF 20V SMD TANT	510-2626-229
C 094	10 µF 16V SMD TANT	510-2625-100
C 095	2.2 µF 20V SMD TANT	510-2626-229
C 096	10 µF 16V SMD TANT	510-2625-100
C 097	2.2 µF 20V SMD TANT	510-2626-229
C 098	10 µF 16V SMD TANT	510-2625-100
C 099	10 µF 16V SMD TANT	510-2625-100
C 100	2.2 µF 20V SMD TANT	510-2626-229
C 101	2.2 µF 20V SMD TANT	510-2626-229
C 102	2.2 µF 20V SMD TANT	510-2626-229
C 103	2.2 µF 20V SMD TANT	510-2626-229
C 104	2.2 µF 20V SMD TANT	510-2626-229
C 105	2.2 µF 20V SMD TANT	510-2626-229
C 106	2.2 µF 20V SMD TANT	510-2626-229
C 107	2.2 µF 20V SMD TANT	510-2626-229
C 108	33 µF 10V SMD TANT	510-2624-330
C 109	10 µF 16V SMD TANT	510-2625-100
C 110	10 µF 16V SMD TANT	510-2625-100
C 111	10 µF 16V SMD TANT	510-2625-100
C 112	10 µF 16V SMD TANT	510-2625-100
C 113	33 µF 10V SMD TANT	510-2624-330
C 114	1 µF 16V SMD TANT	510-2625-109
C 115	2.2 µF 20V SMD TANT	510-2626-229
C 116	10 µF 16V SMD TANT	510-2625-100
C 117	2.2 µF 20V SMD TANT	510-2626-229
C 118	47 µF 25V aluminum radial	510-4225-470
C 119	47 µF 25V aluminum radial	510-4225-470
C 120	47 µF 25V aluminum radial	510-4225-470
C 121	47 µF 25V aluminum radial	510-4225-470
C 122	47 µF 25V aluminum radial	510-4225-470
C 123	1 µF 16V SMD TANT	510-2625-109
C 124	1 µF 16V SMD TANT	510-2625-109
C 125	2.2 µF 20V SMD TANT	510-2626-229
C 126	2.2 µF 20V SMD TANT	510-2626-229
CR001	Green LED submin	549-4001-122
CR002	Yellow LED submin	549-4001-121
CR003	Green LED submin	549-4001-122
CR004	Yellow LED submin	549-4001-121
CR005	Green LED submin	549-4001-122
CR006	Yellow LED submin	549-4001-121
CR007	Green LED submin	549-4001-122
CR008	Yellow LED submin	549-4001-121
CR009	Green LED submin	549-4001-122
CR010	Yellow LED submin	549-4001-121
CR011	Yellow LED submin	549-4001-121
CR012	Green LED submin	549-4001-122
CR013	SI Diode 1N4448	523-1500-883
EP001	Crystal pin insulator	018-1080-001
EP002	Crystal pin insulator	018-1080-001
EP003	Crystal pin insulator	018-1080-001
EP004	Crystal pin insulator	018-1080-001
EP005	Crystal pin insulator	018-1080-001
EP006	Crystal pin insulator	018-1080-001
EP007	Crystal pin insulator	018-1080-001
EP008	Crystal pin insulator	018-1080-001
EP009	Crystal pin insulator	018-1080-001
EP010	Double sided foam tape	574-3002-015
EP018	Heatsink insulator TO-220	574-5005-060
F 001	1A high reliability pigtail	534-0014-100
F 002	1A high reliability pigtail	534-0014-100
F 003	1A high reliability pigtail	534-0014-100
F 004	2A high reliability pigtail	534-0014-200
HW001	Nut 2-56 x 0.063	560-2102-006
HW002	Lockwasher int 2 x 0.013 NPB	596-2102-006
HW003	Screw 2-56 panhead phil NPB	575-2602-014
HW004	Card injector/extractor nylon	537-9057-020
HW005	Nut 4-40 x 0.094 NPB	560-2104-008
HW006	4-40 mach panhead phil ZPS	575-1604-008
HW007	Lockwasher 4 x 0.015	596-2104-908
J 002	2-pin single inline header	515-7100-002
J 003	2-pin single inline header	515-7100-002
J 004	2-pin single inline header	515-7100-002
J 005	11-pin single row receptacle	515-7110-211
J 006	2-pin single inline header	515-7100-002
K 001	2A DPDT relay, sub min	567-0024-003
P 001	DIN 64-pin male right angle	515-7082-101
P 002	Shorting socket	515-5010-001
P 003	Shorting socket	515-5010-001
P 004	Shorting socket	515-5010-001
P 006	Shorting socket	515-5010-001
PC100	PC board	035-3039-520
Q 001	NPN gen purp 2N3904	576-0003-058
R 001	300 ohm ±5% 1206 SMD	569-0115-301
R 002	10k ohm ±5% 1206 SMD	569-0115-103

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
R 003	100k ohm ±5% 1206 SMD	569-0115-104
R 004	100k ohm ±5% 1206 SMD	569-0115-104
R 005	10k ohm ±5% 1206 SMD	569-0115-103
R 006	620 ohm ±5% 1206 SMD	569-0115-621
R 007	300 ohm ±5% 1206 SMD	569-0115-301
R 008	10k ohm ±5% 1206 SMD	569-0115-103
R 009	10k ohm ±5% 1206 SMD	569-0115-103
R 010	300 ohm ±5% 1206 SMD	569-0115-301
R 011	300 ohm ±5% 1206 SMD	569-0115-301
R 012	300 ohm ±5% 1206 SMD	569-0115-301
R 013	220k ohm ±5% 1206 SMD	569-0115-224
R 014	220k ohm ±5% 1206 SMD	569-0115-224
R 015	10k ohm ±5% 1206 SMD	569-0115-103
R 016	10k ohm ±5% 1206 SMD	569-0115-103
R 017	10k ohm ±5% 1206 SMD	569-0115-103
R 018	910 ohm ±5% 1206 SMD	569-0115-911
R 019	300 ohm ±5% 1206 SMD	569-0115-301
R 020	300 ohm ±5% 1206 SMD	569-0115-301
R 021	910 ohm ±5% 1206 SMD	569-0115-911
R 022	220k ohm ±5% 1206 SMD	569-0115-224
R 023	100k ohm ±5% 1206 SMD	569-0115-104
R 024	100k ohm ±5% 1206 SMD	569-0115-104
R 025	220k ohm ±5% 1206 SMD	569-0115-224
R 026	10k ohm ±5% 1206 SMD	569-0115-103
R 027	620 ohm ±5% 1206 SMD	569-0115-621
R 028	10k ohm ±5% 1206 SMD	569-0115-103
R 029	10k ohm ±5% 1206 SMD	569-0115-103
R 030	300 ohm ±5% 1206 SMD	569-0115-301
R 031	300 ohm ±5% 1206 SMD	569-0115-301
R 032	910 ohm ±5% 1206 SMD	569-0115-911
R 033	220k ohm ±5% 1206 SMD	569-0115-224
R 034	100k ohm ±5% 1206 SMD	569-0115-104
R 035	100k ohm ±5% 1206 SMD	569-0115-104
R 036	220k ohm ±5% 1206 SMD	569-0115-224
R 037	10k ohm ±5% 1206 SMD	569-0115-103
R 038	620 ohm ±5% 1206 SMD	569-0115-621
R 039	10k ohm ±5% 1206 SMD	569-0115-103
R 040	10k ohm ±5% 1206 SMD	569-0115-103
R 041	300 ohm ±5% 1206 SMD	569-0115-301
R 042	910 ohm ±5% 1206 SMD	569-0115-911
R 043	220k ohm ±5% 1206 SMD	569-0115-224
R 044	100k ohm ±5% 1206 SMD	569-0115-104
R 045	100k ohm ±5% 1206 SMD	569-0115-104
R 046	220k ohm ±5% 1206 SMD	569-0115-224
R 047	10k ohm ±5% 1206 SMD	569-0115-103
R 048	620 ohm ±5% 1206 SMD	569-0115-621
R 049	10k ohm ±5% 1206 SMD	569-0115-103
R 050	10k ohm ±5% 1206 SMD	569-0115-103
R 051	10k ohm ±5% 1206 SMD	569-0115-103
R 052	100k ohm ±5% 1206 SMD	569-0115-104
R 053	47k ohm ±5% 1206 SMD	569-0115-473
R 054	10k ohm ±5% 1206 SMD	569-0115-103
R 055	10k ohm ±5% 1206 SMD	569-0115-103
R 056	10k ohm ±5% 1206 SMD	569-0115-103
R 057	100k ohm ±5% 1206 SMD	569-0115-104
R 058	10k ohm ±5% 1206 SMD	569-0115-103
R 059	10k ohm ±5% 1206 SMD	569-0115-103
R 060	100k ohm ±5% 1206 SMD	569-0115-104
R 061	10k ohm ±5% 1206 SMD	569-0115-103
R 062	10k ohm ±5% 1206 SMD	569-0115-103
R 063	100k ohm ±5% 1206 SMD	569-0115-104
R 064	10k ohm ±5% 1206 SMD	569-0115-103
R 065	100k ohm ±5% 1206 SMD	569-0115-104
R 066	82k ohm ±5% 1206 SMD	569-0115-823
R 067	100k ohm ±5% 1206 SMD	569-0115-104
R 068	4.99k ohm ±1% 1206 SMD	569-0111-368
R 069	49.9k ohm ±1% 1206 SMD	569-0111-468
R 070	4.99k ohm ±1% 1206 SMD	569-0111-368
R 071	4.99k ohm ±1% 1206 SMD	569-0111-368
R 072	4.99k ohm ±1% 1206 SMD	569-0111-368
R 073	49.9k ohm ±1% 1206 SMD	569-0111-468
R 074	100k ohm ±5% 1206 SMD	569-0115-104
R 075	10k ohm ±5% 1206 SMD	569-0115-103
R 076	10k ohm ±5% 1206 SMD	569-0115-103
R 077	10k ohm ±5% 1206 SMD	569-0115-103
R 078	10k ohm ±5% 1206 SMD	569-0115-103
R 079	100k ohm ±5% 1206 SMD	569-0115-104
R 080	100k ohm ±5% 1206 SMD	569-0115-104
R 081	2k ohm ±5% 1206 SMD	569-0115-202
R 082	100k ohm ±5% 1206 SMD	569-0115-104
R 083	5.1k ohm ±5% 1206 SMD	569-0115-512
R 084	47k ohm ±5% 1206 SMD	569-0115-473
R 085	100k ohm ±5% 1206 SMD	569-0115-104
R 086	82k ohm ±5% 1206 SMD	569-0115-823
R 087	10k ohm ±5% 1206 SMD	569-0115-103
R 088	10k ohm ±5% 1206 SMD	569-0115-103
R 089	10k ohm ±5% 1206 SMD	569-0115-103
R 090	10k ohm ±5% 1206 SMD	569-0115-103
R 091	100k ohm ±5% 1206 SMD	569-0115-104
R 092	100k ohm ±5% 1206 SMD	569-0115-104
R 093	10k ohm ±5% 1206 SMD	569-0115-103
R 094	10k ohm ±5% 1206 SMD	569-0115-103
R 095	10k ohm ±5% 1206 SMD	569-0115-103
R 096	10k ohm ±5% 1206 SMD	569-0115-103

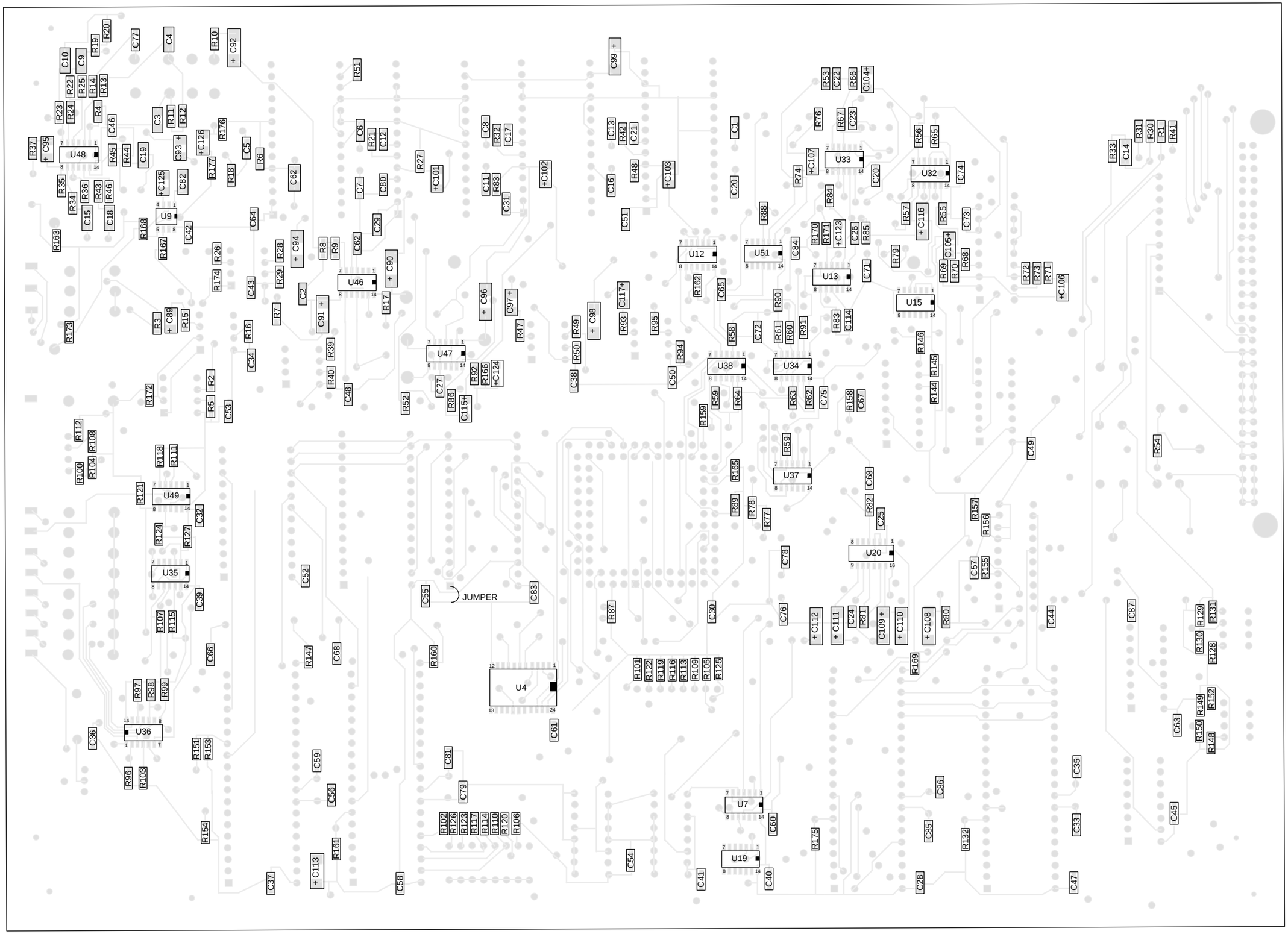
SYMBOL NUMBER	DESCRIPTION	PART NUMBER
R 097	10k ohm ±5% 1206 SMD	569-0115-103
R 098	10k ohm ±5% 1206 SMD	569-0115-103
R 099	10k ohm ±5% 1206 SMD	569-0115-103
R 100	10k ohm ±5% 1206 SMD	569-0115-103
R 101	10k ohm ±5% 1206 SMD	569-0115-103
R 102	10k ohm ±5% 1206 SMD	569-0115-103
R 103	10k ohm ±5% 1206 SMD	569-0115-103
R 104	10k ohm ±5% 1206 SMD	569-0115-103
R 105	10k ohm ±5% 1206 SMD	569-0115-103
R 106	10k ohm ±5% 1206 SMD	569-0115-103
R 107	10k ohm ±5% 1206 SMD	569-0115-103
R 108	10k ohm ±5% 1206 SMD	569-0115-103
R 109	10k ohm ±5% 1206 SMD	569-0115-103
R 110	10k ohm ±5% 1206 SMD	569-0115-103
R 111	10k ohm ±5% 1206 SMD	569-0115-103
R 112	10k ohm ±5% 1206 SMD	569-0115-103
R 113	10k ohm ±5% 1206 SMD	569-0115-103
R 114	10k ohm ±5% 1206 SMD	569-0115-103
R 115	10k ohm ±5% 1206 SMD	569-0115-103
R 116	10k ohm ±5% 1206 SMD	569-0115-103
R 117	10k ohm ±5% 1206 SMD	569-0115-103
R 118	10k ohm ±5% 1206 SMD	569-0115-103
R 119	10k ohm ±5% 1206 SMD	569-0115-103
R 120	10k ohm ±5% 1206 SMD	569-0115-103
R 121	10k ohm ±5% 1206 SMD	569-0115-103
R 122	10k ohm ±5% 1206 SMD	569-0115-103
R 123	10k ohm ±5% 1206 SMD	569-0115-103
R 124	10k ohm ±5% 1206 SMD	569-0115-103
R 125	10k ohm ±5% 1206 SMD	569-0115-103
R 126	10k ohm ±5% 1206 SMD	569-0115-103
R 127	10k ohm ±5% 1206 SMD	569-0115-103
R 128	10k ohm ±5% 1206 SMD	569-0115-103
R 129	10k ohm ±5% 1206 SMD	569-0115-103
R 130	10k ohm ±5% 1206 SMD	569-0115-103
R 131	10k ohm ±5% 1206 SMD	569-0115-103
R 132	10k ohm ±5% 1206 SMD	569-0115-103
R 133	1k ohm ±5% 1/4W CF	569-0513-102
R 134	1k ohm ±5% 1/4W CF	569-0513-102
R 135	1k ohm ±5% 1/4W CF	569-0513-102
R 136	1k ohm ±5% 1/4W CF	569-0513-102
R 137	1k ohm ±5% 1/4W CF	569-0513-102
R 138	1k ohm ±5% 1/4W CF	569-0513-102
R 139	1k ohm ±5% 1/4W CF	569-0513-102
R 140	1k ohm ±5% 1/4W CF	569-0513-102
R 141	1k ohm ±5% 1/4W CF	569-0513-102
R 142	1k ohm ±5% 1/4W CF	569-0513-102
R 143	1k ohm ±5% 1/4W CF	569-0513-102
R 144	10k ohm ±5% 1206 SMD	569-0115-103
R 145	10k ohm ±5% 1206 SMD	569-0115-103
R 146	10k ohm ±5% 1206 SMD	569-0115-103
R 147	10k ohm ±5% 1206 SMD	569-0115-103
R 148	10k ohm ±5% 1206 SMD	569-0115-103
R 149	10k ohm ±5% 1206 SMD	569-0115-103
R 150	10k ohm ±5% 1206 SMD	569-0115-103
R 151	4.7k ohm ±5% 1206 SMD	569-0115-472
R 152	10k ohm ±5% 1206 SMD	569-0115-103
R 153	4.7k ohm ±5% 1206 SMD	569-0115-472
R 154	10k ohm ±5% 1206 SMD	569-0115-103
R 155	10k ohm ±5% 1206 SMD	569-0115-103
R 156	10k ohm ±5% 1206 SMD	569-0115-103
R 157	10k ohm ±5% 1206 SMD	569-0115-103
R 158	1k ohm ±5% 1206 SMD	569-0115-102
R 159	10k ohm ±5% 1206 SMD	569-0115-103
R 160	10k ohm ±5% 1206 SMD	569-0115-103
R 161	10k ohm ±5% 1206 SMD	569-0115-103
R 162	10k ohm ±5% 1206 SMD	569-0115-103
R 163	10k ohm ±5% 1206 SMD	569-0115-103
R 164	430 ohm ±5% 1/4W CF	569-0513-431
R 165	10k ohm ±5% 1206 SMD	569-0115-103
R 166	10k ohm ±5% 1206 SMD	569-0115-103
R 167	10k ohm ±5% 1206 SMD	569-0115-103
R 168	10k ohm ±5% 1206 SMD	569-0115-103
R 169	10k ohm ±5% 1206 SMD	569-0115-103
R 170	10k ohm ±5% 1206 SMD	569-0115-103
R 171	10k ohm ±5% 1206 SMD	569-0115-103
R 172	10k ohm ±5% 1206 SMD	569-0115-103
R 173	10k ohm ±5% 1206 SMD	569-0115-103
R 174	10k ohm ±5% 1206 SMD	569-0115-103
R 175	10k ohm ±5% 1206 SMD	569-0115-103
R 176	620 ohm ±5% 1/4W CF	569-0513-621
R 177	10k ohm ±5% 1206 SMD	569-0115-103
S 001	Momentary SPST	583-4005-002
S 002	Dip switch 4PST	583-5002-004
S 003	Dip switch 8-pos	583-5002-008
S 005	Dip switch 8-pos	583-5002-008
S 006	Dip switch 4PST	583-5002-004
S 007	Dip switch 4PST	583-5002-004
S 008	Momentary SPST	583-4005-002
TP001	Brown tip jack	105-2208-201
TP002	Red tip jack	105-2202-211
TP003	Orange tip jack	105-2206-201
TP004	Yellow tip jack	105-2207-201

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
TP005	Green tip jack	105-2204-201
TP006	Blue tip jack	105-2210-201
U 001	16-bit CMOS CPU	544-5002-016
U 002	8kx8 SRAM DIP-28 70NS	544-5002-116
U 003	RVM software	023-9998-234
U 004	1of16 Demux SOIC HC154	544-3766-154
U 005	RS232 C/V.28 driver/receiver	544-2023-014
U 006	RS232 C/V.28 driver/receiver	544-2023-014
U 007	HEX inverter SOIC 74HC04	544-3766-004
U 008	16k EEPROM 2816A	544-5001-401
U 009	µP power reset 5V S0-8	544-2012-001
U 010	Dual line driver	544-2023-002
U 011	Triple line receiver	544-2023-003
U 012	Quad 2-IN OR 74HC32	544-3766-032
U 013	Quad OP-AMP SOIC	544-2020-008
U 014	Serial input phase lock loop	544-3014-158
U 015	Dual D flip-flop 74HC74	544-3766-074
U 018	+9V volt regulator TO-220	544-2003-059
U 019	Quad 2-in AND SOIC HC08	544-3766-008
U 020	Low pwr FM IF SO16 SA604	544-2026-008
U 021	8-bit AC/DC converter	544-2031-001
U 023	CMOS DUART 88C681J	544-5002-326
U 024	CMOS DUART 88C681J	544-5002-326
U 025	CMOS DUART 88C681J	544-5002-326
U 026	Dual line driver	544-2023-002
U 027	FSK MODEM 28-DIP 7911	544-3988-004
U 028	FSK MODEM 28-DIP 7911	544-3988-004
U 029	FSK MODEM 28-DIP 7911	544-3988-004
U 030	FSK MODEM 28-DIP 7911	544-3988-004
U 031	CMOS DUART 88C681J	544-5002-326
U 032	Bilateral switch SOIC 4066B	544-3016-066
U 033	Bilateral switch SOIC 4066B	544-3016-066
U 034	Bilateral switch SOIC 4066B	544-3016-066
U 035	Hex open drain buffer SO-14	544-3716-906
U 036	Hex open drain buffer SO-14	544-3716-906
U 037	Hex open drain buffer SO-14	544-3716-906
U 038	Hex open drain buffer SO-14	544-3716-906
U 039	DIG POT x 9C104 100k DP8	544-0004-210
U 040	DIG POT x 9C104 100k DP8	544-0004-210
U 041	DIG POT x 9C104 100k DP8	544-0004-210
U 042	DIG POT x 9C104 100k DP8	544-0004-210
U 043	DIG POT x 9C104 100k DP8	544-0004-210
U 044	DIG POT x 9C104 100k DP8	544-0004-210
U 045	Dual switch cap filter MF-10	544-9015-001
U 046	Quad OP-AMP SOIC 3403	544-2020-008
U 047	Quad OP-AMP SOIC 3403	544-2020-008
U 048	Quad OP-AMP SOIC 3403	544-2020-008
U 049	Hex open drain buffer SO-14	544-3716-906
U 051	Quad OP-AMP SOIC	544-2020-008
W 002	#30 AWG Kynar green wire	597-7042-634
X 001	84-pos PLCC socket	515-5020-100
X 002	28-pin IC socket	515-5008-018
X 003	28-pin IC socket	515-5008-018
X 027	28-pin IC socket	515-5008-018
X 028	28-pin IC socket	515-5008-018
X 029	28-pin IC socket	515-5008-018
X 030	28-pin IC socket	515-5008-018
Y 001	3.686 MHz crystal HC-18	521-0003-686
Y 002	3.686 MHz crystal HC-18	521-0003-686
Y 003	3.686 MHz crystal HC-18	521-0003-686
Y 004	3.686 MHz crystal HC-18	521-0003-686
Y 005	12 MHz µP crystal	521-0012-000
Y 006	2.4576 MHz HC-18U	521-0002-458
Y 007	2.4576 MHz HC-18U	521-0002-458
Y 008	2.4576 MHz HC-18U	521-0002-458
Y 009	2.4576 MHz HC-18U	521-0002-458
Y 010	15 MHz HC-18U	521-0015-000
Z 001	EMI suppression filter	532-3003-002
Z 002	EMI suppression filter	532-3003-002
Z 003	EMI suppression filter	532-3003-002
Z 004	EMI suppression filter	532-3003-002

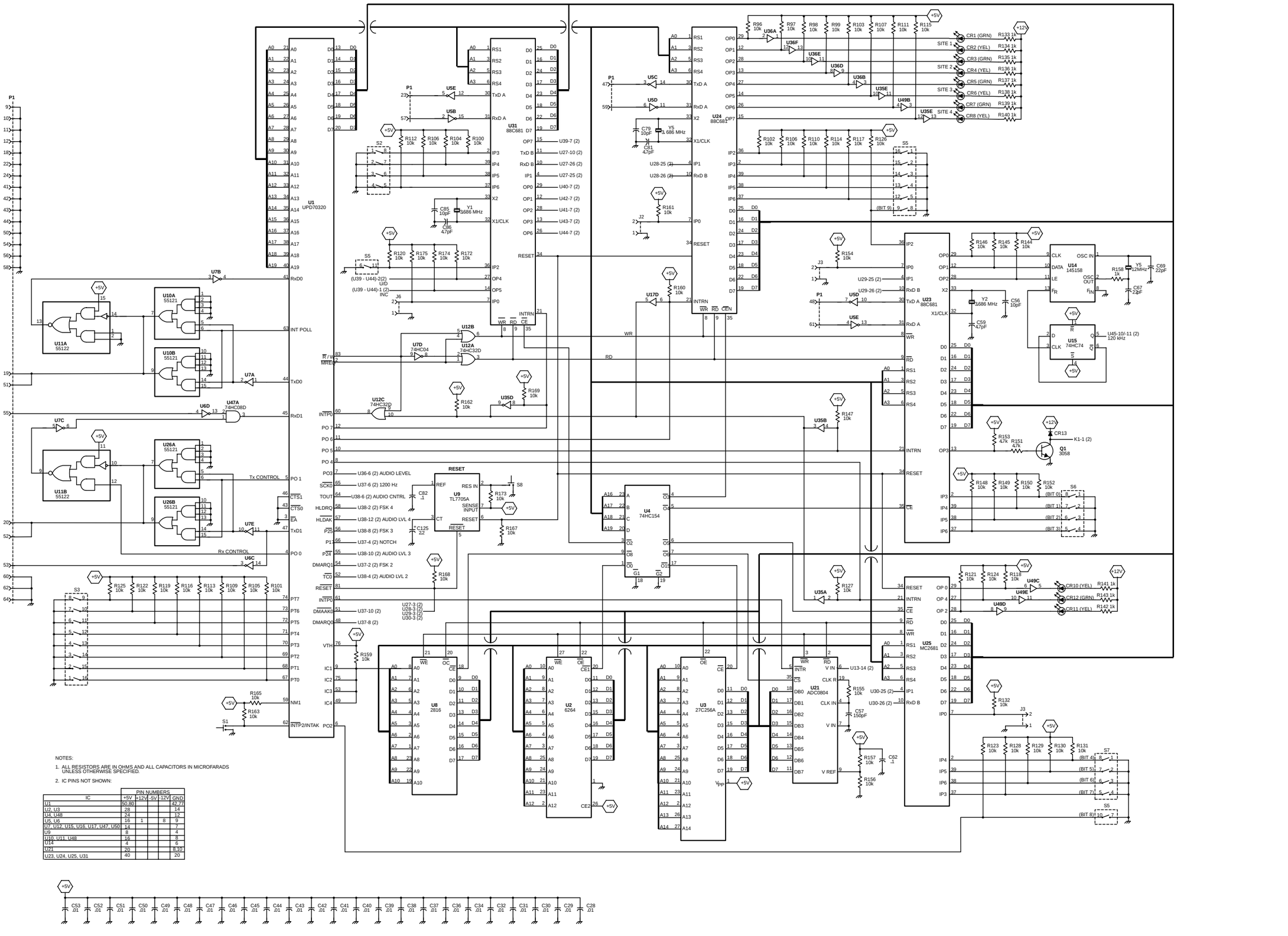


March 2000
Part No. 001-3139-502

RVM COMPONENT LAYOUT (COMPONENT SIDE) FOLDOUT
FIGURE 6-6



RVM COMPONENT LAYOUT (OPP COMPONENT SIDE)
FIGURE 6-7



NOTES:

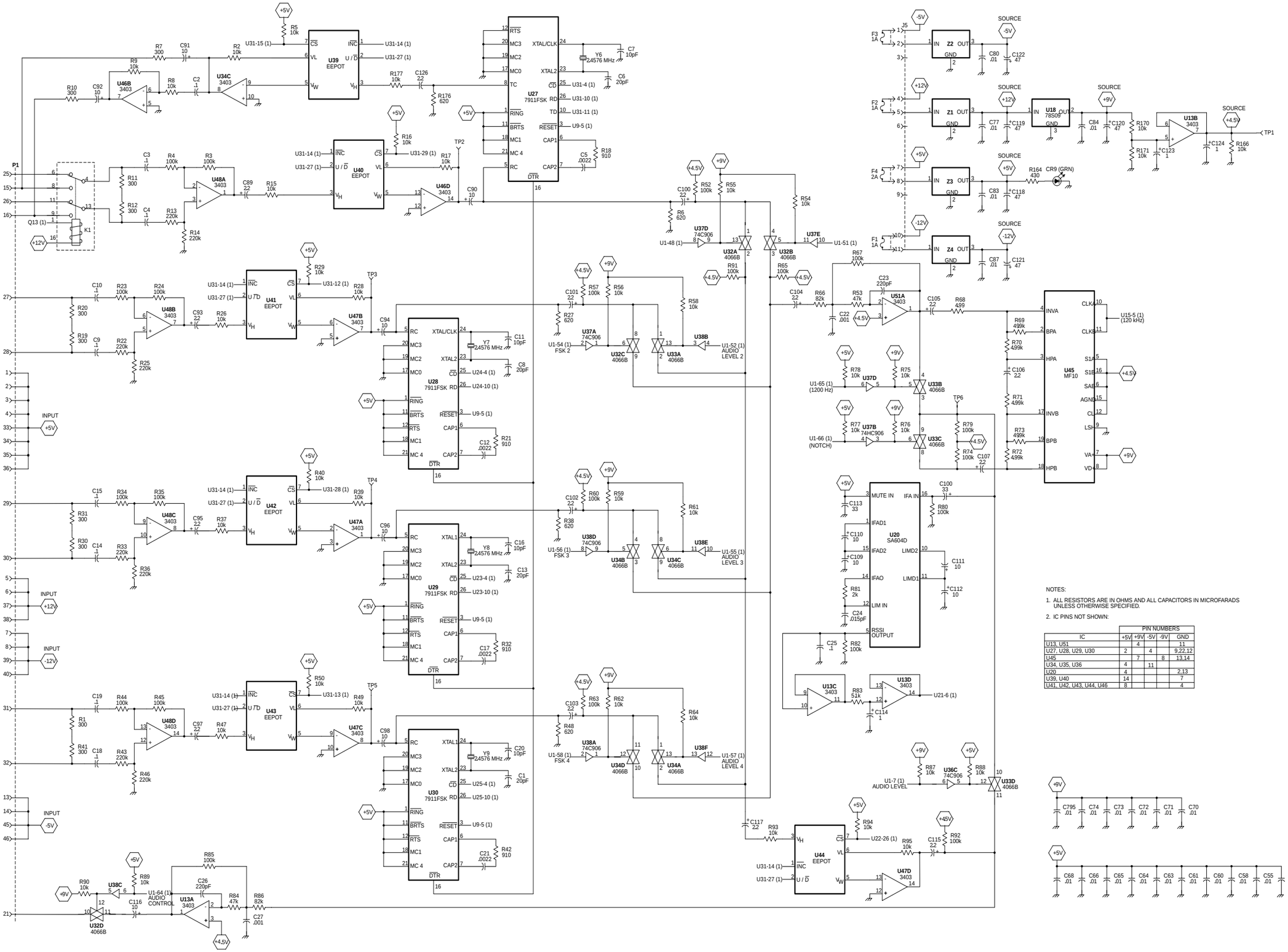
1. ALL RESISTORS ARE IN OHMS AND ALL CAPACITORS IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
2. IC PINS NOT SHOWN:

IC	PIN NUMBERS				
	+5V	+12V	-5V	-12V	GND
U1	50,80				42,77
U2, U3	28				14
U4, U48	24				12
U5, U6	16	1		8	9
U7, U12, U15, U16, U17, U47, U50	14				7
U9	8				4
U10, U11, U48	16				8
U14	4				6
U21	20				8,10
U23, U24, U25, U31	40				20

March 2000
Part No. 001-3139-502

RVM SCHEMATIC (1 OF 2)
FIGURE 6-8

FOLDOUT →



IC	PIN NUMBERS				
	+5V	+9V	-5V	-9V	GND
U13, U51		4			11
U27, U28, U29, U30	2		4		9,22,12
U45		7		8	13,14
U34, U35, U36	4		11		
U20	4				2,13
U39, U40	14				7
U41, U42, U43, U44, U46	8				4

SECTION 7 VOTER DIAGNOSTIC MODULE (VDM)

7.1 DESCRIPTION

The Voter Diagnostics Module (VDM), in the Switch, is the data communication buffer between the SMM and the Voting System. The type of data exchanges between the Voting System and the VDM pertains to: Memory Read of the voters; Receiver Site Enable/Disable; and Alarm/Control Information.

The Voter Diagnostic Module is a Basic Board Module (BBM) with voter software installed that communicates to the receiver voter system. The VDM communicates to the System Management Module via the Intra-Terminal Data Bus (IDB) and to the Receiver Voter Module(s) (RVMs) via the Voter Diagnostic Bus (VDB). Voice communication does not take place on this module.

The VDM passes messages from the SMM receiver to enable and disable sites. The VDM polls the voter shelf for alarms and passes the information to the SMM. See Appendix E.

The VDM communicates with the Voter System at 1200 baud. The VDM polls the Voter System every 2-seconds for data or alarms.

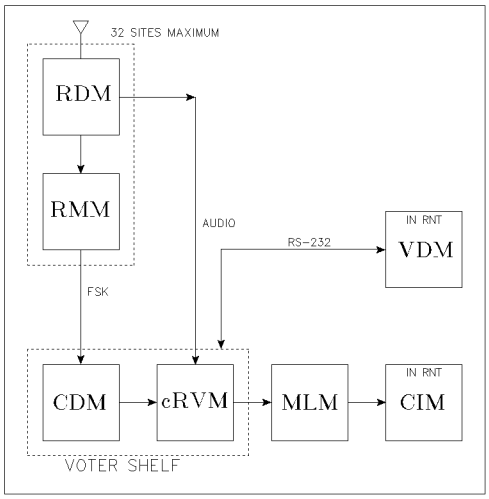


Figure 7-1 VDM BLOCK DIAGRAM

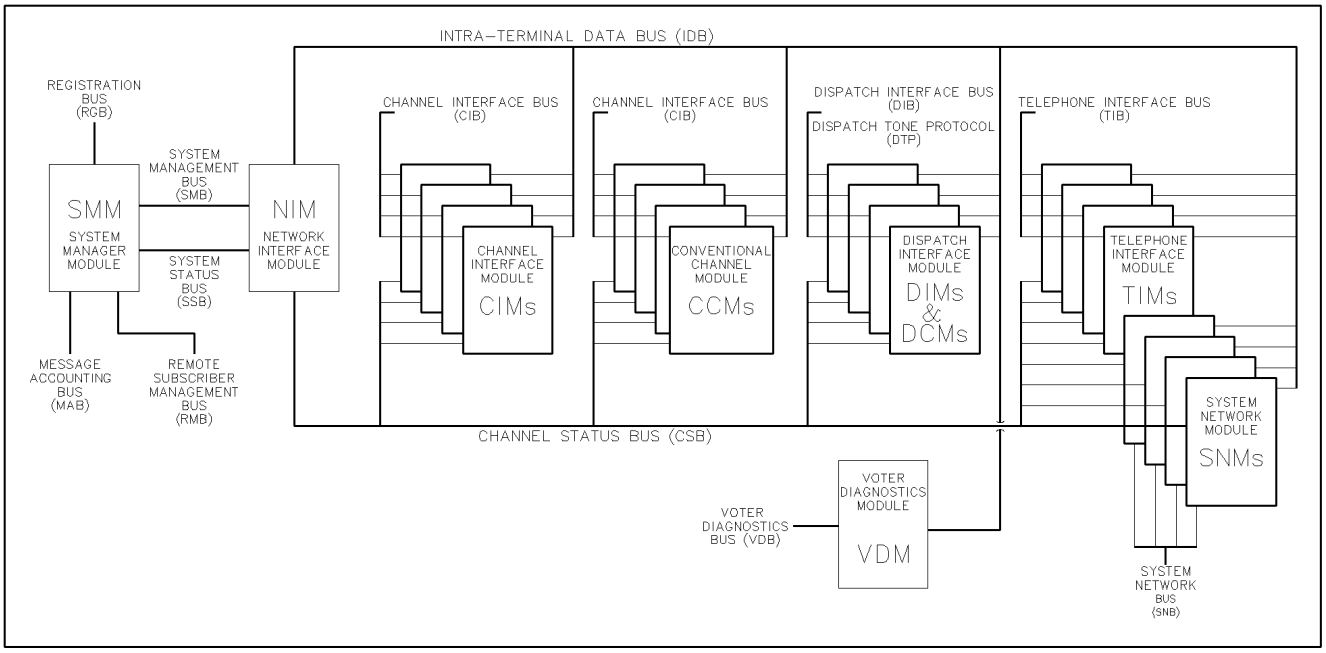


Figure 7-2 DATA BUSSES

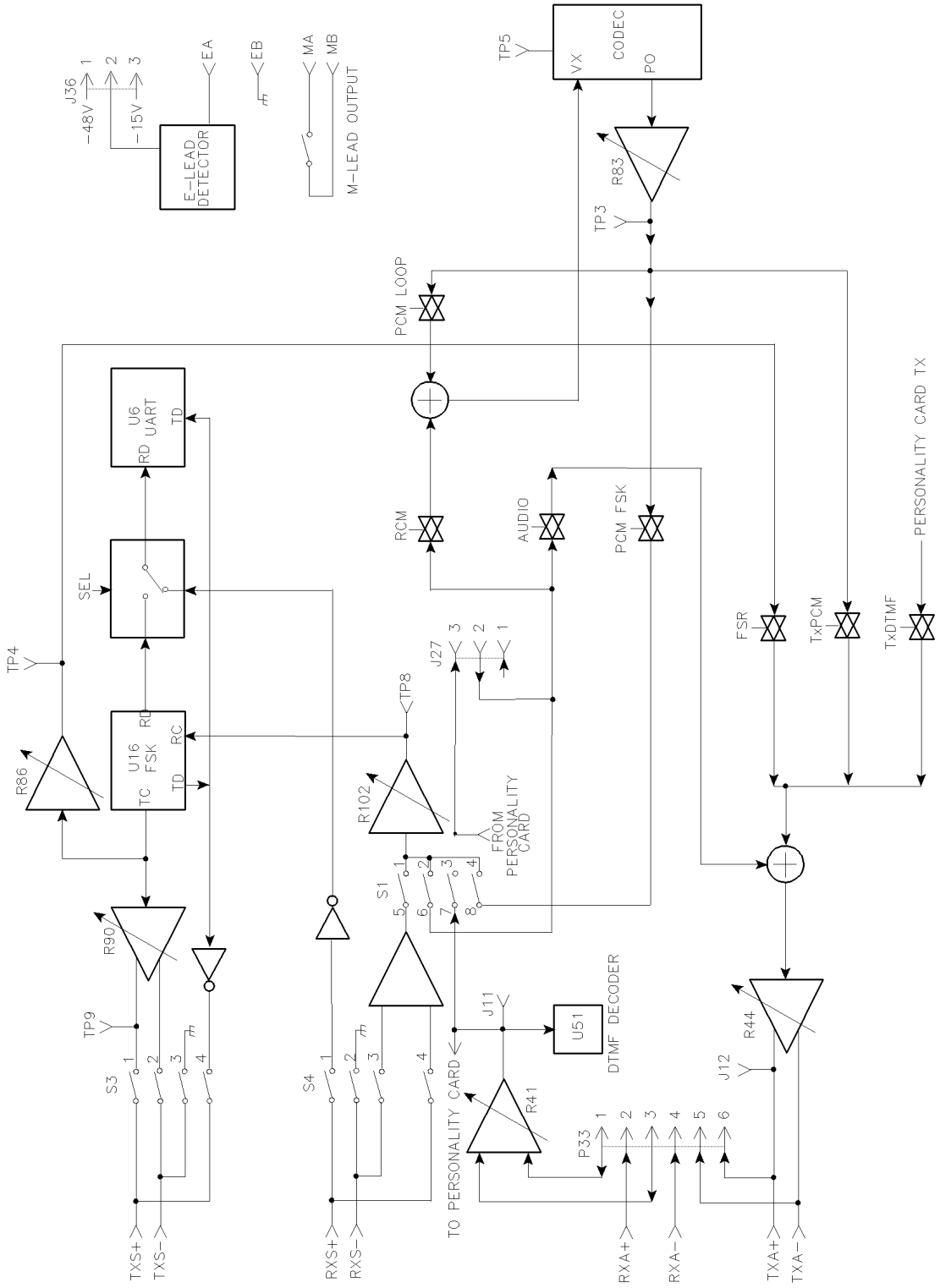


Figure 7-3 VDM BLOCK DIAGRAM

7.2 VDM SETUP PROCEDURE

7.2.1 SWITCH SETTINGS

Refer to the VDM alignment points diagram for the location of these switches (See Figure 7-4).

Table 7-1 VDM SWITCH SETTINGS

Sw	Sec	Description
S1	1 2 3 4	On = AFSK Data Receive Secondary Line Enabled On = AFSK Data Receive Main Audio Input Enabled On = Voice from main board Enabled On = AFSK Data Receive from PCM Enabled
S2		Resets the microprocessor
S3	1 2 3 4	On = AFSK Secondary Transmit Data + Enabled On = AFSK Secondary Transmit Data - Enabled On = Digital Secondary Transmit Data gnd Enabled On = Digital Secondary Transmit Data signal Enabled
S4	1 2 3 4	On = Digital Secondary Receive Data signal Enabled On = Digital Secondary Receive Data ground Enabled On = AFSK Secondary Receive Data + Enabled On = AFSK Secondary Receive Data - Enabled
S5	1 2 3 4	Bit 0 - Alignment Test Switch Bit 1 Bit 2 Bit 3

7.2.2 JUMPER PLACEMENT

Refer to the VDM alignment points diagram for the location of these switches (See Figure 7-4).

Table 7-2 VDM JUMPER PLACEMENT

JU	Pin	Description
J24	1 to 2 2 to 3*	Not Used Normal operation
J27	1 to 2 2 to 3*	Not Used No ALC
P33	1 to 2* 3 to 4* 5 6	No personality card attached No personality card attached open open
J36	1 only* 1 to 2 2 to 3	Not used -48V E-lead operation -15V E-lead operation

Table 7-2 VDM JUMPER PLACEMENT

JU	Pin	Description
J14 J15 J21 J22	Jumper pin 1 to 2 for high impedance ground path for split 600 ohm inputs and outputs. Leave open if no ground path desired.	
* Normal setting.		

7.2.3 VDM BACKPLANE EXTERNAL CONNECTIONS

Refer to Section 7 for pinouts on the shelf backplane and wire harness pinouts.

Table 7-3 BACKPLANE PINOUTS

Backplane P34 to P49	Description	Wire Harness P-Odd J1,3,5,7		
pin 25	Test Tx Data	pin 1		
pin 26	Test Rx Data	pin 2		
pin 27	Sec Rx +	pin 3	RxS+	pin 1
pin 28	Sec Rx -	pin 4	RxS-	pin 2
pin 29	EA lead	pin 5	EA	pin 3
pin 30	EB lead	pin 6	EB	pin 4
pin 31	Main RxA Tip +	pin 7	RxA+	pin 5
pin 32	Main RxA Ring -	pin 8	RxA-	pin 6
		P-Even J2,4,6,8		
pin 57	Alarm	pin 1		
pin 58	Alarm	pin 2		
pin 59	Sec Tx +	pin 3	TxS+	pin 1
pin 60	Sec Tx -	pin 4	TxS-	pin 2
pin 61	MA lead	pin 5	MA	pin 3
pin 62	MB lead	pin 6	MB	pin 4
pin 63	Main TxA +	pin 7	TxA+	pin 5
pin 64	Main TxA -	pin 8	TxA-	pin 6

7.3 ALIGNMENT

Alignment of the Voter Diagnostic Manual is not required because of the RS-232 connection.

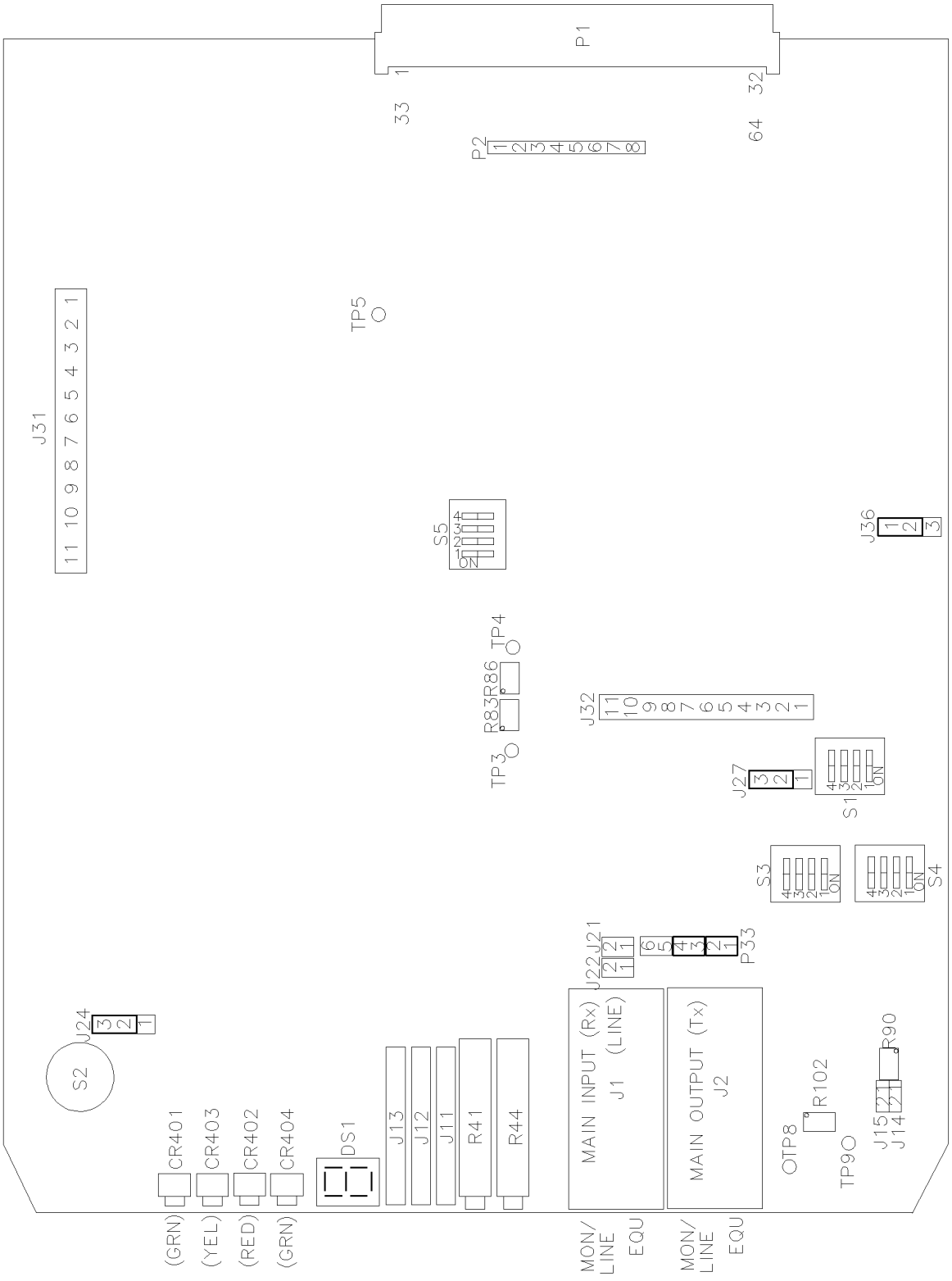


Figure 7-4 VDM ALIGNMENT POINTS DIAGRAM

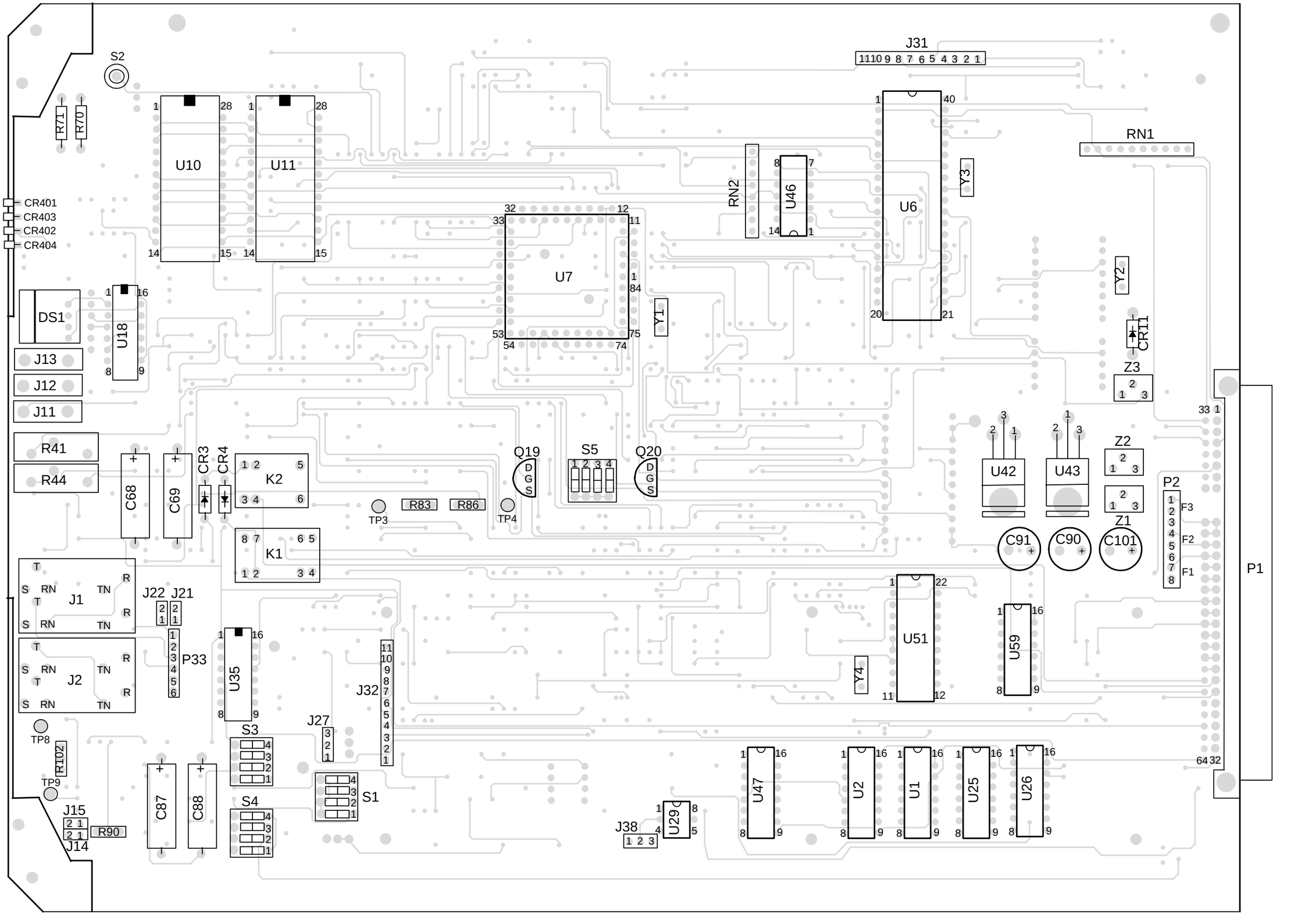
VOTER DIAGNOSTIC MODULE
PART NO. 023-3039-570

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
A 001	Basic board module	023-3039-030
C 001	.01 µF ±10% X7R 50V chip	510-3606-103
C 002	.01 µF ±10% X7R 50V chip	510-3606-103
C 003	.01 µF ±10% X7R 50V chip	510-3606-103
C 004	10 pF ±5% NPO 50V 1206	510-3602-100
C 006	4.7 pF ±5% N470 chip	510-3624-479
C 007	.01 µF ±10% X7R 50V chip	510-3606-103
C 009	.01 µF ±10% X7R 50V chip	510-3606-103
C 010	2.2 µF 20V tantalum chip	510-2626-229
C 011	.1 µF ±10% X7R 50V chip	510-3607-104
C 012	.01 µF ±10% X7R 50V chip	510-3606-103
C 013	.01 µF ±10% X7R 50V chip	510-3606-103
C 014	.01 µF ±10% X7R 50V chip	510-3606-103
C 015	10 pF ±5% NPO 50V 1206	510-3602-100
C 016	.01 µF ±10% X7R 50V chip	510-3606-103
C 017	10 pF ±5% NPO 50V 1206	510-3602-100
C 018	.01 µF ±10% X7R 50V chip	510-3606-103
C 019	.01 µF ±10% X7R 50V chip	510-3606-103
C 020	.01 µF ±10% X7R 50V chip	510-3606-103
C 021	.01 µF ±10% X7R 50V chip	510-3606-103
C 022	.01 µF ±10% X7R 50V chip	510-3606-103
C 023	.01 µF ±10% X7R 50V chip	510-3606-103
C 024	.01 µF ±10% X7R 50V chip	510-3606-103
C 025	.01 µF ±10% X7R 50V chip	510-3606-103
C 026	.01 µF ±10% X7R 50V chip	510-3606-103
C 027	.01 µF ±10% X7R 50V chip	510-3606-103
C 028	.01 µF ±10% X7R 50V chip	510-3606-103
C 030	.01 µF ±10% X7R 50V chip	510-3606-103
C 031	.01 µF ±10% X7R 50V chip	510-3606-103
C 032	.01 µF ±10% X7R 50V chip	510-3606-103
C 033	.01 µF ±10% X7R 50V chip	510-3606-103
C 034	.01 µF ±10% X7R 50V chip	510-3606-103
C 035	.01 µF ±10% X7R 50V chip	510-3606-103
C 036	.01 µF ±10% X7R 50V chip	510-3606-103
C 037	.01 µF ±10% X7R 50V chip	510-3606-103
C 038	.01 µF ±10% X7R 50V chip	510-3606-103
C 041	.01 µF ±10% X7R 50V chip	510-3606-103
C 045	.01 µF ±10% X7R 50V chip	510-3606-103
C 046	.01 µF ±10% X7R 50V chip	510-3606-103
C 047	.01 µF ±10% X7R 50V chip	510-3606-103
C 048	.01 µF ±10% X7R 50V chip	510-3606-103
C 049	.01 µF ±10% X7R 50V chip	510-3606-103
C 051	2.2 µF 20V tantalum chip	510-2626-229
C 058	10 pF ±5% NPO 50V 1206	510-3602-100
C 059	20 pF ±5% NPO 50V 1206	510-3602-200
C 060	.1 µF ±10% X7R 50V chip	510-3607-104
C 061	10 µF 16V tantalum chip	510-2625-100
C 062	.1 µF ±10% X7R 50V chip	510-3607-104
C 063	.1 µF ±10% X7R 50V chip	510-3607-104
C 064	.1 µF ±10% X7R 50V chip	510-3607-104
C 065	10 µF 16V tantalum chip	510-2625-100
C 066	2.2 µF 20V tantalum chip	510-2626-229
C 067	.1 µF ±10% X7R 50V chip	510-3607-104
C 068	10 µF 63V axial low temp	510-4363-100
C 069	10 µF 63V axial low temp	510-4363-100
C 071	2.2 µF 20V tantalum chip	510-2626-229
C 072	2.2 µF 20V tantalum chip	510-2626-229
C 073	2.2 µF 20V tantalum chip	510-2626-229
C 074	2.2 µF 20V tantalum chip	510-2626-229
C 075	2.2 µF 20V tantalum chip	510-2626-229
C 077	2.2 µF 20V tantalum chip	510-2626-229
C 081	.1 µF ±10% X7R 50V chip	510-3607-104
C 082	.1 µF ±10% X7R 50V chip	510-3607-104
C 083	.1 µF ±10% X7R 50V chip	510-3607-104
C 085	.1 µF ±10% X7R 50V chip	510-3607-104
C 086	.1 µF ±10% X7R 50V chip	510-3607-104
C 087	10 µF 63V axial low temp	510-4363-100
C 088	10 µF 63V axial low temp	510-4363-100
C 089	.0022 µF ±10% X7R 50V cer	510-3606-222
C 090	47 µF 25V alum electrolytic	510-4225-470
C 091	47 µF 25V alum electrolytic	510-4225-470
C 092	.01 µF ±10% X7R 50V chip	510-3606-103
C 093	.01 µF ±10% X7R 50V chip	510-3606-103
C 094	.01 µF ±10% X7R 50V chip	510-3606-103
C 095	10 µF 16V tantalum chip	510-2625-100
C 096	10 µF 16V tantalum chip	510-2625-100
C 097	10 µF 16V tantalum chip	510-2625-100
C 098	.01 µF ±10% X7R 50V chip	510-3606-103
C 099	.01 µF ±10% X7R 50V chip	510-3606-103
C 100	.01 µF ±10% X7R 50V chip	510-3606-103
C 101	47 µF 25V alum electrolytic	510-4225-470
C 102	2.2 µF 20V tantalum chip	510-2626-229
C 103	2.2 µF 20V tantalum chip	510-2626-229
C 110	.01 µF ±10% X7R 50V chip	510-3606-103
C 111	2.2 µF 20V tantalum chip	510-2626-229
C 112	2.2 µF 20V tantalum chip	510-2626-229
C 113	2.2 µF 20V tantalum chip	510-2626-229
C 200	.0039 µF ±5% X7R 1206	510-3609-392
C 201	.022 µF ±10% X7R chip	510-3609-223

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
CR003	Si diode 1N4448	523-1500-883
CR004	Si diode 1N4448	523-1500-883
CR011	6.2V ±5% 1W zener	523-2503-629
CR401	LED green	549-4001-122
CR402	LED red	549-4001-120
CR403	LED yellow	549-4001-121
CR404	LED green	549-4001-122
DS001	7-segment display green	549-4002-020
EP001	Crystal pin insulator	018-1080-001
EP002	Crystal pin insulator	018-1080-001
EP003	Insulator, TO-220	018-1132-007
F 001	1A hirel pigtail	534-0014-100
F 002	.5A hirel pigtail	534-0014-050
F 003	2A hirel pigtail	534-0014-200
HW001	NUT 2-56 X .063 NPB	560-2102-006
HW002	Lockwasher int 2 x .013 NPB	596-2102-006
HW003	Screw 2-56 panhead phil NPB	575-2602-014
HW004	Inject-extract nylon handle	537-9057-020
HW005	Nut 4-40 x .094 NPB	560-2104-008
HW006	4-40 mach panhead ZPS phil	575-1604-008
HW011	Dual phone jack cover	515-2008-003
HW012	Dual phone jack cover	515-2008-003
J 001	Dual phone jack .178 ID	515-2008-002
J 002	Dual phone jack .178 ID	515-2008-002
J 011	Horz tip jack .080	105-2208-101
J 012	Horz tip jack .080	105-2208-101
J 014	2-pin single inline header	515-7100-002
J 015	2-pin single inline header	515-7100-002
J 021	2-pin single inline header	515-7100-002
J 022	2-pin single inline header	515-7100-002
J 024	3-pin single inline header	515-7100-003
J 027	3-pin single inline header	515-7100-003
J 031	11-pos receptacle SIP	515-5012-011
J 032	11-pos single row receptacle	515-7110-211
J 036	3-pin single inline header	515-7100-003
K 001	SPDT 12V reed PC mount	567-2002-021
K 002	SPDT 12V reed PC mount	567-0024-001
P 001	64-pin DIN male right angle	515-7082-101
P 002	8-pin single row receptacle	515-7110-208
P 014	Shorting socket	515-5010-001
P 015	Shorting socket	515-5010-001
P 021	Shorting socket	515-5010-001
P 022	Shorting socket	515-5010-001
P 024	Shorting socket	515-5010-001
P 027	Shorting socket	515-5010-001
P 033	8-pin single row receptacle	515-9031-476
P 034	Shorting socket	515-5010-001
P 035	Shorting socket	515-5010-001
P 036	Shorting socket	515-5010-001
Q 001	Si NPN SOT-23	576-0003-658
Q 002	Si NPN SOT-23	576-0003-658
Q 006	Si NPN SOT-23	576-0003-658
Q 007	Si NPN SOT-23	576-0003-658
Q 011	Si NPN SOT-23	576-0003-658
Q 012	Si NPN SOT-23	576-0003-658
Q 014	Si NPN SOT-23	576-0003-658
Q 015	Si NPN SOT-23	576-0003-658
Q 016	Si NPN SOT-23	576-0003-658
Q 017	Si NPN SOT-23	576-0003-658
Q 018	Si NPN SOT-23	576-0003-658
Q 019	P-chnl E-MOSFET TO-92	576-0006-109
Q 020	P-chnl E-MOSFET TO-92	576-0006-109
R 001	10k ohm ±5% 1/8W chip	569-0115-103
R 004	10k ohm ±5% 1/8W chip	569-0115-103
R 005	140 ohm ±1% chip	569-0111-215
R 006	10k ohm ±5% 1/8W chip	569-0115-103
R 008	10k ohm ±5% 1/8W chip	569-0115-103
R 010	10k ohm ±5% 1/8W chip	569-0115-103
R 011	140 ohm ±5% 1/8W chip	569-0115-103
R 012	10k ohm ±5% 1/8W chip	569-0115-103
R 014	10k ohm ±5% 1/8W chip	569-0115-103
R 019	10k ohm ±5% 1/8W chip	569-0115-103
R 021	10k ohm ±5% 1/8W chip	569-0115-103
R 022	10k ohm ±5% 1/8W chip	569-0115-103
R 023	10k ohm ±5% 1/8W chip	569-0115-103
R 027	10k ohm ±5% 1/8W chip	569-0115-103
R 028	10k ohm ±5% 1/8W chip	569-0115-103
R 029	10k ohm ±5% 1/8W chip	569-0115-103
R 031	10k ohm ±5% 1/8W chip	569-0115-103
R 032	10k ohm ±5% 1/8W chip	569-0115-103
R 033	10k ohm ±5% 1/8W chip	569-0115-103
R 036	100k ohm ±5% 1/8W chip	569-0115-104
R 037	100k ohm ±5% 1/8W chip	569-0115-104
R 038	220k ohm ±5% 1/8W chip	569-0115-224
R 039	220k ohm ±5% 1/8W chip	569-0115-224

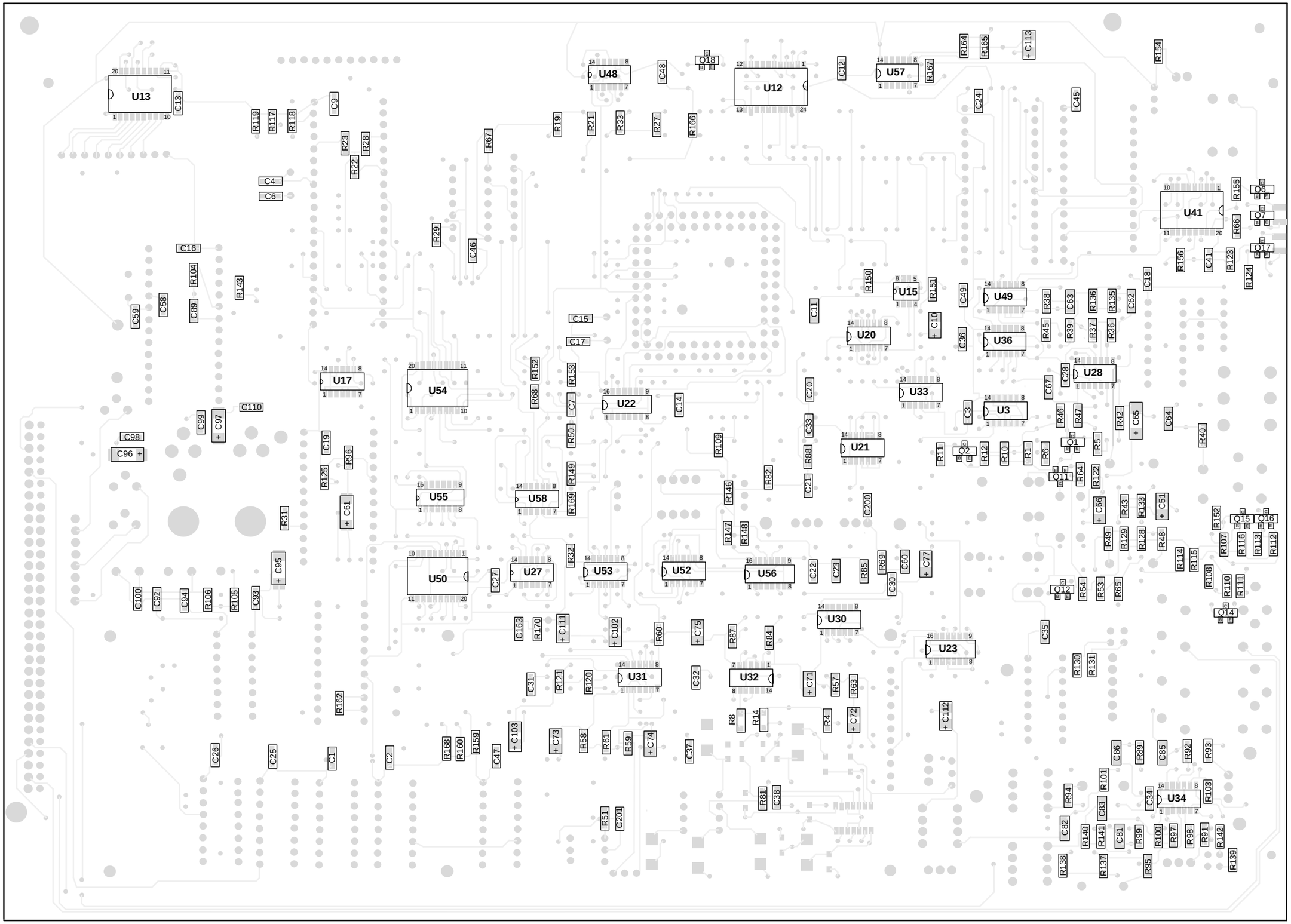
SYMBOL NUMBER	DESCRIPTION	PART NUMBER
R 040	3.3k ohm ±5% 1/8W chip	569-0115-332
R 041	100k ohm ±5% 1/8W chip	569-0115-104
R 042	3.3k ohm ±5% 1/8W chip	569-0115-332
R 043	3.3k ohm ±5% 1/8W chip	569-0115-332
R 044	100k ohm 20 turn trim pot	562-0108-104
R 045	10k ohm ±5% 1/8W chip	569-0115-103
R 046	10k ohm ±5% 1/8W chip	569-0115-103
R 047	3.3k ohm ±5% 1/8W chip	569-0115-332
R 048	300 ohm ±5% 1/8W chip	569-0115-301
R 049	300 ohm ±5% 1/8W chip	569-0115-301
R 050	620 ohm ±5% 1/8W chip	569-0115-621
R 051	1k ohm ±5% 1/8W chip	569-0115-102
R 053	4.7k ohm ±5% 1/8W chip	569-0115-472
R 054	4.7k ohm ±5% 1/8W chip	569-0115-472
R 057	100k ohm ±5% 1/8W chip	569-0115-104
R 058	100k ohm ±5% 1/8W chip	569-0115-104
R 059	100k ohm ±5% 1/8W chip	569-0115-104
R 060	100k ohm ±5% 1/8W chip	569-0115-104
R 061	100k ohm ±5% 1/8W chip	569-0115-104
R 063	100k ohm ±5% 1/8W chip	569-0115-104
R 064	100k ohm ±5% 1/8W chip	569-0115-104
R 065	4.7k ohm ±5% 1/8W chip	569-0115-472
R 066	10k ohm ±5% 1/8W chip	569-0115-103
R 067	10k ohm ±5% 1/8W chip	569-0115-103
R 068	10k ohm ±5% 1/8W chip	569-0115-103
R 069	10k ohm ±5% 1/8W chip	569-0115-103
R 070	1.5k ohm ±5% 1/8W chip	569-0115-152
R 071	1.5k ohm ±5% 1/8W chip	569-0115-152
R 081	10k ohm ±5% 1/8W chip	569-0115-103
R 082	10k ohm ±5% 1/8W chip	569-0115-103
R 083	100k ohm ±5% 1/8W chip	569-0115-104
R 084	10k ohm ±5% 1/8W chip	569-0115-103
R 085	10k ohm ±5% 1/8W chip	569-0115-103
R 086	100k ohm trim pot	562=0110-104
R 087	1k ohm ±5% 1/8W chip	569-0115-102
R 088	10k ohm ±5% 1/8W chip	569-0115-103
R 089	10k ohm ±5% 1/8W chip	569-0115-103
R 090	100k ohm ±5% 1/8W chip	569-0115-104
R 091	10k ohm ±5% 1/8W chip	569-0115-103
R 092	10k ohm ±5% 1/8W chip	569-0115-103
R 093	10k ohm ±5% 1/8W chip	569-0115-103
R 094	300 ohm ±5% 1/8W chip	569-0115-301
R 095	300 ohm ±5% 1/8W chip	569-0115-301
R 096	22k ohm ±5% 1/8W chip	569-0115-223
R 097	220k ohm ±5% 1/8W chip	569-0115-224
R 098	100k ohm ±5% 1/8W chip	569-0115-104
R 099	220k ohm ±5% 1/8W chip	569-0115-224
R 100	100k ohm ±5% 1/8W chip	569-0115-104
R 101	10k ohm ±5% 1/8W chip	569-0115-103
R 102	100k ohm trim pot	562-0110-104
R 103	10k ohm ±5% 1/8W chip	569-0115-103
R 104	100 ohm ±5% 1/8W chip	569-0115-101
R 105	1k ohm ±5% 1/8W chip	569-0115-102
R 106	1k ohm ±5% 1/8W chip	569-0115-102
R 107	10k ohm ±5% 1/8W chip	569-0115-103
R 108	10k ohm ±5% 1/8W chip	569-0115-103
R 109	10k ohm ±5% 1/8W chip	569-0115-103
R 110	1k ohm ±5% 1/8W chip	569-0115-102
R 111	10k ohm ±5% 1/8W chip	569-0115-103
R 112	47k ohm ±5% 1/8W chip	569-0115-473
R 113	47k ohm ±5% 1/8W chip	569-0115-473
R 114	910 ohm ±5% 1/8W chip	569-0115-911
R 115	1k ohm ±5% 1/8W chip	569-0115-102
R 116	47k ohm ±5% 1/8W chip	569-0115-473
R 117	22k ohm ±5% 1/8W chip	569-0115-223
R 118	22k ohm ±5% 1/8W chip	569-0115-223
R 119	22k ohm ±5% 1/8W chip	569-0115-223
R 120	100k ohm ±5% 1/8W chip	569-0115-104
R 121	100k ohm ±5% 1/8W chip	569-0115-104
R 122	10k ohm ±5% 1/8W chip	569-0115-103
R 123	10k ohm ±5% 1/8W chip	569-0115-103
R 124	430 ohm ±5% 1/8W chip	569-0115-431
R 125	2.2k ohm ±5% 1/8W chip	569-0115-222
R 128	100k ohm ±5% 1/8W chip	569-0115-104
R 129	100k ohm ±5% 1/8W chip	569-0115-104
R 130	100k ohm ±5% 1/8W chip	569-0115-104
R 131	Zero ohm ±5% 1/8W chip	569-0115-001
R 133	3.3k ohm ±5% 1/8W chip	569-0115-332
R 135	300 ohm ±5% 1/8W chip	569-0115-301
R 136	300 ohm ±5% 1/8W chip	569-0115-301
R 137	100k ohm ±5% 1/8W chip	569-0115-104
R 138	100k ohm ±5% 1/8W chip	569-0115-104
R 139	Zero ohm ±5% 1/8W chip	569-0115-001
R 140	300 ohm ±5% 1/8W chip	569-0115-301
R 141	300 ohm ±5% 1/8W chip	569-0115-301
R 142	100k ohm ±5% 1/8W chip	569-0115-104
R 143	620 ohm ±5% 1/8W chip	569-0115-621
R 146	22k ohm ±5% 1/8W chip	569-0115-223
R 147	22k ohm ±5% 1/8W chip	569-0115-223
R 148	22k ohm ±5% 1/8W chip	569-0115-223
R 149	22k ohm ±5% 1/8W chip	569-0115-223
R 150	10k ohm ±5% 1/8W chip	569-0115-103
R 151	10k ohm ±5% 1/8W chip	569-0115-103
R 152	10k ohm ±5% 1/8W chip	569-0115-103

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
R 153	10k ohm ±5% 1/8W chip	569-0115-103
R 154	10k ohm ±5% 1/8W chip	569-0115-103
R 155	10k ohm ±5% 1/8W chip	569-0115-103
R 156	10k ohm ±5% 1/8W chip	569-0115-103
R 157	10k ohm ±5% 1/8W chip	569-0115-103
R 159	10k ohm ±5% 1/8W chip	569-0115-103
R 160	10k ohm ±5% 1/8W chip	569-0115-103
R 162	10M ohm ±5% 1/8W chip	569-0115-106
R 163	620 ohm ±5% 1/8W chip	569-0115-621
R 164	100k ohm ±5% 1/8W chip	569-0115-104
R 165	100k ohm ±5% 1/8W chip	569-0115-104
R 166	10k ohm ±5% 1/8W chip	569-0115-103
R 167	10k ohm ±5% 1/8W chip	569-0115-103
R 168	10k ohm ±5% 1/8W chip	569-0115-103
R 169	10k ohm ±5% 1/8W chip	569-0115-103
RN001	22K ohm 9-res 10-pin SIP	569-6000-009
RN002	10k ohm 7-res 8-pin SIP	569-6000-014
S 001	4-pos DIP switch recessed	583-5002-104
S 002	Momentary SPST	583-4005-002
S 003	4-pos DIP switch recessed	583-5002-104
S 004	4-pos DIP switch recessed	583-5002-104
S 005	4-pos DIP switch recessed	583-5002-104
TP003	Orange tip jack vert .080	105-2206-201
TP004	Yellow tip jack vert .080	105-2207-201
TP005	Green tip jack vert .080	105-2204-201
TP006	Blue tip jack vert .080	105-2210-102
TP008	Gray tip jack vert .080	105-2213-201
TP009	White tip jack vert .080	105-2201-201
U 001	Triple line receiver 55122	544-2023-003
U 002	Dual line driver 55121	544-2023-002
U 003	Hex inverter SOIC 74HC04	544-3766-004
U 006	Dual asynch Rx-Tx 40-DIP	544-5001-326
U 007	16-bit CMOS CPU ROMless	544-5002-016
U 010	MNET voter cont PROM	023-9998-204
U 011	8kx8 CMOS static RAM	544-5001-109
U 012	1 of 16 demux SOIC 74HC154	544-3766-154
U 013	Transparent latch 74HC573	544-3766-573
U 015	µP power reset 5V SO-8	544-2012-001
U 016	FSK modem DIP 7911	544-3988-004
U 017	Quad 2-in OR 74HC32	544-3766-032
U 018	BCD-7 latch MC144951	544-3014-495
U 019	CODEC CMOS 29C14PCM	544-2035-001
U 020	Quad 2-in AND 74HC08	544-3766-008
U 021	Quad 2-in NAND 74HC00	544-3766-000
U 022	Preset counter SOIC 74HC163	544-3766-163
U 023	Preset counter SOIC 74HC163	544-3766-163
U 025	Dual line driver 55121	544-2023-002
U 026	Triple line receiver 55122	544-2023-003
U 027	Bilateral switch SOIC 4066B	544-3016-066
U 028	Quad op amp SOIC 3403	544-2020-008
U 029	Opto isol NPN out 4N35	544-2010-001
U 030	Bilateral switch SOIC 4066B	544-3016-066
U 031	Bilateral switch SOIC 4066B	544-3016-066
U 032	Quad op amp SOIC 3403	544-2020-008
U 033	Bilateral switch SOIC 4066B	544-3016-066
U 034	Quad op amp SOIC 3403	544-2020-008
U 035	RS232C/V.28 driver/receiver	544-2020-008
U 036	Hex inverter SOIC 74HC04	544-3766-004
U 041	D flip-flop SOIC 74HC574	544-3766-674
U 042	+9V reg TO-220 78SO9	544-2003-059
U 043	-5V regulator 320T-5	544-2003-034
U 046	Hex buffer 74C906	544-3714-906
U 047	Dual line driver 55121	544-2023-002
U 048	Quad 2-in OR 74HC32	544-3766-032
U 049	Quad 2-in OR 74HC32	544-3766-032
U 050	Transparent latch 74HC573	544-3766-573
U 051	DTMF xcvr call prog detector	544-4005-005
U 052	Quad 2-in AND 74HC08	544-3766-008
U 053	Hex inverter SOIC 74HC04	544-3766-004
U 054	D flip-flop SOIC 74HC574	544-3766-574
U 055	Preset counter SOIC 74HC163	544-3766-163
U 056	Preset counter SOIC 74HC163	544-3766-163
U 057	Bilateral switch SOIC 4066B	544-3016-066
U 058	Quad 2-in OR 74HC32	544-3766-032
U 059	Triple line receiver 55122	544-2023-003
X 001	84-pos PLCC socket	515-5020-100
X 002	10-pos right angle IC socket	515-5008-270
X 006	40-pin IC socket	515-5008-019
X 010	28-pin IC socket	515-5008-018
X 016	28-pin IC socket	515-5008-018
X 019	24-pin IC socket	515-5008-017
Y 001	10 MHz crystal HC-18U	521-0010-000
Y 002	2.4576 MHz HC-18U	521-0002-458
Y 003	3.686 MHz crystal HC-18U	521-0003-686
Y 004	3.5795 MHz crystal	521-0003-579
Z 001	EMI suppression filter	532-3003-002
Z 002	EMI suppression filter	532-3003-002
Z 003	EMI suppression filter	532-3003-002

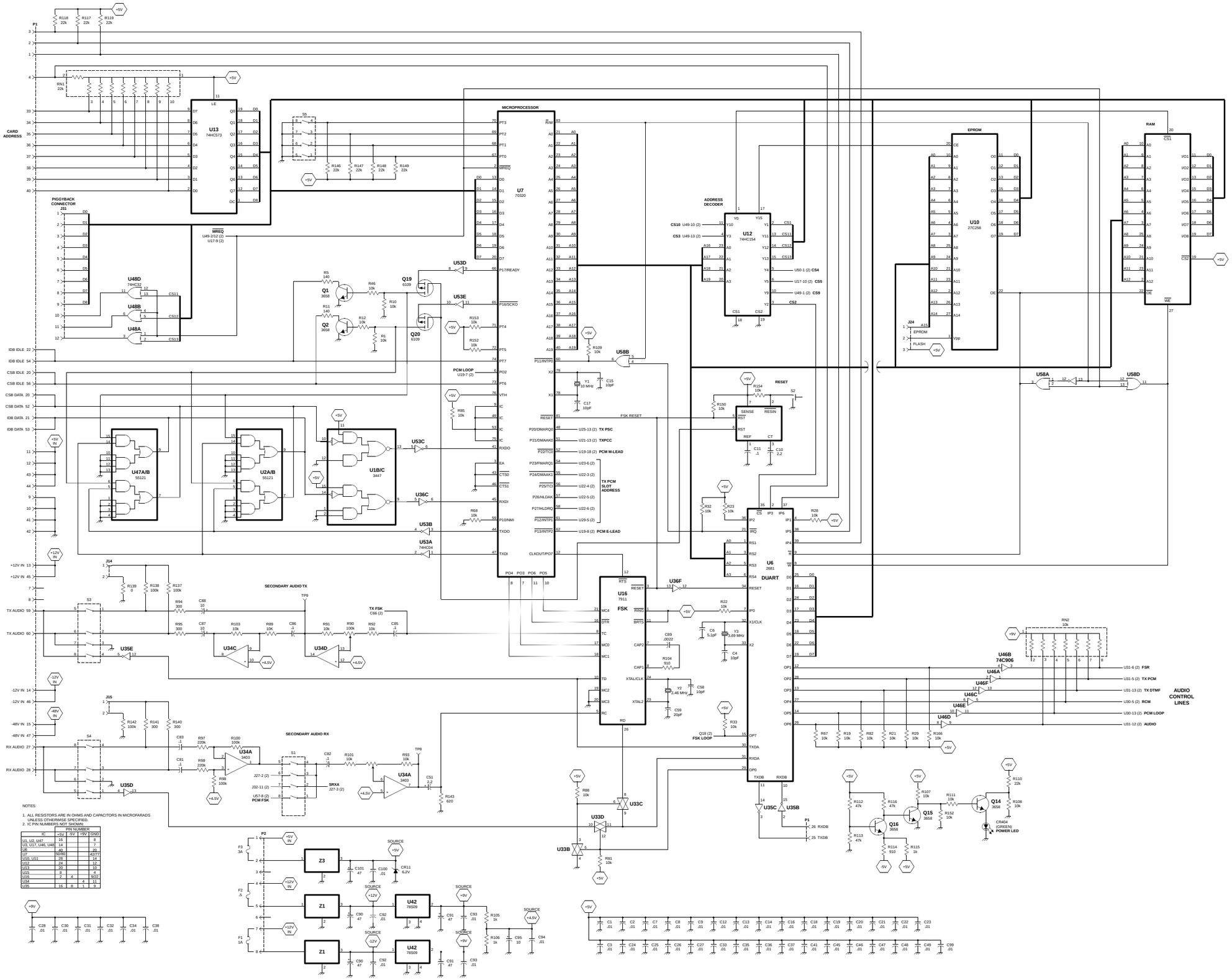


March 2000
Part No. 001-3139-502

VDM COMPONENT LAYOUT (COMPONENT SIDE) FOLDOUT
FIGURE 7-5

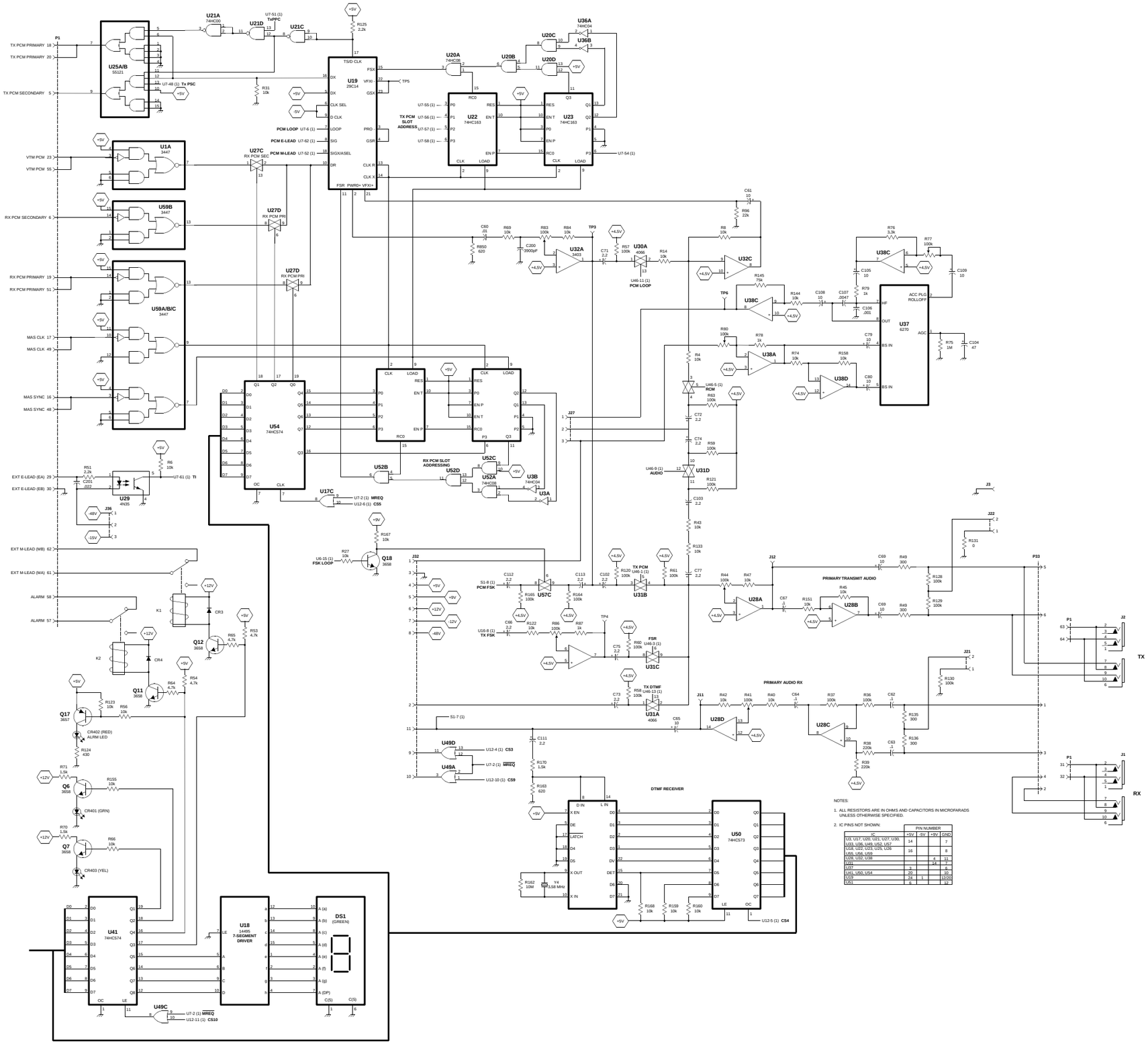


VDM COMPONENT LAYOUT (OPP COMPONENT SIDE)
FIGURE 7-6



VDM SCHEMATIC (1 OF 2)
FIGURE 7-7

FOLDOUT →



March 2000
Part No. 001-3139-502

VDM SCHEMATIC (2 OF 2)
FIGURE 7-8
7-12

SECTION 8 BACKPLANE

8.1 DESCRIPTION

The Multi-Net Voter shelf backplane contains slots for RVMs and CDMs. The slot defines the module's address. The backplane provides for cRVM to RVM Bus loading and distributes:

1. Power.

2. Voter Diagnostics Bus.

3. cRVM to RVM Bus.

4. cRVM and RVM Received Audio.

The backplane has active circuitry that distributes the Voter Diagnostics Bus. The Voter shelves can be linked together by connecting a cable from J1 of one shelf to J2 of the next shelf.

8.2 VDM BUS LOADING

The VDM bus needs to be loaded at 75 ohms. A resistor is added to each shelf to provide a 75 ohm load. Therefore, the number of shelves times 75 ohms equals the value of the resistor that must be installed in each shelf at location R14.

8.3 SWITCH SETTINGS

S1 through S13

Section 1
On = cRVM/RVM common audio enabled.
Section 2
On = cRVM to RVM bus connection enabled.
Section 3
On = Load resistor for cRVM to RVM bus* enabled.
Section 4
Not Used.

**NOTE: Only one load resistor is switched in when there is an RVM(s) connected to a cRVM. Refer to RVM Section 5.*

8.4 POWER CONNECTIONS

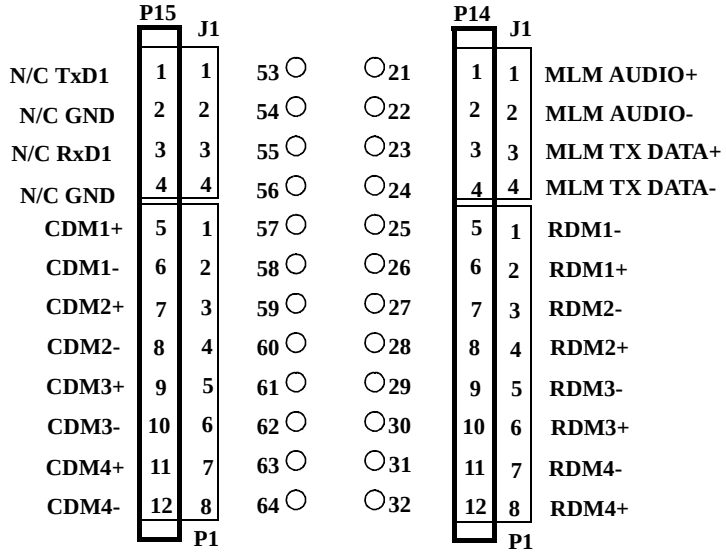
Table 8-1 POWER CONNECTIONS

WIRE NO.	GAUGE	COLOR	DESCRIPTION
W100	12	Red	+5V
W101	12	Red	+5V
W102	18	Blue	+12V
W103	18	White	-12V
W104	12	Blue	Ground
W105	12	Blue	Ground
W106	18	Green	-5V

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
	VOTER SHELF BACKPLANE PART NO. 023-3039-550	
A 001	Backplane	023-3039-551
A 002	19" 13 card rack	585-0918-012
A 003	Voter shelf wiring kit	023-3039-552
A 004	Card rack mounting strip 19"	585-3039-013
EP001	Plug contact .093 dia PC	515-9030-013
HW001	4-40 mach panhead ZPS phil	575-1604-012
HW001	Hardware kit baillock PC mt	537-9055-007
HW002	Hardware kit baillock PC mt	537-9055-007
HW003	0.345 panel fastener	537-0011-030
J 001	4-pos connector receptacle	515-9031-258
J 001	14-pin ribbon cont rcpt str PC	515-7141-101
J 002	14-pin ribbon cont rcpt str PC	515-7141-101
MP002	Voter card rack number panel	014-0783-099
P 001	DIN 64-pin female straight	515-7082-201
P 002	DIN 64-pin female straight	515-7082-201
P 003	DIN 64-pin female straight	515-7082-201
P 004	DIN 64-pin female straight	515-7082-201
P 005	DIN 64-pin female straight	515-7082-201
P 006	DIN 64-pin female straight	515-7082-201
P 007	DIN 64-pin female straight	515-7082-201
P 008	DIN 64-pin female straight	515-7082-201
P 009	DIN 64-pin female straight	515-7082-201
P 010	DIN 64-pin female straight	515-7082-201
P 011	DIN 64-pin female straight	515-7082-201
P 012	DIN 64-pin female straight	515-7082-201
P 013	DIN 64-pin female straight	515-7082-201
P 014	12-pin locking header	515-9031-211
P 015	12-pin locking header	515-9031-211
P 016	12-pin locking header	515-9031-211
P 017	12-pin locking header	515-9031-211
P 018	12-pin locking header	515-9031-211
P 019	12-pin locking header	515-9031-211
P 020	12-pin locking header	515-9031-211
P 021	12-pin locking header	515-9031-211
P 022	12-pin locking header	515-9031-211
P 023	12-pin locking header	515-9031-211
P 024	12-pin locking header	515-9031-211
P 025	12-pin locking header	515-9031-211
P 026	12-pin locking header	515-9031-211
P 027	12-pin locking header	515-9031-211
P 028	12-pin locking header	515-9031-211
P 029	12-pin locking header	515-9031-211
P 030	12-pin locking header	515-9031-211
P 031	12-pin locking header	515-9031-211
P 032	12-pin locking header	515-9031-211
P 033	12-pin locking header	515-9031-211
P 034	12-pin locking header	515-9031-211
P 035	12-pin locking header	515-9031-211
P 036	12-pin locking header	515-9031-211
P 037	12-pin locking header	515-9031-211
P 038	12-pin locking header	515-9031-211
P 039	12-pin locking header	515-9031-211
P 040	4-pin friction lock header	515-9031-203
PC001	PCB Multi-Net voter shelf	035-3039-550
R 001	75 ohm ±5% 1/4W CF	569-0513-750
R 002	75 ohm ±5% 1/4W CF	569-0513-750
R 003	75 ohm ±5% 1/4W CF	569-0513-750
R 004	75 ohm ±5% 1/4W CF	569-0513-750
R 005	75 ohm ±5% 1/4W CF	569-0513-750
R 006	75 ohm ±5% 1/4W CF	569-0513-750
R 007	75 ohm ±5% 1/4W CF	569-0513-750
R 008	75 ohm ±5% 1/4W CF	569-0513-750
R 009	75 ohm ±5% 1/4W CF	569-0513-750
R 010	75 ohm ±5% 1/4W CF	569-0513-750
R 011	75 ohm ±5% 1/4W CF	569-0513-750
R 012	75 ohm ±5% 1/4W CF	569-0513-750
R 013	75 ohm ±5% 1/4W CF	569-0513-750
R 014	75 ohm ±5% 1/4W CF	569-0513-750
S 001	DIP switch 4PST	583-5002-004
S 002	DIP switch 4PST	583-5002-004
S 003	DIP switch 4PST	583-5002-004
S 004	DIP switch 4PST	583-5002-004
S 005	DIP switch 4PST	583-5002-004
S 006	DIP switch 4PST	583-5002-004
S 007	DIP switch 4PST	583-5002-004
S 008	DIP switch 4PST	583-5002-004
S 009	DIP switch 4PST	583-5002-004
S 010	DIP switch 4PST	583-5002-004
S 011	DIP switch 4PST	583-5002-004
S 012	DIP switch 4PST	583-5002-004
S 013	DIP switch 4PST	583-5002-004

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
U 001	Dual line driver 55121	544-2023-002
U 002	Triple line receiver MC3447	544-2023-003
U 003	Driver/Receiver RS-232C/V	544-2023-014
U 004	Hex inverter 74HC04	544-3764-004
X 001	16-pin IC socket	515-5008-013
X 002	16-pin IC socket	515-5008-013
X 003	16-pin IC socket	515-5008-013
X 004	14-pin IC socket	515-5008-012
	VOTER SHELF WIRING KIT PART NO. 023-3039-552	
J 001	Conn RCPT IDC #24 4-pos	515-9031-258
P 001	8-pin connector housing	515-9031-262

RVM



CDM

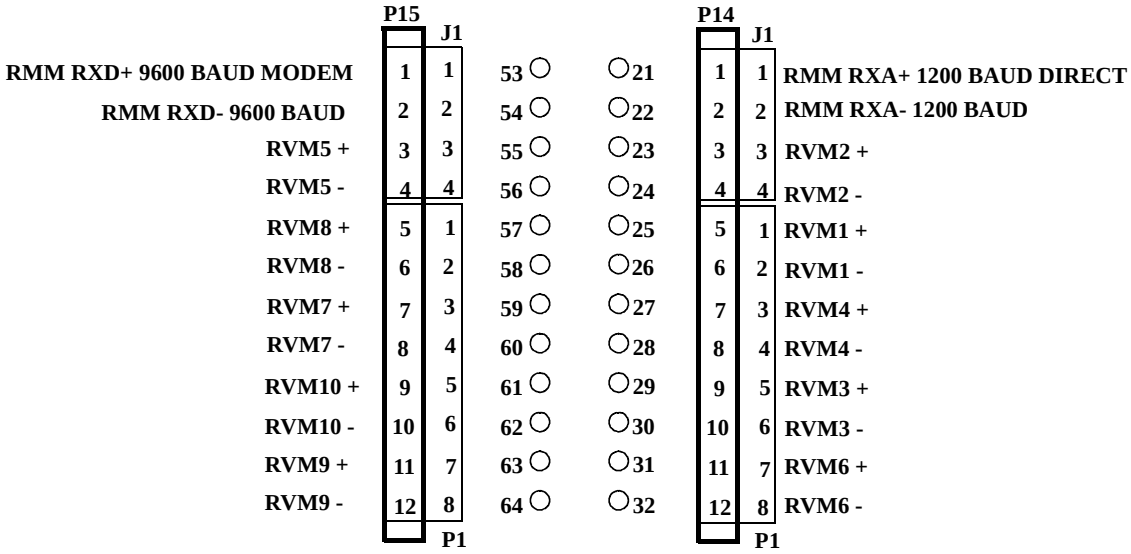
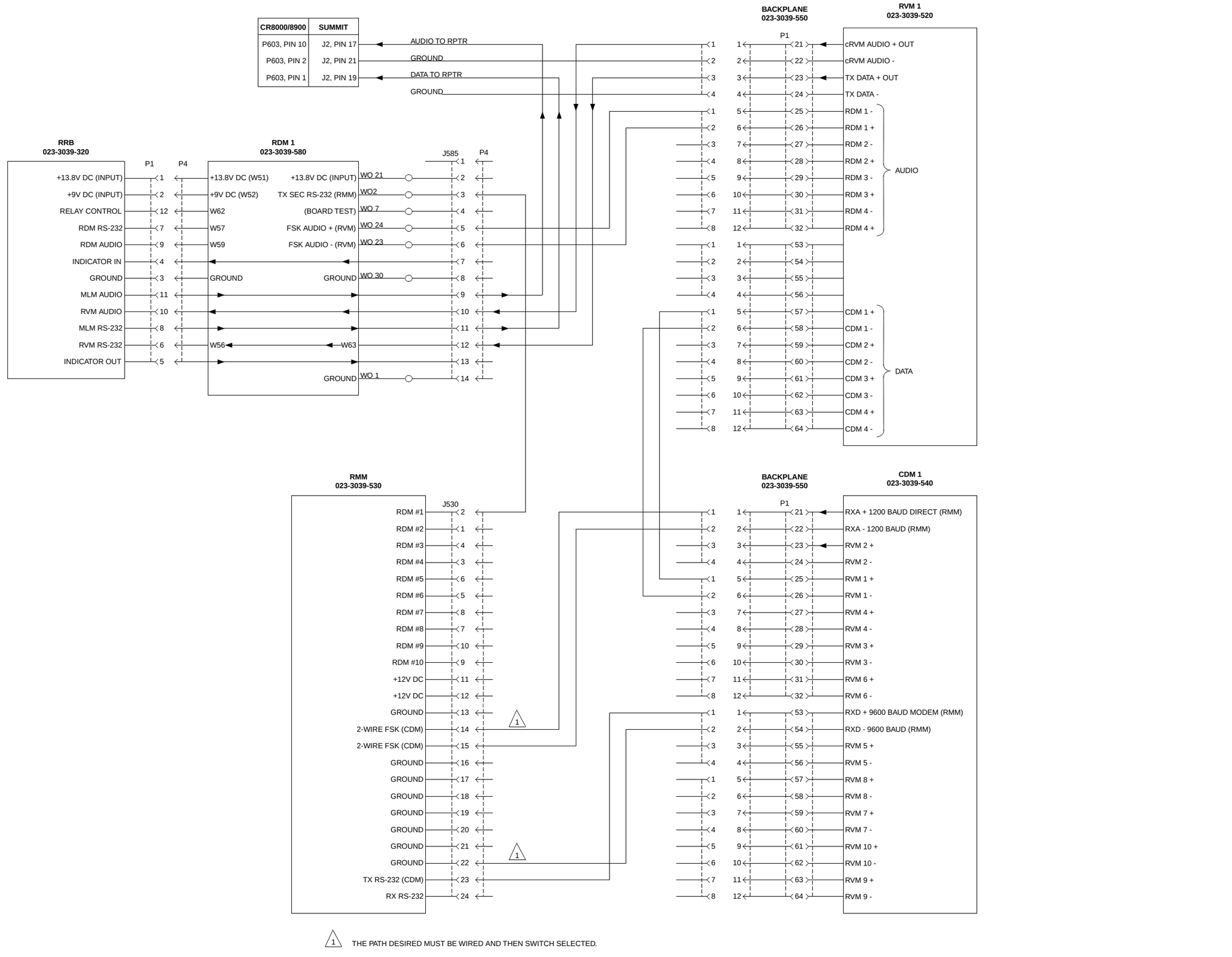


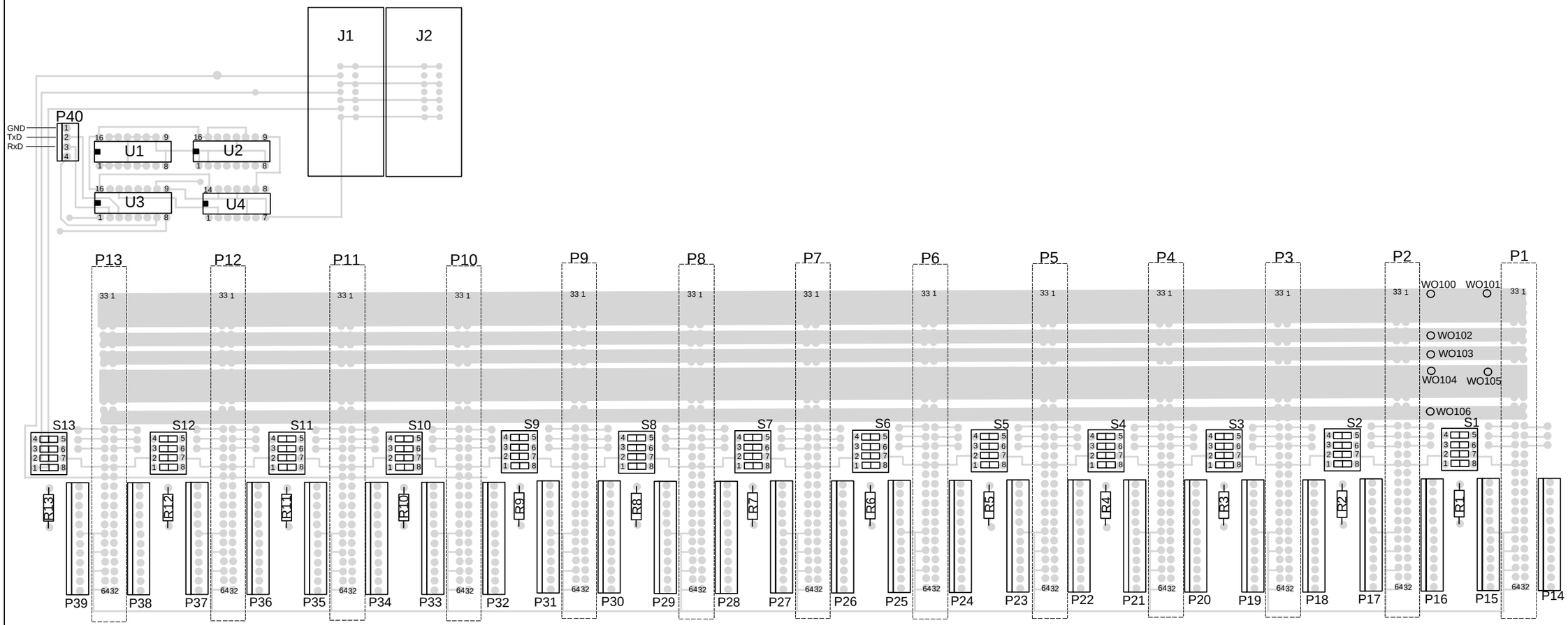
Figure 8-1 BACKPLANE WIRING DIAGRAM



1 THE PATH DESIRED MUST BE WIRED AND THEN SWITCH SELECTED.

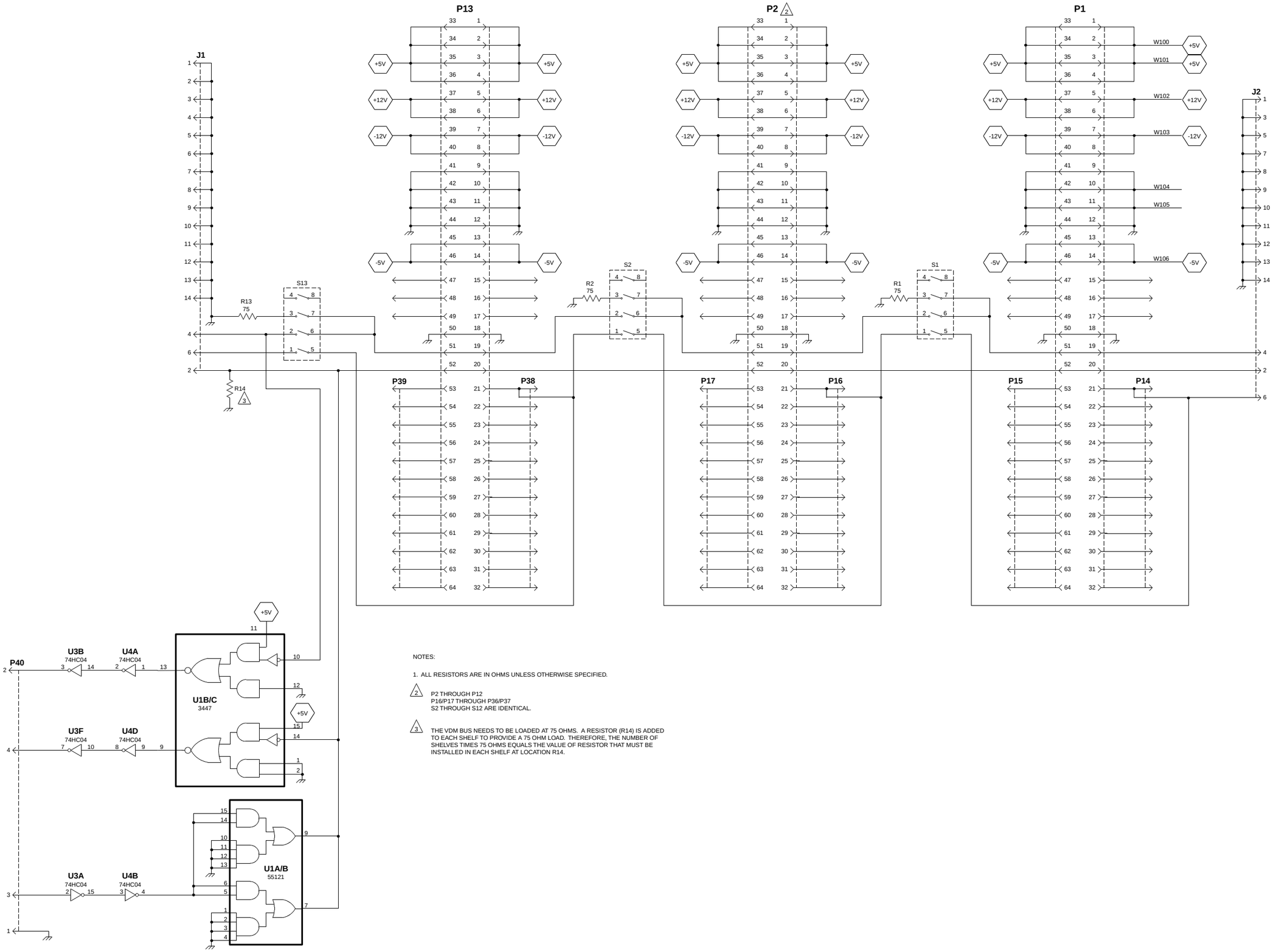
VOTER INTERCONNECT SCHEMATIC
FIGURE 8-2

FOLDOUT



March 2000
Part No. 001-3139-502

VOTER SHELF BACKPLANE COMPONENT LAYOUT
FIGURE 8-3



NOTES:

1. ALL RESISTORS ARE IN OHMS UNLESS OTHERWISE SPECIFIED.

△2 P2 THROUGH P12
P16/P17 THROUGH P36/P37
S2 THROUGH S12 ARE IDENTICAL.

△3 THE VDM BUS NEEDS TO BE LOADED AT 75 OHMS. A RESISTOR (R14) IS ADDED TO EACH SHELF TO PROVIDE A 75 OHM LOAD. THEREFORE, THE NUMBER OF SHELVES TIMES 75 OHMS EQUALS THE VALUE OF RESISTOR THAT MUST BE INSTALLED IN EACH SHELF AT LOCATION R14.

VOTER SHELF SCHEMATIC
FIGURE 8-4

FOLDOUT

SECTION 9 POWER SUPPLIES

9.1 RECEIVER SITE POWER SUPPLY (-490)

The -490 Receiver Site Power Supply has a 110V AC 50/60 Hz, 5A maximum input and 10 separate 13.8V DC/ground output connections.

9.2 RECEIVER SITE REDUNDANT KIT (-495)

The -495 Receiver Site Redundant Supply Kit allows two power supplies to share the load.

9.3 VOTER SHELF POWER SUPPLY (-555)

The -555 Voter Shelf Power Supply has a 115/230V AC 50/60 Hz input and 4 continuous duty outputs as follows:

+5V DC 24A.
-5V DC 6A.
+12V DC 3A.
-12V DC 5A.

The -555 power supply can handle 2 Voter Shelves. The -555 has:

4 separate +5V 2A connections.
2 separate -5V connections.
2 separate +12V connections.
2 separate -12V connections.
6 separate ground connections.

9.4 VOTER POWER SUPPLY REDUNDANT PLATE (-553)

The voter power supply drawer can be made redundant by the use of the redundant diode plate. The redundant plate allows two power supply drawers to share the load via diodes. One of the power supply drawers may be removed and the remaining drawer will supply the full load. (See Figure 9-7.)

9.5 POWER CONSUMPTION

The voltage, current and power for each supply voltage per card is shown in Table 9-1.

Table 9-1 POWER CONSUMPTION

Voltage	Current	Power
+5V DC	0.80A	4.00W
-5V DC	0.07A	0.35W
+12V DC	0.08A	0.96W
-12V DC	0.06A	0.72W

Total watts for a module is 6.03W. The following formulas are used to find the BTUs per hour. The total wattage of the voter system is found by multiplying the wattage (6.03W) by the number of modules.

Watts x Number of Modules = Voter Power

The wattage required by the power supply is found by dividing the total wattage of the Voter by the efficiency (0.7) of the power supply.

Voter Power ÷ 0.7 = Wattage of the Power Supply

The BTUs per hour are found by multiplying a known value (3.6) by the wattage of the power supply.

3.6 x Wattage of the Power Supply = BTU per hour

Example:

6.01 x 13 = 78.13W (Voter Power)

78.13 ÷ 0.7 = 111.6W (Wattage of the Power Supply)

3.6 x 111.6 = 401.76 BTUs per hour

Table 9-2 POWER SUPPLY CONNECTIONS

TB1	Wire No.	Color		From
Term 1	W1	Blk	AC (Hot)	Line
Term 2	W1	Wht	AC (Ntrl)	Line
Term 3	W1	Grn	AC (Gnd)	Line
TB2				
Term 1	W1	Red	+5V	F1
Term 2	W2	Red	+5V	F1
Term 3	W6	Blu	Gnd	Gnd
Term 4	NC			
Term 5	W7	Blu	Gnd	Gnd
Term 6	W4	Blu	+12V	F3
Term 7	W5	Wht	-12V	F4
Term 8	W3	Grn	-5V	F2
Term 9	W8	Blu	Gnd	Gnd

9.6 VOLTAGE ADJUSTMENTS

9.6.1 -555 SUPPLY

See Figure 9-5 for location of components and Table 9-2 for wire connections.

1. Connect a voltmeter to U1, pin 76 on an RVM (DO NOT use an extender card).
2. Adjust the +5V pot on the power supply for a reading of 5.1V.
3. If +5.1V cannot be obtained, change R84 to a 5.6k ohm 1/4W resistor.

9.6.2 REDUNDANT SUPPLY ADJUSTMENTS

See Figure 9-5 for location of components and Table 9-2 for wire connections.

1. Remove the AC voltage to one of the supplies.
2. Connect a voltmeter to U1, pin 76 on an RVM (DO NOT use an extender card).
3. Adjust the +5V pot for a reading of 5.1V. (If +5.1V cannot be obtained, change R84 to a 5.1k ohm 1/4W resistor.)
4. Connect a voltmeter to output of CR3 and verify that the -5V line is -4.8V to -5.2V. (If not, make R68 lower to raise voltage.)
5. Remove the AC voltage to the adjusted supply and connect AC voltage to the other power supply.
6. Connect a voltmeter to U1, pin 76 on an RVM (DO NOT use an extender card).
7. Adjust the +5V pot for a reading of 5.1V. (If +5.1V cannot be obtained, change R84 to a 5.1k ohm 1/4W resistor.)
8. Connect a voltmeter to output of CR3 and verify that the -5V line is -4.8V to -5.2V. (If not, make R68 lower to raise voltage.)

9.7 RECEIVER SITE REDUNDANT KIT INSTALLATION

1. Remove connector J1 from the -491 board (see Figure 9-1).
2. Cut connectors off Challenger power supplies.
3. Install a .250 tab receptacle with heat shrink onto each Challenger power supply wire.
4. On the -491 board, install the Red #12 wire into hole connected to fuse.
5. Install .250 tab receptacle and heat shrink to other end of the wire.
6. Install the U-shaped connector to ground hole on the -491 board with hardware provided and solder to board.
7. Install diode onto -490 shelf using hardware provided.
8. Connect the Red wires of the Challenger supplies to the inputs to the diode.
9. Connect the Red #12 wire from the -491 board to the output of the diode.
10. Connect the ground wires from the Challenger supplies to the U-shaped connector on the -491 board.
11. Two green LEDs are provided for power supply operation indicators. Early shelves do not have holes in the front panel and must be drilled to accommodate these LEDs (see Figure 9-2 for wiring details).

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
	RECEIVER SITE POWER SUPPLY PART NO. 023-3039-490	
A 002	Challenger power supply	023-0226-141
HW001	#4 shakeproof washer	596-1104-008
HW003	4-40 panhead philips ZPS	575-1604-008
HW004	Self clinching fastener	537-9047-002
HW005	6-32 panhead philips ZPS	575-1606-009
HW006	6 x .018 lockwasher NPB	596-2106-009
F 001	10A 32V fastblow AGC	534-0003-036
FH001	Fuse clip	534-1007-001
J 001	Power connector	023-4110-001
J 002	Latch header right angle	515-7100-840
MP001	Power supply shelf	017-2222-217
MP002	Challenger power supply cover	017-2222-219
MP001	Left latching arm	515-6010-011
MP002	Right latching arm	515-6010-012
P 001	10-pos vertical connector	515-1502-030
P 002	10-pos vertical connector	515-1502-030
PC001	PC board	035-3039-490
	RECEIVER SITE REDUNDANT DIODE PART NO. 023-3039-495	
CR001	Bridge rectifier 200V 25A	523-4004-008
EP001	1/4" 2 AWG ring terminal	586-0001-028
EP002	1/4" 2 AWG ring terminal	586-0001-028
EP003	1/4" 2 AWG ring terminal	586-0001-028
EP004	1/4" 2 AWG ring terminal	586-0001-028
EP005	1/4" 2 AWG ring terminal	586-0001-028
EP006	1/4" heat shrink tubing	042-0241-555
EP007	1/4" heat shrink tubing	042-0241-555
EP008	1/4" heat shrink tubing	042-0241-555
EP009	1/4" heat shrink tubing	042-0241-555
EP010	1/4" heat shrink tubing	042-0241-555
HW001	8-32 pan head ZPS philips	575-1608-032
HW002	8 x .02 lockwasher int. CPS	596-1108-011
HW003	8-32 x .125 nut CPS	560-1108-011
HW004	4-40 pan head ZPS philips	575-1604-012
HW005	No. 4 shakeproof washer	596-1104-008
HW006	No. 4 shakeproof washer	596-1104-008
HW007	4-40 x .094 NPB nut	560-2104-008
W 001	#12 red stranded	597-7021-202
	RECEIVER SITE REDUNDANT POWER SUPPLY WITH DIODE KIT PART NO. 023-0226-141 (Factory Installed) 239-0226-141 (Field Installed)	
	2 SHELF POWER SUPPLY PART NO. 023-3039-555	
A 001	Voter PS interface board	023-3039-510
A 002	PS 90V AC:out ±5V, ±12V	585-4001-506
B 001	12V 2.36" square x 1" fan	529-2002-016
CR001	Green LED (+5V)	549-4001-003
CR002	Green LED (-5V)	549-4001-003
CR003	Green LED (+12V)	549-4001-003
CR004	Green LED (-12V)	549-4001-003
EP001	6-ring terminal 16-14 wire	586-0001-010
EP002	1/8" heat shrink tubing	042-0241-553
EP003	1/8" heat shrink tubing	042-0241-553
EP004	1/8" heat shrink tubing	042-0241-553
EP005	1/8" heat shrink tubing	042-0241-553
EP006	.055 teflon tubing	058-0053-515
EP007	.055 teflon tubing	058-0053-515
EP008	.055 teflon tubing	058-0053-515
EP009	.055 teflon tubing	058-0053-515
HW001	7/16 inch cable clamp	572-0001-006
HW002	Screw 8-32 panhead CPS phil	575-0608-012
HW003	Panel mount LED socket	550-0006-100
HW004	Lockwasher int 8 x .020 CPS	596-1108-011
HW005	No. 4 shakeproof washer	596-1104-008
HW006	5/8" cable clamp	572-0001-009
HW007	4-40 pan head ZPS philips	575-1604-008
HW008	Self clinching fastener	537-9047-002
HW009	Panel mount LED socket	550-0006-100
HW010	6-32 pan head ZPS philips	575-1606-048
HW011	6-32 pan head ZPS philips	575-1606-048
HW012	6 x .018 int lockwasher CPS	596-1106-009
HW013	6-32 x .094 nut	560-1106-010

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
J 002	22 AWG 4 cond connector	515-9031-233
MP002	Card rack panel number	014-0783-099
MP003	Shelf	017-2222-215
MP004	Fan finger guard 2.36"	578-1000-010
W 001	8 ft. AC cord 3-18 black	597-1001-002

POWER SUPPLY CONTROL BOARD
PART NO. 023-3039-510

C 001	10000 µF 35V radial	510-4054-004
EP001	6 ring terminal 16-14 wire	586-0001-010
F 001	5A 32V fast blow AGC fuse	534-0003-029
F 002	5A 32V fast blow AGC fuse	534-0003-029
F 003	5A 32V fast blow AGC fuse	534-0003-029
F 004	5A 32V fast blow AGC fuse	534-0003-029
FH001	Fuse clip	534-1007-001
J 001	Right angle latch header	515-7100-840
MP001	Left latching arm	515-6010-011
MP002	Right latching arm	515-6010-012
PC 001	PC board	035-3039-510
R 001	220 ohm ±5% 1/4W CF	569-0513-221
R 002	220 ohm ±5% 1/4W CF	569-0513-221
R 003	560 ohm ±5% 1/4W CF	569-0513-561
R 004	560 ohm ±5% 1/4W CF	569-0513-561
TB003	10 pos vert plug wire conn.	515-1502-030
TB004	10 pos vert plug wire conn.	515-1502-030
W 001	12 AWG stranded	597-7021-202
W 002	12 AWG stranded	597-7021-202
W 003	18 AWG	597-7031-809
W 004	18 AWG	597-7031-809
W 005	18 AWG	597-7031-809
W 006	12 AWG stranded	597-7021-206
W 007	12 AWG stranded	597-7021-206
W 008	12 AWG stranded	597-7021-206
W 009	18 AWG	597-7031-809
W 010	18 AWG	597-7031-809
W 011	18 AWG	597-7031-809
W 012	18 AWG	597-7031-809
W 013	18 AWG	597-7031-809

VOTER REDUNDANT POWER SUPPLY
PART NO. 023-3039-553

CR001	200V 25A bridge rectifier	523-4004-008
CR002	200V 25A bridge rectifier	523-4004-008
CR003	200V 25A bridge rectifier	523-4004-008
CR004	200V 25A bridge rectifier	523-4004-008
CR005	200V 25A bridge rectifier	523-4004-008
EP001	1/4” heat shrink tubing	042-0241-555
EP002	1/4” heat shrink tubing	042-0241-555
EP003	1/4" heat shrink tubing	042-0241-555
EP004	1/4" heat shrink tubing	042-0241-555
EP005	1/4" heat shrink tubing	042-0241-555
EP006	1/4" heat shrink tubing	042-0241-555
EP007	1/4" heat shrink tubing	042-0241-555
EP008	1/4" heat shrink tubing	042-0241-555
EP009	1/4" heat shrink tubing	042-0241-555
EP010	1/4" heat shrink tubing	042-0241-555
EP011	1/4" heat shrink tubing	042-0241-555
EP012	1/4" heat shrink tubing	042-0241-555
EP013	1/4" heat shrink tubing	042-0241-555
EP014	1/4" heat shrink tubing	042-0241-555
EP015	1/4" heat shrink tubing	042-0241-555
EP016	1/4" heat shrink tubing	042-0241-555
EP017	1/4" heat shrink tubing	042-0241-555
EP018	1/4" heat shrink tubing	042-0241-555
EP019	1/4" heat shrink tubing	042-0241-555
EP020	1/4" heat shrink tubing	042-0241-555
EP021	1/4" heat shrink tubing	042-0241-555
HW001	8-32 pan head ZPS philips	575-1608-032
HW002	1/4"-20 HH flange ZPS screw	575-1914-010
HW003	8 x .020 int lock washer CPS	596-1108-011
HW004	7/16" cable clamp	572-0001-006
MP001	Diode heatsink 19"	014-0783-097
W 001	12 AWG stranded red	597-7021-202
W 002	12 AWG stranded red	597-7021-202
W 003	12 AWG stranded blue	597-7021-206
W 004	12 AWG stranded blue	597-7021-206
W 005	18 AWG prebonded	597-7031-809

SYMBOL NUMBER	DESCRIPTION	PART NUMBER	
W 006	18 AWG prebonded	597-7031-809	
W 007	18 AWG prebonded	597-7031-809	
W 011	12 AWG stranded red	597-7021-202	
W 012	12 AWG stranded red	597-7021-202	
W 013	12 AWG stranded blue	597-7021-206	
W 014	12 AWG stranded blue	597-7021-206	
W 015	18 AWG prebonded	597-7031-809	
W 016	18 AWG prebonded	597-7031-809	
W 017	18 AWG prebonded	597-7031-809	

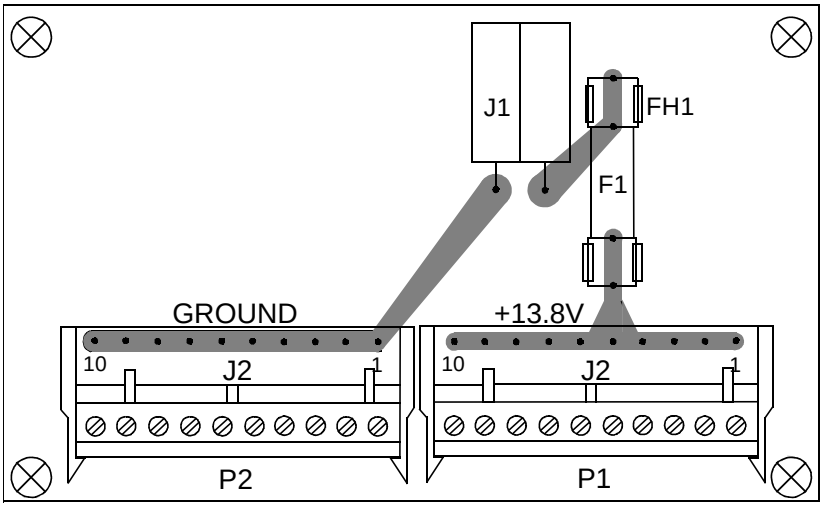


Figure 9-1 RECEIVER SITE POWER SUPPLY COMPONENT LAYOUT

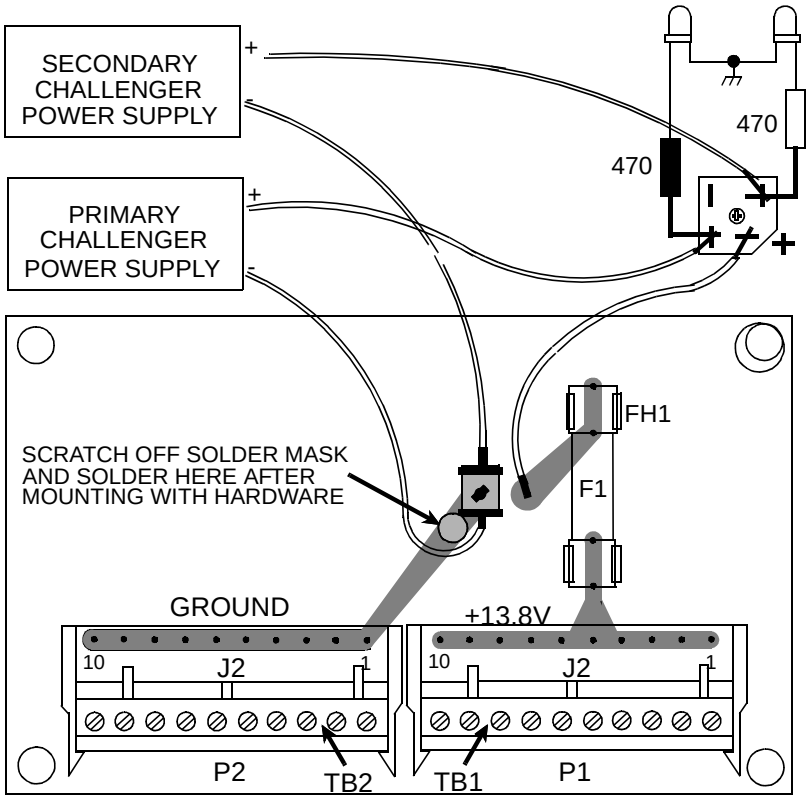


Figure 9-2 RECEIVER SITE REDUNDANT KIT

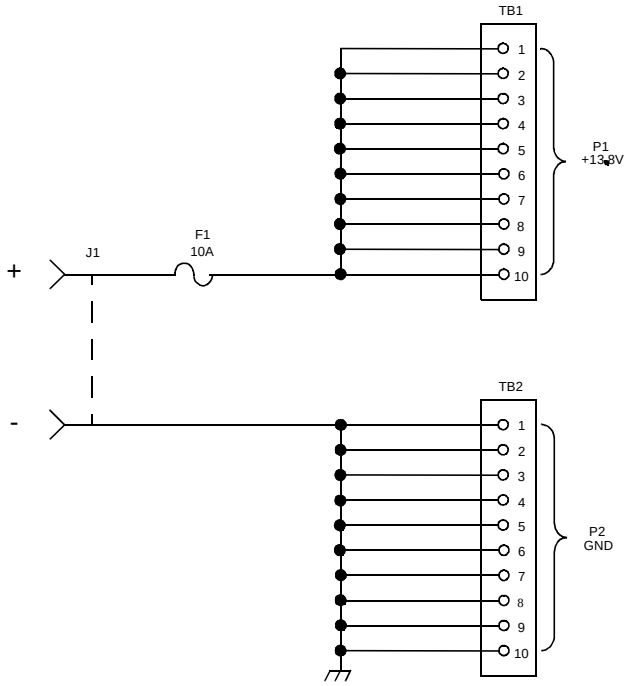


Figure 9-3 RECEIVER SITE POWER SUPPLY SCHEMATIC

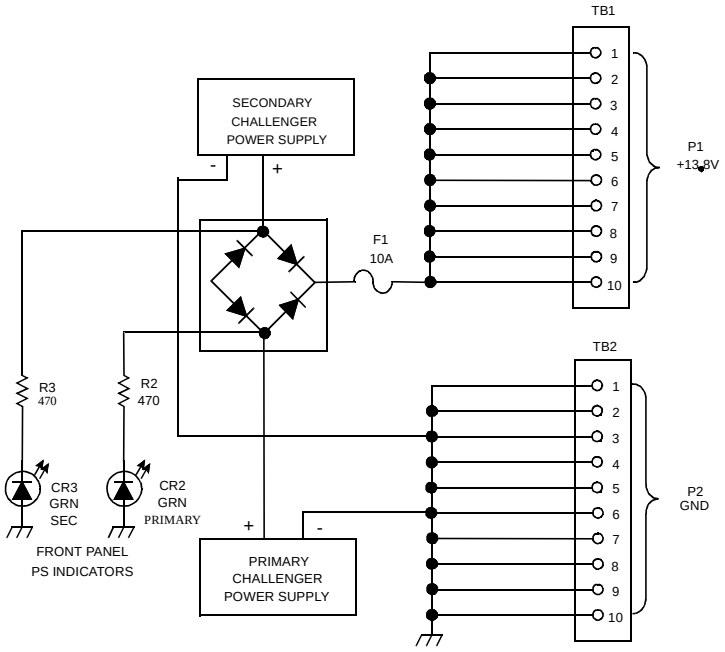


Figure 9-4 RECEIVER SITE REDUNDANT KIT SCHEMATIC

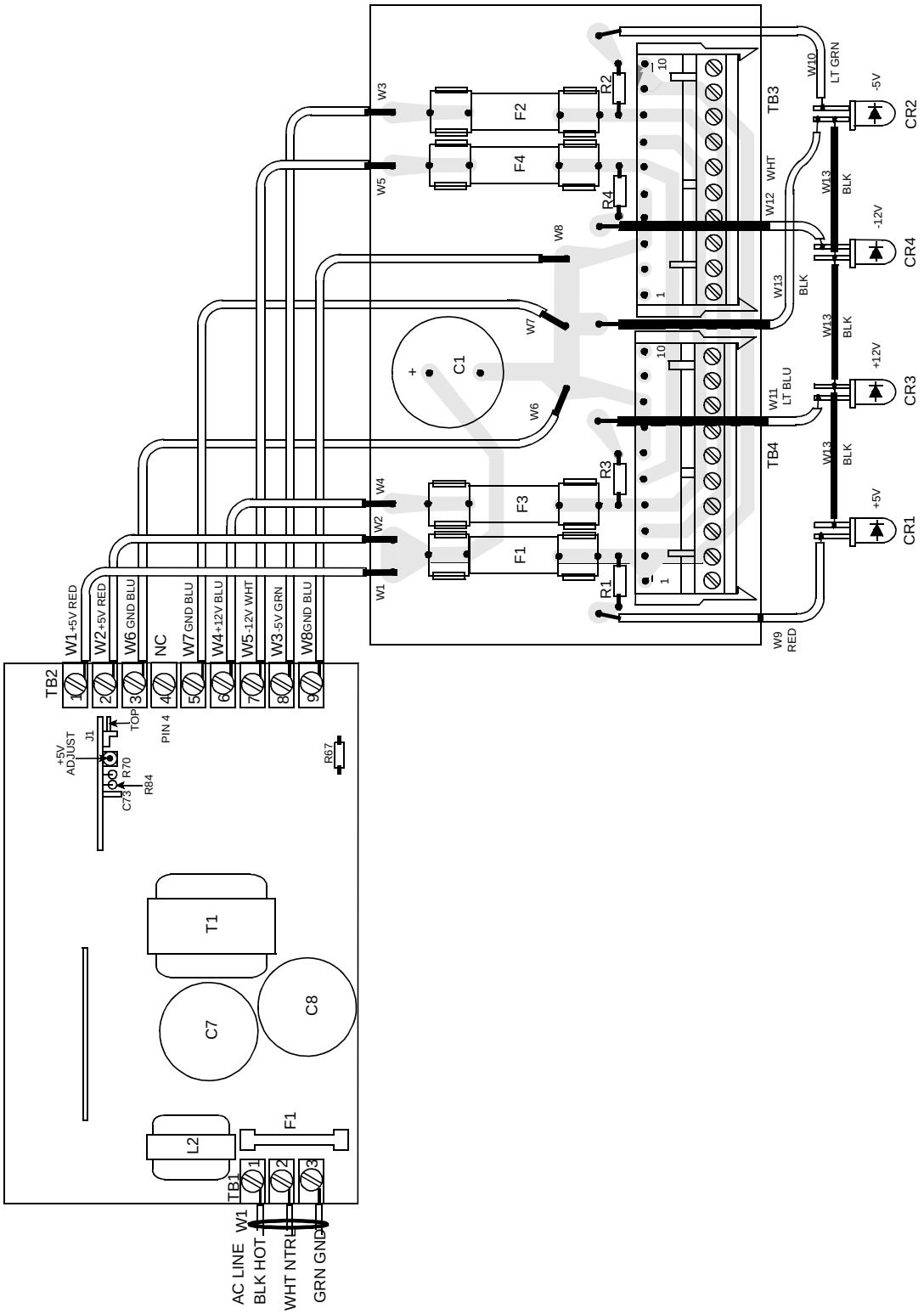


Figure 9-5 POWER SUPPLY AND CONTROL BOARD

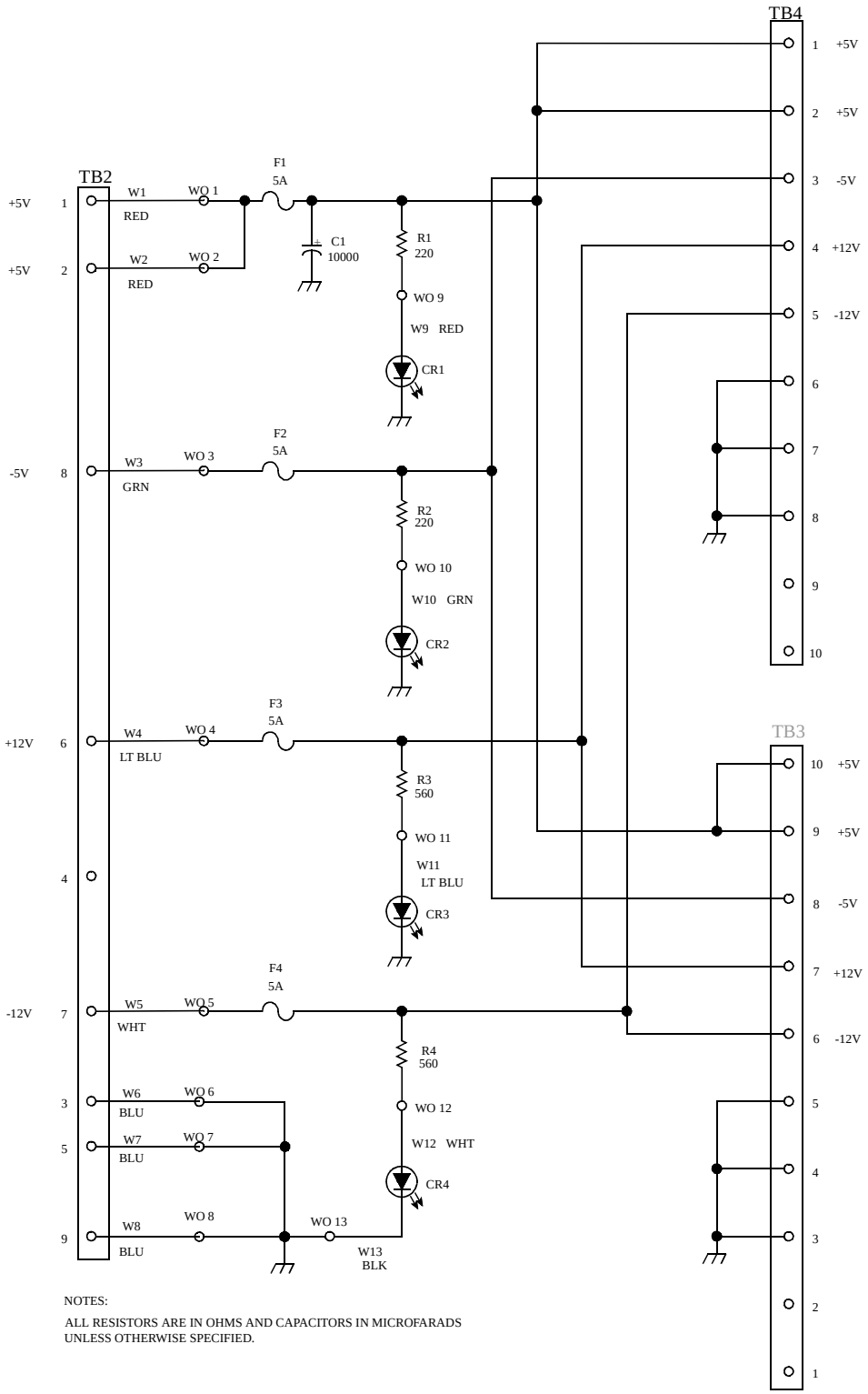


Figure 9-6 POWER SUPPLY CONTROL BOARD SCHEMATIC

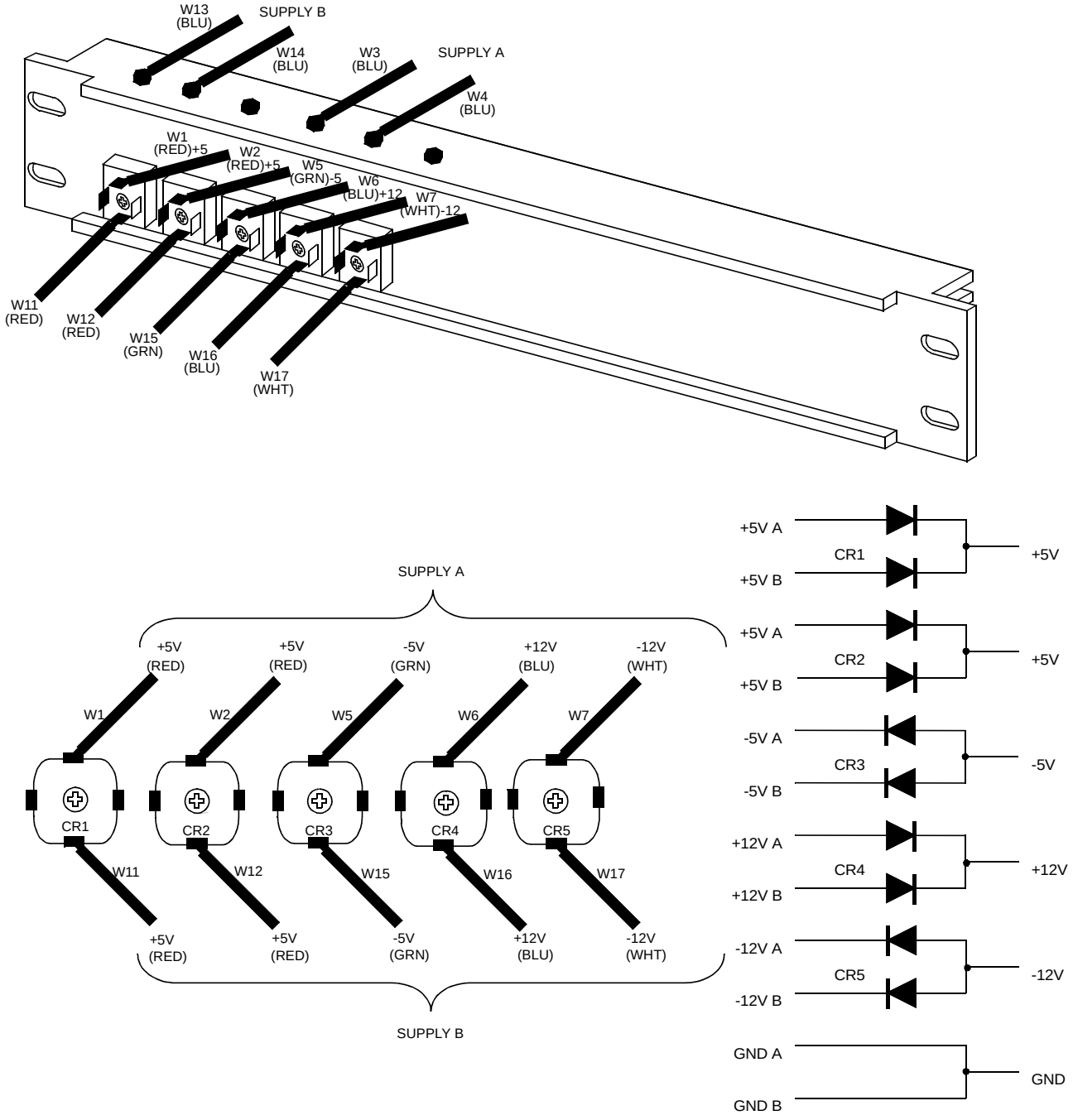


Figure 9-7 REDUNDANT PLATE

9.8 VOTER SHELF POWER SUPPLY (-501)

The -501 Voter Shelf Power Supply has a 90-264V AC 47-63 Hz input and 4 sets of 4 continuous duty outputs as follows:

+5V DC 15A.
-5V DC 2A.
+12V DC 2A.
-12V DC 2A.

The -501 power supply can handle 4 Voter Shelves. The -501 has:

4 separate +5V 15A connections.
4 separate -5V connections.
4 separate +12V connections.
4 separate -12V connections.
4 separate +12V Auxiliary connections.
4 ground connections plus ground bar.

9.9 REDUNDANT POWER SUPPLY

The voter power supply drawer is made redundant by the use of a second power supply. The fuse board allows two power supplies to share the load via diodes. One of the power supplies may be removed and the remaining power supply will supply the full load (see Figure 9-7.)

9.10 POWER CONSUMPTION

The voltage, current and power for each supply voltage per card is shown in Table 9-3.

Table 9-3 POWER CONSUMPTION

Voltage	Current	Power
+5V DC	0.80A	4.00W
-5V DC	0.07A	0.35W
+12V DC	0.08A	0.96W
-12V DC	0.06A	0.72W

Total watts for a module is 6.03W. The following formulas are used to find the BTUs per hour. The total wattage of the voter system is found by multiplying the wattage (6.03W) by the number of modules.

Watts x Number of Modules = Voter Power

The wattage required by the power supply is found by dividing the total wattage of the Voter by the efficiency (0.7) of the power supply.

Voter Power ÷ 0.7 = Wattage of the Power Supply

The BTUs per hour are found by multiplying a known value (3.6) by the wattage of the power supply.

3.6 x Wattage of the Power Supply = BTU per hour

Example:

6.01 x 13 = 78.13W (Voter Power)

78.13 ÷ 0.7 = 111.6W (Wattage of the Power Supply)

3.6 x 111.6 = 401.76 BTUs per hour

9.11 VOLTAGE ADJUSTMENTS

9.11.1 -501 SUPPLY

See Figure 9-5 for location of components and Figure 9-8, Figure 9-9 and Figure 9-10 for wire connections.

After all the Voter shelves are connected to the power supply:

1. Connect the 5V Sence wire (Grn/Yel), to the 5V line on the back plane of the appropriate Voter shelf. (In a 2 or 3 shelf system, connect the 5V sense line to the second shelf. In a 4-shelf system connect the 5V sence line to the third shelf.)
2. Turn one of the power supplies OFF.
3. **On an RVM**, connect a voltmeter to U1, pin 76 (DO NOT use an extender card).
4. Adjust the +5V pot on the back of the power supply for a reading of 5.1V (see Figure 9-12).
5. Check the voltage at 5V jack on the back of the power supply. The reading should be close to 5.1V.
6. Repeat the process for the second power supply.
7. Turn both power supplies ON.

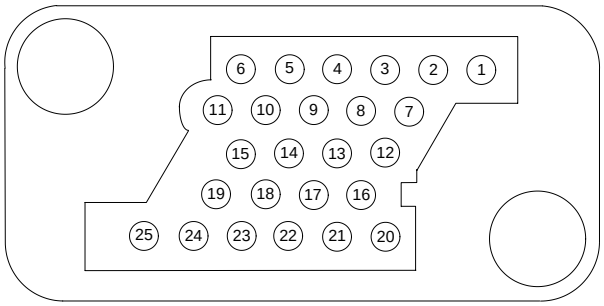
SYMBOL NUMBER	DESCRIPTION	PART NUMBER
	VOTER POWER SUPPLY PART NO. 023-3039-501	
A 001	PS VAC in, 5V/12V/-12V/ -5V	585-4001-607
A 002	PS VAC in, 5V/12V/-12V/ -5V	585-4001-607
A 003	Power Supply fuse panel	023-3039-502
A 979	Power harness #1	023-3039-979
A 980	Power harness #2	023-3039-980
A 985	Redundant PS harness	023-3039-985
A 986	PS auxiliary cable harness	023-3039-986
A 991	Power cable assembly - 1 shelf	023-3039-991
A 992	Power cable assembly - 2 shelf	023-3039-991
A 993	Power cable assembly - 3 shelf	023-3039-993
A 994	Power cable assembly - 4 shelf	023-3039-994
EP001	Ground bar	537-9001-079
EP002	1/4" heatshrink tubing	042-0241-555
EP003	1/4" heatshrink tubing	042-0241-555
EP004	1/4" heatshrink tubing	042-0241-555
EP005	Solder splice wire terminator	586-0007-086
HW002	10-32 x 0,375 nut CPS	560-1110-012
HW003	2-56 0.063 nut NPB	560-2102-006
HW004	Strain relief	574-0001-010
HW005	2-56 mach panhead phil ZPS	575-1602-020
HW006	6-32 mach panhead phil ZPS	575-1606-008
HW007	6-32 mach panhead phil ZPS	575-1606-016
HW008	6-32 mach panhead phil ZPS	575-1606-020
HW009	10-32 mach panhead phil ZPS	575-1610-010
HW010	8-32 panhead phil BZPS	575-8608-012
HW011	#10 x 3/4 socket headcap scr	575-0976-024
HW012	#2 lockwasher internal	596-1102-006
HW013	6 x 0.018 lockwasher int CPS	596-1106-009
HW014	#10 shakeproof washer	596-1110-012
HW015	Washer	596-2406-012
HW016	5/8" split loom wire guard	537-9057-105
HW017	5/8" split loom wire guard	537-9057-105
HW018	5/8" split loom wire guard	537-9057-105
HW019	6-32 connector mounting scr	515-7141-215
HW020	4" nylon cable tie	574-9008-004
J 001	Tip jack, black 0.081	105-0803-001
J 003	Tip jack, red 0.081	105-0802-001
MP001	Power cord strain relief	016-2187-270
MP002	Mounting bracket ear	017-2210-330
MP003	Front panel	017-2210-332
MP004	Enclosure cover	017-2210-334
MP005	Adjustable pot U bracket	017-2210-335
MP006	U-channel divider	017-2210-336
MP007	L-channel	017-2210-337
MP008	Connector inner wall	017-2210-338
MP009	Main enclosure assembly	017-2210-339
S 001	Pwr cord conn. & switch panel	515-0028-023
TB001	2-circuit terminal block	586-2006-002
W 001	#14 stranded wire, red	597-7021-402
W 002	#14 stranded wire, black	597-7021-400
W 003	#14 stranded wire, black	597-7021-400
W 004	AC pwr cord 6’7" 16 AWG	597-1001-013
	VOTER FUSE PANEL PART NO. 023-3039-502	
CR001	Blue LED	549-4001-008
CR002	Blue LED	549-4001-008
CR003	Blue LED	549-4001-008
CR004	Blue LED	549-4001-008
CR005	Amber LED	549-4001-006
CR006	Amber LED	549-4001-006
CR007	Amber LED	549-4001-006
CR008	Amber LED	549-4001-006
CR009	Amber LED	549-4001-006
CR010	Amber LED	549-4001-006
CR011	Amber LED	549-4001-006
CR012	Amber LED	549-4001-006
CR013	Amber LED	549-4001-006
CR014	Amber LED	549-4001-006
CR015	Amber LED	549-4001-006
CR016	Amber LED	549-4001-006
CR017	Amber LED	549-4001-006
CR018	Amber LED	549-4001-006
CR019	Amber LED	549-4001-006
CR020	Amber LED	549-4001-006
CR027	Switching diode SOT-23	523-1504-002
CR028	Switching diode SOT-23	523-1504-002
CR029	Switching diode SOT-23	523-1504-002
CR030	Switching diode SOT-23	523-1504-002
CR031	Switching diode SOT-23	523-1504-002
CR032	Switching diode SOT-23	523-1504-002
CR033	Switching diode SOT-23	523-1504-002
CR034	Switching diode SOT-23	523-1504-002

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
CR035	Switching diode SOT-23	523-1504-002
CR036	Switching diode SOT-23	523-1504-002
CR037	Switching diode SOT-23	523-1504-002
CR038	Switching diode SOT-23	523-1504-002
CR043	Switching diode SOT-23	523-1504-002
CR044	Switching diode SOT-23	523-1504-002
CR045	Switching diode SOT-23	523-1504-002
CR046	Switching diode SOT-23	523-1504-002
CR047	Switching diode SOT-23	523-1504-002
CR048	Switching diode SOT-23	523-1504-002
CR049	Switching diode SOT-23	523-1504-002
CR050	Switching diode SOT-23	523-1504-002
EP002	PC mount spade lug 0.25"	586-3502-021
EP003	PC mount spade lug 0.25"	586-3502-021
EP005	PC mount spade lug 0.25"	586-3502-021
EP006	PC mount spade lug 0.25"	586-3502-021
EP008	PC mount spade lug 0.25"	586-3502-021
EP009	PC mount spade lug 0.25"	586-3502-021
EP011	PC mount spade lug 0.25"	586-3502-021
EP012	PC mount spade lug 0.25"	586-3502-021
EP014	PC mount spade lug 0.25"	586-3502-021
EP015	PC mount spade lug 0.25"	586-3502-021
EP017	PC mount spade lug 0.25"	586-3502-021
EP018	PC mount spade lug 0.25"	586-3502-021
EP020	PC mount spade lug 0.25"	586-3502-021
EP021	PC mount spade lug 0.25"	586-3502-021
EP023	PC mount spade lug 0.25"	586-3502-021
EP024	PC mount spade lug 0.25"	586-3502-021
EP025	PC mount spade lug 0.25"	586-3502-021
EP026	PC mount spade lug 0.25"	586-3502-021
EP027	PC mount spade lug 0.25"	586-3502-021
EP028	PC mount spade lug 0.25"	586-3502-021
EP032	PC mount spade lug 0.25"	586-3502-021
EP033	PC mount spade lug 0.25"	586-3502-021
EP034	PC mount spade lug 0.25"	586-3502-021
EP035	PC mount spade lug 0.25"	586-3502-021
EP036	PC mount spade lug 0.25"	586-3502-021
EP037	PC mount spade lug 0.25"	586-3502-021
EP038	PC mount spade lug 0.25"	586-3502-021
EP039	PC mount spade lug 0.25"	586-3502-021
EP040	PC mount spade lug 0.25"	586-3502-021
EP043	PC mount spade lug 0.25"	586-3502-021
EP046	PC mount spade lug 0.25"	586-3502-021
EP049	PC mount spade lug 0.25"	586-3502-021
EP052	PC mount spade lug 0.25"	586-3502-021
EP053	PC mount spade lug 0.25"	586-3502-021
EP054	PC mount spade lug 0.25"	586-3502-021
EP055	PC mount spade lug 0.25"	586-3502-021
EP040	PC mount spade lug 0.25"	586-3502-021
EP060	PC mount spade lug 0.25"	586-3502-021
EP061	PC mount spade lug 0.25"	586-3502-021
EP062	PC mount spade lug 0.25"	586-3502-021
EP063	PC mount spade lug 0.25"	586-3502-021
EP064	PC mount spade lug 0.25"	586-3502-021
EP065	PC mount spade lug 0.25"	586-3502-021
F 001	15A 32V fuse	534-0332-015
F 002	2A 32V fuse	534-0332-002
F 003	2A 32V fuse	534-0332-002
F 004	2A 32V fuse	534-0332-002
F 005	15A 32V fuse	534-0332-015
F 006	2A 32V fuse	534-0332-002
F 007	2A 32V fuse	534-0332-002
F 008	2A 32V fuse	534-0332-002
F 009	15A 32V fuse	534-0332-015
F 010	2A 32V fuse	534-0332-002
F 011	2A 32V fuse	534-0332-002
F 012	2A 32V fuse	534-0332-002
F 013	15A 32V fuse	534-0332-015
F 014	2A 32V fuse	534-0332-002
F 015	2A 32V fuse	534-0332-002
F 016	2A 32V fuse	534-0332-002
F 017	2A 32V fuse	534-0332-002
F 018	2A 32V fuse	534-0332-002
F 019	2A 32V fuse	534-0332-002
F 020	2A 32V fuse	534-0332-002
FH001	Fuse clip	534-1007-006
PC001	PC board	035-3039-500
R 001	150 ohm ±5% 1206 SMD	569-0115-151
R 002	150 ohm ±5% 1206 SMD	569-0115-151
R 003	150 ohm ±5% 1206 SMD	569-0115-151
R 004	150 ohm ±5% 1206 SMD	569-0115-151
R 005	150 ohm ±5% 1206 SMD	569-0115-151
R 006	150 ohm ±5% 1206 SMD	569-0115-151
R 007	150 ohm ±5% 1206 SMD	569-0115-151
R 008	150 ohm ±5% 1206 SMD	569-0115-151
R 009	150 ohm ±5% 1206 SMD	569-0115-151
R 010	150 ohm ±5% 1206 SMD	569-0115-151
R 011	150 ohm ±5% 1206 SMD	569-0115-151
R 012	150 ohm ±5% 1206 SMD	569-0115-151

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
R 013	150 ohm ±5% 1206 SMD	569-0115-151
R 014	150 ohm ±5% 1206 SMD	569-0115-151
R 015	150 ohm ±5% 1206 SMD	569-0115-151
R 016	150 ohm ±5% 1206 SMD	569-0115-151
R 017	150 ohm ±5% 1206 SMD	569-0115-151
R 018	150 ohm ±5% 1206 SMD	569-0115-151
R 019	150 ohm ±5% 1206 SMD	569-0115-151
R 020	150 ohm ±5% 1206 SMD	569-0115-151
R 021	150 ohm ±5% 1206 SMD	569-0115-151
R 022	150 ohm ±5% 1206 SMD	569-0115-151
R 023	150 ohm ±5% 1206 SMD	569-0115-151
R 024	150 ohm ±5% 1206 SMD	569-0115-151
R 025	240 ohm ±5% 1206 SMD	569-0115-241
R 026	240 ohm ±5% 1206 SMD	569-0115-241
R 027	240 ohm ±5% 1206 SMD	569-0115-241
R 028	240 ohm ±5% 1206 SMD	569-0115-241
R 029	240 ohm ±5% 1206 SMD	569-0115-241
R 030	240 ohm ±5% 1206 SMD	569-0115-241
R 031	240 ohm ±5% 1206 SMD	569-0115-241
R 032	240 ohm ±5% 1206 SMD	569-0115-241
R 035	240 ohm ±5% 1206 SMD	569-0115-241
R 036	240 ohm ±5% 1206 SMD	569-0115-241
R 037	240 ohm ±5% 1206 SMD	569-0115-241
R 038	240 ohm ±5% 1206 SMD	569-0115-241
R 039	240 ohm ±5% 1206 SMD	569-0115-241
R 040	240 ohm ±5% 1206 SMD	569-0115-241
R 041	240 ohm ±5% 1206 SMD	569-0115-241
R 042	240 ohm ±5% 1206 SMD	569-0115-241
R 059	240 ohm ±5% 1206 SMD	569-0115-241
R 060	240 ohm ±5% 1206 SMD	569-0115-241
R 061	240 ohm ±5% 1206 SMD	569-0115-241
R 062	240 ohm ±5% 1206 SMD	569-0115-241
R 063	240 ohm ±5% 1206 SMD	569-0115-241
R 064	240 ohm ±5% 1206 SMD	569-0115-241
R 065	240 ohm ±5% 1206 SMD	569-0115-241
R 066	240 ohm ±5% 1206 SMD	569-0115-241
R 067	240 ohm ±5% 1206 SMD	569-0115-241
R 068	240 ohm ±5% 1206 SMD	569-0115-241
R 069	240 ohm ±5% 1206 SMD	569-0115-241
R 070	240 ohm ±5% 1206 SMD	569-0115-241
R 071	240 ohm ±5% 1206 SMD	569-0115-241
R 072	240 ohm ±5% 1206 SMD	569-0115-241
R 073	240 ohm ±5% 1206 SMD	569-0115-241
R 074	240 ohm ±5% 1206 SMD	569-0115-241
R 077	100 ohm ±5% 1206 SMD	569-0115-101
R 078	100 ohm ±5% 1206 SMD	569-0115-101
R 079	100 ohm ±5% 1206 SMD	569-0115-101
R 080	100 ohm ±5% 1206 SMD	569-0115-101
R 081	100 ohm ±5% 1206 SMD	569-0115-101
R 082	100 ohm ±5% 1206 SMD	569-0115-101
R 083	100 ohm ±5% 1206 SMD	569-0115-101
R 084	100 ohm ±5% 1206 SMD	569-0115-101
R 089	10k ohm ±5% 1206 SMD	569-0115-103
R 091	330 ohm ±5% 1206 SMD	569-0115-331
R 092	330 ohm ±5% 1206 SMD	569-0115-331
R 093	330 ohm ±5% 1206 SMD	569-0115-331
R 094	330 ohm ±5% 1206 SMD	569-0115-331
U 001	Opto isolator, NPN out 4N35	544-2010-001
U 002	Opto isolator, NPN out 4N35	544-2010-001
U 003	Opto isolator, NPN out 4N35	544-2010-001
U 004	Opto isolator, NPN out 4N35	544-2010-001
U 005	Opto isolator, NPN out 4N35	544-2010-001
U 006	Opto isolator, NPN out 4N35	544-2010-001
U 007	Opto isolator, NPN out 4N35	544-2010-001
U 008	Opto isolator, NPN out 4N35	544-2010-001
U 009	Opto isolator, NPN out 4N35	544-2010-001
U 010	Opto isolator, NPN out 4N35	544-2010-001
U 011	Opto isolator, NPN out 4N35	544-2010-001
U 012	Opto isolator, NPN out 4N35	544-2010-001
U 017	Opto isolator, NPN out 4N35	544-2010-001
U 018	Opto isolator, NPN out 4N35	544-2010-001
U 019	Opto isolator, NPN out 4N35	544-2010-001
U 020	Opto isolator, NPN out 4N35	544-2010-001
U 021	Opto isolator, NPN out 4N35	544-2010-001
U 022	Opto isolator, NPN out 4N35	544-2010-001
U 023	Opto isolator, NPN out 4N35	544-2010-001
U 024	Opto isolator, NPN out 4N35	544-2010-001

PIN	COLOR	DESCRIPTION	TO POWER SUPPLY		LOCATION
1	RED	+5V SENSE*	A	A	
2	GRN/YEL	GROUND	EP1**	EP1	BACK PANEL
3	BLK	GROUND	EP1	EP1	BACK PANEL
4	GRN	-5V	EP52	EP53	FUSE BOARD
5	BLK	GROUND	EP1	EP1	BACK PANEL
6	WHT	-12V	EP54	EP55	FUSE BOARD
8	DK BLU	NC			
9	ORN	+5V	ADJ POT PIN 1	ADJ POT PIN 1	BACK PANEL
10	RED	+5V	ADJ POT PIN 2	ADJ POT PIN 2	BACK PANEL
11	BLU	+5V	ADJ POT PIN 3	ADJ POT PIN 3	BACK PANEL
23	WHT	AC NEUTRAL	AC IN SOCKET	AC IN SOCKET	BACK PANEL
24	BLK	AC LOAD	AC IN SWITCH	AC IN SWITCH	BACK PANEL
25	GRN	AC GROUND	AC IN SOCKET	AC IN SOCKET	BACK PANEL

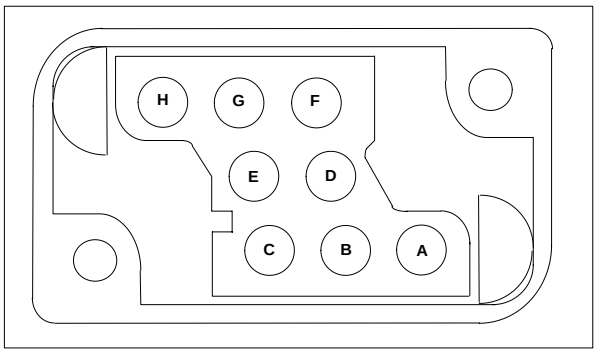
*SHELF #1 OUTPUT / RED TIP JACK
**GROUND BAR



023-3039-980 WIRE SIDE VIEW
POWER HARNESS #2 FROM POWER SUPPLY

Figure 9-8 POWER SUPPLY 25-PIN CONNECTOR

PIN	WIRE COLOR	DESCRIPTION	TO POWER SUPPLY		LOCATION
			A	B	
A	BLACK	GROUND	EP1*	EP1*	BACK PANEL
B	BLACK	GROUND	EP1	EP1	BACK PANEL
C	BLACK	GROUND	EP1	EP1	BACK PANEL
D	RED	+5V	EP20	EP8	FUSE BOARD
E	RED	+5V	EP21	EP9	FUSE BOARD
F	RED	+5V	EP15	EP2	FUSE BOARD
G	BLACK	GROUND	EP1	EP1	BACK PANEL
H	BLUE	+12V	EP61	EP60	FUSE BOARD

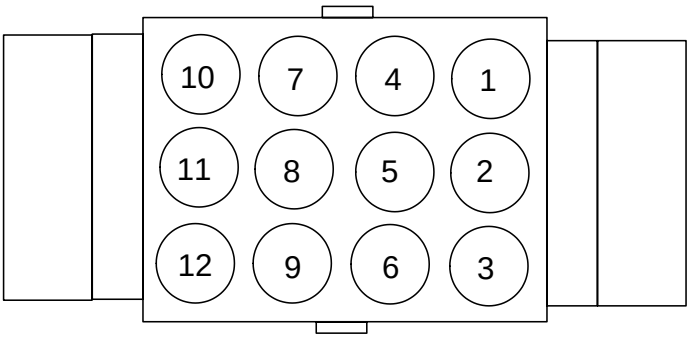


023-3039-979 WIRE SIDE VIEW
POWER HARNESS #1 FROM POWER SUPPLY

Figure 9-9 POWER SUPPLY 8-PIN CONNECTOR

PIN	COLOR	DESCRIPTION	TO SHELF				LOCATION
1	RED	+5V SENSE*	1	2	3	4	BACK PANEL
3	BLK	GROUND	EP1**	EP1	EP1	EP1	BACK PANEL
4	BLU	+12V OUT	EP43	EP40	EP46	EP49	FUSE BOARD
6	BLK	GROUND	EP1	EP1	EP1	EP1	BACK PANEL
7	GRN	-5V OUT	EP36	EP37	EP38	EP39	FUSE BOARD
8	RED	+5V OUT	EP17	EP23	EP5	EP11	FUSE BOARD
10	WHT	-12V OUT	EP32	EP33	EP34	EP35	FUSE BOARD
11	RED	+5V OUT	EP18	EP24	EP6	EP12	FUSE BOARD

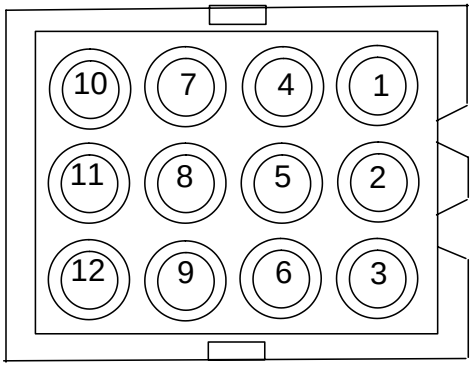
*SHELF #1 ONLY
**GROUND BAR



023-3039-985
REDUNDANT PS CABLE
IN REAR PANEL
(OPPOSITE WIRE SIDE VIEW)

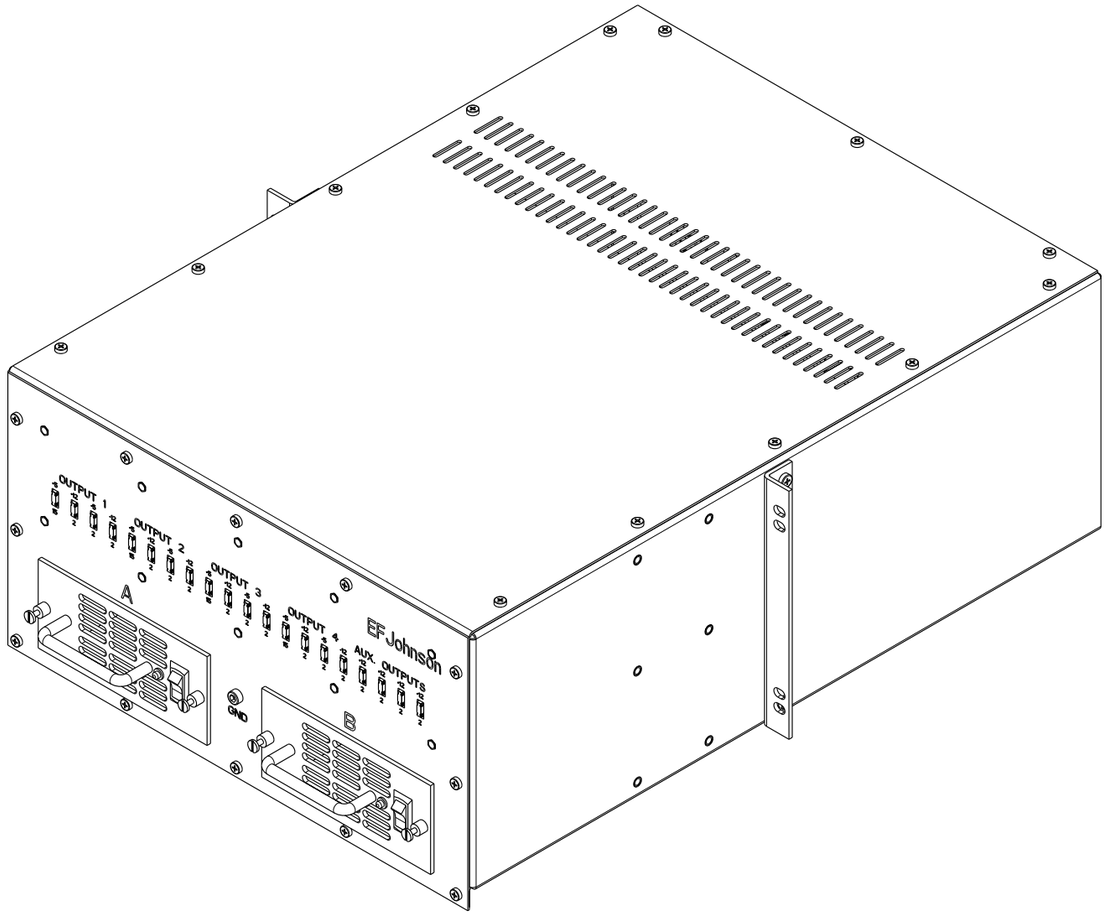
PIN	COLOR	DESCRIPTION
1	GRN/YEL	+5V SENSE*
3	BLK	GROUND
4	BLU	+12V
6	BLK	GROUND
7	GRN	-5V
8	RED	+5V
10	WHT	-12V
11	RED	+5V

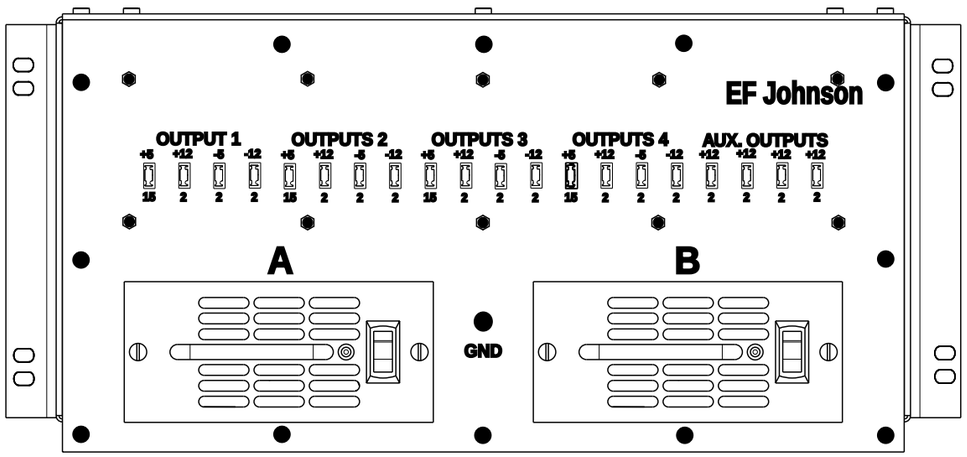
*SHELF #1 ONLY



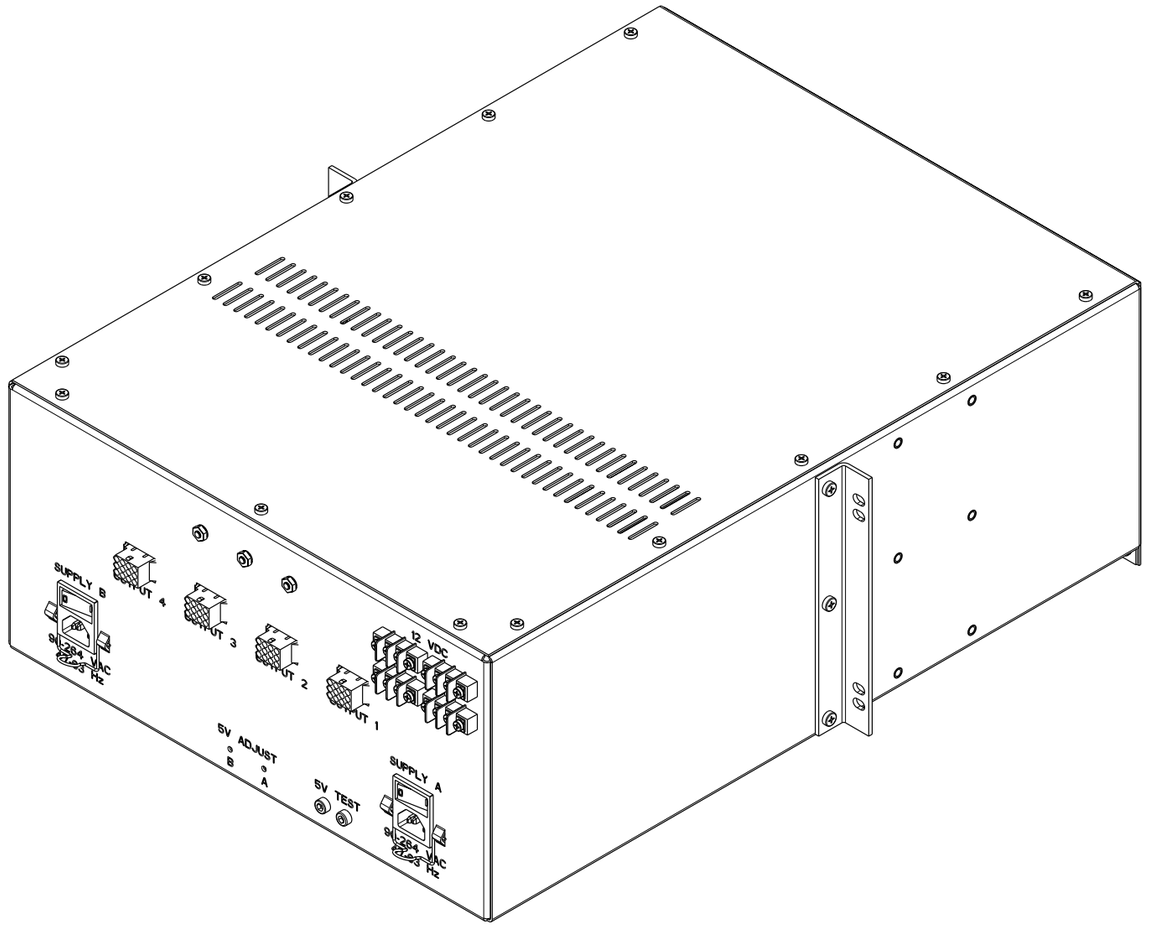
023-3039-991
POWER CABLE ASSEMBLY 1-4 SHELF
(WIRE SIDE VIEW)

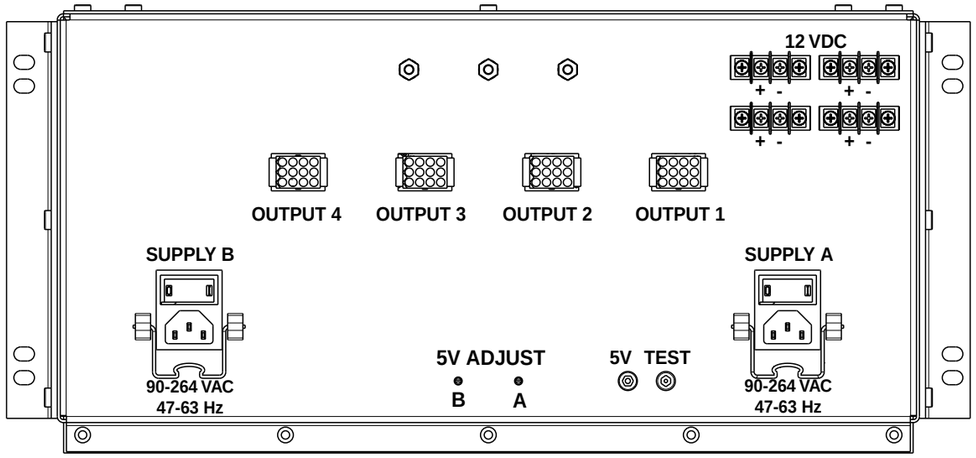
Figure 9-10 POWER SUPPLY 12-PIN CONNECTORS



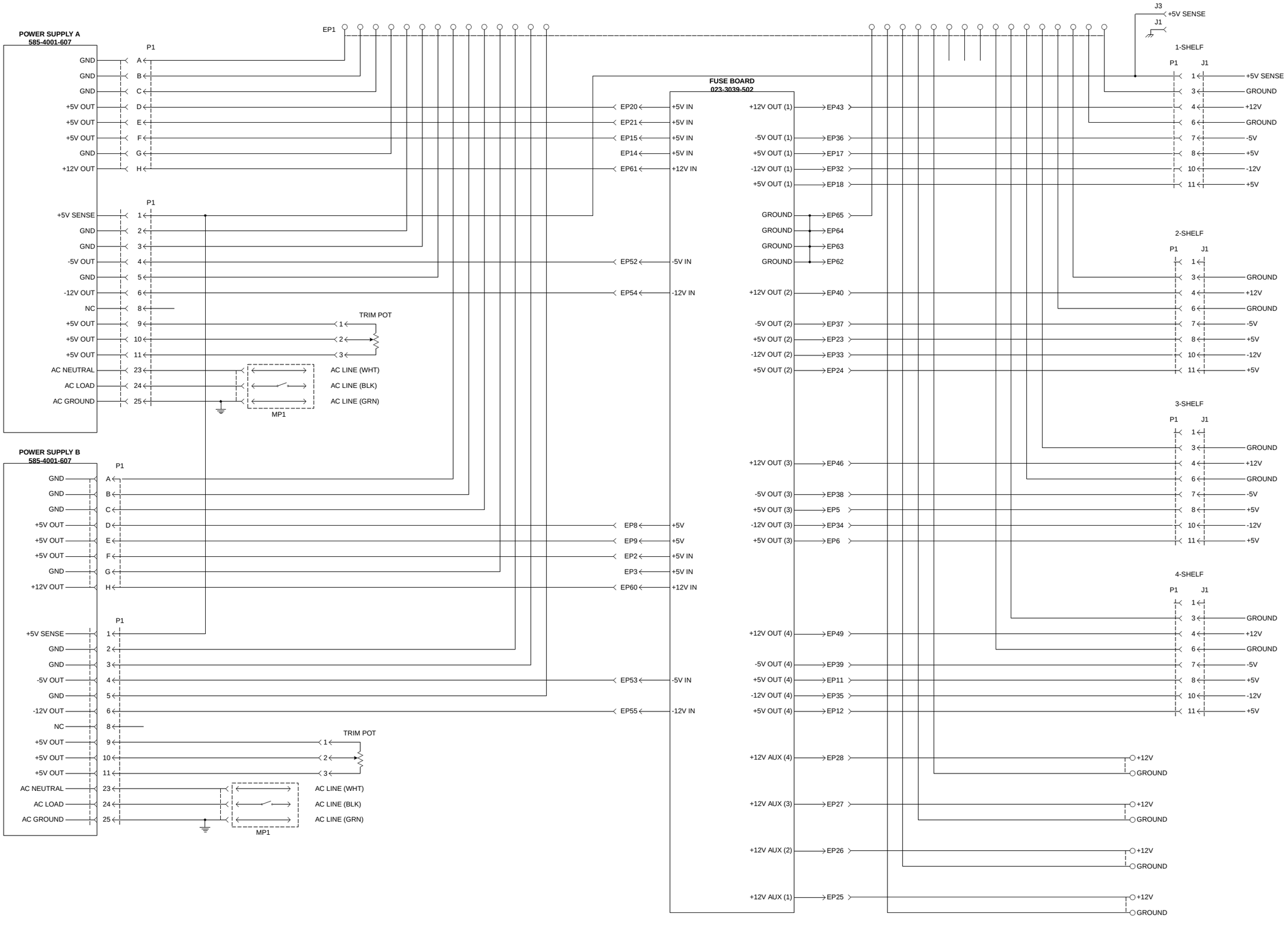


-500 POWER SUPPLY FRONT VIEW
FIGURE 9-11



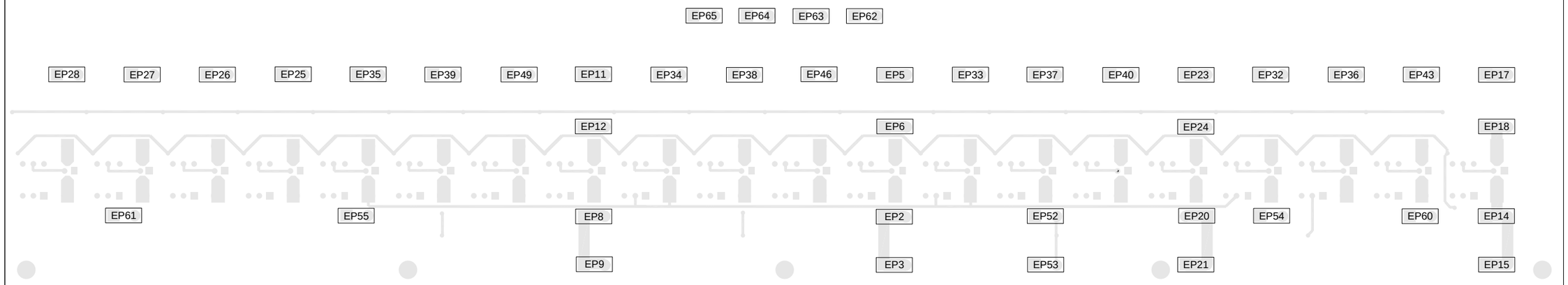


-500 POWER SUPPLY REAR VIEW
FIGURE 9-12



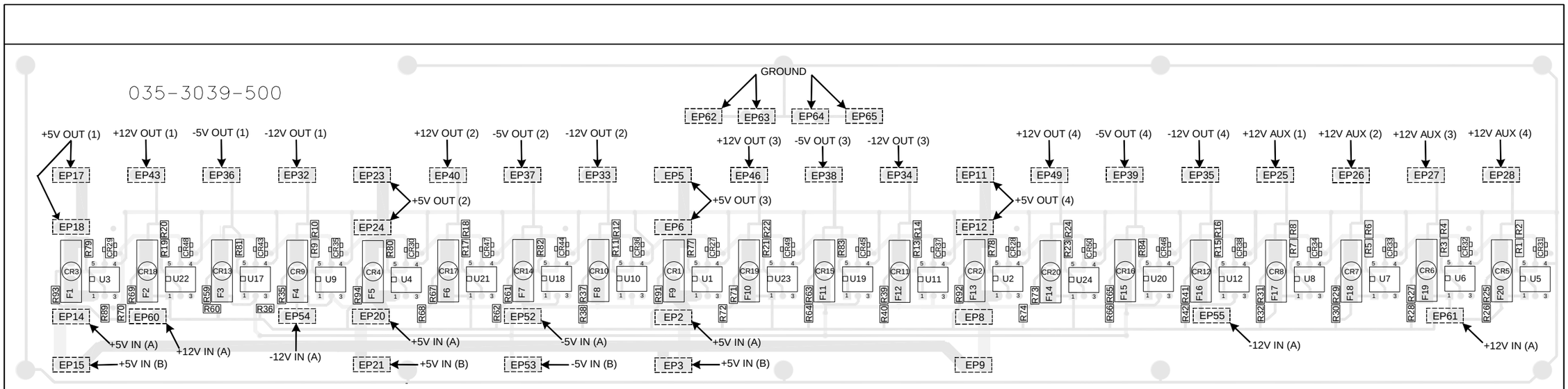
March 2000
Part No. 001-3139-502

-500 POWER SUPPLY INTERCONNECT
FIGURE 9-13



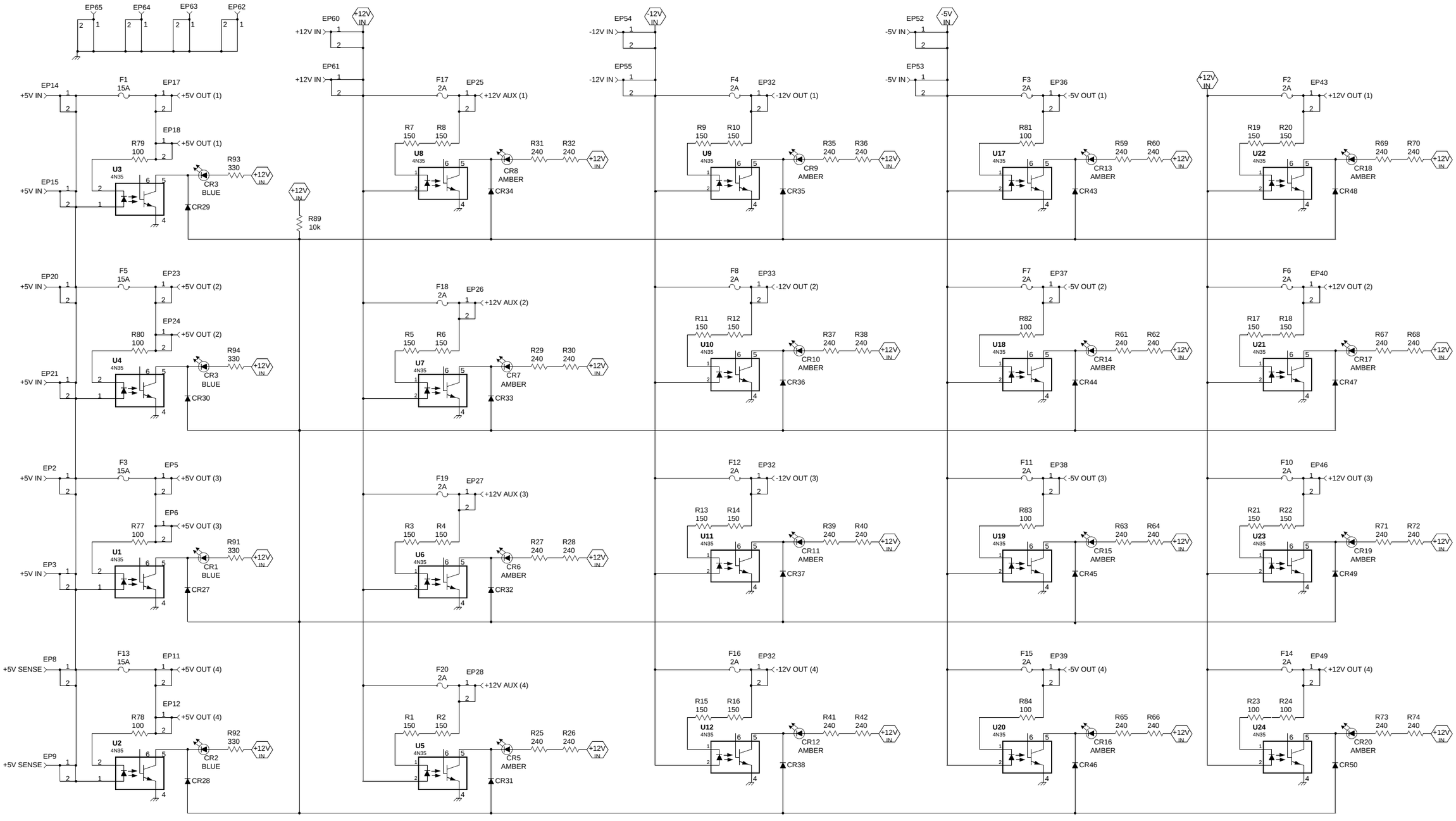
FUSE PANEL COMPONENT LAYOUT
(CONNECTOR SIDE VIEW)
FIGURE 9-14

FOLDOUT



March 2000
Part No. 001-3139-502

FUSE PANEL COMPONENT LAYOUT
(FUSE SIDE VIEW)
FIGURE 9-15



FUSE PANEL SCHEMATIC
FIGURE 9-16

FOLDOUT

SECTION 10 RECEIVER REVERT BOARD (RRB)

10.1 GENERAL

The Receiver Revert Board (RRB) is designed for either operation with the 800 MHz or 900 MHz receivers. There is only one RRB per channel in the system and it is installed in the Receiver Decoder Module (RDM) at the local site containing the transmitter portion of the voter. The RRB is a plug-in module to an existing wire harness. The RRB operates in the temperature range of -30°C to +60°C (-22°F to +140°F) with 10-90% humidity.

The RDM monitors for the presence of RS-232 data from the RVM to the MLM. If the RS-232 data is lost, the RDM causes the RRB to switch, bypassing the RVM and connects the RDM's receiver directly to the MLM. The RRB connects the receiver's audio and data directly to the MLM. The RS-232 data could be lost due to an RVM failure, loss of link or power failure at the voter.

10.2 INPUT DATA

The RVM sends RS-232 Data at 9600 baud for local MLM and at 2400 baud for a remoted MLM. The RDM is not verifying the data but only looking for the presence of data from the RVM.

10.3 INSTALLATION

The Receiver Revert Board (RRB) feature installation requires rewiring the RVM to MLM link and verifying the switch settings of the RDM, RVM and MLM. The RRB is located in the RDM (see Figures 10-5 and 2-8), for ease of explanation the RDM wiring and switch settings are referenced.

Install the RRB into the RDM by plugging the wire harness onto the RRB board. The revert feature is enabled or disabled by RDM S1, section 6. Set S1, section 6 "Off" to enable the revert feature.

10.3.1 RVM AUDIO AND RS-232 DATA

The Audio and RS-232 Data from the RVM to the MLM need to be routed through the RRB located in the RDM via the rear connector J585.

The Audio In is wired from the RVM, pin 21 (MLM Audio +) or J1, pin 1 on the backplane, to the RRB via J585, pin 10. The Audio Out is wired from the RRB via J585, pin 9 to the MLM at TB1, pin 4 (see Figure 10-1).

The RS-232 Data In is wired from the RVM, pin 23 (MLM Tx Data +) or J1, pin 3 on the back- plane, to the RRB via J585, pin 12. The RS-232 Data Out is wired from the RRB via J585, pin 11, to the MLM at TB1, pin 6 (see Figure 10-1).

10.3.2 BAUD RATE

Verify the baud rate settings for the link in the RVM, RDM and MLM (see Table 10-1).

Use 9600 baud for Direct Link where the RVM, RDM and MLM are all located at the same location (see Table 2-2 and Table 5-2).

Use 2400 baud for Remote Link where either the RVM, RDM or MLM is at a different location.

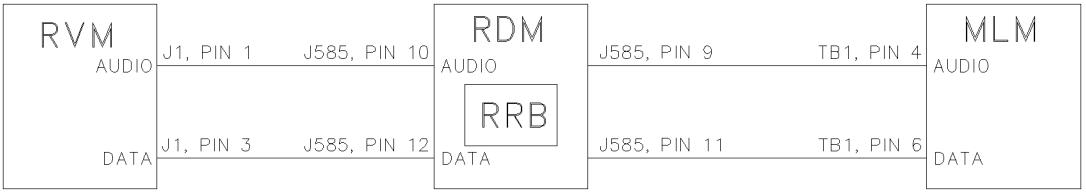


Figure 10-1 RVM TO MLM LINK WIRING

10.4 SWITCH SETTINGS

Table 10-1 BAUD SWITCH SETTINGS

Module Switch-Section	Normal Link (9600 baud)	Remote Link (2400 baud)
RVM S5- sec 6	ON	OFF
RDM S1- sec 5	ON	OFF
MLM S3- sec 6	OFF	ON

10.5 ALIGNMENT

1. With the RVM installed, bring up the channel. Connect a transmission test set to J1, pin 11 on the RRB and record the audio level from the RVM.

   _____

2. With the RVM removed, bring up the channel. Connect the transmission test set to J1, pin 11 and adjust R1 for the same audio level from the RVM.

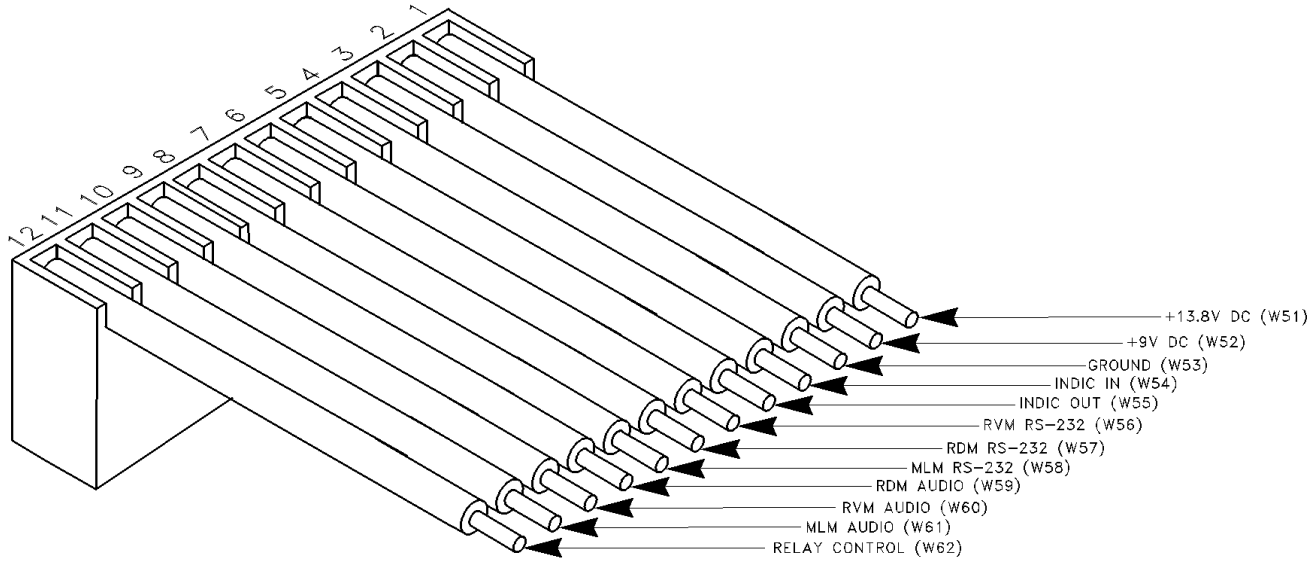


Figure 10-2 REVERT HARNESS

SYMBOL NUMBER	DESCRIPTION	PART NUMBER
	RECEIVER REVERT BOARD (RRB) PART NO. 023-3039-320	
C 001	1000 pF ±5% 50V NPO sub	510-3113-102
C 002	1 µF ±10% 35V submin	510-2575-109
C 003	220 pF ±5% 50V NPO submin	510-3113-221
C 004	1 µF ±10% 35V submin	510-2575-109
CR002	Si diode 1N4448	523-1500-883
CR003	Si diode 1N4448	523-1500-883
K 001	2A DPDT relay submin	567-0024-003
K 002	2A DPDT relay submin	567-0024-003
P 001	12-pin locking header	515-9031-211
PC001	PC board RDM revert board	035-3039-320
Q 001	NPN gen purp 2N3904	576-0003-058
Q 002	NPN gen purp 2N3904	576-0003-058
R 001	50k ohm multi-turn pot	562-0110-503
R 002	10k ohm ±5% 1/4W CF	569-0513-103
R 003	47k ohm ±5% 1/4W CF	569-0513-473
R 004	82k ohm ±5% 1/4W CF	569-0513-823
R 005	100k ohm ±5% 1/4W CF	569-0513-104
R 006	4.7k ohm ±5% 1/4W CF	569-0513-472
R 007	10k ohm ±5% 1/4W CF	569-0513-103
R 008	10k ohm ±5% 1/4W CF	569-0513-103
R 009	10k ohm ±5% 1/4W CF	569-0513-103
U 001	Quad op amp 3303	544-2020-003
	RDM REVERT HARNESS PART NO. 023-3039-321	
J 002	12-pin connector housing	515-9031-241
W 051	22 AWG prebonded	597-7032-209
W 052	22 AWG prebonded	597-7032-209
W 053	22 AWG prebonded	597-7032-209
W 054	22 AWG prebonded	597-7032-209
W 055	22 AWG prebonded	597-7032-209
W 056	22 AWG prebonded	597-7032-209
W 057	22 AWG prebonded	597-7032-209
W 058	22 AWG prebonded	597-7032-209
W 059	22 AWG prebonded	597-7032-209
W 060	22 AWG prebonded	597-7032-209
W 061	22 AWG prebonded	597-7032-209
W 062	22 AWG prebonded	597-7032-209

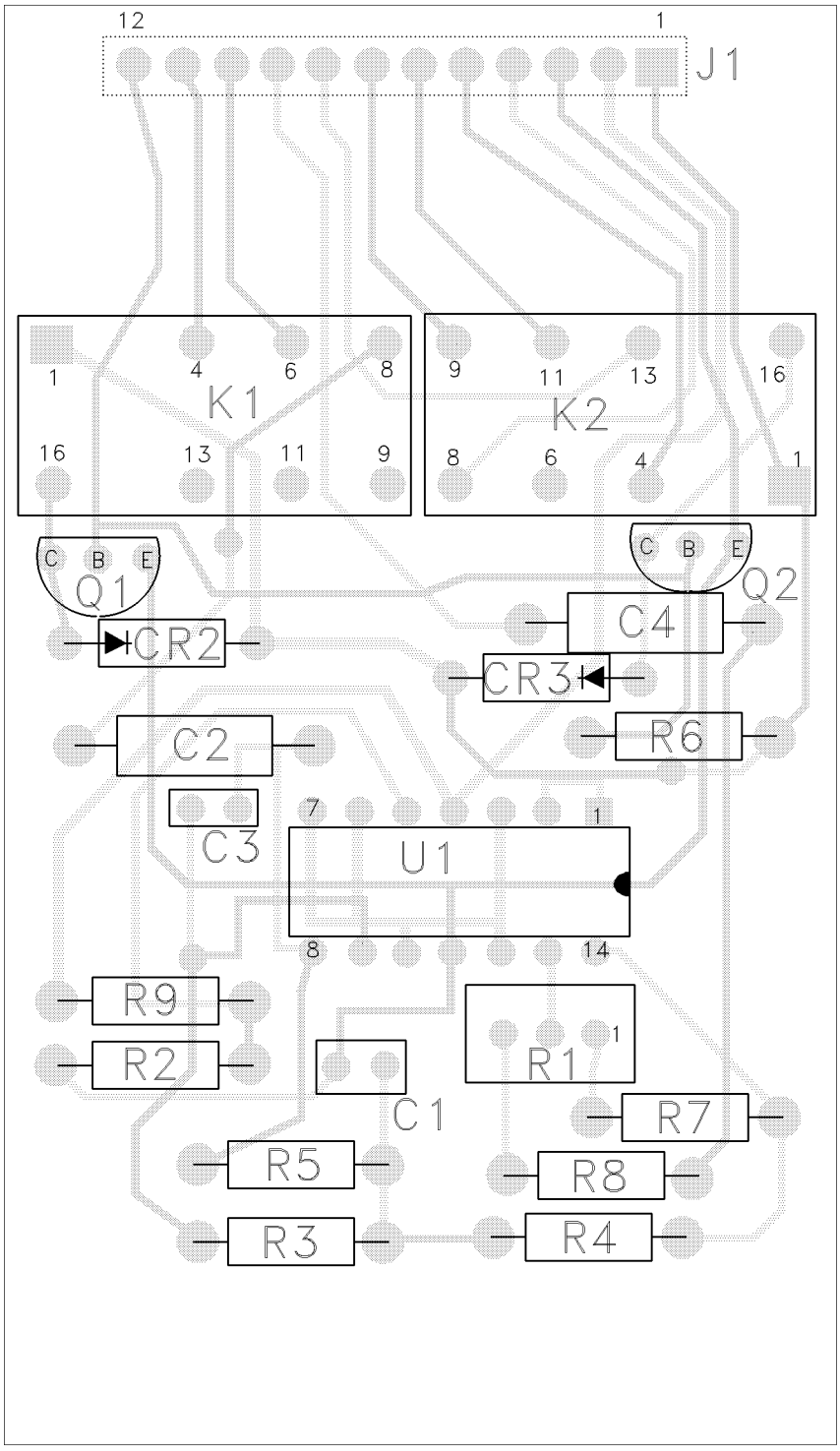


Figure 10-3 RECEIVER REVERT BOARD (COMP SIDE)

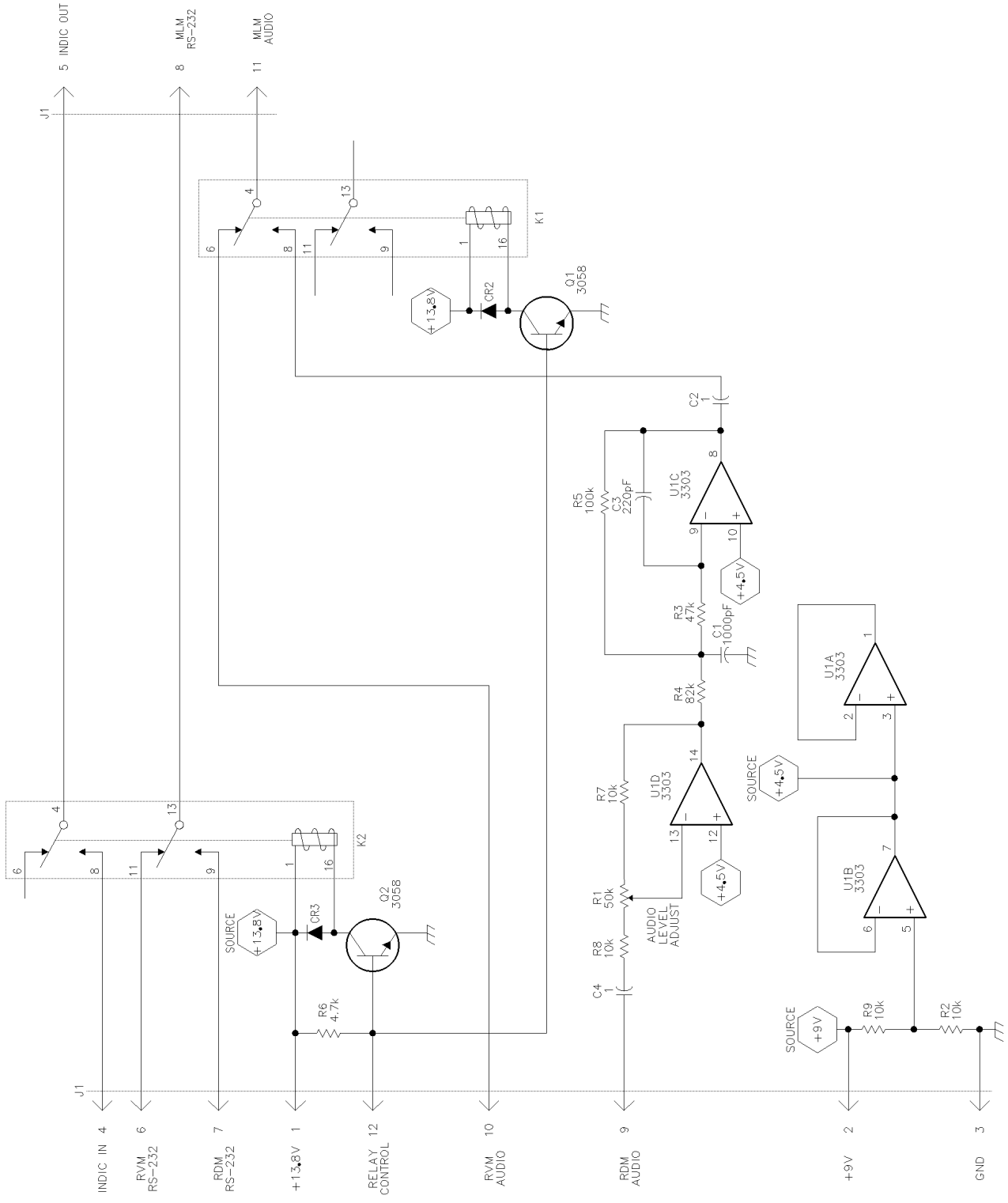


Figure 10-4 RECEIVER REVERT SCHEMATIC

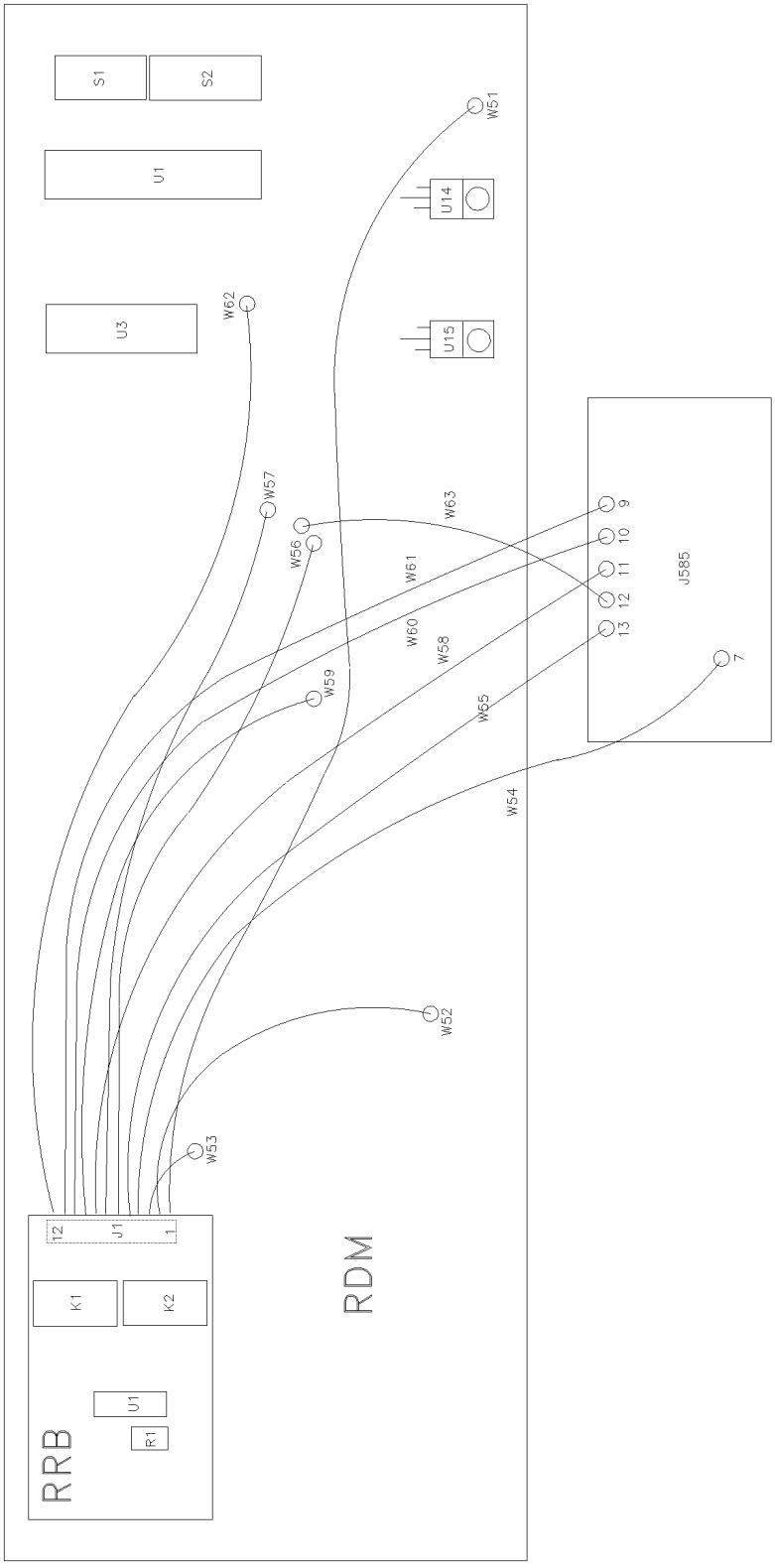


Figure 10-5 RRB INSTALLATION

APPENDIX A 8000 RECEIVER CHANNEL FREQUENCY CHART

NOTE: ON = 1 OFF = 0

			LSB				**RDM**				MSB	LSB				**RVM**				MSB
Channel	FCC	Receive	S2				S6					S7				S5				
Number	Number	Frequency	10	9	8	7	6	5	4	3	2	0	0	2	3	4	0	2	3	4	7	8
1	1	806.0125	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
2	2	806.0375	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1
3	3	806.0625	0	0	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1
4	4	806.0875	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1
5	5	806.1125	0	1	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1
6	6	806.1375	1	0	0	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1
7	7	806.1625	0	0	0	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
8	8	806.1875	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1
9	9	806.2125	0	1	1	0	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1
10	10	806.2375	1	0	1	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1
11	11	806.2625	0	0	1	0	1	1	1	1	1	1	0	0	1	0	1	1	1	1	1	1
12	12	806.2875	1	1	0	0	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1
13	13	806.3125	0	1	0	0	1	1	1	1	1	1	0	1	0	0	1	1	1	1	1	1
14	14	806.3375	1	0	0	0	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1
15	15	806.3625	0	0	0	0	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1
16	16	806.3875	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1
17	17	806.4125	0	1	1	1	0	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1
18	18	806.4375	1	0	1	1	0	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1
19	19	806.4625	0	0	1	1	0	1	1	1	1	1	0	0	1	1	0	1	1	1	1	1
20	20	806.4875	1	1	0	1	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1
21	21	806.5125	0	1	0	1	0	1	1	1	1	1	0	1	0	1	0	1	1	1	1	1
22	22	806.5375	1	0	0	1	0	1	1	1	1	1	1	0	0	1	0	1	1	1	1	1
23	23	806.5625	0	0	0	1	0	1	1	1	1	1	0	0	0	1	0	1	1	1	1	1
24	24	806.5875	1	1	1	0	0	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1
25	25	806.6125	0	1	1	0	0	1	1	1	1	1	0	1	1	0	0	1	1	1	1	1
26	26	806.6375	1	0	1	0	0	1	1	1	1	1	1	0	1	0	0	1	1	1	1	1
27	27	806.6625	0	0	1	0	0	1	1	1	1	1	0	0	1	0	0	1	1	1	1	1
28	28	806.6875	1	1	0	0	0	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1
29	29	806.7125	0	1	0	0	0	1	1	1	1	1	0	1	0	0	0	1	1	1	1	1
30	30	806.7375	1	0	0	0	0	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1
31	31	806.7625	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1
32	32	806.7875	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1
33	33	806.8125	0	1	1	1	1	0	1	1	1	1	0	1	1	1	1	0	1	1	1	1
34	34	806.8375	1	0	1	1	1	0	1	1	1	1	1	0	1	1	1	0	1	1	1	1
35	35	806.8625	0	0	1	1	1	0	1	1	1	1	0	0	1	1	1	0	1	1	1	1
36	36	806.8875	1	1	0	1	1	0	1	1	1	1	1	1	0	1	1	0	1	1	1	1
37	37	806.9125	0	1	0	1	1	0	1	1	1	1	0	1	0	1	1	0	1	1	1	1
38	38	806.9375	1	0	0	1	1	0	1	1	1	1	1	0	0	1	1	0	1	1	1	1
39	39	806.9625	0	0	0	1	1	0	1	1	1	1	0	0	0	1	1	0	1	1	1	1
40	40	806.9875	1	1	1	0	1	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1

NOTE: ON = 1, OFF = 0

			LSB				**RDM**				MSB	LSB				**RVM**				MSB
Channel	FCC	Receive	S2				S6							S7				S5			
Number	Number	Frequency	10	9	8	7	6	5	4	3	2	1		1	2	3	4	1	2	3	4	7	8
41	41	807.0125	0	1	1	0	1	0	1	1	1	1		0	1	1	0	1	0	1	1	1	1
42	42	807.0375	1	0	1	0	1	0	1	1	1	1		1	0	1	0	1	0	1	1	1	1
43	43	807.0625	0	0	1	0	1	0	1	1	1	1		0	0	1	0	1	0	1	1	1	1
44	44	807.0875	1	1	0	0	1	0	1	1	1	1		1	1	0	0	1	0	1	1	1	1
45	45	807.1125	0	1	0	0	1	0	1	1	1	1		0	1	0	0	1	0	1	1	1	1
46	46	807.1375	1	0	0	0	1	0	1	1	1	1		1	0	0	0	1	0	1	1	1	1
47	47	807.1625	0	0	0	0	1	0	1	1	1	1		0	0	0	0	1	0	1	1	1	1
48	48	807.1875	1	1	1	1	0	0	1	1	1	1		1	1	1	1	0	0	1	1	1	1
49	49	807.2125	0	1	1	1	0	0	1	1	1	1		0	1	1	1	0	0	1	1	1	1
50	50	807.2375	1	0	1	1	0	0	1	1	1	1		1	0	1	1	0	0	1	1	1	1
51	51	807.2625	0	0	1	1	0	0	1	1	1	1		0	0	1	1	0	0	1	1	1	1
52	52	807.2875	1	1	0	1	0	0	1	1	1	1		1	1	0	1	0	0	1	1	1	1
53	53	807.3125	0	1	0	1	0	0	1	1	1	1		0	1	0	1	0	0	1	1	1	1
54	54	807.3375	1	0	0	1	0	0	1	1	1	1		1	0	0	1	0	0	1	1	1	1
55	55	807.3625	0	0	0	1	0	0	1	1	1	1		0	0	0	1	0	0	1	1	1	1
56	56	807.3875	1	1	1	0	0	0	1	1	1	1		1	1	1	0	0	0	1	1	1	1
57	57	807.4125	0	1	1	0	0	0	1	1	1	1		0	1	1	0	0	0	1	1	1	1
58	58	807.4375	1	0	1	0	0	0	1	1	1	1		1	0	1	0	0	0	1	1	1	1
59	59	807.4625	0	0	1	0	0	0	1	1	1	1		0	0	1	0	0	0	1	1	1	1
60	60	807.4875	1	1	0	0	0	0	1	1	1	1		1	1	0	0	0	0	1	1	1	1
61	61	807.5125	0	1	0	0	0	0	1	1	1	1		0	1	0	0	0	0	1	1	1	1
62	62	807.5375	1	0	0	0	0	0	1	1	1	1		1	0	0	0	0	0	1	1	1	1
63	63	807.5625	0	0	0	0	0	0	1	1	1	1		0	0	0	0	0	0	1	1	1	1
64	64	807.5875	1	1	1	1	1	1	0	1	1	1		1	1	1	1	1	1	0	1	1	1
65	65	807.6125	0	1	1	1	1	1	0	1	1	1		0	1	1	1	1	1	0	1	1	1
66	66	807.6375	1	0	1	1	1	1	0	1	1	1		1	0	1	1	1	1	0	1	1	1
67	67	807.6625	0	0	1	1	1	1	0	1	1	1		0	0	1	1	1	1	0	1	1	1
68	68	807.6875	1	1	0	1	1	1	0	1	1	1		1	1	0	1	1	1	0	1	1	1
69	69	807.7125	0	1	0	1	1	1	0	1	1	1		0	1	0	1	1	1	0	1	1	1
70	70	807.7375	1	0	0	1	1	1	0	1	1	1		1	0	0	1	1	1	0	1	1	1
71	71	807.7625	0	0	0	1	1	1	0	1	1	1		0	0	0	1	1	1	0	1	1	1
72	72	807.7875	1	1	1	0	1	1	0	1	1	1		1	1	1	0	1	1	0	1	1	1
73	73	807.8125	0	1	1	0	1	1	0	1	1	1		0	1	1	0	1	1	0	1	1	1
74	74	807.8375	1	0	1	0	1	1	0	1	1	1		1	0	1	0	1	1	0	1	1	1
75	75	807.8625	0	0	1	0	1	1	0	1	1	1		0	0	1	0	1	1	0	1	1	1
76	76	807.8875	1	1	0	0	1	1	0	1	1	1		1	1	0	0	1	1	0	1	1	1
77	77	807.9125	0	1	0	0	1	1	0	1	1	1		0	1	0	0	1	1	0	1	1	1
78	78	807.9375	1	0	0	0	1	1	0	1	1	1		1	0	0	0	1	1	0	1	1	1
79	79	807.9625	0	0	0	0	1	1	0	1	1	1		0	0	0	0	1	1	0	1	1	1
80	80	807.9875	1	1	1	1	0	1	0	1	1	1		1	1	1	1	0	1	0	1	1	1
81	81	808.0125	0	1	1	1	0	1	0	1	1	1		0	1	1	1	0	1	0	1	1	1
82	82	808.0375	1	0	1	1	0	1	0	1	1	1		1	0	1	1	0	1	0	1	1	1
83	83	808.0625	0	0	1	1	0	1	0	1	1	1		0	0	1	1	0	1	0	1	1	1
84	84	808.0875	1	1	0	1	0	1	0	1	1	1		1	1	0	1	0	1	0	1	1	1
85	85	808.1125	0	1	0	1	0	1	0	1	1	1		0	1	0	1	0	1	0	1	1	1
86	86	808.1375	1	0	0	1	0	1	0	1	1	1		1	0	0	1	0	1	0	1	1	1

NOTE: ON = 1, OFF = 0

			LSB					**RDM**			MSB	LSB					**RVM**			MSB
Channel	FCC	Receive	S2					S6							S7				S5	
Number	Number	Frequency	10	9	8	7	6	5	4	3	2	1	1	2	3	4	1	2	3	4	7	8
87	87	808.1625	0	0	0	1	0	1	0	1	1	1	0	0	0	1	0	1	0	1	1	1
88	88	808.1875	1	1	1	0	0	1	0	1	1	1	1	1	1	0	0	1	0	1	1	1
89	89	808.2125	0	1	1	0	0	1	0	1	1	1	0	1	1	0	0	1	0	1	1	1
90	90	808.2375	1	0	1	0	0	1	0	1	1	1	1	0	1	0	0	1	0	1	1	1
91	91	808.2625	0	0	1	0	0	1	0	1	1	1	0	0	1	0	0	1	0	1	1	1
92	92	808.2875	1	1	0	0	0	1	0	1	1	1	1	1	0	0	0	1	0	1	1	1
93	93	808.3125	0	1	0	0	0	1	0	1	1	1	0	1	0	0	0	1	0	1	1	1
94	94	808.3375	1	0	0	0	0	1	0	1	1	1	1	0	0	0	0	1	0	1	1	1
95	95	808.3625	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	1	0	1	1	1
96	96	808.3875	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	0	0	1	1	1
97	97	808.4125	0	1	1	1	1	0	0	1	1	1	0	1	1	1	1	0	0	1	1	1
98	98	808.4375	1	0	1	1	1	0	0	1	1	1	1	0	1	1	1	0	0	1	1	1
99	99	808.4625	0	0	1	1	1	0	0	1	1	1	0	0	1	1	1	0	0	1	1	1
100	100	808.4875	1	1	0	1	1	0	0	1	1	1	1	1	0	1	1	0	0	1	1	1
101	101	808.5125	0	1	0	1	1	0	0	1	1	1	0	1	0	1	1	0	0	1	1	1
111	111	808.5375	1	0	0	1	1	0	0	1	1	1	1	0	0	1	1	0	0	1	1	1
103	103	808.5625	0	0	0	1	1	0	0	1	1	1	0	0	0	1	1	0	0	1	1	1
104	104	808.5875	1	1	1	0	1	0	0	1	1	1	1	1	1	0	1	0	0	1	1	1
105	105	808.6125	0	1	1	0	1	0	0	1	1	1	0	1	1	0	1	0	0	1	1	1
106	106	808.6375	1	0	1	0	1	0	0	1	1	1	1	0	1	0	1	0	0	1	1	1
107	107	808.6625	0	0	1	0	1	0	0	1	1	1	0	0	1	0	1	0	0	1	1	1
108	108	808.6875	1	1	0	0	1	0	0	1	1	1	1	1	0	0	1	0	0	1	1	1
109	109	808.7125	0	1	0	0	1	0	0	1	1	1	0	1	0	0	1	0	0	1	1	1
110	110	808.7375	1	0	0	0	1	0	0	1	1	1	1	0	0	0	1	0	0	1	1	1
111	111	808.7625	0	0	0	0	1	0	0	1	1	1	0	0	0	0	1	0	0	1	1	1
112	112	808.7875	1	1	1	1	0	0	0	1	1	1	1	1	1	1	0	0	0	1	1	1
113	113	808.8125	0	1	1	1	0	0	0	1	1	1	0	1	1	1	0	0	0	1	1	1
114	114	808.8375	1	0	1	1	0	0	0	1	1	1	1	0	1	1	0	0	0	1	1	1
115	115	808.8625	0	0	1	1	0	0	0	1	1	1	0	0	1	1	0	0	0	1	1	1
116	116	808.8875	1	1	0	1	0	0	0	1	1	1	1	1	0	1	0	0	0	1	1	1
117	117	808.9125	0	1	0	1	0	0	0	1	1	1	0	1	0	1	0	0	0	1	1	1
118	118	808.9375	1	0	0	1	0	0	0	1	1	1	1	0	0	1	0	0	0	1	1	1
119	119	808.9625	0	0	0	1	0	0	0	1	1	1	0	0	0	1	0	0	0	1	1	1
110	110	808.9875	1	1	1	0	0	0	0	1	1	1	1	1	1	0	0	0	0	1	1	1
111	111	809.0125	0	1	1	0	0	0	0	1	1	1	0	1	1	0	0	0	0	1	1	1
112	112	809.0375	1	0	1	0	0	0	0	1	1	1	1	0	1	0	0	0	0	1	1	1
113	113	809.0625	0	0	1	0	0	0	0	1	1	1	0	0	1	0	0	0	0	1	1	1
114	114	809.0875	1	1	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	1	1	1
115	115	809.1125	0	1	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	1	1	1
116	116	809.1375	1	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	1	1	1
117	117	809.1625	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	1	1
118	118	809.1875	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1
119	119	809.2125	0	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	0	1	1
130	130	809.2375	1	0	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	0	1	1
131	131	809.2625	0	0	1	1	1	1	1	0	1	1	0	0	1	1	1	1	1	0	1	1
132	132	809.2875	1	1	0	1	1	1	1	0	1	1	1	1	0	1	1	1	1	0	1	1

NOTE: ON = 1, OFF = 0

			LSB				**RDM**				MSB	LSB				**RVM**				MSB
Channel	FCC	Receive	S2				S6							S7				S5			
Number	Number	Frequency	10	9	8	7	6	5	4	3	2	1		1	2	3	4	1	2	3	4	7	8
133	133	809.3125	0	1	0	1	1	1	1	0	1	1		0	1	0	1	1	1	1	0	1	1
134	134	809.3375	1	0	0	1	1	1	1	0	1	1		1	0	0	1	1	1	1	0	1	1
135	135	809.3625	0	0	0	1	1	1	1	0	1	1		0	0	0	1	1	1	1	0	1	1
136	136	809.3875	1	1	1	0	1	1	1	0	1	1		1	1	1	0	1	1	1	0	1	1
137	137	809.4125	0	1	1	0	1	1	1	0	1	1		0	1	1	0	1	1	1	0	1	1
138	138	809.4375	1	0	1	0	1	1	1	0	1	1		1	0	1	0	1	1	1	0	1	1
139	139	809.4625	0	0	1	0	1	1	1	0	1	1		0	0	1	0	1	1	1	0	1	1
140	140	809.4875	1	1	0	0	1	1	1	0	1	1		1	1	0	0	1	1	1	0	1	1
141	141	809.5125	0	1	0	0	1	1	1	0	1	1		0	1	0	0	1	1	1	0	1	1
142	142	809.5375	1	0	0	0	1	1	1	0	1	1		1	0	0	0	1	1	1	0	1	1
143	143	809.5625	0	0	0	0	1	1	1	0	1	1		0	0	0	0	1	1	1	0	1	1
144	144	809.5875	1	1	1	1	0	1	1	0	1	1		1	1	1	1	0	1	1	0	1	1
145	145	809.6125	0	1	1	1	0	1	1	0	1	1		0	1	1	1	0	1	1	0	1	1
146	146	809.6375	1	0	1	1	0	1	1	0	1	1		1	0	1	1	0	1	1	0	1	1
147	147	809.6625	0	0	1	1	0	1	1	0	1	1		0	0	1	1	0	1	1	0	1	1
148	148	809.6875	1	1	0	1	0	1	1	0	1	1		1	1	0	1	0	1	1	0	1	1
149	149	809.7125	0	1	0	1	0	1	1	0	1	1		0	1	0	1	0	1	1	0	1	1
150	150	809.7375	1	0	0	1	0	1	1	0	1	1		1	0	0	1	0	1	1	0	1	1
151	151	809.7625	0	0	0	1	0	1	1	0	1	1		0	0	0	1	0	1	1	0	1	1
152	152	809.7875	1	1	1	0	0	1	1	0	1	1		1	1	1	0	0	1	1	0	1	1
153	153	809.8125	0	1	1	0	0	1	1	0	1	1		0	1	1	0	0	1	1	0	1	1
154	154	809.8375	1	0	1	0	0	1	1	0	1	1		1	0	1	0	0	1	1	0	1	1
155	155	809.8625	0	0	1	0	0	1	1	0	1	1		0	0	1	0	0	1	1	0	1	1
156	156	809.8875	1	1	0	0	0	1	1	0	1	1		1	1	0	0	0	1	1	0	1	1
157	157	809.9125	0	1	0	0	0	1	1	0	1	1		0	1	0	0	0	1	1	0	1	1
158	158	809.9375	1	0	0	0	0	1	1	0	1	1		1	0	0	0	0	1	1	0	1	1
159	159	809.9625	0	0	0	0	0	1	1	0	1	1		0	0	0	0	0	1	1	0	1	1
160	160	809.9875	1	1	1	1	1	0	1	0	1	1		1	1	1	1	1	0	1	0	1	1
161	161	810.0125	0	1	1	1	1	0	1	0	1	1		0	1	1	1	1	0	1	0	1	1
162	162	810.0375	1	0	1	1	1	0	1	0	1	1		1	0	1	1	1	0	1	0	1	1
163	163	810.0625	0	0	1	1	1	0	1	0	1	1		0	0	1	1	1	0	1	0	1	1
064	164	810.0875	1	1	0	1	1	0	1	0	1	1		1	1	0	1	1	0	1	0	1	1
165	165	810.1125	0	1	0	1	1	0	1	0	1	1		0	1	0	1	1	0	1	0	1	1
166	166	810.1375	1	0	0	1	1	0	1	0	1	1		1	0	0	1	1	0	1	0	1	1
167	167	810.1625	0	0	0	1	1	0	1	0	1	1		0	0	0	1	1	0	1	0	1	1
168	168	810.1875	1	1	1	0	1	0	1	0	1	1		1	1	1	0	1	0	1	0	1	1
169	169	810.2125	0	1	1	0	1	0	1	0	1	1		0	1	1	0	1	0	1	0	1	1
170	170	810.2375	1	0	1	0	1	0	1	0	1	1		1	0	1	0	1	0	1	0	1	1
171	171	810.2625	0	0	1	0	1	0	1	0	1	1		0	0	1	0	1	0	1	0	1	1
172	172	810.2875	1	1	0	0	1	0	1	0	1	1		1	1	0	0	1	0	1	0	1	1
173	173	810.3125	0	1	0	0	1	0	1	0	1	1		0	1	0	0	1	0	1	0	1	1
174	174	810.3375	1	0	0	0	1	0	1	0	1	1		1	0	0	0	1	0	1	0	1	1
175	175	810.3625	0	0	0	0	1	0	1	0	1	1		0	0	0	0	1	0	1	0	1	1
176	176	810.3875	1	1	1	1	0	0	1	0	1	1		1	1	1	1	0	0	1	0	1	1
177	177	810.4125	0	1	1	1	0	0	1	0	1	1		0	1	1	1	0	0	1	0	1	1
178	178	810.4375	1	0	1	1	0	0	1	0	1	1		1	0	1	1	0	0	1	0	1	1

NOTE: ON = 1, OFF = 0

			LSB				**RDM**				MSB	LSB				**RVM**				MSB
Channel	FCC	Receive	S2				S6					S7				S5				
Number	Number	Frequency	10	9	8	7	6	5	4	3	2 1	1	2	3	4	1	2	3	4	7 8
179	179	810.4625	0	0	1	1	0	0	1	0	1 1	0	0	1	1	0	0	1	0	1 1
180	180	810.4875	1	1	0	1	0	0	1	0	1 1	1	1	0	1	0	0	1	0	1 1
181	181	810.5125	0	1	0	1	0	0	1	0	1 1	0	1	0	1	0	0	1	0	1 1
182	182	810.5375	1	0	0	1	0	0	1	0	1 1	1	0	0	1	0	0	1	0	1 1
183	183	810.5625	0	0	0	1	0	0	1	0	1 1	0	0	0	1	0	0	1	0	1 1
184	184	810.5875	1	1	1	0	0	0	1	0	1 1	1	1	1	0	0	0	1	0	1 1
185	185	810.6125	0	1	1	0	0	0	1	0	1 1	0	1	1	0	0	0	1	0	1 1
186	186	810.6375	1	0	1	0	0	0	1	0	1 1	1	0	1	0	0	0	1	0	1 1
187	187	810.6625	0	0	1	0	0	0	1	0	1 1	0	0	1	0	0	0	1	0	1 1
188	188	810.6875	1	1	0	0	0	0	1	0	1 1	1	1	0	0	0	0	1	0	1 1
189	189	810.7125	0	1	0	0	0	0	1	0	1 1	0	1	0	0	0	0	1	0	1 1
190	190	810.7375	1	0	0	0	0	0	1	0	1 1	1	0	0	0	0	0	1	0	1 1
191	191	810.7625	0	0	0	0	0	0	1	0	1 1	0	0	0	0	0	0	1	0	1 1
192	192	810.7875	1	1	1	1	1	1	0	0	1 1	1	1	1	1	1	1	0	0	1 1
193	193	810.8125	0	1	1	1	1	1	0	0	1 1	0	1	1	1	1	1	0	0	1 1
194	194	810.8375	1	0	1	1	1	1	0	0	1 1	1	0	1	1	1	1	0	0	1 1
195	195	810.8625	0	0	1	1	1	1	0	0	1 1	0	0	1	1	1	1	0	0	1 1
196	196	810.8875	1	1	0	1	1	1	0	0	1 1	1	1	0	1	1	1	0	0	1 1
197	197	810.9125	0	1	0	1	1	1	0	0	1 1	0	1	0	1	1	1	0	0	1 1
198	198	810.9375	1	0	0	1	1	1	0	0	1 1	1	0	0	1	1	1	0	0	1 1
199	199	810.9625	0	0	0	1	1	1	0	0	1 1	0	0	0	1	1	1	0	0	1 1
200	200	810.9875	1	1	1	0	1	1	0	0	1 1	1	1	1	0	1	1	0	0	1 1
201	201	811.0125	0	1	1	0	1	1	0	0	1 1	0	1	1	0	1	1	0	0	1 1
202	202	811.0375	1	0	1	0	1	1	0	0	1 1	1	0	1	0	1	1	0	0	1 1
203	203	811.0625	0	0	1	0	1	1	0	0	1 1	0	0	1	0	1	1	0	0	1 1
204	204	811.0875	1	1	0	0	1	1	0	0	1 1	1	1	0	0	1	1	0	0	1 1
205	205	811.1215	0	1	0	0	1	1	0	0	1 1	0	1	0	0	1	1	0	0	1 1
206	206	811.1375	1	0	0	0	1	1	0	0	1 1	1	0	0	0	1	1	0	0	1 1
207	207	811.1625	0	0	0	0	1	1	0	0	1 1	0	0	0	0	1	1	0	0	1 1
208	208	811.1875	1	1	1	1	0	1	0	0	1 1	1	1	1	1	0	1	0	0	1 1
209	209	811.2125	0	1	1	1	0	1	0	0	1 1	0	1	1	1	0	1	0	0	1 1
210	210	811.2375	1	0	1	1	0	1	0	0	1 1	1	0	1	1	0	1	0	0	1 1
211	211	811.2625	0	0	1	1	0	1	0	0	1 1	0	0	1	1	0	1	0	0	1 1
212	212	811.2875	1	1	0	1	0	1	0	0	1 1	1	1	0	1	0	1	0	0	1 1
213	213	811.3125	0	1	0	1	0	1	0	0	1 1	0	1	0	1	0	1	0	0	1 1
214	214	811.3375	1	0	0	1	0	1	0	0	1 1	1	0	0	1	0	1	0	0	1 1
215	215	811.3625	0	0	0	1	0	1	0	0	1 1	0	0	0	1	0	1	0	0	1 1
216	216	811.3875	1	1	1	0	0	1	0	0	1 1	1	1	1	0	0	1	0	0	1 1
217	217	811.4125	0	1	1	0	0	1	0	0	1 1	0	1	1	0	0	1	0	0	1 1
218	218	811.4375	1	0	1	0	0	1	0	0	1 1	1	0	1	0	0	1	0	0	1 1
219	219	811.4625	0	0	1	0	0	1	0	0	1 1	0	0	1	0	0	1	0	0	1 1
220	220	811.4875	1	1	0	0	0	1	0	0	1 1	1	1	0	0	0	1	0	0	1 1
221	221	811.5125	0	1	0	0	0	1	0	0	1 1	0	1	0	0	0	1	0	0	1 1
222	222	811.5375	1	0	0	0	0	1	0	0	1 1	1	0	0	0	0	1	0	0	1 1
223	223	811.5625	0	0	0	0	0	1	0	0	1 1	0	0	0	0	0	1	0	0	1 1
224	224	811.5875	1	1	1	1	1	0	0	0	1 1	1	1	1	1	1	0	0	0	1 1

NOTE: ON = 1, OFF = 0

			LSB				**RDM**				MSB		LSB				**RVM**				MSB	
Channel	FCC	Receive	S2				S6						S7				S5					
Number	Number	Frequency	10	9	8	7	6	5	4	3	2	1	1	2	3	4	1	2	3	4	7	8
225	225	811.6125	0	1	1	1	1	0	0	0	1	1	0	1	1	1	1	0	0	0	1	1
226	226	811.6375	1	0	1	1	1	0	0	0	1	1	1	0	1	1	1	0	0	0	1	1
227	227	811.6625	0	0	1	1	1	0	0	0	1	1	0	0	1	1	1	0	0	0	1	1
228	228	811.6875	1	1	0	1	1	0	0	0	1	1	1	1	0	1	1	0	0	0	1	1
229	229	811.7125	0	1	0	1	1	0	0	0	1	1	0	1	0	1	1	0	0	0	1	1
230	230	811.7375	1	0	0	1	1	0	0	0	1	1	1	0	0	1	1	0	0	0	1	1
231	231	811.7625	0	0	0	1	1	0	0	0	1	1	0	0	0	1	1	0	0	0	1	1
232	232	811.7875	1	1	1	0	1	0	0	0	1	1	1	1	1	0	1	0	0	0	1	1
233	233	811.8125	0	1	1	0	1	0	0	0	1	1	0	1	1	0	1	0	0	0	1	1
234	234	811.8375	1	0	1	0	1	0	0	0	1	1	1	0	1	0	1	0	0	0	1	1
235	235	811.8625	0	0	1	0	1	0	0	0	1	1	0	0	1	0	1	0	0	0	1	1
236	236	811.8875	1	1	0	0	1	0	0	0	1	1	1	1	0	0	1	0	0	0	1	1
237	237	811.9125	0	1	0	0	1	0	0	0	1	1	0	1	0	0	1	0	0	0	1	1
238	238	811.9375	1	0	0	0	1	0	0	0	1	1	1	0	0	0	1	0	0	0	1	1
239	239	811.9625	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	1	1
240	240	811.9875	1	1	1	1	0	0	0	0	1	1	1	1	1	1	0	0	0	0	1	1
241	241	812.0125	0	1	1	1	0	0	0	0	1	1	0	1	1	1	0	0	0	0	1	1
242	242	812.0375	1	0	1	1	0	0	0	0	1	1	1	0	1	1	0	0	0	0	1	1
243	243	812.0625	0	0	1	1	0	0	0	0	1	1	0	0	1	1	0	0	0	0	1	1
244	244	812.0875	1	1	0	1	0	0	0	0	1	1	1	1	0	1	0	0	0	0	1	1
245	245	812.1215	0	1	0	1	0	0	0	0	1	1	0	1	0	1	0	0	0	0	1	1
246	246	812.1375	1	0	0	1	0	0	0	0	1	1	1	0	0	1	0	0	0	0	1	1
247	247	812.1625	0	0	0	1	0	0	0	0	1	1	0	0	0	1	0	0	0	0	1	1
248	248	812.1875	1	1	1	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	1	1
249	249	812.2125	0	1	1	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	1	1
250	250	812.2375	1	0	1	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	1	1
251	251	812.2625	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1
252	252	812.2875	1	1	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	1	1
253	253	812.3125	0	1	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	1	1
254	254	812.3375	1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	1
255	255	812.3625	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
256	256	812.3875	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1
257	257	812.4125	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	0	1
258	258	812.4375	1	0	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	0	1
259	259	812.4625	0	0	1	1	1	1	1	1	0	1	0	0	1	1	1	1	1	1	0	1
260	260	812.4875	1	1	0	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	0	1
261	261	812.5125	0	1	0	1	1	1	1	1	0	1	0	1	0	1	1	1	1	1	0	1
262	262	812.5375	1	0	0	1	1	1	1	1	0	1	1	0	0	1	1	1	1	1	0	1
263	263	812.5625	0	0	0	1	1	1	1	1	0	1	0	0	0	1	1	1	1	1	0	1
264	264	812.5875	1	1	1	0	1	1	1	1	0	1	1	1	1	0	1	1	1	1	0	1
265	265	812.6125	0	1	1	0	1	1	1	1	0	1	0	1	1	0	1	1	1	1	0	1
266	266	812.6375	1	0	1	0	1	1	1	1	0	1	1	0	1	0	1	1	1	1	0	1
267	267	812.6625	0	0	1	0	1	1	1	1	0	1	0	0	1	0	1	1	1	1	0	1
268	268	812.6875	1	1	0	0	1	1	1	1	0	1	1	1	0	0	1	1	1	1	0	1
269	269	812.7125	0	1	0	0	1	1	1	1	0	1	0	1	0	0	1	1	1	1	0	1
270	270	812.7375	1	0	0	0	1	1	1	1	0	1	1	0	0	0	1	1	1	1	0	1

NOTE: ON = 1, OFF = 0

			LSB					**RDM**			MSB	LSB					**RVM**			MSB
Channel	FCC	Receive	S2					S6					S7				S5			
Number	Number	Frequency	10	9	8	7	6	5	4	3	2	1	1	2	3	4	1	2	3	4	7	8
271	271	812.7625	0	0	0	0	1	1	1	1	0	1	0	0	0	0	1	1	1	1	0	1
272	272	812.7875	1	1	1	1	0	1	1	1	0	1	1	1	1	1	0	1	1	1	0	1
273	273	812.8125	0	1	1	1	0	1	1	1	0	1	0	1	1	1	0	1	1	1	0	1
274	274	812.8375	1	0	1	1	0	1	1	1	0	1	1	0	1	1	0	1	1	1	0	1
275	275	812.8625	0	0	1	1	0	1	1	1	0	1	0	0	1	1	0	1	1	1	0	1
276	276	812.8875	1	1	0	1	0	1	1	1	0	1	1	1	0	1	0	1	1	1	0	1
277	277	812.9125	0	1	0	1	0	1	1	1	0	1	0	1	0	1	0	1	1	1	0	1
278	278	812.9375	1	0	0	1	0	1	1	1	0	1	1	0	0	1	0	1	1	1	0	1
279	279	812.9625	0	0	0	1	0	1	1	1	0	1	0	0	0	1	0	1	1	1	0	1
280	280	812.9875	1	1	1	0	0	1	1	1	0	1	1	1	1	0	0	1	1	1	0	1
281	281	813.0125	0	1	1	0	0	1	1	1	0	1	0	1	1	0	0	1	1	1	0	1
282	282	813.0375	1	0	1	0	0	1	1	1	0	1	1	0	1	0	0	1	1	1	0	1
283	283	813.0625	0	0	1	0	0	1	1	1	0	1	0	0	1	0	0	1	1	1	0	1
284	284	813.0875	1	1	0	0	0	1	1	1	0	1	1	1	0	0	0	1	1	1	0	1
285	285	813.1125	0	1	0	0	0	1	1	1	0	1	0	1	0	0	0	1	1	1	0	1
286	286	813.1375	1	0	0	0	0	1	1	1	0	1	1	0	0	0	0	1	1	1	0	1
287	287	813.1625	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	1	1	1	0	1
288	288	813.1875	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	0	1	1	0	1
289	289	813.2125	0	1	1	1	1	0	1	1	0	1	0	1	1	1	1	0	1	1	0	1
290	290	813.2375	1	0	1	1	1	0	1	1	0	1	1	0	1	1	1	0	1	1	0	1
291	291	813.2625	0	0	1	1	1	0	1	1	0	1	0	0	1	1	1	0	1	1	0	1
292	292	813.2875	1	1	0	1	1	0	1	1	0	1	1	1	0	1	1	0	1	1	0	1
293	293	813.3125	0	1	0	1	1	0	1	1	0	1	0	1	0	1	1	0	1	1	0	1
294	294	813.3375	1	0	0	1	1	0	1	1	0	1	1	0	0	1	1	0	1	1	0	1
295	295	813.3625	0	0	0	1	1	0	1	1	0	1	0	0	0	1	1	0	1	1	0	1
296	296	813.3875	1	1	1	0	1	0	1	1	0	1	1	1	1	0	1	0	1	1	0	1
297	297	813.4125	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1
298	298	813.4375	1	0	1	0	1	0	1	1	0	1	1	0	1	0	1	0	1	1	0	1
299	299	813.4625	0	0	1	0	1	0	1	1	0	1	0	0	1	0	1	0	1	1	0	1
300	300	813.4875	1	1	0	0	1	0	1	1	0	1	1	1	0	0	1	0	1	1	0	1
301	301	813.5125	0	1	0	0	1	0	1	1	0	1	0	1	0	0	1	0	1	1	0	1
302	302	813.5375	1	0	0	0	1	0	1	1	0	1	1	0	0	0	1	0	1	1	0	1
303	303	813.5625	0	0	0	0	1	0	1	1	0	1	0	0	0	0	1	0	1	1	0	1
304	304	813.5875	1	1	1	1	0	0	1	1	0	1	1	1	1	1	0	0	1	1	0	1
305	305	813.6125	0	1	1	1	0	0	1	1	0	1	0	1	1	1	0	0	1	1	0	1
306	306	813.6375	1	0	1	1	0	0	1	1	0	1	1	0	1	1	0	0	1	1	0	1
307	307	813.6625	0	0	1	1	0	0	1	1	0	1	0	0	1	1	0	0	1	1	0	1
308	308	813.6875	1	1	0	1	0	0	1	1	0	1	1	1	0	1	0	0	1	1	0	1
309	309	813.7125	0	1	0	1	0	0	1	1	0	1	0	1	0	1	0	0	1	1	0	1
311	311	813.7375	1	0	0	1	0	0	1	1	0	1	1	0	0	1	0	0	1	1	0	1
310	310	813.7625	0	0	0	1	0	0	1	1	0	1	0	0	0	1	0	0	1	1	0	1
312	312	813.7875	1	1	1	0	0	0	1	1	0	1	1	1	1	0	0	0	1	1	0	1
313	313	813.8125	0	1	1	0	0	0	1	1	0	1	0	1	1	0	0	0	1	1	0	1
314	314	813.8375	1	0	1	0	0	0	1	1	0	1	1	0	1	0	0	0	1	1	0	1
315	315	813.8625	0	0	1	0	0	0	1	1	0	1	0	0	1	0	0	0	1	1	0	1
316	316	813.8875	1	1	0	0	0	0	1	1	0	1	1	1	0	0	0	0	1	1	0	1

NOTE: ON = 1, OFF = 0

			LSB				**RDM**				MSB		LSB				**RVM**				MSB	
Channel	FCC	Receive	S2				S6						S7				S5					
Number	Number	Frequency	10	9	8	7	6	5	4	3	2	1	1	2	3	4	1	2	3	4	7	8
317	317	813.9125	0	1	0	0	0	0	1	1	0	1	0	1	0	0	0	0	1	1	0	1
318	318	813.9375	1	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	1	1	0	1
319	319	813.9625	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	1	1	0	1
320	320	813.9875	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	0	1	0	1
321	321	814.0125	0	1	1	1	1	1	0	1	0	1	0	1	1	1	1	1	0	1	0	1
322	322	814.0375	1	0	1	1	1	1	0	1	0	1	1	0	1	1	1	1	0	1	0	1
323	323	814.0625	0	0	1	1	1	1	0	1	0	1	0	0	1	1	1	1	0	1	0	1
324	324	814.0875	1	1	0	1	1	1	0	1	0	1	1	1	0	1	1	1	0	1	0	1
325	325	814.1125	0	1	0	1	1	1	0	1	0	1	0	1	0	1	1	1	0	1	0	1
326	326	814.1375	1	0	0	1	1	1	0	1	0	1	1	0	0	1	1	1	0	1	0	1
327	327	814.1625	0	0	0	1	1	1	0	1	0	1	0	0	0	1	1	1	0	1	0	1
328	328	814.1875	1	1	1	0	1	1	0	1	0	1	1	1	1	0	1	1	0	1	0	1
329	329	814.2125	0	1	1	0	1	1	0	1	0	1	0	1	1	0	1	1	0	1	0	1
330	330	814.2375	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1
331	331	814.2625	0	0	1	0	1	1	0	1	0	1	0	0	1	0	1	1	0	1	0	1
332	332	814.2875	1	1	0	0	1	1	0	1	0	1	1	1	0	0	1	1	0	1	0	1
333	333	814.3125	0	1	0	0	1	1	0	1	0	1	0	1	0	0	1	1	0	1	0	1
334	334	814.3375	1	0	0	0	1	1	0	1	0	1	1	0	0	0	1	1	0	1	0	1
335	335	814.3625	0	0	0	0	1	1	0	1	0	1	0	0	0	0	1	1	0	1	0	1
336	336	814.3875	1	1	1	1	0	1	0	1	0	1	1	1	1	1	0	1	0	1	0	1
337	337	814.4125	0	1	1	1	0	1	0	1	0	1	0	1	1	1	0	1	0	1	0	1
338	338	814.4375	1	0	1	1	0	1	0	1	0	1	1	0	1	1	0	1	0	1	0	1
339	339	814.4625	0	0	1	1	0	1	0	1	0	1	0	0	1	1	0	1	0	1	0	1
340	340	814.4875	1	1	0	1	0	1	0	1	0	1	1	1	0	1	0	1	0	1	0	1
341	341	814.5125	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
342	342	814.5375	1	0	0	1	0	1	0	1	0	1	1	0	0	1	0	1	0	1	0	1
343	343	814.5625	0	0	0	1	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	1
344	344	814.5875	1	1	1	0	0	1	0	1	0	1	1	1	1	0	0	1	0	1	0	1
345	345	814.6125	0	1	1	0	0	1	0	1	0	1	0	1	1	0	0	1	0	1	0	1
346	346	814.6375	1	0	1	0	0	1	0	1	0	1	1	0	1	0	0	1	0	1	0	1
347	347	814.6625	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0	1	0	1	0	1
348	348	814.6875	1	1	0	0	0	1	0	1	0	1	1	1	0	0	0	1	0	1	0	1
349	349	814.7125	0	1	0	0	0	1	0	1	0	1	0	1	0	0	0	1	0	1	0	1
350	350	814.7375	1	0	0	0	0	1	0	1	0	1	1	0	0	0	0	1	0	1	0	1
351	351	814.7625	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	1	0	1	0	1
352	352	814.7875	1	1	1	1	1	0	0	1	0	1	1	1	1	1	1	0	0	1	0	1
353	353	814.8125	0	1	1	1	1	0	0	1	0	1	0	1	1	1	1	0	0	1	0	1
354	354	814.8375	1	0	1	1	1	0	0	1	0	1	1	0	1	1	1	0	0	1	0	1
355	355	814.8625	0	0	1	1	1	0	0	1	0	1	0	0	1	1	1	0	0	1	0	1
356	356	814.8875	1	1	0	1	1	0	0	1	0	1	1	1	0	1	1	0	0	1	0	1
357	357	814.9125	0	1	0	1	1	0	0	1	0	1	0	1	0	1	1	0	0	1	0	1
358	358	814.9375	1	0	0	1	1	0	0	1	0	1	1	0	0	1	1	0	0	1	0	1
359	359	814.9625	0	0	0	1	1	0	0	1	0	1	0	0	0	1	1	0	0	1	0	1
360	360	814.9875	1	1	1	0	1	0	0	1	0	1	1	1	1	0	1	0	0	1	0	1
361	361	815.0125	0	1	1	0	1	0	0	1	0	1	0	1	1	0	1	0	0	1	0	1
362	362	815.0375	1	0	1	0	1	0	0	1	0	1	1	0	1	0	1	0	0	1	0	1

NOTE: ON = 1, OFF = 0

			LSB					**RDM**			MSB	LSB					**RVM**			MSB
Channel	FCC	Receive	S2					S6						S7			S5			
Number	Number	Frequency	10	9	8	7	6	5	4	3	2	1	1	2	3	4	1	2	3	4	7	8
363	363	815.0625	0	0	1	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	0	1
364	364	815.0875	1	1	0	0	1	0	0	1	0	1	1	1	0	0	1	0	0	1	0	1
365	365	815.1125	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0	1	0	1
366	366	815.1375	1	0	0	0	1	0	0	1	0	1	1	0	0	0	1	0	0	1	0	1
367	367	815.1625	0	0	0	0	1	0	0	1	0	1	0	0	0	0	1	0	0	1	0	1
368	368	815.1875	1	1	1	1	0	0	0	1	0	1	1	1	1	1	0	0	0	1	0	1
369	369	815.2125	0	1	1	1	0	0	0	1	0	1	0	1	1	1	0	0	0	1	0	1
370	370	815.2375	1	0	1	1	0	0	0	1	0	1	1	0	1	1	0	0	0	1	0	1
371	371	815.2625	0	0	1	1	0	0	0	1	0	1	0	0	1	1	0	0	0	1	0	1
372	372	815.2875	1	1	0	1	0	0	0	1	0	1	1	1	0	1	0	0	0	1	0	1
373	373	815.3125	0	1	0	1	0	0	0	1	0	1	0	1	0	1	0	0	0	1	0	1
374	374	815.3375	1	0	0	1	0	0	0	1	0	1	1	0	0	1	0	0	0	1	0	1
375	375	815.3625	0	0	0	1	0	0	0	1	0	1	0	0	0	1	0	0	0	1	0	1
376	376	815.3875	1	1	1	0	0	0	0	1	0	1	1	1	1	0	0	0	0	1	0	1
377	377	815.4125	0	1	1	0	0	0	0	1	0	1	0	1	1	0	0	0	0	1	0	1
378	378	815.4375	1	0	1	0	0	0	0	1	0	1	1	0	1	0	0	0	0	1	0	1
379	379	815.4625	0	0	1	0	0	0	0	1	0	1	0	0	1	0	0	0	0	1	0	1
380	380	815.4875	1	1	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	1	0	1
381	381	815.5125	0	1	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	1	0	1
382	382	815.5375	1	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	1	0	1
383	383	815.5625	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
384	384	815.5875	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	0	0	1
385	385	815.6125	0	1	1	1	1	1	1	0	0	1	0	1	1	1	1	1	1	0	0	1
386	386	815.6375	1	0	1	1	1	1	1	0	0	1	1	0	1	1	1	1	1	0	0	1
387	387	815.6625	0	0	1	1	1	1	1	0	0	1	0	0	1	1	1	1	1	0	0	1
388	388	815.6875	1	1	0	1	1	1	1	0	0	1	1	1	0	1	1	1	1	0	0	1
389	389	815.7125	0	1	0	1	1	1	1	0	0	1	0	1	0	1	1	1	1	0	0	1
390	390	815.7375	1	0	0	1	1	1	1	0	0	1	1	0	0	1	1	1	1	0	0	1
391	391	815.7625	0	0	0	1	1	1	1	0	0	1	0	0	0	1	1	1	1	0	0	1
392	392	815.7875	1	1	1	0	1	1	1	0	0	1	1	1	1	0	1	1	1	0	0	1
393	393	815.8125	0	1	1	0	1	1	1	0	0	1	0	1	1	0	1	1	1	0	0	1
394	394	815.8375	1	0	1	0	1	1	1	0	0	1	1	0	1	0	1	1	1	0	0	1
395	395	815.8625	0	0	1	0	1	1	1	0	0	1	0	0	1	0	1	1	1	0	0	1
396	396	815.8875	1	1	0	0	1	1	1	0	0	1	1	1	0	0	1	1	1	0	0	1
397	397	815.9125	0	1	0	0	1	1	1	0	0	1	0	1	0	0	1	1	1	0	0	1
398	398	815.9375	1	0	0	0	1	1	1	0	0	1	1	0	0	0	1	1	1	0	0	1
399	399	815.9625	0	0	0	0	1	1	1	0	0	1	0	0	0	0	1	1	1	0	0	1
400	400	815.9875	1	1	1	1	0	1	1	0	0	1	1	1	1	1	0	1	1	0	0	1
401	401	816.0125	0	1	1	1	0	1	1	0	0	1	0	1	1	1	0	1	1	0	0	1
402	402	816.0375	1	0	1	1	0	1	1	0	0	1	1	0	1	1	0	1	1	0	0	1
403	403	816.0625	0	0	1	1	0	1	1	0	0	1	0	0	1	1	0	1	1	0	0	1
404	404	816.0875	1	1	0	1	0	1	1	0	0	1	1	1	0	1	0	1	1	0	0	1
405	405	816.1125	0	1	0	1	0	1	1	0	0	1	0	1	0	1	0	1	1	0	0	1
406	406	816.1375	1	0	0	1	0	1	1	0	0	1	1	0	0	1	0	1	1	0	0	1
407	407	816.1625	0	0	0	1	0	1	1	0	0	1	0	0	0	1	0	1	1	0	0	1
408	408	816.1875	1	1	1	0	0	1	1	0	0	1	1	1	1	0	0	1	1	0	0	1

NOTE: ON = 1, OFF = 0

			LSB				**RDM**				MSB		LSB				**RVM**				MSB	
Channel	FCC	Receive	S2				S6						S7				S5					
Number	Number	Frequency	10	9	8	7	6	5	4	3	2	1	1	2	3	4	1	2	3	4	7	8
409	409	816.2125	0	1	1	0	0	1	1	0	0	1	0	1	1	0	0	1	1	0	0	1
410	410	816.2375	1	0	1	0	0	1	1	0	0	1	1	0	1	0	0	1	1	0	0	1
411	411	816.2625	0	0	1	0	0	1	1	0	0	1	0	0	1	0	0	1	1	0	0	1
412	412	816.2875	1	1	0	0	0	1	1	0	0	1	1	1	0	0	0	1	1	0	0	1
413	413	816.3125	0	1	0	0	0	1	1	0	0	1	0	1	0	0	0	1	1	0	0	1
414	414	816.3375	1	0	0	0	0	1	1	0	0	1	1	0	0	0	0	1	1	0	0	1
415	415	816.3625	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1	0	0	1
416	416	816.3875	1	1	1	1	1	0	1	0	0	1	1	1	1	1	1	0	1	0	0	1
417	417	816.4125	0	1	1	1	1	0	1	0	0	1	0	1	1	1	1	0	1	0	0	1
418	418	816.4375	1	0	1	1	1	0	1	0	0	1	1	0	1	1	1	0	1	0	0	1
419	419	816.4625	0	0	1	1	1	0	1	0	0	1	0	0	1	1	1	0	1	0	0	1
420	420	816.4875	1	1	0	1	1	0	1	0	0	1	1	1	0	1	1	0	1	0	0	1
421	421	816.5125	0	1	0	1	1	0	1	0	0	1	0	1	0	1	1	0	1	0	0	1
422	422	816.5375	1	0	0	1	1	0	1	0	0	1	1	0	0	1	1	0	1	0	0	1
423	423	816.5625	0	0	0	1	1	0	1	0	0	1	0	0	0	1	1	0	1	0	0	1
424	424	816.5875	1	1	1	0	1	0	1	0	0	1	1	1	1	0	1	0	1	0	0	1
425	425	816.6125	0	1	1	0	1	0	1	0	0	1	0	1	1	0	1	0	1	0	0	1
426	426	816.6375	1	0	1	0	1	0	1	0	0	1	1	0	1	0	1	0	1	0	0	1
427	427	816.6625	0	0	1	0	1	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1
428	428	816.6875	1	1	0	0	1	0	1	0	0	1	1	1	0	0	1	0	1	0	0	1
429	429	816.7125	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1
430	430	816.7375	1	0	0	0	1	0	1	0	0	1	1	0	0	0	1	0	1	0	0	1
431	431	816.7625	0	0	0	0	1	0	1	0	0	1	0	0	0	0	1	0	1	0	0	1
432	432	816.7875	1	1	1	1	0	0	1	0	0	1	1	1	1	1	0	0	1	0	0	1
433	433	816.8125	0	1	1	1	0	0	1	0	0	1	0	1	1	1	0	0	1	0	0	1
434	434	816.8375	1	0	1	1	0	0	1	0	0	1	1	0	1	1	0	0	1	0	0	1
435	435	816.8625	0	0	1	1	0	0	1	0	0	1	0	0	1	1	0	0	1	0	0	1
436	436	816.8875	1	1	0	1	0	0	1	0	0	1	1	1	0	1	0	0	1	0	0	1
437	437	816.9125	0	1	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0	1
438	438	816.9375	1	0	0	1	0	0	1	0	0	1	1	0	0	1	0	0	1	0	0	1
439	439	816.9625	0	0	0	1	0	0	1	0	0	1	0	0	0	1	0	0	1	0	0	1
440	440	816.9875	1	1	1	0	0	0	1	0	0	1	1	1	1	0	0	0	1	0	0	1
441	441	817.0125	0	1	1	0	0	0	1	0	0	1	0	1	1	0	0	0	1	0	0	1
442	442	817.0375	1	0	1	0	0	0	1	0	0	1	1	0	1	0	0	0	1	0	0	1
443	443	817.0625	0	0	1	0	0	0	1	0	0	1	0	0	1	0	0	0	1	0	0	1
444	444	817.0875	1	1	0	0	0	0	1	0	0	1	1	1	0	0	0	0	1	0	0	1
445	445	817.1125	0	1	0	0	0	0	1	0	0	1	0	1	0	0	0	0	1	0	0	1
446	446	817.1375	1	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	1	0	0	1
447	447	817.1625	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
448	448	817.1875	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	0	0	0	1
449	449	817.2125	0	1	1	1	1	1	0	0	0	1	0	1	1	1	1	1	0	0	0	1
450	450	817.2375	1	0	1	1	1	1	0	0	0	1	1	0	1	1	1	1	0	0	0	1
451	451	817.2625	0	0	1	1	1	1	0	0	0	1	0	0	1	1	1	1	0	0	0	1
452	452	817.2875	1	1	0	1	1	1	0	0	0	1	1	1	0	1	1	1	0	0	0	1
453	453	817.3125	0	1	0	1	1	1	0	0	0	1	0	1	0	1	1	1	0	0	0	1
454	454	817.3375	1	0	0	1	1	1	0	0	0	1	1	0	0	1	1	1	0	0	0	1

NOTE: ON = 1, OFF = 0

			LSB				**RDM**				MSB	LSB				**RVM**				MSB
Channel	FCC	Receive	S2				S6					S7				S5				
Number	Number	Frequency	10	9	8	7	6	5	4	3	2 1	1	2	3	4	1	2	3	4	7 8
455	455	817.3625	0	0	0	1	1	1	0	0	0 1	0	0	0	1	1	1	0	0	0 1
456	456	817.3875	1	1	1	0	1	1	0	0	0 1	1	1	1	0	1	1	0	0	0 1
457	457	817.4125	0	1	1	0	1	1	0	0	0 1	0	1	1	0	1	1	0	0	0 1
458	458	817.4375	1	0	1	0	1	1	0	0	0 1	1	0	1	0	1	1	0	0	0 1
459	459	817.4625	0	0	1	0	1	1	0	0	0 1	0	0	1	0	1	1	0	0	0 1
460	460	817.4875	1	1	0	0	1	1	0	0	0 1	1	1	0	0	1	1	0	0	0 1
461	461	817.5125	0	1	0	0	1	1	0	0	0 1	0	1	0	0	1	1	0	0	0 1
462	462	817.5375	1	0	0	0	1	1	0	0	0 1	1	0	0	0	1	1	0	0	0 1
463	463	817.5625	0	0	0	0	1	1	0	0	0 1	0	0	0	0	1	1	0	0	0 1
464	464	817.5875	1	1	1	1	0	1	0	0	0 1	1	1	1	1	0	1	0	0	0 1
465	465	817.6125	0	1	1	1	0	1	0	0	0 1	0	1	1	1	0	1	0	0	0 1
466	466	817.6375	1	0	1	1	0	1	0	0	0 1	1	0	1	1	0	1	0	0	0 1
467	467	817.6625	0	0	1	1	0	1	0	0	0 1	0	0	1	1	0	1	0	0	0 1
468	468	817.6875	1	1	0	1	0	1	0	0	0 1	1	1	0	1	0	1	0	0	0 1
469	469	817.7125	0	1	0	1	0	1	0	0	0 1	0	1	0	1	0	1	0	0	0 1
470	470	817.7375	1	0	0	1	0	1	0	0	0 1	1	0	0	1	0	1	0	0	0 1
471	471	817.7625	0	0	0	1	0	1	0	0	0 1	0	0	0	1	0	1	0	0	0 1
472	472	817.7875	1	1	1	0	0	1	0	0	0 1	1	1	1	0	0	1	0	0	0 1
473	473	817.8125	0	1	1	0	0	1	0	0	0 1	0	1	1	0	0	1	0	0	0 1
474	474	817.8375	1	0	1	0	0	1	0	0	0 1	1	0	1	0	0	1	0	0	0 1
475	475	817.8625	0	0	1	0	0	1	0	0	0 1	0	0	1	0	0	1	0	0	0 1
476	476	817.8875	1	1	0	0	0	1	0	0	0 1	1	1	0	0	0	1	0	0	0 1
477	477	817.9125	0	1	0	0	0	1	0	0	0 1	0	1	0	0	0	1	0	0	0 1
478	478	817.9375	1	0	0	0	0	1	0	0	0 1	1	0	0	0	0	1	0	0	0 1
479	479	817.9625	0	0	0	0	0	1	0	0	0 1	0	0	0	0	0	1	0	0	0 1
480	480	817.9875	1	1	1	1	1	0	0	0	0 1	1	1	1	1	1	0	0	0	0 1
481	481	818.0125	0	1	1	1	1	0	0	0	0 1	0	1	1	1	1	0	0	0	0 1
482	482	818.0375	1	0	1	1	1	0	0	0	0 1	1	0	1	1	1	0	0	0	0 1
483	483	818.0625	0	0	1	1	1	0	0	0	0 1	0	0	1	1	1	0	0	0	0 1
484	484	818.0875	1	1	0	1	1	0	0	0	0 1	1	1	0	1	1	0	0	0	0 1
485	485	818.1125	0	1	0	1	1	0	0	0	0 1	0	1	0	1	1	0	0	0	0 1
486	486	818.1375	1	0	0	1	1	0	0	0	0 1	1	0	0	1	1	0	0	0	0 1
487	487	818.1625	0	0	0	1	1	0	0	0	0 1	0	0	0	1	1	0	0	0	0 1
488	488	818.1875	1	1	1	0	1	0	0	0	0 1	1	1	1	0	1	0	0	0	0 1
489	489	818.2125	0	1	1	0	1	0	0	0	0 1	0	1	1	0	1	0	0	0	0 1
490	490	818.2375	1	0	1	0	1	0	0	0	0 1	1	0	1	0	1	0	0	0	0 1
491	491	818.2625	0	0	1	0	1	0	0	0	0 1	0	0	1	0	1	0	0	0	0 1
492	492	818.2875	1	1	0	0	1	0	0	0	0 1	1	1	0	0	1	0	0	0	0 1
493	493	818.3125	0	1	0	0	1	0	0	0	0 1	0	1	0	0	1	0	0	0	0 1
494	494	818.3375	1	0	0	0	1	0	0	0	0 1	1	0	0	0	1	0	0	0	0 1
495	495	818.3625	0	0	0	0	1	0	0	0	0 1	0	0	0	0	1	0	0	0	0 1
496	496	818.3875	1	1	1	1	0	0	0	0	0 1	1	1	1	1	0	0	0	0	0 1
497	497	818.4125	0	1	1	1	0	0	0	0	0 1	0	1	1	1	0	0	0	0	0 1
498	498	818.4375	1	0	1	1	0	0	0	0	0 1	1	0	1	1	0	0	0	0	0 1
499	499	818.4625	0	0	1	1	0	0	0	0	0 1	0	0	1	1	0	0	0	0	0 1
500	500	818.4875	1	1	0	1	0	0	0	0	0 1	1	1	0	1	0	0	0	0	0 1

NOTE: ON = 1, OFF = 0

			LSB			**RDM**					MSB	LSB				**RVM**				MSB
Channel	FCC	Receive	S2			S6						S7				S5				
Number	Number	Frequency	10	9	8	7	6	5	4	3	2	1	1	2	3	4	1	2	3	4	7	8
501	501	818.5125	0	1	0	1	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	1
502	502	818.5375	1	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1
503	503	818.5625	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
504	504	818.5875	1	1	1	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	1
505	505	818.6125	0	1	1	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	1
506	506	818.6375	1	0	1	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	1
507	507	818.6625	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1
508	508	818.6875	1	1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1
509	509	818.7125	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1
510	510	818.7375	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
511	511	818.7625	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
512	512	818.7875	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0
513	513	818.8125	0	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	0
514	514	818.8375	1	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	0
515	515	818.8625	0	0	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	0
516	516	818.8875	1	1	0	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	0
517	517	818.9125	0	1	0	1	1	1	1	1	1	0	0	1	0	1	1	1	1	1	1	0
518	518	818.9375	1	0	0	1	1	1	1	1	1	0	1	0	0	1	1	1	1	1	1	0
519	519	818.9625	0	0	0	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	0
520	520	818.9875	1	1	1	0	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	0
521	521	819.0125	0	1	1	0	1	1	1	1	1	0	0	1	1	0	1	1	1	1	1	0
522	522	819.0375	1	0	1	0	1	1	1	1	1	0	1	0	1	0	1	1	1	1	1	0
523	523	819.0625	0	0	1	0	1	1	1	1	1	0	0	0	1	0	1	1	1	1	1	0
524	524	819.0875	1	1	0	0	1	1	1	1	1	0	1	1	0	0	1	1	1	1	1	0
525	525	819.1125	0	1	0	0	1	1	1	1	1	0	0	1	0	0	1	1	1	1	1	0
526	526	819.1375	1	0	0	0	1	1	1	1	1	0	1	0	0	0	1	1	1	1	1	0
527	527	819.1625	0	0	0	0	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	0
528	528	819.1875	1	1	1	1	0	1	1	1	1	0	1	1	1	1	0	1	1	1	1	0
529	529	819.2125	0	1	1	1	0	1	1	1	1	0	0	1	1	1	0	1	1	1	1	0
530	530	819.2375	1	0	1	1	0	1	1	1	1	0	1	0	1	1	0	1	1	1	1	0
531	531	819.2625	0	0	1	1	0	1	1	1	1	0	0	0	1	1	0	1	1	1	1	0
532	532	819.2875	1	1	0	1	0	1	1	1	1	0	1	1	0	1	0	1	1	1	1	0
533	533	819.3125	0	1	0	1	0	1	1	1	1	0	0	1	0	1	0	1	1	1	1	0
534	534	819.3375	1	0	0	1	0	1	1	1	1	0	1	0	0	1	0	1	1	1	1	0
535	535	819.3625	0	0	0	1	0	1	1	1	1	0	0	0	0	1	0	1	1	1	1	0
536	536	819.3875	1	1	1	0	0	1	1	1	1	0	1	1	1	0	0	1	1	1	1	0
537	537	819.4125	0	1	1	0	0	1	1	1	1	0	0	1	1	0	0	1	1	1	1	0
538	538	819.4375	1	0	1	0	0	1	1	1	1	0	1	0	1	0	0	1	1	1	1	0
539	539	819.4625	0	0	1	0	0	1	1	1	1	0	0	0	1	0	0	1	1	1	1	0
540	540	819.4875	1	1	0	0	0	1	1	1	1	0	1	1	0	0	0	1	1	1	1	0
541	541	819.5125	0	1	0	0	0	1	1	1	1	0	0	1	0	0	0	1	1	1	1	0
542	542	819.5375	1	0	0	0	0	1	1	1	1	0	1	0	0	0	0	1	1	1	1	0
543	543	819.5625	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	1	1	1	1	0
544	544	819.5875	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	0	1	1	1	0
545	545	819.6125	0	1	1	1	1	0	1	1	1	0	0	1	1	1	1	0	1	1	1	0
546	546	819.6375	1	0	1	1	1	0	1	1	1	0	1	0	1	1	1	0	1	1	1	0

NOTE: ON = 1, OFF = 0

			LSB				**RDM**				MSB	LSB				**RVM**				MSB
Channel	FCC	Receive	S2				S6					S7				S5				
Number	Number	Frequency	10	9	8	7	6	5	4	3	2 1	1	2	3	4	1	2	3	4	7 8
547	547	819.6625	0	0	1	1	1	0	1	1	1 0	0	0	1	1	1	0	1	1	1 0
548	548	819.6875	1	1	0	1	1	0	1	1	1 0	1	1	0	1	1	0	1	1	1 0
549	549	819.7125	0	1	0	1	1	0	1	1	1 0	0	1	0	1	1	0	1	1	1 0
550	550	819.7375	1	0	0	1	1	0	1	1	1 0	1	0	0	1	1	0	1	1	1 0
551	551	819.7625	0	0	0	1	1	0	1	1	1 0	0	0	0	1	1	0	1	1	1 0
552	552	819.7875	1	1	1	0	1	0	1	1	1 0	1	1	1	0	1	0	1	1	1 0
553	553	819.8125	0	1	1	0	1	0	1	1	1 0	0	1	1	0	1	0	1	1	1 0
554	554	819.8375	1	0	1	0	1	0	1	1	1 0	1	0	1	0	1	0	1	1	1 0
555	555	819.8625	0	0	1	0	1	0	1	1	1 0	0	0	1	0	1	0	1	1	1 0
556	556	819.8875	1	1	0	0	1	0	1	1	1 0	1	1	0	0	1	0	1	1	1 0
557	557	819.9125	0	1	0	0	1	0	1	1	1 0	0	1	0	0	1	0	1	1	1 0
558	558	819.9375	1	0	0	0	1	0	1	1	1 0	1	0	0	0	1	0	1	1	1 0
559	559	819.9625	0	0	0	0	1	0	1	1	1 0	0	0	0	0	1	0	1	1	1 0
560	560	819.9875	1	1	1	1	0	0	1	1	1 0	1	1	1	1	0	0	1	1	1 0
561	561	820.0125	0	1	1	1	0	0	1	1	1 0	0	1	1	1	0	0	1	1	1 0
562	562	820.0375	1	0	1	1	0	0	1	1	1 0	1	0	1	1	0	0	1	1	1 0
563	563	820.0625	0	0	1	1	0	0	1	1	1 0	0	0	1	1	0	0	1	1	1 0
564	564	820.0875	1	1	0	1	0	0	1	1	1 0	1	1	0	1	0	0	1	1	1 0
565	565	820.1125	0	1	0	1	0	0	1	1	1 0	0	1	0	1	0	0	1	1	1 0
566	566	820.1375	1	0	0	1	0	0	1	1	1 0	1	0	0	1	0	0	1	1	1 0
567	567	820.1625	0	0	0	1	0	0	1	1	1 0	0	0	0	1	0	0	1	1	1 0
568	568	820.1875	1	1	1	0	0	0	1	1	1 0	1	1	1	0	0	0	1	1	1 0
569	569	820.2125	0	1	1	0	0	0	1	1	1 0	0	1	1	0	0	0	1	1	1 0
570	570	820.2375	1	0	1	0	0	0	1	1	1 0	1	0	1	0	0	0	1	1	1 0
571	571	820.2625	0	0	1	0	0	0	1	1	1 0	0	0	1	0	0	0	1	1	1 0
572	572	820.2875	1	1	0	0	0	0	1	1	1 0	1	1	0	0	0	0	1	1	1 0
573	573	820.3125	0	1	0	0	0	0	1	1	1 0	0	1	0	0	0	0	1	1	1 0
574	574	820.3375	1	0	0	0	0	0	1	1	1 0	1	0	0	0	0	0	1	1	1 0
575	575	820.3625	0	0	0	0	0	0	1	1	1 0	0	0	0	0	0	0	1	1	1 0
576	576	820.3875	1	1	1	1	1	1	0	1	1 0	1	1	1	1	1	1	0	1	1 0
577	577	820.4125	0	1	1	1	1	1	0	1	1 0	0	1	1	1	1	1	0	1	1 0
578	578	820.4375	1	0	1	1	1	1	0	1	1 0	1	0	1	1	1	1	0	1	1 0
579	579	820.4625	0	0	1	1	1	1	0	1	1 0	0	0	1	1	1	1	0	1	1 0
580	580	820.4875	1	1	0	1	1	1	0	1	1 0	1	1	0	1	1	1	0	1	1 0
581	581	820.5125	0	1	0	1	1	1	0	1	1 0	0	1	0	1	1	1	0	1	1 0
582	582	820.5375	1	0	0	1	1	1	0	1	1 0	1	0	0	1	1	1	0	1	1 0
583	583	820.5625	0	0	0	1	1	1	0	1	1 0	0	0	0	1	1	1	0	1	1 0
584	584	820.5875	1	1	1	0	1	1	0	1	1 0	1	1	1	0	1	1	0	1	1 0
585	585	820.6125	0	1	1	0	1	1	0	1	1 0	0	1	1	0	1	1	0	1	1 0
586	586	820.6375	1	0	1	0	1	1	0	1	1 0	1	0	1	0	1	1	0	1	1 0
587	587	820.6625	0	0	1	0	1	1	0	1	1 0	0	0	1	0	1	1	0	1	1 0
588	588	820.6875	1	1	0	0	1	1	0	1	1 0	1	1	0	0	1	1	0	1	1 0
589	589	820.7125	0	1	0	0	1	1	0	1	1 0	0	1	0	0	1	1	0	1	1 0
590	590	820.7375	1	0	0	0	1	1	0	1	1 0	1	0	0	0	1	1	0	1	1 0
591	591	820.7625	0	0	0	0	1	1	0	1	1 0	0	0	0	0	1	1	0	1	1 0
592	592	820.7875	1	1	1	1	0	1	0	1	1 0	1	1	1	1	0	1	0	1	1 0

NOTE: ON = 1, OFF = 0

			LSB			**RDM**					MSB	LSB				**RVM**				MSB
Channel	FCC	Receive	S2			S6						S7				S5				
Number	Number	Frequency	10	9	8	7	6	5	4	3	2	1	1	2	3	4	1	2	3	4	7	8
593	593	820.8125	0	1	1	1	0	1	0	1	1	0	0	1	1	1	0	1	0	1	1	0
594	594	820.8375	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0
595	595	820.8625	0	0	1	1	0	1	0	1	1	0	0	0	1	1	0	1	0	1	1	0
596	596	820.8875	1	1	0	1	0	1	0	1	1	0	1	1	0	1	0	1	0	1	1	0
597	597	820.9125	0	1	0	1	0	1	0	1	1	0	0	1	0	1	0	1	0	1	1	0
598	598	820.9375	1	0	0	1	0	1	0	1	1	0	1	0	0	1	0	1	0	1	1	0
599	599	820.9625	0	0	0	1	0	1	0	1	1	0	0	0	0	1	0	1	0	1	1	0
600	600	820.9875	1	1	1	0	0	1	0	1	1	0	1	1	1	0	0	1	0	1	1	0
601	-	821.0000	0	1	1	0	0	1	0	1	1	0	0	1	1	0	0	1	0	1	1	0
601	601	821.0125	1	0	1	0	0	1	0	1	1	0	1	0	1	0	0	1	0	1	1	0
603	-	821.0250	0	0	1	0	0	1	0	1	1	0	0	0	1	0	0	1	0	1	1	0
604	602	821.0375	1	1	0	0	0	1	0	1	1	0	1	1	0	0	0	1	0	1	1	0
605	603	821.0500	0	1	0	0	0	1	0	1	1	0	0	1	0	0	0	1	0	1	1	0
606	604	821.0625	1	0	0	0	0	1	0	1	1	0	1	0	0	0	0	1	0	1	1	0
607	605	821.0750	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	1	0	1	1	0
608	606	821.0875	1	1	1	1	1	0	0	1	1	0	1	1	1	1	1	0	0	1	1	0
609	607	821.1000	0	1	1	1	1	0	0	1	1	0	0	1	1	1	1	0	0	1	1	0
610	608	821.1115	1	0	1	1	1	0	0	1	1	0	1	0	1	1	1	0	0	1	1	0
611	609	821.1250	0	0	1	1	1	0	0	1	1	0	0	0	1	1	1	0	0	1	1	0
612	610	821.1375	1	1	0	1	1	0	0	1	1	0	1	1	0	1	1	0	0	1	1	0
613	611	821.1500	0	1	0	1	1	0	0	1	1	0	0	1	0	1	1	0	0	1	1	0
614	612	821.1625	1	0	0	1	1	0	0	1	1	0	1	0	0	1	1	0	0	1	1	0
615	613	821.1750	0	0	0	1	1	0	0	1	1	0	0	0	0	1	1	0	0	1	1	0
616	614	821.1875	1	1	1	0	1	0	0	1	1	0	1	1	1	0	1	0	0	1	1	0
617	615	821.2000	0	1	1	0	1	0	0	1	1	0	0	1	1	0	1	0	0	1	1	0
618	616	821.2125	1	0	1	0	1	0	0	1	1	0	1	0	1	0	1	0	0	1	1	0
619	617	821.2250	0	0	1	0	1	0	0	1	1	0	0	0	1	0	1	0	0	1	1	0
620	618	821.2375	1	1	0	0	1	0	0	1	1	0	1	1	0	0	1	0	0	1	1	0
621	619	821.2510	0	1	0	0	1	0	0	1	1	0	0	1	0	0	1	0	0	1	1	0
622	620	821.2625	1	0	0	0	1	0	0	1	1	0	1	0	0	0	1	0	0	1	1	0
623	621	821.2750	0	0	0	0	1	0	0	1	1	0	0	0	0	0	1	0	0	1	1	0
624	622	821.2875	1	1	1	1	0	0	0	1	1	0	1	1	1	1	0	0	0	1	1	0
625	623	821.3101	0	1	1	1	0	0	0	1	1	0	0	1	1	1	0	0	0	1	1	0
626	624	821.3125	1	0	1	1	0	0	0	1	1	0	1	0	1	1	0	0	0	1	1	0
627	625	821.3250	0	0	1	1	0	0	0	1	1	0	0	0	1	1	0	0	0	1	1	0
628	626	821.3375	1	1	0	1	0	0	0	1	1	0	1	1	0	1	0	0	0	1	1	0
629	627	821.3500	0	1	0	1	0	0	0	1	1	0	0	1	0	1	0	0	0	1	1	0
630	628	821.3625	1	0	0	1	0	0	0	1	1	0	1	0	0	1	0	0	0	1	1	0
631	629	821.3750	0	0	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	1	1	0
632	630	821.3875	1	1	1	0	0	0	0	1	1	0	1	1	1	0	0	0	0	1	1	0
633	631	821.4000	0	1	1	0	0	0	0	1	1	0	0	1	1	0	0	0	0	1	1	0
634	632	821.4125	1	0	1	0	0	0	0	1	1	0	1	0	1	0	0	0	0	1	1	0
635	633	821.4250	0	0	1	0	0	0	0	1	1	0	0	0	1	0	0	0	0	1	1	0
636	634	821.4375	1	1	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	1	1	0
637	635	821.4500	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1	0
638	636	821.4625	1	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	1	1	0

NOTE: ON = 1, OFF = 0

Channel Number	FCC Number	Receive Frequency	RDM LSB S2 10	9	RDM S6 8	7	6	5	4	3	2	RDM MSB S6 1	RVM LSB S7 1	2	3	RVM MSB S7 4	RVM LSB S5 1	2	3	RVM MSB S5 4	7	8
639	637	821.4750	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0
640	638	821.4875	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	0	1	0
641	-	821.5000	0	1	1	1	1	1	1	0	1	0	0	1	1	1	1	1	1	0	1	0
642	639	821.5125	1	0	1	1	1	1	1	0	1	0	1	0	1	1	1	1	1	0	1	0
643	-	821.5250	0	0	1	1	1	1	1	0	1	0	0	0	1	1	1	1	1	0	1	0
644	640	821.5375	1	1	0	1	1	1	1	0	1	0	1	1	0	1	1	1	1	0	1	0
645	641	821.5500	0	1	0	1	1	1	1	0	1	0	0	1	0	1	1	1	1	0	1	0
646	642	821.5625	1	0	0	1	1	1	1	0	1	0	1	0	0	1	1	1	1	0	1	0
647	643	821.5750	0	0	0	1	1	1	1	0	1	0	0	0	0	1	1	1	1	0	1	0
648	644	821.5875	1	1	1	0	1	1	1	0	1	0	1	1	1	0	1	1	1	0	1	0
649	645	821.6000	0	1	1	0	1	1	1	0	1	0	0	1	1	0	1	1	1	0	1	0
650	646	821.6125	1	0	1	0	1	1	1	0	1	0	1	0	1	0	1	1	1	0	1	0
651	647	821.6250	0	0	1	0	1	1	1	0	1	0	0	0	1	0	1	1	1	0	1	0
652	648	821.6375	1	1	0	0	1	1	1	0	1	0	1	1	0	0	1	1	1	0	1	0
653	649	821.6500	0	1	0	0	1	1	1	0	1	0	0	1	0	0	1	1	1	0	1	0
654	650	821.6625	1	0	0	0	1	1	1	0	1	0	1	0	0	0	1	1	1	0	1	0
655	651	821.6750	0	0	0	0	1	1	1	0	1	0	0	0	0	0	1	1	1	0	1	0
656	652	821.6875	1	1	1	1	0	1	1	0	1	0	1	1	1	1	0	1	1	0	1	0
657	653	821.7000	0	1	1	1	0	1	1	0	1	0	0	1	1	1	0	1	1	0	1	0
658	654	821.7125	1	0	1	1	0	1	1	0	1	0	1	0	1	1	0	1	1	0	1	0
659	655	821.7250	0	0	1	1	0	1	1	0	1	0	0	0	1	1	0	1	1	0	1	0
660	656	821.7375	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0
661	657	821.7500	0	1	0	1	0	1	1	0	1	0	0	1	0	1	0	1	1	0	1	0
662	658	821.7625	1	0	0	1	0	1	1	0	1	0	1	0	0	1	0	1	1	0	1	0
663	659	821.7750	0	0	0	1	0	1	1	0	1	0	0	0	0	1	0	1	1	0	1	0
664	660	821.7875	1	1	1	0	0	1	1	0	1	0	1	1	1	0	0	1	1	0	1	0
665	661	821.8000	0	1	1	0	0	1	1	0	1	0	0	1	1	0	0	1	1	0	1	0
666	662	821.8125	1	0	1	0	0	1	1	0	1	0	1	0	1	0	0	1	1	0	1	0
667	663	821.8250	0	0	1	0	0	1	1	0	1	0	0	0	1	0	0	1	1	0	1	0
668	664	821.8375	1	1	0	0	0	1	1	0	1	0	1	1	0	0	0	1	1	0	1	0
669	665	821.8500	0	1	0	0	0	1	1	0	1	0	0	1	0	0	0	1	1	0	1	0
670	666	821.8625	1	0	0	0	0	1	1	0	1	0	1	0	0	0	0	1	1	0	1	0
671	667	821.8750	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	1	1	0	1	0
672	668	821.8875	1	1	1	1	1	0	1	0	1	0	1	1	1	1	1	0	1	0	1	0
673	669	821.9000	0	1	1	1	1	0	1	0	1	0	0	1	1	1	1	0	1	0	1	0
674	670	821.9125	1	0	1	1	1	0	1	0	1	0	1	0	1	1	1	0	1	0	1	0
675	671	821.9250	0	0	1	1	1	0	1	0	1	0	0	0	1	1	1	0	1	0	1	0
676	672	821.9375	1	1	0	1	1	0	1	0	1	0	1	1	0	1	1	0	1	0	1	0
677	673	821.9500	0	1	0	1	1	0	1	0	1	0	0	1	0	1	1	0	1	0	1	0
678	674	821.9625	1	0	0	1	1	0	1	0	1	0	1	0	0	1	1	0	1	0	1	0
679	675	821.9750	0	0	0	1	1	0	1	0	1	0	0	0	0	1	1	0	1	0	1	0
680	676	821.9875	1	1	1	0	1	0	1	0	1	0	1	1	1	0	1	0	1	0	1	0
681	-	822.0000	0	1	1	0	1	0	1	0	1	0	0	1	1	0	1	0	1	0	1	0
682	677	822.0125	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
683	-	822.0250	0	0	1	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	1	0
684	678	822.0375	1	1	0	0	1	0	1	0	1	0	1	1	0	0	1	0	1	0	1	0

NOTE: ON = 1, OFF = 0

			LSB				**RDM**				MSB		LSB				**RVM**				MSB	
Channel	FCC	Receive	S2				S6						S7				S5					
Number	Number	Frequency	10	9	8	7	6	5	4	3	2	1	1	2	3	4	1	2	3	4	7	8
685	679	822.0500	0	1	0	0	1	0	1	0	1	0	0	1	0	0	1	0	1	0	1	0
686	680	822.0625	1	0	0	0	1	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0
687	681	822.0750	0	0	0	0	1	0	1	0	1	0	0	0	0	0	1	0	1	0	1	0
688	682	822.0875	1	1	1	1	0	0	1	0	1	0	1	1	1	1	0	0	1	0	1	0
689	683	822.1000	0	1	1	1	0	0	1	0	1	0	0	1	1	1	0	0	1	0	1	0
690	684	822.1125	1	0	1	1	0	0	1	0	1	0	1	0	1	1	0	0	1	0	1	0
691	685	822.1250	0	0	1	1	0	0	1	0	1	0	0	0	1	1	0	0	1	0	1	0
692	686	822.1375	1	1	0	1	0	0	1	0	1	0	1	1	0	1	0	0	1	0	1	0
693	687	822.1500	0	1	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	0	1	0
694	688	822.1625	1	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0	1	0	1	0
695	689	822.1750	0	0	0	1	0	0	1	0	1	0	0	0	0	1	0	0	1	0	1	0
696	690	822.1875	1	1	1	0	0	0	1	0	1	0	1	1	1	0	0	0	1	0	1	0
697	691	822.2000	0	1	1	0	0	0	1	0	1	0	0	1	1	0	0	0	1	0	1	0
698	692	822.2125	1	0	1	0	0	0	1	0	1	0	1	0	1	0	0	0	1	0	1	0
699	693	822.2250	0	0	1	0	0	0	1	0	1	0	0	0	1	0	0	0	1	0	1	0
700	694	822.2375	1	1	0	0	0	0	1	0	1	0	1	1	0	0	0	0	1	0	1	0
701	695	822.2500	0	1	0	0	0	0	1	0	1	0	0	1	0	0	0	0	1	0	1	0
702	696	822.2625	1	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	1	0	1	0
703	697	822.2750	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	0
704	698	822.2875	1	1	1	1	1	1	0	0	1	0	1	1	1	1	1	1	0	0	1	0
705	699	822.3000	0	1	1	1	1	1	0	0	1	0	0	1	1	1	1	1	0	0	1	0
706	700	822.3125	1	0	1	1	1	1	0	0	1	0	1	0	1	1	1	1	0	0	1	0
707	701	822.3250	0	0	1	1	1	1	0	0	1	0	0	0	1	1	1	1	0	0	1	0
708	702	822.3375	1	1	0	1	1	1	0	0	1	0	1	1	0	1	1	1	0	0	1	0
709	703	822.3500	0	1	0	1	1	1	0	0	1	0	0	1	0	1	1	1	0	0	1	0
711	704	822.3625	1	0	0	1	1	1	0	0	1	0	1	0	0	1	1	1	0	0	1	0
710	705	822.3750	0	0	0	1	1	1	0	0	1	0	0	0	0	1	1	1	0	0	1	0
712	706	822.3875	1	1	1	0	1	1	0	0	1	0	1	1	1	0	1	1	0	0	1	0
713	707	822.4000	0	1	1	0	1	1	0	0	1	0	0	1	1	0	1	1	0	0	1	0
714	708	822.4125	1	0	1	0	1	1	0	0	1	0	1	0	1	0	1	1	0	0	1	0
715	709	822.4250	0	0	1	0	1	1	0	0	1	0	0	0	1	0	1	1	0	0	1	0
716	711	822.4375	1	1	0	0	1	1	0	0	1	0	1	1	0	0	1	1	0	0	1	0
717	710	822.4500	0	1	0	0	1	1	0	0	1	0	0	1	0	0	1	1	0	0	1	0
718	712	822.4625	1	0	0	0	1	1	0	0	1	0	1	0	0	0	1	1	0	0	1	0
719	713	822.4750	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1	0	0	1	0
720	714	822.4875	1	1	1	1	0	1	0	0	1	0	1	1	1	1	0	1	0	0	1	0
721	-	822.5000	0	1	1	1	0	1	0	0	1	0	0	1	1	1	0	1	0	0	1	0
722	715	822.5125	1	0	1	1	0	1	0	0	1	0	1	0	1	1	0	1	0	0	1	0
723	-	822.5250	0	0	1	1	0	1	0	0	1	0	0	0	1	1	0	1	0	0	1	0
724	716	822.5375	1	1	0	1	0	1	0	0	1	0	1	1	0	1	0	1	0	0	1	0
725	717	822.5510	0	1	0	1	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	0
726	718	822.5625	1	0	0	1	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	0
727	719	822.5750	0	0	0	1	0	1	0	0	1	0	0	0	0	1	0	1	0	0	1	0
728	720	822.5875	1	1	1	0	0	1	0	0	1	0	1	1	1	0	0	1	0	0	1	0
729	721	822.6000	0	1	1	0	0	1	0	0	1	0	0	1	1	0	0	1	0	0	1	0
730	722	822.6125	1	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0	1	0

NOTE: ON = 1, OFF = 0

			LSB					**RDM**			MSB	LSB						**RVM**MSB					
Channel	FCC	Receive	S2					S6							S7				S5					
Number	Number	Frequency	10	9	8	7	6	5	4	3	2	1		1	2	3	4		1	2	3	4	7	8
731	723	822.6250	0	0	1	0	0	1	0	0	1	0		0	0	1	0		0	1	0	0	1	0
732	724	822.6375	1	1	0	0	0	1	0	0	1	0		1	1	0	0		0	1	0	0	1	0
733	725	822.6500	0	1	0	0	0	1	0	0	1	0		0	1	0	0		0	1	0	0	1	0
734	726	822.6625	1	0	0	0	0	1	0	0	1	0		1	0	0	0		0	1	0	0	1	0
735	727	822.6750	0	0	0	0	0	1	0	0	1	0		0	0	0	0		0	1	0	0	1	0
736	728	822.6875	1	1	1	1	1	0	0	0	1	0		1	1	1	1		1	0	0	0	1	0
737	729	822.7000	0	1	1	1	1	0	0	0	1	0		0	1	1	1		1	0	0	0	1	0
738	730	822.7125	1	0	1	1	1	0	0	0	1	0		1	0	1	1		1	0	0	0	1	0
739	731	822.7250	0	0	1	1	1	0	0	0	1	0		0	0	1	1		1	0	0	0	1	0
740	732	822.7375	1	1	0	1	1	0	0	0	1	0		1	1	0	1		1	0	0	0	1	0
741	733	822.7500	0	1	0	1	1	0	0	0	1	0		0	1	0	1		1	0	0	0	1	0
742	734	822.7625	1	0	0	1	1	0	0	0	1	0		1	0	0	1		1	0	0	0	1	0
743	735	822.7750	0	0	0	1	1	0	0	0	1	0		0	0	0	1		1	0	0	0	1	0
744	736	822.7875	1	1	1	0	1	0	0	0	1	0		1	1	1	0		1	0	0	0	1	0
745	737	822.8000	0	1	1	0	1	0	0	0	1	0		0	1	1	0		1	0	0	0	1	0
746	738	822.8125	1	0	1	0	1	0	0	0	1	0		1	0	1	0		1	0	0	0	1	0
747	739	822.8250	0	0	1	0	1	0	0	0	1	0		0	0	1	0		1	0	0	0	1	0
748	740	822.8375	1	1	0	0	1	0	0	0	1	0		1	1	0	0		1	0	0	0	1	0
749	741	822.8500	0	1	0	0	1	0	0	0	1	0		0	1	0	0		1	0	0	0	1	0
750	742	822.8625	1	0	0	0	1	0	0	0	1	0		1	0	0	0		1	0	0	0	1	0
751	743	822.8750	0	0	0	0	1	0	0	0	1	0		0	0	0	0		1	0	0	0	1	0
752	744	822.8875	1	1	1	1	0	0	0	0	1	0		1	1	1	1		0	0	0	0	1	0
753	745	822.9000	0	1	1	1	0	0	0	0	1	0		0	1	1	1		0	0	0	0	1	0
754	746	822.9125	1	0	1	1	0	0	0	0	1	0		1	0	1	1		0	0	0	0	1	0
755	747	822.9250	0	0	1	1	0	0	0	0	1	0		0	0	1	1		0	0	0	0	1	0
756	748	822.9375	1	1	0	1	0	0	0	0	1	0		1	1	0	1		0	0	0	0	1	0
757	749	822.9500	0	1	0	1	0	0	0	0	1	0		0	1	0	1		0	0	0	0	1	0
758	750	822.9625	1	0	0	1	0	0	0	0	1	0		1	0	0	1		0	0	0	0	1	0
759	751	822.9750	0	0	0	1	0	0	0	0	1	0		0	0	0	1		0	0	0	0	1	0
760	752	822.9875	1	1	1	0	0	0	0	0	1	0		1	1	1	0		0	0	0	0	1	0
761	-	823.0000	0	1	1	0	0	0	0	0	1	0		0	1	1	0		0	0	0	0	1	0
762	753	823.0125	1	0	1	0	0	0	0	0	1	0		1	0	1	0		0	0	0	0	1	0
763	-	823.0250	0	0	1	0	0	0	0	0	1	0		0	0	1	0		0	0	0	0	1	0
764	754	823.0375	1	1	0	0	0	0	0	0	1	0		1	1	0	0		0	0	0	0	1	0
765	755	823.0500	0	1	0	0	0	0	0	0	1	0		0	1	0	0		0	0	0	0	1	0
766	756	823.0625	1	0	0	0	0	0	0	0	1	0		1	0	0	0		0	0	0	0	1	0
767	757	823.0750	0	0	0	0	0	0	0	0	1	0		0	0	0	0		0	0	0	0	1	0
768	758	823.0875	1	1	1	1	1	1	1	1	0	0		1	1	1	1		1	1	1	1	0	0
769	759	823.1000	0	1	1	1	1	1	1	1	0	0		0	1	1	1		1	1	1	1	0	0
770	760	823.1125	1	0	1	1	1	1	1	1	0	0		1	0	1	1		1	1	1	1	0	0
771	761	823.1250	0	0	1	1	1	1	1	1	0	0		0	0	1	1		1	1	1	1	0	0
772	762	823.1375	1	1	0	1	1	1	1	1	0	0		1	1	0	1		1	1	1	1	0	0
773	763	823.1500	0	1	0	1	1	1	1	1	0	0		0	1	0	1		1	1	1	1	0	0
774	764	823.0625	1	0	0	1	1	1	1	1	0	0		1	0	0	1		1	1	1	1	0	0
775	765	823.0750	0	0	0	1	1	1	1	1	0	0		0	0	0	1		1	1	1	1	0	0
776	766	823.0875	1	1	1	0	1	1	1	1	0	0		1	1	1	0		1	1	1	1	0	0

NOTE: ON = 1, OFF = 0

			LSB					**RDM**				MSB	LSB					**RVM**				MSB
Channel	FCC	Receive						S2									S6			S7		S5
Number	Number	Frequency	10	9	8	7	6	5	4	3	2	1 1	2	3	4	1	2	3	4	7	8	
777	767	823.2100	0	1	1	0	1	1	1	1	0	0	0	1	1	0			1	1	1	1	0 0
778	768	823.2125	1	0	1	0	1	1	1	1	0	0	1	0	1	0			1	1	1	1	0 0
779	769	823.2250	0	0	1	0	1	1	1	1	0	0	0	0	1	0			1	1	1	1	0 0
780	770	823.2375	1	1	0	0	1	1	1	1	0	0	1	1	0	0			1	1	1	1	0 0
781	771	823.2500	0	1	0	0	1	1	1	1	0	0	0	1	0	0			1	1	1	1	0 0
782	772	823.2625	1	0	0	0	1	1	1	1	0	0	1	0	0	0			1	1	1	1	0 0
783	773	823.2750	0	0	0	0	1	1	1	1	0	0	0	0	0	0			1	1	1	1	0 0
784	774	823.2875	1	1	1	1	0	1	1	1	0	0	1	1	1	1			0	1	1	1	0 0
785	775	823.3000	0	1	1	1	0	1	1	1	0	0	0	1	1	1			0	1	1	1	0 0
786	776	823.3125	1	0	1	1	0	1	1	1	0	0	1	0	1	1			0	1	1	1	0 0
787	777	823.3250	0	0	1	1	0	1	1	1	0	0	0	0	1	1			0	1	1	1	0 0
788	778	823.3375	1	1	0	1	0	1	1	1	0	0	1	1	0	1			0	1	1	1	0 0
789	779	823.3500	0	1	0	1	0	1	1	1	0	0	0	1	0	1			0	1	1	1	0 0
790	780	823.3625	1	0	0	1	0	1	1	1	0	0	1	0	0	1			0	1	1	1	0 0
791	781	823.3750	0	0	0	1	0	1	1	1	0	0	0	0	0	1			0	1	1	1	0 0
792	782	823.3875	1	1	1	0	0	1	1	1	0	0	1	1	1	0			0	1	1	1	0 0
793	783	823.4000	0	1	1	0	0	1	1	1	0	0	0	1	1	0			0	1	1	1	0 0
794	784	823.4125	1	0	1	0	0	1	1	1	0	0	1	0	1	0			0	1	1	1	0 0
795	785	823.4250	0	0	1	0	0	1	1	1	0	0	0	0	1	0			0	1	1	1	0 0
796	786	823.4375	1	1	0	0	0	1	1	1	0	0	1	1	0	0			0	1	1	1	0 0
797	787	823.4500	0	1	0	0	0	1	1	1	0	0	0	1	0	0			0	1	1	1	0 0
798	788	823.4625	1	0	0	0	0	1	1	1	0	0	1	0	0	0			0	1	1	1	0 0
799	789	823.4750	0	0	0	0	0	1	1	1	0	0	0	0	0	0			0	1	1	1	0 0
800	790	823.4875	1	1	1	1	1	0	1	1	0	0	1	1	1	1			1	0	1	1	0 0
801	791	823.5000	0	1	1	1	1	0	1	1	0	0	0	1	1	1			1	0	1	1	0 0
802	792	823.5125	1	0	1	1	1	0	1	1	0	0	1	0	1	1			1	0	1	1	0 0
803	793	823.5250	0	0	1	1	1	0	1	1	0	0	0	0	1	1			1	0	1	1	0 0
804	794	823.5375	1	1	0	1	1	0	1	1	0	0	1	1	0	1			1	0	1	1	0 0
805	795	823.5500	0	1	0	1	1	0	1	1	0	0	0	1	0	1			1	0	1	1	0 0
816	796	823.5625	1	0	0	1	1	0	1	1	0	0	1	0	0	1			1	0	1	1	0 0
817	797	823.5750	0	0	0	1	1	0	1	1	0	0	0	0	0	1			1	0	1	1	0 0
818	798	823.5875	1	1	1	0	1	0	1	1	0	0	1	1	1	0			1	0	1	1	0 0
819	799	823.6000	0	1	1	0	1	0	1	1	0	0	0	1	1	0			1	0	1	1	0 0
810	800	823.6125	1	0	1	0	1	0	1	1	0	0	1	0	1	0			1	0	1	1	0 0
811	801	823.6250	0	0	1	0	1	0	1	1	0	0	0	0	1	0			1	0	1	1	0 0
812	802	823.6375	1	1	0	0	1	0	1	1	0	0	1	1	0	0			1	0	1	1	0 0
813	803	823.6500	0	1	0	0	1	0	1	1	0	0	0	1	0	0			1	0	1	1	0 0
814	804	823.6625	1	0	0	0	1	0	1	1	0	0	1	0	0	0			1	0	1	1	0 0
815	805	823.6750	0	0	0	0	1	0	1	1	0	0	0	0	0	0			1	0	1	1	0 0
816	816	823.6875	1	1	1	1	0	0	1	1	0	0	1	1	1	1			0	0	1	1	0 0
817	817	823.7000	0	1	1	1	0	0	1	1	0	0	0	1	1	1			0	0	1	1	0 0
818	818	823.7125	1	0	1	1	0	0	1	1	0	0	1	0	1	1			0	0	1	1	0 0
819	819	823.7250	0	0	1	1	0	0	1	1	0	0	0	0	1	1			0	0	1	1	0 0
820	810	823.7375	1	1	0	1	0	0	1	1	0	0	1	1	0	1			0	0	1	1	0 0
821	811	823.7500	0	1	0	1	0	0	1	1	0	0	0	1	0	1			0	0	1	1	0 0
822	812	823.7625	1	0	0	1	0	0	1	1	0	0	1	0	0	1			0	0	1	1	0 0

NOTE: ON = 1, OFF = 0

			LSB			**RDM**					MSB	LSB				**RVM**				MSB
Channel	FCC	Receive	S2			S6						S7				S5				
Number	Number	Frequency	10	9	8	7	6	5	4	3	2	0	0	2	3	4	0	2	3	4	7	8
823	813	823.7750	0	0	0	1	0	0	1	1	0	0	0	0	0	1	0	0	1	1	0	0
824	814	823.7875	1	1	1	0	0	0	1	1	0	0	1	1	1	0	0	0	1	1	0	0
825	815	823.8000	0	1	1	0	0	0	1	1	0	0	0	1	1	0	0	0	1	1	0	0
826	816	823.8125	1	0	1	0	0	0	1	1	0	0	1	0	1	0	0	0	1	1	0	0
827	817	823.8250	0	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	1	1	0	0
828	818	823.8375	1	1	0	0	0	0	1	1	0	0	1	1	0	0	0	0	1	1	0	0
829	819	823.8500	0	1	0	0	0	0	1	1	0	0	0	1	0	0	0	0	1	1	0	0
830	820	823.8625	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1	0	0
831	821	823.8750	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0
832	822	823.8875	1	1	1	1	1	1	0	1	0	0	1	1	1	1	1	1	0	1	0	0
833	823	823.9000	0	1	1	1	1	1	0	1	0	0	0	1	1	1	1	1	0	1	0	0
834	824	823.9125	1	0	1	1	1	1	0	1	0	0	1	0	1	1	1	1	0	1	0	0
835	825	823.9250	0	0	1	1	1	1	0	1	0	0	0	0	1	1	1	1	0	1	0	0
836	826	823.9375	1	1	0	1	1	1	0	1	0	0	1	1	0	1	1	1	0	1	0	0
837	827	823.9500	0	1	0	1	1	1	0	1	0	0	0	1	0	1	1	1	0	1	0	0
838	828	823.9625	1	0	0	1	1	1	0	1	0	0	1	0	0	1	1	1	0	1	0	0
839	829	823.9750	0	0	0	1	1	1	0	1	0	0	0	0	0	1	1	1	0	1	0	0
840	830	823.9875	1	1	1	0	1	1	0	1	0	0	1	1	1	0	1	1	0	1	0	0
841	-	824.0000	0	1	1	0	1	1	0	1	0	0	0	1	1	0	1	1	0	1	0	0
842	-	824.0125	1	0	1	0	1	1	0	1	0	0	1	0	1	0	1	1	0	1	0	0
843	-	824.0250	0	0	1	0	1	1	0	1	0	0	0	0	1	0	1	1	0	1	0	0
844	-	824.0375	1	1	0	0	1	1	0	1	0	0	1	1	0	0	1	1	0	1	0	0
845	-	824.0500	0	1	0	0	1	1	0	1	0	0	0	1	0	0	1	1	0	1	0	0
846	-	824.0625	1	0	0	0	1	1	0	1	0	0	1	0	0	0	1	1	0	1	0	0
847	-	824.0750	0	0	0	0	1	1	0	1	0	0	0	0	0	0	1	1	0	1	0	0
848	-	824.0875	1	1	1	1	0	1	0	1	0	0	1	1	1	1	0	1	0	1	0	0
849	-	824.1000	0	1	1	1	0	1	0	1	0	0	0	1	1	1	0	1	0	1	0	0
850	-	824.1125	1	0	1	1	0	1	0	1	0	0	1	0	1	1	0	1	0	1	0	0
851	-	824.1150	0	0	1	1	0	1	0	1	0	0	0	0	1	1	0	1	0	1	0	0
852	-	824.1375	1	1	0	1	0	1	0	1	0	0	1	1	0	1	0	1	0	1	0	0
853	-	824.1500	0	1	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	1	0	0
854	-	824.1625	1	0	0	1	0	1	0	1	0	0	1	0	0	1	0	1	0	1	0	0
855	-	824.1750	0	0	0	1	0	1	0	1	0	0	0	0	0	1	0	1	0	1	0	0
856	-	824.1875	1	1	1	0	0	1	0	1	0	0	1	1	1	0	0	1	0	1	0	0
857	-	824.2100	0	1	1	0	0	1	0	1	0	0	0	1	1	0	0	1	0	1	0	0
858	-	824.2125	1	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	0	1	0	0
859	-	824.2250	0	0	1	0	0	1	0	1	0	0	0	0	1	0	0	1	0	1	0	0
860	-	824.2375	1	1	0	0	0	1	0	1	0	0	1	1	0	0	0	1	0	1	0	0
861	-	824.2500	0	1	0	0	0	1	0	1	0	0	0	1	0	0	0	1	0	1	0	0
862	-	824.2625	1	0	0	0	0	1	0	1	0	0	1	0	0	0	0	1	0	1	0	0
863	-	824.2750	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	0	0
864	-	824.2875	1	1	1	1	1	0	0	1	0	0	1	1	1	1	1	0	0	1	0	0
865	-	824.3000	0	1	1	1	1	0	0	1	0	0	0	1	1	1	1	0	0	1	0	0
866	-	824.3125	1	0	1	1	1	0	0	1	0	0	1	0	1	1	1	0	0	1	0	0
867	-	824.3250	0	0	1	1	1	0	0	1	0	0	0	0	1	1	1	0	0	1	0	0
868	-	824.3375	1	1	0	1	1	0	0	1	0	0	1	1	0	1	1	0	0	1	0	0

NOTE: ON = 1, OFF = 0

			LSB				**RDM**				MSB		LSB				**RVM**				MSB	
Channel	FCC	Receive	S2				S6						S7				S5					
Number	Number	Frequency	10	9	8	7	6	5	4	3	2	1	1	2	3	4	1	2	3	4	7	8
869	-	824.3500	0	1	0	1	1	0	0	1	0	0	0	1	0	1	1	0	0	1	0	0
870	-	824.3625	1	0	0	1	1	0	0	1	0	0	1	0	0	1	1	0	0	1	0	0
871	-	824.3750	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0
872	-	824.3875	1	1	1	0	1	0	0	1	0	0	1	1	1	0	1	0	0	1	0	0
873	-	824.4000	0	1	1	0	1	0	0	1	0	0	0	1	1	0	1	0	0	1	0	0
874	-	824.4125	1	0	1	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0
875	-	824.4250	0	0	1	0	1	0	0	1	0	0	0	0	1	0	1	0	0	1	0	0
876	-	824.4375	1	1	0	0	1	0	0	1	0	0	1	1	0	0	1	0	0	1	0	0
877	-	824.4500	0	1	0	0	1	0	0	1	0	0	0	1	0	0	1	0	0	1	0	0
878	-	824.4625	1	0	0	0	1	0	0	1	0	0	1	0	0	0	1	0	0	1	0	0
879	-	824.4750	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0
880	-	824.4875	1	1	1	1	0	0	0	1	0	0	1	1	1	1	0	0	0	1	0	0
881	-	824.5000	0	1	1	1	0	0	0	1	0	0	0	1	1	1	0	0	0	1	0	0
882	-	824.5125	1	0	1	1	0	0	0	1	0	0	1	0	1	1	0	0	0	1	0	0
883	-	824.5250	0	0	1	1	0	0	0	1	0	0	0	0	1	1	0	0	0	1	0	0
884	-	824.5375	1	1	0	1	0	0	0	1	0	0	1	1	0	1	0	0	0	1	0	0
885	-	824.5500	0	1	0	1	0	0	0	1	0	0	0	1	0	1	0	0	0	1	0	0
886	-	824.5625	1	0	0	1	0	0	0	1	0	0	1	0	0	1	0	0	0	1	0	0
887	-	824.5750	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0
888	-	824.5875	1	1	1	0	0	0	0	1	0	0	1	1	1	0	0	0	0	1	0	0
889	-	824.6000	0	1	1	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	0	0
890	-	824.6125	1	0	1	0	0	0	0	1	0	0	1	0	1	0	0	0	0	1	0	0
891	-	824.6250	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0
892	-	824.6375	1	1	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	1	0	0
893	-	824.6500	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0
894	-	824.6625	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0
895	-	824.6750	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
896	-	824.6875	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	0	0	0
897	-	824.7000	0	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	0	0	0
898	-	824.7125	1	0	1	1	1	1	1	0	0	0	1	0	1	1	1	1	1	0	0	0
899	-	824.7250	0	0	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	0	0	0
900	-	824.7375	1	1	0	1	1	1	1	0	0	0	1	1	0	1	1	1	1	0	0	0
901	-	824.7500	0	1	0	1	1	1	1	0	0	0	0	1	0	1	1	1	1	0	0	0
902	-	824.7625	1	0	0	1	1	1	1	0	0	0	1	0	0	1	1	1	1	0	0	0
903	-	824.7750	0	0	0	1	1	1	1	0	0	0	0	0	0	1	1	1	1	0	0	0
904	-	824.7875	1	1	1	0	1	1	1	0	0	0	1	1	1	0	1	1	1	0	0	0
905	-	824.8000	0	1	1	0	1	1	1	0	0	0	0	1	1	0	1	1	1	0	0	0
906	-	824.8125	1	0	1	0	1	1	1	0	0	0	1	0	1	0	1	1	1	0	0	0
907	-	824.8250	0	0	1	0	1	1	1	0	0	0	0	0	1	0	1	1	1	0	0	0
908	-	824.8375	1	1	0	0	1	1	1	0	0	0	1	1	0	0	1	1	1	0	0	0
909	-	824.8500	0	1	0	0	1	1	1	0	0	0	0	1	0	0	1	1	1	0	0	0
910	-	824.8625	1	0	0	0	1	1	1	0	0	0	1	0	0	0	1	1	1	0	0	0
911	-	824.8750	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	1	1	0	0	0
912	-	824.8875	1	1	1	1	0	1	1	0	0	0	1	1	1	1	0	1	1	0	0	0
913	-	824.9000	0	1	1	1	0	1	1	0	0	0	0	1	1	1	0	1	1	0	0	0
914	-	824.9125	1	0	1	1	0	1	1	0	0	0	1	0	1	1	0	1	1	0	0	0

NOTE: ON = 1, OFF = 0

			LSB			**RDM**					MSB	LSB				**RVM**				MSB	
Channel	FCC	Receive	S2			S6						S7				S5					
Number	Number	Frequency	10	9	8	7	6	5	4	3	2	1	1	2	3	4	1	2	3	4	7	8
915	-	824.9250	0	0	1	1	0	1	1	0	0	0	0	0	1	1	0	1	1	0	0	0
916	-	824.9375	1	1	0	1	0	1	1	0	0	0	1	1	0	1	0	1	1	0	0	0
917	-	824.9500	0	1	0	1	0	1	1	0	0	0	0	1	0	1	0	1	1	0	0	0
918	-	824.9625	1	0	0	1	0	1	1	0	0	0	1	0	0	1	0	1	1	0	0	0
919	-	824.9750	0	0	0	1	0	1	1	0	0	0	0	0	0	1	0	1	1	0	0	0
920	-	824.9875	1	1	1	0	0	1	1	0	0	0	1	1	1	0	0	1	1	0	0	0

APPENDIX B 8900 RECEIVER CHANNEL FREQUENCY CHART

NOTE: ON = 1 OFF = 0

		LSB				**RDM**				MSB	LSB				**RVM**				MSB
Channel	Receive					S2								S6				S7	S5
Number	Frequency	10	9	8	7	6	5	4	3	2 1	1	2	3	4	1	2	3	4	7 8
001	896.0125	0	1	1	1	1	1	1	1	1 1	0	1	1	1	1	1	1	1	1 1
002	896.0250	1	0	1	1	1	1	1	1	1 1	1	0	1	1	1	1	1	1	1 1
003	896.0375	0	0	1	1	1	1	1	1	1 1	0	0	1	1	1	1	1	1	1 1
004	896.0500	1	1	0	1	1	1	1	1	1 1	1	1	0	1	1	1	1	1	1 1
005	896.0625	0	1	0	1	1	1	1	1	1 1	0	1	0	1	1	1	1	1	1 1
006	896.0750	1	0	0	1	1	1	1	1	1 1	1	0	0	1	1	1	1	1	1 1
007	896.0875	0	0	0	1	1	1	1	1	1 1	0	0	0	1	1	1	1	1	1 1
008	896.1000	1	1	1	0	1	1	1	1	1 1	1	1	1	0	1	1	1	1	1 1
009	896.1125	0	1	1	0	1	1	1	1	1 1	0	1	1	0	1	1	1	1	1 1
010	896.1250	1	0	1	0	1	1	1	1	1 1	1	0	1	0	1	1	1	1	1 1
011	896.1375	0	0	1	0	1	1	1	1	1 1	0	0	1	0	1	1	1	1	1 1
012	896.1500	1	1	0	0	1	1	1	1	1 1	1	1	0	0	1	1	1	1	1 1
013	896.1625	0	1	0	0	1	1	1	1	1 1	0	1	0	0	1	1	1	1	1 1
014	896.1750	1	0	0	0	1	1	1	1	1 1	1	0	0	0	1	1	1	1	1 1
015	896.1875	0	0	0	0	1	1	1	1	1 1	0	0	0	0	1	1	1	1	1 1
016	896.2000	1	1	1	1	0	1	1	1	1 1	1	1	1	1	0	1	1	1	1 1
017	896.2125	0	1	1	1	0	1	1	1	1 1	0	1	1	1	0	1	1	1	1 1
018	896.2250	1	0	1	1	0	1	1	1	1 1	1	0	1	1	0	1	1	1	1 1
019	896.2375	0	0	1	1	0	1	1	1	1 1	0	0	1	1	0	1	1	1	1 1
020	896.2500	1	1	0	1	0	1	1	1	1 1	1	1	0	1	0	1	1	1	1 1
021	896.2625	0	1	0	1	0	1	1	1	1 1	0	1	0	1	0	1	1	1	1 1
022	896.2750	1	0	0	1	0	1	1	1	1 1	1	0	0	1	0	1	1	1	1 1
023	896.2875	0	0	0	1	0	1	1	1	1 1	0	0	0	1	0	1	1	1	1 1
024	896.3000	1	1	1	0	0	1	1	1	1 1	1	1	1	0	0	1	1	1	1 1
025	896.3125	0	1	1	0	0	1	1	1	1 1	0	1	1	0	0	1	1	1	1 1
026	896.3250	1	0	1	0	0	1	1	1	1 1	1	0	1	0	0	1	1	1	1 1
027	896.3375	0	0	1	0	0	1	1	1	1 1	0	0	1	0	0	1	1	1	1 1
028	896.3500	1	1	0	0	0	1	1	1	1 1	1	1	0	0	0	1	1	1	1 1
029	896.3625	0	1	0	0	0	1	1	1	1 1	0	1	0	0	0	1	1	1	1 1
030	896.3750	1	0	0	0	0	1	1	1	1 1	1	0	0	0	0	1	1	1	1 1
031	896.3875	0	0	0	0	0	1	1	1	1 1	0	0	0	0	0	1	1	1	1 1
032	896.4000	1	1	1	1	1	0	1	1	1 1	1	1	1	1	1	0	1	1	1 1
033	896.4125	0	1	1	1	1	0	1	1	1 1	0	1	1	1	1	0	1	1	1 1
034	896.4250	1	0	1	1	1	0	1	1	1 1	1	0	1	1	1	0	1	1	1 1
035	896.4375	0	0	1	1	1	0	1	1	1 1	0	0	1	1	1	0	1	1	1 1
036	896.4500	1	1	0	1	1	0	1	1	1 1	1	1	0	1	1	0	1	1	1 1
037	896.4625	0	1	0	1	1	0	1	1	1 1	0	1	0	1	1	0	1	1	1 1
038	896.4750	1	0	0	1	1	0	1	1	1 1	1	0	0	1	1	0	1	1	1 1
039	896.4875	0	0	0	1	1	0	1	1	1 1	0	0	0	1	1	0	1	1	1 1
040	896.5000	1	1	1	0	1	0	1	1	1 1	1	1	1	0	1	0	1	1	1 1

NOTE: ON = 1, OFF = 0

		LSB				**RDM**				MSB		LSB				**RVM**				MSB	
Channel	Receive	S2				S6						S7				S5					
Number	Frequency	10	9	8	7	6	5	4	3	2	1	1	2	3	4	1	2	3	4	7	8
041	896.5125	0	1	1	0	1	0	1	1	1	1	0	1	1	0	1	0	1	1	1	1
042	896.5250	1	0	1	0	1	0	1	1	1	1	1	0	1	0	1	0	1	1	1	1
043	896.5375	0	0	1	0	1	0	1	1	1	1	0	0	1	0	1	0	1	1	1	1
044	896.5500	1	1	0	0	1	0	1	1	1	1	1	1	0	0	1	0	1	1	1	1
045	896.5625	0	1	0	0	1	0	1	1	1	1	0	1	0	0	1	0	1	1	1	1
046	896.5750	1	0	0	0	1	0	1	1	1	1	1	0	0	0	1	0	1	1	1	1
047	896.5875	0	0	0	0	1	0	1	1	1	1	0	0	0	0	1	0	1	1	1	1
048	896.6000	1	1	1	1	0	0	1	1	1	1	1	1	1	1	0	0	1	1	1	1
049	896.6125	0	1	1	1	0	0	1	1	1	1	0	1	1	1	0	0	1	1	1	1
050	896.6250	1	0	1	1	0	0	1	1	1	1	1	0	1	1	0	0	1	1	1	1
051	896.6375	0	0	1	1	0	0	1	1	1	1	0	0	1	1	0	0	1	1	1	1
052	896.6500	1	1	0	1	0	0	1	1	1	1	1	1	0	1	0	0	1	1	1	1
053	896.6625	0	1	0	1	0	0	1	1	1	1	0	1	0	1	0	0	1	1	1	1
054	896.6750	1	0	0	1	0	0	1	1	1	1	1	0	0	1	0	0	1	1	1	1
055	896.6875	0	0	0	1	0	0	1	1	1	1	0	0	0	1	0	0	1	1	1	1
056	896.7000	1	1	1	0	0	0	1	1	1	1	1	1	1	0	0	0	1	1	1	1
057	896.7125	0	1	1	0	0	0	1	1	1	1	0	1	1	0	0	0	1	1	1	1
058	896.7250	1	0	1	0	0	0	1	1	1	1	1	0	1	0	0	0	1	1	1	1
059	896.7375	0	0	1	0	0	0	1	1	1	1	0	0	1	0	0	0	1	1	1	1
060	896.7500	1	1	0	0	0	0	1	1	1	1	1	1	0	0	0	0	1	1	1	1
061	896.7625	0	1	0	0	0	0	1	1	1	1	0	1	0	0	0	0	1	1	1	1
062	896.7750	1	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	1	1	1	1
063	896.7875	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	1	1	1	1
064	896.8000	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1
065	896.8125	0	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	0	1	1	1
066	896.8250	1	0	1	1	1	1	0	1	1	1	1	0	1	1	1	1	0	1	1	1
067	896.8375	0	0	1	1	1	1	0	1	1	1	0	0	1	1	1	1	0	1	1	1
068	896.8500	1	1	0	1	1	1	0	1	1	1	1	1	0	1	1	1	0	1	1	1
069	896.8625	0	1	0	1	1	1	0	1	1	1	0	1	0	1	1	1	0	1	1	1
070	896.8750	1	0	0	1	1	1	0	1	1	1	1	0	0	1	1	1	0	1	1	1
071	896.8875	0	0	0	1	1	1	0	1	1	1	0	0	0	1	1	1	0	1	1	1
072	896.9000	1	1	1	0	1	1	0	1	1	1	1	1	1	0	1	1	0	1	1	1
073	896.9125	0	1	1	0	1	1	0	1	1	1	0	1	1	0	1	1	0	1	1	1
074	896.9250	1	0	1	0	1	1	0	1	1	1	1	0	1	0	1	1	0	1	1	1
075	896.9375	0	0	1	0	1	1	0	1	1	1	0	0	1	0	1	1	0	1	1	1
076	896.9500	1	1	0	0	1	1	0	1	1	1	1	1	0	0	1	1	0	1	1	1
077	896.9625	0	1	0	0	1	1	0	1	1	1	0	1	0	0	1	1	0	1	1	1
078	896.9750	1	0	0	0	1	1	0	1	1	1	1	0	0	0	1	1	0	1	1	1
079	896.9875	0	0	0	0	1	1	0	1	1	1	0	0	0	0	1	1	0	1	1	1
080	897.0000	1	1	1	1	0	1	0	1	1	1	1	1	1	1	0	1	0	1	1	1
081	897.0125	0	1	1	1	0	1	0	1	1	1	0	1	1	1	0	1	0	1	1	1
082	897.0250	1	0	1	1	0	1	0	1	1	1	1	0	1	1	0	1	0	1	1	1
083	897.0375	0	0	1	1	0	1	0	1	1	1	0	0	1	1	0	1	0	1	1	1
084	897.0500	1	1	0	1	0	1	0	1	1	1	1	1	0	1	0	1	0	1	1	1
085	897.0625	0	1	0	1	0	1	0	1	1	1	0	1	0	1	0	1	0	1	1	1
086	897.0750	1	0	0	1	0	1	0	1	1	1	1	0	0	1	0	1	0	1	1	1

NOTE: ON = 1, OFF = 0

Channel Number	Receive Frequency	RDM LSB S2 10	9	8	7	6	5	4	3	2	RDM MSB S6 1	RVM LSB S7 1	2	3	RVM MSB 4	S5 1	2	3	4	S5 7	8
087	897.0875	0	0	0	1	0	1	0	1	1	1	0	0	0	1	0	1	0	1	1	1
088	897.1000	1	1	1	0	0	1	0	1	1	1	1	1	1	0	0	1	0	1	1	1
089	897.1125	0	1	1	0	0	1	0	1	1	1	0	1	1	0	0	1	0	1	1	1
090	897.1250	1	0	1	0	0	1	0	1	1	1	1	0	1	0	0	1	0	1	1	1
091	897.1375	0	0	1	0	0	1	0	1	1	1	0	0	1	0	0	1	0	1	1	1
092	897.1500	1	1	0	0	0	1	0	1	1	1	1	1	0	0	0	1	0	1	1	1
093	897.1625	0	1	0	0	0	1	0	1	1	1	0	1	0	0	0	1	0	1	1	1
094	897.1750	1	0	0	0	0	1	0	1	1	1	1	0	0	0	0	1	0	1	1	1
095	897.1875	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	1	0	1	1	1
096	897.2000	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	0	0	1	1	1
097	897.2125	0	1	1	1	1	0	0	1	1	1	0	1	1	1	1	0	0	1	1	1
098	897.2250	1	0	1	1	1	0	0	1	1	1	1	0	1	1	1	0	0	1	1	1
099	897.2375	0	0	1	1	1	0	0	1	1	1	0	0	1	1	1	0	0	1	1	1
100	897.2500	1	1	0	1	1	0	0	1	1	1	1	1	0	1	1	0	0	1	1	1
101	897.2625	0	1	0	1	1	0	0	1	1	1	0	1	0	1	1	0	0	1	1	1
102	897.2750	1	0	0	1	1	0	0	1	1	1	1	0	0	1	1	0	0	1	1	1
103	897.2875	0	0	0	1	1	0	0	1	1	1	0	0	0	1	1	0	0	1	1	1
104	897.3000	1	1	1	0	1	0	0	1	1	1	1	1	1	0	1	0	0	1	1	1
105	897.3125	0	1	1	0	1	0	0	1	1	1	0	1	1	0	1	0	0	1	1	1
106	897.3250	1	0	1	0	1	0	0	1	1	1	1	0	1	0	1	0	0	1	1	1
107	897.3375	0	0	1	0	1	0	0	1	1	1	0	0	1	0	1	0	0	1	1	1
108	897.3500	1	1	0	0	1	0	0	1	1	1	1	1	0	0	1	0	0	1	1	1
109	897.3625	0	1	0	0	1	0	0	1	1	1	0	1	0	0	1	0	0	1	1	1
110	897.3750	1	0	0	0	1	0	0	1	1	1	1	0	0	0	1	0	0	1	1	1
111	897.3875	0	0	0	0	1	0	0	1	1	1	0	0	0	0	1	0	0	1	1	1
112	897.4000	1	1	1	1	0	0	0	1	1	1	1	1	1	1	0	0	0	1	1	1
113	897.4125	0	1	1	1	0	0	0	1	1	1	0	1	1	1	0	0	0	1	1	1
114	897.4250	1	0	1	1	0	0	0	1	1	1	1	0	1	1	0	0	0	1	1	1
115	897.4375	0	0	1	1	0	0	0	1	1	1	0	0	1	1	0	0	0	1	1	1
116	897.4500	1	1	0	1	0	0	0	1	1	1	1	1	0	1	0	0	0	1	1	1
117	897.4625	0	1	0	1	0	0	0	1	1	1	0	1	0	1	0	0	0	1	1	1
118	897.4750	1	0	0	1	0	0	0	1	1	1	1	0	0	1	0	0	0	1	1	1
119	897.4875	0	0	0	1	0	0	0	1	1	1	0	0	0	1	0	0	0	1	1	1
120	897.5000	1	1	1	0	0	0	0	1	1	1	1	1	1	0	0	0	0	1	1	1
121	897.5125	0	1	1	0	0	0	0	1	1	1	0	1	1	0	0	0	0	1	1	1
122	897.5250	1	0	1	0	0	0	0	1	1	1	1	0	1	0	0	0	0	1	1	1
123	897.5375	0	0	1	0	0	0	0	1	1	1	0	0	1	0	0	0	0	1	1	1
124	897.5500	1	1	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	1	1	1
125	897.5625	0	1	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	1	1	1
126	897.5750	1	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	1	1	1
127	897.5875	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	1	1
128	897.6000	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1
129	897.6125	0	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	0	1	1
130	897.6250	1	0	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	0	1	1
131	897.6375	0	0	1	1	1	1	1	0	1	1	0	0	1	1	1	1	1	0	1	1
132	897.6500	1	1	0	1	1	1	1	0	1	1	1	1	0	1	1	1	1	0	1	1

NOTE: ON = 1, OFF = 0

		LSB					**RDM**				MSB	LSB					**RVM**				MSB
Channel	Receive	S2					S6							S7				S5			
Number	Frequency	10	9	8	7	6	5	4	3	2	1	1	2	3	4	1	2	3	4	7	8
133	897.6625	0	1	0	1	1	1	1	0	1	1	0	1	0	1	1	1	1	0	1	1
134	897.6750	1	0	0	1	1	1	1	0	1	1	1	0	0	1	1	1	1	0	1	1
135	897.6875	0	0	0	1	1	1	1	0	1	1	0	0	0	1	1	1	1	0	1	1
136	897.7000	1	1	1	0	1	1	1	0	1	1	1	1	1	0	1	1	1	0	1	1
137	897.7125	0	1	1	0	1	1	1	0	1	1	0	1	1	0	1	1	1	0	1	1
138	897.7250	1	0	1	0	1	1	1	0	1	1	1	0	1	0	1	1	1	0	1	1
139	897.7375	0	0	1	0	1	1	1	0	1	1	0	0	1	0	1	1	1	0	1	1
140	897.7500	1	1	0	0	1	1	1	0	1	1	1	1	0	0	1	1	1	0	1	1
141	897.7625	0	1	0	0	1	1	1	0	1	1	0	1	0	0	1	1	1	0	1	1
142	897.7750	1	0	0	0	1	1	1	0	1	1	1	0	0	0	1	1	1	0	1	1
143	897.7875	0	0	0	0	1	1	1	0	1	1	0	0	0	0	1	1	1	0	1	1
144	897.8000	1	1	1	1	0	1	1	0	1	1	1	1	1	1	0	1	1	0	1	1
145	897.8125	0	1	1	1	0	1	1	0	1	1	0	1	1	1	0	1	1	0	1	1
146	897.8250	1	0	1	1	0	1	1	0	1	1	1	0	1	1	0	1	1	0	1	1
147	897.8375	0	0	1	1	0	1	1	0	1	1	0	0	1	1	0	1	1	0	1	1
148	897.8500	1	1	0	1	0	1	1	0	1	1	1	1	0	1	0	1	1	0	1	1
149	897.8625	0	1	0	1	0	1	1	0	1	1	0	1	0	1	0	1	1	0	1	1
150	897.8750	1	0	0	1	0	1	1	0	1	1	1	0	0	1	0	1	1	0	1	1
151	897.8875	0	0	0	1	0	1	1	0	1	1	0	0	0	1	0	1	1	0	1	1
152	897.9000	1	1	1	0	0	1	1	0	1	1	1	1	1	0	0	1	1	0	1	1
153	897.9125	0	1	1	0	0	1	1	0	1	1	0	1	1	0	0	1	1	0	1	1
154	897.9250	1	0	1	0	0	1	1	0	1	1	1	0	1	0	0	1	1	0	1	1
155	897.9375	0	0	1	0	0	1	1	0	1	1	0	0	1	0	0	1	1	0	1	1
156	897.9500	1	1	0	0	0	1	1	0	1	1	1	1	0	0	0	1	1	0	1	1
157	897.9625	0	1	0	0	0	1	1	0	1	1	0	1	0	0	0	1	1	0	1	1
158	897.9750	1	0	0	0	0	1	1	0	1	1	1	0	0	0	0	1	1	0	1	1
159	897.9875	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	1	1	0	1	1
160	898.0000	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	0	1	0	1	1
161	898.0125	0	1	1	1	1	0	1	0	1	1	0	1	1	1	1	0	1	0	1	1
162	898.0250	1	0	1	1	1	0	1	0	1	1	1	0	1	1	1	0	1	0	1	1
163	898.0375	0	0	1	1	1	0	1	0	1	1	0	0	1	1	1	0	1	0	1	1
164	898.0500	1	1	0	1	1	0	1	0	1	1	1	1	0	1	1	0	1	0	1	1
165	898.0625	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1
166	898.0750	1	0	0	1	1	0	1	0	1	1	1	0	0	1	1	0	1	0	1	1
167	898.0875	0	0	0	1	1	0	1	0	1	1	0	0	0	1	1	0	1	0	1	1
168	898.1000	1	1	1	0	1	0	1	0	1	1	1	1	1	0	1	0	1	0	1	1
169	898.1125	0	1	1	0	1	0	1	0	1	1	0	1	1	0	1	0	1	0	1	1
170	898.1250	1	0	1	0	1	0	1	0	1	1	1	0	1	0	1	0	1	0	1	1
171	898.1375	0	0	1	0	1	0	1	0	1	1	0	0	1	0	1	0	1	0	1	1
172	898.1500	1	1	0	0	1	0	1	0	1	1	1	1	0	0	1	0	1	0	1	1
173	898.1625	0	1	0	0	1	0	1	0	1	1	0	1	0	0	1	0	1	0	1	1
174	898.1750	1	0	0	0	1	0	1	0	1	1	1	0	0	0	1	0	1	0	1	1
175	898.1875	0	0	0	0	1	0	1	0	1	1	0	0	0	0	1	0	1	0	1	1
176	898.2000	1	1	1	1	0	0	1	0	1	1	1	1	1	1	0	0	1	0	1	1
177	898.2125	0	1	1	1	0	0	1	0	1	1	0	1	1	1	0	0	1	0	1	1
178	898.2250	1	0	1	1	0	0	1	0	1	1	1	0	1	1	0	0	1	0	1	1

NOTE: ON = 1, OFF = 0

Channel Number	Receive Frequency	RDM LSB S2 10	9	8	7	6	5	4	3	2	RDM MSB S6 1	RVM LSB S7 1	2	3	4	RVM S5 1	2	3	MSB 4	7	8
179	898.2375	0	0	1	1	0	0	1	0	1	1	0	0	1	1	0	0	1	0	1	1
180	898.2500	1	1	0	1	0	0	1	0	1	1	1	1	0	1	0	0	1	0	1	1
181	898.2625	0	1	0	1	0	0	1	0	1	1	0	1	0	1	0	0	1	0	1	1
182	898.2750	1	0	0	1	0	0	1	0	1	1	1	0	0	1	0	0	1	0	1	1
183	898.2875	0	0	0	1	0	0	1	0	1	1	0	0	0	1	0	0	1	0	1	1
184	898.3000	1	1	1	0	0	0	1	0	1	1	1	1	1	0	0	0	1	0	1	1
185	898.3125	0	1	1	0	0	0	1	0	1	1	0	1	1	0	0	0	1	0	1	1
186	898.3250	1	0	1	0	0	0	1	0	1	1	1	0	1	0	0	0	1	0	1	1
187	898.3375	0	0	1	0	0	0	1	0	1	1	0	0	1	0	0	0	1	0	1	1
188	898.3500	1	1	0	0	0	0	1	0	1	1	1	1	0	0	0	0	1	0	1	1
189	898.3625	0	1	0	0	0	0	1	0	1	1	0	1	0	0	0	0	1	0	1	1
190	898.3750	1	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	1	0	1	1
191	898.3875	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	1	0	1	1
192	898.4000	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	0	0	1	1
193	898.4125	0	1	1	1	1	1	0	0	1	1	0	1	1	1	1	1	0	0	1	1
194	898.4250	1	0	1	1	1	1	0	0	1	1	1	0	1	1	1	1	0	0	1	1
195	898.4375	0	0	1	1	1	1	0	0	1	1	0	0	1	1	1	1	0	0	1	1
196	898.4500	1	1	0	1	1	1	0	0	1	1	1	1	0	1	1	1	0	0	1	1
197	898.4625	0	1	0	1	1	1	0	0	1	1	0	1	0	1	1	1	0	0	1	1
198	898.4750	1	0	0	1	1	1	0	0	1	1	1	0	0	1	1	1	0	0	1	1
199	898.4875	0	0	0	1	1	1	0	0	1	1	0	0	0	1	1	1	0	0	1	1
200	898.5000	1	1	1	0	1	1	0	0	1	1	1	1	1	0	1	1	0	0	1	1
201	898.5125	0	1	1	0	1	1	0	0	1	1	0	1	1	0	1	1	0	0	1	1
202	898.5250	1	0	1	0	1	1	0	0	1	1	1	0	1	0	1	1	0	0	1	1
203	898.5375	0	0	1	0	1	1	0	0	1	1	0	0	1	0	1	1	0	0	1	1
204	898.5500	1	1	0	0	1	1	0	0	1	1	1	1	0	0	1	1	0	0	1	1
205	898.5625	0	1	0	0	1	1	0	0	1	1	0	1	0	0	1	1	0	0	1	1
206	898.5750	1	0	0	0	1	1	0	0	1	1	1	0	0	0	1	1	0	0	1	1
207	898.5875	0	0	0	0	1	1	0	0	1	1	0	0	0	0	1	1	0	0	1	1
208	898.6000	1	1	1	1	0	1	0	0	1	1	1	1	1	1	0	1	0	0	1	1
209	898.6125	0	1	1	1	0	1	0	0	1	1	0	1	1	1	0	1	0	0	1	1
210	898.6250	1	0	1	1	0	1	0	0	1	1	1	0	1	1	0	1	0	0	1	1
211	898.6375	0	0	1	1	0	1	0	0	1	1	0	0	1	1	0	1	0	0	1	1
212	898.6500	1	1	0	1	0	1	0	0	1	1	1	1	0	1	0	1	0	0	1	1
213	898.6625	0	1	0	1	0	1	0	0	1	1	0	1	0	1	0	1	0	0	1	1
214	898.6750	1	0	0	1	0	1	0	0	1	1	1	0	0	1	0	1	0	0	1	1
215	898.6875	0	0	0	1	0	1	0	0	1	1	0	0	0	1	0	1	0	0	1	1
216	898.7000	1	1	1	0	0	1	0	0	1	1	1	1	1	0	0	1	0	0	1	1
217	898.7125	0	1	1	0	0	1	0	0	1	1	0	1	1	0	0	1	0	0	1	1
218	898.7250	1	0	1	0	0	1	0	0	1	1	1	0	1	0	0	1	0	0	1	1
219	898.7375	0	0	1	0	0	1	0	0	1	1	0	0	1	0	0	1	0	0	1	1
220	898.7500	1	1	0	0	0	1	0	0	1	1	1	1	0	0	0	1	0	0	1	1
221	898.7625	0	1	0	0	0	1	0	0	1	1	0	1	0	0	0	1	0	0	1	1
222	898.7750	1	0	0	0	0	1	0	0	1	1	1	0	0	0	0	1	0	0	1	1
223	898.7875	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	1	0	0	1	1
224	898.8000	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	0	0	0	1	1

NOTE: ON = 1, OFF = 0

		LSB				**RDM**				MSB		LSB				**RVM**				MSB	
Channel	Receive	S2				S6						S7				S5					
Number	Frequency	10	9	8	7	6	5	4	3	2	1	1	2	3	4	1	2	3	4	7	8
225	898.8125	0	1	1	1	1	0	0	0	1	1	0	1	1	1	1	0	0	0	1	1
226	898.8250	1	0	1	1	1	0	0	0	1	1	1	0	1	1	1	0	0	0	1	1
227	898.8375	0	0	1	1	1	0	0	0	1	1	0	0	1	1	1	0	0	0	1	1
228	898.8500	1	1	0	1	1	0	0	0	1	1	1	1	0	1	1	0	0	0	1	1
229	898.8625	0	1	0	1	1	0	0	0	1	1	0	1	0	1	1	0	0	0	1	1
230	898.8750	1	0	0	1	1	0	0	0	1	1	1	0	0	1	1	0	0	0	1	1
231	898.8875	0	0	0	1	1	0	0	0	1	1	0	0	0	1	1	0	0	0	1	1
232	898.9000	1	1	1	0	1	0	0	0	1	1	1	1	1	0	1	0	0	0	1	1
233	898.9125	0	1	1	0	1	0	0	0	1	1	0	1	1	0	1	0	0	0	1	1
234	898.9250	1	0	1	0	1	0	0	0	1	1	1	0	1	0	1	0	0	0	1	1
235	898.9375	0	0	1	0	1	0	0	0	1	1	0	0	1	0	1	0	0	0	1	1
236	898.9500	1	1	0	0	1	0	0	0	1	1	1	1	0	0	1	0	0	0	1	1
237	898.9625	0	1	0	0	1	0	0	0	1	1	0	1	0	0	1	0	0	0	1	1
238	898.9750	1	0	0	0	1	0	0	0	1	1	1	0	0	0	1	0	0	0	1	1
239	898.9875	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	1	1
240	899.0000	1	1	1	1	0	0	0	0	1	1	1	1	1	1	0	0	0	0	1	1
241	899.0125	0	1	1	1	0	0	0	0	1	1	0	1	1	1	0	0	0	0	1	1
242	899.0250	1	0	1	1	0	0	0	0	1	1	1	0	1	1	0	0	0	0	1	1
243	899.0375	0	0	1	1	0	0	0	0	1	1	0	0	1	1	0	0	0	0	1	1
244	899.0500	1	1	0	1	0	0	0	0	1	1	1	1	0	1	0	0	0	0	1	1
245	899.0625	0	1	0	1	0	0	0	0	1	1	0	1	0	1	0	0	0	0	1	1
246	899.0750	1	0	0	1	0	0	0	0	1	1	1	0	0	1	0	0	0	0	1	1
247	899.0875	0	0	0	1	0	0	0	0	1	1	0	0	0	1	0	0	0	0	1	1
248	899.1000	1	1	1	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	1	1
249	899.1125	0	1	1	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	1	1
250	899.1250	1	0	1	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	1	1
251	899.1375	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1
252	899.1500	1	1	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	1	1
253	899.1625	0	1	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	1	1
254	899.1750	1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	1
255	899.1875	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
256	899.2000	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1
257	899.2125	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	0	1
258	899.2250	1	0	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	0	1
259	899.2375	0	0	1	1	1	1	1	1	0	1	0	0	1	1	1	1	1	1	0	1
260	899.2500	1	1	0	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	0	1
261	899.2625	0	1	0	1	1	1	1	1	0	1	0	1	0	1	1	1	1	1	0	1
262	899.2750	1	0	0	1	1	1	1	1	0	1	1	0	0	1	1	1	1	1	0	1
263	899.2875	0	0	0	1	1	1	1	1	0	1	0	0	0	1	1	1	1	1	0	1
264	899.3000	1	1	1	0	1	1	1	1	0	1	1	1	1	0	1	1	1	1	0	1
265	899.3125	0	1	1	0	1	1	1	1	0	1	0	1	1	0	1	1	1	1	0	1
266	899.3250	1	0	1	0	1	1	1	1	0	1	1	0	1	0	1	1	1	1	0	1
267	899.3375	0	0	1	0	1	1	1	1	0	1	0	0	1	0	1	1	1	1	0	1
268	899.3500	1	1	0	0	1	1	1	1	0	1	1	1	0	0	1	1	1	1	0	1
269	899.3625	0	1	0	0	1	1	1	1	0	1	0	1	0	0	1	1	1	1	0	1
270	899.3750	1	0	0	0	1	1	1	1	0	1	1	0	0	0	1	1	1	1	0	1

NOTE: ON = 1, OFF = 0

		LSB					**RDM**				MSB	LSB					**RVM**				MSB
Channel	Receive	S2					S6					S7					S5				
Number	Frequency	10	9	8	7	6	5	4	3	2	1	1	2	3	4	1	2	3	4	7	8
271	899.3875	0	0	0	0	1	1	1	1	0	1	0	0	0	0	1	1	1	1	0	1
272	899.4000	1	1	1	1	0	1	1	1	0	1	1	1	1	1	0	1	1	1	0	1
273	899.4125	0	1	1	1	0	1	1	1	0	1	0	1	1	1	0	1	1	1	0	1
274	899.4250	1	0	1	1	0	1	1	1	0	1	1	0	1	1	0	1	1	1	0	1
275	899.4375	0	0	1	1	0	1	1	1	0	1	0	0	1	1	0	1	1	1	0	1
276	899.4500	1	1	0	1	0	1	1	1	0	1	1	1	0	1	0	1	1	1	0	1
277	899.4625	0	1	0	1	0	1	1	1	0	1	0	1	0	1	0	1	1	1	0	1
278	899.4750	1	0	0	1	0	1	1	1	0	1	1	0	0	1	0	1	1	1	0	1
279	899.4875	0	0	0	1	0	1	1	1	0	1	0	0	0	1	0	1	1	1	0	1
280	899.5000	1	1	1	0	0	1	1	1	0	1	1	1	1	0	0	1	1	1	0	1
281	899.5125	0	1	1	0	0	1	1	1	0	1	0	1	1	0	0	1	1	1	0	1
282	899.5250	1	0	1	0	0	1	1	1	0	1	1	0	1	0	0	1	1	1	0	1
283	899.5375	0	0	1	0	0	1	1	1	0	1	0	0	1	0	0	1	1	1	0	1
284	899.5500	1	1	0	0	0	1	1	1	0	1	1	1	0	0	0	1	1	1	0	1
285	899.5625	0	1	0	0	0	1	1	1	0	1	0	1	0	0	0	1	1	1	0	1
286	899.5750	1	0	0	0	0	1	1	1	0	1	1	0	0	0	0	1	1	1	0	1
287	899.5875	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	1	1	1	0	1
288	899.6000	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	0	1	1	0	1
289	899.6125	0	1	1	1	1	0	1	1	0	1	0	1	1	1	1	0	1	1	0	1
290	899.6250	1	0	1	1	1	0	1	1	0	1	1	0	1	1	1	0	1	1	0	1
291	899.6375	0	0	1	1	1	0	1	1	0	1	0	0	1	1	1	0	1	1	0	1
292	899.6500	1	1	0	1	1	0	1	1	0	1	1	1	0	1	1	0	1	1	0	1
293	899.6625	0	1	0	1	1	0	1	1	0	1	0	1	0	1	1	0	1	1	0	1
294	899.6750	1	0	0	1	1	0	1	1	0	1	1	0	0	1	1	0	1	1	0	1
295	899.6875	0	0	0	1	1	0	1	1	0	1	0	0	0	1	1	0	1	1	0	1
296	899.7000	1	1	1	0	1	0	1	1	0	1	1	1	1	0	1	0	1	1	0	1
297	899.7125	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1
298	899.7250	1	0	1	0	1	0	1	1	0	1	1	0	1	0	1	0	1	1	0	1
299	899.7375	0	0	1	0	1	0	1	1	0	1	0	0	1	0	1	0	1	1	0	1
300	899.7500	1	1	0	0	1	0	1	1	0	1	1	1	0	0	1	0	1	1	0	1
301	899.7625	0	1	0	0	1	0	1	1	0	1	0	1	0	0	1	0	1	1	0	1
302	899.7750	1	0	0	0	1	0	1	1	0	1	1	0	0	0	1	0	1	1	0	1
303	899.7875	0	0	0	0	1	0	1	1	0	1	0	0	0	0	1	0	1	1	0	1
304	899.8000	1	1	1	1	0	0	1	1	0	1	1	1	1	1	0	0	1	1	0	1
305	899.8125	0	1	1	1	0	0	1	1	0	1	0	1	1	1	0	0	1	1	0	1
306	899.8250	1	0	1	1	0	0	1	1	0	1	1	0	1	1	0	0	1	1	0	1
307	899.8375	0	0	1	1	0	0	1	1	0	1	0	0	1	1	0	0	1	1	0	1
308	899.8500	1	1	0	1	0	0	1	1	0	1	1	1	0	1	0	0	1	1	0	1
309	899.8625	0	1	0	1	0	0	1	1	0	1	0	1	0	1	0	0	1	1	0	1
310	899.8750	1	0	0	1	0	0	1	1	0	1	1	0	0	1	0	0	1	1	0	1
311	899.8875	0	0	0	1	0	0	1	1	0	1	0	0	0	1	0	0	1	1	0	1
312	899.9000	1	1	1	0	0	0	1	1	0	1	1	1	1	0	0	0	1	1	0	1
313	899.9125	0	1	1	0	0	0	1	1	0	1	0	1	1	0	0	0	1	1	0	1
314	899.9250	1	0	1	0	0	0	1	1	0	1	1	0	1	0	0	0	1	1	0	1
315	899.9375	0	0	1	0	0	0	1	1	0	1	0	0	1	0	0	0	1	1	0	1
316	899.9500	1	1	0	0	0	0	1	1	0	1	1	1	0	0	0	0	1	1	0	1

NOTE: ON = 1, OFF = 0

		LSB					**RDM**				MSB	LSB					**RVM**				MSB
Channel	Receive	S2					S6					S7					S5				
Number	Frequency	10	9	8	7	6	5	4	3	2	1	1	2	3	4	1	2	3	4	7	8
317	899.9625	0	1	0	0	0	0	1	1	0	1	0	1	0	0	0	0	1	1	0	1
318	899.9750	1	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	1	1	0	1
319	899.9875	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	1	1	0	1
320	900.0000	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	0	1	0	1
321	900.0125	0	1	1	1	1	1	0	1	0	1	0	1	1	1	1	1	0	1	0	1
322	900.0250	1	0	1	1	1	1	0	1	0	1	1	0	1	1	1	1	0	1	0	1
323	900.0375	0	0	1	1	1	1	0	1	0	1	0	0	1	1	1	1	0	1	0	1
324	900.0500	1	1	0	1	1	1	0	1	0	1	1	1	0	1	1	1	0	1	0	1
325	900.0625	0	1	0	1	1	1	0	1	0	1	0	1	0	1	1	1	0	1	0	1
326	900.0750	1	0	0	1	1	1	0	1	0	1	1	0	0	1	1	1	0	1	0	1
327	900.0875	0	0	0	1	1	1	0	1	0	1	0	0	0	1	1	1	0	1	0	1
328	900.1000	1	1	1	0	1	1	0	1	0	1	1	1	1	0	1	1	0	1	0	1
329	900.1125	0	1	1	0	1	1	0	1	0	1	0	1	1	0	1	1	0	1	0	1
330	900.1250	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1
331	900.1375	0	0	1	0	1	1	0	1	0	1	0	0	1	0	1	1	0	1	0	1
332	900.1500	1	1	0	0	1	1	0	1	0	1	1	1	0	0	1	1	0	1	0	1
333	900.1625	0	1	0	0	1	1	0	1	0	1	0	1	0	0	1	1	0	1	0	1
334	900.1750	1	0	0	0	1	1	0	1	0	1	1	0	0	0	1	1	0	1	0	1
335	900.1875	0	0	0	0	1	1	0	1	0	1	0	0	0	0	1	1	0	1	0	1
336	900.2000	1	1	1	1	0	1	0	1	0	1	1	1	1	1	0	1	0	1	0	1
337	900.2125	0	1	1	1	0	1	0	1	0	1	0	1	1	1	0	1	0	1	0	1
338	900.2250	1	0	1	1	0	1	0	1	0	1	1	0	1	1	0	1	0	1	0	1
339	900.2375	0	0	1	1	0	1	0	1	0	1	0	0	1	1	0	1	0	1	0	1
340	900.2500	1	1	0	1	0	1	0	1	0	1	1	1	0	1	0	1	0	1	0	1
341	900.2625	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
342	900.2750	1	0	0	1	0	1	0	1	0	1	1	0	0	1	0	1	0	1	0	1
343	900.2875	0	0	0	1	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	1
344	900.3000	1	1	1	0	0	1	0	1	0	1	1	1	1	0	0	1	0	1	0	1
345	900.3125	0	1	1	0	0	1	0	1	0	1	0	1	1	0	0	1	0	1	0	1
346	900.3250	1	0	1	0	0	1	0	1	0	1	1	0	1	0	0	1	0	1	0	1
347	900.3375	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0	1	0	1	0	1
348	900.3500	1	1	0	0	0	1	0	1	0	1	1	1	0	0	0	1	0	1	0	1
349	900.3625	0	1	0	0	0	1	0	1	0	1	0	1	0	0	0	1	0	1	0	1
350	900.3750	1	0	0	0	0	1	0	1	0	1	1	0	0	0	0	1	0	1	0	1
351	900.3875	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	1	0	1	0	1
352	900.4000	1	1	1	1	1	0	0	1	0	1	1	1	1	1	1	0	0	1	0	1
353	900.4125	0	1	1	1	1	0	0	1	0	1	0	1	1	1	1	0	0	1	0	1
354	900.4250	1	0	1	1	1	0	0	1	0	1	1	0	1	1	1	0	0	1	0	1
355	900.4375	0	0	1	1	1	0	0	1	0	1	0	0	1	1	1	0	0	1	0	1
356	900.4500	1	1	0	1	1	0	0	1	0	1	1	1	0	1	1	0	0	1	0	1
357	900.4625	0	1	0	1	1	0	0	1	0	1	0	1	0	1	1	0	0	1	0	1
358	900.4750	1	0	0	1	1	0	0	1	0	1	1	0	0	1	1	0	0	1	0	1
359	900.4875	0	0	0	1	1	0	0	1	0	1	0	0	0	1	1	0	0	1	0	1
360	900.5000	1	1	1	0	1	0	0	1	0	1	1	1	1	0	1	0	0	1	0	1
361	900.5125	0	1	1	0	1	0	0	1	0	1	0	1	1	0	1	0	0	1	0	1
362	900.5250	1	0	1	0	1	0	0	1	0	1	1	0	1	0	1	0	0	1	0	1

NOTE: ON = 1, OFF = 0

		LSB					**RDM**				MSB	LSB					**RVM**				MSB
Channel	Receive	S2					S6					S7					S5				
Number	Frequency	10	9	8	7	6	5	4	3	2	1	1	2	3	4	1	2	3	4	7	8
363	900.5375	0	0	1	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	0	1
364	900.5500	1	1	0	0	1	0	0	1	0	1	1	1	0	0	1	0	0	1	0	1
365	900.5625	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0	1	0	1
366	900.5750	1	0	0	0	1	0	0	1	0	1	1	0	0	0	1	0	0	1	0	1
367	900.5875	0	0	0	0	1	0	0	1	0	1	0	0	0	0	1	0	0	1	0	1
368	900.6000	1	1	1	1	0	0	0	1	0	1	1	1	1	1	0	0	0	1	0	1
369	900.6125	0	1	1	1	0	0	0	1	0	1	0	1	1	1	0	0	0	1	0	1
370	900.6250	1	0	1	1	0	0	0	1	0	1	1	0	1	1	0	0	0	1	0	1
371	900.6375	0	0	1	1	0	0	0	1	0	1	0	0	1	1	0	0	0	1	0	1
372	900.6500	1	1	0	1	0	0	0	1	0	1	1	1	0	1	0	0	0	1	0	1
373	900.6625	0	1	0	1	0	0	0	1	0	1	0	1	0	1	0	0	0	1	0	1
374	900.6750	1	0	0	1	0	0	0	1	0	1	1	0	0	1	0	0	0	1	0	1
375	900.6875	0	0	0	1	0	0	0	1	0	1	0	0	0	1	0	0	0	1	0	1
376	900.7000	1	1	1	0	0	0	0	1	0	1	1	1	1	0	0	0	0	1	0	1
377	900.7125	0	1	1	0	0	0	0	1	0	1	0	1	1	0	0	0	0	1	0	1
378	900.7250	1	0	1	0	0	0	0	1	0	1	1	0	1	0	0	0	0	1	0	1
379	900.7375	0	0	1	0	0	0	0	1	0	1	0	0	1	0	0	0	0	1	0	1
380	900.7500	1	1	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	1	0	1
381	900.7625	0	1	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	1	0	1
382	900.7750	1	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	1	0	1
383	900.7875	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
384	900.8000	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	0	0	1
385	900.8125	0	1	1	1	1	1	1	0	0	1	0	1	1	1	1	1	1	0	0	1
386	900.8250	1	0	1	1	1	1	1	0	0	1	1	0	1	1	1	1	1	0	0	1
387	900.8375	0	0	1	1	1	1	1	0	0	1	0	0	1	1	1	1	1	0	0	1
388	900.8500	1	1	0	1	1	1	1	0	0	1	1	1	0	1	1	1	1	0	0	1
389	900.8625	0	1	0	1	1	1	1	0	0	1	0	1	0	1	1	1	1	0	0	1
390	900.8750	1	0	0	1	1	1	1	0	0	1	1	0	0	1	1	1	1	0	0	1
391	900.8875	0	0	0	1	1	1	1	0	0	1	0	0	0	1	1	1	1	0	0	1
392	900.9000	1	1	1	0	1	1	1	0	0	1	1	1	1	0	1	1	1	0	0	1
393	900.9125	0	1	1	0	1	1	1	0	0	1	0	1	1	0	1	1	1	0	0	1
394	900.9250	1	0	1	0	1	1	1	0	0	1	1	0	1	0	1	1	1	0	0	1
395	900.9375	0	0	1	0	1	1	1	0	0	1	0	0	1	0	1	1	1	0	0	1
396	900.9500	1	1	0	0	1	1	1	0	0	1	1	1	0	0	1	1	1	0	0	1
397	900.9625	0	1	0	0	1	1	1	0	0	1	0	1	0	0	1	1	1	0	0	1
398	900.9750	1	0	0	0	1	1	1	0	0	1	1	0	0	0	1	1	1	0	0	1
399	900.9875	0	0	0	0	1	1	1	0	0	1	0	0	0	0	1	1	1	0	0	1

APPENDIX C 2008 RECEIVER CHANNEL FREQUENCY CHART

Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency	Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency
1	1	851.0125	806.0125	45	45	852.1125	807.1125
2	2	851.0375	806.0375	46	46	852.1375	807.1375
3	3	851.0625	806.0625	47	47	852.1625	807.1625
4	4	851.0875	806.0875	48	48	852.1875	807.1875
5	5	851.1125	806.1125	49	49	852.2125	807.2125
6	6	851.1375	806.1375	50	50	852.2375	807.2375
7	7	851.1625	806.1625	51	51	852.2625	807.2625
8	8	851.1875	806.1875	52	52	852.2875	807.2875
9	9	851.2125	806.2125	53	53	852.3125	807.3125
10	10	851.2375	806.2375	54	54	852.3375	807.3375
11	11	851.2625	806.2625	55	55	852.3625	807.3625
12	12	851.2875	806.2875	56	56	852.3875	807.3875
13	13	851.3125	806.3125	57	57	852.4125	807.4125
14	14	851.3375	806.3375	58	58	852.4375	807.4375
15	15	851.3625	806.3625	59	59	852.4625	807.4625
16	16	851.3875	806.3875	60	60	852.4875	807.4875
17	17	851.4125	806.4125	61	61	852.5125	807.5125
18	18	851.4375	806.4375	62	62	852.5375	807.5375
19	19	851.4625	806.4625	63	63	852.5625	807.5625
20	20	851.4875	806.4875	64	64	852.5875	807.5875
21	21	851.5125	806.5125	65	65	852.6125	807.6125
22	22	851.5375	806.5375	66	66	852.6375	807.6375
23	23	851.5625	806.5625	67	67	852.6625	807.6625
24	24	851.5875	806.5875	68	68	852.6875	807.6875
25	25	851.6125	806.6125	69	69	852.7125	807.7125
26	26	851.6375	806.6375	70	70	852.7375	807.7375
27	27	851.6625	806.6625	71	71	852.7625	807.7625
28	28	851.6875	806.6875	72	72	852.7875	807.7875
29	29	851.7125	806.7125	73	73	852.8125	807.8125
30	30	851.7375	806.7375	74	74	852.8375	807.8375
31	31	851.7625	806.7625	75	75	852.8625	807.8625
32	32	851.7875	806.7875	76	76	852.8875	807.8875
33	33	851.8125	806.8125	77	77	852.9125	807.9125
34	34	851.8375	806.8375	78	78	852.9375	807.9375
35	35	851.8625	806.8625	79	79	852.9625	807.9625
36	36	851.8875	806.8875	80	80	852.9875	807.9875
37	37	851.9125	806.9125	81	81	853.0125	808.0125
38	38	851.9375	806.9375	82	82	853.0375	808.0375
39	39	851.9625	806.9625	83	83	853.0625	808.0625
40	40	851.9875	806.9875	84	84	853.0875	808.0875
41	41	852.0125	807.0125	85	85	853.1125	808.1125
42	42	852.0375	807.0375	86	86	853.1375	808.1375
43	43	852.0625	807.0625	87	87	853.1625	808.1625
44	44	852.0875	807.0875	88	88	853.1875	808.1875

Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency
89	89	853.2125	808.2125
90	90	853.2375	808.2375
91	91	853.2625	808.2625
92	92	853.2875	808.2875
93	93	853.3125	808.3125
94	94	853.3375	808.3375
95	95	853.3625	808.3625
96	96	853.3875	808.3875
97	97	853.4125	808.4125
98	98	853.4375	808.4375
99	99	853.4625	808.4625
100	100	853.4875	808.4875
101	101	853.5125	808.5125
102	102	853.5375	808.5375
103	103	853.5625	808.5625
104	104	853.5875	808.5875
105	105	853.6125	808.6125
106	106	853.6375	808.6375
107	107	853.6625	808.6625
108	108	853.6875	808.6875
109	109	853.7125	808.7125
110	110	853.7375	808.7375
111	111	853.7625	808.7625
112	112	853.7875	808.7875
113	113	853.8125	808.8125
114	114	853.8375	808.8375
115	115	853.8625	808.8625
116	116	853.8875	808.8875
117	117	853.9125	808.9125
118	118	853.9375	808.9375
119	119	853.9625	808.9625
120	120	853.9875	808.9875
121	121	854.0125	809.0125
122	122	854.0375	809.0375
123	123	854.0625	809.0625
124	124	854.0875	809.0875
125	125	854.1125	809.1125
126	126	854.1375	809.1375
127	127	854.1625	809.1625
128	128	854.1875	809.1875
129	129	854.2125	809.2125
130	130	854.2375	809.2375
131	131	854.2625	809.2625
132	132	854.2875	809.2875
133	133	854.3125	809.3125
134	134	854.3375	809.3375
135	135	854.3625	809.3625
136	136	854.3875	809.3875
137	137	854.4125	809.4125
138	138	854.4375	809.4375
139	139	854.4625	809.4625
140	140	854.4875	809.4875
141	141	854.5125	809.5125
142	142	854.5375	809.5375
143	143	854.5625	809.5625
144	144	854.5875	809.5875
145	145	854.6125	809.6125
146	146	854.6375	809.6375
147	147	854.6625	809.6625
148	148	854.6875	809.6875
149	149	854.7125	809.7125
150	150	854.7375	809.7375
151	151	854.7625	809.7625
152	152	854.7875	809.7875
153	153	854.8125	809.8125
154	154	854.8375	809.8375
155	155	854.8625	809.8625
156	156	854.8875	809.8875
157	157	854.9125	809.9125
158	158	854.9375	809.9375
159	159	854.9625	809.9625
160	160	854.9875	809.9875
161	161	855.0125	810.0125
162	162	855.0375	810.0375
163	163	855.0625	810.0625
164	164	855.0875	810.0875
165	165	855.1125	810.1125
166	166	855.1375	810.1375
167	167	855.1625	810.1625
168	168	855.1875	810.1875
169	169	855.2125	810.2125
170	170	855.2375	810.2375
171	171	855.2625	810.2625
172	172	855.2875	810.2875
173	173	855.3125	810.3125
174	174	855.3375	810.3375
175	175	855.3625	810.3625
176	176	855.3875	810.3875
177	177	855.4125	810.4125

Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency	Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency
178	178	855.4375	810.4375	221	221	856.5125	811.5125
179	179	855.4625	810.4625	222	222	856.5375	811.5375
180	180	855.4875	810.4875	223	223	856.5625	811.5625
181	181	855.5125	810.5125	224	224	856.5875	811.5875
182	182	855.5375	810.5375	225	225	856.6125	811.6125
183	183	855.5625	810.5625	226	226	856.6375	811.6375
184	184	855.5875	810.5875	227	227	856.6625	811.6625
185	185	855.6125	810.6125	228	228	856.6875	811.6875
186	186	855.6375	810.6375	229	229	856.7125	811.7125
187	187	855.6625	810.6625	230	230	856.7375	811.7375
188	188	855.6875	810.6875	231	231	856.7625	811.7625
189	189	855.7125	810.7125	232	232	856.7875	811.7875
190	190	855.7375	810.7375	233	233	856.8125	811.8125
191	191	855.7625	810.7625	234	234	856.8375	811.8375
192	192	855.7875	810.7875	235	235	856.8625	811.8625
193	193	855.8125	810.8125	236	236	856.8875	811.8875
194	194	855.8375	810.8375	237	237	856.9125	811.9125
195	195	855.8625	810.8625	238	238	856.9375	811.9375
196	196	855.8875	810.8875	239	239	856.9625	811.9625
197	197	855.9125	810.9125	240	240	856.9875	811.9875
198	198	855.9375	810.9375	241	241	857.0125	812.0125
199	199	855.9625	810.9625	242	242	857.0375	812.0375
200	200	855.9875	810.9875	243	243	857.0625	812.0625
201	201	856.0125	811.0125	244	244	857.0875	812.0875
202	202	856.0375	811.0375	245	245	857.1125	812.1125
203	203	856.0625	811.0625	246	246	857.1375	812.1375
204	204	856.0875	811.0875	247	247	857.1625	812.1625
205	205	856.1125	811.1125	249	249	857.2125	812.2125
206	206	856.1375	811.1375	250	250	857.2375	812.2375
207	207	856.1625	811.1625	251	251	857.2625	812.2625
208	208	856.1875	811.1875	252	252	857.2875	812.2875
209	209	856.2125	811.2125	253	253	857.3125	812.3125
210	210	856.2375	811.2375	254	254	857.3375	812.3375
211	211	856.2625	811.2625	255	255	857.3625	812.3625
212	212	856.2875	811.2875	256	256	857.3875	812.3875
213	213	856.3125	811.3125	257	257	857.4125	812.4125
214	214	856.3375	811.3375	258	258	857.4375	812.4375
215	215	856.3625	811.3625	259	259	857.4625	812.4625
216	216	856.3875	811.3875	260	260	857.4875	812.4875
217	217	856.4125	811.4125	261	261	857.5125	812.5125
218	218	856.4375	811.4375	262	262	857.5375	812.5375
219	219	856.4625	811.4625	263	263	857.5625	812.5625
220	220	856.4875	811.4875	264	264	857.5875	812.5875

Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency	Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency
265	265	857.6125	812.6125	308	308	858.6875	813.6875
266	266	857.6375	812.6375	309	309	858.7125	813.7125
267	267	857.6625	812.6625	310	310	858.7375	813.7375
268	268	857.6875	812.6875	311	311	858.7625	813.7625
269	269	857.7125	812.7125	312	312	858.7875	813.7875
270	270	857.7375	812.7375	313	313	858.8125	813.8125
271	271	857.7625	812.7625	314	314	858.8375	813.8375
272	272	857.7875	812.7875	315	315	858.8625	813.8625
273	273	857.8125	812.8125	316	316	858.8875	813.8875
274	274	857.8375	812.8375	318	318	858.9375	813.9375
275	275	857.8625	812.8625	319	319	858.9625	813.9625
276	276	857.8875	812.8875	320	320	858.9875	813.9875
277	277	857.9125	812.9125	321	321	859.0125	814.0125
278	278	857.9375	812.9375	322	322	859.0375	814.0375
279	279	857.9625	812.9625	323	323	859.0625	814.0625
280	280	857.9875	812.9875	324	324	859.0875	814.0875
281	281	858.0125	813.0125	325	325	859.1125	814.1125
282	282	858.0375	813.0375	326	326	859.1375	814.1375
283	283	858.0625	813.0625	327	327	859.1625	814.1625
284	284	858.0875	813.0875	328	328	859.1875	814.1875
285	285	858.1125	813.1125	329	329	859.2125	814.2125
286	286	858.1375	813.1375	330	330	859.2375	814.2375
287	287	858.1625	813.1625	331	331	859.2625	814.2625
288	288	858.1875	813.1875	332	332	859.2875	814.2875
289	289	858.2125	813.2125	333	333	859.3125	814.3125
290	290	858.2375	813.2375	334	334	859.3375	814.3375
291	291	858.2625	813.2625	335	335	859.3625	814.3625
292	292	858.2875	813.2875	336	336	859.3875	814.3875
293	293	858.3125	813.3125	337	337	859.4125	814.4125
294	294	858.3375	813.3375	338	338	859.4375	814.4375
295	295	858.3625	813.3625	339	339	859.4625	814.4625
296	296	858.3875	813.3875	340	340	859.4875	814.4875
297	297	858.4125	813.4125	341	341	859.5125	814.5125
298	298	858.4375	813.4375	342	342	859.5375	814.5375
299	299	858.4625	813.4625	343	343	859.5625	814.5625
300	300	858.4875	813.4875	344	344	859.5875	814.5875
301	301	858.5125	813.5125	345	345	859.6125	814.6125
302	302	858.5375	813.5375	346	346	859.6375	814.6375
303	303	858.5625	813.5625	347	347	859.6625	814.6625
304	304	858.5875	813.5875	348	348	859.6875	814.6875
305	305	858.6125	813.6125	349	349	859.7125	814.7125
306	306	858.6375	813.6375	350	350	859.7375	814.7375
307	307	858.6625	813.6625	351	351	859.7625	814.7625

Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency	Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency
352	352	859.7875	814.7875	398	398	860.9375	815.9375
353	353	859.8125	814.8125	399	399	860.9625	815.9625
354	354	859.8375	814.8375	400	400	860.9875	815.9875
355	355	859.8625	814.8625	401	401	861.0125	816.0125
356	356	859.8875	814.8875	402	402	861.0375	816.0375
357	357	859.9125	814.9125	403	403	861.0625	816.0625
358	358	859.9375	814.9375	404	404	861.0875	816.0875
359	359	859.9625	814.9625	405	405	861.1125	816.1125
360	360	859.9875	814.9875	406	406	861.1375	816.1375
361	361	860.0125	815.0125	407	407	861.1625	816.1625
362	362	860.0375	815.0375	408	408	861.1875	816.1875
363	363	860.0625	815.0625	409	409	861.2125	816.2125
364	364	860.0875	815.0875	410	410	861.2375	816.2375
365	365	860.1125	815.1125	411	411	861.2625	816.2625
366	366	860.1375	815.1375	412	412	861.2875	816.2875
367	367	860.1625	815.1625	413	413	861.3125	816.3125
368	368	860.1875	815.1875	414	414	861.3375	816.3375
369	369	860.2125	815.2125	415	415	861.3625	816.3625
370	370	860.2375	815.2375	416	416	861.3875	816.3875
371	371	860.2625	815.2625	417	417	861.4125	816.4125
372	372	860.2875	815.2875	418	418	861.4375	816.4375
373	373	860.3125	815.3125	419	419	861.4625	816.4625
374	374	860.3375	815.3375	420	420	861.4875	816.4875
375	375	860.3625	815.3625	421	421	861.5125	816.5125
376	376	860.3875	815.3875	422	422	861.5375	816.5375
377	377	860.4125	815.4125	423	423	861.5625	816.5625
378	378	860.4375	815.4375	424	424	861.5875	816.5875
379	379	860.4625	815.4625	425	425	861.6125	816.6125
380	380	860.4875	815.4875	426	426	861.6375	816.6375
381	381	860.5125	815.5125	427	427	861.6625	816.6625
382	382	860.5375	815.5375	428	428	861.6875	816.6875
383	383	860.5625	815.5625	429	429	861.7125	816.7125
384	384	860.5875	815.5875	430	430	861.7375	816.7375
385	385	860.6125	815.6125	431	431	861.7625	816.7625
386	386	860.6375	815.6375	432	432	861.7875	816.7875
387	387	860.6625	815.6625	433	433	861.8125	816.8125
388	388	860.6875	815.6875	434	434	861.8375	816.8375
389	389	860.7125	815.7125	435	435	861.8625	816.8625
390	390	860.7375	815.7375	436	436	861.8875	816.8875
391	391	860.7625	815.7625	437	437	861.9125	816.9125
392	392	860.7875	815.7875	438	438	861.9375	816.9375
393	393	860.8125	815.8125	439	439	861.9625	816.9625
394	394	860.8375	815.8375	440	440	861.9875	816.9875
395	395	860.8625	815.8625	441	441	862.0125	817.0125
396	396	860.8875	815.8875	442	442	862.0375	817.0375
397	397	860.9125	815.9125	443	443	862.0625	817.0625

Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency	Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency
444	444	862.0875	817.0875	490	490	863.2375	818.2375
445	445	862.1125	817.1125	491	491	863.2625	818.2625
446	446	862.1375	817.1375	492	492	863.2875	818.2875
447	447	862.1625	817.1625	493	493	863.3125	818.3125
448	448	862.1875	817.1875	494	494	863.3375	818.3375
449	449	862.2125	817.2125	495	495	863.3625	818.3625
450	450	862.2375	817.2375	496	496	863.3875	818.3875
451	451	862.2625	817.2625	497	497	863.4125	818.4125
452	452	862.2875	817.2875	498	498	863.4375	818.4375
453	453	862.3125	817.3125	499	499	863.4625	818.4625
454	454	862.3375	817.3375	500	500	863.4875	818.4875
455	455	862.3625	817.3625	501	501	863.5125	818.5125
456	456	862.3875	817.3875	502	502	863.5375	818.5375
457	457	862.4125	817.4125	503	503	863.5625	818.5625
458	458	862.4375	817.4375	504	504	863.5875	818.5875
459	459	862.4625	817.4625	505	505	863.6125	818.6125
460	460	862.4875	817.4875	506	506	863.6375	818.6375
461	461	862.5125	817.5125	507	507	863.6625	818.6625
462	462	862.5375	817.5375	508	508	863.6875	818.6875
463	463	862.5625	817.5625	509	509	863.7125	818.7125
464	464	862.5875	817.5875	510	510	863.7375	818.7375
465	465	862.6125	817.6125	511	511	863.7625	818.7625
466	466	862.6375	817.6375	512	512	863.7875	818.7875
467	467	862.6625	817.6625	513	513	863.8125	818.8125
468	468	862.6875	817.6875	514	514	863.8375	818.8375
469	469	862.7125	817.7125	515	515	863.8625	818.8625
470	470	862.7375	817.7375	516	516	863.8875	818.8875
471	471	862.7625	817.7625	517	517	863.9125	818.9125
472	472	862.7875	817.7875	518	518	863.9375	818.9375
473	473	862.8125	817.8125	519	519	863.9625	818.9625
474	474	862.8375	817.8375	520	520	863.9875	818.9875
475	475	862.8625	817.8625	521	521	864.0125	819.0125
476	476	862.8875	817.8875	522	522	864.0375	819.0375
477	477	862.9125	817.9125	523	523	864.0625	819.0625
478	478	862.9375	817.9375	524	524	864.0875	819.0875
479	479	862.9625	817.9625	525	525	864.1125	819.1125
480	480	862.9875	817.9875	526	526	864.1375	819.1375
481	481	863.0125	818.0125	527	527	864.1625	819.1625
482	482	863.0375	818.0375	528	528	864.1875	819.1875
483	483	863.0625	818.0625	529	529	864.2125	819.2125
484	484	863.0875	818.0875	530	530	864.2375	819.2375
485	485	863.1125	818.1125	531	531	864.2625	819.2625
486	486	863.1375	818.1375	532	532	864.2875	819.2875
487	487	863.1625	818.1625	533	533	864.3125	819.3125
488	488	863.1875	818.1875	534	534	864.3375	819.3375
489	489	863.2125	818.2125	535	535	864.3625	819.3625

Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency	Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency
536	536	864.3875	819.3875	582	582	865.5375	820.5375
537	537	864.4125	819.4125	583	583	865.5625	820.5625
538	538	864.4375	819.4375	584	584	865.5875	820.5875
539	539	864.4625	819.4625	585	585	865.6125	820.6125
540	540	864.4875	819.4875	586	586	865.6375	820.6375
541	541	864.5125	819.5125	587	587	865.6625	820.6625
542	542	864.5375	819.5375	588	588	865.6875	820.6875
543	543	864.5625	819.5625	589	589	865.7125	820.7125
544	544	864.5875	819.5875	590	590	865.7375	820.7375
545	545	864.6125	819.6125	591	591	865.7625	820.7625
546	546	864.6375	819.6375	592	592	865.7875	820.7875
547	547	864.6625	819.6625	593	593	865.8125	820.8125
548	548	864.6875	819.6875	594	594	865.8375	820.8375
549	549	864.7125	819.7125	595	595	865.8625	820.8625
550	550	864.7375	819.7375	596	596	865.8875	820.8875
551	551	864.7625	819.7625	597	597	865.9125	820.9125
552	552	864.7875	819.7875	598	598	865.9375	820.9375
553	553	864.8125	819.8125	599	599	865.9625	820.9625
554	554	864.8375	819.8375	600	600	865.9875	820.9875
555	555	864.8625	819.8625	601	-	866.0000	821.0000
556	556	864.8875	819.8875	602	601	866.0125	821.0125
557	557	864.9125	819.9125	603	-	866.0250	821.0250
558	558	864.9375	819.9375	604	602	866.0375	821.0375
559	559	864.9625	819.9625	605	603	866.0500	821.0500
560	560	864.9875	819.9875	606	604	866.0625	821.0625
561	561	865.0125	820.0125	607	605	866.0750	821.0750
562	562	865.0375	820.0375	608	606	866.0875	821.0875
563	563	865.0625	820.0625	609	607	866.1000	821.1000
564	564	865.0875	820.0875	610	608	866.1125	821.1125
565	565	865.1125	820.1125	611	609	866.1250	821.1250
566	566	865.1375	820.1375	612	610	866.1375	821.1375
567	567	865.1625	820.1625	613	611	866.1500	821.1500
568	568	865.1875	820.1875	614	612	866.1625	821.1625
569	569	865.2125	820.2125	615	613	866.1750	821.1750
570	570	865.2375	820.2375	616	614	866.1875	821.1875
571	571	865.2625	820.2625	617	615	866.2000	821.2000
572	572	865.2875	820.2875	618	616	866.2125	821.2125
573	573	865.3125	820.3125	619	617	866.2250	821.2250
574	574	865.3375	820.3375	620	618	866.2375	821.2375
575	575	865.3625	820.3625	621	619	866.2500	821.2500
576	576	865.3875	820.3875	622	620	866.2625	821.2625
577	577	865.4125	820.4125	623	621	866.2750	821.2750
578	578	865.4375	820.4375	624	622	866.2875	821.2875
579	579	865.4625	820.4625	625	623	866.3000	821.3000
580	580	865.4875	820.4875	626	624	866.3125	821.3125
581	581	865.5125	820.5125	627	625	866.3250	821.3250

Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency	Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency
628	626	866.3375	821.3375	674	670	866.9125	821.9125
629	627	866.3500	821.3500	675	671	866.9250	821.9250
630	628	866.3625	821.3625	676	672	866.9375	821.9375
631	629	866.3750	821.3750	677	673	866.9500	821.9500
632	630	866.3875	821.3875	678	674	866.9625	821.9625
633	631	866.4000	821.4000	679	675	866.9750	821.9750
634	632	866.4125	821.4125	680	676	866.9875	821.9875
635	633	866.4250	821.4250	681	-	867.0000	822.0000
636	634	866.4375	821.4375	682	677	867.0125	822.0125
637	635	866.4500	821.4500	683	-	867.0250	822.0250
638	636	866.4625	821.4625	684	678	867.0375	822.0375
639	637	866.4750	821.4750	685	679	867.0500	822.0500
640	638	866.4875	821.4875	686	680	867.0625	822.0625
641	-	866.5000	821.5000	687	681	867.0750	822.0750
642	639	866.5125	821.5125	688	682	867.0875	822.0875
643	-	866.5250	821.5250	689	683	867.1000	822.1000
644	640	866.5375	821.5375	690	684	867.1125	822.1125
645	641	866.5500	821.5500	691	685	867.1250	822.1250
646	642	866.5625	821.5625	692	686	867.1375	822.1375
647	643	866.5750	821.5750	693	687	867.1500	822.1500
648	644	866.5875	821.5875	694	688	867.1625	822.1625
649	645	866.6000	821.6000	695	689	867.1750	822.1750
650	646	866.6125	821.6125	696	690	867.1875	822.1875
651	647	866.6250	821.6250	697	691	867.2000	822.2000
652	648	866.6375	821.6375	698	692	867.2125	822.2125
653	649	866.6500	821.6500	699	693	867.2250	822.2250
654	650	866.6625	821.6625	700	694	867.2375	822.2375
655	651	866.6750	821.6750	701	695	867.2500	822.2500
656	652	866.6875	821.6875	702	696	867.2625	822.2625
657	653	866.7000	821.7000	703	697	867.2750	822.2750
658	654	866.7125	821.7125	704	698	867.2875	822.2875
659	655	866.7250	821.7250	705	699	867.3000	822.3000
660	656	866.7375	821.7375	706	700	867.3125	822.3125
661	657	866.7500	821.7500	707	701	867.3250	822.3250
662	658	866.7625	821.7625	708	702	867.3375	822.3375
663	659	866.7750	821.7750	709	703	867.3500	822.3500
664	660	866.7875	821.7875	710	704	867.3625	822.3625
665	661	866.8000	821.8000	711	705	867.3750	822.3750
666	662	866.8125	821.8125	712	706	867.3875	822.3875
667	663	866.8250	821.8250	713	707	867.4000	822.4000
668	664	866.8375	821.8375	714	708	867.4125	822.4125
669	665	866.8500	821.8500	715	709	867.4250	822.4250
670	666	866.8625	821.8625	716	710	867.4375	822.4375
671	667	866.8750	821.8750	717	711	867.4500	822.4500
672	668	866.8875	821.8875	718	712	867.4625	822.4625
673	669	866.9000	821.9000	719	713	867.4750	822.4750

Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency	Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency
720	714	867.4875	822.4875	767	757	868.0750	823.0750
721	-	867.5000	822.5000	768	758	868.0875	823.0875
722	715	867.5125	822.5125	769	759	868.1000	823.1000
723	-	867.5250	822.5250	770	760	868.1125	823.1125
724	716	867.5375	822.5375	771	761	868.1250	823.1250
725	717	867.5500	822.5500	772	762	868.1375	823.1375
726	718	867.5625	822.5625	773	763	868.1500	823.1500
727	719	867.5750	822.5750	774	764	868.1625	823.1625
728	720	867.5875	822.5875	775	765	868.1750	823.1750
729	721	867.6000	822.6000	776	766	868.1875	823.1875
731	723	867.6250	822.6250	777	767	868.2000	823.2000
732	724	867.6375	822.6375	778	768	868.2125	823.2125
733	725	867.6500	822.6500	779	769	868.2250	823.2250
734	726	867.6625	822.6625	780	770	868.2375	823.2375
735	727	867.6750	822.6750	781	771	868.2500	823.2500
736	728	867.6875	822.6875	782	772	868.2625	823.2625
737	729	867.7000	822.7000	783	773	868.2750	823.2750
738	730	867.7125	822.7125	784	774	868.2875	823.2875
739	731	867.7250	822.7250	785	775	868.3000	823.3000
740	732	867.7375	822.7375	786	776	868.3125	823.3125
741	733	867.7500	822.7500	787	777	868.3250	823.3250
742	734	867.7625	822.7625	788	778	868.3375	823.3375
743	735	867.7750	822.7750	789	779	868.3500	823.3500
744	736	867.7875	822.7875	790	780	868.3625	823.3625
745	737	867.8000	822.8000	791	781	868.3750	823.3750
746	738	867.8125	822.8125	792	782	868.3875	823.3875
747	739	867.8250	822.8250	793	783	868.4000	823.4000
748	740	867.8375	822.8375	794	784	868.4125	823.4125
749	741	867.8500	822.8500	795	785	868.4250	823.4250
750	742	867.8625	822.8625	796	786	868.4375	823.4375
751	743	867.8750	822.8750	797	787	868.4500	823.4500
752	744	867.8875	822.8875	798	788	868.4625	823.4625
753	745	867.9000	822.9000	799	789	868.4750	823.4750
754	746	867.9125	822.9125	800	790	868.4875	823.4875
755	747	867.9250	822.9250	801	791	868.5000	823.5000
756	748	867.9375	822.9375	802	792	868.5125	823.5125
757	749	867.9500	822.9500	803	793	868.5250	823.5250
758	750	867.9625	822.9625	804	794	868.5375	823.5375
759	751	867.9750	822.9750	805	795	868.5500	823.5500
760	752	867.9875	822.9875	806	796	868.5625	823.5625
761	-	868.0000	823.0000	807	797	868.5750	823.5750
762	753	868.0125	823.0125	808	798	868.5875	823.5875
763	-	868.0250	823.0250	809	799	868.6000	823.6000
764	754	868.0375	823.0375	810	800	868.6125	823.6125
765	755	868.0500	823.0500	811	801	868.6250	823.6250
766	756	868.0625	823.0625	812	802	868.6375	823.6375

Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency	Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency
813	803	868.6500	823.6500	859	-	869.2250	824.2250
814	804	868.6625	823.6625	860	-	869.2375	824.2375
815	805	868.6750	823.6750	861	-	869.2500	824.2500
816	806	868.6875	823.6875	862	-	869.2625	824.2625
817	807	868.7000	823.7000	863	-	869.2750	824.2750
818	808	868.7125	823.7125	864	-	869.2875	824.2875
819	809	868.7250	823.7250	865	-	869.3000	824.3000
820	810	868.7375	823.7375	866	-	869.3125	824.3125
821	811	868.7500	823.7500	867	-	869.3250	824.3250
822	812	868.7625	823.7625	868	-	869.3375	824.3375
823	813	868.7750	823.7750	869	-	869.3500	824.3500
824	814	868.7875	823.7875	870	-	869.3625	824.3625
825	815	868.8000	823.8000	871	-	869.3750	824.3750
826	816	868.8125	823.8125	872	-	869.3875	824.3875
827	817	868.8250	823.8250	873	-	869.4000	824.4000
828	818	868.8375	823.8375	874	-	869.4125	824.4125
829	819	868.8500	823.8500	875	-	869.4250	824.4250
830	820	868.8625	823.8625	876	-	869.4375	824.4375
831	821	868.8750	823.8750	877	-	869.4500	824.4500
832	822	868.8875	823.8875	878	-	869.4625	824.4625
833	823	868.9000	823.9000	879	-	869.4750	824.4750
834	824	868.9125	823.9125	880	-	869.4875	824.4875
835	825	868.9250	823.9250	881	-	869.5000	824.5000
836	826	868.9375	823.9375	882	-	869.5125	824.5125
837	827	868.9500	823.9500	883	-	869.5250	824.5250
838	828	868.9625	823.9625	884	-	869.5375	824.5375
839	829	868.9750	823.9750	885	-	869.5500	824.5500
840	830	868.9875	823.9875	886	-	869.5625	824.5625
841	-	869.0000	824.0000	887	-	869.5750	824.5750
842	-	869.0125	824.0125	888	-	869.5875	824.5875
843	-	869.0250	824.0250	889	-	869.6000	824.6000
844	-	869.0375	824.0375	890	-	869.6125	824.6125
845	-	869.0500	824.0500	891	-	869.6250	824.6250
846	-	869.0625	824.0625	892	-	869.6375	824.6375
847	-	869.0750	824.0750	893	-	869.6500	824.6500
848	-	869.0875	824.0875	894	-	869.6625	824.6625
849	-	869.1000	824.1000	895	-	869.6750	824.6750
850	-	869.1125	824.1125	896	-	869.6875	824.6875
851	-	869.1250	824.1250	897	-	869.7000	824.7000
852	-	869.1375	824.1375	898	-	869.7125	824.7125
853	-	869.1500	824.1500	899	-	869.7250	824.7250
854	-	869.1625	824.1625	900	-	869.7375	824.7375
855	-	869.1750	824.1750	901	-	869.7500	824.7500
856	-	869.1875	824.1875	902	-	869.7625	824.7625
857	-	869.2000	824.2000	903	-	869.7750	824.7750
858	-	869.2125	824.2125	904	-	869.7875	824.7875

Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency	
905	-	869.8000	824.8000	
906	-	869.8125	824.8125	
907	-	869.8250	824.8250	
908	-	869.8375	824.8375	
909	-	869.8500	824.8500	
910	-	869.8625	824.8625	
911	-	869.8750	824.8750	
912	-	869.8875	824.8875	
913	-	869.9000	824.9000	
914	-	869.9125	824.9125	
915	-	869.9250	824.9250	
916	-	869.9375	824.9375	
917	-	869.9500	824.9500	
918	-	869.9625	824.9625	
919	-	869.9750	824.9750	
920	-	869.9875	824.9875	

APPENDIX D 2009 RECEIVER CHANNEL FREQUENCY CHART

Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency	Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency
1	1	935.0125	896.0125	45	45	935.5625	896.5625
2	2	935.0250	896.0250	46	46	935.5750	896.5750
3	3	935.0375	896.0375	47	47	935.5875	896.5875
4	4	935.0500	896.0500	48	48	935.6000	896.6000
5	5	935.0625	896.0625	49	49	935.6125	896.6125
6	6	935.0750	896.0750	50	50	935.6250	896.6250
7	7	935.0875	896.0875	51	51	935.6375	896.6375
8	8	935.1000	896.1000	52	52	935.6500	896.6500
9	9	935.1125	896.1125	53	53	935.6625	896.6625
10	10	935.1250	896.1250	54	54	935.6750	896.6750
11	11	935.1375	896.1375	55	55	935.6875	896.6875
12	12	935.1500	896.1500	56	56	935.7000	896.7000
13	13	935.1625	896.1625	57	57	935.7125	896.7125
14	14	935.1750	896.1750	58	58	935.7250	896.7250
15	15	935.1875	896.1875	59	59	935.7375	896.7375
16	16	935.2000	896.2000	60	60	935.7500	896.7500
17	17	935.2125	896.2125	61	61	935.7625	896.7625
18	18	935.2250	896.2250	62	62	935.7750	896.7750
19	19	935.2375	896.2375	63	63	935.7875	896.7875
20	20	935.2500	896.2500	64	64	935.8000	896.8000
21	21	935.2625	896.2625	65	65	935.8125	896.8125
22	22	935.2750	896.2750	66	66	935.8250	896.8250
23	23	935.2875	896.2875	67	67	935.8375	896.8375
24	24	935.3000	896.3000	68	68	935.8500	896.8500
25	25	935.3125	896.3125	69	69	935.8625	896.8625
26	26	935.3250	896.3250	70	70	935.8750	896.8750
27	27	935.3375	896.3375	71	71	935.8875	896.8875
28	28	935.3500	896.3500	72	72	935.9000	896.9000
29	29	935.3625	896.3625	73	73	935.9125	896.9125
30	30	935.3750	896.3750	74	74	935.9250	896.9250
31	31	935.3875	896.3875	75	75	935.9375	896.9375
32	32	935.4000	896.4000	76	76	935.9500	896.9500
33	33	935.4125	896.4125	77	77	935.9625	896.9625
34	34	935.4250	896.4250	78	78	935.9750	896.9750
35	35	935.4375	896.4375	79	79	935.9875	896.9875
36	36	935.4500	896.4500	80	80	936.0000	897.0000
37	37	935.4625	896.4625	81	81	936.0125	897.0125
38	38	935.4750	896.4750	82	82	936.0250	897.0250
39	39	935.4875	896.4875	83	83	936.0375	897.0375
40	40	935.5000	896.5000	84	84	936.0500	897.0500
41	41	935.5125	896.5125	85	85	936.0625	897.0625
42	42	935.5250	896.5250	86	86	936.0750	897.0750
43	43	935.5375	896.5375	87	87	936.0875	897.0875
44	44	935.5500	896.5500	88	88	936.1000	897.1000

Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency	Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency
89	89	936.1125	897.1125	137	137	936.7125	897.7125
90	90	936.1250	897.1250	138	138	936.7250	897.7250
91	91	936.1375	897.1375	139	139	936.7375	897.7375
92	92	936.1500	897.1500	140	140	936.7500	897.7500
93	93	936.1625	897.1625	141	141	936.7625	897.7625
94	94	936.1750	897.1750	142	142	936.7750	897.7750
95	95	936.1875	897.1875	143	143	936.7875	897.7875
96	96	936.2000	897.2000	144	144	936.8000	897.8000
97	97	936.2125	897.2125	145	145	936.8125	897.8125
98	98	936.2250	897.2250	146	146	936.8250	897.8250
99	99	936.2375	897.2375	147	147	936.8375	897.8375
100	100	936.2500	897.2500	148	148	936.8500	897.8500
101	101	936.2625	897.2625	149	149	936.8625	897.8625
102	102	936.2750	897.2750	150	150	936.8750	897.8750
103	103	936.2875	897.2875	151	151	936.8875	897.8875
104	104	936.3000	897.3000	152	152	936.9000	897.9000
105	105	936.3125	897.3125	153	153	936.9125	897.9125
106	106	936.3250	897.3250	154	154	936.9250	897.9250
107	107	936.3375	897.3375	155	155	936.9375	897.9375
108	108	936.3500	897.3500	156	156	936.9500	897.9500
109	109	936.3625	897.3625	157	157	936.9625	897.9625
110	110	936.3750	897.3750	158	158	936.9750	897.9750
111	111	936.3875	897.3875	159	159	936.9875	897.9875
112	112	936.4000	897.4000	160	160	937.0000	898.0000
113	113	936.4125	897.4125	161	161	937.0125	898.0125
114	114	936.4250	897.4250	162	162	937.0250	898.0250
115	115	936.4375	897.4375	163	163	937.0375	898.0375
116	116	936.4500	897.4500	164	164	937.0500	898.0500
117	117	936.4625	897.4625	165	165	937.0625	898.0625
118	118	936.4750	897.4750	166	166	937.0750	898.0750
119	119	936.4875	897.4875	167	167	937.0875	898.0875
120	120	936.5000	897.5000	168	168	937.1000	898.1000
121	121	936.5125	897.5125	169	169	937.1125	898.1125
122	122	936.5250	897.5250	170	170	937.1250	898.1250
123	123	936.5375	897.5375	171	171	937.1375	898.1375
124	124	936.5500	897.5500	172	172	937.1500	898.1500
125	125	936.5625	897.5625	173	173	937.1625	898.1625
126	126	936.5750	897.5750	174	174	937.1750	898.1750
127	127	936.5875	897.5875	175	175	937.1875	898.1875
128	128	936.6000	897.6000	176	176	937.2000	898.2000
129	129	936.6125	897.6125	177	177	937.2125	898.2125
130	130	936.6250	897.6250	178	178	937.2250	898.2250
131	131	936.6375	897.6375	179	179	937.2375	898.2375
132	132	936.6500	897.6500	180	180	937.2500	898.2500
133	133	936.6625	897.6625	181	181	937.2625	898.2625
134	134	936.6750	897.6750	182	182	937.2750	898.2750
135	135	936.6875	897.6875	183	183	937.2875	898.2875
136	136	936.7000	897.7000	184	184	937.3000	898.3000

Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency	Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency
185	185	937.3125	898.3125	233	233	937.9125	898.9125
186	186	937.3250	898.3250	234	234	937.9250	898.9250
187	187	937.3375	898.3375	235	235	937.9375	898.9375
188	188	937.3500	898.3500	236	236	937.9500	898.9500
189	189	937.3625	898.3625	237	237	937.9625	898.9625
190	190	937.3750	898.3750	238	238	937.9750	898.9750
191	191	937.3875	898.3875	239	239	937.9875	898.9875
192	192	937.4000	898.4000	240	240	938.0000	899.0000
193	193	937.4125	898.4125	241	241	938.0125	899.0125
194	194	937.4250	898.4250	242	242	938.0250	899.0250
195	195	937.4375	898.4375	243	243	938.0375	899.0375
196	196	937.4500	898.4500	244	244	938.0500	899.0500
197	197	937.4625	898.4625	245	245	938.0625	899.0625
198	198	937.4750	898.4750	246	246	938.0750	899.0750
199	199	937.4875	898.4875	247	247	938.0875	899.0875
200	200	937.5000	898.5000	248	248	938.1000	899.1000
201	201	937.5125	898.5125	249	249	938.1125	899.1125
202	202	937.5250	898.5250	250	250	938.1250	899.1250
203	203	937.5375	898.5375	251	251	938.1375	899.1375
204	204	937.5500	898.5500	252	252	938.1500	899.1500
205	205	937.5625	898.5625	253	253	938.1625	899.1625
206	206	937.5750	898.5750	254	254	938.1750	899.1750
207	207	937.5875	898.5875	255	255	938.1875	899.1875
208	208	937.6000	898.6000	256	256	938.2000	899.2000
209	209	937.6125	898.6125	257	257	938.2125	899.2125
210	210	937.6250	898.6250	258	258	938.2250	899.2250
211	211	937.6375	898.6375	259	259	938.2375	899.2375
212	212	937.6500	898.6500	260	260	938.2500	899.2500
213	213	937.6625	898.6625	261	261	938.2625	899.2625
214	214	937.6750	898.6750	262	262	938.2750	899.2750
215	215	937.6875	898.6875	263	263	938.2875	899.2875
216	216	937.7000	898.7000	264	264	938.3000	899.3000
217	217	937.7125	898.7125	265	265	938.3125	899.3125
218	218	937.7250	898.7250	266	266	938.3250	899.3250
219	219	937.7375	898.7375	267	267	938.3375	899.3375
220	220	937.7500	898.7500	268	268	938.3500	899.3500
221	221	937.7625	898.7625	269	269	938.3625	899.3625
222	222	937.7750	898.7750	270	270	938.3750	899.3750
223	223	937.7875	898.7875	271	271	938.3875	899.3875
224	224	937.8000	898.8000	272	272	938.4000	899.4000
225	225	937.8125	898.8125	273	273	938.4125	899.4125
226	226	937.8250	898.8250	274	274	938.4250	899.4250
227	227	937.8375	898.8375	275	275	938.4375	899.4375
228	228	937.8500	898.8500	276	276	938.4500	899.4500
229	229	937.8625	898.8625	277	277	938.4625	899.4625
230	230	937.8750	898.8750	278	278	938.4750	899.4750
231	231	937.8875	898.8875	279	279	938.4875	899.4875
232	232	937.9000	898.9000	280	280	938.5000	899.5000

Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency	Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency
281	281	938.5125	899.5125	329	329	939.1125	900.1125
282	282	938.5250	899.5250	330	330	939.1250	900.1250
283	283	938.5375	899.5375	331	331	939.1375	900.1375
284	284	938.5500	899.5500	332	332	939.1500	900.1500
285	285	938.5625	899.5625	333	333	939.1625	900.1625
286	286	938.5750	899.5750	334	334	939.1750	900.1750
287	287	938.5875	899.5875	335	335	939.1875	900.1875
288	288	938.6000	899.6000	336	336	939.2000	900.2000
289	289	938.6125	899.6125	337	337	939.2125	900.2125
290	290	938.6250	899.6250	338	338	939.2250	900.2250
291	291	938.6375	899.6375	339	339	939.2375	900.2375
292	292	938.6500	899.6500	340	340	939.2500	900.2500
293	293	938.6625	899.6625	341	341	939.2625	900.2625
294	294	938.6750	899.6750	342	342	939.2750	900.2750
295	295	938.6875	899.6875	343	343	939.2875	900.2875
296	296	938.7000	899.7000	344	344	939.3000	900.3000
297	297	938.7125	899.7125	345	345	939.3125	900.3125
298	298	938.7250	899.7250	346	346	939.3250	900.3250
299	299	938.7375	899.7375	347	347	939.3375	900.3375
300	300	938.7500	899.7500	348	348	939.3500	900.3500
301	301	938.7625	899.7625	349	349	939.3625	900.3625
302	302	938.7750	899.7750	350	350	939.3750	900.3750
303	303	938.7875	899.7875	351	351	939.3875	900.3875
304	304	938.8000	899.8000	352	352	939.4000	900.4000
305	305	938.8125	899.8125	353	353	939.4125	900.4125
306	306	938.8250	899.8250	354	354	939.4250	900.4250
307	307	938.8375	899.8375	355	355	939.4375	900.4375
308	308	938.8500	899.8500	356	356	939.4500	900.4500
309	309	938.8625	899.8625	357	357	939.4625	900.4625
310	310	938.8750	899.8750	358	358	939.4750	900.4750
311	311	938.8875	899.8875	359	359	939.4875	900.4875
312	312	938.9000	899.9000	360	360	939.5000	900.5000
313	313	938.9125	899.9125	361	361	939.5125	900.5125
314	314	938.9250	899.9250	362	362	939.5250	900.5250
315	315	938.9375	899.9375	363	363	939.5375	900.5375
316	316	938.9500	899.9500	364	364	939.5500	900.5500
317	317	938.9625	899.9625	365	365	939.5625	900.5625
318	318	938.9750	899.9750	366	366	939.5750	900.5750
319	319	938.9875	899.9875	367	367	939.5875	900.5875
320	320	939.0000	900.0000	368	368	939.6000	900.6000
321	321	939.0125	900.0125	369	369	939.6125	900.6125
322	322	939.0250	900.0250	370	370	939.6250	900.6250
323	323	939.0375	900.0375	371	371	939.6375	900.6375
324	324	939.0500	900.0500	372	372	939.6500	900.6500
325	325	939.0625	900.0625	373	373	939.6625	900.6625
326	326	939.0750	900.0750	374	374	939.6750	900.6750
327	327	939.0875	900.0875	375	375	939.6875	900.6875
328	328	939.1000	900.1000	376	376	939.7000	900.7000

Program Channel Number	FCC Channel Number	Repeater Transmit Frequency	Repeater Receive Frequency	
377	377	939.7125	900.7125	
378	378	939.7250	900.7250	
379	379	939.7375	900.7375	
380	380	939.7500	900.7500	
381	381	939.7625	900.7625	
382	382	939.7750	900.7750	
383	383	939.7875	900.7875	
384	384	939.8000	900.8000	
385	385	939.8125	900.8125	
386	386	939.8250	900.8250	
387	387	939.8375	900.8375	
388	388	939.8500	900.8500	
389	389	939.8625	900.8625	
390	390	939.8750	900.8750	
391	391	939.8875	900.8875	
392	392	939.9000	900.9000	
393	393	939.9125	900.9125	
394	394	939.9250	900.9250	
395	395	939.9375	900.9375	
396	396	939.9500	900.9500	
397	397	939.9625	900.9625	
398	398	939.9750	900.9750	
399	399	939.9875	900.9875	

APPENDIX E VOTER FAILURE ALARMS

ALARM	DESCRIPTION
1. CRVMSTAT	Chnl: 1 RVM: 0 FailVDM to Voter shelf link failed or whole voter shelf failed.
CRVMSTAT	Chnl: 2 RVM: 0 FailVDM to Voter shelf link failed or whole voter shelf failed.
CRVMSTAT	Chnl: 3 RVM: 0 FailVDM to Voter shelf link failed or whole voter shelf failed.
2. CRVMSTAT	Chnl: 1 RVM: 0 FailCRVM failed.
3. CRVM Msg	Chnl: 1 failed CDMs: 1RDM failed.
CRVM Msg	Chnl: 1 failed RDMs: 1RDM failed.
4. CRVM Msg	Chnl: 1 failed RDMs: 1RDM to RVM link failed.
5. CRVM Msg	Chnl: 1 failed CDMs: 1RMM to CDM link failed or CDM failed or RMM failed.
CRVM Msg	Chnl: 2 failed CDMs: 1RMM to CDM link failed or CDM failed or RMM failed.
CRVM Msg	Chnl: 1 failed CDMs: 1RMM to CDM link failed or CDM failed or RMM failed.
6. CRVM Msg	Chnl: 1 failed CDMs: 1RMM to RVM link (wiring) or RS-232 Tx/Rx or UART.