EPU / EPV SERIES
PORTABLE RADIO
Service Manual

BENDIX/KING

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SECTION I
GENERAL INFORMATION

INTRODUCTION

This manual contains information concerning the physical, mechanical, and electrical characteristics of the Bendix/King EPU Series handheld UHF radios.

INTRINSICALLY SAFE MODELS

Radios certified Intrinsically Safe for use in hazardous environments require special care in their repair and maintenance. Therefore, it is strongly recommended that you send all Intrinsically Safe radios in need of repair to the Bendix/King factory to ensure compliance with Intrinsically Safe certification.

> WARNING
>
> MODIFICATION OR IMPROPER REPAIR OF INTRINSICALLY SAFE RADIOS WILL MAKE THEM UNSAFE FOR OPERATION IN HAZARDOUS ENVIRONMENTS AND WILL VOID THEIR INTRINSICALLY SAFE RATING.

DESCRIPTION

The EPU Series radios are self-contained 4-watt UHF FM transceivers covering the frequency range of 450MHz to 512MHz (EPV 403MHz to 457MHz). The units are multi-channel, digitally synthesized radios using a single crystal for frequency control. All models incorporate an EEPROM for the storage of channel frequency, Code Guard™, and Dual Tone Multiple Frequency/Automatic Numeric Identifier (DTMF/ANI) encode information. All models also include low battery and busy channel indicators. Toggle switches control talk-around, multi-channel scan, and priority scan. Status and channel information are displayed over a liquid crystal display on Keyboard/Display models. Connectors are provided on the side of the unit for external antenna, microphone, speaker, and other optional accessories. A variety of twist-off battery packs are also available.

A partial list of EPU models and unit features appear in the table below:

EPU MODEL	CHANNELS	KEYBOARD DISPLAY	SPECIAL FEATURES
414 0A	14	none	
414 0M	14	none	Metal Case
499 1A	210	Numeric	
499 1M	210	Numeric	Metal Case
499 2A	210	Alphanumeric	
499 SL	210	Alphanumeric	Custom Signaling Options Available

NOTE: 210-Channel radios may have special programming features that reduce the number of channels available to the user. Depending on the model, these radios may have as many as 210 channels, or as few as 14 channels.

TECHNICAL CHARACTERISTICS

FREQUENCY:	450-512 MHz - EPU 403-457 MHz - EPV
POWER SUPPLY:	One rechargeable nickel-cadmium battery pack with temperature sensor or one Alkaline battery pack
OPERATIONAL FEATURES:	
Priority Channel Scan	Programmable
Transmit-Time-Out Timer	Programmable
Scan Delay	Programmable
DTMF/ANI Encode	Programmable
Code Guard Squelch	Programmable
Squelch Tail Elimination	Standard
CHANNELS:	
EPU 414	14
EPU 499	Up to 210 in fifteen 14-channel groups, depending on system installed
FREQUENCY SPREAD:	62 MHz with no degradation - EPU 54 MHz with no degradation - EPV
OPERATING TEMPERATURE:	-30° to +60°c
PHYSICAL DIMENSIONS:	
Weight:	20 oz. (0.6 Kg) 24 oz. (0.7 Kg) with large battery
Width:	2.55 in. (64.8 mm)
Depth:	1.5 in. (38.1 mm)
Height:	6.6 in. (167.6 mm) 7.8 in. (198.1 mm) with large battery
ANTENNA TYPE:	Threaded Helical wound rubber flex (standard) BNC Helical wound rubber flex (optional)
CHANNEL SPACING:	25 KHz
MAX CURRENT DRAIN:	
Transmit 4 watts:	1500 mA 1540 mA (with Options installed)
Receive 500 mw audio:	185 mA
Receive standby:	70 mA (battery save off) 21 mA (battery save on) 31 mA (with Options installed)
FCC Identification number:	K95 LT 30001

TRANSMITTER

RF OUTPUT POWER:	4 Watts
MODULATION CHARACTERISTICS:	15KOF2D 16KOF3E 16KOFXE
SPURIOUS INCLUDING IMAGE:	70 dB
MAXIMUM DEVIATION:	5 Khz
FM HUM AND NOISE (EIA):	43 dB

FREQUENCY STABILITY:	±5 PPM
AUDIO DISTORTION:	3% maximum with 3KHz deviation
AUDIO RESPONSE:	+1 to -3dB from 6dB/octave pre-emphasis at 0.3 to 3 Khz
DUTY CYCLE:	5 - 5 - 90%

RECEIVER

SENSITIVITY: 12dB SINAD	0.30µV
NOISE SQUELCH:	0.18µV
SELECTIVITY:	70dB
IMAGE AND SPURIOUS RESPONSES:	70dB
INTERMODULATION:	65dB
AUDIO RESPONSE:	+1dB to -3dB from 6dB/octave de-emphasis at 0.3 to 3Khz
AUDIO OUTPUT:	500mW with 5% maximum distortion into an 8 ohm load

ACCESSORIES

A wide variety of optional accessories are available for EPU and EPV Series radios. Contact your BENDIX/KING dealer for complete information.

LICENSE REQUIREMENTS

This equipment must be licensed by the Federal Communications Commission (FCC) before it may be used. Your BENDIX/KING dealer can assist you in filing the appropriate application for the FCC, and will program each radio with your authorized frequencies and signaling codes.

SERVICE INFORMATION

If you need service, contact your BENDIX/KING dealer or any other BENDIX/KING Mobile Communications dealer equipped to service your radio. If you find it impractical to have service performed by your local dealer, contact BK Radio at this address:

BK Radio, Inc.
ATTN: Technical Services Dept.
2901 Lakeview Road, Suite 100
Lawrence, Kansas 66049
(913) 842-0402

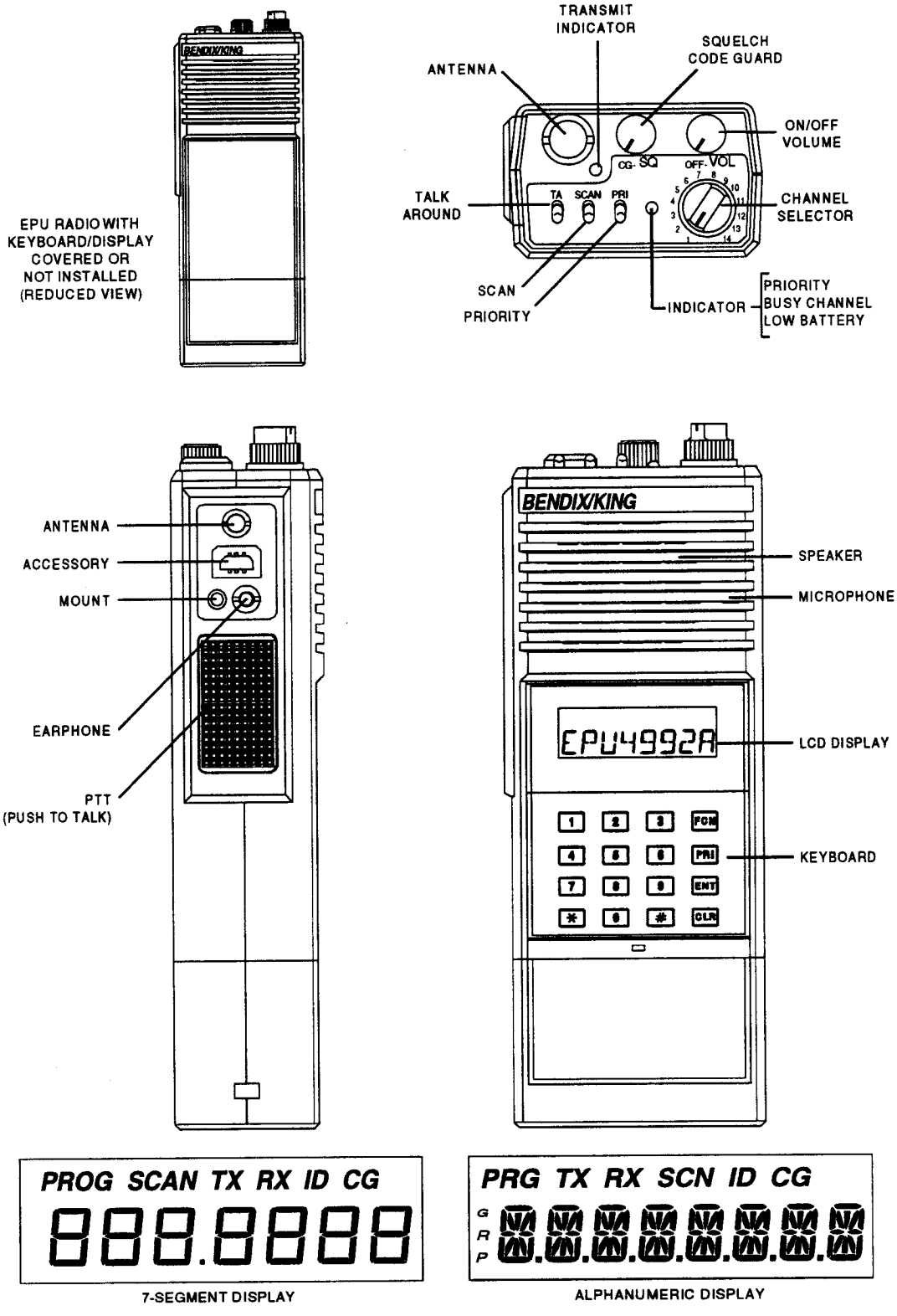


FIGURE 1-1 CONTROLS

SECTION II
INSTALLATION AND PROGRAMMING

GENERAL INFORMATION

This section contains information concerning the installation and programming of Bendix/King EPU Series handheld UHF radios.

UNPACKING AND INSPECTING EQUIPMENT

Exercise extreme care when unpacking the equipment. Make a visual inspection of the unit for evidence of damage incurred during shipment. If a claim for damage is to be made, save the shipping container to substantiate the claim. The claim should be promptly filed with the transportation company. It would be advisable to retain the container and packaging material after all equipment has been removed in the event that equipment storage or reshipment should become necessary.

BATTERY INSTALLATION

A. Bendix/King battery packs are available in a variety of sizes and types for special applications. Rechargeable battery packs can be charged separately or while attached to a radio.

B. To install the battery, locate the center hub on the radio base and place it in the recess of the battery pack. Position the pack at the 30° offset, seating two metal studs in their recess. Apply upward pressure to the pack while twisting the pack to its original position. The metal tab will click, locking the pack in position.

C. To remove the battery, turn the radio off. Press up the metal tab on the side of the case while twisting the battery pack approximately 30° and remove it from the radio.

D. Periodically check the contacts on battery pack for dirt that may prevent a good electrical contact with the charging base.

WARNING
DO NOT DISPOSE OF A BATTERY PACK IN FIRE. AN EXPLOSION MAY OCCUR.

WARNING
FOR INTRINSICALLY SAFE RADIOS DESIGNED FOR USE IN HAZARDOUS ENVIRONMENTS, REPLACEMENT BATTERIES MUST BE APPROVED BY FACTORY MUTUAL RESEARCH FOR USE WITH BENDIX/KING RADIOS.

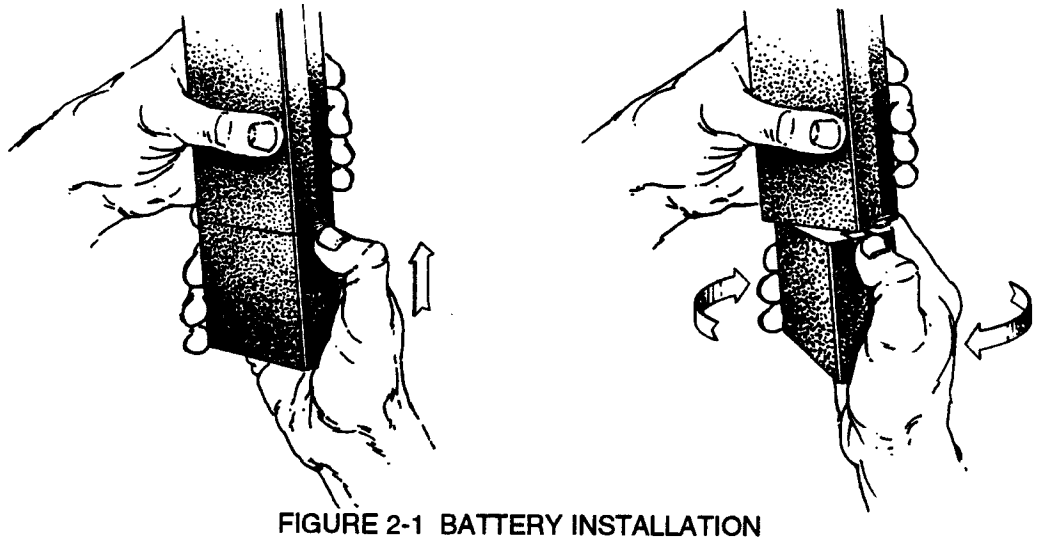


FIGURE 2-1 BATTERY INSTALLATION

PROGRAMMING

Bendix/King offers two basic types of EPU handheld radios. The first type has a keyboard and liquid crystal display (LCD). The second type has no keyboard or display.

There are three different ways to program these radios:

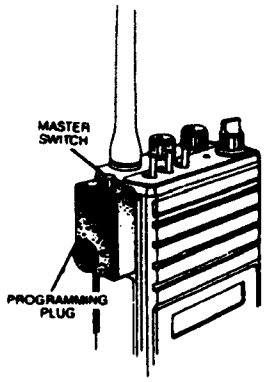
A. A radio with a keyboard and display can be programmed by using its keyboard and a programming plug. This section of the manual describes that procedure.

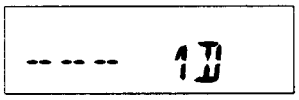
B. A radio with a keyboard and display can transfer its programmed settings (except Alphanumeric display settings) to another radio of the same frequency band, by using a cloning cable. See "Cloning Radio Settings" on page 2-15.

C. Any Bendix/King handheld radio can be programmed from a computer by using a special RS-232 interface cable. That procedure is not described in this manual. Contact Bendix/King for the programming cable, software, and instruction manual.

ENTER PROGRAMMING MODE

Radios are shipped with a door covering the keyboard and display. Before programming, remove the door by removing the battery pack, engaging the door just below the speaker grill, and sliding the door downward. Replace the battery pack.





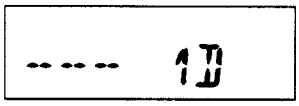
1. Make sure the battery pack is charged.
2. Insert the programming plug into the side connector of the radio. The pushbutton master switch will be on top.

   NOTE: The cloning cable may be used as a substitute for the programming plug by inserting the end with the pushbutton master switch into the side connector of the radio.

3. Select a channel group to be programmed. (Not necessary in 14-channel radios.) See "Group Selection" on page 2-14.
4. Press and hold the master switch.
5. While holding the master switch, press and hold the **[FCN]** key. After approximately three seconds the LCD will display **- - - ID**.
6. Release the **[FCN]** key and the master switch. The radio is now in the password entry mode.
7. Enter the six-digit password code. Without the correct password code, you cannot proceed with programming.

   NOTE: New radios shipped from the factory are assigned the password code **000000**.

   While entering the password code the display will not change, but a beep will sound for each key pressed. If the password code is entered incorrectly, the radio will reset to normal operation. Try again, starting at step 4.



8. To keep the password unchanged, press the **[ENT]** key and continue with normal radio programming.

   To change the password, press the **[FCN]** key and enter a new six-digit password code. The digits are displayed as you enter them.

   NOTE: Do not use a **1** for the first digit of the password code - the radio will malfunction. The password code can contain the digits **0** through **9**, *, and #.

   If you make an error entering the new password code, press the **[CLR]** key and try again.

9. Press the **[ENT]** key to store the new password and proceed to programming mode. The display will change to **PRG Ch 00** (Alphanumeric display) or **PROG Ch 0** (standard 7-Segment display).

GENERAL PERFORMANCE VARIABLES (CHANNEL 0)

Channel 0 is the portion of the program that controls general performance variables for all the channels in a 14-channel radio. For a 210-channel radio, the Channel 0 settings for each group must be programmed separately. Select the group to be programmed before entering Programming Mode. See "Group Selection" on page 2-14.

The same password code is used for all groups in the radio.

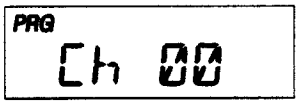
NOTE: Settings listed as Group One functions, Group Two functions, and Group Three functions refer to programming function groups, not channel groups.

Press the **[FCN]** key repeatedly to view the settings in Channel 0, then loop back to the **Ch 00** entry point. Channel 0 settings include:

NOTE: Illustrations in this section show an Alphanumeric Display. The same procedures are also used to program radios with standard 7-Segment displays, except that some procedures apply only to Alphanumeric Displays (see below).

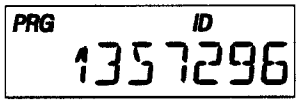
- Automatic Number Identification (ANI)
- Transmitter Timeout Timer
- Scan Delay Time
- Group One functions: 1-12345
  - Battery Saver
  - Priority Scan Operation
  - Priority Key Lockout
  - Scan List Lockout
- Group Two functions: 2-12345
  - Enable User Code Guard
  - Busy Channel Operation
  - ANI Enable
  - DTMF Enable
- Group Three functions: 3-12345 (Alphanumeric Display only)
  - Backlight Enable Conditions (Alphanumeric Display only)
  - Alphanumeric Mode Enable (Alphanumeric Display only)
- Backlight Duration (Alphanumeric Display only)
- Group Label (Alphanumeric Display only)

Automatic Number Identification (ANI)



1. After entering the programming mode the LCD will display **PRG Ch 00** (Alphanumeric) or **PROG CH 0** (7-Segment).

2. Press the **[FCN]** key.



3. The display will indicate the ANI ID number (as many as seven digits may be used). The ID number can be used for either radio management or transmitted as a DTMF tone burst for ANI purposes. The ANI can be enabled or disabled. See "ANI ENABLE" on page 2-8.

4a. If no change is needed for the ID number, press the **[FCN]** key to advance to the next section.

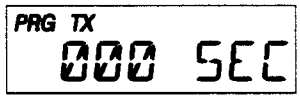
4b. A new number can be entered by pressing the **[CLR]** key, followed by number keys. The digits will appear to right of the display and move to the left.

4c. The existing ID number can be incremented one digit by pressing **[PRI]**.

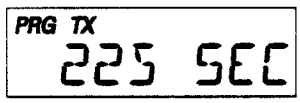
4d. Press the **[ENT]** key to store the new ID number and advance to the next section.

If the new ID number will be used only for cloning, press **[FCN]** instead of **[ENT]** to advance to the next section. The ID number will not be stored locally.

Transmitter Time Out Timer



After the ID number is set, the display annunciator will indicate **PRG TX**. This is the duration of the transmitter Time Out Timer. **0 SEC** means the Time Out Timer is disabled.



Press the **[PRI]** key to increase the Time Out Timer duration by 15 seconds, with a maximum of 225 seconds (3 minutes, 45 seconds). Press the **[PRI]** key again to change the duration from 225 seconds to zero.

Press the **[CLR]** key to set the Time Out Timer duration to zero.

Press the **[ENT]** key to store the changed setting and advance to the next section.

Press the **[FCN]** key to advance to the next section if no change is needed, or if a new setting is only to be cloned, not stored locally.

Scan Delay Time

After the Time Out Timer is set, the upper display will indicate **PRG SCN**. This is the scan delay time in seconds.

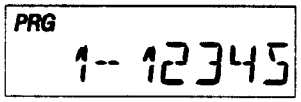
Press the **[PRI]** key to increase the scan delay time by .5 seconds, up to 7.5 seconds. Press the **[PRI]** key again to change the time from 7.5 seconds to 0.

Press the **[CLR]** key to reset the scan delay time to 0.

Press the **[ENT]** key to store the changed setting and advance to the next section.

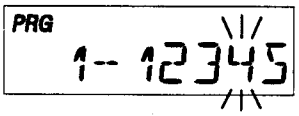
Press the **[FCN]** key to advance to the next section if no change is needed, or if a new setting is only to be cloned, not stored locally.

CHANNEL 0 GROUP ONE FUNCTIONS



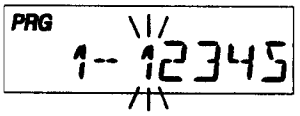
After the scan delay time is set the LCD will display **PRG 1-12345**. This is a group of five individual functions that can be enabled or disabled.

When a function is enabled, the corresponding number in the display will flash. When the function is disabled the number is steady. If you wish to change the function from enable to disable or vice versa, press the number key corresponding to that function.



EXAMPLE: If function 4 (Priority Key Lockout) is disabled, the 4 in the display will not be flashing. If the **[4]** key is pressed, the **4** in the display will flash, signifying that Priority Key Lockout is enabled. A subsequent press of the **[4]** key will disable Priority Key Lockout.

Battery Saver Inhibit

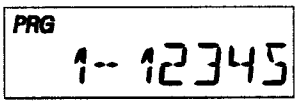


When function 1 is enabled (flashing) the battery saver is turned off . The battery saver should be turned off only to get proper voltage readings during service or in systems requiring extremely fast squelch attack time.

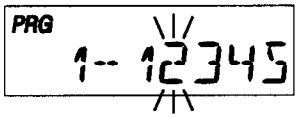
NOTE: Bendix/King current drain and battery life specifications are based on performance with the battery saver on.

Priority Scan

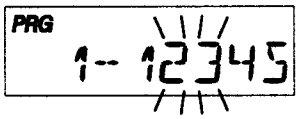
Functions 2 and 3 are used to define Priority Scan operation. There are three types of Priority Scan available. They are described in greater detail under "Priority Operation" beginning on page 3-5. Priority Scan modes include:



Priority Mode A - The Priority Channel follows the position of the Channel Selector knob.



Priority Mode B - The Priority Channel is fixed. You will transmit on the channel selected by the Channel Selector knob.

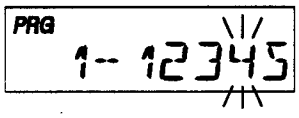


Priority Mode C - The Priority Channel is fixed. When the **PRI** toggle switch is on, you will transmit on the Priority Channel regardless of the Channel Selector knob setting.

To set Function 2 and 3 for Priority Mode A, B, or C, use the following chart:

	FUNCTION 2	FUNCTION 3
PRIORITY MODE A	DISABLE (STEADY)	DISABLE (STEADY)
PRIORITY MODE B	ENABLE (FLASHING)	DISABLE (STEADY)
PRIORITY MODE C	ENABLE (FLASHING)	ENABLE (FLASHING)

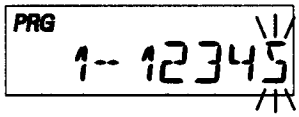
PRI Key Lockout



When function 4 is enabled (flashing) the **[PRI]** key is locked out in the operating mode. The user will not be able to change the designation of the Priority Channel.

When function 4 is disabled (steady) the user will be able to change the channel that is designated as Priority Channel. See "Changing the Priority Channel" on page 3-8.

Scan List Lockout



When function 5 is enabled (flashing), the user will not be able to change the channels in the scan list. When disabled (steady), the user can enter or delete channels from the scan list. See "Changing the Scan List" on page 3-5.

STORE GROUP ONE SETTINGS

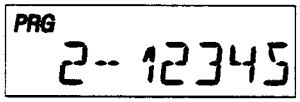
Once each function 1-5 is set as desired, you can store the changes, discard the changes, or disable all 5 functions.

Press the **[CLR]** key to disable all Group One functions (steady).

Press the **[ENT]** key to store new Group One settings into memory and advance to the next section.

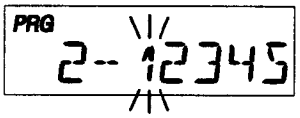
Press the **[FCN]** key to advance to the next section without saving changes or if the new settings are only to be cloned, not stored locally.

CHANNEL 0 GROUP TWO FUNCTIONS



After Group One functions are set, the LCD will display **PRG 2-12345** for Group Two functions. As with Group One functions, the enabled function number will flash. The disabled functions remain steady.

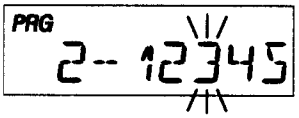
User Code Guard Selection



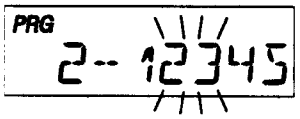
When function 1 is enabled (flashing) the user will be able to press the keyboard to independently select the Code Guard values that are programmed into Channels 1 thru 9 while operating on any Channel 1 thru 14. When disabled the user will be unable to use the keyboard for Code Guard selection. See "User Code Guard Selection" on page 3-8.

Busy Channel Operation

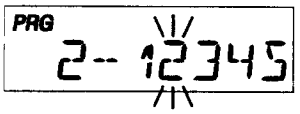
Functions two and three are used to set Busy Channel operation. There are three types of busy channel operation available. They are described more fully under "Busy Channel Indication" on page 3-9. Busy Channel modes include:



Busy Channel Indicator - The yellow LED illuminates when a signal is received on the channel selected, with or without the programmed receive Code Guard setting.



Busy Channel Lockout - The yellow LED illuminates and the transmitter PTT is disabled when a signal is received without the programmed receive Code Guard setting.

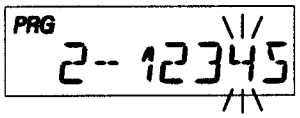


Busy Channel Override - This function is similar to Busy Channel Lockout except the transmitter PTT can be activated by rotating the Squelch knob clockwise off the Code Guard detent.

To set Busy Channel operation use the following chart:

	FUNCTION 2	FUNCTION 3
BUSY CHANNEL INDICATION	DISABLE (STEADY)	ENABLE (FLASHING)
BUSY CHANNEL LOCKOUT	ENABLE (FLASHING)	ENABLE (FLASHING)
BUSY CHANNEL OVERRIDE	ENABLE (FLASHING)	DISABLE (STEADY)

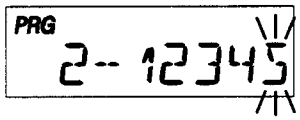
ANI Enable



When function 4 is enabled (flashing) the ANI ID number will be transmitted (as a DTMF tone sequence) with each press of the PTT switch. See "Automatic Number Identification (ANI)" on page 2-4 for instructions on setting the ANI number..

When functions 4 and 5 are both enabled (flashing) the ANI tone sequence will be transmitted only after the **[ENT]** key is pressed while the transmit PTT switch is activated. A sidetone of the ANI number transmitted will also be heard through the speaker.

DTMF Enable



When function 5 is enabled (flashing) the keypad becomes active for manual DTMF operation.

STORE GROUP TWO SETTINGS

Once Group Two functions are set, press the **[ENT]** key to store them into memory and automatically advance the program to the next section. Alphanumeric displays advance to Group Three settings. Standard 7-Segment displays go back to the starting point for Channel 0 settings.

Once each function 1-5 is set as desired, you can store the changes, discard the changes, or disable all 5 functions.

Press the **[CLR]** key to disable all Group Two functions (steady).

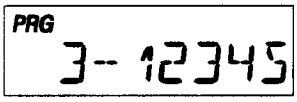
Press the **[ENT]** key to store new Group Two settings into memory and advance to the next section.

Press the **[FCN]** key to advance to the next section without saving changes or if the new settings are only to be cloned, not stored locally.

NOTE: If programmed settings are to be cloned (not stored locally) proceed with the cloning procedure before advancing to the next section. Otherwise, these settings will be lost. See "Cloning Radio Settings" on page 2-15.

NOTE: Group Three settings, Alphanumeric display functions, group labels, and channel labels cannot be transferred by cloning.

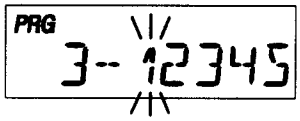
CHANNEL 0 GROUP THREE FUNCTIONS (ALPHANUMERIC DISPLAY ONLY)



After Group Two functions are set, the LCD will display **PRG 3-12345** for Group Three functions. As with Group One and Group Two functions, the enabled function number will flash. The disabled functions remain steady.

Group three functions are available only with Alphanumeric displays.

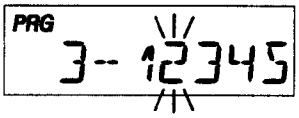
Backlight On Main Channel Activity



When function 1 is enabled (flashing) the LCD backlight will illuminate each time the display receives input related to the main channel. This includes displayed changes in the selected channel and the PR, TX, and SCN annunciators.

The LCD will not illuminate if backlight duration is set to **LITE OFF**. See "Backlight Duration" on page 2-10.

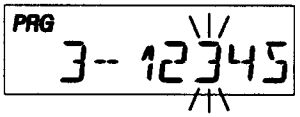
Backlight On Scan Channel Activity



When function 2 is enabled (flashing) the LCD backlight will illuminate each time the display receives input related to the scan channel. This includes displaying the scan channel and the CG annunciator.

The LCD will not illuminate if backlight duration is set to **LITE OFF**. See "Backlight Duration" on page 2-10.

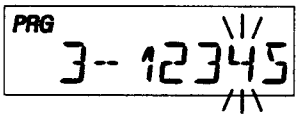
Backlight On Other Display Activity



When function 3 is enabled (flashing) the LCD backlight will illuminate each time the display receives input not related to the main or scan channel. This is not used often, but includes the **- - - Id** prompt for password input.

The LCD will not illuminate if backlight duration is set to **LITE OFF**. See "Backlight Duration" on page 2-10.

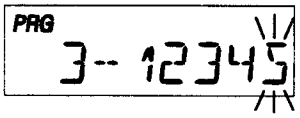
Backlight On Key Press



When function 4 is enabled (flashing) the LCD backlight will illuminate each time a key is pressed on the keypad, even if pressing the key has no other effect.

The LCD will not illuminate if backlight duration is set to **LITE OFF**. See "Backlight Duration" on page 2-10.

Alphanumeric Mode



When function 5 is enabled (flashing) the LCD operates in Alphanumeric mode, enabling display of channel labels. When disabled (steady) the LCD operates in standard (7-segment) display mode. This disables display of channel labels.

STORE GROUP THREE SETTINGS

Once each function 1-5 is set as desired, you can store the changes, discard the changes, or disable all 5 functions.

Press the **[CLR]** key to disable all Group Three functions (steady).

Press the **[ENT]** key to store new Group Three settings into memory and advance to the next section.

Press the **[FCN]** key to advance to the next section without saving changes.

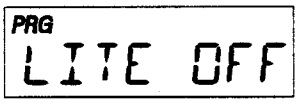
ALPHANUMERIC DISPLAY FUNCTIONS (ALPHANUMERIC DISPLAY ONLY)

The following Display Functions are available only with Alphanumeric displays.

Backlight Duration

After Group Three functions, the LCD displays the current backlight duration setting. Available settings are **LITE OFF**, **1 SEC ON**, one second increments up to **6 SEC ON**, and **LITE ON**.

If no change is needed, press the **[FCN]** key to advance to the next section.



Press the **[CLR]** key to set backlight duration to zero and display **LITE OFF**.

Press the **[PRI]** key to increase backlight duration by 1 second increments from **LITE OFF**, to **1 SEC ON**, **2**, **3**, **4**, **5**, **6 SEC ON**, **LITE ON** (illumination remains on constantly) then back to **LITE OFF**.

NOTE: The backlight illuminates for the duration of the new setting. For example, if you press the **[PRI]** key to change the setting from **2 SEC ON** to **3 SEC ON** the backlight immediately illuminates for three seconds.

NOTE: Excessive battery drain will result if **LITE ON** is set and used for extended periods of time.

Press the **[ENT]** key to store changes and advance to the next function.

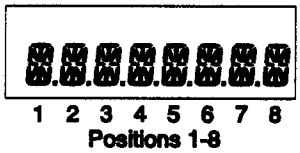
Press the **[FCN]** key to advance to the next function without storing changes.

Group Label

After the Backlight Duration setting, the LCD displays the current label for the channel group. Each channel group can have a label of up to eight characters or spaces. The characters can include 0 - 9, A - Z, -, *, $, /, +, %, \, |, _, <, >, h, or blank.

- If no change is needed, press the **[FCN]** key to go back to the starting point for Channel 0 settings.
- Press the **[CLR]** key to erase the current label.
- Press the **[CLR]** key a second time to restore the current label.

NOTE: Special software available from Bendix/King enables entering group labels and channel labels from a computer. Contact Bendix/King for the programming cable, software, and instruction manual.



Change The Label

1 Press the **[CLR]** key. The display becomes blank.

2. Press number keys to enter **0** - **9** in positions one through seven. The digits start in position seven, then move left.

3. Press the **[#]** key to toggle a decimal on or off to the right of the character in position seven. The decimal moves left with the number in position seven as new numbers are entered.

4. Use the following steps to enter a number in position eight, or characters in positions one through eight:

Label With Letters, Numbers, Etc.

1. Press the **[PRI]** key repeatedly to cycle through characters 0 - 9, A - Z, -, *, $, /, +, %, \, |, _, <, >, h, blank, then back to the start again.

   If you pass the desired character, press the **[PRI]** key repeatedly until you return to the start and reach that character again.

2. Press the **[FCN]** key to shift the display left by one position, leaving position eight blank.

3. Press the **[PRI]** key repeatedly to enter the next character, or press the **[FCN]** key a second time to enter a blank space.

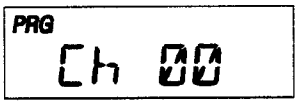
4. To abandon changes, press the **[CLR]** key, restoring the original label.

5. Press the **[ENT]** key to store changes and go back to the starting point for Channel 0 settings.

REVIEW CHANNEL 0 VALUES

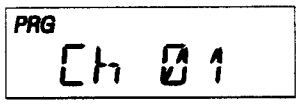
Press the **[FCN]** key repeatedly to display each value in Channel 0, then return to the Channel 0 starting point.

ENTER CHANNEL FREQUENCIES AND CODE GUARD VALUES

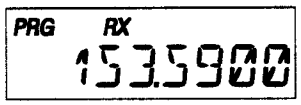


At the starting point for Channel 0, the LCD will display **PRG Ch 00**. At this point, a channel number can now be pressed to allow access to the frequency and Code Guard values for that channel.

NOTE: A valid receive frequency must be programmed into each channel intended for use. If a 0 value or an invalid frequency is programmed, the LCD will give a false reading in the operation mode, and may result in radio malfunction. If a malfunction occurs, reset the radio by turning it off and then back on.



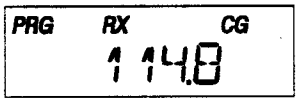
1. Press **1** and the LCD will display **PRG CH 01**. This is the starting point for entering channel 1 values.



2. Press the **[FCN]** key and the upper part of the LCD will display **PRG RX**. This is the receive frequency for channel 1 (in MHz).

3. If the displayed frequency is correct, press the **[FCN]** key to advance to the next value.

   If a new frequency is desired, press the **[CLR]** key followed by the digits of the desired frequency. Then press the **[ENT]** key to store this frequency and automatically advance to the next value.

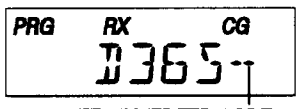


4. After the receive frequency is set, the upper part of the LCD will display **PRG RX CG**. This is the Code Guard value for Channel 1 receive.

   NOTE: **0.0** indicates carrier squelch operation (no Code Guard).

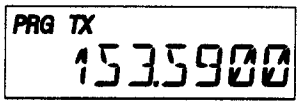
   If the displayed value is correct, press the **[FCN]** key to advance to the next value.

If a new value is desired, press the **[CLR]** key to reset the display to **0.0**. Press the number keys **0** thru **9** to enter a Tone Code Guard value. See "Tone Code Guard Values" on page 2-18.



INDICATES INVERTED CODE

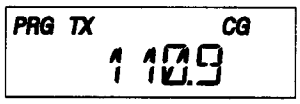
To enter a Digital Code Guard value press the **[#]** key, causing the letter **D** to appear followed by three zeros. Enter the desired digital code using keys 0 thru 7 (keys 8 & 9 do not respond). See "Digital Code Guard Values" on page 2-18. Pressing the **[PRI]** key after the three-digit code has been entered allows the digital code to be inverted. When the displayed value is correct, press the **[ENT]** key to store the Code Guard value and automatically advance to the next value.



5. After the receive Code Guard is set the upper part of the LCD will display **PRG TX**. This is the transmitter frequency for Channel 1. If it is correct, press the **[FCN]** key to advance to the next value.

If you wish to change it, press the **[CLR]** key followed by the frequency in MHz then **[ENT]** to store the new frequency and automatically advance to the next value.

Only valid frequencies will be operable.



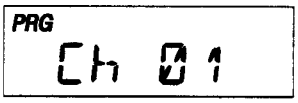
6. After the transmit frequency is set the upper part of the LCD will display **PRG TX CG**. This is the Code Guard value for Channel 1 transmit (0.0 indicates carrier squelch). If this value is correct press the **[FCN]** key to advance to the next value.

To enter a new value, press the **[CLR]** key to reset the display to **0.0**. Press the number keys to enter a Tone Code Guard value. See "Tone Code Guard Values" on page 2-18.

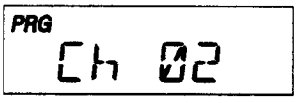
To enter Digital Code Guard, first press the **[CLR]** key, then the **[#]** key, causing the letter **D** to appear followed by three zeros. Enter the desired digital code using keys 0 thru 7 (keys 8 & 9 do not respond). See "Digital Code Guard Values" on page 2-18. Pressing the **[PRI]** key after the three digit code has been entered allows the digital code to be inverted. When the displayed value is correct, press the **[ENT]** key to store the Code Guard and automatically advance to the next value.

7. After the transmit Code Guard is set, the LCD will display the channel label. If this label is correct press the **[FCN]** key to proceed to the entry point.

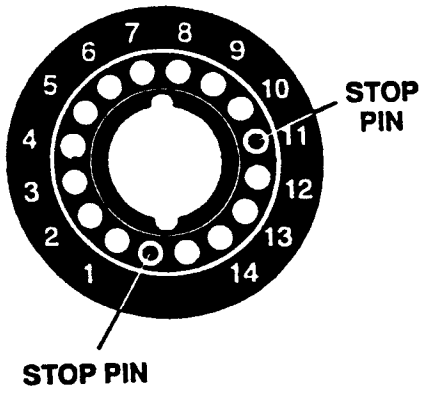
If a new channel label is desired, follow the instructions under "Change the Label" on page 2-11.



8. After the channel label is set, the display will return to the Channel 1 starting point. If you wish to review the frequencies and Code Guard values in Channel 1, subsequent pressing of the **[FCN]** key will show each value and then return to the Channel 1 starting point.



9. At the starting point for Channel 1, the display will show **PRG CH 01**. Press the number keys for another channel number to gain access to the frequencies and Code Guard values for that channel. Each channel is then programmed using the same steps described for Channel 1.



10. After the frequencies and Code Guard values are entered for each channel, the Channel Selector knob can be modified to limit it's travel. The procedure is as follows: Remove the Channel Selector knob from the radio. There are two pins. The pins can be set to limit the travel from two to 14 channels as needed. Place the pins in to the appropriate hole and reinstall the Channel Selector knob. For example, to limit the travel to channels 1-10 set the pins as shown in the illustration to the left.

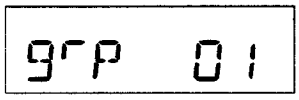
LEAVE THE PROGRAMMING MODE

1. Rotate the On/Off/Volume knob on the top of the radio counterclockwise to the Off position.
2. Remove the programming plug.
3. The radio will be in normal operation mode the next time it is turned on.

GROUP SELECTION

For a 210-channel radio, Channel 0 settings affect one "group" of 14 channels. Each group must be programmed separately. To select a group for programming, perform the following steps:

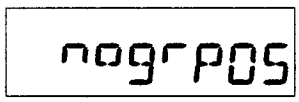
7-SEGMENT DISPLAY



ALPHANUMERIC DISPLAY

1. Change the radio from programming mode to normal operation mode by turning it off, then on.

   In normal operation mode, press the **[#]** key to display the current group number for 5 seconds. Press the **[#]** key a second time within 5 seconds to display the alphanumeric label for the current group.



2. To select a group to be programmed, press the **[#]** key followed by number keys for the group number. Enter the selection then wait 5 seconds.

   If an invalid group number has been selected (for example, group 5) the LCD will display **no group 05**. To exit this mode either turn the radio off, then on; or enter a valid group number from the keypad.

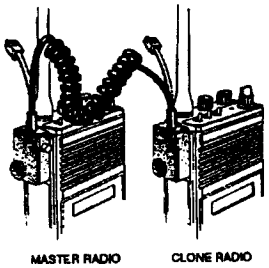
3. Enter the programming mode and set the values. See "Enter Programming Mode" on page 2-2.

   NOTE: The same password code is used for all groups in the radio.

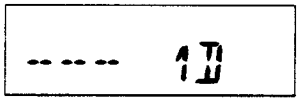
CLONING RADIO SETTINGS

A radio with a keyboard and display can transfer its programmed settings to another radio by using a cloning cable. A radio cannot transfer Alphanumeric display settings, including channel labels, group labels, and Channel 0 Group Three functions. Both units must be of the same frequency band. For example, an EPV series UHF radio can be used to clone settings to or from an LPV or EMV series radio.

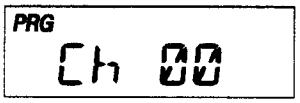
The radio (with a keyboard and display) transferring its programmed settings is referred to here as a Master unit. The radio receiving the programmed settings is referred to here as a Clone unit.



1. Make sure that both units are connected to a charged battery pack.
2. Attach the Master end of the cloning cable into the side connector of the Master radio. This is the cable end with the pushbutton Master switch.
3. Turn on the Master radio.



4. Put the Master radio in the programming mode by holding down the Master switch and pressing the **[FCN]** key until the LCD displays **- - - ID**.
5. Enter the correct Password Code.



6. Press the **[FCN]** key repeatedly to review the values in Channel 0. Make any required changes at this time.
7. Attach the other end of the cloning cable into the side connector of the radio to be cloned.
8. Turn on the clone radio.
9. Press the **[*]** key on the Master radio. The display will flash **PROG**, signifying that the radio is ready to download.
10. Press the **[FCN]** key. The program in the Master will download to the clone. The clone will send back the program to the Master to verify successful cloning.

11. If the download was successful, the Master radio will resume flashing **PROG**. Turn off the clone radio. Disconnect the cable. Normal radio operation will occur the next time the clone radio is turned on.

12. If the download was not successful the Master radio will flash **FAIL**, followed by continuous beeps. Failure to download the Master program can be due to:

    A. Incorrect radio types.
    B. Improper connection.
    C. Failure to power up radio.
    D. Clone set in programming mode.

    NOTE: To stop FAIL mode, press the **[CLR]** key, turn off the radios, and start again at Step 1.

GROUP CLONING

Cloning radios equipped with more than 14 channels (more than one group) can only be accomplished group by group. Settings for any group in a Master radio can be downloaded to any group in the clone radio. To perform group cloning:

1. With the Master radio in normal operation mode, press the **[#]** key followed by number keys to select the group to be downloaded.
2. Set the clone radio to the group that is to receive the download, using the same method as in step 1.
3. Follow the cloning instructions on page 2-15.

   Only the Channel 0 and channel 1-14 information for the selected Master radio group will be downloaded to the selected clone radio group. Channel 0 Group Three settings, other Alphanumeric settings, and labels cannot be downloaded by cloning.

SPECIAL CLONING INSTRUCTIONS

It is possible to change Channel 0 values on the Master radio, hold them in a temporary memory, and download them to the clone without actually entering them into the permanent memory of the Master radio. This is convenient for sequential identification numbers used to identify a series of portables in a radio system. Assuming that the frequencies, Code Guard values, and other Ch 0 values are common for all radios in the system, but that the radio identification number should be unique to each radio, the following method would be used to clone additional radios for the system.

1. Program the Master radio with all frequencies, Code Guard values, and Channel 0 values that will be common to all radios.

2. Advance the display to show the Master radio's ID number - for example, 100.

3. Press the **[CLR]** key; press **1 2 5**. Do not press the **[ENT]** key. Now 125 is in temporary memory.
4. Press the **[*]** key, connect the cable to the radio and download by pressing the **[FCN]** key. ID number 125 is now stored in permanent memory of the clone.
5. After download, press the **[CLR]** key. Disconnect the clone. The Master radio display will show that 125 is still being held in the temporary memory of the Master radio.

6. Press the **[PRI]** key. This will increment the ID number one digit to 126. (Note: any new number can be entered at this point by pressing the **[CLR]** key and using the digit keys to enter the new number.)

7. Press the **[*]** key. Connect the cable to the second clone and download by pressing **[FCN]**.

8. Any number of radios can be coded with different or sequential ID numbers using this technique. The ID number in the permanent memory of the Master radio will remain unchanged as 100.

SCAN LIST AND PRIORITY CHANNEL CLONING

When a Master radio downloads to a clone, the Scan List and Priority Channel designations are also transferred to the clone. This includes Priority Mode and any lockout functions.

To program a clone with a specific Priority Mode, Priority Channel, and Scan List along with the respective lockout functions (if desired), the Master radio must first be programmed with these parameters. The lockout functions cannot be held in temporary memory. See the appropriate operating procedures in Section 3 for selecting the Scan List, Priority Channel, and Lockout functions. See "Priority Scan" on page 2-6 for Priority Mode selection procedures.

PROGRAMMING BY COMPUTER

Programming a radio from a computer is not covered in this manual. Contact Bendix/King for the programming cable, software, and manual required.

TONE CODE GUARD VALUES

The tone Code Guard system may be set for any frequency in the range of 67 to 255.9 Hz. However, since most systems adhere to the Electronic Industry Association (EIA) standards, tones should be selected from the following EIA list. In order to insure optimum performance, tone selection for use on the same radio frequency (RF) channel or adjacent channels in the same coverage area should be made from one of the Groups A, B, or C to the maximum degree possible. BENDIX/KING guarantees optimum receiver performance only if tone frequencies below 220 Hz are chosen.

GROUP A		GROUP B		GROUP C
67.0 (XZ)	*151.4 (5Z)	71.9 (XA)	146.2 (4B)	74.4
77.0 (XB)	162.2 (5B)	82.5 (YZ)	156.7 (5A)	79.7
88.5 (YB)	173.8 (6A)	94.8 (ZA)	167.9 (6Z)	85.4 (YA)
*100.0 (1Z)	186.2 (7Z)	103.5 (1A)	*179.9 (6B)	91.5 (ZZ)
107.2 (1B)	203.5 (M1)	110.9 (2X)	192.8 (7A)	
114.8 (2A)	218.1 (M3)	*118.8 (2B)	210.7 (M2)	
123.0 (3Z)	233.6	127.3 (3A)	225.7 (M4)	
131.8 (3B)	250.3	136.5 (4Z)	241.8	
141.3 (4A)				

* 50/60 Hz power distribution systems could cause falsing.

The assignments in a given area shall be made from within one of the Groups: A, B, or C.

DIGITAL CODE GUARD VALUES

Codes for the Digital Code Guard system may be chosen from the following list. Since there are no EIA standards for the performance or compatibility of Digital Code Guard systems it is recommended that an operational test be made on the intended system before wholesale assignments are made. In some cases either or both the transmit and receive codes will require an inverted code to operate with existing systems. This can be done during the code programming of the system. Usually systems using direct unit to unit transmission (systems without mobile relays, repeaters, remote control, etc) may use codes from the table. Systems with relays etc. may use code variations for system control and operational efficiency. The system operator or engineer should be consulted regarding the operational requirement on such systems.

023	065	131	172	251	331	412	466	612	703
025	071	132	174	261	343	413	503	624	712
026	072	134	205	263	346	423	506	627	723
031	073	143	223	265	351	431	516	631	731
032	074	152	226	271	364	432	532	632	732
043	114	155	243	306	365	445	546	654	734
047	115	156	244	311	371	464	565	662	743
051	116	162	245	315	411	465	606	664	754
054	125	165							

SECTION III
OPERATION

INTRODUCTION

This section contains information concerning the operation procedures for the EPH Series radio. Information on programming and installation is contained in Section 2 of this manual.

WARNING

DO NOT OPERATE THE TRANSMITTER IN CLOSE PROXIMITY TO BLASTING CAPS.

WARNING

DO NOT OPERATE THE RADIO IN AN EXPLOSIVE ATMOSPHERE (PETROLEUM FUELS, SOLVENTS, DUST, ETC.) UNLESS IT IS AN INTRINSICALLY SAFE MODEL DESIGNED FOR SUCH USE.

DISPLAY OPTIONS

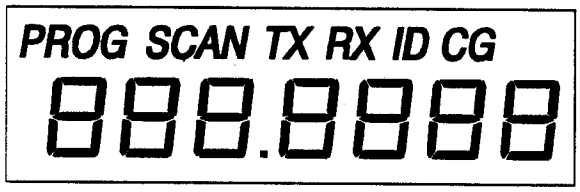
EPH Series radios can be equipped with a standard 7-Segment Display, an Alphanumeric Display, or no display at all. Radios with either a 7-Segment Display or an Alphanumeric Display are also equipped with a keyboard.

An Alphanumeric Display shows channel and scanning information in a different way from a 7-Segment Display. The annunciators across the top of the display are arranged differently, but convey the same meaning. An Alphanumeric Display can also show letters, instead of just numbers.

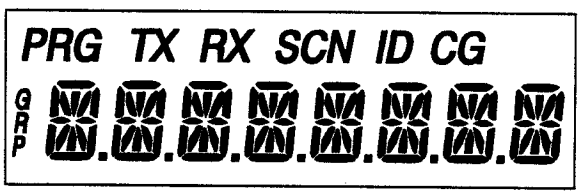
Radios with Alphanumeric Display can be programmed to operate one or more groups in 7-Segment mode (see Section 2.3.6.5). The channel and scanning information will appear in the same way as a 7-Segment Display, but the annunciators are still different.

Display annunciators indicate the following information:

7-Segment	Alpha-Numeric	Indication
PR	PR	Priority Channel
PROG	PRG	Programming Mode (includes PR)
SCAN	SCN	Scan List Channel (On Alphanumeric Display, flashing SCN indicates Scanning in progress, and RX SCN indicates Receiving on a Scanned channel.)
TX	TX	Transmit
RX	RX	Receive- programming mode only
ID	ID	Automatic Number Identification (ANI) - programming mode only
CG	CG	User Code Guard- programming mode only
	GRP	Group Label (Alphanumeric Display only)



7-SEGMENT DISPLAY



ALPHA NUMERIC DISPLAY

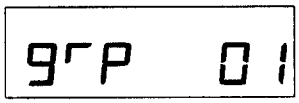
FIGURE 3-1 LIQUID CRYSTAL DISPLAYS

OPERATION

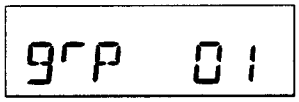
Operating procedures are basically the same for all three display types (7-Segment, Alphanumeric, and no display), with some obvious differences. For example, a radio with no display or keyboard has no keys to press. The actual display on the radio may appear different from the illustrations, depending on the features installed and programmed in the radio.

BASIC OPERATION

Receive



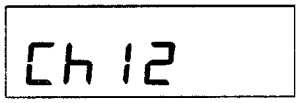
7-SEGMENT DISPLAY



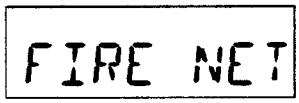
ALPHANUMERIC DISPLAY

Turn power on by rotating the Volume knob clockwise past the OFF detent. The yellow LED will flash, the Display will show the current group number, then the channel number (7-Segment display) or channel label (Alphanumeric display). A beep will sound, indicating the radio is operational.

See channel label programming instructions on pages 2-13 and 2-10.



7-SEGMENT DISPLAY



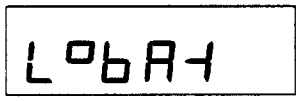
ALPHANUMERIC DISPLAY

Rotate the Channel Selector knob to select the appropriate channel. Rotate the Squelch knob clockwise until a rushing noise is heard. Set the volume to a comfortable level, then rotate the Squelch knob backwards (counterclockwise) until the noise stops. This is called the threshold squelch setting.

Further rotation counterclockwise tightens the squelch setting, allowing only stronger signals to open the squelch and be heard. Full rotation counterclockwise past the detent places the receiver in Code Guard operation mode. A message will be heard only when the proper Code Guard is received.

Transmit

Press and hold the side Push To Talk (PTT) switch. The Display will show the **TX** annunciator and the red Transmit Indicator will glow when the transmitter is on. Talk in a normal voice with the microphone one to two inches from your lips. Make each transmission as brief as possible. Release the PTT switch to end transmission.



7-SEGMENT DISPLAY

ALPHANUMERIC DISPLAY

If the Transmit Indicator does not glow when you press the PTT Switch, the battery pack may need to be charged; if so, the Display will show **Lobat** and the yellow Low Battery Indicator will flash. If the Transmit Indicator does not glow and a tone sounds, you are on a receive-only channel, or the channel is busy (if Busy Channel Lockout is installed). Rotate the Channel Selector knob to an authorized transmit channel.

If the length of your message exceeds the preset time out timer setting, the Transmitter will automatically shut off and a tone will sound. If you wish to continue this transmission, release the PTT switch, then press it again and continue talking.

CODE GUARD OPERATION

Code Guard™ allows one radio or group of radios to be selectively called within a system. If the radio has been programmed with Code Guard, use the following receive and transmit instructions.

Receive

Turn power on by rotating the Volume knob clockwise past the OFF detent. Rotate the Squelch knob clockwise until a rushing noise is heard. Set the volume to a comfortable level, then rotate the Squelch knob completely counterclockwise, past the detent for Code Guard operation. A message will be heard only when the proper Code Guard is received.

Transmit

Before transmitting on Code Guard channels, monitor the channel by turning the Squelch knob clockwise, off the detent. If the channel is not busy, press and hold the PTT switch. The red Transmit Indicator will glow when the transmitter is on. Release the PTT switch to end transmission. Reset the Squelch knob to the Code Guard position to receive only the transmissions with the proper Code Guard. During extended transmissions the squelch can be left open until the exchange has ended.

HI/LO TRANSMIT POWER

Placing the HI/LO toggle switch in the HI position enables full transmitter power. The LO position reduces power to the programmed low power setting, thereby reducing current drain and increasing battery life.

BUILT IN FEATURES

BENDIX/KING EPH Series radios are based on a microprocessor core that allows extra features and operational characteristics to be built into the radio. Dealers can help define the best operational settings for a system and program them into the radio.

Additional transmit and receive frequencies can be added. To monitor other local radio systems that fall anywhere in the band, a frequency with or without Code Guard can be added to the radio.

The radio comes equipped with a time out timer. This is used to limit the duration of calls and to guard against accidentally locking on the transmitter and tying up the radio system. The duration of the time out timer can be set from 0 to 225 seconds, in 15-second increments.

A DTMF/ANI encoding feature is also available on all keyboard/display models. If enabled, a sequence of DTMF tones similar to the tones used by a standard pushbutton telephone will be transmitted each time the transmit PTT switch is activated. If DTMF and ANI are both enabled, the ANI tone sequence will be transmitted only after the [ENT] key is pressed while the transmit PTT switch is activated. A sidetone of the ANI number transmitted will also be heard through the speaker. Dealers can program or change the ANI number to be sent.

A SCAN delay is included to allow a response to a transmission to be received before the scanner moves on to search for new activity. If the scanner is restarting before message replies are heard, the scan delay time can be increased. (0-7.5 seconds)

Radios equipped with the Alphanumeric Display can be programmed with custom channel labels and group labels. See "Group Label" on page 2-10, and channel label instructions on page 2-13, step 7.

Alphanumeric Display radios can also be programmed for LCD backlighting when a message is received or a key is pressed. See "Channel 0 Group Three Functions" on page 2-8.

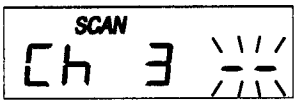
There are three different priority modes available. These are discussed in the section Priority Operation on page 3-5. Dealers can help choose the best priority mode for a system.

Code Guard is a trademark of King Radio Corp.

OPERATIONAL FEATURES AVAILABLE

Scan Operation With Carrier Squelch

When in the Scan mode with carrier squelch set (not Code Guard), the radio receiver samples channels in a predetermined list (scan list) looking for activity. If an active channel is found, the scanning action stops and the message on that channel is heard. Once the message stops, the receiver will wait for a response before scanning resumes. This waiting period, called the "scan delay time," can be preset from 0 seconds to 7.5 seconds, in .5 second increments. The scan list can also be preset. On some radios the user will be able to add or delete channels from the scan list. The channel to which the Channel Selector knob is set is always included in the scan list, whether it is programmed for scan or not.

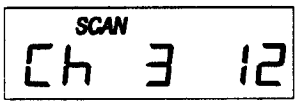


7-SEGMENT DISPLAY

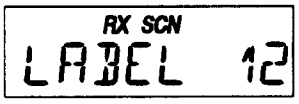
ALPHANUMERIC DISPLAY

To begin scanning, place the SCAN toggle switch in the SCAN position. Place the Priority Scan toggle switch (PRI) in the off position (down). See "Priority Operation" on page 3-5.

Scan operation occurs only while the radio is not transmitting. SCAN operation is indicated by two flashing bars (7-Segment display) or a flashing **SCN** annunciator (Alphanumeric display).



7-SEGMENT DISPLAY



ALPHANUMERIC DISPLAY

When a signal is detected, scanning stops and the signal being received is heard. The active channel is shown on the right side of the display (7-Segment display) or in place of the transmit channel (Alphanumeric display). The radio receiver stays on that channel until activity ceases and resumes scanning after the "scan delay" time.

If you wish to transmit on the last active scan channel, turn the Channel Selector knob to that channel. Turn OFF the SCAN toggle switch for normal transmit/receive operation.

When the PTT is pressed while in the scan mode, the radio transmits on the channel selected by the Channel Selector knob. Upon release of PTT, the radio receiver will hold on that channel. If no reply occurs during the "scan delay" time, the radio resumes scanning.

Scanning Code Guard Channels

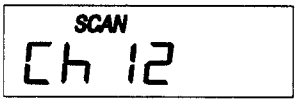
To scan for channels with programmed Code Guard, rotate the Squelch knob completely counterclockwise, past the detent. When a signal is detected, scanning stops and the Code Guard for that channel is checked. If the proper Code Guard is present, the radio receives that channel until Code Guard ceases. If the proper Code Guard is not present, the radio receiver will resume scanning immediately.

Changing the Scan List

The radio can be programmed with a permanent or changeable scan list. If the scan list can be changed, use the following steps to enter or clear channels.

To avoid confusion, turn OFF the PRI and SCAN toggle switches on the top of the radio.

Turn the Channel Selector knob to the channel to be entered or cleared.



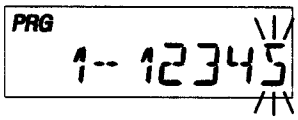
7-SEGMENT DISPLAY

ALPHANUMERIC DISPLAY

To ENTER a channel into the scan list, press the [ENT] key on the keyboard. A short beep will be heard. The display will show the annunciator "SCAN" (7-Segment display) or "SCN" (Alphanumeric display).

To CLEAR a channel from the scan list, press the [CLR] key. A short beep will be heard, and the "SCAN" or "SCN" annunciator in the display will disappear.

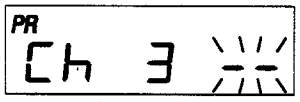
Permanent Scan List



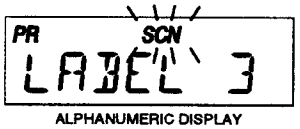
To make the scan list permanent or changeable, program the function to either enabled or disabled. See "Scan List Lockout" on page 2-6.

Priority Operation

Priority operation consists of receiving on any channel while still monitoring for a message on the priority channel. Priority can also be used in combination with Scan operation. When scanning a priority channel that uses Code Guard, the radio will lock on to that channel, but a message will be heard only when the correct code has been detected. The radio will resume scanning after the signal has ended and the scan delay time has expired.



7-SEGMENT DISPLAY



ALPHANUMERIC DISPLAY

When the PRI (priority) toggle switch is turned ON, the channel designated "priority" is sampled at a preset rate (.25 to 3.75 seconds) regardless of activity on any other channel. The display flashes two bars (7-Segment display) or "SCN" (Alphanumeric display) to indicate that the radio is sampling the priority channel. If a signal is received on the priority channel, the radio receiver will lock on to that channel for the duration of the transmission.

When the SCAN toggle switch is ON and the PRI toggle switch is OFF, normal scanning will occur but the priority channel will not be sampled. If both scan and priority toggles are off, the radio will function as in basic operation.

Priority Modes

Priority Mode A -- The priority channel is tied to the Channel Selector knob. When the selector is set on channel 5, this is the priority channel. If the selector is switched to channel 8, this becomes the priority channel. You will transmit on the frequency chosen by the Channel Selector knob.

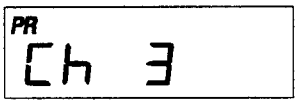
Priority Mode B -- The priority channel is fixed. You will transmit on the frequency chosen by the Channel Selector knob.

Priority Mode C -- The priority channel is fixed. When the PRI toggle switch is ON, you will transmit on the priority channel regardless of the Channel Selector knob setting.

Which Priority Mode is Installed

Follow these steps to determine which priority mode is set in a radio equipped with a keyboard and display.

1. Set the PRI and SCAN toggle switches to OFF.
2. Rotate the Channel Selector knob, stopping at each detent to view the LCD Display.



7-SEGMENT DISPLAY

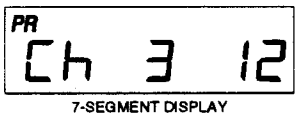
ALPHANUMERIC DISPLAY

3. If a "PR" symbol (in the upper left of the LCD Display) does not appear for any channel, you have priority Mode A.
4. If "PR" is displayed, rotate the Channel Selector knob to a different channel, then turn the PRI toggle ON.

   If the LCD channel stays on the selected channel, you have priority Mode B.

   If the LCD channel changes to the priority channel, you have priority Mode C.

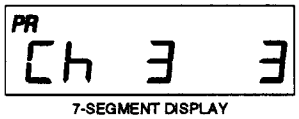
Priority Mode A Details



7-SEGMENT DISPLAY

ALPHANUMERIC DISPLAY

In this mode, the priority channel is tied to the Channel Selector knob. When the SCAN and PRI (priority) Toggle Switches are ON, scanning will occur until an active scan channel is found. The radio will receive the active channel while continuing to sample the priority channel. If during this sampling the priority channel becomes active, the Priority Indicator will light. The radio receiver will go to the priority channel and hold for the duration of the transmission. The priority channel will be shown the display (on the right hand side of 7 Segment displays).



7-SEGMENT DISPLAY

ALPHANUMERIC DISPLAY

If you wish to reply to a message on the priority channel, press the PTT and you will transmit on the priority channel. Once activity ceases on the priority channel, the radio returns to scan operation.

Priority Mode B Details

This mode fixes one channel in the radio as the priority channel. With the SCAN toggle switch OFF and PRI (priority) toggle switch ON, the radio can receive on the knob-selected channel while still sampling the priority channel. If the priority channel becomes active, the Priority Indicator goes on and the radio holds on the priority channel for the duration of the transmission. If you wish to reply to a message on the priority channel, you must rotate the Channel Selector knob to the priority channel, then transmit.

With both SCAN and PRI toggle switches ON, the radio will scan until it locks on to an active channel. The radio continues to sample the priority channel while listening to the active channel. If activity occurs on the priority channel, the radio will override the active scan channel, go to the priority channel, and hold for the duration of the transmission. If you wish to reply to a message on the priority channel, rotate the Channel Selector knob to the priority channel, then transmit. Once activity has ceased on the priority channel, the radio returns to scan operation.

Priority Mode C Details

With the PRI toggle switch ON and SCAN switch OFF, radio operation is much the same as in Mode B. The fixed priority channel is sampled at the preset rate. If activity occurs on the priority channel, the radio will go to the priority channel and hold for the duration of the transmission. If you wish to reply to a message heard on the priority channel, press the PTT switch and the radio will automatically transmit on the priority channel regardless of the setting of the Channel Selector knob. In Priority Mode C the radio will always transmit on the priority channel if the PRI toggle switch is ON. The Priority Indicator will come on as a reminder that you are transmitting on the priority channel. Once activity has ceased on the priority channel, the radio will return to the Channel Selector knob receive channel.

With both SCAN and PRI toggle switches ON, the radio will scan until it locks on to an active channel. The radio continues to sample the priority channel while listening to the active channel. If activity occurs on the priority channel, the radio will override the active scan channel, go to the priority channel and hold for the duration of the transmission. If you wish to reply to a message on the priority channel, press the PTT switch and the radio will automatically transmit on the priority channel, regardless of the setting of the Channel Selector knob. In Priority Mode C the radio will always transmit on the priority channel if the PRI toggle switch is on. The Priority Indicator will come on to remind you that you are transmitting on the priority channel. Once activity ceases on the priority channel, the radio returns to scan operation.

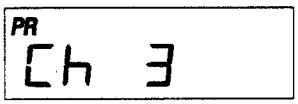
Changing the Priority Channel

The fixed priority channel used in Priority Modes B and C may be permanently set or may be changeable. See "PRI Key Lockout" on page 2-6. If the radio has a changeable priority channel, use the following steps to make this change.

NOTE: Only one channel can be designated as the priority channel.

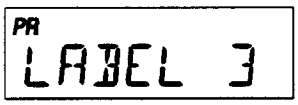
1. To avoid possible confusion, turn OFF the PRI and SCAN toggle switches on the top of the radio.

2. Rotate the Channel Selector knob to the channel that you wish to enter as the new priority channel.



7-SEGMENT DISPLAY

3. Press the [PRI] key. A short beep will sound, and the "PR" annunciator will be displayed, indicating that the displayed channel is now the priority channel.



ALPHANUMERIC DISPLAY

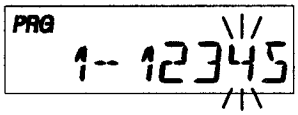
A channel can be both a priority and a scanned channel. Due to multiple sampling of the same channel, maximum performance occurs when the priority channel is not also a scan channel.

Setting Priority Channel Lockout

1. To lockout a priority channel setting the radio must first be programmed for priority mode B or C.

2. With the radio in normal operation mode set the channel select knob to the desired priority channel.

3. Press the [PRI] key on the keyboard. If the **PR** annunciator appears on the display, the PRI Key Lockout function is disabled. If the **PR** annunciator does not appear on the display, the PRI Key Lockout function is enabled.



4. Program the PRI Key Lockout function to either enabled or disabled. See "PRI Key Lockout" on page 2-6.

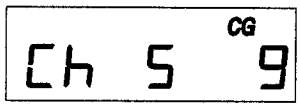
User Code Guard Selection

Certain Bendix/King Radio models with keyboard and display allow user selection of Code Guard values independent of the Channel Selector knob setting. This is accomplished using the keyboard. The radio can be programmed to enable or disable this feature. The programming has also assigned a transmit frequency and Code Guard and a receive frequency and Code Guard to each position shown on the Channel Selector knob. The Code Guard values for Channels 1-9 can be pulled away from their normal pairing and matched with any of the other frequencies in the radio.

For example, to use the Code Guard values of Channel 9 with the frequencies of Channel 5:

1. Turn OFF the PRI and SCAN toggle switches on the top of the radio.

2. Set the Channel Selector knob to Channel 5.



7-SEGMENT DISPLAY

ALPHANUMERIC DISPLAY - COPY CODE GUARD VALUES FROM CH 9

ALPHANUMERIC DISPLAY - USE CH 9 CODE GUARD VALUES FOR CH 5

3. Press the [9] key on the radio keyboard. The CG annunciator will be displayed.

   The radio will now operate on the frequencies of Channel 5 with Channel 9 Code Guard values.

   The 7 Segment display will show the selected channel on the left (5) and the Code Guard value channel on the right (9).

   The Alphanumeric display will show the Code Guard value channel, then the selected channel. To see the Code Guard value channel again, press the [#] key on the keyboard. The group number will be displayed, followed briefly by the Code Guard value channel, then the selected channel.

4. Press the [0] key to reset all values to the original programming, or press a different digit key (1-9) to select a new set of Code Guard values.

NOTE: In scan or priority scan mode, the display will not show selected user Code Guard values, nor will it use operator-selected Code Guard values in scan mode.

NOTE: Once a Code Guard value has been selected by the keyboard it will not change even if power is interrupted or if the Channel Selector knob is changed.

Busy Channel Operation

If the radio has been programmed for busy channel operation, it will operate in one of the following three modes.

Busy Channel Indication

The yellow Busy Channel Indicator will glow if there is carrier activity on the channel selected. If the channel selected is a Code Guard channel and the correct code is not detected, the Busy Channel Indicator will remain on for the duration of the carrier activity and no messages will be heard. During Scan and Priority Scan operation, the Busy Channel Indicator will glow when activity is detected on any channel that is in the scan list. When scanning Code Guard channels, with the Squelch knob set to the Code Guard position, and the activity has been detected, the Busy Channel Indicator will glow for the time period necessary to determine if the proper Code Guard has been received, causing the LED to "flash" at various rates. In Priority Scan operation, the Busy Channel Indicator will remain on for the duration of the carrier activity on the priority channel whether the correct Code Guard is detected or not.

Busy Channel Lockout

The Busy Channel Lockout feature applies only to those channels programmed for receive Code Guard operation. When carrier activity has been detected on the channel selected, the receive Code Guard is checked. If the proper code is present, you will be able to transmit on that channel. If an incorrect code or carrier activity only is detected, even if the Squelch knob is not in the Code Guard position, the transmitter is disabled, an alert tone is heard, and the LCD displays the word "Busy" when the radio's PTT is depressed.

Channels not programmed for receive Code Guard operation will transmit regardless of carrier activity.

Busy Channel Lockout Override

This mode operates in the same manner as Busy Channel Lockout except that the user can override and transmit by turning the Squelch knob off the Code Guard detent. The transmitter is locked out only if the Squelch knob is set to the Code Guard detent.

ANI Operation

A DTMF/ANI encoding feature is also available on all models. If enabled, a sequence of DTMF tones similar to the tones used by a standard pushbutton telephone will be transmitted each time the transmit PTT switch is activated. A sidetone of the ANI number transmitted will also be heard through the front speaker.

When DTMF and ANI are both enabled the ANI tone sequence will be transmitted only after the **[ENT]** key is pressed while the transmit PTT switch is activated. A sidetone of the ANI number transmitted will also be heard through the speaker.

DTMF Operation

Portable radios equipped with a keypad can be used for DTMF encoding. The radio can be programmed to enable or disable this feature. To operate the DTMF function simply press and hold the PTT switch and press any of the 12 keys desired. An audible sidetone will be heard through the front speaker.

The [FCN], [PRI], [ENT], and [CLR] keys respond as DTMF tones A, B, C, and D respectively.

GROUP OPERATION

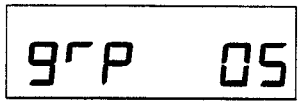
Group Description

The Channel Selector knob has 14 positions. Radios with more than 14 channels are separated into "groups" of 14 channels each.

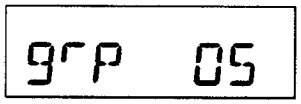
For simplification purposes each group should be looked at as an individual 14-channel radio. Each group can be programmed to have an "individual personality" with the operational features described earlier.

Radios with an Alphanumeric display can be programmed with group labels. See "Group Label" on page 2-10.

Group Selection



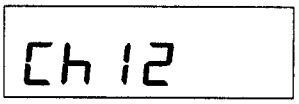
7-SEGMENT DISPLAY



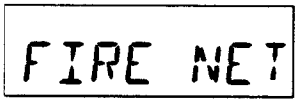
ALPHANUMERIC DISPLAY

To avoid confusion, switch the SCAN and PRI switches to the OFF position. By pressing the **[#]** key on the keypad, the display shows you which group you are operating in. For example, this illustration shows the display indicating **grp 05**. Press the **[ENT]** key or wait approximately 5 seconds; the radio reverts to normal operation and the display shows the channel selected.

With an Alphanumeric display pressing the **[#]** key a second time shows the group label. After a 5-second delay, the radio briefly displays the User Code Guard channel label (if any) then reverts to normal operation and displays the label of the channel selected.



7-SEGMENT DISPLAY



ALPHANUMERIC DISPLAY

To change groups, press the **[#]** key followed by the group number desired. After a 5-second delay, the radio reverts to normal operation for that group and the selected channel appears in the display. All scanning and priority functions selected affect only the channels in the group you are operating in.

7-SEGMENT DISPLAY

ALPHANUMERIC DISPLAY

When changing groups, if a non-programmed or invalid number is selected (05, for example), the display will show **nogrp05** and the radio will return to the previously selected group.

UNIVERSAL COMMUNICATIONS OPTIONS MODULE (UCOM)

The Universal Communications Options Module (UCOM) is an options board that can be installed in Bendix/King E-Series portable radios.

UCOM is an option that can be installed only at the factory. It comes ready to be programmed with the Tone Decode and/or Scrambling options to suit the user's needs. Dealers can program UCOM options by computer using UCOM Editor software (LAA 0760) and an RS-232 serial cable (LAA 0725) available from Bendix/King.

UCOM Operation

Each heading in this section describes a typical UCOM configuration. Because of the many possible configurations, consult your dealer or communications manager to determine the actual operation procedures for your radio.

Check For Installed UCOM

To determine whether a UCOM board is installed, turn the radio on. The radio gives a power up beep and UCOM gives another beep. If the radio does not give two beeps when turned on, it is not equipped with a UCOM board. This test does not indicate whether UCOM has been programmed.

UCOM Tone Decoding

The UCOM module can be programmed to decode various tone signalling systems such as 5/6 tone (CCIR, ZVEI, EEA, etc.) and 2 tone sequential (Quik Call II, Reach, etc.). Up to 4 codesets can be controlled using the Channel Selector knob. Muting can be turned On and Off automatically by using the Channel Selector knob or manually by using a toggle switch. Muting can be combined with Code Guard operation. Channels can also be programmed for clear operation only (no tone decode).

No Muting — Alert Tones Only

Turn the Channel Selector knob to the channel with the proper codeset. In addition to receiving messages normally, the UCOM module beeps when it receives the correct tone sequence. After 20 seconds* the radio beeps again, indicating the end of the time out period.

The UCOM module beeps every 20 seconds* to alert you that you have been called. To reset UCOM after the message, turn the Squelch knob clockwise off the detent and then back on. A beep indicates that UCOM has reset.

Before transmitting on a Code Guard channel, monitor the channel by turning the Squelch knob clockwise off the detent position.

**The 20-second delay can be programmed to a different duration.*

Muting — Channel Knob

Turn the Channel Selector knob to the channel with the proper codeset. With the Squelch knob in the detent position (full counterclockwise) no traffic will be heard until the correct tone sequence is received. The UCOM module beeps when it receives the correct tone sequence, and the radio unmutes for 20 seconds*. After 20 seconds* the radio beeps again, indicating the end of the time out period, and resumes the original muting condition.

The UCOM module beeps every 20 seconds* to alert you that you have been called. To reset UCOM after the message, turn the Squelch knob off the detent and then back on. A beep indicates that UCOM has reset.

Before transmitting, monitor the channel by turning the Squelch knob clockwise off the detent position. If the channel is clear, press the PTT switch and talk, releasing the PTT switch to listen.

Muting — Toggle Switch

Turn the Channel Selector knob to the channel with the proper codeset and turn the Muting (TA) toggle switch on (up). With the Squelch knob in the detent position and the Muting toggle switch on (up) no traffic will be heard until the correct tone sequence is received. The UCOM module beeps when it receives the correct tone sequence, and the radio unmutes for 20 seconds*. After 20 seconds* the radio beeps again, indicating the end of the time out period, and resumes the original muting condition.

The UCOM module beeps every 20 seconds* to alert you that you have been called. To reset UCOM after the message, turn the Squelch knob off the detent and then back on, or turn the toggle switch off and then back on. A beep indicates that UCOM has reset.

Before transmitting, monitor the channel by turning the Squelch knob clockwise off the detent position. If the channel is clear, press the PTT switch and talk, releasing the PTT switch to listen.

UCOM Scrambling Operation

If optional Inversion Scrambling is installed, UCOM can be programmed to scramble transmit audio, making it unintelligible to the casual listener. The receiving UCOM radio unscrambles the audio using the proper code. Up to 4 codes can be controlled using the Channel Selector knob. Scrambling can be turned On and Off automatically with the Channel Selector knob or manually with a toggle switch. Scrambling can be combined with Code Guard operation. Channels can also be programmed for clear operation only (no scrambling).

**The 20-second delay can be programmed to a different duration.*

Scrambling — Channel Knob

To receive a scrambled message, turn the Channel Selector knob to the channel with the proper code. Signals with the same code will be unscrambled and heard. All other signals (including clear) will be unintelligible or distorted. To receive these other signals, turn the Channel Selector knob to the proper position.

To transmit a scrambled message, turn the Channel Selector knob to the channel with the proper code. Before transmitting on a Code Guard channel, monitor the channel by turning the Squelch knob clockwise off the detent. Regardless of the signal distortion, wait until the channel is unoccupied before transmitting.

Scrambling — Toggle Switch

To receive a scrambled message, turn the Channel Selector knob to the channel with the proper code. Turn on the Scrambler toggle switch (the left toggle switch marked TA). Signals with the correct code will be unscrambled and heard. All other signals (including clear) will be unintelligible or distorted.

To receive a signal that has not been scrambled, turn off the Scrambler toggle switch. To receive other coded traffic, turn the Channel Selector knob to the channel with the proper code and turn on the Scrambler toggle switch.

To transmit a scrambled message, turn the Channel Selector knob to the channel with the proper code, and turn on the Scrambler toggle switch. Before transmitting on a Code Guard channel, monitor the channel by turning the Squelch knob clockwise off the detent. Regardless of the signal distortion, wait until the channel is unoccupied before transmitting.

SECTION IV
THEORY OF OPERATION

INTRODUCTION

This section contains the theory of operation for the EPU Series transceivers. To aid in understanding the operation of the equipment, schematic diagrams are found in Section VI of this manual.

EQUIPMENT DESCRIPTION

The EPU Series radios are self-contained 4-watt UHF FM transceivers covering the frequency range of 450MHz to 512MHz (EPV 403MHz to 457MHz). The units are multi-channel, digitally synthesized radios using a single crystal for frequency control. All models use a rotary switch for channel selection, and incorporate an EEPROM for the storage of channel frequency, CODE GUARD™, and DTMF/ANI encode information. All models also include low battery and busy channel indicators. A variety of 4 watt 14 and 210 channel models using toggle switches to control repeater talk-around, priority scan, and multi-channel scan are available.

Controls include an On/Off/Volume control, Squelch Sensitivity, Channel Selector, and a Repeater Talk Around Switch. In addition, the EPU 4141, 4421, and the EPU 4991 contain a keyboard, and a liquid crystal display that displays channel and status information. Connectors are provided on the side of each unit for an external antenna, speaker, microphone, programming, and other related accessories. Usable channels are dealer programmable.

FUNCTIONAL DESCRIPTION

The BENDIX/KING EPU 4000 Series handheld radio is comprised of the following sub-assemblies:

Systems Board

Contained within this sub-assembly are the microprocessor control, the synthesizer, regulation, and switching circuitry. A casting is used to shield the synthesizer area. The VCO board plugs into the sub-assembly. Interconnection to other boards are provided by pin and socket connectors.

RF Board

This sub-assembly consists of receiver circuitry through the discriminator and the transmitter line-up.

Options Board/Keyboard Display

This sub-assembly consists of receive and transmit audio chains. Both the systems board and the keyboard/display unit interface through this board. Additional area on this board Is reserved for options.

VCO Board

The VCO board is a separate assembly containing only the VCO that plugs into the systems board.

THEORY OF OPERATION

SYSTEMS BOARD

The systems board functions include:

1. Microprocessor Control
2. Voltage Regulation
3. Receiver Front End Tuning/Signaling
4. Synthesizer
5. Audio Amplifier
6. CTCSS/CDCSS (Continuous Tone or Digital Coded Squelch System) Decode

Microprocessor Control

The microprocessor, I5, receives inputs from user controls such as SCAN, PTT, Keyboard, and controls radio functions, such as loading the synthesizer, adjusting the deviation and receiver tuning, time out functions, and the audio mute. Y1, C46, C47, and R71 connected to pin 42 and pin 43 form a 4.000 MHz master oscillator.

The EEPROM, I8, stores user specific parameters such as frequencies. time-out-timer length, and scan list. I8 is accessed through Q 23 (Q11 on earlier models) by a signal from pin 17 of I5. Transistors Q6, Q7, Q8, Q9, Q10, and Q11 provide level interfaces and current capability for the various microprocessor functions.

Voltage Regulation

I6A, Q4, and associated circuitry comprise a low noise +7.5 VDC regulator for use by the VCO. I6B, Q16, and associated circuitry comprise a low noise +5 VDC regulator used by the synthesizer and the VCO. I4 is the +5 VDC supply for the radio. In addition, I4 supplies a power on reset indication for the microprocessor. The microprocessor oscillator drives a FET Q1 amplifier tied to a peak-to-peak detector. The detector is referenced to +5 VDC. The gain of Q1 is controlled by an error amplifier, I3A. The result is a 20 VDC switching regulator used by the synthesizer and the receiver front end.

Front End Tuning/Signaling

RN1 is a resistor network providing digital to analog conversion for the receiver front end tuning in the receive mode, and for DTMF and CTCSS/CDCSS tone generation In the transmit mode. Buffering of this output is provided by I3B. I9, potentiometer R27, and the associated circuitry form an adjustable level converter for tuning the receiver front end.

Synthesizer

I11 forms the main synthesizer. The IC contains three programmable CMOS counters, a sample-and-hold phase detector, and the amplifier for the reference oscillator. Oscillator inputs (pins 2 and 3) form an on-chip reference oscillator when connected to terminals of an external crystal (Y2). The first counter, (÷ by R), counts down the reference oscillator to a frequency used as a reference by the sample-and-hold analog phase detector. The second counter, (÷ by N), counts down the output of the Prescaler to the reference frequency when the loop is locked. the third counter, (÷ by A), controls the modules control line of the Prescaler. The sample-and-hold phase detector provides a DC voltage that is proportional to the phase error between the divided reference, and the divided carrier frequency. This voltage is fed through the loop filter to the VCO, and adjusts the VCO frequency in a direction to maintain phase and frequency lock between the divided down frequencies.

Prescaler

The prescaler I12 is the first counter in the feedback path of the synthesizer. Using emitter coupled logic, it divides the RF signal to a frequency that is processed by the CMOS dividers. The prescaler is of the dual modulus type which allows the divided value to be set by the synthesizer I11, either + by I28, (modulus control line high) or + by I29 (low) . This capability allows the channel spacing to be determined by the counted down reference frequency.

Reference Oscillator

The reference oscillator provides the reference frequency from which the receiver and transmitter injection signals are synthesized. The oscillator frequency is controlled by the crystal Y2 that operates in the parallel resonant mode across an amplifier built into the synthesizer's IC. This crystal is compensated to + 5ppm by a temperature compensating circuit consisting of transistor Q14, thermistor RT1, varactors CR8, and CR9.

In addition, a method of modulation is provided to improve the synthesizer frequency response to low frequency modulation.

Loop Filter

The loop filter removes noise and unwanted frequency components from the output of the phase detector, that would modulate the VCO. The filter is a multiple bandwidth design that allows fast response during frequency changes (such as in channel scan) without degrading the noise and spurious performance of the synthesizer during steady state receive and transmit conditions. The filter bandwidth is switched to a wide condition when the latch enable line pulses high for approximately 4msec during a frequency change. This allows the new frequency to be reached quickly. When the latch enable returns to a low state, the bandwidth changes to a narrow condition and provides for good noise and spurious performance. Transmit uses a different bandwidth than is used by receive. Better hum and noise performance on transmit, and better response time on receive, is accomplished by changing the bandwidth to a narrow value when the RX/TX line goes high.

Offset D/A

I13 is a serial latching D/A that Is loaded by the microprocessor when it loads the synthesizer. This provides an offset voltage that is summed in to the loop filter. The op amp I10 provides translation from the zero to four volt output of the phase detector. Calibration of the VCO is provided for in the software by altering the loaded values of this IC.

Deviation Compensation

I2 is used to switch pins 28, 29, 30, and 31 of the UPC from channel position inputs during receive mode to deviation compensation outputs during TX. R94, R95, R96, and R97 comprise a voltage divider with R30 on the Options Board. This divider controls the peak deviation on transmit. As the transmit frequency increases, less voltage is needed at the VCO, so the effective, parallel resistance is lowered with microprocessor control. It is used for channel selection, or to isolate the channel selector circuitry from the mod dev compensation during TX.

Audio Amplifier

I7 is a 0.5 watt audio IC that is muted and unmuted by the transistor Q15 on pin 8. The FET Q23 provides for muting on the tone line when needed.

CTCSS Decode

I1 and associated circuitry act as a filter and limiter for CTCSS/CDCSS decoding interface to the microprocessor.

RF BOARD RECEIVER SECTION

LO Buffer

Transistor Q17 is a LO buffer that provides approximately 10dB of gain to run the input mixer and transmitter line-up.

RF Preselectors

The first and second RF preselectors are varactor tuned, two pole filters which are identical in structure. Coupling has been adjusted to allow the first filter to operate with a low loss, and the second filter to provide greater selectivity at a higher loss. Overall the preselectors exhibit a 3dB bandwidth of 16MHz, and greater than 70dB of rejection at the image frequency. The first preselector consists of L1, CR4, C86, L2, CR5, and C87. The second preselector consists of L5, CR6, C88, L6, CR7 and C89. The microprocessor generated tuning voltage for the preselectors is fed to varactors CR4 CR5, CR6, and CR7 through R5, R6, R14, and R76.

RF Amplifier

The RF amplifier is a cascade amplifier providing 20dB of gain. It is comprised of Q2 and Q3 and associated biasing circuitry.

Mixer

The Active Singly-Balanced Mixer is comprised of Input transformer T1, transistors Q4 and Q5, T2, and associated circuitry. Local oscillator injection is provided at the primary winding of TI. The mixer converts the signal to an IF of 45MHz.

IF Filter and IF Amplifier

The output of the mixer is fed to the first IF filter, consisting of crystal filters FL1A and FL1B. This filter is 15KHz wide centered at 45MHz. The output of the first IF filter is coupled to IF amplifier Q6 and associated biasing circuitry through T3.

FM IF Subsystem

The FM IF Subsystem is built around I1, a multi-function integrated circuit. The following discussion describes the functions performed by I1.

The second local oscillator consists of Y1, L8, C29, C30, and variable capacitor C31 connected to pins 1 and 2 of I1. The second mixer is contained in I1 and its output is filtered by 455KHz ceramic filters FL3 and FL4. A five stage limiting amplifier within I1 provides most of the radio gain at 455KHz. The FM signal is demodulated by ceramic discriminator FL5, and the audio signal appears at pin 9 of I1. The audio signal is then split and simultaneously fed to the audio processing circuitry on the options board, and the noise squelch circuitry.

Noise Squelch

A high pass filter for the detection of audio high frequency noise is provided by R34, R36, R38, R70, C22, and C26. Potentiometer R36 acts as an internal tight squelch adjustment. The filtered noise is internally amplified (input pin 10, output pin 11), then externally amplified by transistor Q15. The gain of Q15 is controlled by the squelch potentiometer.

RF BOARD TRANSMITTER SECTION

Line Up

Transmitter Q17 is a LO buffer that provides approximately 10dB of gain to run the mixer and transmitter line-up.

The transmitter consists of two class A and two class C amplifiers coupled by broadband matching networks. Low level amplifier Q7 and pre-driver Q8 operate class A, providing power levels of 0.01 watts and 0.1 watts respectively. Driver Q9 and final Q11 operate class C, providing power levels of 0.7 watts and 5.0 watts respectively.

Power Control

The power control circuitry provides a feedback loop to maintain a constant power level. A portion of the RF power is detected by Q1. After being rectified by CR10, the voltage is applied to pin 2 of the error amplifier of I2. The error voltage is amplified by I2, level shifted by Q12 and Q13, then, the voltage is supplied as a bias voltage for the driver Q9. Power control potentiometer R52 controls transmitter power out by setting a reference voltage for error amplifier

Harmonic Filter / Antenna Switch

The Harmonic filter consists of L13, L20, L22, L23, L24, C66, C70, C71, C72, C73, and C79. This circuit forms a seven pole elliptical filter that reduces harmonics reaching the antenna. In the receive mode, the antenna switching network is inactive, allowing the incoming signal to pass from the antenna, through L26 to the preselector section. In the transmit mode, a DPTT voltage is applied to Q1 through CR1, causing Q1 to conduct. The receiver input is then shunted through pin diode CR3. Q1 conducting causes Q14 to conduct, supplying a switched A+ voltage to pin diode CR14. When CR14 conducts, Transmit RF is passed to the antenna.

OPTIONS BOARD

Control Functions

When the local PTT or the external PTT line is grounded, Q1 is biased by CR1, and applies a 5VDC level to the microprocessor for PTT control. Q2 forms a switch that passes voltage to the transmit and receive audio circuits. Quad analog switch I4 is used to control transmit and receive audio paths.

Receive Audio

The discriminated audio is buffered by amplifier I1D before being fed to the audio high pass filter. The audio high pass filter, consisting of I1A, B, and C, and associated circuitry, filters low frequency tones from the audio signal. R14 and C11 provides passive de-emphasis for the audio signal. The signal is amplified by I3B before being fed to the final receive audio amplifier located on the systems board. Analog switches I4B, I4C, and I4D provide control for receiver muting.

Transmit Audio

The transmit audio is first amplified by the microphone pre-amplifier I2D. The PTT controlled analog switch, I4A, passes the audio to the same high pass filter circuits used in the receiver audio processing. The audio is then fed to I2A, providing pre-emphasis and limiting. The audio is amplified by I2B before being filtered by the three pole low pass filter, comprised of I2C and associated circuitry. The low pass filter has a cutoff near 3KHz and limits modulation bandwidth to be within FCC requirements. The output from I2C is then fed to the deviation control circuit on the systems board.

VCO

The FET, QI, generates the RF signal for both the receiver and the transmitter. Frequency control of the oscillator is accomplished by tuning the resonant tank circuit comprised of microstrip inductor Z1, CR1, and C12. The VCO tuning is controlled by the synthesizer through the steering line input. Q2 and the associated circuitry form an RF buffer. Q3, CR4, L4, C14, and C18, supply biasing for QI. and is microprocessor controlled through the TX +5V line. A biased Q3 causes the 45MHz frequency shift between transmit and receive. Transmit audio is fed to CR3 through R6 for modulating the VCO. Q4 is a regulator for the main +7.5V supply.

UNIVERSAL COMMUNICATIONS OPTIONS MODULE (UCOM)

The Universal Communications Options Module (UCOM) is an options board that can be installed in Bendix/King E-Series portable radios.

UCOM is an option that can be installed only at the factory. It comes ready to be programmed with the Tone Decode and/or Scrambling options to suit the user's needs. Dealers can program UCOM options by computer using UCOM Editor software (LAA 0760) and an RS-232 serial cable (LAA 0725) available from Bendix/King.

Audio Path To Digitizer

The audio path on the UCOM starts from the FM discriminator for receive and from the Mic HI for transmit. These signals are merged into one channel.

Disc Audio

The discriminator audio is routed through the systems board from the RX/TX board. This is the demodulated receive audio. One fork is filtered, amplified and sent back to the systems board for CTCSS decode. The other fork is factory adjusted (R22) for consistent level and merged with Transmit audio. Of course only the receive or transmit signal is active at one time. The op amp I6 acts as a low pass. The next step is a three pole anti-aliasing circuit, frequencies above 3kHz are attenuated.

Mic Hi

Mic Hi comes from the microphone and is only active during transmit. When not in transmit the opamp feed back signal is shorted out by means of Q8. The signal is then merged with the common audio channel at I6.

Digitizing and Revolterizing

New Sample

After the anti-aliasing filter in I11. The instantaneous voltage is captured in C2 by the 6805 which allows I5 to conduct as part of its cycle. When the voltage is captured in C2, the 6805 uses successive approximation to arrive at a digital value by using the output of the comparator I8 and the R2R ladder. This digital value is passed to the DSP through I12 which (depending if in transmit, or receive) filters it, tests it for presence of in band tones and possibly performs scrambling. The processed audio sample is passed back through I3 to the 6805. The 6805 then sends the newly received filtered value back to the R2R ladder where it reappears as a quantized filtered audio sample. I11 buffers the output of the R2R and prepares to latch the new sample in to C1.

In the next cycle this sample is reintroduced to the analog channel. I11 buffers the capacitor and sends it to the low pass filter to smooth the signal and ensure (for transmit) that it meets FCC specs for modulation.

Commands

From time to time as needed the 6805 will send the DSP commands that configure the audio processing and detection functions of the chip. These commands are passed through I3 and I12. The audio channel must be shut down to do this. The DSP keeps the 6805 appraised if the tones loaded in it are present in the audio. The DSP cannot determine the frequency of arbitrary tones. The 6805 sequences the DSP through a decoding system by loading the tones expected and timing their occurrence and absence.

Squelching Operations

The UCOM receives information about what channel is current (not scan channel, but the knob channel) and the other user switches on the top of the radio serially through the prog signal. The 6805 can control the squelch state of the radio by driving AUDIO POWER high to force the speaker on or low to force the speaker to mute. The 6805 can also tristate the pin and return control of the muting functions to the systems board. This is always done when the UCOM does not have code set defined for the current channel, when the MON switch is out of detent and if the UCOM is disabled via the HI/LO-TA switch.

When the squelch circuit goes active, the ACTIVE channel is driven low to indicate that a signal is present. The DSP is turned off via Q3 when there is no signal to conserve battery.

High Level Operations

The UCOM gets its configuration information from I2. This chip is programmed by UCOM.EXE and determines what tones UCOM is to look for, what channels to look for them on etc.

The UCOM communicates to the programming software serially through the prog and Mon lines. The programming mode requires synchronization protocol to ensure that the 6805 does not attempt to read data intended for the systems board.

SECTION V
MAINTENANCE

INTRODUCTION

This maintenance section contains test and alignment procedures for an operational EPU Series radio. This section also contains troubleshooting and assembly/disassembly procedures. An understanding of the theory of operation is recommended before maintenance is attempted.

TEST EQUIPMENT REQUIRED

A. RF Signal Generator: HP8640B or equivalent

B. Distortion Analyzer: HP334A or equivalent

C. RF Voltmeter (optional): Boonton 92C or equivalent

D. RF Power Meter: HP435B with 30 dB pad or equivalent

E. Service Monitor: Cushman 4000 Radio Communications Test Set or equivalent

F. Digital Multimeter: Fluke 8012A or equivalent

G. Programmer: Companion radio with keyboard display.
(for non-keyboard/display units only)

H. Computer: IBM PC or compatible with disk drive, serial port, and DOS 3 or later

Programming cable	LAA0725 or LAA0705
UHF frequency programming software	LAA0733
Synthesizer calibration software (SYNCAL)	LAA0734

I. Portable Tool Kit, LAA0600

This tool kit includes the following parts:

	Old Part Number	New Part Number
Antenna Adaptor Key	047-06745-0000	1400-2029-100
Battery Eliminator	071-05087-0000	1100-4019-200
Spline Wrench .48	071-06119-0000	5420-2064-800
Spanner Tool	076-01451-0000	5420-4019-000
Accessory Test Cable	155-02260-0000	6006-2092-101
RF Cable	155-02268-0000	6043-2091-800
Audio Cable	155-02269-0000	6006-2092-200

J. Test Cable Kit, LAA0608

This kit includes the following cables for EPU:

	Old Part Number	New Part Number
RF Output interconnect cable	155-02566-0000	6006-2099-100
Local Oscillator cable	155-02567-0000	6006-2099-200
1 X 8 interconnect cable	155-02528-0000	6006-2036-800
2 X 5 interconnect cable	155-02564-0000	6006-2098-900
2 X 6 interconnect cable (tin)	155-02565-0000	6006-2099-000
2 X 6 interconnect cable (gold)	155-02623-0000	6006-2099-300

This kit also includes the following cables for EPH:

	Old Part Number	New Part Number
RF output interconnect cable	155-02706-0000	6006-2099-500
2 X 4 interconnect cable	155-02709-0000	6006-2099-600
Local Oscillator cable	155-02567-0000	6006-2099-200
2 X 6 interconnect cable	155-02705-0000	6006-2099-400
2 X 6 interconnect cable	155-02623-0000	6006-2099-300

OVERHAUL

VISUAL INSPECTION

This section contains instructions to assist in determining, by inspection, the condition of EPU assemblies. Defects resulting from wear, physical damage, deterioration, or other causes can be found by these inspection procedures. To aid inspection, detailed procedures are arranged in alphabetical order.

Capacitors, Fixed

Inspect capacitors for case damage, body damage, and cracked, broken, or charred insulation. Check for loose, broken, or corroded terminal studs, lugs, or leads. Inspect for loose, broken, or improperly soldered connections. On chip caps be especially alert for hairline cracks in the body and broken terminations.

Capacitors, Variable

Inspect trimmers for chipped and cracked bodies, damaged dielectrics and damaged contacts.

Chassis

Inspect the chassis for deformation, dents, punctures, badly worn surfaces, damaged connectors, damaged fastener devices, loose or missing hardware, component corrosion, and damage to the finish.

Connectors

Inspect connectors for broken parts, and other irregularities. Inspect for cracked or broken insulation and for contacts that are broken, deformed, or out of alignment. Also, check for corroded or damaged plating on contacts and for loose, improperly soldered, broken, or corroded terminal connections.

Covers and Shields

Inspect covers and shields for punctures, deep dents, and badly worn surfaces. Also, check for damaged fastener devices, corrosion and damage to finish.

Flex Circuits

Inspect flex circuits for punctures, and badly worn surfaces. Check for broken traces, especially near the solder contact points.

Fuse

Inspect for blown fuse and check for loose solder joints.

Insulators

Inspect insulators for evidence of damage, such as broken or chipped edges, burned areas, and presence of foreign matter.

Jacks

Inspect all jacks for corrosion, rust, deformations, loose or broken parts, cracked insulation, bad contacts, or other irregularities.

Potentiometers

Inspect all potentiometers for evidence of damage or loose terminals, cracked insulation or other irregularities.

Resistors, Fixed

Inspect the fixed resistors for cracked, broken, blistered, or charred bodies and loose, broken, or improperly soldered connections. On chip resistors be especially alert for hairline cracks in the body and broken terminations.

RF Coils

Inspect all RF coils for broken leads, loose mountings, and loose, improperly soldered, or broken terminal connections. Check for crushed, scratched, cut or charred windings. Inspect the windings, leads, terminals and connections for corrosion or physical damage. Check for physical damage to forms and tuning slug adjustment screws.

Terminal Connections, Soldered

1. Inspect for cold-soldered or resin joints. These joints present a porous or dull, rough appearance. Check for strength of bond using the points of a tool.
2. Examine the terminals for excess solder, protrusions from the joint, pieces adhering to adjacent insulation, and particles lodged between joints, conductors, or other components.
3. Inspect for insufficient solder and unsoldered strands of wire protruding from conductor at the terminal. Check for insulation that is stripped back too far from the terminal.
4. Inspect for corrosion at the terminal.

Wiring/Coaxial Cable

Inspect wiring in chassis for breaks in insulation, conductor breaks, cut or broken lacing and improper dress in relation to adjacent wiring or chassis.

CLEANING

1. Using a clean, lint-free cloth lightly moistened with soap and water only, remove the foreign matter from the equipment case and unit front panel. Wipe dry using a clean, dry, lint-free cloth.
2. Using a hand controlled dry air jet (not more than 15psi), blow the dust from inaccessible areas. Care should be taken to prevent damage by the air blast.
3. Clean the receptacles and plugs with a hand controlled dry air jet (not more than 25psi), and a clean, lint-free cloth lightly moistened with soap and water only. Wipe dry with a clean, dry, lint-free cloth.

REPAIR

This section describes the procedure along with any special techniques for replacing damaged or defective components.

Connectors

When replacing a connector, refer to the appropriate PC board assembly drawing and follow the notes to insure correct mounting and mating of each connector.

Crystal

The use of any other than a BENDIX/KING crystal is considered an unauthorized modification.

Diodes

Use long nose pliers as a heat sink under normal soldering conditions. Note the diode polarity before removal.

Integrated Circuits

Refer to Appendix A for removal and replacement instructions.

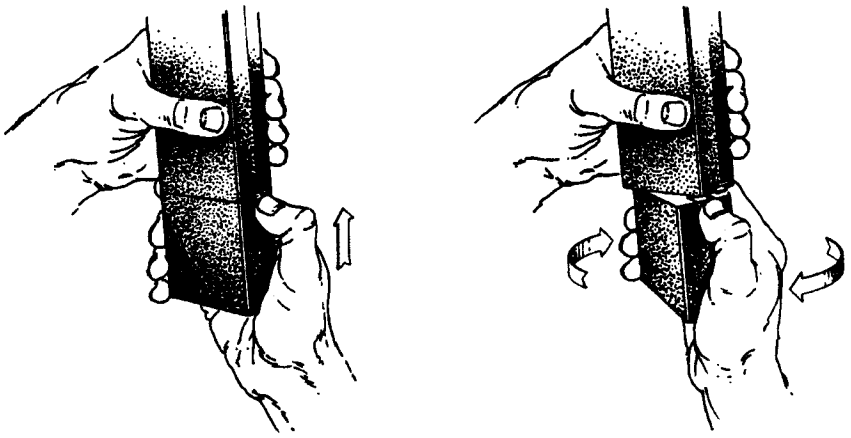
Wiring/Coaxial Cable

When repairing a wire that has broken from it's terminal, remove all old solder and pieces of wire from the terminal, restrip the wire to the necessary length and resolder the wire to the terminal. Replace a damaged wire or coax with one of the same type, size and length.

DISASSEMBLY/ASSEMBLY

Battery Removal

To remove the battery pack, turn the radio off. Press up the metal tab on the side of the case while turning the pack approximately 30°. Remove the pack from the radio.



Unit Disassembly

1. Remove the four screws from the radio rear cover (the side opposite the speaker grill).
2. Loosen the PTT housing screw and separate the front cover from the main frame.

Options Board and Keyboard

1. Disconnect the zero force insertion connector (J 10) from the options board, by sliding the connector sleeve toward the top of the radio. This allows the flex cable to be unplugged.
2. Remove the five screws that secure the options board to the keyboard and the front cover, unplug the keyboard.

RX/TX Board

1. Unfasten the three retaining clip screws that secure the RX/TX board to the main frame.
2. Lift up on the RX/TX board until it is disconnected from the systems board.
3. Slide the RX/TX board toward the battery

Synthesizer and VCO Board

Remove the nine screws that secure the synthesizer shield and the VCO board to the systems board. The VCO board unplugs from the Systems board.

Top Plate and Switch Board

1. Remove the channel select, volume, and the squelch knobs.
2. Remove the retaining fasteners from the channel select switch, volume control, and the squelch control.
3. Remove the bezel and, if necessary, the inlay.
4. Remove the retaining fasteners from the talk around, scan, and priority switches.
5. Unfasten the four screws that secure the top frame assembly to the main frame (the screws are located on the side of the frame. two screws beside the channel select switch and two screws below the PTT housing).

ASSEMBLY

To assemble the unit complete the disassembly procedure in reverse order.

TEST AND ALIGNMENT PROCEDURES

TEST SET-UP

The radio should be supplied with I0.5VDC power from an external power supply, and the manual controls shall be set as follows:

Channel Selector: Channel One

On/Off Volume: On

Squelch/Monitor: Monitor Detent

Scan: Off

Priority: Off

TA: Off

NOTE: Some models do not include all of the controls listed.

SYNTHESIZER

VCO Adjustment

VCO calibration requires the use of an IBM compatible personal computer, Synthesizer Calibration (SYNCAL) software (order LAA 0734), and a custom serial interface cable (order LAA 0725). Connect the computer's RS232 serial port to the radio with the interface cable. Load and run the SYNCAL software. Select the calibration section for the UHF Portable VCO. Use the Software Manual to assist in the calibration section of the disc.

Reference Oscillator Adjustment

1. Connect the antenna output to the RF input jack of the service monitor.
2. Set the radio for any valid transmit frequency and set the service monitor to receive on this frequency.
3. Key the transmitter and adjust C63 to obtain the frequency selected within + 200Hz.

Deviation Adjustment

1. Connect the antenna output to the RF input jack of the service monitor.
2. Connect the modulation output of the service monitor to the mic audio input of the radio, as shown in Figure 5-2. Connect the digital multimeter to monitor this input voltage.
3. Adjust the audio output level of the modulation output to 0.15 volts RMS at a frequency of 1 kHz.
4. Select a transmit test frequency as follows: If the radio will be transmitting with CODE GUARD™ select a frequency where CODE GUARD™ will be operational. If both the Tone and Digital Code GUARD™ are used, select a frequency using Digital CODE GUARD™.
5. Set the service monitor to receive the selected transmitter frequency.
6. Adjust R128 to the center of its range.
7. Key the transmitter and adjust R127 on the System Board to obtain a deviation reading of 4.2 kHz on the service monitor.
8. Check the deviation reading on all of the transmit frequencies. On any frequency where the deviation is greater than 5 kHz, adjust R127 on the systems Board to reduce the deviation to 5 kHz.

Reference Modulation Adjustment

For radios using Digital CODE GUARD™, Make the following adjustments:

1. Adjust the modulation output level from the service monitor to 0.0 volts.
2. Key the transmitter and observe the resulting waveform on the CRT display of the service monitor.
3. Adjust R128 on the Systems Board to obtain the flattest waveform as shown in Figure 5-1. A droop of 30% is allowable.

4. Return the modulation output level from the service monitor to 0.15 VRMS, and readjust deviation if necessary. On any frequency where the deviation is greater than 5 kHz, adjust R127 on the systems Board to reduce the deviation to 5 kHz.

Transmitter Carrier Power Set

All Transmitter power readings should be measured from the side connector jack.

1. Connect the antenna output to the power meter and load.
2. Set the radio to the highest available frequency
3. Key the transmitter and adjust R52 on the RF Board for a 4.0 watt reading on the power meter.
4. Select frequencies near Midband and near 450 MHz. Check output power of each frequency, where the power is less than 4 watts, readjust to 4 watts.

Receiver Front End Tuning

1. The following test frequencies should be programmed into the EEPROM as needed: 451.55 MHz and 511.10 MHz
2. Set the signal generator to the selected frequency, modulation off, output level approximately -40 dBm.
3. Connect the signal generator to the antenna input. Connect the distortion analyzer to the audio load.
4. Set the generator modulation to FM, 1 KHz tone, 3 KHz deviation.
5. Set the radio to receive on 451.55 MHz, squelch open, volume at approximately mid-level.
6. Make sure that the reference oscillator has been adjusted and the signal generator is on frequency. Adjust C31 for maximum audio level and minimum distortion.
7. Adjust T2 and T3 for a minimum audio distortion.
8. Decrease the RF level for an output SINAD reading (6 to 12 dB SINAD).
9. Adjust (mechanically spread the windings) L1, L2, L5, and L6 in a sequence for best SINAD while reducing the RF input level to maintain approximately 10 dB SINAD. Continue to adjust until no further improvement can be obtained.
10. Change the receive frequency to 511.10 MHz and adjust R27 on the Systems Board for best SINAD.

Receiver Squelch Adjustment
(Early Models - Identified by top RX/TX shield screws installed in bottom edge of shield)

1. On any programmed frequency, set the radio squelch knob to tight (counterclockwise but not past detent).
2. Setup a 3.5 kHz tone, modulated at 5 kHz with an RF level of -92 dBm. Adjust R36 on the RF Board until the squelch just opens.

Receiver Squelch Adjustment
(Later Models - Identified by top RX/TX shield screws installed through top of shield)

1. Open the squelch knob fully clockwise.
2. Set the radio to low end of band, programmed with 0 Hz receive Code Guard. Set the volume knob at 6 dB down from the rated audio. Set the RF level to the level which gives 8 dB SINAD (usable sense -2 dB).
3. Set the radio squelch knob fully counterclockwise (past detent).
4. Turn R36 on the RX/TX board clockwise until squelch closes.
5. Slowly turn R36 counterclockwise until squelch just opens.

TROUBLESHOOTING

Refer to the schematics in the Illustrated Parts List for troubleshooting information.

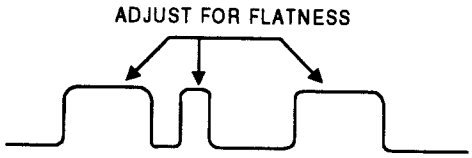
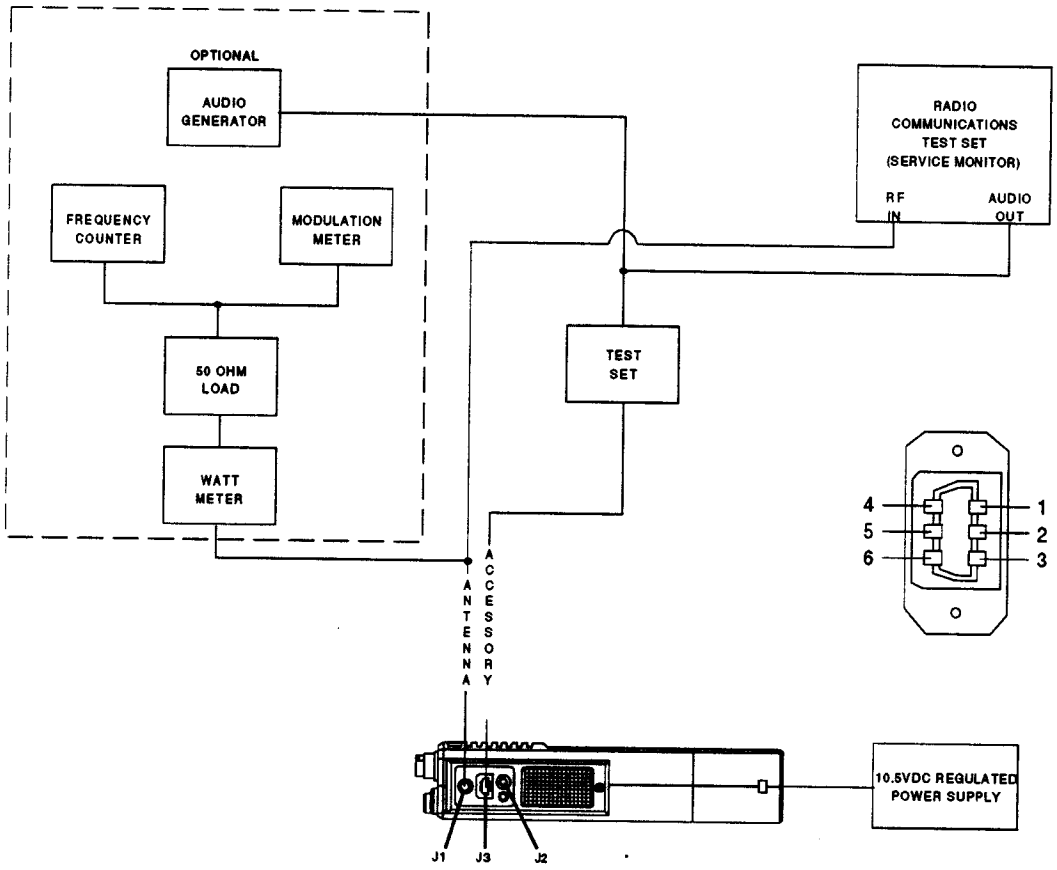


FIGURE 5-1 REFERENCE MODULATION ADJUSTMENT



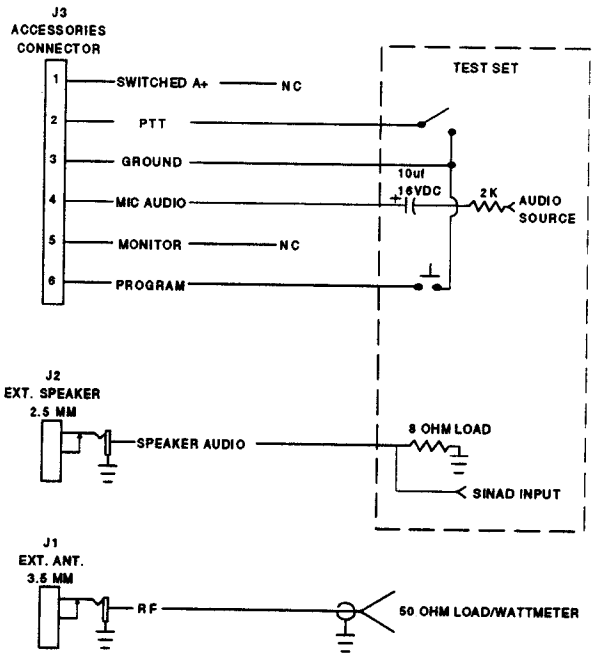


FIGURE 5-2 TRANSMITTER TEST SET-UP

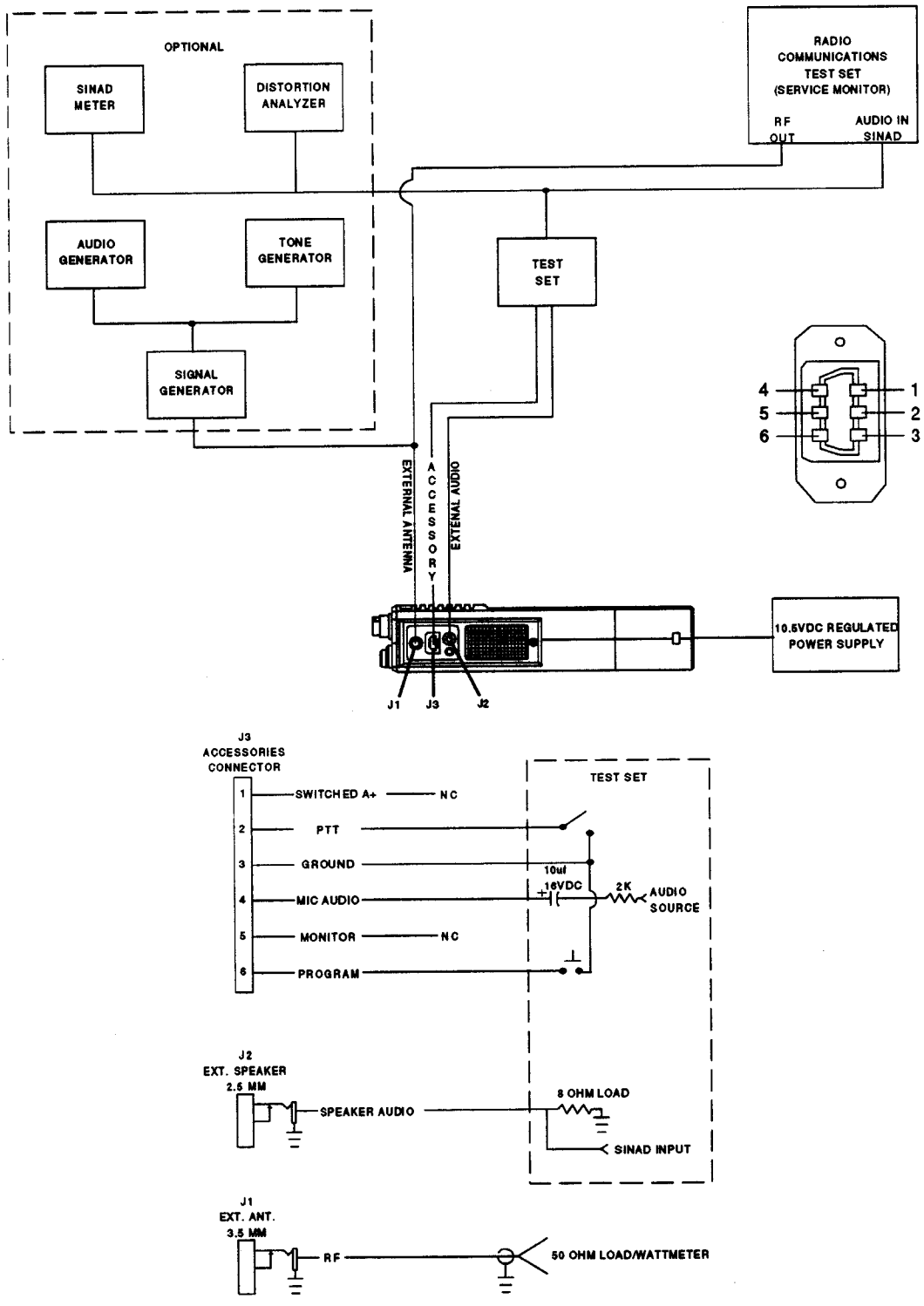


FIGURE 5-3 RECEIVER TEST SET-UP

SECTION VI
ILLUSTRATED PARTS LIST

INTRODUCTION

This section helps you identify parts used in BENDIX/KING EPU/EPV Series portable UHF radios. It includes Bills Of Material (BOM) for all major assemblies arranged from Final Assembly down to individual part level. Each BOM is followed by the corresponding Assembly Drawing and Schematic Diagram.

Parts listed in the BOMs meet BENDIX/KING design specifications and are the recommended replacement parts.

For your convenience, these bills of materials have been reduced from twenty models of EPU and twenty models of EPV to six models of each. The parts listed here cover as many feature combinations as possible. These include:

MODEL	CHANNELS	KEYBOARD	SPECIAL FEATURES
414 0A	14	None	
414 0M	14	None	Metal Case
499 1A	210	Numeric	
499 1M	210	Numeric	Metal Case
499 2A	210	Alphanumeric	
499 SL	210	Alphanumeric	UCOM Signalling Module

BILLS OF MATERIAL

Bills of Material contain specific information on each part in the corresponding Assembly Drawing and Schematic Diagram. Sub-assemblies are listed by BOM number, helping you find the correct sub-assembly parts for each specific radio model.

BOM NUMBER

The Bill of Material Number, which is also the 12-digit Part Number for the assembly, appears at the top of the BOM. If the assembly is available in a variety of "flavors", the BOM Number for each flavor appears at the top of the BOM. Parts common to more than one flavor are often listed in a Common BOM, ending with -0098 or -0099. The last four digits of each BOM Number appear above a flavor column at the right side of the BOM.

SYMBOL COLUMN

This column contains the Reference Designators of parts as labelled in the Assembly Drawing and Schematic Diagram. The Reference Designator consists of an abbreviation for type of component and a number assigned to that part (ITM 4, R 31, etc). Common Reference Designator abbreviations are listed below.

ASY	Assembly	MK	Microphone
B	Motor or Synchro	P	Plug
C	Capacitor	Q	Transistor
CJ	Circuit Jumper	R	Resistor
CR	Diode	REF	Reference
DS	Lamp	RN	Resistor Network
F	Fuse	RT	Thermistor
FL	Filter	S	Switch
I	Integrated Circuit	T	Transformer
ITM	Item	TP	Test Point
J	Jack	U	Resistor/Capacitor Network
L	Inductor	V	Photocell/Vacuum Tube
LS	Speaker	WG	Waveguide
M	Meter	Y	Crystal

PART NUMBER COLUMNS

These columns contain the individual Part Numbers used when ordering replacement parts. If the part is listed as an assembly (ASY), the BOM and drawings for that assembly follow after the current BOM and drawings.

The Old Part Number and New Part Number are both listed for your convenience.

DESCRIPTION COLUMN

This column contains the description of each part in the assembly. Common abbreviations which may appear in this column are listed below.

AL	Aluminum	MY	Mylar
ASSY	Assembly	PC	Polycarbonate
BIFLR	Bifilar	PF	Precision Film
BOM	Bill of Material	PP	Paper
CC	Carbon Composite	PS	Polystyrene
CF	Carbon Film	QW	Quarter Watt
CH	Choke	RES	Resistor
CAP	Capacitor	S	Silicon
CR	Ceramic	SCR	Screw
DC	Disc Ceramic	SM	Silver Mica
DIO	Diode	STDF	Standoff
EL	Electrode	SW	Switch
EW	Eighth Watt	TERM	Terminal
FC	Fixed Composition	TN	Tantalum
FERR	Ferrite	TST PT	Test Point
FLTR	Filter	TW	Tenth Watt
FT	Feedthru	VA	Variable
HV	High Voltage	WW	Wire Wound
HW	Half Watt	XFMR	Transformer
IC	Integrated Circuit	XSTR	Transistor
MC	Monolithic Ceramic	XTAL	Crystal

ASSEMBLY COLUMN

An "A" in this column indicates that the part is an assembly. If the P/N and description reads "200-0XXXX-0099 COMMON BOM" the parts for that assembly are included in the current BOM. The parts breakdown for an assembly with any other P/N will be found in the BOM with the same number. Those assemblies with BOMs and drawings included in this manual are indicated by "ASY" in the Symbol Column.

UNIT OF MEASURE (UM) COLUMN

This column indicates the Unit of Measure for each part. Common abbreviations found in this column are listed below.

EA	Each	RF	For Reference Only
FT	Foot	IN	Inch
AR	As Required		

QUANTITY COLUMNS

These columns indicate the part quantities for each flavor of the assembly. The four-digit number above each column corresponds to the last four digits of a BOM Number at the top of the BOM. Parts common to more than one flavor are often listed in Common BOMs, ending with -0098 or -0099.

EPU FINAL ASSEMBLY

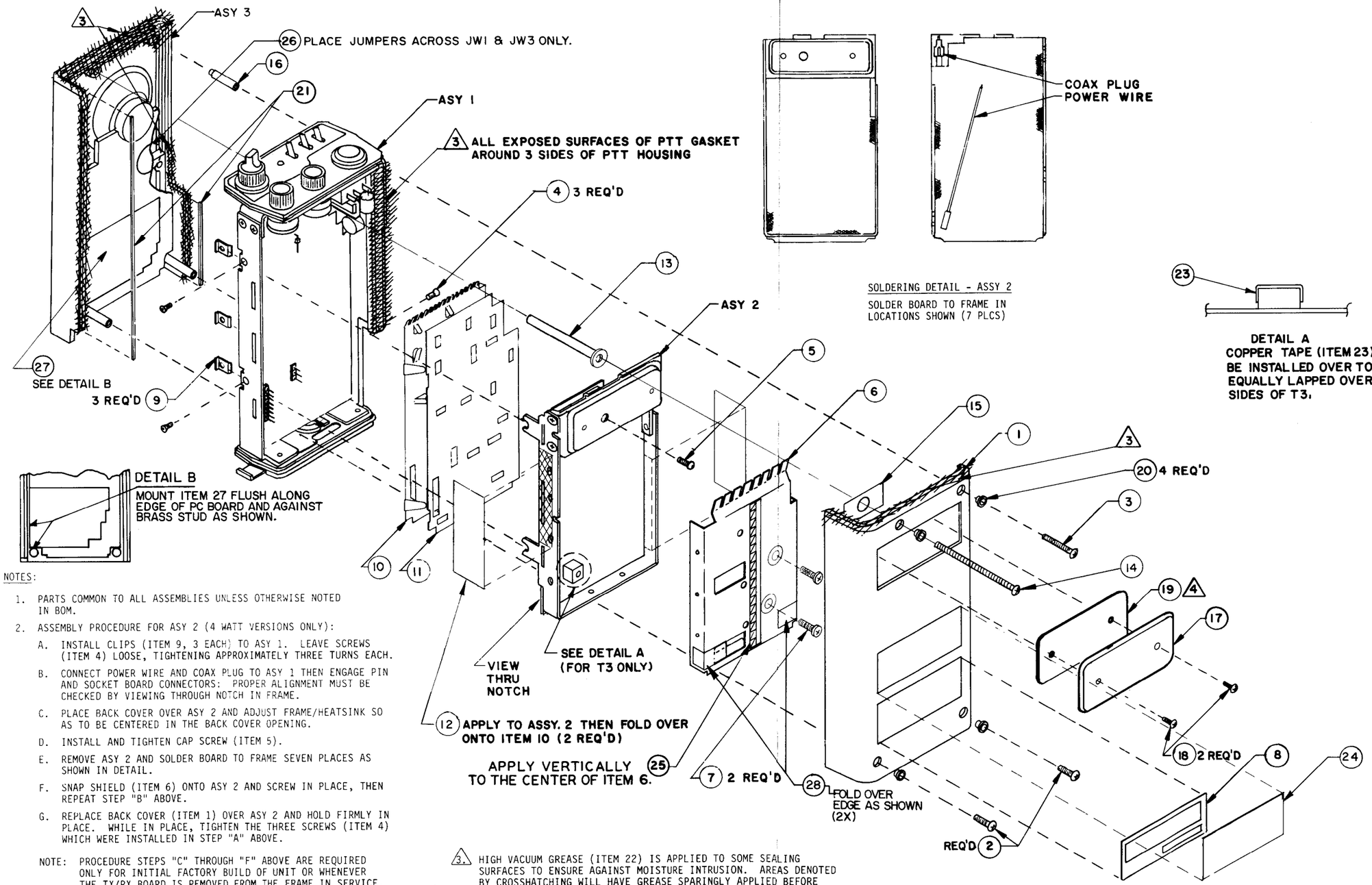
062-00139-0000	EPU 414 0A
062-00139-0002	EPU 499 SL
062-00139-0003	EPU 414 OM
062-00139-0010	EPU 499 1M
062-00139-0011	EPU 499 1A
062-00139-0012	EPU 499 2A
062-00139-0099	EPU COMMON BOM

SYMBOL	OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 4140A 0000	499SL 0002	4140M 0003	4991M 0010	4991A 0011	4992A 0012	COMMON 0099
	062-00139-0099		COMMON BOM EPU	A	EA	1.00	1.00	1.00	1.00	1.00	1.00	.
ASY 1	200-03482-0000		EPU SYS FRM ASSY	A	EA	1.00	1.00	1.00	1.00	1.00	1.00	.
ASY 2	200-03476-0030		RX/TX 4/2W	A	EA	1.00	1.00	1.00	1.00	1.00	1.00	.
ASY 3	200-03477-0004		FT CVR W/O KYBD	A	EA	.	.	1.00	.	.	.	.
ASY 3	200-03477-0005		FRT CVR W/KYBD	A	EA	.	.	.	1.00	.	.	.
ASY 3	200-03477-0006		FRONT CVR	A	EA	1.00	.	.	.	.	.	.
ASY 3	200-03477-0007		FRONT CVR W/KBD	A	EA	.	.	.	.	1.00	.	.
ASY 3	200-03477-0009		EPH CVR W/ALPHA	A	EA	.	1.00	.	.	.	.	.
ASY 3	200-03477-0010		A-N E STD OPT	A	EA	.	.	.	.	.	1.00	.
ITM 1	073-00609-0004	1411-6701-304	CAST BACK CVR	A	EA	.	.	1.00	1.00	.	.	.
ITM 1	088-02078-0010	1411-5702-000	BCK CVR METALLIZED	A	EA	1.00	1.00	.	.	1.00	1.00	.
ITM 2	089-07071-0008	2820-3603-017	SCR PHP M2.5X8		EA	.	.	.	.	.	.	2.00
ITM 3	089-07071-0023	2820-3603-018	SCR PHP M2.5X23		EA	.	.	.	.	.	.	1.00
ITM 4	089-06004-0003	2801-3714-510	SCR FHP 2-56X3/16		EA	.	.	.	.	.	.	3.00
ITM 5	089-07070-0003	2803-3668-125	SCR BHC 4-40X3/16		EA	.	.	.	.	.	.	1.00
ITM 6	047-08816-0005	2508-4009-505	SHIELD TX/TX	A	EA	.	.	.	.	.	.	1.00
ITM 7	089-05569-0002	2801-3714-507	SCR THP 2-56X1/8		EA	.	.	.	.	.	.	2.00
ITM 8	195-00018-0000	0011-2093-700	FCC DECAL OPTIONS		EA	.	.	.	.	.	.	1.00
ITM 9	047-08958-0001	2830-2028-401	CLIP 256W/FIN		EA	.	.	.	.	.	.	3.00
ITM 10	047-09084-0001	2508-5703-801	SHIELD TX/RX/ BTM	A	EA	.	.	.	.	.	.	1.00
ITM 11	012-01459-0000	3110-4010-800	INSUL TX/RX BD		EA	.	.	.	.	.	.	1.00
ITM 12	047-09141-0000	2508-2016-200	SHLD TP 3/4X1/3/4		EA	.	.	.	.	.	.	2.00
ITM 13	076-01466-0000	2800-2026-900	STANDOFF		EA	.	.	.	.	.	.	1.00
ITM 14	089-07071-0035	2820-3603-019	SCR PHP M2.5X35		EA	.	.	.	.	.	.	1.00
ITM 15	012-01470-0000	3110-2034-300	INSULATOR MYLAR		EA	.	.	1.00	1.00	.	.	.
ITM 16	076-01440-0000	2813-2027-700	STANDOFF .550		EA	.	.	.	.	.	.	1.00
ITM 17	088-02089-0000	1411-4004-800	PLATE		EA	.	.	.	.	.	.	1.00
ITM 18	089-07074-0005	2820-2031-405	SCR FHP M2.5X5.0		EA	.	.	.	.	.	.	2.00
ITM 19	187-01333-0000	2512-2034-000	HEAT SINK GASKET		EA	.	.	1.00	1.00	.	.	.
ITM 20	091-00187-0001	2844-2035-201	WASHER SHOULDER		EA	.	.	4.00	4.00	.	.	.
ITM 21	187-01331-0000	2512-2033-900	TEFLON CORD GASKET		IN	.	.	7.00	7.00	.	.	.
ITM 22	016-01013-0000	1605-2033-200	VAC GREASE DC 976		AR	.	.	1.00	1.00	.	.	.
ITM 23	012-01353-0000	1601-2051-500	COPPER TAPE SHLD		IN	.	.	.	.	.	.	0.75
ITM 25	047-04977-0007	2540-4000-207	FNGR STOCK 2.625		EA	1.00	1.00	.	.	1.00	1.00	.
ITM 27	012-01297-0001	3110-2032-801	INSULATOR		AR	.	.	.	.	.	.	1.00
REF 1	300-04986-0000		FINAL ASSEMBLY DRAWING		RF	.	.	.	.	.	.	X.
REF 2	002-06908-0010		INTERCONNECT DIAGRAM		RF	.	.	.	.	.	.	X.

EPV FINAL ASSEMBLY

062-00140-0001	EPV 499 SL
062-00140-0008	EPV 414 0A
062-00140-0009	EPV 414 0M
062-00140-0010	EPV 499 1A
062-00140-0011	EPV 499 1M
062-00140-0012	EPV 499 2A
062-00140-0099	EPV COMMON BOM

SYMBOL	OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 499SL 0001	4140A 0008	4140M 0009	4991A 0010	4991M 0011	4992A 0012	COMMON 0099
	006-08444-0000		OPERATORS MANUAL		EA	1.00	1.00	1.00	1.00	1.00	1.00	.
	062-00140-0099		COMMON BOM EPV	A	EA	1.00	1.00	1.00	1.00	1.00	1.00	.
ASY 1	200-03482-0020		EPV DNBD SYS FRAME	A	EA	1.00	1.00	1.00	1.00	1.00	1.00	.
ASY 2	200-03476-0020		EPV 4/2W R/T	A	EA	1.00	1.00	1.00	1.00	1.00	1.00	.
ASY 3	200-03477-0004		FT CVR W/O KYBD	A	EA	.	.	1.00	.	.	.	.
ASY 3	200-03477-0005		FRT CVR W/KYBD	A	EA	.	.	.	.	1.00	.	.
ASY 3	200-03477-0006		FRONT CVR	A	EA	.	1.00	.	.	.	.	.
ASY 3	200-03477-0007		FRONT CVR W/KBD	A	EA	.	.	.	1.00	.	.	.
ASY 3	200-03477-0009		EPH CVR W/ALPHA	A	EA	1.00	.	.	.	.	.	.
ASY 3	200-03477-0010		A-N E STD OPT	A	EA	.	.	.	.	.	1.00	.
ITM 1	073-00609-0004	1411-6701-304	CAST BACK CVR	A	EA	.	.	1.00	.	1.00	.	.
ITM 1	088-02078-0010	1411-5702-000	BCK CVR METALLIZED	A	EA	1.00	1.00	.	1.00	.	1.00	.
ITM 2	089-07071-0008	2820-3603-017	SCR PHP M2.5X8		EA	.	.	.	.	.	.	2.00
ITM 3	089-07071-0023	2820-3603-018	SCR PHP M2.5X23		EA	.	.	.	.	.	.	1.00
ITM 4	089-06004-0003	2801-3714-510	SCR FHP 2-56X3/16		EA	.	.	.	.	.	.	3.00
ITM 5	089-07070-0003	2803-3668-125	SCR BHC 4-40X3/16		EA	.	.	.	.	.	.	1.00
ITM 6	047-08816-0005	2508-4009-505	SHIELD TX/TX	A	EA	.	.	.	.	.	.	1.00
ITM 7	089-05569-0002	2801-3714-507	SCR THP 2-56X1/8		EA	.	.	.	.	.	.	2.00
ITM 8	195-00018-0000	0011-2093-700	FCC DECAL OPTIONS		EA	.	.	.	.	.	.	1.00
ITM 9	047-08958-0001	2830-2028-401	CLIP 256W/FIN		EA	.	.	.	.	.	.	3.00
ITM 10	047-09084-0001	2508-5703-801	SHIELD TX/RX/ BTM	A	EA	.	.	.	.	.	.	1.00
ITM 11	012-01459-0000	3110-4010-800	INSUL TX/RX BD		EA	.	.	.	.	.	.	1.00
ITM 12	047-09141-0000	2508-2016-200	SHLD TP 3/4X1/3/4		EA	.	.	.	.	.	.	2.00
ITM 13	076-01466-0000	2800-2026-900	STANDOFF		EA	.	.	.	.	.	.	1.00
ITM 14	089-07071-0035	2820-3603-019	SCR PHP M2.5X35		EA	.	.	.	.	.	.	1.00
ITM 15	012-01470-0000	3110-2034-300	INSULATOR MYLAR		EA	.	.	1.00	.	1.00	.	.
ITM 16	076-01440-0000	2813-2027-700	STANDOFF .550		EA	.	.	.	.	.	.	1.00
ITM 17	088-02089-0000	1411-4004-800	PLATE		EA	.	.	.	.	.	.	1.00
ITM 18	089-07074-0005	2820-2031-405	SCR FHP M2.5X5.0		EA	.	.	.	.	.	.	2.00
ITM 19	187-01333-0000	2512-2034-000	HEAT SINK GASKET		EA	.	.	1.00	.	1.00	.	.
ITM 20	091-00187-0001	2844-2035-201	WASHER SHOULDER		EA	.	.	4.00	.	4.00	.	.
ITM 21	187-01331-0000	2512-2033-900	TEFLON CORD GASKET		IN	.	.	7.00	.	7.00	.	.
ITM 22	016-01013-0000	1605-2033-200	VAC GREASE DC 976		AR	.	.	1.00	.	1.00	.	.
ITM 23	012-01353-0000	1601-2051-500	COPPER TAPE SHLD		IN	.	.	.	.	.	.	0.75
ITM 25	047-04977-0007	2540-4000-207	FNGR STOCK 2.625		EA	1.00	1.00	.	1.00	.	1.00	.
ITM 27	012-01297-0001	3110-2032-801	INSULATOR		AR	.	.	.	.	.	.	1.00
REF 1	300-04986-0000		FINAL ASSEMBLY DRAWING		RF	.	.	.	.	.	.	X.
REF 2	002-06908-0010		INTERCONNECT DIAGRAM		RF	.	.	.	.	.	.	X.



NOTES:

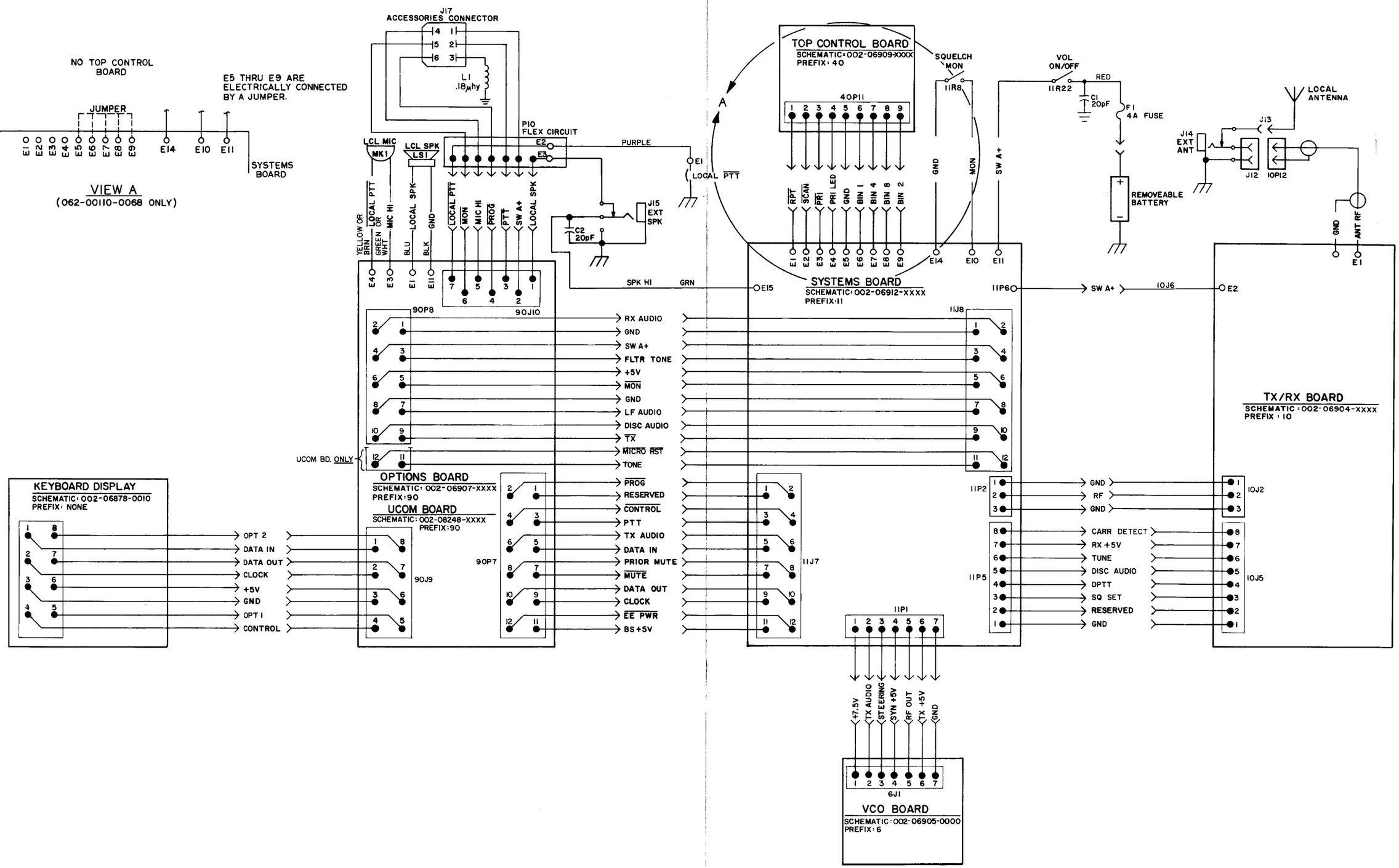
1. PARTS COMMON TO ALL ASSEMBLIES UNLESS OTHERWISE NOTED IN BOM.
2. ASSEMBLY PROCEDURE FOR ASY 2 (4 WATT VERSIONS ONLY):
   - A. INSTALL CLIPS (ITEM 9, 3 EACH) TO ASY 1. LEAVE SCREWS (ITEM 4) LOOSE, TIGHTENING APPROXIMATELY THREE TURNS EACH.
   - B. CONNECT POWER WIRE AND COAX PLUG TO ASY 1 THEN ENGAGE PIN AND SOCKET BOARD CONNECTORS: PROPER ALIGNMENT MUST BE CHECKED BY VIEWING THROUGH NOTCH IN FRAME.
   - C. PLACE BACK COVER OVER ASY 2 AND ADJUST FRAME/HEATSINK SO AS TO BE CENTERED IN THE BACK COVER OPENING.
   - D. INSTALL AND TIGHTEN CAP SCREW (ITEM 5).
   - E. REMOVE ASY 2 AND SOLDER BOARD TO FRAME SEVEN PLACES AS SHOWN IN DETAIL.
   - F. SNAP SHIELD (ITEM 6) ONTO ASY 2 AND SCREW IN PLACE, THEN REPEAT STEP "B" ABOVE.
   - G. REPLACE BACK COVER (ITEM 1) OVER ASY 2 AND HOLD FIRMLY IN PLACE. WHILE IN PLACE, TIGHTEN THE THREE SCREWS (ITEM 4) WHICH WERE INSTALLED IN STEP "A" ABOVE.

   NOTE: PROCEDURE STEPS "C" THROUGH "F" ABOVE ARE REQUIRED ONLY FOR INITIAL FACTORY BUILD OF UNIT OR WHENEVER THE TX/RX BOARD IS REMOVED FROM THE FRAME IN SERVICE. THESE STEPS MAY BE ELIMINATED BY USE OF A FIXTURE PROVIDED BY MANUFACTURING. STEPS "B" AND "G" ABOVE HOWEVER MUST ALWAYS BE FOLLOWED WHENEVER ASY 2 IS REMOVED FROM ASY 1.

△3. HIGH VACUUM GREASE (ITEM 22) IS APPLIED TO SOME SEALING SURFACES TO ENSURE AGAINST MOISTURE INTRUSION. AREAS DENOTED BY CROSSHATCHING WILL HAVE GREASE SPARINGLY APPLIED BEFORE UNIT IS ASSEMBLED. ONCE ASSEMBLED, EXCESS GREASE SHALL BE REMOVED FROM THE UNIT EXTERIOR USING AN ALCOHOL SATURATED CLOTH OR AN EQUIVALENT CLEANING METHOD.

△4. CENTER GASKET OVER MOUNTING HOLES, ADHESIVE SIDE TOWARD HEAT SINK. PRESS TO SEAL GASKET EDGES TO BACK COVER.

NO TOP CONTROL BOARD
E5 THRU E9 ARE ELECTRICALLY CONNECTED BY A JUMPER.
JUMPER
E1 E2 E3 E4 E5 E6 E7 E8 E9 E14 E10 E11
SYSTEMS BOARD
VIEW A
(062-00110-0068 ONLY)


J17
ACCESSORIES CONNECTOR
L1
.18μhy
LCL MIC
MK1
LCL SPK
LS1
P10
FLEX CIRCUIT
E2
E3
PURPLE
E1
LOCAL PTT
C2
20pF
J15
EXT SPK
YELLOW OR BRN
GREEN OR WHT
LOCAL PTT
MIC HI
LOCAL SPK
GND
MON
PROG
PTT
SW A+
E4 E3 E1 E11
90P8
90J10
SPK HI
GRN
E15
RX AUDIO
GND
SW A+
FLTR TONE
+5V
MON
GND
LF AUDIO
DISC AUDIO
TX
MICRO RST
TONE
UCOM BD. ONLY
PROG
RESERVED
CONTROL
PTT
TX AUDIO
DATA IN
PRIOR MUTE
MUTE
DATA OUT
CLOCK
EE PWR
BS+5V
OPTIONS BOARD
SCHEMATIC: 002-06907-XXXX
PREFIX: 90
UCOM BOARD
SCHEMATIC: 002-08248-XXXX
PREFIX: 90
90P7
90J9
KEYBOARD DISPLAY
SCHEMATIC: 002-06878-0010
PREFIX: NONE
OPT 2
DATA IN
DATA OUT
CLOCK
+5V
GND
OPT 1
CONTROL
TOP CONTROL BOARD
SCHEMATIC: 002-06909-XXXX
PREFIX: 40
40P11
RPT
SCAN
PRI
PRI LED
GND
BIN 1
BIN 4
BIN 8
BIN 2
SQUELCH
MON
11R8
VOL
ON/OFF
11R22
RED
C1
20pF
F1
4A FUSE
REMOVEABLE BATTERY
LOCAL ANTENNA
J13
J14
EXT ANT
J12
10P12
GND
ANT RF
E1
E1 E2 E3 E4 E5 E6 E7 E8 E9 E14 E10 E11
SYSTEMS BOARD
SCHEMATIC: 002-06912-XXXX
PREFIX: 11
11P6
SW A+
10J6
E2
TX/RX BOARD
SCHEMATIC: 002-06904-XXXX
PREFIX: 10
11J8
11J7
11P2
GND
RF
GND
10J2
11P5
CARR DETECT
RX +5V
TUNE
DISC AUDIO
DPTT
SQ SET
RESERVED
GND
10J5
11P1
+7.5V
TX AUDIO
STEERING
SYN +5V
RF OUT
TX +5V
GND
6J1
VCO BOARD
SCHEMATIC: 002-06905-0000
PREFIX: 6

SYSTEMS FRAME ASSEMBLY

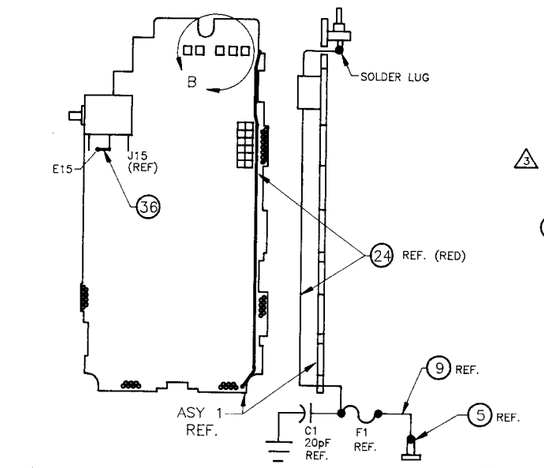
200-03482-0000 EPU SYSTEMS FRAME ASSEMBLY
200-03482-0020 EPV SYSTEMS FRAME ASSEMBLY
200-03482-0099 UHF COMMON BOM

SYMBOL	OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY EPU 0000	QUANTITY EPV 0020	QUANTITY COMMON 0099
	200-03482-0099		UHF COMMON BOM	A	EA	1.00	1.00	.
ASY 1	200-08727-0000		UHF SYSTEMS BD	A	EA	1.00	1.00	.
ASY 2	200-06909-0001		CTRL BD 14CH WK	A	EA	1.00	1.00	.
ASY 3	200-03475-0001		TOP FRAME ASSY	A	EA	1.00	1.00	.
ASY 4	200-05332-0000		EPU VCO MODULE	A	EA	1.00	.	.
ASY 4	200-05332-0020		EPU DNBD VCO MOD	A	EA	.	1.00	.
C 1	111-00002-0013	1518-2049-313	CAP CER 22PF X7R		EA	.	.	1.00
F 1	036-00057-0009	5106-2046-109	FUSE 275 125V 4A		EA	.	.	1.00
ITM 1	089-07394-0000	2801-3714-506	SCR FHP 2-56X9/32		EA	.	.	4.00
ITM 2	047-06702-0000	1400-4007-400	BTRY LATCH PLATE		EA	.	.	1.00
ITM 3	076-01469-0000	2114-2031-300	POSITIVE CONTACT		EA	.	.	1.00
ITM 4	089-08335-0000	2847-2035-000	WSHR CURVED SPRING		EA	.	.	1.00
ITM 5	010-00019-0093	2114-2033-693	TERM STDF WHT		EA	.	.	2.00
ITM 6	088-01304-0010	1411-5702-200	LTCH PLT HSG MOD	A	EA	.	.	1.00
ITM 7	047-06703-0000	2830-4007-500	LATCH SPRING	A	EA	.	.	1.00
ITM 8	090-00019-0000	2510-2034-900	RING RTNR .125		EA	.	.	1.00
ITM 9	026-00030-0000	6024-0000-001	WIRE CU24AWG TIN		IN	.	.	0.50
ITM 10	047-07478-0003	1403-4009-303	LOWER FRAME	A	EA	.	.	1.00
ITM 11	047-07479-0003	1403-4009-203	SIDE FRAME	A	EA	.	.	1.00
ITM 12	089-06004-0002	2801-3714-509	SCR FHP 2-56X1/8		EA	.	.	4.00
ITM 13	047-07465-0000	2840-2028-600	WSHR CHNL SLCT		EA	1.00	1.00	.
ITM 14	076-01461-0000	2800-2027-400	SPACER SWITCH		EA	3.00	3.00	.
ITM 15	076-01439-0000	2856-2003-301	NUT SLOT M5X0.50		EA	3.00	3.00	.
ITM 16	088-01311-0000	1411-4005-600	LED BUSHING		EA	1.00	1.00	.
ITM 17	057-03551-0001	2509-5704-901	INLAY TOP		EA	1.00	1.00	.
ITM 18	076-01439-0001	2856-2003-302	NUT SLOT M6X0.70		EA	2.00	2.00	.
ITM 19	088-02087-0001	2402-4004-701	KNOB MOLDED	A	EA	2.00	2.00	.
ITM 20	088-02052-0001	1411-4006-001	SWITCH BEZEL W/DCR	A	EA	1.00	1.00	.
ITM 21	090-00492-0000	2530-2003-600	PIN DOW .047X.165		EA	2.00	2.00	.
ITM 22	076-01439-0002	2858-2003-401	NUT SLOT 1/4-40		EA	1.00	1.00	.
ITM 23	088-02085-0001	2402-4005-001	CHANNEL KNOB MLED	A	EA	1.00	1.00	.
ITM 24	025-00001-0002	6026-3315-803	WIRE 26 RED		IN	.	.	6.00
ITM 27	047-10361-0001	2508-4008-301	BOTTOM LID	A	EA	.	.	1.00
ITM 28	047-10360-0001	2508-4008-201	TOP LID	A	EA	.	.	1.00
ITM 29	090-00502-0010	2540-2019-710	FINGER STOCK		EA	.	.	1.00
ITM 30	090-00502-0003	2540-2019-703	FINGER STOCK		EA	.	.	1.00
ITM 31	088-01301-0000	1411-4005-400	ANTENNA BUSHING		EA	.	.	1.00
ITM 32	088-01310-0000	1411-4005-700	ANTENNA NUT		EA	.	.	1.00
ITM 33	088-02067-0001	1411-5701-401	TOP PLT SPEC		EA	.	.	1.00
ITM 34	187-01755-0000	2512-2034-200	O-RING		EA	.	.	1.00
ITM 35	088-02058-0000	1411-4004-200	SWITCH BOOT		EA	1.00	1.00	.
ITM 36	026-00030-0000	6024-0000-001	WIRE CU24AWG TIN		IN	.	.	0.30
ITM 37	187-01323-0000	3106-2035-600	INSULATOR		EA	.	.	1.00
ITM 41	187-01321-0000	2512-2031-600	GSKT,LTCH PLT HSG		EA	.	.	1.00
ITM 42	012-01421-0000	1601-2032-700	MICROTHIN TAPE		IN	.	.	2.00
ITM 43	035-08373-0002	1601-2073-401	SEALING TAPE TAN		IN	.	.	0.50
ITM 44	012-01558-0000	1601-2032-900	XFR TAPE(F-9469PC)		IN	.	.	1.20
ITM 45	016-01013-0000	1605-2033-200	VAC GREASE DC 976		AR	.	.	1.00
ITM 46	089-08335-0001	2847-2035-001	SPRING WASHER		EA	2.00	2.00	.
ITM 47	089-08341-0000	2840-3191-936	WASHER FLAT		EA	2.00	2.00	.
ITM 48	016-01412-0000	1609-0000-007	LOCTITE 425		AR	.	.	1.00
ITM 55	012-01005-0003	1601-2007-102	TAPE MYLAR .25 W		IN	.	.	0.25
J 13	076-01438-0000	2114-4007-600	ADAPTER ANTENNA		EA	.	.	1.00
REF 1	300-03482-0000		EPU SYS FRM ASSY		RF	.	.	X.
REF 2	300-03482-0010		MOD SYS FRM ASSY		RF	.	.	X.

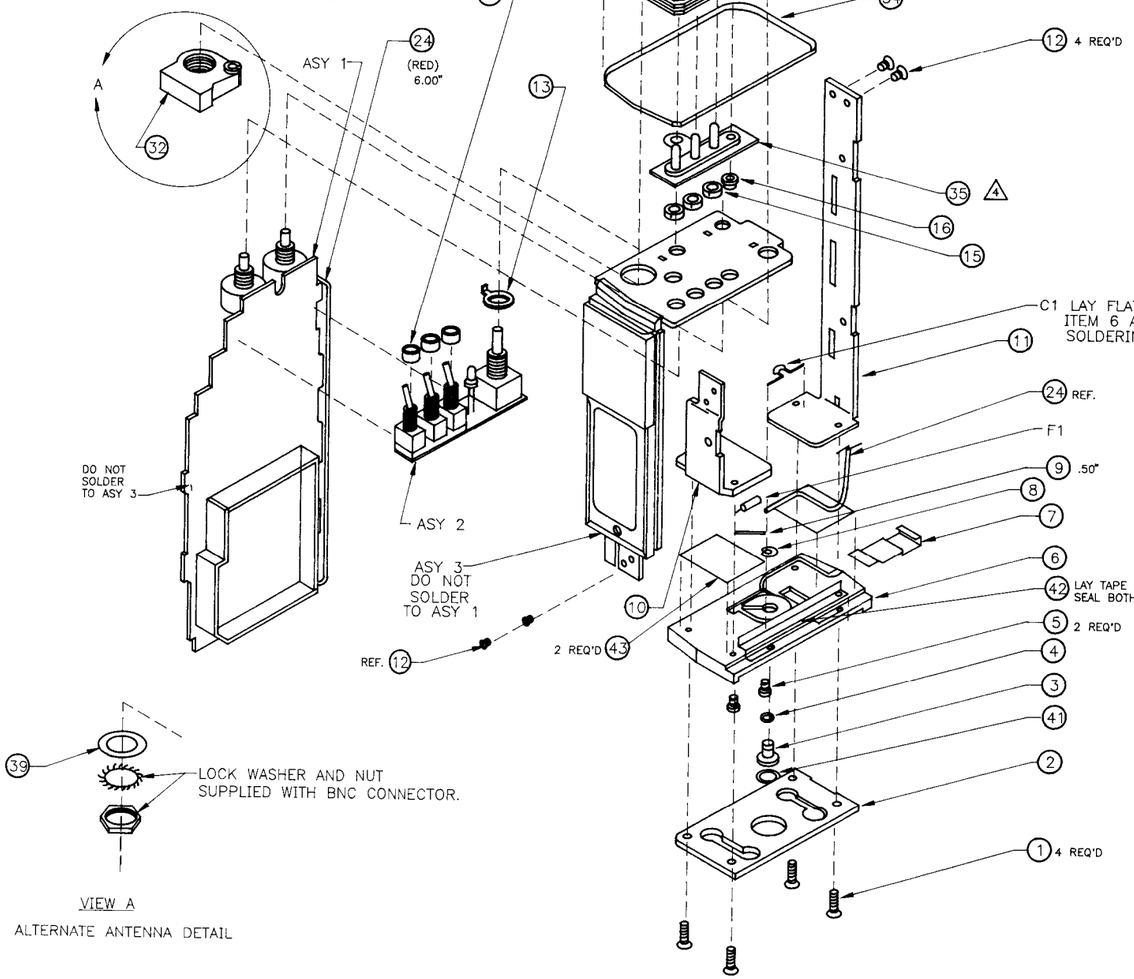
SYSTEMS FRAME ASSEMBLY

200-03482-0000 EPU SYSTEMS FRAME ASSEMBLY
200-03482-0020 EPV SYSTEMS FRAME ASSEMBLY
200-03482-0099 UHF COMMON BOM

SYMBOL	OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY EPU 0000	QUANTITY EPV 0020	QUANTITY COMMON 0099
	200-03482-0099		UHF COMMON BOM	A	EA	1.00	1.00	.
ASY 1	200-08727-0000		UHF SYSTEMS BD	A	EA	1.00	1.00	.
ASY 2	200-06909-0001		CTRL BD 14CH WK	A	EA	1.00	1.00	.
ASY 3	200-03475-0001		TOP FRAME ASSY	A	EA	1.00	1.00	.
ASY 4	200-05332-0000		EPU VCO MODULE	A	EA	1.00	.	.
ASY 4	200-05332-0020		EPU DNBD VCO MOD	A	EA	.	1.00	.
C 1	111-00002-0013	1518-2049-313	CAP CER 22PF X7R		EA	.	.	1.00
F 1	036-00057-0009	5106-2046-109	FUSE 275 125V 4A		EA	.	.	1.00
ITM 1	089-07394-0000	2801-3714-506	SCR FHP 2-56X9/32		EA	.	.	4.00
ITM 2	047-06702-0000	1400-4007-400	BTRY LATCH PLATE		EA	.	.	1.00
ITM 3	076-01469-0000	2114-2031-300	POSITIVE CONTACT		EA	.	.	1.00
ITM 4	089-08335-0000	2847-2035-000	WSHR CURVED SPRING		EA	.	.	1.00
ITM 5	010-00019-0093	2114-2033-693	TERM STDF WHT		EA	.	.	2.00
ITM 6	088-01304-0010	1411-5702-200	LTCH PLT HSG MOD	A	EA	.	.	1.00
ITM 7	047-06703-0000	2830-4007-500	LATCH SPRING	A	EA	.	.	1.00
ITM 8	090-00019-0000	2510-2034-900	RING RTNR .125		EA	.	.	1.00
ITM 9	026-00030-0000	6024-0000-001	WIRE CU24AWG TIN		IN	.	.	0.50
ITM 10	047-07478-0003	1403-4009-303	LOWER FRAME	A	EA	.	.	1.00
ITM 11	047-07479-0003	1403-4009-203	SIDE FRAME	A	EA	.	.	1.00
ITM 12	089-06004-0002	2801-3714-509	SCR FHP 2-56X1/8		EA	.	.	4.00
ITM 13	047-07465-0000	2840-2028-600	WSHR CHNL SLCT		EA	1.00	1.00	.
ITM 14	076-01461-0000	2800-2027-400	SPACER SWITCH		EA	3.00	3.00	.
ITM 15	076-01439-0000	2856-2003-301	NUT SLOT M5X0.50		EA	3.00	3.00	.
ITM 16	088-01311-0000	1411-4005-600	LED BUSHING		EA	1.00	1.00	.
ITM 17	057-03551-0001	2509-5704-901	INLAY TOP		EA	1.00	1.00	.
ITM 18	076-01439-0001	2856-2003-302	NUT SLOT M6X0.70		EA	2.00	2.00	.
ITM 19	088-02087-0001	2402-4004-701	KNOB MOLDED	A	EA	2.00	2.00	.
ITM 20	088-02052-0001	1411-4006-001	SWITCH BEZEL W/DCR	A	EA	1.00	1.00	.
ITM 21	090-00492-0000	2530-2003-600	PIN DOW .047X.165		EA	2.00	2.00	.
ITM 22	076-01439-0002	2858-2003-401	NUT SLOT 1/4-40		EA	1.00	1.00	.
ITM 23	088-02085-0001	2402-4005-001	CHANNEL KNOB MLED	A	EA	1.00	1.00	.
ITM 24	025-00001-0002	6026-3315-803	WIRE 26 RED		IN	.	.	6.00
ITM 27	047-10361-0001	2508-4008-301	BOTTOM LID	A	EA	.	.	1.00
ITM 28	047-10360-0001	2508-4008-201	TOP LID	A	EA	.	.	1.00
ITM 29	090-00502-0010	2540-2019-710	FINGER STOCK		EA	.	.	1.00
ITM 30	090-00502-0003	2540-2019-703	FINGER STOCK		EA	.	.	1.00
ITM 31	088-01301-0000	1411-4005-400	ANTENNA BUSHING		EA	.	.	1.00
ITM 32	088-01310-0000	1411-4005-700	ANTENNA NUT		EA	.	.	1.00
ITM 33	088-02067-0001	1411-5701-401	TOP PLT SPEC		EA	.	.	1.00
ITM 34	187-01755-0000	2512-2034-200	O-RING		EA	.	.	1.00
ITM 35	088-02058-0000	1411-4004-200	SWITCH BOOT		EA	1.00	1.00	.
ITM 36	026-00030-0000	6024-0000-001	WIRE CU24AWG TIN		IN	.	.	0.30
ITM 37	187-01323-0000	3106-2035-600	INSULATOR		EA	.	.	1.00
ITM 41	187-01321-0000	2512-2031-600	GSKT,LTCH PLT HSG		EA	.	.	1.00
ITM 42	012-01421-0000	1601-2032-700	MICROTHIN TAPE		IN	.	.	2.00
ITM 43	035-08373-0002	1601-2073-401	SEALING TAPE TAN		IN	.	.	0.50
ITM 44	012-01558-0000	1601-2032-900	XFR TAPE(F-9469PC)		IN	.	.	1.20
ITM 45	016-01013-0000	1605-2033-200	VAC GREASE DC 976		AR	.	.	1.00
ITM 46	089-08335-0001	2847-2035-001	SPRING WASHER		EA	2.00	2.00	.
ITM 47	089-08341-0000	2840-3191-936	WASHER FLAT		EA	2.00	2.00	.
ITM 48	016-01412-0000	1609-0000-007	LOCTITE 425		AR	.	.	1.00
ITM 55	012-01005-0003	1601-2007-102	TAPE MYLAR .25 W		IN	.	.	0.25
J 13	076-01438-0000	2114-4007-600	ADAPTER ANTENNA		EA	.	.	1.00
REF 1	300-03482-0000		EPU SYS FRM ASSY		RF	.	.	X.
REF 2	300-03482-0010		MOD SYS FRM ASSY		RF	.	.	X.

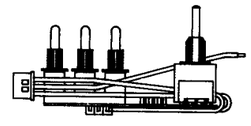


SCHEMATIC DIAGRAM



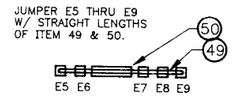
VIEW A

ALTERNATE ANTENNA DETAIL

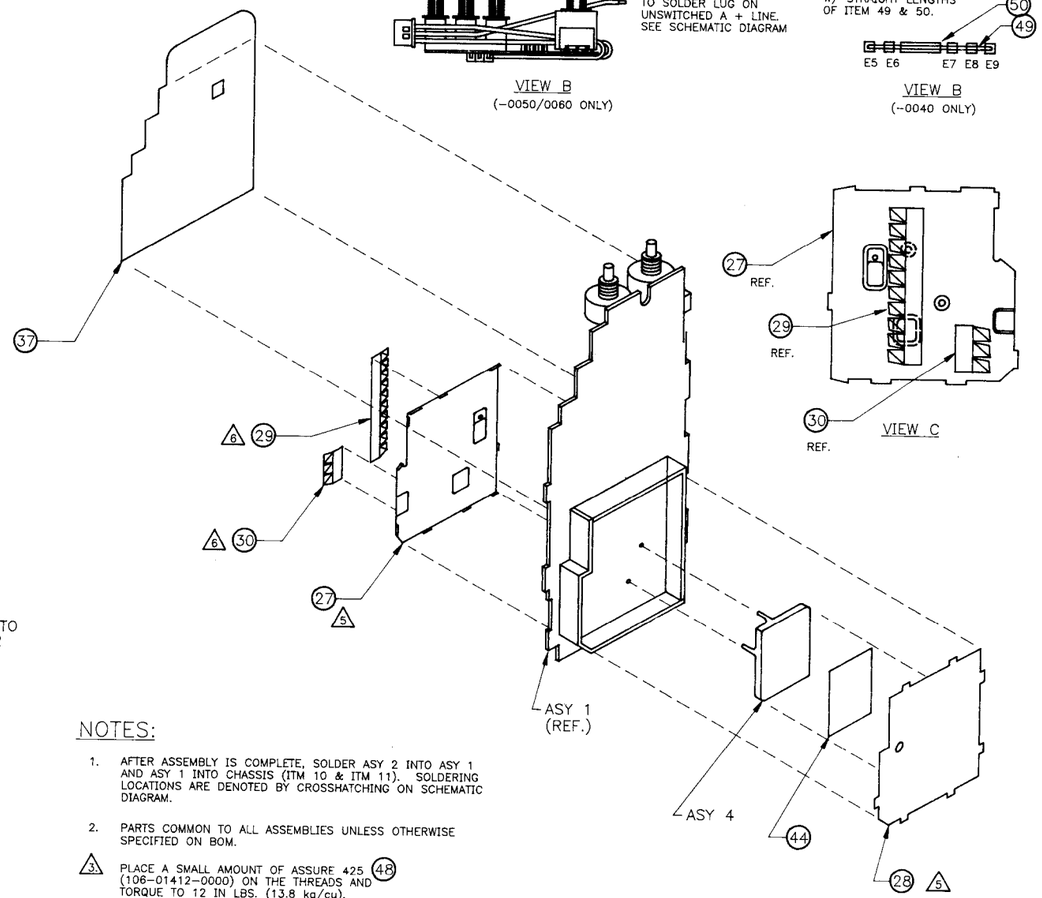


SOLDER LOOSE END OF RED WIRE TO SOLDER LUG ON UNSWITCHED A + LINE. SEE SCHEMATIC DIAGRAM

VIEW B
(-0050/0060 ONLY)



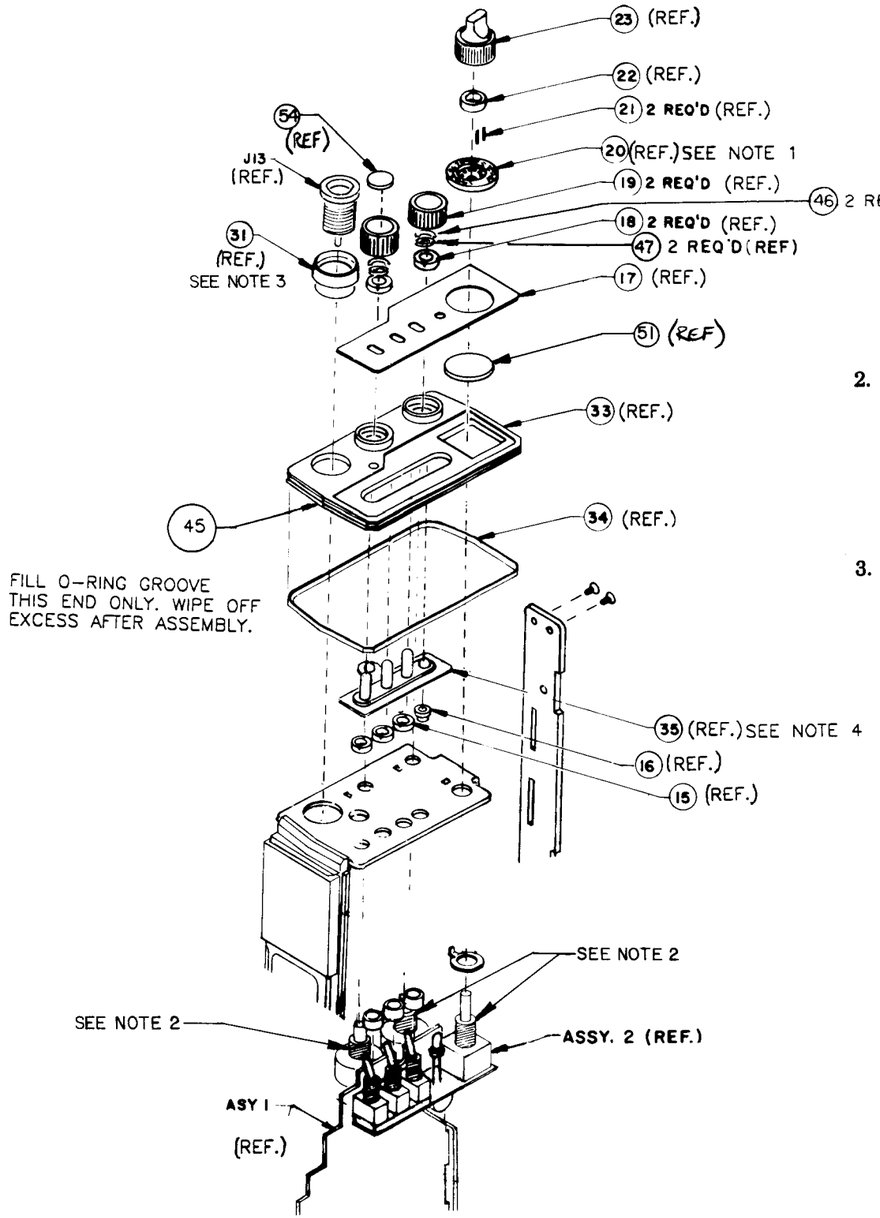
VIEW B
(-0040 ONLY)



NOTES:

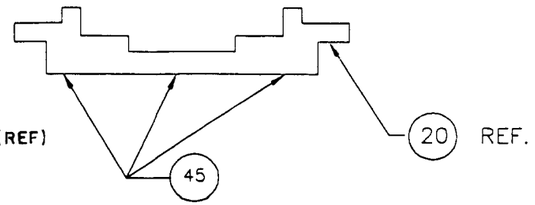
1. AFTER ASSEMBLY IS COMPLETE, SOLDER ASY 2 INTO ASY 1 AND ASY 1 INTO CHASSIS (ITM 10 & ITM 11). SOLDERING LOCATIONS ARE DENOTED BY CROSSHATCHING ON SCHEMATIC DIAGRAM.
2. PARTS COMMON TO ALL ASSEMBLIES UNLESS OTHERWISE SPECIFIED ON BOM.

3. PLACE A SMALL AMOUNT OF ASSURE 425 (48) (106-01412-0000) ON THE THREADS AND TORQUE TO 12 IN LBS. (13.8 kg/cu).
4. INVERT EACH UNUSED NIPPLE INTO OPEN SPACE CREATED BY THE MISSING TOGGLE SWITCH. THIS WILL ALLOW ITM 17 TO MOUNT FLUSH.
5. SOLDER LIDS IN PLACE WITH A CONTINOUS BEAD AROUND THE PERIMETER.
6. SEE VIEW C FOR EXACT PLACEMENT OF FINGER STOCK.



NOTES:

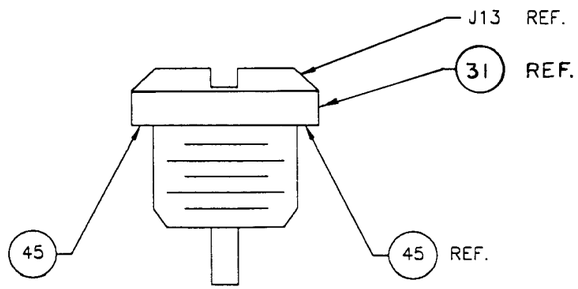
1. UNDERCOAT BOTTOM SURFACE OF BEZEL (ITEM 20) WITH VACUUM GREASE (ITEM 45) BEFORE INSTALLATION INTO TOP PLATE RECESS. ALLOW GREASE TO FILL ALL STOP PIN HOLES. KNOB WILL CONCEAL EXCESS GREASE.



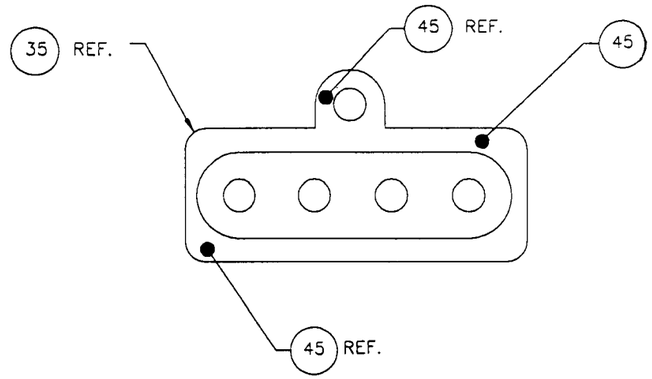
UNDERCOAT ENTIRE SURFACE AS SHOWN

2. APPLY VACUUM GREASE (ITEM 45) TO THREADED BUSHING. FILL ALL THREADS BEFORE INSTALLING SPANNER NUT. INSTALLATION OF SPANNER NUT WILL FORCE VACUUM GREASE INTO RECESSES SEALING ALL POINTS OF MOISTURE ENTRY.

3. COAT FLANGE SURFACE WITH VACUUM GREASE (ITEM 45) AS SHOWN. WIPE OFF EXCESS AFTER INSTALLATION.



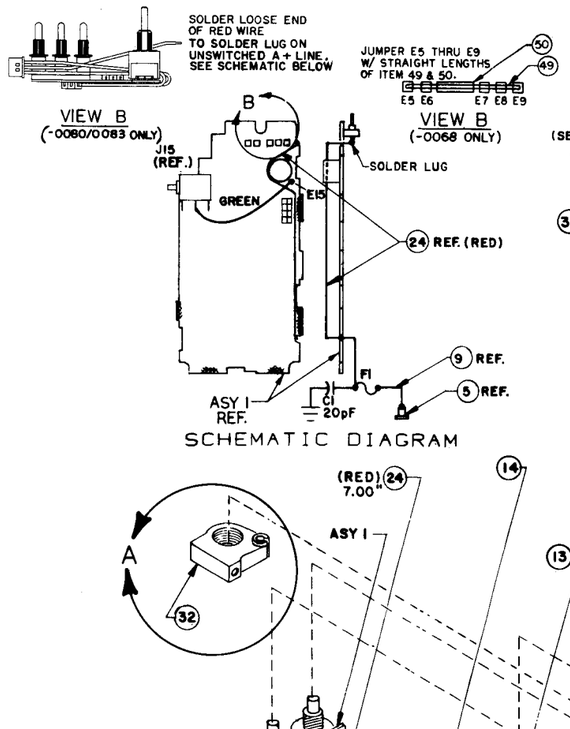
4. INVERT EACH UNUSED NIPPLE INTO OPEN SPACE CREATED BY THE MISSING TOGGLE SWITCH. THIS WILL ALLOW ITM 17 TO MOUNT FLUSH. APPLY A THIN LAYER OF VACUUM GREASE (ITEM 45) TO THE CONTINUOUS SURFACE INDICATED. THIS LAYER WILL SEAL ALL POINTS OF MOISTURE ENTRY. WIPE OFF EXCESS BEFORE INSTALLATION OF INLAY (ITEM 17).



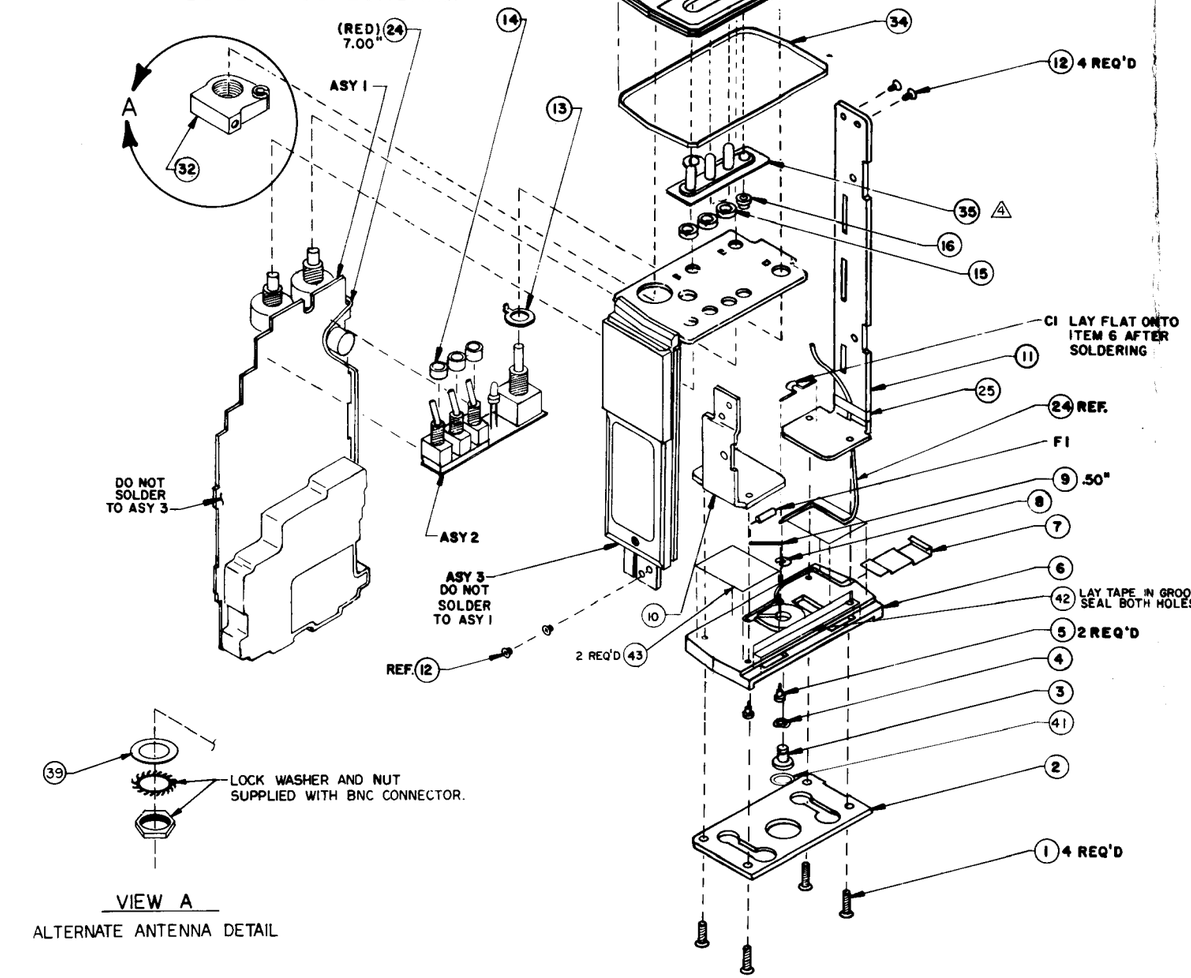
SYSTEMS FRAME ASSEMBLY

200-03481-0018 SYS FRAME
200-03481-0019 SYS FRAME
200-03481-0099 COMMON BOM

SYMBOL	OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0018	0019	0099
	200-03481-0099		COMMON BOM	A	EA	1.00	1.00	.
ASY 1	200-06912-0018		EPU SYS TRUNK	A	EA	1.00	1.00	.
ASY 3	200-03475-0001		TOP FRAME ASSY	A	EA	1.00	1.00	.
ASY 4	200-06905-0000		VCO BD ASSY	A	EA	.	1.00	.
ASY 4	200-06905-0020		VCO BD ASSY DNBD	A	EA	1.00	.	.
C 1	111-00002-0013	1518-2049-313	CAP CER 22PF X7R		EA	.	.	1.00
F 1	036-00057-0009	5106-2046-109	FUSE 275 125V 4A		EA	.	.	1.00
ITM 1	089-07394-0000	2801-3714-506	SCR FHP 2-56X9/32		EA	.	.	4.00
ITM 2	047-06702-0000	1400-4007-400	BTRY LATCH PLATE		EA	.	.	1.00
ITM 3	076-01469-0000	2114-2031-300	POSITIVE CONTACT		EA	.	.	1.00
ITM 4	089-08335-0000	2847-2035-000	WSHR CURVED SPRING		EA	.	.	1.00
ITM 5	010-00019-0093	2114-2033-693	TERM STDF WHT		EA	.	.	2.00
ITM 6	088-01304-0010	1411-5702-200	LTCH PLT HSG MOD	A	EA	.	.	1.00
ITM 7	047-06703-0000	2830-4007-500	LATCH SPRING	A	EA	.	.	1.00
ITM 8	090-00019-0000	2510-2034-900	RING RTNR .125		EA	.	.	1.00
ITM 9	026-00002-0000	6024-0000-001	WIRE COP TIN 24G		IN	.	.	0.50
ITM 10	047-07478-0003	1403-4009-303	LOWER FRAME	A	EA	.	.	1.00
ITM 11	047-07479-0003	1403-4009-203	SIDE FRAME	A	EA	.	.	1.00
ITM 12	089-06004-0002	2801-3714-509	SCR FHP 2-56X1/8		EA	.	.	4.00
ITM 16	088-01311-0000	1411-4005-600	LED BUSHING		EA	1.00	1.00	.
ITM 17	057-03551-0025	2509-5704-925	INLAY TOP		EA	1.00	1.00	.
ITM 18	076-01439-0001	2856-2003-302	NUT SLOT M6X0.70		EA	1.00	1.00	.
ITM 19	088-02087-0001	2402-4004-701	KNOB MOLDED	A	EA	1.00	1.00	.
ITM 24	025-00001-0002	6026-3315-803	WIRE 26 RED		IN	.	.	7.00
ITM 25	012-01421-0000	1601-2032-700	MICROTHIN TAPE		IN	.	.	1.50
ITM 26	089-05895-0006	2832-3737-505	SCR PHP 0-80X3/8		EA	.	.	9.00
ITM 27	009-06923-0001	1700-5707-101	PCBD SPCR/FRSD SHL	A	EA	1.00	1.00	.
ITM 28	073-00616-0001	1411-6705-001	CASTING LWR VCO SY	A	EA	1.00	1.00	.
ITM 29	073-00617-0001	1411-4006-301	CSTG SHORT VCO CVR		EA	1.00	1.00	.
ITM 31	088-01301-0000	1411-4005-400	ANTENNA BUSHING		EA	1.00	1.00	.
ITM 32	088-01310-0000	1411-4005-700	ANTENNA NUT		EA	1.00	1.00	.
ITM 33	088-02067-0001	1411-5701-401	TOP PLT SPEC		EA	.	.	1.00
ITM 34	187-01755-0000	2512-2034-200	O-RING		EA	.	.	1.00
ITM 35	088-02058-0000	1411-4004-200	SWITCH BOOT		EA	1.00	1.00	.
ITM 37	187-01768-0000	3110-2037-600	INSULATOR		EA	.	.	1.00
ITM 41	187-01321-0000	2512-2031-600	GSKT,LTCH PLT HSG		EA	1.00	1.00	.
ITM 42	012-01421-0000	1601-2032-700	MICROTHIN TAPE		IN	2.00	2.00	.
ITM 43	035-08373-0002	1601-2073-401	SEALING TAPE TAN		IN	0.500	0.500	.
ITM 44	012-01492-0000	3110-2052-500	VCO SHIELD INSUL		EA	1.00	1.00	.
ITM 45	016-01013-0000	1605-2033-200	VAC GREASE DC 976		AR	1.00	1.00	.
ITM 46	089-08335-0001	2847-2035-001	SPRING WASHER		EA	1.00	1.00	.
ITM 47	089-08341-0000	2840-3191-936	WASHER FLAT		EA	1.00	1.00	.
ITM 48	016-01412-0000	1609-0000-007	LOCTITE 425		AR	1.00	1.00	.
ITM 51	047-06708-0000	2800-2029-300	WASHER FREQ SW		EA	1.00	1.00	.
ITM 52	012-01005-0002	1601-2007-101	TAPE MYLAR .500 W		IN	1.00	1.00	.
ITM 53	016-01134-0000	1601-2033-300	COPPER TAPE 3 IN		AR	1.00	1.00	.
ITM 54	187-01817-0000	1401-2037-700	RUBBER PLUG		EA	1.00	1.00	.
ITM 55	016-00134-0003	9999-9999-999	COPPER TAPE		AR	1.00	1.00	.
ITM 56	012-01005-0005	1601-2007-103	TAPE MYLAR 1 W		AR	1.00	1.00	.
J 13	076-01438-0000	2114-4007-600	ADAPTER ANTENNA		EA	1.00	1.00	.
REF 1	300-03481-0000		SYSTEMS FRAME ASSY		RF	.	.	X.
REF 2	300-03481-0010		MOD SYS FRM ASSY		RF	X.	X.	.

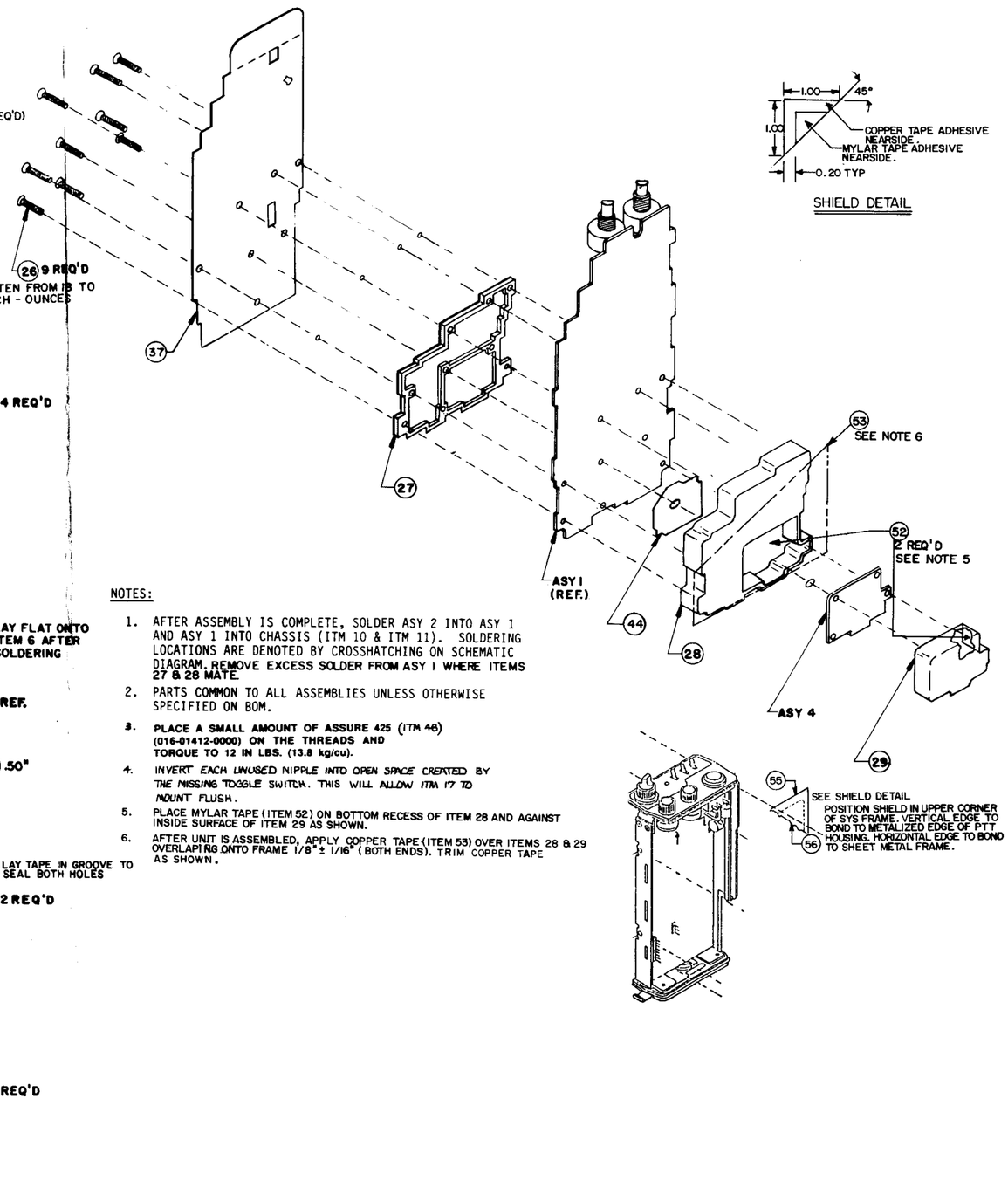


SCHEMATIC DIAGRAM



VIEW A

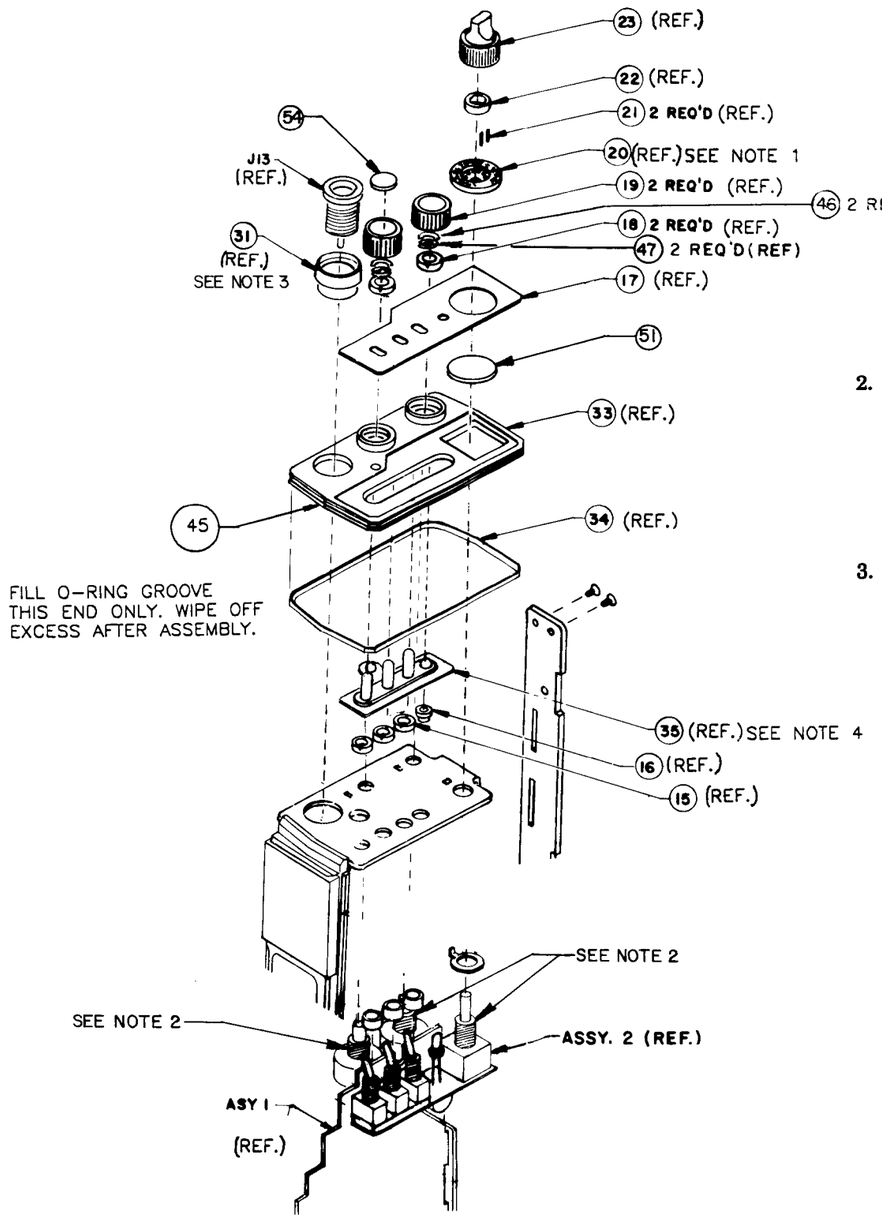
ALTERNATE ANTENNA DETAIL



SHIELD DETAIL

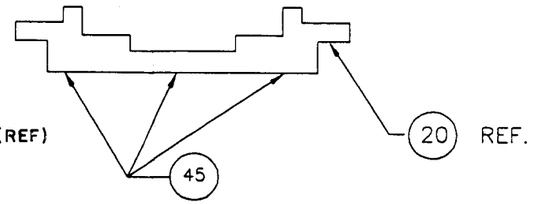
NOTES:

1. AFTER ASSEMBLY IS COMPLETE, SOLDER ASY 2 INTO ASY 1 AND ASY 1 INTO CHASSIS (ITM 10 & ITM 11). SOLDERING LOCATIONS ARE DENOTED BY CROSSHATCHING ON SCHEMATIC DIAGRAM. REMOVE EXCESS SOLDER FROM ASY 1 WHERE ITEMS 27 & 28 MATE.
2. PARTS COMMON TO ALL ASSEMBLIES UNLESS OTHERWISE SPECIFIED ON BOM.
3. **PLACE A SMALL AMOUNT OF ASSURE 425 (ITM 46) (016-01412-0000) ON THE THREADS AND TORQUE TO 12 IN LBS. (13.8 kg/cu).**
4. *INVERT EACH UNUSED NIPPLE INTO OPEN SPACE CREATED BY THE MISSING TOGGLE SWITCH. THIS WILL ALLOW ITM 17 TO MOUNT FLUSH.*
5. PLACE MYLAR TAPE (ITEM 52) ON BOTTOM RECESS OF ITEM 28 AND AGAINST INSIDE SURFACE OF ITEM 29 AS SHOWN.
6. AFTER UNIT IS ASSEMBLED, APPLY COPPER TAPE (ITEM 53) OVER ITEMS 28 & 29 OVERLAPPING ONTO FRAME 1/8" ± 1/16" (BOTH ENDS). TRIM COPPER TAPE AS SHOWN.



NOTES:

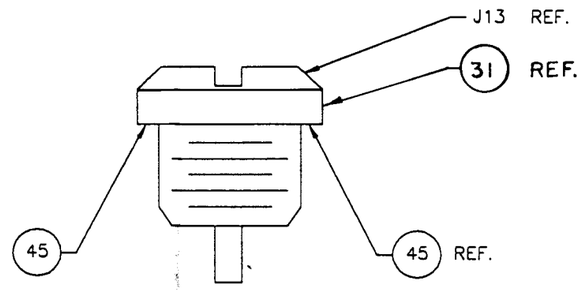
1. UNDERCOAT BOTTOM SURFACE OF BEZEL (ITEM 20) WITH VACUUM GREASE (ITEM 45) BEFORE INSTALLATION INTO TOP PLATE RECESS. ALLOW GREASE TO FILL ALL STOP PIN HOLES. KNOB WILL CONCEAL EXCESS GREASE.



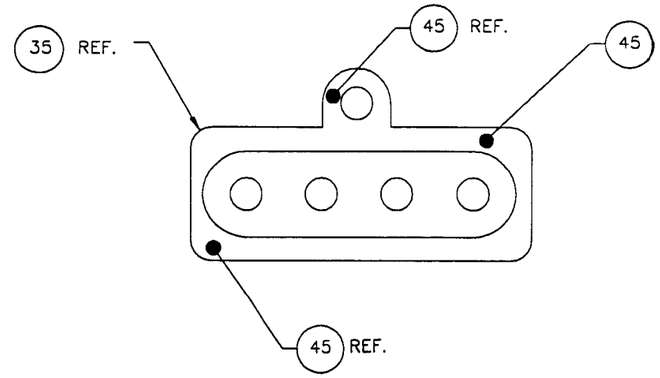
UNDERCOAT ENTIRE SURFACE AS SHOWN

2. APPLY VACUUM GREASE (ITEM 45) TO THREADED BUSHING. FILL ALL THREADS BEFORE INSTALLING SPANNER NUT. INSTALLATION OF SPANNER NUT WILL FORCE VACUUM GREASE INTO RECESSES SEALING ALL POINTS OF MOISTURE ENTRY.

3. COAT FLANGE SURFACE WITH VACUUM GREASE (ITEM 45) AS SHOWN. WIPE OFF EXCESS AFTER INSTALLATION.



4. INVERT EACH UNUSED NIPPLE INTO OPEN SPACE CREATED BY THE MISSING TOGGLE SWITCH. THIS WILL ALLOW ITM 17 TO MOUNT FLUSH. APPLY A THIN LAYER OF VACUUM GREASE (ITEM 45) TO THE CONTINUOUS SURFACE INDICATED. THIS LAYER WILL SEAL ALL POINTS OF MOISTURE ENTRY. WIPE OFF EXCESS BEFORE INSTALLATION OF INLAY (ITEM 17).



TOP FRAME ASSEMBLY

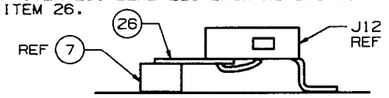
200-03475-0001 TOP FRAME ASSY

SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0001
C	2	111-00002-0013	1518-2049-313	CAP CER 22PF X7R		EA	1.00
ITM	1	009-06881-0000	1700-4011-000	PCB PTT SWITCH		EA	1.00
ITM	2	092-05099-0000	2883-2035-500	RVT OH .060X.125		EA	2.00
ITM	3	012-01277-0001	3110-2032-600	SNAP DOME ALGNMNT		EA	1.00
ITM	4	031-00475-0000	5112-4010-900	SNAP DOME SWITCH		EA	2.00
ITM	5	088-01303-0000	1411-4005-500	PTT ACTUATOR		EA	1.00
ITM	6	088-01295-0001	1411-5703-000	PTT SWITCH BOOT	A	EA	1.00
ITM	7	088-01321-0000	1411-4005-900	OPTIONS PLUG SPCR		EA	1.00
ITM	8	089-07397-0006	2820-3603-022	SCR PHP M2.0X6		EA	2.00
ITM	9	076-01437-0000	2858-4007-700	BLIND PRESS NUT		EA	1.00
ITM	11	088-02060-0010	1411-5702-100	SPEC PTT HSG MOD	A	EA	1.00
ITM	12	089-06159-0005	2801-3714-512	SCR FHP 2-56X5/16		EA	1.00
ITM	13	012-01386-0000	3110-2032-500	SHIM PIT HOUSING		EA	1.00
ITM	14	012-01415-0000	3106-2032-400	INSULATOR, COAX		EA	1.00
ITM	15	187-01327-0000	2512-4011-200	O RING PTT		EA	1.00
ITM	17	088-03115-0000	1411-4006-200	SIDE CONN COVER		EA	1.00
ITM	18	047-07474-0001	1403-5704-301	TOP FRAME UHF	A	EA	1.00
ITM	19	150-00003-0010	3101-0000-013	TUBING TFLN 24AWG		IN	1.50
ITM	20	026-00030-0000	6024-0000-001	WIRE CU24AWG TIN		IN	0.50
ITM	21	025-00001-0007	6026-3315-808	WIRE 26 PUR		IN	1.20
ITM	23	016-01013-0000	1605-2033-200	VAC GREASE DC 976		AR	1.00
ITM	26	008-00001-0000	2102-2033-700	GND LUG		EA	1.00
J	12	030-00244-0000	2101-5521-201	ANTENNA CONN RECTP		EA	1.00
J	14	033-00128-0000	2101-2033-100	JACK 3.5MM		EA	1.00
J	15	033-00127-0000	2101-2033-000	JACK 2.5MM		EA	1.00
J	17	030-02529-0000	2105-2032-300	CONN RECEPTACLE		EA	1.00
L	1	019-02084-0002	1802-2013-702	CH .18UH 5%		EA	1.00
P	10	009-06911-0000	1700-6705-900	FLEX CKT UHF PORT		EA	1.00
REF	1	300-03475-0000		TOP FRAME ASSY		RF	X.

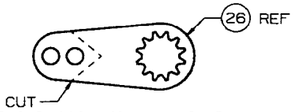
NOTES:

1. APPLY VACUUM GREASE (ITEM 23) SPARINGLY TO THE PERIMETER SURFACES AS SHOWN BEFORE INSTALLATION. AFTER ITEM 6 IS ASSEMBLED, REMOVE EXCESS GREASE FROM THE EXTERIOR & INTERIOR SURFACE WITH AN ALCOHOL SATURATED CLOTH OR EQUIVALENT.

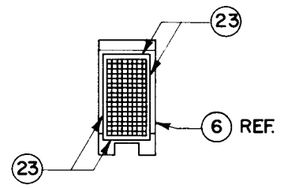
2. REMOVE 1/2 OF FRONT LEG. LOOP THIS LEG THROUGH EXPOSED HOLE OF ITEM 26. BEND LEG BACK AS SHOWN. SOLDER LEG TO ITEM 26.

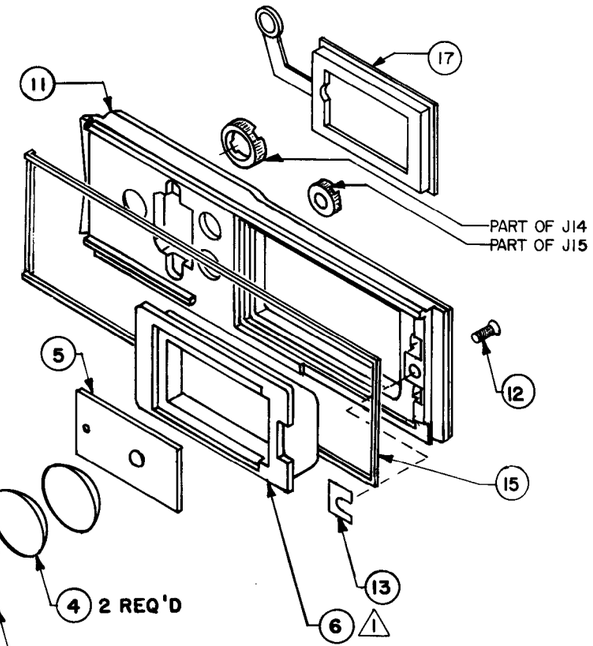


3. MODIFY ITEM 26 BEFORE INSTALLATION. REMOVE STAR WASH END BY CUTTING LUG AS SHOWN. INSTALL THE REMAIN PORTION WITH TWO HOLES BETWEEN J17 AND ITEM 7.

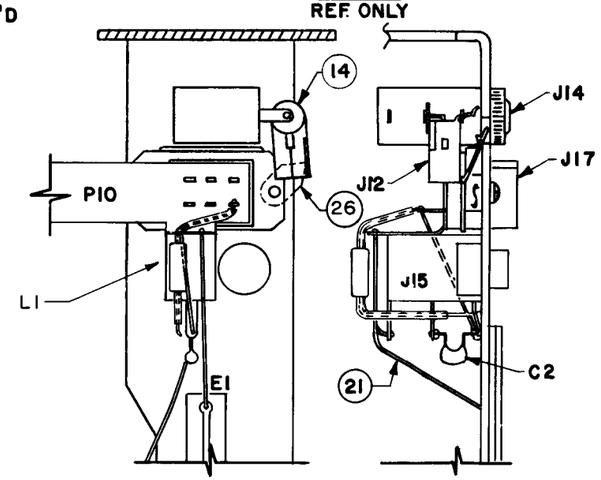


4. PREFORM REAR-MOST LEG OF J15 30°-45° TO THE REAR.

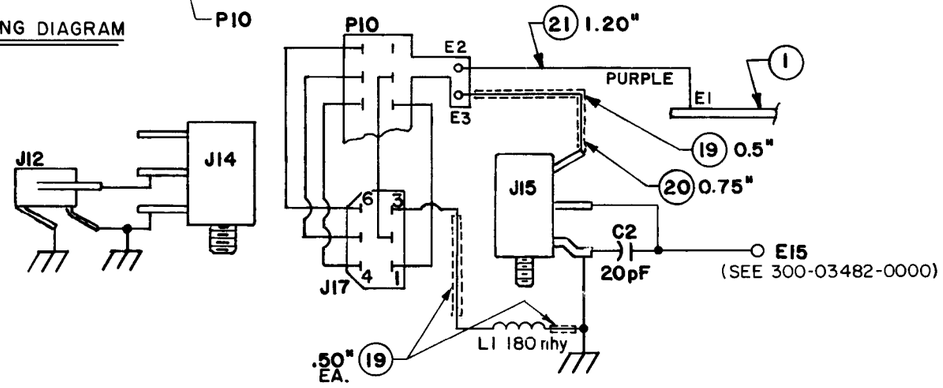




DETAIL
REF. ONLY



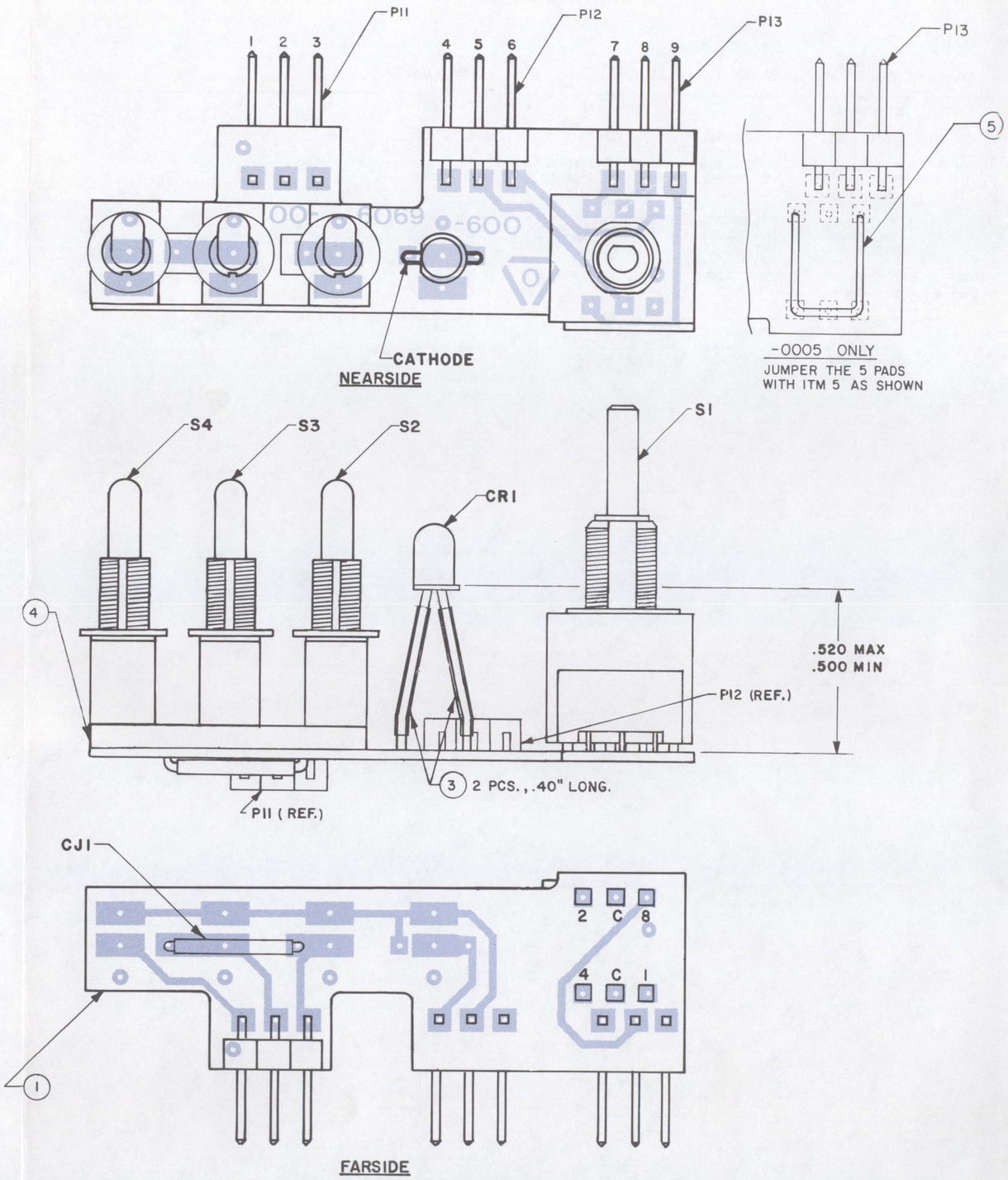
WIRING DIAGRAM

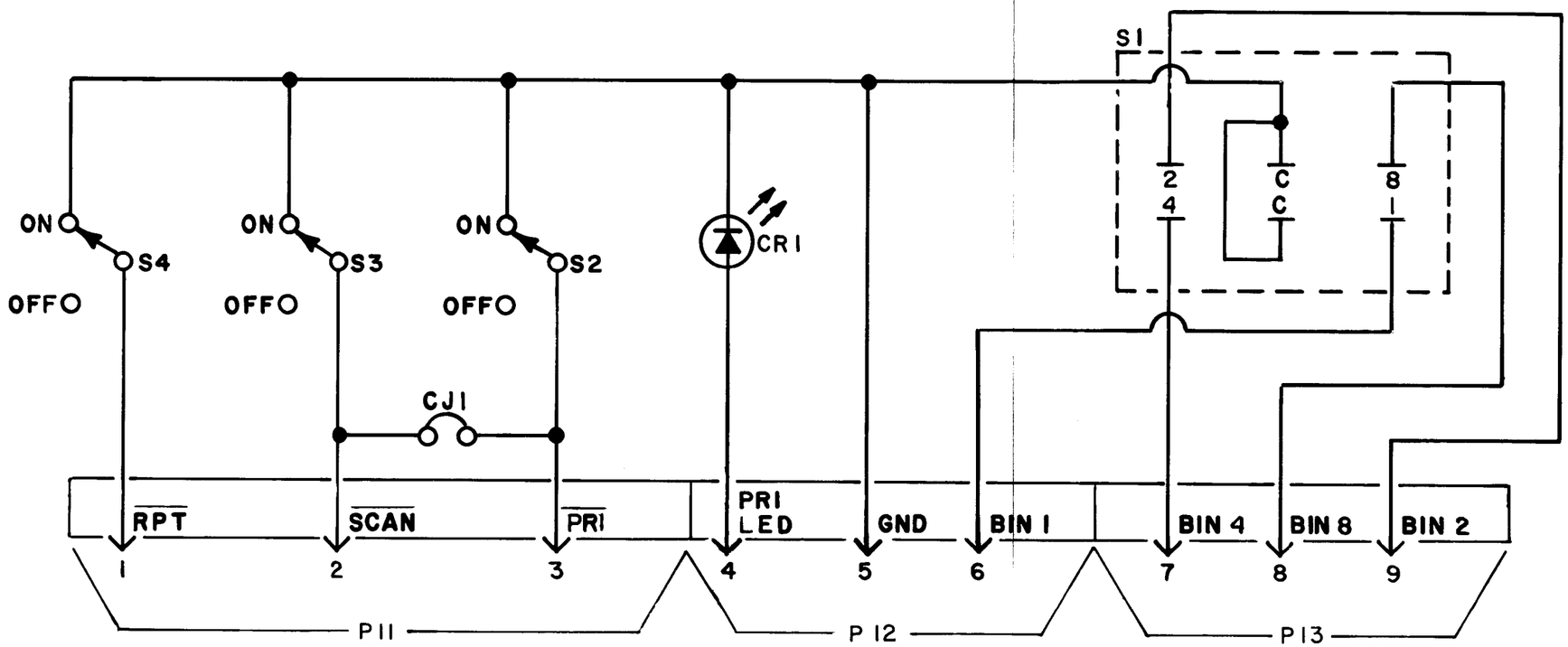


CONTROL BOARD

200-06909-0001 CONTROL BOARD

SYMBOL	OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY
	200-06909-0099		COMMON BOM	A	EA	1.00
CR 1	007-06176-0002	4810-2009-300	DIO MV5374C		EA	1.00
ITM 1	009-06909-0000	1700-5703-500	PC BD TOP CONTROL		EA	1.00
ITM 3	150-00002-0010	3101-0000-022	TUBING TFLN 26AWG		IN	0.800
ITM 4	088-02068-0000	1411-4004-300	SPACER, SWITCH		EA	1.00
P 11	030-02386-0003	2105-2031-703	HDR RT ANG 3P		EA	1.00
P 12	030-02386-0003	2105-2031-703	HDR RT ANG 3P		EA	1.00
P 13	030-02386-0003	2105-2031-703	HDR RT ANG 3P		EA	1.00
REF 1	300-06909-0000	0008-5705-300	TOP CNTRL BD ASSY		RF	X.
REF 2	002-06909-0000		SCH CONTROL BD		RF	X.
S 1	031-00474-0010	5111-2004-500	DIP SW MOD	A	EA	1.00
S 2	031-00480-0000	5114-2004-300	TOGGLE SWITCH		EA	1.00
S 3	031-00480-0000	5114-2004-300	TOGGLE SWITCH		EA	1.00
S 4	031-00480-0000	5114-2004-300	TOGGLE SWITCH		EA	1.00


P11
P12
P13
P13
1 2 3
4 5 6
7 8 9
5
CATHODE
NEARSIDE
-0005 ONLY
JUMPER THE 5 PADS
WITH ITM 5 AS SHOWN
S4
S3
S2
CR1
S1
4
.520 MAX
.500 MIN
P12 (REF.)
3 2 PCS., .40" LONG.
P11 (REF.)
CJ1
2 C 8
4 C 1
1
FARSIDE



* =0= CLOSED

CODE	S1 SWITCH POSITION															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	*		*		*		*		*		*		*		*	
2	*	*			*	*			*	*			*	*		
4	*	*	*	*					*	*	*	*				
8	*	*	*	*	*	*	*	*								

SYSTEMS BOARD

200-08727-0000 UHF SYSTEMS BD

SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0000
B	1	013-00173-0000	2502-2022-300	FERRITE BEAD		EA	1.00
B	2	013-00173-0000	2502-2022-300	FERRITE BEAD		EA	1.00
B	3	013-00173-0000	2502-2022-300	FERRITE BEAD		EA	1.00
B	4	013-00173-0000	2502-2022-300	FERRITE BEAD		EA	1.00
B	5	013-00173-0000	2502-2022-300	FERRITE BEAD		EA	1.00
C	1	106-00072-0026	1553-5237-763	CAP CH 27PFNPO/50V		EA	1.00
C	2	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	3	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	1.00
C	4	106-05471-0016	1553-5313-583	CAP CH470PFNPO/50V		EA	1.00
C	5	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	1.00
C	6	096-01186-0062	1552-6463-121	CAP 1.0UF 16V 20%		EA	1.00
C	7	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	8	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	9	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	10	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	11	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	13	106-05101-0016	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	14	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	15	096-01186-0014	1552-6463-126	CAP 10.0UF 16V 10%		EA	1.00
C	16	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	18	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	19	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	20	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	1.00
C	21	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	1.00
C	22	097-00213-0077	1513-3790-820	CAP AL 220.UF 16V		EA	1.00
C	23	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	27	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	28	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	29	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	30	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	31	106-00078-0010	1553-5525-341	CAP CERAMIC CHIP		EA	1.00
C	35	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	1.00
C	36	096-01186-0062	1552-6463-121	CAP 1.0UF 16V 20%		EA	1.00
C	37	096-01186-0032	1552-6463-130	CAP 2.2UF 35V 10%		EA	1.00
C	38	106-05104-0078	1553-5313-572	CAP CH 100KZ5U/50V		EA	1.00
C	41	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	1.00
C	43	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	1.00
C	44	106-05104-0078	1553-5313-572	CAP CH 100KZ5U/50V		EA	1.00
C	45	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	1.00
C	46	106-00072-0020	1553-2083-420	CAP CH 20PFNPO/50V		EA	1.00
C	47	106-00072-0020	1553-2083-420	CAP CH 20PFNPO/50V		EA	1.00
C	48	096-01186-0014	1552-6463-126	CAP 10.0UF 16V 10%		EA	1.00
C	50	106-00078-0010	1553-5525-341	CAP CERAMIC CHIP		EA	1.00
C	51	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	52	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	1.00
C	54	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	55	096-01186-0017	1552-6463-139	CAP 2.2UF 20V 10%		EA	1.00
C	57	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	1.00
C	59	106-05102-0016	1553-5313-582	CAP CH 1K NPO/50V		EA	1.00
C	60	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	1.00
C	61	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	62	106-05103-0048	1553-5313-572	CAP CH 10K X7R/50V		EA	1.00
C	63	102-00070-0001	1517-2054-501	CAP VAR 5.2-30N750		EA	1.00
C	64	106-00075-0002	1553-2044-702	MULTI LAYER CER CH		EA	1.00
C	66	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	68	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	69	106-05103-0048	1553-5313-572	CAP CH 10K X7R/50V		EA	1.00
C	77	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	1.00
C	78	106-04152-0016	1553-5237-723	CAPCH1500PFNPO/50V		EA	1.00
C	79	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	80	096-01186-0059	1552-6463-137	CAP 4.7UF 10V 20%		EA	1.00
C	81	096-01186-0026	1552-6463-116	CAP .22UF 35V 10%		EA	1.00
C	82	108-05077-0001	1528-2044-201	CAP PC 1.0UF30V10%		EA	1.00
C	84	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	1.00
C	85	106-04473-0047	1553-5237-782	CAP CH 47K X7R/50V		EA	1.00
C	86	106-05182-0047	1553-5237-736	CAPCH1800PFX7R/50V		EA	1.00
C	87	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	1.00
C	88	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	89	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00

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SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0000
C	90	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	91	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	92	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	93	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	94	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	100	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	1.00
C	101	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	103	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	104	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	105	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	106	096-01186-0014	1552-6463-126	CAP 10.0UF 16V 10%		EA	1.00
C	109	096-01186-0062	1552-6463-121	CAP 1.0UF 16V 20%		EA	1.00
C	110	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	111	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	112	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	114	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	115	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	1.00
C	116	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	117	106-05104-0078	1553-5313-572	CAP CH 100KZ5U/50V		EA	1.00
C	119	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	120	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	121	106-05103-0048	1553-5313-572	CAP CH 10K X7R/50V		EA	1.00
C	122	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	123	096-01186-0014	1552-6463-126	CAP 10.0UF 16V 10%		EA	1.00
C	124	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	1.00
C	125	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	127	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	128	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	130	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	131	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	132	096-01186-0062	1552-6463-121	CAP 1.0UF 16V 20%		EA	1.00
C	133	106-00078-0010	1553-5525-341	CAP CERAMIC CHIP		EA	1.00
C	134	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	135	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	136	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
C	137	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	1.00
C	138	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00
CR	4	007-06184-0000	4824-2008-500	DIO DUAL SWITCHING		EA	1.00
CR	5	007-06180-0000	4824-2009-400	DIO SW MMBD6050		EA	1.00
CR	6	007-06184-0000	4824-2008-500	DIO DUAL SWITCHING		EA	1.00
CR	8	007-04066-0000	4824-2021-200	DIODE DUAL VAR		EA	1.00
CR	9	007-04066-0000	4824-2021-200	DIODE DUAL VAR		EA	1.00
CR	10	007-06180-0000	4824-2009-400	DIO SW MMBD6050		EA	1.00
CR	11	007-06180-0000	4824-2009-400	DIO SW MMBD6050		EA	1.00
DS	1	007-06176-0003	4810-2009-301	DIO MV5774C		EA	1.00
I	1	120-03196-0000	3134-3670-504	IC LM2902D		EA	1.00
I	2	120-06084-0003	3134-2061-700	HEX 3 STATE BUFFER		EA	1.00
I	3	120-03195-0000	3134-3670-413	IC LM2904D		EA	1.00
I	4	120-03274-0000	3134-3670-403	VOLT REG LM2951ACM		EA	1.00
I	5	122-05037-0000	7019-2003-101	EPU/V CORE OTP PRC		EA	1.00
I	6	120-03195-0000	3134-3670-413	IC LM2904D		EA	1.00
I	7	120-03428-0000	3134-2048-800	AUD AMP SL6310L/MP		EA	1.00
I	8	120-02163-0000	3134-2040-000	EEPROM 2048X8 BIT		EA	1.00
I	9	120-03191-0000	3134-2046-300	IC OP AMP MC1776CD		EA	1.00
I	10	120-03194-0000	3134-2006-700	IC OP AMP MC1741CD		EA	1.00
I	11	120-06132-0002	3134-2010-200	IC FREQ SYN		EA	1.00
I	12	120-04027-0000	3134-2040-700	PRESCALER		EA	1.00
I	13	120-06056-0003	3134-2040-800	4094(SO) REGISTER		EA	1.00
I	14	120-06139-0000	3134-2041-100	QUAD ANALOG SWITCH		EA	1.00
I	15	120-06131-0000	3134-3670-505	IC QUAD ANLG SW		EA	1.00
I	16	120-03274-0000	3134-3670-403	VOLT REG LM2951ACM		EA	1.00
ITM	1	009-08727-0000	1700-5705-000	PC BD SYSTEMS		EA	1.00
ITM	10	012-01174-0000	3110-2001-500	INSULATOR		EA	1.00
ITM	11	026-00030-0000	6024-0000-001	WIRE CU24AWG TIN		AR	1.00
ITM	12	195-00153-0000	0011-2076-200	CRYSTAL KIT		EA	1.00
ITM	13	016-01082-0000	1607-0000-001	DC RTV 3145		AR	1.00
ITM	14	016-01124-0001	1601-2000-902	TAPE DOUB SIDE FOA		IN	1.35
ITM	15	150-00003-0010	3101-0000-013	TUBING TFLN 24AWG		IN	1.28
ITM	19	047-10358-0001	2508-4008-001	SYNTH FENCE LEFT	A	EA	1.00
ITM	20	047-10359-0001	2508-4008-101	SYNTH FENCE RIGHT	A	EA	1.00

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SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0000
J	7	030-03052-0006	2105-2017-606	BOX CONN STRIP		EA	1.00
J	8	030-03052-0006	2105-2017-606	BOX CONN STRIP		EA	1.00
L	1	019-02084-0065	1802-2013-765	CH 68UH 10%		EA	1.00
L	2	019-02660-0052	1808-2013-652	INDUCT SURFACE MT		EA	1.00
L	3	019-02725-0028	1808-2042-428	INDCTR SURFACE MT		EA	1.00
L	4	019-02660-0021	1808-2013-621	SURFACE MT, 470 NH		EA	1.00
L	5	019-02660-0021	1808-2013-621	SURFACE MT, 470 NH		EA	1.00
P	1	030-01411-0000	2107-2031-500	PC 10'S		EA	5.00
P	2	030-03247-0003	2105-2032-203	STRAIGHT HEADER		EA	1.00
P	5	030-02898-0008	2105-2031-800	LO PRFL TERM STRIP		EA	1.00
P	6	030-02386-0001	2105-2031-701	HDR RT ANG 1P		EA	1.00
Q	1	007-00535-0001	4823-2020-200	XSTR JFET MMBF4392		EA	1.00
Q	3	007-08064-0014	4823-2010-814	XSTR PNP 4.7K, 10K		EA	1.00
Q	4	007-00537-0000	4823-3741-301	XSTR PNP MMBT5087		EA	1.00
Q	5	007-08064-0017	4823-2010-817	XSTR NPN 47K. 47K		EA	1.00
Q	6	007-08064-0014	4823-2010-814	XSTR PNP 4.7K, 10K		EA	1.00
Q	7	007-08064-0014	4823-2010-814	XSTR PNP 4.7K, 10K		EA	1.00
Q	8	007-08064-0014	4823-2010-814	XSTR PNP 4.7K, 10K		EA	1.00
Q	9	007-08064-0014	4823-2010-814	XSTR PNP 4.7K, 10K		EA	1.00
Q	10	007-08064-0014	4823-2010-814	XSTR PNP 4.7K, 10K		EA	1.00
Q	12	007-00065-0001	4823-3669-001	XSTR 2N3906 (SOT)		EA	1.00
Q	13	007-00065-0001	4823-3669-001	XSTR 2N3906 (SOT)		EA	1.00
Q	14	007-00537-0000	4823-3741-301	XSTR PNP MMBT5087		EA	1.00
Q	15	007-00903-0000	4823-2025-100	2N7002 MOSFET		EA	1.00
Q	16	007-00813-0000	4823-2020-300	XSTR NPN S MMBTA14		EA	1.00
Q	17	007-00537-0000	4823-3741-301	XSTR PNP MMBT5087		EA	1.00
Q	23	007-08064-0017	4823-2010-817	XSTR NPN 47K. 47K		EA	1.00
Q	24	007-08064-0016	4823-3680-006	XSTR PNP 47K. 47K		EA	1.00
Q	25	007-08064-0017	4823-2010-817	XSTR NPN 47K. 47K		EA	1.00
Q	26	007-00821-0000	4824-2020-400	XSTR RF MMBR901		EA	1.00
Q	29	007-08064-0017	4823-2010-817	XSTR NPN 47K. 47K		EA	1.00
Q	30	007-08064-0017	4823-2010-817	XSTR NPN 47K. 47K		EA	1.00
Q	31	007-08064-0014	4823-2010-814	XSTR PNP 4.7K, 10K		EA	1.00
R	1	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00
R	2	130-05101-0013	4724-0101-233	RES CH 100 TW 5%		EA	1.00
R	3	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	1.00
R	4	139-04752-0010	4724-4752-113	RES CH 47.5K TW 1%		EA	1.00
R	5	139-02433-0010	4724-2433-113	RES CH 243K TW 1%		EA	1.00
R	6	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	1.00
R	7	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	1.00
R	8	133-00270-0007	4750-2003-904	RES VA 100K.08W20%		EA	1.00
R	9	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00
R	10	131-05123-0003	4720-0123-234	RES MELF 12K TW 5%		EA	1.00
R	11	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00
R	12	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00
R	13	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00
R	14	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	1.00
R	17	130-05101-0013	4724-0101-233	RES CH 100 TW 5%		EA	1.00
R	18	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00
R	19	130-05100-0013	4724-0100-233	RES CH 10 TW 5%		EA	1.00
R	20	130-05914-0013	4724-0914-233	RES CH 910K TW 5%		EA	1.00
R	21	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	1.00
R	22	133-00270-0007	4750-2003-904	RES VA 100K.08W20%		EA	1.00
R	24	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	1.00
R	25	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	1.00
R	26	139-02433-0010	4724-2433-113	RES CH 243K TW 1%		EA	1.00
R	27	133-00272-0007	4719-2046-007	RES VARI 100K 30%		EA	1.00
R	28	139-01213-0010	4724-1213-113	RES CH 121K TW 1%		EA	1.00
R	29	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	1.00
R	30	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	1.00
R	33	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	1.00
R	34	130-05152-0013	4724-0152-233	RES CH 1.5K TW 5%		EA	1.00
R	35	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	1.00
R	36	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	1.00
R	37	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	1.00
R	38	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	1.00
R	39	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	1.00
R	40	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	1.00
R	41	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	1.00

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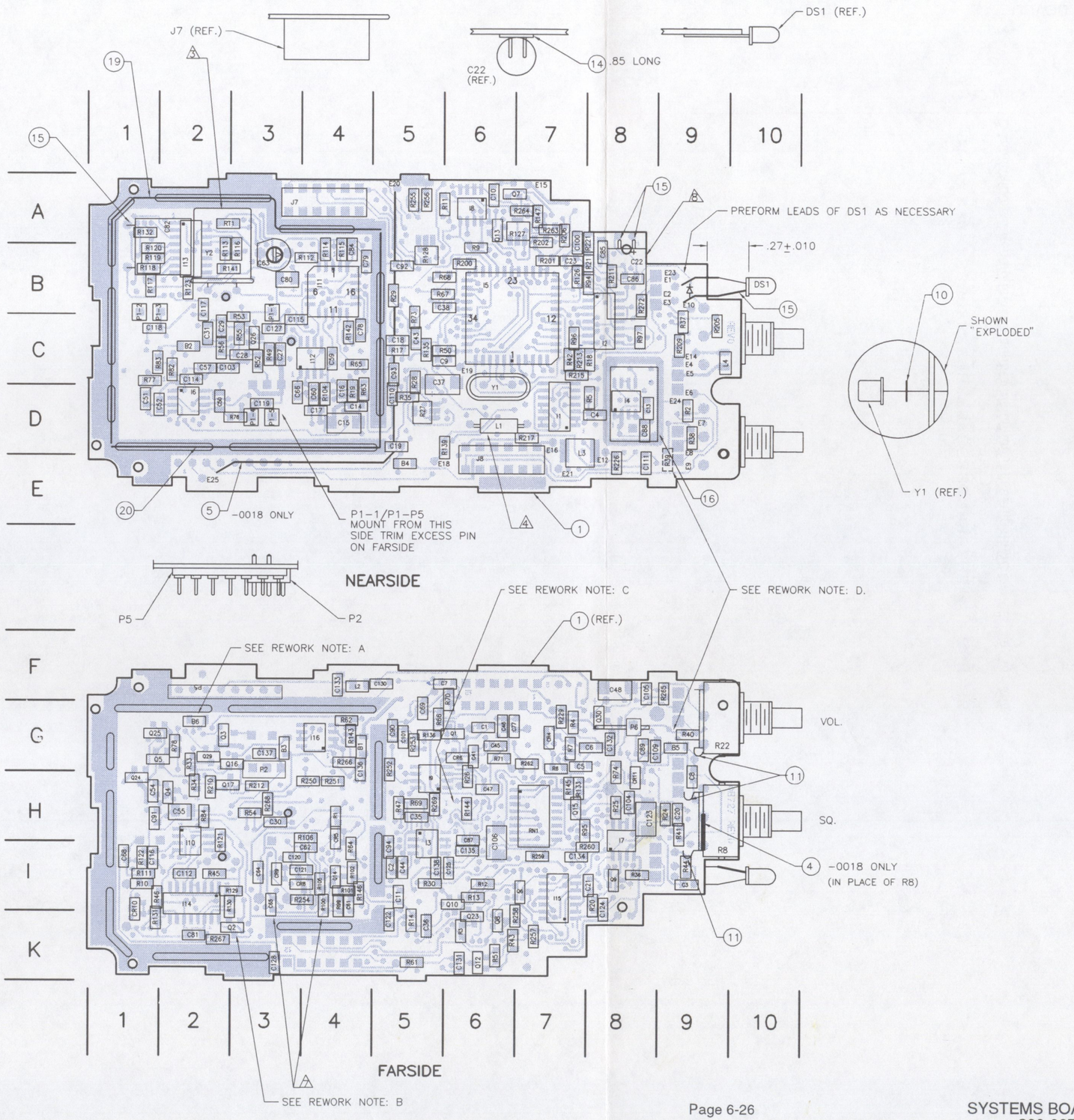
SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0000
R	42	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00
R	43	130-05471-0023	4718-5237-318	RES CHIP 470EW5%		EA	1.00
R	44	130-05471-0023	4718-5237-318	RES CHIP 470EW5%		EA	1.00
R	45	130-05000-0015	4724-0000-009	RES CH 0 TW		EA	1.00
R	46	130-05200-0013	4724-0200-233	RES CH 20 TW 5%		EA	1.00
R	47	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00
R	49	130-05471-0013	4724-0471-233	RES CH 470 TW 5%		EA	1.00
R	50	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	1.00
R	51	130-05243-0013	4724-0243-233	RES CH 24K TW 5%		EA	1.00
R	52	130-05271-0013	4724-0271-233	RES CH 270 TW 5%		EA	1.00
R	53	130-05101-0013	4724-0101-233	RES CH 100 TW 5%		EA	1.00
R	54	130-05101-0013	4724-0101-233	RES CH 100 TW 5%		EA	1.00
R	55	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00
R	56	130-05302-0013	4724-0302-233	RES CH 3K TW 5%		EA	1.00
R	61	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	1.00
R	62	130-05101-0013	4724-0101-233	RES CH 100 TW 5%		EA	1.00
R	63	130-05100-0013	4724-0100-233	RES CH 10 TW 5%		EA	1.00
R	64	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	1.00
R	65	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	1.00
R	66	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	1.00
R	67	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	1.00
R	68	139-03323-0010	4724-3323-113	RES CH 332K TW 1%		EA	1.00
R	69	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00
R	70	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	1.00
R	71	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	1.00
R	73	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	1.00
R	74	130-05394-0013	4724-0394-233	RES CH 390K TW 5%		EA	1.00
R	76	130-05473-0013	4724-0473-233	RES CH 47K TW 5%		EA	1.00
R	77	130-05204-0013	4724-0204-233	RES CH 200K TW 5%		EA	1.00
R	78	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	1.00
R	82	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00
R	83	130-05752-0013	4724-0752-233	RES CH 7.5K TW 5%		EA	1.00
R	84	130-05030-0013	4724-0030-233	RES CH 3 OHM TW 5%		EA	1.00
R	94	130-05164-0013	4724-0164-233	RES CH 160K TW 5%		EA	1.00
R	95	130-05823-0013	4724-0823-233	RES CH 82K TW 5%		EA	1.00
R	96	130-05393-0013	4724-0393-233	RES CH 39K TW 5%		EA	1.00
R	97	130-05203-0013	4724-0203-233	RES CH 20K TW 5%		EA	1.00
R	99	130-05224-0013	4724-0224-233	RES CH 220K TW 5%		EA	1.00
R	101	130-05823-0013	4724-0823-233	RES CH 82K TW 5%		EA	1.00
R	102	130-05244-0013	4724-0244-233	RES CH 240K TW 5%		EA	1.00
R	104	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00
R	105	130-05333-0013	4724-0333-233	RES CH 33K TW 5%		EA	1.00
R	106	130-05333-0013	4724-0333-233	RES CH 33K TW 5%		EA	1.00
R	111	131-05243-0003	4720-0243-234	RES MELF 24K TW 5%		EA	1.00
R	112	130-05332-0013	4724-0332-233	RES CH 3.3K TW 5%		EA	1.00
R	113	139-01002-0010	4724-1002-113	RES CH 10K TW 1%		EA	1.00
R	114	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	1.00
R	115	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00
R	116	139-02002-0010	4724-2002-113	RES CH 20K TW 1%		EA	1.00
R	117	139-03922-0010	4724-3922-113	RES CH 39.2K TW 1%		EA	1.00
R	118	139-08252-0010	4724-8252-113	RES CH 82.5K TW 1%		EA	1.00
R	119	130-05164-0013	4724-0164-233	RES CH 160K TW 5%		EA	1.00
R	120	130-05334-0013	4724-0334-233	RES CH 330K TW 5%		EA	1.00
R	121	131-05563-0003	4720-0563-134	RES MELF 56K TW 5%		EA	1.00
R	122	130-05134-0013	4724-0134-233	RES CH 130K TW 5%		EA	1.00
R	123	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00
R	126	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00
R	127	133-00272-0004	4719-2046-004	RES VARI 10K 30%		EA	1.00
R	128	133-00272-0007	4719-2046-007	RES VARI 100K 30%		EA	1.00
R	129	130-05624-0013	4724-0624-233	RES CH 620K TW 5%		EA	1.00
R	130	130-05303-0013	4724-0303-233	RES CH 30K TW 5%		EA	1.00
R	131	130-05163-0013	4724-0163-233	RES CH 16K TW 5%		EA	1.00
R	132	130-05302-0013	4724-0302-233	RES CH 3K TW 5%		EA	1.00
R	133	130-05823-0013	4724-0823-233	RES CH 82K TW 5%		EA	1.00
R	135	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	1.00
R	136	130-05473-0013	4724-0473-233	RES CH 47K TW 5%		EA	1.00
R	139	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	1.00
R	141	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00
R	142	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	1.00
R	143	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	1.00
R	144	130-05101-0013	4724-0101-233	RES CH 100 TW 5%		EA	1.00
R	145	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	1.00
R	146	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	1.00

SYSTEMS BOARD

200-08727-0000

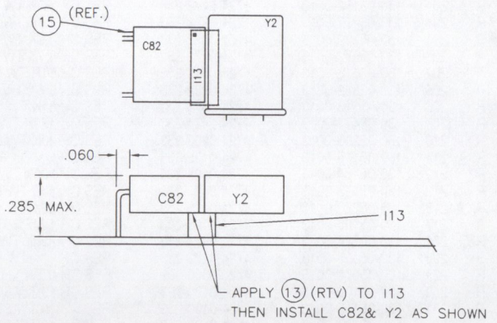
SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0000
R	147	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	1.00
R	200	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00
R	201	130-05182-0013	4724-0182-233	RES CH 1.8K TW 5%		EA	0.25
R	201	130-05272-0013	4724-0272-233	RES CH 2.7K TW 5%		EA	0.25
R	201	130-05392-0013	4724-0392-233	RES CH 3.9K TW 5%		EA	0.25
R	201	130-05472-0013	4724-0472-233	RES CH 4.7K TW 5%		EA	0.25
R	202	130-05513-0013	4724-0513-233	RES CH 51K TW 5%		EA	1.00
R	205	130-05682-0013	4724-0682-233	RES CH 6.8K TW 5%		EA	1.00
R	206	130-05513-0013	4724-0513-233	RES CH 51K TW 5%		EA	1.00
R	209	130-05474-0013	4724-0474-233	RES CH 470K TW 5%		EA	1.00
R	210	130-05203-0013	4724-0203-233	RES CH 20K TW 5%		EA	1.00
R	211	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	1.00
R	212	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	1.00
R	213	130-05473-0013	4724-0473-233	RES CH 47K TW 5%		EA	1.00
R	215	130-05223-0013	4724-0223-233	RES CH 22K TW 5%		EA	1.00
R	217	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	1.00
R	221	130-05224-0013	4724-0224-233	RES CH 220K TW 5%		EA	1.00
R	226	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00
R	229	130-05000-0015	4724-0000-009	RES CH 0 TW		EA	1.00
R	250	130-05100-0013	4724-0100-233	RES CH 10 TW 5%		EA	1.00
R	251	130-05100-0013	4724-0100-233	RES CH 10 TW 5%		EA	1.00
R	252	130-05100-0013	4724-0100-233	RES CH 10 TW 5%		EA	1.00
R	253	130-05101-0013	4724-0101-233	RES CH 100 TW 5%		EA	1.00
R	254	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	1.00
R	255	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	1.00
R	256	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	1.00
R	258	130-05000-0015	4724-0000-009	RES CH 0 TW		EA	1.00
R	260	130-05000-0015	4724-0000-009	RES CH 0 TW		EA	1.00
R	262	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	1.00
R	263	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	1.00
R	264	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	1.00
R	265	130-05243-0013	4724-0243-233	RES CH 24K TW 5%		EA	1.00
R	266	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00
R	267	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	1.00
R	268	130-05100-0013	4724-0100-233	RES CH 10 TW 5%		EA	1.00
R	269	130-05101-0013	4724-0101-233	RES CH 100 TW 5%		EA	1.00
R	272	130-05000-0015	4724-0000-009	RES CH 0 TW		EA	1.00
REF	1	300-08727-0000	0008-5705-000	SYSTEMS BD ASSY		RF	X.
REF	2	002-08727-0000	0007-5705-000	SCH SYSTEMS BD		RF	X.
RN	1	015-00208-0006	4726-2041-606	R/2R NETWORK		EA	1.00
RT	1	134-01044-0013	5302-2025-813	THRMSTR SURFACE MT		EA	1.00
Y	1	044-00245-0000	2342-2048-600	XTAL 4.00MHZ		EA	1.00
Y	2	044-00158-0000	2338-2024-700	10.4 MHZ QZ XSTAL		EA	1.00



NOTE:

1. TRIM ENDS OF SWITCH SPRING WIRES ON R8 AND R22 FLUSH OR BELOW TOP OF SWITCH BODY. SWITCHES WILL BE MOUNTED .031 IN. ABOVE BOARD SURFACE.
2. Y2 IS SOLDERED UPRIGHT AND THEN LAYED DOWN AS SHOWN AFTER FAIRCHILD TESTING IS COMPLETED.

⚠3 SEE DETAILS BELOW FOR C82 & Y2 ASS'Y INFORMATION. (C82, Y2, I13 ONLY ARE SHOWN):

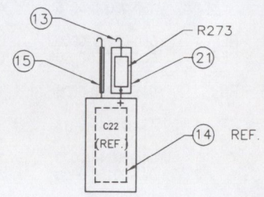


⚠4 PREFORM L1 LEADS AND SURFACE MOUNT WITH THE DEVICE DOWN AGAINST THE BOARD SURFACE.

5. DUE TO HEIGHT RESTRICTIONS, ALL LEADED DEVICES MUST BE MOUNTED AS CLOSE TO THE BOARD SURFACE AS POSSIBLE.
6. PLACE FENCE ASSYS (ITMS 19 & 20) INTO BOARD SLOTS FROM NEARSIDE. MAKE SURE THE BOTTOM EDGE OF FENCE REMAINS FLUSH WITH BOARD SURFACE WITH SOLDERING.

⚠1 USE MATCHED COMPONENT SET (3 PCS.) AS SPECIFIED IN (12) CRYSTAL KIT.

⚠6 C22 INSTALLATION DETAILS FOR -0013 FM VERSION. REPOSITION C22 TOWARD CENTER OF PCBD. SPLICE R273 ON TO POSITIVE LEAD USING MINIMUM LEAD LENGTHS. BUTT TEFLON TUBING AGAINST BODY OF C22 WHILE APPLYING RTV TO PCB, EXPOSED LEADS AND OPEN ENDS OF TEFLON TUBING.



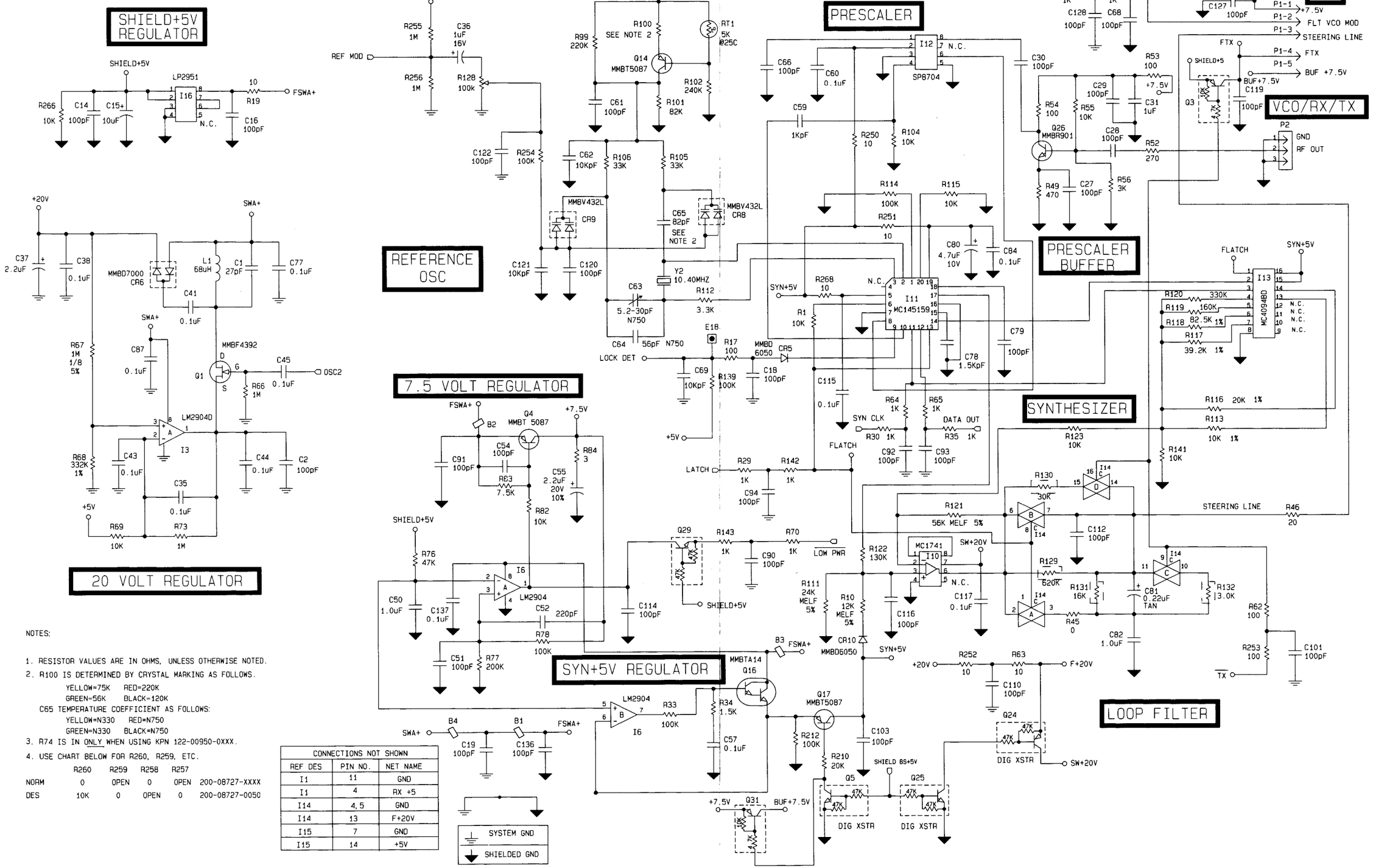
REWORK NOTES:

A. REMOVE B6 FROM FARSIDE IF PRESENT. CUT TRACE CONNECTING LEFT PAD OF B6 TO VIA. ADD Q31 WITH BASE CONNECTED TO LEFT B6 PAD, COLLECTOR CONNNECTED TO RIGHT B6 PAD AND EMMITTER CONNECTED TO DISCONNECTED VIA. ADD JUMPER WIRE FROM LEFT B6 PAD TO Q5 COLLECTOR.

B. REMOVE Q2 FROM FARSIDE IF PRESENT. ADD JUMPER WIRE FROM Q2 BASE PAD TO Q2 COLLECTOR PAD.

C. ON FARSIDE, CUT TRACE THAT CONNECTS TWO VIAS AND RUNS DIRECTLY BELOW R144. ADD JUMPER WIRE FROM LEFT VIA OF CUT TRACE TO VIA JUST TO THE LEFT OF PIN 3 OF RN1.

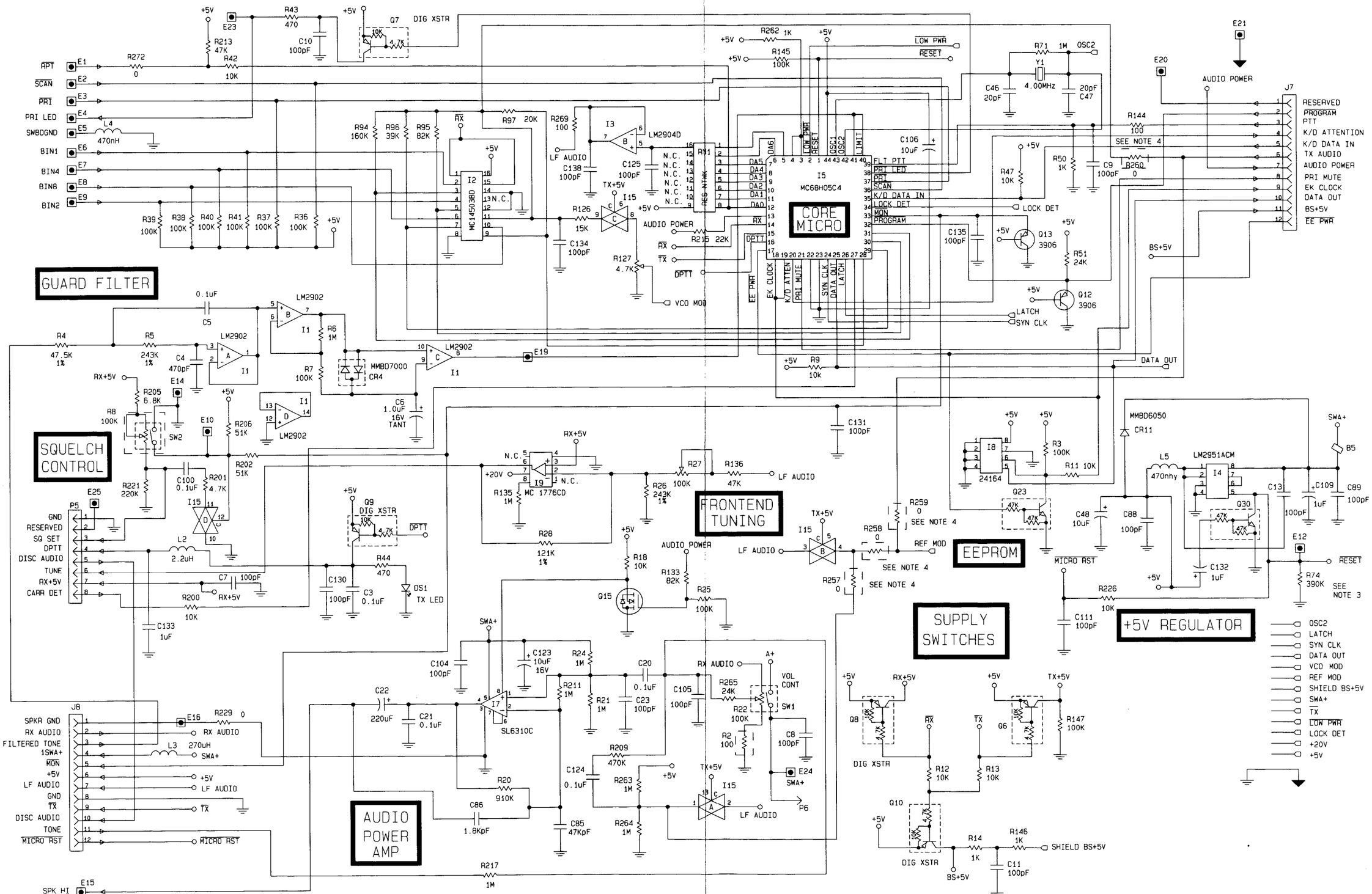
D. REMOVE R39 FROM NEARSIDE. ON FARSIDE, SOLDER R39 BETWEEN THE VIA CONNECTED TO THE LEFT PAD OF R40 AND THE VIA JUST ABOVE B5.



NOTES:

1. RESISTOR VALUES ARE IN OHMS, UNLESS OTHERWISE NOTED.
2. R100 IS DETERMINED BY CRYSTAL MARKING AS FOLLOWS.
   YELLOW=75K RED=220K
   GREEN=56K BLACK=120K
   C65 TEMPERATURE COEFFICIENT AS FOLLOWS:
   YELLOW=N330 RED=N750
   GREEN=N330 BLACK=N750
3. R74 IS IN ONLY WHEN USING KPN 122-00950-0XXX.
4. USE CHART BELOW FOR R260, R259, ETC.

	R260	R259	R258	R257	
NORM	0	OPEN	0	OPEN	200-08727-XXXX
DES	10K	0	OPEN	0	200-08727-0050


GUARD FILTER
SQUELCH CONTROL
AUDIO POWER AMP
FRONTEND TUNING
EEPROM
SUPPLY SWITCHES
+5V REGULATOR
CORE MICRO
MC68H05C4
MC1450360
MC 1776CD
SL6310C
LM2902
LM2904D
LM2951ACM
MMBD7000
MMBD6050
DIG XSTR
APT
SCAN
PRI
PRI LED
SWBDGND
BIN1
BIN4
BIN8
BIN2
LF AUDIO
RX AUDIO
FILTERED TONE
SPK HI
SPKR GND
VCO MOD
LOCK DET
LATCH
SYN CLK
DATA OUT
AUDIO POWER
REF MOD
MICRO RST
SHIELD BS+5V
SEE NOTE 4
SEE NOTE 3
RESERVED
PROGRAM
PTT
K/D ATTENTION
K/D DATA IN
TX AUDIO
AUDIO POWER
PRI MUTE
EK CLOCK
DATA OUT
BS+5V
EE PWR
OSC2
LATCH
SYN CLK
DATA OUT
VCO MOD
REF MOD
SHIELD BS+5V
SWA+
TX
LOW PWR
LOCK DET
+20V
+5V

SYSTEMS BOARD

200-06912-0010	SYSTEMS BOARD 14 CH
200-06912-0011	SYSTEMS BOARD 42 CH
200-06912-0012	SYSTEMS BOARD 210 CH
200-06912-0098	COMMON BOM

SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 14CH 0010	42CH 0011	210CH 0012	COMMON 0098
		200-06912-0098		COMMON BOM	A	EA	1.00	1.00	1.00	.
C	1	106-00072-0026	1553-2083-426	CAP CH 27PFNPO/50V		EA	.	.	.	1.00
C	2	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	3	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	.	.	.	1.00
C	4	106-06472-0014	1553-5313-546	CAP CH 4.7K NP0/50		EA	.	.	.	1.00
C	5	106-06472-0014	1553-5313-546	CAP CH 4.7K NP0/50		EA	.	.	.	1.00
C	6	096-01186-0062	1552-6463-121	CAP 1.0UF 16V 20%		EA	.	.	.	1.00
C	7	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	8	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	10	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	20	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	.	.	.	1.00
C	21	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	.	.	.	1.00
C	22	097-00213-0077	1513-3790-820	CAP AL 220.UF 16V		EA	.	.	.	1.00
C	23	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	24	106-04562-0046		CAP CH 5600PF X7R		EA	.	.	.	1.00
C	25	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	35	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	.	.	.	1.00
C	36	096-01186-0064	1552-6463-113	CAP 10UF 16V 20%		EA	.	.	.	1.00
C	37	097-00109-0000	1513-3254-781	CAP EL 2.2UF 50V		EA	.	.	.	1.00
C	38	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	.	.	.	1.00
C	40	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	.	.	.	1.00
C	41	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	.	.	.	1.00
C	43	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	.	.	.	1.00
C	44	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	.	.	.	1.00
C	45	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	.	.	.	1.00
C	46	106-00072-0020	1553-2083-420	CAP CH 20PFNPO/50V		EA	.	.	.	1.00
C	47	106-00072-0020	1553-2083-420	CAP CH 20PFNPO/50V		EA	.	.	.	1.00
C	48	096-01186-0086	1552-6463-120	CAP 10UF 35V 20%		EA	.	.	.	1.00
C	50	106-00078-0010	1553-5525-341	CAP CERAMIC CHIP		EA	.	.	.	1.00
C	51	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	52	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	.	.	.	1.00
C	54	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	55	106-04153-0047	1553-5237-764	CAP CH 15K X7R/50V		EA	.	.	.	1.00
C	56	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	.	.	.	1.00
C	57	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	.	.	.	1.00
C	59	106-05102-0016	1553-5313-582	CAP CH 1K NPO/50V		EA	.	.	.	1.00
C	60	106-04103-0047	1553-5237-705	CH 10K X7R/50V		EA	.	.	.	1.00
C	61	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	62	106-04103-0046	1553-5237-705	CAP CH 10K X7R/50V		EA	.	.	.	1.00
C	63	102-00070-0001	1517-2054-501	CAP VAR 5.2-30N750		EA	.	.	.	1.00
C	64	106-00075-0002	1553-2044-702	MULTI LAYER CER CH		EA	.	.	.	1.00
C	66	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	.	.	.	1.00
C	67	106-00072-0044	1553-2083-444	CAP CH 1.5PF		EA	.	.	.	1.00
C	68	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	.	.	.	1.00
C	69	106-04103-0046	1553-5237-705	CAP CH 10K X7R/50V		EA	.	.	.	1.00
C	70	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	.	.	.	1.00
C	77	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	.	.	.	1.00
C	78	106-04152-0047	1553-5525-355	CAPCH1500PFX7R/50V		EA	.	.	.	1.00
C	79	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	80	096-01186-0067	1552-6463-131	CAP 2.2UF 20V 20%		EA	.	.	.	1.00
C	81	096-01186-0026	1552-6463-116	CAP .22UF 35V 10%		EA	.	.	.	1.00
C	82	108-05077-0001	1528-2044-201	CAP PC 1.0UF30V10%		EA	.	.	.	1.00
C	83	096-01186-0062	1552-6463-121	CAP 1.0UF 16V 20%		EA	.	.	.	1.00
C	84	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	.	.	.	1.00
C	85	106-04473-0047	1553-5237-782	CAP CH 47K X7R/50V		EA	.	.	.	1.00
C	86	106-05182-0047	1553-5237-736	CAPCH1800PFX7R/50V		EA	.	.	.	1.00
C	87	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	88	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	89	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	90	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	91	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	92	106-04333-0046	1553-5237-791	CAP CH 33K X7R/50V		EA	.	.	.	1.00
C	100	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	.	.	.	1.00
C	101	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	102	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	103	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	104	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	105	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	109	096-01186-0062	1552-6463-121	CAP 1.0UF 16V 20%		EA	.	.	.	1.00

SYSTEMS BOARD

200-06912-0000

SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 14CH 0010	42CH 0011	210CH 0012	COMMON 0098
C	110	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	111	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	112	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	113	106-00072-0006	1553-2083-406	CAP CH5.6PFNPO/50V		EA	.	.	.	1.00
C	114	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	115	106-05101-0016	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	117	106-05101-0016	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	121	097-00109-0006	1513-3254-774	CAP EL 100UF 16V		EA	.	.	.	1.00
C	123	111-00002-0008	1518-2049-308	CAP .0022UF 5% NPO		EA	.	.	.	1.00
C	124	106-05101-0016	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	125	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	126	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
C	127	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	.	.	1.00
CR	1	007-05117-0007	4828-2009-200	DIO Z 6.2V SOT		EA	.	.	.	1.00
CR	2	007-05117-0007	4828-2009-200	DIO Z 6.2V SOT		EA	.	.	.	1.00
CR	3	007-06181-0000	4824-2009-500	DIO DUAL MMBD2835		EA	.	.	.	1.00
CR	4	007-06184-0000	4824-2008-500	DIO DUAL SWITCHING		EA	.	.	.	1.00
CR	5	007-06180-0000	4824-2009-400	DIO SW MMBD6050		EA	.	.	.	1.00
CR	6	007-06184-0000	4824-2008-500	DIO DUAL SWITCHING		EA	.	.	.	1.00
CR	8	007-04066-0000	4824-2021-200	DIODE DUAL VAR		EA	.	.	.	1.00
CR	9	007-04066-0000	4824-2021-200	DIODE DUAL VAR		EA	.	.	.	1.00
CR	10	007-06180-0000	4824-2009-400	DIO SW MMBD6050		EA	.	.	.	1.00
CR	11	007-06180-0000	4824-2009-400	DIO SW MMBD6050		EA	.	.	.	1.00
DS	1	007-06176-0003	4810-2009-301	DIO MV5774C		EA	.	.	.	1.00
I	1	120-03195-0000	3134-3670-413	IC LM2904D		EA	.	.	.	1.00
I	2	120-06084-0003	3134-2061-700	HEX 3 STATE BUFFER		EA	.	.	.	1.00
I	3	120-03195-0000	3134-3670-413	IC LM2904D		EA	.	.	.	1.00
I	4	120-03274-0000	3134-3670-403	VOLT REG LM2951ACM		EA	.	.	.	1.00
I	5	122-00886-0002	3134-2095-100	KNR UHF PROC	A	EA	1.00	1.00	1.00	.
I	6	120-03533-0000	3134-2091-300	AMP OP DUAL		EA	.	.	.	1.00
I	7	120-03428-0000	3134-2048-800	AUD AMP SL6310L/MP		EA	.	.	.	1.00
I	8	120-02159-0005	3130-3359-816	EEPROM 16K CMOS		EA	1.00	1.00	1.00	.
I	9	120-03191-0000	3134-2046-300	IC OP AMP MC1776CD		EA	.	.	.	1.00
I	10	120-03194-0000	3134-2006-700	IC OP AMP MC1741CD		EA	.	.	.	1.00
I	11	120-06132-0002	3134-2010-200	IC FREQ SYN		EA	.	.	.	1.00
I	12	120-04027-0000	3134-2040-700	PRESCALER		EA	.	.	.	1.00
I	13	120-06056-0003	3134-2040-800	4094(SO) REGISTER		EA	.	.	.	1.00
I	14	120-06131-0000	3134-3670-505	IC QUAD ANLG SW		EA	.	.	.	1.00
ITM	1	009-06912-0010	1700-5707-010	PC BD SYS UHF		EA	.	.	.	1.00
ITM	10	012-01174-0000	3110-2001-500	INSULATOR		EA	.	.	.	1.00
ITM	11	026-00002-0000	6024-0000-001	WIRE COP TIN 24G		IN	.	.	.	2.00
ITM	12	195-00052-0000		CRYSTAL KIT		EA	.	.	.	1.00
ITM	13	016-01082-0000	1607-0000-001	DC RTV 3145		AR	.	.	.	1.00
ITM	14	016-01124-0001	1601-2000-902	TAPE DOUB SIDE FOA		IN	.	.	.	0.850
ITM	15	150-00003-0010	3101-0000-013	TUBING TFLN 24AWG		IN	.	.	.	1.00
ITM	16	047-09489-0001	2508-2030-701	REGULATOR SHIELD		EA	.	.	.	1.00
ITM	18	024-05065-0000	6028-3315-821	WIRE SLD 28AWG GRN		IN	.	.	.	1.00
J	7	030-03052-0006	2105-2017-606	BOX CONN STRIP		EA	.	.	.	1.00
J	8	030-03052-0006	2105-2017-606	BOX CONN STRIP		EA	.	.	.	1.00
L	1	019-02084-0065	1802-2013-765	CH 68UH 10%		EA	.	.	.	1.00
P	1	030-01411-0000	2107-2031-500	PC 10'S		EA	.	.	.	7.00
P	2	030-02219-0021	2105-2035-821	HEADER STRT 3P		EA	.	.	.	1.00
P	5	030-02898-0008	2105-2031-800	LO PRFL TERM STRIP		EA	.	.	.	1.00
P	6	030-02386-0001	2105-2031-701	HDR RT ANG 1P		EA	.	.	.	1.00
Q	1	007-00535-0001	4823-2020-200	XSTR JFET MMBF4392		EA	.	.	.	1.00
Q	4	007-00537-0000	4823-3741-301	XSTR PNP MMBT5087		EA	.	.	.	1.00
Q	5	007-08064-0017	4823-2010-817	XSTR NPN 47K. 47K		EA	.	.	.	1.00
Q	6	007-08064-0014	4823-2010-814	XSTR PNP 4.7K, 10K		EA	.	.	.	1.00
Q	7	007-08064-0014	4823-2010-814	XSTR PNP 4.7K, 10K		EA	.	.	.	1.00
Q	8	007-08064-0014	4823-2010-814	XSTR PNP 4.7K, 10K		EA	.	.	.	1.00
Q	9	007-08064-0014	4823-2010-814	XSTR PNP 4.7K, 10K		EA	.	.	.	1.00
Q	10	007-08064-0000	4823-2010-800	XSTR PNP 10K, 10K		EA	.	.	.	1.00
Q	11	007-08064-0014	4823-2010-814	XSTR PNP 4.7K, 10K		EA	.	.	.	1.00
Q	13	007-00903-0000	4823-2025-100	2N7002 MOSFET		EA	.	.	.	1.00
Q	14	007-00537-0000	4823-3741-301	XSTR PNP MMBT5087		EA	.	.	.	1.00
Q	15	007-00903-0000	4823-2025-100	2N7002 MOSFET		EA	.	.	.	1.00

SYSTEMS BOARD

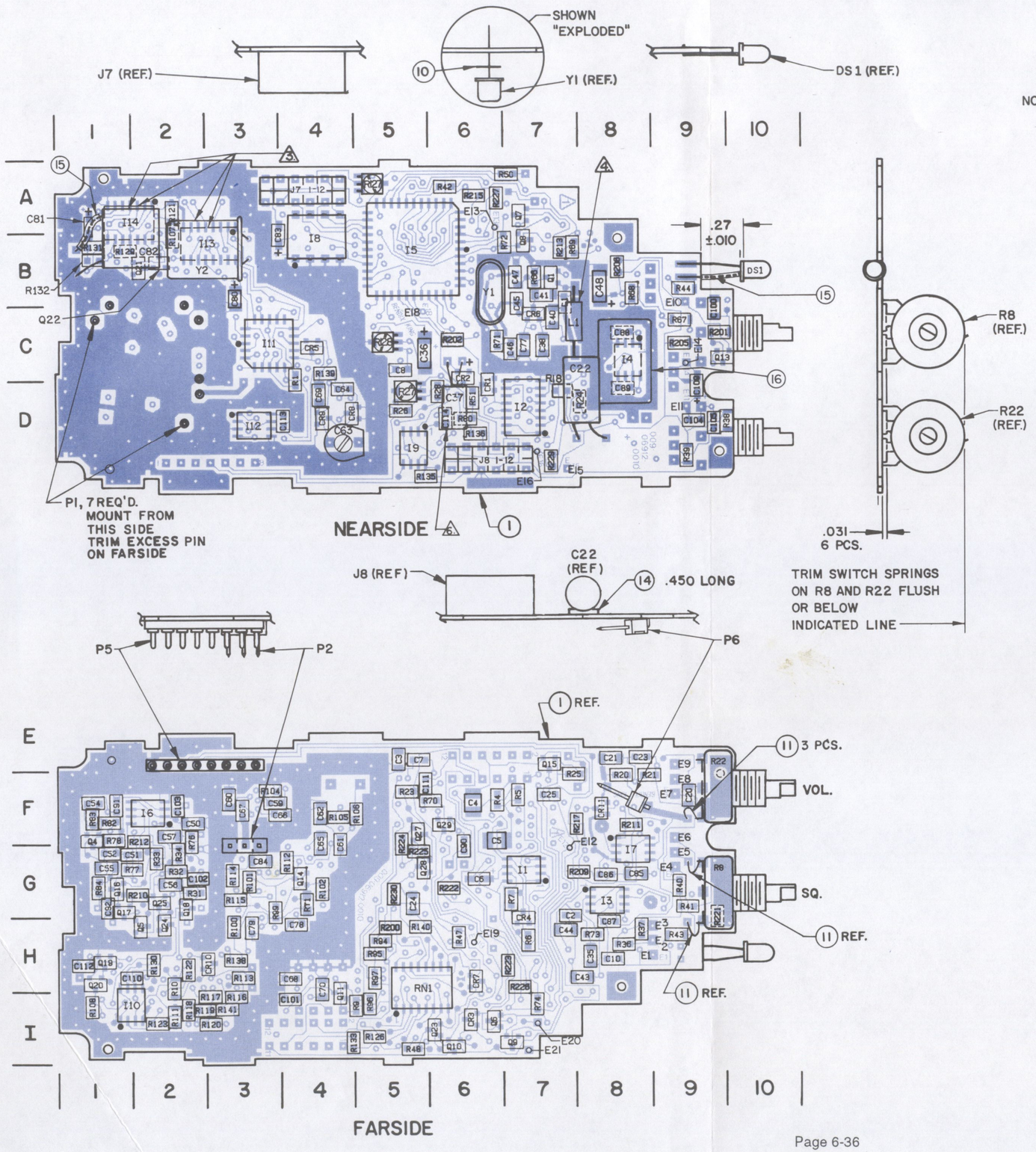
200-06912-0000

SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 14CH 0010	42CH 0011	210CH 0012	COMMON 0098
Q	16	007-00813-0000	4823-2020-300	XSTR NPN S MMBTA14		EA	.	.	.	1.00
Q	17	007-00537-0000	4823-3741-301	XSTR PNP MMBT5087		EA	.	.	.	1.00
Q	18	007-00813-0000	4823-2020-300	XSTR NPN S MMBTA14		EA	.	.	.	1.00
Q	19	007-08064-0017	4823-2010-817	XSTR NPN 47K. 47K		EA	.	.	.	1.00
Q	20	007-08064-0016	4823-3680-006	XSTR PNP 47K. 47K		EA	.	.	.	1.00
Q	21	007-08064-0017	4823-2010-817	XSTR NPN 47K. 47K		EA	.	.	.	1.00
Q	22	007-08064-0016	4823-3680-006	XSTR PNP 47K. 47K		EA	.	.	.	1.00
Q	23	007-00535-0000	4823-2020-201	XSTR JFET MMBF4393		EA	.	.	.	1.00
Q	24	007-08064-0016	4823-3680-006	XSTR PNP 47K. 47K		EA	.	.	.	1.00
Q	25	007-08064-0017	4823-2010-817	XSTR NPN 47K. 47K		EA	.	.	.	1.00
Q	27	007-00187-0002	4823-3741-401	XSTR SOT-23 2N5089		EA	.	.	.	1.00
Q	28	007-00187-0002	4823-3741-401	XSTR SOT-23 2N5089		EA	.	.	.	1.00
Q	29	007-00187-0002	4823-3741-401	XSTR SOT-23 2N5089		EA	.	.	.	1.00
R	1	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	.	1.00
R	4	130-05393-0012	4724-0393-223	RES CH 39K TW 2%		EA	.	.	.	1.00
R	5	130-05624-0012	4724-0624-223	RES CH 620K TW 2%		EA	.	.	.	1.00
R	6	130-05105-0012	4724-0105-223	RES CH 1M TW 2%		EA	.	.	.	1.00
R	7	130-05623-0012	4724-0623-223	RES CH 62K TW 2%		EA	.	.	.	1.00
R	8	133-00270-0007	4750-2003-904	RES VA 100K.08W20%		EA	1.00	1.00	1.00	.
R	9	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	.	1.00
R	10	131-05123-0013	4720-0123-235	RES MELF 12K EW 5%		EA	.	.	.	1.00
R	18	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	.	1.00
R	20	130-05914-0013	4724-0914-233	RES CH 910K TW 5%		EA	.	.	.	1.00
R	21	130-05224-0013	4724-0224-233	RES CH 220K TW 5%		EA	.	.	.	1.00
R	22	133-00270-0007	4750-2003-904	RES VA 100K.08W20%		EA	.	.	.	1.00
R	23	130-05203-0013	4724-0203-233	RES CH 20K TW 5%		EA	.	.	.	1.00
R	24	130-05224-0013	4724-0224-233	RES CH 220K TW 5%		EA	.	.	.	1.00
R	25	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	.	.	1.00
R	26	130-05244-0013	4724-0244-233	RES CH 240K TW 5%		EA	.	.	.	1.00
R	27	133-00272-0007	4719-2046-007	RES VARI 100K 30%		EA	.	.	.	1.00
R	28	130-05124-0012	4724-0124-223	RES CH 120K TW 2%		EA	.	.	.	1.00
R	31	130-05204-0012	4724-0204-223	RES CH 200K TW 2%		EA	.	.	.	1.00
R	32	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	.	.	.	1.00
R	33	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	.	.	1.00
R	34	130-05152-0013	4724-0152-233	RES CH 1.5K TW 5%		EA	.	.	.	1.00
R	36	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	.	.	1.00
R	37	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	.	.	1.00
R	38	130-05104-0023	4718-5237-322	RES CH 100K EW 5%		EA	.	.	.	1.00
R	39	130-05104-0023	4718-5237-322	RES CH 100K EW 5%		EA	.	.	.	1.00
R	40	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	.	.	1.00
R	41	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	.	.	1.00
R	42	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	.	1.00
R	43	130-05471-0023	4718-5237-318	RES CHIP 470EW5%		EA	.	.	.	1.00
R	44	130-05471-0023	4718-5237-318	RES CHIP 470EW5%		EA	.	.	.	1.00
R	47	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	.	1.00
R	48	130-05474-0013	4724-0474-233	RES CH 470K TW 5%		EA	.	.	.	1.00
R	50	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	.	.	.	1.00
R	51	130-05752-0013	4724-0752-233	RES CH 7.5K TW 5%		EA	.	.	.	1.00
R	66	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	.	.	.	1.00
R	67	130-05105-0023	4718-5237-367	RES CHIP 1M EW 5%		EA	.	.	.	1.00
R	68	130-05334-0012	4724-0334-223	RES CH 330K TW 2%		EA	.	.	.	1.00
R	69	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	.	1.00
R	70	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	.	.	1.00
R	71	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	.	.	.	1.00
R	72	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	.	.	1.00
R	73	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	.	.	.	1.00
R	74	130-05394-0013	4724-0394-233	RES CH 390K TW 5%		EA	.	.	.	1.00
R	76	130-05473-0013	4724-0473-233	RES CH 47K TW 5%		EA	.	.	.	1.00
R	77	130-05204-0013	4724-0204-233	RES CH 200K TW 5%		EA	.	.	.	1.00
R	78	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	.	.	1.00
R	80	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	.	1.00
R	82	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	.	1.00
R	83	130-05752-0013	4724-0752-233	RES CH 7.5K TW 5%		EA	.	.	.	1.00
R	84	130-05561-0013	4724-0561-233	RES CH 560 TW 5%		EA	.	.	.	1.00
R	94	130-05164-0013	4724-0164-233	RES CH 160K TW 5%		EA	.	.	.	1.00
R	95	130-05823-0013	4724-0823-233	RES CH 82K TW 5%		EA	.	.	.	1.00
R	96	130-05393-0013	4724-0393-233	RES CH 39K TW 5%		EA	.	.	.	1.00
R	97	130-05203-0013	4724-0203-233	RES CH 20K TW 5%		EA	.	.	.	1.00
R	99	130-05224-0013	4724-0224-233	RES CH 220K TW 5%		EA	.	.	.	1.00
R	101	130-05823-0013	4724-0823-233	RES CH 82K TW 5%		EA	.	.	.	1.00
R	102	130-05244-0013	4724-0244-233	RES CH 240K TW 5%		EA	.	.	.	1.00
R	104	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	.	1.00

SYSTEMS BOARD

200-06912-0000

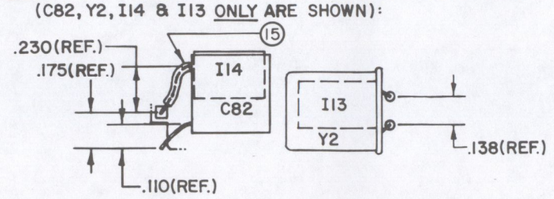
SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 14CH 0010	42CH 0011	210CH 0012	COMMON 0098
R	105	130-05333-0013	4724-0333-233	RES CH 33K TW 5%		EA	.	.	.	1.00
R	106	130-05333-0013	4724-0333-233	RES CH 33K TW 5%		EA	.	.	.	1.00
R	107	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	.	.	1.00
R	108	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	.	.	.	1.00
R	111	131-05243-0013	4720-0243-235	RES MELF 24K EW 5%		EA	.	.	.	1.00
R	112	130-05152-0013	4724-0152-233	RES CH 1.5K TW 5%		EA	.	.	.	1.00
R	113	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	.	1.00
R	114	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	.	.	1.00
R	115	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	.	1.00
R	116	130-05203-0013	4724-0203-233	RES CH 20K TW 5%		EA	.	.	.	1.00
R	117	130-05393-0013	4724-0393-233	RES CH 39K TW 5%		EA	.	.	.	1.00
R	118	130-05823-0013	4724-0823-233	RES CH 82K TW 5%		EA	.	.	.	1.00
R	119	130-05164-0013	4724-0164-233	RES CH 160K TW 5%		EA	.	.	.	1.00
R	120	130-05334-0013	4724-0334-233	RES CH 330K TW 5%		EA	.	.	.	1.00
R	121	131-05563-0013	4720-0563-235	RES MELF 56K EW 5%		EA	.	.	.	1.00
R	122	130-05134-0013	4724-0134-233	RES CH 130K TW 5%		EA	.	.	.	1.00
R	123	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	.	1.00
R	126	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	.	1.00
R	127	133-00272-0003	4719-2046-003	RES VARI		EA	.	.	.	1.00
R	128	133-00272-0007	4719-2046-007	RES VARI 100K 30%		EA	.	.	.	1.00
R	129	130-05624-0013	4724-0624-233	RES CH 620K TW 5%		EA	1.00	1.00	1.00	.
R	130	130-05303-0013	4724-0303-233	RES CH 30K TW 5%		EA	1.00	1.00	1.00	.
R	131	130-05163-0013	4724-0163-233	RES CH 16K TW 5%		EA	1.00	1.00	1.00	.
R	132	130-05302-0013	4724-0302-233	RES CH 3K TW 5%		EA	1.00	1.00	1.00	.
R	133	130-05823-0013	4724-0823-233	RES CH 82K TW 5%		EA	.	.	.	1.00
R	135	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	.	.	.	1.00
R	136	130-05473-0013	4724-0473-233	RES CH 47K TW 5%		EA	.	.	.	1.00
R	138	130-05474-0013	4724-0474-233	RES CH 470K TW 5%		EA	.	.	.	1.00
R	139	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	.	.	1.00
R	140	130-05914-0013	4724-0914-233	RES CH 910K TW 5%		EA	.	.	.	1.00
R	141	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	.	1.00
R	142	131-00243-0013	4704-0243-031	RES CF 24K EW 5%		EA	.	.	.	1.00
R	200	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	.	1.00
R	201	130-05182-0023	4718-5237-391	RES CHIP 1.8KEW5%		EA	0.25	0.25	0.25	.
R	201	130-05272-0023	4718-5237-386	RES CHIP 2.7KEW5%		EA	0.25	0.25	0.25	.
R	201	130-05392-0023	4718-5237-371	RES CHIP 3.9KEW5%		EA	0.25	0.25	0.25	.
R	201	130-05472-0023	4718-5237-303	RES CHIP 4.7KEW5%		EA	0.25	0.25	0.25	.
R	202	130-05513-0013	4724-0513-233	RES CH 51K TW 5%		EA	.	.	.	1.00
R	205	130-05682-0023	4718-5237-381	RES CHIP 6.8KEW5%		EA	.	.	.	1.00
R	206	130-05513-0013	4724-0513-233	RES CH 51K TW 5%		EA	.	.	.	1.00
R	209	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	.	1.00
R	210	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	.	1.00
R	211	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	.	.	.	1.00
R	212	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	.	.	1.00
R	213	130-05473-0013	4724-0473-233	RES CH 47K TW 5%		EA	.	.	.	1.00
R	215	130-05223-0013	4724-0223-233	RES CH 22K TW 5%		EA	.	.	.	1.00
R	217	130-05000-0015	4724-0000-009	RES CH 0 TW		EA	.	.	.	1.00
R	221	130-05224-0013	4724-0224-233	RES CH 220K TW 5%		EA	.	.	.	1.00
R	222	130-05392-0013	4724-0392-233	RES CH 3.9K TW 5%		EA	.	.	.	1.00
R	223	130-05222-0013	4724-0222-233	RES CH 2.2K TW 5%		EA	.	.	.	1.00
R	224	130-05474-0013	4724-0474-233	RES CH 470K TW 5%		EA	.	.	.	1.00
R	225	130-05474-0013	4724-0474-233	RES CH 470K TW 5%		EA	.	.	.	1.00
R	226	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	.	1.00
R	227	130-05000-0015	4724-0000-009	RES CH 0 TW		EA	1.00	1.00	1.00	.
R	228	130-05000-0015	4724-0000-009	RES CH 0 TW		EA	.	.	.	1.00
R	230	130-05823-0013	4724-0823-233	RES CH 82K TW 5%		EA	.	.	.	1.00
REF	1	300-06912-0010		SYSTEMS BD ASSY		RF	.	.	.	X.
REF	2	002-06912-0010		SCH SYS BD ASSY		RF	X.	X.	X.	.
RN	1	015-00208-0006	4726-2041-606	R/2R NETWORK		EA	.	.	.	1.00
RT	1	134-01044-0013	5302-2025-813	THRMSTR SURFACE MT		EA	.	.	.	1.00
Y	1	044-00245-0000	2342-2048-600	XTAL 4.00MHZ		EA	.	.	.	1.00
Y	2	044-00158-0000	2338-2024-700	10.4 MHZ QZ XSTAL		EA	.	.	.	1.00

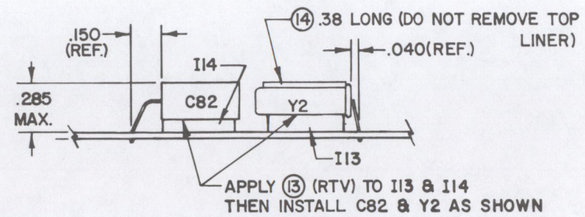


TRIM SWITCH SPRINGS ON R8 AND R22 FLUSH OR BELOW INDICATED LINE

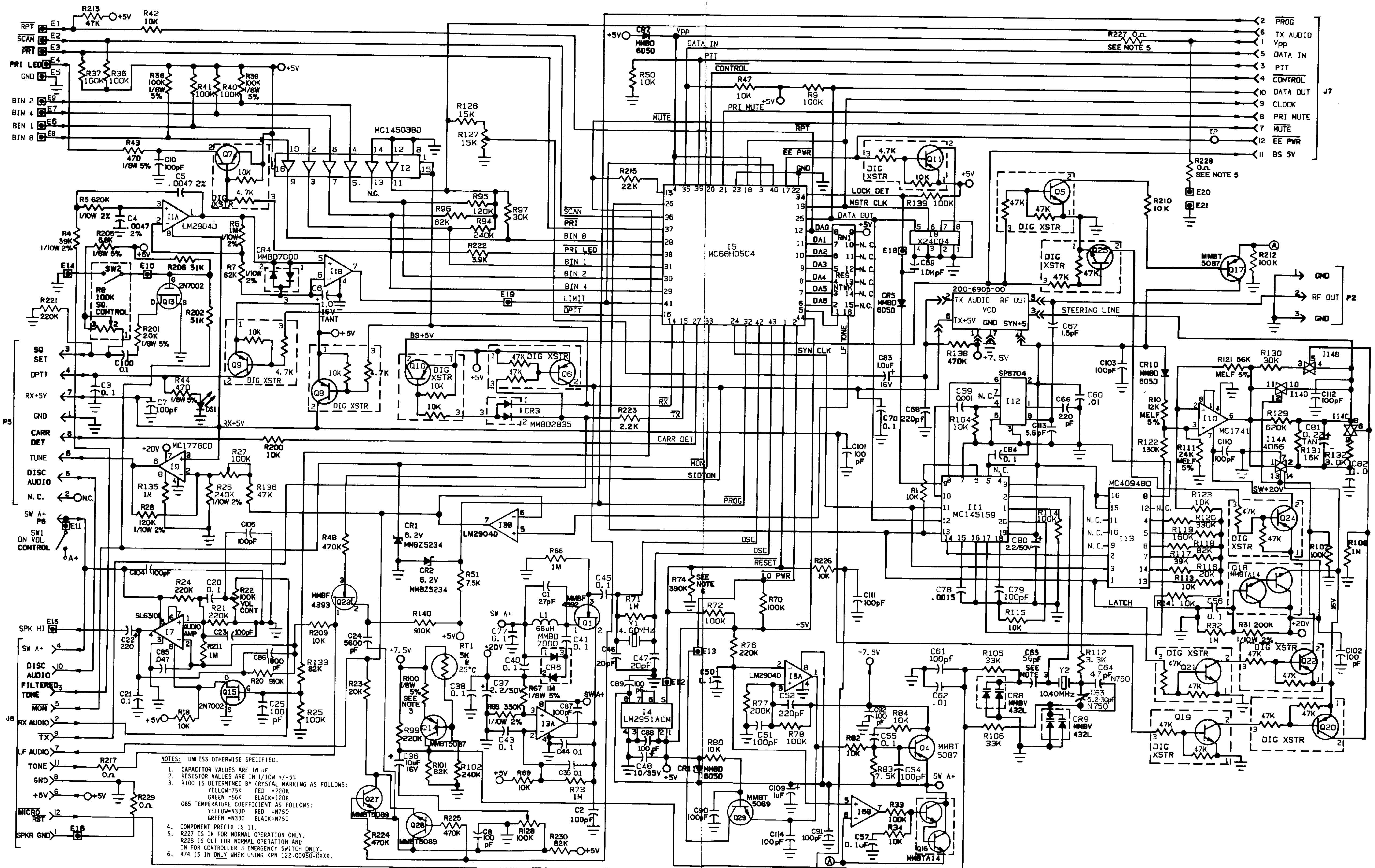
NOTES:

1. BOARD PREFIX IS 11.
2. Y2 IS SOLDERED UPRIGHT AND THEN LAYED DOWN AS SHOWN AFTER FAIRCHILD TESTING IS COMPLETED.
3. SEE DETAILS BELOW FOR C82 & Y2 ASSY. INFORMATION. (C82, Y2, I14 & I13 ONLY ARE SHOWN):





4. PREFORM L1 LEADS AND SURFACE MOUNT WITH THE DEVICE DOWN AGAINST THE BOARD SURFACE.
5. DUE TO HEIGHT RESTRICTIONS, ALL LEADED DEVICES MUST BE MOUNTED AS CLOSE TO THE BOARD SURFACE AS POSSIBLE.
6. TOTAL HEIGHT OF C37 BENT OVER CANNOT EXCEED .200.


NOTES: UNLESS OTHERWISE SPECIFIED.
1. CAPACITOR VALUES ARE IN uF.
2. RESISTOR VALUES ARE IN 1/10W +/-5%
3. R100 IS DETERMINED BY CRYSTAL MARKING AS FOLLOWS:
YELLOW=75K RED =220K
GREEN =56K BLACK=120K
C65 TEMPERATURE COEFFICIENT AS FOLLOWS:
YELLOW=N330 RED =N750
GREEN =N330 BLACK=N750
4. COMPONENT PREFIX IS 11.
5. R227 IS IN FOR NORMAL OPERATION ONLY.
R228 IS OUT FOR NORMAL OPERATION AND
IN FOR CONTROLLER 3 EMERGENCY SWITCH ONLY.
6. R74 IS IN ONLY WHEN USING KPN 122-00950-0XXX.
MC14503BD
MC68HC05C4
MC145159
MC4094BD
LM2904D
MC1776CD
MC1741
X24C04
SP8704
LM2951ACM
200-6905-00
J7
P2
P5
J8

VCO BOARD

200-05332-0000 EPU VCO MODULE
200-05332-0020 EPV VCO MODULE

SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY EPU 0000	QUANTITY EPV 0020
ASY	1	200-06906-0000		D/S UHF VCO BD	A	EA	1.00	
ASY	1	200-06906-0020		DNBD UHF VCO BD	A	EA		1.00
ITM	1	047-10163-0001	2508-4007-901	VCO CAN	A	EA	1.00	1.00
J	1	030-02666-0000	2108-2034-600	SOCKET MIN		EA	5.00	5.00
J	2	030-01386-0004	2108-2017-404	SCKT MINATURE SPRG		EA	2.00	2.00

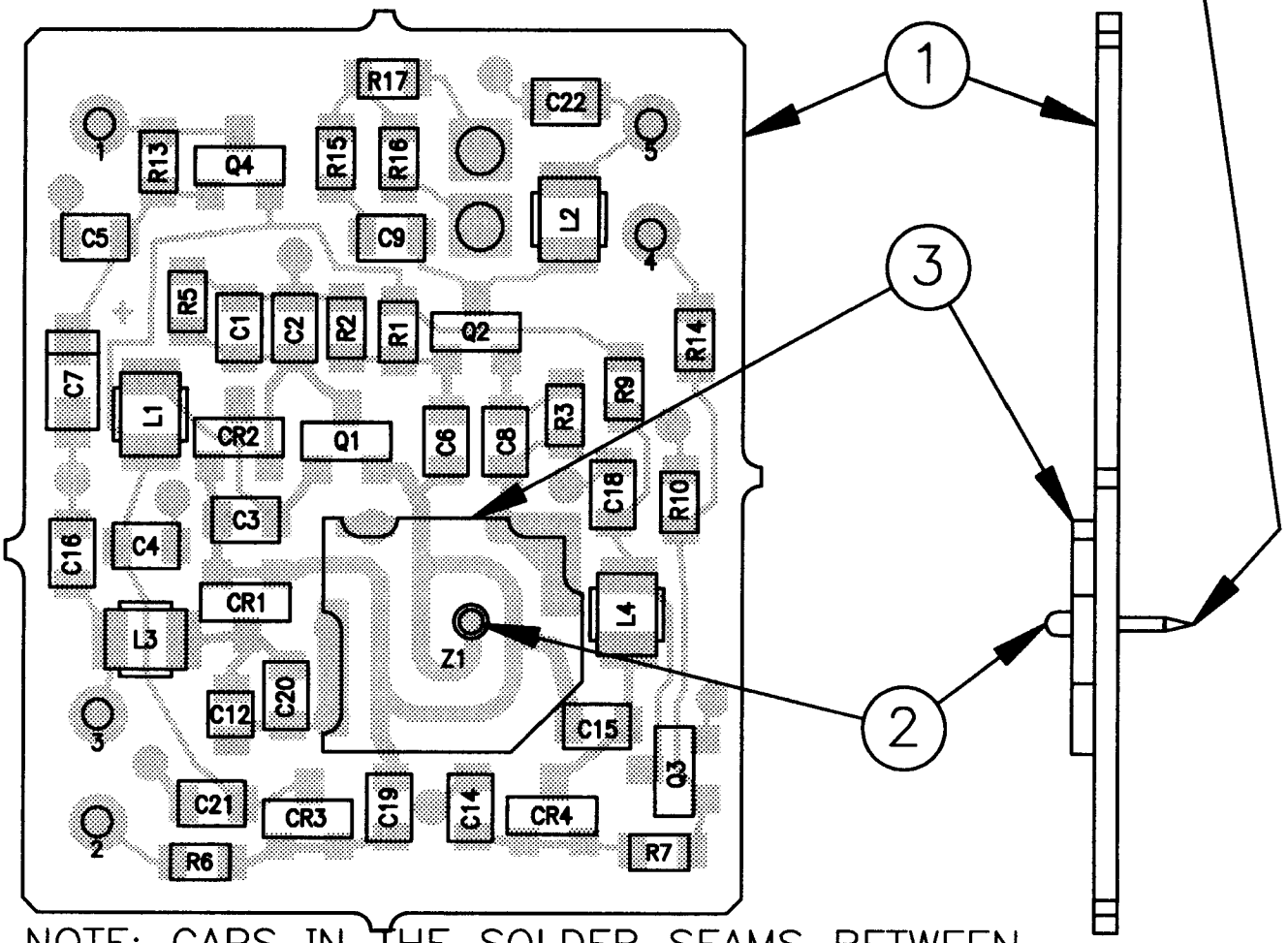
VCO BOARD

200-06906-0000 EPU VCO BD
200-06906-0020 EPV VCO BD
200-06906-0099 COMMON BOM

SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY EPU 0000	QUANTITY EPV 0020	QUANTITY COMMON 0099
		200-06906-0099		EPU COMMON BOM	A	EA	1.00	1.00	.
C	1	106-05103-0046	1553-5237-794	CAP CH 10K X7R/50V		EA	.	.	1.00
C	2	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	.	.	1.00
C	3	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	.	.	1.00
C	4	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	.	.	1.00
C	5	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	.	.	1.00
C	6	106-00072-0068	1553-2083-468	CAP CH0.5PFNPO/50V		EA	.	.	1.00
C	7	096-01186-0062	1552-6463-121	CAP 1.0UF 16V 20%		EA	.	.	1.00
C	8	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	.	.	1.00
C	9	106-00072-0010	1553-2083-410	CAP CH8.2PFNPO/50V		EA	.	.	1.00
C	12	106-00116-0039	1564-2042-539	CAP CHIP PORCELAIN		EA	.	.	1.00
C	14	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	.	.	1.00
C	15	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	.	.	1.00
C	16	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	.	.	1.00
C	18	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	.	.	1.00
C	19	106-00072-0046	1553-2083-446	CAP CH 1PF NPO/50V		EA	.	.	1.00
C	20	195-00152-0000	0011-2076-100	CAP OPTION		EA	.	.	1.00
C	21	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	.	.	1.00
C	22	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	.	.	1.00
CR	1	007-04067-0000	4809-2047-000	VOT VARI CAP DIODE		EA	.	.	1.00
CR	2	007-06415-0000	4824-2047-200	DIODE DUAL		EA	.	.	1.00
CR	3	007-04057-0000	4824-2021-100	DIO V MMBV105G		EA	.	.	1.00
CR	4	007-06178-0000	4824-5483-300	DIO PIN MMBV3401		EA	.	.	1.00
ITM	1	009-06906-0000	1700-6706-000	PCBD D/S UHF VCO		EA	1.00	.	.
ITM	1	009-06906-0020	1700-6706-520	PCBD DNBD UHF VCO		EA	.	1.00	.
ITM	2	047-09874-0000	2107-2016-400	PIN FHD MINATURE		EA	.	.	1.00
ITM	3	009-06920-0020	1700-4011-120	PCBD DNBD RESN SD		EA	.	.	1.00
ITM	4	016-01364-0000	1609-2033-500	LOCTITE 3606		AR	.	.	1.00
L	1	019-02660-0021	1808-2013-621	SURFACE MT, 470 NH		EA	.	.	1.00
L	2	019-02660-0005	1808-2013-605	SURFACE MT 30 NH		EA	.	.	1.00
L	3	019-02660-0021	1808-2013-621	SURFACE MT, 470 NH		EA	.	.	1.00
L	4	019-02660-0021	1808-2013-621	SURFACE MT, 470 NH		EA	.	.	1.00
Q	1	007-00815-0000	4823-5483-200	XSTR FET MMBFU310		EA	.	.	1.00
Q	2	007-00943-0000	4823-2025-300	XSTR RF NPN		EA	.	.	1.00
Q	3	007-00903-0000	4823-2025-100	2N7002 MOSFET		EA	.	.	1.00
Q	4	007-00813-0000	4823-2020-300	XSTR NPN S MMBTA14		EA	.	.	1.00
R	1	130-05472-0013	4724-0472-233	RES CH 4.7K TW 5%		EA	.	.	1.00
R	2	130-05202-0013	4724-0202-233	RES CH 2K TW 5%		EA	.	.	1.00
R	3	130-05101-0013	4724-0101-233	RES CH 100 TW 5%		EA	.	.	1.00
R	5	130-05473-0013	4724-0473-233	RES CH 47K TW 5%		EA	.	.	1.00
R	6	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	1.00
R	7	130-05471-0013	4724-0471-233	RES CH 470 TW 5%		EA	.	.	1.00
R	9	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	1.00
R	10	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	.	1.00
R	13	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	.	1.00
R	14	130-05200-0013	4724-0200-233	RES CH 20 TW 5%		EA	.	.	1.00
R	15	130-05200-0013	4724-0200-233	RES CH 20 TW 5%		EA	.	.	1.00
R	16	130-05510-0013	4724-0510-233	RES CH 51 TW 5%		EA	.	.	1.00
R	17	130-05200-0013	4724-0200-233	RES CH 20 TW 5%		EA	.	.	1.00
REF	1	300-06906-0000		D/S UHF VCO BD ASY		RF	.	.	X.
REF	2	002-06906-0000		SCH D/S UHF VCO BD		RF	.	.	X.

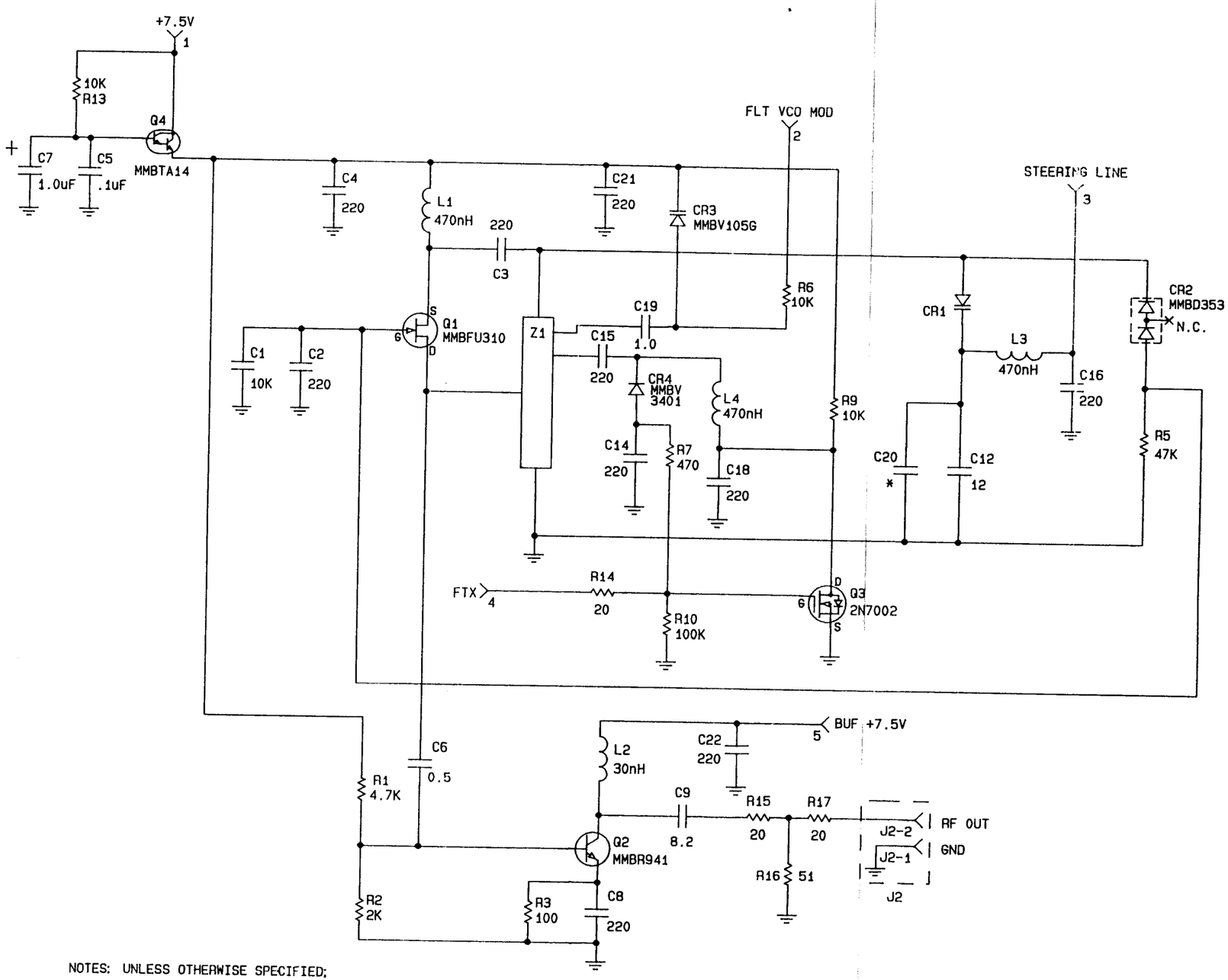
TOP
(NO COMPONENTS ON BOTTOM SIDE)

INSERT THIS END THRU ITEM 3, THEN THRU ITEM 1 UNTIL PIN SHOULDER STOPS ON TOP SURFACE OF ITEM 1



NOTE: GAPS IN THE SOLDER SEAMS BETWEEN THE SHIELD AND BOARD MAY NOT EXCEED .1" AT ANY ONE POINT, NOR THE SUM OF ALL THE GAPS EXCEED 25% OF THE TOTAL LENGTH FOR ANY ONE SIDE.

EDGE DETAIL
(COMPONENTS NOT SHOWN)



NOTES: UNLESS OTHERWISE SPECIFIED;

1. CAPACITOR VALUES ARE IN pF.
2. RESISTOR VALUES ARE OHMS.

VCO BOARD

200-06905-0000 EPU VCO BD ASSY
200-06905-0020 EPV VCO BD ASSY

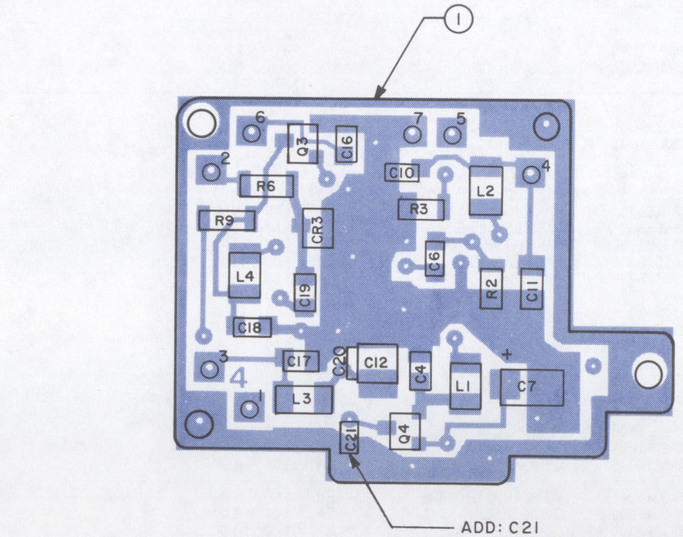
SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY EPU 0000	QUANTITY EPV 0020
C	1	106-05103-0046	1553-5237-794	CAP CH 10K X7R/50V		EA	1.00	1.00
C	2	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	1.00	1.00
C	3	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	1.00	1.00
C	4	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	1.00	1.00
C	5	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	6	106-00072-0068	1553-2083-468	CAP CH0.5PFNPO/50V		EA	1.00	1.00
C	7	096-01186-0021	1552-6463-133	CAP 1.5UF 25V 10%		EA	1.00	1.00
C	8	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	1.00	1.00
C	9	106-00072-0002	1553-2083-402	CAP CH3.9PFNPO/50V		EA	1.00	1.00
C	10	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	1.00	1.00
C	11	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	12	106-00074-0040	1553-2011-940	CAP PF 13 500VDC		EA	1.00	1.00
C	14	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	1.00	1.00
C	15	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	1.00	1.00
C	16	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	1.00	1.00
C	17	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	1.00	1.00
C	18	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	1.00	1.00
C	19	106-00072-0046	1553-2083-446	CAP CH 1PF NPO/50V		EA	1.00	1.00
C	20	195-00111-0000	0011-2075-500	CAP OPTION		EA	1.00	.
C	20	195-00111-0020	0011-2075-600	CAP OPTION(DWNBND)		EA	.	1.00
C	21	106-00076-0001	1553-2093-301	CAP CERAMIC CHIP		EA	1.00	1.00
C	22	106-04101-0016	1553-5237-719	CH 100PF NPO/50V		EA	1.00	1.00
CR	1	007-04067-0000	4809-2047-000	VOT VARI CAP DIODE		EA	1.00	1.00
CR	2	007-06415-0000	4824-2047-200	DIODE DUAL		EA	1.00	1.00
CR	3	007-04057-0000	4824-2021-100	DIO V MMBV105G		EA	1.00	1.00
CR	4	007-06178-0000	4824-5483-300	DIO PIN MMBV3401		EA	1.00	1.00
ITM	1	009-06905-0000	1700-5707-700	PC BD VCO BD		EA	1.00	.
ITM	1	009-06905-0020	1700-5705-820	PCBD VCO DNBD		EA	.	1.00
ITM	2	047-09067-0000	2530-2030-900	PIN FLTHD MINIATUR		EA	1.00	1.00
ITM	3	009-06920-0000	1700-4011-100	PCBD VCO RESN SHD		EA	1.00	1.00
ITM	4	016-01364-0000	1609-2033-500	LOCTITE 3606		AR	1.00	1.00
J	1	030-02907-0000	2108-2056-600	SOCKET, MIN SPRING		EA	7.00	7.00
L	1	019-02660-0021	1308-2013-621	SURFACE MT, 470 NH		EA	1.00	1.00
L	2	019-02660-0005	1808-2013-605	SURFACE MT 30 NH		EA	1.00	1.00
L	3	019-02660-0021	1808-2013-621	SURFACE MT, 470 NH		EA	1.00	1.00
L	4	019-02660-0021	1808-2013-621	SURFACE MT, 470 NH		EA	1.00	1.00
Q	1	007-00815-0000	4823-5483-200	XSTR FET MMBFU310		EA	1.00	1.00
Q	2	007-00821-0000	4824-2020-400	XSTR RF MMBR901		EA	1.00	1.00
Q	3	007-00187-0002	4823-3741-401	XSTR SOT-23 2N5089		EA	1.00	1.00
Q	4	007-00813-0000	4823-2020-300	XSTR NPN S MMBTA14		EA	1.00	1.00
R	1	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	1.00
R	2	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	1.00
R	3	130-05471-0023	4718-5237-318	RES CHIP 470EW5%		EA	1.00	1.00
R	5	130-05473-0023	4718-5237-324	RES CHIP 47KEW5%		EA	1.00	1.00
R	6	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	1.00
R	7	130-05471-0023	4718-5237-318	RES CHIP 470EW5%		EA	1.00	1.00
R	9	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	1.00
R	10	130-05104-0023	4718-5237-322	RES CH 100K EW 5%		EA	1.00	1.00
R	11	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	1.00
R	13	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	1.00
R	19	131-00101-0013	4704-0101-031	RES CF 100 EW 5%		EA	1.00	1.00
REF	1	300-06905-0000		UHF VCO BD ASSY		RF	X.	.
REF	1	300-06905-0020		DWNBND BCO BD ASSY		RF	.	X.
REF	2	002-06905-0000		SCH UHF VCO BD		RF	X.	.
REF	2	002-06905-0020		SCH DWNSAND VCO BD		RF	.	X.

NOTES:

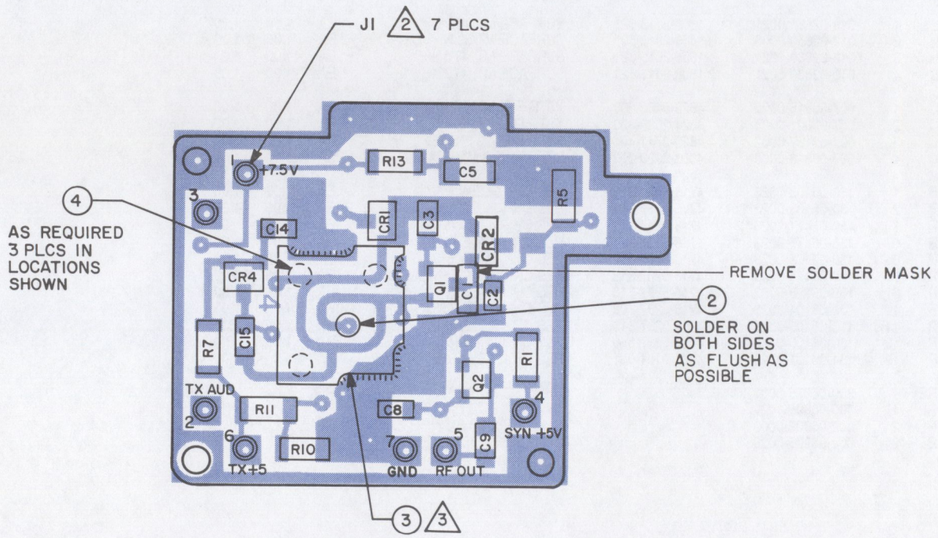
1. ALL REFERENCE DESIGNATORS ARE PRECEDED BY THE NUMBER 6 . FOR EXAMPLE C19 IS 6C19.
2. INSTALL J1 FROM FARSIDE.
3. SOLDER EDGES OF ITEM 3 TO GROUND PLANE WHERE APPLICABLE.
4. MOUNT C20 (TO THE SIDE OF C12) FLUSH OR BELOW C12 AS REQ'D BY 195-00111-0000.

REWORK NOTE:

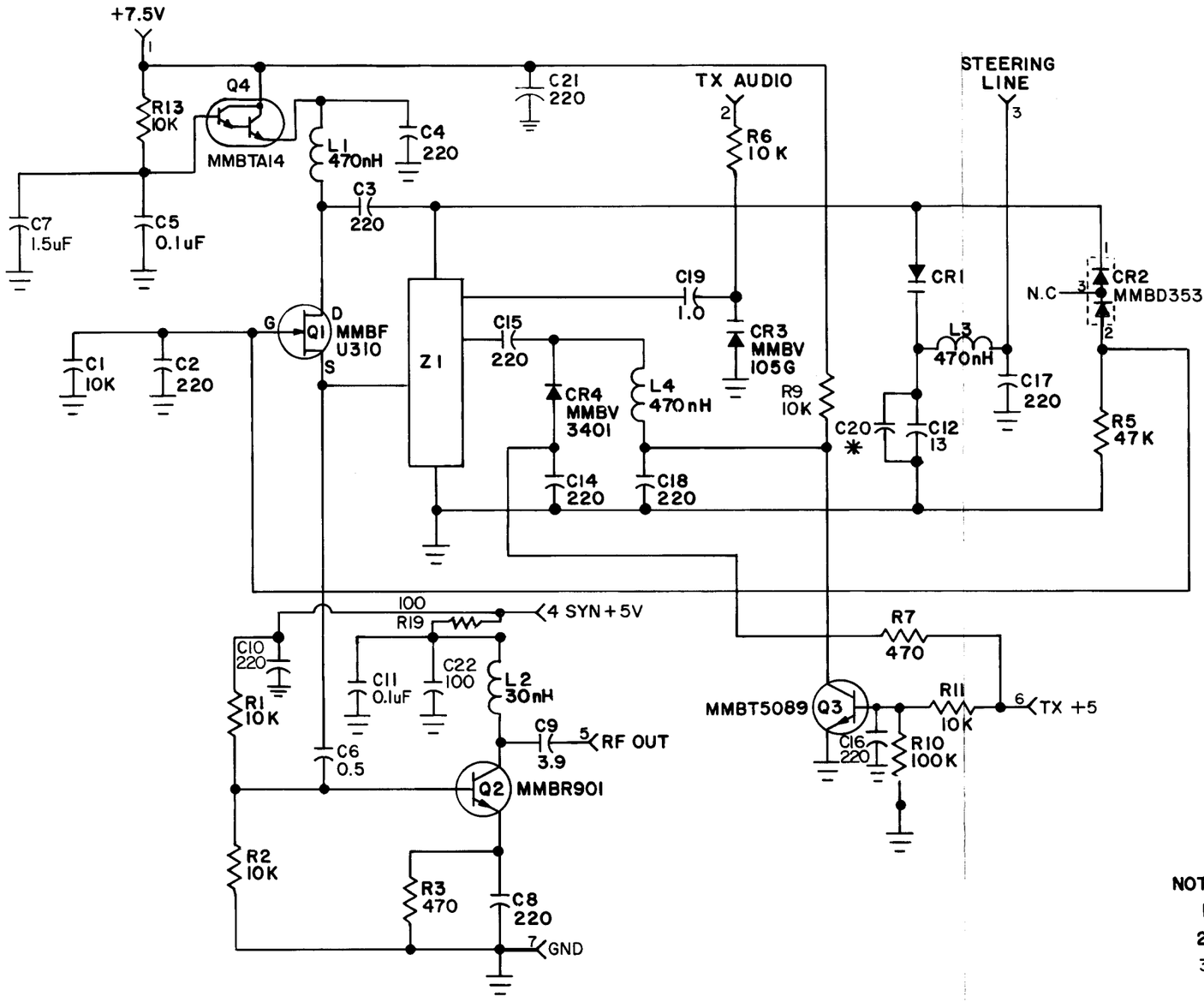
A. REMOVE SOLDER MASK BENEATH C1 WHERE NECESSARY.



NEARSIDE



FARSIDE

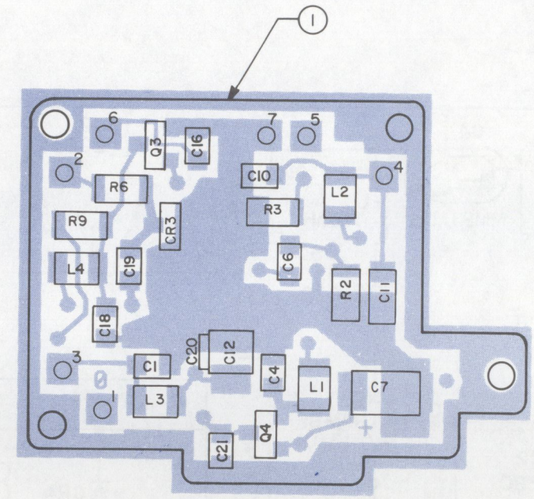


NOTES: UNLESS OTHERWISE SPECIFIED;

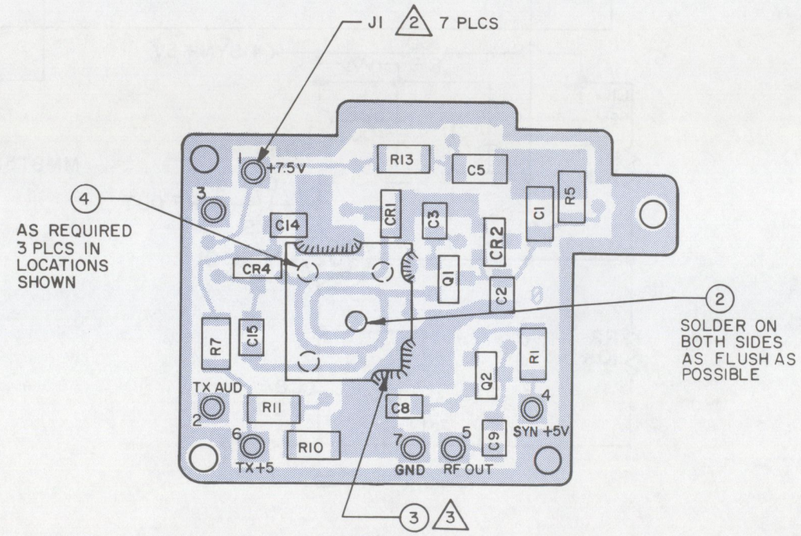
1. **CAPACITOR VALUES ARE IN pF.**
2. **RESISTOR VALUES ARE IN OHMS.**
3. ALL REFERENCE DESIGNATORS ARE PRECEEDED BY THE NUMBER 6. FOR EXAMPLE C19 IS 6C19.

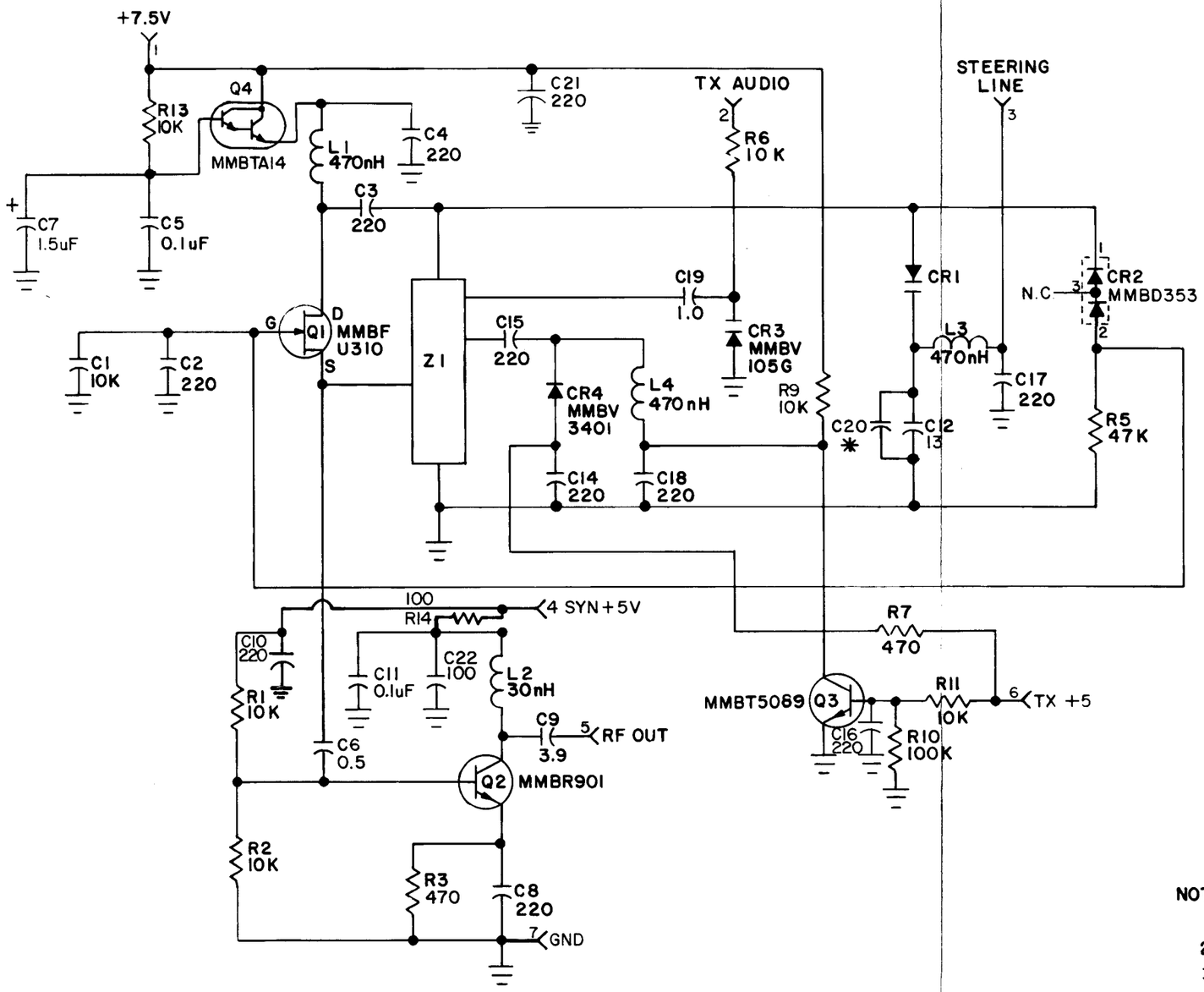
NOTES:

1. ALL REFERENCE DESIGNATORS ARE PRECEDED BY THE NUMBER 6 . FOR EXAMPLE C19 IS 6C19.
2. INSTALL J1 FROM FARSIDE.
3. SOLDER EDGES OF ITEM 3 TO GROUND PLANE WHERE APPLICABLE.
4. MOUNT C20 (TO THE SIDE OF C12) FLUSH OR BELOW C12 AS REQ'D BY 195-00111-0000.



NEARSIDE





NOTES: UNLESS OTHERWISE SPECIFIED;

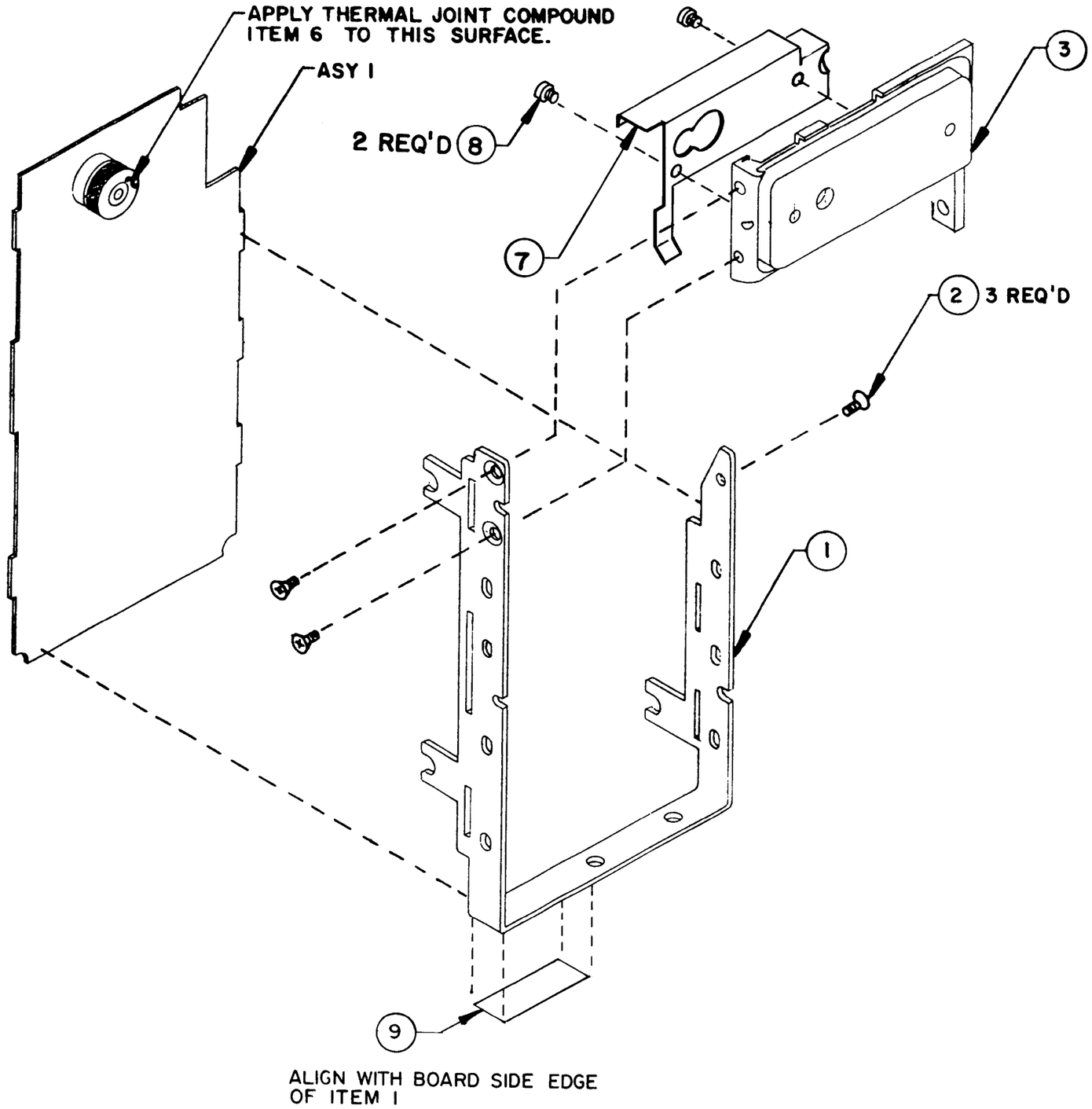
1. **CAPACITOR VALUES ARE IN pF.**
2. **RESISTOR VALUES ARE IN OHMS.**
3. ALL REFERENCE DESIGNATORS ARE PRECEEDED BY THE NUMBER 6. FOR EXAMPLE C19 IS 6C19.

TX/RX FRAME ASSEMBLY

200-03476-0020 EPV 4/2W RX/TX
200-03476-0030 EPU 4/2W RX/TX

SYMBOL	OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY EPU 0030	QUANTITY EPV 0020
ASY 1	200-06903-0000		4/2 W UHF R/T	A	EA	1.00	.
ASY 1	200-06903-0020		4/2 W UHF DNBD R/T	A	EA.	.	1.00
ITM 1	047-07476-0001	1403-5704-001	SUBFRAME UHF	A	EA	1.00	1.00
ITM 2	089-06004-0003	2801-3714-510	SCR FHP 2-56X3/16		EA	3.00	3.00
ITM 3	073-00614-0001	5400-6705-101	CSTG HEAT SINK W/F	A	EA	1.00	1.00
ITM 6	016-01004-0000	1602-0000-001	COMPOUND THRML JNT		AR	1.00	1.00
ITM 7	047-09082-0001	2508-4009-100	SHIELD FINAL		EA	.	1.00
ITM 8	089-06292-0002	2825-0125-036	SCR PHP 2-56X1/78		EA	.	2.00
ITM 9	016-01124-0004	1601-2000-905	FOAM TAPE .35W		IN	0.70	0.70
REF 1	300-03476-0000		RX/TX SUB-FRAME		RF	X.	X.

NOTE: The data on pages 6-51 and 6-52 has been moved to pages 6-16a and 6-16b.



NOTES:

1. DO NOT SOLDER ASY 1 TO ITEM 1, UNTIL FINAL ASSEMBLY, UNLESS ASSEMBLY FIXTURE IS USED. REFER TO DRWG. NO. 300-3474-00 FOR DETAILS.

4/2 W TX/RX BOARD

200-06903-0000 EPU 4/2 W UHF R/T
200-06903-0020 EPV 4/2 W UHF DNBD R/T

SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY EPU 0000	QUANTITY EPV 0020
B	1	013-00006-0000	2502-2011-100	FERR BEAD		EA	1.00	1.00
B	2	013-00006-0000	2502-2011-100	FERR BEAD		EA	1.00	1.00
B	3	013-00038-0002	2502-2047-402	FERR BEAD		EA	1.00	1.00
B	4	013-00038-0002	2502-2047-402	FERR BEAD		EA	1.00	1.00
B	5	013-00038-0002	2502-2047-402	FERR BEAD		EA	1.00	1.00
C	1	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	2	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	3	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	1.00	1.00
C	4	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	5	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	7	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	8	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	9	106-00072-0014	1553-2083-414	CAP CH12PFNPO/50V		EA	1.00	1.00
C	10	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	11	106-00072-0034	1553-2083-434	CAP CH 56PFNPO/50V		EA	1.00	1.00
C	12	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	13	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	14	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	15	106-05103-0046	1553-5237-794	CAP CH 10K X7R/50V		EA	1.00	1.00
C	16	106-00072-0018	1553-2083-418	CAP CH 18PFNPO/50V		EA	1.00	1.00
C	17	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	18	106-00072-0032	1553-2083-432	CAP CH 47PFNPO/50V		EA	1.00	1.00
C	19	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	20	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	21	106-05103-0046	1553-5237-794	CAP CH 10K X7R/50V		EA	1.00	1.00
C	22	106-04121-0016	1553-5313-534	CAP CH120PFNPO/50V		EA	1.00	1.00
C	23	106-00072-0016	1553-2083-416	CAP CH 15PFNPO/50V		EA	1.00	1.00
C	24	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	25	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	26	106-04561-0016	1553-5525-311	CAP CH560PFNPO/50V		EA	1.00	1.00
C	27	106-04103-0047	1553-5237-705	CH 10K X7R/50V		EA	1.00	1.00
C	28	106-04103-0047	1553-5237-705	CH 10K X7R/50V		EA	1.00	1.00
C	29	106-04150-0016	1553-5313-504	CH 15PF NPO/50V		EA	1.00	1.00
C	30	106-00072-0010	1553-2083-410	CAP CH8.2PFNPO/50V		EA	1.00	1.00
C	31	102-00066-0000	1517-2082-600	CAP VA 5-20PF 25V		EA	1.00	1.00
C	32	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	33	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	34	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	35	106-04820-0016	1553-5525-312	CAP CH 82PFNPO/50V		EA	1.00	1.00
C	36	106-04102-0016	1553-5237-703	CAP CH 1K NPO/50V		EA	1.00	1.00
C	37	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	38	106-00072-0034	1553-2083-434	CAP CH 56PFNPO/50V		EA	1.00	1.00
C	39	106-05561-0046	1553-5525-317	CH 560PF 7R/50V		EA	1.00	1.00
C	40	106-05272-0047	1553-5525-302	CAPCH2700PFX7R/50V		EA	1.00	1.00
C	41	106-00072-0012	1553-2083-412	CAP CH10PF NPO/50V		EA	1.00	1.00
C	42	106-04102-0047	1553-5237-706	CH 1K X7R/50V		EA	1.00	1.00
C	43	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	1.00	1.00
C	44	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	1.00	1.00
C	45	106-00072-0018	1553-2083-418	CAP CH 18PFNPO/50V		EA	.	1.00
C	45	106-00072-0065	1553-2083-465	CAP CH 13PF 50V 2%		EA	1.00	.
C	46	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	1.00	1.00
C	47	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	48	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	1.00	1.00
C	49	106-00072-0030	1553-2083-430	CAP CH 39PFNPO/50V		EA	.	1.00
C	49	106-00072-0042	1553-2083-442	CAP CH 33PFNPO/50V		EA	1.00	.
C	50	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	1.00	1.00
C	51	106-05221-0048	1553-5313-529	CAP CH 220X7R/50V		EA	1.00	1.00
C	52	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	53	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	54	106-04103-0046	1553-5237-705	CAP CH 10K X7R/50V		EA	1.00	1.00
C	55	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	57	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	59	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	.
C	60	106-00072-0016	1553-2083-416	CAP CH 15PFNPO/50V		EA	.	1.00
C	60	106-00072-0065	1553-2083-465	CAP CH 13PF 50V 2%		EA	1.00	.
C	61	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	1.00	1.00
C	62	106-00072-0034	1553-2083-434	CAP CH 56PFNPO/50V		EA	1.00	1.00
C	63	106-00072-0024	1553-2083-424	CAP CH 22PFNPO/50V		EA	1.00	1.00
C	64	106-00072-0021	1553-2083-421	CAP CH 20PFNPO/50V		EA	1.00	1.00
C	65	106-04103-0047	1553-5237-705	CH 10K X7R/50V		EA	1.00	1.00
C	66	106-00072-0008	1553-2083-408	CAP CH6.8PFNPO/50V		EA	1.00	1.00

4/2 W TX/RX BOARD

200-06903-0000

SYMBOL	OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY EPU 0000	QUANTITY EPV 0020
C 67	106-00072-0010	1553-2083-410	CAP CH8.2PFNPO/50V		EA	1.00	1.00
C 68	106-05103-0046	1553-5237-794	CAP CH 10K X7R/50V		EA	1.00	1.00
C 69	097-00109-0002	1513-3790-815	CAP EL 10UF 35V		EA	1.00	1.00
C 70	106-00072-0016	1553-2083-416	CAP CH 15PFNPO/50V		EA	1.00	.
C 70	106-00072-0018	1553-2083-418	CAP CH 18PFNPO/50V		EA	.	1.00
C 71	106-00072-0016	1553-2083-416	CAP CH 15PFNPO/50V		EA	1.00	.
C 71	106-00072-0018	1553-2083-418	CAP CH 18PFNPO/50V		EA	.	1.00
C 72	106-00072-0016	1553-2083-416	CAP CH 15PFNPO/50V		EA	1.00	.
C 72	106-00072-0024	1553-2083-424	CAP CH 22PFNPO/50V		EA	.	1.00
C 73	106-00072-0008	1553-2083-408	CAP CH6.8PFNPO/50V		EA	1.00	.
C 73	106-00072-0010	1553-2083-410	CAP CH8.2PFNPO/50V		EA	.	1.00
C 74	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C 75	106-05221-0048	1553-5313-529	CAP CH 220X7R/50V		EA	1.00	1.00
C 77	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C 78	106-00072-0026	1553-2083-426	CAP CH 27PFNPO/50V		EA	1.00	1.00
C 79	106-00072-0010	1553-2083-410	CAP CH8.2PFNPO/50V		EA	1.00	.
C 79	106-00072-0016	1553-2083-416	CAP CH 15PFNPO/50V		EA	.	1.00
C 81	106-00072-0034	1553-2083-434	CAP CH 56PFNPO/50V		EA	1.00	.
C 82	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C 83	096-01186-0012	1552-6463-128	CAP 1.0UF 16V 10%		EA	1.00	1.00
C 86	106-00072-0010	1553-2083-410	CAP CH8.2PFNPO/50V		EA	1.00	.
C 86	106-00072-0061	1553-2083-461	CAP CR CH 9.1PF		EA	.	1.00
C 87	106-00072-0010	1553-2083-410	CAP CH8.2PFNPO/50V		EA	1.00	.
C 87	106-00072-0061	1553-2083-461	CAP CR CH 9.1PF		EA	.	1.00
C 88	106-00072-0010	1553-2083-410	CAP CH8.2PFNPO/50V		EA	1.00	.
C 88	106-00072-0061	1553-2083-461	CAP CR CH 9.1PF		EA	.	1.00
C 89	106-00072-0010	1553-2083-410	CAP CH8.2PFNPO/50V		EA	1.00	.
C 89	106-00072-0061	1553-2083-461	CAP CR CH 9.1PF		EA	.	1.00
C 90	106-00072-0002	1553-2083-402	CAP CH3.9PFNPO/50V		EA	1.00	.
C 90	106-00072-0008	1553-2083-408	CAP CH6.8PFNPO/50V		EA	.	1.00
C 91	106-00072-0052	1553-2083-452	CAP CR CH 2.7PF		EA	.	1.00
C 91	106-00072-0053	1553-2083-453	CAP CR CH 3.0PF		EA	1.00	.
C 94	106-04103-0046	1553-5237-705	CAP CH 10K X7R/50V		EA	1.00	1.00
C 95	106-05221-0048	1553-5313-529	CAP CH 220X7R/50V		EA	1.00	1.00
C 96	106-04103-0046	1553-5237-705	CAP CH 10K X7R/50V		EA	1.00	1.00
C 97	106-05221-0048	1553-5313-529	CAP CH 220X7R/50V		EA	1.00	1.00
C 100	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C 101	106-05221-0048	1553-5313-529	CAP CH 220X7R/50V		EA	1.00	1.00
C 102	106-00072-0016	1553-2083-416	CAP CH 15PFNPO/50V		EA	1.00	1.00
C 103	106-04103-0046	1553-5237-705	CAP CH 10K X7R/50V		EA	1.00	1.00
C 107	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	1.00	1.00
C 108	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C 110	106-00072-0016	1553-2083-416	CAP CH 15PFNPO/50V		EA	1.00	1.00
C 111	106-04103-0046	1553-5237-705	CAP CH 10K X7R/50V		EA	1.00	1.00
C 112	106-00072-0008	1553-2083-408	CAP CH6.8PFNPO/50V		EA	1.00	1.00
C 113	106-00072-0034	1553-2083-434	CAP CH 56PFNPO/50V		EA	1.00	1.00
C 114	106-00072-0004	1553-2083-404	CAP CH4.7PFNPO/50V		EA	1.00	1.00
C 116	106-05221-0048	1553-5313-529	CAP CH 220X7R/50V		EA	1.00	1.00
C 118	106-00072-0034	1553-2083-434	CAP CH 56PFNPO/50V		EA	1.00	1.00
C 121	106-04273-0046	1553-5313-540	CAP CH 27K X7R/50V		EA	1.00	1.00
C 123	106-00072-0020	1553-2083-420	CAP CH 20PFNPO/50V		EA	1.00	1.00
C 124	106-00072-0020	1553-2083-420	CAP CH 20PFNPO/50V		EA	1.00	1.00
C 125	106-00072-0020	1553-2083-420	CAP CH 20PFNPO/50V		EA	1.00	1.00
CR 1	007-06180-0000	4824-2009-400	DIO SW MMBD6050		EA	1.00	1.00
CR 3	007-06178-0000	4824-5483-300	DIO PIN MMBV3401		EA	1.00	.
CR 3	007-06418-0000	4824-2047-300	PIN DIODE		EA	.	1.00
CR 4	007-04064-0000	4809-2046-900	DIODE VARACAP		EA	1.00	1.00
CR 5	007-04064-0000	4809-2046-900	DIODE VARACAP		EA	1.00	1.00
CR 6	007-04064-0000	4809-2046-900	DIODE VARACAP		EA	1.00	1.00
CR 7	007-04064-0000	4809-2046-900	DIODE VARACAP		EA	1.00	1.00
CR 10	007-06441-0000	4816-2064-300	DIODE HOT CARRIER		EA	1.00	1.00
CR 14	007-06178-0000	4824-5483-300	DIO PIN MMBV3401		EA	1.00	.
CR 14	007-06418-0000	4824-2047-300	PIN DIODE		EA	.	1.00
CR 15	007-06227-0000	4824-2008-800	SOT23 DIO MMBD6100		EA	1.00	1.00
CR 16	007-06180-0000	4824-2009-400	DIO SW MMBD6050		EA	1.00	1.00
CR 17	007-06226-0001	4824-2021-800	SOT23 DIO MMBD352		EA	1.00	1.00
FL 1	017-00134-0000	2705-2022-700	XTAL FILTER 45MHZ		EA	1.00	1.00
FL 3	017-00106-0000	2700-2011-200	FLTR CR 455KHZ		EA	1.00	1.00
FL 4	017-00106-0000	2700-2011-200	FLTR CR 455KHZ		EA	1.00	1.00
FL 5	017-00137-0000	2701-2047-500	DISCRIMINATOR CER.		EA	1.00	1.00

4/2 W TX/RX BOARD

200-06903-0000

SYMBOL	OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY EPU 0000	QUANTITY EPV 0020
I 1	120-03199-0000	3134-3670-602	IC FM IF MC3361		EA	1.00	1.00
I 2	120-03195-0000	3134-3670-413	IC LM2904D		EA	1.00	1.00
ITM 1	009-06903-0000	1700-5705-100	PCBD 4/2 W UHF R/T		EA	1.00	1.00
ITM 2	009-06913-0000	1700-4011-400	SHLD DIR CPLR UHF		EA	1.00	1.00
ITM 3	047-09136-0001	1409-2028-001	CHANNEL PLT BRASS		EA	1.00	1.00
ITM 4	016-01004-0000	1602-0000-001	COMPOUND THRML JNT		AR	1.00	1.00
ITM 5	076-01459-0001	5400-2027-201	STUD HEAT SINK		EA	1.00	1.00
ITM 6	089-08339-0000	2847-2034-800	WASHER CURVED SPRG		EA	1.00	1.00
ITM 7	076-01460-0001	2858-2027-301	NUT ADJUSTING		EA	1.00	1.00
ITM 8	091-00523-0000	3110-2019-400	INSULATOR XTAL		EA	2.00	2.00
ITM 9	016-01082-0000	1607-0000-001	DC RTV 3145		AR	1.00	1.00
ITM 10	026-00002-0000	6024-0000-001	WIRE COP TIN 24G		IN	1.00	1.00
ITM 11	016-01184-0000	1609-0000-004	ADHESIVE		AR	1.00	1.00
ITM 12	047-09138-0001	2107-4008-901	GND LUG XSTR	A	EA	1.00	1.00
ITM 13	076-01465-0001	2813-2026-801	RIVET STANDOFF		EA	2.00	2.00
ITM 15	024-05002-0000	8016-2036-100	RBN LEAD .086W		AR	1.00	1.00
ITM 16	026-00030-0000	6024-0000-001	WIRE CU24AWG TIN		AR	2.00	2.00
J 2	030-01386-0001	2108-2017-401	SCKT MINATURE SPRG		EA	3.00	3.00
J 5	030-02902-0008	2105-2031-908	LIF LOW PRFL SKT		EA	1.00	1.00
J 6	155-02531-0000	6006-4017-800	CABLE ASSY SWA +	A	EA	1.00	1.00
L 1	019-02676-0000	1801-2047-700	COIL		EA	1.00	.
L 1	019-02718-4002	1801-2023-413	IND 2TX.140 20 AWG		EA	.	1.00
L 2	019-02676-0001	1801-2047-701	IND 2TX.13 20 AWG		EA	1.00	.
L 2	019-02718-5802	1801-2023-414	IND 2TX.158 20 AWG		EA	.	1.00
L 3	019-02660-0017	1808-2013-617	IND SM 220 NH		EA	.	1.00
L 3	019-02660-0021	1808-2013-621	SURFACE MT, 470 NH		EA	1.00	.
L 4	019-02663-0000	1811-2023-000	COIL SURFACE MOUNT		EA	1.00	.
L 4	019-02663-0003	1811-2023-003	IND 1TX .09 22 AWG		EA	.	1.00
L 5	019-02676-0000	1801-2047-700	COIL		EA	1.00	.
L 5	019-02718-3002	1801-2023-412	IND 2TX.130 20 AWG		EA	.	1.00
L 6	019-02676-0005	1801-2047-705	COIL 2TX145 20GA		EA	1.00	.
L 6	019-02676-0006	1801-2047-706	IND 2TX.173 20GA		EA	.	1.00
L 7	019-02673-0001	1801-2047-801	COIL VERT 3-1/2T		EA	1.00	1.00
L 8	019-02084-0028	1802-2013-728	CH 2.2UH 5%		EA	1.00	1.00
L 9	019-02673-0001	1801-2047-801	COIL VERT 3-1/2T		EA	1.00	1.00
L 11	019-02084-0002	1802-2013-702	CH .18UH 5%		EA	1.00	1.00
L 12	019-02675-0011	1811-2013-111	IND 2TX.090 22AWG		EA	1.00	1.00
L 13	019-02663-0000	1811-2023-000	COIL SURFACE MOUNT		EA	1.00	1.00
L 14	019-02673-0001	1801-2047-801	COIL VERT 3-1/2T		EA	1.00	1.00
L 15	019-02673-0000	1801-2047-800	COIL VERTICAL MOUN		EA	1.00	1.00
L 16	019-02673-0001	1801-2047-801	COIL VERT 3-1/2T		EA	1.00	1.00
L 17	019-02675-0001	1811-2013-101	IND 2TX.061 22 AWG		EA	1.00	1.00
L 18	019-02675-0001	1811-2013-101	IND 2TX.061 22 AWG		EA	1.00	1.00
L 19	019-02675-0011	1811-2013-111	IND 2TX.090 22AWG		EA	1.00	1.00
L 20	019-02675-0009	1811-2013-109	IND 3TX.09 22 AWG		EA	1.00	1.00
L 20	019-02675-0019	1811-2013-119	IND 3TX.082 22GA		EA	.	1.00
L 21	019-02675-0007	1811-2013-107	IND 3TX.07 22 AWG		EA	1.00	.
L 22	019-02674-0001	1811-2047-901	IND 2TX.110 20 AWG		EA	1.00	1.00
L 23	019-02675-0002	1811-2013-102	IND 2TX.07 22 AWG		EA	1.00	1.00
L 24	019-02674-0001	1811-2047-901	IND 2TX.110 20 AWG		EA	1.00	1.00
L 25	019-02084-0002	1802-2013-702	CH .18UH 5%		EA	1.00	1.00
L 26	019-02400-0027	1811-2047-627	COIL 4TX.085		EA	1.00	1.00
L 27	019-02675-0002	1811-2013-102	IND 2TX.07 22 AWG		EA	1.00	1.00
L 28	019-02675-0009	1811-2013-109	IND 3TX.09 22 AWG		EA	1.00	1.00
L 28	019-02675-0018	1811-2013-118	IND 4TX.083 22GA		EA	.	1.00
L 29	019-02660-0005	1808-2013-605	SURFACE MT 30 NH		EA	1.00	1.00
L 30	019-02675-0009	1811-2013-109	IND 3TX.09 22 AWG		EA	1.00	1.00
L 31	019-02660-0000	1808-2013-600	IND SM 4 NH		EA	.	1.00
L 31	019-02660-0002	1808-2013-602	INDUCT SURFACE MT		EA	1.00	.
L 33	019-02400-0027	1811-2047-627	COIL 4TX.085		EA	1.00	1.00
P 1	155-02484-0000	6006-2079-200	CABLE ASSY, COAX	A	EA	1.00	1.00
Q 1	007-00903-0000	4823-2025-100	2N7002 MOSFET		EA	1.00	1.00
Q 2	007-00821-0000	4824-2020-400	XSTR RF MMBR901		EA	1.00	1.00
Q 3	007-00536-0000	4823-2008-100	XSTR MMBR920		EA	1.00	1.00
Q 4	007-00536-0000	4823-2008-100	XSTR MMBR920		EA	1.00	1.00
Q 5	007-00536-0000	4823-2008-100	XSTR MMBR920		EA	1.00	1.00
Q 6	007-00529-0000	4823-2006-400	XSTR NPN MMBTH24		EA	1.00	1.00
Q 7	007-00536-0000	4823-2008-100	XSTR MMBR920		EA	1.00	1.00

4/2 W TX/RX BOARD

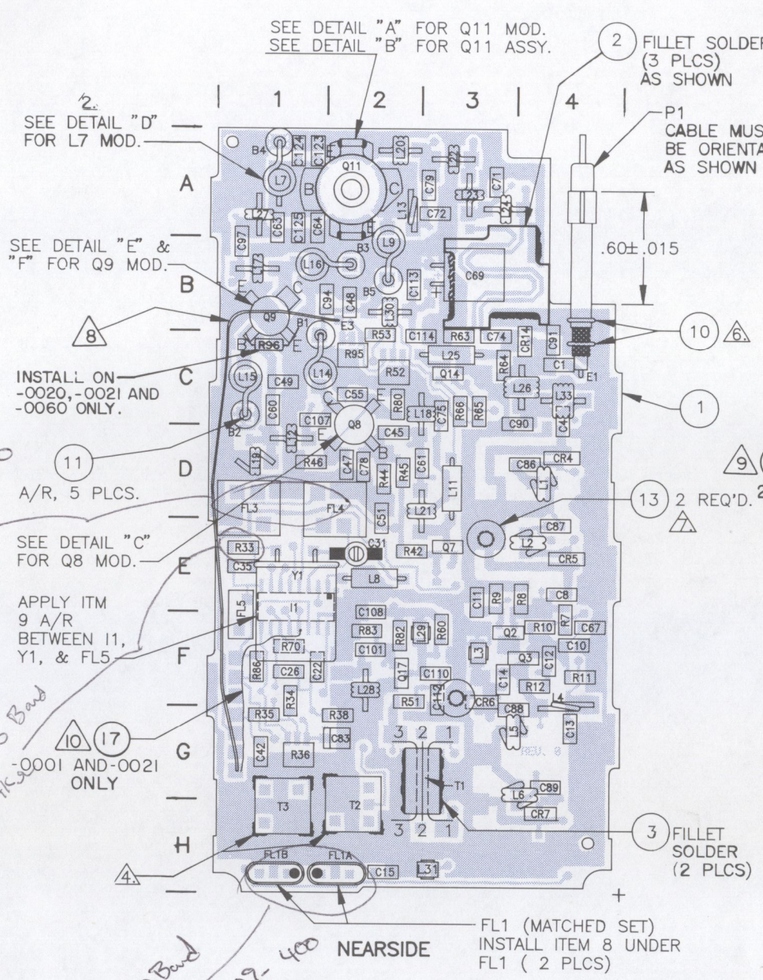
200-06903-0000

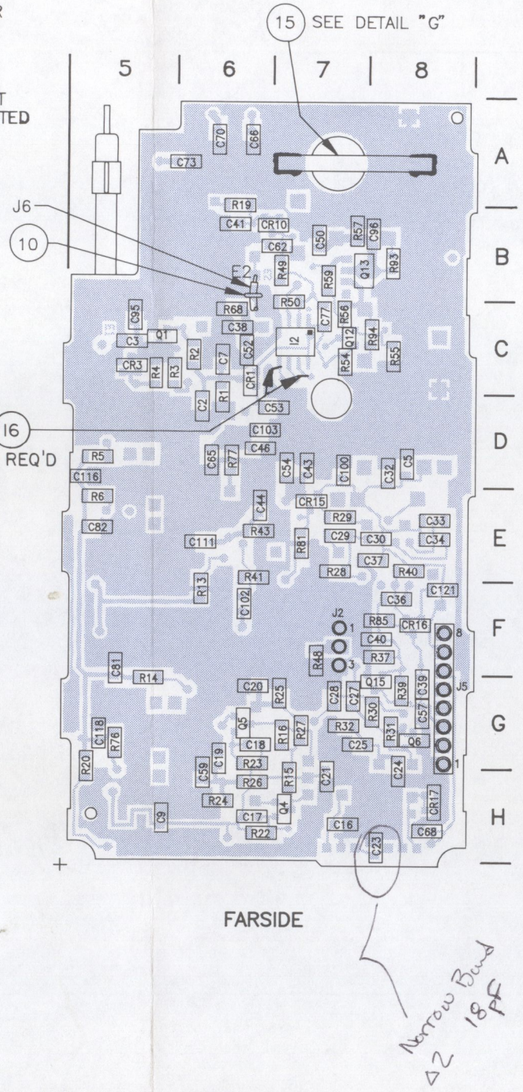
SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY EPU 0000	QUANTITY EPV 0020
Q	8	007-00823-0000	4804-3437-101	XSTR RF MRF559		EA	1.00	1.00
Q	9	007-00917-0000	4804-3750-201	XSTR RF NPN		EA	1.00	1.00
Q	11	007-00993-0000	4804-2046-800	XSTR NPN UHF 10W		EA	1.00	1.00
Q	12	007-00530-0001	4823-3669-101	XSTR NPN MMBT3904		EA	1.00	1.00
Q	13	007-00900-0000	4823-2006-500	BCX 69		EA	1.00	1.00
Q	14	007-00537-0000	4823-3741-301	XSTR PNP MMBT5087		EA	1.00	1.00
Q	15	007-00187-0002	4823-3741-401	XSTR SOT-23 2N5089		EA	1.00	1.00
Q	17	007-00822-0000	4823-2046-500	XSTR RF MMBR930		EA	1.00	1.00
R	1	130-05334-0023	4718-5237-335	RES CHIP 330KEW5%		EA	1.00	1.00
R	2	130-05203-0023	4718-5237-388	RES CHIP 20K EW 5%		EA	1.00	1.00
R	3	130-05203-0023	4718-5237-388	RES CHIP 20K EW 5%		EA	1.00	1.00
R	4	130-05334-0023	4718-5237-335	RES CHIP 330KEW5%		EA	1.00	1.00
R	5	130-05124-0023	4718-5237-359	RES CHIP 120KEW5%		EA	1.00	1.00
R	6	130-05124-0023	4718-5237-359	RES CHIP 120KEW5%		EA	1.00	1.00
R	7	130-05362-0023	4718-5237-342	RES CHIP 3.6K5%EW		EA	1.00	1.00
R	8	130-05122-0023	4718-5237-327	RES CHIP 1.2KEW5%		EA	1.00	1.00
R	9	130-05820-0023	4718-5398-910	RES CHIP 82 EW 5%		EA	1.00	1.00
R	10	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00	1.00
R	11	130-05303-0023	4718-5237-338	RES CHIP 30KEW5%		EA	1.00	1.00
R	12	130-05151-0023	4718-5237-329	RES CHIP 150EW5%		EA	.	1.00
R	12	130-05301-0023	4718-5317-147	RES CHIP 300 EW 5%		EA	1.00	.
R	13	130-05100-0023	4718-5237-347	RES CH 10 EW 5%		EA	1.00	1.00
R	14	130-05124-0023	4718-5237-359	RES CHIP 120KEW5%		EA	1.00	1.00
R	15	130-05392-0023	4718-5237-371	RES CHIP 3.9KEW5%		EA	1.00	1.00
R	16	130-05392-0023	4718-5237-371	RES CHIP 3.9KEW5%		EA	1.00	1.00
R	19	130-05680-0023	4718-5237-346	RES CHIP 68 EW 5%		EA	1.00	1.00
R	20	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	1.00
R	22	130-05152-0023	4718-5237-319	RES CHIP 1.5KEW5%		EA	1.00	1.00
R	23	130-05152-0023	4718-5237-319	RES CHIP 1.5KEW5%		EA	1.00	1.00
R	24	130-05203-0023	4718-5237-388	RES CHIP 20K EW 5%		EA	1.00	1.00
R	25	130-05203-0023	4718-5237-388	RES CHIP 20K EW 5%		EA	1.00	1.00
R	26	130-05203-0023	4718-5237-388	RES CHIP 20K EW 5%		EA	1.00	1.00
R	27	130-05203-0023	4718-5237-388	RES CHIP 20K EW 5%		EA	1.00	1.00
R	28	130-05203-0023	4718-5237-388	RES CHIP 20K EW 5%		EA	1.00	1.00
R	29	130-05821-0023	4718-5237-395	RES 820 EW 5%		EA	1.00	1.00
R	30	130-05242-0023	4718-5237-372	RES CHIP 2.4KEW5%		EA	1.00	1.00
R	31	130-05472-0023	4718-5237-303	RES CHIP 4.7KEW5%		EA	1.00	1.00
R	32	130-05202-0023	4718-5317-151	RES CHIP 2K EW 5%		EA	1.00	1.00
R	33	130-05302-0023	4718-5237-332	RES CHIP 3K EW 5%		EA	1.00	1.00
R	34	130-05272-0023	4718-5237-386	RES CHIP 2.7KEW5%		EA	1.00	1.00
R	35	130-05752-0023	4718-5237-380	RES CHIP 7.5KEW5%		EA	1.00	1.00
R	36	133-00272-0004	4719-2046-004	RES VARI 10K 30%		EA	1.00	1.00
R	37	130-05473-0023	4718-5237-324	RES CHIP 47KEW5%		EA	1.00	1.00
R	38	130-05511-0023	4718-5317-149	RES CHIP 510 EW 5%		EA	1.00	1.00
R	39	130-05473-0023	4718-5237-324	RES CHIP 47KEW5%		EA	1.00	1.00
R	40	130-05684-0023	4718-5237-334	RES CHIP 680KEW5%		EA	1.00	1.00
R	41	130-05562-0023	4718-5237-328	RES CHIP 5.6KEW5%		EA	1.00	1.00
R	42	130-05332-0023	4718-5237-350	RES CHIP 3.3KEW5%		EA	1.00	1.00
R	43	130-05101-0023	4718-5237-313	RES CH 100 EW 5%		EA	1.00	1.00
R	44	130-05202-0023	4718-5317-151	RES CHIP 2K EW 5%		EA	1.00	1.00
R	45	130-05152-0023	4718-5237-319	RES CHIP 1.5KEW5%		EA	1.00	1.00
R	46	130-05360-0023	4718-5398-919	RES CHIP 36.0EW5%		EA	1.00	1.00
R	48	130-05151-0023	4718-5237-329	RES CHIP 150EW5%		EA	1.00	1.00
R	49	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	1.00
R	50	130-05104-0023	4718-5237-322	RES CH 100K EW 5%		EA	1.00	1.00
R	51	130-05200-0023	4718-5317-141	RES CHIP 20 EW 5%		EA	1.00	1.00
R	52	133-00272-0007	4719-2046-007	RES VARI 100K 30%		EA	1.00	1.00
R	53	130-05154-0013	4724-0154-233	RES CH 150K TW 5%		EA	1.00	1.00
R	54	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00	1.00
R	55	130-05102-0023	4718-5237-301	RES CH 1K EW 5%		EA	1.00	1.00
R	56	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	1.00	1.00
R	57	130-05102-0023	4718-5237-301	RES CH 1K EW 5%		EA	1.00	1.00
R	59	130-05202-0023	4718-5317-151	RES CHIP 2K EW 5%		EA	1.00	1.00
R	60	130-05561-0023	4718-5237-365	RES CHIP 560EW5%		EA	1.00	1.00
R	63	139-00511-0000	4718-5398-946	RES CH 51.1 EW 1%		EA	1.00	1.00
R	64	130-05334-0023	4718-5237-335	RES CHIP 330KEW5%		EA	1.00	1.00
R	65	130-05331-0023	4718-5237-314	RES CHIP 330 EW5%		EA	1.00	1.00
R	66	130-05203-0023	4718-5237-388	RES CHIP 20K EW 5%		EA	1.00	1.00
R	68	130-05203-0023	4718-5237-388	RES CHIP 20K EW 5%		EA	1.00	1.00
R	70	130-05154-0023	4718-5237-353	RES CHIP 150K5%EW		EA	1.00	1.00
R	76	130-05124-0023	4718-5237-359	RES CHIP 120KEW5%		EA	1.00	1.00
R	77	130-05271-0023	4718-5237-317	RES CHIP 270EW5%		EA	1.00	1.00

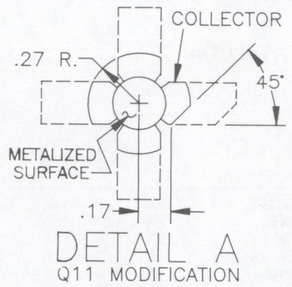
4/2 W TX/RX BOARD

200-06903-0000

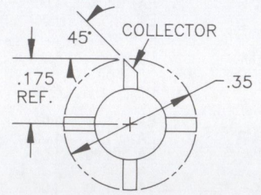
SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY EPU 0000	QUANTITY EPV 0020
R	80	130-05360-0023	4718-5398-919	RES CHIP 36.0EW5%		EA	1.00	1.00
R	81	130-05161-0023	4718-5317-144	RES CHIP 160EW5%		EA	1.00	1.00
R	82	130-05223-0023	4718-5237-320	RES CHIP 22K EW 5%		EA	1.00	1.00
R	83	130-05153-0023	4718-5237-339	RES CHIP 15K EW 5%		EA	1.00	1.00
R	85	130-05823-0023	4718-5237-363	RES CHIP 82KEW5%		EA	1.00	1.00
R	86	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	1.00
R	93	130-05201-0013	4724-0201-233	RES CHIP 200 TW 5%		EA	1.00	1.00
R	94	130-05201-0023	4718-5317-145	RES CHIP 200EW5%		EA	1.00	1.00
R	95	133-00272-0007	4719-2046-007	RES VARI 100K 30%		EA	1.00	1.00
R	96	131-00200-0013	4704-0200-031	RES CF 20 EW 5%		EA	.	1.00
REF	1	300-06903-0000	0008-5705-100	4/2 W UHF R/T ASSY		RF	X.	X.
REF	2	002-06903-0000	0007-5705-100	SCH 4/2 W UHF R/T		RF	X.	.
REF	2	002-06903-0020		SCH 4/2W DNBD R/T		RF	.	X.
T	1	019-03160-0000	5608-2054-700	XFMR TRIFILAR		EA	1.00	1.00
T	2	019-08147-0000	1800-2048-500	MIXER OUTPUT XFMR		EA	1.00	1.00
T	3	019-08142-0000	1800-2048-400	TRANSFORMER IF		EA	1.00	1.00
Y	1	044-00154-0000	2301-2024-600	44.545MHZ XTAL		EA	1.00	1.00



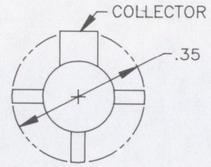




DETAIL A
Q11 MODIFICATION

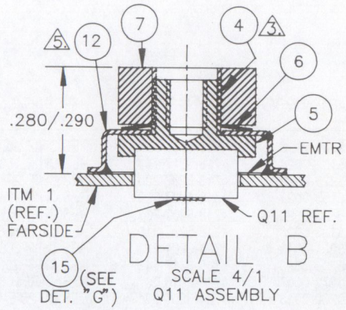


DETAIL C
SCALE 4/1
Q8 MODIFICATION

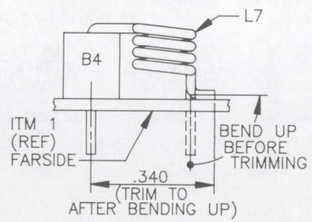


DETAIL E
SCALE 4/1
Q9 MODIFICATION

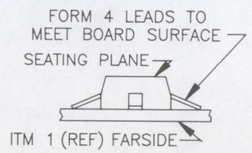
DETAIL G
SCALE 4/1
(FARSIDE SHOWN)



DETAIL B
SCALE 4/1
Q11 ASSEMBLY



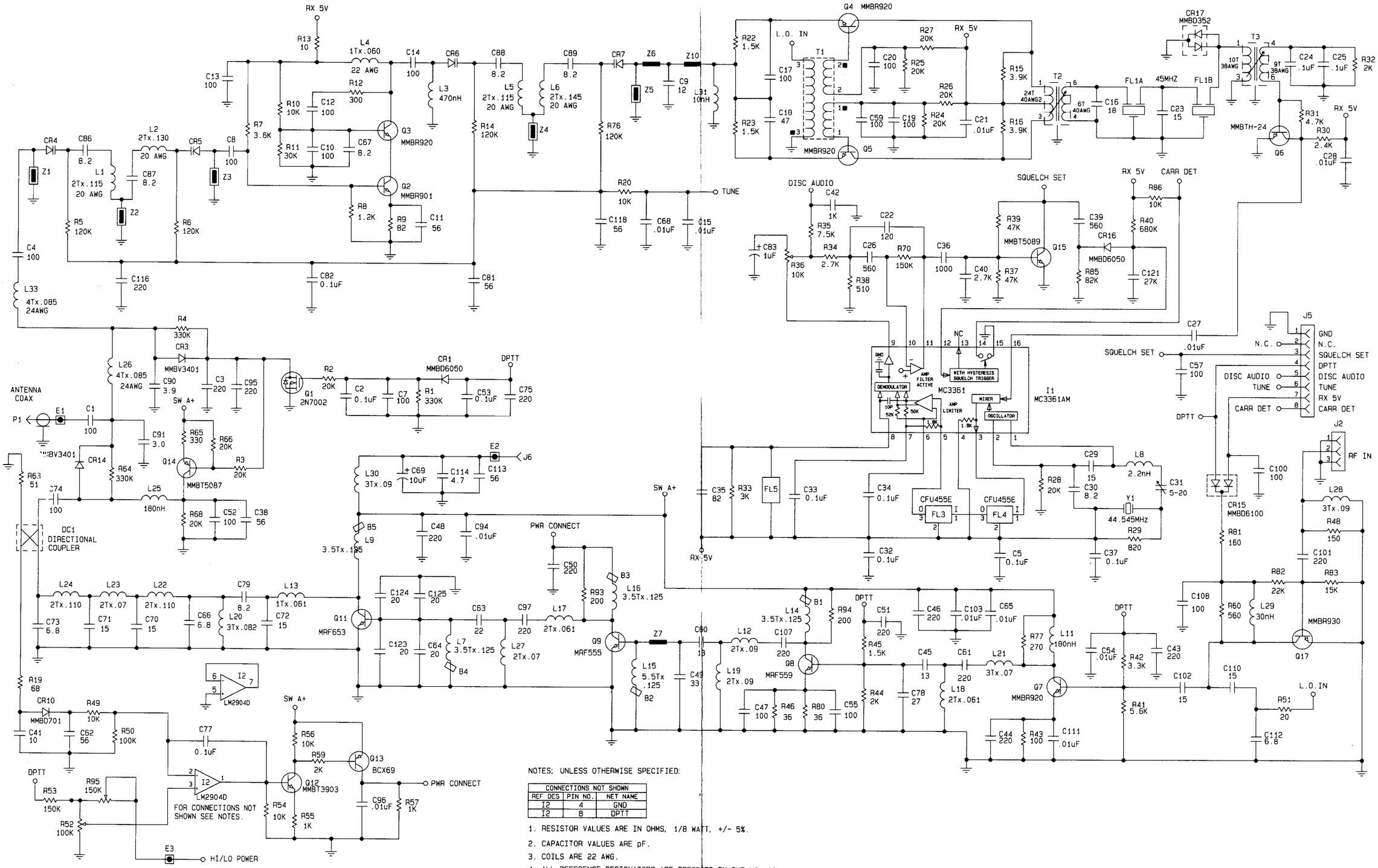
DETAIL D
SCALE 4/1
L7 MODIFICATION TO
SURFACE MNT. ONE LEAD

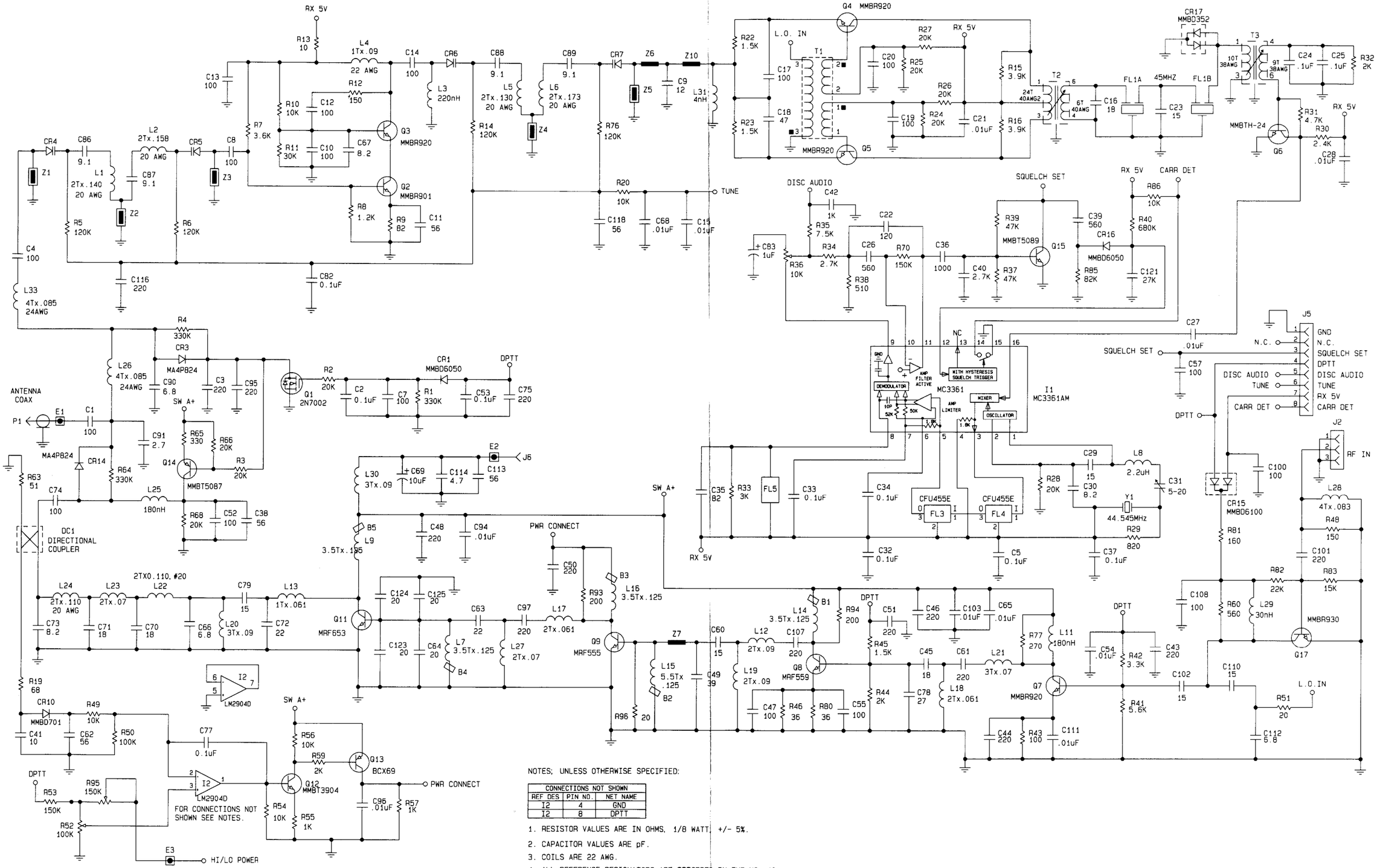


DETAIL F
SCALE 4/1
Q9 MODIFICATION
(SHOWN BEFORE SOLDERING)

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. ALL REFERENCE DESIGNATORS ARE PRECEEDED BY THE NO. 10.
2. VERTICAL MOUNT COILS (L7, L9, L14, L15, L16) NOT TO EXCEED .225 IN. ABOVE BOARD SURFACE.
3. APPLY THERMAL JOINT COMPOUND (ITM 4) TO THREADS OF HEAT SINK STUD (ITM 5).
4. SOLDER CORNERS OF T2 & T3 TO GROUND PLANE 3 PLCS. & 4 PLCS. RESPECTIVELY.
5. SOLDER "FEET" OF TRANSISTER LUG (ITM 12) TO EMITTER LEADS OF Q11, 2 PLCS.
6. AFTER INSTALLATION OF STRAIN RELIEF WIRES (ITM 10), SOLDER METAL BRAID OF COAX CABLE (P1) TO GROUND PLANE.
7. SOLDER TO GROUND PLANE AFTER SWAGING FARSIDE OF STAND-OFF.
8. LOCATION OF WIRE (SOLDERED BETWEEN E3 & J5 PIN 2) FOR SWITCH SELECTABLE POWER CONTROL.
9. INSTALL ITEM 16 BETWEEN I2 PINS 6 AND 7 AND I2 PIN 5 TO GROUND FEEDTHRU AS SHOWN.
10. LIFT PIN 13 OF I1 UP FROM PAD BEFORE ATTACHING ITEM 17. PIN AND WIRE MUST NOT CONTACT PAD.


RX 5V
R13 10
L4 1Tx.060 22 AWG
C14 100
CR6
C88 8.2
C89 8.2
CR7
Z6
Z10
C13 100
R10 10K
C12 100
R12 300
R7 3.6K
R11 30K
C10 100
C67 8.2
Q3 MMBR920
L3 470nH
L5 2Tx.115 20 AWG
L6 2Tx.145 20 AWG
Z4
Z5
C9 12
L31 10nH
R14 120K
R76 120K
CR4
C86 8.2
L2 2Tx.130 20 AWG
CR5
C8 100
Z1
L1 2Tx.115 20 AWG
C87 8.2
Z2
Z3
R5 120K
R6 120K
Q2 MMBR901
R8 1.2K
R9 82
C11 56
C4 100
L33 4Tx.085 24AWG
C116 220
C82 0.1uF
C81 56
R20 10K
TUNE
C118 56
C68 .01uF
C15 .01uF
R4 330K
CR3 MMBV3401
L26 4Tx.085 24AWG
C90 3.9
C3 220
C95 220
ANTENNA COAX
P1
E1
C1 100
SW A+
R65 330
R66 20K
Q14 MMBT5087
R3 20K
CR1 MMBD6050
DPTT
R2 20K
Q1 2N7002
C2 0.1uF
C7 100
R1 330K
C53 0.1uF
C75 220
E2
J6
L30 3Tx.09
C69 10uF
C114 4.7
C113 56
R63 51
C74 100
L25 180nH
R68 20K
C52 100
C38 56
DC1 DIRECTIONAL COUPLER
B5
L9 3.5Tx.125
C48 220
C94 .01uF
PWR CONNECT
C50 220
B3
L16 3.5Tx.125
R93 200
L24 2Tx.110
L23 2Tx.07
L22 2Tx.110
C79 8.2
L13 1Tx.061
C73 6.8
C71 15
C70 15
C66 6.8
L20 3Tx.082
C72 15
C124 20
C125 20
C123 20
C64 20
C63 22
L7 3.5Tx.125
B4
C97 220
L27 2Tx.07
L17 2Tx.061
Q11 MRF653
Q9 MRF555
Z7
L15 5.5Tx .125
B2
C49 33
C60 13
L12 2Tx.09
C107 220
L19 2Tx.09
B1
L14 3.5Tx.125
R94 200
Q8 MRF559
C47 100
R46 36
R80 36
C55 100
R45 1.5K
R44 2K
C78 27
C45 13
C61 220
L21 3Tx.07
L18 2Tx.061
R77 270
L11 180nH
Q7 MMBR920
C44 220
R43 100
C111 .01uF
C54 .01uF
R42 3.3K
C43 220
R41 5.6K
C102 15
C110 15
R51 20
L.O.IN
C112 6.8
C108 100
R60 560
L29 30nH
MMBR930
Q17
R82 22K
R83 15K
C101 220
L28 3Tx.09
R48 150
RF IN
J2
CR15 MMBD6100
C100 100
R81 160
I2 LM2904D
R19 68
CR10 MMBD701
C41 10
C62 56
R49 10K
R50 100K
C77 0.1uF
DPTT
R53 150K
R95 150K
R52 100K
FOR CONNECTIONS NOT SHOWN SEE NOTES.
SW A+
R56 10K
R59 2K
Q13 BCX69
Q12 MMBT3903
R54 10K
R55 1K
C96 .01uF
R57 1K
PWR CONNECT
E3
HI/LO POWER
Q4 MMBR920
L.O. IN
T1
C17 100
C18 47
R22 1.5K
R23 1.5K
Q5 MMBR920
C20 100
R25 20K
R27 20K
C59 100
C19 100
R24 20K
R26 20K
C21 .01uF
R15 3.9K
R16 3.9K
CR17 MMBD352
T3
T2
24T 40AWG2
6T 40AWG
FL1A
45MHZ
FL1B
C16 18
C23 15
C24 .1uF
C25 .1uF
R32 2K
MMBTH-24
Q6
R31 4.7K
R30 2.4K
C26 .01uF
RX 5V
DISC AUDIO
C42 1K
R35 7.5K
C22 120
C83 1uF
R36 10K
R34 2.7K
C26 560
R38 510
R70 150K
C36 1000
C40 2.7K
SQUELCH SET
R39 47K
MMBT5089
Q15
R37 47K
C39 560
CR16 MMBD6050
R85 82K
C121 27K
CARR DET
R86 10K
R40 680K
C27 .01uF
C57 100
J5
GND
N.C.
SQUELCH SET
DPTT
DISC AUDIO
TUNE
RX 5V
CARR DET
I1 MC3361AM
MC3361
NC
GND
DEMODULATOR
AMP FILTER ACTIVE
WITH HYSTERESIS SQUELCH TRIGGER
MIXER
OSCILLATOR
AMP LIMITER
C35 82
R33 3K
FL5
C33 0.1uF
C34 0.1uF
CFU455E
FL3
FL4
C32 0.1uF
C5 0.1uF
C37 0.1uF
R28 20K
C29 15
C30 8.2
L8 2.2nH
C31 5-20
Y1 44.545MHz
R29 820
RX 5V
NOTES; UNLESS OTHERWISE SPECIFIED:
CONNECTIONS NOT SHOWN
REF DES | PIN NO. | NET NAME
I2 | 4 | GND
I2 | 8 | DPTT
1. RESISTOR VALUES ARE IN OHMS, 1/8 WATT, +/- 5%.
2. CAPACITOR VALUES ARE pF.
3. COILS ARE 22 AWG.
4. ALL REFERENCE DESIGNATORS ARE PRECEDED BY THE NO. 10.



NOTES; UNLESS OTHERWISE SPECIFIED:

CONNECTIONS NOT SHOWN		
REF DES	PIN NO.	NET NAME
I2	4	GND
I2	8	DPTT

1. RESISTOR VALUES ARE IN OHMS, 1/8 WATT, +/- 5%.
2. CAPACITOR VALUES ARE pF.
3. COILS ARE 22 AWG.
4. ALL REFERENCE DESIGNATORS ARE PRECEDED BY THE NO. 10.

4W TX/RX BOARD

200-06904-0010 EPU R/T BOARD
200-06904-0020 EPV R/T BOARD

SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0010	0020
B	1	013-00006-0000	2502-2011-100	FERR BEAD		EA	1.00	1.00
B	2	013-00006-0000	2502-2011-100	FERR BEAD		EA	1.00	1.00
B	3	013-00006-0000	2502-2011-100	FERR BEAD		EA	1.00	1.00
B	4	013-00006-0000	2502-2011-100	FERR BEAD		EA	1.00	1.00
B	5	013-00006-0000	2502-2011-100	FERR BEAD		EA	1.00	1.00
C	1	106-00072-0034	1553-2083-434	CAP CH 56PFNPO/50V		EA	1.00	.
C	1	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	2	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	3	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	1.00	1.00
C	4	106-04221-0016	1553-5313-537	CAP CH220PFNPO/50V		EA	1.00	1.00
C	5	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	7	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	8	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	9	106-00072-0002	1553-2083-402	CAP CH3.9PFNPO/50V		EA	.	1.00
C	9	106-00072-0061	1553-2083-461	CAP CR CH 9.1PF		EA	1.00	.
C	10	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	11	106-00072-0034	1553-2083-434	CAP CH 56PFNPO/50V		EA	1.00	1.00
C	12	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	13	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	14	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	15	106-05103-0046	1553-5237-794	CAP CH 10K X7R/50V		EA	1.00	1.00
C	16	106-00072-0018	1553-2083-418	CAP CH 18PFNPO/50V		EA	1.00	1.00
C	17	106-00072-0034	1553-2083-434	CAP CH 56PFNPO/50V		EA	.	1.00
C	17	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	.
C	18	106-00072-0032	1553-2083-432	CAP CH 47PFNPO/50V		EA	1.00	.
C	18	106-00072-0034	1553-2083-434	CAP CH 56PFNPO/50V		EA	.	1.00
C	19	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	20	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	21	106-05103-0046	1553-5237-794	CAP CH 10K X7R/50V		EA	1.00	1.00
C	22	106-04121-0016	1553-5313-534	CAP CH120PFNPO/50V		EA	1.00	1.00
C	23	106-00072-0016	1553-2083-416	CAP CH 15PFNPO/50V		EA	1.00	1.00
C	24	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	25	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	26	106-04561-0016	1553-5525-311	CAP CH560PFNPO/50V		EA	1.00	1.00
C	27	106-04103-0047	1553-5237-705	CH 10K X7R/50V		EA	1.00	1.00
C	28	106-04103-0047	1553-5237-705	CH 10K X7R/50V		EA	1.00	1.00
C	29	106-04150-0016	1553-5313-504	CH 15PF NPO/50V		EA	1.00	1.00
C	30	106-00072-0010	1553-2083-410	CAP CH8.2PFNPO/50V		EA	1.00	1.00
C	31	102-00066-0000	1517-2082-600	CAP VA 5-20PF 25V		EA	1.00	1.00
C	32	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	33	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	34	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	35	106-04820-0016	1553-5525-312	CAP CH 82PFNPO/50V		EA	1.00	1.00
C	36	106-04102-0016	1553-5237-703	CAP CH 1K NPO/50V		EA	1.00	1.00
C	37	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	38	106-00072-0034	1553-2083-434	CAP CH 56PFNPO/50V		EA	1.00	1.00
C	39	106-05561-0046	1553-5525-317	CH 560PF 7R/50V		EA	1.00	1.00
C	40	106-05272-0047	1553-5525-302	CAPCH2700PFX7R/50V		EA	1.00	1.00
C	41	106-00072-0012	1553-2083-412	CAP CH10PF NPO/50V		EA	1.00	.
C	41	106-00072-0060	1553-2083-460	CAP CR CH 7.5PF		EA	.	1.00
C	42	106-04102-0047	1553-5237-706	CH 1K X7R/50V		EA	1.00	1.00
C	43	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	1.00	1.00
C	44	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	1.00	1.00
C	45	106-00072-0014	1553-2083-414	CAP CH12PFNPO/50V		EA	1.00	.
C	45	106-00072-0018	1553-2083-418	CAP CH 18PFNPO/50V		EA	.	1.00
C	46	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	1.00	1.00
C	47	106-05221-0048	1553-5313-529	CAP CH 220X7R/50V		EA	1.00	1.00
C	48	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	1.00	1.00
C	49	106-00072-0018	1553-2083-418	CAP CH 18PFNPO/50V		EA	1.00	.
C	49	106-00072-0026	1553-2083-426	CAP CH 27PFNPO/50V		EA	.	1.00
C	50	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	1.00	1.00
C	51	106-05221-0048	1553-5313-529	CAP CH 220X7R/50V		EA	1.00	1.00
C	52	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	53	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	54	106-04103-0046	1553-5237-705	CAP CH 10K X7R/50V		EA	1.00	1.00
C	55	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	1.00	1.00
C	57	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	58	106-00072-0012	1553-2083-412	CAP CH10PF NPO/50V		EA	1.00	.
C	59	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	.
C	60	106-00072-0012	1553-2083-412	CAP CH10PF NPO/50V		EA	.	1.00
C	60	106-00072-0014	1553-2083-414	CAP CH12PFNPO/50V		EA	1.00	.

4W TX/RX BOARD

200-06904-0000

SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0010	0020
C	61	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	1.00	1.00
C	62	106-00072-0034	1553-2083-434	CAP CH 56PFNPO/50V		EA	1.00	1.00
C	63	106-00072-0016	1553-2083-416	CAP CH 15PFNPO/50V		EA	1.00	.
C	63	106-00072-0018	1553-2083-418	CAP CH 18PFNPO/50V		EA	.	1.00
C	64	106-00072-0030	1553-2083-430	CAP CH 39PFNPO/50V		EA	1.00	.
C	64	106-00072-0034	1553-2083-434	CAP CH 56PFNPO/50V		EA	.	1.00
C	65	106-04103-0047	1553-5237-705	CH 10K X7R/50V		EA	1.00	1.00
C	66	106-00072-0008	1553-2083-408	CAP CH6.8PFNPO/50V		EA	1.00	.
C	66	106-00072-0060	1553-2083-460	CAP CR CH 7.5PF		EA	.	1.00
C	67	106-00072-0010	1553-2083-410	CAP CH8.2PFNPO/50V		EA	1.00	1.00
C	68	106-05103-0046	1553-5237-794	CAP CH 10K X7R/50V		EA	1.00	1.00
C	69	097-00109-0002	1513-3790-815	CAP EL 10UF 35V		EA	1.00	1.00
C	70	106-00072-0014	1553-2083-414	CAP CH12PFNPO/50V		EA	1.00	.
C	70	106-00072-0018	1553-2083-418	CAP CH 18PFNPO/50V		EA	.	1.00
C	71	106-00072-0014	1553-2083-414	CAP CH12PFNPO/50V		EA	1.00	.
C	71	106-00072-0018	1553-2083-418	CAP CH 18PFNPO/50V		EA	.	1.00
C	72	106-00072-0016	1553-2083-416	CAP CH 15PFNPO/50V		EA	1.00	1.00
C	73	106-00072-0008	1553-2083-408	CAP CH6.8PFNPO/50V		EA	1.00	.
C	73	106-00072-0060	1553-2083-460	CAP CR CH 7.5PF		EA	.	1.00
C	74	106-00072-0034	1553-2083-434	CAP CH 56PFNPO/50V		EA	1.00	.
C	74	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	75	106-05221-0048	1553-5313-529	CAP CH 220X7R/50V		EA	1.00	1.00
C	77	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	78	106-00072-0016	1553-2083-416	CAP CH 15PFNPO/50V		EA	1.00	.
C	78	106-00072-0026	1553-2083-426	CAP CH 27PFNPO/50V		EA	.	1.00
C	79	106-00072-0014	1553-2083-414	CAP CH12PFNPO/50V		EA	1.00	.
C	79	106-00072-0016	1553-2083-416	CAP CH 15PFNPO/50V		EA	.	1.00
C	80	106-00072-0034	1553-2083-434	CAP CH 56PFNPO/50V		EA	1.00	1.00
C	81	106-00072-0034	1553-2083-434	CAP CH 56PFNPO/50V		EA	1.00	1.00
C	82	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	1.00
C	83	096-01186-0012	1552-6463-128	CAP 1.0UF 16V 10%		EA	1.00	1.00
C	86	106-00072-0010	1553-2083-410	CAP CH8.2PFNPO/50V		EA	1.00	.
C	86	106-00072-0061	1553-2083-461	CAP CR CH 9.1PF		EA	.	1.00
C	87	106-00072-0010	1553-2083-410	CAP CH8.2PFNPO/50V		EA	1.00	.
C	87	106-00072-0061	1553-2083-461	CAP CR CH 9.1PF		EA	.	1.00
C	88	106-00072-0010	1553-2083-410	CAP CH8.2PFNPO/50V		EA	1.00	.
C	88	106-00072-0061	1553-2083-461	CAP CR CH 9.1PF		EA	.	1.00
C	89	106-00072-0010	1553-2083-410	CAP CH8.2PFNPO/50V		EA	1.00	.
C	89	106-00072-0061	1553-2083-461	CAP CR CH 9.1PF		EA	.	1.00
C	90	106-00072-0002	1553-2083-402	CAP CH3.9PFNPO/50V		EA	1.00	1.00
C	91	106-00072-0051	1553-2083-451	CAP CR CH 2.2PF		EA	1.00	1.00
C	94	106-04103-0046	1553-5237-705	CAP CH 10K X7R/50V		EA	1.00	1.00
C	95	106-05221-0048	1553-5313-529	CAP CH 220X7R/50V		EA	1.00	1.00
C	96	106-04103-0046	1553-5237-705	CAP CH 10K X7R/50V		EA	1.00	1.00
C	97	106-05221-0048	1553-5313-529	CAP CH 220X7R/50V		EA	1.00	1.00
C	100	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	101	106-05221-0048	1553-5313-529	CAP CH 220X7R/50V		EA	1.00	1.00
C	102	106-00072-0016	1553-2083-416	CAP CH 15PFNPO/50V		EA	1.00	1.00
C	103	106-04103-0046	1553-5237-705	CAP CH 10K X7R/50V		EA	1.00	1.00
C	107	106-05221-0016	1553-5313-589	CAP CH220PFNPO/50V		EA	1.00	1.00
C	108	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	1.00	1.00
C	110	106-00072-0016	1553-2083-416	CAP CH 15PFNPO/50V		EA	1.00	1.00
C	111	106-04103-0046	1553-5237-705	CAP CH 10K X7R/50V		EA	1.00	1.00
C	112	106-00072-0008	1553-2083-408	CAP CH6.8PFNPO/50V		EA	1.00	.
C	112	106-00072-0014	1553-2083-414	CAP CH12PFNPO/50V		EA	.	1.00
C	113	106-00072-0034	1553-2083-434	CAP CH 56PFNPO/50V		EA	1.00	1.00
C	114	106-00072-0004	1553-2083-404	CAP CH4.7PFNPO/50V		EA	1.00	1.00
C	116	106-05221-0048	1553-5313-529	CAP CH 220X7R/50V		EA	1.00	1.00
C	118	106-00072-0034	1553-2083-434	CAP CH 56PFNPO/50V		EA	1.00	1.00
C	121	106-04273-0046	1553-5313-540	CAP CH 27K X7R/50V		EA	1.00	1.00
C	122	106-00072-0054	1553-2083-454	CAP CH 3.3PF		EA	.	1.00
CR	1	007-06180-0000	4824-2009-400	DIO SW MMBD6050		EA	1.00	1.00
CR	3	007-06178-0000	4824-5483-300	DIO PIN MMBV3401		EA	1.00	1.00
CR	4	007-04064-0000	4809-2046-900	DIODE VARACAP		EA	1.00	1.00
CR	5	007-04064-0000	4809-2046-900	DIODE VARACAP		EA	1.00	1.00
CR	6	007-04064-0000	4809-2046-900	DIODE VARACAP		EA	1.00	1.00
CR	7	007-04064-0000	4809-2046-900	DIODE VARACAP		EA	1.00	1.00
CR	10	007-06179-0000	4816-2064-400	DIO SI MMBD501		EA	1.00	1.00
CR	14	007-06178-0000	4824-5483-300	DIO PIN MMBV3401		EA	1.00	1.00
CR	15	007-06227-0000	4824-2008-800	SOT23 DIO MMBD6100		EA	1.00	1.00
CR	16	007-06180-0000	4824-2009-400	DIO SW MMBD6050		EA	1.00	1.00
CR	17	007-06226-0001	4824-2021-800	SOT23 DIO MMBD352		EA	1.00	1.00

4W TX/RX BOARD

200-06904-0000

SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0010	QUANTITY 0020
FL	1	017-00134-0000	2705-2022-700	XTAL FILTER 45MHZ		EA	1.00	1.00
FL	3	017-00106-0000	2700-2011-200	FLTR CR 455KHZ		EA	1.00	1.00
FL	4	017-00106-0000	2700-2011-200	FLTR CR 455KHZ		EA	1.00	1.00
FL	5	017-00137-0000	2701-2047-500	DISCRIMINATOR CER.		EA	1.00	1.00
I	1	120-03199-0000	3134-3670-602	IC FM IF MC3361		EA	1.00	1.00
I	2	120-03195-0000	3134-3670-413	IC LM2904D		EA	1.00	1.00
ITM	1	009-06904-0010	1700-5706-910	PC 4W RX/TX BD		EA	1.00	1.00
ITM	2	009-06913-0000	1700-4011-400	SHLD DIR CPLR UHF		EA	1.00	1.00
ITM	3	047-09136-0001	1409-2028-001	CHANNEL PLT BRASS		EA	1.00	1.00
ITM	4	016-01004-0000	1602-0000-001	COMPOUND THRML JNT		AR	1.00	1.00
ITM	5	076-01459-0001	5400-2027-201	STUD HEAT SINK		EA	1.00	1.00
ITM	6	089-08339-0000	2847-2034-800	WASHER CURVED SPRG		EA	1.00	1.00
ITM	7	076-01460-0001	2858-2027-301	NUT ADJUSTING		EA	1.00	1.00
ITM	8	091-00523-0000	3110-2019-400	INSULATOR XTAL		EA	2.00	2.00
ITM	9	016-01082-0000	1607-0000-001	DC RTV 3145		AR	1.00	1.00
ITM	10	026-00002-0000	6024-0000-001	WIRE COP TIN 24G		IN	1.00	1.00
ITM	11	016-01184-0000	1609-0000-004	ADHESIVE		AR	1.00	1.00
ITM	12	047-09138-0001	2107-4008-901	GND LUG XSTR	A	EA	1.00	1.00
ITM	13	076-01465-0001	2813-2026-801	RIVET STANDOFF		EA	2.00	2.00
ITM	14	026-00030-0000	6024-0000-001	WIRE CU24AWG TIN		AR	1.00	1.00
J	2	030-01386-0001	2108-2017-401	SCKT MINATURE SPRG		EA	3.00	3.00
J	5	030-02902-0008	2105-2031-908	LIF LOW PRFL SKT		EA	1.00	1.00
J	6	155-02531-0000	6006-4017-800	CABLE ASSY SWA +	A	EA	1.00	1.00
L	1	019-02676-0000	1801-2047-700	COIL		EA	1.00	.
L	1	019-02676-0004	1801-2047-704	COIL 2TX.140 20AWG		EA	.	1.00
L	2	019-02676-0001	1801-2047-701	IND 2TX.13 20 AWG		EA	1.00	.
L	2	019-02676-0005	1801-2047-705	COIL 2TX145 20GA		EA	.	1.00
L	3	019-02674-0001	1811-2047-901	IND 2TX.110 20 AWG		EA	1.00	1.00
L	4	019-02674-0001	1811-2047-901	IND 2TX.110 20 AWG		EA	1.00	1.00
L	5	019-02676-0001	1801-2047-701	IND 2TX.13 20 AWG		EA	.	1.00
L	5	019-02676-0002	1801-2047-702	IND 2TX.105 20 AWG		EA	1.00	.
L	6	019-02704-0000		COIL 1-3/4 TURN		EA	.	1.00
L	6	019-02704-0002	1801-2100-900	COIL 1-3/4 TURNS		EA	1.00	.
L	7	019-02673-0000	1801-2047-800	COIL VERTICAL MOUN		EA	1.00	1.00
L	8	019-02084-0028	1802-2013-728	CH 2.2UH 5%		EA	1.00	1.00
L	9	019-02673-0000	1801-2047-800	COIL VERTICAL MOUN		EA	1.00	1.00
L	11	019-02084-0002	1802-2013-702	CH .18UH 5%		EA	1.00	1.00
L	12	019-02675-0011	1811-2013-111	IND 2TX.090 22AWG		EA	1.00	1.00
L	13	019-02663-0000	1811-2023-000	COIL SURFACE MOUNT		EA	1.00	.
L	13	019-02706-0001		COIL SURFACE MOUNT		EA	.	1.00
L	14	019-02673-0000	1801-2047-800	COIL VERTICAL MOUN		EA	1.00	1.00
L	15	019-02673-0000	1801-2047-800	COIL VERTICAL MOUN		EA	1.00	.
L	15	019-02673-0001	1801-2047-801	COIL VERT 3-1/2T		EA	.	1.00
L	16	019-02673-0000	1801-2047-800	COIL VERTICAL MOUN		EA	1.00	.
L	16	019-02673-0001	1801-2047-801	COIL VERT 3-1/2T		EA	.	1.00
L	17	019-02675-0002	1811-2013-102	IND 2TX.07 22 AWG		EA	1.00	.
L	17	019-02675-0004	1811-2013-104	IND 2TX.10 22 AWG		EA	.	1.00
L	18	019-02675-0002	1811-2013-102	IND 2TX.07 22 AWG		EA	.	1.00
L	18	019-02675-0007	1811-2013-107	IND 3TX.07 22 AWG		EA	1.00	.
L	19	019-02675-0002	1811-2013-102	IND 2TX.07 22 AWG		EA	1.00	.
L	19	019-02675-0015	1811-2013-115	IND 2TX.08 22 AWG		EA	.	1.00
L	20	019-02675-0006	1811-2013-106	IND 3TX.061 22 AWG		EA	1.00	.
L	20	019-02675-0007	1811-2013-107	IND 3TX.07 22 AWG		EA	.	1.00
L	21	019-02675-0007	1811-2013-107	IND 3TX.07 22 AWG		EA	1.00	1.00
L	22	019-02675-0003	1811-2013-103	IND 2TX.098 22 AWG		EA	1.00	1.00
L	23	019-02675-0002	1811-2013-102	IND 2TX.07 22 AWG		EA	1.00	1.00
L	24	019-02675-0003	1811-2013-103	IND 2TX.098 22 AWG		EA	1.00	.
L	24	019-02675-0017	1811-2013-117	IND 2TX.110 22GA		EA	.	1.00
L	25	019-02084-0002	1802-2013-702	CH .18UH 5%		EA	1.00	1.00
L	26	019-02674-0000	1811-2047-900	COIL SURFACE MOUNT		EA	1.00	1.00
L	27	019-02675-0001	1811-2013-101	IND 2TX.061 22 AWG		EA	1.00	1.00
L	28	019-02675-0009	1811-2013-109	IND 3TX.09 22 AWG		EA	1.00	.
L	28	019-02675-0018	1811-2013-118	IND 4TX.083 22GA		EA	.	1.00
L	29	019-02660-0005	1808-2013-605	SURFACE MT 30 NH		EA	1.00	1.00
L	30	019-02675-0009	1811-2013-109	IND 3TX.09 22 AWG		EA	1.00	1.00
P	1	155-02484-0000	6006-2079-200	CABLE ASSY, COAX	A	EA	1.00	1.00
Q	1	007-00903-0000	4823-2025-100	2N7002 MOSFET		EA	1.00	1.00

4W TX/RX BOARD

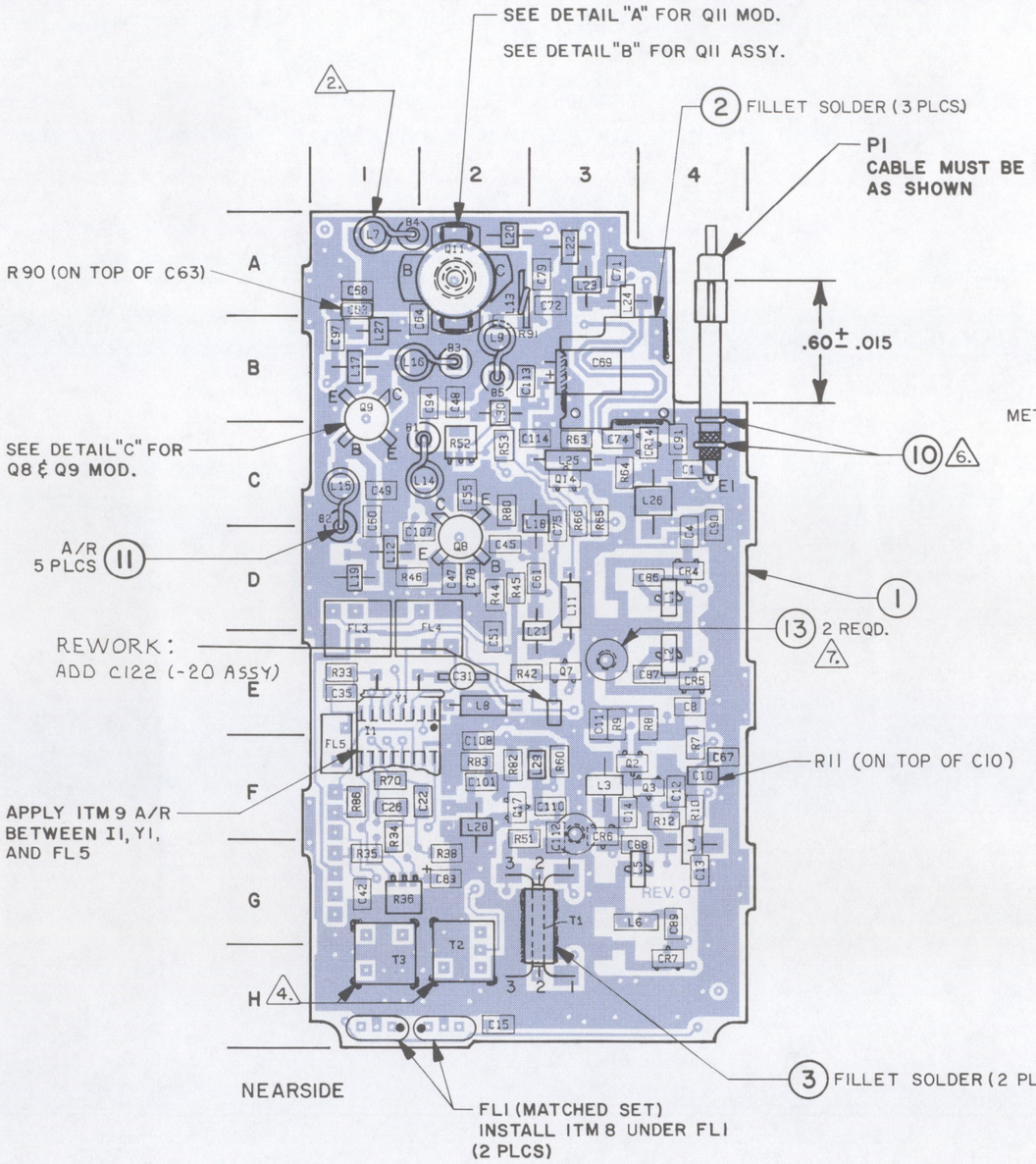
200-06904-0000

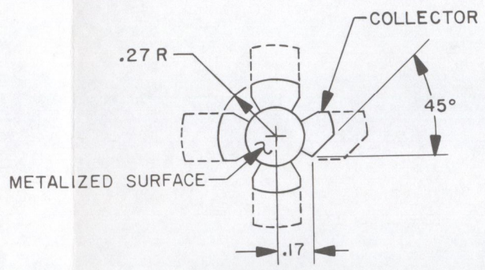
SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0010	0020
Q	2	007-00821-0000	4824-2020-400	XSTR RF MMBR901		EA	1.00	1.00
Q	3	007-00536-0000	4823-2008-100	XSTR MMBR920		EA	1.00	1.00
Q	4	007-00536-0000	4823-2008-100	XSTR MMBR920		EA	1.00	1.00
Q	5	007-00536-0000	4823-2008-100	XSTR MMBR920		EA	1.00	1.00
Q	6	007-00529-0000	4823-2006-400	XSTR NPN MMBTH24		EA	1.00	1.00
Q	7	007-00822-0000	4823-2046-500	XSTR RF MMBR930		EA	1.00	1.00
Q	8	007-00823-0000	4804-3437-101	XSTR RF MRF559		EA	1.00	1.00
Q	9	007-00823-0000	4804-3437-101	XSTR RF MRF559		EA	1.00	1.00
Q	11	007-00826-0000	4804-2088-500	XSTR RF SRF3927		EA	1.00	1.00
Q	12	007-00530-0001	4823-3669-101	XSTR NPN MMBT3904		EA	1.00	1.00
Q	13	007-00900-0000	4823-2006-500	BCX 69		EA	1.00	1.00
Q	14	007-00537-0000	4823-3741-301	XSTR PNP MMBT5087		EA	1.00	1.00
Q	15	007-00187-0002	4823-3741-401	XSTR SOT-23 2N5089		EA	1.00	1.00
Q	17	007-00822-0000	4823-2046-500	XSTR RF MMBR930		EA	1.00	1.00
R	1	130-05334-0023	4718-5237-335	RES CHIP 330KEW5%		EA	1.00	1.00
R	2	130-05203-0023	4718-5237-388	RES CHIP 20K EW 5%		EA	1.00	1.00
R	3	130-05203-0023	4718-5237-388	RES CHIP 20K EW 5%		EA	1.00	1.00
R	4	130-05334-0023	4718-5237-335	RES CHIP 330KEW5%		EA	1.00	1.00
R	5	130-05124-0023	4718-5237-359	RES CHIP 120KEW5%		EA	1.00	1.00
R	6	130-05124-0023	4718-5237-359	RES CHIP 120KEW5%		EA	1.00	1.00
R	7	130-05362-0023	4718-5237-342	RES CHIP 3.6K5%EW		EA	1.00	1.00
R	8	130-05122-0023	4718-5237-327	RES CHIP 1.2KEW5%		EA	1.00	1.00
R	9	130-05820-0023	4718-5398-910	RES CHIP 82 EW 5%		EA	1.00	1.00
R	10	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	1.00
R	11	130-05303-0013	4724-0303-233	RES CH 30K TW 5%		EA	1.00	1.00
R	12	130-05151-0023	4718-5237-329	RES CHIP 150EW5%		EA	.	1.00
R	12	130-05301-0023	4718-5317-147	RES CHIP 300 EW 5%		EA	1.00	.
R	13	130-05100-0023	4718-5237-347	RES CH 10 EW 5%		EA	1.00	1.00
R	14	130-05124-0023	4718-5237-359	RES CHIP 120KEW5%		EA	1.00	1.00
R	15	130-05392-0023	4718-5237-371	RES CHIP 3.9KEW5%		EA	1.00	1.00
R	16	130-05392-0023	4718-5237-371	RES CHIP 3.9KEW5%		EA	1.00	1.00
R	19	130-05100-0023	4718-5237-347	RES CH 10 EW 5%		EA	.	1.00
R	19	130-05101-0023	4718-5237-313	RES CH 100 EW 5%		EA	1.00	.
R	20	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	1.00
R	21	130-05000-0025	4718-5317-140	RES CHIP 0 EW CJ		EA	1.00	1.00
R	22	130-05152-0023	4718-5237-319	RES CHIP 1.5KEW5%		EA	1.00	1.00
R	23	130-05152-0023	4718-5237-319	RES CHIP 1.5KEW5%		EA	1.00	1.00
R	24	130-05203-0023	4718-5237-388	RES CHIP 20K EW 5%		EA	1.00	1.00
R	25	130-05203-0023	4718-5237-388	RES CHIP 20K EW 5%		EA	1.00	1.00
R	26	130-05203-0023	4718-5237-388	RES CHIP 20K EW 5%		EA	1.00	1.00
R	27	130-05203-0023	4718-5237-388	RES CHIP 20K EW 5%		EA	1.00	1.00
R	28	130-05203-0023	4718-5237-388	RES CHIP 20K EW 5%		EA	1.00	1.00
R	29	130-05821-0023	4718-5237-395	RES 820 EW 5%		EA	1.00	1.00
R	30	130-05242-0023	4718-5237-372	RES CHIP 2.4KEW5%		EA	1.00	1.00
R	31	130-05472-0023	4718-5237-303	RES CHIP 4.7KEW5%		EA	1.00	1.00
R	32	130-05202-0023	4718-5317-151	RES CHIP 2K EW 5%		EA	1.00	1.00
R	33	130-05302-0023	4718-5237-332	RES CHIP 3K EW 5%		EA	1.00	1.00
R	34	130-05123-0023	4718-5237-340	RES CHIP 12K5%EW		EA	1.00	1.00
R	35	130-05752-0023	4718-5237-380	RES CHIP 7.5KEW5%		EA	1.00	1.00
R	36	133-00272-0004	4719-2046-004	RES VARI 10K 30%		EA	1.00	1.00
R	37	130-05823-0023	4718-5237-363	RES CHIP 82KEW5%		EA	1.00	1.00
R	38	130-05471-0023	4718-5237-318	RES CHIP 470EW5%		EA	1.00	1.00
R	39	130-05823-0023	4718-5237-363	RES CHIP 82KEW5%		EA	1.00	1.00
R	40	130-05684-0023	4718-5237-334	RES CHIP 680KEW5%		EA	1.00	1.00
R	41	130-05562-0023	4718-5237-328	RES CHIP 5.6KEW5%		EA	1.00	1.00
R	42	130-05332-0023	4718-5237-350	RES CHIP 3.3KEW5%		EA	1.00	1.00
R	43	130-05101-0023	4718-5237-313	RES CH 100 EW 5%		EA	1.00	1.00
R	44	130-05202-0023	4718-5317-151	RES CHIP 2K EW 5%		EA	1.00	1.00
R	45	130-05152-0023	4718-5237-319	RES CHIP 1.5KEW5%		EA	1.00	1.00
R	46	130-05510-0023	4718-5237-312	RES CHIP 51 EW 5%		EA	1.00	1.00
R	48	130-05151-0023	4718-5237-329	RES CHIP 150EW5%		EA	1.00	1.00
R	49	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	.
R	49	130-05104-0023	4718-5237-322	RES CH 100K EW 5%		EA	.	1.00
R	50	130-05104-0023	4718-5237-322	RES CH 100K EW 5%		EA	1.00	1.00
R	51	130-05200-0023	4718-5317-141	RES CHIP 20 EW 5%		EA	1.00	1.00
R	52	133-00272-0007	4719-2046-007	RES VARI 100K 30%		EA	1.00	1.00
R	53	130-05154-0023	4718-5237-353	RES CHIP 150K5%EW		EA	1.00	1.00
R	54	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	1.00
R	55	130-05102-0023	4718-5237-301	RES CH 1K EW 5%		EA	1.00	1.00
R	56	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	1.00
R	57	130-05102-0023	4718-5237-301	RES CH 1K EW 5%		EA	1.00	1.00
R	59	130-05202-0023	4718-5317-151	RES CHIP 2K EW 5%		EA	1.00	1.00

4W TX/RX BOARD

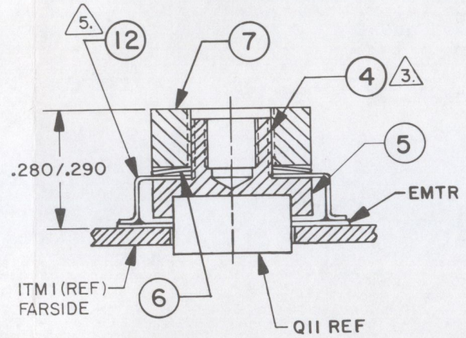
200-06904-0000

SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0010	QUANTITY 0020
R	60	130-05561-0023	4718-5237-365	RES CHIP 560EW5%		EA	1.00	1.00
R	63	139-00511-0000	4718-5398-946	RES CH 51.1 EW 1%		EA	1.00	1.00
R	64	130-05334-0023	4718-5237-335	RES CHIP 330KEW5%		EA	1.00	1.00
R	65	130-05331-0023	4718-5237-314	RES CHIP 330 EW5%		EA	1.00	1.00
R	66	130-05203-0023	4718-5237-388	RES CHIP 20K EW 5%		EA	1.00	1.00
R	68	130-05203-0023	4718-5237-388	RES CHIP 20K EW 5%		EA	1.00	1.00
R	70	130-05154-0023	4718-5237-353	RES CHIP 150K5%EW		EA	1.00	1.00
R	76	130-05124-0023	4718-5237-359	RES CHIP 120KEW5%		EA	1.00	1.00
R	77	130-05271-0023	4718-5237-317	RES CHIP 270EW5%		EA	1.00	1.00
R	80	130-05510-0023	4718-5237-312	RES CHIP 51 EW 5%		EA	1.00	1.00
R	81	130-05161-0023	4718-5317-144	RES CHIP 160EW5%		EA	1.00	1.00
R	82	130-05223-0023	4718-5237-320	RES CHIP 22K EW 5%		EA	1.00	1.00
R	83	130-05153-0023	4718-5237-339	RES CHIP 15K EW 5%		EA	1.00	1.00
R	85	130-05823-0023	4718-5237-363	RES CHIP 82KEW5%		EA	1.00	1.00
R	86	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	1.00
R	90	130-05301-0013	4724-0301-233	RES CHIP 300 TW 5%		EA	1.00	1.00
R	91	130-05201-0013	4724-0201-233	RES CHIP 200 TW 5%		EA	1.00	1.00
REF	1	300-06904-0010		UHF RX/TX BD ASSY		RF	X.	X.
REF	2	002-06904-0010		SCH UHF RX/TX BD		RF	X.	.
REF	2	002-06904-0020		SCH T/X BD UHF		RF	.	X.
T	1	019-03160-0000	5608-2054-700	XFMR TRIFILAR		EA	1.00	1.00
T	2	019-08147-0000	1800-2048-500	MIXER OUTPUT XFMR		EA	1.00	1.00
T	3	019-08142-0000	1800-2048-400	TRANSFORMER IF		EA	1.00	1.00
Y	1	044-00154-0000	2301-2024-600	44.545MHZ XTAL		EA	1.00	1.00

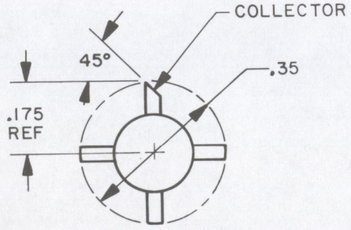




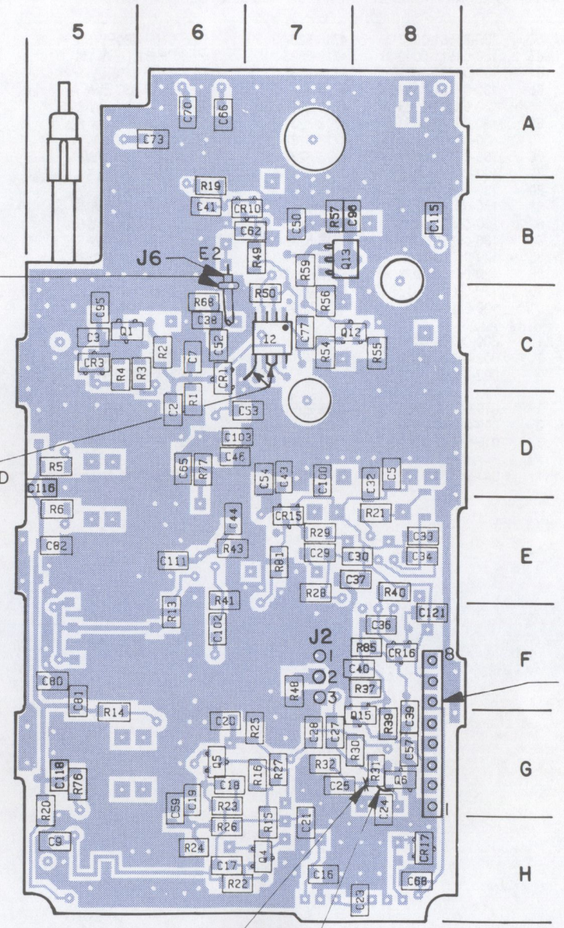
DETAIL A
Q11 MODIFICATION



DETAIL B SCALE 4/1
Q11 ASSEMBLY

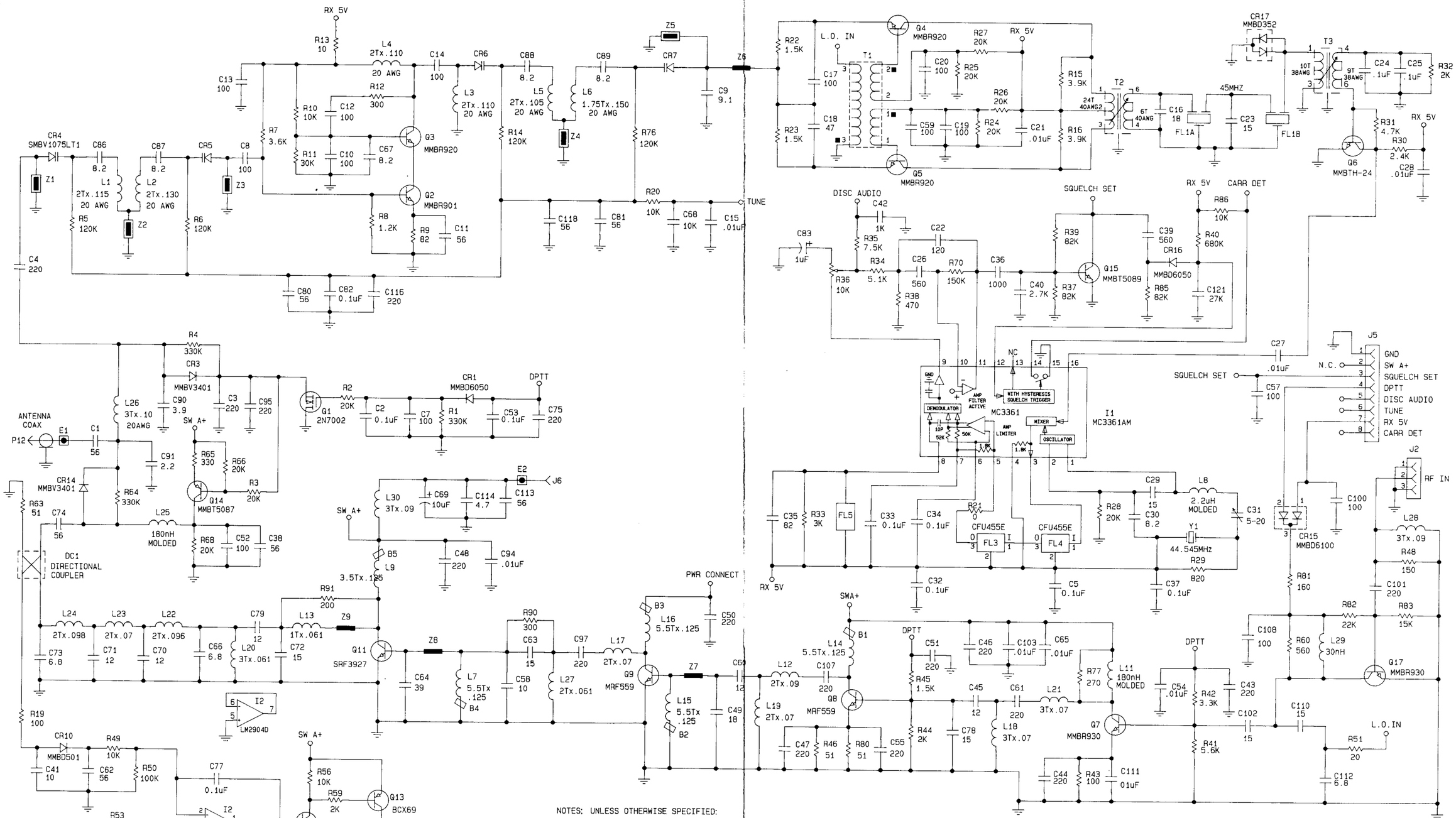


DETAIL C SCALE 4/1
Q8 & Q9 MODIFICATION



NOTES: UNLESS OTHERWISE SPECIFIED;

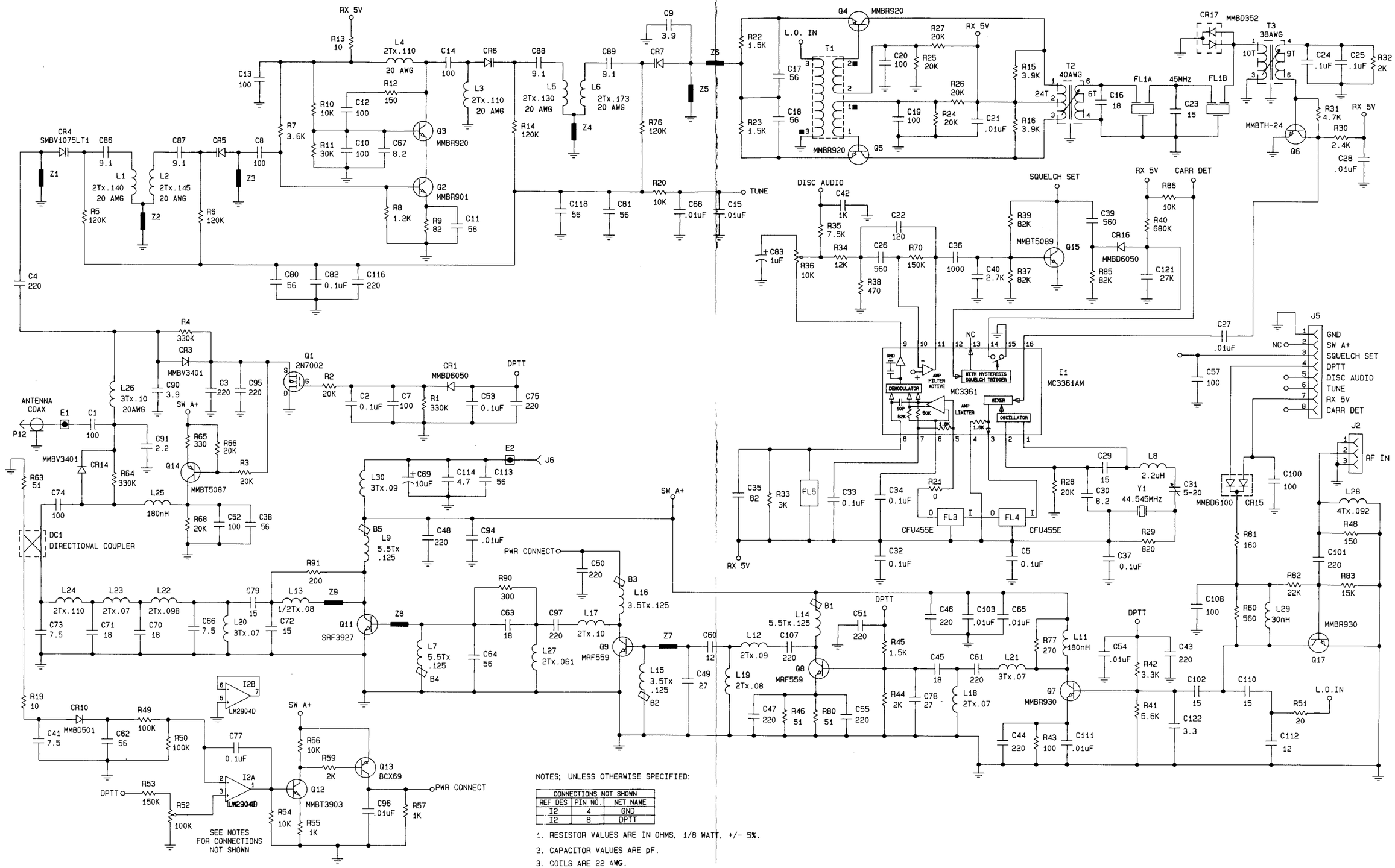
1. ALL REFERENCE DESIGNATORS ARE PRECEEDED BY THE NO. 10.
2. VERTICAL MOUNT COILS (L7, L9, L14, L15, L16) NOT TO EXCEED .225 IN. ABOVE BOARD SURFACE.
3. APPLY THERMAL JOINT COMPOUND (ITM 4) TO THREADS OF HEAT SINK STUD (ITM 5).
4. SOLDER CORNERS OF T2 & T3 TO GROUND PLANE 3 PLCS & 4 PLCS RESPECTIVELY.
5. SOLDER "FEET" OF TRANSISTOR LUG (ITM 12) TO EMITTER LEADS OF Q11, 2 PLCS.
6. AFTER INSTALLATION OF STRAIN RELIEF WIRES (ITM 10), SOLDER METAL BRAID OF COAX CABLE (P12) TO GROUND PLANE.
7. SOLDER TO GROUND PLANE AFTER SWAGING FARSIDE OF STAND-OFF.
8. INSTALL ITEM 14 BETWEEN PINS 6 & 7 OF I2 AND FROM I2 PIN 5 TO GROUND.



NOTES: UNLESS OTHERWISE SPECIFIED:

CONNECTIONS NOT SHOWN		
REF DES	PIN NO.	NET NAME
I2	4	GND
I2	8	DPTT

1. RESISTOR VALUES ARE IN OHMS. 1/8 WATT, +/- 5%.
2. CAPACITOR VALUES ARE pF.
3. COILS ARE 22 AWG.
4. ALL REFERENCE DESIGNATORS ARE PRECEDED BY THE NO. 10.



NOTES: UNLESS OTHERWISE SPECIFIED:

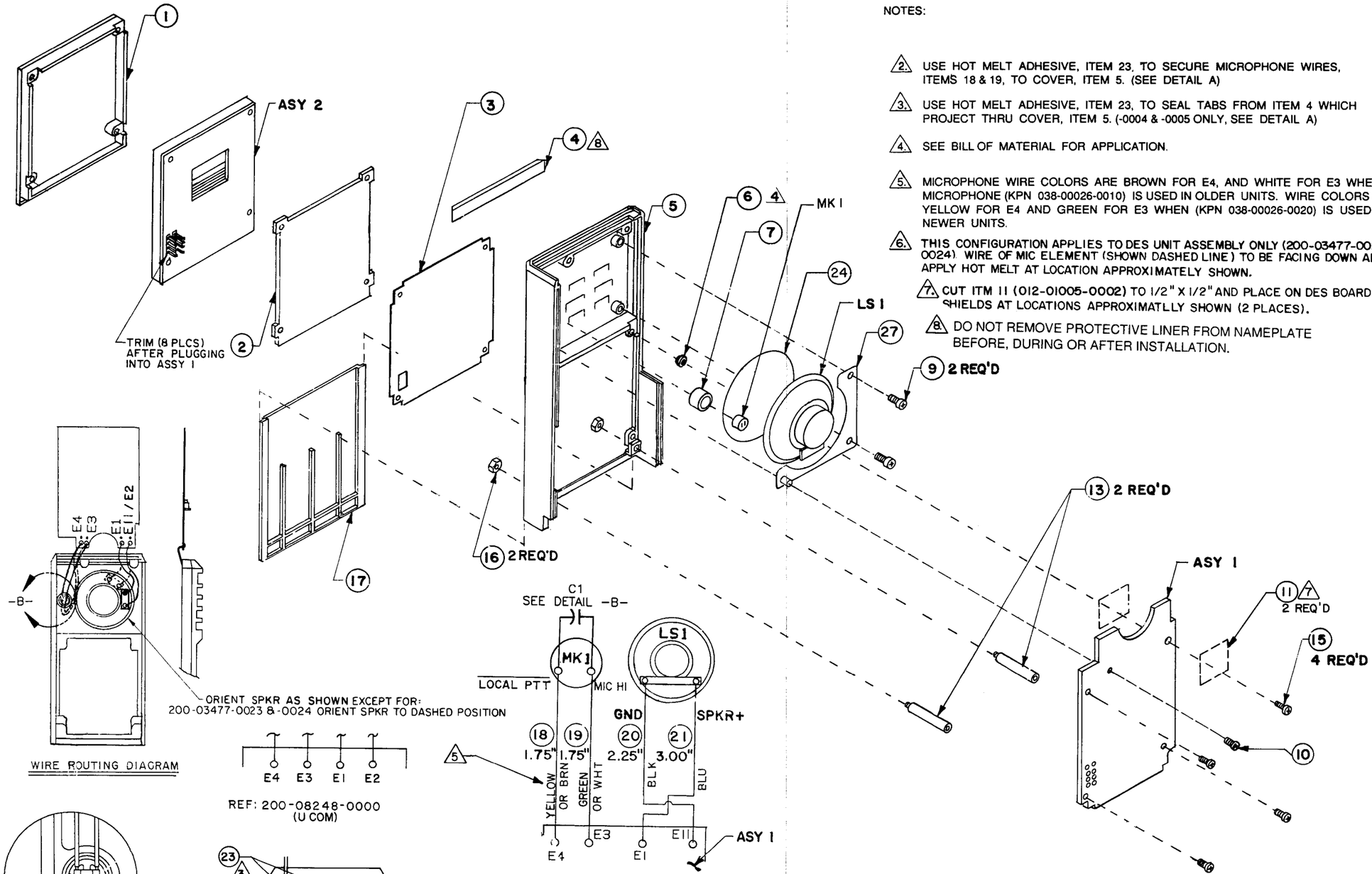
CONNECTIONS NOT SHOWN		
REF DES	PIN NO.	NET NAME
I2	4	GND
I2	8	DPTT

1. RESISTOR VALUES ARE IN OHMS, 1/8 WATT, +/- 5%.
2. CAPACITOR VALUES ARE pF.
3. COILS ARE 22 AWG.
4. ALL REFERENCE DESIGNATORS ARE PRECEDED BY THE NO. 10.

FRONT COVER ASSEMBLY

200-03477-0004	FRONT COVER 414 0M
200-03477-0005	FRONT COVER 499 1M
200-03477-0006	FRONT COVER 414 0A
200-03477-0007	FRONT COVER 499 1A
200-03477-0009	FRONT COVER 499 SL
200-03477-0010	FRONT COVER 499 2A
200-03477-0099	COMMON BOM

SYMBOL	OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 4140M 0004	4991M 0005	4140A 0006	4991A 0007	499SL 0009	4992A 0010	COMMON 0099
	200-03477-0099		COMMON BOM	A	EA	1.00	1.00	1.00	1.00	1.00	1.00	.
ASY 1	200-06907-0020		OPTION BD ASSY	A	EA	1.00	1.00	1.00	1.00	.	1.00	.
ASY 1	200-08248-0010		UCOM BOARD	A	EA	.	.	.	.	1.00	.	.
ASY 2	200-03223-0005		KBD/DSPL ASSY MOD	A	EA	.	1.00	.	1.00	.	.	.
ASY 2	200-03223-0022		ALPHA DSPL ASSY	A	EA	.	.	.	.	1.00	1.00	.
ITM 1	073-00613-0001	1411-5703-101	FRT CVR INSERT W/F		EA	1.00	.	.	.	.	.	.
ITM 1	088-01315-0000	1411-5702-500	INSRT FRNT CVR BLK		EA	.	.	1.00	.	.	.	.
ITM 2	091-00408-0000	3106-2034-400	SPACER BD		EA	1.00	.	1.00	.	.	.	.
ITM 3	187-01696-0000	2512-2034-100	KYBD DSPLY GASKET		EA	.	.	.	.	.	.	1.00
ITM 4	088-02080-0002	2509-4004-502	GOLD INLY NAMEPLT		EA	1.00	1.00	1.00	1.00	1.00	1.00	.
ITM 5	073-00893-0001	1411-6701-201	COVER W/FINISH		EA	1.00	1.00	.	.	.	.	.
ITM 5	088-02095-0002	1411-6704-502	FRONT COVER EPH		EA	.	.	1.00	1.00	1.00	1.00	.
ITM 7	088-01322-0000	1411-4001-800	BUSHING MICROPHONE		EA	.	.	.	.	.	.	1.00
ITM 9	089-05874-0003	2807-3298-011	SCR PHP 2-56X3/16		EA	.	.	.	.	.	.	2.00
ITM 10	089-06292-0006	2825-0375-036	SCR PHP 2-56X3/8		EA	.	.	.	.	.	.	1.00
ITM 13	076-01440-0002	2813-2027-702	STANDOFF 1.105		EA	.	.	.	.	.	.	2.00
ITM 15	089-06615-0008	2820-3603-023	SCR PHP M2.0 X 08		EA	4.00	.	.	.	.	.	.
ITM 15	089-07075-0000	2816-3434-007	SCR PHP 2-28		EA	.	4.00	4.00	4.00	4.00	4.00	.
ITM 16	090-00459-0001	2856-2035-100	NUT FLAT M2.5		EA	.	.	2.00	2.00	2.00	2.00	.
ITM 17	088-01306-0000	1411-5702-300	DOOR KEYBOARD BLK		EA	.	1.00	.	1.00	1.00	1.00	.
ITM 20	025-00001-0000	6026-3315-801	WIRE 26 BLK		IN	.	.	.	.	.	.	2.25
ITM 21	025-00001-0006	6026-3315-807	WIRE 26 BLU		IN	.	.	.	.	.	.	3.00
ITM 23	016-01112-0000	1606-1478-500	HOT MELT 1943		AR	.	.	.	.	.	.	1.00
ITM 24	187-01319-0000	1406-2033-800	GRILL CLOTH, SPEAK		EA	.	.	.	.	.	.	1.00
ITM 27	088-03074-0000	1411-4006-100	SPEAKER CLIP		EA	.	.	.	.	.	.	1.00
LS 1	038-00034-0001	1301-2034-700	SPEAKER 8OHM 1/2W		EA	.	.	.	.	.	.	1.00
MK 1	038-00026-0020	1310-2000-420	MIC CRTRDG MOD		EA	.	.	.	.	.	.	1.00
REF 1	300-03477-0000		FRONT COVER ASSY		RF	.	.	.	.	.	.	X



NOTES:

2. USE HOT MELT ADHESIVE, ITEM 23, TO SECURE MICROPHONE WIRES, ITEMS 18 & 19, TO COVER, ITEM 5. (SEE DETAIL A)

3. USE HOT MELT ADHESIVE, ITEM 23, TO SEAL TABS FROM ITEM 4 WHICH PROJECT THRU COVER, ITEM 5. (-0004 & -0005 ONLY, SEE DETAIL A)

4. SEE BILL OF MATERIAL FOR APPLICATION.

5. MICROPHONE WIRE COLORS ARE BROWN FOR E4, AND WHITE FOR E3 WHEN MICROPHONE (KPN 038-00026-0010) IS USED IN OLDER UNITS. WIRE COLORS ARE YELLOW FOR E4 AND GREEN FOR E3 WHEN (KPN 038-00026-0020) IS USED IN NEWER UNITS.

6. THIS CONFIGURATION APPLIES TO DES UNIT ASSEMBLY ONLY (200-03477-0023 & 0024). WIRE OF MIC ELEMENT (SHOWN DASHED LINE) TO BE FACING DOWN AND APPLY HOT MELT AT LOCATION APPROXIMATELY SHOWN.

7. CUT ITM 11 (012-01005-0002) TO 1/2" X 1/2" AND PLACE ON DES BOARD SHIELDS AT LOCATIONS APPROXIMATLLY SHOWN (2 PLACES).

8. DO NOT REMOVE PROTECTIVE LINER FROM NAMEPLATE BEFORE, DURING OR AFTER INSTALLATION.

OPTIONS BOARD

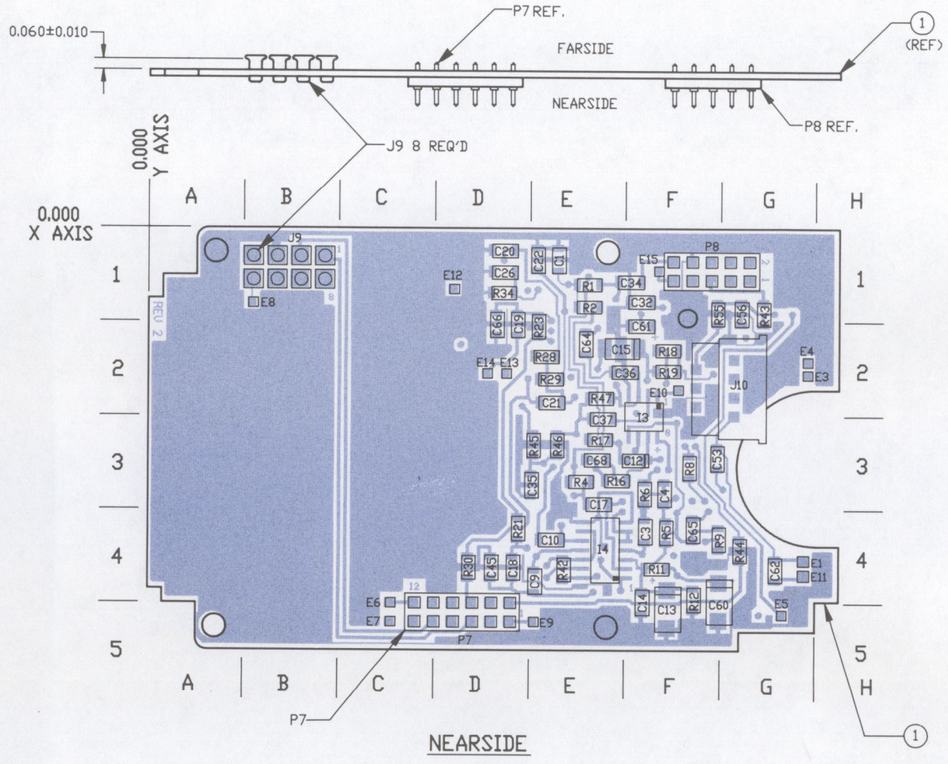
200-06907-0020 OPTIONS BOARD

SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A UM	QUANTITY 0020
C	1	106-04102-0047	1553-5237-706	CH 1K X7R/50V	EA	1.00
C	2	106-04561-0014	1553-5313-579	CAP CH560PF NPO 2%	EA	1.00
C	3	106-04104-0047	1553-5237-780	CH 100KX7R/50V	EA	1.00
C	4	106-04561-0014	1553-5313-579	CAP CH560PF NPO 2%	EA	1.00
C	5	106-04182-0014	1553-5313-580	CAP CH1.8K NPO 2%	EA	1.00
C	6	106-04182-0014	1553-5313-580	CAP CH1.8K NPO 2%	EA	1.00
C	7	106-00077-0000	1553-5313-569	CAP CH 15K NPO 2%	EA	1.00
C	8	106-00077-0000	1553-5313-569	CAP CH 15K NPO 2%	EA	1.00
C	9	106-04103-0046	1553-5237-705	CAP CH 10K X7R/50V	EA	1.00
C	10	106-04103-0046	1553-5237-705	CAP CH 10K X7R/50V	EA	1.00
C	11	106-04152-0016	1553-5237-723	CAPCH1500PFNPO/50V	EA	1.00
C	12	096-01186-0062	1552-6463-121	CAP 1.0UF 16V 20%	EA	1.00
C	13	096-01186-0064	1552-6463-113	CAP 10UF 16V 20%	EA	1.00
C	14	106-04104-0047	1553-5237-780	CH 100KX7R/50V	EA	1.00
C	15	096-01186-0028	1552-6463-136	CAP .47UF 35V 10%	EA	1.00
C	16	106-04104-0047	1553-5237-780	CH 100KX7R/50V	EA	1.00
C	17	106-04272-0046	1553-5313-574	CAP CH 2.7KX7R/50V	EA	1.00
C	18	106-04103-0046	1553-5237-705	CAP CH 10K X7R/50V	EA	1.00
C	19	106-04103-0046	1553-5237-705	CAP CH 10K X7R/50V	EA	1.00
C	20	106-04272-0046	1553-5313-574	CAP CH 2.7KX7R/50V	EA	1.00
C	21	106-04822-0046	1553-5313-575	CAPCH.0082MX7R/50	EA	1.00
C	22	106-04121-0016	1553-5313-534	CAP CH120PFNPO/50V	EA	1.00
C	26	106-04104-0047	1553-5237-780	CH 100KX7R/50V	EA	1.00
C	30	106-04102-0047	1553-5237-706	CH 1K X7R/50V	EA	1.00
C	31	106-04102-0047	1553-5237-706	CH 1K X7R/50V	EA	1.00
C	32	106-04102-0047	1553-5237-706	CH 1K X7R/50V	EA	1.00
C	33	106-04102-0047	1553-5237-706	CH 1K X7R/50V	EA	1.00
C	34	106-04104-0047	1553-5237-780	CH 100KX7R/50V	EA	1.00
C	35	106-04333-0046	1553-5237-791	CAP CH 33K X7R/50V	EA	1.00
C	36	106-04222-0046	1553-5313-573	CAP CH 2.2K 50V 5%	EA	1.00
C	37	106-04563-0046	1553-5313-542	CAP CH 56K X7R/50V	EA	1.00
C	38	106-04101-0047	1553-5525-323	CAPCH 100PFX7R/50V	EA	1.00
C	40	106-04101-0047	1553-5525-323	CAPCH 100PFX7R/50V	EA	1.00
C	41	106-04104-0047	1553-5237-780	CH 100KX7R/50V	EA	1.00
C	42	106-04101-0047	1553-5525-323	CAPCH 100PFX7R/50V	EA	1.00
C	45	106-04101-0016	1553-5237-719	CH 100PF NPO/50V	EA	1.00
C	46	106-04101-0047	1553-5525-323	CAPCH 100PFX7R/50V	EA	1.00
C	47	106-04101-0016	1553-5237-719	CH 100PF NPO/50V	EA	1.00
C	51	106-04471-0026		CH 470PF NPO/100V	EA	1.00
C	52	106-04101-0047	1553-5525-323	CAPCH 100PFX7R/50V	EA	1.00
C	53	106-04101-0047	1553-5525-323	CAPCH 100PFX7R/50V	EA	1.00
C	54	106-04101-0047	1553-5525-323	CAPCH 100PFX7R/50V	EA	1.00
C	55	106-04101-0047	1553-5525-323	CAPCH 100PFX7R/50V	EA	1.00
C	56	106-04101-0047	1553-5525-323	CAPCH 100PFX7R/50V	EA	1.00
C	57	106-04101-0047	1553-5525-323	CAPCH 100PFX7R/50V	EA	1.00
C	58	106-04101-0047	1553-5525-323	CAPCH 100PFX7R/50V	EA	1.00
C	59	106-04101-0047	1553-5525-323	CAPCH 100PFX7R/50V	EA	1.00
C	60	096-01186-0064	1552-6463-113	CAP 10UF 16V 20%	EA	1.00
C	61	106-04101-0047	1553-5525-323	CAPCH 100PFX7R/50V	EA	1.00
C	62	106-04101-0047	1553-5525-323	CAPCH 100PFX7R/50V	EA	1.00
C	63	106-04101-0047	1553-5525-323	CAPCH 100PFX7R/50V	EA	1.00
C	64	106-04101-0047	1553-5525-323	CAPCH 100PFX7R/50V	EA	1.00
C	65	106-04101-0047	1553-5525-323	CAPCH 100PFX7R/50V	EA	1.00
C	66	106-04101-0047	1553-5525-323	CAPCH 100PFX7R/50V	EA	1.00
C	67	106-04101-0047	1553-5525-323	CAPCH 100PFX7R/50V	EA	1.00
C	68	106-04391-0016		CH 390PF NPO/50V	EA	1.00
C	69	111-00001-0094	1501-2062-500	CAP CR 220PF 50V	EA	1.00
C	70	106-05101-0016	1553-5313-531	CAP CH100PFNPO/50V	EA	1.00
C	71	106-05101-0016	1553-5313-531	CAP CH100PFNPO/50V	EA	1.00
CR	1	007-06181-0000	4824-2009-500	DIO DUAL MMBD2835	EA	1.00
I	1	120-03196-0000	3134-3670-504	IC LM2902D	EA	1.00
I	2	120-03426-0000	3134-2040-200	LMC660CM	EA	1.00
I	3	120-03195-0000	3134-3670-413	IC LM2904D	EA	1.00
I	4	120-06131-0001	3134-2054-400	IC QUAD ANLG SW	EA	1.00
ITM	1	009-06907-0020	1700-5705-320	PCBD OPTIONS	EA	1.00
ITM	6	012-01440-0000	2512-2035-900	SPACER RESILIANT	EA	1.00
J	9	030-01249-0004	2108-2002-501	SCKT MIN SPRING	EA	8.00
J	10	030-02905-0007	2105-4012-107	FLEX 7 POS	EA	1.00
P	7	030-03053-0006	2105-2053-706	2500 SQ TERM STRIP	EA	1.00

OPTIONS BOARD

200-06907-0020

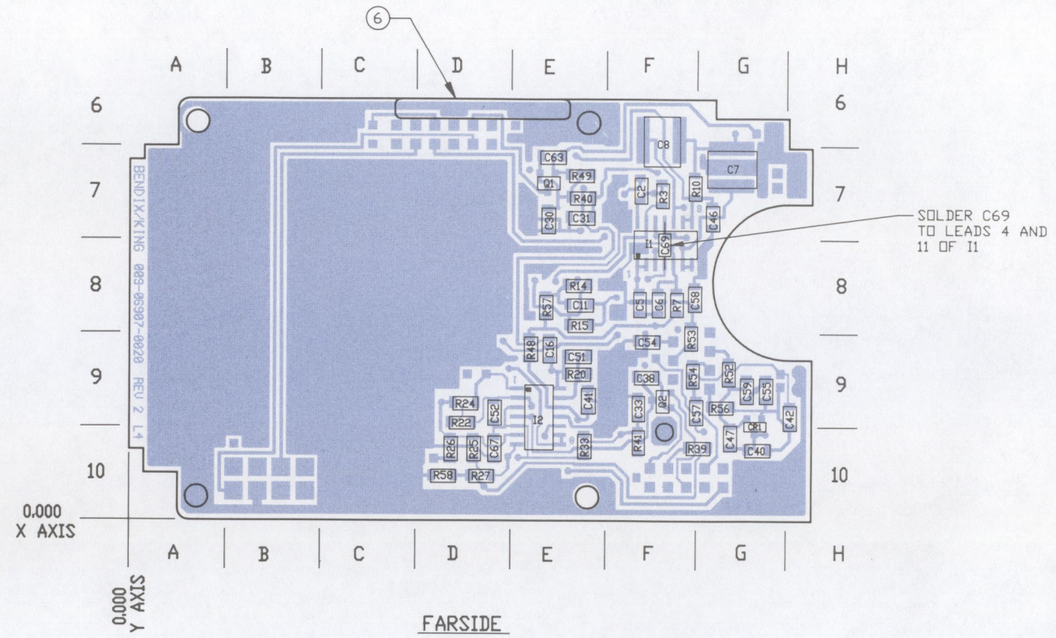
SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0020
P	8	030-03053-0005	2105-2035-705	2500 SQ TERM STRIP		EA	1.00
Q	1	007-08064-0000	4823-2010-800	XSTR PNP 10K, 10K		EA	1.00
Q	2	007-08064-0016	4823-3680-006	XSTR PNP 47K. 47K		EA	1.00
R	1	130-05163-0023	4718-5237-379	RES CHIP 16KEW5%		EA	1.00
R	2	130-05823-0023	4718-5237-363	RES CHIP 82KEW5%		EA	1.00
R	3	130-05164-0023	4718-5317-153	RES CHIP 160K EW5%		EA	1.00
R	4	130-05334-0023	4718-5237-335	RES CHIP 330KEW5%		EA	1.00
R	5	139-05113-0000	4718-5317-101	RES CH 511K EW 1%		EA	1.00
R	6	139-02673-0000	4718-5317-171	RES CH 267K EW 1%		EA	1.00
R	7	139-08253-0000	4718-5398-902	RES CH 825K EW 1%		EA	1.00
R	8	139-06192-0000	4718-5317-162	RES CH 61.9K EW 1%		EA	1.00
R	9	139-04753-0000	4718-5317-196	RES CH 475K EW 1%		EA	1.00
R	10	139-02671-0000	4718-5398-941	RES CH 2.67K EW 1%		EA	1.00
R	11	130-05204-0023	4718-5237-382	RES CHIP 200KEW5%		EA	1.00
R	12	130-05204-0023	4718-5237-382	RES CHIP 200KEW5%		EA	1.00
R	14	130-05224-0023	4718-5237-358	RES CHIP 220K5%EW		EA	1.00
R	15	130-05224-0023	4718-5237-358	RES CHIP 220K5%EW		EA	1.00
R	16	130-05154-0023	4718-5237-353	RES CHIP 150K5%EW		EA	1.00
R	17	130-05510-0023	4718-5237-312	RES CHIP 51 EW 5%		EA	1.00
R	18	130-05392-0023	4718-5237-371	RES CHIP 3.9KEW5%		EA	1.00
R	19	130-05432-0023	4718-5237-354	RES CHIP 4.3KEW5%		EA	1.00
R	20	130-05563-0023	4718-5237-360	RES CHIP 56K5%EW		EA	1.00
R	21	130-05102-0023	4718-5237-301	RES CH 1K EW 5%		EA	1.00
R	22	130-05304-0023	4718-5237-349	RES CHIP 300KEW5%		EA	1.00
R	23	130-05102-0023	4718-5237-301	RES CH 1K EW 5%		EA	1.00
R	24	130-05304-0023	4718-5237-349	RES CHIP 300KEW5%		EA	1.00
R	25	130-05204-0023	4718-5237-382	RES CHIP 200KEW5%		EA	1.00
R	26	130-05102-0023	4718-5237-301	RES CH 1K EW 5%		EA	1.00
R	27	130-05124-0023	4718-5237-359	RES CHIP 120KEW5%		EA	1.00
R	28	130-05563-0023	4718-5237-360	RES CHIP 56K5%EW		EA	1.00
R	29	130-05393-0023	4718-5237-364	RES CHIP 39K EW 5%		EA	1.00
R	30	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00
R	33	130-05244-0023	4718-5237-351	RES CHIP 240K5%EW		EA	1.00
R	34	130-05244-0023	4718-5237-351	RES CHIP 240K5%EW		EA	1.00
R	39	130-05134-0023	4718-5317-116	RES CHIP 130KEW5%		EA	1.00
R	40	130-05102-0023	4718-5237-301	RES CH 1K EW 5%		EA	1.00
R	41	130-05102-0023	4718-5237-301	RES CH 1K EW 5%		EA	1.00
R	42	130-05104-0023	4718-5237-322	RES CH 100K EW 5%		EA	1.00
R	43	130-05102-0023	4718-5237-301	RES CH 1K EW 5%		EA	1.00
R	44	130-05102-0023	4718-5237-301	RES CH 1K EW 5%		EA	1.00
R	45	139-08252-0000	4718-5317-164	RES CH 82.5K EW 1%		EA	1.00
R	46	139-01003-0000	4718-5317-138	RES CHIP 100KEW1%		EA	1.00
R	47	139-09092-0000	4718-5317-165	RES CHIP 90.9KEW1%		EA	1.00
R	48	130-05105-0023	4718-5237-367	RES CHIP 1M EW 5%		EA	1.00
R	49	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00
R	52	130-05100-0023	4718-5237-347	RES CH 10 EW 5%		EA	1.00
R	53	130-05100-0023	4718-5237-347	RES CH 10 EW 5%		EA	1.00
R	54	130-05100-0023	4718-5237-347	RES CH 10 EW 5%		EA	1.00
R	55	130-05100-0023	4718-5237-347	RES CH 10 EW 5%		EA	1.00
R	56	130-05100-0023	4718-5237-347	RES CH 10 EW 5%		EA	1.00
R	57	130-05273-0023	4718-5237-304	RES CHIP 27K EW 5%		EA	1.00
R	58	130-05134-0023	4718-5317-116	RES CHIP 130KEW5%		EA	1.00
REF	1	300-06907-0020	0008-5705-300	OPTIONS BD PC ASSY		RF	X.
REF	2	002-06907-0020	0007-5705-300	SCH OPTIONS BD		RF	X.



NEARSIDE

NOTES:

1. ALL REFERENCE DESIGNATORS ARE PRECEDED BY THE NUMBER 90. FOR EXAMPLE C34 IS 90C34.



FARSIDE

CONNECTIONS NOT SHOWN
I1 PIN 4 BS +5V
I1 PIN 11 GND
I2 PIN 4 TX PWR
I2 PIN 11 GND
I3 PIN 4 GND
I3 PIN 8 BS +5V
I4 PIN 7 GND
I4 PIN 14 +5V

NOTES: UNLESS OTHERWISE SPECIFIED

1. CAPACITOR VALUES ARE IN pF, UNLESS OTHERWISE NOTED.
2. RESISTOR VALUES ARE IN OHMS.
3. ALL REFERENCE DESIGNATORS ARE PRECEEDED BY THE NUMBER 90. FOR EXAMPLE C34 IS 90C34.

UCOM BOARD

200-08248-0000 EARLY UCOM BOARD
200-08248-0010 LATER UCOM BOARD

SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0000	QUANTITY 0010
C	1	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	1	106-04101-0016	1553-5237-719	CH 100PF NPO/50V		EA	1.00	.
C	2	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	2	106-04101-0016	1553-5237-719	CH 100PF NPO/50V		EA	1.00	.
C	3	106-04150-0026		CH 15PF NPO/100V		EA	1.00	.
C	3	106-05150-0026	1553-5313-598	CAP CH15PFNPO/100V		EA	.	1.00
C	4	106-04150-0026		CH 15PF NPO/100V		EA	1.00	.
C	4	106-05150-0026	1553-5313-598	CAP CH15PFNPO/100V		EA	.	1.00
C	5	106-04150-0026		CH 15PF NPO/100V		EA	1.00	.
C	5	106-05150-0026	1553-5313-598	CAP CH15PFNPO/100V		EA	.	1.00
C	6	106-04150-0026		CH 15PF NPO/100V		EA	1.00	.
C	6	106-05150-0026	1553-5313-598	CAP CH15PFNPO/100V		EA	.	1.00
C	8	106-04560-0016	1553-5525-321	CAP CH 56PFNPO/50V		EA	1.00	.
C	8	106-05560-0016	1553-5237-767	CAP CH 56PFNPO/50V		EA	.	1.00
C	9	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	9	106-04101-0016	1553-5237-719	CH 100PF NPO/50V		EA	1.00	.
C	10	106-04472-0057	1553-5525-307	CAPCH4700PFX74/100		EA	1.00	.
C	10	106-05472-0046	1553-5237-785	CAP CH 4.7KX7R/50V		EA	.	1.00
C	11	106-04154-0078	1553-5525-306	CAP CH 150KZ5U/50V		EA	1.00	.
C	11	106-05154-0078	1553-5525-599	CAP CER 150K25U/50		EA	.	1.00
C	12	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	.
C	12	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	.	1.00
C	13	106-04272-0046	1553-5313-574	CAP CH 2.7KX7R/50V		EA	1.00	.
C	13	106-05272-0047	1553-5525-302	CAPCH2700PFX7R/50V		EA	.	1.00
C	14	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	.
C	14	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	.	1.00
C	15	096-01186-0026	1552-6463-116	CAP .22UF 35V 10%		EA	1.00	1.00
C	16	106-04103-0047	1553-5237-705	CH 10K X7R/50V		EA	1.00	.
C	16	106-05103-0047	1553-5237-734	CAP CH 10K X7R/50V		EA	.	1.00
C	17	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	17	106-04101-0016	1553-5237-719	CH 100PF NPO/50V		EA	1.00	.
C	19	106-04682-0057	1553-5525-309	CAPCH6800PFX7R/100		EA	1.00	.
C	19	106-05682-0046	1553-5237-797	CAP CH 6.8KX7R/50V		EA	.	1.00
C	21	106-04150-0026		CH 15PF NPO/100V		EA	1.00	.
C	21	106-05150-0026	1553-5313-598	CAP CH15PFNPO/100V		EA	.	1.00
C	22	106-04272-0046	1553-5313-574	CAP CH 2.7KX7R/50V		EA	1.00	.
C	22	106-05272-0047	1553-5525-302	CAPCH2700PFX7R/50V		EA	.	1.00
C	25	096-01186-0074	1552-6463-138	CAP .1UF 35V 20%		EA	1.00	1.00
C	30	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	30	106-04101-0016	1553-5237-719	CH 100PF NPO/50V		EA	1.00	.
C	31	096-01186-0067	1552-6463-131	CAP 2.2UF 20V 20%		EA	1.00	1.00
C	32	106-04102-0016	1553-5237-703	CAP CH 1K NPO/50V		EA	1.00	.
C	32	106-05102-0047	1553-5237-733	CAP CH 1K X7R/50V		EA	.	1.00
C	33	096-01186-0062	1552-6463-121	CAP 1.0UF 16V 20%		EA	1.00	1.00
C	35	106-04333-0046	1553-5237-791	CAP CH 33K X7R/50V		EA	1.00	.
C	35	106-05333-0036	1553-5313-526	CAP CH 33K X7R/25V		EA	.	1.00
C	36	106-04222-0046	1553-5313-573	CAP CH 2.2K 50V 5%		EA	1.00	.
C	36	106-05222-0046	1553-5525-301	CAP CH 2.2KX7R/50V		EA	.	1.00
C	37	106-04563-0046	1553-5313-542	CAP CH 56K X7R/50V		EA	1.00	.
C	37	106-05563-0036	1553-5525-303	CAP CH 56K X7R/25V		EA	.	1.00
C	38	106-04101-0016	1553-5237-719	CH 100PF NPO/50V		EA	1.00	.
C	39	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	39	106-04101-0016	1553-5237-719	CH 100PF NPO/50V		EA	1.00	.
C	40	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	40	106-04101-0016	1553-5237-719	CH 100PF NPO/50V		EA	1.00	.
C	120	106-04272-0046	1553-5313-574	CAP CH 2.7KX7R/50V		EA	1.00	.
C	120	106-05272-0047	1553-5525-302	CAPCH2700PFX7R/50V		EA	.	1.00
C	121	106-04103-0047	1553-5237-705	CH 10K X7R/50V		EA	1.00	.
C	121	106-05103-0046	1553-5237-794	CAP CH 10K X7R/50V		EA	.	1.00
C	122	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	122	106-04101-0016	1553-5237-719	CH 100PF NPO/50V		EA	1.00	.
C	123	096-01186-0062	1552-6463-121	CAP 1.0UF 16V 20%		EA	1.00	1.00
C	124	106-04273-0046	1553-5313-540	CAP CH 27K X7R/50V		EA	1.00	.
C	124	106-05273-0037	1553-5525-304	CAP CH 27K X7R/25V		EA	.	1.00
C	125	106-04154-0078	1553-5525-306	CAP CH 150KZ5U/50V		EA	1.00	.
C	125	106-05154-0078	1553-5313-599	CAP CER 150K25U/50		EA	.	1.00
C	126	106-04821-0016	1553-5313-544	CAP CH820PFNPO/50V		EA	1.00	.
C	126	106-05102-0046	1553-5237-787	CAP CH 1K X7R/50V		EA	.	1.00
C	127	106-04102-0016	1553-5237-703	CAP CH 1K NPO/50V		EA	1.00	.
C	127	106-05102-0046	1553-5237-787	CAP CH 1K X7R/50V		EA	.	1.00
C	128	106-04560-0026		CAP CH56PFNPO/100V		EA	1.00	.
C	128	106-05560-0016	1553-5237-767	CAP CH 56PFNPO/50V		EA	.	1.00

UCOM BOARD

200-08248-0000

SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0000	QUANTITY 0010
C	129	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	.
C	129	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	.	1.00
C	130	106-04683-0046	1553-5237-792	CAP CH 68KX7R 50V		EA	1.00	.
C	130	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	.	1.00
C	131	106-04560-0026		CAP CH56PFNPO/100V		EA	1.00	.
C	131	106-05560-0016	1553-5237-767	CAP CH 56PFNPO/50V		EA	.	1.00
C	132	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	.
C	132	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	.	1.00
C	133	106-05221-0048	1553-5313-529	CAP CH 220X7R/50V		EA	.	1.00
C	133	111-00001-0094	1501-2062-500	CAP CR 220PF 50V		EA	1.00	.
C	135	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	136	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	139	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	145	096-01186-0059	1552-6463-137	CAP 4.7UF 10V 20%		EA	.	1.00
C	146	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	147	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	148	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	.	1.00
C	149	106-05104-0037	1553-5313-597	CAP CH 100KX7R/25V		EA	.	1.00
C	150	096-01186-0059	1552-6463-137	CAP 4.7UF 10V 20%		EA	.	1.00
C	152	096-01186-0062	1552-6463-121	CAP 1.0UF 16V 20%		EA	.	1.00
C	153	096-01186-0059	1552-6463-137	CAP 4.7UF 10V 20%		EA	.	1.00
C	155	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	156	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	157	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	158	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	159	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	160	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
C	161	106-00072-0040	1553-5313-531	CAP CH100PFNPO/50V		EA	.	1.00
CJ	1	130-05000-0015	4724-0000-009	RES CH 0 TW		EA	1.00	.
CR	1	007-06181-0000	4824-2009-500	DIO DUAL MMBD2835		EA	1.00	1.00
CR	3	007-05117-0007	4828-2009-200	DIO Z 6.2V SOT		EA	1.00	1.00
I	1	122-05011-0001	7019-2062-600	6805P9 OPT PRGMD	A	EA	1.00	1.00
I	2	120-02160-0000	3134-2065-100	256 X 8 EPROM		EA	1.00	1.00
I	3	123-00574-0003	3134-2062-700	IC MOS 74HC574		EA	1.00	1.00
I	4	122-05014-0001	7019-2061-900	DSP OTP UCOM REV1	A	EA	1.00	1.00
I	5	120-06259-0000	3134-2062-100	QUAL ANALOG SWITCH		EA	1.00	1.00
I	6	120-03426-0000	3134-2040-200	LMC660CM		EA	1.00	1.00
I	8	120-03127-0011	3134-2062-000	IC LM2903 SO PKG		EA	1.00	1.00
I	11	120-03196-0000	3134-3670-504	IC LM2902D		EA	1.00	1.00
I	12	123-00574-0003	3134-2062-700	IC MOS 74HC574		EA	1.00	1.00
I	15	120-03274-0000	3134-3670-403	VOLT REG LM2951ACM		EA	.	1.00
ITM	1	009-08248-0000	1700-6706-200	PC UCOM BD		EA	1.00	.
ITM	1	009-08248-0010	1700-6706-210	PCBD UCOM		EA	.	1.00
ITM	2	047-09999-0000	2508-2030-400	SHLD UCOM OPTION		EA	1.00	1.00
ITM	3	150-00003-0010	3101-0000-013	TUBING TFLN 24AWG		IN	0.50	.
ITM	4	016-01184-0000	1609-0000-004	ADHESIVE		AR	1.00	.
ITM	6	012-01440-0000	2512-2035-900	SPACER RESILIANT		EA	1.00	1.00
ITM	7	012-01005-0002	1601-2007-101	TAPE MYLAR .500 W		IN	0.50	1.00
J	9	030-01249-0004	2108-2002-501	SCKT MIN SPRING		EA	8.00	8.00
J	10	030-02905-0007	2105-4012-107	FLEX 7 POS		EA	1.00	1.00
P	7	030-02453-0006	2105-2001-906	CONNECTOR 12P		EA	1.00	1.00
P	8	030-02453-0006	2105-2001-906	CONNECTOR 12P		EA	1.00	1.00
Q	1	007-08064-0000	4823-2010-800	XSTR PNP 10K, 10K		EA	1.00	1.00
Q	2	007-08064-0014	4823-2010-814	XSTR PNP 4.7K, 10K		EA	.	1.00
Q	2	007-08064-0016	4823-3680-006	XSTR PNP 47K. 47K		EA	1.00	.
Q	3	007-00065-0001	4823-3669-001	XSTR 2N3906 (SOT)		EA	1.00	1.00
Q	4	007-00535-0000	4823-2020-201	XSTR JFET MMBF4393		EA	1.00	1.00
Q	8	007-00530-0001	4823-3669-101	XSTR NPN MMBT3904		EA	1.00	1.00
Q	9	007-08064-0017	4823-2010-817	XSTR NPN 47K. 47K		EA	1.00	1.00
Q	10	007-00530-0001	4823-3669-101	XSTR NPN MMBT3904		EA	1.00	1.00
R	2	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	1.00
R	2	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	.
R	3	130-05152-0013	4724-0152-233	RES CH 1.5K TW 5%		EA	.	1.00
R	3	139-01502-0000	4718-5313-166	RES CHIP 15K EW 1%		EA	1.00	.
R	4	130-05334-0013	4724-0334-233	RES CH 330K TW 5%		EA	.	1.00
R	4	139-03323-0000	4718-5317-189	RES CH 332K EW 1%		EA	1.00	.

UCOM BOARD

200-08248-0000

SYMBOL	OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0000	QUANTITY 0010
R 5	130-05222-0013	4724-0222-233	RES CH 2.2K TW 5%		EA	.	1.00
R 5	130-05222-0023	4718-5237-331	RES CHIP 2.2KEW5%		EA	1.00	.
R 6	130-05222-0013	4724-0222-233	RES CH 2.2K TW 5%		EA	.	1.00
R 6	139-02211-0000		RES CH 2.21K EW 1%		EA	1.00	.
R 8	130-05472-0013	4724-0472-233	RES CH 4.7K TW 5%		EA	.	1.00
R 8	130-05472-0023	4718-5237-303	RES CHIP 4.7KEW5%		EA	1.00	.
R 9	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	.	1.00
R 9	130-05105-0023	4718-5237-367	RES CHIP 1M EW 5%		EA	1.00	.
R 10	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	1.00
R 10	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	.
R 11	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	1.00
R 11	139-01053-0000		RES CHIP 105K EW 1		EA	1.00	.
R 12	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	1.00
R 12	139-01003-0000	4718-5317-138	RES CHIP 100KEW1%		EA	1.00	.
R 14	130-05473-0023	4718-5237-324	RES CHIP 47KEW5%		EA	.	1.00
R 14	139-04752-0000	4718-5317-122	RES CH 47.5K EW 1%		EA	1.00	.
R 16	130-05335-0013		RES CH 3.3M TW 5%		EA	.	1.00
R 16	130-05335-0023	4718-5398-905	RES CH 3.3M EW 5%		EA	1.00	.
R 17	139-03922-0000	4718-5317-192	RES CH 39.2K EW 1%		EA	1.00	.
R 17	139-03922-0010	4724-3922-113	RES CH 39.2K TW 1%		EA	.	1.00
R 18	130-05392-0013	4724-0392-233	RES CH 3.9K TW 5%		EA	.	1.00
R 18	130-05392-0023	4718-5237-371	RES CHIP 3.9KEW5%		EA	1.00	.
R 19	130-05432-0013	4724-0432-233	RES CH 4.3K TW 5%		EA	.	1.00
R 19	130-05432-0023	4718-5237-354	RES CHIP 4.3KEW5%		EA	1.00	.
R 20	139-05112-0000	4718-5317-198	RES CHIP 51.1K 1%		EA	1.00	.
R 20	139-05112-0010	4724-5112-113	RES CH 51.1K TW 1%		EA	.	1.00
R 21	139-03922-0000	4718-5317-192	RES CH 39.2K EW 1%		EA	1.00	.
R 21	139-03922-0010	4724-3922-113	RES CH 39.2K TW 1%		EA	.	1.00
R 22	133-00272-0006	4719-2046-006	RES VARI		EA	1.00	1.00
R 25	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	1.00
R 25	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	.
R 28	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	1.00
R 28	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	.
R 40	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	.	1.00
R 40	131-00102-0013	4704-2062-200	RES CF 1K EW 5%		EA	1.00	.
R 43	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	.	1.00
R 43	130-05102-0023	4718-5237-301	RES CH 1K EW 5%		EA	1.00	.
R 44	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	.	1.00
R 44	130-05102-0023	4718-5237-301	RES CH 1K EW 5%		EA	1.00	.
R 45	139-08252-0000	4718-5317-164	RES CH 82.5K EW 1%		EA	1.00	.
R 45	139-08252-0010	4724-8252-113	RES CH 82.5K TW 1%		EA	.	1.00
R 46	139-01003-0000	4718-5317-138	RES CHIP 100KEW1%		EA	1.00	.
R 46	139-01003-0010	4724-1003-113	RES CH 100K EW 1%		EA	.	1.00
R 47	139-09092-0000	4718-5317-165	RES CHIP 90.9KEW1%		EA	1.00	.
R 47	139-09092-0010	4724-9092-113	RES CH 90.9K TW 1%		EA	.	1.00
R 52	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	.	1.00
R 52	130-05102-0023	4718-5237-301	RES CH 1K EW 5%		EA	1.00	.
R 103	130-05273-0013	4724-0273-233	RES CH 27K TW 5%		EA	.	1.00
R 103	139-02672-0000	4718-5398-940	RES CHIP 26.7KEW1%		EA	1.00	.
R 112	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	1.00
R 112	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	.
R 113	130-05624-0013	4724-0624-233	RES CH 620K TW 5%		EA	.	1.00
R 113	139-06193-0000		RES CH 619KEW 1%		EA	1.00	.
R 127	139-02742-0000		RES CHIP 27.4KEW1%		EA	1.00	.
R 127	139-02742-0010	4724-2742-113	RES CH 27.4K TW 1%		EA	.	1.00
R 128	139-05112-0000	4718-5317-198	RES CHIP 51.1K 1%		EA	1.00	.
R 128	139-05112-0010	4724-5112-113	RES CH 51.1K TW 1%		EA	.	1.00
R 129	139-03922-0000	4718-5317-192	RES CH 39.2K EW 1%		EA	1.00	.
R 129	139-03922-0010	4724-3922-113	RES CH 39.2K TW 1%		EA	.	1.00
R 139	139-06812-0000		RES 68.1K EW 1%		EA	1.00	.
R 139	139-06812-0010	4724-6812-113	RES CH 68.1K TW 1%		EA	.	1.00
R 140	130-05682-0013	4724-0682-233	RES CH 6.8K TW 5%		EA	.	1.00
R 140	130-05682-0023	4718-5237-381	RES CHIP 6.8KEW5%		EA	1.00	.
R 141	130-05272-0013	4724-0272-233	RES CH 2.7K TW 5%		EA	.	1.00
R 141	130-05272-0023	4718-5237-386	RES CHIP 2.7KEW5%		EA	1.00	.
R 142	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	.	1.00
R 142	130-05102-0023	4718-5237-301	RES CH 1K EW 5%		EA	1.00	.
R 143	130-05912-0013	4724-0912-233	RES CH 9.1K TW 5%		EA	.	1.00
R 143	130-05912-0023	4718-5317-105	RES CHIP 9.1K5%EW		EA	1.00	.
R 144	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	1.00
R 144	130-05104-0023	4718-5237-322	RES CH 100K EW 5%		EA	1.00	.
R 145	130-05103-0013	4724-0103-233	RES CH 10K TW 5%		EA	.	1.00
R 145	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	.

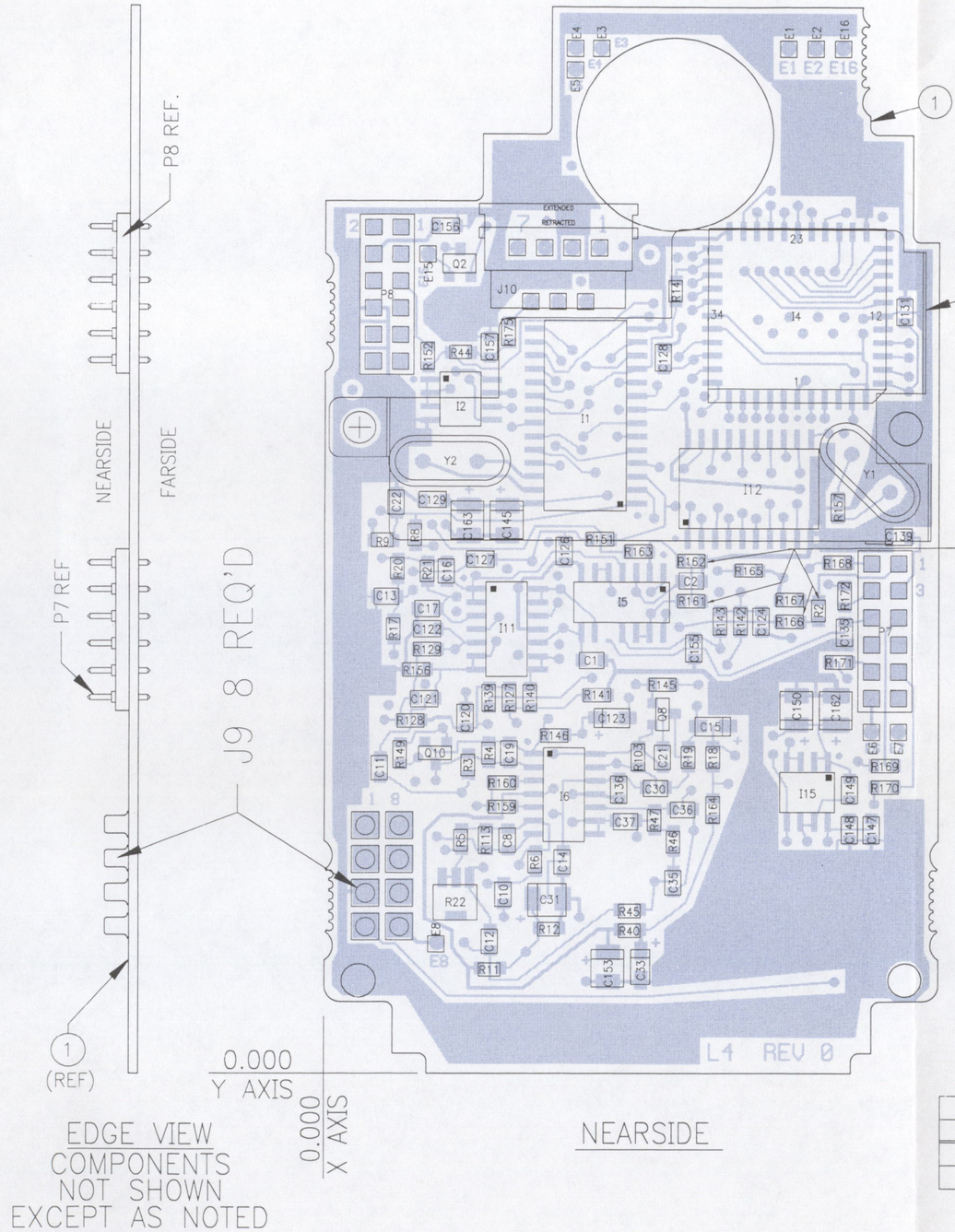
UCOM BOARD

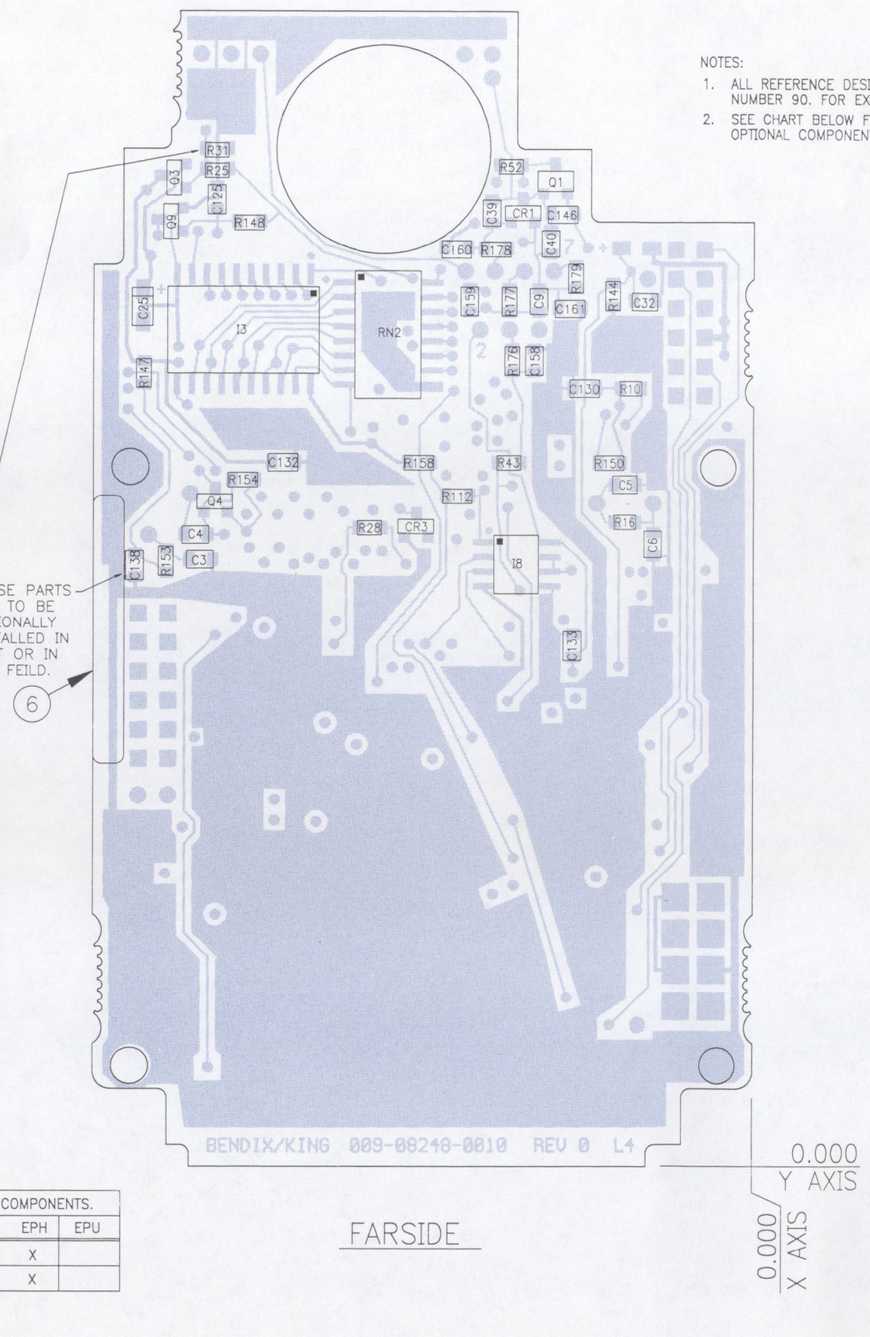
200-08248-0000

SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0000	0010
R	146	130-05471-0013	4724-0471-233	RES CH 470 TW 5%		EA	.	1.00
R	146	130-05471-0023	4718-5237-318	RES CHIP 470EW5%		EA	1.00	.
R	147	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	1.00
R	147	130-05104-0023	4718-5237-322	RES CH 100K EW 5%		EA	1.00	.
R	148	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	1.00
R	148	130-05104-0023	4718-5237-322	RES CH 100K EW 5%		EA	1.00	.
R	149	130-05273-0013	4724-0273-233	RES CH 27K TW 5%		EA	.	1.00
R	149	139-02672-0000	4718-5398-940	RES CHIP 26.7KEW1%		EA	1.00	.
R	150	130-05303-0013	4724-0303-233	RES CH 30K TW 5%		EA	.	1.00
R	150	130-05303-0023	4718-5237-338	RES CHIP 30KEW5%		EA	1.00	.
R	151	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	1.00
R	151	130-05104-0023	4718-5237-322	RES CH 100K EW 5%		EA	1.00	.
R	152	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	.	1.00
R	152	139-01001-0000	4718-5237-315	RES CHIP 1K EW 1%		EA	1.00	.
R	153	130-05242-0013	4724-0242-233	RES CH 2.4K TW 5%		EA	.	1.00
R	153	130-05242-0023	4718-5237-372	RES CHIP 2.4KEW5%		EA	1.00	.
R	154	130-05104-0013	4724-0104-233	RES CH 100K TW 5%		EA	.	1.00
R	154	130-05104-0023	4718-5237-322	RES CH 100K EW 5%		EA	1.00	.
R	156	130-05512-0013	4724-0512-233	RES CH 5.1K TW 5%		EA	.	1.00
R	156	130-05512-0023	4718-5237-355	RES CHIP 5.1KEW5%		EA	1.00	.
R	157	130-05105-0013	4724-0105-233	RES CH 1 MEG TW 5%		EA	.	1.00
R	157	130-05105-0023	4718-5237-367	RES CHIP 1M EW 5%		EA	1.00	.
R	158	130-05101-0013	4724-0101-233	RES CH 100 TW 5%		EA	.	1.00
R	159	130-05473-0013	4724-0473-233	RES CH 47K TW 5%		EA	.	1.00
R	160	130-05473-0013	4724-0473-233	RES CH 47K TW 5%		EA	.	1.00
R	163	130-05000-0015	4724-0000-009	RES CH 0 TW		EA	.	1.00
R	164	130-05000-0015	4724-0000-009	RES CH 0 TW		EA	.	1.00
R	165	130-05000-0015	4724-0000-009	RES CH 0 TW		EA	.	1.00
R	166	130-05000-0015	4724-0000-009	RES CH 0 TW		EA	.	1.00
R	167	130-05000-0015	4724-0000-009	RES CH 0 TW		EA	.	1.00
R	168	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	.	1.00
R	169	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	.	1.00
R	170	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	.	1.00
R	171	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	.	1.00
R	172	130-05102-0013	4724-0102-233	RES CH 1K TW 5%		EA	.	1.00
R	175	130-05100-0013	4724-0100-233	RES CH 10 TW 5%		EA	.	1.00
R	176	130-05100-0013	4724-0100-233	RES CH 10 TW 5%		EA	.	1.00
R	177	130-05100-0013	4724-0100-233	RES CH 10 TW 5%		EA	.	1.00
R	178	130-05100-0013	4724-0100-233	RES CH 10 TW 5%		EA	.	1.00
R	179	130-05100-0013	4724-0100-233	RES CH 10 TW 5%		EA	.	1.00
REF	1	002-08248-0000		SCH UCOM BD		RF	X.	.
REF	2	300-08248-0000		UCOM BD ASSY		RF	X.	.
REF	3	002-08248-0010		SCH UCOM BD		RF	.	X.
REF	4	300-08248-0010		ASY UCOM BD		RF	.	X.
RN	2	015-00208-0006	4726-2041-606	R/2R NETWORK		EA	1.00	1.00
Y	1	044-00155-0000	2342-2062-400	XTAL 16.000000MHZ		EA	1.00	1.00
Y	2	044-00302-0000	2342-2062-300	XTAL 4.194304MHZ		EA	1.00	1.00

NOTES:

1. ALL REFERENCE DESIGNATORS ARE PRECEDED BY THE NUMBER 90. FOR EXAMPLE C34 IS 90C34.
2. SEE CHART BELOW FOR DISTRIBUTION OF ALL OPTIONAL COMPONENTS.





OPTIONAL COMPONENTS.		
	EPH	EPU
R165	X	
R167	X	

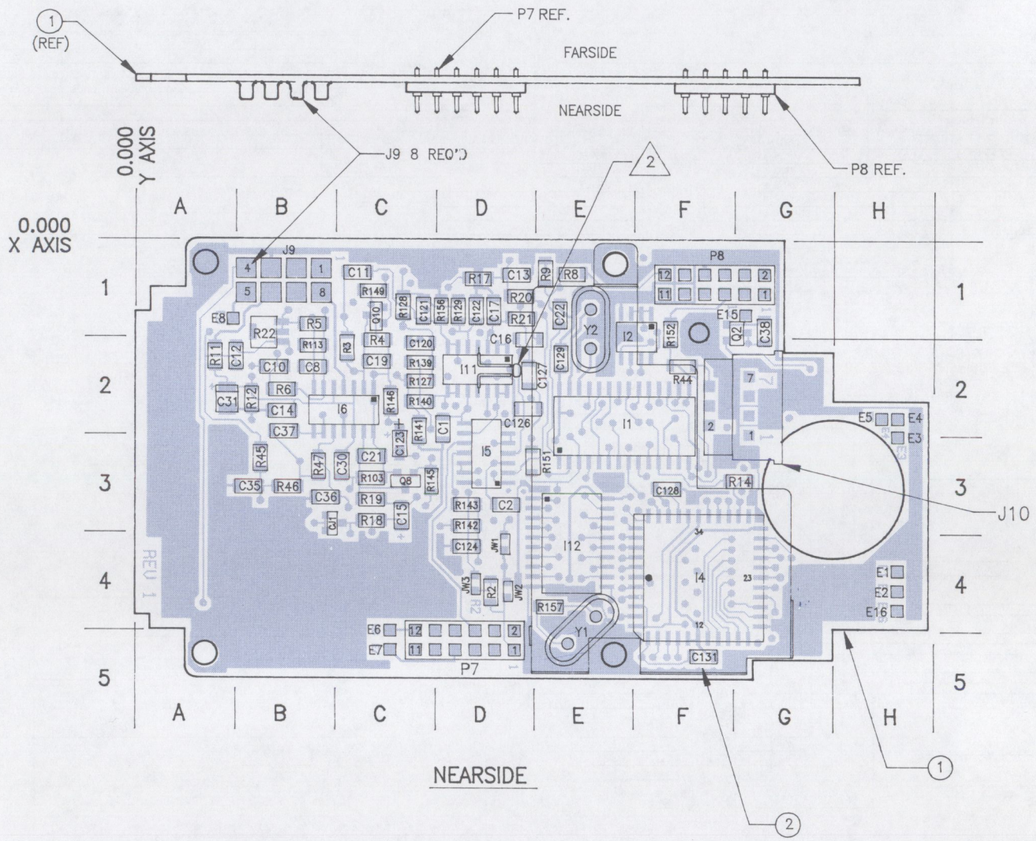
NOTES:

1. ALL RESISTOR VALUERS ARE IN OHMS 1/8W +/- 5% UNLESS NOTED.
2. ALL CAPACITOR VALUES ARE IN PICOFARADS +/- 5% UNLESS NOTED.

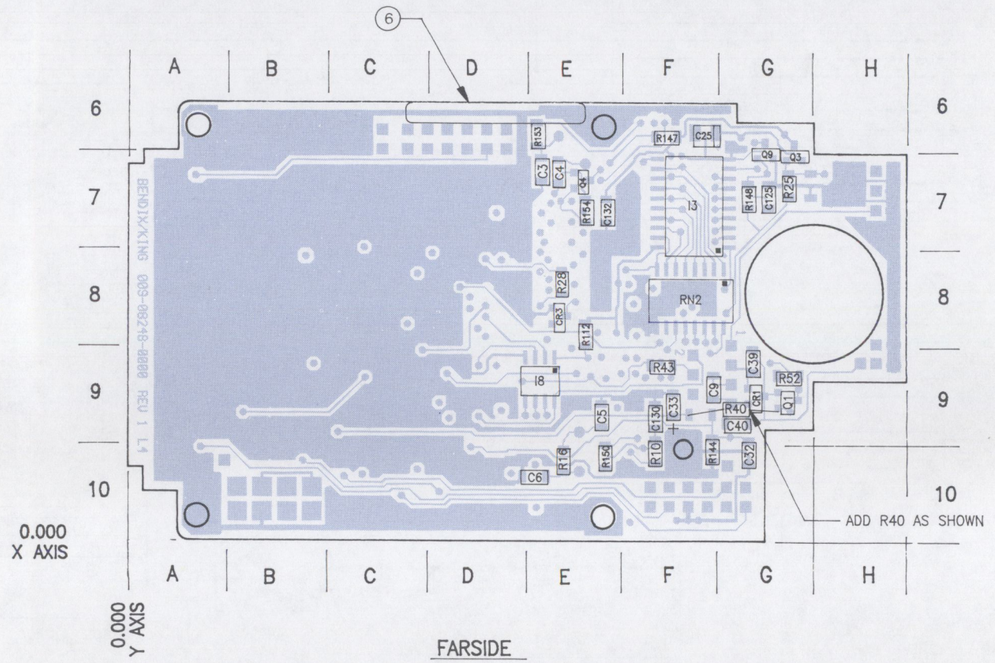
CONNECTIONS NOT SHOWN		
I5	PIN 7	GND
I5	PIN 14	+5V
I6	PIN 4	FILT+5V
I6	PIN 11	GND
I8	PIN 4	GND
I8	PIN 8	SW_A+

OPTIONAL COMPONENTS					
	EPH	EPU 200-06912-XXX	USE WITH	FIELD INSTALLED FOR 16MHZ SPURS	USE FOR I1 PIN 13
R161			X		
R162			X		
R163	X	X			
R165	X				
R166					X
R167	X				
C138				X	
R2					X

X= INSTALLED



NEARSIDE



FARSIDE

NOTES:

1. ALL REFERENCE DESIGNATORS ARE PRECEDED BY THE NUMBER 90. FOR EXAMPLE C34 IS 90C34.

2. CONNECT C133 BETWEEN PINS 4 AND 11 OF I11. INSULATE BOTH LEADS WITH (3). LOCATE C133 ON TOP OF C127 AND SECURE WITH ITEM (4).

NOTES:

1. ALL RESISTOR VALUERS ARE IN OHMS 1/8W +/- 5% UNLESS NOTED.
2. ALL CAPACITOR VALUES ARE IN PICOFARADS +/- 5% UNLESS NOTED.

CONNECTIONS NOT SHOWN		
I5	PIN 7	GND
I5	PIN 14	+5V
I6	PIN 4	+5V
I6	PIN 11	GND
I8	PIN 4	GND
I8	PIN 8	SW A+

GATES NOT USED

I8 MC2903

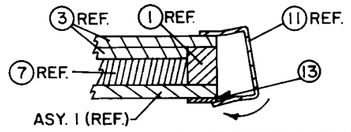
KEYBOARD/DISPLAY ASSEMBLY

200-03223-0005 KBD/DSPL ASSY MOD
200-03223-0022 ALPHA DSPL ASSY

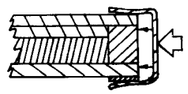
SYMBOL	OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0005	QUANTITY 0022
ASY 1	200-06878-0001		KYBD/DSPL BD TONE	A	EA	1.00	
ASY 1	200-06924-0012		ALPHA DSPL BD 15GR	A	EA		1.00
ITM 1	030-02530-0000	2105-2002-701	ZEBRA CONNECTOR		EA	1.00	1.00
ITM 2	031-00472-0005	2004-5700-805	KEYPAD BLK	A	EA	1.00	1.00
ITM 3	043-00011-0002	2003-2002-802	LAND MOBILE LCD		EA	1.00	.
ITM 3	043-00013-0000	2003-2053-100	EPH HI CNTRST LCD		EA		1.00
ITM 4	057-02846-0000	2509-4012-200	OVERLAY KYBD BLK		EA	1.00	1.00
ITM 6	088-02079-0020	1411-2026-300	INSERT ASSY		EA	1.00	1.00
ITM 7	088-02096-0001	1411-5701-901	LIGHT PIPE		EA	1.00	1.00
ITM 8	089-06297-0003	2825-0188-037	SCR FHP 2-56X3/16		EA	3.00	3.00
ITM 11	047-10441-0001	2830-2030-001	LCD CLIP		EA	1.00	1.00
ITM 12	012-01517-0000	3904-2046-400	DIFFUSER MYLAR		EA	1.00	1.00
ITM 13	012-01021-0004	1601-2036-204	TAPE ELEC 1/4 WD		IN	1.750	1.750
REF 1	300-03223-0020		ALPHA DSPL ASSY		RF	X.	X.

NOTES:

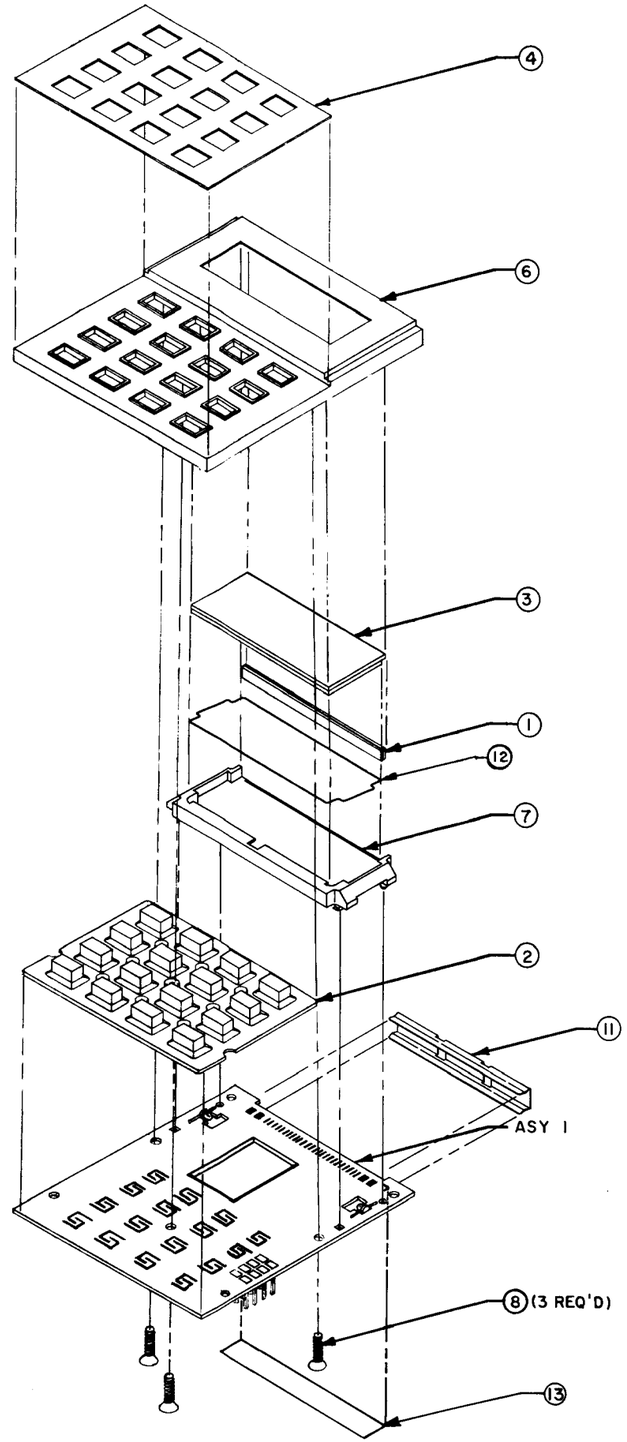
1. SLIDE ITEM 11 (CLIP) FIRST OVER ITEM 3 (LCD) THEN ROCK INTO PLACE TO PREVENT CHIPPING THE LCD GLASS.



THEN, PUSH CLIP OVER UNTIL IT SLIDES INTO POSITION AGAINST THE WHOLE ASSEMBLY.



2. CUT ITEM 13 TO APPROXIMATELY 1.75 IN LENGTH AND ADHERE TO LOCATION SHOWN BEFORE PUTTING THE CLIP ON.

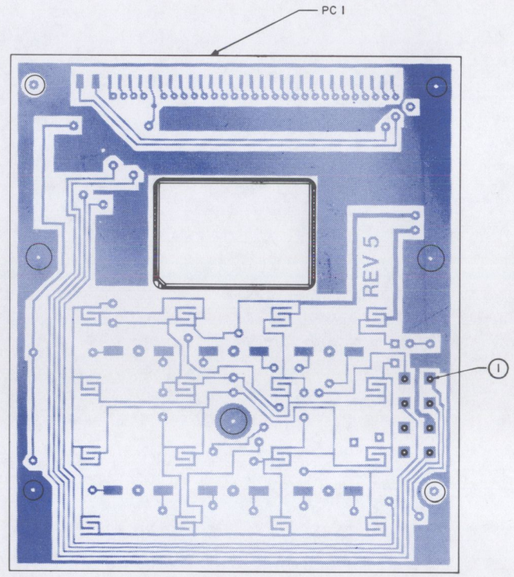


KEYBOARD/DISPLAY ASSEMBLY
300-03223-0020

NUMERIC DISPLAY BOARD

200-06878-0001 KYBD/DSPL BD TONE
200-06878-0099 KYBD/DSPLY BD

SYMBOL		OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0001	QUANTITY 0099
		200-06878-0099		KYBD/DSPLY BD	A	EA	1.00	.
C	1	106-00078-0010	1553-5525-341	CAP CERAMIC CHIP		EA	.	1.00
C	2	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	.	1.00
CJ	1	130-05000-0025	4718-5317-140	RES CHIP 0 EW CJ		EA	1.00	.
I	1	122-00058-0001	3134-2054-300	LMR/KYBD/DSPL/PROC	A	EA	1.00	.
ITM	1	030-02174-0004	2107-2001-101	PIN CONTACT		EA	8.00	
PC	1	009-06878-0012	1700-6703-900	PCBD KYBD/DSPL		EA	1.00	
Q	1	007-00530-0001	4823-3669-101	XSTR NPN MMBT3904		EA	1.00	
R	1	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	
R	2	130-05202-0023	4718-5317-151	RES CHIP 2K EW 5%		EA	1.00	
R	3	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	
R	4	130-05103-0023	4718-5237-310	RES CH 10K EW 5%		EA	1.00	
R	5	130-05104-0023	4718-5237-322	RES CH 100K EW 5%		EA	1.00	
R	6	130-05202-0023	4718-5317-151	RES CHIP 2K EW 5%		EA	1.00	
R	7	130-05202-0023	4718-5317-151	RES CHIP 2K EW 5%		EA	1.00	
R	8	130-05202-0023	4718-5317-151	RES CHIP 2K EW 5%		EA	1.00	
R	9	130-05202-0023	4718-5317-151	RES CHIP 2K EW 5%		EA	1.00	
R	10	130-05101-0023	4718-5237-313	RES CH 100 EW 5%		EA	1.00	
R	11	130-05203-0023	4718-5237-388	RES CHIP 20K EW 5%		EA	1.00	
REF	1	300-06878-0010		KYBD/DSPLY BD ASSY		RF	X.	
REF	2	002-06878-0010		SCH KYBD DSPL		RF	X.	



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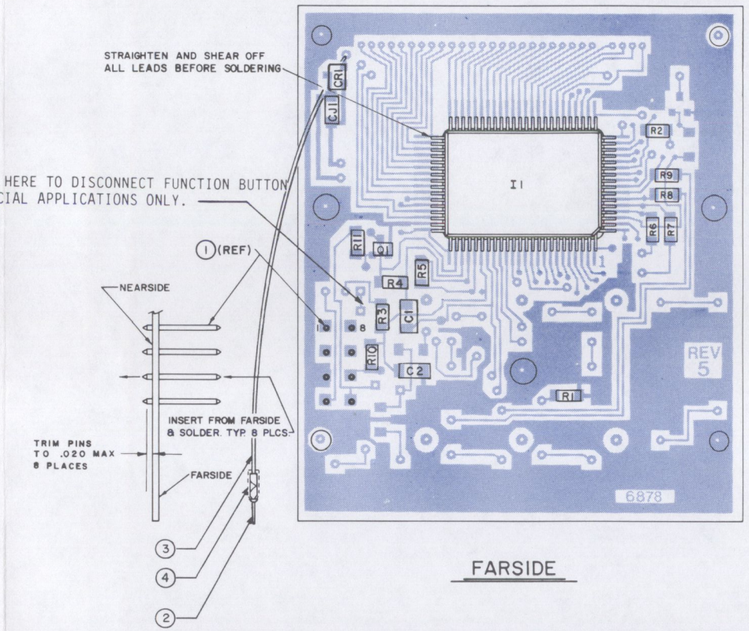
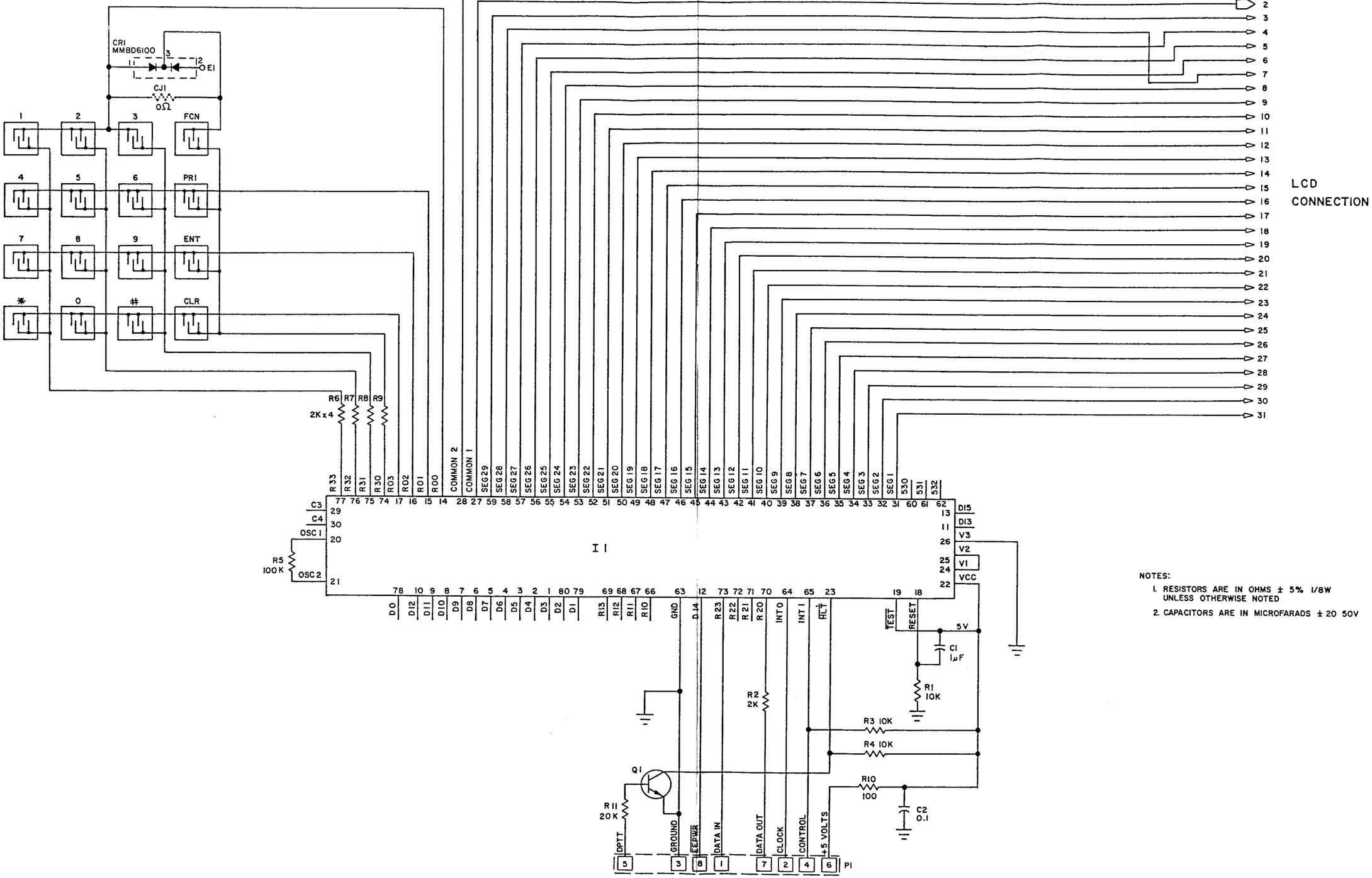


FARSIDE



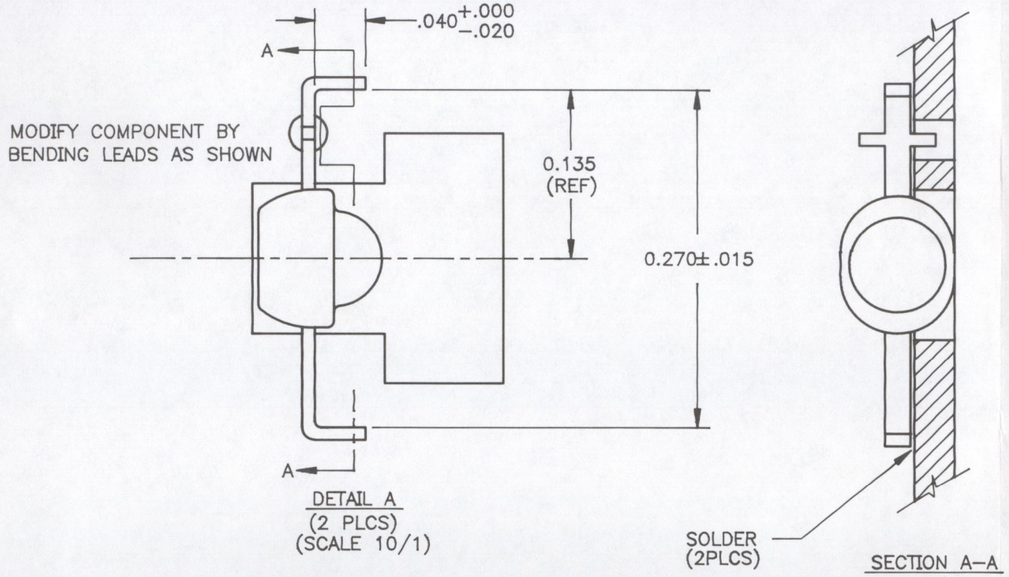
NOTES:

1. RESISTORS ARE IN OHMS ± 5% 1/8W UNLESS OTHERWISE NOTED
2. CAPACITORS ARE IN MICROFARADS ± 20 50V

ALPHANUMERIC DISPLAY BOARD

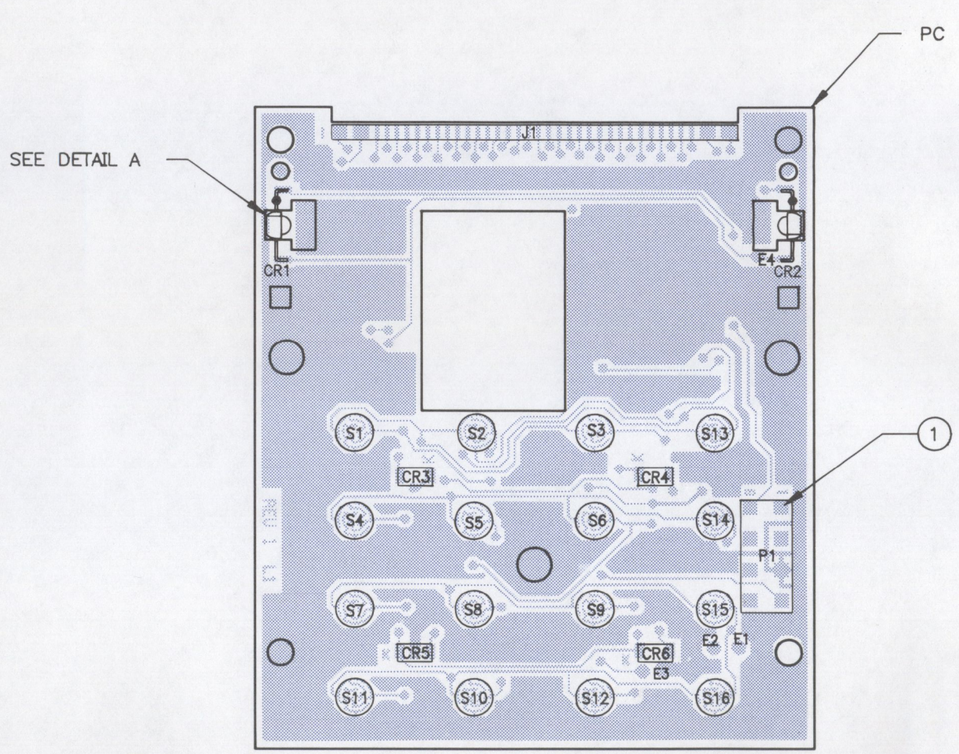
200-06924-0012 ALPHA DSPLAY BOARD

SYMBOL	OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	A	UM	QUANTITY 0012	QUANTITY 0098
	009-06924-0010	1700-5705-510	PCBO KYBD ALPHREV1		EA	1.00	
	200-06924-0098		COMMON BOM REV1	A	EA	1.00	
C 3	106-04104-0047	1553-5237-780	CH 100KX7R/50V		EA	1.00	
C 4	106-05120-0016	1553-5237-779	CAP CH 12PFNPO/50V		EA		1.00
CR 1	007-06193-0000	4826-2003-701	LED		EA		1.00
CR 2	007-06193-0000	4826-2003-701	LED		EA		1.00
I 1	122-05006-0002	7019-6251-404	ALPHA NUMERIC PROC	A	EA	.	1.00
I 3	120-02161-0000	3134-2043-700	EEPROM 2KX8		EA	1.00	
ITM 1	030-02174-0004	2107-2001-101	PIN CONTACT		EA	.	8.00
Q 1	007-08064-0005	4823-2010-805	TSTR DIGITAL SO		EA	1.00	.
Q 2	007-08064-0004	4823-2010-804	TSTR DIGITAL SO		EA	.	1.00
Q 3	007-00529-0000	4823-2006-400	XSTR NPN MMBTH24		EA	.	1.00
Q 4	007-00529-0000	4823-2006-400	XSTR NPN MMBTH24		EA	.	1.00
R 3	130-05683-0023	4718-5237-368	RES CHIP 68K EW 5%		EA	.	1.00
R 4	130-05513-0023	4718-5237-305	RES CHIP 51K EW 5%		EA		1.00
R 5	130-05273-0023	4718-5237-304	RES CHIP 27K EW 5%		EA	.	1.00
R 6	130-05513-0023	4718-5237-305	RES CHIP 51K EW 5%		EA		1.00
R 7	130-05000-0025	4718-5317-140	RES CHIP 0 EW CJ		EA	1.00	
R 8	130-05201-0023	4718-5317-145	RES CHIP 200EW5%		EA	1.00	
R 9	130-05201-0023	4718-5317-145	RES CHIP 200EW5%		EA	1.00	
R 10	130-05134-0023	4718-5317-116	RES CHIP 130KEW5%		EA	.	1.00
R 11	130-05104-0023	4718-5237-322	RES CH 100K EW 5%		EA	.	1.00
R 12	130-05104-0023	4718-5237-322	RES CH 100K EW 5%		EA	.	1.00
R 13	130-05473-0023	4718-5237-324	RES CHIP 47KEW5%		EA	.	1.00
R 14	130-05562-0023	4718-5237-328	RES CHIP 5.6KEW5%		EA	.	1.00
R 15	134-01044-0002	5302-2025-802	THRMSTR SURFACE MT		EA	.	1.00
R 16	130-05753-0023	4718-5317-103	RES CHIP 75KEW 5%		EA	.	1.00
R 20	130-05000-0025	4718-5317-140	RES CHIP 0 EW CJ		EA	1.00	.
REF 1	300-06924-0010		KYBD ALPHA SSYREV1		EA		1.00
REF 2	002-06924-0010		SCH KYBD ALPHREV1		RF	X.	.

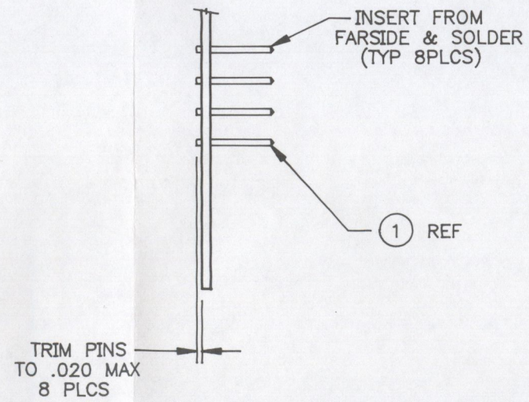


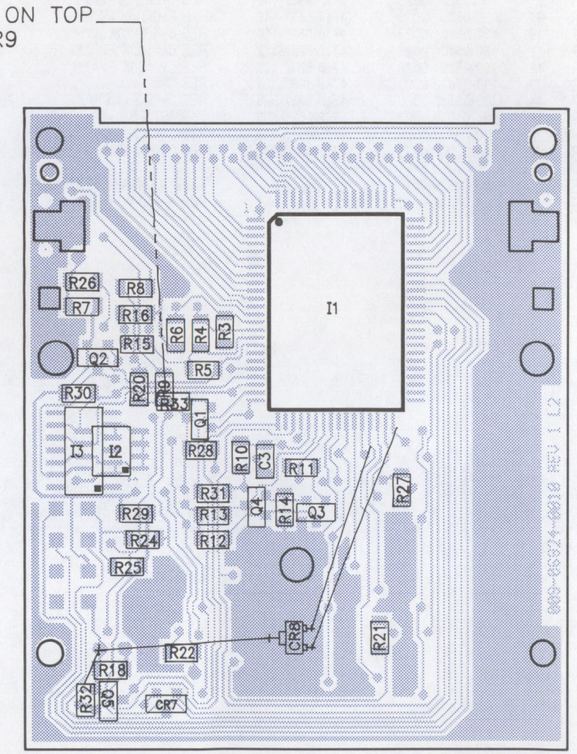
NOTES: UNLESS OTHERWISE SPECIFIED;

1. CR2 IS SHOWN IN IT'S ALTERNATE POLARITY WHICH IS STANDARD FOR RADIOS USING +5V FOR THEIR LIGHTING SUPPLY. (SEE NOTE 5 OF 002–06924–0010).
2. FOR 200–06924–0013 FLAVOP, INSTALL CR8, R32 & R33. Q1, R18, Q5 ARE NOT USED FOR THIS FLAVOR. R33'S PLACED ON TOP OF R9. CR8 SHOULD BE HELD TO THE BOARD WITH APPROPRIATE ADHESIVE.



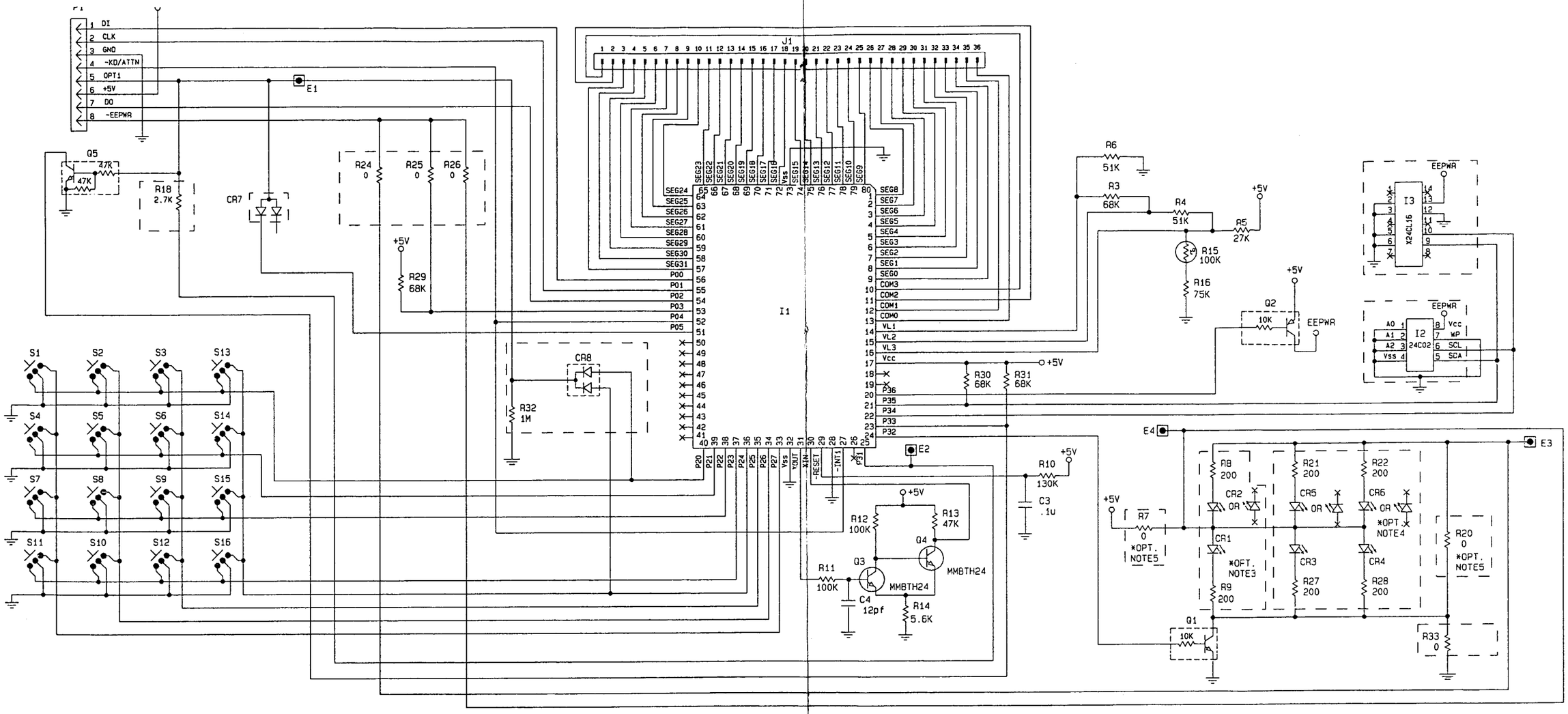
NEARSIDE





FARSIDE

ALPHANUMERIC DISPLAY BOARD DRAWING
300-06924-0010


P1
1 DI
2 CLK
3 GND
4 -KD/ATTN
5 OPT1
6 +5V
7 DO
8 -EEPWR
E1
Q5
47K
47K
R18
2.7K
CR7
R24
0
R25
0
R26
0
+5V
R29
68K
J1
SEG24
SEG25
SEG26
SEG27
SEG28
SEG29
SEG30
SEG31
P00
P01
P02
P03
P04
P05
P20
P21
P22
P23
P24
P25
P26
P27
Vss
VOUT
XIN
RESET
INT1
P31
P32
P33
P34
P35
P36
SEG23
SEG22
SEG21
SEG20
SEG19
SEG18
SEG17
SEG16
Vss
SEG15
SEG14
SEG13
SEG12
SEG11
SEG10
SEG9
SEG8
SEG7
SEG6
SEG5
SEG4
SEG3
SEG2
SEG1
SEG0
COM3
COM2
COM1
COM0
VL1
VL2
VL3
Vcc
I1
CR8
R32
1M
S1
S2
S3
S13
S4
S5
S6
S14
S7
S8
S9
S15
S11
S10
S12
S16
E2
R10
130K
+5V
C3
.1u
R12
100K
R13
47K
Q4
MMBTH24
Q3
MMBTH24
R11
100K
C4
12pf
R14
5.6K
R6
51K
R3
68K
R4
51K
R5
27K
R15
100K
R16
75K
R30
68K
R31
68K
Q2
10K
EEPWR
I3
X24CL16
I2
24C02
A0
A1
A2
Vss
Vcc
WP
SCL
SCA
E4
E3
R8
200
R21
200
R22
200
CR2
OR
CR5
OR
CR6
OR
*OPT
NOTE4
R7
0
*OPT.
NOTE5
CR1
*OPT.
NOTE3
CR3
CR4
R27
200
R28
200
R9
200
Q1
10K
R20
0
*OPT.
NOTE5
R33
0

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LAA 0016
BK REF 006-01276-0000

P/N 0300-2052-200

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