
Mega-E

Synthesized Trunk-Mount VHF Low-Band FM Transceiver



**Technical
Manual**

Mega-E

Synthesized Trunk-Mount VHF Low-Band FM Transceiver

Caution

The voltages in this equipment can cause burns and other injuries. Use caution when servicing this unit. When replacing components, disconnect the power cable so that the unit cannot be accidentally energized.

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Section 1

Specifications

1.1 General

FCC data:	
30-36 MHz	APC9RB70SM100B
36-42 MHz	APC9RB70SM100C
42-50 MHz	APC9RB70SM100D
Channels	1, 4, up to 16
Input voltage	±13.6 V
Current drain:	
Receiver, unscelched	0.4 A
Receiver, squelched	2.5 A
Transmitter (at 100 W)	18 A
Environmental range	-30 to +60°C, 95%
relative humidity	
Frequency stability:	
Standard	±0.0005%
Optional	±0.0002%
1.2 Transmitter	
Modulation	16F3
Modulation distortion	≤3%
Audio response	Standard EIA pre-emphasis curve, +1 to -3 dB from 300 to 3000 Hz, 1-kHz reference
Multifrequency spread	3 MHz
Spurious and harmonic output	-85 dB below rated output
FM hum and noise	-65 dB
Power output	50-100 W

1.3 Receiver

Sensitivity:	
12-dB SINAD	0.25 μV
20-dB quieting	0.35 μV
Selectivity	-90 dB
Intermodulation	-80 dB
Spurious/image rejection	-100 dB
Squelch sensitivity	0.15 μV
Audio power	12 W at less than 5% distortion to the external speaker

1.4 Dimensions

Control Head:	
Height	1.9 in. (4.8 cm)
Width	7.1 in. (18.0 cm)
Depth	5.0 in. (12.7 cm)
Transceiver:	
Height	2.5 in. (6.4 cm)
Width	10.0 in. (25.4 cm)
Depth	14.3 in. (36.3 cm)
Speaker:	
Height	5.0 in. (12.7 cm)
Width	5.0 in. (12.7 cm)
Depth	3.0 in. (7.6 cm)
Weight:	
Net	5.0 in. (12.7 cm)
Width	5.0 in. (12.7 cm)
Depth	3.0 in. (7.6 cm)

Section 2

General Information

2.1 Introduction

The Mega-E is a compact, two-way, programmable, synthesized VHF trunk-mount transceiver designed for land-mobile communications. The unit features a high-stability, temperature-compensated reference oscillator, 50-100 W of output transmit power, and an external speaker driven by a low-distortion 12-W audio signal. Both the receiver and transmitter are certified by the FCC (parts 15 and 21 and 90, respectively).

The Mega-E features superior performance in areas involving sensitivity, selectivity, stability, and intermodulation rejection. A high-performance noise blanker, which can be switched in and out from the control head, is standard equipment. A variety of optional configurations are available to meet the most demanding communications environment.

The Mega-E is completely solid state (including the power and antenna switching circuits). A test jack that monitors the major circuits is included to simplify maintenance, and special circuits protect the transceiver if the antenna becomes disconnected or the chassis overheats.

The data for all operating parameters are stored in a field-programmable erasable-programmable read-only memory (EPROM).

2.2 Installation

The Mega-E can be fully programmed and aligned at the factory, or it can be programmed after being received. In either case, the unit should be carefully checked before being placed in service.

Read the installation instructions thoroughly and completely before attempting to install the transceiver. A simplified installation diagram is shown in Figure 2-1.

2.2.1 Transceiver

The transceiver is typically mounted on a flat, elevated surface in the trunk of a vehicle. Install the unit using the following steps.

1. Remove the radio from the mounting bracket: (1) turn the radio (with the bracket attached) upside down; (2) unlock the recessed handle with the key and swing the handle free of the bracket locking bar; (3) lift the mounting bracket clear of the radio.
2. Use the mounting bracket as a template to mark the points where holes must be drilled to mount the unit, drill the holes, and secure the mounting bracket.

Note

Do not block the mounting bracket's drainage holes.

3. Attach the radio to the mounting bracket: (1) position the unit so that the two forward machine screws clear the forward edge of the mounting bracket; (2) slide the radio into place and secure the handle in the recessed position; (3) lock the handle into place. (When the radio cover must be removed, unlock and lower the carrying handle and then press the square white button.)

2.2.2 Control head, speaker, and microphone/handset

1. Verify that all control head printed circuit board (PCB) jumpers are in the proper position (see section 6).
2. Mount the control head in a convenient location; as with the transceiver itself, use the mounting bracket as a template to mark

- the locations of the necessary holes, drill the holes, and secure the control head.
3. Mount the external speaker and microphone (or handset) bracket in the same manner. Ensure that the bracket is grounded (this is essential if tone-coded squelch or scanning is used).
 4. Connect the speaker and microphone to the appropriate jacks on the control head.

2.2.3 Cables

1. Turn the radio off.
2. Route the control cable from the transceiver to the control head.
3. Route the power cable from the transceiver to a position near the vehicle's battery; *do not connect it to the battery.*

4. Cut off the excess cable and attach the lugs to the ends of the cable leads.
5. Mount the circuit breaker on the vehicle chassis as close to the battery as possible.
6. Connect the *red* power cable lead to one of the *circuit breaker* lugs.
7. Connect the *black* (or *brown*) power cable lead to the *negative* (-) battery terminal.
8. Connect a no. 8 wire between the remaining circuit breaker lug and the *positive* (+) battery terminal.

Note

Although the power cable leads can be connected to any available high-voltage (13.6 VDC) and ground points, it is recommended that they be connected directly to the battery.

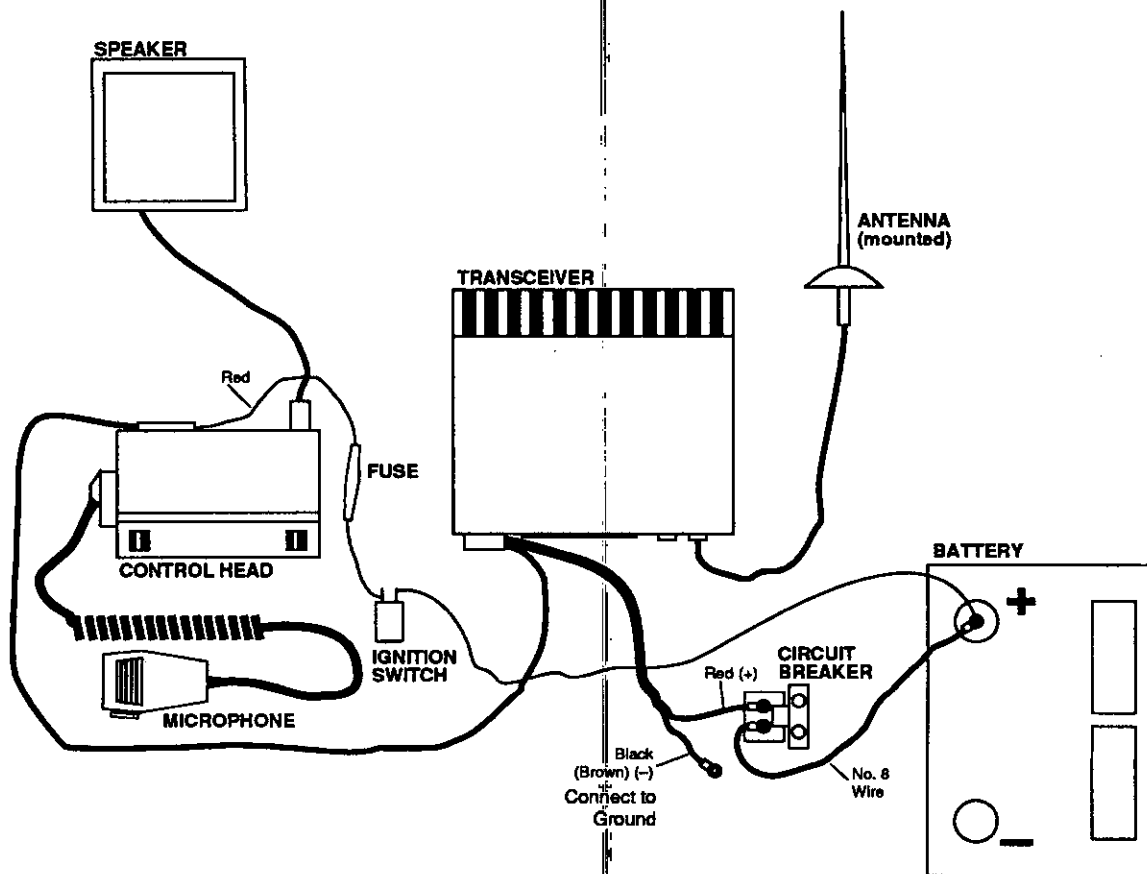


Figure 2.1. Mega-E Installation (negative-ground system).

9. Connect the red 13.6-V service lead from the control head to the dash accessory block/ignition switch as necessary.
10. Connect the cable to the transceiver (insure that the radio is still turned off).

Note

The control cable plug and jack are keyed to avoid wrong connections. In the standard factory assembly, the cable crosses in front of the radio latching mechanism to the control jack at the left front of the radio. For service-from-the-left installation, the top and bottom shells of the cable plug can be removed, reversed, and reassembled.

11. Attach the antenna according to the manufacturer's instructions.
12. Connect the antenna and power cables and check the fuses.

13. Using a short piece of 50- Ω coaxial cable, connect wattmeter between the radio and the antenna.
14. Select the channel closest to the center of the range of programmed channels or the main channel.
15. Turn the radio on and key the transmitter.
16. Note the forward and reflected power. Adjust the antenna so that the voltage-standing-wave ratio (VSWR) does not exceed 1.5:1 (a reflected power $\leq 4\%$); *adjust only the antenna.*

Warning

Although the transceiver includes built-in protection, the transmitter *should not be keyed* unless the antenna is connected or a 50- Ω dummy load is connected to the antenna jack.

Section 3

Programming

3.1 Introduction

The operation of the Mega-E is controlled by an erasable read-only memory (EPROM), which is located on the EPROM PC board. EPROM devices offer a number of advantages versus older, diode-programming methods. These memory devices are readily available and inexpensive, and they simplify the process of adding additional radios to a communications system—the data in the EPROM of an existing unit can be quickly copied into a new transceiver.

EPROM programming has a number of other advantages:

- fewer parts,
- more available channels (up to 64),
- electrically quieter switching,
- relatively error-free programming,
- flexibility (units can be programmed at the factory or in the field),
- low-cost programming hardware/software,
- easier, quicker reprogramming.

3.2 Circuit Description

3.2.1 General

The data clock lines (DS1 and DS2) are connected directly to address lines A0 and A1 (pins 7 and 8) of the EPROM. The channel-select lines to the synthesizer (A–D) are connected to address lines A2–A5 (pins 6, 5, 4, and 3, respectively).

Address lines A6 and A7 (pins 2 and 1 of the EPROM) are usually grounded with jumpers. Either line can, however, be connected to special binary switching components that select banks of 16 channels; this allows up to 64 channels to be used.

The data for a single frequency are read from D0–D3 (pins 9–13) in four 4-bit words as A0 and A1

cycle at a rate of 1.172 kHz. The same data are repeatedly read until the channel (A2–A5) or mode (A8) changes to select new data.

In the receive mode, address line A8 is at ground potential (0 V). When the transmitter is keyed, this line switches to 5 V, a logic-level high (or 1). The 5-V potential is developed by a resistive divider network (R1 and R2) from the 9.5-V source available in the transmit mode.

3.2.2 EPROM

The EPROM is a 16-kb device, which is organized as 2048×8 bits ($2K \times 8$) and can provide up to 64 transmit and receive frequencies. Before it is programmed, all address are high (1). The programming process writes (or “burns”) only those bits that must be set low (to 0). During operation, the EPROM sinks current to provide pull down for the low (0) data bits.

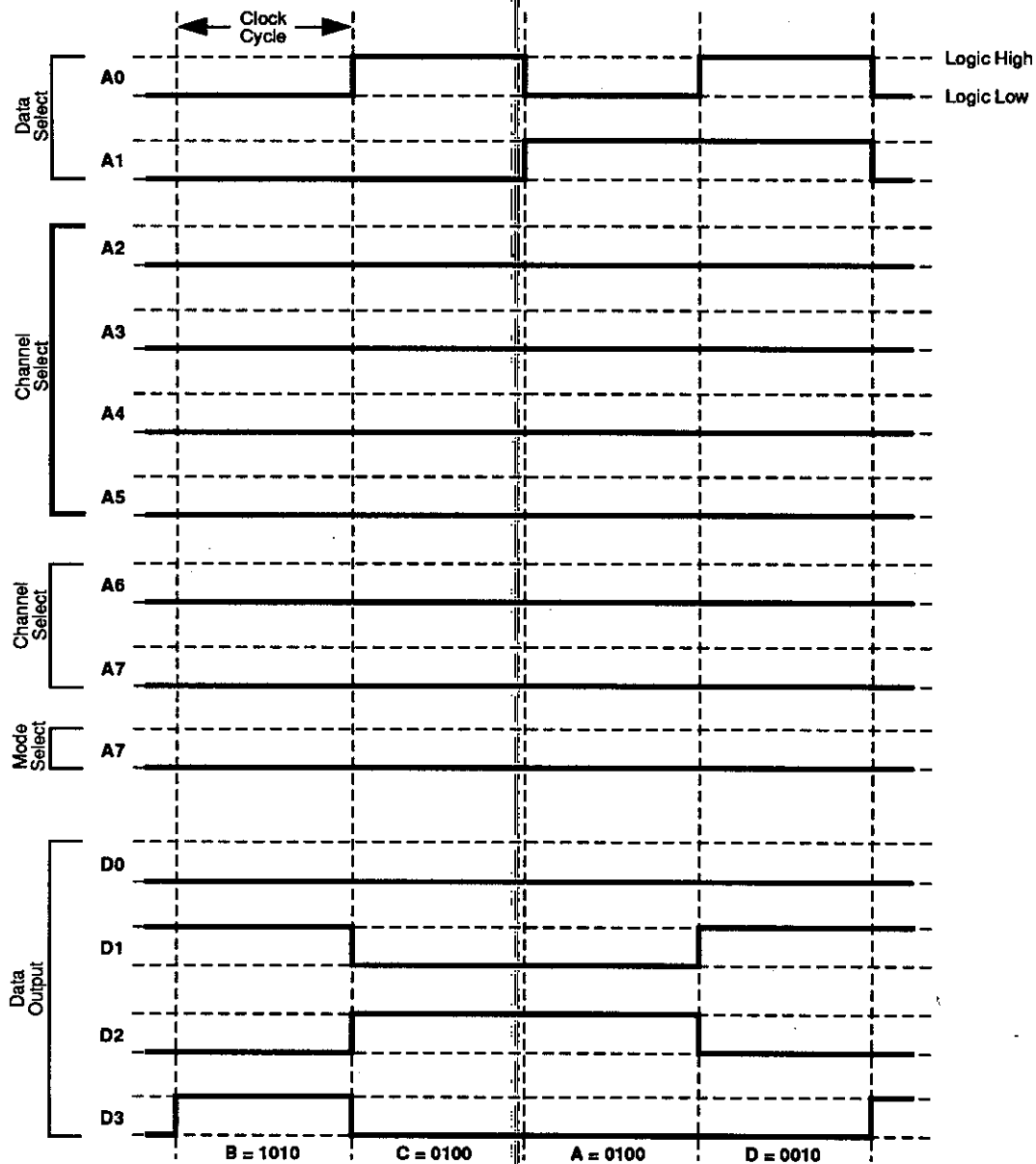
Because the EPROM directly addresses the synthesizer, it eliminates the need for data multiplexing.

3.2.3 Data address

The binary address data needed to access the transmit and receive frequency data stored in the EPROM are sent on address lines A0–A8. The functions of these data bits are as follows:

- A0, A1: select the data word for each channel frequency,
- A2–A5: channel-selection information for the first 16 channels,
- A6, A7: contain selection data for optional 32- and 64-channel modes,
- A8: specifies transmit or receive data.

The input data sent to the EPROM to select the transmit frequency data for channel 1 are shown



Data shown are for a channel 1
transmit frequency of 165.250 MHz

Figure 3-1. Data selection, address, and data outputs.

graphically in Figure 2-1. As previously stated, the data are sent from the EPROM as four-bit words; these are also shown in Figure 2-1.

3.2.4 Clock timing

As DS1 and DS2 count, the data-select lines (A0 and A1) increment as shown in Figure 2-1. Each change in the state of A0 and A1 selects a 4-bit "nibble" of data stored in the EPROM. The selected data are then sent from the EPROM to the

synthesizer via data lines D0, D1, D2, and D3. During a complete cycle of DS1 and DS2 (A0 and A1), the selected four 4-bit words (A-D) are read by the synthesizer. These words—which are read in the order B, C, A, and D—contain the data needed by the synthesizer to produce the correct frequency for the selected channel.

The EPROM line designations and pin numbers, their functions, and the corresponding J10 pin numbers are given in Table 3-1.

Table 3-1. Designators, pins, and functions.

EPROM			
Designator	Pin	J10 Pin*	Function*
A0	7	12	DS1 clock
A1	8	16	DS1 clock
A2	6	5	A 16-channel select
A3	5	6	B 16-channel select
A4	4	7	C 16-channel select
A5	3	3	D 16-channel select
A6	2	—	E 32-channel option
A7	1	—	F 32-channel option
A8	23	2	Mode select†
Q4	14	—	—
Q5	15	—	—
Q6	16	—	—
Q7	17	—	—
D0	9	8	Channel frequency data 0
D1	10	9	Channel frequency data 1
D2	11	10	Channel frequency data 2
D3	13	11	Channel frequency data 3
GND	12	1	Ground

* —, Not connected or not used.

† High (1) = transmit.

3.2.5 EPROM data organization

Each transmit and receive frequency is represented by a 16-bit binary number that is divided into four 4-bit words (designated D, C, A, and B). These are stored in the EPROM as hexadecimal data. The order in which the words are stored is not consecutive in either direction; instead, they are stored in the order required by the synthesizer (B, C, A, D; see Figure 3-2).

Receive frequency information for each channel is stored separately from the transmit information. Receive data is stored in the upper half of the EPROM, transmit information is stored in the lower half. The beginning address for the frequency data in 1- and 2-channel units is slightly different than that for radios with 16 or more channels.

The receive frequencies for 16-channel radios begin at hexadecimal address 0 and continue through 3F. Transmit frequencies begin at 100 and run through 13F. Extended frequency options for 32- and 64-channel transceivers are stored above those for the 16-channel transceiver.

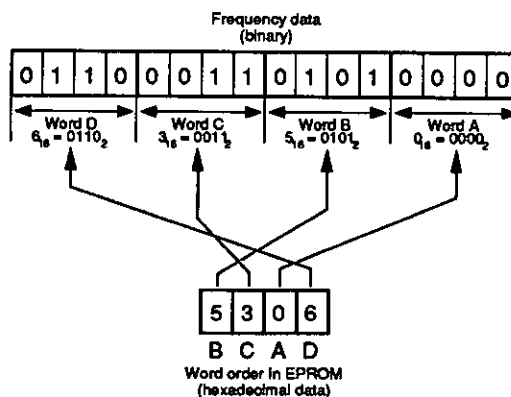


Figure 3.2. Data organization.

3.3 Field Programming

The radio is typically programmed at the factory for anywhere from 1 to 16 transmit and receive frequencies. Factory-programmed memories are also available for reconfiguring existing units. Programming can, however, also be accomplished in the field.

Field programming can be done with a user-supplied EPROM programming device and standard test equipment using the information provided here. Charts and work sheets included at the end of this section can be used for to determine configurations and convert data.

Users with access to IBM or compatible computers can obtain software that automatically performs most of the programming steps from the Aerotron Customer Service Department.

Note

The VCO lock alignment procedures should be performed after any programming change.

3.3.1 Programming requirements

The following conditions must be met to insure that planning the channel information is simple and that it results in a functional unit.

1. **Range:** Verify that the required operating frequency range matches the operating range of the transceiver. The master PC board and

Table 3-2. Receiver Injection frequencies.

Range	Channel Frequencies	Receiver Injection	Mega-E Offset Resistor
B	30-36 MHz	High side	R755 (cut R758)
C	36-42 MHz	High side	R755 (cut R758)
D	42-50 MHz	Low side	R758 (cut R755)

the VCO are color coded to indicate the factory-set operating range. The standard VHF low band ranges and the corresponding dot color are as follows:

- B range (30-36 MHz)— red,
- C range (36-42 MHz)— orange,
- D range (42-50 MHz)— yellow.

The existing range of the transceiver can be changed by replacing the parts necessary to change the operation to the desired range. These parts, which may include the VCO itself, are identified in Section 8 of this manual.

2. *Frequency spread:* To maintain the stated specifications, all transmit channels must be within a 3.0 MHz spread and all receive channels must be within 3%.
3. *Channel spacing:* The space between frequencies should be a multiple of 10 kHz; for domestic applications in the United States, frequencies must be separated by at least 20 kHz. Special and overseas users can select frequencies that are a multiple of 12.5 kHz for 25-kHz channel spacing.
4. *Receiver injection frequency:* The factory-selected receiver injection frequency is appropriate for most configurations. A list of the low-band VHF ranges and the corresponding receiver injection frequencies and offset configurations is given in Table 3-2. When the expected transmit and receive frequency spread is greater than 8 MHz, an alternate receiver injection frequency setting may be needed to maintain the operating specifications. Special configurations are identified during the programming process and are discussed later in this section.

3.3.2 Channel programming procedures

When the EPROM is not programmed at the factory, the unit is built and aligned to the expected range and set up for standard receiver injection. Most communications systems can use

the standard configuration and take advantage of programming tables 3A-3D, which are used to derive the hexadecimal data needed to program the EPROM, included at the end of this section.

The following describes the Mega-E EPROM programming procedure. The tables at the end of this section containing the hexadecimal frequency data are described in Table 3-3.

3.3.3 Programming procedure

1. List all of the frequencies to be programmed (transmit and receive) above the corresponding channel numbers on the Hexadecimal Data Worksheet. List simplex (or talk-around) channels as the same frequency for *both* the transmit and receive channels. (The data will be different for the synthesizer.)
2. Subtract the lowest frequency (transmit or receive) from the highest frequency. If the difference is 8 MHz or more, see the discussion of alternate programming strategies later in this section or call the Aerotron Customer Service Department. If the difference is less than 8 MHz, use the factory-set injection and continue with step 3.
3. Verify that the configuration (see Table 3-2) is correct for the range being used.
4. Verify the presence or absence of jumper D as follows (jumper D is located near pin 8 of IC402 on the master PC board):
 - 20-kHz channel spacing, 10-kHz interval— jumper D installed;
 - 25-kHz channel spacing, 12.5-kHz interval— jumper D removed.
5. Use the appropriate table at the end of this section to find the hexadecimal number for each transmit and receive frequency pair and enter that number in the four boxes below the channel number.

Table 3-3. Data tables, 30–50 MHz.

	Channel		
	Interval	Spacing	Injection
Table 3A	10 kHz	20 kHz	Low side
Table 3B	10 kHz	20 kHz	High side
Table 3C	12.5 kHz	25 kHz	Low side
Table 3D	12.5 kHz	25 kHz	High side

The hexadecimal data tables (Tables 3A–3D) give the four octal words for the desired frequency. These must be entered on the channel data worksheets included at the end of this section.

- The data recorded in step 5 can be entered into the EPROM according to the manufacturer's instructions for the programming device; the hexadecimal number at the right represents the EPROM address at which the data must be stored. Repeat the entire procedure for all channels to be programmed.
- Insert the programmed EPROM onto the EPROM programming board and reinstall the board in the transceiver.
- Complete the control head (board)/channel number programming procedures described elsewhere in this manual.
- Readjust the VCO as described in later in this section.

For more information or assistance, contact the Aerotron Customer Service Department.

3.4 Realignment

When the transceiver is initially programmed or the programming data are changed, certain circuits must be realigned to assure that the VCO locks and that specified operating parameters (such as sensitivity and output power) are not adversely affected. In addition, all transmit and receive frequencies should be verified to insure that the correct data was programmed.

If the programmed frequencies fall within the guaranteed multifrequency spread (3 MHz for the transmitter, 3% for the receiver), only minor tuning should be required involving (1) the VCO, (2) the receiver front end, injection, and noise blanker, and (3) the transmitter deviation.

The closer the programmed frequencies are to the factory-set "tune-up" frequency, the less tuning

will be required. If the radio had been tuned at one end of a range and the new frequencies are at the other end, however, more extensive adjustments will be required.

3.4.1 Test equipment required

- DC power supply (13.6 V, 25 A),
- RF wattmeter and 50- Ω dummy load,
- RF signal generator,
- audio signal generator,
- oscilloscope,
- ammeter,
- 1037 test set or high-impedance DC voltmeter.

3.4.2 VCO adjustment

- Select the channel that is closest to the center of the range of programmed channels.
- Use the DC voltmeter to check the control voltage at TP16 (1037 switch position 3); it should be between 2 and 8 V (the optimum center reading is 4 V). If the voltage is within this range, go to step 5. If it is not between 2 and 8 V, go to step 4.

Caution

If the control voltage is less than 2 or more than 8 V, the VCO may be unlocked; if the VCO is unlocked, the transmitter is automatically disabled and the VCO must be adjusted. Adjust the VCO slowly and carefully.

- Use an insulated tuning tool to adjust the VCO voltage to approximately 4 V.
- Select the lowest and highest frequency channel pairs and note the voltage at TP16 in both the transmit and receive modes. If the control voltage is not between 2 and 8 V, adjust the VCO slightly to bring it within the given range.
- Once the center, highest, and lowest frequency channels have been checked and, if necessary, adjusted, verify that the VCO is locked on all programmed channels in the transmit and receive modes.

3.4.3 Receiver

- Remove the microphone or handset.
- Turn off the noise blanker using the switch on the bottom of the control head (AUX 2 on the 1292 control head).

3. Select the receive frequency closest to the center of the programmed frequencies.
4. Connect the RF signal generator to the antenna connector. Set the generator to the receive frequency and increase the output level; keep the signal below the saturation level for the duration of the procedure.
5. Measure the DC voltage at TP1 (1037 switch position 4) and adjust L109 and L110 until a reading of 1.8 to 2.3 V is obtained.
6. Alternately select the channels with the highest and lowest frequencies and readjust L109 and L110 as necessary to balance the LO injection.
7. Select the center channel (the one used in step 3).
8. Adjust the RF generator output level to 3.0 μ V.
9. Measure the DC voltage at TP6 (1037 switch position 5). Adjust L101-L106 (limiter current) as necessary to bring the voltage between 2 and 3 V.
10. Again alternately select the highest and lowest frequency channels; readjust L101-L106 if necessary bring the voltage at TP6 to 2-3 V and balance the limiter current.

The process of "switching and tweaking" may have to be repeated two or more times to obtain the desired results. When finished, the sensitivity should be at least 0.35 μ V for 20-dB quieting and 0.25 μ V for 12-dB SINAD across a 3% multifrequency spread. If this sensitivity is not achieved, use the quieting or SINAD procedure to bring it within specifications; begin by lightly adjusting L105 and, if necessary, L102.

If one or more of the channels fails to respond properly, check the channel programming data for errors.

3.4.4 Noise blanker

The noise blanker should be tuned to a clear frequency that is (1) approximately 4 MHz from the closest programmed channel frequency and (2) on the side of the channel opposite from the LO injection frequency—for high-side injection, use a frequency *below* the channel frequency; for low-side injection, use a frequency *above* the channel frequency.

Caution

Avoid tuning the noise blanker to a frequency that will cause interference with other equipment—for example, with paging systems operating near 35 and 43.5 MHz operating in the area.

1. Set the RF signal generator to the clear frequency; keep the output level below saturation for the duration of this procedure.
2. Turn on the noise blanker.
3. Connect the oscilloscope probe to TP19.
4. Sequentially adjust L111, L112, L113, and L115 for a maximum display on the oscilloscope; continue the adjustment until no additional increase can be obtained.

The noise blanker should now be correctly adjusted and should attenuate all noise pulses between 10 and 100 kHz. For a more complete evaluation of the noise blanker, see the alignment procedures given in section 5.

3.4.5 Transmitter

1. Reconnect the microphone.
2. Connect the RF wattmeter and dummy load to the antenna connector.
3. Sequentially select and key each programmed channel (use the microphone PTT switch to key the transmitter); the wattmeter should indicate the proper output power (50-100 W) for each channel.
4. Lightly couple the frequency counter to the exciter or final amplifier (loop piece of wire around the coaxial cable and connect one end to the frequency counter) and verify the frequencies of all programmed channels.
5. Connect the DC voltmeter to TP8 (1037 switch position 7).
6. Key the transmitter using the microphone PTT switch and check the indication on the DC voltmeter; it should read 12.5 V. If the reading is not correct, adjust R530 as necessary.
7. Use the microphone PTT switch to key the transmitter again and check the indication on the wattmeter. If the output power is correct, go to step 9; if it is not, go to step 8.
8. Key the transmitter and adjust R516 to bring the output power to the desired level (50-100 W); adjust C901 and C910 for maximum RF output.
9. Place an ammeter in the DC line and adjust C931 and C932 for maximum RF output and minimum current. Remove the ammeter.

3.4.6 Modulator

1. Rotate the audio gain control (R705) fully clockwise.

2. Lightly couple the deviation monitor to the exciter or final amplifier.
3. Apply a 1-kHz tone at 1 Vrms to the audio input; use a DC-blocking capacitor.
4. Adjust the deviation control (R721) for a deviation between ± 4 and ± 5 kHz.
5. Key the transmitter while sweeping the audio generator from 300 to 3000 Hz; insure that the deviation below ± 5 kHz. If CTCSS is installed, it must be activated during this step.
6. Repeat step 5 for all programmed transmit channels.
7. Disconnect all test equipment and replace all covers and cables. The transceiver is now ready to be placed into service.

3.5 Alternative Programming

Alternative programming is any programming that differs from the standard, no-frills procedure. Although standard programming is seldom a problem with the Mega-E (it works well in 99% of all possible situations), alternative programming is used to minimize possible or actual problem conditions so that they can be handled routinely.

This section describes information on alternative programming. In general, any standard channel that can be installed on a crystal-controlled radio can be installed in the Mega-E.

The Mega-E is set for 20-kHz channel spacing at the factory (the actual interval used is 10 kHz). Tables 3A and 3B at the end of this section contain the data for VHF low-band channel frequencies using 20-kHz spacing and, respectively, high- and low-side injection. If the data in these tables is not sufficient, the information in this section should be helpful.

3.5.1 Reasons for alternative programming

Alternative programming can be used when a condition (or conditions) exists that requires non-standard programming:

- injection interference or "birdy" problems requires opposite-side injection;
- across-range channeling (across-range channel assignments) is used;
- range-edge-channeling exists (assigned channels are at the edge of the range);
- nonstandard channel spacing is used (e.g., for certain government services).

If known in advance, special or problem situations are, in general, best handled by ordering factory-programmed transceivers; special or problem conditions can be described in the order and all necessary alternative programming can be accomplished before the units are shipped. If a special situation or problem occurs during programming, common sense and, perhaps, a call to the Aerotron Customer Service Department will suffice.

3.5.2 Opposite-side Injection

Opposite-side programming data like those in the programming tables can be calculated using the formula shown in Figure 3-3. They can also be obtained from the Aerotron Customer Service Department. In many cases the transceiver can be put into service after programming these data and aligning the appropriate circuits. Because tuned circuits are involved with the injection frequencies, other cases require component (capacitor) changes. In still other cases, the VCO must be replaced to accommodate the channel frequencies.

In general, the size of the task (i.e., if simply changing the data will do the trick or if components will have to be changed) can be determined by listing the frequencies to be programmed, noting the range of the radio, and comparing the standard injection frequency with that for opposite-side injection.

3.5.3 Across-range channeling

Channeling is normally restricted to a limited portion of the RF spectrum in a transceiver's range. Operating outside of the range is, for many radios, impossible. The Mega-E, however, normally includes at least 1 MHz of overlap at each end of the range.

Channeling requirements occasionally involve widely spread channels. For example, most may be near the top of range B while one or two are at the bottom of range C. Programming channels such as these is not a problem if (1) the across-range channeling does not exceed the range overlap and (2) the channels are within the multifrequency spread of the unit.

B- and C-range transceivers usually employ high-side injection; D-range units typically use low-side injection. Across-range channeling is pos-

sible for C- and D-range units if the conditions noted previously are met. In this case, the out-of-range channels must use opposite-side injection and, therefore, use programming data from the same table as the other channels.

3.5.4 Range-edge channeling

Range-edge channeling is a problem only when repeaters are involved, especially when the multifrequency spread of the radio is exceeded or when the repeater access or transmit frequency falls outside of the normal range of the radio. The multifrequency ability of the radio has defined limits (3 MHz for the transmitter, 3% for the receiver), and operating outside of these limits can result in less-than-optimum performance. Working through a repeater that has transmit or receive frequencies outside of the range of the radio is practical only when across-range channeling is used and the radio operates within its multifrequency spread.

3.5.5 Nonstandard channel spacing

Certain government communications systems and some nondomestic users require channel spacings other than the standard 20 kHz (e.g., 25 kHz). These do not conflict with domestic land-mobile service because (1) the frequencies used are not within the 30-50 MHz group of assigned land-mobile frequencies or (2) the unit is being used outside of the continental limits of the United States.

3.5.6 Alternative programming procedures

After evaluating the frequencies to be programmed and determining that the standard programming procedure is not appropriate, verify the configuration and obtain the necessary channel frequency data as follows:

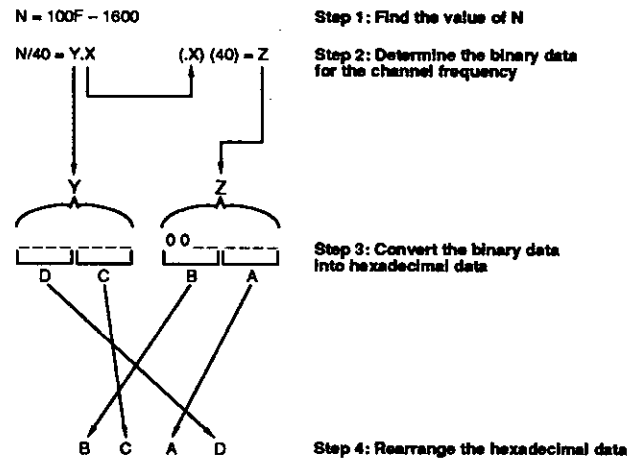
1. review the "Offset" and "VCO" subsections (these subsections follow this list);
2. insure that the correct offset resistor (R755 or R758) is installed;
3. determine the appropriate channel programming data by consulting Tables 3A-3D, Figure 3-3, or the Aerotron Customer Service Department.

For programming requirements not covered in this manual, contact the Aerotron Customer Service Department.

Offset

Two resistors, R755 and R758, are used to create an offset of 5 MHz between the transmit and receive frequencies. The offset accommodates the 5.26-MHz IF signal as well as the offset required for repeater operation.

The offset resistors are located next to each other at the rear of the synthesizer shield on the master PC board; R758 is closest to the synthesizer. In



Example: 32.20 MHz VCO output, 10-kHz intervals, 20-kHz spacing

- Step 1: Find N
 $N = (100 \times 32.20) - 1600$
 $N = 3220 - 1600$
 $N = 1620$
- Step 2: Convert 1620 to binary, convert the binary data to hexadecimal, and rearrange

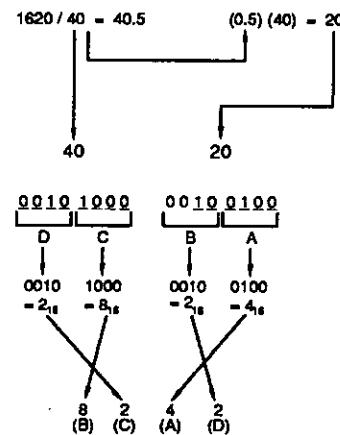


Figure 3-3. Frequency data calculation.

Table 3-4. Mega-E frequency ranges and standard operating conditions.

Range and Frequencies	Injection	Offset Resistor	Normal VCO Range (MHz)*	Offset VCO Range (MHz)*
B (30-36 MHz)	High side	R755	35.26-41.26†	30.00-36.00
C (36-42 MHz)	High side	R755	41.26-47.26†	36.00-42.00
D (42-50 MHz)	Low side	R758	42.00-50.00	36.74-44.74†

* The normal range is selected when voltage is applied to the VCO offset port (J401-1) via either offset resistor. The offset range is selected when no voltage is applied to the offset port.

† LO injection.

rare situations both resistors are used; occasionally, neither is used.

R755 increases the VCO operating frequency range by approximately 5 MHz in the transmit mode; this is the normal configuration for B- and C-range radios and provides high-side LO injection. R758 lowers the VCO range by about 5 MHz; this is the normal configuration for D-range radios and provides low-side LO injection.

Table 3-4 shows the VHF low band Mega-E frequency ranges along with the standard operating conditions in each range.

VCO

The Mega-E features a dual-range, switchable VCO. The two ranges are identified as standard and offset for simplicity. The range is selected by the presence or absence of voltage at the VCO offset port (see Table 3-4).

The offset range is approximately 5 MHz lower than the standard range. The offset between the two ranges provides the LO injection needed for the 5.26-MHz IF.

Range Switching

The VCO switches ranges as the transceiver switches between the transmit and receive operating modes. With R755 installed, the VCO is in the offset (low) range and provides low-side injection for D-range units. With R758 installed, the VCO operates in the standard (high) range and provides high-side injection for B- and C-range transceivers.

The range is controlled by a transistor switch within the VCO. This switch changes LC ratios within the oscillator and lowers the frequency range when a voltage is applied to the offset port. In this mode, the same control voltage keeps the PLL circuit locked at a frequency about 5 MHz lower than that of the standard mode.

VCO Operation

The VCO is controlled by an error-pulse voltage generated by a comparator (IC402) and the loop filter. The control voltage varies continuously between 2 and 8 V at high speed to keep the PLL locked (the voltage varies as different channels are selected and the radio switches between the transmit and receive modes of operation; it is adjusted to 4 V by the VCO control).

The control voltage is the same for both the standard and offset VCO ranges even though they differ by 5 MHz.

VCO Operating Ranges

Because both ranges are more than 3 MHz wide, the transmitter can produce channels up to 3 MHz apart when the VCO is properly adjusted. (The 3% receiver multifrequency spread depends primarily on receiver front-end LC ratios, not on the VCO.) If either range is moved by adjusting the VCO control, the other range moves by a similar amount--the relationship between the two ranges remains relatively constant.

The VCO operating parameters differ considerably between C- and D-range radios because the LO injection changes. C- (and B-) range radios typically use high-side injection while D-range units use low-side injection.

The standard range for, both B- and C-range radios is from 6 MHz above the lowest operating frequency to 6 MHz below the highest operating frequency (and vice versa). In the offset range, the VCO range coincides with the range of the radio (30-36 MHz and 36-42 MHz for B- and C-range radios, respectively).

The standard operating range for D-range radios coincides with the range of the radio (42-50 MHz); the offset range is 5.26 MHz lower.

The VCO is designed so that range overlap is such that the channels 1 MHz above and below the indicated range can be used.

VCO Adjustment

The VCO control "places" the operating ranges of the VCO in the portion of the band where channels are to be located. The control is typically adjusted to set the control voltage (which is measured at TP16) at 4 V. During operation, the control voltage usually varies between 2 and 8 V. Variations outside of this range can result in noisy operation or an unlocked PLL.

Typical Operation

B- and C-range transceivers are factory programmed for high-side injection. D-range units are programmed for low-side injection.

For a simplex channel at 34.0000 MHz (range B using high-side injection), the transmit frequency data specify 34.0000 MHz and the receive frequency data specify 39.260 MHz. (The 5.26-MHz difference between the two is because of the 5.26-MHz IF signal; the injection is high side because the injection signal is higher than the actual receive frequency.) Offset resistor R755 is installed so that the VCO shifts to the offset range whenever the transmitter is keyed.

For a simplex channel in a D-range radio, the injection signal is 5.26 MHz below the receive frequency. Offset resistor R758 is installed and shifts the VCO into the offset range when the unit is in the receive mode.

In some cases, opposite-side injection may be required because of interference. In this case, opposite-side programming data is required, and component changes may be necessary. Contact the Aerotron Customer Service Department for more information.

Table 3A. Hexadecimal frequency data, low-band Mega-E,
high-side injection, 5.26 MHz, 20-kHz channel spacing.

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
30.0000	0302	0063	30.5200	04C2	1123	31.0400	1582	12E3
30.0100	0312	0073	30.5300	04D2	1133	31.0500	1592	12F3
30.0200	0322	0083	30.5400	04E2	1143	31.0600	15A2	2203
30.0300	0332	0093	30.5500	04F2	1153	31.0700	15B2	2213
30.0400	0342	00A3	30.5600	1402	1163	31.0800	15C2	2223
30.0500	0352	00B3	30.5700	1412	1173	31.0900	15D2	2233
30.0600	0362	00C3	30.5800	1422	1183	31.1000	15E2	2243
30.0700	0372	00D3	30.5900	1432	1193	31.1100	15F2	2253
30.0800	0382	00E3	30.6000	1442	11A3	31.1200	2502	2263
30.0900	0392	00F3	30.6100	1452	11B3	31.1300	2512	2273
30.1000	03A2	1003	30.6200	1462	11C3	31.1400	2522	0303
30.1100	03B2	1013	30.6300	1472	11D3	31.1500	2532	0313
30.1200	03C2	1023	30.6400	1482	11E3	31.1600	2542	0323
30.1300	03D2	1033	30.6500	1492	11F3	31.1700	2552	0333
30.1400	03E2	1043	30.6600	14A2	2103	31.1800	2562	0343
30.1500	03F2	1053	30.6700	14B2	2113	31.1900	2572	0353
30.1600	1302	1063	30.6800	14C2	2123	31.2000	0602	0363
30.1700	1312	1073	30.6900	14D2	2133	31.2100	0612	0373
30.1800	1322	1083	30.7000	14E2	2143	31.2200	0622	0383
30.1900	1332	1093	30.7100	14F2	2153	31.2300	0632	0393
30.2000	1342	10A3	30.7200	2402	2163	31.2400	0642	03A3
30.2100	1352	10B3	30.7300	2412	2173	31.2500	0652	03B3
30.2200	1362	10C3	30.7400	2422	0203	31.2600	0662	03C3
30.2300	1372	10D3	30.7500	2432	0213	31.2700	0672	03D3
30.2400	1382	10E3	30.7600	2442	0223	31.2800	0682	03E3
30.2500	1392	10F3	30.7700	2452	0233	31.2900	0692	03F3
30.2600	13A2	2003	30.7800	2462	0243	31.3000	06A2	1303
30.2700	13B2	2013	30.7900	2472	0253	31.3100	06B2	1313
30.2800	13C2	2023	30.8000	0502	0263	31.3200	06C2	1323
30.2900	13D2	2033	30.8100	0512	0273	31.3300	06D2	1333
30.3000	13E2	2043	30.8200	0522	0283	31.3400	06E2	1343
30.3100	13F2	2053	30.8300	0532	0293	31.3500	06F2	1353
30.3200	2302	2063	30.8400	0542	02A3	31.3600	1602	1363
30.3300	2312	2073	30.8500	0552	02B3	31.3700	1612	1373
30.3400	2322	0103	30.8600	0562	02C3	31.3800	1622	1383
30.3500	2332	0113	30.8700	0572	02D3	31.3900	1632	1393
30.3600	2342	0123	30.8800	0582	02E3	31.4000	1642	13A3
30.3700	2352	0133	30.8900	0592	02F3	31.4100	1652	13B3
30.3800	2362	0143	30.9000	05A2	1203	31.4200	1662	13C3
30.3900	2372	0153	30.9100	05B2	1213	31.4300	1672	13D3
30.4000	0402	0163	30.9200	05C2	1223	31.4400	1682	13E3
30.4100	0412	0173	30.9300	05D2	1233	31.4500	1692	13F3
30.4200	0422	0183	30.9400	05E2	1243	31.4600	16A2	2303
30.4300	0432	0193	30.9500	05F2	1253	31.4700	16B2	2313
30.4400	0442	01A3	30.9600	1502	1263	31.4800	16C2	2323
30.4500	0452	01B3	30.9700	1512	1273	31.4900	16D2	2333
30.4600	0462	01C3	30.9800	1522	1283	31.5000	16E2	2343
30.4700	0472	01D3	30.9900	1532	1293	31.5100	16F2	2353
30.4800	0482	01E3	31.0000	1542	12A3	31.5200	2602	2363
30.4900	0492	01F3	31.0100	1552	12B3	31.5300	2612	2373
30.5000	04A2	1103	31.0200	1562	12C3	31.5400	2622	0403
30.5100	04B2	1113	31.0300	1572	12D3	31.5500	2632	0413

Table 3A (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
31.5600	2642	0423	32.0800	0882	05E3	32.6000	1942	16A3
31.5700	2652	0433	32.0900	0892	05F3	32.6100	1952	16B3
31.5800	2662	0443	32.1000	08A2	1503	32.6200	1962	16C3
31.5900	2672	0453	32.1100	08B2	1513	32.6300	1972	16D3
31.6000	0702	0463	32.1200	08C2	1523	32.6400	1982	16E3
31.6100	0712	0473	32.1300	08D2	1533	32.6500	1992	16F3
31.6200	0722	0483	32.1400	08E2	1543	32.6600	19A2	2603
31.6300	0732	0493	32.1500	08F2	1553	32.6700	19B2	2613
31.6400	0742	04A3	32.1600	1802	1563	32.6800	19C2	2623
31.6500	0752	04B3	32.1700	1812	1573	32.6900	19D2	2633
31.6600	0762	04C3	32.1800	1822	1583	32.7000	19E2	2643
31.6700	0772	04D3	32.1900	1832	1593	32.7100	19F2	2653
31.6800	0782	04E3	32.2000	1842	15A3	32.7200	2902	2663
31.6900	0792	04F3	32.2100	1852	15B3	32.7300	2912	2673
31.7000	07A2	1403	32.2200	1862	15C3	32.7400	2922	0703
31.7100	07B2	1413	32.2300	1872	15D3	32.7500	2932	0713
31.7200	07C2	1423	32.2400	1882	15E3	32.7600	2942	0723
31.7300	07D2	1433	32.2500	1892	15F3	32.7700	2952	0733
31.7400	07E2	1443	32.2600	18A2	2503	32.7800	2962	0743
31.7500	07F2	1453	32.2700	18B2	2513	32.7900	2972	0753
31.7600	1702	1463	32.2800	18C2	2523	32.8000	0A02	0763
31.7700	1712	1473	32.2900	18D2	2533	32.8100	0A12	0773
31.7800	1722	1483	32.3000	18E2	2543	32.8200	0A22	0783
31.7900	1732	1493	32.3100	18F2	2553	32.8300	0A32	0793
31.8000	1742	14A3	32.3200	2802	2563	32.8400	0A42	07A3
31.8100	1752	14B3	32.3300	2812	2573	32.8500	0A52	07B3
31.8200	1762	14C3	32.3400	2822	0603	32.8600	0A62	07C3
31.8300	1772	14D3	32.3500	2832	0613	32.8700	0A72	07D3
31.8400	1782	14E3	32.3600	2842	0623	32.8800	0A82	07E3
31.8500	1792	14F3	32.3700	2852	0633	32.8900	0A92	07F3
31.8600	17A2	2403	32.3800	2862	0643	32.9000	0AA2	1703
31.8700	17B2	2413	32.3900	2872	0653	32.9100	0AB2	1713
31.8800	17C2	2423	32.4000	0902	0663	32.9200	0AC2	1723
31.8900	17D2	2433	32.4100	0912	0673	32.9300	0AD2	1733
31.9000	17E2	2443	32.4200	0922	0683	32.9400	0AE2	1743
31.9100	17F2	2453	32.4300	0932	0693	32.9500	0AF2	1753
31.9200	2702	2463	32.4400	0942	06A3	32.9600	1A02	1763
31.9300	2712	2473	32.4500	0952	06B3	32.9700	1A12	1773
31.9400	2722	0503	32.4600	0962	06C3	32.9800	1A22	1783
31.9500	2732	0513	32.4700	0972	06D3	32.9900	1A32	1793
31.9600	2742	0523	32.4800	0982	06E3	33.0000	1A42	17A3
31.9700	2752	0533	32.4900	0992	06F3	33.0100	1A52	17B3
31.9800	2762	0543	32.5000	09A2	1603	33.0200	1A62	17C3
31.9900	2772	0553	32.5100	09B2	1613	33.0300	1A72	17D3
32.0000	0802	0563	32.5200	09C2	1623	33.0400	1A82	17E3
32.0100	0812	0573	32.5300	09D2	1633	33.0500	1A92	17F3
32.0200	0822	0583	32.5400	09E2	1643	33.0600	1AA2	2703
32.0300	0832	0593	32.5500	09F2	1653	33.0700	1AB2	2713
32.0400	0842	05A3	32.5600	1902	1663	33.0800	1AC2	2723
32.0500	0852	05B3	32.5700	1912	1673	33.0900	1AD2	2733
32.0600	0862	05C3	32.5800	1922	1683	33.1000	1AE2	2743
32.0700	0872	05D3	32.5900	1932	1693	33.1100	1AF2	2753

Table 3A (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
33.1200	2A02	2763	33.6400	0C42	09A3	34.1600	1D02	1A63
33.1300	2A12	2773	33.6500	0C52	09B3	34.1700	1D12	1A73
33.1400	2A22	0803	33.6600	0C62	09C3	34.1800	1D22	1A83
33.1500	2A32	0813	33.6700	0C72	09D3	34.1900	1D32	1A93
33.1600	2A42	0823	33.6800	0C82	09E3	34.2000	1D42	1AA3
33.1700	2A52	0833	33.6900	0C92	09F3	34.2100	1D52	1AB3
33.1800	2A62	0843	33.7000	0CA2	1903	34.2200	1D62	1AC3
33.1900	2A72	0853	33.7100	0CB2	1913	34.2300	1D72	1AD3
33.2000	0B02	0863	33.7200	0CC2	1923	34.2400	1D82	1AE3
33.2100	0B12	0873	33.7300	0CD2	1933	34.2500	1D92	1AF3
33.2200	0B22	0883	33.7400	0CE2	1943	34.2600	1DA2	2A03
33.2300	0B32	0893	33.7500	0CF2	1953	34.2700	1DB2	2A13
33.2400	0B42	08A3	33.7600	1C02	1963	34.2800	1DC2	2A23
33.2500	0B52	08B3	33.7700	1C12	1973	34.2900	1DD2	2A33
33.2600	0B62	08C3	33.7800	1C22	1983	34.3000	1DE2	2A43
33.2700	0B72	08D3	33.7900	1C32	1993	34.3100	1DF2	2A53
33.2800	0B82	08E3	33.8000	1C42	19A3	34.3200	2D02	2A63
33.2900	0B92	08F3	33.8100	1C52	19B3	34.3300	2D12	2A73
33.3000	0BA2	1803	33.8200	1C62	19C3	34.3400	2D22	0B03
33.3100	0BB2	1813	33.8300	1C72	19D3	34.3500	2D32	0B13
33.3200	0BC2	1823	33.8400	1C82	19E3	34.3600	2D42	0B23
33.3300	0BD2	1833	33.8500	1C92	19F3	34.3700	2D52	0B33
33.3400	0BE2	1843	33.8600	1CA2	2903	34.3800	2D62	0B43
33.3500	0BF2	1853	33.8700	1CR2	2913	34.3900	2D72	0B53
33.3600	1B02	1863	33.8800	1CC2	2923	34.4000	0E02	0B63
33.3700	1B12	1873	33.8900	1CD2	2933	34.4100	0E12	0B73
33.3800	1B22	1883	33.9000	1CE2	2943	34.4200	0E22	0B83
33.3900	1B32	1893	33.9100	1CF2	2953	34.4300	0E32	0B93
33.4000	1B42	18A3	33.9200	2C02	2963	34.4400	0E42	0BA3
33.4100	1B52	18B3	33.9300	2C12	2973	34.4500	0E52	0BB3
33.4200	1B62	18C3	33.9400	2C22	0A03	34.4600	0E62	0BC3
33.4300	1B72	18D3	33.9500	2C32	0A13	34.4700	0E72	0BD3
33.4400	1B82	18E3	33.9600	2C42	0A23	34.4800	0E82	0BE3
33.4500	1B92	18F3	33.9700	2C52	0A33	34.4900	0E92	0BF3
33.4600	1BA2	2803	33.9800	2C62	0A43	34.5000	0EA2	1B03
33.4700	1BB2	2813	33.9900	2C72	0A53	34.5100	0EB2	1B13
33.4800	1BC2	2823	34.0000	0D02	0A63	34.5200	0EC2	1B23
33.4900	1BD2	2833	34.0100	0D12	0A73	34.5300	0ED2	1B33
33.5000	1BE2	2843	34.0200	0D22	0A83	34.5400	0EE2	1B43
33.5100	1BF2	2853	34.0300	0D32	0A93	34.5500	0EF2	1B53
33.5200	2B02	2863	34.0400	0D42	0AA3	34.5600	1F02	1B63
33.5300	2B12	2873	34.0500	0D52	0AB3	34.5700	1E12	1B73
33.5400	2B22	0903	34.0600	0D62	0AC3	34.5800	1E22	1B83
33.5500	2B32	0913	34.0700	0D72	0AD3	34.5900	1E32	1B93
33.5600	2B42	0923	34.0800	0D82	0AE3	34.6000	1E42	1BA3
33.5700	2B52	0933	34.0900	0D92	0AF3	34.6100	1E52	1BB3
33.5800	2B62	0943	34.1000	0DA2	1A03	34.6200	1E62	1BC3
33.5900	2B72	0953	34.1100	0DB2	1A13	34.6300	1E72	1BD3
33.6000	0C02	0963	34.1200	0DC2	1A23	34.6400	1E82	1BE3
33.6100	0C12	0973	34.1300	0DD2	1A33	34.6500	1E92	1BF3
33.6200	0C22	0983	34.1400	0DE2	1A43	34.6600	1EA2	2B03
33.6300	0C32	0993	34.1500	0DF2	1A53	34.6700	1EB2	2B13

Table 3A (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
34.6800	1EC2	2B23	35.2000	0003	0D63	35.7200	01C3	1E23
34.6900	1ED2	2B33	35.2100	0013	0D73	35.7300	01D3	1E33
34.7000	1EE2	2B43	35.2200	0023	0D83	35.7400	01F3	1E43
34.7100	1EF2	2B53	35.2300	0033	0D93	35.7500	01F3	1E53
34.7200	2E02	2B63	35.2400	0043	0DA3	35.7600	1103	1E63
34.7300	2E12	2B73	35.2500	0053	0DB3	35.7700	1113	1E73
34.7400	2E22	0C03	35.2600	0063	0DC3	35.7800	1123	1E83
34.7500	2E32	0C13	35.2700	0073	0DD3	35.7900	1133	1E93
34.7600	2E42	0C23	35.2800	0083	0DE3	35.8000	1143	1EA3
34.7700	2E52	0C33	35.2900	0093	0DF3	35.8100	1153	1EB3
34.7800	2E62	0C43	35.3000	00A3	1D03	35.8200	1163	1EC3
34.7900	2E72	0C53	35.3100	00B3	1D13	35.8300	1173	1ED3
34.8000	0F02	0C63	35.3200	00C3	1D23	35.8400	1183	1EE3
34.8100	0F12	0C73	35.3300	00D3	1D33	35.8500	1193	1EF3
34.8200	0F22	0C83	35.3400	00E3	1D43	35.8600	11A3	2E03
34.8300	0F32	0C93	35.3500	00F3	1D53	35.8700	11B3	2E13
34.8400	0F42	0CA3	35.3600	1003	1D63	35.8800	11C3	2E23
34.8500	0F52	0CB3	35.3700	1013	1D73	35.8900	11D3	2E33
34.8600	0F62	0CC3	35.3800	1023	1D83	35.9000	11E3	2E43
34.8700	0F72	0CD3	35.3900	1033	1D93	35.9100	11F3	2E53
34.8800	0F82	0CE3	35.4000	1043	1DA3	35.9200	2103	2E63
34.8900	0F92	0CF3	35.4100	1053	1DB3	35.9300	2113	2E73
34.9000	0FA2	1C03	35.4200	1063	1DC3	35.9400	2123	0F03
34.9100	0FB2	1C13	35.4300	1073	1DD3	35.9500	2133	0F13
34.9200	0FC2	1C23	35.4400	1083	1DE3	35.9600	2143	0F23
34.9300	0FD2	1C33	35.4500	1093	1DF3	35.9700	2153	0F33
34.9400	0FE2	1C43	35.4600	10A3	2D03	35.9800	2163	0F43
34.9500	0FF2	1C53	35.4700	10B3	2D13	35.9900	2173	0F53
34.9600	1F02	1C63	35.4800	10C3	2D23	36.0000	0203	0F63
34.9700	1F12	1C73	35.4900	10D3	2D33	36.0100	0213	0F73
34.9800	1F22	1C83	35.5000	10E3	2D43	36.0200	0223	0F83
34.9900	1F32	1C93	35.5100	10F3	2D53	36.0300	0233	0F93
35.0000	1F42	1CA3	35.5200	2003	2D63	36.0400	0243	0FA3
35.0100	1F52	1CB3	35.5300	2013	2D73	36.0500	0253	0FB3
35.0200	1F62	1CC3	35.5400	2023	0E03	36.0600	0263	0FC3
35.0300	1F72	1CD3	35.5500	2033	0E13	36.0700	0273	0FD3
35.0400	1F82	1CE3	35.5600	2043	0E23	36.0800	0283	0FE3
35.0500	1F92	1CF3	35.5700	2053	0E33	36.0900	0293	0FF3
35.0600	1FA2	2C03	35.5800	2063	0E43	36.1000	02A3	1F03
35.0700	1FB2	2C13	35.5900	2073	0E53	36.1100	02B3	1F13
35.0800	1FC2	2C23	35.6000	0103	0E63	36.1200	02C3	1F23
35.0900	1FD2	2C33	35.6100	0113	0E73	36.1300	02D3	1F33
35.1000	1FE2	2C43	35.6200	0123	0E83	36.1400	02E3	1F43
35.1100	1FF2	2C53	35.6300	0133	0E93	36.1500	02F3	1F53
35.1200	2F02	2C63	35.6400	0143	0EA3	36.1600	1203	1F63
35.1300	2F12	2C73	35.6500	0153	0EB3	36.1700	1213	1F73
35.1400	2F22	0D03	35.6600	0163	0EC3	36.1800	1223	1F83
35.1500	2F32	0D13	35.6700	0173	0ED3	36.1900	1233	1F93
35.1600	2F42	0D23	35.6800	0183	0EE3	36.2000	1243	1FA3
35.1700	2F52	0D33	35.6900	0193	0EF3	36.2100	1253	1FB3
35.1800	2F62	0D43	35.7000	01A3	1E03	36.2200	1263	1FC3
35.1900	2F72	0D53	35.7100	01B3	1E13	36.2300	1273	1FD3

Table 3A (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
36.2400	1283	1FE3	36.7600	2343	0124	37.2800	0583	02E4
36.2500	1293	1FF3	36.7700	2353	0134	37.2900	0593	02F4
36.2600	12A3	2F03	36.7800	2363	0144	37.3000	05A3	1204
36.2700	12B3	2F13	36.7900	2373	0154	37.3100	05B3	1214
36.2800	12C3	2F23	36.8000	0403	0164	37.3200	05C3	1224
36.2900	12D3	2F33	36.8100	0413	0174	37.3300	05D3	1234
36.3000	12E3	2F43	36.8200	0423	0184	37.3400	05E3	1244
36.3100	12F3	2F53	36.8300	0433	0194	37.3500	05F3	1254
36.3200	2203	2F63	36.8400	0443	01A4	37.3600	1503	1264
36.3300	2213	2F73	36.8500	0453	01B4	37.3700	1513	1274
36.3400	2223	0004	36.8600	0463	01C4	37.3800	1523	1284
36.3500	2233	0014	36.8700	0473	01D4	37.3900	1533	1294
36.3600	2243	0024	36.8800	0483	01E4	37.4000	1543	12A4
36.3700	2253	0034	36.8900	0493	01F4	37.4100	1553	12B4
36.3800	2263	0044	36.9000	04A3	1104	37.4200	1563	12C4
36.3900	2273	0054	36.9100	04B3	1114	37.4300	1573	12D4
36.4000	0303	0064	36.9200	04C3	1124	37.4400	1583	12E4
36.4100	0313	0074	36.9300	04D3	1134	37.4500	1593	12F4
36.4200	0323	0084	36.9400	04E3	1144	37.4600	15A3	2204
36.4300	0333	0094	36.9500	04F3	1154	37.4700	15B3	2214
36.4400	0343	00A4	36.9600	1403	1164	37.4800	15C3	2224
36.4500	0353	00B4	36.9700	1413	1174	37.4900	15D3	2234
36.4600	0363	00C4	36.9800	1423	1184	37.5000	15E3	2244
36.4700	0373	00D4	36.9900	1433	1194	37.5100	15F3	2254
36.4800	0383	00E4	37.0000	1443	11A4	37.5200	2503	2264
36.4900	0393	00F4	37.0100	1453	11B4	37.5300	2513	2274
36.5000	03A3	1004	37.0200	1463	11C4	37.5400	2523	0304
36.5100	03B3	1014	37.0300	1473	11D4	37.5500	2533	0314
36.5200	03C3	1024	37.0400	1483	11E4	37.5600	2543	0324
36.5300	03D3	1034	37.0500	1493	11F4	37.5700	2553	0334
36.5400	03E3	1044	37.0600	14A3	2104	37.5800	2563	0344
36.5500	03F3	1054	37.0700	14B3	2114	37.5900	2573	0354
36.5600	1303	1064	37.0800	14C3	2124	37.6000	0603	0364
36.5700	1313	1074	37.0900	14D3	2134	37.6100	0613	0374
36.5800	1323	1084	37.1000	14E3	2144	37.6200	0623	0384
36.5900	1333	1094	37.1100	14F3	2154	37.6300	0633	0394
36.6000	1343	10A4	37.1200	2403	2164	37.6400	0643	03A4
36.6100	1353	10B4	37.1300	2413	2174	37.6500	0653	03B4
36.6200	1363	10C4	37.1400	2423	0204	37.6600	0663	03C4
36.6300	1373	10D4	37.1500	2433	0214	37.6700	0673	03D4
36.6400	1383	10E4	37.1600	2443	0224	37.6800	0683	03E4
36.6500	1393	10F4	37.1700	2453	0234	37.6900	0693	03F4
36.6600	13A3	2004	37.1800	2463	0244	37.7000	06A3	1304
36.6700	13B3	2014	37.1900	2473	0254	37.7100	06B3	1314
36.6800	13C3	2024	37.2000	0503	0264	37.7200	06C3	1324
36.6900	13D3	2034	37.2100	0513	0274	37.7300	06D3	1334
36.7000	13E3	2044	37.2200	0523	0284	37.7400	06E3	1344
36.7100	13F3	2054	37.2300	0533	0294	37.7500	06F3	1354
36.7200	2303	2064	37.2400	0543	02A4	37.7600	1603	1364
36.7300	2313	2074	37.2500	0553	02B4	37.7700	1613	1374
36.7400	2323	0104	37.2600	0563	02C4	37.7800	1623	1384
36.7500	2333	0114	37.2700	0573	02D4	37.7900	1633	1394

Table 3A (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
37.8000	1643	13A4	38.3200	2703	2464	38.8400	0943	06A4
37.8100	1653	13B4	38.3300	2713	2474	38.8500	0953	06B4
37.8200	1663	13C4	38.3400	2723	0504	38.8600	0963	06C4
37.8300	1673	13D4	38.3500	2733	0514	38.8700	0973	06D4
37.8400	1683	13E4	38.3600	2743	0524	38.8800	0983	06E4
37.8500	1693	13F4	38.3700	2753	0534	38.8900	0993	06F4
37.8600	16A3	2304	38.3800	2763	0544	38.9000	09A3	1604
37.8700	16B3	2314	38.3900	2773	0554	38.9100	09B3	1614
37.8800	16C3	2324	38.4000	0803	0564	38.9200	09C3	1624
37.8900	16D3	2334	38.4100	0813	0574	38.9300	09D3	1634
37.9000	16E3	2344	38.4200	0823	0584	38.9400	09E3	1644
37.9100	16F3	2354	38.4300	0833	0594	38.9500	09F3	1654
37.9200	2603	2364	38.4400	0843	05A4	38.9600	1903	1664
37.9300	2613	2374	38.4500	0853	05B4	38.9700	1913	1674
37.9400	2623	0404	38.4600	0863	05C4	38.9800	1923	1684
37.9500	2633	0414	38.4700	0873	05D4	38.9900	1933	1694
37.9600	2643	0424	38.4800	0883	05E4	39.0000	1943	16A4
37.9700	2653	0434	38.4900	0893	05F4	39.0100	1953	16B4
37.9800	2663	0444	38.5000	08A3	1504	39.0200	1963	16C4
37.9900	2673	0454	38.5100	08B3	1514	39.0300	1973	16D4
38.0000	0703	0464	38.5200	08C3	1524	39.0400	1983	16E4
38.0100	0713	0474	38.5300	08D3	1534	39.0500	1993	16F4
38.0200	0723	0484	38.5400	08E3	1544	39.0600	19A3	2604
38.0300	0733	0494	38.5500	08F3	1554	39.0700	19B3	2614
38.0400	0743	04A4	38.5600	1803	1564	39.0800	19C3	2624
38.0500	0753	04B4	38.5700	1813	1574	39.0900	19D3	2634
38.0600	0763	04C4	38.5800	1823	1584	39.1000	19E3	2644
38.0700	0773	04D4	38.5900	1833	1594	39.1100	19F3	2654
38.0800	0783	04E4	38.6000	1843	15A4	39.1200	2903	2664
38.0900	0793	04F4	38.6100	1853	15B4	39.1300	2913	2674
38.1000	07A3	1404	38.6200	1863	15C4	39.1400	2923	0704
38.1100	07B3	1414	38.6300	1873	15D4	39.1500	2933	0714
38.1200	07C3	1424	38.6400	1883	15E4	39.1600	2943	0724
38.1300	07D3	1434	38.6500	1893	15F4	39.1700	2953	0734
38.1400	07E3	1444	38.6600	18A3	2504	39.1800	2963	0744
38.1500	07F3	1454	38.6700	18B3	2514	39.1900	2973	0754
38.1600	1703	1464	38.6800	18C3	2524	39.2000	0A03	0764
38.1700	1713	1474	38.6900	18D3	2534	39.2100	0A13	0774
38.1800	1723	1484	38.7000	18E3	2544	39.2200	0A23	0784
38.1900	1733	1494	38.7100	18F3	2554	39.2300	0A33	0794
38.2000	1743	14A4	38.7200	2803	2564	39.2400	0A43	07A4
38.2100	1753	14B4	38.7300	2813	2574	39.2500	0A53	07B4
38.2200	1763	14C4	38.7400	2823	0604	39.2600	0A63	07C4
38.2300	1773	14D4	38.7500	2833	0614	39.2700	0A73	07D4
38.2400	1783	14E4	38.7600	2843	0624	39.2800	0A83	07E4
38.2500	1793	14F4	38.7700	2853	0634	39.2900	0A93	07F4
38.2600	17A3	2404	38.7800	2863	0644	39.3000	0AA3	1704
38.2700	17B3	2414	38.7900	2873	0654	39.3100	0AB3	1714
38.2800	17C3	2424	38.8000	0903	0664	39.3200	0AC3	1724
38.2900	17D3	2434	38.8100	0913	0674	39.3300	0AD3	1734
38.3000	17E3	2444	38.8200	0923	0684	39.3400	0AE3	1744
38.3100	17F3	2454	38.8300	0933	0694	39.3500	0AF3	1754

Table 3A (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
39.3600	1A03	1764	39.8800	18C3	2824	40.4000	0D03	0A64
39.3700	1A13	1774	39.8900	18D3	2834	40.4100	0D13	0A74
39.3800	1A23	1784	39.9000	18E3	2844	40.4200	0D23	0A84
39.3900	1A33	1794	39.9100	18F3	2854	40.4300	0D33	0A94
39.4000	1A43	17A4	39.9200	2803	2864	40.4400	0D43	0AA4
39.4100	1A53	17B4	39.9300	2813	2874	40.4500	0D53	0AB4
39.4200	1A63	17C4	39.9400	2823	0904	40.4600	0D63	0AC4
39.4300	1A73	17D4	39.9500	2833	0914	40.4700	0D73	0AD4
39.4400	1A83	17E4	39.9600	2843	0924	40.4800	0D83	0AE4
39.4500	1A93	17F4	39.9700	2853	0934	40.4900	0D93	0AF4
39.4600	1AA3	2704	39.9800	2863	0944	40.5000	0DA3	1A04
39.4700	1AB3	2714	39.9900	2873	0954	40.5100	0DB3	1A14
39.4800	1AC3	2724	40.0000	0C03	0964	40.5200	0DC3	1A24
39.4900	1AD3	2734	40.0100	0C13	0974	40.5300	0DD3	1A34
39.5000	1AE3	2744	40.0200	0C23	0984	40.5400	0DE3	1A44
39.5100	1AF3	2754	40.0300	0C33	0994	40.5500	0DF3	1A54
39.5200	2A03	2764	40.0400	0C43	09A4	40.5600	1D03	1A64
39.5300	2A13	2774	40.0500	0C53	09B4	40.5700	1D13	1A74
39.5400	2A23	0804	40.0600	0C63	09C4	40.5800	1D23	1A84
39.5500	2A33	0814	40.0700	0C73	09D4	40.5900	1D33	1A94
39.5600	2A43	0824	40.0800	0C83	09E4	40.6000	1D43	1AA4
39.5700	2A53	0834	40.0900	0C93	09F4	40.6100	1D53	1AB4
39.5800	2A63	0844	40.1000	0CA3	1904	40.6200	1D63	1AC4
39.5900	2A73	0854	40.1100	0CB3	1914	40.6300	1D73	1AD4
39.6000	0R03	0864	40.1200	0CC3	1924	40.6400	1D83	1AE4
39.6100	0B13	0874	40.1300	0CD3	1934	40.6500	1D93	1AF4
39.6200	0B23	0884	40.1400	0CE3	1944	40.6600	1DA3	2A04
39.6300	0B33	0894	40.1500	0CF3	1954	40.6700	1DB3	2A14
39.6400	0B43	08A4	40.1600	1C03	1964	40.6800	1DC3	2A24
39.6500	0B53	08B4	40.1700	1C13	1974	40.6900	1DD3	2A34
39.6600	0B63	08C4	40.1800	1C23	1984	40.7000	1DE3	2A44
39.6700	0B73	08D4	40.1900	1C33	1994	40.7100	1DF3	2A54
39.6800	0B83	08E4	40.2000	1C43	19A4	40.7200	2D03	2A64
39.6900	0B93	08F4	40.2100	1C53	19B4	40.7300	2D13	2A74
39.7000	0BA3	1804	40.2200	1C63	19C4	40.7400	2D23	0B04
39.7100	0BB3	1814	40.2300	1C73	19D4	40.7500	2D33	0B14
39.7200	0BC3	1824	40.2400	1C83	19E4	40.7600	2D43	0B24
39.7300	0BD3	1834	40.2500	1C93	19F4	40.7700	2D53	0B34
39.7400	0BE3	1844	40.2600	1CA3	2904	40.7800	2D63	0B44
39.7500	0BF3	1854	40.2700	1CB3	2914	40.7900	2D73	0B54
39.7600	1B03	1864	40.2800	1CC3	2924	40.8000	0E03	0B64
39.7700	1B13	1874	40.2900	1CD3	2934	40.8100	0E13	0B74
39.7800	1B23	1884	40.3000	1CE3	2944	40.8200	0E23	0B84
39.7900	1B33	1894	40.3100	1CF3	2954	40.8300	0E33	0B94
39.8000	1B43	18A4	40.3200	2C03	2964	40.8400	0E43	0BA4
39.8100	1B53	18B4	40.3300	2C13	2974	40.8500	0E53	0BB4
39.8200	1B63	18C4	40.3400	2C23	0A04	40.8600	0E63	0BC4
39.8300	1B73	18D4	40.3500	2C33	0A14	40.8700	0E73	0BD4
39.8400	1B83	18E4	40.3600	2C43	0A24	40.8800	0E83	0BE4
39.8500	1B93	18F4	40.3700	2C53	0A34	40.8900	0E93	0BF4
39.8600	1BA3	2804	40.3800	2C63	0A44	40.9000	0EA3	1B04
39.8700	1BB3	2814	40.3900	2C73	0A54	40.9100	0EB3	1B14

Table 3A (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
40.9200	0EC3	1B24	41.4400	1F83	1CE4	41.9600	2044	0E24
40.9300	0ED3	1B34	41.4500	1F93	1CF4	41.9700	2054	0E34
40.9400	0EE3	1B44	41.4600	1FA3	2C04	41.9800	2064	0E44
40.9500	0EF3	1B54	41.4700	1FB3	2C14	41.9900	2074	0E54
40.9600	1E03	1B64	41.4800	1FC3	2C24	42.0000	0104	0E64
40.9700	1E13	1B74	41.4900	1FD3	2C34	42.0100	0114	0E74
40.9800	1E23	1B84	41.5000	1FE3	2C44	42.0200	0124	0E84
40.9900	1E33	1B94	41.5100	1FF3	2C54	42.0300	0134	0E94
41.0000	1E43	1BA4	41.5200	2F03	2C64	42.0400	0144	0EA4
41.0100	1E53	1BB4	41.5300	2F13	2C74	42.0500	0154	0EB4
41.0200	1E63	1BC4	41.5400	2F23	0D04	42.0600	0164	0EC4
41.0300	1E73	1BD4	41.5500	2F33	0D14	42.0700	0174	0ED4
41.0400	1E83	1BE4	41.5600	2F43	0D24	42.0800	0184	0EE4
41.0500	1E93	1BF4	41.5700	2F53	0D34	42.0900	0194	0EF4
41.0600	1EA3	2B04	41.5800	2F63	0D44	42.1000	01A4	1E04
41.0700	1EB3	2B14	41.5900	2F73	0D54	42.1100	01B4	1E14
41.0800	1EC3	2B24	41.6000	0004	0D64	42.1200	01C4	1E24
41.0900	1ED3	2B34	41.6100	0014	0D74	42.1300	01D4	1E34
41.1000	1EE3	2B44	41.6200	0024	0D84	42.1400	01E4	1E44
41.1100	1EF3	2B54	41.6300	0034	0D94	42.1500	01F4	1E54
41.1200	2E03	2B64	41.6400	0044	0DA4	42.1600	1104	1E64
41.1300	2E13	2B74	41.6500	0054	0DB4	42.1700	1114	1E74
41.1400	2E23	0C04	41.6600	0064	0DC4	42.1800	1124	1E84
41.1500	2E33	0C14	41.6700	0074	0DD4	42.1900	1134	1E94
41.1600	2E43	0C24	41.6800	0084	0DE4	42.2000	1144	1EA4
41.1700	2E53	0C34	41.6900	0094	0DF4	42.2100	1154	1EB4
41.1800	2E63	0C44	41.7000	00A4	1D04	42.2200	1164	1EC4
41.1900	2E73	0C54	41.7100	00B4	1D14	42.2300	1174	1ED4
41.2000	0F03	0C64	41.7200	00C4	1D24	42.2400	1184	1EE4
41.2100	0F13	0C74	41.7300	00D4	1D34	42.2500	1194	1EF4
41.2200	0F23	0C84	41.7400	00E4	1D44	42.2600	11A4	2E04
41.2300	0F33	0C94	41.7500	00F4	1D54	42.2700	11B4	2E14
41.2400	0F43	0CA4	41.7600	1004	1D64	42.2800	11C4	2E24
41.2500	0F53	0CB4	41.7700	1014	1D74	42.2900	11D4	2E34
41.2600	0F63	0CC4	41.7800	1024	1D84	42.3000	11E4	2E44
41.2700	0F73	0CD4	41.7900	1034	1D94	42.3100	11F4	2E54
41.2800	0F83	0CE4	41.8000	1044	1DA4	42.3200	2104	2E64
41.2900	0F93	0CF4	41.8100	1054	1DB4	42.3300	2114	2E74
41.3000	0FA3	1C04	41.8200	1064	1DC4	42.3400	2124	0F04
41.3100	0FB3	1C14	41.8300	1074	1DD4	42.3500	2134	0F14
41.3200	0FC3	1C24	41.8400	1084	1DE4	42.3600	2144	0F24
41.3300	0FD3	1C34	41.8500	1094	1DF4	42.3700	2154	0F34
41.3400	0FE3	1C44	41.8600	10A4	2D04	42.3800	2164	0F44
41.3500	0FF3	1C54	41.8700	10B4	2D14	42.3900	2174	0F54
41.3600	1F03	1C64	41.8800	10C4	2D24	42.4000	0204	0F64
41.3700	1F13	1C74	41.8900	10D4	2D34	42.4100	0214	0F74
41.3800	1F23	1C84	41.9000	10E4	2D44	42.4200	0224	0F84
41.3900	1F33	1C94	41.9100	10F4	2D54	42.4300	0234	0F94
41.4000	1F43	1CA4	41.9200	2004	2D64	42.4400	0244	0FA4
41.4100	1F53	1CB4	41.9300	2014	2D74	42.4500	0254	0FB4
41.4200	1F63	1CC4	41.9400	2024	0E04	42.4600	0264	0FC4
41.4300	1F73	1CD4	41.9500	2034	0E14	42.4700	0274	0FD4

Table 3A (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
42.4800	0284	0FE4	43.0000	1344	10A5	43.5200	2404	2165
42.4900	0294	0FF4	43.0100	1354	10B5	43.5300	2414	2175
42.5000	02A4	1F04	43.0200	1364	10C5	43.5400	2424	0205
42.5100	02B4	1F14	43.0300	1374	10D5	43.5500	2434	0215
42.5200	02C4	1F24	43.0400	1384	10E5	43.5600	2444	0225
42.5300	02D4	1F34	43.0500	1394	10F5	43.5700	2454	0235
42.5400	02E4	1F44	43.0600	13A4	2005	43.5800	2464	0245
42.5500	02F4	1F54	43.0700	13B4	2015	43.5900	2474	0255
42.5600	1204	1F64	43.0800	13C4	2025	43.6000	0504	0265
42.5700	1214	1F74	43.0900	13D4	2035	43.6100	0514	0275
42.5800	1224	1F84	43.1000	13E4	2045	43.6200	0524	0285
42.5900	1234	1F94	43.1100	13F4	2055	43.6300	0534	0295
42.6000	1244	1FA4	43.1200	2304	2065	43.6400	0544	02A5
42.6100	1254	1FB4	43.1300	2314	2075	43.6500	0554	02B5
42.6200	1264	1FC4	43.1400	2324	0105	43.6600	0564	02C5
42.6300	1274	1FD4	43.1500	2334	0115	43.6700	0574	02D5
42.6400	1284	1FE4	43.1600	2344	0125	43.6800	0584	02E5
42.6500	1294	1FF4	43.1700	2354	0135	43.6900	0594	02F5
42.6600	12A4	2F04	43.1800	2364	0145	43.7000	05A4	1205
42.6700	12B4	2F14	43.1900	2374	0155	43.7100	05B4	1215
42.6800	12C4	2F24	43.2000	0404	0165	43.7200	05C4	1225
42.6900	12D4	2F34	43.2100	0414	0175	43.7300	05D4	1235
42.7000	12E4	2F44	43.2200	0424	0185	43.7400	05E4	1245
42.7100	12F4	2F54	43.2300	0434	0195	43.7500	05F4	1255
42.7200	2204	2F64	43.2400	0444	01A5	43.7600	1504	1265
42.7300	2214	2F74	43.2500	0454	01B5	43.7700	1514	1275
42.7400	2224	0005	43.2600	0464	01C5	43.7800	1524	1285
42.7500	2234	0015	43.2700	0474	01D5	43.7900	1534	1295
42.7600	2244	0025	43.2800	0484	01E5	43.8000	1544	12A5
42.7700	2254	0035	43.2900	0494	01F5	43.8100	1554	12B5
42.7800	2264	0045	43.3000	04A4	1105	43.8200	1564	12C5
42.7900	2274	0055	43.3100	04B4	1115	43.8300	1574	12D5
42.8000	0304	0065	43.3200	04C4	1125	43.8400	1584	12E5
42.8100	0314	0075	43.3300	04D4	1135	43.8500	1594	12F5
42.8200	0324	0085	43.3400	04E4	1145	43.8600	15A4	2205
42.8300	0334	0095	43.3500	04F4	1155	43.8700	15B4	2215
42.8400	0344	00A5	43.3600	1404	1165	43.8800	15C4	2225
42.8500	0354	00B5	43.3700	1414	1175	43.8900	15D4	2235
42.8600	0364	00C5	43.3800	1424	1185	43.9000	15E4	2245
42.8700	0374	00D5	43.3900	1434	1195	43.9100	15F4	2255
42.8800	0384	00E5	43.4000	1444	11A5	43.9200	2504	2265
42.8900	0394	00F5	43.4100	1454	11B5	43.9300	2514	2275
42.9000	03A4	1005	43.4200	1464	11C5	43.9400	2524	0305
42.9100	03B4	1015	43.4300	1474	11D5	43.9500	2534	0315
42.9200	03C4	1025	43.4400	1484	11E5	43.9600	2544	0325
42.9300	03D4	1035	43.4500	1494	11F5	43.9700	2554	0335
42.9400	03E4	1045	43.4600	14A4	2105	43.9800	2564	0345
42.9500	03F4	1055	43.4700	14B4	2115	43.9900	2574	0355
42.9600	1304	1065	43.4800	14C4	2125	44.0000	0604	0365
42.9700	1314	1075	43.4900	14D4	2135	44.0100	0614	0375
42.9800	1324	1085	43.5000	14E4	2145	44.0200	0624	0385
42.9900	1334	1095	43.5100	14F4	2155	44.0300	0634	0395

Table 3A (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
44.0400	0644	03A5	44.5600	1704	1465	45.0800	18C4	2525
44.0500	0654	03B5	44.5700	1714	1475	45.0900	18D4	2535
44.0600	0664	03C5	44.5800	1724	1485	45.1000	18E4	2545
44.0700	0674	03D5	44.5900	1734	1495	45.1100	18F4	2555
44.0800	0684	03E5	44.6000	1744	14A5	45.1200	2804	2565
44.0900	0694	03F5	44.6100	1754	14B5	45.1300	2814	2575
44.1000	06A4	1305	44.6200	1764	14C5	45.1400	2824	0605
44.1100	06B4	1315	44.6300	1774	14D5	45.1500	2834	0615
44.1200	06C4	1325	44.6400	1784	14E5	45.1600	2844	0625
44.1300	06D4	1335	44.6500	1794	14F5	45.1700	2854	0635
44.1400	06E4	1345	44.6600	17A4	2405	45.1800	2864	0645
44.1500	06F4	1355	44.6700	17B4	2415	45.1900	2874	0655
44.1600	1604	1365	44.6800	17C4	2425	45.2000	0904	0665
44.1700	1614	1375	44.6900	17D4	2435	45.2100	0914	0675
44.1800	1624	1385	44.7000	17E4	2445	45.2200	0924	0685
44.1900	1634	1395	44.7100	17F4	2455	45.2300	0934	0695
44.2000	1644	13A5	44.7200	2704	2465	45.2400	0944	06A5
44.2100	1654	13B5	44.7300	2714	2475	45.2500	0954	06B5
44.2200	1664	13C5	44.7400	2724	0505	45.2600	0964	06C5
44.2300	1674	13D5	44.7500	2734	0515	45.2700	0974	06D5
44.2400	1684	13E5	44.7600	2744	0525	45.2800	0984	06E5
44.2500	1694	13F5	44.7700	2754	0535	45.2900	0994	06F5
44.2600	16A4	2305	44.7800	2764	0545	45.3000	09A4	1605
44.2700	16B4	2315	44.7900	2774	0555	45.3100	09B4	1615
44.2800	16C4	2325	44.8000	0804	0565	45.3200	09C4	1625
44.2900	16D4	2335	44.8100	0814	0575	45.3300	09D4	1635
44.3000	16E4	2345	44.8200	0824	0585	45.3400	09E4	1645
44.3100	16F4	2355	44.8300	0834	0595	45.3500	09F4	1655
44.3200	2604	2365	44.8400	0844	05A5	45.3600	1904	1665
44.3300	2614	2375	44.8500	0854	05B5	45.3700	1914	1675
44.3400	2624	0405	44.8600	0864	05C5	45.3800	1924	1685
44.3500	2634	0415	44.8700	0874	05D5	45.3900	1934	1695
44.3600	2644	0425	44.8800	0884	05E5	45.4000	1944	16A5
44.3700	2654	0435	44.8900	0894	05F5	45.4100	1954	16B5
44.3800	2664	0445	44.9000	08A4	1505	45.4200	1964	16C5
44.3900	2674	0455	44.9100	08B4	1515	45.4300	1974	16D5
44.4000	0704	0465	44.9200	08C4	1525	45.4400	1984	16E5
44.4100	0714	0475	44.9300	08D4	1535	45.4500	1994	16F5
44.4200	0724	0485	44.9400	08E4	1545	45.4600	19A4	2605
44.4300	0734	0495	44.9500	08F4	1555	45.4700	19B4	2615
44.4400	0744	04A5	44.9600	1804	1565	45.4800	19C4	2625
44.4500	0754	04B5	44.9700	1814	1575	45.4900	19D4	2635
44.4600	0764	04C5	44.9800	1824	1585	45.5000	19E4	2645
44.4700	0774	04D5	44.9900	1834	1595	45.5100	19F4	2655
44.4800	0784	04E5	45.0000	1844	15A5	45.5200	2904	2665
44.4900	0794	04F5	45.0100	1854	15B5	45.5300	2914	2675
44.5000	07A4	1405	45.0200	1864	15C5	45.5400	2924	0705
44.5100	07B4	1415	45.0300	1874	15D5	45.5500	2934	0715
44.5200	07C4	1425	45.0400	1884	15E5	45.5600	2944	0725
44.5300	07D4	1435	45.0500	1894	15F5	45.5700	2954	0735
44.5400	07E4	1445	45.0600	18A4	2505	45.5800	2964	0745
44.5500	07F4	1455	45.0700	18B4	2515	45.5900	2974	0755

Table 3A (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
45.6000	0A04	0765	46.1200	0BC4	1825	46.6400	1C84	19E5
45.6100	0A14	0775	46.1300	0BD4	1835	46.6500	1C94	19F5
45.6200	0A24	0785	46.1400	0BE4	1845	46.6600	1CA4	2905
45.6300	0A34	0795	46.1500	0BF4	1855	46.6700	1CR4	2915
45.6400	0A44	07A5	46.1600	1B04	1865	46.6800	1CC4	2925
45.6500	0A54	07B5	46.1700	1B14	1875	46.6900	1CD4	2935
45.6600	0A64	07C5	46.1800	1B24	1885	46.7000	1CE4	2945
45.6700	0A74	07D5	46.1900	1B34	1895	46.7100	1CF4	2955
45.6800	0A84	07E5	46.2000	1B44	18A5	46.7200	2C04	2965
45.6900	0A94	07F5	46.2100	1B54	18B5	46.7300	2C14	2975
45.7000	0AA4	1705	46.2200	1B64	18C5	46.7400	2C24	0A05
45.7100	0AB4	1715	46.2300	1B74	18D5	46.7500	2C34	0A15
45.7200	0AC4	1725	46.2400	1B84	18E5	46.7600	2C44	0A25
45.7300	0AD4	1735	46.2500	1B94	18F5	46.7700	2C54	0A35
45.7400	0AE4	1745	46.2600	1BA4	2805	46.7800	2C64	0A45
45.7500	0AF4	1755	46.2700	1BB4	2815	46.7900	2C74	0A55
45.7600	1A04	1765	46.2800	1BC4	2825	46.8000	0D04	0A65
45.7700	1A14	1775	46.2900	1BD4	2835	46.8100	0D14	0A75
45.7800	1A24	1785	46.3000	1BE4	2845	46.8200	0D24	0A85
45.7900	1A34	1795	46.3100	1BF4	2855	46.8300	0D34	0A95
45.8000	1A44	17A5	46.3200	2B04	2865	46.8400	0D44	0AA5
45.8100	1A54	17B5	46.3300	2B14	2875	46.8500	0D54	0AB5
45.8200	1A64	17C5	46.3400	2B24	0905	46.8600	0D64	0AC5
45.8300	1A74	17D5	46.3500	2B34	0915	46.8700	0D74	0AD5
45.8400	1A84	17E5	46.3600	2B44	0925	46.8800	0D84	0AE5
45.8500	1A94	17F5	46.3700	2B54	0935	46.8900	0D94	0AF5
45.8600	1AA4	2705	46.3800	2B64	0945	46.9000	0DA4	1A05
45.8700	1AB4	2715	46.3900	2B74	0955	46.9100	0DB4	1A15
45.8800	1AC4	2725	46.4000	0C04	0965	46.9200	0DC4	1A25
45.8900	1AD4	2735	46.4100	0C14	0975	46.9300	0DD4	1A35
45.9000	1AE4	2745	46.4200	0C24	0985	46.9400	0DE4	1A45
45.9100	1AF4	2755	46.4300	0C34	0995	46.9500	0DF4	1A55
45.9200	2A04	2765	46.4400	0C44	09A5	46.9600	1D04	1A65
45.9300	2A14	2775	46.4500	0C54	09B5	46.9700	1D14	1A75
45.9400	2A24	0805	46.4600	0C64	09C5	46.9800	1D24	1A85
45.9500	2A34	0815	46.4700	0C74	09D5	46.9900	1D34	1A95
45.9600	2A44	0825	46.4800	0C84	09E5	47.0000	1D44	1AA5
45.9700	2A54	0835	46.4900	0C94	09F5	47.0100	1D54	1AB5
45.9800	2A64	0845	46.5000	0CA4	1905	47.0200	1D64	1AC5
45.9900	2A74	0855	46.5100	0CB4	1915	47.0300	1D74	1AD5
46.0000	0B04	0865	46.5200	0CC4	1925	47.0400	1D84	1AE5
46.0100	0B14	0875	46.5300	0CD4	1935	47.0500	1D94	1AF5
46.0200	0B24	0885	46.5400	0CE4	1945	47.0600	1DA4	2A05
46.0300	0B34	0895	46.5500	0CF4	1955	47.0700	1DB4	2A15
46.0400	0B44	08A5	46.5600	1C04	1965	47.0800	1DC4	2A25
46.0500	0B54	08B5	46.5700	1C14	1975	47.0900	1DD4	2A35
46.0600	0B64	08C5	46.5800	1C24	1985	47.1000	1DE4	2A45
46.0700	0B74	08D5	46.5900	1C34	1995	47.1100	1DF4	2A55
46.0800	0B84	08E5	46.6000	1C44	19A5	47.1200	2D04	2A65
46.0900	0B94	08F5	46.6100	1C54	19B5	47.1300	2D14	2A75
46.1000	0BA4	1805	46.6200	1C64	19C5	47.1400	2D24	0B05
46.1100	0BB4	1815	46.6300	1C74	19D5	47.1500	2D34	0B15

Table 3A (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
47.1600	2D44	0B25	47.6800	0F84	0CE5	48.2000	1045	10A5
47.1700	2D54	0B35	47.6900	0F94	0CF5	48.2100	1055	10B5
47.1800	2D64	0B45	47.7000	0FA4	1C05	48.2200	1065	10C5
47.1900	2D74	0B55	47.7100	0FB4	1C15	48.2300	1075	10D5
47.2000	0E04	0B65	47.7200	0FC4	1C25	48.2400	1085	10E5
47.2100	0E14	0B75	47.7300	0FD4	1C35	48.2500	1095	10F5
47.2200	0E24	0B85	47.7400	0FE4	1C45	48.2600	10A5	2D05
47.2300	0E34	0B95	47.7500	0FF4	1C55	48.2700	10B5	2D15
47.2400	0E44	0BA5	47.7600	1F04	1C65	48.2800	10C5	2D25
47.2500	0E54	0BB5	47.7700	1F14	1C75	48.2900	10D5	2D35
47.2600	0E64	0BC5	47.7800	1F24	1C85	48.3000	10E5	2D45
47.2700	0E74	0BD5	47.7900	1F34	1C95	48.3100	10F5	2D55
47.2800	0E84	0BE5	47.8000	1F44	1CA5	48.3200	2005	2D65
47.2900	0E94	0BF5	47.8100	1F54	1CB5	48.3300	2015	2D75
47.3000	0EA4	1B05	47.8200	1F64	1CC5	48.3400	2025	0E05
47.3100	0EB4	1B15	47.8300	1F74	1CD5	48.3500	2035	0E15
47.3200	0EC4	1B25	47.8400	1F84	1CE5	48.3600	2045	0E25
47.3300	0ED4	1B35	47.8500	1F94	1CF5	48.3700	2055	0E35
47.3400	0EE4	1B45	47.8600	1FA4	2C05	48.3800	2065	0E45
47.3500	0EF4	1B55	47.8700	1FB4	2C15	48.3900	2075	0E55
47.3600	1E04	1B65	47.8800	1FC4	2C25	48.4000	0105	0E65
47.3700	1E14	1B75	47.8900	1FD4	2C35	48.4100	0115	0E75
47.3800	1E24	1B85	47.9000	1FE4	2C45	48.4200	0125	0E85
47.3900	1E34	1B95	47.9100	1FF4	2C55	48.4300	0135	0E95
47.4000	1E44	1BA5	47.9200	2F04	2C65	48.4400	0145	0EA5
47.4100	1E54	1BB5	47.9300	2F14	2C75	48.4500	0155	0EB5
47.4200	1E64	1BC5	47.9400	2F24	0D05	48.4600	0165	0EC5
47.4300	1E74	1BD5	47.9500	2F34	0D15	48.4700	0175	0ED5
47.4400	1E84	1BE5	47.9600	2F44	0D25	48.4800	0185	0EE5
47.4500	1E94	1BF5	47.9700	2F54	0D35	48.4900	0195	0EF5
47.4600	1EA4	2B05	47.9800	2F64	0D45	48.5000	01A5	1E05
47.4700	1EB4	2B15	47.9900	2F74	0D55	48.5100	01R5	1E15
47.4800	1EC4	2B25	48.0000	0D05	0D65	48.5200	01C5	1E25
47.4900	1ED4	2B35	48.0100	0D15	0D75	48.5300	01D5	1E35
47.5000	1EE4	2B45	48.0200	0D25	0D85	48.5400	01E5	1E45
47.5100	1EF4	2B55	48.0300	0D35	0D95	48.5500	01F5	1E55
47.5200	2E04	2B65	48.0400	0D45	0DA5	48.5600	1105	1E65
47.5300	2E14	2B75	48.0500	0D55	0DB5	48.5700	1115	1E75
47.5400	2E24	0C05	48.0600	0D65	0DC5	48.5800	1125	1E85
47.5500	2E34	0C15	48.0700	0D75	0DD5	48.5900	1135	1E95
47.5600	2E44	0C25	48.0800	0D85	0DE5	48.6000	1145	1FA5
47.5700	2E54	0C35	48.0900	0D95	0DF5	48.6100	1155	1EB5
47.5800	2E64	0C45	48.1000	0DA5	1D05	48.6200	1165	1EC5
47.5900	2E74	0C55	48.1100	0DB5	1D15	48.6300	1175	1ED5
47.6000	0F04	0C65	48.1200	0DC5	1D25	48.6400	1185	1EE5
47.6100	0F14	0C75	48.1300	0DD5	1D35	48.6500	1195	1EF5
47.6200	0F24	0C85	48.1400	0DE5	1D45	48.6600	11A5	2E05
47.6300	0F34	0C95	48.1500	0DF5	1D55	48.6700	11B5	2E15
47.6400	0F44	0CA5	48.1600	1005	1D65	48.6800	11C5	2E25
47.6500	0F54	0CB5	48.1700	1015	1D75	48.6900	11D5	2E35
47.6600	0F64	0CC5	48.1800	1025	1D85	48.7000	11E5	2E45
47.6700	0F74	0CD5	48.1900	1035	1D95	48.7100	11F5	2E55

Table 3A (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
48.7200	2105	2E65	49.2400	0345	00A6	49.7600	1405	1166
48.7300	2115	2E75	49.2500	0355	00B6	49.7700	1415	1176
48.7400	2125	0F05	49.2600	0365	00C6	49.7800	1425	1186
48.7500	2135	0F15	49.2700	0375	00D6	49.7900	1435	1196
48.7600	2145	0F25	49.2800	0385	00E6	49.8000	1445	11A6
48.7700	2155	0F35	49.2900	0395	00F6	49.8100	1455	11B6
48.7800	2165	0F45	49.3000	03A5	1006	49.8200	1465	11C6
48.7900	2175	0F55	49.3100	0385	1016	49.8300	1475	11D6
48.8000	0205	0F65	49.3200	03C5	1026	49.8400	1485	11E6
48.8100	0215	0F75	49.3300	03D5	1036	49.8500	1495	11F6
48.8200	0225	0F85	49.3400	03E5	1046	49.8600	14A5	2106
48.8300	0235	0F95	49.3500	03F5	1056	49.8700	14B5	2116
48.8400	0245	0FA5	49.3600	1305	1066	49.8800	14C5	2126
48.8500	0255	0FB5	49.3700	1315	1076	49.8900	14D5	2136
48.8600	0265	0FC5	49.3800	1325	1086	49.9000	14E5	2146
48.8700	0275	0FD5	49.3900	1335	1096	49.9100	14F5	2156
48.8800	0285	0FE5	49.4000	1345	10A6	49.9200	2405	2166
48.8900	0295	0FF5	49.4100	1355	10B6	49.9300	2415	2176
48.9000	02A5	1F05	49.4200	1365	10C6	49.9400	2425	0206
48.9100	02B5	1F15	49.4300	1375	10D6	49.9500	2435	0216
48.9200	02C5	1F25	49.4400	1385	10E6	49.9600	2445	0226
48.9300	02D5	1F35	49.4500	1395	10F6	49.9700	2455	0236
48.9400	02E5	1F45	49.4600	13A5	2006	49.9800	2465	0246
48.9500	02F5	1F55	49.4700	13B5	2016	49.9900	2475	0256
48.9600	1205	1F65	49.4800	13C5	2026	50.0000	0505	0266
48.9700	1215	1F75	49.4900	13D5	2036			
48.9800	1225	1F85	49.5000	13E5	2046			
48.9900	1235	1F95	49.5100	13F5	2056			
49.0000	1245	1FA5	49.5200	2305	2066			
49.0100	1255	1FB5	49.5300	2315	2076			
49.0200	1265	1FC5	49.5400	2325	0106			
49.0300	1275	1FD5	49.5500	2335	0116			
49.0400	1285	1FE5	49.5600	2345	0126			
49.0500	1295	1FF5	49.5700	2355	0136			
49.0600	12A5	2F05	49.5800	2365	0146			
49.0700	12B5	2F15	49.5900	2375	0156			
49.0800	12C5	2F25	49.6000	0405	0166			
49.0900	12D5	2F35	49.6100	0415	0176			
49.1000	12E5	2F45	49.6200	0425	0186			
49.1100	12F5	2F55	49.6300	0435	0196			
49.1200	2205	2F65	49.6400	0445	01A6			
49.1300	2215	2F75	49.6500	0455	01B6			
49.1400	2225	0006	49.6600	0465	01C6			
49.1500	2235	0016	49.6700	0475	01D6			
49.1600	2245	0026	49.6800	0485	01E6			
49.1700	2255	0036	49.6900	0495	01F6			
49.1800	2265	0046	49.7000	04A5	1106			
49.1900	2275	0056	49.7100	04B5	1116			
49.2000	0305	0066	49.7200	04C5	1126			
49.2100	0315	0076	49.7300	04D5	1136			
49.2200	0325	0086	49.7400	04E5	1146			
49.2300	0335	0096	49.7500	04F5	1156			

Table 3B. Hexadecimal frequency data, low-band Mega-E,
low-side injection, 5.26 MHz, 20-kHz channel spacing.

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
30.0000	0302	2521	30.5200	04C2	0761	31.0400	1582	1821
30.0100	0312	2531	30.5300	04D2	0771	31.0500	1592	1831
30.0200	0322	2541	30.5400	04E2	0781	31.0600	15A2	1841
30.0300	0332	2551	30.5500	04F2	0791	31.0700	15B2	1851
30.0400	0342	2561	30.5600	1402	07A1	31.0800	15C2	1861
30.0500	0352	2571	30.5700	1412	07B1	31.0900	15D2	1871
30.0600	0362	0601	30.5800	1422	07C1	31.1000	15E2	1881
30.0700	0372	0611	30.5900	1432	07D1	31.1100	15F2	1891
30.0800	0382	0621	30.6000	1442	07E1	31.1200	2502	18A1
30.0900	0392	0631	30.6100	1452	07F1	31.1300	2512	18B1
30.1000	03A2	0641	30.6200	1462	1701	31.1400	2522	18C1
30.1100	03B2	0651	30.6300	1472	1711	31.1500	2532	18D1
30.1200	03C2	0661	30.6400	1482	1721	31.1600	2542	18E1
30.1300	03D2	0671	30.6500	1492	1731	31.1700	2552	18F1
30.1400	03E2	0681	30.6600	14A2	1741	31.1800	2562	2801
30.1500	03F2	0691	30.6700	14B2	1751	31.1900	2572	2811
30.1600	1302	06A1	30.6800	14C2	1761	31.2000	0602	2821
30.1700	1312	06B1	30.6900	14D2	1771	31.2100	0612	2831
30.1800	1322	06C1	30.7000	14E2	1781	31.2200	0622	2841
30.1900	1332	06D1	30.7100	14F2	1791	31.2300	0632	2851
30.2000	1342	06E1	30.7200	2402	17A1	31.2400	0642	2861
30.2100	1352	06F1	30.7300	2412	17B1	31.2500	0652	2871
30.2200	1362	1601	30.7400	2422	17C1	31.2600	0662	0901
30.2300	1372	1611	30.7500	2432	17D1	31.2700	0672	0911
30.2400	1382	1621	30.7600	2442	17E1	31.2800	0682	0921
30.2500	1392	1631	30.7700	2452	17F1	31.2900	0692	0931
30.2600	13A2	1641	30.7800	2462	2701	31.3000	06A2	0941
30.2700	13B2	1651	30.7900	2472	2711	31.3100	06B2	0951
30.2800	13C2	1661	30.8000	0502	2721	31.3200	06C2	0961
30.2900	13D2	1671	30.8100	0512	2731	31.3300	06D2	0971
30.3000	13E2	1681	30.8200	0522	2741	31.3400	06E2	0981
30.3100	13F2	1691	30.8300	0532	2751	31.3500	06F2	0991
30.3200	2302	16A1	30.8400	0542	2761	31.3600	1602	09A1
30.3300	2312	16B1	30.8500	0552	2771	31.3700	1612	09B1
30.3400	2322	16C1	30.8600	0562	0801	31.3800	1622	09C1
30.3500	2332	16D1	30.8700	0572	0811	31.3900	1632	09D1
30.3600	2342	16E1	30.8800	0582	0821	31.4000	1642	09E1
30.3700	2352	16F1	30.8900	0592	0831	31.4100	1652	09F1
30.3800	2362	2601	30.9000	05A2	0841	31.4200	1662	1901
30.3900	2372	2611	30.9100	05B2	0851	31.4300	1672	1911
30.4000	0402	2621	30.9200	05C2	0861	31.4400	1682	1921
30.4100	0412	2631	30.9300	05D2	0871	31.4500	1692	1931
30.4200	0422	2641	30.9400	05E2	0881	31.4600	16A2	1941
30.4300	0432	2651	30.9500	05F2	0891	31.4700	16B2	1951
30.4400	0442	2661	30.9600	1502	08A1	31.4800	16C2	1961
30.4500	0452	2671	30.9700	1512	08B1	31.4900	16D2	1971
30.4600	0462	0701	30.9800	1522	08C1	31.5000	16E2	1981
30.4700	0472	0711	30.9900	1532	08D1	31.5100	16F2	1991
30.4800	0482	0721	31.0000	1542	08E1	31.5200	2602	19A1
30.4900	0492	0731	31.0100	1552	08F1	31.5300	2612	19B1
30.5000	04A2	0741	31.0200	1562	1801	31.5400	2622	19C1
30.5100	04B2	0751	31.0300	1572	1811	31.5500	2632	19D1

Table 3B (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
31.5600	2642	19E1	32.0800	0882	0B21	32.6000	1942	0CE1
31.5700	2652	19F1	32.0900	0892	0B31	32.6100	1952	0CF1
31.5800	2662	2901	32.1000	08A2	0B41	32.6200	1962	1C01
31.5900	2672	2911	32.1100	08B2	0B51	32.6300	1972	1C11
31.6000	0702	2921	32.1200	08C2	0B61	32.6400	1982	1C21
31.6100	0712	2931	32.1300	08D2	0B71	32.6500	1992	1C31
31.6200	0722	2941	32.1400	08E2	0B81	32.6600	19A2	1C41
31.6300	0732	2951	32.1500	08F2	0B91	32.6700	19B2	1C51
31.6400	0742	2961	32.1600	1802	0BA1	32.6800	19C2	1C61
31.6500	0752	2971	32.1700	1812	0BB1	32.6900	19D2	1C71
31.6600	0762	0A01	32.1800	1822	0BC1	32.7000	19E2	1C81
31.6700	0772	0A11	32.1900	1832	0BD1	32.7100	19F2	1C91
31.6800	0782	0A21	32.2000	1842	0BE1	32.7200	2902	1CA1
31.6900	0792	0A31	32.2100	1852	0BF1	32.7300	2912	1CB1
31.7000	07A2	0A41	32.2200	1862	1B01	32.7400	2922	1CC1
31.7100	07B2	0A51	32.2300	1872	1B11	32.7500	2932	1CD1
31.7200	07C2	0A61	32.2400	1882	1B21	32.7600	2942	1CE1
31.7300	07D2	0A71	32.2500	1892	1B31	32.7700	2952	1CF1
31.7400	07E2	0A81	32.2600	18A2	1B41	32.7800	2962	2C01
31.7500	07F2	0A91	32.2700	18B2	1B51	32.7900	2972	2C11
31.7600	1702	0AA1	32.2800	18C2	1B61	32.8000	0A02	2C21
31.7700	1712	0AB1	32.2900	18D2	1B71	32.8100	0A12	2C31
31.7800	1722	0AC1	32.3000	18E2	1B81	32.8200	0A22	2C41
31.7900	1732	0AD1	32.3100	18F2	1B91	32.8300	0A32	2C51
31.8000	1742	0AE1	32.3200	2802	1BA1	32.8400	0A42	2C61
31.8100	1752	0AF1	32.3300	2812	1BB1	32.8500	0A52	2C71
31.8200	1762	1A01	32.3400	2822	1BC1	32.8600	0A62	0D01
31.8300	1772	1A11	32.3500	2832	1BD1	32.8700	0A72	0D11
31.8400	1782	1A21	32.3600	2842	1BE1	32.8800	0A82	0D21
31.8500	1792	1A31	32.3700	2852	1BF1	32.8900	0A92	0D31
31.8600	17A2	1A41	32.3800	2862	2B01	32.9000	0AA2	0D41
31.8700	17B2	1A51	32.3900	2872	2B11	32.9100	0AB2	0D51
31.8800	17C2	1A61	32.4000	0902	2B21	32.9200	0AC2	0D61
31.8900	17D2	1A71	32.4100	0912	2B31	32.9300	0AD2	0D71
31.9000	17E2	1A81	32.4200	0922	2B41	32.9400	0AE2	0D81
31.9100	17F2	1A91	32.4300	0932	2B51	32.9500	0AF2	0D91
31.9200	2702	1AA1	32.4400	0942	2B61	32.9600	1A02	0DA1
31.9300	2712	1AB1	32.4500	0952	2B71	32.9700	1A12	0DB1
31.9400	2722	1AC1	32.4600	0962	0C01	32.9800	1A22	0DC1
31.9500	2732	1AD1	32.4700	0972	0C11	32.9900	1A32	0DD1
31.9600	2742	1AE1	32.4800	0982	0C21	33.0000	1A42	0DE1
31.9700	2752	1AF1	32.4900	0992	0C31	33.0100	1A52	0DF1
31.9800	2762	2A01	32.5000	09A2	0C41	33.0200	1A62	1D01
31.9900	2772	2A11	32.5100	09B2	0C51	33.0300	1A72	1D11
32.0000	0802	2A21	32.5200	09C2	0C61	33.0400	1A82	1D21
32.0100	0812	2A31	32.5300	09D2	0C71	33.0500	1A92	1D31
32.0200	0822	2A41	32.5400	09E2	0C81	33.0600	1AA2	1D41
32.0300	0832	2A51	32.5500	09F2	0C91	33.0700	1AB2	1D51
32.0400	0842	2A61	32.5600	1902	0CA1	33.0800	1AC2	1D61
32.0500	0852	2A71	32.5700	1912	0CB1	33.0900	1AD2	1D71
32.0600	0862	0B01	32.5800	1922	0CC1	33.1000	1AE2	1D81
32.0700	0872	0B11	32.5900	1932	0CD1	33.1100	1AF2	1D91

Table 3B (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
33.1200	2A02	1DA1	33.6400	0G42	2E61	34.1600	1D02	00A2
33.1300	2A12	1DB1	33.6500	0G52	2E71	34.1700	1D12	00B2
33.1400	2A22	1DC1	33.6600	0G62	0F01	34.1800	1D22	00C2
33.1500	2A32	1DD1	33.6700	0G72	0F11	34.1900	1D32	00D2
33.1600	2A42	1DE1	33.6800	0G82	0F21	34.2000	1D42	00E2
33.1700	2A52	1DF1	33.6900	0G92	0F31	34.2100	1D52	00F2
33.1800	2A62	2D01	33.7000	0GA2	0F41	34.2200	1D62	1002
33.1900	2A72	2D11	33.7100	0GB2	0F51	34.2300	1D72	1012
33.2000	0B02	2D21	33.7200	0GC2	0F61	34.2400	1D82	1022
33.2100	0B12	2D31	33.7300	0GD2	0F71	34.2500	1D92	1032
33.2200	0B22	2D41	33.7400	0GE2	0F81	34.2600	1DA2	1042
33.2300	0B32	2D51	33.7500	0GF2	0F91	34.2700	1DB2	1052
33.2400	0B42	2D61	33.7600	1G02	0FA1	34.2800	1DC2	1062
33.2500	0B52	2D71	33.7700	1G12	0FB1	34.2900	1DD2	1072
33.2600	0B62	0E01	33.7800	1G22	0FC1	34.3000	1DE2	1082
33.2700	0B72	0E11	33.7900	1G32	0FD1	34.3100	1DF2	1092
33.2800	0B82	0E21	33.8000	1G42	0FE1	34.3200	2D02	10A2
33.2900	0B92	0E31	33.8100	1G52	0FF1	34.3300	2D12	10B2
33.3000	0BA2	0E41	33.8200	1G62	1F01	34.3400	2D22	10C2
33.3100	0BB2	0E51	33.8300	1G72	1F11	34.3500	2D32	10D2
33.3200	0BC2	0E61	33.8400	1G82	1F21	34.3600	2D42	10E2
33.3300	0BD2	0E71	33.8500	1G92	1F31	34.3700	2D52	10F2
33.3400	0BE2	0E81	33.8600	1GA2	1F41	34.3800	2D62	2002
33.3500	0BF2	0E91	33.8700	1GB2	1F51	34.3900	2D72	2012
33.3600	1B02	0EA1	33.8800	1GC2	1F61	34.4000	0E02	2022
33.3700	1B12	0EB1	33.8900	1GD2	1F71	34.4100	0E12	2032
33.3800	1B22	0EC1	33.9000	1GE2	1F81	34.4200	0E22	2042
33.3900	1B32	0ED1	33.9100	1GF2	1F91	34.4300	0E32	2052
33.4000	1B42	0EE1	33.9200	2G02	1FA1	34.4400	0E42	2062
33.4100	1B52	0EF1	33.9300	2G12	1FB1	34.4500	0E52	2072
33.4200	1B62	1E01	33.9400	2G22	1FC1	34.4600	0E62	0102
33.4300	1B72	1E11	33.9500	2G32	1FD1	34.4700	0E72	0112
33.4400	1B82	1E21	33.9600	2G42	1FE1	34.4800	0E82	0122
33.4500	1B92	1E31	33.9700	2G52	1FF1	34.4900	0E92	0132
33.4600	1BA2	1E41	33.9800	2G62	2F01	34.5000	0EA2	0142
33.4700	1BR2	1E51	33.9900	2G72	2F11	34.5100	0EB2	0152
33.4800	1BC2	1E61	34.0000	0D02	2F21	34.5200	0FC2	0162
33.4900	1BD2	1E71	34.0100	0D12	2F31	34.5300	0ED2	0172
33.5000	1BE2	1E81	34.0200	0D22	2F41	34.5400	0EE2	0182
33.5100	1BF2	1E91	34.0300	0D32	2F51	34.5500	0EF2	0192
33.5200	2B02	1EA1	34.0400	0D42	2F61	34.5600	1E02	01A2
33.5300	2B12	1EB1	34.0500	0D52	2F71	34.5700	1E12	01B2
33.5400	2B22	1EC1	34.0600	0D62	0002	34.5800	1E22	01C2
33.5500	2B32	1ED1	34.0700	0D72	0012	34.5900	1E32	01D2
33.5600	2B42	1EE1	34.0800	0D82	0022	34.6000	1E42	01E2
33.5700	2B52	1EF1	34.0900	0D92	0032	34.6100	1E52	01F2
33.5800	2B62	2E01	34.1000	0DA2	0042	34.6200	1E62	1102
33.5900	2B72	2E11	34.1100	0DB2	0052	34.6300	1E72	1112
33.6000	0C02	2E21	34.1200	0DC2	0062	34.6400	1E82	1122
33.6100	0C12	2E31	34.1300	0DD2	0072	34.6500	1E92	1132
33.6200	0C22	2E41	34.1400	0DE2	0082	34.6600	1EA2	1142
33.6300	0C32	2E51	34.1500	0DF2	0092	34.6700	1ER2	1152

Table 3B (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
34.6800	1EC2	1162	35.2000	0003	2222	35.7200	01C3	0462
34.6900	1ED2	1172	35.2100	0013	2232	35.7300	01D3	0472
34.7000	1EE2	1182	35.2200	0023	2242	35.7400	01F3	0482
34.7100	1EF2	1192	35.2300	0033	2252	35.7500	01F3	0492
34.7200	2E02	11A2	35.2400	0043	2262	35.7600	1103	04A2
34.7300	2E12	11B2	35.2500	0053	2272	35.7700	1113	04B2
34.7400	2E22	11C2	35.2600	0063	0302	35.7800	1123	04C2
34.7500	2E32	11D2	35.2700	0073	0312	35.7900	1133	04D2
34.7600	2E42	11E2	35.2800	0083	0322	35.8000	1143	04E2
34.7700	2E52	11F2	35.2900	0093	0332	35.8100	1153	04F2
34.7800	2E62	2102	35.3000	00A3	0342	35.8200	1163	1402
34.7900	2E72	2112	35.3100	00B3	0352	35.8300	1173	1412
34.8000	0F02	2122	35.3200	00C3	0362	35.8400	1183	1422
34.8100	0F12	2132	35.3300	00D3	0372	35.8500	1193	1432
34.8200	0F22	2142	35.3400	00E3	0382	35.8600	11A3	1442
34.8300	0F32	2152	35.3500	00F3	0392	35.8700	11B3	1452
34.8400	0F42	2162	35.3600	1003	03A2	35.8800	11C3	1462
34.8500	0F52	2172	35.3700	1013	03B2	35.8900	1103	1472
34.8600	0F62	0202	35.3800	1023	03C2	35.9000	11E3	1482
34.8700	0F72	0212	35.3900	1033	03D2	35.9100	11F3	1492
34.8800	0F82	0222	35.4000	1043	03E2	35.9200	2103	14A2
34.8900	0F92	0232	35.4100	1053	03F2	35.9300	2113	14B2
34.9000	0FA2	0242	35.4200	1063	1302	35.9400	2123	14C2
34.9100	0FB2	0252	35.4300	1073	1312	35.9500	2133	14D2
34.9200	0FC2	0262	35.4400	1083	1322	35.9600	2143	14E2
34.9300	0FD2	0272	35.4500	1093	1332	35.9700	2153	14F2
34.9400	0FE2	0282	35.4600	10A3	1342	35.9800	2163	2402
34.9500	0FF2	0292	35.4700	10B3	1352	35.9900	2173	2412
34.9600	1F02	02A2	35.4800	10C3	1362	36.0000	0203	2422
34.9700	1F12	02B2	35.4900	10D3	1372	36.0100	0213	2432
34.9800	1F22	02C2	35.5000	10E3	1382	36.0200	0223	2442
34.9900	1F32	02D2	35.5100	10F3	1392	36.0300	0233	2452
35.0000	1F42	02E2	35.5200	2003	13A2	36.0400	0243	2462
35.0100	1F52	02F2	35.5300	2013	13B2	36.0500	0253	2472
35.0200	1F62	1202	35.5400	2023	13C2	36.0600	0263	0502
35.0300	1F72	1212	35.5500	2033	13D2	36.0700	0273	0512
35.0400	1F82	1222	35.5600	2043	13E2	36.0800	0283	0522
35.0500	1F92	1232	35.5700	2053	13F2	36.0900	0293	0532
35.0600	1FA2	1242	35.5800	2063	2302	36.1000	02A3	0542
35.0700	1FB2	1252	35.5900	2073	2312	36.1100	02B3	0552
35.0800	1FC2	1262	35.6000	0103	2322	36.1200	02C3	0562
35.0900	1FD2	1272	35.6100	0113	2332	36.1300	02D3	0572
35.1000	1FE2	1282	35.6200	0123	2342	36.1400	02E3	0582
35.1100	1FF2	1292	35.6300	0133	2352	36.1500	02F3	0592
35.1200	2F02	12A2	35.6400	0143	2362	36.1600	1203	05A2
35.1300	2F12	12B2	35.6500	0153	2372	36.1700	1213	05B2
35.1400	2F22	12C2	35.6600	0163	0402	36.1800	1223	05C2
35.1500	2F32	12D2	35.6700	0173	0412	36.1900	1233	05D2
35.1600	2F42	12E2	35.6800	0183	0422	36.2000	1243	05E2
35.1700	2F52	12F2	35.6900	0193	0432	36.2100	1253	05F2
35.1800	2F62	2202	35.7000	01A3	0442	36.2200	1263	1502
35.1900	2F72	2212	35.7100	01B3	0452	36.2300	1273	1512

Table 3B (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
36.2400	1283	1522	36.7600	2343	16E2	37.2800	0583	0822
36.2500	1293	1532	36.7700	2353	16F2	37.2900	0593	0832
36.2600	12A3	1542	36.7800	2363	2602	37.3000	05A3	0842
36.2700	12B3	1552	36.7900	2373	2612	37.3100	05B3	0852
36.2800	12C3	1562	36.8000	0403	2622	37.3200	05C3	0862
36.2900	12D3	1572	36.8100	0413	2632	37.3300	05D3	0872
36.3000	12E3	1582	36.8200	0423	2642	37.3400	05E3	0882
36.3100	12F3	1592	36.8300	0433	2652	37.3500	05F3	0892
36.3200	2203	15A2	36.8400	0443	2662	37.3600	1503	08A2
36.3300	2213	15B2	36.8500	0453	2672	37.3700	1513	08B2
36.3400	2223	15C2	36.8600	0463	0702	37.3800	1523	08C2
36.3500	2233	15D2	36.8700	0473	0712	37.3900	1533	08D2
36.3600	2243	15E2	36.8800	0483	0722	37.4000	1543	08E2
36.3700	2253	15F2	36.8900	0493	0732	37.4100	1553	08F2
36.3800	2263	2502	36.9000	04A3	0742	37.4200	1563	1802
36.3900	2273	2512	36.9100	04B3	0752	37.4300	1573	1812
36.4000	0303	2522	36.9200	04C3	0762	37.4400	1583	1822
36.4100	0313	2532	36.9300	04D3	0772	37.4500	1593	1832
36.4200	0323	2542	36.9400	04E3	0782	37.4600	15A3	1842
36.4300	0333	2552	36.9500	04F3	0792	37.4700	15B3	1852
36.4400	0343	2562	36.9600	1403	07A2	37.4800	15C3	1862
36.4500	0353	2572	36.9700	1413	07B2	37.4900	15D3	1872
36.4600	0363	0602	36.9800	1423	07C2	37.5000	15E3	1882
36.4700	0373	0612	36.9900	1433	07D2	37.5100	15F3	1892
36.4800	0383	0622	37.0000	1443	07E2	37.5200	2503	18A2
36.4900	0393	0632	37.0100	1453	07F2	37.5300	2513	18B2
36.5000	03A3	0642	37.0200	1463	1702	37.5400	2523	18C2
36.5100	03B3	0652	37.0300	1473	1712	37.5500	2533	18D2
36.5200	03C3	0662	37.0400	1483	1722	37.5600	2543	18E2
36.5300	03D3	0672	37.0500	1493	1732	37.5700	2553	18F2
36.5400	03E3	0682	37.0600	14A3	1742	37.5800	2563	2802
36.5500	03F3	0692	37.0700	14B3	1752	37.5900	2573	2812
36.5600	1303	06A2	37.0800	14C3	1762	37.6000	0603	2822
36.5700	1313	06B2	37.0900	14D3	1772	37.6100	0613	2832
36.5800	1323	06C2	37.1000	14E3	1782	37.6200	0623	2842
36.5900	1333	06D2	37.1100	14F3	1792	37.6300	0633	2852
36.6000	1343	06E2	37.1200	2403	17A2	37.6400	0643	2862
36.6100	1353	06F2	37.1300	2413	17B2	37.6500	0653	2872
36.6200	1363	1602	37.1400	2423	17C2	37.6600	0663	0902
36.6300	1373	1612	37.1500	2433	17D2	37.6700	0673	0912
36.6400	1383	1622	37.1600	2443	17E2	37.6800	0683	0922
36.6500	1393	1632	37.1700	2453	17F2	37.6900	0693	0932
36.6600	13A3	1642	37.1800	2463	2702	37.7000	06A3	0942
36.6700	13B3	1652	37.1900	2473	2712	37.7100	06B3	0952
36.6800	13C3	1662	37.2000	0503	2722	37.7200	06C3	0962
36.6900	13D3	1672	37.2100	0513	2732	37.7300	06D3	0972
36.7000	13E3	1682	37.2200	0523	2742	37.7400	06E3	0982
36.7100	13F3	1692	37.2300	0533	2752	37.7500	06F3	0992
36.7200	2303	16A2	37.2400	0543	2762	37.7600	1603	09A2
36.7300	2313	16B2	37.2500	0553	2772	37.7700	1613	09B2
36.7400	2323	16C2	37.2600	0563	0802	37.7800	1623	09C2
36.7500	2333	16D2	37.2700	0573	0812	37.7900	1633	09D2

Table 3B (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
37.8000	1643	09E2	38.3200	2703	1AA2	38.8400	0943	2B62
37.8100	1653	09F2	38.3300	2713	1AB2	38.8500	0953	2B72
37.8200	1663	1902	38.3400	2723	1AC2	38.8600	0963	0C02
37.8300	1673	1912	38.3500	2733	1AD2	38.8700	0973	0C12
37.8400	1683	1922	38.3600	2743	1AE2	38.8800	0983	0C22
37.8500	1693	1932	38.3700	2753	1AF2	38.8900	0993	0C32
37.8600	16A3	1942	38.3800	2763	2A02	38.9000	09A3	0C42
37.8700	16B3	1952	38.3900	2773	2A12	38.9100	09B3	0C52
37.8800	16C3	1962	38.4000	0803	2A22	38.9200	09C3	0C62
37.8900	16D3	1972	38.4100	0813	2A32	38.9300	09D3	0C72
37.9000	16E3	1982	38.4200	0823	2A42	38.9400	09E3	0C82
37.9100	16F3	1992	38.4300	0833	2A52	38.9500	09F3	0C92
37.9200	2603	19A2	38.4400	0843	2A62	38.9600	1903	0CA2
37.9300	2613	19B2	38.4500	0853	2A72	38.9700	1913	0CB2
37.9400	2623	19C2	38.4600	0863	0B02	38.9800	1923	0CC2
37.9500	2633	19D2	38.4700	0873	0B12	38.9900	1933	0CD2
37.9600	2643	19E2	38.4800	0883	0B22	39.0000	1943	0CE2
37.9700	2653	19F2	38.4900	0893	0B32	39.0100	1953	0CF2
37.9800	2663	2902	38.5000	08A3	0B42	39.0200	1963	1C02
37.9900	2673	2912	38.5100	08B3	0B52	39.0300	1973	1C12
38.0000	0703	2922	38.5200	08C3	0B62	39.0400	1983	1C22
38.0100	0713	2932	38.5300	08D3	0B72	39.0500	1993	1C32
38.0200	0723	2942	38.5400	08E3	0B82	39.0600	19A3	1C42
38.0300	0733	2952	38.5500	08F3	0B92	39.0700	19B3	1C52
38.0400	0743	2962	38.5600	1803	0BA2	39.0800	19C3	1C62
38.0500	0753	2972	38.5700	1813	0BB2	39.0900	19D3	1C72
38.0600	0763	0A02	38.5800	1823	0BC2	39.1000	19E3	1C82
38.0700	0773	0A12	38.5900	1833	0BD2	39.1100	19F3	1C92
38.0800	0783	0A22	38.6000	1843	0BE2	39.1200	2903	1CA2
38.0900	0793	0A32	38.6100	1853	0BF2	39.1300	2913	1CB2
38.1000	07A3	0A42	38.6200	1863	1B02	39.1400	2923	1CC2
38.1100	07B3	0A52	38.6300	1873	1B12	39.1500	2933	1CD2
38.1200	07C3	0A62	38.6400	1883	1B22	39.1600	2943	1CE2
38.1300	07D3	0A72	38.6500	1893	1B32	39.1700	2953	1CF2
38.1400	07E3	0A82	38.6600	18A3	1B42	39.1800	2963	2C02
38.1500	07F3	0A92	38.6700	18B3	1B52	39.1900	2973	2C12
38.1600	1703	0AA2	38.6800	18C3	1B62	39.2000	0A03	2C22
38.1700	1713	0AB2	38.6900	18D3	1B72	39.2100	0A13	2C32
38.1800	1723	0AC2	38.7000	18E3	1B82	39.2200	0A23	2C42
38.1900	1733	0AD2	38.7100	18F3	1B92	39.2300	0A33	2C52
38.2000	1743	0AE2	38.7200	2803	1BA2	39.2400	0A43	2C62
38.2100	1753	0AF2	38.7300	2813	1BB2	39.2500	0A53	2C72
38.2200	1763	1A02	38.7400	2823	1BC2	39.2600	0A63	0D02
38.2300	1773	1A12	38.7500	2833	1BD2	39.2700	0A73	0D12
38.2400	1783	1A22	38.7600	2843	1BE2	39.2800	0A83	0D22
38.2500	1793	1A32	38.7700	2853	1BF2	39.2900	0A93	0D32
38.2600	17A3	1A42	38.7800	2863	2B02	39.3000	0AA3	0D42
38.2700	17B3	1A52	38.7900	2873	2B12	39.3100	0AB3	0D52
38.2800	17C3	1A62	38.8000	0903	2B22	39.3200	0AC3	0D62
38.2900	17D3	1A72	38.8100	0913	2B32	39.3300	0AD3	0D72
38.3000	17E3	1A82	38.8200	0923	2B42	39.3400	0AE3	0D82
38.3100	17F3	1A92	38.8300	0933	2B52	39.3500	0AF3	0D92

Table 3B (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
39.3600	1A03	0DA2	39.8800	1B03	1E62	40.4000	0D03	2F22
39.3700	1A13	0DB2	39.8900	1B03	1E72	40.4100	0D13	2F32
39.3800	1A23	0DC2	39.9000	1B03	1E82	40.4200	0D23	2F42
39.3900	1A33	0DD2	39.9100	1B03	1E92	40.4300	0D33	2F52
39.4000	1A43	0DE2	39.9200	2B03	1EA2	40.4400	0D43	2F62
39.4100	1A53	0DF2	39.9300	2B13	1EB2	40.4500	0D53	2F72
39.4200	1A63	1D02	39.9400	2B23	1EC2	40.4600	0D63	0003
39.4300	1A73	1D12	39.9500	2B33	1ED2	40.4700	0D73	0013
39.4400	1A83	1D22	39.9600	2B43	1EE2	40.4800	0D83	0023
39.4500	1A93	1D32	39.9700	2B53	1EF2	40.4900	0D93	0033
39.4600	1AA3	1D42	39.9800	2B63	2E02	40.5000	0DA3	0043
39.4700	1AB3	1D52	39.9900	2B73	2E12	40.5100	0DB3	0053
39.4800	1AC3	1D62	40.0000	0C03	2E22	40.5200	0DC3	0063
39.4900	1AD3	1D72	40.0100	0C13	2E32	40.5300	0DD3	0073
39.5000	1AE3	1D82	40.0200	0C23	2E42	40.5400	0DE3	0083
39.5100	1AF3	1D92	40.0300	0C33	2E52	40.5500	0DF3	0093
39.5200	2A03	1DA2	40.0400	0C43	2E62	40.5600	1D03	00A3
39.5300	2A13	1DB2	40.0500	0C53	2E72	40.5700	1D13	00B3
39.5400	2A23	1DC2	40.0600	0C63	0F02	40.5800	1D23	00C3
39.5500	2A33	1DD2	40.0700	0C73	0F12	40.5900	1D33	00D3
39.5600	2A43	1DE2	40.0800	0C83	0F22	40.6000	1D43	00E3
39.5700	2A53	1DF2	40.0900	0C93	0F32	40.6100	1D53	00F3
39.5800	2A63	2D02	40.1000	0CA3	0F42	40.6200	1D63	1003
39.5900	2A73	2D12	40.1100	0CB3	0F52	40.6300	1D73	1013
39.6000	0B03	2D22	40.1200	0CC3	0F62	40.6400	1D83	1023
39.6100	0B13	2D32	40.1300	0CD3	0F72	40.6500	1D93	1033
39.6200	0B23	2D42	40.1400	0CE3	0F82	40.6600	1DA3	1043
39.6300	0B33	2D52	40.1500	0CF3	0F92	40.6700	1DB3	1053
39.6400	0B43	2D62	40.1600	1C03	0FA2	40.6800	1DC3	1063
39.6500	0B53	2D72	40.1700	1C13	0FB2	40.6900	1DD3	1073
39.6600	0B63	0E02	40.1800	1C23	0FC2	40.7000	1DE3	1083
39.6700	0B73	0E12	40.1900	1C33	0FD2	40.7100	1DF3	1093
39.6800	0B83	0E22	40.2000	1C43	0FE2	40.7200	2D03	10A3
39.6900	0B93	0E32	40.2100	1C53	0FF2	40.7300	2D13	10B3
39.7000	0BA3	0E42	40.2200	1C63	1F02	40.7400	2D23	10C3
39.7100	0BB3	0E52	40.2300	1C73	1F12	40.7500	2D33	10D3
39.7200	0BC3	0E62	40.2400	1C83	1F22	40.7600	2D43	10E3
39.7300	0BD3	0E72	40.2500	1C93	1F32	40.7700	2D53	10F3
39.7400	0BE3	0E82	40.2600	1CA3	1F42	40.7800	2D63	2003
39.7500	0BF3	0E92	40.2700	1CB3	1F52	40.7900	2D73	2013
39.7600	1B03	0EA2	40.2800	1CC3	1F62	40.8000	0E03	2023
39.7700	1B13	0EB2	40.2900	1CD3	1F72	40.8100	0E13	2033
39.7800	1B23	0EC2	40.3000	1CE3	1F82	40.8200	0E23	2043
39.7900	1B33	0ED2	40.3100	1CF3	1F92	40.8300	0E33	2053
39.8000	1B43	0EE2	40.3200	2C03	1FA2	40.8400	0E43	2063
39.8100	1B53	0EF2	40.3300	2C13	1FB2	40.8500	0E53	2073
39.8200	1B63	1E02	40.3400	2C23	1FC2	40.8600	0E63	0103
39.8300	1B73	1E12	40.3500	2C33	1FD2	40.8700	0E73	0113
39.8400	1B83	1E22	40.3600	2C43	1FE2	40.8800	0E83	0123
39.8500	1B93	1E32	40.3700	2C53	1FF2	40.8900	0E93	0133
39.8600	1BA3	1E42	40.3800	2C63	2F02	40.9000	0EA3	0143
39.8700	1BR3	1E52	40.3900	2C73	2F12	40.9100	0ER3	0153

Table 3B (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
40.9200	0EC3	0163	41.4400	1F83	1223	41.9600	2044	13E3
40.9300	0ED3	0173	41.4500	1F93	1233	41.9700	2054	13F3
40.9400	0EE3	0183	41.4600	1FA3	1243	41.9800	2064	2303
40.9500	0EF3	0193	41.4700	1F83	1253	41.9900	2074	2313
40.9600	1E03	01A3	41.4800	1FC3	1263	42.0000	0104	2323
40.9700	1E13	01B3	41.4900	1FD3	1273	42.0100	0114	2333
40.9800	1E23	01C3	41.5000	1FE3	1283	42.0200	0124	2343
40.9900	1E33	01D3	41.5100	1FF3	1293	42.0300	0134	2353
41.0000	1E43	01E3	41.5200	2F03	12A3	42.0400	0144	2363
41.0100	1E53	01F3	41.5300	2F13	12B3	42.0500	0154	2373
41.0200	1E63	1103	41.5400	2F23	12C3	42.0600	0164	0403
41.0300	1E73	1113	41.5500	2F33	12D3	42.0700	0174	0413
41.0400	1E83	1123	41.5600	2F43	12E3	42.0800	0184	0423
41.0500	1E93	1133	41.5700	2F53	12F3	42.0900	0194	0433
41.0600	1EA3	1143	41.5800	2F63	2203	42.1000	01A4	0443
41.0700	1EB3	1153	41.5900	2F73	2213	42.1100	01B4	0453
41.0800	1EC3	1163	41.6000	0004	2223	42.1200	01C4	0463
41.0900	1ED3	1173	41.6100	0014	2233	42.1300	01D4	0473
41.1000	1EE3	1183	41.6200	0024	2243	42.1400	01E4	0483
41.1100	1EF3	1193	41.6300	0034	2253	42.1500	01F4	0493
41.1200	2E03	11A3	41.6400	0044	2263	42.1600	1104	04A3
41.1300	2E13	11B3	41.6500	0054	2273	42.1700	1114	04B3
41.1400	2E23	11C3	41.6600	0064	0303	42.1800	1124	04C3
41.1500	2E33	11D3	41.6700	0074	0313	42.1900	1134	04D3
41.1600	2E43	11E3	41.6800	0084	0323	42.2000	1144	04E3
41.1700	2E53	11F3	41.6900	0094	0333	42.2100	1154	04F3
41.1800	2E63	2103	41.7000	00A4	0343	42.2200	1164	1403
41.1900	2E73	2113	41.7100	00B4	0353	42.2300	1174	1413
41.2000	0F03	2123	41.7200	00C4	0363	42.2400	1184	1423
41.2100	0F13	2133	41.7300	00D4	0373	42.2500	1194	1433
41.2200	0F23	2143	41.7400	00E4	0383	42.2600	11A4	1443
41.2300	0F33	2153	41.7500	00F4	0393	42.2700	11B4	1453
41.2400	0F43	2163	41.7600	1004	03A3	42.2800	11C4	1463
41.2500	0F53	2173	41.7700	1014	03B3	42.2900	11D4	1473
41.2600	0F63	0203	41.7800	1024	03C3	42.3000	11E4	1483
41.2700	0F73	0213	41.7900	1034	03D3	42.3100	11F4	1493
41.2800	0F83	0223	41.8000	1044	03E3	42.3200	2104	14A3
41.2900	0F93	0233	41.8100	1054	03F3	42.3300	2114	14B3
41.3000	0FA3	0243	41.8200	1064	1303	42.3400	2124	14C3
41.3100	0FB3	0253	41.8300	1074	1313	42.3500	2134	14D3
41.3200	0FC3	0263	41.8400	1084	1323	42.3600	2144	14E3
41.3300	0FD3	0273	41.8500	1094	1333	42.3700	2154	14F3
41.3400	0FE3	0283	41.8600	10A4	1343	42.3800	2164	2403
41.3500	0FF3	0293	41.8700	10B4	1353	42.3900	2174	2413
41.3600	1F03	02A3	41.8800	10C4	1363	42.4000	0204	2423
41.3700	1F13	02B3	41.8900	10D4	1373	42.4100	0214	2433
41.3800	1F23	02C3	41.9000	10E4	1383	42.4200	0224	2443
41.3900	1F33	02D3	41.9100	10F4	1393	42.4300	0234	2453
41.4000	1F43	02E3	41.9200	2004	13A3	42.4400	0244	2463
41.4100	1F53	02F3	41.9300	2014	13B3	42.4500	0254	2473
41.4200	1F63	1203	41.9400	2024	13C3	42.4600	0264	0503
41.4300	1F73	1213	41.9500	2034	13D3	42.4700	0274	0513

Table 3B (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
42.4800	0284	0523	43.0000	1344	06E3	43.5200	2404	17A3
42.4900	0294	0533	43.0100	1354	06F3	43.5300	2414	17B3
42.5000	02A4	0543	43.0200	1364	1603	43.5400	2424	17C3
42.5100	02B4	0553	43.0300	1374	1613	43.5500	2434	17D3
42.5200	02C4	0563	43.0400	1384	1623	43.5600	2444	17E3
42.5300	02D4	0573	43.0500	1394	1633	43.5700	2454	17F3
42.5400	02E4	0583	43.0600	13A4	1643	43.5800	2464	2703
42.5500	02F4	0593	43.0700	13B4	1653	43.5900	2474	2713
42.5600	1204	05A3	43.0800	13C4	1663	43.6000	0504	2723
42.5700	1214	05B3	43.0900	13D4	1673	43.6100	0514	2733
42.5800	1224	05C3	43.1000	13E4	1683	43.6200	0524	2743
42.5900	1234	05D3	43.1100	13F4	1693	43.6300	0534	2753
42.6000	1244	05E3	43.1200	2304	16A3	43.6400	0544	2763
42.6100	1254	05F3	43.1300	2314	16B3	43.6500	0554	2773
42.6200	1264	1503	43.1400	2324	16C3	43.6600	0564	0803
42.6300	1274	1513	43.1500	2334	16D3	43.6700	0574	0813
42.6400	1284	1523	43.1600	2344	16E3	43.6800	0584	0823
42.6500	1294	1533	43.1700	2354	16F3	43.6900	0594	0833
42.6600	12A4	1543	43.1800	2364	2603	43.7000	05A4	0843
42.6700	12B4	1553	43.1900	2374	2613	43.7100	05B4	0853
42.6800	12C4	1563	43.2000	0404	2623	43.7200	05C4	0863
42.6900	12D4	1573	43.2100	0414	2633	43.7300	05D4	0873
42.7000	12E4	1583	43.2200	0424	2643	43.7400	05E4	0883
42.7100	12F4	1593	43.2300	0434	2653	43.7500	05F4	0893
42.7200	2204	15A3	43.2400	0444	2663	43.7600	1504	08A3
42.7300	2214	15B3	43.2500	0454	2673	43.7700	1514	08B3
42.7400	2224	15C3	43.2600	0464	0703	43.7800	1524	08C3
42.7500	2234	15D3	43.2700	0474	0713	43.7900	1534	08D3
42.7600	2244	15E3	43.2800	0484	0723	43.8000	1544	08E3
42.7700	2254	15F3	43.2900	0494	0733	43.8100	1554	08F3
42.7800	2264	2503	43.3000	04A4	0743	43.8200	1564	1803
42.7900	2274	2513	43.3100	04B4	0753	43.8300	1574	1813
42.8000	0304	2523	43.3200	04C4	0763	43.8400	1584	1823
42.8100	0314	2533	43.3300	04D4	0773	43.8500	1594	1833
42.8200	0324	2543	43.3400	04E4	0783	43.8600	15A4	1843
42.8300	0334	2553	43.3500	04F4	0793	43.8700	15B4	1853
42.8400	0344	2563	43.3600	1404	07A3	43.8800	15C4	1863
42.8500	0354	2573	43.3700	1414	07B3	43.8900	15D4	1873
42.8600	0364	0603	43.3800	1424	07C3	43.9000	15E4	1883
42.8700	0374	0613	43.3900	1434	07D3	43.9100	15F4	1893
42.8800	0384	0623	43.4000	1444	07E3	43.9200	2504	18A3
42.8900	0394	0633	43.4100	1454	07F3	43.9300	2514	18B3
42.9000	03A4	0643	43.4200	1464	1703	43.9400	2524	18C3
42.9100	03B4	0653	43.4300	1474	1713	43.9500	2534	18D3
42.9200	03C4	0663	43.4400	1484	1723	43.9600	2544	18E3
42.9300	03D4	0673	43.4500	1494	1733	43.9700	2554	18F3
42.9400	03E4	0683	43.4600	14A4	1743	43.9800	2564	2803
42.9500	03F4	0693	43.4700	14B4	1753	43.9900	2574	2813
42.9600	1304	06A3	43.4800	14C4	1763	44.0000	0604	2823
42.9700	1314	06B3	43.4900	14D4	1773	44.0100	0614	2833
42.9800	1324	06C3	43.5000	14E4	1783	44.0200	0624	2843
42.9900	1334	06D3	43.5100	14F4	1793	44.0300	0634	2853

Table 3B (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
44.0400	0644	2863	44.5600	1704	0AA3	45.0800	18C4	1863
44.0500	0654	2873	44.5700	1714	0AB3	45.0900	18D4	1873
44.0600	0664	0903	44.5800	1724	0AC3	45.1000	18E4	1883
44.0700	0674	0913	44.5900	1734	0AD3	45.1100	18F4	1893
44.0800	0684	0923	44.6000	1744	0AE3	45.1200	2804	18A3
44.0900	0694	0933	44.6100	1754	0AF3	45.1300	2814	18B3
44.1000	06A4	0943	44.6200	1764	1A03	45.1400	2824	18C3
44.1100	06B4	0953	44.6300	1774	1A13	45.1500	2834	18D3
44.1200	06C4	0963	44.6400	1784	1A23	45.1600	2844	18E3
44.1300	06D4	0973	44.6500	1794	1A33	45.1700	2854	18F3
44.1400	06E4	0983	44.6600	17A4	1A43	45.1800	2864	2803
44.1500	06F4	0993	44.6700	17B4	1A53	45.1900	2874	2813
44.1600	1604	09A3	44.6800	17C4	1A63	45.2000	0904	2823
44.1700	1614	09B3	44.6900	17D4	1A73	45.2100	0914	2833
44.1800	1624	09C3	44.7000	17E4	1A83	45.2200	0924	2843
44.1900	1634	09D3	44.7100	17F4	1A93	45.2300	0934	2853
44.2000	1644	09E3	44.7200	2704	1AA3	45.2400	0944	2863
44.2100	1654	09F3	44.7300	2714	1AB3	45.2500	0954	2873
44.2200	1664	1903	44.7400	2724	1AC3	45.2600	0964	0C03
44.2300	1674	1913	44.7500	2734	1AD3	45.2700	0974	0C13
44.2400	1684	1923	44.7600	2744	1AE3	45.2800	0984	0C23
44.2500	1694	1933	44.7700	2754	1AF3	45.2900	0994	0C33
44.2600	16A4	1943	44.7800	2764	2A03	45.3000	09A4	0C43
44.2700	16B4	1953	44.7900	2774	2A13	45.3100	09B4	0C53
44.2800	16C4	1963	44.8000	0804	2A23	45.3200	09C4	0C63
44.2900	16D4	1973	44.8100	0814	2A33	45.3300	09D4	0C73
44.3000	16E4	1983	44.8200	0824	2A43	45.3400	09E4	0C83
44.3100	16F4	1993	44.8300	0834	2A53	45.3500	09F4	0C93
44.3200	2604	19A3	44.8400	0844	2A63	45.3600	1904	0CA3
44.3300	2614	19B3	44.8500	0854	2A73	45.3700	1914	0CB3
44.3400	2624	19C3	44.8600	0864	0R03	45.3800	1924	0CC3
44.3500	2634	19D3	44.8700	0874	0R13	45.3900	1934	0CD3
44.3600	2644	19E3	44.8800	0884	0R23	45.4000	1944	0CE3
44.3700	2654	19F3	44.8900	0894	0R33	45.4100	1954	0CF3
44.3800	2664	2903	44.9000	08A4	0R43	45.4200	1964	1C03
44.3900	2674	2913	44.9100	08B4	0R53	45.4300	1974	1C13
44.4000	0704	2923	44.9200	08C4	0R63	45.4400	1984	1C23
44.4100	0714	2933	44.9300	08D4	0R73	45.4500	1994	1C33
44.4200	0724	2943	44.9400	08E4	0R83	45.4600	19A4	1C43
44.4300	0734	2953	44.9500	08F4	0R93	45.4700	19B4	1C53
44.4400	0744	2963	44.9600	1804	0RA3	45.4800	19C4	1C63
44.4500	0754	2973	44.9700	1814	0RB3	45.4900	19D4	1C73
44.4600	0764	0A03	44.9800	1824	0RC3	45.5000	19E4	1C83
44.4700	0774	0A13	44.9900	1834	0RD3	45.5100	19F4	1C93
44.4800	0784	0A23	45.0000	1844	0RE3	45.5200	2904	1CA3
44.4900	0794	0A33	45.0100	1854	0RF3	45.5300	2914	1CB3
44.5000	07A4	0A43	45.0200	1864	1803	45.5400	2924	1CC3
44.5100	07B4	0A53	45.0300	1874	1813	45.5500	2934	1CD3
44.5200	07C4	0A63	45.0400	1884	1823	45.5600	2944	1CE3
44.5300	07D4	0A73	45.0500	1894	1833	45.5700	2954	1CF3
44.5400	07E4	0A83	45.0600	18A4	1843	45.5800	2964	2C03
44.5500	07F4	0A93	45.0700	18B4	1853	45.5900	2974	2C13

Table 3B (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
45.6000	0A04	2C23	46.1200	0BC4	0E63	46.6400	1C84	1F23
45.6100	0A14	2C33	46.1300	0BD4	0E73	46.6500	1C94	1F33
45.6200	0A24	2C43	46.1400	0BE4	0E83	46.6600	1CA4	1F43
45.6300	0A34	2C53	46.1500	0BF4	0E93	46.6700	1CR4	1F53
45.6400	0A44	2C63	46.1600	1B04	0EA3	46.6800	1CC4	1F63
45.6500	0A54	2C73	46.1700	1B14	0EB3	46.6900	1CD4	1F73
45.6600	0A64	0D03	46.1800	1B24	0EC3	46.7000	1CE4	1F83
45.6700	0A74	0D13	46.1900	1B34	0ED3	46.7100	1CF4	1F93
45.6800	0A84	0D23	46.2000	1B44	0EE3	46.7200	2C04	1FA3
45.6900	0A94	0D33	46.2100	1B54	0EF3	46.7300	2C14	1FB3
45.7000	0AA4	0D43	46.2200	1B64	1E03	46.7400	2C24	1FC3
45.7100	0AB4	0D53	46.2300	1B74	1E13	46.7500	2C34	1FD3
45.7200	0AC4	0D63	46.2400	1B84	1E23	46.7600	2C44	1FE3
45.7300	0AD4	0D73	46.2500	1B94	1E33	46.7700	2C54	1FF3
45.7400	0AE4	0D83	46.2600	1BA4	1E43	46.7800	2C64	2F03
45.7500	0AF4	0D93	46.2700	1BB4	1E53	46.7900	2C74	2F13
45.7600	1A04	0DA3	46.2800	1BC4	1E63	46.8000	0D04	2F23
45.7700	1A14	0DB3	46.2900	1BD4	1E73	46.8100	0D14	2F33
45.7800	1A24	0DC3	46.3000	1BE4	1E83	46.8200	0D24	2F43
45.7900	1A34	0DD3	46.3100	1BF4	1E93	46.8300	0D34	2F53
45.8000	1A44	0DE3	46.3200	2B04	1EA3	46.8400	0D44	2F63
45.8100	1A54	0DF3	46.3300	2B14	1EB3	46.8500	0D54	2F73
45.8200	1A64	1D03	46.3400	2B24	1EC3	46.8600	0D64	0004
45.8300	1A74	1D13	46.3500	2B34	1ED3	46.8700	0D74	0014
45.8400	1A84	1D23	46.3600	2B44	1EE3	46.8800	0D84	0024
45.8500	1A94	1D33	46.3700	2B54	1EF3	46.8900	0D94	0034
45.8600	1AA4	1D43	46.3800	2B64	2E03	46.9000	0DA4	0044
45.8700	1AB4	1D53	46.3900	2B74	2E13	46.9100	0DB4	0054
45.8800	1AC4	1D63	46.4000	0C04	2E23	46.9200	0DC4	0064
45.8900	1AD4	1D73	46.4100	0C14	2E33	46.9300	0DD4	0074
45.9000	1AE4	1D83	46.4200	0C24	2E43	46.9400	0DE4	0084
45.9100	1AF4	1D93	46.4300	0C34	2E53	46.9500	0DF4	0094
45.9200	2A04	1DA3	46.4400	0C44	2E63	46.9600	1D04	00A4
45.9300	2A14	1DB3	46.4500	0C54	2E73	46.9700	1D14	00B4
45.9400	2A24	1DC3	46.4600	0C64	0F03	46.9800	1D24	00C4
45.9500	2A34	1DD3	46.4700	0C74	0F13	46.9900	1D34	00D4
45.9600	2A44	1DE3	46.4800	0C84	0F23	47.0000	1D44	00E4
45.9700	2A54	1DF3	46.4900	0C94	0F33	47.0100	1D54	00F4
45.9800	2A64	2D03	46.5000	0CA4	0F43	47.0200	1D64	1004
45.9900	2A74	2D13	46.5100	0CB4	0F53	47.0300	1D74	1014
46.0000	0B04	2D23	46.5200	0CC4	0F63	47.0400	1D84	1024
46.0100	0B14	2D33	46.5300	0CD4	0F73	47.0500	1D94	1034
46.0200	0B24	2D43	46.5400	0CE4	0F83	47.0600	1DA4	1044
46.0300	0B34	2D53	46.5500	0CF4	0F93	47.0700	1DB4	1054
46.0400	0B44	2D63	46.5600	1C04	0FA3	47.0800	1DC4	1064
46.0500	0B54	2D73	46.5700	1C14	0FB3	47.0900	1DD4	1074
46.0600	0B64	0E03	46.5800	1C24	0FC3	47.1000	1DE4	1084
46.0700	0B74	0E13	46.5900	1C34	0FD3	47.1100	1DF4	1094
46.0800	0B84	0E23	46.6000	1C44	0FE3	47.1200	2D04	10A4
46.0900	0B94	0E33	46.6100	1C54	0FF3	47.1300	2D14	10B4
46.1000	0BA4	0E43	46.6200	1C64	1F03	47.1400	2D24	10C4
46.1100	0BB4	0E53	46.6300	1C74	1F13	47.1500	2D34	10D4

Table 3B (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
47.1600	2D44	10E4	47.6800	0F84	0224	48.2000	1045	03E4
47.1700	2D54	10F4	47.6900	0F94	0234	48.2100	1055	03F4
47.1800	2D64	2004	47.7000	0FA4	0244	48.2200	1065	1304
47.1900	2D74	2014	47.7100	0FB4	0254	48.2300	1075	1314
47.2000	0E04	2024	47.7200	0FC4	0264	48.2400	1085	1324
47.2100	0E14	2034	47.7300	0FD4	0274	48.2500	1095	1334
47.2200	0E24	2044	47.7400	0FE4	0284	48.2600	10A5	1344
47.2300	0E34	2054	47.7500	0FF4	0294	48.2700	10B5	1354
47.2400	0E44	2064	47.7600	1F04	02A4	48.2800	10C5	1364
47.2500	0E54	2074	47.7700	1F14	02B4	48.2900	10D5	1374
47.2600	0E64	0104	47.7800	1F24	02C4	48.3000	10E5	1384
47.2700	0E74	0114	47.7900	1F34	02D4	48.3100	10F5	1394
47.2800	0E84	0124	47.8000	1F44	02E4	48.3200	2005	13A4
47.2900	0E94	0134	47.8100	1F54	02F4	48.3300	2015	13B4
47.3000	0EA4	0144	47.8200	1F64	1204	48.3400	2025	13C4
47.3100	0EB4	0154	47.8300	1F74	1214	48.3500	2035	13D4
47.3200	0EC4	0164	47.8400	1F84	1224	48.3600	2045	13E4
47.3300	0ED4	0174	47.8500	1F94	1234	48.3700	2055	13F4
47.3400	0EE4	0184	47.8600	1FA4	1244	48.3800	2065	2304
47.3500	0EF4	0194	47.8700	1FB4	1254	48.3900	2075	2314
47.3600	1E04	01A4	47.8800	1FC4	1264	48.4000	0105	2324
47.3700	1E14	01B4	47.8900	1FD4	1274	48.4100	0115	2334
47.3800	1E24	01C4	47.9000	1FE4	1284	48.4200	0125	2344
47.3900	1E34	01D4	47.9100	1FF4	1294	48.4300	0135	2354
47.4000	1E44	01E4	47.9200	2F04	12A4	48.4400	0145	2364
47.4100	1E54	01F4	47.9300	2F14	12B4	48.4500	0155	2374
47.4200	1E64	1104	47.9400	2F24	12C4	48.4600	0165	0404
47.4300	1E74	1114	47.9500	2F34	12D4	48.4700	0175	0414
47.4400	1E84	1124	47.9600	2F44	12E4	48.4800	0185	0424
47.4500	1E94	1134	47.9700	2F54	12F4	48.4900	0195	0434
47.4600	1EA4	1144	47.9800	2F64	2204	48.5000	01A5	0444
47.4700	1EB4	1154	47.9900	2F74	2214	48.5100	01B5	0454
47.4800	1EC4	1164	48.0000	0005	2224	48.5200	01C5	0464
47.4900	1ED4	1174	48.0100	0015	2234	48.5300	01D5	0474
47.5000	1EE4	1184	48.0200	0025	2244	48.5400	01E5	0484
47.5100	1EF4	1194	48.0300	0035	2254	48.5500	01F5	0494
47.5200	2E04	11A4	48.0400	0045	2264	48.5600	1105	04A4
47.5300	2E14	11B4	48.0500	0055	2274	48.5700	1115	04B4
47.5400	2E24	11C4	48.0600	0065	0304	48.5800	1125	04C4
47.5500	2E34	11D4	48.0700	0075	0314	48.5900	1135	04D4
47.5600	2E44	11E4	48.0800	0085	0324	48.6000	1145	04E4
47.5700	2E54	11F4	48.0900	0095	0334	48.6100	1155	04F4
47.5800	2E64	2104	48.1000	00A5	0344	48.6200	1165	1404
47.5900	2E74	2114	48.1100	00B5	0354	48.6300	1175	1414
47.6000	0F04	2124	48.1200	00C5	0364	48.6400	1185	1424
47.6100	0F14	2134	48.1300	00D5	0374	48.6500	1195	1434
47.6200	0F24	2144	48.1400	00E5	0384	48.6600	11A5	1444
47.6300	0F34	2154	48.1500	00F5	0394	48.6700	11B5	1454
47.6400	0F44	2164	48.1600	1005	03A4	48.6800	11C5	1464
47.6500	0F54	2174	48.1700	1015	03B4	48.6900	11D5	1474
47.6600	0F64	0204	48.1800	1025	03C4	48.7000	11E5	1484
47.6700	0F74	0214	48.1900	1035	03D4	48.7100	11F5	1494

Table 3B (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
48.7200	2105	14A4	49.2400	0345	2564	49.7600	1405	07A4
48.7300	2115	14B4	49.2500	0355	2574	49.7700	1415	07B4
48.7400	2125	14C4	49.2600	0365	0604	49.7800	1425	07C4
48.7500	2135	14D4	49.2700	0375	0614	49.7900	1435	07D4
48.7600	2145	14E4	49.2800	0385	0624	49.8000	1445	07E4
48.7700	2155	14F4	49.2900	0395	0634	49.8100	1455	07F4
48.7800	2165	2404	49.3000	03A5	0644	49.8200	1465	1704
48.7900	2175	2414	49.3100	03B5	0654	49.8300	1475	1714
48.8000	0205	2424	49.3200	03C5	0664	49.8400	1485	1724
48.8100	0215	2434	49.3300	03D5	0674	49.8500	1495	1734
48.8200	0225	2444	49.3400	03E5	0684	49.8600	14A5	1744
48.8300	0235	2454	49.3500	03F5	0694	49.8700	14B5	1754
48.8400	0245	2464	49.3600	1305	06A4	49.8800	14C5	1764
48.8500	0255	2474	49.3700	1315	06B4	49.8900	14D5	1774
48.8600	0265	0504	49.3800	1325	06C4	49.9000	14E5	1784
48.8700	0275	0514	49.3900	1335	06D4	49.9100	14F5	1794
48.8800	0285	0524	49.4000	1345	06E4	49.9200	2405	17A4
48.8900	0295	0534	49.4100	1355	06F4	49.9300	2415	17B4
48.9000	02A5	0544	49.4200	1365	1604	49.9400	2425	17C4
48.9100	02B5	0554	49.4300	1375	1614	49.9500	2435	17D4
48.9200	02C5	0564	49.4400	1385	1624	49.9600	2445	17E4
48.9300	02D5	0574	49.4500	1395	1634	49.9700	2455	17F4
48.9400	02E5	0584	49.4600	13A5	1644	49.9800	2465	2704
48.9500	02F5	0594	49.4700	13B5	1654	49.9900	2475	2714
48.9600	1205	05A4	49.4800	13C5	1664	50.0000	0505	2724
48.9700	1215	05B4	49.4900	13D5	1674			
48.9800	1225	05C4	49.5000	13E5	1684			
48.9900	1235	05D4	49.5100	13F5	1694			
49.0000	1245	05E4	49.5200	2305	16A4			
49.0100	1255	05F4	49.5300	2315	16B4			
49.0200	1265	1504	49.5400	2325	16C4			
49.0300	1275	1514	49.5500	2335	16D4			
49.0400	1285	1524	49.5600	2345	16E4			
49.0500	1295	1534	49.5700	2355	16F4			
49.0600	12A5	1544	49.5800	2365	2604			
49.0700	12B5	1554	49.5900	2375	2614			
49.0800	12C5	1564	49.6000	0405	2624			
49.0900	12D5	1574	49.6100	0415	2634			
49.1000	12E5	1584	49.6200	0425	2644			
49.1100	12F5	1594	49.6300	0435	2654			
49.1200	2205	15A4	49.6400	0445	2664			
49.1300	2215	15B4	49.6500	0455	2674			
49.1400	2225	15C4	49.6600	0465	0704			
49.1500	2235	15D4	49.6700	0475	0714			
49.1600	2245	15E4	49.6800	0485	0724			
49.1700	2255	15F4	49.6900	0495	0734			
49.1800	2265	2504	49.7000	04A5	0744			
49.1900	2275	2514	49.7100	04B5	0754			
49.2000	0305	2524	49.7200	04C5	0764			
49.2100	0315	2534	49.7300	04D5	0774			
49.2200	0325	2544	49.7400	04E5	0784			
49.2300	0335	2554	49.7500	04F5	0794			

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ESTIMATED VALUES.

JE 6/25/2007
WB5RUA

Table 3B Hexadecimal frequency data, low-band MegaE, low-side injection, 5.26 mhz, 20Khz

MHZ	TX				RX				MHZ	TX				RX			
49.58	2	3	6	5	2	6	0	4									
49.59	2	3	7	5	2	6	1	4									
49.60	0	4	0	5	2	6	2	4									
49.61	0	4	1	5	2	6	3	4									
49.62	0	4	2	5	2	6	4	4									
49.63	0	4	3	5	2	6	5	4									
49.64	0	4	4	5	2	6	6	4									
49.65	0	4	5	5	2	6	7	4									
49.66	0	4	6	5	0	7	0	4									
49.67	0	4	7	5	0	7	1	4									
49.68	0	4	8	5	0	7	2	4									
49.69	0	4	9	5	0	7	3	4									
49.70	0	4	A	5	0	7	4	4									
49.71	0	4	B	5	0	7	5	4									
49.72	0	4	C	5	0	7	6	4									
49.73	0	4	D	5	0	7	7	4									
49.74	0	4	E	5	0	7	8	4									
49.75	0	4	F	5	0	7	9	4									
49.76	1	4	0	5	0	7	A	4									
49.77	1	4	1	5	0	7	B	4									
49.78	1	4	2	5	0	7	C	4									
49.79	1	4	3	5	0	7	D	4									
49.80	1	4	4	5	0	7	E	4									
49.81	1	4	5	5	0	7	F	4									
49.82	1	4	6	5	1	7	0	4									
49.83	1	4	7	5	1	7	1	4									
49.84	1	4	8	5	1	7	2	4									
49.85	1	4	9	5	1	7	3	4									
49.86	1	4	A	5	1	7	4	4									
49.87	1	4	B	5	1	7	5	4									
49.88	1	4	C	5	1	7	6	4									
49.89	1	4	D	5	1	7	7	4									
49.90	1	4	E	5	1	7	8	4									
49.91	1	4	F	5	1	7	9	4									
49.92	2	4	0	5	1	7	A	4									
49.93	2	4	1	5	1	7	B	4									
49.94	2	4	2	5	1	7	C	4									
49.95	2	4	3	5	1	7	D	4									
49.96	2	4	4	5	1	7	E	4									
49.97	2	4	5	5	1	7	F	4									
49.98	2	4	6	5	2	7	0	4									
49.99	2	4	7	5	2	7	1	4									
50.00	0	5	0	5	2	7	2	4	52.00	0	A	0	5	2	C	2	4
50.01	0	5	1	5	2	7	3	4	52.01	0	A	1	5	2	C	3	4
50.02	0	5	2	5	2	7	4	4	52.02	0	A	2	5	2	C	4	4
50.03	0	5	3	5	2	7	5	4	52.03	0	A	3	5	2	C	5	4
50.04	0	5	4	5	2	7	6	4	52.04	0	A	4	5	2	C	6	4
50.05	0	5	5	5	2	7	7	4	52.05	0	A	5	5	2	C	7	4
50.06	0	5	6	5	0	8	0	4	52.06	0	A	6	5	0	D	0	4

50.07	0 5 7 5	0 8 1 4	52.07	0 A 7 5	0 D 1 4
50.08	0 5 8 5	0 8 2 4	52.08	0 A 8 5	0 D 2 4
50.09	0 5 9 5	0 8 3 4	52.09	0 A 9 5	0 D 3 4
50.10	0 5 A 5	0 8 4 4	52.10	0 A A 5	0 D 4 4
50.11	0 5 B 5	0 8 5 4	52.11	0 A B 5	0 D 5 4
50.12	0 5 C 5	0 8 6 4	52.12	0 A C 5	0 D 6 4
50.13	0 5 D 5	0 8 7 4	52.13	0 A D 5	0 D 7 4
50.14	0 5 E 5	0 8 8 4	52.14	0 A E 5	0 D 8 4
50.15	0 5 F 5	0 8 9 4	52.15	0 A F 5	0 D 9 4
50.16	1 5 0 5	0 8 A 4	52.16	1 A 0 5	0 D A 4
50.17	1 5 1 5	0 8 B 4	52.17	1 A 1 5	0 D B 4
50.18	1 5 2 5	0 8 C 4	52.18	1 A 2 5	0 D C 4
50.19	1 5 3 5	0 8 D 4	52.19	1 A 3 5	0 D D 4
50.20	1 5 4 5	0 8 E 4	52.20	1 A 4 5	0 D E 4
50.21	1 5 5 5	0 8 F 4	52.21	1 A 5 5	0 D F 4
50.22	1 5 6 5	1 8 0 4	52.22	1 A 6 5	1 D 0 4
50.23	1 5 7 5	1 8 1 4	52.23	1 A 7 5	1 D 1 4
50.24	1 5 8 5	1 8 2 4	52.24	1 A 8 5	1 D 2 4
50.25	1 5 9 5	1 8 3 4	52.25	1 A 9 5	1 D 3 4
50.26	1 5 A 5	1 8 4 4	52.26	1 A A 5	1 D 4 4
50.27	1 5 B 5	1 8 5 4	52.27	1 A B 5	1 D 5 4
50.28	1 5 C 5	1 8 6 4	52.28	1 A C 5	1 D 6 4
50.29	1 5 D 5	1 8 7 4	52.29	1 A D 5	1 D 7 4
50.30	1 5 E 5	1 8 8 4	52.30	1 A E 5	1 D 8 4
50.31	1 5 F 5	1 8 9 4	52.31	1 A F 5	1 D 9 4
50.32	2 5 0 5	1 8 A 4	52.32	2 A 0 5	1 D A 4
50.33	2 5 1 5	1 8 B 4	52.33	2 A 1 5	1 D B 4
50.34	2 5 2 5	1 8 C 4	52.34	2 A 2 5	1 D C 4
50.35	2 5 3 5	1 8 D 4	52.35	2 A 3 5	1 D D 4
50.36	2 5 4 5	1 8 E 4	52.36	2 A 4 5	1 D E 4
50.37	2 5 5 5	1 8 F 4	52.37	2 A 5 5	1 D F 4
50.38	2 5 6 5	2 8 0 4	52.38	2 A 6 5	2 D 0 4
50.39	2 5 7 5	2 8 1 4	52.39	2 A 7 5	2 D 1 4
50.40	0 6 0 5	2 8 2 4	52.40	0 B 0 5	2 D 2 4
50.41	0 6 1 5	2 8 3 4	52.41	0 B 1 5	2 D 3 4
50.42	0 6 2 5	2 8 4 4	52.42	0 B 2 5	2 D 4 4
50.43	0 6 3 5	2 8 5 4	52.43	0 B 3 5	2 D 5 4
50.44	0 6 4 5	2 8 6 4	52.44	0 B 4 5	2 D 6 4
50.45	0 6 5 5	2 8 7 4	52.45	0 B 5 5	2 D 7 4
50.46	0 6 6 5	0 9 0 4	52.46	0 B 6 5	0 E 0 4
50.47	0 6 7 5	0 9 1 4	52.47	0 B 7 5	0 E 1 4
50.48	0 6 8 5	0 9 2 4	52.48	0 B 8 5	0 E 2 4
50.49	0 6 9 5	0 9 3 4	52.49	0 B 9 5	0 E 3 4
50.50	0 6 A 5	0 9 4 4	52.50	0 B A 5	0 E 4 4
50.51	0 6 B 5	0 9 5 4	52.51	0 B B 5	0 E 5 4
50.52	0 6 C 5	0 9 6 4	52.52	0 B C 5	0 E 6 4
50.53	0 6 D 5	0 9 7 4	52.53	0 B D 5	0 E 7 4
50.54	0 6 E 5	0 9 8 4	52.54	0 B E 5	0 E 8 4
50.55	0 6 F 5	0 9 9 4	52.55	0 B F 5	0 E 9 4
50.56	1 6 0 5	0 9 A 4	52.56	1 B 0 5	0 E A 4
50.57	1 6 1 5	0 9 B 4	52.57	1 B 1 5	0 E B 4
50.58	1 6 2 5	0 9 C 4	52.58	1 B 2 5	0 E C 4

50.59	1 6 3 5	0 9 D 4	52.59	1 B 3 5	0 E D 4
50.60	1 6 4 5	0 9 E 4	52.60	1 B 4 5	0 E E 4
50.61	1 6 5 5	0 9 F 4	52.61	1 B 5 5	0 E F 4
50.62	1 6 6 5	1 9 0 4	52.62	1 B 6 5	1 E 0 4
50.63	1 6 7 5	1 9 1 4	52.63	1 B 7 5	1 E 1 4
50.64	1 6 8 5	1 9 2 4	52.64	1 B 8 5	1 E 2 4
50.65	1 6 9 5	1 9 3 4	52.65	1 B 9 5	1 E 3 4
50.66	1 6 A 5	1 9 4 4	52.66	1 B A 5	1 E 4 4
50.67	1 6 B 5	1 9 5 4	52.67	1 B B 5	1 E 5 4
50.68	1 6 C 5	1 9 6 4	52.68	1 B C 5	1 E 6 4
50.69	1 6 D 5	1 9 7 4	52.69	1 B D 5	1 E 7 4
50.70	1 6 E 5	1 9 8 4	52.70	1 B E 5	1 E 8 4
50.71	1 6 F 5	1 9 9 4	52.71	1 B F 5	1 E 9 4
50.72	2 6 0 5	1 9 A 4	52.72	2 B 0 5	1 E A 4
50.73	2 6 1 5	1 9 B 4	52.73	2 B 1 5	1 E B 4
50.74	2 6 2 5	1 9 C 4	52.74	2 B 2 5	1 E C 4
50.75	2 6 3 5	1 9 D 4	52.75	2 B 3 5	1 E D 4
50.76	2 6 4 5	1 9 E 4	52.76	2 B 4 5	1 E E 4
50.77	2 6 5 5	1 9 F 4	52.77	2 B 5 5	1 E F 4
50.78	2 6 6 5	2 9 0 4	52.78	2 B 6 5	2 E 0 4
50.79	2 6 7 5	2 9 1 4	52.79	2 B 7 5	2 E 1 4
50.80	0 7 0 5	2 9 2 4	52.80	0 C 0 5	2 E 2 4
50.81	0 7 1 5	2 9 3 4	52.81	0 C 1 5	2 E 3 4
50.82	0 7 2 5	2 9 4 4	52.82	0 C 2 5	2 E 4 4
50.83	0 7 3 5	2 9 5 4	52.83	0 C 3 5	2 E 5 4
50.84	0 7 4 5	2 9 6 4	52.84	0 C 4 5	2 E 6 4
50.85	0 7 5 5	2 9 7 4	52.85	0 C 5 5	2 E 7 4
50.86	0 7 6 5	0 A 0 4	52.86	0 C 6 5	0 F 0 4
50.87	0 7 7 5	0 A 1 4	52.87	0 C 7 5	0 F 1 4
50.88	0 7 8 5	0 A 2 4	52.88	0 C 8 5	0 F 2 4
50.89	0 7 9 5	0 A 3 4	52.89	0 C 9 5	0 F 3 4
50.90	0 7 A 5	0 A 4 4	52.90	0 C A 5	0 F 4 4
50.91	0 7 B 5	0 A 5 4	52.91	0 C B 5	0 F 5 4
50.92	0 7 C 5	0 A 6 4	52.92	0 C C 5	0 F 6 4
50.93	0 7 D 5	0 A 7 4	52.93	0 C D 5	0 F 7 4
50.94	0 7 E 5	0 A 8 4	52.94	0 C E 5	0 F 8 4
50.95	0 7 F 5	0 A 9 4	52.95	0 C F 5	0 F 9 4
50.96	1 7 0 5	0 A A 4	52.96	1 C 0 5	0 F A 4
50.97	1 7 1 5	0 A B 4	52.97	1 C 1 5	0 F B 4
50.98	1 7 2 5	0 A C 4	52.98	1 C 2 5	0 F C 4
50.99	1 7 3 5	0 A D 4	52.99	1 C 3 5	0 F D 4
51.00	1 7 4 5	0 A E 4	53.00	1 C 4 5	0 F E 4
51.01	1 7 5 5	0 A F 4	53.01	1 C 5 5	0 F F 4
51.02	1 7 6 5	1 A 0 4	53.02	1 C 6 5	1 F 0 4
51.03	1 7 7 5	1 A 1 4	53.03	1 C 7 5	1 F 1 4
51.04	1 7 8 5	1 A 2 4	53.04	1 C 8 5	1 F 2 4
51.05	1 7 9 5	1 A 3 4	53.05	1 C 9 5	1 F 3 4
51.06	1 7 A 5	1 A 4 4	53.06	1 C A 5	1 F 4 4
51.07	1 7 B 5	1 A 5 4	53.07	1 C B 5	1 F 5 4
51.08	1 7 C 5	1 A 6 4	53.08	1 C C 5	1 F 6 4
51.09	1 7 D 5	1 A 7 4	53.09	1 C D 5	1 F 7 4
51.10	1 7 E 5	1 A 8 4	53.10	1 C E 5	1 F 8 4

51.11	1	7	F	5	1 A	9	4	53.11	1	C	F	5	1 F	9	4	
51.12	2	7	0	5	1 A	A	4	53.12	2	C	0	5	1 F	A	4	
51.13	2	7	1	5	1 A	B	4	53.13	2	C	1	5	1 F	B	4	
51.14	2	7	2	5	1 A	C	4	53.14	2	C	2	5	1 F	C	4	
51.15	2	7	3	5	1 A	D	4	53.15	2	C	3	5	1 F	D	4	
51.16	2	7	4	5	1 A	E	4	53.16	2	C	4	5	1 F	E	4	
51.17	2	7	5	5	1 A	F	4	53.17	2	C	5	5	1 F	F	4	
51.18	2	7	6	5	2 A	0	4	53.18	2	C	6	5	2 F	0	4	
51.19	2	7	7	5	2 A	1	4	53.19	2	C	7	5	2 F	1	4	
51.20	0	8	0	5	2 A	2	4	53.20	0	D	0	5	2 F	2	4	
51.21	0	8	1	5	2 A	3	4	53.21	0	D	1	5	2 F	3	4	
51.22	0	8	2	5	2 A	4	4	53.22	0	D	2	5	2 F	4	4	
51.23	0	8	3	5	2 A	5	4	53.23	0	D	3	5	2 F	5	4	
51.24	0	8	4	5	2 A	6	4	53.24	0	D	4	5	2 F	6	4	
51.25	0	8	5	5	2 A	7	4	53.25	0	D	5	5	2 F	7	4	
51.26	0	8	6	5	0 B	0	4	53.26	0	D	6	5	0	0	0	5
51.27	0	8	7	5	0 B	1	4	53.27	0	D	7	5	0	0	1	5
51.28	0	8	8	5	0 B	2	4	53.28	0	D	8	5	0	0	2	5
51.29	0	8	9	5	0 B	3	4	53.29	0	D	9	5	0	0	3	5
51.30	0	8	A	5	0 B	4	4	53.30	0	D	A	5	0	0	4	5
51.31	0	8	B	5	0 B	5	4	53.31	0	D	B	5	0	0	5	5
51.32	0	8	C	5	0 B	6	4	53.32	0	D	C	5	0	0	6	5
51.33	0	8	D	5	0 B	7	4	53.33	0	D	D	5	0	0	7	5
51.34	0	8	E	5	0 B	8	4	53.34	0	D	E	5	0	0	8	5
51.35	0	8	F	5	0 B	9	4	53.35	0	D	F	5	0	0	9	5
51.36	1	8	0	5	0 B	A	4	53.36	1	D	0	5	0	0	A	5
51.37	1	8	1	5	0 B	B	4	53.37	1	D	1	5	0	0	B	5
51.38	1	8	2	5	0 B	C	4	53.38	1	D	2	5	0	0	C	5
51.39	1	8	3	5	0 B	D	4	53.39	1	D	3	5	0	0	D	5
51.40	1	8	4	5	0 B	E	4	53.40	1	D	4	5	0	0	E	5
51.41	1	8	5	5	0 B	F	4	53.41	1	D	5	5	0	0	F	5
51.42	1	8	6	5	1 B	0	4	53.42	1	D	6	5	1	0	0	5
51.43	1	8	7	5	1 B	1	4	53.43	1	D	7	5	1	0	1	5
51.44	1	8	8	5	1 B	2	4	53.44	1	D	8	5	1	0	2	5
51.45	1	8	9	5	1 B	3	4	53.45	1	D	9	5	1	0	3	5
51.46	1	8	A	5	1 B	4	4	53.46	1	D	A	5	1	0	4	5
51.47	1	8	B	5	1 B	5	4	53.47	1	D	B	5	1	0	5	5
51.48	1	8	C	5	1 B	6	4	53.48	1	D	C	5	1	0	6	5
51.49	1	8	D	5	1 B	7	4	53.49	1	D	D	5	1	0	7	5
51.50	1	8	E	5	1 B	8	4	53.50	1	D	E	5	1	0	8	5
51.51	1	8	F	5	1 B	9	4	53.51	1	D	F	5	1	0	9	5
51.52	2	8	0	5	1 B	A	4	53.52	2	D	0	5	1	0	A	5
51.53	2	8	1	5	1 B	B	4	53.53	2	D	1	5	1	0	B	5
51.54	2	8	2	5	1 B	C	4	53.54	2	D	2	5	1	0	C	5
51.55	2	8	3	5	1 B	D	4	53.55	2	D	3	5	1	0	D	5
51.56	2	8	4	5	1 B	E	4	53.56	2	D	4	5	1	0	E	5
51.57	2	8	5	5	1 B	F	4	53.57	2	D	5	5	1	0	F	5
51.58	2	8	6	5	2 B	0	4	53.58	2	D	6	5	2	0	0	5
51.59	2	8	7	5	2 B	1	4	53.59	2	D	7	5	2	0	1	5
51.60	0	9	0	5	2 B	2	4	53.60	0	E	0	5	2	0	2	5
51.61	0	9	1	5	2 B	3	4	53.61	0	E	1	5	2	0	3	5
51.62	0	9	2	5	2 B	4	4	53.62	0	E	2	5	2	0	4	5

51.63	0 9 3 5	2 B 5 4	53.63	0 E 3 5	2 0 5 5
51.64	0 9 4 5	2 B 6 4	53.64	0 E 4 5	2 0 6 5
51.65	0 9 5 5	2 B 7 4	53.65	0 E 5 5	2 0 7 5
51.66	0 9 6 5	0 C 0 4	53.66	0 E 6 5	0 1 0 5
51.67	0 9 7 5	0 C 1 4	53.67	0 E 7 5	0 1 1 5
51.68	0 9 8 5	0 C 2 4	53.68	0 E 8 5	0 1 2 5
51.69	0 9 9 5	0 C 3 4	53.69	0 E 9 5	0 1 3 5
51.70	0 9 A 5	0 C 4 4	53.70	0 E A 5	0 1 4 5
51.71	0 9 B 5	0 C 5 4	53.71	0 E B 5	0 1 5 5
51.72	0 9 C 5	0 C 6 4	53.72	0 E C 5	0 1 6 5
51.73	0 9 D 5	0 C 7 4	53.73	0 E D 5	0 1 7 5
51.74	0 9 E 5	0 C 8 4	53.74	0 E E 5	0 1 8 5
51.75	0 9 F 5	0 C 9 4	53.75	0 E F 5	0 1 9 5
51.76	1 9 0 5	0 C A 4	53.76	1 E 0 5	0 1 A 5
51.77	1 9 1 5	0 C B 4	53.77	1 E 1 5	0 1 B 5
51.78	1 9 2 5	0 C C 4	53.78	1 E 2 5	0 1 C 5
51.79	1 9 3 5	0 C D 4	53.79	1 E 3 5	0 1 D 5
51.80	1 9 4 5	0 C E 4	53.80	1 E 4 5	0 1 E 5
51.81	1 9 5 5	0 C F 4	53.81	1 E 5 5	0 1 F 5
51.82	1 9 6 5	1 C 0 4	53.82	1 E 6 5	1 1 0 5
51.83	1 9 7 5	1 C 1 4	53.83	1 E 7 5	1 1 1 5
51.84	1 9 8 5	1 C 2 4	53.84	1 E 8 5	1 1 2 5
51.85	1 9 9 5	1 C 3 4	53.85	1 E 9 5	1 1 3 5
51.86	1 9 A 5	1 C 4 4	53.86	1 E A 5	1 1 4 5
51.87	1 9 B 5	1 C 5 4	53.87	1 E B 5	1 1 5 5
51.88	1 9 C 5	1 C 6 4	53.88	1 E C 5	1 1 6 5
51.89	1 9 D 5	1 C 7 4	53.89	1 E D 5	1 1 7 5
51.90	1 9 E 5	1 C 8 4	53.90	1 E E 5	1 1 8 5
51.91	1 9 F 5	1 C 9 4	53.91	1 E F 5	1 1 9 5
51.92	2 9 0 5	1 C A 4	53.92	2 E 0 5	1 1 A 5
51.93	2 9 1 5	1 C B 4	53.93	2 E 1 5	1 1 B 5
51.94	2 9 2 5	1 C C 4	53.94	2 E 2 5	1 1 C 5
51.95	2 9 3 5	1 C D 4	53.95	2 E 3 5	1 1 D 5
51.96	2 9 4 5	1 C E 4	53.96	2 E 4 5	1 1 E 5
51.97	2 9 5 5	1 C F 4	53.97	2 E 5 5	1 1 F 5
51.98	2 9 6 5	2 C 0 4	53.98	2 E 6 5	2 1 0 5
51.99	2 9 7 5	2 C 1 4	53.99	2 E 7 5	2 1 1 5
52.00	0 A 0 5	2 C 2 4	54.00	0 F 0 5	2 1 2 5

**Table 3C. Hexadecimal frequency data, low-band Mega-E,
high-side injection, 5.25 MHz, 25-kHz channel spacing.**

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
30.0000	0401	1E41	30.6500	05C1	2F01	31.3000	1681	0142
30.0125	0411	1E51	30.6625	05D1	2F11	31.3125	1691	0152
30.0250	0421	1E61	30.6750	05E1	2F21	31.3250	16A1	0162
30.0375	0431	1E71	30.6875	05F1	2F31	31.3375	16B1	0172
30.0500	0441	1E81	30.7000	1501	2F41	31.3500	16C1	0182
30.0625	0451	1E91	30.7125	1511	2F51	31.3625	16D1	0192
30.0750	0461	1EA1	30.7250	1521	2F61	31.3750	16E1	01A2
30.0875	0471	1EB1	30.7375	1531	2F71	31.3875	16F1	01B2
30.1000	0481	1EC1	30.7500	1541	0002	31.4000	2601	01C2
30.1125	0491	1ED1	30.7625	1551	0012	31.4125	2611	01D2
30.1250	04A1	1EE1	30.7750	1561	0022	31.4250	2621	01E2
30.1375	04B1	1EF1	30.7875	1571	0032	31.4375	2631	01F2
30.1500	04C1	2E01	30.8000	1581	0042	31.4500	2641	1102
30.1625	04D1	2E11	30.8125	1591	0052	31.4625	2651	1112
30.1750	04E1	2E21	30.8250	15A1	0062	31.4750	2661	1122
30.1875	04F1	2E31	30.8375	15B1	0072	31.4875	2671	1132
30.2000	1401	2E41	30.8500	15C1	0082	31.5000	0701	1142
30.2125	1411	2E51	30.8625	15D1	0092	31.5125	0711	1152
30.2250	1421	2E61	30.8750	15E1	00A2	31.5250	0721	1162
30.2375	1431	2E71	30.8875	15F1	00B2	31.5375	0731	1172
30.2500	1441	0F01	30.9000	2501	00C2	31.5500	0741	1182
30.2625	1451	0F11	30.9125	2511	00D2	31.5625	0751	1192
30.2750	1461	0F21	30.9250	2521	00E2	31.5750	0761	11A2
30.2875	1471	0F31	30.9375	2531	00F2	31.5875	0771	11B2
30.3000	1481	0F41	30.9500	2541	1002	31.6000	0781	11C2
30.3125	1491	0F51	30.9625	2551	1012	31.6125	0791	11D2
30.3250	14A1	0F61	30.9750	2561	1022	31.6250	07A1	11E2
30.3375	14B1	0F71	30.9875	2571	1032	31.6375	07B1	11F2
30.3500	14C1	0F81	31.0000	0601	1042	31.6500	07C1	2102
30.3625	14D1	0F91	31.0125	0611	1052	31.6625	07D1	2112
30.3750	14E1	0FA1	31.0250	0621	1062	31.6750	07E1	2122
30.3875	14F1	0FB1	31.0375	0631	1072	31.6875	07F1	2132
30.4000	2401	0FC1	31.0500	0641	1082	31.7000	1701	2142
30.4125	2411	0FD1	31.0625	0651	1092	31.7125	1711	2152
30.4250	2421	0FE1	31.0750	0661	10A2	31.7250	1721	2162
30.4375	2431	0FF1	31.0875	0671	10B2	31.7375	1731	2172
30.4500	2441	1F01	31.1000	0681	10C2	31.7500	1741	0202
30.4625	2451	1F11	31.1125	0691	10D2	31.7625	1751	0212
30.4750	2461	1F21	31.1250	06A1	10E2	31.7750	1761	0222
30.4875	2471	1F31	31.1375	06B1	10F2	31.7875	1771	0232
30.5000	0501	1F41	31.1500	06C1	2002	31.8000	1781	0242
30.5125	0511	1F51	31.1625	06D1	2012	31.8125	1791	0252
30.5250	0521	1F61	31.1750	06E1	2022	31.8250	17A1	0262
30.5375	0531	1F71	31.1875	06F1	2032	31.8375	17B1	0272
30.5500	0541	1F81	31.2000	1601	2042	31.8500	17C1	0282
30.5625	0551	1F91	31.2125	1611	2052	31.8625	17D1	0292
30.5750	0561	1FA1	31.2250	1621	2062	31.8750	17E1	02A2
30.5875	0571	1FB1	31.2375	1631	2072	31.8875	17F1	02B2
30.6000	0581	1FC1	31.2500	1641	0102	31.9000	2701	02C2
30.6125	0591	1FD1	31.2625	1651	0112	31.9125	2711	02D2
30.6250	05A1	1FE1	31.2750	1661	0122	31.9250	2721	02E2
30.6375	05B1	1FF1	31.2875	1671	0132	31.9375	2731	02F2

Table 3C (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
31.9500	2741	1202	32.6000	0981	13C2	33.2500	1A41	0502
31.9625	2751	1212	32.6125	0991	13D2	33.2625	1A51	0512
31.9750	2761	1222	32.6250	09A1	13E2	33.2750	1A61	0522
31.9875	2771	1232	32.6375	09B1	13F2	33.2875	1A71	0532
32.0000	0801	1242	32.6500	09C1	2302	33.3000	1A81	0542
32.0125	0811	1252	32.6625	09D1	2312	33.3125	1A91	0552
32.0250	0821	1262	32.6750	09E1	2322	33.3250	1AA1	0562
32.0375	0831	1272	32.6875	09F1	2332	33.3375	1AB1	0572
32.0500	0841	1282	32.7000	1901	2342	33.3500	1AC1	0582
32.0625	0851	1292	32.7125	1911	2352	33.3625	1AD1	0592
32.0750	0861	12A2	32.7250	1921	2362	33.3750	1AE1	05A2
32.0875	0871	12B2	32.7375	1931	2372	33.3875	1AF1	05B2
32.1000	0881	12C2	32.7500	1941	0402	33.4000	2A01	05C2
32.1125	0891	12D2	32.7625	1951	0412	33.4125	2A11	05D2
32.1250	08A1	12E2	32.7750	1961	0422	33.4250	2A21	05E2
32.1375	08B1	12F2	32.7875	1971	0432	33.4375	2A31	05F2
32.1500	08C1	2202	32.8000	1981	0442	33.4500	2A41	1502
32.1625	08D1	2212	32.8125	1991	0452	33.4625	2A51	1512
32.1750	08E1	2222	32.8250	19A1	0462	33.4750	2A61	1522
32.1875	08F1	2232	32.8375	19B1	0472	33.4875	2A71	1532
32.2000	1801	2242	32.8500	19C1	0482	33.5000	0B01	1542
32.2125	1811	2252	32.8625	19D1	0492	33.5125	0B11	1552
32.2250	1821	2262	32.8750	19E1	04A2	33.5250	0B21	1562
32.2375	1831	2272	32.8875	19F1	04B2	33.5375	0B31	1572
32.2500	1841	0302	32.9000	2901	04C2	33.5500	0B41	1582
32.2625	1851	0312	32.9125	2911	04D2	33.5625	0B51	1592
32.2750	1861	0322	32.9250	2921	04E2	33.5750	0B61	15A2
32.2875	1871	0332	32.9375	2931	04F2	33.5875	0B71	15B2
32.3000	1881	0342	32.9500	2941	1402	33.6000	0B81	15C2
32.3125	1891	0352	32.9625	2951	1412	33.6125	0B91	15D2
32.3250	18A1	0362	32.9750	2961	1422	33.6250	0BA1	15E2
32.3375	18B1	0372	32.9875	2971	1432	33.6375	0BB1	15F2
32.3500	18C1	0382	33.0000	0A01	1442	33.6500	0BC1	2502
32.3625	18D1	0392	33.0125	0A11	1452	33.6625	0BD1	2512
32.3750	18E1	03A2	33.0250	0A21	1462	33.6750	0BE1	2522
32.3875	18F1	03B2	33.0375	0A31	1472	33.6875	0BF1	2532
32.4000	2801	03C2	33.0500	0A41	1482	33.7000	1B01	2542
32.4125	2811	03D2	33.0625	0A51	1492	33.7125	1B11	2552
32.4250	2821	03E2	33.0750	0A61	14A2	33.7250	1B21	2562
32.4375	2831	03F2	33.0875	0A71	14B2	33.7375	1B31	2572
32.4500	2841	1302	33.1000	0A81	14C2	33.7500	1B41	0602
32.4625	2851	1312	33.1125	0A91	14D2	33.7625	1B51	0612
32.4750	2861	1322	33.1250	0AA1	14E2	33.7750	1B61	0622
32.4875	2871	1332	33.1375	0AB1	14F2	33.7875	1B71	0632
32.5000	0901	1342	33.1500	0AC1	2402	33.8000	1B81	0642
32.5125	0911	1352	33.1625	0AD1	2412	33.8125	1B91	0652
32.5250	0921	1362	33.1750	0AE1	2422	33.8250	1BA1	0662
32.5375	0931	1372	33.1875	0AF1	2432	33.8375	1BB1	0672
32.5500	0941	1382	33.2000	1A01	2442	33.8500	1BC1	0682
32.5625	0951	1392	33.2125	1A11	2452	33.8625	1BD1	0692
32.5750	0961	13A2	33.2250	1A21	2462	33.8750	1BE1	06A2
32.5875	0971	13B2	33.2375	1A31	2472	33.8875	1BF1	06B2

Table 3C (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
33.9000	2B01	06C2	34.5500	0D41	1782	35.2000	1E01	2842
33.9125	2B11	06D2	34.5625	0D51	1792	35.2125	1E11	2852
33.9250	2B21	06E2	34.5750	0D61	17A2	35.2250	1E21	2862
33.9375	2B31	06F2	34.5875	0D71	17B2	35.2375	1E31	2872
33.9500	2B41	1602	34.6000	0D81	17C2	35.2500	1E41	0902
33.9625	2B51	1612	34.6125	0D91	17D2	35.2625	1E51	0912
33.9750	2B61	1622	34.6250	0DA1	17E2	35.2750	1E61	0922
33.9875	2B71	1632	34.6375	0DB1	17F2	35.2875	1E71	0932
34.0000	0C01	1642	34.6500	0DC1	2702	35.3000	1E81	0942
34.0125	0C11	1652	34.6625	0DD1	2712	35.3125	1E91	0952
34.0250	0C21	1662	34.6750	0DE1	2722	35.3250	1EA1	0962
34.0375	0C31	1672	34.6875	0DF1	2732	35.3375	1EB1	0972
34.0500	0C41	1682	34.7000	1D01	2742	35.3500	1EC1	0982
34.0625	0C51	1692	34.7125	1D11	2752	35.3625	1ED1	0992
34.0750	0C61	16A2	34.7250	1D21	2762	35.3750	1EE1	09A2
34.0875	0C71	16B2	34.7375	1D31	2772	35.3875	1EF1	09B2
34.1000	0C81	16C2	34.7500	1D41	0802	35.4000	2E01	09C2
34.1125	0C91	16D2	34.7625	1D51	0812	35.4125	2E11	09D2
34.1250	0CA1	16E2	34.7750	1D61	0822	35.4250	2E21	09E2
34.1375	0CB1	16F2	34.7875	1D71	0832	35.4375	2E31	09F2
34.1500	0CC1	2602	34.8000	1D81	0842	35.4500	2E41	1902
34.1625	0CD1	2612	34.8125	1D91	0852	35.4625	2E51	1912
34.1750	0CE1	2622	34.8250	1DA1	0862	35.4750	2E61	1922
34.1875	0CF1	2632	34.8375	1DB1	0872	35.4875	2E71	1932
34.2000	1C01	2642	34.8500	1DC1	0882	35.5000	0F01	1942
34.2125	1C11	2652	34.8625	1DD1	0892	35.5125	0F11	1952
34.2250	1C21	2662	34.8750	1DE1	08A2	35.5250	0F21	1962
34.2375	1C31	2672	34.8875	1DF1	08B2	35.5375	0F31	1972
34.2500	1C41	0702	34.9000	2D01	08C2	35.5500	0F41	1982
34.2625	1C51	0712	34.9125	2D11	08D2	35.5625	0F51	1992
34.2750	1C61	0722	34.9250	2D21	08E2	35.5750	0F61	19A2
34.2875	1C71	0732	34.9375	2D31	08F2	35.5875	0F71	19B2
34.3000	1C81	0742	34.9500	2D41	1802	35.6000	0F81	19C2
34.3125	1C91	0752	34.9625	2D51	1812	35.6125	0F91	19D2
34.3250	1CA1	0762	34.9750	2D61	1822	35.6250	0FA1	19E2
34.3375	1CB1	0772	34.9875	2D71	1832	35.6375	0FB1	19F2
34.3500	1CC1	0782	35.0000	0E01	1842	35.6500	0FC1	2902
34.3625	1CD1	0792	35.0125	0E11	1852	35.6625	0FD1	2912
34.3750	1CE1	07A2	35.0250	0E21	1862	35.6750	0FE1	2922
34.3875	1CF1	07B2	35.0375	0E31	1872	35.6875	0FF1	2932
34.4000	2C01	07C2	35.0500	0E41	1882	35.7000	1F01	2942
34.4125	2C11	07D2	35.0625	0E51	1892	35.7125	1F11	2952
34.4250	2C21	07E2	35.0750	0E61	18A2	35.7250	1F21	2962
34.4375	2C31	07F2	35.0875	0E71	18B2	35.7375	1F31	2972
34.4500	2C41	1702	35.1000	0E81	18C2	35.7500	1F41	0A02
34.4625	2C51	1712	35.1125	0E91	18D2	35.7625	1F51	0A12
34.4750	2C61	1722	35.1250	0EA1	18E2	35.7750	1F61	0A22
34.4875	2C71	1732	35.1375	0EB1	18F2	35.7875	1F71	0A32
34.5000	0D01	1742	35.1500	0EC1	2802	35.8000	1F81	0A42
34.5125	0D11	1752	35.1625	0ED1	2812	35.8125	1F91	0A52
34.5250	0D21	1762	35.1750	0EE1	2822	35.8250	1FA1	0A62
34.5375	0D31	1772	35.1875	0EF1	2832	35.8375	1FB1	0A72

Table 3C (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
35.8500	1FC1	0A82	36.5000	0102	1R42	37.1500	02C2	2C02
35.8625	1FD1	0A92	36.5125	0112	1R52	37.1625	02D2	2C12
35.8750	1FE1	0AA2	36.5250	0122	1R62	37.1750	02E2	2C22
35.8875	1FF1	0AB2	36.5375	0132	1R72	37.1875	02F2	2C32
35.9000	2F01	0AC2	36.5500	0142	1R82	37.2000	1202	2C42
35.9125	2F11	0AD2	36.5625	0152	1R92	37.2125	1212	2C52
35.9250	2F21	0AE2	36.5750	0162	1RA2	37.2250	1222	2C62
35.9375	2F31	0AF2	36.5875	0172	1RB2	37.2375	1232	2C72
35.9500	2F41	1A02	36.6000	0182	1RC2	37.2500	1242	0D02
35.9625	2F51	1A12	36.6125	0192	1RD2	37.2625	1252	0D12
35.9750	2F61	1A22	36.6250	01A2	1RE2	37.2750	1262	0D22
35.9875	2F71	1A32	36.6375	01B2	1RF2	37.2875	1272	0D32
36.0000	0002	1A42	36.6500	01C2	2R02	37.3000	1282	0D42
36.0125	0012	1A52	36.6625	01D2	2R12	37.3125	1292	0D52
36.0250	0022	1A62	36.6750	01E2	2R22	37.3250	12A2	0D62
36.0375	0032	1A72	36.6875	01F2	2R32	37.3375	12B2	0D72
36.0500	0042	1A82	36.7000	1102	2R42	37.3500	12C2	0D82
36.0625	0052	1A92	36.7125	1112	2R52	37.3625	12D2	0D92
36.0750	0062	1AA2	36.7250	1122	2R62	37.3750	12E2	0DA2
36.0875	0072	1AB2	36.7375	1132	2R72	37.3875	12F2	0DB2
36.1000	0082	1AC2	36.7500	1142	0C02	37.4000	2202	0DC2
36.1125	0092	1AD2	36.7625	1152	0C12	37.4125	2212	0DD2
36.1250	00A2	1AE2	36.7750	1162	0C22	37.4250	2222	0DE2
36.1375	00B2	1AF2	36.7875	1172	0C32	37.4375	2232	0DF2
36.1500	00C2	2A02	36.8000	1182	0C42	37.4500	2242	1D02
36.1625	00D2	2A12	36.8125	1192	0C52	37.4625	2252	1D12
36.1750	00E2	2A22	36.8250	11A2	0C62	37.4750	2262	1D22
36.1875	00F2	2A32	36.8375	11B2	0C72	37.4875	2272	1D32
36.2000	1002	2A42	36.8500	11C2	0C82	37.5000	0302	1D42
36.2125	1012	2A52	36.8625	11D2	0C92	37.5125	0312	1D52
36.2250	1022	2A62	36.8750	11E2	0CA2	37.5250	0322	1D62
36.2375	1032	2A72	36.8875	11F2	0CB2	37.5375	0332	1D72
36.2500	1042	0B02	36.9000	2102	0CC2	37.5500	0342	1D82
36.2625	1052	0B12	36.9125	2112	0CD2	37.5625	0352	1D92
36.2750	1062	0B22	36.9250	2122	0CE2	37.5750	0362	1DA2
36.2875	1072	0B32	36.9375	2132	0CF2	37.5875	0372	1DB2
36.3000	1082	0B42	36.9500	2142	1C02	37.6000	0382	1DC2
36.3125	1092	0B52	36.9625	2152	1C12	37.6125	0392	1DD2
36.3250	10A2	0B62	36.9750	2162	1C22	37.6250	03A2	1DE2
36.3375	10B2	0B72	36.9875	2172	1C32	37.6375	03B2	1DF2
36.3500	10C2	0B82	37.0000	0202	1C42	37.6500	03C2	2D02
36.3625	10D2	0B92	37.0125	0212	1C52	37.6625	03D2	2D12
36.3750	10E2	0BA2	37.0250	0222	1C62	37.6750	03E2	2D22
36.3875	10F2	0BB2	37.0375	0232	1C72	37.6875	03F2	2D32
36.4000	2002	0BC2	37.0500	0242	1C82	37.7000	1302	2D42
36.4125	2012	0BD2	37.0625	0252	1C92	37.7125	1312	2D52
36.4250	2022	0BE2	37.0750	0262	1CA2	37.7250	1322	2D62
36.4375	2032	0BF2	37.0875	0272	1CB2	37.7375	1332	2D72
36.4500	2042	1B02	37.1000	0282	1CC2	37.7500	1342	0E02
36.4625	2052	1B12	37.1125	0292	1CD2	37.7625	1352	0E12
36.4750	2062	1B22	37.1250	02A2	1CE2	37.7750	1362	0E22
36.4875	2072	1B32	37.1375	02B2	1CF2	37.7875	1372	0E32

Table 3C (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
37.8000	1382	0E42	38.4500	2442	1F02	39.1000	0682	10C3
37.8125	1392	0E52	38.4625	2452	1F12	39.1125	0692	10D3
37.8250	13A2	0E62	38.4750	2462	1F22	39.1250	06A2	10E3
37.8375	13B2	0E72	38.4875	2472	1F32	39.1375	06B2	10F3
37.8500	13C2	0E82	38.5000	0502	1F42	39.1500	06C2	2003
37.8625	13D2	0E92	38.5125	0512	1F52	39.1625	06D2	2013
37.8750	13E2	0EA2	38.5250	0522	1F62	39.1750	06E2	2023
37.8875	13F2	0EB2	38.5375	0532	1F72	39.1875	06F2	2033
37.9000	2302	0EC2	38.5500	0542	1F82	39.2000	1602	2043
37.9125	2312	0ED2	38.5625	0552	1F92	39.2125	1612	2053
37.9250	2322	0EE2	38.5750	0562	1FA2	39.2250	1622	2063
37.9375	2332	0EF2	38.5875	0572	1FB2	39.2375	1632	2073
37.9500	2342	1E02	38.6000	0582	1FC2	39.2500	1642	0103
37.9625	2352	1E12	38.6125	0592	1FD2	39.2625	1652	0113
37.9750	2362	1E22	38.6250	05A2	1FE2	39.2750	1662	0123
37.9875	2372	1E32	38.6375	05B2	1FF2	39.2875	1672	0133
38.0000	0402	1E42	38.6500	05C2	2F02	39.3000	1682	0143
38.0125	0412	1E52	38.6625	05D2	2F12	39.3125	1692	0153
38.0250	0422	1E62	38.6750	05E2	2F22	39.3250	16A2	0163
38.0375	0432	1E72	38.6875	05F2	2F32	39.3375	16B2	0173
38.0500	0442	1E82	38.7000	1502	2F42	39.3500	16C2	0183
38.0625	0452	1E92	38.7125	1512	2F52	39.3625	16D2	0193
38.0750	0462	1EA2	38.7250	1522	2F62	39.3750	16E2	01A3
38.0875	0472	1EB2	38.7375	1532	2F72	39.3875	16F2	01B3
38.1000	0482	1EC2	38.7500	1542	0003	39.4000	2602	01C3
38.1125	0492	1ED2	38.7625	1552	0013	39.4125	2612	01D3
38.1250	04A2	1EE2	38.7750	1562	0023	39.4250	2622	01E3
38.1375	04B2	1EF2	38.7875	1572	0033	39.4375	2632	01F3
38.1500	04C2	2E02	38.8000	1582	0043	39.4500	2642	1103
38.1625	04D2	2E12	38.8125	1592	0053	39.4625	2652	1113
38.1750	04E2	2E22	38.8250	15A2	0063	39.4750	2662	1123
38.1875	04F2	2E32	38.8375	15B2	0073	39.4875	2672	1133
38.2000	1402	2E42	38.8500	15C2	0083	39.5000	0702	1143
38.2125	1412	2E52	38.8625	15D2	0093	39.5125	0712	1153
38.2250	1422	2E62	38.8750	15E2	00A3	39.5250	0722	1163
38.2375	1432	2E72	38.8875	15F2	00B3	39.5375	0732	1173
38.2500	1442	0F02	38.9000	2502	00C3	39.5500	0742	1183
38.2625	1452	0F12	38.9125	2512	00D3	39.5625	0752	1193
38.2750	1462	0F22	38.9250	2522	00E3	39.5750	0762	11A3
38.2875	1472	0F32	38.9375	2532	00F3	39.5875	0772	11B3
38.3000	1482	0F42	38.9500	2542	1003	39.6000	0782	11C3
38.3125	1492	0F52	38.9625	2552	1013	39.6125	0792	11D3
38.3250	14A2	0F62	38.9750	2562	1023	39.6250	07A2	11E3
38.3375	14B2	0F72	38.9875	2572	1033	39.6375	07B2	11F3
38.3500	14C2	0F82	39.0000	0602	1043	39.6500	07C2	2103
38.3625	14D2	0F92	39.0125	0612	1053	39.6625	07D2	2113
38.3750	14E2	0FA2	39.0250	0622	1063	39.6750	07E2	2123
38.3875	14F2	0FB2	39.0375	0632	1073	39.6875	07F2	2133
38.4000	2402	0FC2	39.0500	0642	1083	39.7000	1702	2143
38.4125	2412	0FD2	39.0625	0652	1093	39.7125	1712	2153
38.4250	2422	0FE2	39.0750	0662	10A3	39.7250	1722	2163
38.4375	2432	0FF2	39.0875	0672	10B3	39.7375	1732	2173

Table 3C (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
39.7500	1742	0203	40.4000	2802	03C3	41.0500	0A42	1483
39.7625	1752	0213	40.4125	2812	03D3	41.0625	0A52	1493
39.7750	1762	0223	40.4250	2822	03E3	41.0750	0A62	14A3
39.7875	1772	0233	40.4375	2832	03F3	41.0875	0A72	14B3
39.8000	1782	0243	40.4500	2842	1303	41.1000	0A82	14C3
39.8125	1792	0253	40.4625	2852	1313	41.1125	0A92	14D3
39.8250	17A2	0263	40.4750	2862	1323	41.1250	0AA2	14E3
39.8375	17B2	0273	40.4875	2872	1333	41.1375	0AB2	14F3
39.8500	17C2	0283	40.5000	0902	1343	41.1500	0AC2	2403
39.8625	17D2	0293	40.5125	0912	1353	41.1625	0AD2	2413
39.8750	17E2	02A3	40.5250	0922	1363	41.1750	0AE2	2423
39.8875	17F2	02B3	40.5375	0932	1373	41.1875	0AF2	2433
39.9000	2702	02C3	40.5500	0942	1383	41.2000	1A02	2443
39.9125	2712	02D3	40.5625	0952	1393	41.2125	1A12	2453
39.9250	2722	02E3	40.5750	0962	13A3	41.2250	1A22	2463
39.9375	2732	02F3	40.5875	0972	13B3	41.2375	1A32	2473
39.9500	2742	1203	40.6000	0982	13C3	41.2500	1A42	0503
39.9625	2752	1213	40.6125	0992	13D3	41.2625	1A52	0513
39.9750	2762	1223	40.6250	09A2	13E3	41.2750	1A62	0523
39.9875	2772	1233	40.6375	09B2	13F3	41.2875	1A72	0533
40.0000	0802	1243	40.6500	09C2	2303	41.3000	1A82	0543
40.0125	0812	1253	40.6625	09D2	2313	41.3125	1A92	0553
40.0250	0822	1263	40.6750	09E2	2323	41.3250	1AA2	0563
40.0375	0832	1273	40.6875	09F2	2333	41.3375	1AB2	0573
40.0500	0842	1283	40.7000	1902	2343	41.3500	1AC2	0583
40.0625	0852	1293	40.7125	1912	2353	41.3625	1AD2	0593
40.0750	0862	12A3	40.7250	1922	2363	41.3750	1AE2	05A3
40.0875	0872	12B3	40.7375	1932	2373	41.3875	1AF2	05B3
40.1000	0882	12C3	40.7500	1942	0403	41.4000	2A02	05C3
40.1125	0892	12D3	40.7625	1952	0413	41.4125	2A12	05D3
40.1250	08A2	12E3	40.7750	1962	0423	41.4250	2A22	05E3
40.1375	08B2	12F3	40.7875	1972	0433	41.4375	2A32	05F3
40.1500	08C2	2203	40.8000	1982	0443	41.4500	2A42	1503
40.1625	08D2	2213	40.8125	1992	0453	41.4625	2A52	1513
40.1750	08E2	2223	40.8250	19A2	0463	41.4750	2A62	1523
40.1875	08F2	2233	40.8375	19B2	0473	41.4875	2A72	1533
40.2000	1802	2243	40.8500	19C2	0483	41.5000	0B02	1543
40.2125	1812	2253	40.8625	19D2	0493	41.5125	0B12	1553
40.2250	1822	2263	40.8750	19E2	04A3	41.5250	0B22	1563
40.2375	1832	2273	40.8875	19F2	04B3	41.5375	0B32	1573
40.2500	1842	0303	40.9000	2902	04C3	41.5500	0B42	1583
40.2625	1852	0313	40.9125	2912	04D3	41.5625	0B52	1593
40.2750	1862	0323	40.9250	2922	04E3	41.5750	0B62	15A3
40.2875	1872	0333	40.9375	2932	04F3	41.5875	0B72	15B3
40.3000	1882	0343	40.9500	2942	1403	41.6000	0B82	15C3
40.3125	1892	0353	40.9625	2952	1413	41.6125	0B92	15D3
40.3250	18A2	0363	40.9750	2962	1423	41.6250	0BA2	15E3
40.3375	18B2	0373	40.9875	2972	1433	41.6375	0BB2	15F3
40.3500	18C2	0383	41.0000	0A02	1443	41.6500	0BC2	2503
40.3625	18D2	0393	41.0125	0A12	1453	41.6625	0BD2	2513
40.3750	18E2	03A3	41.0250	0A22	1463	41.6750	0BE2	2523
40.3875	18F2	03B3	41.0375	0A32	1473	41.6875	0BF2	2533

Table 3C (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
41.7000	1B02	2543	42.3500	1CC2	0783	43.0000	0E02	1843
41.7125	1B12	2553	42.3625	1CD2	0793	43.0125	0E12	1853
41.7250	1B22	2563	42.3750	1CE2	07A3	43.0250	0E22	1863
41.7375	1B32	2573	42.3875	1CF2	07B3	43.0375	0E32	1873
41.7500	1B42	0603	42.4000	2C02	07C3	43.0500	0F42	1883
41.7625	1B52	0613	42.4125	2C12	07D3	43.0625	0E52	1893
41.7750	1B62	0623	42.4250	2C22	07E3	43.0750	0E62	18A3
41.7875	1B72	0633	42.4375	2C32	07F3	43.0875	0E72	18B3
41.8000	1B82	0643	42.4500	2C42	1703	43.1000	0E82	18C3
41.8125	1B92	0653	42.4625	2C52	1713	43.1125	0E92	18D3
41.8250	1BA2	0663	42.4750	2C62	1723	43.1250	0EA2	18E3
41.8375	1BB2	0673	42.4875	2C72	1733	43.1375	0EB2	18F3
41.8500	1BC2	0683	42.5000	0D02	1743	43.1500	0EC2	2803
41.8625	1BD2	0693	42.5125	0D12	1753	43.1625	0ED2	2813
41.8750	1BE2	06A3	42.5250	0D22	1763	43.1750	0EE2	2823
41.8875	1BF2	06B3	42.5375	0D32	1773	43.1875	0EF2	2833
41.9000	2B02	06C3	42.5500	0D42	1783	43.2000	1E02	2843
41.9125	2B12	06D3	42.5625	0D52	1793	43.2125	1E12	2853
41.9250	2B22	06E3	42.5750	0D62	17A3	43.2250	1E22	2863
41.9375	2B32	06F3	42.5875	0D72	17B3	43.2375	1E32	2873
41.9500	2B42	1603	42.6000	0D82	17C3	43.2500	1E42	0903
41.9625	2B52	1613	42.6125	0D92	17D3	43.2625	1E52	0913
41.9750	2B62	1623	42.6250	0DA2	17E3	43.2750	1E62	0923
41.9875	2B72	1633	42.6375	0DB2	17F3	43.2875	1E72	0933
42.0000	0C02	1643	42.6500	0DC2	2703	43.3000	1E82	0943
42.0125	0C12	1653	42.6625	0DD2	2713	43.3125	1E92	0953
42.0250	0C22	1663	42.6750	0DE2	2723	43.3250	1EA2	0963
42.0375	0C32	1673	42.6875	0DF2	2733	43.3375	1EB2	0973
42.0500	0C42	1683	42.7000	1D02	2743	43.3500	1EC2	0983
42.0625	0C52	1693	42.7125	1D12	2753	43.3625	1ED2	0993
42.0750	0C62	16A3	42.7250	1D22	2763	43.3750	1FE2	09A3
42.0875	0C72	16B3	42.7375	1D32	2773	43.3875	1FF2	09B3
42.1000	0C82	16C3	42.7500	1D42	0803	43.4000	2E02	09C3
42.1125	0C92	16D3	42.7625	1D52	0813	43.4125	2E12	09D3
42.1250	0CA2	16E3	42.7750	1D62	0823	43.4250	2E22	09E3
42.1375	0CB2	16F3	42.7875	1D72	0833	43.4375	2E32	09F3
42.1500	0CC2	2603	42.8000	1D82	0843	43.4500	2E42	1903
42.1625	0CD2	2613	42.8125	1D92	0853	43.4625	2E52	1913
42.1750	0CE2	2623	42.8250	1DA2	0863	43.4750	2E62	1923
42.1875	0CF2	2633	42.8375	1DB2	0873	43.4875	2E72	1933
42.2000	1C02	2643	42.8500	1DC2	0883	43.5000	0F02	1943
42.2125	1C12	2653	42.8625	1DD2	0893	43.5125	0F12	1953
42.2250	1C22	2663	42.8750	1DE2	08A3	43.5250	0F22	1963
42.2375	1C32	2673	42.8875	1DF2	08B3	43.5375	0F32	1973
42.2500	1C42	0703	42.9000	2D02	08C3	43.5500	0F42	1983
42.2625	1C52	0713	42.9125	2D12	08D3	43.5625	0F52	1993
42.2750	1C62	0723	42.9250	2D22	08E3	43.5750	0F62	19A3
42.2875	1C72	0733	42.9375	2D32	08F3	43.5875	0F72	19B3
42.3000	1C82	0743	42.9500	2D42	1803	43.6000	0F82	19C3
42.3125	1C92	0753	42.9625	2D52	1813	43.6125	0F92	19D3
42.3250	1CA2	0763	42.9750	2D62	1823	43.6250	0FA2	19E3
42.3375	1CB2	0773	42.9875	2D72	1833	43.6375	0FB2	19F3

Table 3C (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
43.6500	0FC2	2903	44.3000	1083	0843	44.9500	2143	1C03
43.6625	0FD2	2913	44.3125	1093	0853	44.9625	2153	1C13
43.6750	0FE2	2923	44.3250	10A3	0863	44.9750	2163	1C23
43.6875	0FF2	2933	44.3375	10B3	0873	44.9875	2173	1C33
43.7000	1F02	2943	44.3500	10C3	0883	45.0000	0203	1C43
43.7125	1F12	2953	44.3625	10D3	0893	45.0125	0213	1C53
43.7250	1F22	2963	44.3750	10E3	08A3	45.0250	0223	1C63
43.7375	1F32	2973	44.3875	10F3	08B3	45.0375	0233	1C73
43.7500	1F42	0A03	44.4000	2003	08C3	45.0500	0243	1C83
43.7625	1F52	0A13	44.4125	2013	08D3	45.0625	0253	1C93
43.7750	1F62	0A23	44.4250	2023	08E3	45.0750	0263	1CA3
43.7875	1F72	0A33	44.4375	2033	08F3	45.0875	0273	1CB3
43.8000	1F82	0A43	44.4500	2043	1803	45.1000	0283	1CC3
43.8125	1F92	0A53	44.4625	2053	1813	45.1125	0293	1CD3
43.8250	1FA2	0A63	44.4750	2063	1823	45.1250	02A3	1CE3
43.8375	1FB2	0A73	44.4875	2073	1833	45.1375	02B3	1CF3
43.8500	1FC2	0A83	44.5000	0103	1843	45.1500	02C3	2C03
43.8625	1FD2	0A93	44.5125	0113	1853	45.1625	02D3	2C13
43.8750	1FE2	0AA3	44.5250	0123	1863	45.1750	02E3	2C23
43.8875	1FF2	0AB3	44.5375	0133	1873	45.1875	02F3	2C33
43.9000	2F02	0AC3	44.5500	0143	1883	45.2000	1203	2C43
43.9125	2F12	0AD3	44.5625	0153	1893	45.2125	1213	2C53
43.9250	2F22	0AE3	44.5750	0163	18A3	45.2250	1223	2C63
43.9375	2F32	0AF3	44.5875	0173	18B3	45.2375	1233	2C73
43.9500	2F42	1A03	44.6000	0183	18C3	45.2500	1243	0D03
43.9625	2F52	1A13	44.6125	0193	18D3	45.2625	1253	0D13
43.9750	2F62	1A23	44.6250	01A3	18E3	45.2750	1263	0D23
43.9875	2F72	1A33	44.6375	01B3	18F3	45.2875	1273	0D33
44.0000	0003	1A43	44.6500	01C3	2803	45.3000	1283	0D43
44.0125	0013	1A53	44.6625	01D3	2813	45.3125	1293	0D53
44.0250	0023	1A63	44.6750	01E3	2823	45.3250	12A3	0D63
44.0375	0033	1A73	44.6875	01F3	2833	45.3375	12B3	0D73
44.0500	0043	1A83	44.7000	1103	2843	45.3500	12C3	0D83
44.0625	0053	1A93	44.7125	1113	2853	45.3625	12D3	0D93
44.0750	0063	1AA3	44.7250	1123	2863	45.3750	12E3	0DA3
44.0875	0073	1AB3	44.7375	1133	2873	45.3875	12F3	0DB3
44.1000	0083	1AC3	44.7500	1143	0C03	45.4000	2203	0DC3
44.1125	0093	1AD3	44.7625	1153	0C13	45.4125	2213	0DD3
44.1250	00A3	1AE3	44.7750	1163	0C23	45.4250	2223	0DE3
44.1375	00B3	1AF3	44.7875	1173	0C33	45.4375	2233	0DF3
44.1500	00C3	2A03	44.8000	1183	0C43	45.4500	2243	1D03
44.1625	00D3	2A13	44.8125	1193	0C53	45.4625	2253	1D13
44.1750	00E3	2A23	44.8250	11A3	0C63	45.4750	2263	1D23
44.1875	00F3	2A33	44.8375	11B3	0C73	45.4875	2273	1D33
44.2000	1003	2A43	44.8500	11C3	0C83	45.5000	0303	1D43
44.2125	1013	2A53	44.8625	11D3	0C93	45.5125	0313	1D53
44.2250	1023	2A63	44.8750	11E3	0CA3	45.5250	0323	1D63
44.2375	1033	2A73	44.8875	11F3	0CB3	45.5375	0333	1D73
44.2500	1043	0B03	44.9000	2103	0CC3	45.5500	0343	1D83
44.2625	1053	0B13	44.9125	2113	0CD3	45.5625	0353	1D93
44.2750	1063	0B23	44.9250	2123	0CE3	45.5750	0363	1DA3
44.2875	1073	0B33	44.9375	2133	0CF3	45.5875	0373	1DB3

Table 3C (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
45.6000	0383	1DC3	46.2500	1443	0F03	46.9000	2503	00C4
45.6125	0393	1DD3	46.2625	1453	0F13	46.9125	2513	00D4
45.6250	03A3	1DE3	46.2750	1463	0F23	46.9250	2523	00E4
45.6375	03B3	1DF3	46.2875	1473	0F33	46.9375	2533	00F4
45.6500	03C3	2D03	46.3000	1483	0F43	46.9500	2543	1004
45.6625	03D3	2D13	46.3125	1493	0F53	46.9625	2553	1014
45.6750	03E3	2D23	46.3250	14A3	0F63	46.9750	2563	1024
45.6875	03F3	2D33	46.3375	14B3	0F73	46.9875	2573	1034
45.7000	1303	2D43	46.3500	14C3	0F83	47.0000	0603	1044
45.7125	1313	2D53	46.3625	14D3	0F93	47.0125	0613	1054
45.7250	1323	2D63	46.3750	14E3	0FA3	47.0250	0623	1064
45.7375	1333	2D73	46.3875	14F3	0FB3	47.0375	0633	1074
45.7500	1343	0E03	46.4000	2403	0FC3	47.0500	0643	1084
45.7625	1353	0E13	46.4125	2413	0FD3	47.0625	0653	1094
45.7750	1363	0E23	46.4250	2423	0FE3	47.0750	0663	10A4
45.7875	1373	0E33	46.4375	2433	0FF3	47.0875	0673	10B4
45.8000	1383	0E43	46.4500	2443	1F03	47.1000	0683	10C4
45.8125	1393	0E53	46.4625	2453	1F13	47.1125	0693	10D4
45.8250	13A3	0E63	46.4750	2463	1F23	47.1250	06A3	10E4
45.8375	13B3	0E73	46.4875	2473	1F33	47.1375	06B3	10F4
45.8500	13C3	0E83	46.5000	0503	1F43	47.1500	06C3	2004
45.8625	13D3	0E93	46.5125	0513	1F53	47.1625	06D3	2014
45.8750	13E3	0EA3	46.5250	0523	1F63	47.1750	06E3	2024
45.8875	13F3	0EB3	46.5375	0533	1F73	47.1875	06F3	2034
45.9000	2303	0EC3	46.5500	0543	1F83	47.2000	1603	2044
45.9125	2313	0ED3	46.5625	0553	1F93	47.2125	1613	2054
45.9250	2323	0EE3	46.5750	0563	1FA3	47.2250	1623	2064
45.9375	2333	0EF3	46.5875	0573	1FB3	47.2375	1633	2074
45.9500	2343	1E03	46.6000	0583	1FC3	47.2500	1643	0104
45.9625	2353	1E13	46.6125	0593	1FD3	47.2625	1653	0114
45.9750	2363	1E23	46.6250	05A3	1FE3	47.2750	1663	0124
45.9875	2373	1E33	46.6375	05B3	1FF3	47.2875	1673	0134
46.0000	0403	1E43	46.6500	05C3	2F03	47.3000	1683	0144
46.0125	0413	1E53	46.6625	05D3	2F13	47.3125	1693	0154
46.0250	0423	1E63	46.6750	05E3	2F23	47.3250	16A3	0164
46.0375	0433	1E73	46.6875	05F3	2F33	47.3375	16B3	0174
46.0500	0443	1E83	46.7000	1503	2F43	47.3500	16C3	0184
46.0625	0453	1E93	46.7125	1513	2F53	47.3625	16D3	0194
46.0750	0463	1EA3	46.7250	1523	2F63	47.3750	16E3	01A4
46.0875	0473	1EB3	46.7375	1533	2F73	47.3875	16F3	01B4
46.1000	0483	1EC3	46.7500	1543	0004	47.4000	2603	01C4
46.1125	0493	1ED3	46.7625	1553	0014	47.4125	2613	01D4
46.1250	04A3	1EE3	46.7750	1563	0024	47.4250	2623	01E4
46.1375	04B3	1EF3	46.7875	1573	0034	47.4375	2633	01F4
46.1500	04C3	2E03	46.8000	1583	0044	47.4500	2643	1104
46.1625	04D3	2E13	46.8125	1593	0054	47.4625	2653	1114
46.1750	04E3	2E23	46.8250	15A3	0064	47.4750	2663	1124
46.1875	04F3	2E33	46.8375	15B3	0074	47.4875	2673	1134
46.2000	1403	2E43	46.8500	15C3	0084	47.5000	0703	1144
46.2125	1413	2E53	46.8625	15D3	0094	47.5125	0713	1154
46.2250	1423	2E63	46.8750	15E3	00A4	47.5250	0723	1164
46.2375	1433	2E73	46.8875	15F3	00B4	47.5375	0733	1174

Table 3C (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
47.5500	0743	1184	48.2000	1803	2244	48.8500	19C3	0484
47.5625	0753	1194	48.2125	1813	2254	48.8625	19D3	0494
47.5750	0763	11A4	48.2250	1823	2264	48.8750	19E3	04A4
47.5875	0773	11B4	48.2375	1833	2274	48.8875	19F3	04B4
47.6000	0783	11C4	48.2500	1843	0304	48.9000	2903	04C4
47.6125	0793	11D4	48.2625	1853	0314	48.9125	2913	04D4
47.6250	07A3	11E4	48.2750	1863	0324	48.9250	2923	04E4
47.6375	07B3	11F4	48.2875	1873	0334	48.9375	2933	04F4
47.6500	07C3	2104	48.3000	1883	0344	48.9500	2943	1404
47.6625	07D3	2114	48.3125	1893	0354	48.9625	2953	1414
47.6750	07E3	2124	48.3250	18A3	0364	48.9750	2963	1424
47.6875	07F3	2134	48.3375	18B3	0374	48.9875	2973	1434
47.7000	1703	2144	48.3500	18C3	0384	49.0000	0A03	1444
47.7125	1713	2154	48.3625	18D3	0394	49.0125	0A13	1454
47.7250	1723	2164	48.3750	18E3	03A4	49.0250	0A23	1464
47.7375	1733	2174	48.3875	18F3	03B4	49.0375	0A33	1474
47.7500	1743	0204	48.4000	2803	03C4	49.0500	0A43	1484
47.7625	1753	0214	48.4125	2813	03D4	49.0625	0A53	1494
47.7750	1763	0224	48.4250	2823	03E4	49.0750	0A63	14A4
47.7875	1773	0234	48.4375	2833	03F4	49.0875	0A73	14B4
47.8000	1783	0244	48.4500	2843	1304	49.1000	0A83	14C4
47.8125	1793	0254	48.4625	2853	1314	49.1125	0A93	14D4
47.8250	17A3	0264	48.4750	2863	1324	49.1250	0AA3	14E4
47.8375	17B3	0274	48.4875	2873	1334	49.1375	0AB3	14F4
47.8500	17C3	0284	48.5000	0903	1344	49.1500	0AC3	2404
47.8625	17D3	0294	48.5125	0913	1354	49.1625	0AD3	2414
47.8750	17E3	02A4	48.5250	0923	1364	49.1750	0AE3	2424
47.8875	17F3	02B4	48.5375	0933	1374	49.1875	0AF3	2434
47.9000	2703	02C4	48.5500	0943	1384	49.2000	1A03	2444
47.9125	2713	02D4	48.5625	0953	1394	49.2125	1A13	2454
47.9250	2723	02E4	48.5750	0963	13A4	49.2250	1A23	2464
47.9375	2733	02F4	48.5875	0973	13B4	49.2375	1A33	2474
47.9500	2743	1204	48.6000	0983	13C4	49.2500	1A43	0504
47.9625	2753	1214	48.6125	0993	13D4	49.2625	1A53	0514
47.9750	2763	1224	48.6250	09A3	13E4	49.2750	1A63	0524
47.9875	2773	1234	48.6375	09B3	13F4	49.2875	1A73	0534
48.0000	0803	1244	48.6500	09C3	2304	49.3000	1A83	0544
48.0125	0813	1254	48.6625	09D3	2314	49.3125	1A93	0554
48.0250	0823	1264	48.6750	09E3	2324	49.3250	1AA3	0564
48.0375	0833	1274	48.6875	09F3	2334	49.3375	1AB3	0574
48.0500	0843	1284	48.7000	1903	2344	49.3500	1AC3	0584
48.0625	0853	1294	48.7125	1913	2354	49.3625	1AD3	0594
48.0750	0863	12A4	48.7250	1923	2364	49.3750	1AE3	05A4
48.0875	0873	12B4	48.7375	1933	2374	49.3875	1AF3	05B4
48.1000	0883	12C4	48.7500	1943	0404	49.4000	2A03	05C4
48.1125	0893	12D4	48.7625	1953	0414	49.4125	2A13	05D4
48.1250	08A3	12E4	48.7750	1963	0424	49.4250	2A23	05E4
48.1375	08B3	12F4	48.7875	1973	0434	49.4375	2A33	05F4
48.1500	08C3	2204	48.8000	1983	0444	49.4500	2A43	1504
48.1625	08D3	2214	48.8125	1993	0454	49.4625	2A53	1514
48.1750	08E3	2224	48.8250	19A3	0464	49.4750	2A63	1524
48.1875	08F3	2234	48.8375	19B3	0474	49.4875	2A73	1534

Table 3C (Continued)

FREQ	-TX-	-RX-
49.5000	0B03	1544
49.5125	0B13	1554
49.5250	0B23	1564
49.5375	0B33	1574
49.5500	0B43	1584
49.5625	0B53	1594
49.5750	0B63	15A4
49.5875	0B73	15B4
49.6000	0B83	15C4
49.6125	0B93	15D4
49.6250	0BA3	15E4
49.6375	0BB3	15F4
49.6500	0BC3	2504
49.6625	0BD3	2514
49.6750	0BE3	2524
49.6875	0BF3	2534
49.7000	1B03	2544
49.7125	1B13	2554
49.7250	1B23	2564
49.7375	1B33	2574
49.7500	1B43	0604
49.7625	1B53	0614
49.7750	1B63	0624
49.7875	1B73	0634
49.8000	1B83	0644
49.8125	1B93	0654
49.8250	1BA3	0664
49.8375	1BB3	0674
49.8500	1BC3	0684
49.8625	1BD3	0694
49.8750	1BE3	06A4
49.8875	1BF3	06B4
49.9000	2B03	06C4
49.9125	2B13	06D4
49.9250	2B23	06E4
49.9375	2B33	06F4
49.9500	2B43	1604
49.9625	2B53	1614
49.9750	2B63	1624
49.9875	2B73	1634
50.0000	0C03	1644

Table 3D. Hexadecimal frequency data, low-band Mega-E,
low-side injection, 5.25 MHz, 25-kHz channel spacing.

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
30.0000	0401	1940	30.6500	05C1	2A00	31.3000	1681	0C40
30.0125	0411	1950	30.6625	05D1	2A10	31.3125	1691	0C50
30.0250	0421	1960	30.6750	05E1	2A20	31.3250	16A1	0C60
30.0375	0431	1970	30.6875	05F1	2A30	31.3375	16B1	0C70
30.0500	0441	1980	30.7000	1501	2A40	31.3500	16C1	0C80
30.0625	0451	1990	30.7125	1511	2A50	31.3625	16D1	0C90
30.0750	0461	19A0	30.7250	1521	2A60	31.3750	16E1	0CA0
30.0875	0471	19B0	30.7375	1531	2A70	31.3875	16F1	0CB0
30.1000	0481	19C0	30.7500	1541	0B00	31.4000	2601	0CC0
30.1125	0491	19D0	30.7625	1551	0B10	31.4125	2611	0CD0
30.1250	04A1	19E0	30.7750	1561	0B20	31.4250	2621	0CE0
30.1375	04B1	19F0	30.7875	1571	0B30	31.4375	2631	0CF0
30.1500	04C1	2900	30.8000	1581	0B40	31.4500	2641	1C00
30.1625	04D1	2910	30.8125	1591	0B50	31.4625	2651	1C10
30.1750	04E1	2920	30.8250	15A1	0B60	31.4750	2661	1C20
30.1875	04F1	2930	30.8375	15B1	0B70	31.4875	2671	1C30
30.2000	1401	2940	30.8500	15C1	0B80	31.5000	0701	1C40
30.2125	1411	2950	30.8625	15D1	0B90	31.5125	0711	1C50
30.2250	1421	2960	30.8750	15E1	0BA0	31.5250	0721	1C60
30.2375	1431	2970	30.8875	15F1	0BB0	31.5375	0731	1C70
30.2500	1441	0A00	30.9000	2501	0BC0	31.5500	0741	1C80
30.2625	1451	0A10	30.9125	2511	0BD0	31.5625	0751	1C90
30.2750	1461	0A20	30.9250	2521	0BE0	31.5750	0761	1CA0
30.2875	1471	0A30	30.9375	2531	0BF0	31.5875	0771	1CB0
30.3000	1481	0A40	30.9500	2541	1B00	31.6000	0781	1CC0
30.3125	1491	0A50	30.9625	2551	1B10	31.6125	0791	1CD0
30.3250	14A1	0A60	30.9750	2561	1B20	31.6250	07A1	1CE0
30.3375	14B1	0A70	30.9875	2571	1B30	31.6375	07B1	1CF0
30.3500	14C1	0A80	31.0000	0601	1B40	31.6500	07C1	2C00
30.3625	14D1	0A90	31.0125	0611	1B50	31.6625	07D1	2C10
30.3750	14E1	0AA0	31.0250	0621	1B60	31.6750	07E1	2C20
30.3875	14F1	0AB0	31.0375	0631	1B70	31.6875	07F1	2C30
30.4000	2401	0AC0	31.0500	0641	1B80	31.7000	1701	2C40
30.4125	2411	0AD0	31.0625	0651	1B90	31.7125	1711	2C50
30.4250	2421	0AE0	31.0750	0661	1BA0	31.7250	1721	2C60
30.4375	2431	0AF0	31.0875	0671	1BB0	31.7375	1731	2C70
30.4500	2441	1A00	31.1000	0681	1BC0	31.7500	1741	0D00
30.4625	2451	1A10	31.1125	0691	1BD0	31.7625	1751	0D10
30.4750	2461	1A20	31.1250	06A1	1BE0	31.7750	1761	0D20
30.4875	2471	1A30	31.1375	06B1	1BF0	31.7875	1771	0D30
30.5000	0501	1A40	31.1500	06C1	2B00	31.8000	1781	0D40
30.5125	0511	1A50	31.1625	06D1	2B10	31.8125	1791	0D50
30.5250	0521	1A60	31.1750	06E1	2B20	31.8250	17A1	0D60
30.5375	0531	1A70	31.1875	06F1	2B30	31.8375	17B1	0D70
30.5500	0541	1A80	31.2000	1601	2B40	31.8500	17C1	0D80
30.5625	0551	1A90	31.2125	1611	2B50	31.8625	17D1	0D90
30.5750	0561	1AA0	31.2250	1621	2B60	31.8750	17E1	0DA0
30.5875	0571	1AB0	31.2375	1631	2B70	31.8875	17F1	0DB0
30.6000	0581	1AC0	31.2500	1641	0C00	31.9000	2701	0DC0
30.6125	0591	1ADC	31.2625	1651	0C10	31.9125	2711	0DD0
30.6250	05A1	1AE0	31.2750	1661	0C20	31.9250	2721	0DE0
30.6375	05B1	1AF0	31.2875	1671	0C30	31.9375	2731	0DF0

Table 3D (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
31.9500	2741	1D00	32.6000	0981	1E00	33.2500	1A41	0001
31.9625	2751	1D10	32.6125	0991	1E00	33.2625	1A51	0011
31.9750	2761	1D20	32.6250	09A1	1EE0	33.2750	1A61	0021
31.9875	2771	1D30	32.6375	09B1	1EF0	33.2875	1A71	0031
32.0000	0801	1D40	32.6500	09C1	2E00	33.3000	1A81	0041
32.0125	0811	1D50	32.6625	09D1	2E10	33.3125	1A91	0051
32.0250	0821	1D60	32.6750	09E1	2E20	33.3250	1AA1	0061
32.0375	0831	1D70	32.6875	09F1	2E30	33.3375	1AB1	0071
32.0500	0841	1D80	32.7000	1901	2E40	33.3500	1AC1	0081
32.0625	0851	1D90	32.7125	1911	2E50	33.3625	1AD1	0091
32.0750	0861	1DA0	32.7250	1921	2E60	33.3750	1AE1	00A1
32.0875	0871	1DB0	32.7375	1931	2E70	33.3875	1AF1	00B1
32.1000	0881	1DC0	32.7500	1941	0F00	33.4000	2A01	00C1
32.1125	0891	1DD0	32.7625	1951	0F10	33.4125	2A11	00D1
32.1250	08A1	1DE0	32.7750	1961	0F20	33.4250	2A21	00E1
32.1375	08B1	1DF0	32.7875	1971	0F30	33.4375	2A31	00F1
32.1500	08C1	2D00	32.8000	1981	0F40	33.4500	2A41	1001
32.1625	08D1	2D10	32.8125	1991	0F50	33.4625	2A51	1011
32.1750	08E1	2D20	32.8250	19A1	0F60	33.4750	2A61	1021
32.1875	08F1	2D30	32.8375	19B1	0F70	33.4875	2A71	1031
32.2000	1801	2D40	32.8500	19C1	0F80	33.5000	0B01	1041
32.2125	1811	2D50	32.8625	19D1	0F90	33.5125	0B11	1051
32.2250	1821	2D60	32.8750	19E1	0FA0	33.5250	0B21	1061
32.2375	1831	2D70	32.8875	19F1	0FB0	33.5375	0B31	1071
32.2500	1841	0E00	32.9000	2901	0FC0	33.5500	0B41	1081
32.2625	1851	0E10	32.9125	2911	0FD0	33.5625	0B51	1091
32.2750	1861	0E20	32.9250	2921	0FE0	33.5750	0B61	10A1
32.2875	1871	0E30	32.9375	2931	0FF0	33.5875	0B71	10B1
32.3000	1881	0E40	32.9500	2941	1F00	33.6000	0B81	10C1
32.3125	1891	0E50	32.9625	2951	1F10	33.6125	0B91	10D1
32.3250	18A1	0E60	32.9750	2961	1F20	33.6250	0BA1	10E1
32.3375	18B1	0E70	32.9875	2971	1F30	33.6375	0BB1	10F1
32.3500	18C1	0E80	33.0000	0A01	1F40	33.6500	0BC1	2001
32.3625	18D1	0E90	33.0125	0A11	1F50	33.6625	0BD1	2011
32.3750	18E1	0EA0	33.0250	0A21	1F60	33.6750	0BE1	2021
32.3875	18F1	0EB0	33.0375	0A31	1F70	33.6875	0BF1	2031
32.4000	2801	0EC0	33.0500	0A41	1F80	33.7000	1B01	2041
32.4125	2811	0ED0	33.0625	0A51	1F90	33.7125	1B11	2051
32.4250	2821	0EE0	33.0750	0A61	1FA0	33.7250	1B21	2061
32.4375	2831	0EF0	33.0875	0A71	1FB0	33.7375	1B31	2071
32.4500	2841	1E00	33.1000	0A81	1FC0	33.7500	1B41	0101
32.4625	2851	1E10	33.1125	0A91	1FD0	33.7625	1B51	0111
32.4750	2861	1E20	33.1250	0AA1	1FE0	33.7750	1B61	0121
32.4875	2871	1E30	33.1375	0AB1	1FF0	33.7875	1B71	0131
32.5000	0901	1E40	33.1500	0AC1	2F00	33.8000	1B81	0141
32.5125	0911	1E50	33.1625	0AD1	2F10	33.8125	1B91	0151
32.5250	0921	1E60	33.1750	0AE1	2F20	33.8250	1BA1	0161
32.5375	0931	1E70	33.1875	0AF1	2F30	33.8375	1BB1	0171
32.5500	0941	1E80	33.2000	1A01	2F40	33.8500	1BC1	0181
32.5625	0951	1E90	33.2125	1A11	2F50	33.8625	1BD1	0191
32.5750	0961	1EA0	33.2250	1A21	2F60	33.8750	1BE1	01A1
32.5875	0971	1EB0	33.2375	1A31	2F70	33.8875	1BF1	01B1

Table 3D (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
33.9000	2B01	01C1	34.5500	0D41	1281	35.2000	1E01	2341
33.9125	2B11	01D1	34.5625	0D51	1291	35.2125	1E11	2351
33.9250	2B21	01E1	34.5750	0D61	12A1	35.2250	1E21	2361
33.9375	2B31	01F1	34.5875	0D71	12B1	35.2375	1E31	2371
33.9500	2B41	1101	34.6000	0D81	12C1	35.2500	1E41	0401
33.9625	2B51	1111	34.6125	0D91	12D1	35.2625	1E51	0411
33.9750	2B61	1121	34.6250	0DA1	12E1	35.2750	1E61	0421
33.9875	2B71	1131	34.6375	0DB1	12F1	35.2875	1E71	0431
34.0000	0C01	1141	34.6500	0DC1	2201	35.3000	1E81	0441
34.0125	0C11	1151	34.6625	0DD1	2211	35.3125	1E91	0451
34.0250	0C21	1161	34.6750	0DE1	2221	35.3250	1EA1	0461
34.0375	0C31	1171	34.6875	0DF1	2231	35.3375	1EB1	0471
34.0500	0C41	1181	34.7000	1D01	2241	35.3500	1EC1	0481
34.0625	0C51	1191	34.7125	1D11	2251	35.3625	1ED1	0491
34.0750	0C61	11A1	34.7250	1D21	2261	35.3750	1EE1	04A1
34.0875	0C71	11B1	34.7375	1D31	2271	35.3875	1EF1	04B1
34.1000	0C81	11C1	34.7500	1D41	0301	35.4000	2E01	04C1
34.1125	0C91	11D1	34.7625	1D51	0311	35.4125	2E11	04D1
34.1250	0CA1	11E1	34.7750	1D61	0321	35.4250	2E21	04E1
34.1375	0CB1	11F1	34.7875	1D71	0331	35.4375	2E31	04F1
34.1500	0CC1	2101	34.8000	1D81	0341	35.4500	2E41	1401
34.1625	0CD1	2111	34.8125	1D91	0351	35.4625	2E51	1411
34.1750	0CE1	2121	34.8250	1DA1	0361	35.4750	2E61	1421
34.1875	0CF1	2131	34.8375	1DB1	0371	35.4875	2E71	1431
34.2000	1C01	2141	34.8500	1DC1	0381	35.5000	0F01	1441
34.2125	1C11	2151	34.8625	1DD1	0391	35.5125	0F11	1451
34.2250	1C21	2161	34.8750	1DE1	03A1	35.5250	0F21	1461
34.2375	1C31	2171	34.8875	1DF1	03B1	35.5375	0F31	1471
34.2500	1C41	0201	34.9000	2D01	03C1	35.5500	0F41	1481
34.2625	1C51	0211	34.9125	2D11	03D1	35.5625	0F51	1491
34.2750	1C61	0221	34.9250	2D21	03E1	35.5750	0F61	14A1
34.2875	1C71	0231	34.9375	2D31	03F1	35.5875	0F71	14B1
34.3000	1C81	0241	34.9500	2D41	1301	35.6000	0F81	14C1
34.3125	1C91	0251	34.9625	2D51	1311	35.6125	0F91	14D1
34.3250	1CA1	0261	34.9750	2D61	1321	35.6250	0FA1	14E1
34.3375	1CB1	0271	34.9875	2D71	1331	35.6375	0FB1	14F1
34.3500	1CC1	0281	35.0000	0E01	1341	35.6500	0FC1	2401
34.3625	1CD1	0291	35.0125	0E11	1351	35.6625	0FD1	2411
34.3750	1CE1	02A1	35.0250	0E21	1361	35.6750	0FE1	2421
34.3875	1CF1	02B1	35.0375	0E31	1371	35.6875	0FF1	2431
34.4000	2C01	02C1	35.0500	0E41	1381	35.7000	1F01	2441
34.4125	2C11	02D1	35.0625	0E51	1391	35.7125	1F11	2451
34.4250	2C21	02E1	35.0750	0E61	13A1	35.7250	1F21	2461
34.4375	2C31	02F1	35.0875	0E71	13B1	35.7375	1F31	2471
34.4500	2C41	1201	35.1000	0E81	13C1	35.7500	1F41	0501
34.4625	2C51	1211	35.1125	0E91	13D1	35.7625	1F51	0511
34.4750	2C61	1221	35.1250	0EA1	13E1	35.7750	1F61	0521
34.4875	2C71	1231	35.1375	0EB1	13F1	35.7875	1F71	0531
34.5000	0D01	1241	35.1500	0EC1	2301	35.8000	1F81	0541
34.5125	0D11	1251	35.1625	0ED1	2311	35.8125	1F91	0551
34.5250	0D21	1261	35.1750	0EF1	2321	35.8250	1FA1	0561
34.5375	0D31	1271	35.1875	0EF1	2331	35.8375	1FB1	0571

Table 3D (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
35.8500	1FC1	0581	36.5000	0102	1641	37.1500	02C2	2701
35.8625	1FD1	0591	36.5125	0112	1651	37.1625	02D2	2711
35.8750	1FE1	05A1	36.5250	0122	1661	37.1750	02E2	2721
35.8875	1FF1	05B1	36.5375	0132	1671	37.1875	02F2	2731
35.9000	2F01	05C1	36.5500	0142	1681	37.2000	1202	2741
35.9125	2F11	05D1	36.5625	0152	1691	37.2125	1212	2751
35.9250	2F21	05E1	36.5750	0162	16A1	37.2250	1222	2761
35.9375	2F31	05F1	36.5875	0172	16B1	37.2375	1232	2771
35.9500	2F41	1501	36.6000	0182	16C1	37.2500	1242	0801
35.9625	2F51	1511	36.6125	0192	16D1	37.2625	1252	0811
35.9750	2F61	1521	36.6250	01A2	16E1	37.2750	1262	0821
35.9875	2F71	1531	36.6375	01B2	16F1	37.2875	1272	0831
36.0000	0002	1541	36.6500	01C2	2601	37.3000	1282	0841
36.0125	0012	1551	36.6625	01D2	2611	37.3125	1292	0851
36.0250	0022	1561	36.6750	01E2	2621	37.3250	12A2	0861
36.0375	0032	1571	36.6875	01F2	2631	37.3375	12B2	0871
36.0500	0042	1581	36.7000	1102	2641	37.3500	12C2	0881
36.0625	0052	1591	36.7125	1112	2651	37.3625	12D2	0891
36.0750	0062	15A1	36.7250	1122	2661	37.3750	12E2	08A1
36.0875	0072	15B1	36.7375	1132	2671	37.3875	12F2	08B1
36.1000	0082	15C1	36.7500	1142	0701	37.4000	2202	08C1
36.1125	0092	15D1	36.7625	1152	0711	37.4125	2212	08D1
36.1250	00A2	15E1	36.7750	1162	0721	37.4250	2222	08E1
36.1375	00B2	15F1	36.7875	1172	0731	37.4375	2232	08F1
36.1500	00C2	2501	36.8000	1182	0741	37.4500	2242	1801
36.1625	00D2	2511	36.8125	1192	0751	37.4625	2252	1811
36.1750	00E2	2521	36.8250	11A2	0761	37.4750	2262	1821
36.1875	00F2	2531	36.8375	11B2	0771	37.4875	2272	1831
36.2000	1002	2541	36.8500	11C2	0781	37.5000	0302	1841
36.2125	1012	2551	36.8625	11D2	0791	37.5125	0312	1851
36.2250	1022	2561	36.8750	11E2	07A1	37.5250	0322	1861
36.2375	1032	2571	36.8875	11F2	07B1	37.5375	0332	1871
36.2500	1042	0601	36.9000	2102	07C1	37.5500	0342	1881
36.2625	1052	0611	36.9125	2112	07D1	37.5625	0352	1891
36.2750	1062	0621	36.9250	2122	07E1	37.5750	0362	18A1
36.2875	1072	0631	36.9375	2132	07F1	37.5875	0372	18B1
36.3000	1082	0641	36.9500	2142	1701	37.6000	0382	18C1
36.3125	1092	0651	36.9625	2152	1711	37.6125	0392	18D1
36.3250	10A2	0661	36.9750	2162	1721	37.6250	03A2	18E1
36.3375	10B2	0671	36.9875	2172	1731	37.6375	03B2	18F1
36.3500	10C2	0681	37.0000	0202	1741	37.6500	03C2	2801
36.3625	10D2	0691	37.0125	0212	1751	37.6625	03D2	2811
36.3750	10E2	06A1	37.0250	0222	1761	37.6750	03E2	2821
36.3875	10F2	06B1	37.0375	0232	1771	37.6875	03F2	2831
36.4000	2002	06C1	37.0500	0242	1781	37.7000	1302	2841
36.4125	2012	06D1	37.0625	0252	1791	37.7125	1312	2851
36.4250	2022	06E1	37.0750	0262	17A1	37.7250	1322	2861
36.4375	2032	06F1	37.0875	0272	17B1	37.7375	1332	2871
36.4500	2042	1601	37.1000	0282	17C1	37.7500	1342	0901
36.4625	2052	1611	37.1125	0292	17D1	37.7625	1352	0911
36.4750	2062	1621	37.1250	02A2	17E1	37.7750	1362	0921
36.4875	2072	1631	37.1375	02B2	17F1	37.7875	1372	0931

Table 3D (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
37.8000	1382	0941	38.4500	2442	1A01	39.1000	0682	18C1
37.8125	1392	0951	38.4625	2452	1A11	39.1125	0692	18D1
37.8250	13A2	0961	38.4750	2462	1A21	39.1250	06A2	18E1
37.8375	13B2	0971	38.4875	2472	1A31	39.1375	06B2	18F1
37.8500	13C2	0981	38.5000	0502	1A41	39.1500	06C2	2801
37.8625	13D2	0991	38.5125	0512	1A51	39.1625	06D2	2811
37.8750	13E2	09A1	38.5250	0522	1A61	39.1750	06E2	2821
37.8875	13F2	09B1	38.5375	0532	1A71	39.1875	06F2	2831
37.9000	2302	09C1	38.5500	0542	1A81	39.2000	1602	2841
37.9125	2312	09D1	38.5625	0552	1A91	39.2125	1612	2851
37.9250	2322	09E1	38.5750	0562	1AA1	39.2250	1622	2861
37.9375	2332	09F1	38.5875	0572	1AB1	39.2375	1632	2871
37.9500	2342	1901	38.6000	0582	1AC1	39.2500	1642	0C01
37.9625	2352	1911	38.6125	0592	1AD1	39.2625	1652	0C11
37.9750	2362	1921	38.6250	05A2	1AE1	39.2750	1662	0C21
37.9875	2372	1931	38.6375	05B2	1AF1	39.2875	1672	0C31
38.0000	0402	1941	38.6500	05C2	2A01	39.3000	1682	0C41
38.0125	0412	1951	38.6625	05D2	2A11	39.3125	1692	0C51
38.0250	0422	1961	38.6750	05E2	2A21	39.3250	16A2	0C61
38.0375	0432	1971	38.6875	05F2	2A31	39.3375	16B2	0C71
38.0500	0442	1981	38.7000	1502	2A41	39.3500	16C2	0C81
38.0625	0452	1991	38.7125	1512	2A51	39.3625	16D2	0C91
38.0750	0462	19A1	38.7250	1522	2A61	39.3750	16E2	0CA1
38.0875	0472	19B1	38.7375	1532	2A71	39.3875	16F2	0CB1
38.1000	0482	19C1	38.7500	1542	0B01	39.4000	2602	0CC1
38.1125	0492	19D1	38.7625	1552	0B11	39.4125	2612	0CD1
38.1250	04A2	19E1	38.7750	1562	0B21	39.4250	2622	0CE1
38.1375	04B2	19F1	38.7875	1572	0B31	39.4375	2632	0CF1
38.1500	04C2	2901	38.8000	1582	0B41	39.4500	2642	1C01
38.1625	04D2	2911	38.8125	1592	0B51	39.4625	2652	1C11
38.1750	04E2	2921	38.8250	15A2	0B61	39.4750	2662	1C21
38.1875	04F2	2931	38.8375	15B2	0B71	39.4875	2672	1C31
38.2000	1402	2941	38.8500	15C2	0B81	39.5000	0702	1C41
38.2125	1412	2951	38.8625	15D2	0B91	39.5125	0712	1C51
38.2250	1422	2961	38.8750	15E2	0BA1	39.5250	0722	1C61
38.2375	1432	2971	38.8875	15F2	0BB1	39.5375	0732	1C71
38.2500	1442	0A01	38.9000	2502	0RC1	39.5500	0742	1C81
38.2625	1452	0A11	38.9125	2512	0RD1	39.5625	0752	1C91
38.2750	1462	0A21	38.9250	2522	0BE1	39.5750	0762	1CA1
38.2875	1472	0A31	38.9375	2532	0BF1	39.5875	0772	1CB1
38.3000	1482	0A41	38.9500	2542	1B01	39.6000	0782	1CC1
38.3125	1492	0A51	38.9625	2552	1B11	39.6125	0792	1CD1
38.3250	14A2	0A61	38.9750	2562	1B21	39.6250	07A2	1CE1
38.3375	14B2	0A71	38.9875	2572	1B31	39.6375	07B2	1CF1
38.3500	14C2	0A81	39.0000	0602	1B41	39.6500	07C2	2C01
38.3625	14D2	0A91	39.0125	0612	1B51	39.6625	07D2	2C11
38.3750	14E2	0AA1	39.0250	0622	1B61	39.6750	07E2	2C21
38.3875	14F2	0AB1	39.0375	0632	1B71	39.6875	07F2	2C31
38.4000	2402	0AC1	39.0500	0642	1B81	39.7000	1702	2C41
38.4125	2412	0AD1	39.0625	0652	1B91	39.7125	1712	2C51
38.4250	2422	0AE1	39.0750	0662	1BA1	39.7250	1722	2C61
38.4375	2432	0AF1	39.0875	0672	1BB1	39.7375	1732	2C71

Table 3D (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
39.7500	1742	0D01	40.4000	2802	0EC1	41.0500	0A42	1F81
39.7625	1752	0D11	40.4125	2812	0FD1	41.0625	0A52	1F91
39.7750	1762	0D21	40.4250	2822	0EE1	41.0750	0A62	1FA1
39.7875	1772	0D31	40.4375	2832	0EF1	41.0875	0A72	1FB1
39.8000	1782	0D41	40.4500	2842	1E01	41.1000	0A82	1FC1
39.8125	1792	0D51	40.4625	2852	1E11	41.1125	0A92	1FD1
39.8250	17A2	0D61	40.4750	2862	1E21	41.1250	0AA2	1FE1
39.8375	17B2	0D71	40.4875	2872	1E31	41.1375	0AB2	1FF1
39.8500	17C2	0D81	40.5000	0902	1E41	41.1500	0AC2	2F01
39.8625	17D2	0D91	40.5125	0912	1E51	41.1625	0AD2	2F11
39.8750	17E2	0DA1	40.5250	0922	1E61	41.1750	0AE2	2F21
39.8875	17F2	0DB1	40.5375	0932	1E71	41.1875	0AF2	2F31
39.9000	2702	0DC1	40.5500	0942	1E81	41.2000	1A02	2F41
39.9125	2712	0DD1	40.5625	0952	1E91	41.2125	1A12	2F51
39.9250	2722	0DE1	40.5750	0962	1EA1	41.2250	1A22	2F61
39.9375	2732	0DF1	40.5875	0972	1EB1	41.2375	1A32	2F71
39.9500	2742	1D01	40.6000	0982	1EC1	41.2500	1A42	0002
39.9625	2752	1D11	40.6125	0992	1ED1	41.2625	1A52	0012
39.9750	2762	1D21	40.6250	09A2	1EE1	41.2750	1A62	0022
39.9875	2772	1D31	40.6375	09B2	1EF1	41.2875	1A72	0032
40.0000	0802	1D41	40.6500	09C2	2E01	41.3000	1A82	0042
40.0125	0812	1D51	40.6625	09D2	2E11	41.3125	1A92	0052
40.0250	0822	1D61	40.6750	09E2	2E21	41.3250	1AA2	0062
40.0375	0832	1D71	40.6875	09F2	2E31	41.3375	1AB2	0072
40.0500	0842	1D81	40.7000	1902	2E41	41.3500	1AC2	0082
40.0625	0852	1D91	40.7125	1912	2E51	41.3625	1AD2	0092
40.0750	0862	1DA1	40.7250	1922	2E61	41.3750	1AE2	00A2
40.0875	0872	1DB1	40.7375	1932	2E71	41.3875	1AF2	00B2
40.1000	0882	1DC1	40.7500	1942	0F01	41.4000	2A02	00C2
40.1125	0892	1DD1	40.7625	1952	0F11	41.4125	2A12	00D2
40.1250	08A2	1DE1	40.7750	1962	0F21	41.4250	2A22	00E2
40.1375	08B2	1DF1	40.7875	1972	0F31	41.4375	2A32	00F2
40.1500	08C2	2D01	40.8000	1982	0F41	41.4500	2A42	1002
40.1625	08D2	2D11	40.8125	1992	0F51	41.4625	2A52	1012
40.1750	08E2	2D21	40.8250	19A2	0F61	41.4750	2A62	1022
40.1875	08F2	2D31	40.8375	19B2	0F71	41.4875	2A72	1032
40.2000	1802	2D41	40.8500	19C2	0F81	41.5000	0B02	1042
40.2125	1812	2D51	40.8625	19D2	0F91	41.5125	0B12	1052
40.2250	1822	2D61	40.8750	19E2	0FA1	41.5250	0B22	1062
40.2375	1832	2D71	40.8875	19F2	0FB1	41.5375	0B32	1072
40.2500	1842	0E01	40.9000	2902	0FC1	41.5500	0B42	1082
40.2625	1852	0E11	40.9125	2912	0FD1	41.5625	0B52	1092
40.2750	1862	0E21	40.9250	2922	0FE1	41.5750	0B62	10A2
40.2875	1872	0E31	40.9375	2932	0FF1	41.5875	0B72	10B2
40.3000	1882	0E41	40.9500	2942	1F01	41.6000	0B82	10C2
40.3125	1892	0E51	40.9625	2952	1F11	41.6125	0B92	10D2
40.3250	18A2	0E61	40.9750	2962	1F21	41.6250	0BA2	10E2
40.3375	18B2	0E71	40.9875	2972	1F31	41.6375	0BB2	10F2
40.3500	18C2	0E81	41.0000	0A02	1F41	41.6500	0BC2	2002
40.3625	18D2	0E91	41.0125	0A12	1F51	41.6625	0BD2	2012
40.3750	18E2	0EA1	41.0250	0A22	1F61	41.6750	0BE2	2022
40.3875	18F2	0EB1	41.0375	0A32	1F71	41.6875	0BF2	2032

Table 3D (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
41.7000	1B02	2042	42.3500	1CC2	0282	43.0000	0E02	1342
41.7125	1B12	2052	42.3625	1CD2	0292	43.0125	0E12	1352
41.7250	1B22	2062	42.3750	1CE2	02A2	43.0250	0E22	1362
41.7375	1B32	2072	42.3875	1CF2	02B2	43.0375	0E32	1372
41.7500	1B42	0102	42.4000	2C02	02C2	43.0500	0E42	1382
41.7625	1B52	0112	42.4125	2C12	02D2	43.0625	0E52	1392
41.7750	1B62	0122	42.4250	2C22	02E2	43.0750	0E62	13A2
41.7875	1B72	0132	42.4375	2C32	02F2	43.0875	0E72	13B2
41.8000	1B82	0142	42.4500	2C42	1202	43.1000	0E82	13C2
41.8125	1B92	0152	42.4625	2C52	1212	43.1125	0E92	13D2
41.8250	1BA2	0162	42.4750	2C62	1222	43.1250	0EA2	13E2
41.8375	1BB2	0172	42.4875	2C72	1232	43.1375	0EB2	13F2
41.8500	1BC2	0182	42.5000	0D02	1242	43.1500	0EC2	2302
41.8625	1BD2	0192	42.5125	0D12	1252	43.1625	0ED2	2312
41.8750	1BE2	01A2	42.5250	0D22	1262	43.1750	0EE2	2322
41.8875	1BF2	01B2	42.5375	0D32	1272	43.1875	0EF2	2332
41.9000	2B02	01C2	42.5500	0D42	1282	43.2000	1E02	2342
41.9125	2B12	01D2	42.5625	0D52	1292	43.2125	1E12	2352
41.9250	2B22	01E2	42.5750	0D62	12A2	43.2250	1E22	2362
41.9375	2B32	01F2	42.5875	0D72	12B2	43.2375	1E32	2372
41.9500	2B42	1102	42.6000	0D82	12C2	43.2500	1E42	0402
41.9625	2B52	1112	42.6125	0D92	12D2	43.2625	1E52	0412
41.9750	2B62	1122	42.6250	0DA2	12E2	43.2750	1E62	0422
41.9875	2B72	1132	42.6375	0DB2	12F2	43.2875	1E72	0432
42.0000	0C02	1142	42.6500	0DC2	2202	43.3000	1E82	0442
42.0125	0C12	1152	42.6625	0DD2	2212	43.3125	1E92	0452
42.0250	0C22	1162	42.6750	0DE2	2222	43.3250	1EA2	0462
42.0375	0C32	1172	42.6875	0DF2	2232	43.3375	1EB2	0472
42.0500	0C42	1182	42.7000	1D02	2242	43.3500	1EC2	0482
42.0625	0C52	1192	42.7125	1D12	2252	43.3625	1ED2	0492
42.0750	0C62	11A2	42.7250	1D22	2262	43.3750	1EE2	04A2
42.0875	0C72	11B2	42.7375	1D32	2272	43.3875	1EF2	04B2
42.1000	0C82	11C2	42.7500	1D42	0302	43.4000	2E02	04C2
42.1125	0C92	11D2	42.7625	1D52	0312	43.4125	2E12	04D2
42.1250	0CA2	11E2	42.7750	1D62	0322	43.4250	2E22	04E2
42.1375	0CB2	11F2	42.7875	1D72	0332	43.4375	2E32	04F2
42.1500	0CC2	2102	42.8000	1D82	0342	43.4500	2E42	1402
42.1625	0CD2	2112	42.8125	1D92	0352	43.4625	2E52	1412
42.1750	0CE2	2122	42.8250	1DA2	0362	43.4750	2E62	1422
42.1875	0CF2	2132	42.8375	1DB2	0372	43.4875	2E72	1432
42.2000	1C02	2142	42.8500	1DC2	0382	43.5000	0F02	1442
42.2125	1C12	2152	42.8625	1DD2	0392	43.5125	0F12	1452
42.2250	1C22	2162	42.8750	1DE2	03A2	43.5250	0F22	1462
42.2375	1C32	2172	42.8875	1DF2	03B2	43.5375	0F32	1472
42.2500	1C42	0202	42.9000	2D02	03C2	43.5500	0F42	1482
42.2625	1C52	0212	42.9125	2D12	03D2	43.5625	0F52	1492
42.2750	1C62	0222	42.9250	2D22	03E2	43.5750	0F62	14A2
42.2875	1C72	0232	42.9375	2D32	03F2	43.5875	0F72	14B2
42.3000	1C82	0242	42.9500	2D42	1302	43.6000	0F82	14C2
42.3125	1C92	0252	42.9625	2D52	1312	43.6125	0F92	14D2
42.3250	1CA2	0262	42.9750	2D62	1322	43.6250	0FA2	14E2
42.3375	1CB2	0272	42.9875	2D72	1332	43.6375	0FB2	14F2

Table 3D (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
43.6500	0FC2	2402	44.3000	1083	0642	44.9500	2143	1702
43.6625	0FD2	2412	44.3125	1093	0652	44.9625	2153	1712
43.6750	0FE2	2422	44.3250	10A3	0662	44.9750	2163	1722
43.6875	0FF2	2432	44.3375	10B3	0672	44.9875	2173	1732
43.7000	1F02	2442	44.3500	10C3	0682	45.0000	0203	1742
43.7125	1F12	2452	44.3625	10D3	0692	45.0125	0213	1752
43.7250	1F22	2462	44.3750	10E3	06A2	45.0250	0223	1762
43.7375	1F32	2472	44.3875	10F3	06B2	45.0375	0233	1772
43.7500	1F42	0502	44.4000	2003	06C2	45.0500	0243	1782
43.7625	1F52	0512	44.4125	2013	06D2	45.0625	0253	1792
43.7750	1F62	0522	44.4250	2023	06E2	45.0750	0263	17A2
43.7875	1F72	0532	44.4375	2033	06F2	45.0875	0273	17B2
43.8000	1F82	0542	44.4500	2043	1602	45.1000	0283	17C2
43.8125	1F92	0552	44.4625	2053	1612	45.1125	0293	17D2
43.8250	1FA2	0562	44.4750	2063	1622	45.1250	02A3	17E2
43.8375	1FB2	0572	44.4875	2073	1632	45.1375	02B3	17F2
43.8500	1FC2	0582	44.5000	0103	1642	45.1500	02C3	2702
43.8625	1FD2	0592	44.5125	0113	1652	45.1625	02D3	2712
43.8750	1FE2	05A2	44.5250	0123	1662	45.1750	02E3	2722
43.8875	1FF2	05B2	44.5375	0133	1672	45.1875	02F3	2732
43.9000	2F02	05C2	44.5500	0143	1682	45.2000	1203	2742
43.9125	2F12	05D2	44.5625	0153	1692	45.2125	1213	2752
43.9250	2F22	05E2	44.5750	0163	16A2	45.2250	1223	2762
43.9375	2F32	05F2	44.5875	0173	16B2	45.2375	1233	2772
43.9500	2F42	1502	44.6000	0183	16C2	45.2500	1243	0802
43.9625	2F52	1512	44.6125	0193	16D2	45.2625	1253	0812
43.9750	2F62	1522	44.6250	01A3	16E2	45.2750	1263	0822
43.9875	2F72	1532	44.6375	01B3	16F2	45.2875	1273	0832
44.0000	0003	1542	44.6500	01C3	2602	45.3000	1283	0842
44.0125	0013	1552	44.6625	01D3	2612	45.3125	1293	0852
44.0250	0023	1562	44.6750	01E3	2622	45.3250	12A3	0862
44.0375	0033	1572	44.6875	01F3	2632	45.3375	12B3	0872
44.0500	0043	1582	44.7000	1103	2642	45.3500	12C3	0882
44.0625	0053	1592	44.7125	1113	2652	45.3625	12D3	0892
44.0750	0063	15A2	44.7250	1123	2662	45.3750	12E3	08A2
44.0875	0073	15B2	44.7375	1133	2672	45.3875	12F3	08B2
44.1000	0083	15C2	44.7500	1143	0702	45.4000	2203	08C2
44.1125	0093	15D2	44.7625	1153	0712	45.4125	2213	08D2
44.1250	00A3	15E2	44.7750	1163	0722	45.4250	2223	08E2
44.1375	00B3	15F2	44.7875	1173	0732	45.4375	2233	08F2
44.1500	00C3	2502	44.8000	1183	0742	45.4500	2243	1802
44.1625	00D3	2512	44.8125	1193	0752	45.4625	2253	1812
44.1750	00E3	2522	44.8250	11A3	0762	45.4750	2263	1822
44.1875	00F3	2532	44.8375	11B3	0772	45.4875	2273	1832
44.2000	1003	2542	44.8500	11C3	0782	45.5000	0303	1842
44.2125	1013	2552	44.8625	11D3	0792	45.5125	0313	1852
44.2250	1023	2562	44.8750	11E3	07A2	45.5250	0323	1862
44.2375	1033	2572	44.8875	11F3	07B2	45.5375	0333	1872
44.2500	1043	0602	44.9000	2103	07C2	45.5500	0343	1882
44.2625	1053	0612	44.9125	2113	07D2	45.5625	0353	1892
44.2750	1063	0622	44.9250	2123	07E2	45.5750	0363	18A2
44.2875	1073	0632	44.9375	2133	07F2	45.5875	0373	18B2

Table 3D (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
45.6000	0383	18C2	46.2500	1443	0A02	46.9000	2503	08C2
45.6125	0393	18D2	46.2625	1453	0A12	46.9125	2513	08D2
45.6250	03A3	18E2	46.2750	1463	0A22	46.9250	2523	08E2
45.6375	03B3	18F2	46.2875	1473	0A32	46.9375	2533	08F2
45.6500	03C3	2802	46.3000	1483	0A42	46.9500	2543	1802
45.6625	03D3	2812	46.3125	1493	0A52	46.9625	2553	1812
45.6750	03E3	2822	46.3250	14A3	0A62	46.9750	2563	1822
45.6875	03F3	2832	46.3375	14B3	0A72	46.9875	2573	1832
45.7000	1303	2842	46.3500	14C3	0A82	47.0000	0603	1842
45.7125	1313	2852	46.3625	14D3	0A92	47.0125	0613	1852
45.7250	1323	2862	46.3750	14E3	0AA2	47.0250	0623	1862
45.7375	1333	2872	46.3875	14F3	0AB2	47.0375	0633	1872
45.7500	1343	0902	46.4000	2403	0AC2	47.0500	0643	1882
45.7625	1353	0912	46.4125	2413	0AD2	47.0625	0653	1892
45.7750	1363	0922	46.4250	2423	0AE2	47.0750	0663	18A2
45.7875	1373	0932	46.4375	2433	0AF2	47.0875	0673	18B2
45.8000	1383	0942	46.4500	2443	1A02	47.1000	0683	18C2
45.8125	1393	0952	46.4625	2453	1A12	47.1125	0693	18D2
45.8250	13A3	0962	46.4750	2463	1A22	47.1250	06A3	18E2
45.8375	13B3	0972	46.4875	2473	1A32	47.1375	06B3	18F2
45.8500	13C3	0982	46.5000	0503	1A42	47.1500	06C3	2802
45.8625	13D3	0992	46.5125	0513	1A52	47.1625	06D3	2812
45.8750	13E3	09A2	46.5250	0523	1A62	47.1750	06E3	2822
45.8875	13F3	09B2	46.5375	0533	1A72	47.1875	06F3	2832
45.9000	2303	09C2	46.5500	0543	1A82	47.2000	1603	2842
45.9125	2313	09D2	46.5625	0553	1A92	47.2125	1613	2852
45.9250	2323	09E2	46.5750	0563	1AA2	47.2250	1623	2862
45.9375	2333	09F2	46.5875	0573	1AB2	47.2375	1633	2872
45.9500	2343	1902	46.6000	0583	1AC2	47.2500	1643	0C02
45.9625	2353	1912	46.6125	0593	1AD2	47.2625	1653	0C12
45.9750	2363	1922	46.6250	05A3	1AE2	47.2750	1663	0C22
45.9875	2373	1932	46.6375	05B3	1AF2	47.2875	1673	0C32
46.0000	0403	1942	46.6500	05C3	2A02	47.3000	1683	0C42
46.0125	0413	1952	46.6625	05D3	2A12	47.3125	1693	0C52
46.0250	0423	1962	46.6750	05E3	2A22	47.3250	16A3	0C62
46.0375	0433	1972	46.6875	05F3	2A32	47.3375	16B3	0C72
46.0500	0443	1982	46.7000	1503	2A42	47.3500	16C3	0C82
46.0625	0453	1992	46.7125	1513	2A52	47.3625	16D3	0C92
46.0750	0463	19A2	46.7250	1523	2A62	47.3750	16E3	0CA2
46.0875	0473	19B2	46.7375	1533	2A72	47.3875	16F3	0CB2
46.1000	0483	19C2	46.7500	1543	0B02	47.4000	2603	0CC2
46.1125	0493	19D2	46.7625	1553	0B12	47.4125	2613	0CD2
46.1250	04A3	19E2	46.7750	1563	0B22	47.4250	2623	0CE2
46.1375	04B3	19F2	46.7875	1573	0B32	47.4375	2633	0CF2
46.1500	04C3	2902	46.8000	1583	0B42	47.4500	2643	1C02
46.1625	04D3	2912	46.8125	1593	0B52	47.4625	2653	1C12
46.1750	04E3	2922	46.8250	15A3	0B62	47.4750	2663	1C22
46.1875	04F3	2932	46.8375	15B3	0B72	47.4875	2673	1C32
46.2000	1403	2942	46.8500	15C3	0B82	47.5000	0703	1C42
46.2125	1413	2952	46.8625	15D3	0B92	47.5125	0713	1C52
46.2250	1423	2962	46.8750	15E3	0BA2	47.5250	0723	1C62
46.2375	1433	2972	46.8875	15F3	0BB2	47.5375	0733	1C72

Table 3D (Continued)

FREQ	-TX-	-RX-	FREQ	-TX-	-RX-	FREQ	-TX-	-RX-
47.5500	0743	1C82	48.2000	1803	2D42	48.8500	19C3	0F82
47.5625	0753	1C92	48.2125	1813	2D52	48.8625	19D3	0F92
47.5750	0763	1CA2	48.2250	1823	2D62	48.8750	19E3	0FA2
47.5875	0773	1CB2	48.2375	1833	2D72	48.8875	19F3	0FB2
47.6000	0783	1CC2	48.2500	1843	0E02	48.9000	2903	0FC2
47.6125	0793	1CD2	48.2625	1853	0E12	48.9125	2913	0FD2
47.6250	07A3	1CE2	48.2750	1863	0E22	48.9250	2923	0FE2
47.6375	07B3	1CF2	48.2875	1873	0E32	48.9375	2933	0FF2
47.6500	07C3	2C02	48.3000	1883	0E42	48.9500	2943	1F02
47.6625	07D3	2C12	48.3125	1893	0E52	48.9625	2953	1F12
47.6750	07E3	2C22	48.3250	18A3	0E62	48.9750	2963	1F22
47.6875	07F3	2C32	48.3375	18B3	0E72	48.9875	2973	1F32
47.7000	1703	2C42	48.3500	18C3	0E82	49.0000	0A03	1F42
47.7125	1713	2C52	48.3625	18D3	0E92	49.0125	0A13	1F52
47.7250	1723	2C62	48.3750	18E3	0EA2	49.0250	0A23	1F62
47.7375	1733	2C72	48.3875	18F3	0EB2	49.0375	0A33	1F72
47.7500	1743	0D02	48.4000	2803	0EC2	49.0500	0A43	1F82
47.7625	1753	0D12	48.4125	2813	0ED2	49.0625	0A53	1F92
47.7750	1763	0D22	48.4250	2823	0EE2	49.0750	0A63	1FA2
47.7875	1773	0D32	48.4375	2833	0EF2	49.0875	0A73	1FB2
47.8000	1783	0D42	48.4500	2843	1E02	49.1000	0A83	1FC2
47.8125	1793	0D52	48.4625	2853	1E12	49.1125	0A93	1FD2
47.8250	17A3	0D62	48.4750	2863	1E22	49.1250	0AA3	1FE2
47.8375	17B3	0D72	48.4875	2873	1E32	49.1375	0AB3	1FF2
47.8500	17C3	0D82	48.5000	0903	1E42	49.1500	0AC3	2F02
47.8625	17D3	0D92	48.5125	0913	1E52	49.1625	0AD3	2F12
47.8750	17E3	0DA2	48.5250	0923	1E62	49.1750	0AE3	2F22
47.8875	17F3	0DB2	48.5375	0933	1E72	49.1875	0AF3	2F32
47.9000	2703	0DC2	48.5500	0943	1E82	49.2000	1A03	2F42
47.9125	2713	0DD2	48.5625	0953	1E92	49.2125	1A13	2F52
47.9250	2723	0DE2	48.5750	0963	1EA2	49.2250	1A23	2F62
47.9375	2733	0DF2	48.5875	0973	1EB2	49.2375	1A33	2F72
47.9500	2743	1002	48.6000	0983	1EC2	49.2500	1A43	0003
47.9625	2753	1012	48.6125	0993	1ED2	49.2625	1A53	0013
47.9750	2763	1022	48.6250	09A3	1EE2	49.2750	1A63	0023
47.9875	2773	1032	48.6375	09B3	1EF2	49.2875	1A73	0033
48.0000	0803	1042	48.6500	09C3	2E02	49.3000	1A83	0043
48.0125	0813	1052	48.6625	09D3	2E12	49.3125	1A93	0053
48.0250	0823	1062	48.6750	09E3	2E22	49.3250	1AA3	0063
48.0375	0833	1072	48.6875	09F3	2E32	49.3375	1AB3	0073
48.0500	0843	1082	48.7000	1903	2E42	49.3500	1AC3	0083
48.0625	0853	1092	48.7125	1913	2E52	49.3625	1AD3	0093
48.0750	0863	1DA2	48.7250	1923	2E62	49.3750	1AE3	00A3
48.0875	0873	1DB2	48.7375	1933	2E72	49.3875	1AF3	00B3
48.1000	0883	1DC2	48.7500	1943	0F02	49.4000	2A03	00C3
48.1125	0893	1DD2	48.7625	1953	0F12	49.4125	2A13	00D3
48.1250	08A3	1DE2	48.7750	1963	0F22	49.4250	2A23	00E3
48.1375	08B3	1DF2	48.7875	1973	0F32	49.4375	2A33	00F3
48.1500	08C3	2D02	48.8000	1983	0F42	49.4500	2A43	1003
48.1625	08D3	2D12	48.8125	1993	0F52	49.4625	2A53	1013
48.1750	08E3	2D22	48.8250	19A3	0F62	49.4750	2A63	1023
48.1875	08F3	2D32	48.8375	19B3	0F72	49.4875	2A73	1033

Table 3D (Continued)

FREQ	-TX-	-RX-
49.5000	0B03	1043
49.5125	0B13	1053
49.5250	0B23	1063
49.5375	0B33	1073
49.5500	0B43	1083
49.5625	0B53	1093
49.5750	0B63	10A3
49.5875	0B73	10B3
49.6000	0B83	10C3
49.6125	0B93	10D3
49.6250	0BA3	10E3
49.6375	0BB3	10F3
49.6500	0BC3	2003
49.6625	0BD3	2013
49.6750	0BE3	2023
49.6875	0BF3	2033
49.7000	1B03	2043
49.7125	1B13	2053
49.7250	1B23	2063
49.7375	1B33	2073
49.7500	1B43	0103
49.7625	1B53	0113
49.7750	1B63	0123
49.7875	1B73	0133
49.8000	1B83	0143
49.8125	1B93	0153
49.8250	1B43	0163
49.8375	1B83	0173
49.8500	1BC3	0183
49.8625	1BD3	0193
49.8750	1BE3	01A3
49.8875	1BF3	01B3
49.9000	2B03	01C3
49.9125	2B13	01D3
49.9250	2B23	01E3
49.9375	2B33	01F3
49.9500	2B43	1103
49.9625	2B53	1113
49.9750	2B63	1123
49.9875	2B73	1133
50.0000	0C03	1143

ESTIMATED VALUES

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Table 3D Hexadecimal frequency Data, low-band MegaE, low-side injection, 5.25 mhz, 25-khz spac

MHZ	TX			RX			MHZ	TX			RX		
49.5750	0 B	6	3	1	0	A	3						
49.5875	0 B	7	3	1	0	B	3						
49.6000	0 B	8	3	1	0	C	3						
49.6125	0 B	9	3	1	0	D	3						
49.6250	0 B	A	3	1	0	E	3						
49.6375	0 B	B	3	1	0	F	3						
49.6500	0 B	C	3	2	0	0	3						
49.6625	0 B	D	3	2	0	1	3						
49.6750	0 B	E	3	2	0	2	3						
49.6875	0 B	F	3	2	0	3	3						
49.7000	1 B	0	3	2	0	4	3						
49.7125	1 B	1	3	2	0	5	3						
49.7250	1 B	2	3	2	0	6	3						
49.7375	1 B	3	3	2	0	7	3						
49.7500	1 B	4	3	0	1	0	3						
49.7625	1 B	5	3	0	1	1	3						
49.7750	1 B	6	3	0	1	2	3						
49.7875	1 B	7	3	0	1	3	3						
49.8000	1 B	8	3	0	1	4	3						
49.8125	1 B	9	3	0	1	5	3						
49.8250	1 B	A	3	0	1	6	3						
49.8375	1 B	B	3	0	1	7	3						
49.8500	1 B	C	3	0	1	8	3						
49.8625	1 B	D	3	0	1	9	3						
49.8750	1 B	E	3	0	1	A	3						
49.8875	1 B	F	3	0	1	B	3						
49.9000	2 B	0	3	0	1	C	3						
49.9125	2 B	1	3	0	1	D	3						
49.9250	2 B	2	3	0	1	E	3						
49.9375	2 B	3	3	0	1	F	3						
49.9500	2 B	4	3	1	1	0	3						
49.9625	2 B	5	3	1	1	1	3						
49.9750	2 B	6	3	1	1	2	3						
49.9875	2 B	7	3	1	1	3	3						
50.0000	0 C	0	3	1	1	4	3	52.0000	0 F	0	3	1 5 4 3	
50.0125	0 C	1	3	1	1	5	3	52.0125	0 F	1	3	1 5 5 3	
50.0250	0 C	2	3	1	1	6	3	52.0250	0 F	2	3	1 5 6 3	
50.0375	0 C	3	3	1	1	7	3	52.0375	0 F	3	3	1 5 7 3	
50.0500	0 C	4	3	1	1	8	3	52.0500	0 F	4	3	1 5 8 3	
50.0625	0 C	5	3	1	1	9	3	52.0625	0 F	5	3	1 5 9 3	
50.0750	0 C	6	3	1	1	A	3	52.0750	0 F	6	3	1 5 A 3	
50.0875	0 C	7	3	1	1	B	3	52.0875	0 F	7	3	1 5 B 3	
50.1000	0 C	8	3	1	1	C	3	52.1000	0 F	8	3	1 5 C 3	
50.1125	0 C	9	3	1	1	D	3	52.1125	0 F	9	3	1 5 D 3	
50.1250	0 C	A	3	1	1	E	3	52.1250	0 F	A	3	1 5 E 3	
50.1375	0 C	B	3	1	1	F	3	52.1375	0 F	B	3	1 5 F 3	
50.1500	0 C	C	3	2	1	0	3	52.1500	0 F	C	3	2 5 0 3	
50.1625	0 C	D	3	2	1	1	3	52.1625	0 F	D	3	2 5 1 3	
50.1750	0 C	E	3	2	1	2	3	52.1750	0 F	E	3	2 5 2 3	

50.1875	0 C	F	3	2	1	3	3	52.1875	0 F	F	3	2	5	3	3
50.2000	1 C	0	3	2	1	4	3	52.2000	1 F	0	3	2	5	4	3
50.2125	1 C	1	3	2	1	5	3	52.2125	1 F	1	3	2	5	5	3
50.2250	1 C	2	3	2	1	6	3	52.2250	1 F	2	3	2	5	6	3
50.2375	1 C	3	3	2	1	7	3	52.2375	1 F	3	3	2	5	7	3
50.2500	1 C	4	3	0	2	0	3	52.2500	1 F	4	3	0	6	0	3
50.2625	1 C	5	3	0	2	1	3	52.2625	1 F	5	3	0	6	1	3
50.2750	1 C	6	3	0	2	2	3	52.2750	1 F	6	3	0	6	2	3
50.2875	1 C	7	3	0	2	3	3	52.2875	1 F	7	3	0	6	3	3
50.3000	1 C	8	3	0	2	4	3	52.3000	1 F	8	3	0	6	4	3
50.3125	1 C	9	3	0	2	5	3	52.3125	1 F	9	3	0	6	5	3
50.3250	1 C	A	3	0	2	6	3	52.3250	1 F	A	3	0	6	6	3
50.3375	1 C	B	3	0	2	7	3	52.3375	1 F	B	3	0	6	7	3
50.3500	1 C	C	3	0	2	8	3	52.3500	1 F	C	3	0	6	8	3
50.3625	1 C	D	3	0	2	9	3	52.3625	1 F	D	3	0	6	9	3
50.3750	1 C	E	3	0	2	A	3	52.3750	1 F	E	3	0	6	A	3
50.3875	1 C	F	3	0	2	B	3	52.3875	1 F	F	3	0	6	B	3
50.4000	2 C	0	3	0	2	C	3	52.4000	2 F	0	3	0	6	C	3
50.4125	2 C	1	3	0	2	D	3	52.4125	2 F	1	3	0	6	D	3
50.4250	2 C	2	3	0	2	E	3	52.4250	2 F	2	3	0	6	E	3
50.4375	2 C	3	3	0	2	F	3	52.4375	2 F	3	3	0	6	F	3
50.4500	2 C	4	3	1	2	0	3	52.4500	2 F	4	3	1	6	0	3
50.4625	2 C	5	3	1	2	1	3	52.4625	2 F	5	3	1	6	1	3
50.4750	2 C	6	3	1	2	2	3	52.4750	2 F	6	3	1	6	2	3
50.4875	2 C	7	3	1	2	3	3	52.4875	2 F	7	3	1	6	3	3
50.5000	0 D	0	3	1	2	4	3	52.5000	0 0	0	4	1	6	4	3
50.5125	0 D	1	3	1	2	5	3	52.5125	0 0	1	4	1	6	5	3
50.5250	0 D	2	3	1	2	6	3	52.5250	0 0	2	4	1	6	6	3
50.5375	0 D	3	3	1	2	7	3	52.5375	0 0	3	4	1	6	7	3
50.5500	0 D	4	3	1	2	8	3	52.5500	0 0	4	4	1	6	8	3
50.5625	0 D	5	3	1	2	9	3	52.5625	0 0	5	4	1	6	9	3
50.5750	0 D	6	3	1	2	A	3	52.5750	0 0	6	4	1	6	A	3
50.5875	0 D	7	3	1	2	B	3	52.5875	0 0	7	4	1	6	B	3
50.6000	0 D	8	3	1	2	C	3	52.6000	0 0	8	4	1	6	C	3
50.6125	0 D	9	3	1	2	D	3	52.6125	0 0	9	4	1	6	D	3
50.6250	0 D	A	3	1	2	E	3	52.6250	0 0	A	4	1	6	E	3
50.6375	0 D	B	3	1	2	F	3	52.6375	0 0	B	4	1	6	F	3
50.6500	0 D	C	3	2	2	0	3	52.6500	0 0	C	4	2	6	0	3
50.6625	0 D	D	3	2	2	1	3	52.6625	0 0	D	4	2	6	1	3
50.6750	0 D	E	3	2	2	2	3	52.6750	0 0	E	4	2	6	2	3
50.6875	0 D	F	3	2	2	3	3	52.6875	0 0	F	4	2	6	3	3
50.7000	1 D	0	3	2	2	4	3	52.7000	1 0	0	4	2	6	4	3
50.7125	1 D	1	3	2	2	5	3	52.7125	1 0	1	4	2	6	5	3
50.7250	1 D	2	3	2	2	6	3	52.7250	1 0	2	4	2	6	6	3
50.7375	1 D	3	3	2	2	7	3	52.7375	1 0	3	4	2	6	7	3
50.7500	1 D	4	3	0	3	0	3	52.7500	1 0	4	4	0	7	0	3
50.7625	1 D	5	3	0	3	1	3	52.7625	1 0	5	4	0	7	1	3
50.7750	1 D	6	3	0	3	2	3	52.7750	1 0	6	4	0	7	2	3
50.7875	1 D	7	3	0	3	3	3	52.7875	1 0	7	4	0	7	3	3
50.8000	1 D	8	3	0	3	4	3	52.8000	1 0	8	4	0	7	4	3
50.8125	1 D	9	3	0	3	5	3	52.8125	1 0	9	4	0	7	5	3
50.8250	1 D	A	3	0	3	6	3	52.8250	1 0	A	4	0	7	6	3

50.8375	1 D B 3	0 3 7 3	52.8375	1 0 B 4	0 7 7 3
50.8500	1 D C 3	0 3 8 3	52.8500	1 0 C 4	0 7 8 3
50.8625	1 D D 3	0 3 9 3	52.8625	1 0 D 4	0 7 9 3
50.8750	1 D E 3	0 3 A 3	52.8750	1 0 E 4	0 7 A 3
50.8875	1 D F 3	0 3 B 3	52.8875	1 0 F 4	0 7 B 3
50.9000	2 D 0 3	0 3 C 3	52.9000	2 0 0 4	0 7 C 3
50.9125	2 D 1 3	0 3 D 3	52.9125	2 0 1 4	0 7 D 3
50.9250	2 D 2 3	0 3 E 3	52.9250	2 0 2 4	0 7 E 3
50.9375	2 D 3 3	0 3 F 3	52.9375	2 0 3 4	0 7 F 3
50.9500	2 D 4 3	1 3 0 3	52.9500	2 0 4 4	1 7 0 3
50.9625	2 D 5 3	1 3 1 3	52.9625	2 0 5 4	1 7 1 3
50.9750	2 D 6 3	1 3 2 3	52.9750	2 0 6 4	1 7 2 3
50.9875	2 D 7 3	1 3 3 3	52.9875	2 0 7 4	1 7 3 3
51.0000	0 E 0 3	1 3 4 3	53.0000	0 1 0 4	1 7 4 3
51.0125	0 E 1 3	1 3 5 3	53.0125	0 1 1 4	1 7 5 3
51.0250	0 E 2 3	1 3 6 3	53.0250	0 1 2 4	1 7 6 3
51.0375	0 E 3 3	1 3 7 3	53.0375	0 1 3 4	1 7 7 3
51.0500	0 E 4 3	1 3 8 3	53.0500	0 1 4 4	1 7 8 3
51.0625	0 E 5 3	1 3 9 3	53.0625	0 1 5 4	1 7 9 3
51.0750	0 E 6 3	1 3 A 3	53.0750	0 1 6 4	1 7 A 3
51.0875	0 E 7 3	1 3 B 3	53.0875	0 1 7 4	1 7 B 3
51.1000	0 E 8 3	1 3 C 3	53.1000	0 1 8 4	1 7 C 3
51.1125	0 E 9 3	1 3 D 3	53.1125	0 1 9 4	1 7 D 3
51.1250	0 E A 3	1 3 E 3	53.1250	0 1 A 4	1 7 E 3
51.1375	0 E B 3	1 3 F 3	53.1375	0 1 B 4	1 7 F 3
51.1500	0 E C 3	2 3 0 3	53.1500	0 1 C 4	2 7 0 3
51.1625	0 E D 3	2 3 1 3	53.1625	0 1 D 4	2 7 1 3
51.1750	0 E E 3	2 3 2 3	53.1750	0 1 E 4	2 7 2 3
51.1875	0 E F 3	2 3 3 3	53.1875	0 1 F 4	2 7 3 3
51.2000	1 E 0 3	2 3 4 3	53.2000	1 1 0 4	2 7 4 3
51.2125	1 E 1 3	2 3 5 3	53.2125	1 1 1 4	2 7 5 3
51.2250	1 E 2 3	2 3 6 3	53.2250	1 1 2 4	2 7 6 3
51.2375	1 E 3 3	2 3 7 3	53.2375	1 1 3 4	2 7 7 3
51.2500	1 E 4 3	0 4 0 3	53.2500	1 1 4 4	0 8 0 3
51.2625	1 E 5 3	0 4 1 3	53.2625	1 1 5 4	0 8 1 3
51.2750	1 E 6 3	0 4 2 3	53.2750	1 1 6 4	0 8 2 3
51.2875	1 E 7 3	0 4 3 3	53.2875	1 1 7 4	0 8 3 3
51.3000	1 E 8 3	0 4 4 3	53.3000	1 1 8 4	0 8 4 3
51.3125	1 E 9 3	0 4 5 3	53.3125	1 1 9 4	0 8 5 3
51.3250	1 E A 3	0 4 6 3	53.3250	1 1 A 4	0 8 6 3
51.3375	1 E B 3	0 4 7 3	53.3375	1 1 B 4	0 8 7 3
51.3500	1 E C 3	0 4 8 3	53.3500	1 1 C 4	0 8 8 3
51.3625	1 E D 3	0 4 9 3	53.3625	1 1 D 4	0 8 9 3
51.3750	1 E E 3	0 4 A 3	53.3750	1 1 E 4	0 8 A 3
51.3875	1 E F 3	0 4 B 3	53.3875	1 1 F 4	0 8 B 3
51.4000	2 E 0 3	0 4 C 3	53.4000	2 1 0 4	0 8 C 3
51.4125	2 E 1 3	0 4 D 3	53.4125	2 1 1 4	0 8 D 3
51.4250	2 E 2 3	0 4 E 3	53.4250	2 1 2 4	0 8 E 3
51.4375	2 E 3 3	0 4 F 3	53.4375	2 1 3 4	0 8 F 3
51.4500	2 E 4 3	1 4 0 3	53.4500	2 1 4 4	1 8 0 3
51.4625	2 E 5 3	1 4 1 3	53.4625	2 1 5 4	1 8 1 3
51.4750	2 E 6 3	1 4 2 3	53.4750	2 1 6 4	1 8 2 3

51.4875	2 E	7 3	1 4 3 3	53.4875	2 1 7 4	1 8 3 3
51.5000	0 E	0 3	1 4 4 3	53.5000	0 2 0 4	1 8 4 3
51.5125	0 E	1 3	1 4 5 3	53.5125	0 2 1 4	1 8 5 3
51.5250	0 E	2 3	1 4 6 3	53.5250	0 2 2 4	1 8 6 3
51.5375	0 E	3 3	1 4 7 3	53.5375	0 2 3 4	1 8 7 3
51.5500	0 E	4 3	1 4 8 3	53.5500	0 2 4 4	1 8 8 3
51.5625	0 E	5 3	1 4 9 3	53.5625	0 2 5 4	1 8 9 3
51.5750	0 E	6 3	1 4 A 3	53.5750	0 2 6 4	1 8 A 3
51.5875	0 E	7 3	1 4 B 3	53.5875	0 2 7 4	1 8 B 3
51.6000	0 E	8 3	1 4 C 3	53.6000	0 2 8 4	1 8 C 3
51.6125	0 E	9 3	1 4 D 3	53.6125	0 2 9 4	1 8 D 3
51.6250	0 E	A 3	1 4 E 3	53.6250	0 2 A 4	1 8 E 3
51.6375	0 E	B 3	1 4 F 3	53.6375	0 2 B 4	1 8 F 3
51.6500	0 E	C 3	2 4 0 3	53.6500	0 2 C 4	2 8 0 3
51.6625	0 E	D 3	2 4 1 3	53.6625	0 2 D 4	2 8 1 3
51.6750	0 E	E 3	2 4 2 3	53.6750	0 2 E 4	2 8 2 3
51.6875	0 E	F 3	2 4 3 3	53.6875	0 2 F 4	2 8 3 3
51.7000	1 E	0 3	2 4 4 3	53.7000	1 2 0 4	2 8 4 3
51.7125	1 E	1 3	2 4 5 3	53.7125	1 2 1 4	2 8 5 3
51.7250	1 E	2 3	2 4 6 3	53.7250	1 2 2 4	2 8 6 3
51.7375	1 E	3 3	2 4 7 3	53.7375	1 2 3 4	2 8 7 3
51.7500	1 E	4 3	0 5 0 3	53.7500	1 2 4 4	0 9 0 3
51.7625	1 E	5 3	0 5 1 3	53.7625	1 2 5 4	0 9 1 3
51.7750	1 E	6 3	0 5 2 3	53.7750	1 2 6 4	0 9 2 3
51.7875	1 E	7 3	0 5 3 3	53.7875	1 2 7 4	0 9 3 3
51.8000	1 E	8 3	0 5 4 3	53.8000	1 2 8 4	0 9 4 3
51.8125	1 E	9 3	0 5 5 3	53.8125	1 2 9 4	0 9 5 3
51.8250	1 E	A 3	0 5 6 3	53.8250	1 2 A 4	0 9 6 3
51.8375	1 E	B 3	0 5 7 3	53.8375	1 2 B 4	0 9 7 3
51.8500	1 E	C 3	0 5 8 3	53.8500	1 2 C 4	0 9 8 3
51.8625	1 E	D 3	0 5 9 3	53.8625	1 2 D 4	0 9 9 3
51.8750	1 E	E 3	0 5 A 3	53.8750	1 2 E 4	0 9 A 3
51.8875	1 E	F 3	0 5 B 3	53.8875	1 2 F 4	0 9 B 3
51.9000	2 E	0 3	0 5 C 3	53.9000	2 2 0 4	0 9 C 3
51.9125	2 E	1 3	0 5 D 3	53.9125	2 2 1 4	0 9 D 3
51.9250	2 E	2 3	0 5 E 3	53.9250	2 2 2 4	0 9 E 3
51.9375	2 E	3 3	0 5 F 3	53.9375	2 2 3 4	0 9 F 3
51.9500	2 E	4 3	1 5 0 3	53.9500	2 2 4 4	1 9 0 3
51.9625	2 E	5 3	1 5 1 3	53.9625	2 2 5 4	1 9 1 3
51.9750	2 E	6 3	1 5 2 3	53.9750	2 2 6 4	1 9 2 3
51.9875	2 E	7 3	1 5 3 3	53.9875	2 2 7 4	1 9 3 3
52.0000	0 F	0 3	1 5 4 3	54.0000	0 3 0 4	1 9 4 3

Frequency Data Worksheet

VHF Low-Band Mega-E

Instructions: Use this sheet to record the hexadecimal data from Tables 3A-3D that correspond to the transmit and receive frequencies being used. The letters above the boxes identify the four-bit binary word represented by the hexadecimal data. The numbers below the boxes identify the corresponding hexadecimal addresses where the data are stored.

Receive Frequencies

Channel 1 Receive

B	C	A	D
0	1	2	3

Channel 2 Receive

B	C	A	D
4	5	6	7

Channel 3 Receive

B	C	A	D
8	9	A	B

Channel 4 Receive

B	C	A	D
C	D	E	F

Channel 5 Receive

B	C	A	D
10	11	12	13

Channel 6 Receive

B	C	A	D
14	15	16	17

Channel 7 Receive

B	C	A	D
18	19	1A	1B

Channel 8 Receive

B	C	A	D
1C	1D	1E	1F

Channel 9 Receive

B	C	A	D
20	21	22	23

Channel 10 Receive

B	C	A	D
24	25	26	27

Channel 11 Receive

B	C	A	D
28	29	2A	2B

Channel 12 Receive

B	C	A	D
2C	2D	2E	2F

For assistance or additional information, contact the Aerotron Customer Service Department.

Frequency Data Worksheet (Continued)

Channel 13 Receive

B	C	A	D
30	31	32	33

Channel 14 Receive

B	C	A	D
34	35	36	37

Channel 15 Receive

B	C	A	D
38	39	3A	3B

Channel 16 Receive

B	C	A	D
3C	3D	3E	3F

Transmit Frequencies

Channel 1 Transmit

B	C	A	D
100	101	102	103

Channel 2 Transmit

B	C	A	D
104	105	106	107

Channel 3 Transmit

B	C	A	D
108	109	10A	10B

Channel 4 Transmit

B	C	A	D
10C	10D	10E	10F

Channel 5 Transmit

B	C	A	D
110	111	112	113

Channel 6 Transmit

B	C	A	D
114	115	116	117

Channel 7 Transmit

B	C	A	D
118	119	11A	11B

Channel 8 Transmit

B	C	A	D
11C	11D	11E	11F

Channel 9 Transmit

B	C	A	D
120	121	122	123

For assistance or additional information, contact the Aerotron Customer Service Department.

Hexadecimal Conversion Worksheet (Continued)

Channel 10 Transmit

B	C	A	D
124	125	126	127

Channel 11 Transmit

B	C	A	D
128	129	12A	12B

Channel 12 Transmit

B	C	A	D
12C	12D	12E	12F

Channel 13 Transmit

B	C	A	D
130	131	132	133

Channel 14 Transmit

B	C	A	D
134	135	136	137

Channel 15 Transmit

B	C	A	D
138	139	13A	13B

Channel 16 Transmit

B	C	A	D
13C	13D	13E	13F

Section 4

Circuit Description

This section describes the operation of the various circuits used in the Mega-E. A block diagram is included at the end of this section (Figure 4-2).

4.1 Voltage Regulation

The 13.6-V vehicle battery functions as the source voltage for five separate regulated voltages developed by circuits in the Mega-E. A transistor switch, Q513, applies power to the transceiver circuits when the unit is turned on and activates the regulated voltage supplies.

4.1.1 Regulated 12.5 V

The regulated 12.5-V supply is used by the final amplifier and exciter stages of the transmitter. This supply comprises a differential amplifier (Q509 and Q510), a current booster (Q506), and two series pass transistors (Q511 and Q512); the pass transistors are mounted on the chassis heat sink. The regulated voltage is adjusted by R530.

Keying the transmitter grounds the push-to-talk (PTT) line, which forward biases Q505 and turns on the 12.5 V supply. Q504 functions as a transmit-inhibit switch and disables the 12.5-V supply whenever the synthesizer is out of lock.

4.1.2 Exciter/Power Amplifier Regulated Supply

The power control PC board contains a circuit that provides a regulated, adjustable voltage for the first stage of the power amplifier. This voltage, like the power control board, is turned on only when the transmitter is keyed. R516 is used to vary the output level from the power amplifier by varying the input excitation level.

The power control circuit also responds to excessive chassis heat or a high VSWR at the final amplifier. The temperature and the VSWR are monitored by IC601B and IC601A; if either condition occurs, these cause IC601D to switch and

reduce the voltage applied to the first stage of the power amplifier. This level of this voltage, which is called the *cutback level*, is preset by R521. If a cutback condition exists, the power control circuit will "latch" into the cutback condition until the PTT is released.

4.1.3 Regulated 10 V

The regulated 10-V circuit supplies the voltage needed by the 6.0- and 8.0-V regulators, all of the receiver circuits except for the power amplifier, and the speech processor. The 10.0-V regulator also provides the reference voltage for the 12.5-V regulator.

The 10.0-V regulator includes a differential amplifier (Q502 and Q503) that senses variations in between a fixed reference (CR503) and a voltage divider (R505, R506, and R509) that divides the voltage being regulated. The 10.0-V output is varied by R506. The differential amplifier supplies the base current for Q501, a series pass transistor.

4.1.4 Regulated 8 V

The regulated 8-V circuit, which provides the voltage for the voltage-controlled oscillator (VCO), comprises a low-current IC regulator (IC405) and related components mounted on the synthesizer PC board. A small pass transistor (Q412) raises the available power level and isolates the output voltage from the regulator circuit in order to provide an electrically quiet voltage source for the VCO. TP401, a red test point on the synthesizer PC board, is used to monitor this voltage.

4.1.5 Regulated 5 V

The regulated 5-V circuit provides the voltage needed by the synthesizer integrated circuits (IC401-IC404) and the programming components. This circuit uses a three-pin regulator integrated circuit that is thermally bonded to the front end of the transceiver chassis and is mounted in a

plug-in socket. It also uses the 10-V regulator output as a source voltage.

4.2 Frequency Synthesizer

The RF signals used by both the transmitter's exciter and the receiver's first local oscillator (LO) are generated by the frequency synthesizer. The synthesizer is enclosed in a shielded housing on the main PC board and includes both a plug-in synthesizer PC board, a temperature-compensated crystal oscillator (TCXO), the VCO, and the programming PC board. The VCO is permanently attached to the synthesizer PC board; the TCXO and programming boards are plug-in boards secured to the synthesizer PC board with screws.

4.2.1 TCXO

The TCXO, in conjunction with a high-stability crystal, generates a 4.8-MHz reference signal for the synthesizer. This signal provides a frequency stability of $\pm 0.0005\%$ between -30 and $+60^\circ\text{C}$ —the crystal provides the specified accuracy from $+60$ to -10°C , and the TCXO extends the range down to -30°C .

At temperatures below 0°C , the crystal frequency normally decreases. To compensate for this reduction, a thermistor-resistor network (R1, R4, and RT1) raises the bias applied to varactor diode CR4 from 3 to approximately 4.5 VDC at -30°C . The increased voltage reduces the crystal loading capacitance (which is usually 32 pF) and compensates for the normal decrease in frequency at low temperatures.

At higher temperatures (above $+50^\circ\text{C}$), the crystal frequency usually increases. A second thermistor-resistor network (R6, R14, and RT3) reduces the bias to approximately 2.5 V, which lowers the crystal frequency and compensates for the temperature increase. Diodes provide isolation between the thermistor-resistor networks.

A high-stability, air-dielectric capacitor is used to adjust the frequency. The TCXO is powered by the 10.0-V regulated supply, and the thermistor-resistor networks receive voltage from the 8.2-V zener-regulated supply.

4.2.2 Phase-locked loop and VCO

PLL. The phase-locked-loop (PLL) circuit controls the output of the VCO. The output of the TCXO is applied to IC402, which divides the 4.8-

MHz reference frequency and sends it to an internal phase comparator circuit. The comparator compares this signal with the output from the VCO to determine if the VCO is operating at the correct frequency. (The output of the VCO is applied to two buffer amplifiers; one, Q407, is a part of the PLL circuit. The output of this buffer amplifier is applied to IC401 and IC402, where it is divided and compared to the divided output of the TCXO.)

The comparator outputs error-frequency pulses that are filtered and applied to the VCO as a DC correction voltage. When in the proper range, the control voltage locks the PLL and holds the VCO at the correct frequency. When a different channel is selected, data stored in the EPROM is used to change the division rate as necessary to change the DC control voltage and adjust the VCO frequency to that of the new channel.

During scanning, a quad bilateral switch (IC406) switches the slow loop filter out of the circuit so that the fast loop filter can quickly lock the synthesizer as the channels are scanned. A scan switch line (J402-10) connected to the control head provides the switching signal.

VCO. The output of the VCO is applied to two buffer amplifiers. One, which was already discussed, is part of the PLL circuit. The other, Q701, is sent to either the first LO or the exciter, depending on whether the transceiver is receiving or transmitting. The path the VCO signal takes is determined by two PIN diodes, CR711 and CR712.

The VCO is located in a separate metal enclosure to minimize radiation and incidental frequency modulation that might be induced by component vibration. The loop filter components are also shielded to minimize noise interference. The VCO is isolated from load variations with both internal and external buffering. The components are "potted" in a special compound that inhibits vibration and are, therefore, not replaceable.

The VCO has the following inputs:

- regulated +8 V (8V), which is the source voltage for the VCO;
- 2- to 8-V control voltage (CV), which determines the frequency of the VCO;
- transmit audio signal (MOD), which is the modulated signal to be transmitted;
- +10-V offset voltage (OFFSET), which offsets the frequency by about 5.26 MHz when transmitting and receiving.

VCO Control Voltage. The DC control voltage, which determines whether or not the VCO is operating on frequency, can be monitored at TP16; a reading between 2 and 8 V indicates that the PLL is locked. The VCO is normally tuned to operate at approximately 4.0 V. The control voltage is buffered by Q410 and Q411 to provide isolation between the high-impedance loop filter and TP16.

VCO Offset. When 10 V is applied to the transmit/receive (T/R) input of the VCO (J401-1), transistors within the VCO switch the tuning components to lower the output frequency by approximately 5.26 MHz. The lower output can be used for either transmit or receive operation depending on whether R755 or R758 is installed (see Section 6).

Lock Detector. The lock-detector circuit (Q406 and Q409) inhibits the 12.5-V transmit source and prevents transmissions if the PLL becomes unlocked.

4.3 Receiver

The Mega-E uses a single-conversion superheterodyne receiver with 1, 4, or up to 16 channels in the 30- to 50-MHz VHF band.

4.3.1 Front end

The receiver front end consists of a two- and three-pole LC resonant filters and an RF preamplifier. The circuit provides the selectivity necessary to reject unwanted received signals as well as any receiver mixer injection signal that might be coupled to the antenna.

4.3.2 LO and mixer

The output of the RF preamplifier is applied to the gate of a field-effect transistor (FET) mixer (Q102) via a filter and an impedance-matching network; the local oscillator signal, which is generated by the VCO, is applied to the source. A double-pole filter provides impedance matching for the VCO-buffer amplifier and attenuates all unwanted injection products. Because the injection signal is 5.26 MHz away from the frequency of the operating channel, the intermediate frequency (IF) signal produced by the mixer is 5.26 MHz.

The noise blanker gating is accomplished between the mixer and the first IF matching circuit (L201) by Q103 and Q104, two junction field-effect transistors (JFETs).

4.3.3 IF circuit

The output of the mixer is applied via the impedance-matching network to FL201, a 5.26-MHz, monolithic crystal filter that is matched to two cascode bipolar amplifiers. The amplifiers provide gain and isolation between the filter and a FL202, a second, four-pole filter that follows the bipolar amplifiers. Matching is also provided by L201, L202, L205, and L209, which, in conjunction with the amplifiers, determine the noise figure, provide modest gain, and provide adequate isolation for the multifunction IF chip (IC201).

4.3.4 FM detection

The IF signal is applied to IC201, an amplifier-limiter-discriminator integrated circuit. Along with its associated components, this chip provides most of the gain, the differential limiting, and the FM detection of the audio signal. The detection circuit incorporates a quadrature detector that utilizes a monolithic discriminator filter (FL203).

The output of the detector is applied to Q205, an emitter follower. Q205 sends the low-impedance audio and wideband noise signal to the control head, where the signals are applied to the volume and squelch controls before being routed back, on separate wires, to the transceiver's squelch and audio-processing circuits.

4.3.5 Audio processing

The audio processing circuit (IC301B, Q301, and associated components) attenuate all signals below 300 Hz and above 3 kHz and provide a deemphasis of 6 dB/octave in the audio pass-band. An optional continuous-tone-coded squelch system (CTCSS) plug-in module provides additional attenuation below 300 Hz. The output of the audio-processing circuits is applied to a bridge power amplifier, IC303 and IC304.

4.3.6 Squelch

The noise and audio signal from the control head's squelch control is applied to the squelch filter and amplifier circuits in the transceiver (IC302A, B, and related components). These cir-

circuits remove all signals below 5 kHz and amplify whatever remains above 5 kHz. This signal is then applied to a detector, which, in conjunction with a voltage doubler (CR304 and CR303), produces a DC voltage. This voltage is applied to the squelch gate circuit (IC301A) and disables the audio signal when no on-channel signal is being received. When an on-channel signal is received, this voltage decreases and forward biases Q302, which turns on the audio processing circuits.

The point at which the squelch circuit turns the audio circuits on and off is determined by the setting of the squelch control knob in the control head. The circuit also includes an internal adjustment R321 (see section 5.3.5).

4.3.7 Audio power amplifier

The audio power amplifier includes two audio power amplifiers (IC303 and IC304) in a bridge configuration. These amplifiers, which are powered from the switched side of the 13.6-V supply, provide an audio signal of up to 12 W. Both sides of the audio output are isolated from ground and are connected to the control head. From the control head, the audio signal is applied to the external speaker or to an optional handset earpiece.

4.3.8 Noise blanker

The noise blanker is employed because communication channels in the 30–50 MHz portion of the spectrum are highly susceptible to atmospheric and artificial impulse noise. This noise, which can reach levels that totally obliterate weak or fringe-area signals, is compounded by highly selective, high-gain circuitry.

The Mega-E noise blanker removes most of the impulse noise before it can enter the IF section and degrade the receiver's performance. A separate front-end section is tuned to a frequency close to the programmed channels so that the noise blanker "hears" the same noise that causes interference in the transceiver.

Theory of operation. Noise enters the blanker and transceiver front end almost simultaneously. In the blanker, the noise signal is applied to a total of four tuned circuits and two high-gain amplifiers before it is detected and processed. In the

receiver, the signal goes through a total of *ix* tuned circuits between the front end and the mixer output. Because of the delay caused by the tuned circuits, the noise pulse appears in the blanker circuit first.

The processed noise signal—the noise pulse—is used to drive two FETs. The FETs gate the noise pulses off before they can enter the first IF filter. The blanking process effectively leaves "holes" in the received waveform equal to the duration of the noise pulse. The repetition rate of the blanking pulses is limited to 10–100 kHz.

Severe signal chopping normally experienced during extremely noisy conditions is inhibited by limiting the noise pulses and the resulting holes.

Mega-E Noise-Blanking Circuit. The noise blanker that is standard on the low-band Mega-E includes a separate front end that obtains its input from the signal at the antenna. The noise blanker is tuned to a clear channel approximately 4 MHz from the nearest receive channel on the opposite side of the LO injection signal. The front end includes a double-tuned LC network (L111 and L112) that is coupled to a high-gain cascode transistor amplifier (Q105 and Q106). The output of this amplifier is connected directly to another LC tuned circuit (L113), which is coupled to a high-gain LC amplifier (IC101). The output of IC101 is tuned to by L115 and applied to successive pulse-detection, amplification, and shaping stages (Q109–Q116).

The blanking pulses, which have a duration of about 3.5 μ sec, drive the noise gates that effectively attenuate the noise pulses from the front end after they leave the mixer but before they reach the first IF filter (FL201); this allows weak signals to be received and detected during high-noise conditions.

Several test points are included to facilitate maintenance and troubleshooting. TP19 is used to "tune up" a specific frequency.

4.4 Transmitter

The transmitter RF signal is derived from the VCO operating at the transmit channel frequency. The exact frequency is determined by data stored in the EPROM.

4.4.1 Transmit audio

The transmit audio signal from the microphone is adjusted by R705 (the microphone gain control potentiometer), preemphasized by C710 and R709, amplified and clipped by IC701B, and buffered by IC701A before being applied to the modulator. The deviation is controlled by R721.

The amplifier-clipper increases the audio to a level that sufficiently limits the peak-to-peak amplitude to a preset level. Signals below this level are passed without changing the waveform. The output of the limiter is applied to a low-pass filter that has a flat frequency response from 300–3000 Hz and provides a 60 log ($F/3$ kHz) rolloff above 3 kHz. High-stability capacitors keep thermal variations from causing changes in the frequency response.

The output of the buffer amplifier is applied to the modulation input of the VCO via R721, the deviation control.

Tone modulation occurs at the input of IC701A.

4.4.2 Exciter

The audio signal is mixed with the VCO signal in the VCO and applied to the exciter. The exciter includes two broadband stages. The first stage, the predriver (Q801), operates as a class A amplifier and provides sufficient excitation for the second stage, the driver (Q802). Q802 operates class C and provides a nominal output of 1 W. Neither stage is adjustable; adjustments are made by components on the power control PC board.

(In the transmit mode, the exciter stages receive voltage from the 12.5-V supply.)

TP2 and TP15 can be used to check for the presence of RF energy at the predriver and driver, respectively.

4.4.3 Final amplifier

The final amplifier is a two-stage, three-transistor circuit housed in a shielded section of the chassis heat sink. The supply voltage of the first stage of the power amplifier, Q901, comes from the power control PC board. The RF signal from the exciter is sent to the final amplifier via a coaxial cable.

The impedance of the input to the final amplifier is 50 Ω and utilizes an interstage matching network consisting of fixed inductors, fixed capacitors, and a variable capacitor (C901) that provide optimum coupling.

The final stage includes networks (both lumped constants and stripline sections) with two 60-W power sections summed with a Wilkinson power combiner that provides an output at 50 Ω . Two capacitors, C931 and C932, in the combiner can be adjusted for maximum amplifier efficiency.

A solid-state T/R switch, a VSWR-sensing circuit, and a low-pass filter are included within the final amplifier assembly.

T/R Switch. The solid-state T/R switch provides isolation between the transmitter and receiver. This switch includes two PIN diodes (CR902 and CR905), two DC-blocking capacitors (C944 and C945), and a discrete-component quarter-wave section (C939, L920, and C941).

Final Amplifier Protection. The switched output from the final amplifier is connected to a directional coupler or VSWR bridge. The bridge, in conjunction with a thermal sensor (RT601), provides sensing information to the power control board. Excessive VSWR or a high chassis temperature causes the power control board to reduce the voltage supplied to the exciter, which reduces the drive to the final amplifier to a preset level. The reduced drive level lowers the output of the final amplifier until the temperature and/or VSWR returns to acceptable levels.

4.4.4 Power control board

The power adjust (Figure 4-1) is normally set by pressing the microphone push-to-talk switch and adjusting R516 on the vertical board for desired power output. The voltage at IC601-9 varies from approximately 1.8V at minimum power to approximately 5.4V at maximum power. As the voltage on IC601-9 increases, the effective resistance between IC601-8 and ground decreases, which causes more current to flow. This increases the forward bias on Q603 and increases the current flowing through R623. This increases the forward bias on Q604, and the increased current raises the output voltage applied to the final amplifier. The output voltage varies from approximately 4.5V to 11.5V.

Q601 and Q602 assure that the power control circuit is cut off when the radio is in the receive mode. The

absence of 12.5V TX on the base of Q601 allows Q602 to conduct, which inhibits IC601.

Pressing the PTT switch on the vertical board or the activation of the cutback circuit (IC601 A,B, or D) effectively switches the cutback control potentiometer (R521) on the vertical board into the power control circuit. When the voltage at the cathode of CR505 is 0.6V below the voltage on IC601-9, an additional decrease of the voltage at the CR505 cathode will decrease the voltage on IC601-9, which decreases the output voltage of the circuit (and, consequently, the power output of the transmitter). The power adjust potentiometer (R516) on the vertical board always controls the maximum power output because CR505 is reverse biased if the cathode voltage increases to less than 0.6V below the voltage on IC601-9, which is established by R516.

If a high-reflected-power or a high-temperature condition occurs, IC601-A and -B on the power control board latch to a high output. Either condition forces pin 14 of IC601 low, which switches power cutback potentiometer R521 into the circuit.

Note

C624 has recently been added to the power control board. It is shown in the Figure 4-1 and included in the parts list, but, because of printed schedules, is not shown on the master schematic.

4.4.5 Low-pass filter

The final low-pass filter comprises four fixed inductors and eight fixed capacitors. It is not adjustable.

4.5 Time-Out Timer

Note

The time-out timer PC board described in this section is not used with the scan control head; the scan control head includes its own time-out timer circuit.

The optional time-out timer (TOT), which cuts off any transmission that exceeds 1 min, can be used alone or in conjunction with the optional CTCSS. The timed interval, which begins when the transmitter is keyed, is determined by IC1, C1, R1, and R2. When the predetermined interval has elapsed, a signal from IC1 causes the transmitter to shut down; it also sends a tone to the external speaker or handset.

The timing sequence begins when the transmitter is keyed and a ground is applied to pin 1 and the base of Q1, which places a high on pin 12 of IC1. When the time-out interval elapses, a signal from pin 3 of IC1 places highs on pins 10 and 11 of IC2. The high on pin 11 causes IC2-3 to go high, which

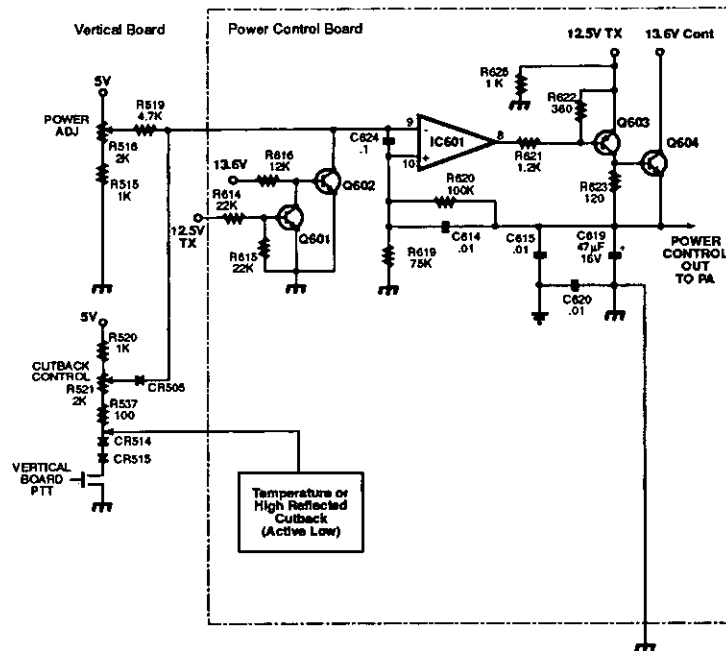


Figure 4-1. Power control board block diagram.

shuts down the transmitter. IC2-4 also goes high, which sends a tone (from IC1-9) to the input of the audio amplifier. The tone alarm continues until the microphone PTT switch is released; releasing the PTT switch resets the TOT circuit.

The TOT is installed on the seven-conductor pin jack. Jumper C, which is located near the pin jack, must be cut when the TOT is installed.

4.6 CTCSS

Note

The CTCSS system described here uses a single tone. Multitone systems are described in separate technical manuals.

The CTCSS system provides some measure of privacy on shared channels by decoding only those received signals that contain the correct subaudible tone; the system is designed so that each user on a given system can have a unique subaudible tone.

The CTCSS includes encode-decode and CTCSS accessory PC boards (the accessory PC board is used on all tone boards as well as on non-CTCSS radios with priority scan. The CTCSS function is enabled for a given channel by cutting an appropriate diode on the control PC board (the control board is located in the control head).

In the receive mode, the CTCSS functions only when the microphone or handset is placed in its hanger; with the microphone or handset in the hanger, only those transmitted signals that contain the correct subaudible tone will be demodulated by the receiver.

When transmitting, the CTCSS encoder causes the same subaudible tone frequency to be added to all transmitted signals.

The tone frequency can be adjusted in the field. See Section 5.

Receive Operation. Receive audio from the emitter of Q301 is applied to pin 1 of the CTCSS accessory PC board. The subaudible tone is removed from the signal by a filter (IC101), and the normal audio signal is sent to the receiver's audio amplifier (IC303 and IC304).

The receive audio is also applied to the CTCSS PC board. It is applied to low-pass filters IC2A and B,

which pass only the subaudible tone. The tone is coupled to the decode gate (IC4C), which is turned on whenever the microphone or handset is in its hanger. When the microphone or handset is in its hanger, IC4C sends the signal to an amplifier (IC3A) and then to a bi-quad filter (IC3B-D).

The correct tone (which is determined by the filter) places a high on the input decode switch (IC1B), which changes the output state of the integrated circuit and places a high on the collector of Q12. This high is applied to pin 12.

From pin 12, the signal is applied to the squelch gate (IC301A) and the busy indicator circuit. This high turns on the squelch gate and audio amplifiers. It does not turn on the busy indicator (a low is required to activate the busy indicator).

The wrong tone (or no tone) produces a low at pin 12. This turns off the audio circuits and turns on the busy indicator.

Tone frequencies from 67 to 120 Hz are encoded and decoded by the bi-quad filter. Removing jumpers J1 and J2 raises the frequency range from 100 to over 200 Hz. The filter is precisely tuned by R25.

Transmit Operation. The encode gate (IC4D) is turned on whenever the microphone or handset is removed from its hanger. This allows the bi-quad filter to function as an oscillator through a feedback loop (R31).

The tone produced by IC3 is applied to the modulator (IC701) via phase-reversal gates IC4A and B (the level of the tone is adjusted by R39). The tone signals, which are 180° out of phase, are selected at IC3B and D for rapid tone-squelch shutdown at the receiver.

A tone phase-reversal pulse generator on the accessory PC board (IC2) generates a positive pulse when the PTT switch is released that reverses the phase of the encoded tone (the tone comes from the encode-decode PC board whenever the transmitter is keyed); the transmitter remains keyed for the duration of the pulse. The squelch rapidly closes when the phase-inverted tone is transmitted.

When the transmitter is keyed, the PTT line on the accessory PC board (pin 6) is grounded. When the PTT switch is released, pin 6 immediately goes high, but pins 1 and 2 of IC2 are delayed and C13

charges through R14. As C13 charges, a pulse is generated at J9 and the transmitter remains keyed because of the low at IC2-4 (J8). The pulse from J9 is applied to pin 11 of the encode-decode PC board. The logic level at pin 11 of the CTCSS encode-decode printed circuit board, which is

normally low, determines the output selected from the phase-inverter gates. Whenever a transmission ends, the positive pulse from the CTCSS reverses the tone phase and eliminates the squelch tail burst that is usually heard at the end of a transmission.

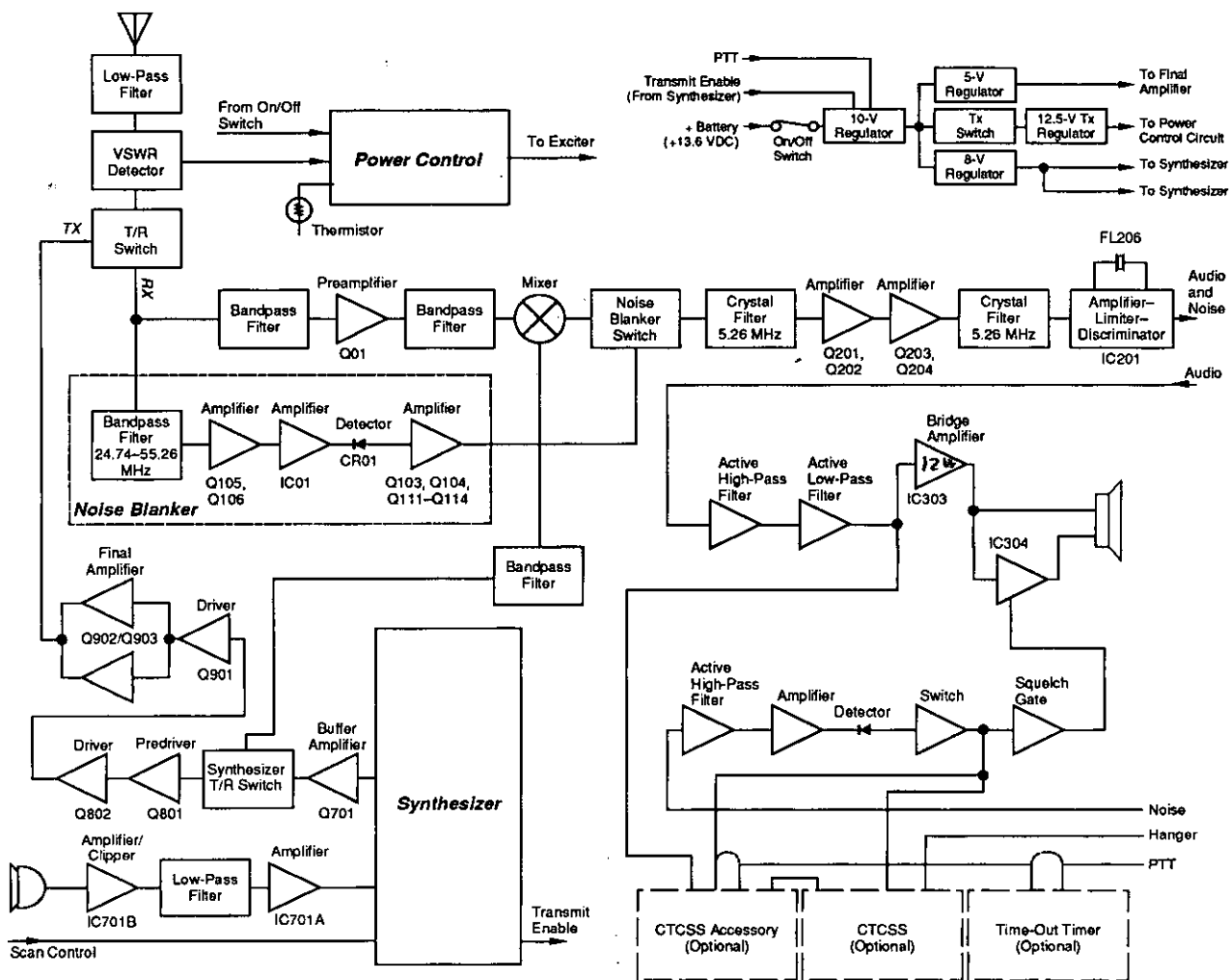


Figure 4-2. Mega-E VHF low-band transceiver block diagram.

Section 5

Maintenance

5.1 Introduction

5.1.1 PC board circuits

All major components in the Mega-E are mounted on PC boards that are mounted with screws or that plug into place. Faulty plug-in boards can be quickly replaced with known good boards so that the suspected board can be serviced at a more convenient time. Other malfunctioning boards can be repaired in place, or replacement boards can be installed.

Caution

The transceiver should be turned off and disconnected from the power source before a PC board or any other component is replaced.

5.1.2 Component replacement

When a component must be replaced, check the parts list and schematic diagram (Section 7) to determine the type, value, and part number. In many cases a component's type is critical and the component must not be replaced with a different type or value. All subminiature capacitors must be replaced by identical components. In some circuits, improperly substituted components may result in degraded or improper performance and could violate FCC regulations.

When removing components, do not use excessive heat or tension. Component removal can be facilitated by cutting the component-side (top) leads of the faulty component and then using a low-wattage soldering iron and needlenose pliers to remove the remaining leads. A solder sucker and/or solder wick can also be used to aid in component removal. Removing a component from plated-through holes can be somewhat more difficult

because of the pronounced solder-wicking effect that can occur.

When replacing a component, use a low-heat (30–40 W) soldering iron; use only rosin-core solder.

Because the pins are very delicate, use extreme caution when replacing dual in-line package (DIP) integrated circuits. Use an IC puller or similar tool to remove an IC from its socket—do not remove ICs by hand. When inserting an IC, line up one row of pins with the corresponding socket holes and then firmly press the IC into place. All socket-mounted ICs should be oriented so that the notch located at one end of the IC is aligned with the notch on the socket.

5.1.3 Component values

All resistor values are indicated by color codes (three bands indicating the value and one indicating the tolerance) or labels. Certain precision resistors have five bands: three bands indicate the significant figures, one indicates the multiplier, and the other indicates the tolerance. Other resistors may have a fifth band that indicates the quality of the component.

The value of most capacitors is stamped on the capacitor body, but, in some cases, the stamp may be a coded number-and-letter combination. Because manufacturers do not follow a standard capacitor-coding system, some judgment must be used. For example, a capacitor coded 271J, for example, has a value of 270 pF and a tolerance of 5%—the first two significant digits are indicated, but the actual value cannot be determined without referring to the schematic or the manufacturer's data.

Typical capacitor color coding is shown in Figure 5-1.

5.2 Troubleshooting

Note

To open the top cover, unlock and lower the carrying handle, press the square white button, and remove the cover.

5.2.1 Test equipment required

- DC power supply,
- RF wattmeter,
- 50-Ω load,
- AC voltmeter,
- DC voltmeter.

5.2.2 Preliminary steps

Before troubleshooting a unit, inspect the PC boards for damage (burned or charred areas, visibly damaged components and connectors, loose cables and wires, etc.). Inspect the power and control cables to insure that they are properly connected. Look for frayed cables and other obvious defects.

Before beginning the actual troubleshooting procedure, set up the test equipment as follows:

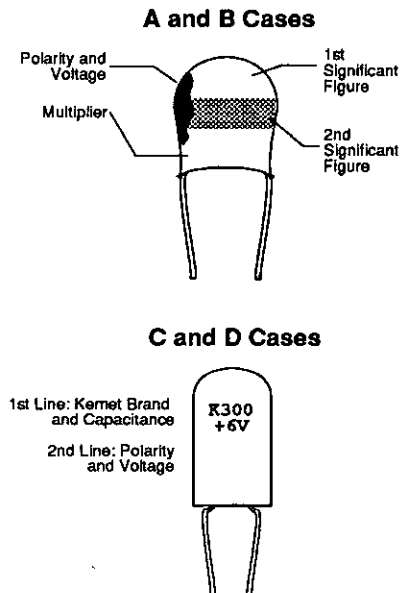
1. Set the output of the DC power supply for +13.6 VDC.
2. Using the 50-Ω load, connect the RF wattmeter to the antenna connector.
3. Connect the control head with the microphone (or handset), speaker, and control-power plug to the radio. Insure that all connections are secure.

5.2.3 Test points

Most of the test points used when aligning and troubleshooting the transceiver are accessible via the test socket on the master PCB. Other test points— such as the regulated +8 V for the VCO— are located nearby. TP1 and TP16 (pins 1 and 16) are toward the finned-heat-sink end of the radio: TP1 is closest to the left side of the radio, TP16 is closest to the synthesizer.

Caution

When taking a reading, use a miniature, insulated test probe and avoid contact with nearby pins.



A and B Cases Capacitance and Voltage Color Code

Rated Voltage (VDC at 25 C)	Color	1st Figure	2nd Figure	Multiplier (pF)
3-4	Black	0	0	x10
3-6	Brown	1	1	x10 ²
3-10	Red	2	2	x10 ³
3-15	Orange	3	3	x10 ⁴
3-20	Yellow	4	4	x10 ⁵
3-25	Green	5	5	x10 ⁶
3-35	Blue	6	6	x10 ⁷
3-50	Violet	7	7	
	Gray	8	8	
3	White	9	9	

Figure 5-1. Capacitor color coding.

Table 5-1. Test point-1037 selector switch functions.*

Pin/ Test Point	1037 Switch Setting	Function
1	4	Receiver injection (LO)
2	8	Transmit predriver
3	—	—
4	—	Audio out (-)
5	—	Audio out (+)
6	5	Receiver limiter
7	1	+10 V
8	7	+12.5 V (transmit)
9	—	Ground
10	—	PTT
11	2	+5 V
12	—	—
13	—	Microphone audio
14	6	PLL lock
15	9	Transmit driver
16	3	Control voltage
401	—	+8 V (synthesizer)
901	—	First stage (final amplifier)

* —, Not connected.

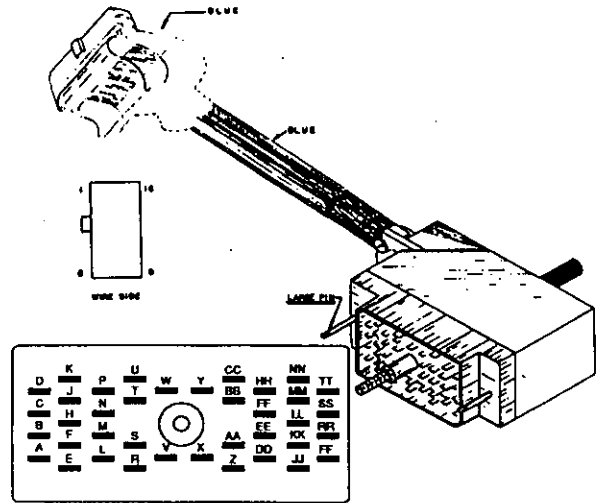


Figure 5-2. 1037 cable diagram.

An adapter plug and harness set is also available so that the 1037 test set can be used with this unit. The 1037 switch positions and the test points they select are given in Table 5-1. The 1037 connecting cable and pin identifications are shown in Figure 5-2.

Table 5-1 also lists the test points and their functions. The alignment points used while aligning the Mega-E are shown in Figure 5-3.

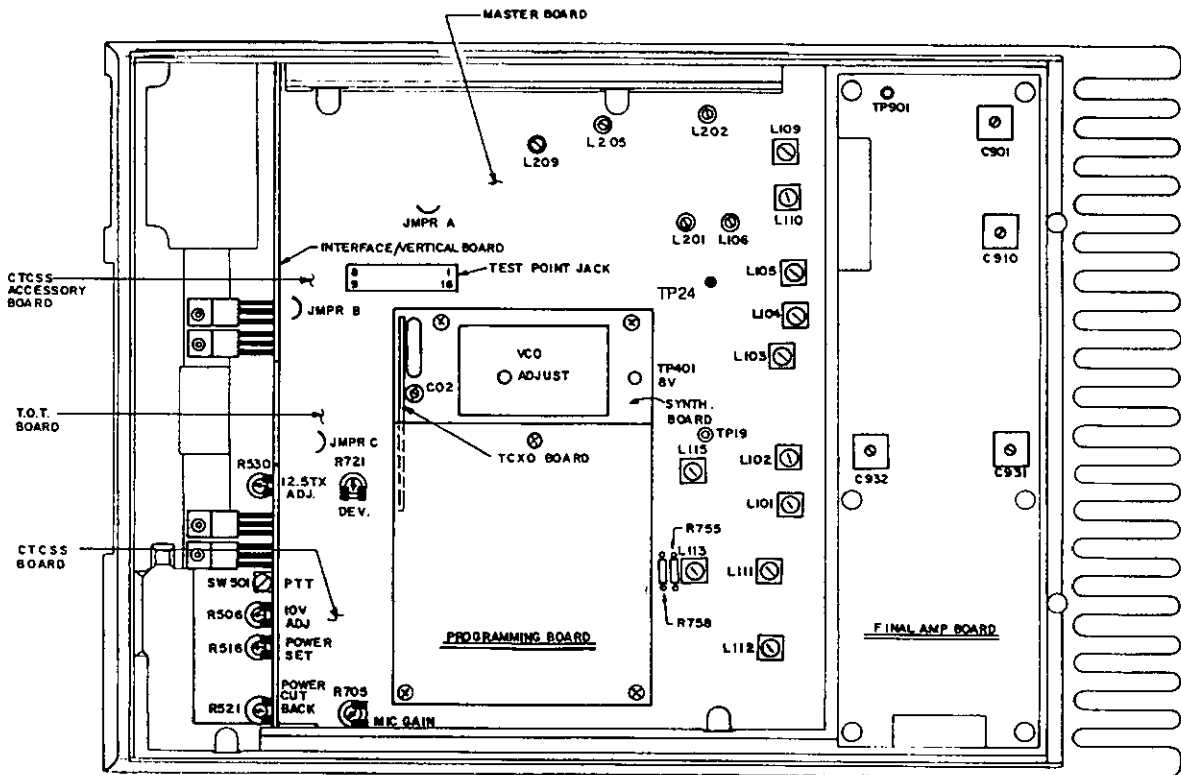


Figure 5-3. Alignment points.

5.2.4 Voltage Regulator

1. Turn the radio on.
2. Using the DC voltmeter, check the voltage at TP7; it should be +10 V.
3. Key the transmitter and measure the voltage at TP8; it should be +12.5 V.

Note

If the VCO is out of lock, there will be no reading at TP8; the VCO must be adjusted for 2-8 V (typically 4 V) at TP16.

4. Unkey the transmitter and check the voltage at TP8; it should be 0 V. The presence of voltage at TP8 when the transmitter is not keyed indicates a shorted regulator or shorted pass transistors.
5. Key the transmitter and check the following voltages; all should be +10V:
 - emitter of Q604 (transmit driver stages);
 - collector of Q704 (channel elements, low-side injection);
 - collector of Q505 (channel elements, high-side injection).
6. Unkey the transmitter.
7. Check the following test points for the voltages indicated with the transmitter keyed and unkeyed:
 - TP7 (source voltage for +5- and +8-V regulators and other transceiver circuits): +10V;
 - TP11 (synthesizer): +5 V.
8. Remove the cover of the synthesizer and check the voltage at TP401 (the red test point) with the transmitter keyed and unkeyed; it should be +8 V.

5.2.5 Synthesizer

An improperly adjusted VCO will result in poor sensitivity, receiver and/or transmitter noise, or a nonlocking PLL. The following can be used to check the operation of the VCO.

Noisy transmitter/receiver

A noisy transmitter or receiver indicates that (1) the VCO must be slightly retuned or (2) the programming data is incorrect. Proceed as follows to check the operation of the VCO.

1. Use the DC voltmeter to check the voltage at TP16; it should be between +2 and +8 V.
2. Sequentially select all programmed channels while monitoring the voltage at TP16; if the voltage is less than +2 V or more than +8 V for any channel, adjust the VCO according to the instructions in section 5.3.
3. If the VCO was successfully adjusted but one or more channels remains noisy, review the programmed frequencies and insure that they are within the multifrequency spread of the transceiver (see Section 1).

Slightly off-frequency operation on all channels

If all channels are slightly off frequency in both the transmit and receive modes, the TCXO needs to be adjusted. See the TCXO adjustment procedures in section 6.3.

No transmit output power

If there is no output power when the transmitter is keyed, the VCO may be out of lock (an out-of-lock VCO inhibits the +12.5-V transmit line. If this occurs, adjust the VCO. Other possible problems include the control voltage and, if the control voltage is correct, the lock detector (Q406 and Q409) and/or transmit-disable circuit (Q504 and associated components).

Integrated circuit failures

The effects of IC failures are difficult to predict because of the complexity of the on-chip circuits. An IC failure generally completely shuts down the synthesizer.

5.2.6 Receiver

The symptoms exhibited by the receiver should help locate a problem to a specific circuit.

No receive operation, squelch/volume controls function normally

If the receiver does not operate but the squelch and volume controls function properly, the problem could be in any stage up to and including the IF circuit. To isolate the problem, proceed as follows.

1. Use the DC voltmeter to check the voltage at TP16; it should be between +2 and +8 V. If the

voltage is not within this range, the VCO is most likely out of lock. Adjust the VCO (see section 6.3). If this does not correct the problem, go to step 2.

2. If the voltage at TP16 is between +2 and +8 V, the injection voltage to the mixer is probably adequate; L109 and L110 may, however, need to be slightly retuned (see section 6.3).
3. Disable the noise blanker and a frequency-modulated, 100- μ V, 5.26-MHz signal through a 4.7 pF capacitor to the IF input at the junction of C126, C127, and L201. Check the limiter at TP6; it should be about 2.9 V.

Caution

The 4.7-pF capacitor results in undercoupling but prevents loading filter FL201. Remove the capacitor after completing this check.

4. If the undercoupled signal passes through the IF circuits, then the front-end LC circuits, the RF preamplifier, the mixer, or the T/R switch may be malfunctioning. If the receiver still has no audio, the IF and audio circuits should be checked.

Caution

The audio amplifier includes two medium-power ICs in a bridge configuration. *Insure that neither output is grounded.*

5. Connect the RF signal generator to the antenna connector. Set the generator to the channel frequency and modulate the output with a 1-kHz tone; adjust the level for a deviation of ± 3 kHz.
6. Use the oscilloscope to check the voltage at pin 6 of IC201; it should be approximately 1.2 V peak to peak. If the reading is correct, the IF stage is working properly, but the squelch and/or audio circuits may be malfunctioning. If there is no reading, go to the next step.
7. Remove the signal generator from the antenna connector. Adjust the output frequency to 5.26 MHz; set the signal level to 10 mV (the signal should still be modulated with a 1-kHz tone, and the deviation should remain at ± 3 kHz). Apply the modulated 5.26-MHz through a 0.001- μ F capacitor to pin 1 of IC201. Use the oscilloscope to check the voltage at pin 6 of IC201; it should be 1.2 V peak to peak. If there is no reading, check the IC201 circuit; if the reading is correct, check the stages before IC201.

Table 5-2. Voltage regulator test points.

Test Point*	Voltage	Adjustment
TP8†	12.5 V	R530
Q604-e†	6-12.5 V	R516
TP7	10 V	R506
Q505-c†	10 V	—
Q704-c	10 V	—
TP11	.5 V	—
TP401‡	8 V	—

* Abbreviations: e = emitter, c = collector.

† Transmit mode voltage; transmitter must be keyed when taking measurement.

‡ On synthesizer.

8. To check the squelch circuit, remove the signal input and check the collector voltage of Q302 at the anode of CR301. With the receiver squelched it should be about 2.8 V; with the receiver unsquelched it should be approximately 0 V.
9. If the voltages in steps 6, 7, and 8 are incorrect, the malfunction may be in the IF or preceding stages. If the voltages are correct, check the audio and squelch circuits.
10. T/R switch failures are rare. If a failure does occur, a shorted diode on the receive side is most likely. If this occurs, the receiver will not perform as specified.

5.2.7 Transmitter

A malfunctioning transmitter usually exhibits symptoms that provide information about the probable cause of the trouble. The voltage regulator checks, for example, should isolate malfunctions that occur in those circuits. A list of the regulator test points, voltages, and adjustments is given in Table 5-2. Table 5-3 lists the test-socket test points, the circuits they are associated, and the approximate transmit and receive voltages for each with the power control (R516) on the vertical PC board fully clockwise.

The following steps should aid in identifying the cause of a malfunctioning transmitter.

1. Check the VCO control voltage at TP16; it should be between 2 and 8 V. No voltage or more than 9 V indicates that the PLL is not locked and the VCO must be adjusted.
2. The transmitter will not transmit when the PLL circuit is out of lock. When the PLL circuit

Table 5-3. Test-socket test points.

Test Point	Circuit	Transmit Voltage	Receive Voltage
TP2	Transmit predriver	2.5	0.0
TP10	PTT	0.0	9.5
TP13	Microphone audio	4.0-6.0	10.0
TP14	PLL (locked)	10.0	10.0
	PLL (unlocked)	0.25	0.25
TP15	Transmit driver	0.6	0.0
TP16	VCO control voltage	4.0*	4.0*

* Approximate (range = 2-8 V).

- is locked, the VCO will produce a signal sufficient to be detected by a monitor receiver.
- With R516 completely clockwise, the output from the VCO should be sufficient to drive the amplifiers mounted on the main PC board (Q801 and Q802) to a level of at least 1 W; with sufficient drive (1 W), the transmitter should develop full power.
 - Because there are no multiplier stages or tuning circuits except for C901, C910, C931, and C932 between the VCO and the antenna connector, a loss of output power can be caused by one of the following:
 - inadequate drive— check exciter test points TP2, TP15, and the emitter of Q604 (6 to 12.5 V);
 - low voltage— check TP8, TP7, and the emitter of Q604;
 - improper termination— check the 50- Ω load;
 - T/R switch— check CR902 and CR905;
 - other component failure.
 - If the transmit audio level is incorrect, monitor the output with the deviation meter and adjust the microphone gain control (R705) and/or the deviation control (R721) as needed to adjust the deviation. Do not exceed a deviation of ± 5 kHz.

Note

The deviation must be checked after all frequency programming changes.

- If the audio is distorted, use the oscilloscope to check the clipping level at pin 7 of IC701. Another microphone can also be used— if one is, monitor TP13 with the oscilloscope and readjust the audio gain and deviation potentiometers as necessary.
- If audio distortion occurs when the micro-

phone is used but not when the signal generator is used, the microphone is defective.

5.2.8 Control head/control cable

If a problem appears to be located in the control head, see Table 5-4, which provides the cable pin functions and color coding.

5.3 Alignment

5.3.1 Preliminary checks

Before beginning the alignment procedures, insure that the channels and frequencies to be used have been programmed. A number of voltage measurements should be done to verify the operation of various voltage regulating circuits and as an indication of overall transceiver operation. These checks can be done quickly with the 1037 test set. Table 5-5 shows a list of the 1037 switch positions, the circuits being tested, the typical voltage readings, and the mode or modes during which the checks must be made. If the test set is not available, these voltages can be checked using the procedures given in section 5.1.

5.3.2 VCO lock

The VCO provides the carrier and local oscillator signals used by the transmitter and receiver, respectively. The VCO output is sent to the transmitter at the channel frequency; it is sent to the receiver at the channel frequency plus or minus 5.26 MHz.

For quick VCO lock and the greatest immunity from noise, the VCO control voltage at TP16 should be about 4 VDC. For the PLL circuit to be locked, this voltage must be between 2 and 8 V.

Table 5-4. Test-socket test points.*

Pin Number		Color	Function
Radio	Control Head		
1	B	Red	Transmit light
2	2	Black (no. 16)	Speaker
3	K	Brown	N. B. enable
4	P	Orange	Tone enable
5	10	Red (no. 16)	10-V line
6	18	White/shield	Volume return
7	A	Yellow	TTS
8	7	Green	Busy light
9	R	Blue	Channel select A
10	—	Violet	—
11	T	Gray	Channel select C
12	S	White	Channel select B
13	V	Black	Ground
14	H	Black (no. 18)	Ground
15	U	Yellow/black	Channel select D
16	5	Yellow/red	Hanger
17	4	Brown/shield	Microphone audio
18	15	Yellow/orange	Unicall defeat
19	C	Black (no. 16)	Speaker
20	—	Yellow/green	—
21	12	White/black	Tone B
22	13	White/brown	Tone C
23	16	Orange/shield	IF noise
24	6	White/red	PTT
25	14	White/orange	Tone D
26	17	Yellow/shield	Squelch return
27	J	White/violet	Mute
28	9	White/blue	Power
29	F	White/green	Filter switch
30	11	White gray	Tone A
—	8	Red (pig tail)	Ignition
—	E		Horn

* —, Not connected.

Table 5-5. 1037 readings.

1037 Switch Position	Circuit	Typical Reading	Mode
1	10-V regulator	10 V	Receive and transmit
2	5-V regulator	5 V	Receive and transmit
3	VCO control voltage	2-8 V	Receive and transmit
4	Receive injection voltage	1.8-2.5 V	Receive
5	Receive limiter	1.2-5.0 V	Receive
6	PLL lock	10 V	Receive and transmit
7	Transmit PA supply	12.5 V	Transmit
8	Transmit predriver	≤2.5 V*	Transmit
9	Transmit driver	≤0.7 V*	Transmit

* Depends on the setting of the power control (R516).

dx 0.1V

Note

The VCO is aligned at the factory for proper locking and noise-free operation. It should be realigned only for the following conditions: (1) slow or nonlocking VCO, (2) poor noise immunity, (3) widely spaced or range-edge channels, or (4) after channels have been reprogrammed.

To align the VCO, proceed as follows.

1. Attach the 50- Ω load and wattmeter to the antenna connector.
2. Set the DC voltmeter to the 10-V range and attach the leads to ground and TP16.
3. Select the programmed channel closest to the center of the *receiver* range.
4. Check the indication on the voltmeter; it should be 4.0 V. If the reading is not 4.0 V, adjust the VCO until that reading is obtained.
5. Select the programmed channel closest to the center of the *transmitter* range.
6. Check the indication on the voltmeter; it should be 4.0 V. If the reading is not 4.0 V, adjust the VCO until the indication is *halfway between* that reading and 4.0 V.
7. Check the voltage at TP16 for all programmed transmit and receive channels. It will vary, but it should remain between 2.0 and 8.0 V. If it is not within this range for a given channel, adjust the VCO slightly to bring the reading within the range.

5.3.3 Transmitter**Note**

Unless otherwise noted, key the transmitter using the microphone PTT switch. Use the on-chassis PTT switch (SW501) only when specifically instructed to do so.

Transmit output power

1. Attach the 50- Ω load and wattmeter to the antenna connector.
2. With the radio on, check the voltage at TP7 with the DC voltmeter (test set position 1); it should be +10.0 V. If the reading is incorrect, adjust R506 to bring the voltmeter indication to 10 V.
3. Key the transmitter using the microphone PTT switch and check the voltage at TP8 (test set position 7); it should be +12.5 V. If the reading is incorrect, adjust R530 until the DC voltmeter indicates 12.5 V.

4. Check the indication on the wattmeter; it should be between 50 and 100 W.

Note

If the VCO failed to lock, the DC voltmeter will indicate 0 V and the wattmeter will indicate 0 W. Readjust the VCO according to Section 5.2.2.

5. If the output power is not correct, go to step 8. If the output power is correct, release the microphone PTT switch and key the transmitter using the on-chassis PTT switch.
6. Check the indication on the wattmeter; it should be no more than 50% of the reading obtained in step 4.
7. If the wattmeter indication is correct, go to step 13; if the reading is incorrect, go to step 8. Release the on-chassis PTT switch.
8. Turn the power level adjust (R516) and the cut-back control (R521) fully clockwise.
9. Key the transmitter and rotate R516 counterclockwise until the wattmeter indicates the desired output power.
10. Adjust C901 and C910 for maximum RF output. (With C901 adjusted properly, the DC voltmeter reading at TP901 should be approximately 1.5 V.) Unkey the transmitter.
11. Insert an ammeter in the DC line, key the transmitter, and adjust C931 and C932 for maximum efficiency (maximum RF output and minimum current). Unkey the transmitter and remove the ammeter.
12. Key the transmitter and recheck the output power to insure that it is still at the desired level.

Note

The following procedure sets the cut-back level and involves simulating a fault condition by disconnecting the antenna, keying the transmitter, and then immediately reconnecting the antenna to prevent damage to the transmitter. The fault condition will remain "latched" until the transmitter is unkeyed, so the transmitter must remain keyed until the adjustment is complete.

The transmitter must be keyed using the microphone PTT switch during this procedure.

13. Set the cut-back level as follows. Read the entire procedure before proceeding.
 - Disconnect the antenna from the transceiver; keep the connector near the antenna jack.
 - Key the transmitter using the microphone PTT switch and then reconnect the antenna; *do not release the PTT switch.*

- Rotate R521 clockwise until the wattmeter indicate half of the maximum output power (50 W for a 100-W transmitter).

Transmit frequency

1. Lightly couple the frequency counter to the exciter or final amplifier circuit. (This can be done by looping a piece of wire around the coaxial cable and connecting one end to the counter input.)
2. Assure that all equipment (including the radio) is approximately at room temperature (70°F, 21°C).
3. Key the transmitter and check the frequency counter; it should indicate the channel frequency ± 30 Hz. If all channels are off frequency more than 30 Hz, adjust the trimmer capacitor on the TCXO until the frequency of one channel is correct (only one channel need be adjusted because all channels are mathematically related). Unkey the transmitter.

Note

Adjusting the TCXO trimmer capacitor will not correct channel-programming errors.

Transmitter deviation

1. Lightly couple the transmitter output to a deviation monitor.
2. Apply a 1-kHz, 0.8-Vrms signal to the microphone jack.
3. If CTCSS is used, rotate the encode level control (R39) on the CTCSS encode/decode PC board fully counterclockwise to remove the subaudible tone.
4. Rotate the microphone gain adjust (R705) completely clockwise.
5. Adjust the deviation control (R721) for a deviation between ± 4.5 and ± 5.0 kHz.
6. Sweep the audio signal generator from 300 to 3000 Hz while watching the deviation monitor; if necessary, readjust R721 to keep the maximum deviation below ± 5 kHz.
7. Disconnect the audio signal generator and reconnect the microphone. Key the transmitter and speak into the microphone using a normal tone of voice; adjust R705 as necessary for the desired clipping level.
8. Repeat steps 6 and 7 for all programmed transmit channels.

CTCSS tone deviation

This procedure applies only to those units using CTCSS. The deviation monitor should still be coupled to the transmitter output.

1. Key the transmitter.
2. While watching the deviation monitor, adjust R39 on the CTCSS encode/decode PC board for a deviation of ± 0.5 to ± 0.75 kHz.
3. Apply a 1-kHz, 0.8-Vrms signal to the microphone jack and insure that the combined audio-level and tone deviation does not exceed ± 5 kHz.
4. Repeat step 3 for all programmed transmit channels.

5.3.4 Receiver

The initial checks done at the beginning of the alignment procedure verify that signals from the RF generator are being received. With the VCO injection voltage established, only the front end-mixer tuning and, possibly, the IF sweep must be aligned to complete the procedure.

Note

The noise blanker must be disabled when aligning the receiver.

Front end

This procedure assumes that the IF section is properly aligned. If the procedure cannot be accomplished, see the following section for the IF alignment procedure.

1. Remove the microphone so that the transmitter cannot be accidentally keyed.
2. Turn the radio on and select the channel closest to the center of the programmed receive channels.
3. Connect the RF signal generator to the antenna connector. Set the output frequency to the channel frequency and adjust the output level to produce some quieting.
4. Connect the DC voltmeter to TP1 (1037 position 4), LO injection; adjust L109 and L110 for a maximum indication on the voltmeter (1.8–2.3 V).
5. Alternately select the programmed channels with the highest and lowest frequencies and readjust L109 and L110 so that the readings on the DC voltmeter are approximately equal.

The sensitivity should now equal or exceed 0.35 μV for 20-dB quieting or 0.25 μV for 12-dB SINAD across a frequency spread of 3 MHz. If this sensitivity is not achieved, use the standard SINAD or 20-dB quieting procedure to fine tune the receiver by slightly adjusting L105. Switch channels as necessary to insure that the desired sensitivity is reached on all channels.

Caution

Do not connect test equipment that has either side of its input grounded across the audio output. Use TP5 and ground or TP9.

If a frequency error is suspected, additional checks are necessary. Gross errors (several hundred hertz or more) could indicate programming errors.

Minor errors (up to 100 Hz) on all channels could indicate that the TCXO is slightly out of alignment.

IF—standard (sweep) alignment

1. Turn off the radio and remove the microphone or handset.
2. Connect the RF signal generator to the antenna connector. Set the signal generator to the channel frequency and adjust the level to 100 μV . Modulate the output with a 20-Hz signal and adjust the level for a deviation of ± 20 kHz. Keep the signal below the limiting level during this procedure.
3. Connect the oscilloscope to pin 1 of IC201.
4. Turn the radio on and adjust the oscilloscope vertical sensitivity to 0.1 V/division; set the sweep rate to 2 msec/division.
5. Adjust the frequency of the RF signal generator slightly above and below the channel frequency until a filter response is displayed by the oscilloscope. Adjust the vertical sensitivity and sweep rate of the oscilloscope and the output level of the RF signal generator for the best filter response. [Note that an inverted (mirror) image of the filter response is displayed below the filter response.]
6. Adjust L201, L202, L205, and L209 for the optimum filter response (maximum amplitude and maximum flatness). Readjust the inductors until the response can no longer be improved.
7. Remove the modulating signal from the RF signal generator and turn off the radio.

8. Connect the oscilloscope probe to the emitter of Q205 (R221). Set the vertical sensitivity to 0.1 V/division and adjust the sweep rate to approximately 0.5 msec/division.
9. Modulate the output of the RF signal generator with a 1-kHz tone and adjust the level for a deviation of ± 3 kHz. Set the output of the generator to the channel frequency and adjust the output level to 100 μV .
10. Turn on the radio and check the oscilloscope; it should display a 1-kHz sine wave.

IF—SINAD procedure

The SINAD procedure is a quick and easy method of accurately measuring the receiver sensitivity. In cases where the IF section must be aligned with the sweep method to achieve precise tuning, the SINAD procedure can be used to verify the results.

This procedure assumes that the front end, TCXO, VCO, and L09–L110 are adjusted properly.

Caution

Grounding either of the audio output leads will short components within the transceiver.

Many test instruments (including SINADDERs) utilize a grounded input. Because the Mega-E is designed with a floating ground to accommodate either positive- or negative-ground voltage sources, care must be used to avoid inadvertent short circuits.

Test Equipment Required

- RF signal generator,
- audio signal generator,
- SINADDER.

Test Procedure

1. Connect the RF signal generator to the antenna connector. Set the signal generator to the channel frequency.
2. Modulate the generator output with a 1-kHz tone; adjust the level for a deviation of ± 1 kHz.
3. Connect the SINADDER between TP5 (TP9 on the test socket) and ground.
4. Adjust the signal generator output level until the SINADDER indicates 12-dB SINAD.
5. Check the output level of the signal generator. If the level is greater than 0.25 μV , adjust L201, L202, L205, and L209 for an optimum SINAD reading.

5.3.5 Squelch

1. Remove the CTCSS accessory board (if installed).
2. Install jumper A (see the master PC board schematic).
3. Rotate the SQ control on the control head completely counterclockwise.
4. Connect the AC voltmeter to IC302 pin 7 and adjust R321 for a reading of 2.0 Vrms.
5. Remove jumper A and reinstall the CTCSS accessory board if used.

5.3.6 Noise blanker

Alignment

To adjust the noise blanker, use a spectrum analyzer or tunable receiver (or any other convenient method) to find a clear, unused frequency to which the noise blanker can be tuned. The frequency should be

- approximately 4 MHz from the nearest programmed receive channel,
- on the side of the channel opposite from the LO injection (i.e., if high-side injection is used, the frequency must be *below* the channel frequency; if low-side injection is used, the frequency must be *above* the channel frequency).

The noise blanker front end may have to be retuned to avoid interfering with other users.

Caution

Avoid tuning the noise blanker front end to frequencies used in paging systems (near 35.5 and 43.5 MHz) if paging systems are used in your area.

1. Connect the RF signal generator to the antenna connector and set the output to the clear frequency.
2. Slide the noise blanker switch (on the left underside of the control head) forward to the on position.
3. Connect the oscilloscope to TP19 (a series 5.6-pF capacitor in the base circuit of Q109).
4. Sequentially adjust L111, L112, L113, and L115 for a maximum indication on the oscilloscope. Keep the output level of the RF signal generator below the saturation level of these components while performing the adjustments.

The noise blanker should now be functioning properly and attenuating all 10-kHz noise pulses by up to 50 dB.

Test

To evaluate the operation of the noise blanker, noise pulses must be coupled to the receiver along with the RF carrier. Without the noise blanker, noise significantly degrades the sensitivity of the receiver. With the noise blanker on, however, noise has little or no effect on receiver operation. The following tests can be used to verify the operation of the noise blanker:

Test Descriptions

Continuous Blanking Effectiveness

The continuous blanking test ensures that, with a given noise input, the noise blanker will remove the noise impulses from the desired signal within limits generally accepted in the communication industry. Establishing a reference level 50 dB above the 25-dB quieting sensitivity allows a noise level to be introduced into the desired signal that degrades the signal by 50 dB. A properly functioning noise blanker should remove enough of these noise impulses to insure that the measured quieting sensitivity is still as good as 20-dB quieting (a degradation of 5 dB).

Threshold Sensitivity

The threshold sensitivity test measures the amount of allowable degradation of signal before the noise blanker turns on. Proper noise blanker operation ensures that no more than 15 dB of receiver degradation will ever occur when noise pulses are present regardless of pulse amplitude.

High Level Shut-off

This test measures the RF signal level needed to cause the noise blanker to turn off by itself.

High Rate Shut-off

This test ensures that the noise blanker will shut itself off when a signal with a frequency (repetition rate) higher than 180 kHz is received.

Noise Blanker Test Procedures

Additional Test Equipment Required

- pulse generator.

Test Setup

1. Connect the pulse generator and RF signal generator to the receiver being tested.
2. Set the pulse width to 100 nsec and the repetition rate to 10 kHz; set the RF signal generator to the frequency of the channel being used.
3. Turn the pulse generator off.

Continuous Blanking Effectiveness

1. Disable the noise blanker (remove the ground on R145 or turn off the noise blanker at the control head).
2. Set the RF signal generator output to the 25-dB quieting level.
3. Increase the RF signal generator level by 50 dB.
4. Turn the pulse generator on and increase the output level until 25-dB quieting is reestablished (this is the 50-dB *maximum pulse point*).
5. Turn the pulse generator off.
6. Turn on the noise blanker.

Note

High signal levels are applied to the transceiver. Some pulse generators decrease the signal level by as much as 4 dB. Use the following conversions:

- 25-dB quieting: 0.4 μ V (-115 dBm),
- 25-dB-degraded 50 dB: 125 μ V (-65 dBm).

7. Readjust the output of the signal generator to achieve 25-dB quieting.
8. Turn on the pulse generator.
9. Turn the pulse generator back on; the quieting be no less than 25 dB.

Blanking Pulse Threshold Sensitivity

1. With the pulse generator off, set the output of the RF signal generator to the 20-dB quieting level.
2. Turn on the noise blanker.
3. Turn on the pulse generator. Set the output level to the lowest point.
4. Connect the oscilloscope to TP24.
5. Increase the pulse generator output level until pulses appear on the oscilloscope. Reduce the pulse generator level slowly until pulses can no longer be seen.

6. Remeasure the quieting sensitivity: the degradation of the receiver 20-dB quieting should not exceed 15 dB (the quieting should be no worse than 5 dB).

High Level Shut-Off

1. Find the 50 dB maximum pulse point described in the continuous blanking test.
2. Turn on the pulse generator.
3. Connect the oscilloscope to TP24.
4. Increase the RF signal generator output until the reading on the oscilloscope drops (this will look the same as removing the ground on R145 or turning off the noise blanker).
5. Note the RF level on the signal generator: the noise blanker should shut off between the following levels:
 - TEK47A: -69.0 dBm (80 μ V) and -39.0 dBm (240 μ V),
 - HP222A: -73.0 dbm (50 μ V) and -43.0 dbm (150 μ V) (this does *not* include external padding).

High Rate Shut-Off

1. Place the pulse generator in the variable mode and select the lowest pulse rate.
2. Connect the oscilloscope probe to TP24.
3. Find the 50-dB maximum pulse point described in the continuous blanking test.
4. Increase the pulse rate until the reading on the oscilloscope drops.
5. Note the pulse rate: shut off should occur between 50 and 180 kHz.

Note

The quieting degrades toward 5 dB at a pulse rate between 50 and 180 kHz. This occurs because the IF stage no longer has a signal sufficient to produce quieting because of the high-frequency gating rate.

Noise blanker test points and typical waveforms

With the noise blanker tuned (L111-L113 and L115 adjusted) to 35 MHz and an RF signal applied to the antenna connector, the following input signals should produce the indicated peak-to-peak output voltages at the test points given:

- 0.1-V input: 0.3 V at TP17,
- 30-mV input: 0.6 V at TP18,
- 0.3-mV input: 0.3 V at TP19.

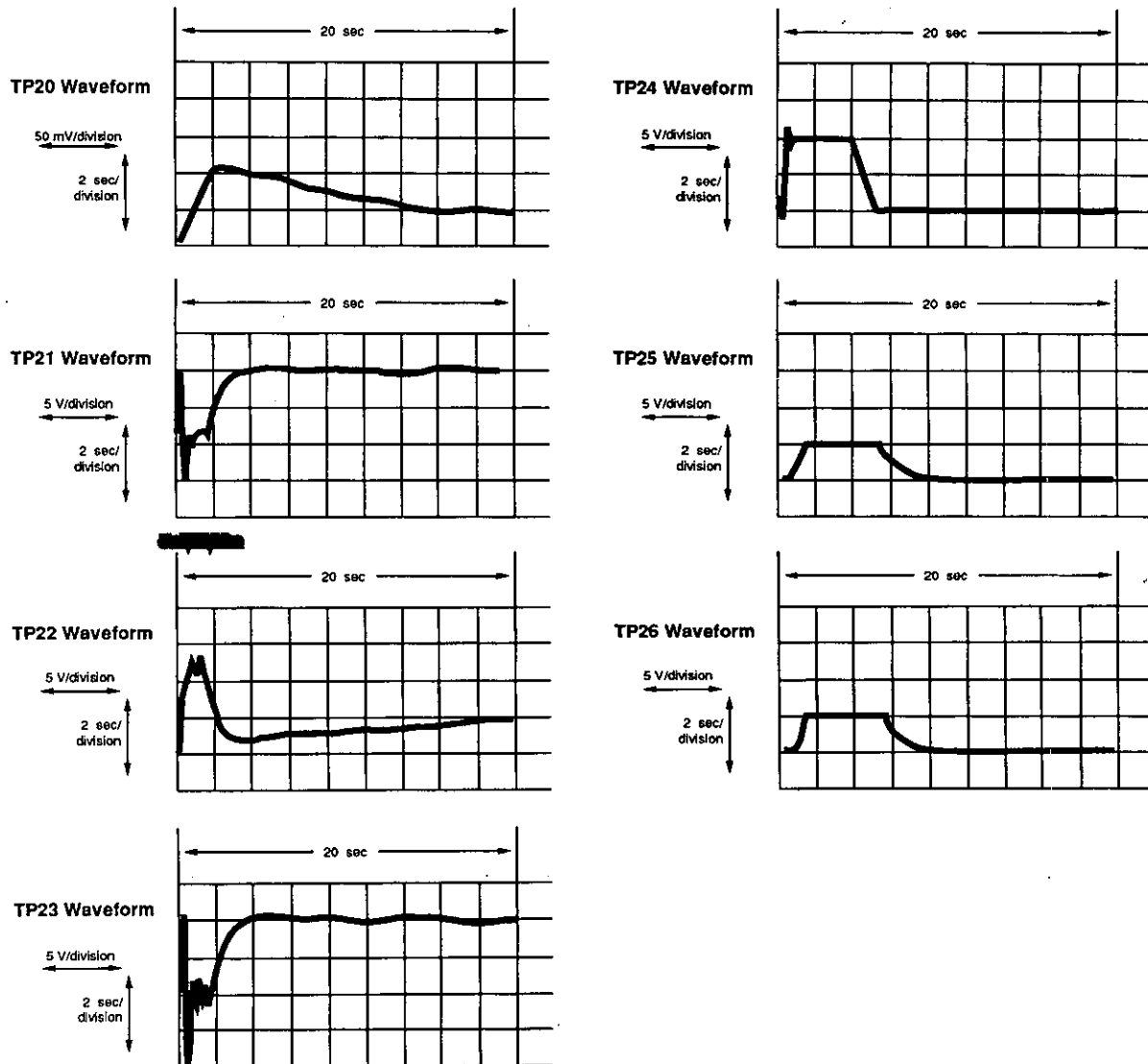


Figure 5-4. Noise blanker waveforms.

The waveforms shown in Figure 6-4 are typical with the pulse generator set for a 50-dB maximum pulse and a pulse-repetition rate of 10 kHz. The trigger is at the top of R117 (the RF input to the blanker).

5.3.7 TCXO

Because the TCXO serves as the reference for all transmit and receive frequencies, it is *imperative* that it be accurately adjusted. The transceiver and all test equipment used during the TCXO adjustment procedure should be turned on and allowed to warm up to nominal operating temperature before beginning.

There are three ways of adjusting the TCXO. Regardless of which is used, double check the frequency if an adjustment is made.

Caution

The adjustment must be done carefully and precisely. A 10-Hz error at the TCXO frequency becomes a 100-Hz error at a channel frequency of 48 MHz.

Method 1

1. Lightly couple the frequency counter to the final amplifier.

Table 5-6. EIA CTCSS frequencies.*

Group A	67.0	77.0	88.5
	100.0	107.2	114.8
	123.0	131.8	141.3
	151.5	162.2	173.8
	186.2	203.5	218.1
	233.6	250.3	
Group B	71.9	82.5	94.8
	103.5	110.9	118.8
	127.3	136.5	146.2
	156.7	167.9	179.9
	192.8	210.7	225.7
	241.8		

* Avoid frequencies above 200 Hz.

2. Terminate the final amplifier with a 50- Ω load.
3. Key the transmitter and check the frequency counter; the indication should be within 0.0005% (5 ppm); if the reading is not correct, adjust the TCXO.

Method 2

1. Attach the frequency counter probe to the junction of R735, CR711, and CR712 (the output of VCO buffer Q701).
2. Check the indication of the frequency counter in the receive mode; it should equal the receive channel frequency plus or minus (depending on the type of injection used) 5.26 MHz.
3. Adjust the TCXO if necessary.

Method 3

1. Touch the frequency probe to pin 18 of IC402.
2. Check the frequency counter; it should indicate 4.800000 MHz \pm 1 Hz.
3. If the reading is not correct, adjust the TCXO.

5.3.8 CTCSS Tone

The subaudible CTCSS tone frequency is typically set at the factory. The tone adjustment should be performed only to change the tone frequency. The standard EIA tone frequencies are given in Table 5-5.

Note

Frequencies above 200 Hz should not be used for CTCSS tones.

1. Determine the range of the CTCSS system by removing the CTCSS encode/decode PC board and examining the jumpers—jumpers are installed for the low range (67–120 Hz) and removed for the high range (120–200 Hz).
2. Install or remove the jumpers if necessary for the new frequency.
3. Reinstall the CTCSS board and connect the frequency counter to pin 10.
4. Disconnect the microphone or handset and turn on the radio.
5. Adjust R25 on the CTCSS encode/decode board until the frequency counter indicates the desired frequency.

5.3.9 Time-Out Timer

The time-out timer is installed on the 7-conductor pin jack with the component side facing the voltage-controlled oscillator (VCO). Jumper C, which is located near the pin jack, must be cut when the time-out timer is installed.

The time-out interval is controlled by the value of R2; the value determines the time-out interval as follows:

- 16 k Ω : 1-min interval,
- 33 k Ω : 2-min interval,
- 47 k Ω : 3-min interval.

The interval can be quickly changed by simply installing a different resistor (e.g., by replacing a 16-k Ω resistor with a 33-k Ω resistor to change the interval from 1 to 2 min). Before placing the unit back into service, verify the time-out interval by keying the transmitter and measuring the time it

Section 6 Control Head

6.1 Introduction

The 1287 control head, which comprises the control and connector PC boards, performs a variety of transceiver control functions. The unit is available in single-, 4-, and 16-channel versions. The boards are typically programmed at the factory for the desired functions, but programming can also be accomplished in the field.

The control head is connected to the transceiver by a multiconductor cable. A separate dual-conductor cable supplies the transceiver with high-current power from the vehicle's power source. Power is supplied to the control head via the control cable or via a separate short power cable connected to the ignition switch.

The control cable (with the ignition pigtail) and a two-conductor speaker wire are connected at the rear of the control head; the external/PA pigtail plug is also located at the rear of the unit. The microphone/handset connector is on the left side.

The major difference between the three versions of the 1287 control head involves channel selec-

tion. The single-channel model has no channel-selector switch and no channel indicator because these are not necessary. CTCSS programming is also unnecessary on the single-channel 1287 because it is either used or not used.

6.2 Control PC Board

The control PC board is located in the upper portion of the control head. The board includes the functions (standard and optional) described in Table 6-1.

On the 16-channel model, the channel-select switch (SW1) provides both binary- and decimal-coded switching; the binary switching provides the up-down sensing information, the decimal switching provides count pulses. The count pulses are converted to binary-coded decimal (BCD) data for the channel-select and display circuits.

On the four-channel model, SW1 also provides four-position rotary switching to select the appropriate channel and power the correct segments of a single, seven-segment LED display.

Table 6-1. Control head functions.

Function	Component*		
	1 Channel	4 Channels	16 Channels
Squelch	R1	R1	R3
Volume	R2	R2	R4
Channel select	—	SW1	SW1
CTCSS	—	CR1-CR4	CR13-CR28

* —, Not used; the CTCSS on single-channel heads does not need to be programmed because it is either used or not used.

Table 6.2 Components and functions.

Component	Function
CR1 (red)	Transmit indicator
CR2 (green)	Power on indicator
CR3 (amber)	Busy (CTCSS) indicator
CR9 (amber)	Call indicator
CR14*	Channel indicator
CR7, CR8†	Channel indicator
SW1	On-off volume control
SW2	Noise blanker on-off
SW3	Internal/external-PA control
Jumpers A, B, J, K	Positive or negative ground control
Jumpers C, L	Ignition switch, transmit lock out
Jumpers E, F, I, and SW3	PA
Jumper G	Handset
Jumpers M, N	One-, four-channel units

* 4-Channel units only.

† 16-Channel units only.

6.3 Connector PC Board

The connector PC board, which is located in the lower portion of the control head, is the interface for all external connections. The standard and optional indicators and controls provided by this board are given in Table 6-2.

The connector PC board contains jumpers that can be cut or installed to control the functioning of the head. These are described in the following section.

6.4 Control Head Programming

The 1287 control head's programming components include diodes and jumpers located on both PC boards. It may also include optional switches. Although these can be programmed in the field for the desired functions, the programming is typically accomplished at the factory before the unit is shipped.

6.4.1 Connector PC board programming

The connector PC board contains most of the control head programming elements. These are used to control the following functions:

- positive or negative ground,
- ignition-switch control of the transceiver,
- PTT lockout with receive monitoring,
- internal speaker-external speaker-PA switching,
- handset operation,
- single-/4-channel operation.

Table 6-3 shows the jumper configurations for each of these operating parameters.

6.4.2 Control PC board programming, 16 channels

The programming components on the 16-channel control board control the following functions:

- the number of channels used,
- the CTCSS-decode-active channels,
- the CTCSS-encode-active channels.

Number of Channels Used. Programming the number of channels used involves nine diodes (CR4-CR11) located next to IC5. The diodes are identified by letters that correspond to those given in Table 6-4-- Table 6-4 gives the diodes that must be removed and left in place for the number of channels used. (Note that the identifying letter and diode reference designator do not run consecutively.)

CTCSS/Tone Option Programming--Decode. Enabling and disabling the CTCSS (or other tone option) decode function for each used channel also involves programming diodes. These diodes are CR13-CR28 for channels 1-16, respectively. To enable the tone system on a channel, remove the diode for that channel (*e.g.*, to enable CTCSS on channel 3, remove CR15).

CTCSS/Tone Option Programming--Encode. The encode function is made to follow the decode function by leaving programming diodes J-M in place (*i.e.*, the encode function for a given channel works in the transmitter when the decode function is active in the receive mode for that channel). The tone encode enable function follows the decode function when diode N is installed.

6.4.3 Control PC board programming, 4 channels

The programming components on the four-channel control board control the following functions:

Table 6.3 Connector board jumpers.*

Function	Jumper												
	A	B	D	E	F	G	I	J	K	L	M	N	
Positive ground	1	0	—	—	—	—	—	1	0	—	—	—	
Negative ground	0	1	—	—	—	—	—	0	1	—	—	—	
Ignition switch on-off	—	—	0	—	—	—	—	—	—	1	—	—	
PTT lockout	—	—	1	—	—	—	—	—	—	0	—	—	
External speaker/PA	—	—	—	0	0	—	0	—	—	—	—	—	
Handset	—	—	—	—	—	0	—	—	—	—	—	—	
Single-channel head	—	—	—	—	—	—	—	—	—	—	1	1	
Four-channel head	—	—	—	—	—	—	—	—	—	—	0	0	

* 1 = installed, 0 = removed, — = has no effect.

Table 6.4 Number of channels used—diode configuration.*

Number of Channels	Diode								
	A CR7	B CR8	C CR9	D CR10	E CR11	F CR3	G CR4	H CR5	I CR6
1	x	—	—	—	x	—	—	—	—
2	—	x	—	x	x	—	—	—	—
3	x	x	—	—	x	—	x	—	—
4	—	—	x	—	x	x	x	—	—
5	x	—	x	—	x	—	—	x	—
6	—	x	x	—	x	x	—	x	—
7	x	x	x	—	x	—	x	x	x
8	—	—	—	x	x	x	x	x	x
9	x	—	—	x	x	—	—	—	x
10	—	x	—	x	x	x	—	—	x
11	x	x	—	x	x	—	x	—	—
12	—	—	x	x	x	x	x	—	x
13	x	—	x	x	x	—	—	x	x
14	—	x	x	x	x	x	—	x	x
15	x	x	x	x	x	—	x	x	x
16	—	—	—	—	—	x	x	x	x

* x = Diode left in place, — = diode removed.

- the number of channels used,
- the CTCSS-decode-active channels,
- the CTCSS-encode-active channels.

Number of Channels Used. The number of channels used is determined by the channel-selector switch on four-channel units. The detent stops of the switch itself can be physically moved to select up to four channels as necessary.

CTCSS/Tone Option Programming—Decode. The tone decode option is enabled on channels 1-4 by removing diodes CR1-CR4, respectively.

CTCSS/Tone Option Programming—Encode. The tone encode option follows the decode programming when diodes B and C are

installed. The decode tone defeat follows the encode tone defeat when jumper A is installed.

6.5 Realignment after Programming

If the Mega-E is reprogrammed, certain transceiver circuits must be realigned to insure that they function properly. See section 3.4 for the realignment procedure.

6.6 Operating Instructions

6.6.1 Controls and Indicators

The front-panel includes the following controls and indicators.

On/Off. (ON/OFF). The on/of control turns the transceiver on and off.

Volume (VOL). The volume control adjusts the volume.

Squelch (SQ). The squelch control adjusts the squelch threshold. To set the threshold, rotate the knob counterclockwise until noise is no longer heard from the speaker (this is the squelch threshold position). If CTCSS is used, the microphone must be removed from its hanger to make this adjustment.

Channel Select (CH). The channel-select knob selects the channel on the 4- and 16-channel control heads. Simply rotate the switch until the desired channel number is displayed by the channel indicator.

Call Indicator (C). The call indicator, an amber LED, illuminates (and remains illuminated until the microphone or handset is removed from the hang-up bracket) whenever a call is received.

Busy Indicator (B). The busy indicator, which is also an amber LED, illuminates whenever the selected channel is active.

Transmit Indicator (TX). The transmit indicator, a red LED, is illuminated whenever the transmitter is keyed (whenever the microphone PTT switch is pressed).

Channel Indicator. The channel indicator displays the selected channel.

Noise Blanker On-Off. The noise blanker on-off switch, which is located on the bottom of the control head on the left-hand side, turns the noise blanker on and off.

Speaker Control Switch. The speaker control switch, a three-position switch located on the bottom right side of the control head, is used to shift the audio mode between the internal speaker and the external speaker and PA outputs.

6.6.2 Operation: 1- and 4-channel units

To operate the 1- and 4-channel 1287 control heads, proceed as follows.

1. Turn the radio on (the green on indicator should light).

2. On the 4-channel unit, rotate the channel-selector knob to the desired channel; the channel indicator should display the correct channel.
3. Rotate the squelch control completely clockwise to disable the squelch system; on units equipped with CTCSS, remove the microphone or handset from the hang-up bracket. Noise should be heard from the speaker.
4. Adjust the volume control for a comfortable listening level.
5. Rotate the squelch control counterclockwise until the noise just disappears. [Note: the squelch can be varied from "tight" (completely counterclockwise, which will only unsquelch for very strong receive signals) to "threshold" (the point at which the noise just disappears) to "off" (completely clockwise).]
6. Place the microphone or handset in the hang-up bracket.
7. To transmit,
 - remove the microphone or handset from the hang-up cradle,
 - press and hold the PTT switch and speak into the microphone.

The red transmit indicator will light when the PTT switch is pressed. To listen, release the PTT switch.

Note

FCC rules state that a channel must be monitored to assure that it is clear (i.e., that no one is currently using it) before transmitting. If CTCSS is installed, do not transmit when the busy indicator is illuminated.

When the CTCSS is installed, the microphone or handset must be in the hang-up bracket to enable the system. If the microphone or handset is not in the hang-up bracket, the CTCSS is automatically disabled.

8. To control the operation of the external monitoring and PA circuits,
 - slide the switch to the front position for normal, internal speaker operation,
 - slide the switch to the center position for normal, internal speaker operation and outside receiver monitoring,
 - slide the switch to the rear position for outside monitoring and to use the microphone and external speaker as a PA system (the volume control controls the PA audio level when operating in the PA mode).

9. To turn the noise blanker on, slide the blanker on/off switch forward; to turn it off, slide the switch to the rear.

6.6.3 Operation: 16-channel units

To operate the 16-channel 1287 control head, proceed as follows.

1. Turn the radio on.
2. The green on indicator should illuminate and the channel indicator should display the last used channel. (The 16-channel unit automatically selects the last channel used.)
3. Use the channel selector to select the desired channel; rotate the knob clockwise to select

higher channel numbers, rotate it counterclockwise to select lower channel numbers.

Note

The channel-selector switch automatically rolls over from the highest channel to the lowest channel. On a unit using all 16 channels that is on channel 16, rotating the knob clockwise one step selects channel 1. If the unit is on channel 1, rotating the knob counterclockwise one step when on channel 1 selects channel 16.

4. The operation of the remaining controls and indicators is identical to those of the 1- and 4-channel models (see section 6.6.2).

Section 7

Parts and Schematics

Note

On the component-layout drawings for the various circuit boards, the gray areas represent circuitry on the front (component) side and the rubine (reddish-purple) areas represent circuitry on the far (rear) side.

Master PCB

B Range, 30–36 MHz (a)

C Range, 36–42 MHz (b)

D Range, 42–50 MHz (c)

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Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
C100	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C120	Cap., cer., 47pF, 10%, NPO (a)	1545-4702-010
C101	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C120	Cap., cer., 39pF, 5%, NPO (b)	1544-3902-005
C102	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C120	Cap., cer., 47pF, 10%, NPO (c)	1545-4702-010
C103	Cap., cer., 68pF, 10% NPO (a)	1545-6802-010	C121	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C103	Cap., cer., 51pF, 5% NPO (b)	1545-5102-005	C122	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C103	Cap., cer., 36pF, 5% NPO (c)	1544-3602-005	C123	Cap., cer., 56pF, 5%, NPO	1501-5602-012
C104	Cap., cer., 68pF, 10% NPO (a)	1545-6802-010	C124	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C104	Cap., cer., 51pF, 5% NPO (b)	1545-5102-005	C125	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C104	Cap., cer., 36pF, 5%, NPO (c)	1544-3602-005	C126	Cap., cer., 5.6pF, 50V, 5%, NPO	1544-5601-005
C105	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C127	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C106	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C128	Cap., cer., 0.1 μ F, 20%	1545-1006-120
C107	Cap., comp., 2.4pF, 5%	1525-2401-002	C129	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C108	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C131	Cap., comp., 1.8pF, 5%	1525-1801-002
C109	Cap., comp., 1.0pF, 5% (a)	1525-1001-002	C132	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C109	Cap., comp., 1.0pF, 5% (b)	1525-1001-002	C133	Cap., cer., 120pF, 10%, NPO (a)	1545-1203-010
C109	Cap., comp., 1.5pF, 5% (c)	1525-1501-002	C133	Cap., cer., 82pF, 10%, NPO (b)	1545-8202-010
C110	Cap., cer., 12pF, 5% NPO (a)	1544-1202-005	C133	Cap., cer., 47pF, 10%, NPO (c)	1545-4702-010
C110	Cap., cer., 4.7pF, 5% NPO (b)	1544-4701-005	C134	Cap., cer., 330pF, 10%, NPO (a)	1545-3303-010
C110	Cap., cer., 5.1pF, 5% NPO (c)	1544-5101-005	C134	Cap., cer., 180pF, 10%, NPO (b)	1544-1803-010
C111	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C134	Cap., cer., 47pF, 100%, NPO (c)	1545-4702-010
C112	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C135	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C114	Cap., cer., 68pF, 10% NPO (a)	1545-6802-010	C136	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C114	Cap., cer., 47pF, 5% NPO (b)	1545-5102-005	C137	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C114	Cap., cer., 36pF, 5% NPO (c)	1544-3602-005	C138	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C116	Cap., cer., 68pF, 10% NPO (a)	1545-6802-010	C140	Cap., cer., 180pF, 10%, NPO (a)	1545-1803-010
C116	Cap., cer., 47pF, 5% NPO (b)	1545-5102-005	C140	Cap., cer., 120pF, 10%, NPO (b)	1545-1203-010
C116	Cap., cer., 56pF, 10% NPO (c)	1545-5602-010	C140	Cap., cer., 47pF, 10%, NPO (c)	1545-4702-010
C117	Cap., cer., 220pF, 10%, NPO (a)	1545-2203-010	C141	Cap., cer., 180pF, 10%, NPO (a)	1545-1803-010
C117	Cap., cer., 180pF, 10%, NPO (b)	1544-1803-010	C141	Cap., cer., 150pF, 10%, NPO (b)	1545-1503-010
C117	Cap., cer., 150pF, 10%, NPO (c)	1545-1503-010	C141	Cap., cer., 100pF, 10%, NPO (c)	1545-1003-010
C118	Cap., cer., 62pF, 10%, NPO (a)	1545-6202-005	C142	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C118	Cap., cer., 47pF, 5%, NPO (b)	1545-5102-005	C143	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C118	Cap., cer., 30pF, 5%, NPO (c)	1544-3002-005	C144	Cap., cer., 0.001 μ F, 20%	1545-1004-120
C119	Cap., comp., 2.7pF, 5%	1525-2701-002	C145	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120

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Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
C146	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C240	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C147	Cap., cer., 120pF, 10%, NPO (a)	1545-1203-010	C242	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C147	Cap., cer., 82pF, 100%, NPO (b)	1545-8202-010	C243	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C147	Cap., cer., 33pF, 5%, NPO (c)	1544-3302-005	C301	Cap., film, 0.01 μ F, 100V, 10%	1529-1005-110
C148	Cap., cer., 220pF, 10%, NPO (a)	1545-2203-010	C302	Cap., film, 0.01 μ F, 100V, 10%	1529-1005-110
C148	Cap., cer., 150pF, 10%, NPO (b)	1545-1503-010	C303	Cap., film, 0.01 μ F, 100V, 10%	1529-1005-110
C148	Cap., cer., 56pF, 10%, NPO (c)	1545-5602-010	C304	Cap., film, 0.0047 μ F, 100V, 10%	1529-4704-110
C149	Cap., cer., 100pF, 10%, NPO	1545-1003-010	C305	Cap., film, 0.0068 μ F, 100V, 10%	1529-6804-110
C150	Cap., cer., 0.1 μ F, 20%	1545-1006-120	C306	Cap., film, 0.033 μ F, 100V, 10%	1529-3305-110
C154	Cap., cer., 0.00047 μ F, 50V, 20%	1545-4704-120	C309	Cap., film, 0.0047 μ F, 100V, 10%	1529-4704-110
C155	Cap., electr., 2.2 μ F, 50V	1535-2201-050	C310	Cap., film, 0.0047 μ F, 100V, 10%	1529-4704-110
C156	Cap., cer., 150pF, 10%, NPO	1545-1503-010	C311	Cap., film, 0.0047 μ F, 100V, 10%	1529-4704-110
C157	Cap., cer., 22pF, 50V	1544-2202-005	C312	Cap., electr., 100 μ F, 16V, 10%	1535-1003-016
C159	Cap., cer., 12pF, 5%	1544-1202-005	C313	Cap., film, 0.033 μ F, 100V, 10%	1529-3304-110
C163	Cap., electr., 2.2 μ F, 50V	1535-2201-050	C314	Cap., cer., 0.1 μ F, 50V, NPO	1505-1006-005
C164	Cap., comp, 1.3pF, 5%	1525-1301-002	C315	Cap., electr., 2.2 μ F, 50V	1535-2201-050
C166	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C316	Cap., electr., 4.7 μ F, 50V	1535-4701-050
C169	Cap., cer., 18pF, 50V, 5%, NPO	1544-1802-005	C319	Cap., cer., 0.1 μ F, 20%	1545-1006-120
C170	Cap., cer., 56pF, 50V, 10%, NPO	1545-5602-010	C320	Cap., electr., 10 μ F, 16V	1545-1002-016
C171	Cap., cer., 100pF, 10%, NPO (a)	1545-1003-010	C321	Cap., electr., 1000 μ F, 16V	1535-1004-016
C171	Cap., cer., 68pF, 10%, NPO (b)	1545-6802-010	C322	Cap., electr., 10 μ F, 16V	1545-1002-016
C171	Cap., cer., 27pF, 5%, NPO (c)	1544-2702-005	C323	Cap., electr., 10 μ F, 16V	1545-1002-016
C172	Cap., comp., 5.6pF, 5%	1525-5601-002	C324	Cap., tant., 2.2 μ F, 16V	1538-2207-115
C200	Cap., cer., 56pF, 50V, 10%, NPO	1544-2701-005	C325	Cap., tant., 2.2 μ F, 16V	1538-2207-115
C202	Cap., cer., 2.7pF, 50V, 5%, NPO	1544-2701-005	C326	Cap., electr., 1000 μ F, 16V	1535-1004-016
C203	Cap., comp., 0.75pF, 5%, NPO	1525-7500-002	C327	Cap., cer., 0.1 μ F, 20%	1545-1006-120
C204	Cap., cer., 27pF, 50V	1544-2702-005	C328	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C205	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C705	Cap., electr., 33 μ F, 25V	1535-3302-025
C206	Cap., cer., 120pF, 50V, 20%, NPO	1502-1203-001	C706	Cap., electr., 10 μ F, 16V	1535-1002-016
C207	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C709	Cap., cer., 0.001 μ F, 20%	1545-1004-120
C208	Cap., cer., 0.1 μ F, 20%	1545-1006-120	C710	Cap., film, 0.0047 μ F, 100V, 10%	1529-4704-110
C209	Cap., cer., 0.01 μ F, 16V, 20%	1502-1005-004	C711	Cap., electr., 0.12 μ F, 10%	1526-1206-001
C210	Cap., cer., 0.01 μ F, 16V, 20%	1502-1005-004	C712	Cap., electr., 0.12 μ F, 10%	1526-1206-001
C211	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C713	Cap., electr., 2.2 μ F, 50V	1535-2201-050
C212	Cap., cer., 0.1 μ F, 20%	1545-1006-120	C714	Cap., electr., 0.1 μ F	1545-1006-120
C213	Cap., cer., 56pF, 50V, 10%, NPO	1544-2701-005	C716	Cap., cer., 0.001 μ F, 20%	1545-1004-120
C214	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C719	Cap., cer., 0.001 μ F, 20%	1545-1004-120
C215	Cap., comp., 0.75pF, 5%	1525-7500-002	C720	Cap., cer., 0.001 μ F, 20%	1545-1004-120
C217	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C721	Cap., cer., 0.001 μ F, 20%	1545-1004-120
C218	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C722	Cap., cer., 0.001 μ F, 20%	1545-1004-120
C219	Cap., cer., 2.7pF, 50V, 5%, NPO	1544-2701-005	C723	Cap., cer., 0.001 μ F, 20%	1545-1004-120
C220	Cap., electr., 10 μ F, 35V	1535-1002-035	C725	Cap., cer., 0.001 μ F, 20%	1545-1004-120
C221	Cap., cer., 0.033 μ F, 50V, 20%	1545-3305-120	C731	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C222	Cap., cer., 56pF, 50V, 10%, NPO	1544-2701-005	C743	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C223	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C744	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C224	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C751	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C225	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C753	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C226	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C759	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120
C229	Cap., cer., 3.9pF, 5%, NPO	1544-3901-005	C762	Cap., alum., non-pol. 6.8 μ F, 25V	1536-6807-015
C230	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C763	Cap., alum., non-pol. 6.8 μ F, 25V	1536-6807-015
C231	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C764	Cap., cer., .01 μ F	1545-1005-120
C232	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	C800	Cap., cer., 68pF, 10%, NPO (a)	1545-4702-010
C234	Cap., cer., 0.001 μ F, 20%	1545-1004-120	C800	Cap., cer., 68pF, 10%, NPO (b)	1545-6802-010
C235	Cap., film, 0.0022 μ F, 100V, 5%	1529-2204-105	C800	Cap., cer., 56pF, 10%, NPO (c)	1545-5602-010
C236	Cap., electr., 1.0 μ F, 50V	1535-1001-050	C801	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120

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Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
C802	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	L113	Coil, variable, 9-1/2T, tapped	1807-0000-045
C804	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	L114	Coil, choke, RF, 33 μ H, 10%	1828-3302-010
C809	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	L115	Coil, variable, 9-1/2T	1807-0000-042
C811	Cap., cer., 68pF, 10%, NPO (a)	1545-6802-010	L116	Coil, choke, 10 μ H, 10%	1828-1002-010
C811	Cap., cer., 68pF, 10%, NPO (b)	1545-6802-010	L201	Coil, tunable, 7mm	1805-0000-005
C811	Cap., cer., 82pF, 10%, NPO (c)	1545-8202-010	L202	Coil, tunable, 7mm	1805-0000-007
C812	Cap., cer., 180pF, 10%, NPO (a)	1545-1803-010	L203	Choke, RF, 5.6 μ H, 10%	1828-5601-010
C812	Cap., cer., 220pF, 10%, NPO (b)	1545-21203-010	L204	Choke, RF, 100 μ H, 10%	1828-1003-010
C812	Cap., cer., 180pF, 10%, NPO (c)	1545-1803-010	L205	Coil, tunable, 7mm	1805-0000-005
C813	Cap., cer., 0.47 μ F, 50V, 10%	1526-4706-002	L206	Choke, RF, 100 μ H, 10%	1828-1003-010
C815	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	L207	Choke, RF, 100 μ H, 10%	1828-1003-010
C819	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	L209	Coil, tunable, 7mm	1805-0000-005
C820	Cap., electr., 10 μ F, 35V	1535-1002-035	L210	Choke, RF, 82 μ H, 10%	1827-8202-102
C822	Cap., cer., 0.001 μ F, 20%	1545-1004-120	L211	Choke, RF, 82 μ H, 10%	1827-8202-102
CR101	Diode, silicon, 1N4148	4803-0000-004	L701	Coil, shielded, 47 μ H	1829-4702-005
CR102	Diode, silicon, 1N4148	4803-0000-004	L734	Coil, 10-1/2T	1810-0000-134
CR103	Diode, silicon, 1N4148	4803-0000-004	L803	Coil, 17-1/2T	1810-0000-127
CR104	Diode, silicon, 1N4148	4803-0000-004	L804	Choke, RF, VK200	1827-0000-002
CR201	Diode, silicon, 1N4148	4803-0000-004	L805	Coil, 17-1/2T	1810-0000-127
CR301	Diode, silicon, 1N4148	4803-0000-004	L806	Coil, 1-1/2T	1810-0000-122
CR302	Diode, silicon, 1N4148	4803-0000-004	L800	Coil, 14-1/2T (a)	1810-0000-126
CR303	Diode, silicon, 1N4148	4803-0000-004	L800	Coil, 12-1/2T (b)	1810-0000-135
CR304	Diode, silicon, 1N4148	4803-0000-004	L800	Coil, 11-1/2T (c)	1810-0000-131
CR305	Diode, silicon, 1N4148	4803-0000-004	L801	Coil, 17-1/2T (a)	1810-0000-127
CR306	Diode, silicon, 1N4148	4803-0000-004	L801	Coil, 14-1/2T (b)	1810-0000-126
CR307	Diode, silicon, 1N4148	4803-0000-004	L801	Coil, 13-1/2T (c)	1810-0000-125
CR309	Diode, silicon, 1N4148	4803-0000-004	L802	Coil, 10-1/2T (a)	1810-0000-134
CR3010	Diode, silicon, 1N4148	4803-0000-004	L802	Coil, 8-1/2T (b)	1810-0000-133
CR703	Diode, silicon, 1N4148	4803-0000-004	L802	Coil, 71-1/2T (c)	1810-0000-132
CR705	Diode, silicon, 1N4148	4803-0000-004	Q101	Transistor, JFET, 2N5486	4812-0000-005
CR706	Diode, silicon, 1N4148	4803-0000-004	Q102	Transistor, JFET, 2N5486	4812-0000-005
CR707	Diode, silicon, 1N4148	4803-0000-004	Q103	Transistor, JFET, 2N5486	4812-0000-005
CR710	Diode, silicon, 1N4148	4803-0000-004	Q104	Transistor, JFET, 2N5486	4812-0000-005
CR311	Diode, silicon, 1N4148	4803-0000-004	Q105	Transistor, MPS6514	4811-0000-012
CR711	Diode, PIN, MPN3402	4805-0000-001	Q106	Transistor, MPS6514	4811-0000-012
CR712	Diode, PIN, MPN3402	4805-0000-001	Q109	Transistor, 2N5223, NPN	4811-0000-032
CR801	Diode, silicon 1N4148	4803-0000-004	Q110	Transistor, 2N5226, PNP	4811-0000-028
IC101	Integrated circuit, IF, MC1350P	4850-0000-039	Q111	Transistor, 2N5525, NPN	4811-0000-027
IC201	Integrated circuit, CA3089E	4850-0802-023	Q112	Transistor, 2N5226, PNP	4811-0000-028
IC301	Integrated circuit, LM2904	4850-0000-025	Q113	Transistor, 2N5226, PNP	4811-0000-028
IC302	Integrated circuit, 1458CP	4850-0000-017	Q114	Transistor, 2N5226, PNP	4811-0000-028
IC303	Integrated circuit, TDA2003	4850-0000-027	Q115	Transistor, 2N5226, PNP	4811-0000-028
IC304	Integrated circuit, TDA2003	4850-0000-027	Q116	Transistor, MPS6514	4811-0000-012
IC701	Integrated circuit, LM2904	4850-0000-025	Q201	Transistor, 2N5223, NPN	4811-0000-032
L101	Coil, variable, 9-1/2T, tapped	1807-0000-044	Q202	Transistor, 2N5223, NPN	4811-0000-032
L102	Coil, variable, 9-1/2T, tapped	1807-0000-045	Q203	Transistor, 2N5223, NPN	4811-0000-032
L103	Coil, variable, 23-1/2T (a)	1807-0000-033	Q204	Transistor, 2N5223, NPN	4811-0000-032
L103	Coil, variable, 23-1/2T (b)	1807-0000-033	Q205	Transistor, 2N5223, NPN	4811-0000-032
L103	Coil, variable, 19-1/2T (c)	1807-0000-036	Q301	Transistor, MPS6514, NPN	4811-0000-012
L104	Coil, variable, 9-1/2T	1807-0000-042	Q302	Transistor, MPS6514, NPN	4811-0000-012
L105	Coil, variable, 9-1/2T	1807-0000-042	Q701	Transistor, MPS6514, NPN	4811-0000-012
L106	Coil, tuneable, 7mm	1805-0000-005	Q703	Transistor, sil., MPS3638A, NPN	4810-0000-018
L109	Coil, variable, 9-1/2T	1807-0000-042	Q704	Transistor, sil., MPS3638A, NPN	4810-0000-018
L110	Coil, variable, 9-1/2T, tapped	1807-0000-045	Q801	Transistor, MPS6514	4811-0000-012
L111	Coil, tuneable, link	1801-0000-044	Q802	Transistor, MRF402	4811-0000-067
L112	Coil, variable, 9-1/2T	1807-0000-042	R101	Resistor, 330 Ω , 1/4W, 5%	4764-3303-001

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Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
R102	Resistor, 5.1K, 1/4W, 5%	4764-5104-001	R301	Resistor, 33K, 1/4W, 5%	4764-3305-001
R103	Resistor, 10 Ω , 1/4W, 5%	4764-1002-001	R302	Resistor, 75K, 1/4W, 5%	4764-7505-001
R105	Resistor, 1.0K, 1/4W, 5%	4764-1004-001	R303	Resistor, 43K, 1/4W, 5%	4764-4305-001
R106	Resistor, 1.0K, 1/4W, 5%	4764-1004-001	R304	Resistor, 130K, 1/4W, 5%	4764-1306-001
R107	Resistor, 2.7K, 1/4W, 5%	4764-2704-001	R305	Resistor, 5.1K, 1/4W, 5%	4764-5104-001
R108	Resistor, 10 Ω , 1/4W, 5%	4764-1002-001	R306	Resistor, 15K, 1/4W, 5%	4764-4705-001
R109	Resistor, 4.7K, 1/4W, 5%	4764-4704-001	R309	Resistor, 47K, 1/4W, 5%	4764-1505-001
R110	Resistor, 3.3K, 1/4W, 5%	4764-3304-001	R310	Resistor, 6.8K, 1/4W, 5%	4764-6804-001
R111	Resistor, 33K, 1/4W, 5%	4764-3305-001	R311	Resistor, 2.7K, 1/4W, 5%	4764-2704-001
R112	Resistor, 33K, 1/4W, 5%	4764-3305-001	R312	Resistor, 10K, 1/4W, 5%	4764-1005-001
R113	Resistor, 1.0K, 1/4W, 5%	4764-1004-001	R313	Resistor, 7.5K, 1/4W, 5%	4764-7504-001
R115	Resistor, 27K, 1/4W, 5%	4764-2705-001	R314	Resistor, 12K, 1/4W, 5%	4764-1205-001
R116	Resistor, 15K, 1/4W, 5%	4764-1505-001	R315	Resistor, 10K, 1/4W, 5%	4764-1005-001
R117	Resistor, 5.1K, 1/4W, 5%	4764-5104-001	R316	Resistor, 30K, 1/4W, 5%	4764-3005-001
R119	Resistor, 560 Ω , 1/4W, 5%	4764-5603-001	R319	Resistor, 18K, 1/4W, 5%	4764-1805-001
R120	Resistor, 30K, 1/4W, 5%	4764-3005-001	R320	Resistor, 10K, 1/4W, 5%	4764-1005-001
R121	Resistor, 100 Ω , 1/4W, 5%	4764-1003-001	R321	Potentiometer	4740-2005-001
R122	Resistor, 22K, 1/4W, 5%	4764-2205-001	R322	Resistor, 30K, 1/4W, 5%	4764-3005-001
R123	Resistor, 10K, 1/4W, 5%	4764-1005-001	R323	Resistor, 5.1K, 1/4W, 5%	4764-5104-001
R124	Resistor, 4.7K, 1/4W, 5%	4764-4704-001	R324	Resistor, 5.1K, 1/4W, 5%	4764-5104-001
R125	Resistor, 220 Ω , 1/4W, 5%	4764-2203-001	R325	Resistor, 68K, 1/4W, 5%	4764-6805-001
R126	Resistor, 2.2K, 1/4W, 5%	4764-2204-001	R326	Resistor, 470K, 1/4W, 5%	4764-4706-001
R127	Resistor, 2.2K, 1/4W, 5%	4764-2204-001	R329	Resistor, 12K, 1/4W, 5%	4764-1205-001
R129	Resistor, 3.3K, 1/4W, 5%	4764-3304-001	R330	Resistor, 22K, 1/4W, 5%	4764-2205-001
R131	Resistor, 47 Ω , 1/4W, 5%	4764-4703-001	R331	Resistor, 6.8K, 1/4W, 5%	4764-6804-001
R133	Resistor, 5.1K, 1/4W, 5%	4764-5104-001	R332	Resistor, 200 Ω , 1/4W, 5%	4764-2003-001
R135	Resistor, 4.7K, 1/4W, 5%	4764-4704-001	R333	Resistor, 33 Ω , 1/4W, 5%	4764-3302-001
R136	Resistor, 1.0K, 1/4W, 5%	4764-1004-001	R334	Resistor, 33 Ω , 1/4W, 5%	4764-3302-001
R139	Resistor, 1.0K, 1/4W, 5%	4764-1004-001	R335	Resistor, 430 Ω , 1/4W, 5%	4764-4303-001
R140	Resistor, 10K, 1/4W, 5%	4764-1005-001	R340	Resistor, 22 Ω , 1/4W, 5%	4764-2202-001
R141	Resistor, 150K, 1/4W, 5%	4764-1506-001	R341	Resistor, 22 Ω , 1/4W, 5%	4764-2202-001
R142	Resistor, 120K, 1/4W, 5%	4764-1206-001	R342	Resistor, 1.0K, 1/4W, 5%	4764-1004-001
R143	Resistor, 3.3K, 1/4W, 5%	4764-3304-001	R343	Resistor, 1.2K, 1/4W, 5%	4764-1204-001
R144	Resistor, 3.9K, 1/4W, 5%	4764-3904-001	R344	Resistor, 10K, 1/4W, 5%	4764-1005-001
R145	Resistor, 5.1K, 1/4W, 5%	4764-5104-001	R705	Potentiometer, lin., 1K, 20%	4735-1004-006
R146	Resistor, 27K, 1/4W, 5%	4764-2705-001	R706	Resistor, 11K, 1/4W, 5%	4764-1105-001
R149	Resistor, 91K, 1/4W, 5%	4764-9105-001	R709	Resistor, 10K, 1/4W, 5%	4764-1005-001
R151	Resistor, 27K, 1/4W, 5%	4764-2705-001	R710	Resistor, 10K, 1/4W, 5%	4764-1005-001
R143	Resistor, 3.3K, 1/4W, 5%	4764-3304-001	R711	Resistor, 10K, 1/4W, 5%	4764-1005-001
R201	Resistor, 27K, 1/4W, 5%	4764-2705-001	R712	Resistor, 680K, 1/4W, 5%	4764-6806-001
R202	Resistor, 15K, 1/4W, 5%	4764-1505-001	R713	Resistor, 33 Ω , 1/4W, 5%	4764-3302-001
R203	Resistor, 1.2K, 1/4W, 5%	4764-1204-001	R714	Resistor, 2.7K, 1/4W, 5%	4764-2704-001
R204	Resistor, 30K, 1/4W, 5%	4764-3005-001	R715	Resistor, 620 Ω , 1/4W, 5%	4764-6203-001
R205	Resistor, 220 Ω , 1/4W, 5%	4764-2203-001	R716	Resistor, 5.1K, 1/4W, 5%	4764-5104-001
R206	Resistor, 27K, 1/4W, 5%	4764-2705-001	R717	Resistor, 820 Ω , 1/4W, 5%	4764-8203-001
R209	Resistor, 15K, 1/4W, 5%	4764-1505-001	R719	Resistor, 15K, 1/4W, 5%	4764-1505-001
R210	Resistor, 1.7K, 1/4W, 5%	4764-1204-001	R720	Resistor, 15K, 1/4W, 5%	4764-1505-001
R211	Resistor, 27K, 1/4W, 5%	4764-2705-001	R721	Potentiometer, lin., 10K, 20%	4735-1005-007
R212	Resistor, 8.2K, 1/4W, 5%	4764-8204-001	R723	Resistor, 22K, 1/4W, 5%	4764-2205-001
R213	Resistor, 51 Ω , 1/4W, 5%	4764-5102-001	R724	Resistor, 22K, 1/4W, 5%	4764-2205-001
R214	Resistor, 33K, 1/4W, 5%	4764-3305-001	R725	Resistor, 10K, 1/4W, 5%	4764-1005-001
R215	Resistor, 10K, 1/4W, 5%	4764-1005-001	R726	Resistor, 6.8K, 1/4W, 5%	4764-6804-001
R216	Resistor, 8.2K, 1/4W, 5%	4764-8204-001	R729	Resistor, 18K, 1/4W, 5%	4764-1805-001
R219	Resistor, 8.2K, 1/4W, 5%	4764-8204-001	R730	Resistor, 12K, 1/4W, 5%	4764-1205-001
R220	Resistor, 1.0K, 1/4W, 5%	4764-1004-001	R733	Resistor, 820 Ω , 1/4W, 5%	4764-8203-001
R221	Resistor, 1.0K, 1/4W, 5%	4764-1004-001	R734	Resistor, 820 Ω , 1/4W, 5%	4764-8203-001

Master PCB (cont.)

1939-0741-102

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
R735	Resistor, 820Ω, 1/4W, 5%	4764-8203-001	R811	Resistor, 100Ω, 1/4W, 10% (b)	4702-1003-001
R736	Resistor, 10K, 1/4W, 5%	4764-1005-001	R811	Resistor, 200Ω, 1/4W, 5% (c)	4764-2203-001
R751	Resistor, 270Ω, 1/4W, 5%	4764-2703-001	R812	Resistor, 2.7K, 1/4W, 5%	4764-2704-001
R752	Resistor, 10Ω, 1/4W, 5%	4764-1002-001	R855	Resistor, 10K, 1/4W, 5% (a)	4764-1005-001
R753	Resistor, 1.0K, 1/4W, 5%	4764-1004-001	R855	Resistor, 10K, 1/4W, 5% (b)	4764-1005-001
R754	Resistor, 100Ω, 1/4W, 5%	4764-1003-001	R855	Resistor, 10K, 1/4W, 5% (c)	4764-1005-001
R756	Resistor, 68Ω, 1/4W, 5%	4764-6802-001	FL201	Filter, crystal, 5.26MHz, 4-pole	2708-0000-003
R757	Resistor, 10K, 1/4W, 5%	4764-1005-001	FL202	Filter, crystal, 5.26MHz, 4-pole	2708-0000-003
R759	Resistor, 24Ω, 1/4W, 5%	4764-2402-001	FL203	Filter, crystal, discr., 5.26MHz	2709-0000-010
R760	Resistor, 100Ω, 1/4W, 5%	4764-1003-001	P401	Connector, male, 3-pin	2108-0000-135
R800	Resistor, 3.6K, 1/4W, 5%	4764-3604-001	P402	Connector, male, 12-pin	2108-0000-094
R801	Resistor, 1.2K, 1/4W, 5%	4764-1204-001	P403	Connector, male, 2-pin	2108-0000-200
R802	Resistor, 10Ω, 1/4W, 5%	4764-1002-001	P500	Connector, male, 15-pin	2108-0000-065
R803	Resistor, 82Ω, 1/4W, 5%	4764-8202-001	P701	Connector, male, 15-pin	2108-0000-084
R804	Resistor, 330Ω, 1/4W, 5%	4764-3303-001	P702	Connector, male, 7-pin	2108-0000-083
R805	Resistor, 1.0K, 1/4W, 5%	4764-1004-001	P703	Connector, male, 16-pin	2108-0000-204
R806	Resistor, 10Ω, 1/4W, 5%	4764-1002-001	TP01	Socket, test	2156-0000-002
R810	Resistor, 6.2K, 1/4W, 5%	4764-6204-001		Cap, coil	1860-0000-002
R812	Resistor, 2.7K, 1/4W, 5%	4764-2704-001		Socket, IC, 8-pin	2136-0000-004
R809	Resistor, 82Ω, 1/4W, 5% (a)	4764-8202-001		Insulator pad (Q802)	4891-0000-005
R809	Resistor, 82Ω, 1/4W, 5% (b)	4764-8202-001		Heat sink (Q802)	4891-0000-008
R809	Resistor, 150Ω, 1/4W, 5% (c)	4764-1503-001		Heat sink (IC303, IC304)	1404-0741-066
R811	Resistor, 100Ω, 1/4W, 10% (a)	4764-8202-001		Cable, coaxial	6050-0828-129

Final Amplifier PCB

1939-0741-105

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
C900	Cap., cer., 0.005μF	1510-5004-001	C926	Cap., cer., 250pF (c)	1540-2503-006
C901	Cap., variable, 55-330pF	1574-3303-001	C927	Cap., cer., 200pF (a)	1540-2003-006
C902	Cap., cer., 220pF (a)	1540-2203-006	C927	Cap., cer., 200pF (b)	1540-2003-006
C902	Cap., cer., 250pF (b)	1540-2503-006	C927	Cap., cer., 250pF (c)	1540-2503-006
C902	Cap., cer., 150pF (c)	1540-1503-006	C928	Cap., cer., 0.1μF	1526-1005-003
C903	Cap., cer., 0.0022μF	1545-2204-120	C929	Cap., cer., 0.1μF	1526-1005-003
C904	Cap., cer., 0.1μF	1509-1006-001	C930	Cap., cer., 0.1μF	1526-1005-003
C905	Cap., cer., 0.005μF	1510-5004-001	C931	Cap., variable, 50-380pF	1574-3803-001
C906	Cap., electr., 10μF, 16V	1535-1002-016	C932	Cap., variable, 50-380pF	1574-3803-001
C907	Cap., cer., 470pF (a)	1526-4703-001	C933	Cap., silver mica, 500pF (b)	1540-5003-001
C907	Cap., cer., 180pF (b)	1526-1803-008	C933	Cap., silver mica, 500pF (c)	1540-5003-006
C908	Cap., cer., 470pF (a)	1526-4703-001	C934	Cap., silver mica, 500pF (b)	1540-5003-001
C908	Cap., cer., 180pF (b)	1526-1803-008	C934	Cap., silver mica, 500pF (c)	1540-5003-006
C909	Cap., cer., 0.005μF	1510-5004-001	C935	Cap., cer., silver mica, 300pF (a)	1540-3003-006
C910	Cap., variable, 55-330pF	1574-3303-001	C936	Cap., cer., silver mica, 300pF (a)	1540-3003-006
C911	Cap., cer., 0.005μF	1510-5004-001	C937	Cap., cer., silver mica, 150pF (a)	1540-1503-006
C912	Cap., cer., 0.005μF	1510-5004-001	C937	Cap., silver mica, 120pF (b)	1540-1203-006
C914	Cap., silver mica, 300pF	1540-3003-006	C937	Cap., silver mica, 100pF (c)	1540-1003-006
C915	Cap., silver mica, 300pF	1540-3003-006	C938	Cap., cer., 0.005μF	1510-5004-001
C916	Cap., silver mica, 1000pF	1540-1004-001	C939	Cap., cer., silver mica, 100pF (a)	1540-1003-006
C919	Cap., silver mica, 1000pF	1540-1004-001	C939	Cap., silver mica, 80pF (b)	1540-8002-006
C920	Cap., electr., 15μF, 16V	1518-1508-018	C939	Cap., silver mica, 80pF (c)	1540-8002-006
C921	Cap., cer., 0.005μF	1510-5004-001	C940	Cap., cer., 0.1μF	1526-1005-003
C922	Cap., cer., 0.1μF	1505-1006-005	C941	Cap., cer., silver mica, 100pF (a)	1540-1003-006
C924	Cap., cer., 0.1μF	1509-1006-001	C941	Cap., silver mica, 80pF (b)	1540-8002-006
C925	Cap., cer., 0.1μF	1509-1006-001	C941	Cap., silver mica, 80pF (c)	1540-8002-006
C926	Cap., cer., 200pF (a)	1540-2003-006	C942	Cap., cer., 0.1μF	1526-1005-003
C926	Cap., cer., 200pF (b)	1540-2003-006	C943	Cap., cer., 0.005μF	1510-5004-001

Final Amplifier PCB (cont.)

1939-0741-105

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
C944	Cap., cer., 0.002 μ F	1506-2004-001	L915	Coil, 2-1/2T (b)	1814-0741-060
C945	Cap., cer., 0.002 μ F	1506-2004-001	L915	Coil, 2-1/2T (c)	1814-0741-068
C946	Cap., cer., 0.0022 μ F	1526-2204-004	L916	Coil, 6-1/2T (a)	1814-0741-075
C950	Cap., cer., silver mica, 80pF (a)	1540-8002-006	L916	Coil, 6-1/2T (b)	1814-0741-060
C950	Cap., silver mica, 60pF (b)	1540-6002-006	L916	Coil, 6-1/2T (c)	1814-0741-069
C950	Cap., silver mica, 50pF (c)	1540-5002-006	L919	Coil, 6-1/2T (a)	1814-0741-075
C951	Cap., cer., silver mica, 150pF (a)	1540-1503-006	L919	Coil, 6-1/2T (b)	1814-0741-061
C951	Cap., silver mica, 120pF (b)	1540-1203-006	L919	Coil, 6-1/2T (c)	1814-0741-069
C951	Cap., silver mica, 100pF (c)	1540-1003-006	L920	Coil, 5-1/2T (a)	1814-0741-076
C952	Cap., cer., 18pF (a)	1501-1802-001	L920	Coil, 5-1/2T (b)	1814-0741-062
C952	Cap., cer., 18pF (b)	1501-1802-001	L920	Coil, 5-1/2T (c)	1814-0741-070
C952	Cap., cer., 12pF (c)	1501-1202-001	L921	Coil, 10-1/2T (a)	1814-0739-033
C953	Cap., cer., silver mica, 180pF (a)	1540-1803-006	L921	Coil, 10-1/2T (b)	1814-0739-033
C953	Cap., silver mica, 150pF (b)	1540-1503-006	L921	Coil, 9-1/2T (c)	1814-0739-032
C953	Cap., silver mica, 120pF (c)	1540-1203-006	L922	Coil, 11-1/2T (a)	1814-0739-034
C955	Cap., cer., silver mica, 150pF (a)	1540-1503-006	L922	Coil, 10-1/2T (b)	1814-0739-031
C955	Cap., silver mica, 120pF (b)	1540-1203-006	L922	Coil, 10-1/2T (c)	1814-0739-031
C955	Cap., silver mica, 100pF (c)	1540-1003-006	L923	Coil, 11-1/2T (a)	1814-0739-034
C956	Cap., cer., 18pF (a)	1501-1802-001	L923	Coil, 10-1/2T (b)	1814-0739-031
C956	Cap., cer., 18pF (b)	1501-1802-001	L923	Coil, 10-1/2T (c)	1814-0739-031
C956	Cap., cer., 12pF (c)	1501-1202-001	L924	Coil, 10-1/2T (a)	1814-0739-033
C959	Cap., cer., silver mica, 80pF (a)	1540-8002-006	L924	Coil, 10-1/2T (b)	1814-0739-033
C959	Cap., silver mica, 60pF (b)	1540-6002-006	L924	Coil, 9-1/2T (c)	1814-0739-032
C959	Cap., silver mica, 50pF (c)	1540-5002-006	Q901	Transistor, RF power, 2N5848	4821-0000-066
C960	Cap., chip, 0.001 μ F	1541-1004-010	Q901	Transistor, RF pwr., PT88518 (sub.)	4821-0000-061
CR901	Diode, silicon, 1N4149	4803-0000-027	Q902	Transistor, RF power, MRF455	4821-0000-065
CR902	Diode, PIN, UM9260B	4805-0000-002	Q902	Transistor, RF pwr., PT8854 (sub.)	4821-0000-060
CR903	Diode, silicon, 1N4149	4803-0000-027	Q903	Transistor, RF pwr., MRF455	4821-0000-060
CR904	Diode, silicon, 1N4149	4803-0000-027	Q903	Transistor, RF pwr., PT8854 (sub.)	4821-0000-060
CR905	Diode, PIN, UM9260B	4805-0000-002	TP901	Test point	2150-0000-014
DC901	Directional coupler	1814-0741-112	Z901	Suppressor, parasitic	1814-0739-027
J901	Connector, male	2146-0000-010	Z902	Suppressor, parasitic	1814-0739-027
J902	Connector, male	2146-0000-010	Z903	Suppressor, parasitic	1814-0739-027
L900	Choke, molded, 5-1/2T (a)	1810-0000-136	R901	Resistor, 15 Ω , 1/4W, 10% (a)	4704-4701-001
L900	Choke, molded, 4-1/2T (b)	1810-0000-130	R901	Resistor, 150 Ω , 1/4W, 10% (b)	4704-1502-001
L900	Choke, molded, 3-1/2T (c)	1810-0000-124	R901	Resistor, 4.7 Ω , 1/4W, 10% (c)	4704-4701-001
L901	Choke, molded, 3-1/2T (a)	1810-0000-124	R902	Resistor, 6.8 Ω , 1/2W, 5%	4701-6801-001
L901	Choke, molded, 4-1/2T (b)	1810-0000-130	R903	Resistor, 10K, 1/4W, 10%	4704-1005-001
L901	Choke, molded, 4-1/2T (b)	1810-0000-130	R904	Resistor, 8.2K, 1/2W, 10%	
L901	Choke, molded, 3-1/2T (c)	1810-0000-124	R905	Resistor, 8.2K, 1/2W, 10%	
L902	Coil, VK-200	1827-0000-002	R906	Resistor, 8.2K, 1/2W, 10%	
L903	Coil, VK-200	1827-0000-002	R907	Resistor, 8.2K, 1/2W, 10%	
L904	Choke, molded, 3-1/2T (a)	1810-0000-124	R908	Resistor, 51 Ω , 1W, 10%	4702-5102-001
L904	Choke, molded, 3-1/2T (b)	1810-0000-124	R909	Resistor, 6.8 Ω , 1/2W, 5%	4701-6801-001
L904	Choke, molded, 2-1/2T (c)	1810-0000-123	R910	Resistor, 6.8 Ω , 1/2W, 5%	4701-6801-001
L905	Choke, molded, 3-1/2T (a)	1810-0000-124	R911	Resistor, 100 Ω , 1W, 10%	4702-1003-001
L905	Choke, molded, 3-1/2T (b)	1810-0000-124	R912	Resistor, 100 Ω , 1W, 10%	4702-1003-001
L905	Choke, molded, 2-1/2T (c)	1810-0000-123	R913	Resistor, 100 Ω , 2W, 10%	4703-1003-001
L906	Coil, VK-200	1827-0000-002	R914	Resistor, 470 Ω , 1/4W, 10%	4704-4703-001
L909	Coil, VK-200	1827-0000-002	R915	Resistor, 620 Ω , 1/4W, 5%	4704-6203-002
L910	Coil, RFI, 7-1/2T	1805-0649-014	R916	Resistor, 22 Ω , 1/4W, 10%	4702-2202-001
L911	Coil, RFI, 7-1/2T	1805-0649-014	R919	Resistor, 1K, 1/4W, 10%	4704-1004-001
L914	Coil, 2-1/2T (a)	1814-0741-074	R920	Resistor, 100 Ω , 1/4W, 10%	4704-1003-001
L914	Coil, 2-1/2T (b)	1814-0741-060	R921	Resistor, wirewound, 50 Ω , 5W	4714-5002-001
L914	Coil, 2-1/2T (c)	1814-0741-068			
L915	Coil, 2-1/2T (a)	1814-0741-074			

Miscellaneous

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
Q511	Transistor, power, 2N5883	4821-1046-013		Plate assy., fdthru cap.	1939-0828-123
Q512	Diode pack, chanel-element	1939-0678-108	C004	Cap., feedthru, 0.001 μ F, 50V	1511-1004-004
	*TCXO PCB, \pm 0.0005%	1939-0828-112	C005	Cap., feedthru, 0.001 μ F, 50V	1511-1004-004
	*TCXO PCB, \pm 0.0002%	1939-0828-117	C006	Cap., feedthru, 0.001 μ F, 50V	1511-1004-004
	Plate assy., latch adjustment	1404-0828-033		Plate, mounting	1404-0828-045
	Pushbutton	1404-0828-034		Plate assy., fdthru cap.	1939-0828-124
	Spring, pushbutton	2523-0828-036	C001	Cap., feedthru, 0.001 μ F, 300V	1511-1004-005
	Shield, RF	1939-0828-132	C002	Cap., feedthru, 0.001 μ F, 300V	1511-1004-005
	Wire assembly	6051-0828-125	C003	Cap., feedthru, 0.001 μ F, 300V	1511-1004-005
	Wire assembly	6051-0828-126		Plate, mounting	1404-0828-046
	Harness, Mega	6057-0828-032		Cable, 1037 intrcnnt.	6057-1037-110
	Cam	1410-0828-032		Bushing	2505-0000-002
	Chassis, heat sink	1939-0828-109		Connector, 1037 test set	2108-0000-003
	Cover, final amplifier	1412-0741-057		Receptacle, 16-pin, test sckt.	2108-0000-214
	Shield	1412-0680-070		Tab, pull	2108-0000-215
	Handle	3150-0828-021		Cable, ribbon, 16-conductor	6069-0000-016
	Lock assembly	2410-0828-038			
	Mounting tray, bottom	1939-0828-106			
	Top, final amplifier	1939-0828-108			
	Latch	1404-0828-031			
	Groove pin	2810-0828-029			
	Spring, compression	2523-0828-037			

Power and Control Cable

1939-0828-135

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
	Cable, control	6051-0000-516		Plug, housing	1417-0828-307
	Cable, power	6051-0000-014		Top, housing	2108-1272-026
	Connector	2191-0000-023		Plug, housing	14170828-308
	Connector, plug, fem.	1417-0828-069		Pin, fem., 24-20 gauge	2108-0000-188
	Contacts, power, fem.	2131-0000-026		Pin, fem., 18-16 gauge	2108-0000-189
	Bottom, housing	2108-1272-027		Pin	2191-0000-027

Connector PCB,
Single-Channel

1939-1287-112

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
C1	Cap., cer., 0.0015 μ F	1510-1504-003	CR17	Diode, silicon, 1N4148	4803-0000-004
C2	Cap., electr., 10 μ F, 16V	1535-1002-016	IC1	IC, CD4066	4850-0000-015
C4	Cap., cer., 0.47 μ F	1526-4706-001	J1	Header, dual-row, 10-pin	2108-0000-203
C6	Cap., cer., 0.1 μ F	1505-1006-005	Q1	Transistor, MPS6514	4811-0000-012
CR1	LED, red	4807-0000-010	Q2	Transistor, MPS6514	4811-0000-012
CR2	LED, green	4807-0000-004	Q3	Transistor, 2N5226	4811-0000-028
CR3	LED, yellow	4807-0000-009	Q4	Transistor, 2N5226	4811-0000-028
CR16	Diode, silicon, 1N4148	4803-0000-004	Q5	Transistor, MPS6514	4811-0000-012

Power Control PCB

1939-0741-116

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
C601	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	IC601	IC, LM2902	4850-0000-024
C602	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	Q603	Transistor, MPS3638A, PNP	4810-0000-018
C603	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	Q604	Transistor, sil., D44C6	4821-0000-059
C604	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	R601	Res., carb., 8.87K, 1/4W, 1%	4774-8874-001
C605	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	R602	Res., carb., 470 Ω , 1/4W, 5%	4764-4703-001
C606	Cap., electr., 2.2 μ F, 50V	1542-2201-050	R603	Res., carb., 47K, 1/4W, 5%	4764-4705-001
C607	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	R604	Res., carb., 470 Ω , 1/4W, 5%	4764-4703-001
C609	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	R605	Res., carb., 10.5K, 1/4W, 1%	4774-1055-001
C610	Cap., electr., 2.2 μ F, 50V	1542-2201-050	R606	Res., carb., 976 Ω , 1/4W, 1%	4774-9763-001
C611	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	R609	Res., carb., 10 Ω , 1/4W, 5%	4764-1002-001
C612	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	R610	Res., carb., 100K, 1/4W, 1%	4774-1006-001
C613	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	R611	Res., carb., 10.5K, 1/4W, 1%	4774-1055-001
C614	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	R613	Res., carb., 10K, 1/4W, 5%	4764-1005-001
C615	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	R614	Res., carb., 22K, 1/4W, 5%	4764-2205-001
C616	Cap., cer., 0.001 μ F, 50V, 20%	1545-1004-120	R615	Res., carb., 22K, 1/4W, 5%	4764-2205-001
C619	Cap., electr., 47 μ F	1542-4702-016	R616	Res., carb., 12K, 1/4W, 5%	4764-1205-001
C620	Cap., cer., 0.01 μ F, 50V, 20%	1545-1005-120	R619	Res., carb., 75K, 1/4W, 5%	4764-7505-001
C621	Cap., electr., 2.2 μ F, 50V	1542-2201-050	R620	Res., carb., 100 Ω , 1/4W, 5%	4764-1006-001
C622	Cap., electr., 22 μ F, 6V	1542-2202-016	R621	Res., carb., 1.2K, 1/4W, 5%	4764-1204-001
C623	Cap., electr., 22 μ F, 6V	1542-2202-016	R622	Res., carb., 360 Ω , 1/4W, 5%	4764-3603-001
C624	Cap., mono., 0.1 μ F, 10%, X7R	1556-1006-010	R623	Res., carb., 120 Ω , 1/4W, 5%	4764-1203-001
CR601	Diode, silicon, 1N4148	4803-0000-004	R624	Res., carb., 360 Ω , 1/4W, 5%	4764-3603-001
CR602	Diode, silicon, 1N4148	4803-0000-004	R625	Res., carb., 1 Ω , 1/4W, 5%	4764-1004-001
CR603	Diode, silicon, 1N4148	4803-0000-004	RFC601	Coil, RF, 10 μ H, 10%	1828-1002-010
CR604	Diode, silicon, 1N4148	4803-0000-004	RFC601	Coil, RF, 10 μ H, 10%	1828-1002-010
CR605	Diode, zener, 10V, 5%, 500/mW	4803-1002-001	RT601	Thermistor, 100K	4750-1006-001
CR606	Diode, silicon, 1N4148	4803-0000-004			

Connector PCB, 16-Channel

1939-1287-106

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
C1	Cap., cer., 0.0015 μ F	1510-1504-003	R7	Resistor, carb., 4.7K	4764-4704-001
C2	Cap., electr., 10 μ F, 16V	1535-1002-016	R8	Resistor, carb., 680 Ω	4764-6803-001
C4	Cap., cer., 0.47 μ F	1526-4706-001	R9	Resistor, carb., 4.7K	4764-4704-001
C6	Cap., cer., 0.1 μ F	1505-1006-005	R10	Resistor, carb., 2.7K	4764-2704-001
CR1	LED, red	4807-0000-010	R11	Resistor, carb., 22K	4764-2205-001
CR2	LED, green	4807-0000-004	R12	Resistor, carb., 8.2K	4764-8204-001
CR3	LED, yellow	4807-0000-009	R13	Resistor, carb., 22K	4764-2205-001
CR7	LED, 7-segment	4807-0000-007	R14	Resistor, carb., 22K	4764-2205-001
CR8	LED, 7-segment	4807-0000-007	R15	Resistor, carb., 22K	4764-2205-001
CR9	LED, yellow	4807-0000-009	R16	Resistor, comp., 51 Ω	4764-5102-001
CR10	Diode, silicon, 1N4148	4803-0000-004	R17	Resistor, carb., 12K	4764-1205-001
CR11	Diode, silicon, 1N4148	4803-0000-004	R18	Resistor, carb., 680 Ω	4764-6803-001
IC1	IC, LM1017	4851-1017-001	R19	Resistor, carb., 22K	4764-2205-001
IC2	IC, CD4066	4850-0000-015	R20	Resistor, carb., 22K	4764-2205-001
Q1	Transistor, MPS6514	4811-0000-012	R21	Resistor, carb., 510 Ω	4764-5103-001
Q2	Transistor, MPS6514	4811-0000-012	R22	Resistor, carb., 510 Ω	4764-5103-001
Q3	Transistor, 2N5226	4811-0000-028	R23	Resistor, carb., 680 Ω	4764-6803-001
Q4	Transistor, 2N5226	4811-0000-028	R24	Resistor, carb., 22K	4764-2205-001
Q5	Transistor, MPS6514	4811-0000-012	R25	Resistor, carb., 22K	4764-2205-001
R1	Resistor, carb., 3.3K	4764-4704-001	SW1	Switch, on/off	5134-0000-008
R2	Resistor, carb., 680 Ω	4764-6803-001	SW2	Switch, slide, 3-position	5134-0000-007
R3	Resistor, carb., 680 Ω	4764-6803-001	SW3	Switch, slide, 3-position	5134-0000-007
R4	Resistor, carb., 22K	4764-2205-001		Socket, IC, 14-pin	2136-0000-002
R5	Resistor, carb., 22K	4764-2205-001		Socket, IC, 16-pin	2136-0802-021
R6	Resistor, carb., 22K	4764-2205-001		Pin, male	2150-0000-010

Connector PCB,
Four-Channel

1939-1287-105

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
C1	Cap., cer., 0.0015 μ F	1510-1504-003	R6	Resistor, carb., 22K	4764-2205-001
C2	Cap., electr., 10 μ F, 16V	1535-1002-016	R7	Resistor, carb., 4.7K	4764-4704-001
C4	Cap., cer., 0.47 μ F	1526-4706-001	R8	Resistor, carb., 680 Ω	4764-6803-001
C6	Cap., cer., 0.1 μ F	1505-1006-005	R9	Resistor, carb., 4.7K	4764-4704-001
CR1	LED, red	4807-0000-010	R10	Resistor, carb., 2.7K	4764-2704-001
CR2	LED, green	4807-0000-004	R11	Resistor, carb., 22K	4764-2205-001
CR3	LED, yellow	4807-0000-009	R12	Resistor, carb., 8.2K	4764-8204-001
CR7	Diode, silicon, 1N4148	4803-0000-004	R13	Resistor, carb., 4.7K	4764-4704-001
CR8	Diode, silicon, 1N4148	4803-0000-004	R14	Resistor, carb., 4.7K	4764-4704-001
CR9	LED, yellow	4807-0000-009	R15	Resistor, carb., 4.7K	4764-4704-001
CR10	Diode, silicon, 1N4148	4803-0000-004	R16	Resistor, carb., 510 Ω	4764-5103-001
CR11	Diode, silicon, 1N4148	4803-0000-004	R17	Resistor, carb., 510 Ω	4764-5103-001
CR12	Diode, silicon, 1N4148	4803-0000-004	R18	Resistor, carb., 510 Ω	4764-5103-001
CR13	Diode, silicon, 1N4148	4803-0000-004	R19	Resistor, carb., 510 Ω	4764-5103-001
CR14	LED, 7-segment	4807-0000-007	R20	Resistor, carb., 510 Ω	4764-5103-001
CR16	Diode, silicon, 1N4148	4803-0000-004	R21	Resistor, carb., 510 Ω	4764-5103-001
IC1	IC, 4066	4850-0000-015	R22	Resistor, carb., 510 Ω	4764-5103-001
Q1	Transistor, MPS6514	4811-0000-012	R23	Resistor, carb., 680 Ω	4764-6803-001
Q2	Transistor, MPS6514	4811-0000-012	R24	Resistor, carb., 22K	4764-2205-001
Q3	Transistor, 2N5226	4811-0000-028	R25	Resistor, carb., 22K	4764-2205-001
Q4	Transistor, 2N5226	4811-0000-028	SW1	Switch, on/off	5134-0000-008
Q5	Transistor, MPS6514	4811-0000-012	SW2	Switch, slide, 3-position	5134-0000-007
R1	Resistor, carb., 3.3K	4764-4704-001	SW3	Switch, slide, 3-position	5134-0000-007
R2	Resistor, carb., 680 Ω	4764-6803-001		Socket, IC, 14-pin	2136-0000-002
R3	Resistor, carb., 680 Ω	4764-6803-001		Pin, male	2150-0000-010
R4	Resistor, carb., 22K	4764-2205-001		Header, dual-row, 10-pin	2108-0000-023
R5	Resistor, carb., 22K	4764-2205-001			

Control PCB, Single-
Channel with Single-
Tone CTCSS

1939-1287-113

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
CR5	Diode, silicon, 1N4148	4803-0000-004	R2	Potentiometer, audio, 5K	4731-5004-033
CR6	Diode, silicon, 1N4148	4803-0000-004		Cable, ribbon	6057-0110-045
R1	Potentiometer, lin., 5K	4731-5004-032			

Control PCB, 16-
Channel with Single-
Tone CTCSS

1939-1287-104

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
C1	Cap., cer., 0.0015 μ F	1510-1504-003	C5	Cap., cer., 0.01 μ F	1510-1005-003
C2	Cap., electr., 10 μ F, 16V	1518-1008-015	C6	Cap., cer., 0.01 μ F	1510-1005-003
C3	Cap., cer., 0.1 μ F	1510-1006-003	C7	Cap., cer., 0.1 μ F	1510-1006-003
C4	Cap., cer., 0.01 μ F	1510-1005-003	C8	Cap., electr., 4.7 μ F, 50V	1518-4701-015

**Control PCB, 16-
Channel with Single-
Tone CTCSS (cont.)**

1939-1287-104

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
C9	Cap., electr., 1 μ F, 50V	1518-1001-015	CR42	Diode, silicon, 1N4148	4803-0000-004
C10	Cap., cer., 0.01 μ F	1510-1005-003	CR43	Diode, silicon, 1N4148	4803-0000-004
C11	Cap., cer., 0.01 μ F	1510-1005-003	CR44	Diode, silicon, 1N4148	4803-0000-004
C12	Cap., cer., 0.01 μ F	1510-1005-003	CR45	Diode, silicon, 1N4148	4803-0000-004
C13	Cap., cer., 0.01 μ F	1510-1005-003	CR46	Diode, silicon, 1N4148	4803-0000-004
C14	Cap., cer., 0.0015 μ F	1510-1504-003	IC1	IC, 4011	4851-4011-001
C15	Cap., cer., 0.01 μ F	1510-1005-003	IC2	IC, 4514	4851-4514-001
CR1	Diode, silicon, 1N4148	4803-0000-004	IC3	IC, 4093	4851-4093-001
CR2	Diode, silicon, 1N4148	4803-0000-004	IC4	IC, 4070	4851-4070-001
CR3	Diode, silicon, 1N4148	4803-0000-004	IC5	IC, 4029	4851-4029-001
CR4	Diode, silicon, 1N4148	4803-0000-004	Q1	Transistor, MPS6514	4811-0000-012
CR5	Diode, silicon, 1N4148	4803-0000-004	R1	Resistor, 18K, 1/4W, 5%	4764-1805-001
CR6	Diode, silicon, 1N4148	4803-0000-004	R2	Resistor, 100K, 1/4W, 5%	4764-1006-001
CR7	Diode, silicon, 1N4148	4803-0000-004	R3	Potentiometer, lin., 5K	4731-5004-032
CR8	Diode, silicon, 1N4148	4803-0000-004	R4	Potentiometer, audio., 5K	4731-5004-033
CR9	Diode, silicon, 1N4148	4803-0000-004	R5	Resistor, 100K, 1/4W, 5%	4764-1006-001
CR10	Diode, silicon, 1N4148	4803-0000-004	R6	Resistor, 47K, 1/4W, 5%	4764-4705-001
CR11	Diode, silicon, 1N4148	4803-0000-004	R7	Resistor, 100K, 1/4W, 5%	4764-1006-001
CR12	Diode, silicon, 1N4148	4803-0000-004	R8	Resistor, 100K, 1/4W, 5%	4764-1006-001
CR13	Diode, silicon, 1N4148	4803-0000-004	R9	Resistor, 10K, 1/4W, 5%	4764-1005-001
CR14	Diode, silicon, 1N4148	4803-0000-004	R10	Resistor, 47K, 1/4W, 5%	4764-4705-001
CR15	Diode, silicon, 1N4148	4803-0000-004	R11	Resistor, 47K, 1/4W, 5%	4764-4705-001
CR16	Diode, silicon, 1N4148	4803-0000-004	R12	Resistor, 47K, 1/4W, 5%	4764-4705-001
CR17	Diode, silicon, 1N4148	4803-0000-004	R13	Resistor, 47K, 1/4W, 5%	4764-4705-001
CR18	Diode, silicon, 1N4148	4803-0000-004	R14	Resistor, 1K, 1/4W, 5%	4764-1004-001
CR19	Diode, silicon, 1N4148	4803-0000-004	R15	Resistor, 100K, 1/4W, 5%	4764-1006-001
CR20	Diode, silicon, 1N4148	4803-0000-004	R16	Resistor, 10K, 1/4W, 5%	4764-1005-001
CR21	Diode, silicon, 1N4148	4803-0000-004	R17	Resistor, 68K, 1/4W, 5%	4764-6805-001
CR22	Diode, silicon, 1N4148	4803-0000-004	R18	Resistor, 22K, 1/4W, 5%	4764-2205-001
CR23	Diode, silicon, 1N4148	4803-0000-004	R19	Resistor, 22K, 1/4W, 5%	4764-2205-001
CR24	Diode, silicon, 1N4148	4803-0000-004	R24	Resistor, 100K, 1/4W, 5%	4764-1006-001
CR25	Diode, silicon, 1N4148	4803-0000-004	R25	Resistor, 100K, 1/4W, 5%	4764-1006-001
CR26	Diode, silicon, 1N4148	4803-0000-004	R26	Resistor, 100K, 1/4W, 5%	4764-1006-001
CR27	Diode, silicon, 1N4148	4803-0000-004	R27	Resistor, 100K, 1/4W, 5%	4764-1006-001
CR28	Diode, silicon, 1N4148	4803-0000-004	R28	Resistor, 47K, 1/4W, 5%	4764-4705-001
CR29	Diode, silicon, 1N4148	4803-0000-004	R29	Resistor, 47K, 1/4W, 5%	4764-4705-001
CR30	Diode, silicon, 1N4148	4803-0000-004	R30	Resistor, 47K, 1/4W, 5%	4764-4705-001
CR31	Diode, silicon, 1N4148	4803-0000-004	R31	Resistor, 47K, 1/4W, 5%	4764-4705-001
CR32	Diode, zener, 9.1V	4831-1002-002	R32	Resistor, 47K, 1/4W, 5%	4764-4705-001
CR33	Diode, silicon, 1N4148	4803-0000-004	R33	Resistor, 47K, 1/4W, 5%	4764-4705-001
CR34	Diode, silicon, 1N4148	4803-0000-004	R34	Resistor, 47K, 1/4W, 5%	4764-4705-001
CR35	Diode, silicon, 1N4148	4803-0000-004	R35	Resistor, 47K, 1/4W, 5%	4764-4705-001
CR36	Diode, silicon, 1N4148	4803-0000-004	SW1	Switch, rotary	5110-0000-023
CR37	Diode, silicon, 1N4148	4803-0000-004		Cable, ribbon	6067-0110-045
CR38	Diode, silicon, 1N4148	4803-0000-004		Socket, IC, 14-pin	2136-0000-002
CR39	Diode, silicon, 1N4148	4803-0000-004		Socket, IC, 24-pin	2136-0000-006
CR40	Diode, silicon, 1N4148	4803-0000-004		Socket, IC, 16-pin	2136-0802-021
CR41	Diode, silicon, 1N4148	4803-0000-004			

Control PCB, Four-
Channel with Single-
Tone CTCSS

1939-1287-103

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
CR1	Diode, silicon, 1N4148	4803-0000-004	R2	Potentiometer, audio, 5K	4731-5004-033
CR2	Diode, silicon, 1N4148	4803-0000-004	R3	Resistor, 47K, 1/4W, 5%	4764-4705-001
CR3	Diode, silicon, 1N4148	4803-0000-004	R4	Resistor, 47K, 1/4W, 5%	4764-4705-001
CR4	Diode, silicon, 1N4148	4803-0000-004	R5	Resistor, 22K, 1/4W, 5%	4764-2205-001
CR5	Diode, silicon, 1N4148	4803-0000-004	R6	Resistor, 22K, 1/4W, 5%	4764-2205-001
CR6	Diode, silicon, 1N4148	4803-0000-004	SW1	Switch, rotary	5110-0000-023
Q1	Transistor, MPS6514	4811-0000-012		Cable, ribbon	6057-0110-045
R1	Potentiometer, lin., 5K	4731-5004-032			

CTCSS Accessory PCB

1939-1186-102

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
C1	Cap., cer., 0.01 μ F, 50V	1526-1005-001	Q3	Transistor, 2N5225, NPN	4811-0000-027
C2	Cap., cer., 0.01 μ F, 50V	1526-1005-001	Q4	Transistor, 2N5225, NPN	4811-0000-027
C3	Cap., cer., 2.2 μ F	1542-2201-050	Q5	Transistor, 2N5225, NPN	4811-0000-027
C4	Cap., cer., 0.01 μ F, 50V	1526-1005-001	R1	Resistor, 110K, 1/4W, 5%	4764-1106-001
C5	Cap., cer., 0.01 μ F, 50V	1526-1005-001	R2	Resistor, 36K, 1/4W, 5%	4764-3605-001
C6	Cap., cer., 0.01 μ F, 50V	1526-1005-001	R3	Resistor, 43K, 1/4W, 5%	4764-4305-001
C9	Cap., cer., 0.01 μ F, 50V	1526-1005-001	R4	Resistor, 160K, 1/4W, 5%	4764-1606-001
C10	Cap., electr., 2.2 μ F, 50V	1542-2201-050	R5	Resistor, 33K, 1/4W, 5%	4764-3305-001
C11	Cap., electr., 2.2 μ F, 50V	1542-2201-050	R6	Resistor, 10K, 1/4W, 5%	4764-1005-001
C12	Cap., electr., 1 μ F, 50V	1542-1001-050	R8	Resistor, 10 Ω , 1/4W, 5%	4764-1003-001
C14	Cap., cer., 0.01 μ F, 50V	1526-1005-001	R9	Resistor, 10K, 1/4W, 5%	4764-1005-001
CR1	Diode, silicon, 1N4148	4803-0000-004	R10	Resistor, 6.8K, 1/4W, 5%	4764-6804-001
CR2	Diode, silicon, 1N4148	4803-0000-004	R11	Resistor, 10K, 1/4W, 5%	4764-1005-001
CR3	Diode, silicon, 1N4148	4803-0000-004	R12	Resistor, 10K, 1/4W, 5%	4764-1005-001
CR4	Diode, silicon, 1N4148	4803-0000-004	R13	Resistor, 100K, 1/4W, 5%	4764-1006-001
CR5	Diode, silicon, 1N4148	4803-0000-004	R14	Resistor, 10K, 1/4W, 5%	4764-1005-001
CR5	Diode, silicon, 1N4148	4803-0000-004	R15	Resistor, 22K, 1/4W, 5%	4764-2205-001
J1	Connector, female, 15-pin	2108-0000-093	R16	Resistor, 10K, 1/4W, 5%	4764-1005-001
J2	Connector, female, 15-pin	2108-0000-093	R19	Resistor, 22K, 1/4W, 5%	4764-2205-001
J3	Connector, female, 15-pin	2108-0000-093	R20	Resistor, 10K, 1/4W, 5%	4764-1005-001
J4	Connector, female, 15-pin	2108-0000-093	R21	Resistor, 22K, 1/4W, 5%	4764-2205-001
J5	Connector, female, 15-pin	2108-0000-093	R22	Resistor, 10K, 1/4W, 5%	4764-1005-001
J6	Connector, female, 15-pin	2108-0000-093	R23	Resistor, 12K, 1/4W, 5%	4764-1205-001
J7	Connector, female, 15-pin	2108-0000-093	R24	Resistor, 100K, 1/4W, 5%	4764-1006-001
J8	Connector, female, 15-pin	2108-0000-093	R25	Resistor, 91K, 1/4W, 5%	4764-9105-001
J9	Connector, female, 15-pin	2108-0000-093	R26	Resistor, 100K, 1/4W, 1%	4774-1006-001
J10	Connector, female, 15-pin	2108-0000-093	R27	Resistor, 12.1K, 1/4W, 1%	4774-1215-001
J11	Connector, female, 15-pin	2108-0000-093	R28	Resistor, 1K, 1/4W, 5%	4768-1004-001
J12	Connector, female, 15-pin	2108-0000-093	R29	Resistor, 10K, 1/4W, 5%	4768-1005-001
J13	Connector, female, 15-pin	2108-0000-093	R30	Resistor, 22K, 1/4W, 5%	4768-1005-001
J14	Connector, female, 15-pin	2108-0000-093	R31	Resistor, 300K, 1/4W, 5%	4768-3006-001
J15	Connector, female, 15-pin	2108-0000-093	R32	Resistor, 33K, 1/4W, 5%	4768-3305-001
IC1	IC, MC1458P	4850-0000-025	R33	Resistor, 100K, 1/4W, 5%	4768-1006-001
IC2	IC, 2904	4850-0000-025	R34	Resistor, 100K, 1/4W, 5%	4768-1006-001
Q1	IC, MPS6514	4811-0000-012	R35	Resistor, 2.7 Ω , 1/4W, 5%	4768-2701-001
Q2	Transistor, 2N5225, NPN	4811-0000-027	R36	Resistor, 2.4K, 1/4W, 5%	4768-2404-001

**CTCSS Accessory PCB
(cont.)**

1939-1186-102

Ref. Des.	Description	Part No.
R37	Resistor, 2.4K, 1/4W, 5%	4768-2404-001
R38	Resistor, 20K, 1/4W, 5%	4768-2005-001
R39	Potentiometer, 10K	4735-2204-001
R40	Resistor, 2.2K, 1/4W, 5%	4768-2204-001
R41	Resistor, 100Ω, 1/4W, 5%	4768-1003-001
R42	Resistor, 100K, 1/4W, 5%	4768-1006-001

Ref. Des.	Description	Part No.
R43	Resistor, 22K, 1/4W, 5%	4768-2205-001
R44	Resistor, 6.8K, 1/4W, 5%	4768-6804-001
R45	Resistor, 330K, 1/4W, 5%	4768-3306-001
R46	Resistor, 15K, 1/4W, 5%	4768-1052-001
R49	Resistor, 22K, 1/4W, 5%	4768-2205-001

Circuit Breaker Kit

1939-0648-124

Ref. Des.	Description	Part No.
	Circuit breaker	5170-3005-001
	Lug, no. 10	2148-1008-002
	Nut, 10/32	2832-1012-601

Ref. Des.	Description	Part No.
	Screw, no. 6 × 3/8	2854-0612-311
	Lock washer, no. 10, ext., tooth	2882-1013-101

**CTCSS Encode/Decode
PCB**

1939-1184-101

Ref. Des.	Description	Part No.
C1	Cap., cer., 0.1μF, 20%	1505-1006-120
C2	Cap., cer., 0.0022μF	1526-2204-001
C3	Cap., cer., 0.0022μF	1526-2204-001
C4	Cap., cer., 0.0022μF	1526-2204-001
C5	Cap., cer., 0.0022μF	1526-2204-001
C6	Cap., electr., 10μF, 25V	1542-1002-023
C7	Cap., cer., 0.01μF	1526-1005-003
C8	Cap., cer., 0.01μF	1526-1005-003
C9	Cap., cer., 0.1μF	1526-1006-120
C10	Cap., cer., 0.01μF	1526-1005-003
C11	Cap., cer., 0.01μF	1526-1005-003
C12	Cap., electr., 33μF, 10V	1542-3302-010
C13	Cap., electr., 10μF, 25V	1542-1002-023
C14	Cap., electr., 2.2μF, 50V	1542-2201-050
C15	Cap., electr., 0.47μF, 50V	1542-0471-050
C16	Cap., electr., 2.2μF, 50V	1542-2201-050
CR1	Diode, silicon, 1N4148	4803-0000-004
CR2	Diode, silicon, 1N4148	4803-0000-004
CR3	Diode, germanium, 1N198	4804-0000-004
CR4	Diode, silicon, 1N4148	4803-0000-004
IC1	IC, CA2904AE	4850-0000-025
IC2	IC, CA2904AE	4850-0000-025
IC3	IC, CA2904AE	4850-0000-025
IC4	IC, CD4066AE	4850-0000-018
Q1	Transistor, MPS3638A, PNP	4810-0000-018
Q2	Transistor, MPS3638A, PNP	4810-0000-018
Q3	Transistor, MPS6514, NPN	4811-0000-012
Q4	Transistor, MPS6514, NPN	4811-0000-012
R1	Resistor, 560K, 1/4W, 5%	4768-5606-001
R2	Resistor, 68K, 1/4W, 5%	4768-6805-001
R3	Resistor, 560K, 1/4W, 5%	4768-5606-001
R4	Resistor, 10K, 1/4W, 5%	4768-1005-001
R5	Resistor, 5.6K, 1/4W, 5%	4768-5604-001
R6	Resistor, 330K, 1/4W, 5%	4768-3306-001
R7	Resistor, 360K, 1/4W, 5%	4768-3606-001

Ref. Des.	Description	Part No.
R8	Resistor, 10K, 1/4W, 5%	4768-1005-001
R9	Resistor, 16K, 1/4W, 5%	4768-1605-001
R10	Resistor, 110K, 1/4W, 5%	4768-1106-001
R12	Resistor, 56K, 1/4W, 5%	4768-5605-001
R13	Resistor, 8.2K, 1/4W, 5%	4768-8204-001
R17	Resistor, 10K, 1/4W, 5%	4768-1005-001
R18	Resistor, 160K, 1/4W, 5%	4768-1606-001
R19	Resistor, 10K, 1/4W, 1%	4774-1005-001
R20	Resistor, 330K, 1/4W, 5%	4768-3306-001
R21	Resistor, 10K, 1/4W, 1%	4774-1005-001
R22	Resistor, 10K, 1/4W, 1%	4774-1005-001
R23	Resistor, 237K, 1/4W, 1%	4774-2376-001
R24	Resistor, 3K, 1/4W, 5%	4768-3004-001
R25	Potentiometer, 100K, 1/4W, 5%	4735-1006-001
R26	Resistor, 100K, 1/4W, 1%	4774-1006-001
R27	Resistor, 12.1K, 1/4W, 1%	4774-1215-001
R28	Resistor, 1K, 1/4W, 5%	4768-1004-001
R29	Resistor, 10K, 1/4W, 5%	4768-1005-001
R30	Resistor, 22K, 1/4W, 5%	4768-1005-001
R31	Resistor, 300K, 1/4W, 5%	4768-3006-001
R32	Resistor, 33K, 1/4W, 5%	4768-3305-001
R33	Resistor, 100K, 1/4W, 5%	4768-1006-001
R34	Resistor, 100K, 1/4W, 5%	4768-1006-001
R35	Resistor, 2.7Ω, 1/4W, 5%	4768-2701-001
R36	Resistor, 2.4K, 1/4W, 5%	4768-2404-001
R37	Resistor, 2.4K, 1/4W, 5%	4768-2404-001
R38	Resistor, 20K, 1/4W, 5%	4768-2005-001
R39	Potentiometer, 10K	4735-2204-001
R40	Resistor, 2.2K, 1/4W, 5%	4768-2204-001
R41	Resistor, 100Ω, 1/4W, 5%	4768-1003-001
R42	Resistor, 100K, 1/4W, 5%	4768-1006-001
R43	Resistor, 22K, 1/4W, 5%	4768-2205-001
R44	Resistor, 6.8K, 1/4W, 5%	4768-6804-001
R45	Resistor, 330K, 1/4W, 5%	4768-3306-001

**CTCSS Encode/Decode
PCB (cont.)**

1939-1184-101

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
R46	Resistor, 15K, 1/4W, 5%	4768-1052-001		Socket, IC 14-pin	2136-0000-002
R49	Resistor, 22K, 1/4W, 5%	4768-2205-001		Socket, IC, 16-pin	2136-0802-021
	Connector, female	2108-0000-092			

Executive Handset Assy.

1939-1287-125

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
C1	Cap., electr., 6.8 μ F, 40V	1518-6807-021		Hanger cup, handset	1369-0000-015
R1	Resistor, 100 Ω , 1/2W, 5%	4762-1003-001		Hood, exterior	2108-1272-024
R2	Resistor, 100 Ω , 1/2W, 5%	4762-1003-001		Hood, interior	2108-1272-025
R3	Resistor, 1K, 1/2W, 5%	4762-1004-001		Ground lug, no. 4	2147-0402-001
	Cable, 6-conductor	6051-0000-003		Plate, mounting	1404-9010-002
	Clamp, cable	6061-0000-015		Ring, retainer	2520-0000-002
	Connector	2191-0000-002		Terminal strip, two-position	2162-0000-002
	Pin, connector	2191-0000-025		Switch, cradle, DPDT	5142-0000-003
	Strain relief, connector	2807-1272-051		Switch, toggle, min., SPST	5106-0000-003
	Handset, with preamplifier	1355-0000-006			

Installation Kit

1939-0828-119

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
	Kit, circuit breaker	1939-0648-124		Grommet	2807-0000-029
	Cable, power and control	6051-0828-115			

EPROM Programming Kit

1939-0828-160

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
	Header, 16-pin	1939-0834-153		Connector, 22-pin	2808-0000-197
	PCB, EPROM	1939-0828-143		Socket, IC	2136-0000-006
IC1	EPROM, 2758	4851-2758-001			

Interface PCB

1939-0828-111

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
C501	Cap., electr., 2.2 μ F, 50V	1535-2201-050	CR502	Diode, silicon, 1N4148	4803-0000-004
C502	Cap., cer. 0.1 μ F, 20%	1545-1006-120	CR503	Diode, zener, 5.1V	4830-5001-001
C503	Cap., cer. 0.01 μ F, 20%	1545-1005-120	CR504	Diode, silicon, 1N4148	4803-0000-004
C504	Cap., electr., 1 μ F, 50V	1535-1001-050	CR505	Diode, silicon, 1N4148	4803-0000-004
C505	Cap., electr., 10 μ F, 16V	1535-1002-016	CR506	Diode, silicon, 1N4003	4803-0000-019
C506	Cap., cer. 0.01 μ F, 20%	1545-1005-120	CR509	Diode, silicon, 1N4003	4803-0000-019
C507	Cap., cer. 0.01 μ F, 20%	1545-1005-120	CR510	Diode, silicon, 1N4003	4803-0000-019
C509	Cap., electr., 1 μ F, 50V	1535-1001-050	CR511	Diode, zener, 8.2V	4830-8201-001
C510	Cap., electr., 100 μ F, 16V	1535-1003-016	CR513	Diode, silicon, 3A, 50V	4803-0000-032
C511	Cap., electr., 470 μ F, 50V	1535-4703-050	CR514	Diode, silicon, 1N4148	4803-0000-004
C513	Cap., electr., 470 μ F, 50V	1535-4703-050	CR515	Diode, silicon, 1N4148	4803-0000-004
C514	Cap., cer. 0.01 μ F, 20%	1545-1005-120	CR516	Diode, silicon, 1N4148	4803-0000-004
C515	Cap., cer. 0.01 μ F, 20%	1545-1005-120	F501	Fuse, 3A	5150-3004-005
CR501	Diode, silicon, 1N4148	4803-0000-004	IC501	IC, 7805	4850-0000-029

Interface PCB (cont.)

1939-0828-111

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
J515	Socket, 15-pin	2108-0000-064	R515	Resistor, 1K, 1/4W, 5%	4764-1004-001
J516	Socket, 3-pin	2126-0000-005	R516	Potentiometer, lin., 2K, 20%	4739-2004-001
L501	Inductor, 100 μ H, 5A	1832-1003-005	R517	Resistor, 4.7K, 1/4W, 5%	4764-4704-001
Q501	Transistor, D45C6	4821-0000-044	R518	Resistor, 2K, 1/4W, 5%	4764-2004-001
Q502	Transistor, 2N5225	4811-0000-027	R521	Potentiometer, lin., 2K, 20%	4739-2004-001
Q503	Transistor, 2N5225	4811-0000-027	R524	Resistor, 120 Ω , 1/4W, 5%	4764-1203-001
Q504	Transistor, MPS3638A	4810-0000-018	R525	Resistor, 1K, 1/4W, 5%	4764-1004-001
Q505	Transistor, MPS3638A	4810-0000-018	R526	Resistor, ww, 10 Ω , 10%	4716-1002-001
Q506	Transistor, D45H6	4821-0000-048	R529	Resistor, 220K, 1/4W, 5%	4764-2203-001
Q509	Transistor, 2N5225	4811-0000-027	R530	Potentiometer, lin., 2K, 20%	4739-2004-001
Q510	Transistor, 2N5225	4811-0000-027	R531	Resistor, 3K, 1/4W, 5%	4764-3004-001
Q513	Transistor, D45H6	4821-0000-048	R532	Resistor, 8.2K, 1/4W, 5%	4764-8204-001
Q514	Transistor, MPS6514	4810-0000-012	R533	Resistor, 5.6K, 1/4W, 5%	4764-5604-001
R501	Resistor, ww, 0.33 Ω , 10%	4713-3300-001	R534	Resistor, 620 Ω , 1/2W, 10%	4762-6203-001
R502	Resistor, 1K, 1/4W, 5%	4764-1004-001	R535	Resistor, 330 Ω , 1/2W, 10%	4762-3303-001
R503	Resistor, 1.5K, 1/4W, 5%	4764-1504-001	R537	Resistor, 100 Ω , 1/4W, 5%	4768-3304-001
R504	Resistor, 220K, 1/4W, 5%	4764-2203-001	R539	Resistor, 3.3K, 1/8W, 10%	4768-3304-001
R505	Resistor, 3.9K, 1/4W, 5%	4764-3904-001		Connector, housing	1417-0828-070
R506	Potentiometer, lin., 2K, 20%	4739-2004-001		Pin, male	2108-0000-190
R509	Resistor, 3.9K, 1/4W, 5%	4764-3904-001		Jumper	6060-0202-242
R511	Resistor, 22K, 1/4W, 5%	4764-2205-001		Cable, tie, black	6065-0000-009
R512	Resistor, 1K, 1/4W, 5%	4764-1004-001		Fuse clip	5160-0000-007
R513	Resistor, 4.7K, 1/4W, 5%	4764-4704-001		Switch, pushbutton	5140-0000-009
R514	Resistor, 330K, 1/4W, 5%	4764-3303-001		Button, red, switch	5140-0000-010

Noise-Canceling Microphone

1939-2030-129

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
	Connector	2191-0000-022		Microphone, noise can	1358-0000-009
	Strain relief, connector	2807-1272-051		Pin	2191-0000-025
	Hood, exterior	2108-1272-024		Ring, retainer	2520-0000-002
	Hood, interior	2108-1272-025			

Microphone Assembly

1939-2047-102

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
C1	Cap., cer., 470pF, 20%	1502-4703-001		Bracket, hanger	1369-0000-002
C2	Cap., electr., 10 μ F, 35V	1535-1002-035		Hood, exterior	2108-1272-024
C3	Cap., cer., 0.01 μ F, 16V	1502-1005-004		Hood, interior	2108-1272-025
Q1	Transistor, MPS6514, NPN	4811-0000-012		Assembly, housing	1939-2030-125
R1	Resistor, 12K, 1/4W, 5%	4764-1205-001		Assembly, housing	1939-2030-119
R2	Resistor, 2K, 1/4W, 5%	4764-2004-001		Pin	2191-0000-025
R3	Resistor, 6.8 Ω , 1/4W, 5%	4764-6801-001		Pushbutton	1410-2030-052
S1	Switch, slide, spring loaded, DPDT	5141-0000-175		Ring, retainer	2520-0000-002
	Connector	2191-0000-022		Strain relief	2807-2030-036
	Assembly, cord	6052-0000-011		Strain relief, connector	2807-1272-051

Mounting Bracket Kit

1939-1272-109

Ref. Des.	Description	Part No.
	Assembly, mounting bracket	1939-1272-108
	Screw, pan head, 10-3/4	2854-1024-311

Ref. Des.	Description	Part No.
	Screw, button head, 8-32 x 5/8	2867-0000-005

Remote Speaker Assy.

1939-1272-141

Ref. Des.	Description	Part No.
	Cable, remote speaker	6052-0000-010
	Connector, male, two-pin	2108-0000-139
	Housing, front	1306-0021-002
	Housing, rear	1306-0021-001
	Pin, contact	2108-0000-014

Ref. Des.	Description	Part No.
	Speaker	1307-0000-001
	Bracket, internal	1404-1243-024
	Bracket, external	1404-1243-027
	Standoff	2876-0000-015

Synthesizer Assy.

1939-0741-110

Ref. Des.	Description	Part No.
C400	Cap., cer., 0.001 μ F, 20%	1545-1004-120
C401	Cap., cer., 0.01 μ F, 20%	1545-1005-120
C402	Cap., cer., 0.01 μ F, 20%	1545-1005-120
C403	Cap., cer., 100 μ F, 10V	1535-1005-120
C404	Cap., 0.001 μ F, 20%	1545-1004-120
C405	Cap., 0.0015 μ F	1510-1504-003
C406	Cap., electr., 47 μ F, 16V	1542-4702-016
C407	Cap., electr., 47 μ F, 16V	1542-4702-016
C408	Cap., cer., 0.01 μ F, 20%	1545-1005-120
C409	Cap., electr., 47 μ F, 16V	1542-4702-016
C410	Cap., cer., 0.01 μ F, 20%	1545-1005-120
C411	Cap., cer., 0.1 μ F, 20%	1545-1006-120
C412	Cap., tant., 0.47 μ F, 35V	1538-4706-118
C413	Cap., tant., 15 μ F, 20V	1538-1508-412
C402	Cap., cer., 0.01 μ F, 20%	1545-1005-120
C415	Cap., cer., 0.01 μ F, 20%	1545-1005-120
C416	Cap., cer., 0.01 μ F, 20%	1545-1005-120
C417	Cap., tant., 2.2 μ F, 25V	1538-2207-115
C418	Cap., cer., 0.22 μ F, 20%	1526-2206-101
C419	Cap., electr., 22 μ F, 10V	1542-2202-010
C420	Cap., cer., 0.01 μ F, 20%	1545-1005-120
C421	Cap., electr., 2.2 μ F, 50V	1542-2201-050
C422	Cap., electr., 2.2 μ F, 50V	1542-2201-050
C423	Cap., cer., 0.01 μ F, 20%	1545-1005-120
C424	Cap., cer., 0.01 μ F, 20%	1545-1005-120
C425	Cap., cer., 8.2 μ F, NPO	1501-8201-001
C426	Cap., cer., 0.01 μ F, 20%	1545-1005-120
C426	Cap., cer., 0.01 μ F, 20%	1545-1005-120
C429	Cap., cer., 0.01 μ F, 20%	1545-1005-120
C431	Cap., cer., 0.01 μ F, 20%	1545-1005-120
CR402	Diode, silicon, 1N4148	4803-0000-004
CR403	Diode, silicon, 1N4148	4803-0000-004
CR404	Diode, silicon, 1N4148	4803-0000-004

Ref. Des.	Description	Part No.
CR405	Diode, silicon, 1N4148	4803-0000-004
CR406	Diode, silicon, 1N4148	4803-0000-004
CR407	Diode, silicon, 1N4148	4803-0000-004
CR410	Diode, silicon, 1N4148	4803-0000-004
CR411	Diode, silicon, 1N4148	4803-0000-004
CR412	Diode, silicon, 1N4148	4803-0000-004
CR413	Diode, silicon, 1N4148	4803-0000-004
CR414	Diode, silicon, 1N4148	4803-0000-004
CR415	Diode, silicon, 1N4148	4803-0000-004
CR416	Diode, silicon, 1N4148	4803-0000-004
CR417	Diode, silicon, 1N4148	4803-0000-004
IC401	IC, 8793	4851-8793-001
IC402	IC, 8812	4851-8812-001
IC403	IC, CD4052BE	4851-4052-001
IC404	IC, CD4052BE	4851-4052-001
IC405	IC, CA3085E	4850-0000-042
IC406	IC, CD4066AE	4850-0000-015
J401	Receptacle, 3-pin	2108-0000-202
J402	Receptacle, 12-pin	2108-0000-196
J403	Receptacle, 2-pin	2108-0000-195
L402	Bead, inductor	181400824-036
L403	Bead, inductor	181400824-036
P404	Connector, male, 3-pin	2108-0000-159
P405	Connector, male, 22-pin	2108-0000-211
Q402	Transistor, MPS6514, NPN	4811-0000-012
Q403	Transistor, MPS3638A, PNP	4810-0000-018
Q404	Transistor, MPS3638A, PNP	4810-0000-018
Q405	Transistor, MPS6514, NPN	4811-0000-012
Q406	Transistor, MPS3638A, PNP	4810-0000-018
Q407	FET, 2N5486	4812-0000-005
Q409	Transistor, MPS6514, NPN	4811-0000-012
Q410	Transistor, MPS3638A, PNP	4810-0000-018
Q411	Transistor, MPS3638A, PNP	4810-0000-018

Synthesizer Assy. (cont.) 1939-0741-110

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
Q412	Transistor, MPS3638A, PNP	4810-0000-018	R434	Resistor, 2.2K, 1/4W, 5%	4764-2204-001
R401	Resistor, 180Ω, 1/4W, 5%	4764-1803-001	R435	Resistor, 10K, 1/4W, 5%	4764-1005-001
R402	Resistor, 100Ω, 1/4W, 5%	4764-1003-001	R436	Resistor, 270Ω, 1/4W, 5%	4764-2703-001
R403	Resistor, 1K, 1/4W, 5%	4764-1004-001	R437	Resistor, 1K, 1/4W, 5%	4764-1004-001
R405	Resistor, 3.3K, 1/4W, 5%	4764-3304-001	R448	Resistor, 100Ω, 1/4W, 5%	4764-1003-001
R406	Resistor, 3.3K, 1/4W, 5%	4764-3304-001	R449	Resistor, 1K, 1/4W, 5%	4764-1004-001
R409	Resistor, 3.3K, 1/4W, 5%	4764-3304-001	R450	Resistor, 18K, 1/4W, 5%	4764-1805-001
R410	Resistor, 3.3K, 1/4W, 5%	4764-3304-001	R451	Resistor, 18K, 1/4W, 5%	4764-1805-001
R413	Resistor, 10K, 1/4W, 5%	4764-1005-001	R452	Resistor, 18K, 1/4W, 5%	4764-1805-001
R414	Resistor, 10Ω, 1/4W, 5%	4764-1002-001	R453	Resistor, 18K, 1/4W, 5%	4764-1805-001
R415	Resistor, 4.7K, 1/4W, 5%	4764-4704-001	R454	Resistor, 22K, 1/4W, 5%	4764-2205-001
R416	Resistor, 47K, 1/4W, 5%	4764-4705-001	R455	Resistor, 22K, 1/4W, 5%	4764-2205-001
R419	Resistor, 22K, 1/4W, 5%	4764-2205-001	R456	Resistor, 22K, 1/4W, 5%	4764-2205-001
R420	Resistor, 10K, 1/4W, 5%	4764-1005-001	R457	Resistor, 22K, 1/4W, 5%	4764-2205-001
R422	Resistor, 2.2K, 1/4W, 5%	4764-2204-001	R458	Resistor, 47K, 1/4W, 5%	4764-4705-001
R423	Resistor, 6.8K, 1/4W, 5%	4764-6804-001	R459	Resistor, 47K, 1/4W, 5%	4764-4705-001
R424	Resistor, 4.7K, 1/4W, 5%	4764-4704-001	TP401	Test point, red2150-0000-014	
R425	Resistor, 1.8K, 1/4W, 5%	4764-1804-001		Socket, IC, 8-pin	2136-0000-004
R426	Resistor, 4.7K, 1/4W, 5%	4764-4704-001		Socket, IC, 18-pin	2136-0000-022
R427	Resistor, 22K, 1/4W, 5%	4764-2205-001		Socket, IC, 16-pin	2136-0802-021
R429	Resistor, 1.2K, 1/4W, 5%	4764-1204-001		Socket, IC, 14-pin	2136-0000-002
R430	Resistor, 240Ω, 1/4W, 5%	4764-2403-001		Cover	1404-0741-067
R431	Resistor, 10K, 1/4W, 5%	4764-1005-001		Housing	1404-0680-065
R432	Resistor, 150K, 1/4W, 5%	4764-1506-001		Cable, coaxial	6050-0828-130
R433	Resistor, 9.1K, 1/4W, 5%	4764-9104-001		Shield	1404-0680-063

Time-Out Timer PCB 1939-2042-101

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
C1	Cap., cer., 0.1μF	1505-1006-005	R4	Resistor, 22K, 1/4W, 5%	4764-2205-001
C2	Cap., cer., 0.01μF	1526-1005-101	R5	Resistor, 2K, 1/4W, 5%	4764-2004-001
C3	Cap., cer., 0.01μF	1526-1005-101	R6	Resistor, 2K, 1/4W, 5%	4764-2004-001
C4	Cap., electr., 2.2μF, 50V	1542-2201-050	R7	Resistor, 15K, 1/4W, 5%	4764-1506-001
IC1	IC, CD4060BE	4851-4060-001	R8	Resistor, 220K, 1/4W, 5%	4764-2206-001
IC2	IC, CD4011BE	4851-4011-001	R9	Resistor, 100K, 1/4W, 5%	4764-1006-001
Q1	Transistor, MPS3638A, PNP	4810-0000-018	R10	Resistor, 10Ω, 1/4W, 5%	4764-1002-001
Q2	Transistor, MPS6514, NPN	4811-0000-012	R11	Resistor, 5.6K, 1/4W, 5%	4764-5604-001
R1	Resistor, 120K, 1/4W, 5%	4764-1206-001		Connector, female, 7-pin	2108-0000-091
R2	Resistor, 16K, 1/4W, 5%	4764-1605-001		Socket, IC 14-pin	2136-0000-002
R3	Resistor, 22K, 1/4W, 5%	4764-2205-001		Socket, IC, 16-pin	2136-0802-021

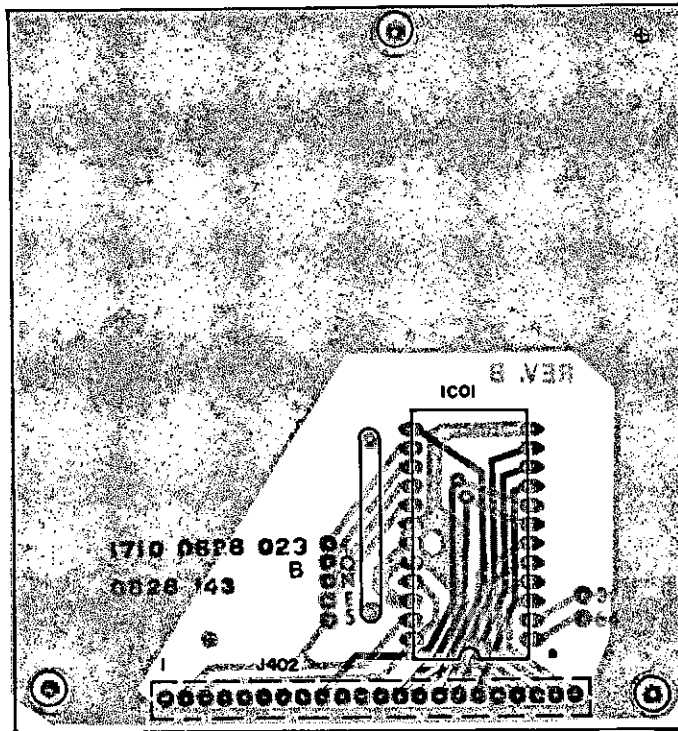
Assembly, Speaker Connector 6057-1272-107

Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
	Connector, female	2108-0000-138		Receptacle, crimpon	2150-0000-024
	Connector, female, terminal	2108-0000-016			

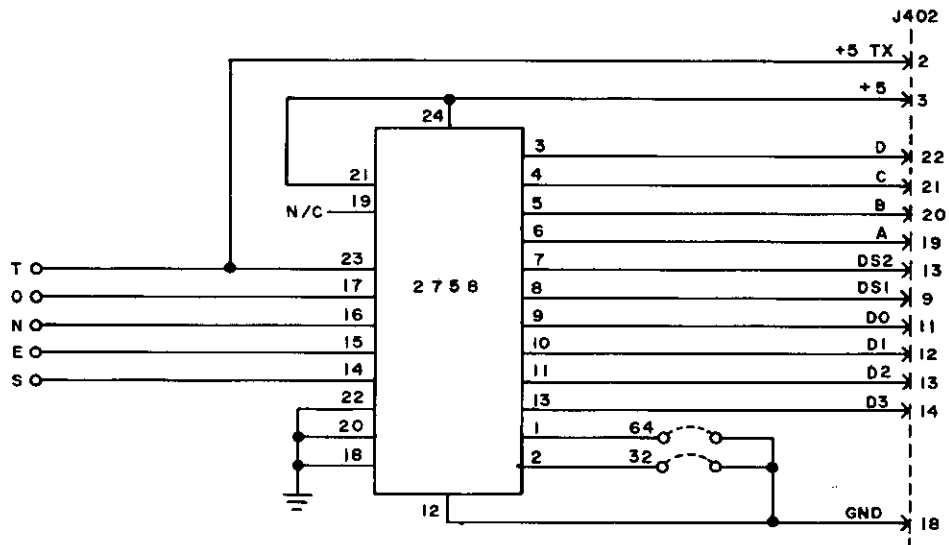
TCXO PCB* 1939-0828-112/117

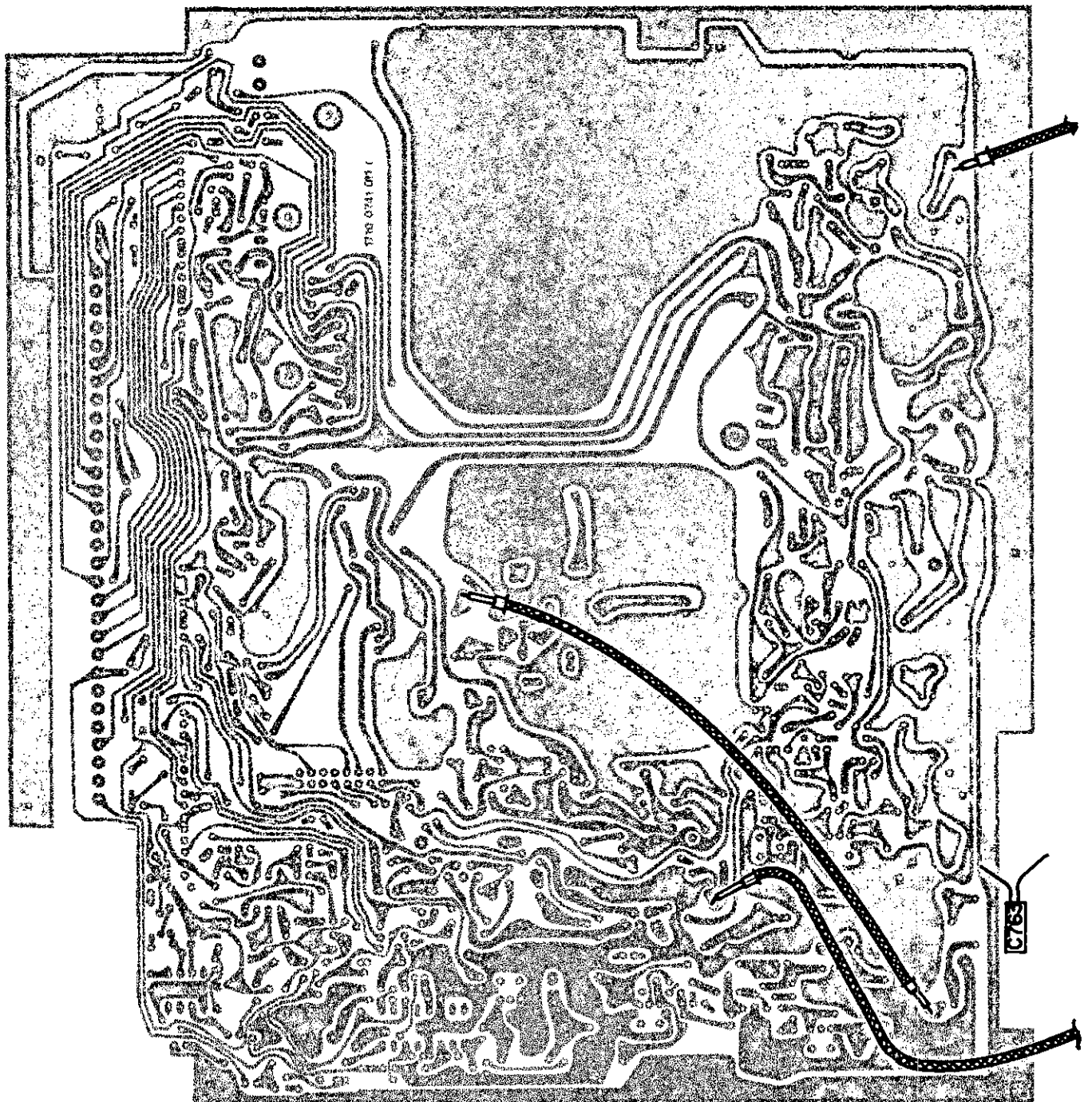
Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
	PCB, TCXO, ±0.0005%	1939-0828-112		PCB, TCXO, ±0.0002%	1939-0828-117

*The TCXO contains no replaceable parts.

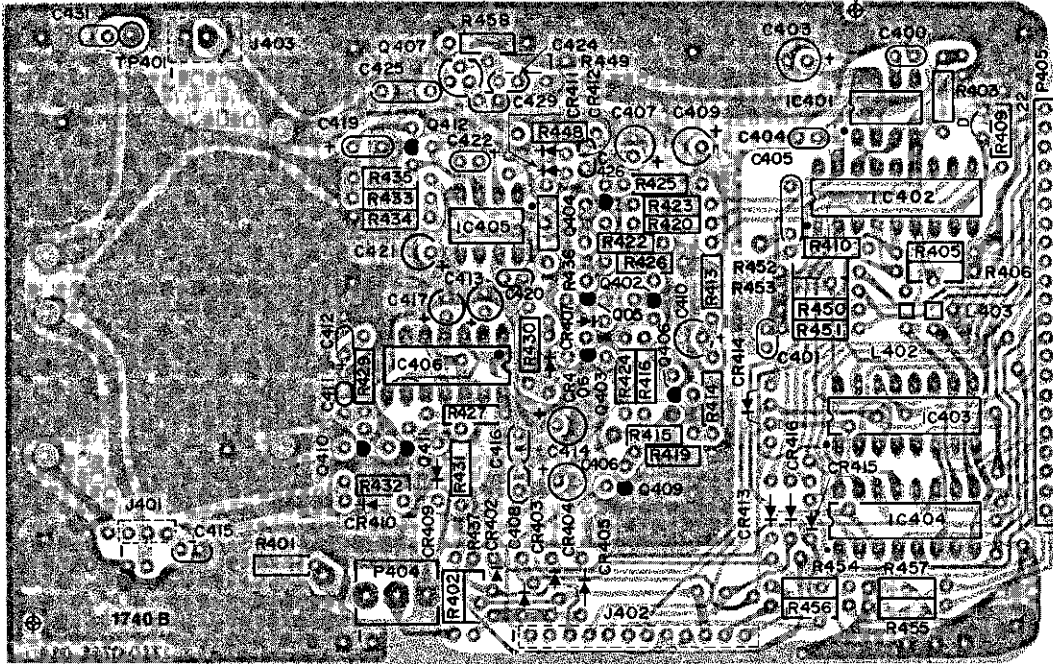


COMPONENT LAYOUT

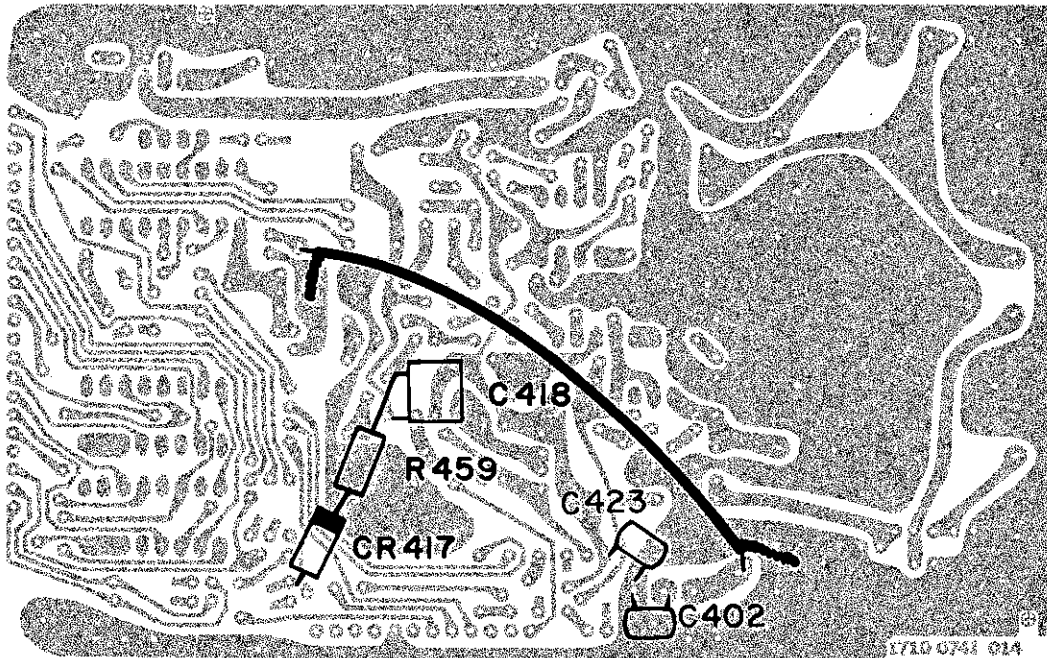




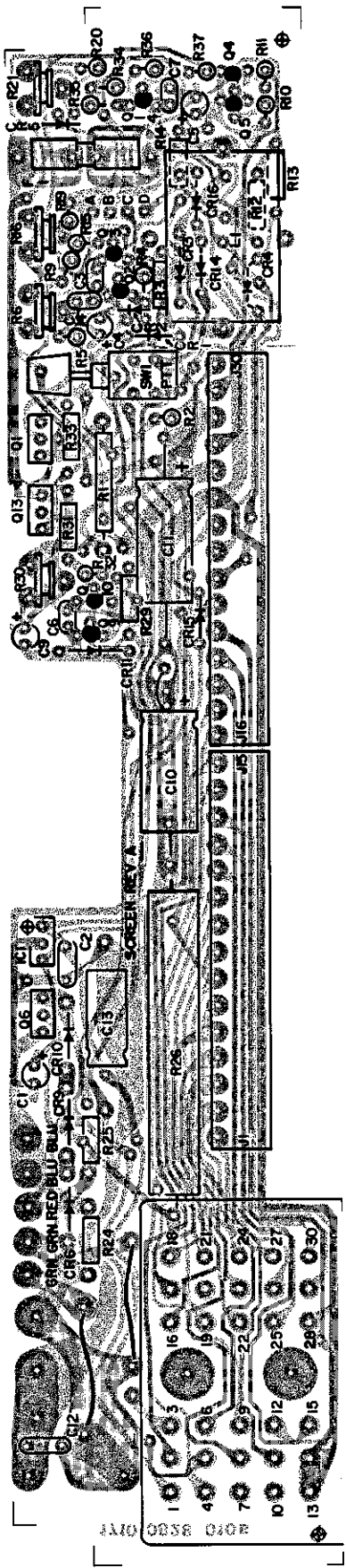
Master PCB
Component Layout, Rear View
p. 7-19



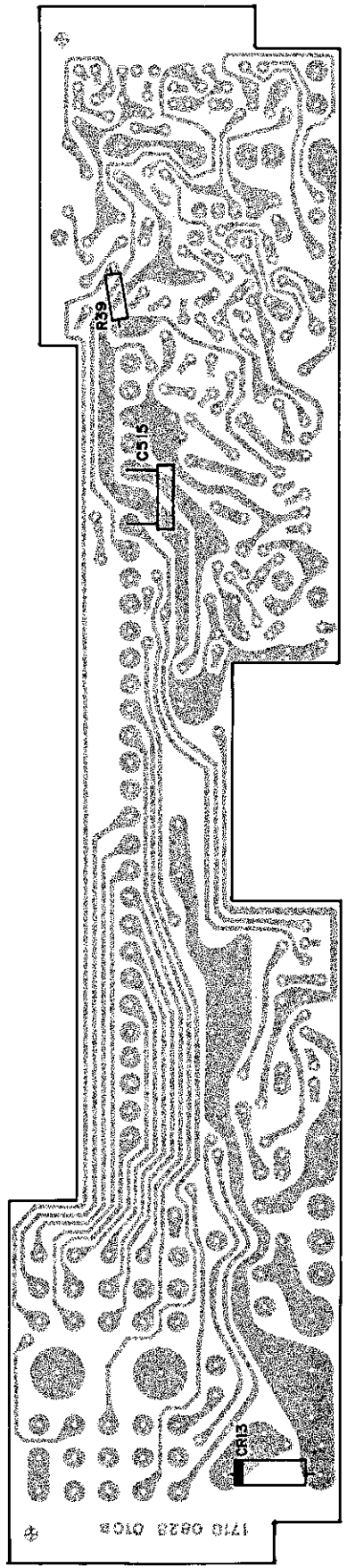
Front View



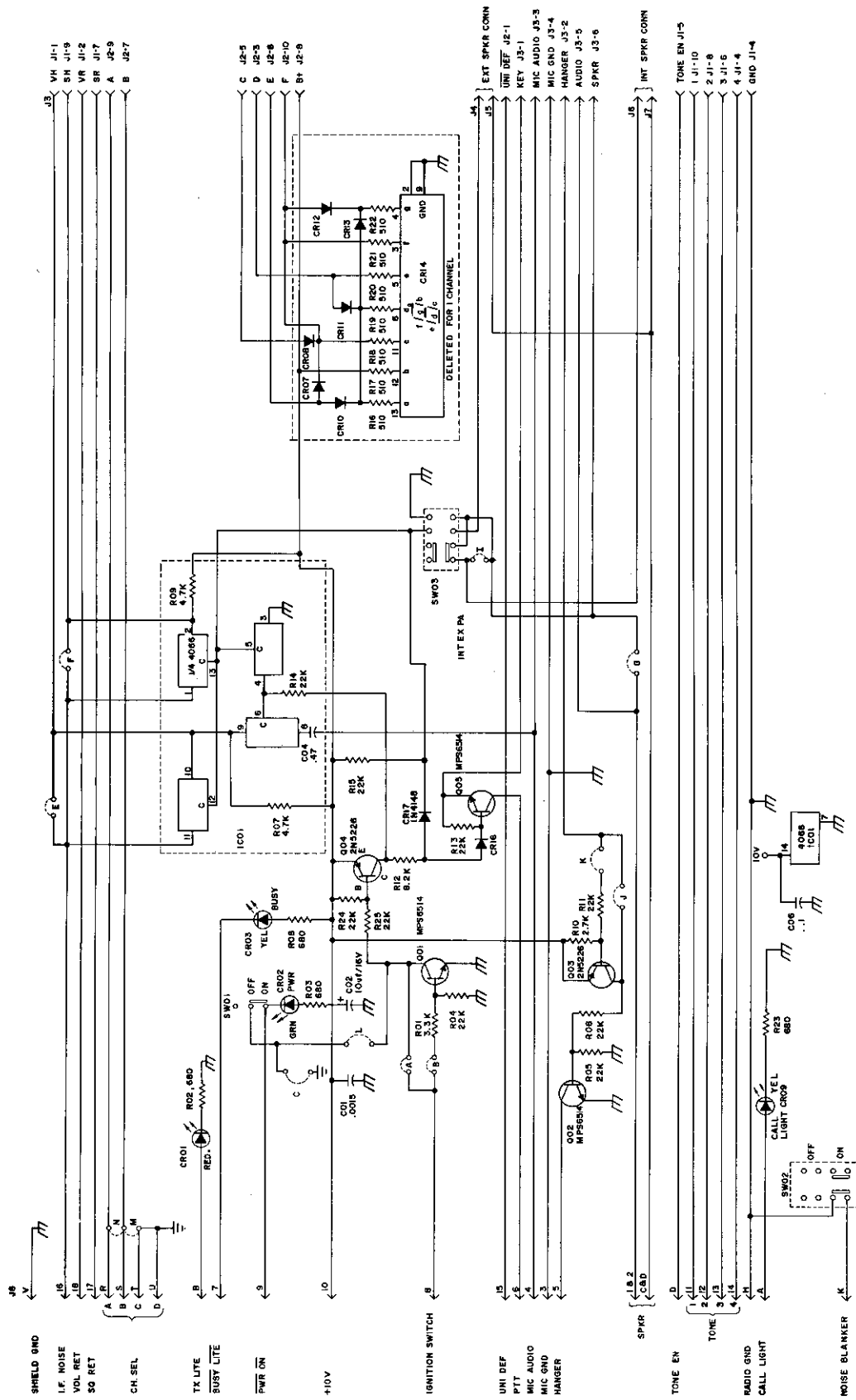
Rear View



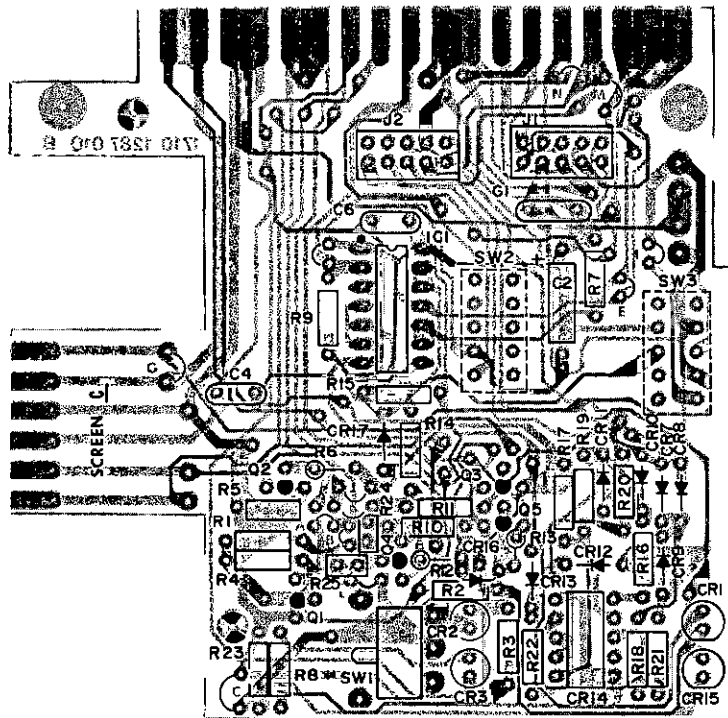
Front View



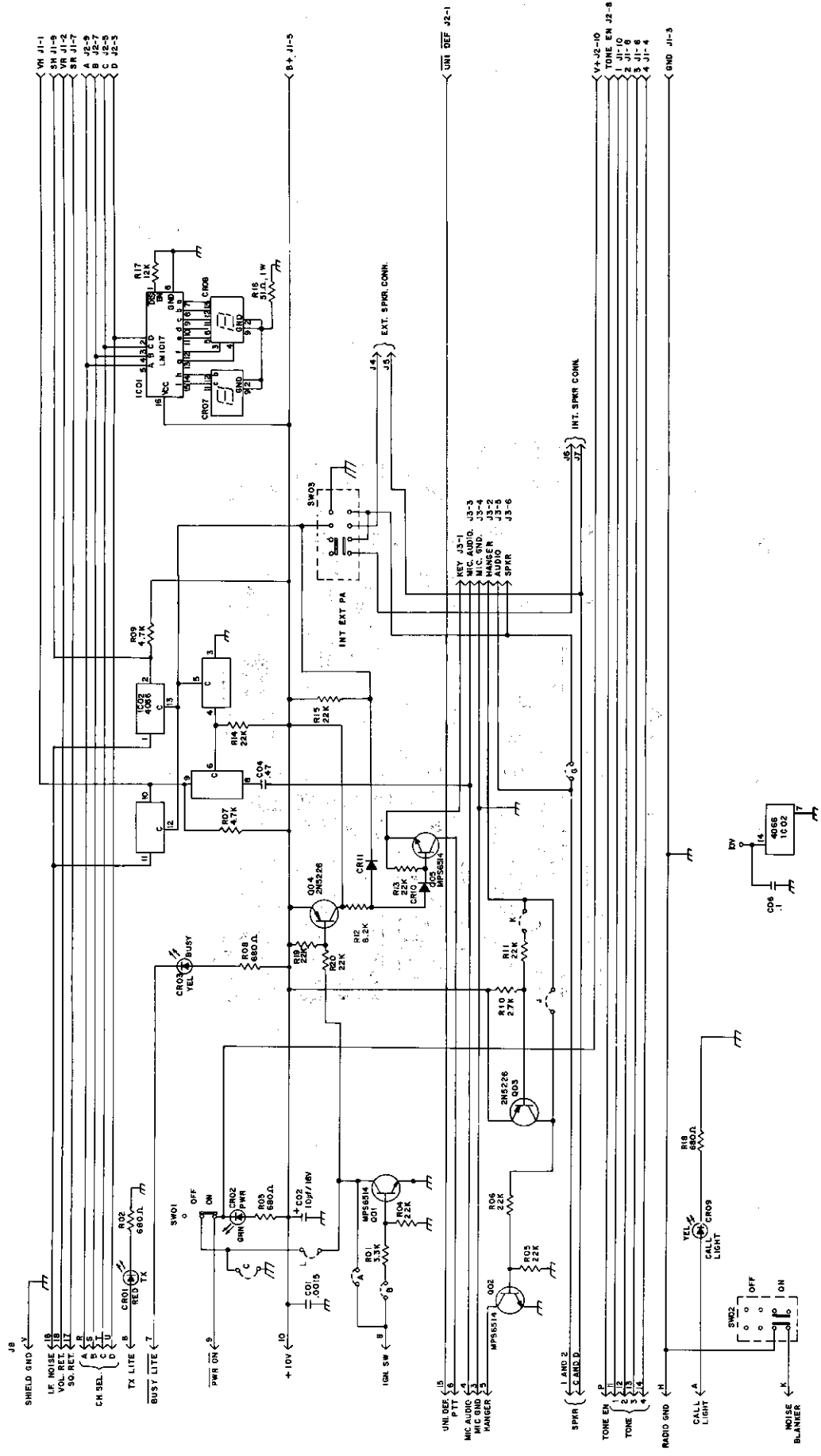
Rear View



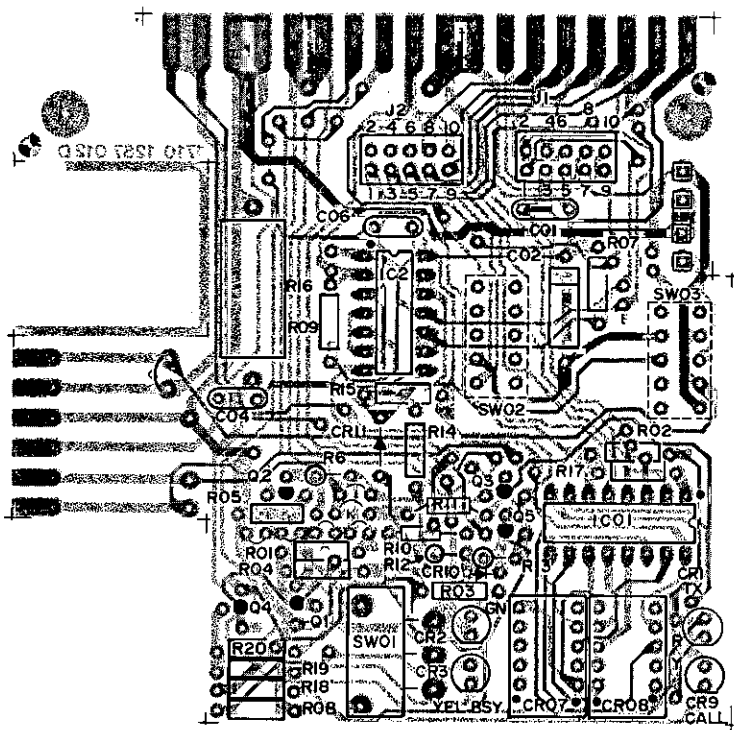
Connector PCB
 One- and Four-Channel
 Schematic Diagram
 p. 7-23



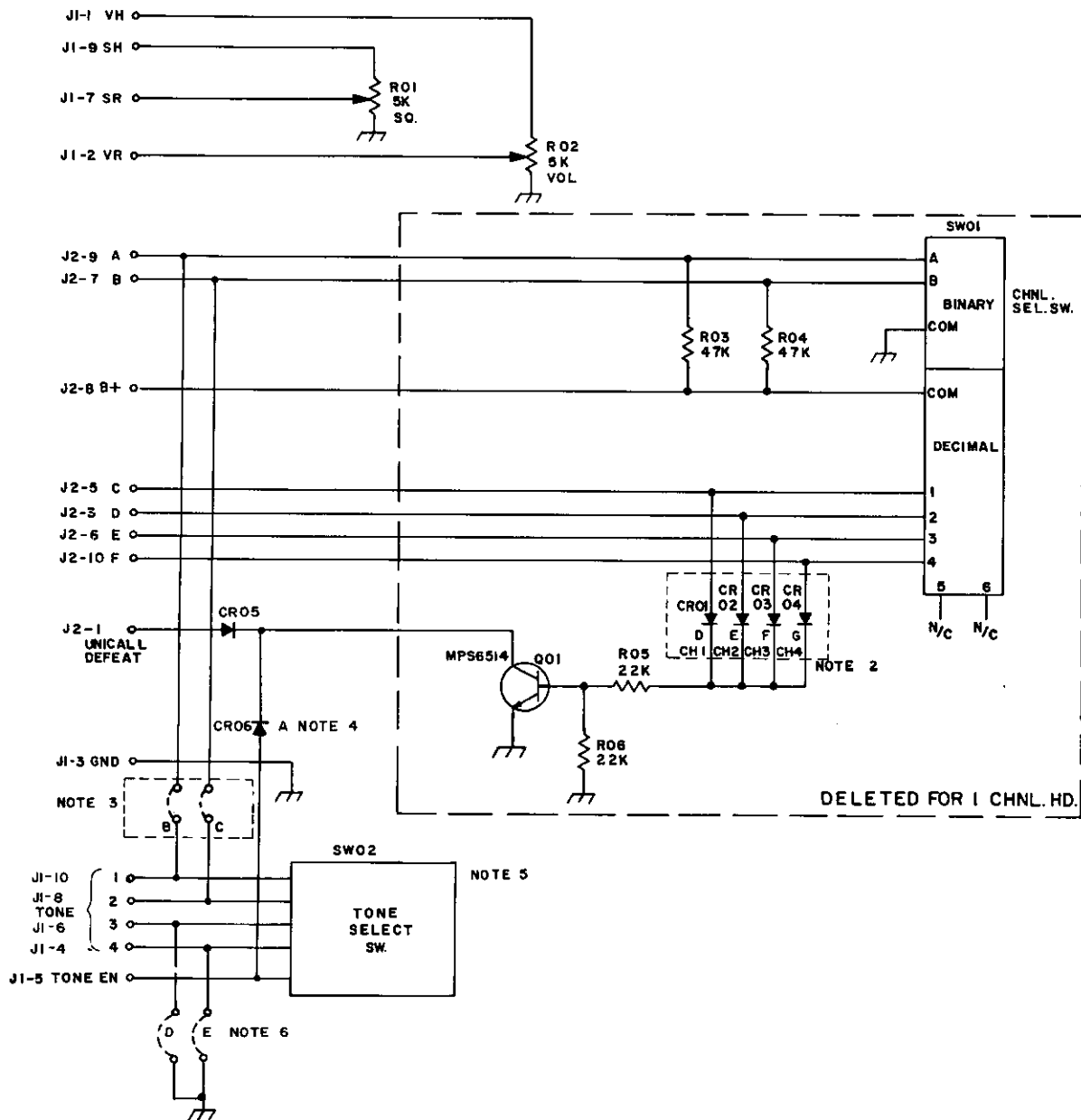
Connector PCB
One- and Four-Channel
Component Layout
 p. 7-24

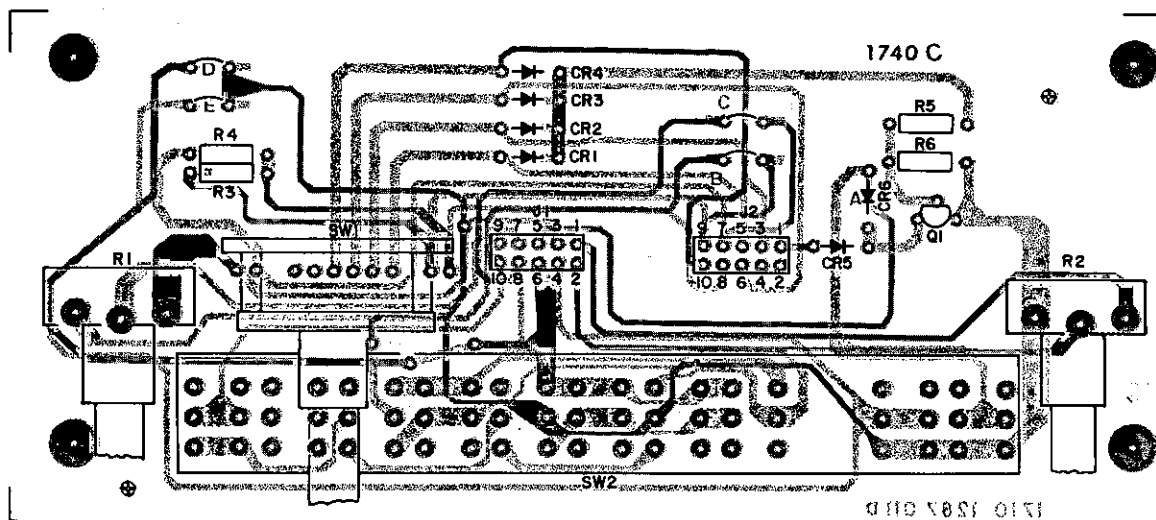


Connector PCB
16-Channel
Schematic Diagram
p. 7-25

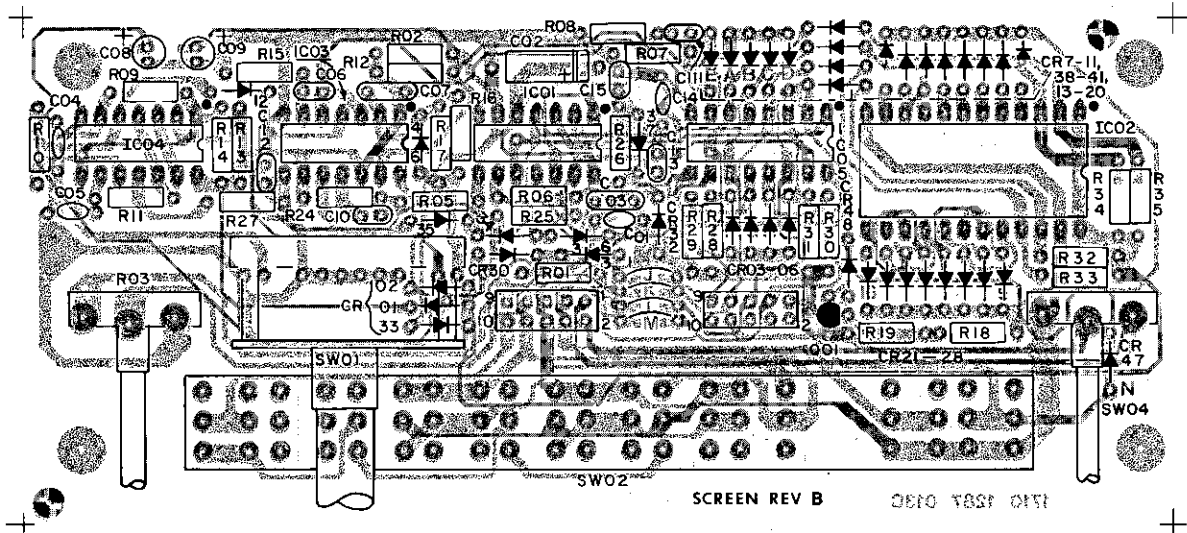


Connector PCB
 16-Channel
 Component Layout
 p. 7-26

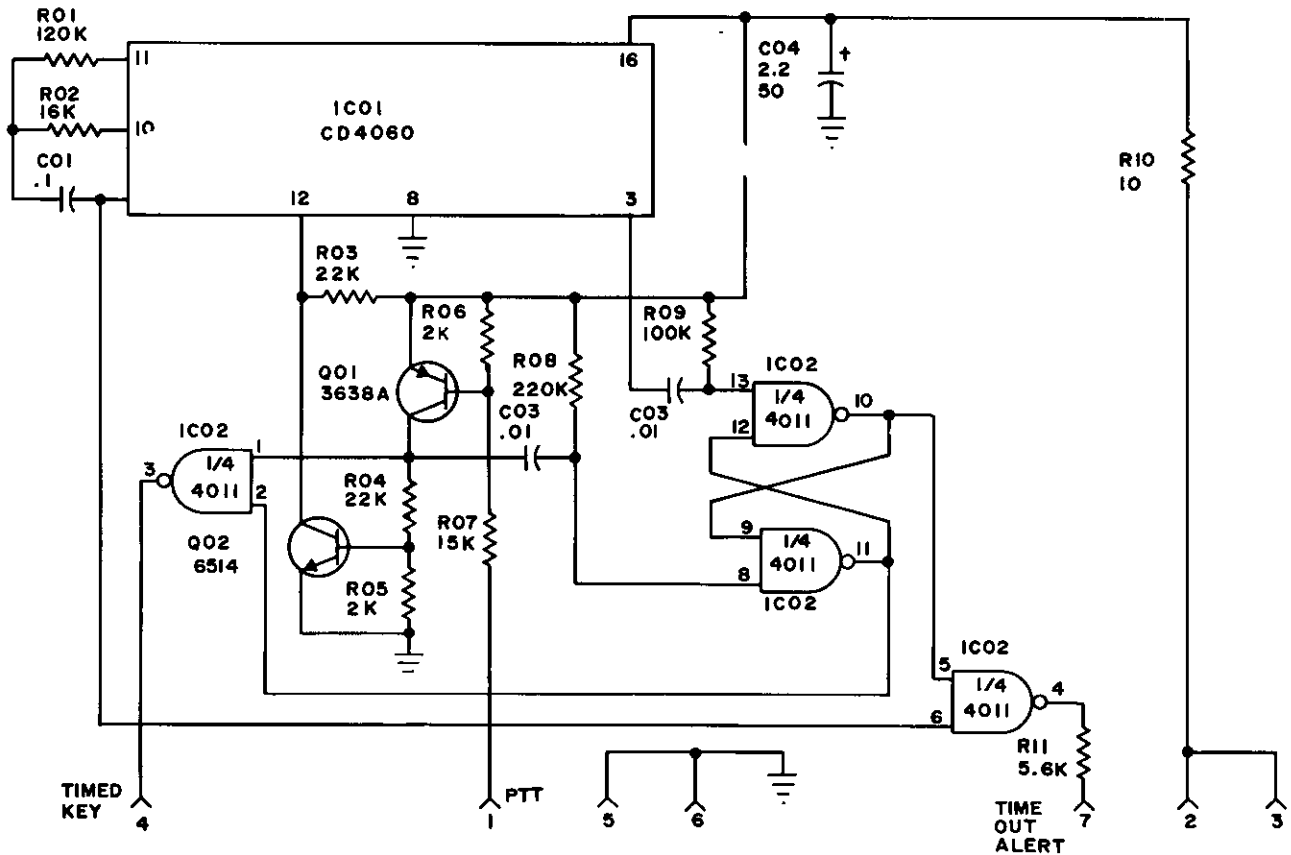
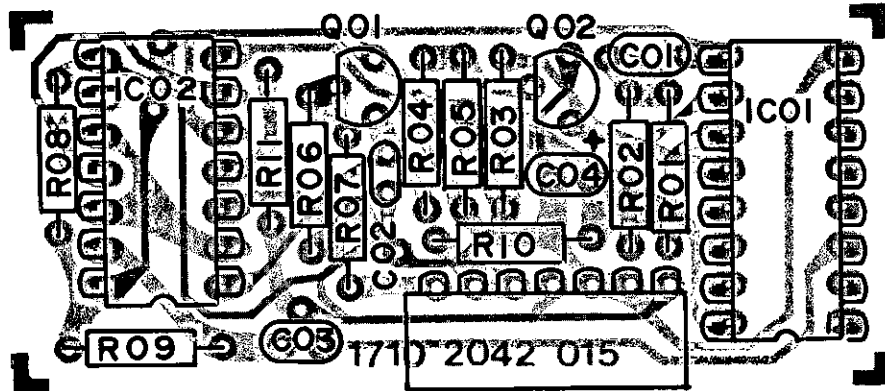




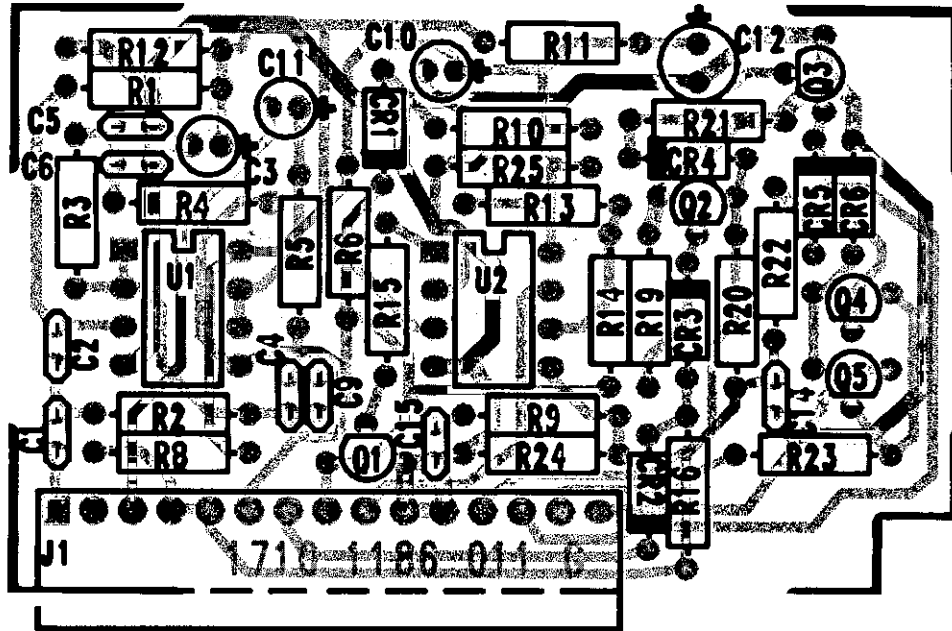
Control PCB
 One- and Four-Channel
 Component Layout
 p. 7-28



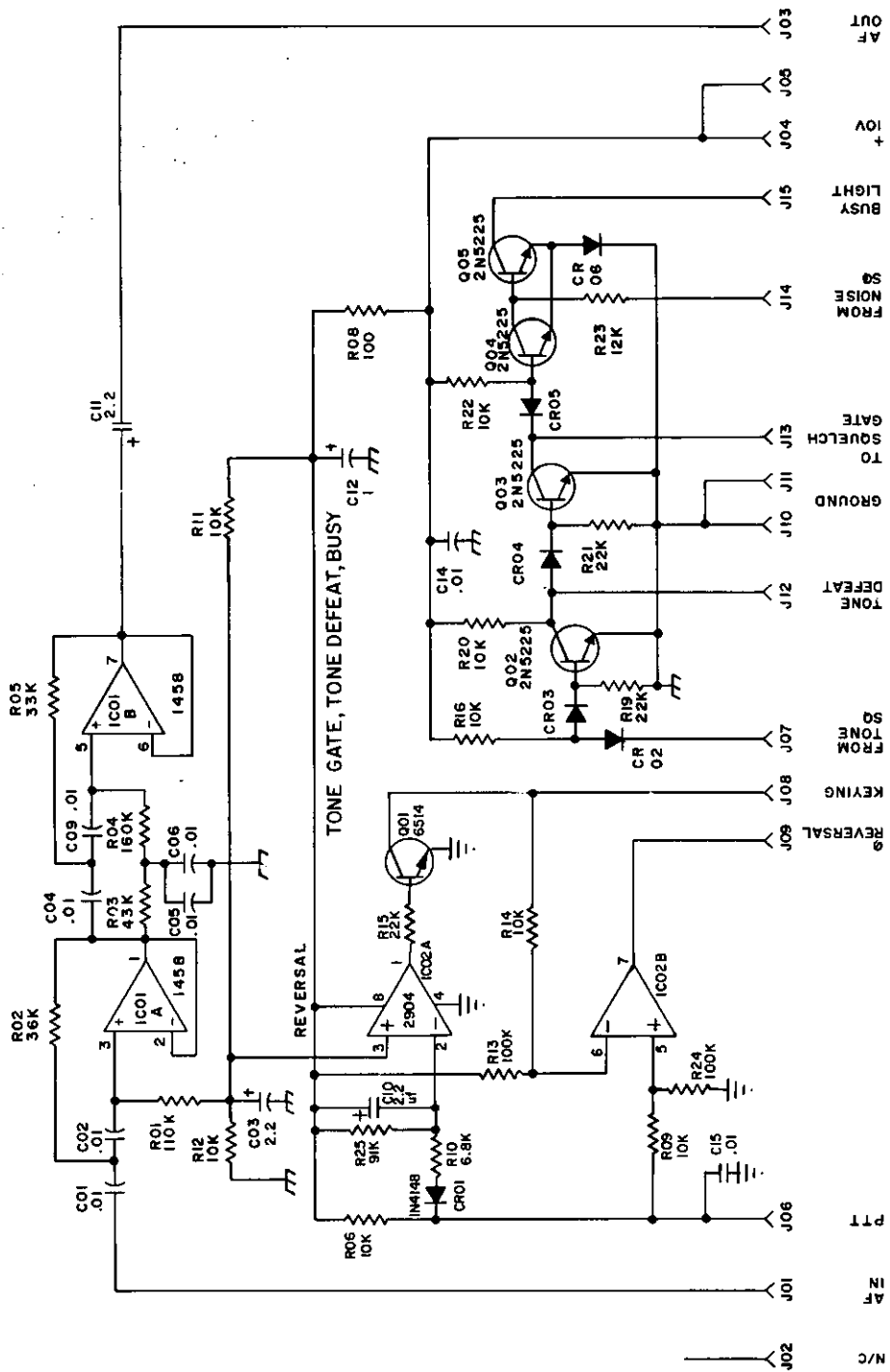
Control PCB
 16-Channel
 Component Layout
 p. 7-30



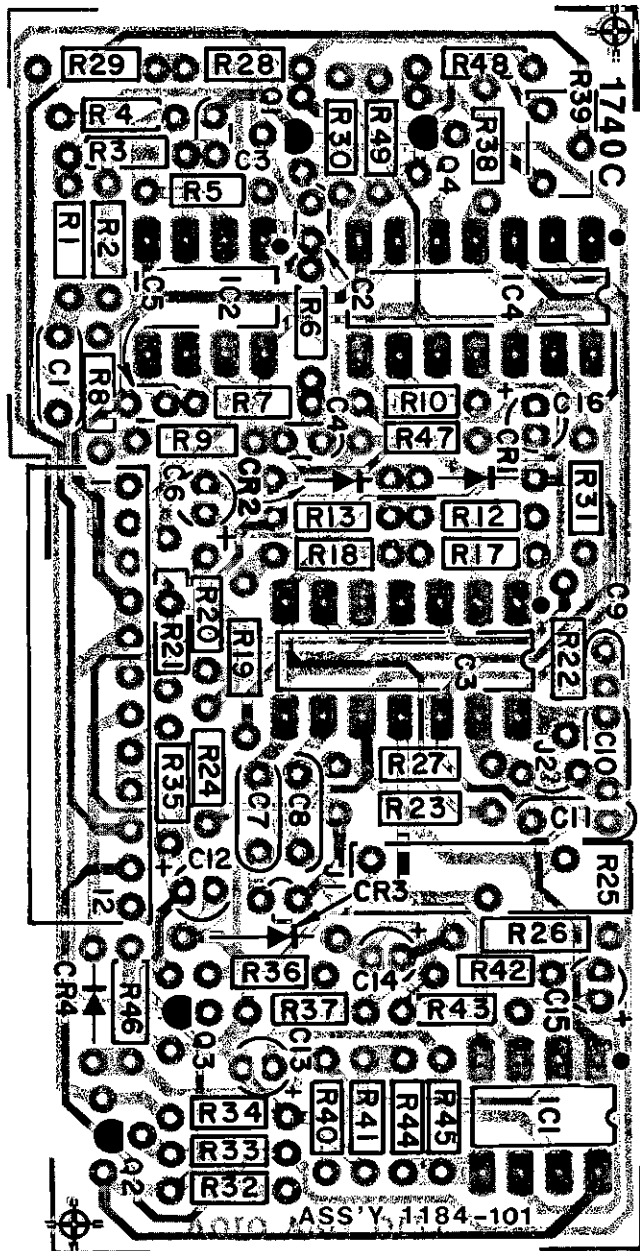
Time-Out Timer PCB
Component Layout and Schematic Diagram
p. 7-31

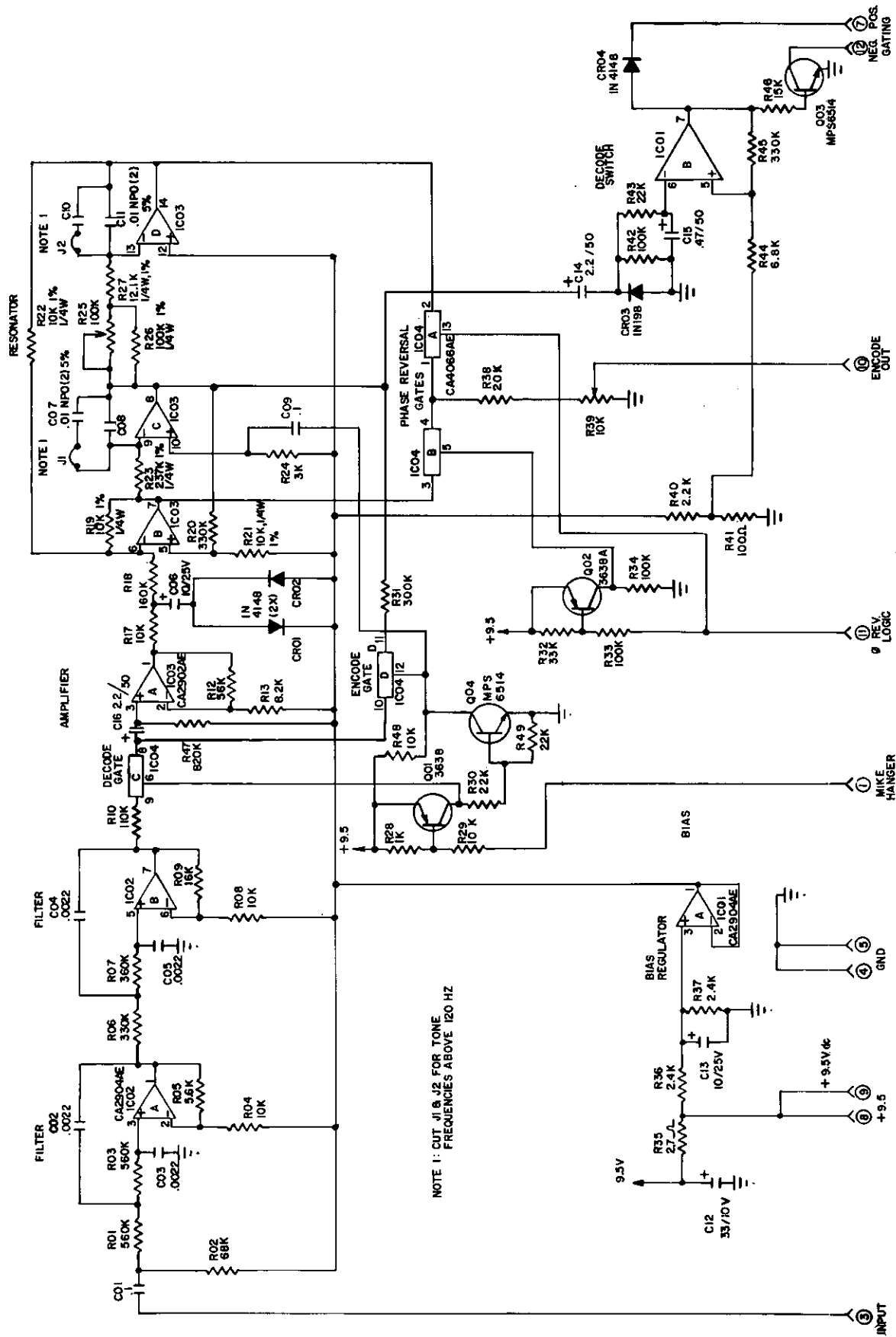


COMPONENT SIDE 3012 R30J02

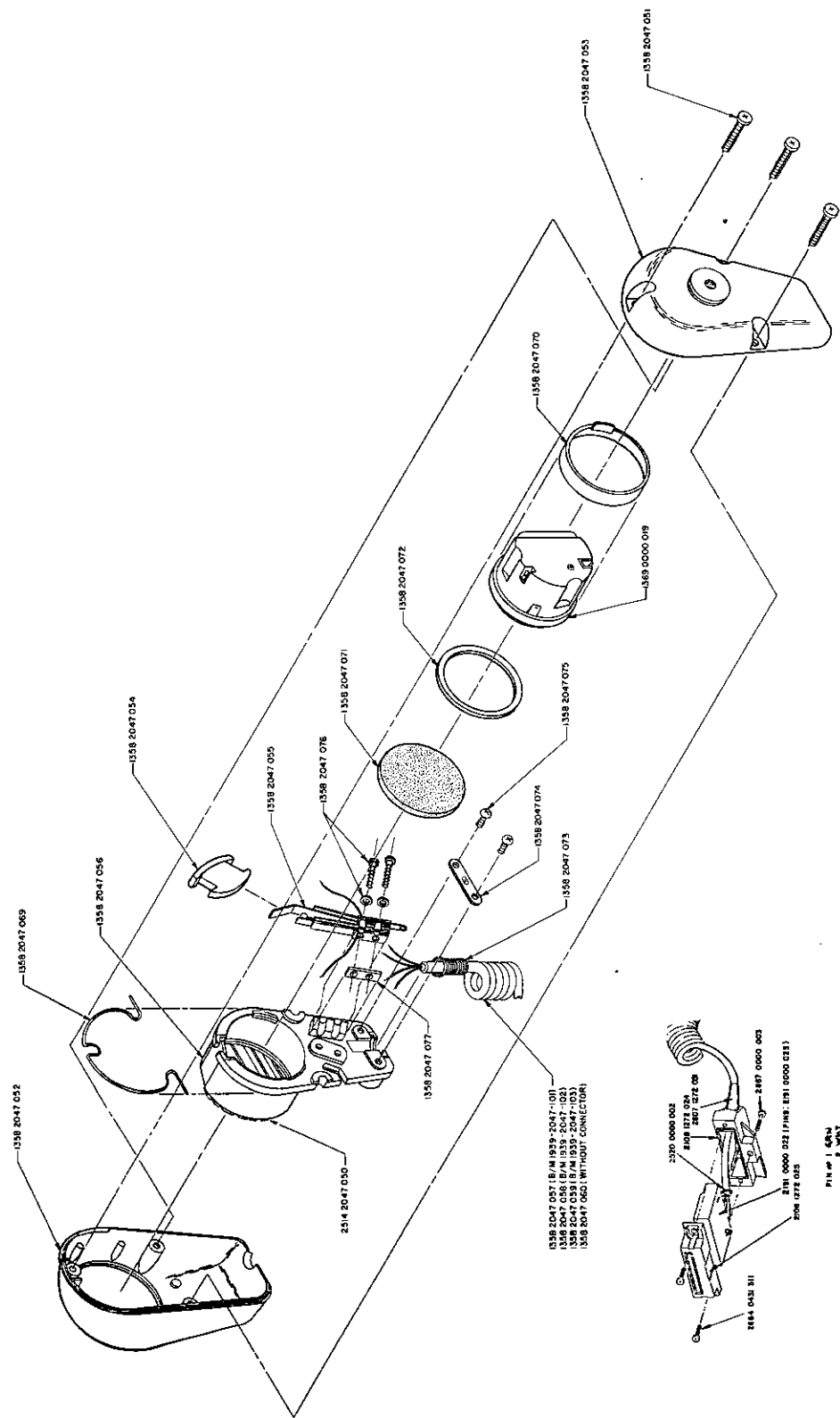
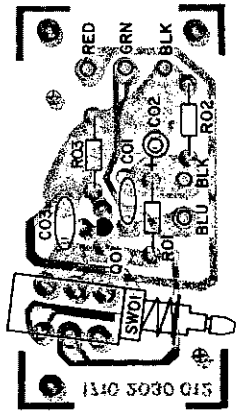
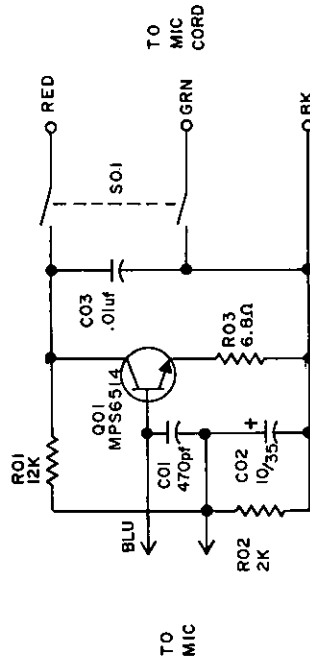


CTCSS Accessory PCB
Schematic Diagram
p. 7-33



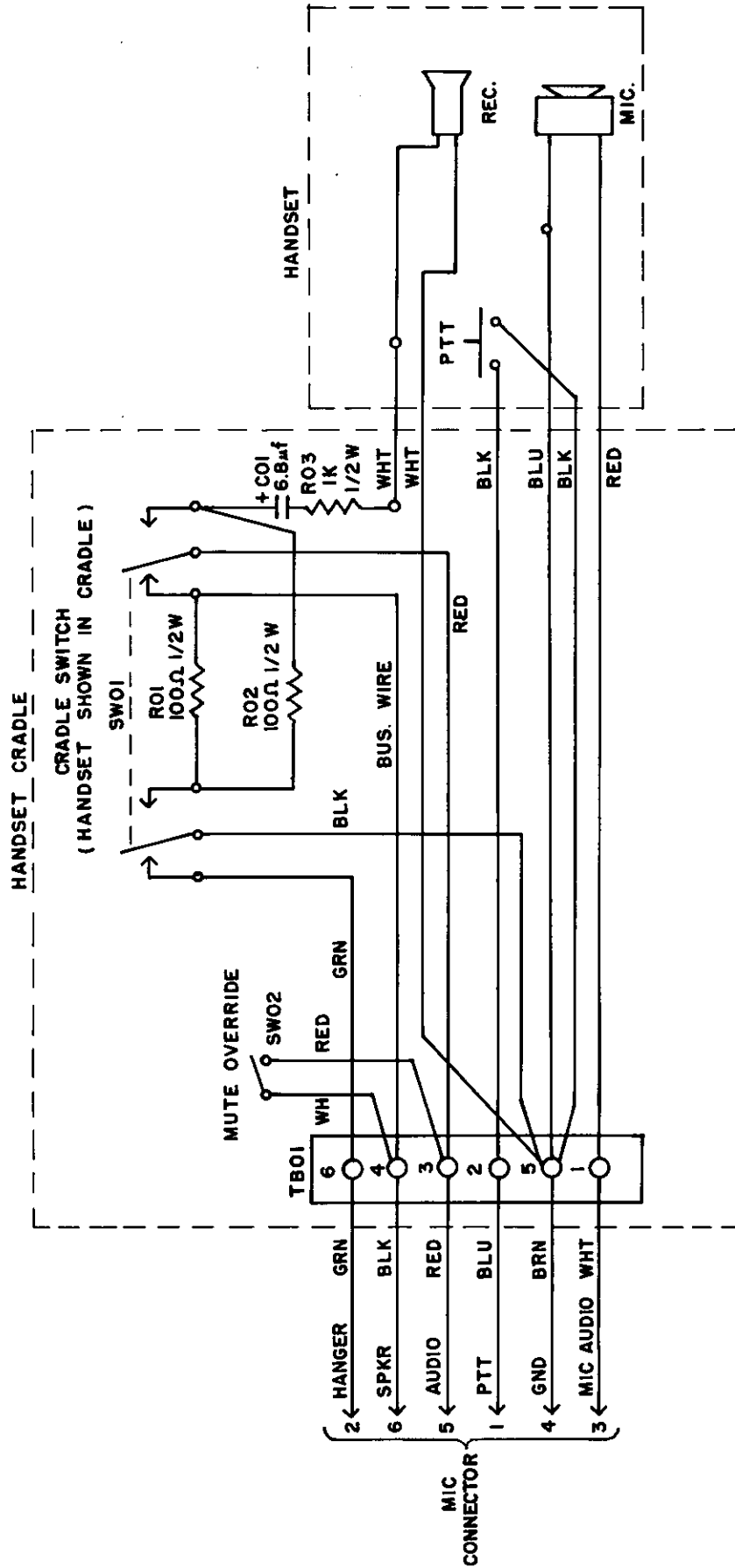


CTCSS Encode/Decode PCB
Schematic Diagram
p. 7-35

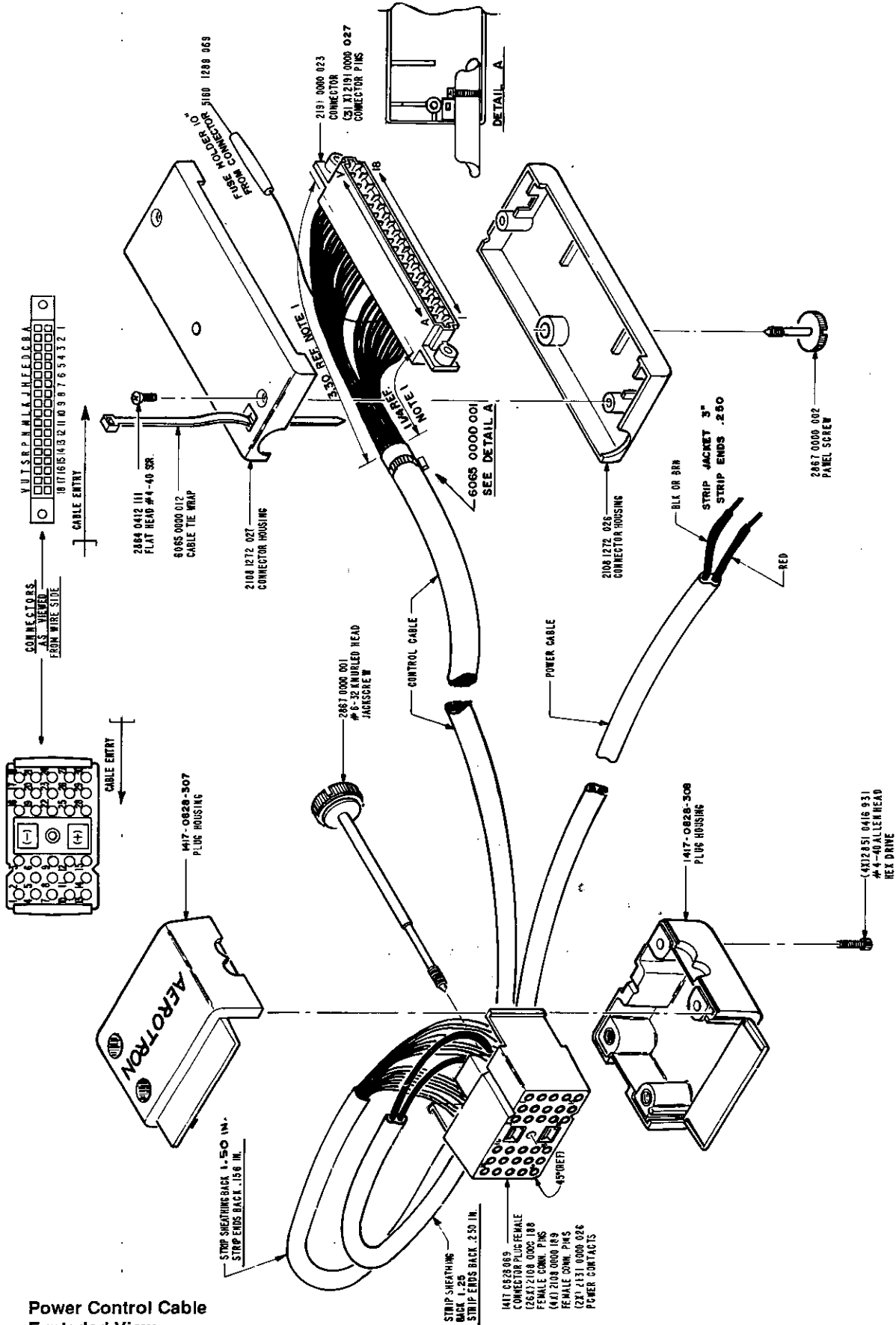


- 1358 2047 057 (S/M 1939-2047-01)
- 1358 2047 058 (S/M 1939-2047-02)
- 1358 2047 059 (S/M 1939-2047-03)
- 1358 2047 060 (WITHOUT CONNECTOR)
- 2370 0000 002
- 2408 1272 024
- 2407 1272 026
- 2480 0000 003
- 2370 0000 023 (PINS)
- 2351 0000 021
- 2308 1272 025
- 2484 0451 311

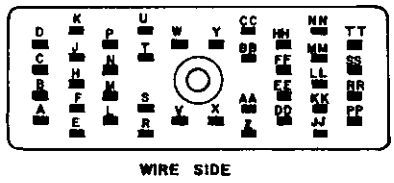
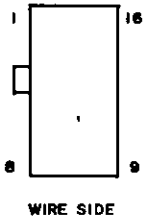
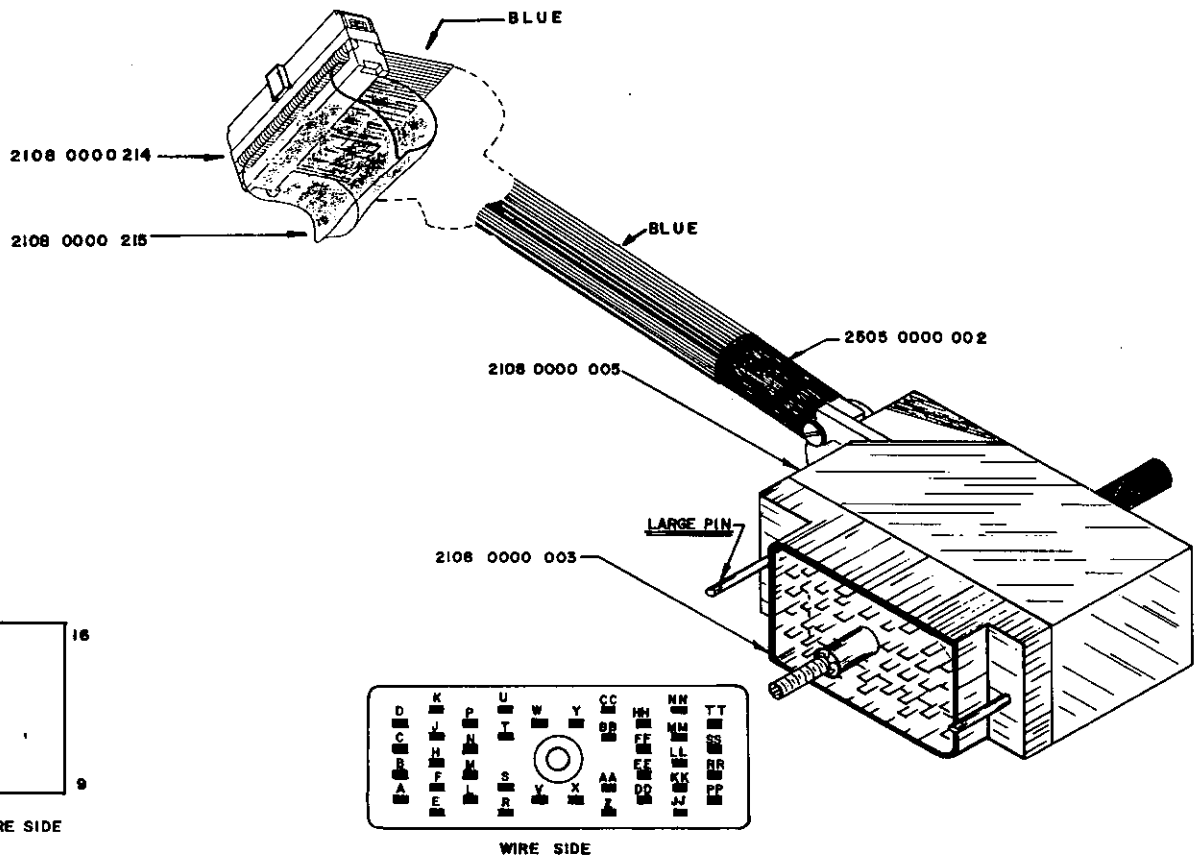
Standard Microphone
Exploded View and Schematic Diagram
p. 7-36



Executive Handset
Schematic Diagram
p. 7-37

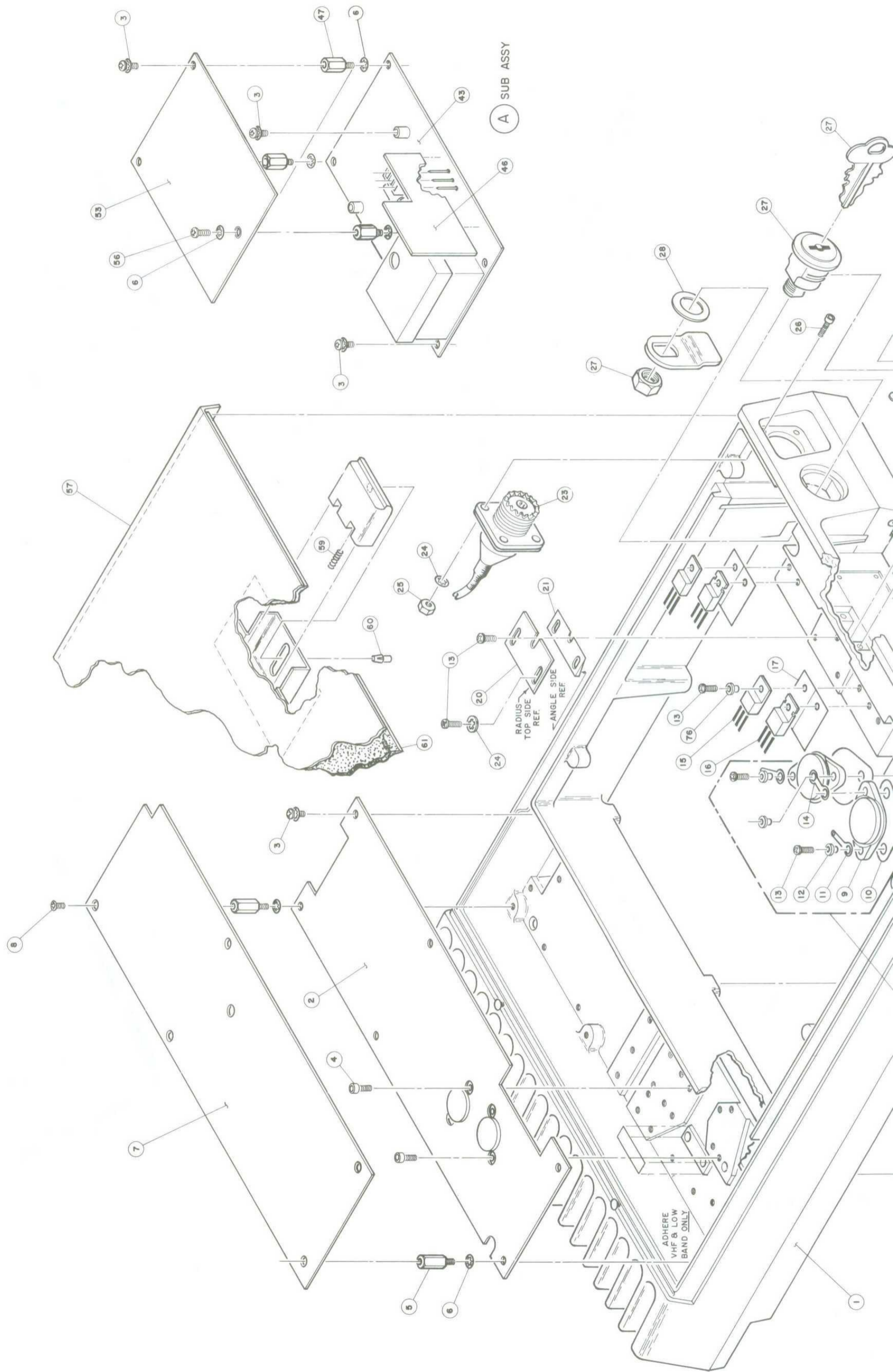


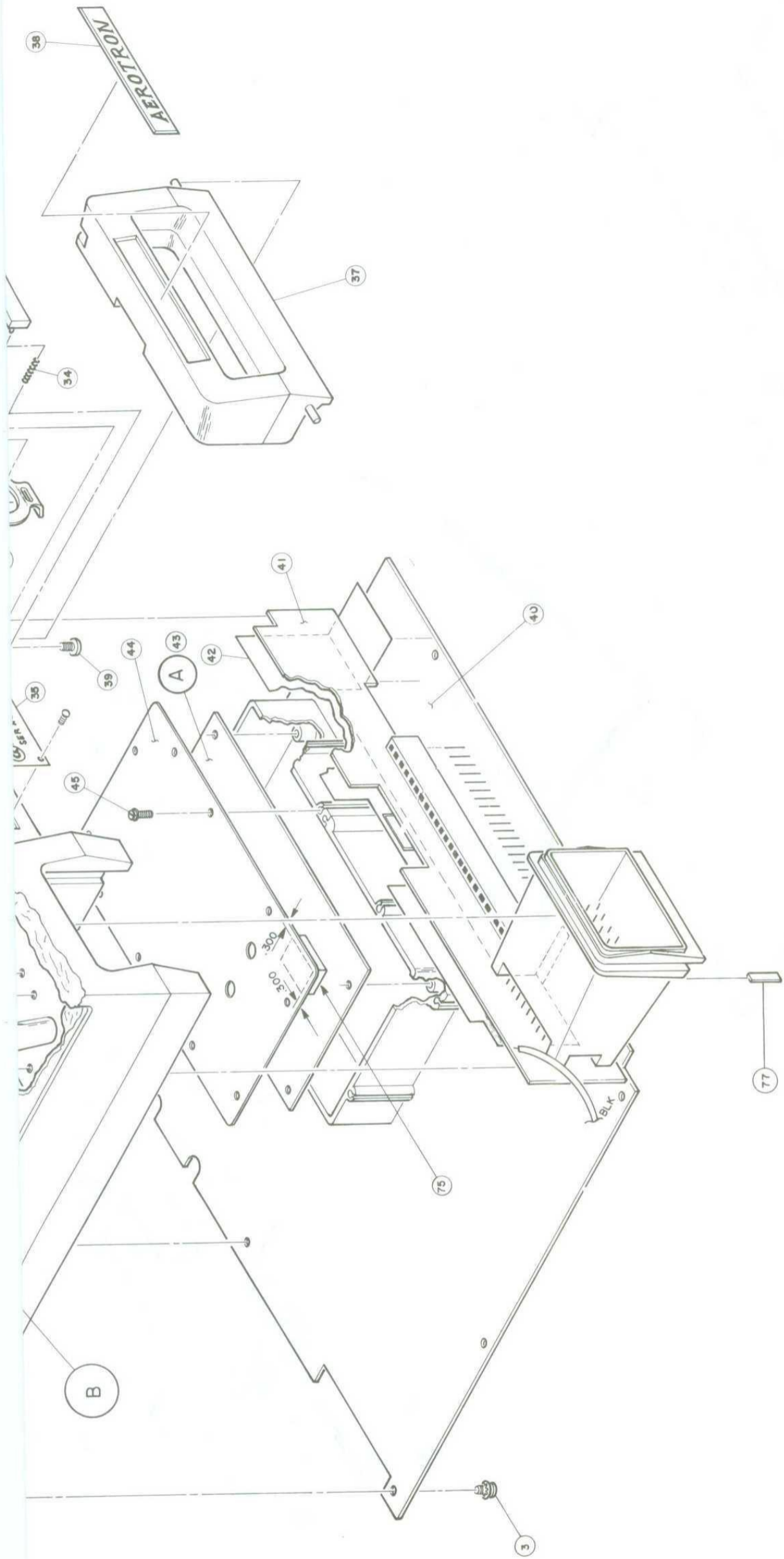
Power Control Cable
Exploded View
p. 7-38



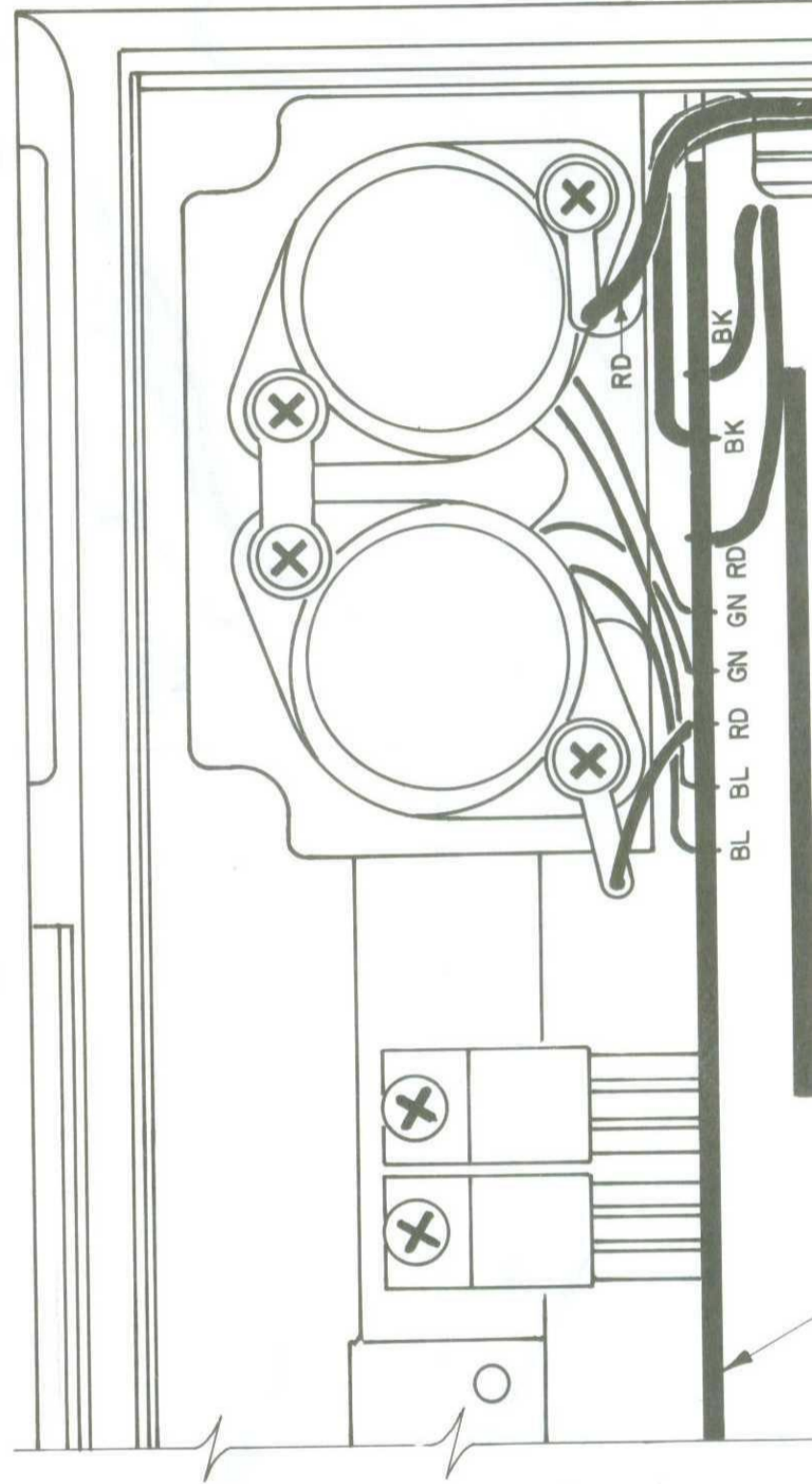
Mechanical Parts Breakdown

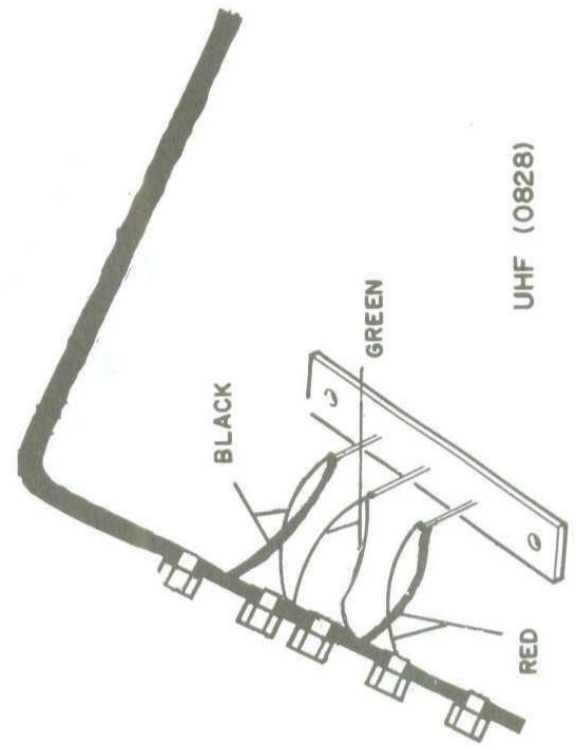
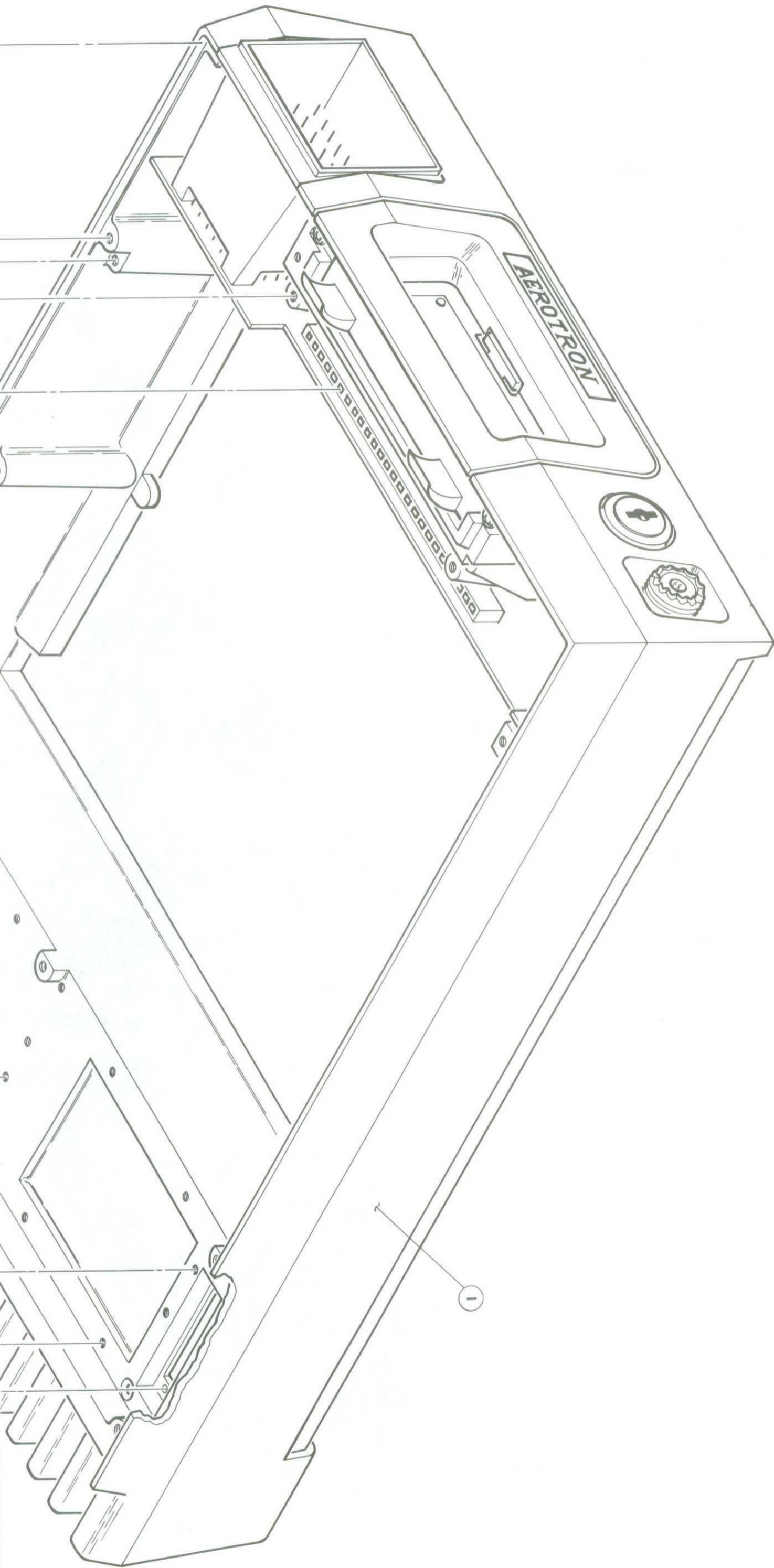
Ref. Des.	Description	Part No.	Ref. Des.	Description	Part No.
1	Chassis	3150-0828-020	34	Spring, button, Mega	2523-0828-036
2	Final amplifier board	1939-0741-105	35	FCC label	
3	Screw, 6-32x1/4, Phil.	2866-0608-311	37	Handle	3150-0828-021
4	Screw, 6/16, #4-40	2851-0410-931	38	Label	2514-0828-049
5	Standoff, 6-32, hex.	2876-0642-036	39	Screw, Allen, 8-32	2851-0808-951
6	Lock washer, #6, ext. tooth	2882-0610-201	40	Master board	1939-0741-102
7	Final amplifier cover	1939-0828-108	41	Interface board	1939-0828-111
8	Screw, 6-32x5/16, Phil.	2851-0610-211	42	Insulator, fishpaper	3107-0828-048
9	Transistor	4811-0805-071	43	Synthesizer board	1939-0741-111
10	Insulator, mica, TO3	3100-0000-002	44	Synthesizer shield cover	1404-0680-063
11	Terminal, solder	2147-0602-019	45	Screw, 4-40x3/8	2867-0412-742
12	Insulator	3110-0000-007	46	TCXO board	1939-0828-XX
13	Screw, 5/16, #4-40, Phil.	2851-0410-311	47	Standoff, 5/8-in., 6-32, threaded	2876-0000-018
14	Lug	2147-0412-020	53	Programming board	1939-0834-143
15	Transistor		56	Screw, 6-32x7/16, Phil.	2851-0614-311
16	Transistor		57	Cover assembly, top	1939-0828-142
17	Insulator, TO220	3100-0000-011	59	Spring, latch, Mega	2523-0828-037
20	Latch catch plate, Mega	1404-0828-034	60	Groove pin, 312 5x0.5	2810-0828-029
21	Latch adjustment plate, Mega	1404-0828-033	61	Foam, closed cell, 1/16-in. thick	2878-0000-008
23	Connector, antenna, final amp.	6050-0680-114	62	Power control board	1939-0741-116
24	Lock washer, #4	2882-0408-201	67	Screw, 4-40x1/4, Phil.	2861-0408-311
25	Nut, 6-32x1/4	2831-0408-601	73	Insulator, RF shield, fishpaper	3107-0828-071
26	Screw, 3/8, #4-40	2851-0412-931	75	Cushion, foam rubber, 1/4-in. thick	2878-0000-001
27	Lock assembly, 2059	2410-0828-038	76	Insulator	3110-0000-007
28	Washer, flat, Nylon	2881-0000-015	77	Shims, power control cable	3204-0000-023
33	Latch, pushbutton, Mega	1404-0828-028	78	Screw, 4-40x1/4, Phil.	2851-0408-311



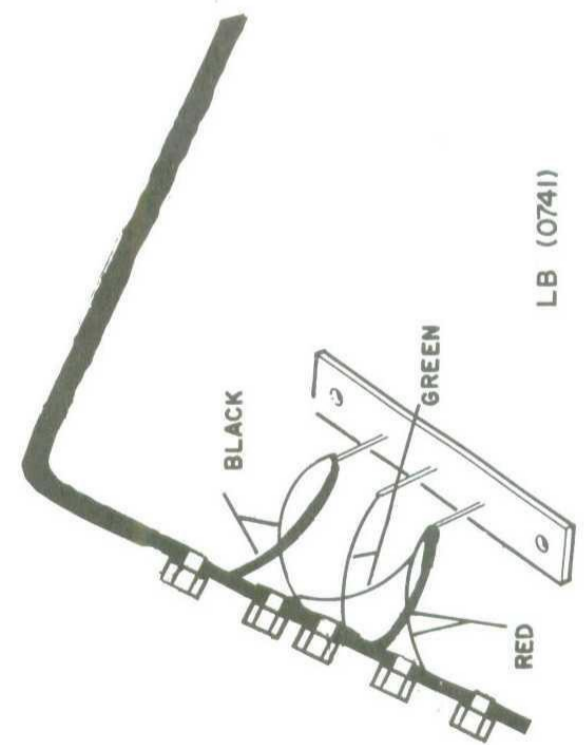


Detail (B)





UHF (0628)



LB (0741)

Mega-E VHF Low-Band Transceiver
 Mechanical View, Bottom View
 p. 7-42

