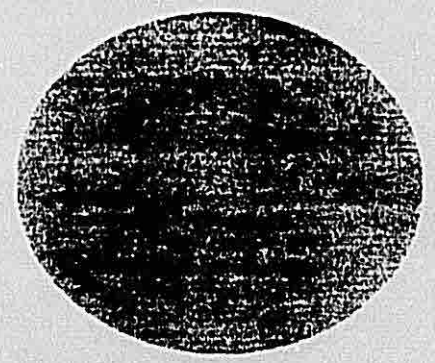

ATP INDEX

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BENDIX/KING
KY 196/E,KY 197/E
MAINTENANCE MANUAL

*** END OF INDEX ***

MFG.

INTRO

KING®

KY 196/196E/197/197E
VHF/COMM TRANSCEIVER

INSTALLATION MANUAL

006-0169-03

REVISION 3 SEPTEMBER, 1983

RECORD OF REVISIONS

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VHF COMMUNICATIONS TRANSCEIVER

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2-3	Updated
2-15	Updated
2-17	Updated
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2-27/2-28	Updated
3-1/3-2	Updated
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CHAPTER 01

SECTION I
GENERAL INFORMATION

1.1 INTRODUCTION

This manual contains information relative to the physical, mechanical, and electrical characteristics of the King Radio Corporation Silver Crown KY 196/196E/197/197E 720 channel VHF communications transceivers. Installation and operating procedures are also included. Information relative to the maintenance, alignment, and procurement of replacement parts may be found in KY 196/196E/197/197E Maintenance/Overhaul Manual.

The units covered are as follows:

NOTE

ALL KY 196/196E RADIOS ARE 27.5 VDC, ALL KY 197/197E RADIOS ARE 13.75 VDC.

KY 196	064-1019-00	Non-Glare Lens		
KY 196E	064-1019-01	Non-Glare Lens		
KY 196	064-1019-02	Standard Lens		
KY 196	064-1019-05	Non-Glare Lens,	Memory Channels	
KY 196E	064-1019-06	Non-Glare Lens,	Memory Channels	
KY 196	064-1019-07	Standard Lens,	Memory Channels	
KY 196	064-1019-10	Non-Glare Lens,	Memory Channels,	Remote Transfer/Inc
KY 196E	064-1019-11	Non-Glare Lens,	Memory Channels,	Remote Transfer/Inc
KY 196	064-1019-12	Standard Lens,	Memory Channels,	Remote Transfer/Inc
KY 197	064-1021-00	Non-Glare Lens		
KY 197E	064-1021-01	Non-Glare Lens		
KY 197	064-1021-05	Non-Glare Lens,	Memory Channels	
KY 197E	064-1021-06	Non-Glare Lens,	Memory Channels	
KY 197	064-1021-10	Non-Glare Lens,	Memory Channels,	Remote Transfer/Inc
KY 197E	064-1021-11	Non-Glare Lens,	Memory Channels,	Remote Transfer/Inc

1.2 EQUIPMENT DESCRIPTION

The KY 196/196E/197/197E transceiver is a TSO'd 720 channel communications transceiver and is designed to provide two-way voice communication within the frequency range of 118.000MHz to 135.975MHz in 25KHz increments.

The KY 196/196E/197/197E is a panel mounted unit. Connections to the unit are made through a 20 pin Molex printed circuit board edge connector and a BNC coax connector at the rear of the unit.

Electrically, the KY 196/196E/197/197E consists of four sections: receiver, transmitter, frequency synthesizer, and gas-discharge display circuitry. The only difference between the KY 196/197 and KY 196E/197E lies in their selectivity specifications (see Section 1.3). The only difference between the KY 196/196E and KY 197/197E is their rated transmitter power output and power requirements (see Section 1.3).

The KY 196/196E (-05, -06, -07) and the KY 197/197E (-05, -06) have the capability of preprogramming up to nine memory channel frequencies for later recall. Channel frequency information is stored in a non-volatile earom memory so that when the radio is turned off and then back on, channel information is retained.

The KY 196/196E (-10, -11, -12) and the KY 197/197E (-10, -11) have the capability of remote transfer of use and standby frequencies and the remote recall of channel frequency information.

1.3 TECHNICAL CHARACTERISTICS

KY 196/196E/197/197E TRANSCEIVER TECHNICAL CHARACTERISTICS

SPECIFICATION	CHARACTERISTIC
TSO COMPLIANCE:	
Transmit:	KY 196/196E C37b (DO-157, Class 3) KY 197/197E C37b (DO-157, Class 4)
Receive:	KY 196/197 C38b (DO-156, Class C and D) KY 196E/197E C38b (DO-156, Class A and B) DO-160 Env. Cat./A1D1/A/KPS/XXXXXXZBAAA
APPLICABLE DOCUMENTS:	RTCA DO-156, DO-157, DO-160
WEIGHT:	3.2 lbs. (1.45Kg)
PHYSICAL DIMENSIONS:	Width: 6.25 inches (15.88 cm) Height: 1.3 inches (3.30 cm) Depth: 10.5 inches (26.67 cm)
MOUNTING:	Panel mounted, no shock mounting required
TEMPERATURE RANGE:	-20°C to +55°C with short time operation at +70°C.
POWER REQUIREMENTS:	KY 196/196E: (27.5V) Receive - .4AMP Transmit - 5.0AMP KY 197/197E: (13.75V) Receive - .8AMP Transmit - 6.0AMP
DESIGN:	All solid state. Printed circuit board and point to point wiring.
FREQUENCY RANGE:	118.000MHz to 135.975MHz in 25KHz increments
FREQUENCY STABILITY:	0.0015% to meet DO-156 Class C and D
TRANSMITTER	
POWER OUTPUT:	KY 196/196E - 16 watts minimum KY 197/197E - 7 watts minimum
MODULATION:	85% modulation capability with 90% limiting, less than 15% distortion at 85% modulation.
SIDETONE OUTPUT:	Adjustable up to 100mw into 500 ohm headphones.
MICROPHONE:	Standard carbon or dynamic mic containing transistorized pre-amp. (Must provide 100mV RMS into 100 ohm load).
HARMONIC CONTENT:	Greater than 60dB down from carrier.

SPECIFICATION	CHARACTERISTIC
TRANSMITTER	
HIGH-TEMPERATURE PROTECTION:	If the transmitter or modulator circuits become hot enough to potentially hurt any components in the transceiver, a protection circuit will automatically turn down the transmitter power consumption and output power (4 watts minimum).
DUTY CYCLE:	1 Min. ON, 4 Min. OFF
RECEIVER	
RECEIVER SENSITIVITY:	2uV (hard) or less for 6dB s+n/n with 1KHz tone modulated 30%.
RECEIVER SELECTIVITY:	KY 196/197 - 6dB at ±8KHz minimum DO-156 Class C & D 40dB at ±17KHz maximum 60dB at ±22KHz maximum KY 196/197E - 6dB at ±15KHz minimum DO-156 Class A & B 60dB at ±43KHz maximum
RECEIVER OUTPUT:	100mw into 500 ohms minimum
AGC CHARACTERISTICS:	From 5uV to 20,000uV audio output will not vary more than 3dB.
SQUELCH:	Automatic squelch (internally adjustable carrier-to-noise setting) with manual disable and carrier squelch override. Both squelch adjustments are externally accessible.
SPURIOUS RESPONSES AND CROSS MODULATION PRODUCTS:	At least 80dB down
INTERCOM INPUT:	The mic is connected to the intercom input. The receiver is operational and mic audio appears at the audio output along with receive audio. 100mV RMS of mic audio into 100 ohm load is required for 100mw output.

1.4 UNITS AND ACCESSORIES SUPPLIED

A. King KY 196/196E/197/197E Transceiver with mounting rack. (KPN 064-1019-00/01 and KPN 064-1021-00/01 respectively)

B. King KY 196/196E/197/197E Installation Kit (050-1704-00)

PART NUMBER	DESCRIPTION	QUANTITY
030-0101-02	Conn BNC	1
030-1094-55	Conn Molex (20 Pin)	1
030-1107-21	Conn Pin (21)	1
057-2193-01	Decal Comm 1	1
057-2193-02	Decal Comm 2	1
089-2013-37	Nut Hex #6-32	1
089-2191-22	Nut Esna #6-32	1
089-2353-01	Clip Nut 6-32	6
089-5903-07	Screw PHP (4-40x7/16)	2
089-5907-08	Screw PHP #6-32 x 1/2	1
089-6012-08	Screw FHP (6-32x1/2)	6
089-8094-30	Flat Washer	1
090-0019-07	Retaining Ring	1
091-0072-02	Cable Clamp	1

1.5 ACCESSORIES REQUIRED, BUT NOT SUPPLIED

A. Communications Antenna and Cables

B. Headphones: (500 ohms nominal impedance)

C. Microphone: Low impedance carbon or dynamic with transistorized pre-amp

D. For 13.75 volt operation of the KY 196/196E a 14 to 28 volt DC to DC converter such as the KGS Electronics Model RB-125 (KPN 068-1016-03) or equivalent may be used.

1.6 LICENSE REQUIREMENTS

The transmitter, as installed in the aircraft, requires an Aircraft Radio Station License. This license is obtained by filing FCC Form 404. The KY 196/196E/197/197E may be operated for up to 30 days without a station license, after filing the FCC Form 404 and while awaiting the receipt of the staion license, if a copy of the FCC Form 404 is kept in the aircraft. This form is available through the local FCC field office.

This equipment has been type accepted by the FCC and entered on their list of type accepted equipment as King KY 196, KY 196E, KY 197 or KY 197E and must be identified as King KY 196, KY 196E, KY 197 or KY 197E on your FCC Form 404, Aircraft Radio Station License Application.

CAUTION

THE VHF TRANSMITTER IN THIS EQUIPMENT IS GUARANTEED TO MEET FEDERAL COMMUNICATIONS COMMISSION ACCEPTANCE OVER THE OPERATING TEMPERATURE RANGE ONLY WHEN A KING CRYSTAL IS USED IN THE STABILIZED MASTER OSCILLATOR.

USE OF OTHER THAN A KING CRYSTAL IS CONSIDERED AN UNAUTHORIZED MODIFICATION, AND WILL VOID THE WARRANTY.

The Federal Communications Commission requires that the operator of the transmitter of this equipment hold a Restricted Radio Telephone Operator Permit (FCC Form 753) or higher class license. A permit may be obtained by a U.S. citzen from the nearest field office of the FCC; no examination is required.

CHAPTER 02

SECTION II
INSTALLATION

2.1 GENERAL

This section contains suggestions and factors to consider before installing the KY 196/196E/197/197E. Close adherence to these suggestions will assure a more satisfactory performance from the equipment.

2.2 UNPACKING AND INSPECTING EQUIPMENT

Exercise extreme care when unpacking the unit. 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.

2.3 EQUIPMENT INSTALLATION

The KY 196/196E/197/197E installation will conform to standards designated by the customer, installing agency and existing conditions as to the unit location and type of installation. However, the following suggestions should be considered before installing your KY 196/196E/197/197E. The installing agency will supply and fabricate all external cables. The connectors required are supplied by King Radio. Interconnect diagrams are Figures 2-6 through 2-13.

NOTE

USE GOOD QUALITY STRANDED WIRE WITH AT LEAST 600 VOLT INSULATION THAT WILL NOT SUPPORT A FLAME.

2.3.1 AVIONICS COOLING REQUIREMENTS FOR PANEL MOUNTED EQUIPMENT

The greatest single contributor to increased reliability of all modern day avionics is to limit the maximum operating temperature of the individual units. While modern day individual circuit designs consume much less electrical energy, the watts per cubic inch dissipated within avionics units remains much the same due to high density packaging techniques utilized. Consequently, the importance of providing avionics stack cooling is still with us.

While each individual unit may not require forced air cooling, the combined heat load of several units operating in a typical avionics stack will significantly degrade the reliability of the avionics if provisions for stack cooling are not incorporated in the initial installation. Recommendations on stack cooling are contained in King Radio Installation Bullentin #55. Failure to provide stack cooling will certainly lead to increased avionics maintenance costs and may void the King warranty.

2.3.2 Mounting Rack Installation

A. The KY 196/196E/197/197E is mounted rigidly in the aircraft panel. Select a position in the panel that is not too close to any high external heat source. Remember to allow adequate space for installation of cables and connectors. Avoid sharp bends and placing the cables too near the aircraft control cables.

B. When installing two or more panel mounted units in a stack, the mounting trays shall be spaced .050 inches (.127 cm) apart. Newer style mounting trays have had .025 inch (.064 cm) dimples built in, top and bottom, both sides, so that two new style trays will automatically be spaced properly.

C. Refer to Figure 2-4 for the KY 196/196E/197/197E mounting dimensions. Mark and cut the mounting holes.

D. Secure the mounting rack to the instrument panel per Figure 2-4. The rear mounting bosses should be attached to the airframe by means of support brackets.

2.3.3 ANTENNA INSTALLATION

A. A conventional 50 ohm vertically polarized COMM antenna is required with the KY 196/196E/197/197E. Vertical bent whip antennas are not recommended. Wideband COMM antennas provide efficient operation over the COMM band. Antennas should be installed per manufacturer's recommendations. Additional recommendations are as follows.

B. Mount antenna on a flat metal surface or install a ground plane at least 18 inches square.

C. The antenna should be well removed from any projections and the engine(s) and propeller(s). Also, for satisfactory operation, the antenna isolation between a communications transmitter antenna and a NAV receiver antenna, as well as between dual COMM antennas, should be a minimum of 30dB. VHF antennas mounted on top and bottom have approximately 30dB isolation. A horizontally polarized NAV antenna and a vertical polarized COMM antenna will have practical values from 10 to 30dB.

D. If both Comm antennas must be top mounted or both bottom mounted, antenna isolation between Comm's may not be adequate to prevent reradiation. In single audio panel installations, reradiation can also be prevented by use of the Xmit-Rec interlock. Refer to Service Bulletin KY 196/196E-9 or KY 197/197E-10 and Installation Bulletin 194. In dual audio panel installations where simultaneous operation of both Comm's is desired, the Xmit-Rec interlock is not recommended. We would recommend adequate antenna isolation, 30dB min.

2.3.4 CABLE HARNESS AND CONNECTOR ASSEMBLY

The KY 196/196E/197/197E uses a special connector that mates directly with the printed circuit board inside the unit. Assembly of the connector is as follows:

A. Contact Terminal Assembly using Molex Crimper (Figure 2-1)

1. Strip each wire 5/32" for contact terminal (KPN 030-1107-XX). (The last two digits of the contact terminal part number indicates the number of terminals required).

2. Open the Molex hand crimper HT 1921 with the engraved side toward the operator. Place the conductor tab section of a contact terminal on Anvil B with the contact portion facing away from the operator. Close the crimper slightly until the contact tabs touch the female jaw.

3. Insert the stripped conductor until the insulation is even with the side of the crimper facing the operator. Crimp the conductor tabs by squeezing the handles together until the jaws are fully closed or a sufficient crimp is obtained.

4. Move the lead to Anvil A. Place the insulating tab section on Anvil A. Crimp again until the jaws are fully closed or a sufficient crimp is obtained.

B. Contact Insertion into Molex Connector Housing

1. After the contact terminals have been installed on the wiring harness, the contact terminals can be inserted into the proper location in the connector housing (KPN 030-1094-54). The terminal cannot be inserted upside down. Be sure to push the terminal all the way in, until a click can be felt or heard.

2. The self locking feature can be tested by gently pulling on the wire.

C. Location of Polarizing Key in Housing

1. Prior to insertion of connector into rear of unit, check polarizing key position between contacts 3 and 4.

2. Refer to Figure 2-5 to check correct position of polarizing key.

D. Extraction of Contact from Molex Connector

1. Slip the flat narrow blade of a Molex contact ejector tool, HT-1884 (KPN 047-5099-01), under the contact on the mating side of the connector. By turning the connector upside down one can see the blade slide into the stop.

2. When the ejector is slid into place, the retaining tab of the contact is raised, allowing the contact to be removed by pulling moderately on the lead.

3. Neither the contact or position is damaged by removing a contact; however, the contact should be checked visually before reinstalling in connector to be certain that retaining tab "A" extends as shown (see Figure 2-1) for retention in connector.

E. Coax Connector

Refer to Figure 2-3 for the details for mounting the right angle coaxial BNC connector to the coax cable. Install the connector into the mounting rack.

2.3.5 KY 196/196E/KY 197/197E INSTALLATION

A. Looking at the top of the unit, make sure the front lobe of the holddown device is in a vertical position.

B. Slide the unit into the mouting rack until the front lobe touches the mounting rack.

C. Insert a 3/32" Allen wrench through a hold in the front panel to engage the locking screw. Turn clockwise until the rear lobe engages the mounting rack. Continue turning until the unit is secure in the mounting rack . Do not overtighten.

D. For removal, turn the locking screw counterclockwise, using a 3/32" Allen wrench, until the unit disengages from the mounting rack. Pull the unit out of the mounting rack by pulling on the metal tabs located behind the front panel on each side of the unit. Radio Extractor KPN 071-6045-00 is designed to aid in the removal of this and other King products (See Figure 2-2).

2.4 POST INSTALLATION CHECK

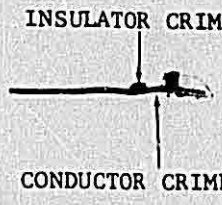
An operation performance flight test is recommended after the installation is completed to insure satisfactory performance of the equipment in its normal environment. Check all aircraft control movements to be sure no electrical cables interfere with their operation. To check the communications transceiver, maintain an appropriate altitude and contact a ground station facility at a range of at least fifty nautical miles. Contact a ground station close in. Pull the volume control knob out to defeat the automatic squelch feature and listen for any unusual electrical noise which would reduce the COMM receiver sensitivity by increasing the squelch threshold. If possible, verify the communications capability on both the high and low end of the VHF COMM band.

NOTE

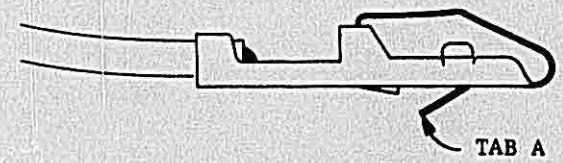
AS AN ADDED PRECAUTION BEFORE THE FLIGHT, CHECK THE ANTENNA. VSWR SHOULD BE CHECKED WITH AN IN-LINE TYPE WATTMETER INSERTED IN THE COAXIAL TRANSMISSION LINE BETWEEN THE TRANSCEIVER AND THE ANTENNA. ANY PROBLEM WITH THE ANTENNA INSTALLATION WILL MOST LIKELY BE SEEN AS A HIGH REFLECTED POWER. A VSWR OF 3:1 WILL RESULT IN A 25% LOSS IN POWER.

NOTE

THE BRIGHTNESS OF THE DISPLAY CAN BE SET FOR THE MOST PLEASING INTENSITY BY ADJUSTING R130 DURING LOW LIGHT LEVEL CONDITIONS. R130 IS ACCESSIBLE THROUGH THE BOTTOM OF THE RADIO WHEN IT IS PARTIALLY PULLED OUT OF THE RACK.



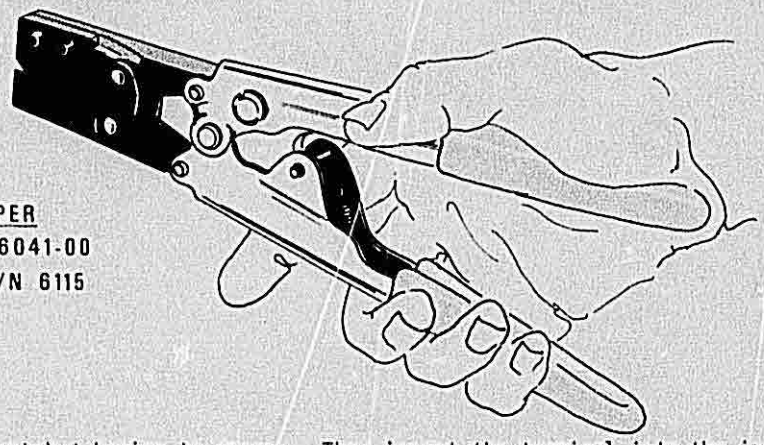
SOLDERLESS CONTACT TERMINAL
KPN 030-1107-30



HAND EJECTOR
KPN 047-5099-01
MOLEX PN HT-1884

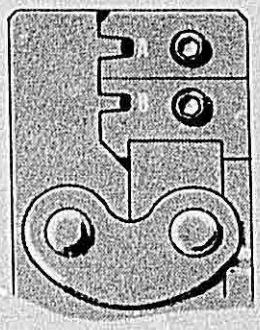
FIGURE 2-1 MOLEX TERMINAL AND TOOLS
(Dwg. No. 696-6333-00, R-1)
(Sheet 1 of 3)

Holding the hand crimpers as shown, release the crimper's ratchet pawl and open by squeezing tightly on the handles, and then releasing pressure.

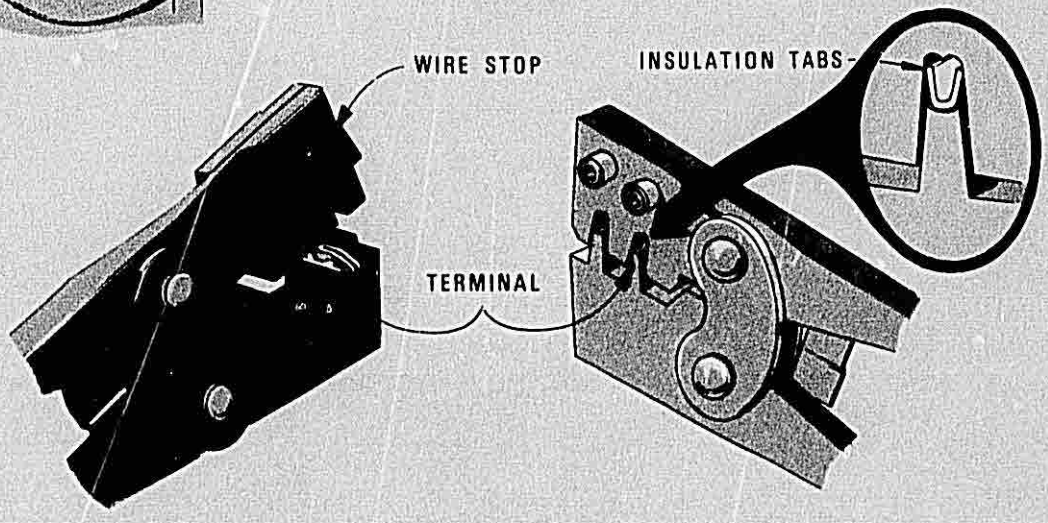


HAND CRIMPER
KPN 071-6041-00
MOLEX P/N 6115

Close crimpers until ratchet begins to engage. Then insert the terminal into the jaws from the back side. (See Figures at bottom of page) For 24 to 30AWG wire, it will be necessary to start the crimp in jaw A and then complete it in jaw B.



JAW	TERMINAL	WIRE SIZE	INSULATION RANGE
A	030-1107-30	18 to 24 AWG	.110 to .055
B	030-1107-30	24 to 30AWG	.055 to .030

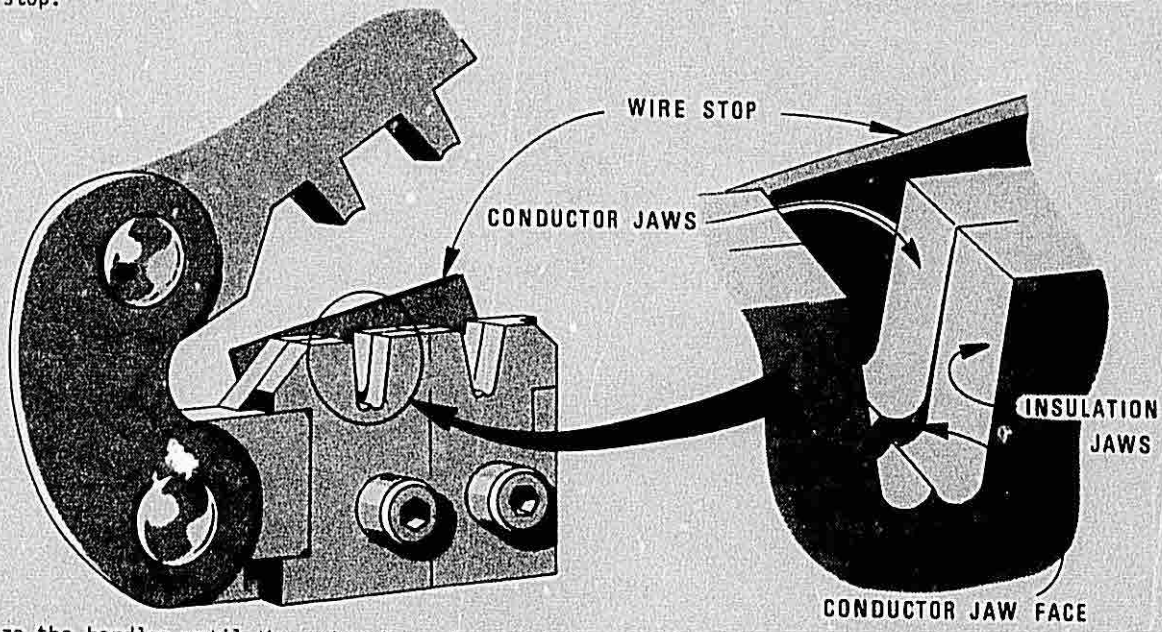


Terminal is in correct position when insulation tabs are flush with outside face of crimp jaws.

FIGURE 2-1 MOLEX TERMINAL AND TOOLS
(Dwg. No. 696-6333-00, R-1)
(Sheet 2 of 3)

Once the terminal is in the correct position, close the jaws gently until the terminal is held loosely in place. Push wire stop down so that it rests snugly behind the contact portion of the terminal.

Strip the wire insulation back 1/8 inch and insert the wire through the insulation tabs into the conductor tabs until the insulation hits the conductor jaw face or until the conductor touches the wire stop.



Squeeze the handles until the crimp jaws close and the ratchet releases.

Straighten the terminal if necessary, then release the plier grips and remove the crimped terminal.

CRIMPING PRESSURE ADJUSTMENT

If too much or too little pressure is needed to release the crimper's ratchet pawl at the end of the crimp stroke, the ratchet can be easily adjusted. A spanner wrench provided with the tool can be used to loosen the lock nut, and rotate the keyed stud clockwise for increased pressure and counter-clockwise for decreased pressure. Once the desired pressure has been set, the lock nut must be tightened again. Newer models may have a screwdriver adjustment.

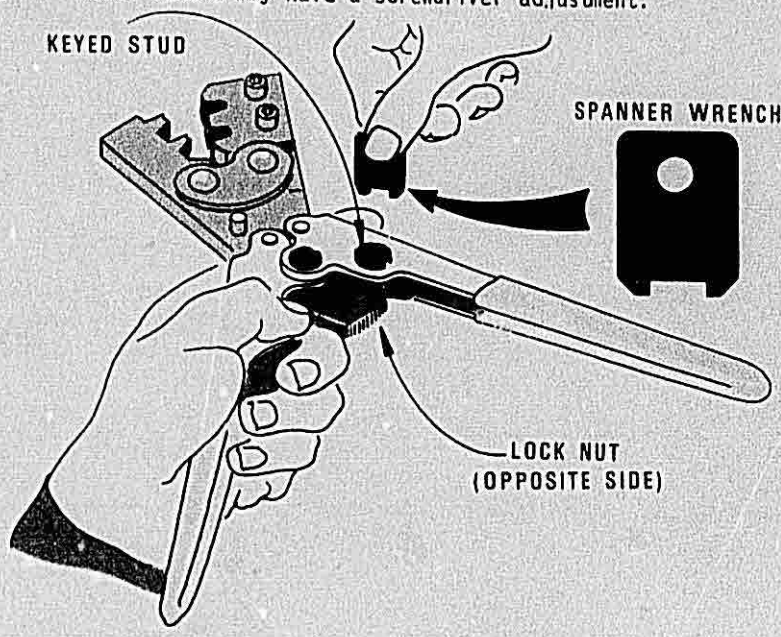
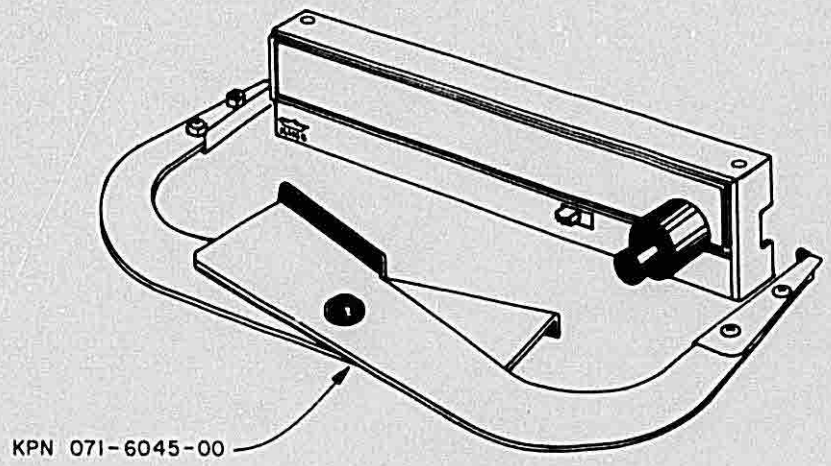


FIGURE 2-1 MOLEX TERMINAL AND TOOLS
(Dwg. No. 696-6333-00, R-1)
(Sheet 3 of 3)

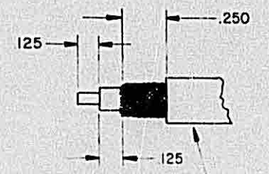


REPLACEMENT HOOKS

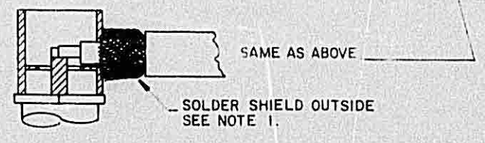
047-4796-00, SHORT HOOKS

047-4796-01, LONG HOOKS

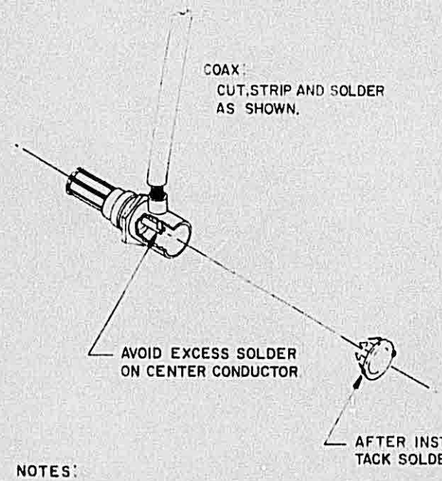
FIGURE 2-2 RADIO REMOVAL TOOL (KPN 071-6045-00)
(Dwg. No. 155-5395-00, R-0)



RG-58A/U KPN 026-0015-00
USED ON NAV,COM,DME,XPONDER
AND RADIO TELEPHONE.



RG-124B/U KPN 024-0002-00
DME LOW LOSS AND T5-50
TIMES AA2413PN KPN 024-0013-00
TRANSPONDER LOW LOSS.
(USE CAUTION WHEN SOLDERING SHIELD,
EXCESS HEAT WILL MELT CENTER
CONDUCTOR INSULATOR.)

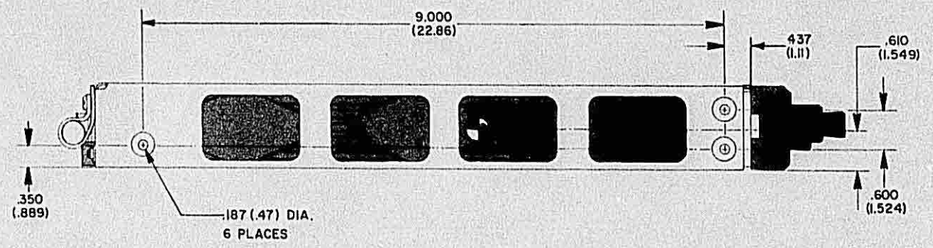


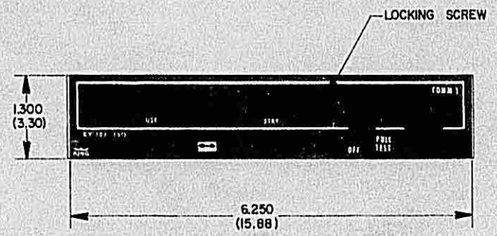
NOTES:

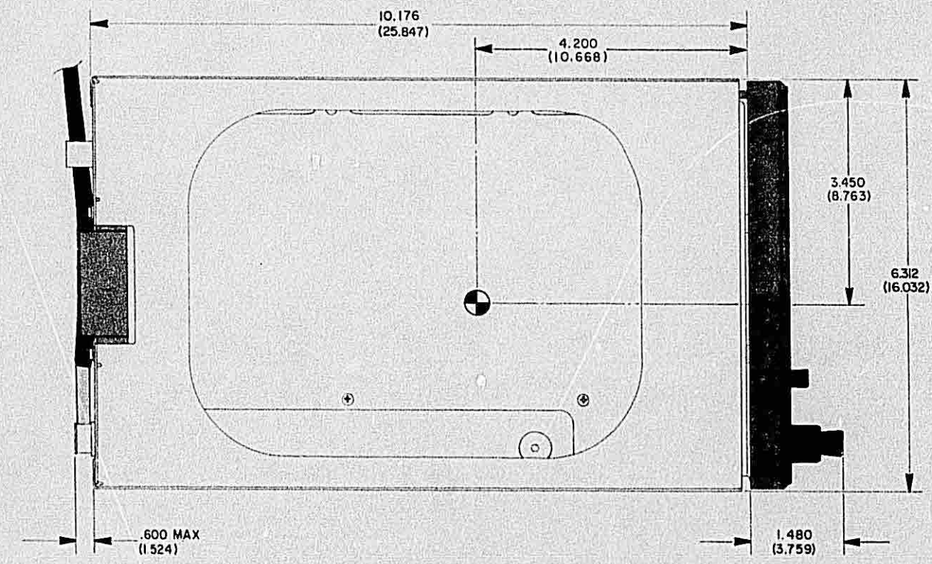
1. AVOID APPLYING EXCESSIVE HEAT TO CONNECTOR BODY. HEAT SINK SPRING CONTACTS DURING SOLDERING.

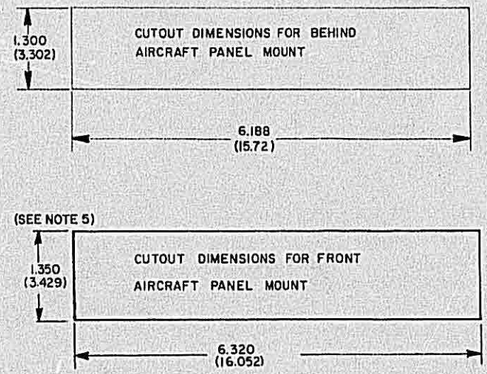
FIGURE 2-3 KPN 030-0101-02 CONNECTOR ASSEMBLY
(Dwg. No. 696-6328-00, R-0)

KING
KY 196/196E/KY 197/197E
VHF COMMUNICATIONS TRANSCEIVER







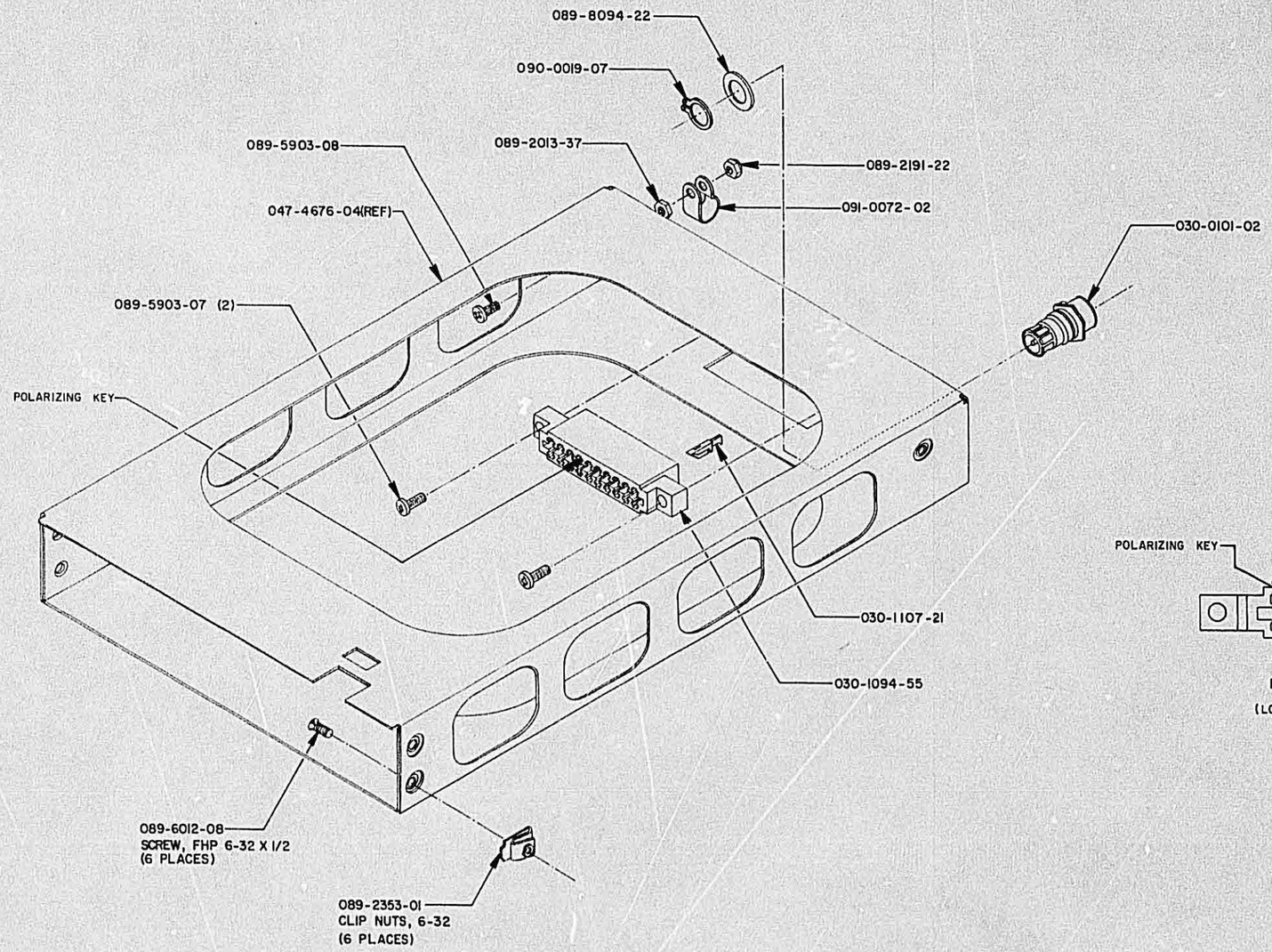


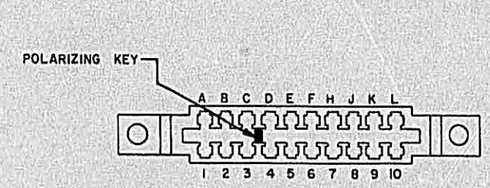
NOTES:

1. DIMENSIONS IN ( ) ARE IN CENTIMETERS.
2. WEIGHT: 3.1 LBS. (1.406 Kg).
3. TOLERANCES FOR PANEL CUTOUTS: $^{+.010}_{-.000}(^{+.025}_{-.000})$
4. WHEN INSTALLING TWO OR MORE PANEL MOUNTED UNITS IN A STACK, THE MOUNTING TRAYS SHALL BE SPACED .050 INCHES (.127 CM.) APART. NEWER STYLE MOUNTING TRAYS HAVE HAD .025 INCH (.063CM) DIMPLES BUILT IN, TOP AND BOTTOM, BOTH SIDES, SO THAT TWO NEW STYLE TRAYS WILL AUTOMATICALLY BE SPACED PROPERLY.
5. TO DETERMINE STACK HEIGHT, USE THE HEIGHT DIMENSION FOR A FRONT AIRCRAFT PANEL MOUNT.

FIGURE 2-4 KY 196/196E/197/197E OUTLINE AND MOUNTING DRAWING
(Dwg. No. 155-5309-00, R-4)

KING
KY 196/196E/KY 197/197E
VHF COMMUNICATIONS TRANSCEIVER

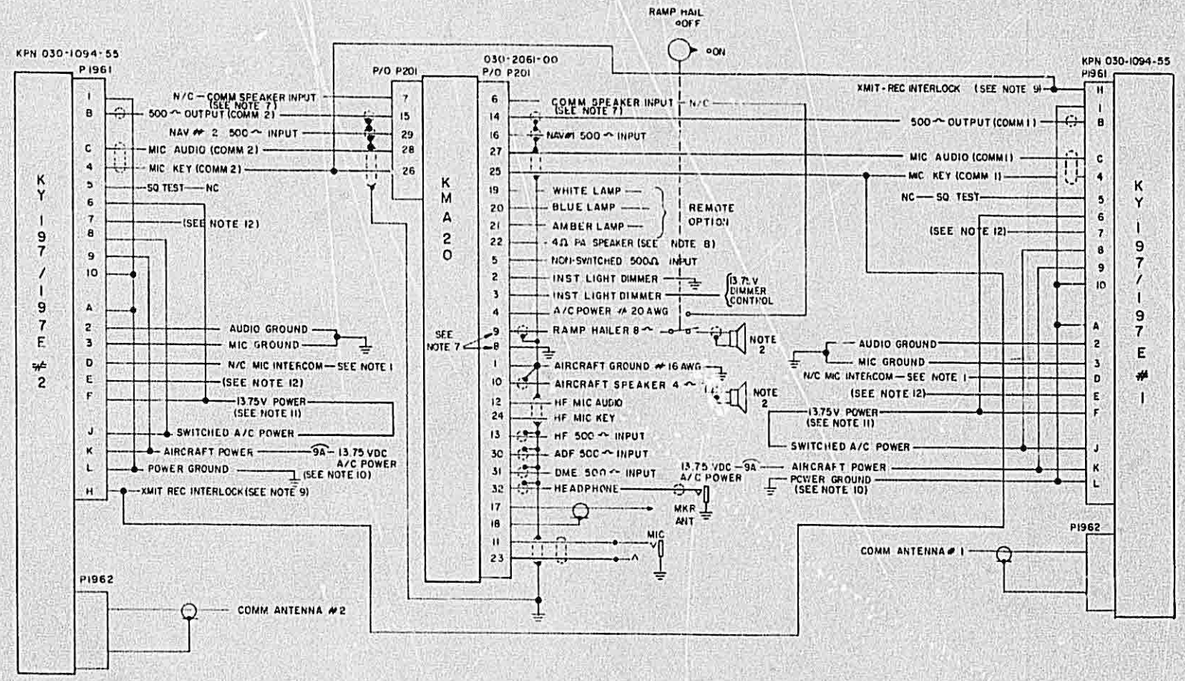




FRONT VIEW – CONNECTOR
(LOOKING IN FROM FRONT OF RACK)

FIGURE 2-5 KY 196/196E/197/197E INSTALLATION ASSEMBLY DRAWING
(Dwg. No. 155-5310-00, R-2)

KING
KY 196/196E/KY 197/197E
VHF COMMUNICATIONS TRANSCEIVER



1. MIC INTERCOM IS NOT USED. INTERCOM IS PROVIDED BY USING EXT. MODE OF KMA 20 AND CONNECTING RAMPMAIL OUTPUT TO A RESISTOR LOAD.
2. RAMP HAILER AND AIRCRAFT SPEAKER SHIELDS SHOULD BE CONNECTED TO PIN I AT KMA 20.
3. UNLESS NOTED, ALL WIRES # 24 AWG MINIMUM.
4. ALL ANTENNA COAX IS RG58 A/U.
5. UNLESS OTHERWISE SPECIFIED, ALL SYSTEM GROUNDS ARE AIRFRAME GROUNDS.
6. POWER BUSS CIRCUIT BREAKERS ARE TO BE MOUNTED IN THE AIRCRAFT BREAKER PANEL OR INSTRUMENT PANEL SUCH THAT THEY WILL BE ACCESSIBLE IN FLIGHT AND SAFE FROM PHYSICAL DAMAGE.
7. THIS INTERCONNECT DRAWING IS FOR KMA 20's S/N 11233 AND ABOVE. KMA 20's S/N 11232 AND BELOW WILL REQUIRE AN EXT. 8Ω LOAD RESISTOR FOR RAMPHAIL OUTPUT. SEE INSTALL BULLETIN # 56.
8. APPLICABLE TO KMA 20-09,-10,-11,-13 AND,-14 ONLY.
9. TX-RX INTERLOCK WIRING NECESSARY WHEN BOTH COMM ANT. ARE TOP MOUNTED, BOTH COMM ANT. ARE BOTTOM MOUNTED OR IN DUAL COMM INSTALLATIONS IN FABRIC AIRCRAFT. REFER TO ANTENNA INSTALLATION RECOMMENDATIONS.
10. AIRCRAFT POWER WIRING SHOULD BE TWO # 18 AWG TO THE CIRCUIT BREAKER AND POWER GROUND SHOULD BE TWO # 18 AWG TO GROUND.
11. SWITCHED A/C POWER, PINS J AND 8 AND 13.75V POWER PINS F AND 6 MUST BE JUMPERED TOGETHER WITH # 20 AWG MINIMUM.
12. FOR REMOTE FREQUENCY TRANSFER/REMOTE FREQUENCY RECALL (064-1021-10/11) OR FIELD MOD. 16. A MOMENTARY GROUND AT PINE WILL CAUSE THE RADIO TO INCREMENT TO THE NEXT FREQUENCY IN MEMORY AND DISPLAY IT IN THE STBY WINDOW. A MOMENTARY GROUND AT PIN 7 WILL TRANSFER THE USE AND STBY FREQUENCIES. A TWO POSITION SPRING LOADED ROCKER SWITCH OR TWO SEPARATE MOMENTARY PUSHBUTTON SWITCHES MAY BE USED AT THE INSTALLERS OPTION.

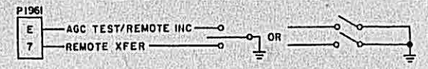
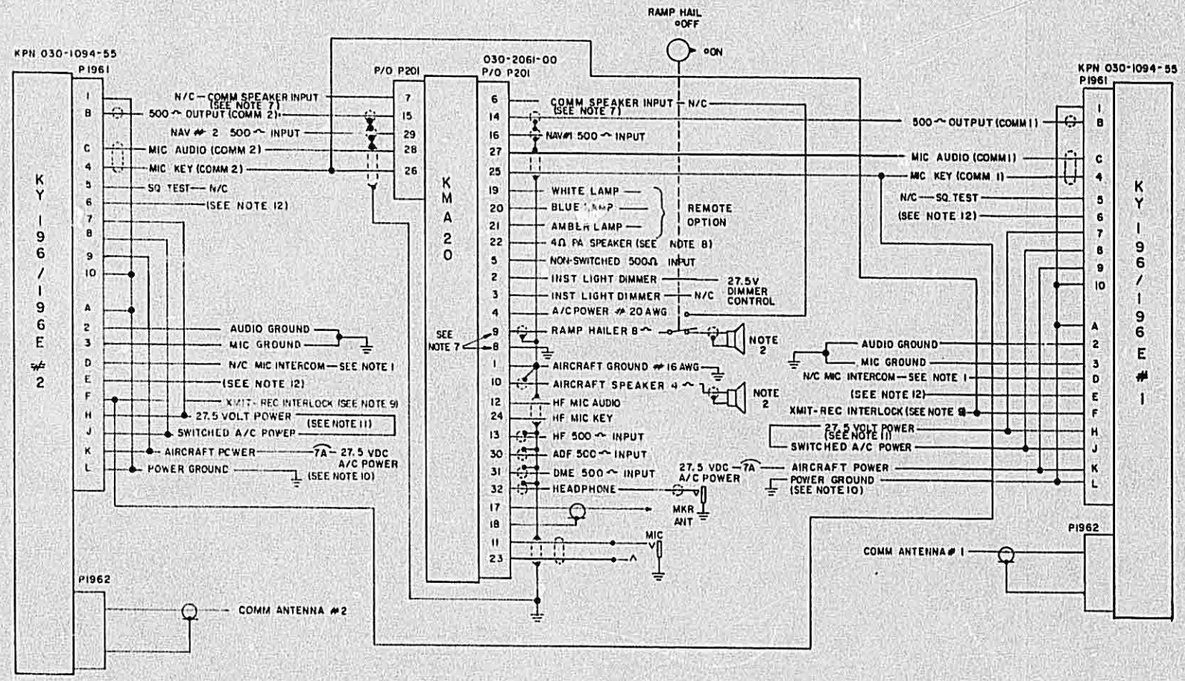


FIGURE 2-6 KY 197/197E INTERCONNECT DIAGRAM WITH KMA 20 (13.75VDC)
TO PROVIDE 4 OHM SPEAKER OUTPUT, RAMP HAILER AND INTERCOM
(Dwg. No. 155-1320-00, R-5)

KING
KY 196/196E/KY 197/197E
VHF COMMUNICATIONS TRANSCEIVER



1. MIC INTERCOM IS NOT USED. INTERCOM IS PROVIDED BY USING EXT. MODE OF KMA 20 AND CONNECTING RAMPHAIL OUTPUT TO A RESISTOR LOAD.
2. RAMP HAILER AND AIRCRAFT SPEAKER SHIELDS SHOULD BE CONNECTED TO PIN 1 AT KMA 20.
3. UNLESS NOTED, ALL WIRES # 24 AWG MINIMUM.
4. ALL ANTENNA COAX IS RG58 A/U.
5. UNLESS OTHERWISE SPECIFIED, ALL SYSTEM GROUNDS ARE AIRFRAME GROUNDS.
6. POWER BUSS CIRCUIT BREAKERS ARE TO BE MOUNTED IN THE AIRCRAFT BREAKER PANEL OR INSTRUMENT PANEL SUCH THAT THEY WILL BE ACCESSIBLE IN FLIGHT AND SAFE FROM PHYSICAL DAMAGE.
7. THIS INTERCONNECT DRAWING IS FOR KMA 20's S/N 11233 AND ABOVE. KMA 20's S/N 11232 AND BELOW WILL REQUIRE AN EXT 8Ω LOAD RESISTOR FOR RAMPHAIL OUTPUT. SEE INSTALL BULLETIN # 56.
8. APPLICABLE TO KMA 20-09,-10,-11,-13 AND,-14 ONLY.
9. TX-RX INTERCONNECT WIRING IS NECESSARY WHEN BOTH COMM ANT. ARE TOP MOUNTED, BOTH COMM ANT. ARE BOTTOM MOUNTED OR IN DUAL COMM INSTALLATIONS IN FABRIC AIRCRAFT. REFER TO ANTENNA INSTALLATION RECOMMENDATIONS.
10. AIRCRAFT POWER WIRING SHOULD BE TWO # 18 AWG TO THE CIRCUIT BREAKER AND POWER GROUND SHOULD BE TWO # 18 AWG TO GROUND.
11. SWITCHED A/C POWER, PINS J AND 8 AND 27.5V POWER PINS H AND 7 MUST BE JUMPERED TOGETHER WITH # 20 AWG MINIMUM.
12. FOR REMOTE FREQUENCY TRANSFER / REMOTE FREQUENCY RECALL (064-1021-10/11/12) OR FIELD MOD IE, A MOMENTARY GROUND AT PIN E WILL CAUSE THE RADIO TO INCREMENT TO THE NEXT FREQUENCY IN MEMORY AND DISPLAY IT IN THE STBY WINDOW. A MOMENTARY GROUND AT PIN 6 WILL TRANSFER THE USE AND STBY. FREQUENCIES. A TWO POSITION SPRING LOADED ROCKER SWITCH OR TWO SEPARATE MOMENTARY PUSHBUTTON SWITCHES MAY BE USED AT THE INSTALLERS OPTION.

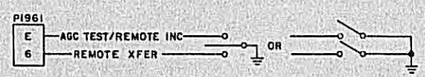
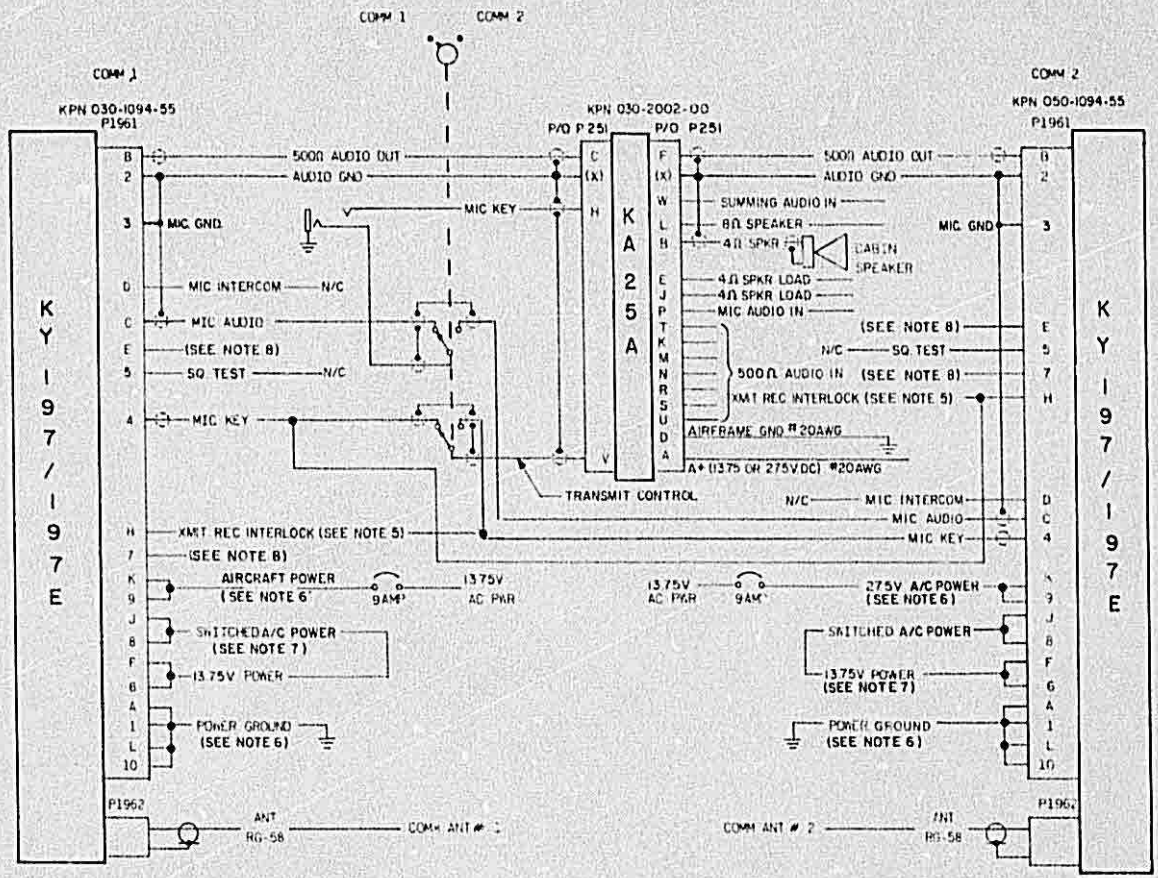


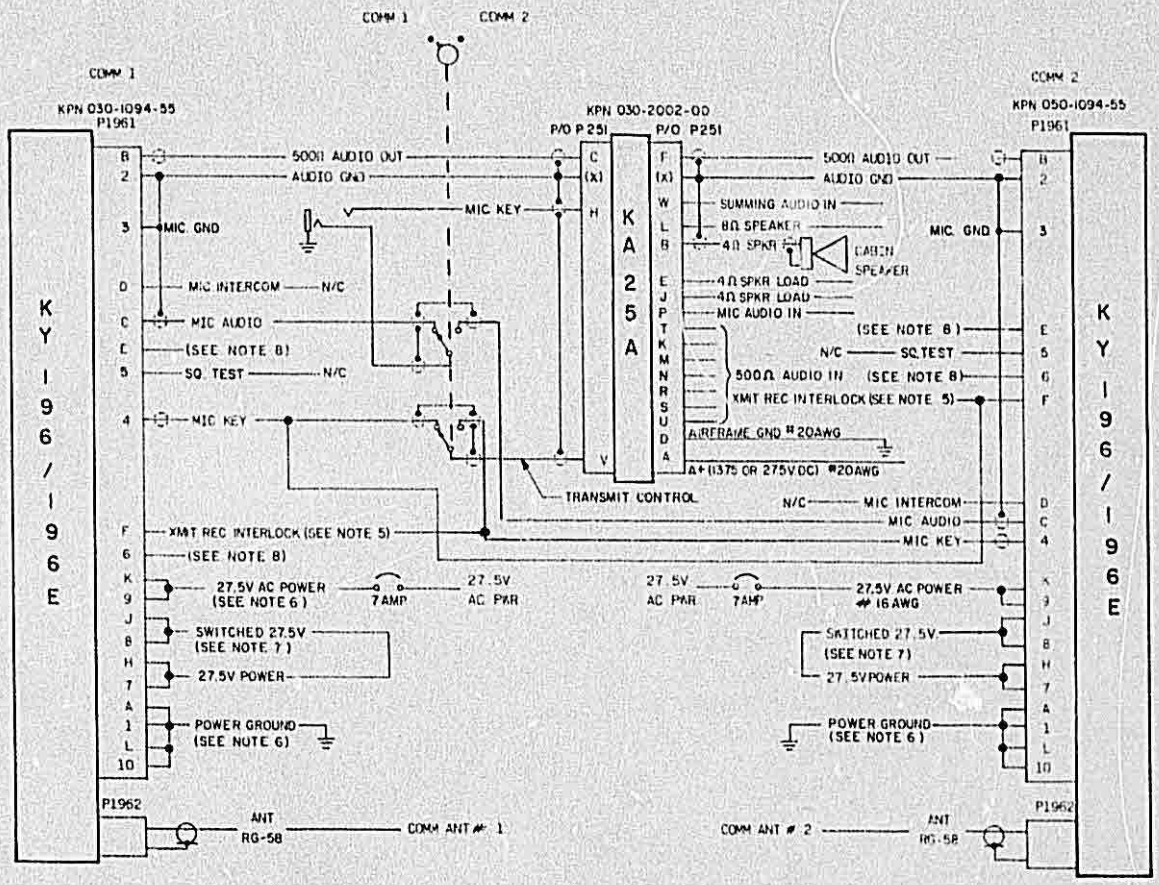
FIGURE 2-7 KY 196/196E INTERCONNECT DIAGRAM WITH KMA 20 (27.5VDC) TO PROVIDE 4 OHM SPEAKER OUTPUT, RAMP HAILER AND INTERCOM (Dwg. No. 155-1321-00, R-5)



NOTES:

1. SELECTOR SWITCH, DOUBLE POLE - DOUBLE THROW (DPDT) (TO BE SUPPLIED BY INSTALLER).
2. ALL WIRES # 24 AWG UNLESS NOTED.
3. TERMINATE AUDIO SHIELDS AT ONE END ONLY AS SHOWN.
4. PIN # IN PARENTHESIS ARE COMMON.
5. TX-RX INTERLOCK WIRING IS NECESSARY WHEN BOTH COMM ANT ARE TOP MOUNTED, WHEN BOTH COMM ANT ARE BOTTOM MOUNTED, OR IN DUAL COMM INSTALLATIONS IN FABRIC AIRCRAFT. REFER TO ANTENNA INSTALLATION RECOMMENDATIONS.
6. AIRCRAFT POWER WIRING SHOULD BE TWO # 18 AWG TO THE CIRCUIT BREAKER AND POWER GROUND SHOULD BE # 18 AWG TO GROUND.
7. SWITCHED A/C POWER, PINS J AND 8 AND 13.75V POWER PINS F AND 6 MUST BE JUMPERED TOGETHER WITH # 20 AWG MINIMUM.
8. FOR REMOTE FREQUENCY TRANSFER / REMOTE FREQUENCY RECALL (064-1021-10/11) OR FIELD MOD 16, A MOMENTARY GROUND AT PIN E WILL CAUSE THE RADIO TO INCREMENT TO THE NEXT FREQUENCY IN MEMORY AND DISPLAY IT IN THE STBY WINDOW. A MOMENTARY GROUND AT PIN 7 WILL TRANSFER THE USE AND STBY FREQUENCIES. A TWO POSITION SPRING LOADED ROCKER SWITCH OR TWO SEPARATE MOMENTARY PUSHBUTTON SWITCHES MAY BE USED AT THE INSTALLERS OPTION.

FIGURE 2-8 KY 197/197E INTERCONNECT DIAGRAM WITH KA 25A (13.75VDC)
TO PROVIDE 4 OHM SPEAKER OUTPUT
(Dwg. No. 155-1325-00, R-5)



NOTES:

1. SELECTOR SWITCH, DOUBLE POLE-DOUBLE THROW DPDT (TO BE SUPPLIED BY INSTALLER).
2. ALL WIRES #24 AWG UNLESS NOTED.
3. TERMINATE AUDIO SHIELDS AT ONE END ONLY AS SHOWN.
4. PIN # IN PARENTHESIS ARE COMMON.
5. TX-RX INTERCONNECT WIRING IS NECESSARY WHEN BOTH COMM ANT. ARE TOP MOUNTED, BOTH COMM ANT. ARE BOTTOM MOUNTED OR IN DUAL COMM INSTALLATIONS IN FABRIC AIRCRAFT. REFER TO ANTENNA INSTALLATION RECOMMENDATIONS.
6. AIRCRAFT POWER WIRING SHOULD BE TWO # 18 AWG TO THE CIRCUIT BREAKER AND POWER GROUND SHOULD BE TWO # 18 AWG TO GROUND.
7. SWITCHED A/C POWER, PINS J AND 8 AND 27.5V POWER PINS H AND 7 MUST BE JUMPERED TOGETHER WITH # 20 AWG MINIMUM.
8. FOR REMOTE FREQUENCY TRANSFER / REMOTE FREQUENCY RECALL (064-1021-10/11/12) OR FIELD MOD 15. A MOMENTARY GROUND AT PIN E WILL CAUSE THE RADIO TO INCREMENT TO THE NEXT FREQUENCY IN MEMORY AND DISPLAY IT IN THE STBY WINDOW. A MOMENTARY GROUND AT PIN 6 WILL TRANSFER THE USE AND STBY FREQUENCIES. A TWO POSITION SPRING LOADED ROCKER SWITCH OR TWO SEPARATE MOMENTARY PUSHBUTTON SWITCHES MAY BE USED AT THE INSTALLERS OPTION.

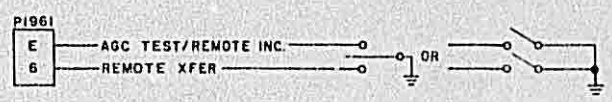
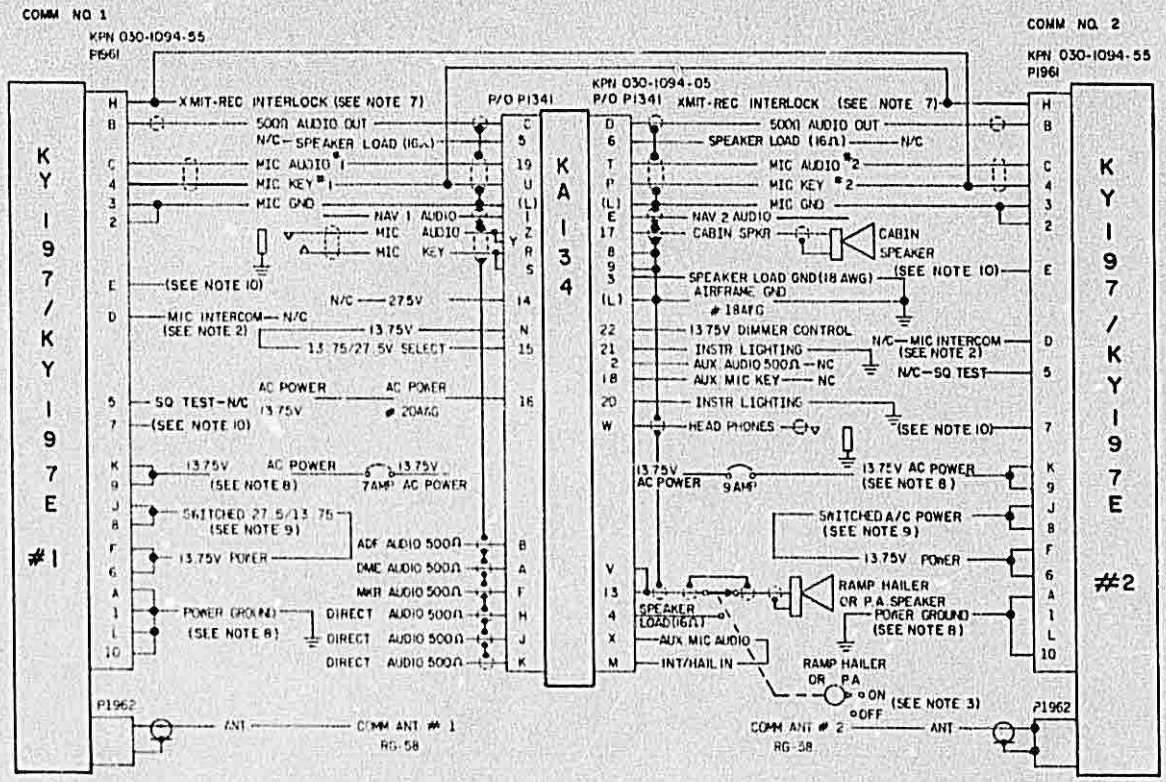


FIGURE 2-9 KY 196/196E INTERCONNECT DIAGRAM WITH KA 25A (27.5VDC)
TO PROVIDE 4 OHM SPEAKER OUTPUT
(Dwg. No. 155-1322-00, R-5)



NOTES:

1. ALL WIRES NO. 24AWG UNLESS NOTED.
2. MIC INTERCOM IS NOT USED. INTERCOM IS PROVIDED BY USING RAMP HAILER OR PA SIDETONE IN EXT. MODE OF KA 134.
3. IF RAMP HAILER OR PA SIDETONE IS DESIRED FOR INTERCOM, RAMP HAILER OR PA SPEAKER OUTPUT PIN 13, MUST BE TERMINATED THROUGH A SWITCH TO A LOAD RESISTOR.
4. POWER BUSS CIRCUIT BREAKERS ARE TO BE MOUNTED IN THE AIRCRAFT BREAKER PANEL OR INSTRUMENT PANEL SUCH THAT THEY WILL BE ACCESSIBLE IN FLIGHT AND SAFE FROM PHYSICAL DAMAGE.
5. UNLESS OTHERWISE SPECIFIED ALL SYSTEM GROUNDS ARE AIRFRAME GROUNDS.
6. PIN NUMBERS IN PARENTHESES ARE ALL COMMON.
7. TX-RX INTERLOCK WIRING NECESSARY WHEN BOTH COMM ANT. ARE TOP MOUNTED, BOTH COMM ANT. ARE BOTTOM MOUNTED, OR IN DUAL COMM INSTALLATIONS IN FABRIC AIRCRAFT. REFER TO ANTENNA INSTALLATION RECOMMENDATIONS.
8. AIRCRAFT POWER WIRING SHOULD BE TWO # 18 AWG TO THE CIRCUIT BREAKER AND POWER GROUND SHOULD BE TWO # 18 AWG TO GROUND.
9. SWITCHED A/C POWER, PINS J AND B 13.75V POWER PINS F AND 6 MUST BE JUMPERED TOGETHER WITH # 20AWG MINIMUM.
10. FOR REMOTE FREQUENCY TRANSFER/REMOTE FREQUENCY RECALL (064-1021-10/11) OR FIELD MOD 16. A MOMENTARY GROUND AT PIN E WILL CAUSE THE RADIO TO INCREMENT TO THE NEXT FREQUENCY IN MEMORY AND DISPLAY IT IN THE STBY WINDOW. A MOMENTARY GROUND AT PIN 7 WILL TRANSFER THE USE AND STBY FREQUENCIES. A TWO POSITION SPRING LOADED ROCKER SWITCH OR TWO SEPERATE MOMENTARY PUSHBUTTON SWITCHES MAY BE USED AT THE INSTALLERS OPTION.

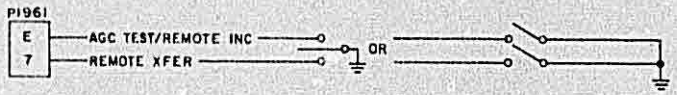
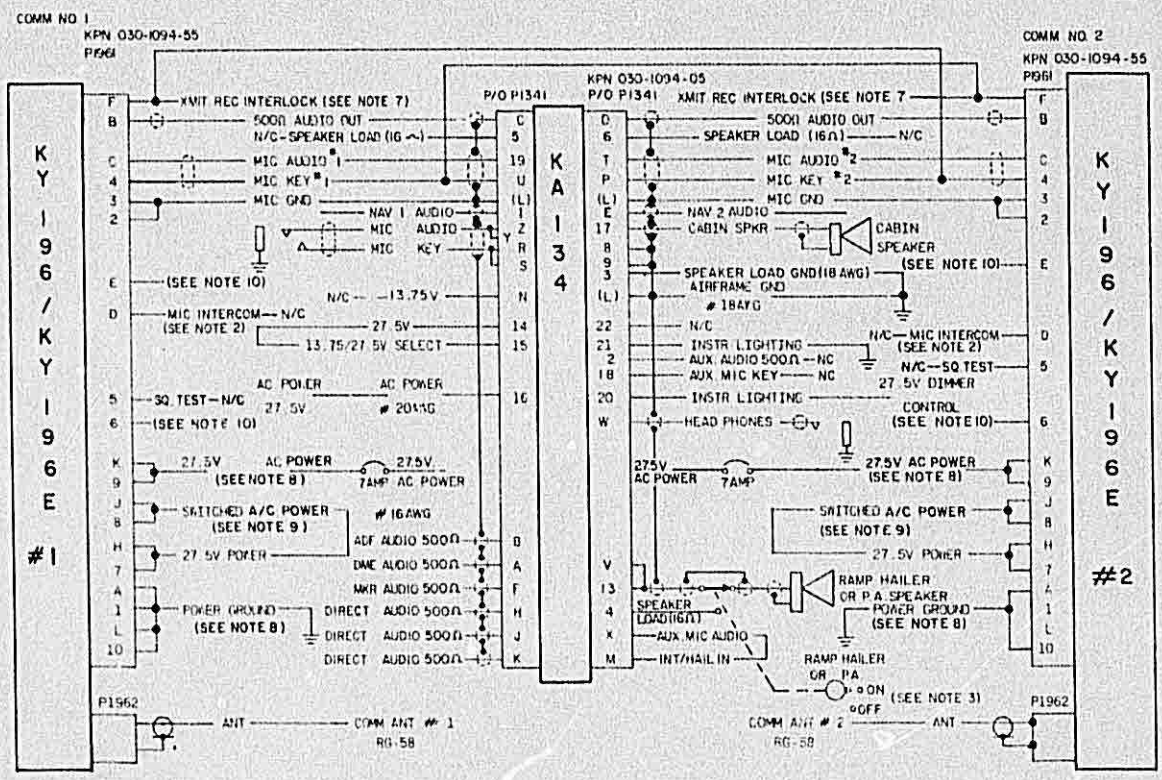


FIGURE 2-10 KY 197/197E INTERCONNECT DIAGRAM WITH KA 134 (13.75VDC)
TO PROVIDE 4 OHM SPEAKER OUTPUT, RAMP HAILER AND INTERCOM
(Dwg. No. 155-1323-00, R-5)



NOTES:

1. ALL WIRES NO. 24AWG UNLESS NOTED.
2. MIC INTERCOM IS NOT USED. INTERCOM IS PROVIDED BY USING RAMP HAILER OR PA SIDETONE IN EXT. MODE OF KA 134.
3. IF RAMP HAILER OR PA SIDETONE IS DESIRED FOR INTERCOM, RAMP HAILER OR PA SPEAKER OUTPUT PIN 13, MUST BE TERMINATED THROUGH A SWITCH TO A LOAD RESISTOR.
4. POWER BUSS CIRCUIT BREAKERS ARE TO BE MOUNTED IN THE AIRCRAFT BREAKER PANEL OR INSTRUMENT PANEL, SUCH THAT THEY WILL BE ACCESSIBLE IN FLIGHT AND SAFE FROM PHYSICAL DAMAGE.
5. UNLESS OTHERWISE SPECIFIED ALL SYSTEM GROUNDS ARE AIRFRAME GROUNDS.
6. PIN NUMBERS IN PARENTHESES ARE ALL COMMON.
7. TX-RX INTERCONNECT WIRING IS NECESSARY WHEN BOTH COMM ANT ARE TOP MOUNTED, BOTH COMM ANT ARE BOTTOM MOUNTED OR IN DUAL COMM INSTALLATIONS IN FABRIC AIRCRAFT. REFER TO ANTENNA INSTALLATION RECOMMENDATIONS.
8. AIRCRAFT POWER WIRING SHOULD BE TWO # 18AWG TO THE CIRCUIT BREAKER AND POWER GROUND SHOULD BE TWO # 18 AWG TO GROUND.
9. SWITCHED A/C POWER, PINS J AND B AND 27.5V POWER PINS H AND 7 MUST BE JUMPERED TOGETHER WITH # 20 AWG MINIMUM.
10. FOR REMOTE FREQUENCY TRANSFER/REMOTE FREQUENCY RECALL (064-1021-10/11/12) OR FIELD MOD 15. A MOMENTARY GROUND AT PIN E WILL CAUSE THE RADIO TO INCREMENT TO THE NEXT FREQUENCY IN MEMORY AND DISPLAY IT IN THE STBY WINDOW. A MOMENTARY GROUND AT PIN 6 WILL TRANSFER THE USE AND STBY FREQUENCIES. A TWO POSITION SPRING LOADED ROCKER SWITCH OR TWO SEPARATE MOMENTARY PUSHBUTTON SWITCHES MAY BE USED AT THE INSTALLERS OPTION.

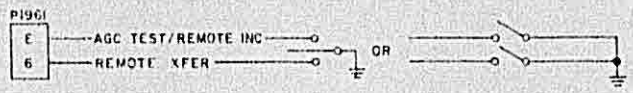
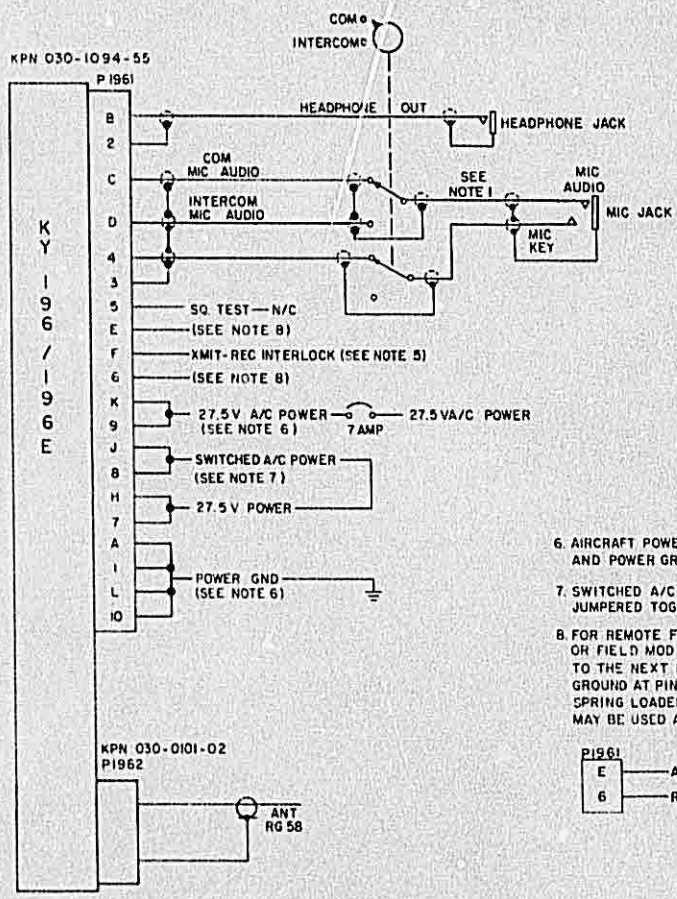
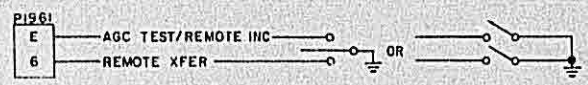


FIGURE 2-11 KY 196/196E INTERCONNECT DIAGRAM WITH KA 134 (27.5VDC)
TO PROVIDE 4 OHM SPEAKER OUTPUT, RAMP HAILER, AND INTERCOM
(Dwg. No. 155-1324-00, R-5)

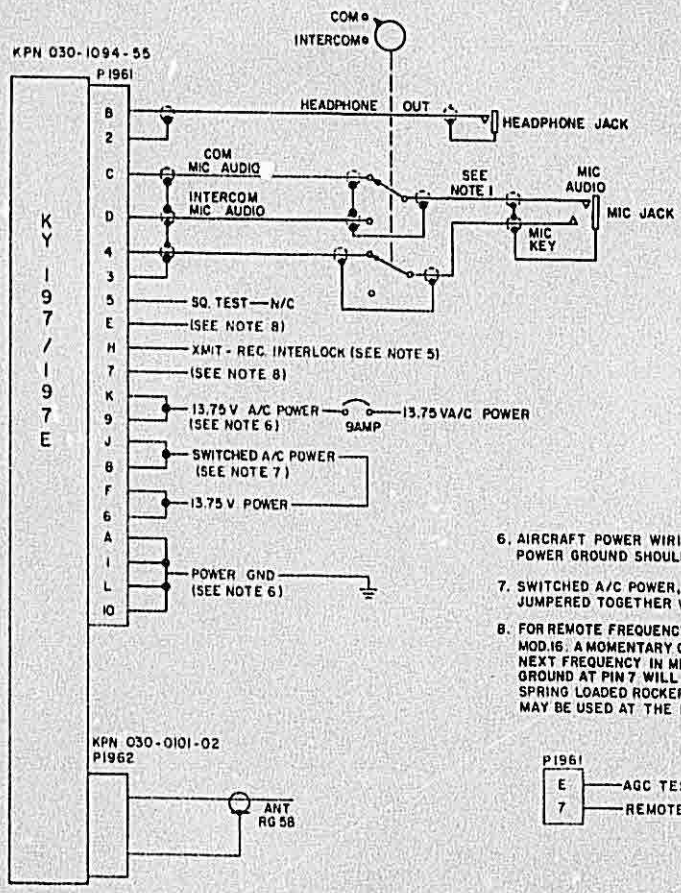




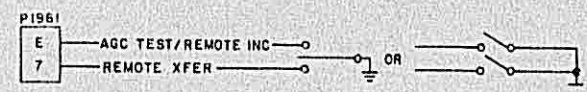
NOTES:

1. INTERCOM OPERATION REQUIRES A MIKE WHICH PROVIDES AUDIO OUT WITH THE MIKE KEY DE-ENERGIZED.
2. ALL WIRES # 24 AWG UNLESS NOTED.
3. TERMINATE SHIELDS AT ONE END ONLY AS SHOWN.
4. ALL GROUNDS ARE AIRFRAME GROUND UNLESS NOTED.
5. XMIT-REC INTERLOCK WIRING NECESSARY WHEN BOTH COMM ANT. ARE TOP MOUNTED, BOTH COMM ANT. ARE BOTTOM MOUNTED OR IN DUAL COMM INSTALLATIONS IN FABRIC AIRCRAFT. CONNECT THIS LINE TO THE MIC KEY LINE OF THE OTHER TRANSCEIVER. REFER TO ANTENNA INSTALLATION RECOMMENDATIONS.
6. AIRCRAFT POWER WIRING SHOULD BE TWO # 18 AWG TO THE CIRCUIT BREAKER AND POWER GROUND SHOULD BE TWO # 18 AWG TO GROUND.
7. SWITCHED A/C POWER, PINS J AND 8 AND 27.5V POWER PINS H AND 7 MUST BE JUMPERED TOGETHER WITH # 20 AWG MINIMUM.
8. FOR REMOTE FREQUENCY TRANSFER / REMOTE FREQUENCY RECALL (064-1021-10/11/12) OR FIELD MOD 15. A MOMENTARY GROUND AT PIN E WILL CAUSE THE RADIO TO INCREMENT TO THE NEXT FREQUENCY IN MEMORY AND DISPLAY IT IN THE STBY WINDOW. A MOMENTARY GROUND AT PIN 6 WILL TRANSFER THE USE AND STBY. FREQUENCIES. A TWO POSITION SPRING LOADED ROCKER SWITCH OR TWO SEPARATE MOMENTARY PUSHBUTTON SWITCHES MAY BE USED AT THE INSTALLERS OPTION.

FIGURE 2-12 KY 196/196E INTERCONNECT TO PROVIDE INTERCOM AND HEADPHONE OUTPUT ONLY
(Dwg. No. 155-1327-00, R-6)



6. AIRCRAFT POWER WIRING SHOULD BE TWO #18 AWG TO THE CIRCUIT BREAKER AND POWER GROUND SHOULD BE TWO #18 AWG TO GROUND.
7. SWITCHED A/C POWER, PINS J AND 8 AND 13.75V POWER PINS F AND 6 MUST BE JUMPERED TOGETHER WITH #20 AWG MINIMUM.
8. FOR REMOTE FREQUENCY TRANSFER/REMOTE FREQUENCY RECALL (064-1021-10/11) OR FIELD MOD.16. A MOMENTARY GROUND AT PIN E WILL CAUSE THE RADIO TO INCREMENT TO THE NEXT FREQUENCY IN MEMORY AND DISPLAY IT IN THE STBY WINDOW. A MOMENTARY GROUND AT PIN 7 WILL TRANSFER THE USE AND STBY FREQUENCIES. A TWO POSITION SPRING LOADED ROCKER SWITCH OR TWO SEPARATE MOMENTARY PUSHBUTTON SWITCHES MAY BE USED AT THE INSTALLERS OPTION.



NOTES:
1. INTERCOM OPERATION REQUIRES A MIKE WHICH PROVIDES AUDIO OUT WITH THE MIKE KEY DE-ENERGIZED.
2. ALL WIRES #24 AWG UNLESS NOTED.
3. TERMINATE SHIELDS AT ONE END ONLY AS SHOWN.
4. ALL GROUNDS ARE AIRFRAME GROUND UNLESS NOTED.
5. XMIT-REC INTERLOCK WIRING NECESSARY WHEN BOTH COMM ANT. ARE TOP MOUNTED, BOTH COMM ANT. ARE BOTTOM MOUNTED OR IN DUAL COMM INSTALLATIONS IN FABRIC AIRCRAFT. CONNECT THIS LINE TO THE MIC KEY LINE OF THE OTHER TRANSCEIVER. REFER TO ANTENNA INSTALLATION RECOMMENDATIONS.

FIGURE 2-13 KY 197/197E INTERCONNECT TO PROVIDE INTERCOM AND HEADPHONE OUTPUT ONLY
(Dwg. No. 155-1326-00, R-6)

CHAPTER 03

SECTION III
OPERATION

3.1 OPERATING PROCEDURE

3.1.1 TURN ON

To turn on the unit, rotate the VOL knob clockwise from the OFF position. A non-volatile memory stores frequency and mode information on power down. When power is activated the USE and STANDBY windows will display the frequencies displayed at power down and the mode of operation will be the same as at power down. Frequencies stored in memory channels are also retained.

After activating power, pull the VOL knob out to override the automatic squelch and rotate the VOL knob to the desired audio level. Push the VOL knob back in to activate the automatic squelch.

NOTE

THE KY 196/197 SHOULD BE TURNED ON ONLY AFTER ENGINE STARTUP. THIS IS A SIMPLE PRECAUTION WHICH HELPS PROTECT THE SOLID STATE CIRCUITRY AND EXTENDS THE OPERATING LIFE OF YOUR AVIONICS EQUIPMENT.

3.1.2 TRANSMIT INDICATOR

During COMM transmission, a lighted "T" will appear between the USE and STANDBY windows to indicate that the transceiver is in the transmit mode of operation.

3.1.3 MODES OF OPERATION

A. Frequency Mode

In the Frequency Mode of operation frequencies are entered into the STANDBY window of the display and can then be transferred into the USE window by pressing the transfer button. The Frequency Mode may be entered either by entering the Program Mode and entering dashes (---) into Channel 0 or alternately may be entered from the Direct Tune Mode.

To select frequencies in this mode, the MHz portion of the frequency displayed in the STANDBY window may be incremented or decremented in 1 MHz steps by rotating the MHz knob either clockwise or counterclockwise. MHz frequencies will roll over or roll under at each band edge (118 or 135 MHz). The KHz portion of the frequency displayed in the STANDBY window may be incremented or decremented by rotating the 25K/MEM knob either clockwise or counterclockwise. Frequency selection is in 50 KHz steps when the 25K/MEM is pushed in and is in 25 KHz steps when the 25K/MEM is pulled out. KHz frequencies roll over from 95 to 97 to 00 and roll under from 00 to 95 or 97 according to the position of the 25K/MEM knob. Frequencies are transferred from the STANDBY to the USE window and vice versa by depressing the transfer button.

B. Program Mode

The Program Mode is used to program frequencies into memory for later recall and to select either the Frequency Mode or the Channel Mode of operation.

To enter the Program Mode:

1. Depress and hold the transfer button until a flashing Channel number appears in the USE window of the display (approximately three (3) seconds).

2. Pull the 25K/MEM knob out and rotate it until a "0" appears in the USE window.

3. Push the 25K/MEM knob in and rotate it until "uuu" is displayed in the STANDBY window of the display.

To program frequencies into memory:

1. Pull the 25K/MEM knob out and rotate it to select a Channel number (1-9).

2. To enter the frequency, push the 25K/MEM knob back in. The MHz portion of the frequency may be incremented or decremented in 1 MHz steps with the MHz knob. As each band edge (118 or 135 MHz) is reached, the next transition of the MHz knob will cause dashes (---) to be displayed. Rollover to the opposite band edge will occur at the next switch transition. The KHz portion of the frequency may be incremented or decremented in 25 KHz steps with the 25K/MEM knob.

3. If it is desired to program less than nine (9) channels, store dashes (---) in the unwanted channels. In the Channel Mode, channels programmed with dashes will be skipped.

4. When all channels have been programmed, press the transfer button to exit the Program Mode. The radio will now be in the Channel Mode of operation. The radio will automatically exit the Program Mode and enter the Channel Mode if at any time while in the Program Mode a twenty (20) second interval lapses with no switch activity.

While in the Program Mode the radio remains tuned to the frequency displayed in the USE window before this mode was entered.

C. Channel Mode

The Channel Mode is used to recall for use the channel information previously stored in the Program Mode. In order to enter the Channel Mode, the Program Mode must first be entered and "uuu" must be programmed into Channel 0. After these requirements are met, either pressing the transfer button or allowing twenty (20) seconds to elapse without any switch activity will cause the radio to enter the Channel Mode.

To recall channel information, pull the 25K/MEM knob out and rotate it until the desired channel number appears in the USE window. The channel number will be displayed for approximately two (2) seconds after which the USE window will display the active frequency. The frequency programmed into the channel selected will be displayed in the STANDBY window and may be transferred to the USE window by pressing the transfer button. The radio will remain tuned to the last active frequency displayed until the recalled channel information is transferred to the USE window.

When operating in the Channel Mode, frequencies displayed in the STANDBY window may be temporarily altered with the frequency selectors and transferred to the USE window. MHz and KHz frequency selection is the same as in the Program Mode. If the programmed frequency for a particular channel is changed in this manner, the original frequency remains in storage and will be displayed the next time that channel is recalled.

D. Direct Tune Mode

The Direct Tune Mode allows direct selection of frequencies displayed in the USE window.

To enter the Direct Tune Mode, the radio must first be turned off. Hold the transfer button depressed while simultaneously turning the radio on, then release the transfer button. Both windows will display 120.00 and the frequency selectors may be used to enter frequencies directly into the USE window. MHz and KHz frequency selection is the same as in the Frequency Mode.

Entering the Direct Tune Mode automatically programs dashes (---) into Channel 0. Therefore, if the transfer button is depressed after entering this mode, the radio will enter the Frequency Mode of operation.

To return to the Channel Mode after operating in the Direct Tune Mode, it is necessary to first enter the Program Mode and program "uuu" into Channel 0. Channel information previously programmed remains stored in memory so it is not necessary to re-enter this information. The Channel Mode may then be entered by depressing the transfer button.

3.1.4 REMOTE FREQEUNCY TRANSFER

This feature requires the installation of a remote mounted momentary contact switch. Depressing the remote transfer button will transfer frequencies from the STANDBY window to the USE window and vice-versa.

3.1.5 REMOTE CHANNEL INCREMENT

This feature requires the installation of a remote mounted momentary contact switch. To use this feature the radio must first be in the Channel Mode of operation. Depressing the remote channel increment button will then cause the radio to increment through the memory channels. Channels will roll over from 9 to 0. Any channel previously programmed with dashes (---) will be skipped and will not be displayed.

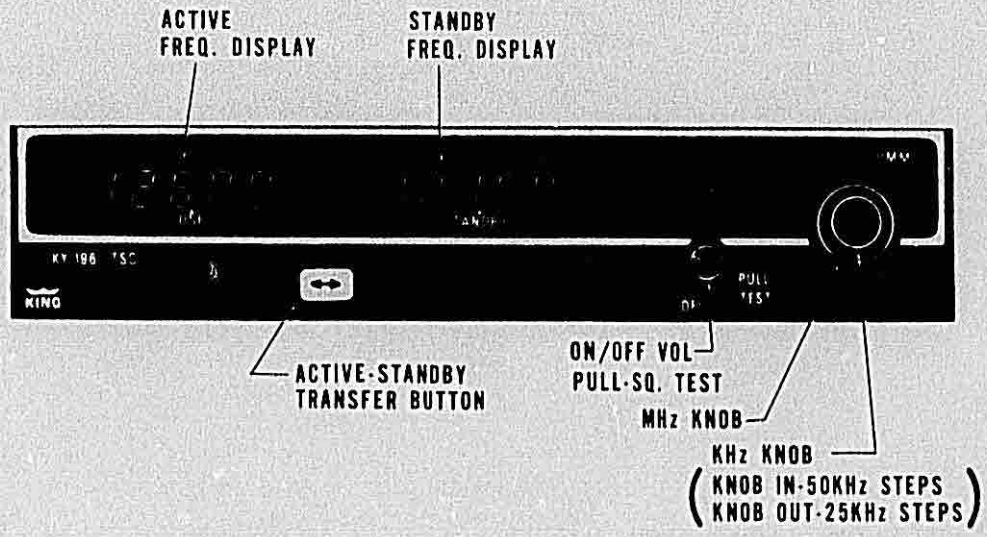


FIGURE 3-1 FREQUENCY MODE
(MEMORY "0" PROGRAMMED TO ---)

FIGURE 3-2
PROGRAM MODE/MEMORY MODE
(MEMORY "0" PROGRAMMED TO UUU)

MFG.

INTRO

MAINTENANCE/OVERHAUL MANUAL

KY 196/196E/KY 197/197E

VHF COMM TRANSCEIVER

MANUAL NUMBER	006-5169-04
REVISION NUMBER	4
1st PRINTING	AUGUST, 1979

KING RADIO CORPORATION®

400 NORTH ROGERS ROAD OLATHE, KANSAS, U.S.A.

RECORD OF REVISIONS

MFG REV NO	DESCRIPTION	ISSUE DATE	ATP REV DATE	INSERTED BY
1	MAINTENANCE MANUAL	AUG 1979	1-25-80	ATP/SP
2		JUNE 1982	8-1-83	"
4		FEB 1984	6-6-84	ATP/JW

RECORD OF TEMPORARY REVISIONS

TEMP REV NO	DESCRIPTION	ISSUE DATE	ATP REV DATE	INSERT BY	DATE REMOVED	REV INCOR	REMOVE BY
KY 196/E	PG 6-55	1-25-80		ATP			
KY 197/e	PG 6-55	"		"			
KY 196/e	PG 6-67	2-18-81		"			

KING RADIO MAINTENANCE MANUAL HISTORY AND REVISION INSTRUCTIONS

MANUAL KY 196/196E KY 197/197E
REVISION 4, February, 1984
KING PART NUMBER 006-5169-04

Where R&R appears in the action column, remove the page now in the maintenance manual and replace it with the enclosed page; otherwise, ADD or DESTROY pages as listed. Retain these instructions in the front of the maintenance manual as a Record of Revisions.

PAGE	ACTION	REASON FOR CHANGE
COVER	R & R	UPDATED
HISTORY REVISION	ADD	UPDATED
i/ii	R & R	UPDATED
iii	R & R	UPDATED
Section IV	Retain tab but replace entire Section IV in its entirety	UPDATED
Section V	Retain tab but replace entire Section V in its entirety	UPDATED
6-i	R & R	UPDATED
6-A//6-B	R & R	UPDATED
6-C/6-D	R & R	UPDATED
6-E	R & R	UPDATED
6-1	R & R	UPDATED
6-3	R & R	UPDATED
6-5	ADD	UPDATED
6-7	ADD	UPDATED
6-9	R & R	UPDATED
6-11	R & R	UPDATED
6-13	ADD	UPDATED
6-15	ADD	UPDATED
6-23/6-24	R & R	UPDATED
6-25/6-26	R & R	UPDATED
6-27/6-28	R & R	UPDATED
6-29	R & R	UPDATED
6-31 thru 6-35	R & R	UPDATED
6-37	ADD	UPDATED
6-39	ADD	UPDATED
6-41	ADD	UPDATED
6-43	ADD	UPDATED
6-45/6-46	R & R	UPDATED
6-47/6-48	R & R	UPDATED
6-49	R & R	UPDATED
6-53	ADD	UPDATED
6-55	ADD	UPDATED
6-57/6-58	R & R	UPDATED
6-61	ADD	UPDATED
6-61.1	ADD	UPDATED
6-63/6-64	R & R	UPDATED
6-67	ADD	UPDATED
6-69/6-70	R & R	UPDATED
6-71	R & R	UPDATED
6-73	ADD	UPDATED
6-75	ADD	UPDATED
6-77	ADD	UPDATED

KING RADIO MAINTENANCE MANUAL HISTORY AND REVISION INSTRUCTIONS

MANUAL	KY 196/196E/KY 197/197E
REVISION	3, December, 1982
KING PART NUMBER	006-5169-03

Where R&R appears in the action column, remove the page now in the maintenance manual and replace it with the enclosed page; otherwise, ADD or DESTROY pages as listed. Retain these instructions in the front of the maintenance manual as a Record of Revisions.

PAGE	ACTION	REASON FOR CHANGE
COVER	R & R	UPDATED
HISTORY REVISION	ADD	UPDATED
6-E	R & R	UPDATED
6-1	R & R	UPDATED
6-3	R & R	UPDATED
6-9	R & R	UPDATED
6-11	R & R	UPDATED
6-17	R & R	UPDATED
6-23/6-24	R & R	UPDATED
6-25/6-26	R & R	UPDATED
6-27/6-28	R & R	UPDATED
6-45/6-46	R & R	UPDATED
6-47/6-48	R & R	UPDATED
6-49	R & R	UPDATED
6-57	R & R	UPDATED
6-61	ADD	UPDATED
6-63/6-64	R & R	UPDATED
6-69/6-70	R & R	UPDATED

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SECTION IV
THEORY OF OPERATION

4.1 GENERAL

The KY 196/E, KY 197/E COMM Transceiver is comprised of: (See Figure 4-1)

A. A single conversion VHF receiver utilizing a four pole varactor tuned preselector, field effect transistors for the RF amplifier and mixer, an 8 pole monolithic crystal IF filter and integrated circuit IF amplifier.

B. A broadband transmitter with flange mounted power transistors on a die-cast aluminum heat sink followed by a three section elliptic function low pass filter.

C. A control section utilizing a microprocessor to increment or decrement the selected frequency, store the use and standby frequencies in non-volatile memory, multiplex the display and generate frequency code, a digital readout for the active and standby frequencies with gas discharge display and automatic intensity dimming and a frequency synthesizer using lower power logic.

The KY 196/E and KY 197/E (-05 and above) have the additional capability of storing up to nine user programmable channels (frequencies) in memory. These versions also have a direct tune feature that allows the user to change the active (USE) frequency directly.

The KY 196/E and KY 197/E (-10 and above) have the program and direct tune features as described above plus the capability of remote transfer of the USE and STANDBY frequencies and remote increment of the stored channels. Refer to Section III of the KY 196/E, KY 197/E Installation Manual for more detailed information concerning operation of these features.

D. A power supply made up of a high efficiency switching regulator which provides over voltage protection on the 5 volt line and current limiting.

4.2 GENERAL CIRCUIT THEORY

4.2.1 RECEIVER

A receiver block diagram is shown in Figure 4-2. The received signal passes through the low pass filter on the transmitter PC board and the T/R diode to the dual gate field effect transistor RF amplifier. The desired signal then proceeds to the dual gate FET mixer where it is converted to 11.4MHz, and fed through the monolithic crystal filter to the integrated circuit IF amplifier followed by a bipolar transistor amplifier before being detected. Automatic gain control voltage is fed back to the first and second IF amplifiers and the RF amplifier to achieve more than 120dB of dynamic range. The detected signal is not allowed to pass through the squelch gate until the input signal has:

A. Exceeded the noise squelch setting or
B. Exceeded the carrier level setting.

It then proceeds through the low pass filter which attenuates all audio frequencies above 2.5KHz. The audio signal is then fed through the volume control to the integrated circuit audio pre-amplifier. Its output will provide more than 100 milliwatts to a headphone, or to an external audio mixer/amplifier such as the King KMA 24.

4.2.2 TRANSMITTER/MODULATOR

The transmitter block diagram is shown in Figure 4-3. In the transmit mode, the SMO feeds a signal to the transmitter of the frequency selected in the "USE" display window on the front panel. The signal is amplified by the broadband transmitter to the 16 watts level (7W KY 197/E) and fed through the elliptic function 3 section low pass filter to the antenna.

Modulation is applied to the power amplifier by series modulating the 27.5 volt line (13.75 for KY 197/E) with mic audio. A small amount of mic audio is also fed to the receiver's audio amp for sidetone.

4.2.3 STABILIZED MASTER OSCILLATOR

The stabilized master oscillator (SMO) (Figure 4-4) generates the RF drive for the transmitter as well as the local oscillator for the receiver. The SMO synthesizes frequencies that are referenced to a 25KHz signal derived from a 3.2MHz crystal oscillator. Receive and transmit codes are fed to the programmable counters from the microprocessor (uP) and represent the frequency indicated in the "USE" window on the front panel.

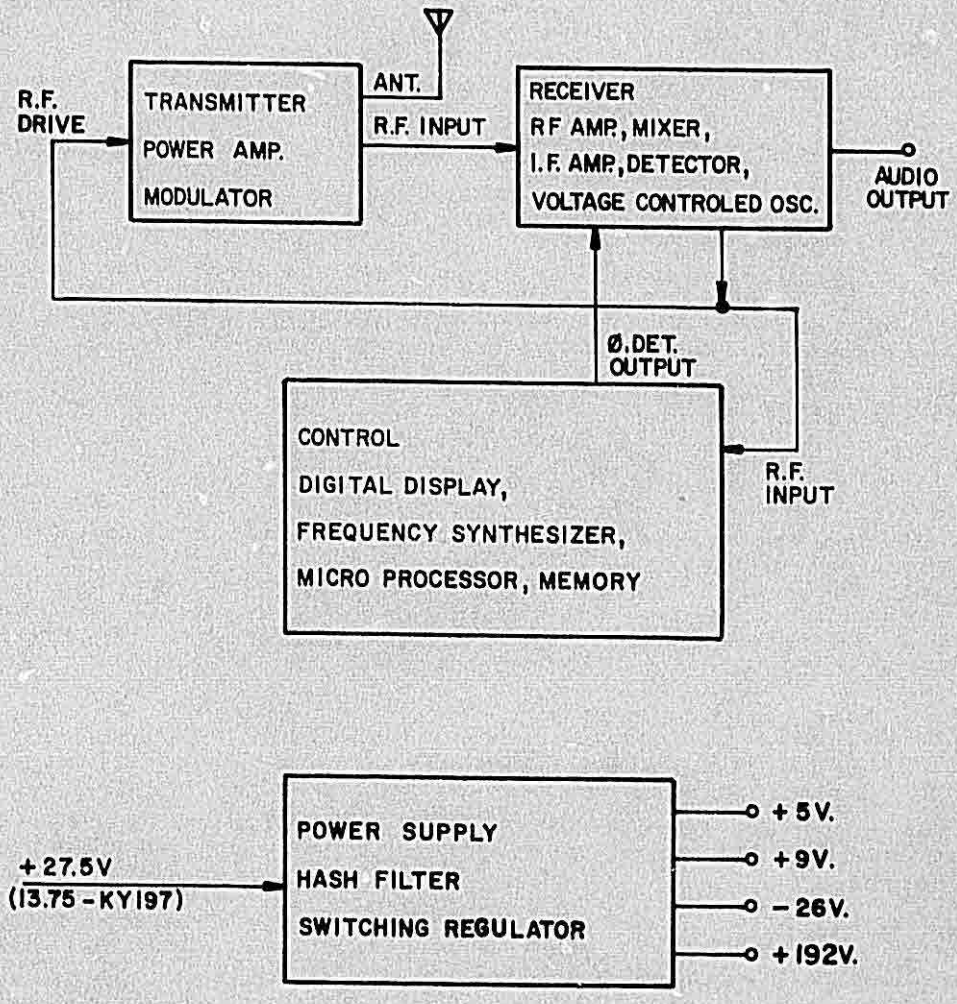


FIGURE 4-1 KY 196/E, KY 197/E COMM TRANSCEIVER

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER

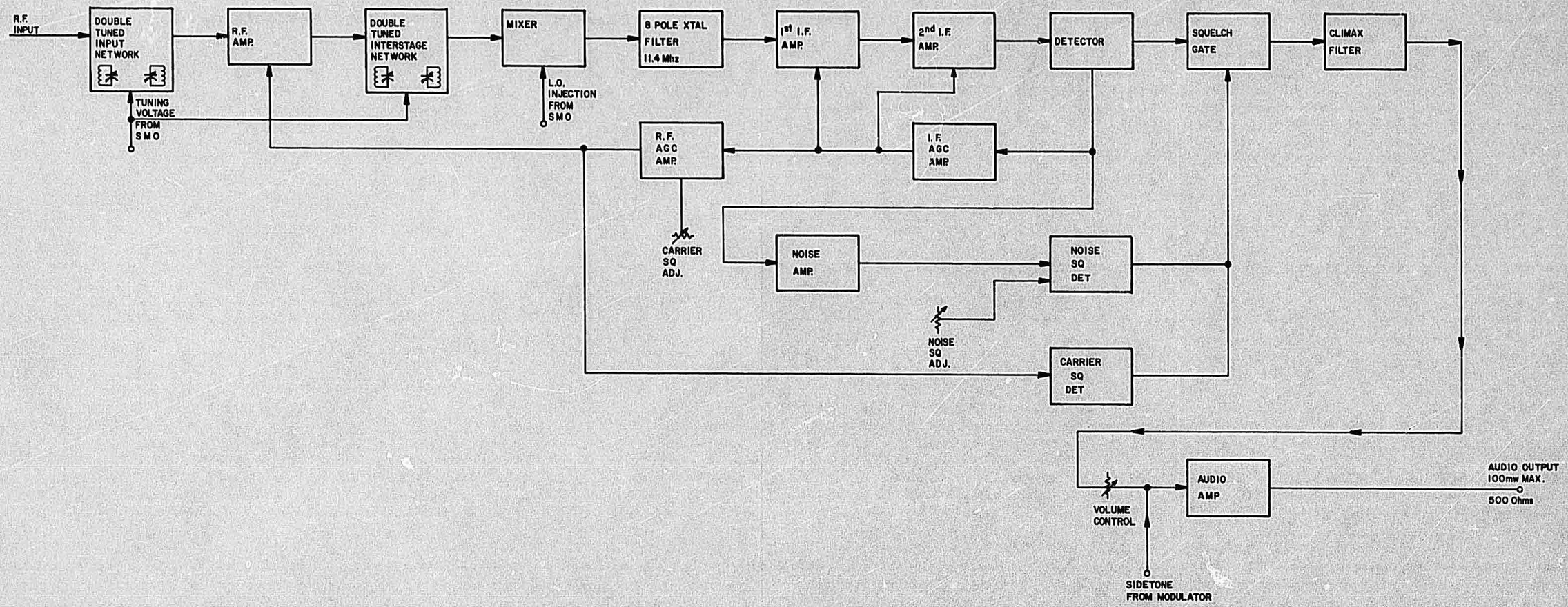
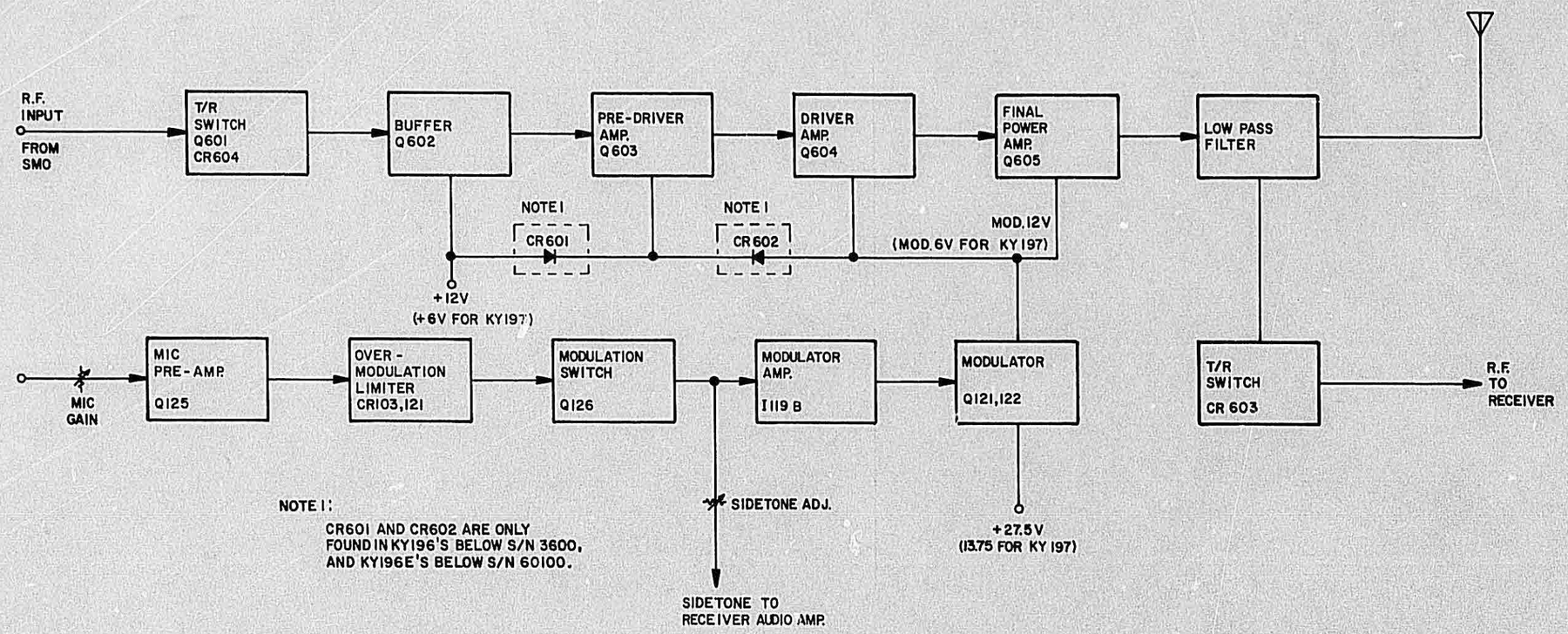


FIGURE 4-2 RECEIVER BLOCK DIAGRAM
(Dwg. No. 696-5900-00, R-0)



NOTE 1:

CR601 AND CR602 ARE ONLY FOUND IN KY196'S BELOW S/N 3600, AND KY196E'S BELOW S/N 60100.

FIGURE 4-3 TRANSMITTER/MODULATOR BLOCK DIAGRAM
(Dwg. No. 696-5901-00, R-1)

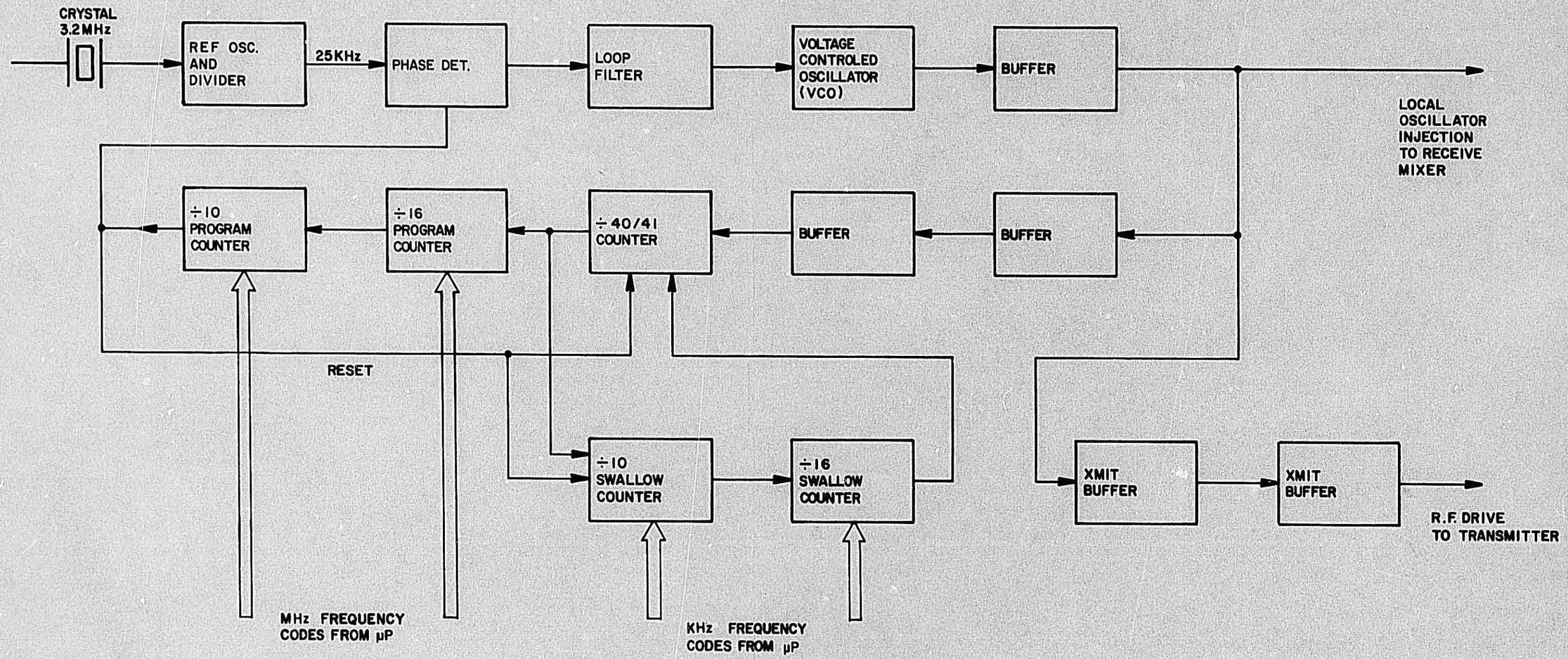


FIGURE 4-4 STABILIZED MASTER OSCILLATOR
(Dwg. No. 696-5902-00, R-0)

4.2.4 MICROPROCESSOR (uP) CONTROLLER AND DISPLAY

The microprocessor controls the frequency of the transmitter and receiver (Figure 4-5). The "USE" and "STANDBY" frequencies are stored in the microprocessor's memory and are decoded to provide the segment and digit information required to drive the display. The "USE" frequency information is also used to generate the codes required by the program and swallow counters to synthesizer the frequency generated by the voltage controlled oscillator (VCO). The "USE" and "STANDBY" frequencies are also stored in non-volatile memory which remembers the frequencies while the transceiver is turned off. The microprocessor also receives the information from the increment/decrement switch which is used to either increase or decrease the "STANDBY" frequency. The "STANDBY" frequency can then be used to control the operating frequency of the transceiver only after being interchanged with the "USE" frequency. During the receive mode of operation, the PTT voltage causes the microprocessor to change the code going to the synthesizer to offset the VCO frequency by 11.4MHz. During the transmit mode a "T" is visible in the display window. During operation in low light levels (night operation), a photocell is used to decrease the intensity of the display automatically. A display dimmer adjustment is provided for setting the brightness to the most pleasing level during night operation.

In addition to the above functions, in radios of flavors -05 and above, the microprocessor also stores the frequencies associated with up to nine memory channels. Also stored is the mode of operation of the radio, ether frequency mode or channel mode. The Frequency/Channel information and the mode information can be programmed by following the operating procedure in the installation manual. This information is also stored in non-volatile memory for recall after a power off condition.

4.2.5 REMOTE TRANSFER/REMOTE INCREMENT (See Figure 6-14)

Applies only to KY 196/E, KY 197/E flavors -10 and above. In a static condition the voltage at I701 pin 13 is +9 ± .5VDC and the potential at I701 pin 5 is ground. This causes the circuit from I701 pin 3 to I701 pin $\overline{4}$ to be open. When a ground is applied at E165 (KY 196/E pin 6 or KY 197/E pin 7) from a remote mounted switch, the charging of C701 causes a negative transition at $\overline{I701}$ pin 13. This in turn causes I701 pin 5 to rise to +9 ± .5VDC which causes the circuit from I701 pin 3 to I701 pin 4 to be low impedance thereby shunting the transfer switch, SW101, on the radio. This has the same effect as pushing the transfer button on the front panel of the radio. All front panel transfer functions are duplicated with the exception of placing the radio in the program mode. Because of capacitor C701, it is not possible to duplicate the two (2) second depression of the front panel button necessary to enter program mode.

The remote memory increment circuit operates in a similar manner. A ground applied at E164 (KY 196/E, KY 197/E pin E) from a remote mounted switch, causes Q701 to turn on and charge capacitor C703. The initial charge of C703 generates a negative going pulse at I701 pin 6 which in turn causes I701C to turn off and allow I701 pin 12 to go positive. This causes a low impedance from I701 pin 10 to I701 pin 11 which supplies a ground pulse at E163. This ground pulse is connected to the microprocessor, I111 pin 22, as a memory increment pulse.

4.2.6 POWER SUPPLY

The 27.5VDC (13.75 for KY 197/E) from the aircraft bus is fed to the transceiver through a switch on the volume control shaft, a fuse and a hash filter (Figure 4-6). A power transistor is used to provide regulated 12 volts (unregulated 12V for KY 197/E) for the modulator, transmitter and audio power amplifier. A switching regulator is used to provide power for the remaining sections of the transceiver. The toroid transformer has windings which supply 192 volts for the gas discharge display, 9 volts for receiver, modulator pre-amp, microphone bias, VCO buffers and PTT switching, 5 volts for the logic circuits and -26 volts for the non-volatile memory.

4.3 DETAILED CIRCUIT THEORY

4.3.1 RECEIVER (See Figure 6-10)

4.3.1.1 Antenna Input Circuit

In the receive mode, one side of R301 is switched low by $\overline{RC}$ thus causing Q301 to conduct through the T/R diodes, CR603 and CR605 or CR603 and CR604 for the KY 197/E, which is located on the transmitter PC board. The desired signal passes through the low pass filter, then through the T/R diodes to the receiver PC board where C301 steps up the impedance to match the first pole of the preselector. Varactor diodes CR301 (CR301A) and CR302 (CR301B) tune the double tuned circuit to the desired frequency. The desired signal is coupled to gate one of the RF amplifier through C308.

4.3.1.2 RF Amplifier

Q302 is a dual gate, enchancement mode, N-channel field-effect transistor with internal diodes to protect the gates against damage due to transients during handling. It provides the necessary high gain, low noise figure, good cross modulation immunity and wide AGC range required in this amplifier. Gate #1 has a positive bias with respect to the source so that the quiescent operating point provides maximum gain when gate #2 is near the supply voltage. Reverse AGC is required to decrease the RF gain. As the gate #2 voltage is decreased to near 0 volts, the FET has approximately 40dB of attenuation, thus providing more than 50dB of AGC range. C311 couples the signal into the double tuned interstage bandpass filter. Varactor diode CR305 (CR301C) tunes the circuit. Inductor L307 provides the coupling between the two poles and improves the image rejection in the front end.

4.3.1.3 Mixer

The mixer input circuit is tuned by varactor CR304 (CR301D). Capacitor C318 couples the desired signal to gate #1 of the mixer. The mixer is also a dual gate FET as is the RF amplifier. Both gate #1 and gate #2 are biased positive with respect to the source by the same amount. The local oscillator signal is fed into gate #2 at approximately 2 volts peak to peak. The FET provides more than 20dB of isolation between G_1 and G_2. The drain is tuned to 11.4MHz by T301 which also matches the FET into the 4100 ohm crystal filter. The desired signal is now at 11.4MHz due to the L.O. being 11.4MHz above the incoming signal.

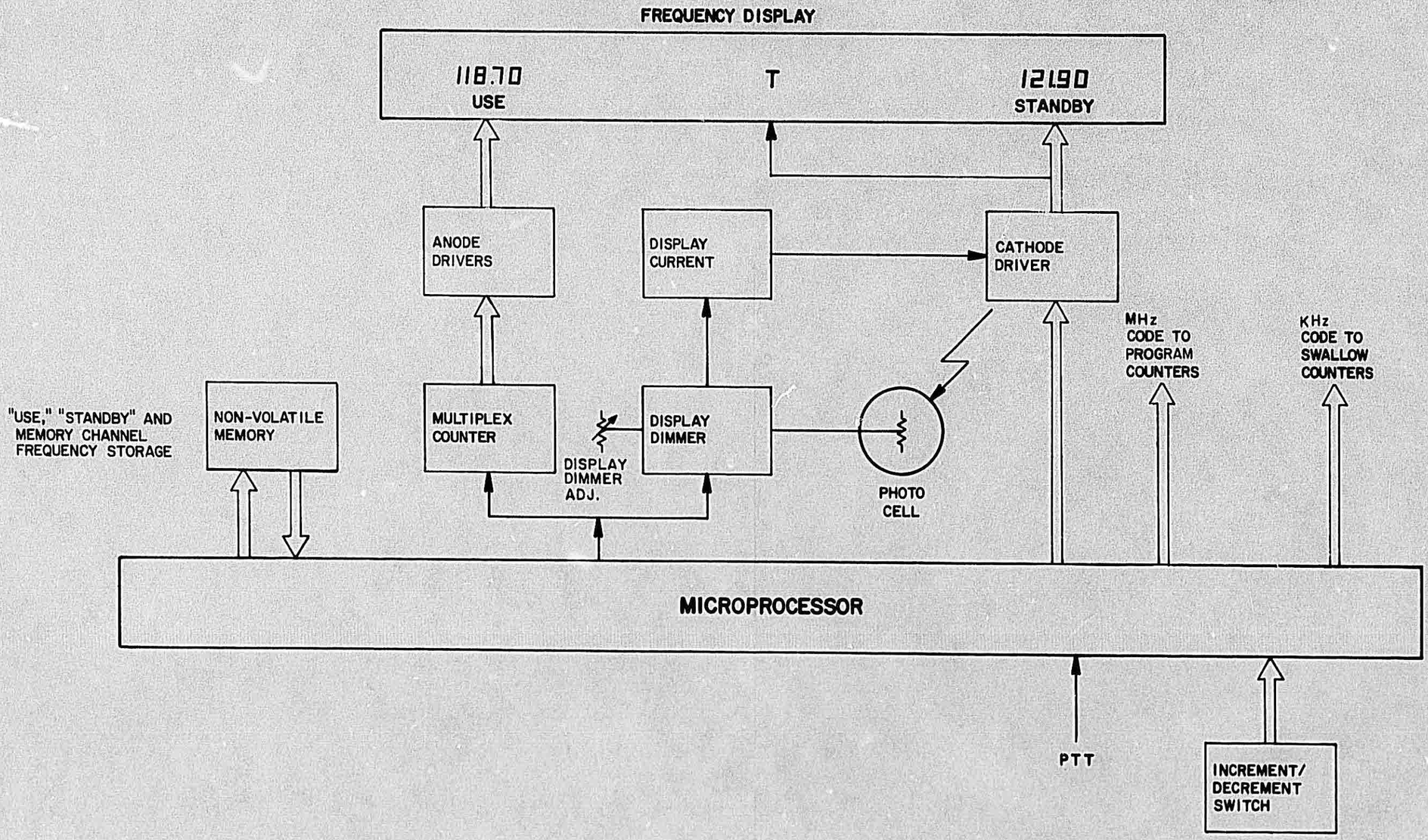


FIGURE 4-5 MICROPROCESSOR CONTROLLER AND DISPLAY
(Dwg. No. 696-5903-00, R-1)

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER

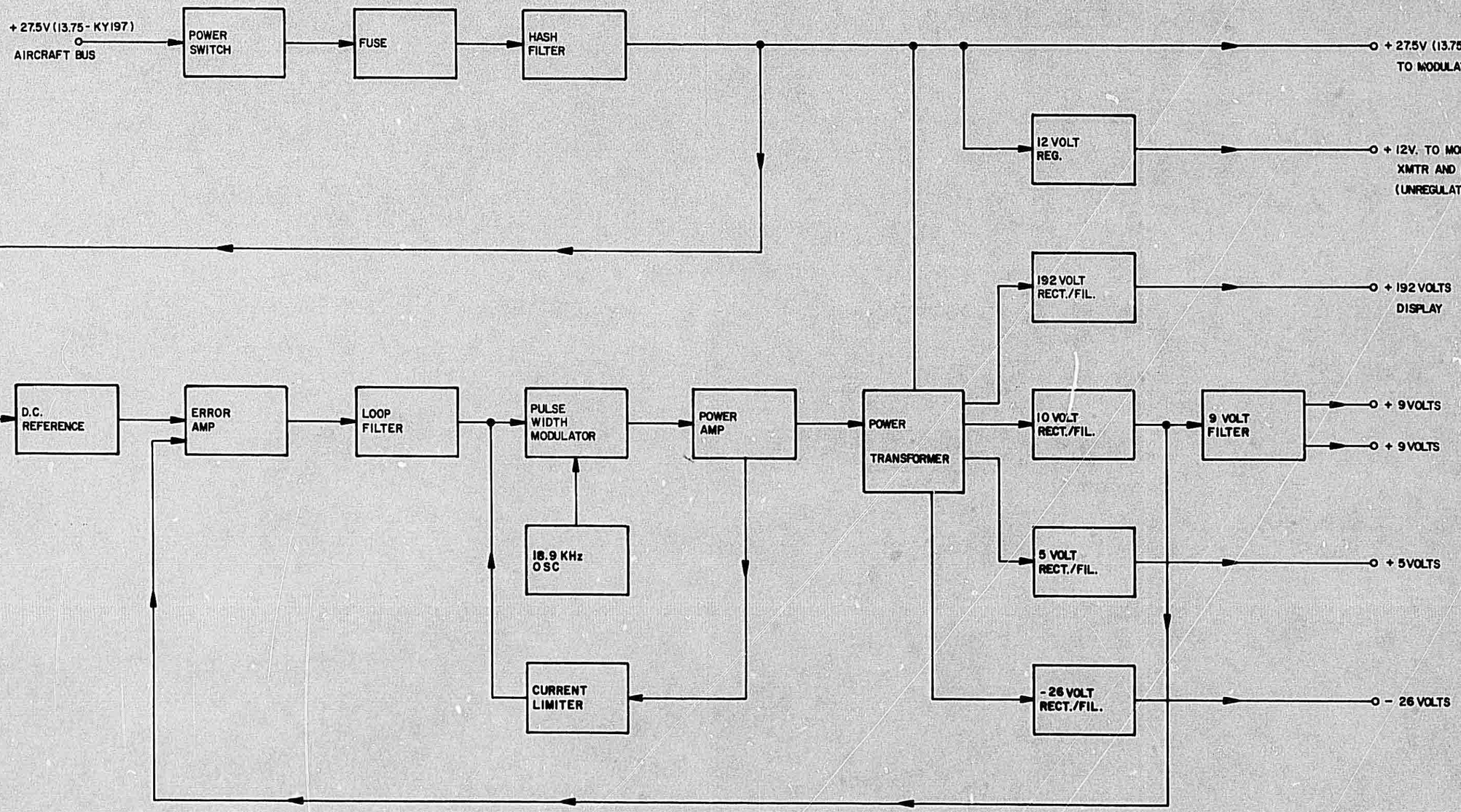


FIGURE 4-6 POWER SUPPLY BLOCK DIAGRAM
(Dwg, No. 696-5904-00, R-0)

4.3.1.4 First IF Amplifier

The crystal filter provides the desired narrow bandpass for the receiver. The signal passes through the crystal filter and is coupled through T302 to the input of I303, the IF amplifier. AGC current is applied to pin 5 and provides approximately 70dB of AGC range. Transformer T304 tunes the collector circuit to 11.4MHz and provides the impedance stepdown required to match into the second IF amplifier.

4.3.1.5 Second IF Amplifier

Q304 is the second IF amplifier. It provides the necessary gain, AGC and output capability required to drive the detector. Forward AGC is applied to the base through R326 and provides up to 50dB of range. Transformer T303 tunes the collector to 11.4MHz and matches to the detector.

4.3.1.6 Detector

NOTE

COMPONENT DESIGNATIONS IN PARENTHESES RELATE TO KY 196/KY 196E'S HAVING MOD 13 AND KY 197/197E'S HAVING MOD 14.

Transistor I301D (Q311) is the amplitude modulated detector. It is biased near collector cut-off by transistor I301E (Q312), which is diode connected to provide stable bias and temperature compensation.

4.3.1.7 IF AGC Circuit

AGC voltage is derived from the average value of the detector collector voltage. Operational amplifier I304B compares this voltage with the DC reference from R333 and R334, amplifies it, filters out the audio variations, inverts it and feeds it back to the 1st and 2nd IF amplifiers. Thus, as the detector collector voltage decreases (with an increase in signal level) the AGC voltage increases which decreases the gain in the 2nd IF amplifier. Test point TP102, is provided for easy access to this voltage. Delayed AGC is applied to the first IF amplifier through R328.

4.3.1.8 RF AGC Circuit

Delayed AGC is provided for the RF amplifier by I304A. The RF input level at which the RF AGC begins to take effect is set by resistor R338. The RF AGC voltage can be measured on TP304. As the IF AGC voltage exceeds the set reference, the RF AGC voltage decreases, thus decreasing the gain in the RF amplifier.

4.3.1.9 Noise and Carrier Squelch Circuit

NOTE

COMPONENT DESIGNATIONS IN PARENTHESES RELATE TO KY 196/KY 196E'S HAVING MOD 13 AND KY 197/197E'S HAVING MOD 14.

Transistor I302D (Q316) amplifies the noise from the collector of the detector and limits its amplitude so that impulse spikes (such as ignition noise) will not be higher amplitude than other noise. The output is lightly coupled to the tuned circuit L309 and C369 which is tuned to approximately 8KHz. Transistor I302C (Q315) detects the noise at 8KHz, that is passed by the filter, amplifies it and feeds it to the base of transistor I302B (Q314). Resistor R344 is set so that the detected noise causes the base voltage of I302B (Q314) to be low and its collector voltage to be high. Therefore, I301B (Q310) is "ON" and no emitter current is supplied to the squelch gate I301A (Q309) and no audio signal is allowed to pass.

When a signal is received, the noise output from the detector decreases; thus, less noise is being fed to the noise detector I302C (Q315). Its collector is allowed to rise until transistor I302B (Q314) conducts, decreasing the base voltage I301B (Q310) base, thus supplying emitter current for the squelch gate I301A (Q309) and allowing the received audio to pass.

Switch S102 is coupled to the volume control shaft to allow the operator to open the squelch gate manually. When the shaft is pulled out, switch S102 closes, shorting the base of the noise detector I302C (Q315) to ground, causing the collector to rise toward the 9 volt supply, which turns on I302B (Q314), as above, which opens the squelch gate to allow the audio signal to pass.

Carrier operated or backup squelch operation is available when the received signal has a great deal of noise on the carrier; thus the noise detector keeps the squelch gate closed. As the carrier level increases to exceed the reference set by R338 "CARR SQ ADJ" and the RF AGC voltage decreases, transistor I302A (Q313) turns "OFF" causing I302B (Q314) to turn "ON". Again, as the collector of I302B (Q314) decreases, I301B (Q310) is turned "OFF", and squelch gate I301A (Q309) allows the received audio to pass.

4.3.1.10 Audio Low Pass Filter

Inductor L310 and its associated capacitors form a low pass, elliptical filter. The design is such that a half power point occurs at 2.5KHz and a null occurs at 5KHz. The null, which is better than 25dB down, provides attenuation of audio hetrodynes which may occur in "climax network" environments.

4.3.1.11 Audio Amp

The audio signal is fed from the wiper of the volume control to pin 8 of I119B. The signal is amplified approximately 63dB and capacitively coupled through C147 to auto-transformer T103. The voltage and impedance are stepped up to provide a minimum of 100mW of audio power into a 500 ohm load such as headphones or an audio mixer. The output is fed through R220 to pin B on the rear panel connector.

4.3.2 TRANSMITTER

NOTE

COMPONENT DESIGNATIONS IN PARENTHESIS RELATE TO THE KY 197/E.

4.3.2.1 RF Amplifier

RF is fed from the transmit buffer to the RF amp, on the transmitter printed circuit board, through a short length of miniature 50 ohm coaxial cable. The drive level is approximately 60mW. During receive mode, this drive is attenuated as RF goes high, turning "ON" Q601, shorting the drive to ground and reverse biasing pin diode CR604 (CR601) to "OPEN" the input to Q602. During transmit mode, base current is supplied through R602 and CR604 (CR601) to operate Q602 class A. Transformer T601 is broadband tuned and steps the collector impedance down to the input impedance of the pre-driver.

4.3.2.2 Pre-Driver

RF drive is fed to pre-driver, Q603 through C633 (C605) and C606. The pre-driver is operated class C and receives "UP" modulation of its collector supply voltage through R606. The collector is broadband tuned and is coupled to the driver by T602.

4.3.2.3 Driver (Omitted in KY 197/E)

RF drive is supplied to the base through capacitive network C610, C611 and C612. Q604 is operated class C and the collector supply voltage is fully modulated. The collector is broadband tuned by T603 which also matches the collector to the input of the final.

4.3.2.4 Final

Capacitors C618 (C609), C619 (C610) and C620 (C608), form the input matching network for the final power amplifier, Q605 (Q604). The final is operated class C and its collector is fully modulated. The low collector output impedance is stepped up to 50 ohms by transformer T604.

4.3.2.5 Low Pass Filter

A three section elliptic function low pass filter is placed between the final and the antenna to attenuate all harmonic which may be generated in the transmitter. During the receive mode T/R diode CR603 and CR605 (CR604) is forward biased to feed the desired signal from the antenna through the low pass filter to the receive RF amplifier.

4.3.3 MODULATOR

4.3.3.1 Microphone Input Circuit

The microphone is connected to pin C on the rear panel connector. Mic bias is supplied by R161. The audio signal passes through C137 to "Mic Gain" control, R159.

4.3.3.2 Mic Pre-Amp

The audio from R159 is fed through C171 and R157 to the base of the mic pre-amp, Q125.

4.3.3.3 Modulation Limiter

The output of the pre-amp is fed to the modulation limiter CR103 and CR121. The level from the clipper is sufficient to insure 85% modulation without exceeding 100%. Field effect transistor Q126 is used as a switch to open the mic audio during the receive mode.

4.3.3.4 Modulation Driver

During transmit, R167 is used to sample a small amount of mix audio and feed it to the receiver's audio amplifier for sidetone. The mic audio is fed through R215 and C150 to I119A. The output is capacitively coupled to transformer T104.

4.3.3.5 Modulator

Transformer T104 supplies the audio drive necessary to cause the emitters of the modulator transistors Q121 and Q122 to swing from 1 to 24 volts (0 to 12 for KY 197/E). The transistors are Darlington compound connected. Resistors R185 and R186 are in the emitters to equalize currents. The collectors are connected to the 27.5 volt (13.75 for KY 197/E) supply.

4.3.4 STABILIZED MASTER OSCILLATOR

4.3.4.1 Reference Oscillator

Integrated circuit I110 is used as the oscillator divider to provide the 25KHz reference. A 3.2MHz crystal Y101 is connected to the input buffer in a modified Colpitts oscillator circuit. Capacitors C110 and C108 provide the impedance matching the feedback ratio while C109 is used to vary the capacitive load across the crystal to adjust the frequency. The output of the oscillator is fed through internal buffers to the dividers. The output of the seventh flip-flop provides the desired ÷2 or ÷128 to provide 25KHz for the phase detector.

4.3.4.2 Phase Detector

A portion of integrated circuit I108 is used as the phase detector. The reference signal is fed to one input (pin 3) and output of the programmable divider is fed into the second input (pin 14).

4.3.4.3 Loop Filter

The output of the phase detector is fed to the loop filter comprised of R384, C349, L311, C350, C352, R168, R388 and C351. The pulsating DC on the output of the phase detector has a DC component that is proportional to the oscillator frequency. The elliptic low-pass filter attenuates components at the reference frequency (25KHz) that are present in the phase-detector output.

4.3.4.4 Voltage Controlled Oscillator

NOTE

COMPONENT DESIGNATIONS IN PARENTHESES RELATE TO KY 196/KY 196E'S HAVING MOD 13 AND KY 197/197E'S HAVING MOD 14.

The voltage controlled oscillator is a modified Hartley type oscillator operating on the transmit frequency in the transmit mode and 11.4MHz above the desired receive frequency when providing the LO signal in the receive mode. An error voltage from the phase detector is applied to the varactor CR312 (CR301E) for phase 1 frequency correction. Buffer stage Q307 isolates the VCO and provides LO injection to the mixer through a stripline conductor. Digital buffers, Q105 and Q104, supply drive back to the digital dividers. Q106 and Q107 isolate the transmitter from the VCO and amplify the signal to approximately 60mW to drive the transmitter. If the synthesizer should malfunction, an out of lock signal will turn Q108 off and Q109 on. This removes base bias from the transmit buffer thus turning the transmitter off. Also, during the receive mode, Q109 is biased on by RC and limiting the radiation of the LO signal.

4.3.4.5 Programmable Divider

The signal from the digital buffers Q104 and Q105 is fed to the high speed divider I101.

This divider which can divide by 10 or 11 is used to drive a divide-by-four circuit (I102). At all discrete megacycle channels the prescaler is programmed to divide by 10, and consequently a total divide of 40 occurs before the signal reaches the program counter (I106, I107). The program counter can be programmed by the microprocessor to divide by an integer from 118 through 145. The result is a total division of 4720 (40 x 118) to 5800 (40 x 145) in steps of 40. The output from the program counter is fed to pin 3 of the phase detector I108.

Another counter, termed the "swallow" counter, is used to program the "fraction-of-megacycle" frequencies. The "swallow" counter (I104, I105) controls the prescaler (I101) division. It is programmed by the microprocessor to cause the prescaler to divide by 11 (instead of 10) anywhere from 0 to 39 times during the program count sequence. Each time the prescaler divides by 11, one pulse (cycle) of the VCO frequency is effectively ignored or "swallowed". This action is equivalent to increasing the total count in the dividers by one and consequently increasing the channel frequency by 25KHz for each divide by 11. Therefore, each whole megacycle can have N x 25KHz added where N ranges from 0 to 39. This produces the 25KHz steps from 0KHz to 975KHz.

4.3.5 MICROPROCESSOR CONTROLLER AND DISPLAY

4.3.5.1 Frequency Code

The microprocessor (uP), I111, has been programmed to generate a binary code for two frequencies, the "USE" and the "STANDBY". The MHz portion of the "USE" frequency is fed to the program counters, I106 and I107. The KHz portion is fed to the swallow counters, I104 and I105. The frequency of the VCO is now controlled by the "USE" frequency code. The "USE" code which may be sent from the microprocessor to the programmable dividers is shown in Tables 4-1, 4-2, 4-3, and 4-4.

The code for the "USE" and "STANDBY" frequency is not only stored internally in the microprocessor, but is also stored in an external non-volatile memory, I112. When power is applied to the unit, the microprocessor is programmed to read the last frequencies stored in the non-volatile memory and utilize them as the initial "USE" and "STANDBY" frequencies. Should the non-volatile memory fail, the microprocessor will display 120.00MHz as its initial frequencies. The non-volatile memory will store the codes for the two frequencies for an indefinite period without power applied to the transceiver.

4.3.5.2 Display

The microprocessor feeds the code for the "USE" and "STANDBY" frequencies to the display drivers. A BCd code for each digit is fed to the BCD decoder cathode/driver, I503. A multiplex clock pulse if fed to a 1 of 8 counter, I501, which drives each digit through the anode driver, I502. In this manner, the appropriate segments of each digit are lighted one digit at a time at approximately 110 times per second. A synchronizing pulse is sent to the 1 of 8 counter, I501, every 8 cycles by the microprocessor to maintain synchronization with the display. This display is a gas discharge type with its intensity controlled by a photocell, V501, located in the display window to the left of the "USE" frequency. As the light reaching the photocell decreases, the pulse width produced by I115 and I116A becomes narrower; also, the current being supplied to the cathode driver, I503, by the current source, I116B, is decreased providing a 48:1 ratio of light dimming.

4.3.5.3 Frequency Selection

The microprocessor is programmed to cause the frequency selector switch to increase or decrease the "STANDBY" frequency by 1MHz for clockwise or counterclockwise detent rotation of the larger knob. Incrementing 135MHz will cause the frequency to rollover to 118MHz and, similarly, decrementing 118MHz will rollover to 135MHz.

The smaller knob is used to increase or decrease the "STANDBY" frequency by either 25KHz or 50KHz, depending upon the position of the push-pull switch associated with this knob. If the knob is pushed in the frequency will change to the next higher or lower 50KHz channel. If the switch is pulled out, the frequency will change by 25KHz.

SELECTED FREQUENCY TRANSMIT (MHz)	PROGRAM COUNTER (MHz CODE)					
	I107		I106			
	Pin 4 P5	Pin 3 P4	Pin 6 P3	Pin 5 P2	Pin 4 P1	Pin 3 P0
118	1	0	1	0	1	0
119	1	0	1	0	0	1
120	1	0	1	0	0	0
121	1	0	0	1	1	1
122	1	0	0	1	1	0
123	1	0	0	1	0	1
124	1	0	0	1	0	0
125	1	0	0	0	1	1
126	1	0	0	0	1	0
127	1	0	0	0	0	1
128	1	0	0	0	0	0
129	0	1	1	1	1	1
130	0	1	1	1	1	0
131	0	1	1	1	0	1
132	0	1	1	1	0	0
133	0	1	1	0	1	1
134	0	1	1	0	1	0
135	0	1	1	0	0	1

TABLE 4-1 TRANSMIT MHz CODE

SELECTED FREQUENCY TRANSMIT (KHz)	SWALLOW COUNTER (KHz CODE)					
	I104		I105			
	Pin 4 B5	Pin 3 B4	Pin 6 B3	Pin 5 B2	Pin 4 B1	Pin 3 B0
000	1	1	1	0	0	1
025	1	1	1	0	0	0
050	1	1	0	1	1	1
075	1	1	0	1	1	0
100	1	1	0	1	0	1
125	1	1	0	1	0	0
150	1	1	0	0	1	1
175	1	1	0	0	1	0
200	1	1	0	0	0	1
225	1	1	0	0	0	0
250	1	0	1	0	0	1
275	1	0	1	0	0	0
300	1	0	0	1	1	1
325	1	0	0	1	1	0
350	1	0	0	1	0	1
375	1	0	0	1	0	0
400	1	0	0	0	1	1
425	1	0	0	0	1	0

TABLE 4-2 TRANSMIT KHz CODE
(Sheet 1 of 3)

SELECTED FREQUENCY TRANSMIT (KHz)	SWALLOW COUNTER (KHz CODE)					
	I104		I105			
	Pin 4 B5	Pin 3 B4	Pin 6 B3	Pin 5 B2	Pin 4 B1	Pin 3 B0
450	1	0	0	0	0	1
475	1	0	0	0	0	0
500	0	1	1	0	0	1
525	0	1	1	0	0	0
550	0	1	0	1	1	1
575	0	1	0	1	1	0
600	0	1	0	1	0	1
625	0	1	0	1	0	0
650	0	1	0	0	1	1
675	0	1	0	0	1	0
700	0	1	0	0	0	1
725	0	1	0	0	0	0
750	0	0	1	0	0	1
775	0	0	1	0	0	0
800	0	0	0	1	1	1
825	0	0	0	1	1	0
850	0	0	0	1	0	1
875	0	0	0	1	0	0

TABLE 4-2 TRANSMIT KHz CODE
(Sheet 2 of 3)

SELECTED FREQUENCY TRANSMIT (KHz)	SWALLOW COUNTER (KHz CODE)					
	I104		I105			
	Pin 4 B5	Pin 3 B4	Pin 6 B3	Pin 5 B2	Pin 4 B1	Pin 3 B0
900	0	0	0	0	1	1
925	0	0	0	0	1	0
950	0	0	0	0	0	1
975	0	0	0	0	0	0

TABLE 4-2 TRANSMIT KHz CODE
(Sheet 3 of 3)

SELECTED FREQUENCY RECEIVE (MHz)	PROGRAM COUNTER (MHz CODE)					
	I107		I106			
	Pin 4 P5	Pin 3 P4	Pin 6 P3	Pin 5 P2	Pin 4 P1	Pin 3 P0
118.000 - 118.575	0	1	1	1	1	1
118.600 - 119.575	0	1	1	1	1	0
119.600 - 120.575	0	1	1	1	0	1
120.600 - 121.575	0	1	1	1	0	0
121.600 - 122.575	0	1	1	0	1	1
122.600 - 123.575	0	1	1	0	1	0
123.600 - 124.575	0	1	1	0	0	1
124.600 - 125.575	0	1	1	0	0	0
125.600 - 126.575	0	1	0	1	1	1
126.600 - 127.575	0	1	0	1	1	0
127.600 - 128.575	0	1	0	1	0	1
128.600 - 129.575	0	1	0	1	0	0
129.600 - 130.575	0	1	0	0	1	1
130.600 - 131.575	0	1	0	0	1	0
131.600 - 132.575	0	1	0	0	0	1
132.600 - 133.575	0	1	0	0	0	0
133.600 - 134.575	0	1	1	1	1	1
134.600 - 135.575	0	0	1	1	1	0
135.600 - 135.975	0	0	1	1	0	1

TABLE 4-3 RECEIVE MHz CODE

SELECTED FREQUENCY TRANSMIT (KHz)	SWALLOW COUNTER (KHz CODE)					
	I104		I105			
	Pin 4 B5	Pin 3 B4	Pin 6 B3	Pin 5 B2	Pin 4 B1	Pin 3 B0
000	1	0	0	0	1	1
025	1	0	0	0	1	0
050	1	0	0	0	0	1
075	1	0	0	0	0	0
100	0	1	1	0	0	1
125	0	1	1	0	0	0
150	0	1	0	1	1	1
175	0	1	0	1	1	0
200	0	1	0	1	0	1
225	0	1	0	1	0	0
250	0	1	0	0	1	1
275	0	1	0	0	1	0
300	0	1	0	0	0	1
325	0	1	0	0	0	0
350	0	0	1	0	0	1
375	0	0	1	0	0	0
400	0	0	0	1	1	1
425	0	0	0	1	1	0
450	0	0	0	1	0	1

TABLE 4-4 RECEIVE KHz CODE
(Sheet 1 of 3)

SELECTED FREQUENCY TRANSMIT (KHz)	SWALLOW COUNTER (KHz CODE)					
	I104		I105			
	Pin 4 B5	Pin 3 B4	Pin 6 B3	Pin 5 B2	Pin 4 B1	Pin 3 B0
475	0	0	0	1	0	0
500	0	0	0	0	1	1
525	0	0	0	0	1	0
550	0	0	0	0	0	1
575	0	0	0	0	0	0
600	1	1	1	0	0	1
625	1	1	1	0	0	0
650	1	1	0	1	1	1
675	1	1	0	1	1	0
700	1	1	0	1	0	1
725	1	1	0	1	0	0
750	1	1	0	0	1	1
775	1	1	0	0	1	0
800	1	1	0	0	0	1
825	1	1	0	0	0	0
850	1	0	1	0	0	1
875	1	0	1	0	0	0
900	1	0	0	1	1	1

TABLE 4-4 RECEIVE KHz CODE
(Sheet 2 of 3)

SELECTED FREQUENCY TRANSMIT (KHz)	SWALLOW COUNTER (KHz CODE)					
	I104		I105			
	Pin 4 B5	Pin 3 B4	Pin 6 B3	Pin 5 B2	Pin 4 B1	Pin 3 B0
925	1	0	0	1	1	0
950	1	0	0	1	0	1
975	1	0	0	1	0	0

TABLE 4-4 RECEIVE KHz CODE
(Sheet 3 of 3)

4.3.5.4 Display Transfer

The transfer switch is a momentary switch which causes the "USE" and "STANDBY" frequencies to exchange positions. This action can be thought of as an "ACTIVATE" for the standby frequency or a "STORE" for the use frequency.

4.3.5.5 Receive/Transmit

When the transceiver is in the receive mode, the microprocessor adds 11.4MHz to the synthesizer preset codes being fed to the programmable dividers. Thus, the VCO shifts 11.4MHz higher than the desired signal. A logic "0" on pin 6 of the microprocessor, I111, causes this change.

When in the transmit mode, a logic "1" is fed to pin 6 of I111 and a "T" is illuminated between the "USE" and "STANDBY" frequencies in the display window.

4.3.6 POWER SUPPLY

4.3.6.1 27.5 Volt Supply (13.75V for KY 197/E)

The 27.5 volt (13.75 for KY 197) aircraft buss is fed through the power switch on the volume control shaft, then through a jumper on the rear panel connector to a fuse and hash filter, L112 and C155. This provides a clean source of power for the modulator, 12 volt regulator and the switching regulator.

4.3.6.2 12 Volt Regulator (6 volts for KY 197/E)

The 12 volt (6 for KY 197/E) regulator is a Darlington connected power transistor, Q120. The collector is connected to +27.5 volts (13.75 for KY 197/E). The base is connected to a voltage divider made up of resistors R181, R182/RT101 and R184. The regulated 12 volts (6 for KY 197/E) on the emitter is set at the factory, by resistors R181 and R184, to provide the desired transmitter power output by varying the DC supply voltage being fed by the modulator transistors to the transmitter power amplifiers. Posistor RT101 is mounted to the heatsink of Q120 and connected so that under extremely high temperature operation the +12 volt (6 for KY 197/E) line is decreased to reduce the power dissipation in the transmitter and thereby prevent damage to the semiconductors.

4.3.6.3 Switching Regulator

Comparator I118A is connected as a 20KHz oscillator. Its output is fed through pulse width modulator I118D to emitter follower Q113, which drives the switching transistor Q114. Q114 is connected to switching transformer T102. T102 connects to the 27.5 volt (13.75 for KY 197/E) supply through low pass filter L113 and C159. When Q114 conducts, the current in the primary winding of T102 increases. Then as Q114 turns off its collector current drops to zero, power is transferred to the secondary and the diodes on the secondary conduct, delivering power to the loads.

Diode CR112 is the high voltage rectifier and capacitor C161 is the filter. Q115 is a current limit and feeds the high voltage (approx. 192 volts) to the gas discharge display.

Diode CR114 is the rectifier on the 5 volt tap and C163 is the filter capacitor. This is the supply for the TTL and ECL logic circuits and the microprocessor.

CR115 is the rectifier on the -26 volt tap and C164 is the filter capacitor. The -26 volt supply feeds power to the non-volatile memory, I112.

CR113 is the rectifier and C162 is the filter on the 10 volt tap of T102. The 10 volt supply feeds the 9 volt filter consisting of Q116, Q117, Q118, C167, R208 and R209. This filtered 9 volt point feeds power to the receiver, VCO buffers, mic bias and the CMOS logic circuits. The 10 volt supply is sampled by resistors R189 and R191 and fed to the error amp, I118B. It is compared with the 5 volt reference from I117 and the difference between the two voltages is amplified and fed through the loop filter R195, C144, R210, R196 and C157. The voltage from the loop filter is compared with the triangle-wave signal from the 20KHz oscillator and produces the proper pulse width to obtain the desired output voltage. Also, the emitter current of the switching transistor Q114 is sampled by R205 and fed to the comparator, I118C, lowers the input voltage on the pulse width modulator, thus decreasing the pulse width which decreases the drive to the switching transistor. Therefore, the supply is regulated for input voltage variations, output load variations and current limit protection for the switching transistor. Overvoltage protection is provided by diode CR118. If the 5 volt supply increases more than one diode drop above the reference between R189 and R191, it causes the output of the error amp, I118B, to go to zero volts which decreases the drive to the switching transistor to its minimum value.

CHAPTER

05

CONTENTS

SECTION V
MAINTENANCE

LIST OF ILLUSTRATIONS

TABLES

SECTION V
MAINTENANCE

5.1 INTRODUCTION

Before maintenance of the KY 196/E, KY 197/E is attempted, a thorough understanding of the theory of operation (Section IV) as well as the information on transistor and integrated circuit maintenance is needed. This material is contained in Appendix A. Detailed information on the various integrated circuit packages used in the KY 196/E, KY 197/E is also found in this reference.

5.2 TEST AND ALIGNMENT

The following procedure is for aligning a KY 196/E, KY 197/E so it will meet the minimum performance specifications. If partial alignment is desired, use only the initial control settings that apply to the section being aligned.

5.2.1 GENERAL INFORMATION

A. "Hard" microvolts indicates use of a 6dB pad between the signal generator and the receiver. (Example: A receiver with 6dB s+n/n at 2uV hard must have 1uV of sensitivity).

B. A standard modulator test signal is a .4VRMS, 1KHz tone, open circuit, with the network shown in Figure 5-5.

5.2.2 TEST EQUIPMENT

The following test equipment, or equivalent, is required to properly align and test the KY 196/E, KY 197/E. All test equipment must be calibrated before attempting alignment.

A. Power Supply: Sorensen SRL 40-6 (27.5V @ 6 AMPS) or equivalent

B. RF Signal Generator: Boonton Model 211A or equivalent

C. Audio Signal Generator: HP 200CD or equivalent

D. Digital Multimeter: Fluke 8000A or equivalent

E. RF Wattmeter: Bird Model 611 or equivalent

F. Frequency Counter: HP 5245L or equivalent

G. Audio Wattmeter with Load: Eico Model 261 or equivalent

H. Oscilloscope: Tektronix Model 454 or equivalent

I. Linear Detector: Figure 5-7 (customer fabricated)

J. Test Harness: Figure 5-2 (customer fabricated)

K. 40dB Attenuator: Figure 5-6 (customer fabricated)

L. Microphone Test Circuit: Figure 5-5 (customer fabricated)

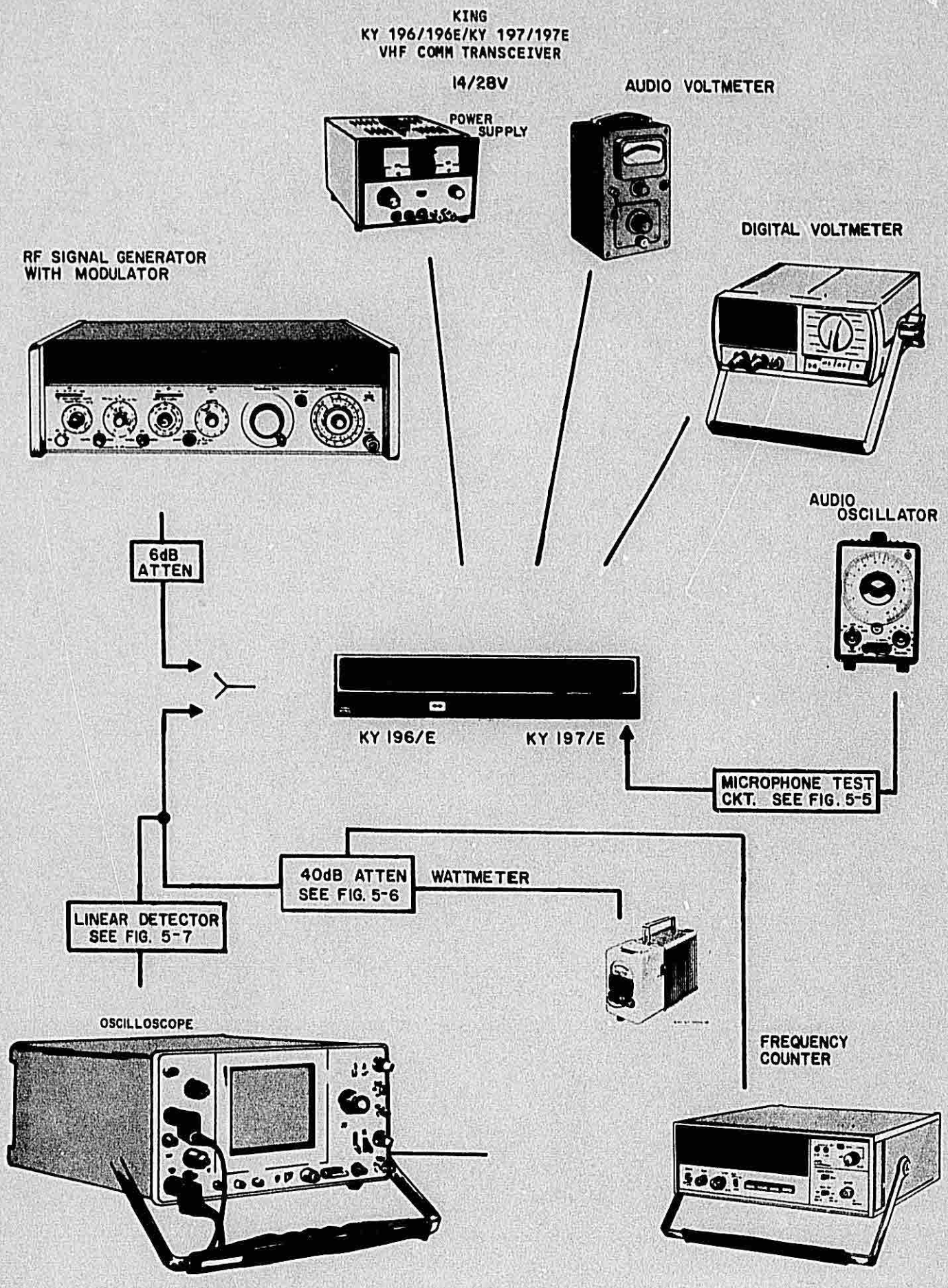


FIGURE 5-1 TYPICAL TEST EQUIPMENT SETUP

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER

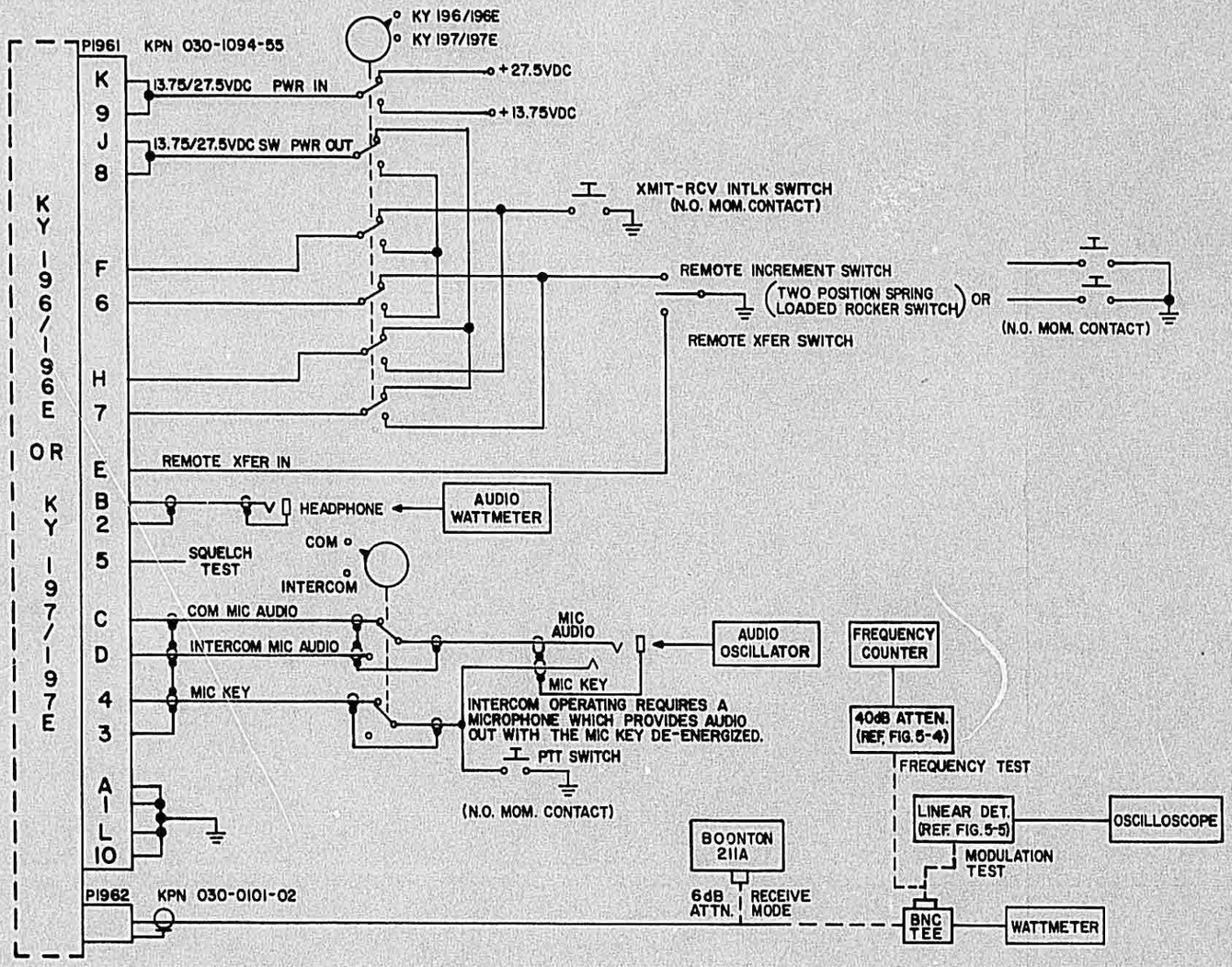


FIGURE 5-2 BENCH TEST HARNESS

5.2.3 TEST PROCEDURE

TEST DATA SHEET

Serial Number: _____
King Part Number: _____
Mod Status: _____

5.2.3.1 Receiver

a. Sensitivity

Input a 2mV standard audio test signal into the unit.

1. S+N/N: 118.000MHz _____ NLT 6dB
126.50MHz _____ NLT 6dB
135.97MHz _____ NLT 6dB

2. Quieting: 126.50MHz _____ NLT 25dB S+N/N

Input a 100uV standard audio test signal into the unit.

b. AGC Characteristics: _____ NMT 3dB

With the unit set to 126.50MHz monitor the receiver output. Vary the input from 5uV to 20KuV.

c. Selectivity:

Using the AGC voltage produced by a 3uV standard signal reference, measure and record the frequencies which reproduce the AGC REF voltage at 6dB and 60dB above the reference input.

1. 6dB Bandwidth: KY 196/197

126.50MHz: Above _____ ≥126.510MHz
Below _____ ≤126.490MHz

2. 6dB Bandwidth: KY 196E/1917E

126.50MHz: Above _____ ≥126.5145MHz
Below _____ ≤126.4855MHz

3. 60dB Bandwidth: KY 196/197

126.50MHz: Above _____ ≤126.520MHz
Below _____ ≥126.480MHz

4. 60dB Bandwidth: KY 196E/197E

126.50MHz: Above _____ ≤126.540MHz
Below _____ ≥126.460MHz

d. Manual Gain Control (Audio Output)

Input a standard 100uV signal into the unit. Disable the squelch by pulling the volume knob out and monitor the audio output.

Volume Control Minimum: _____ NMT .001mW
Volume Control Maximum: _____ NLT 100mW

e. Audio Distortion

Input a 100uV 85% modulated signal between 350Hz and 2500Hz. (This is an optional test that requires a distortion analyzer).

Audio Distortion:		
	350Hz	_____ NMT 15%
	1000Hz	_____ NMT 15%
	2500Hz	_____ NMT 15%

f. Squelch

1. Set the unit at 126.50MHz.
2. Carrier/Noise squelch set to open at 2uV +1 -.5uV.
3. Carrier/Noise squelch _____ OK.
4. With the unit set to 126.50MHz input a 8KHz 85% modulated signal into the unit. Set the carrier squelch to open at 25uV ± 3uV (without KY 196/E-13, KY 197/E-14) or 12.5 ± 3uV (with KY 196/E-13, KY 197/E-14).
5. Carrier Squelch _____ OK.

g. Intercom: _____ NLT 100mW into 500 ohm

Input a 100mV 1KHz signal into the Intercom (pin D) input of J1961.

5.2.3.2 Transmitter

a. Power Out:

Connect a wattmeter to the antenna output and record the following unmodulated values.

KY 196/196E	118.00MHz	_____	16W min., 22W max.
	126.50MHz	_____	16W min., 22W max.
	135.975MHz	_____	16W min., 22W max.
KY 197/197E	118.00MHz	_____	7W min.
	126.50MHz	_____	7W min.
	135.975MHz	_____	7W min.

After two (2) minutes continuous key:

KY 196/196E	118.00MHz	_____	4W min., 10W max.
	126.50MHz	_____	4W min., 10W max.
	135.975MHz	_____	4W min., 10W max.
KY 197/197E	118.00MHz	_____	2.5W min., 6W max.
	126.50MHz	_____	2.5W min., 6W max.
	135.975MHz	_____	2.5W min., 6W max.

Low Voltage:

With a low line voltage input, the following values should be observed.

KY 196/196E	22VDC	118.00MHz	_____	8W min.
		126.50MHz	_____	8W min.
		135.975MHz	_____	8W min.
KY 197/197E	11VDC	118.00MHz	_____	3.5W min.
		126.50MHz	_____	3.5W min.
		135.975MHz	_____	3.5W min.

b. Modulation Capabilities:

Input a standard modulator test signal into the microphone audio. Using the linear detector measure the TX modulation.

1. 118.00MHz _____ NLT 85% and NMT 98%
   126.50MHz _____ NLT 85% and NMT 98%
   135.975MHz _____ NLT 85% and NMT 98%

2. Demodulated Audio Distortion

   This is an optional test that requires a distortion analyzer.

   350Hz _____ NMT 15%
   1000Hz _____ NMT 15%
   2500Hz _____ NMT 15%

3. Carrier Noise Level

   Modulate the carrier with 85% at 1000Hz. Noise on the carrier with modulation removed shall be:

   118.00MHz _____ NLT 40dB
   126.50MHz _____ NLT 40dB
   135.975MHz _____ NLT 40dB

4. Headphone Sidetone

   Input a 1000Hz, 85% modulated signal into the microphone audio. Monitor the headphone output. Set the volume control to midrange. Vary R162 over it's full range. Output variation into a 500 ohm load should be:

   Minimum _____ NMT 0.5mW
   Maximum _____ NLT 100mW
   Final Setting _____ 4mW ±3dB (Set R162)

c. Frequency Stability

Channel Frequency: 123.325MHz
Measured Frequency: _____ 123.325MHz ± 300Hz

5.2.3.3 Display

a. All digits and nomenclature shall be fully and evenly illuminated.

Display _____ (✓) OK

b. All digits and nomenclature shall dim evenly and shall not flicker with photocell covered.

Dimming _____ (✓) OK

5.2.3.4 Control Functions (Unit Must Be In Frequency Mode)

a. Transfer Switch

Pressing transfer switch causes active and standby frequencies to transfer.

_____ (✓) OK

b. Frequency Controls

Increment		Roll Over Characteristics
MHz _____	(✓) OK	(135 to 118MHz)
KHz _____	(✓) OK	(.95 to .000KHz Knob In)
KHz _____	(✓) OK	(.97 to .000KHz Knob Out)

Decrement	-	Roll Under Characteristics
MHz _____	( ) OK	(135 to 118MHz)
KHz _____	( ) OK	(.000 to .95KHz Knob In)
KHz _____	( ) OK	(.000 to .97KHz Knob Out)

c. Memory

When the unit is turned "OFF" and then back "ON", the last active and standby frequencies entered are displayed.

_____ ( ) OK

5.2.3.5 Direct Tune Mode, Program Mode and Channel Mode

Refer to Section 1.1 of the Installation Manual for applicability of the unit under test.

a. Direct Tune Mode

With power off, depress and hold the transfer button while turning the radio on. The frequency displayed in both the "USE" and "STANDBY" windows shall be 120.000MHz.

Rotating the MHz tuning knob shall increment and/or decrement the "USE" MHz frequency in one MHz increments between 118 and 135MHz, rolling over from 135 to 118 and rolling under from 118 to 135.

With the KHz knob pushed in, it shall tune the "USE" KHz frequency in 50KHz increments rolling over from .95MHz to .00MHz and rolling under from .00MHz to .95MHz.

With the KHz knob pulled out, it shall tune the "USE" KHz frequency in 25KHz steps rolling over from .97MHz to .00MHz and rolling under from .00MHz to .97MHz.

Momentarily depressing the transfer button shall cause the "USE" and "STANDBY" frequencies to interchange and operation shall be as described above with the exception that the "STANDBY" frequency shall be tuned.

Direct Tune Mode _____ ( ) OK
_____ (NA) Not Applicable

b. Program Mode

Depressing the transfer button and holding it for approximately 3 seconds shall place the radio in program mode which is indicated by a channel number (0-9) flashing in the "USE DISPLAY" window at approximately 1Hz rate.

With channel 0 selected in program mode, one of only two different configurations shall display in the "STANDBY" window, --- or UUU. One or the other of these two displays shall be selected when rotating either the KHz or MHz knob when the KHz knob is pushed in.

With channel 0 selected in program mode, UUU displayed in the "STANDBY" window, and the KHz knob pulled out, rotating either the KHz or the MHz knob shall cause the channel number flashing in the "USE" window to increment or decrement depending on the direction of rotation.

When any channel other than 0 is flashing in the use window and the KHz knob is pushed in, rotating the KHz knob shall select KHz frequencies in the "STANDBY" display in 25KHz increments. The rollover shall be from .97MHz to .00MHz and the roll under shall be from .00MHz to .97MHz. Rotating the MHz knob shall step the MHz frequency in 1MHz increments rolling over from 135.XXMHz to --- and then to 118.XXMHz and rolling under from 118.XXMHz to --- and then to 135.XXMHz. In the preceeding case, XX represents KHz frequency which is not changed by the knob rotation.

With the radio in program mode (a channel number other than 0 flashing in the "USE" window) proceed to program each channel as follows:

NOTE

LOADING OF THE FREQUENCIES BELOW IS NOT REQUIRED IF YOU WISH NOT TO DISTURB THE CHANNELS ALREADY IN MEMORY.

CHANNEL	STANDBY DISPLAY
1	118.00MHz
2	118.05MHz
3	126.50MHz
4	126.52MHz
5	- - -
6	128.00MHz
7	133.87MHz
8	135.95MHz
9	135.97MHz

Program Mode _____ (✓) OK
_____ (NA) Not Applicable

c. Channel Mode

With the radio configured and programmed as in Step B and at lease 4 seconds elapsed since the last switch action, turn the radio off. When power is restored, with the KHz knob pulled out, rotating either the KHz or the MHz knob shall select, in turn, the memory channel and the frequency as programmed in Step 9. The channel shall be displayed for approximately 2 seconds in the "USE" window after which the active "USE" frequency shall be displayed in the "USE" window. When selecting memory channels, channel 5 shall not display since it was programmed with a "Blank Channel" indication (---).

Channel Mode _____ (✓) OK
_____ (NA) Not Applicable

5.2.3.6 Remote Transfer and Remote Channel Increment

Refer to Section 1.1 of the Installation Manual for applicability of the unit under test.

a. Remote Transfer

Depressing the remote transfer button (in your test panel) will transfer frequencies from the "STANDBY" to the "USE" window and vice-versa.

Remote Transfer _____ (✓) OK
_____ (NA) Not Applicable

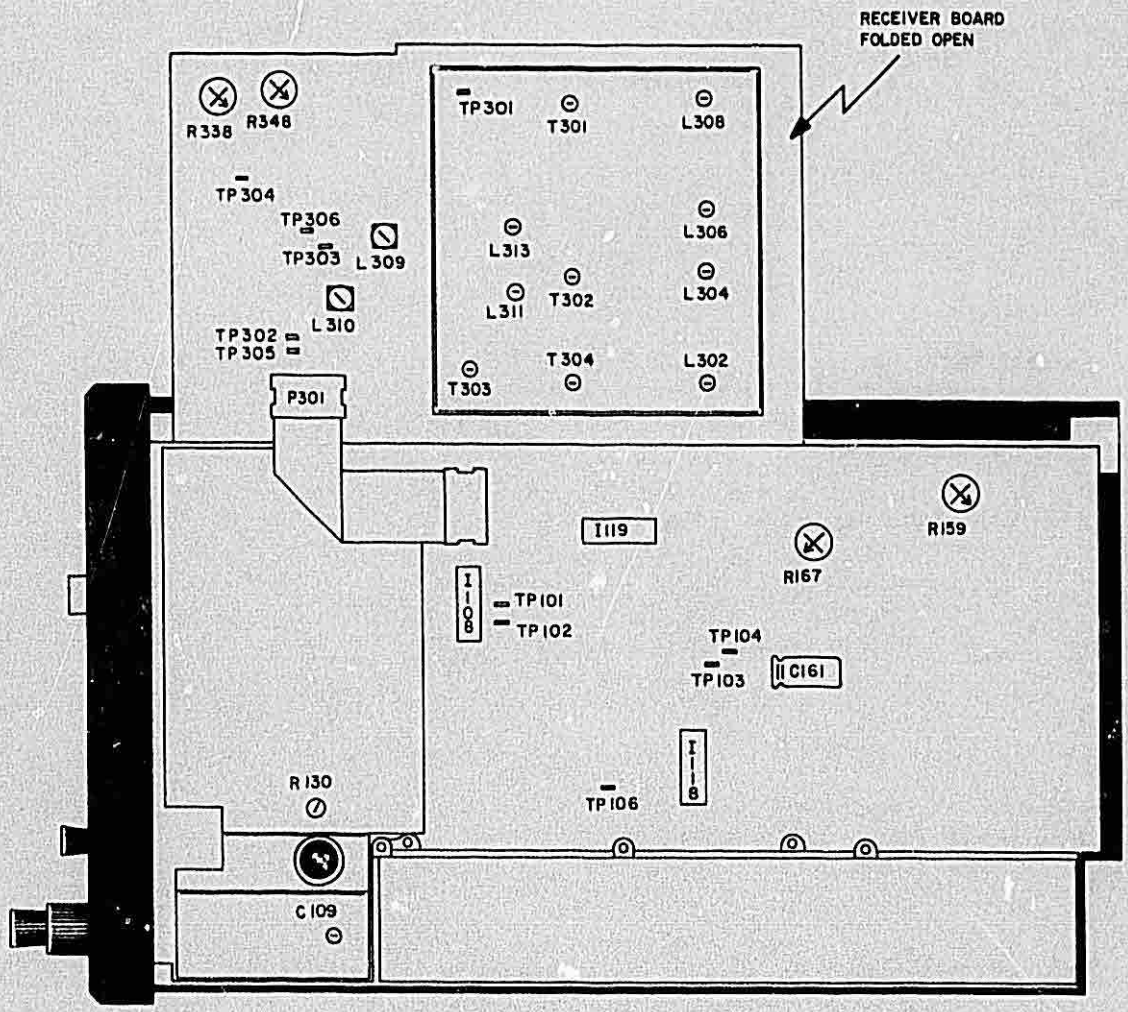
b. Remote Channel Increment

To test this feature, the unit must first be put into the Channel Mode of operation. Depressing the remote channel increment button (in your test set) will then cause the radio to increment through the memory channels. Channels will roll over from 9 to 0. Any channel previously programmed with dashes (---) will be skipped and will not be displayed.

Remote Channel Increment _____ (✓) OK
_____ (NA) Not Applicable

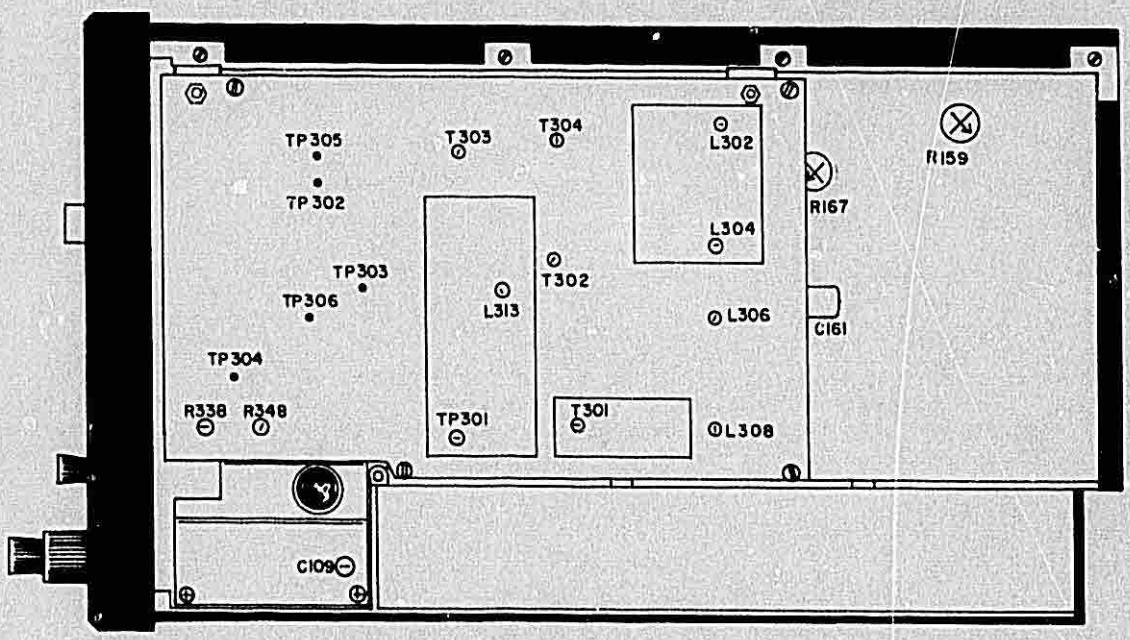
5.2.4 ALIGNMENT PROCEDURE

This alignment procedure is written for a transceiver that has been recently overhauled. If partial alignment is desired, use only the initial control settings that apply to the section being aligned. The receiver squelch adjustments must be done in the correct sequence.



TOP VIEW

FIGURE 5-3 LOCATION OF ADJUSTMENTS AND TEST POINTS
(Dwg. No. 696-5905-00, R-0)



TOP VIEW

FIGURE 5-4 LOCATION ADJUSTMENTS AND TEST POINTS WITH RECEIVER BOARD CLOSED
(Dwg. No. 696-5906-00, R-0)

5.2.4.1 Initial Control Settings (See Figure 5-3)

*R348	Noise Squelch	Max CW
R159	MIC Gain	Mid Range
*R338	Carrier Squelch	Max CW
R167	Sidetone	Mid Range
R505	Volume Control	Max CCW (OFF)
S102	Squelch Test "Use" Frequency	Pull Out 135.975
R130	Display Dimmer	Max CCW

*These settings apply when receiver board is closed and adjustment made through the PC board.

5.2.4.2 Voltage Regulator Test

Connect unit to RF load. Apply power and advance volume to turn unit on. Read voltage at TP106 (9.00 volts ± 0.5VDC).

5.2.4.3 VCO Adjust (L313)

Read voltage at TP301 and adjust L313 for 8.00 volts with 135.975MHz selected.

5.2.4.4 Frequency Adjust (C109)

Count VCO frequency at junction of C361 and C330 through access hole on rear of receiver board with frequency selector at 135.975MHz and adjust C109 for a reading of 147,375,000. This adjustment must be completed within 60 seconds of initial turn on at normal room temperature (75 ±5°F) to ensure temperature tracking within M.P.S. limits over the temperature.

5.2.4.5 RF-IF Alignment

NOTE

BE SURE TRANSMITTER IS NOT KEYED!

Set the "use" frequency to 126.50MHz. Connect RF signal generator to the KY 196/E, KY 197/E through a 6dB pad. Turn unit on with squelch test pulled out and apply sufficient RF signal to obtain approximately 5.0V at TP303. Adjust L302, L304, L306, L308, T301, T302, T303 and T304 for maximum voltage at TP303. Reduce RF input level to maintain the voltage at TP303 near 3.0 volts.

5.2.4.6 Noise Squelch Adjust (L309, R348)

a. Push squelch test knob in and observe signal at TP306 with oscilloscope. Set the RF signal generator for 25uV hard with 85% modulation at 8KHz. Adjust L309 for maximum p-p voltage as observed on the oscilloscope.

b. Apply 2.0uV hard modulated 30% with a 1KHz tone and turn R348 (noise squelch) clockwise until the receiver is just squelched (no audio output).

5.2.4.7 Carrier Squelch Adjust (R338)

a. For KY 196/196E's without MOD 13 and KY 197/197E's without MOD 14, apply 25uV hard, modulated 85% with 8KHz and adjust R338 CCW until the receiver is just squelched.

b. For KY 196/196E's with MOD 13 and KY 197/197E's with MOD 14 apply 12.5uV hard, modulated 85% with 8KHz and adjust R338 CCW until the receiver is just squelched.

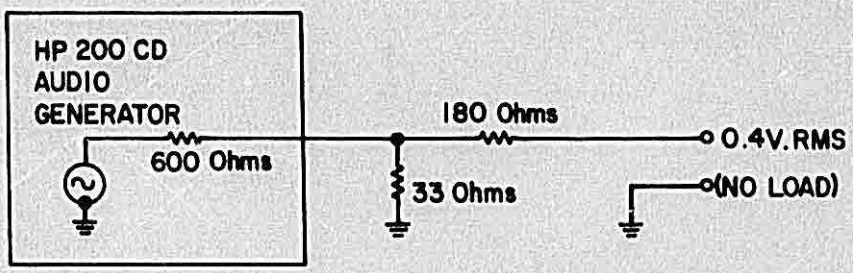


FIGURE 5-5 MICROPHONE TEST CIRCUIT

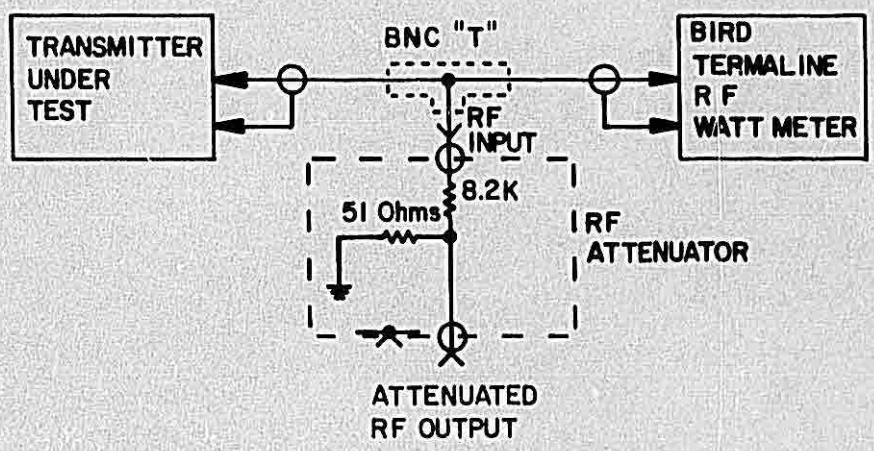


FIGURE 5-6 40dB ATTENUATOR SCHEMATIC DIAGRAM

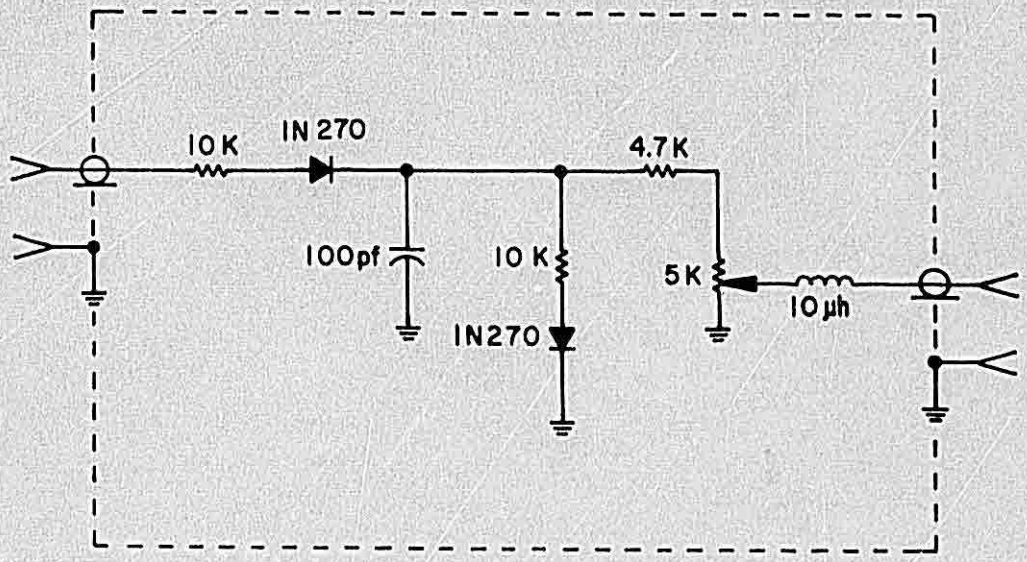


FIGURE 5-7 LINEAR DETECTOR

5.2.4.8 Climax Filter Adjustment

Apply 100uV of RF modulated 30% with 5KHz and read the speaker output voltage. Set the volume control to a convenient level and adjust L310 for minimum speaker output voltage (null).

5.2.4.9 Modulator Adjust

Connect the antenna connector to the RF wattmeter through the linear detector. Apply a 0.4 volt 1KHz standard audio signal to the mic input and key the transmitter. Observe the demodulated output from the linear detector on an oscilloscope and adjust R159 (mic gain) for 85% modulation. Adjust R167 (sidetone adj.) for 4mW at the audio output with a 500 ohm load. Unkey transmitter.

5.3 OVERHAUL

5.3.1 VISUAL INSPECTION

This section contains instructions to assist in determining, by inspection, the condition of the KY 196/197 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.

A. 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.

B. Capacitors, Variable

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

C. 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.

D. Connectors

Inspect connectors for broken parts, deformed shells or clamps, 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.

E. 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.

F. Fuse and Clips

Inspect for blown fuse and check clips for loose or corroded connections.

G. Insulators

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

H. Jacks

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

I. Potentiometers

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

J. Resistors, Fixed

Inspect the fixed resistors for cracked, broken, blistered, or charred bodies and loose, broken, or improperly soldered or corroded terminal connections.

K. 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.

L. 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 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.

M. Transformers

1. Inspect for signs of excessive heating, physical damage to case, cracked or broken insulation, and other abnormal conditions.

2. Inspect for corroded, poorly soldered, or loose connecting wires or terminals.

N. Wiring/Coaxial Cable

Inspect open and laced wiring of chassis, subassembly chassis and parts of equipment for breaks in insulation, conductor breaks, cut or broken lacing and improper dress in relation to adjacent wiring or chassis.

5.3.2 CLEANING

A. Using a clean, lint-free cloth lightly moistened with a mild cleaning detergent, remove all foreign matter from the equipment case and unit front panels. Wipe dry using a clean, dry, lint-free cloth.

B. 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.

C. 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 an approved mild cleaning solvent. Wipe dry with a clean, dry, lint-free cloth.

5.3.3 REPAIR

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

A. Connectors

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

B. Crystal

The use of other than a King crystal is considered an unauthorized modification.

C. Diodes

Diodes used are silicon and germanium; use long nose pliers as a heat sink under normal soldering conditions. Note the diode polarity before removal.

D. Integrated Circuits

Refer to Appendix "A" for removal and replacement instructions.

E. Wiring/Coaxial Cable

When repairing a wire that has broken from its 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.

5.3.4 DISASSEMBLY/ASSEMBLY PROCEDURES (See Figure 6-1 or 6-2, Section VI, Unit Final Assembly)

5.3.4.1 Disassembly of the KY 196/E, KY 197/E for Alignment

a. Disconnect power.

b. Remove top cover by removing screws

c. Remove the screws that hold the receiver board in the chassis and fold the receiver board out for easy access to the coils and transformers.

5.3.4.2 Disassembly of the KY 196/E, KY 197/E for Service and Inspection

a. Perform steps a and c of paragraph 5.3.4.1.

b. Remove bottom cover by removing screws.

c. Remove cover over receiver by removing 4 screws and by gently prying at edges.

d. Remove 5 screws from the digital cover and lift off.

5.3.4.3 Assembly Procedure

The assembly procedure for the KY 196/E, KY 197/E is basically the reverse of the disassembly procedure. Be careful not to pinch any leads under metal parts when reassembling.

5.4 TROUBLESHOOTING

This section is intended for use as a guide in isolating malfunctions in a KY 196/E, KY 197/E. The guidance presented here and the figures referenced by no means cover all causes of failure but are intended as a guide to locate the specific area of failure.

The Troubleshooting Flowchart, Figure 5-8, will help in locating sources of failure.

After troubleshooting procedures have been completed and the cause of the malfunction repaired, the unit should be checked and aligned using the procedures of 5.2.3.

5.4.1 TROUBLESHOOTING PROCEDURE

A. Power Supply

If the voltages below are not correct, compare them with the voltages in Table 5-1: This would help isolate a short circuit between supply outputs.

1. Verify 27.5 volts at each end of F101 (13.75V for KY 197/E).

2. Verify 10.0 volts at CR113 cathode.

3. Verify 5.0 volts at CR114 cathode.

4. Verify -26.0 volts at CR115 anode.

B. Local Oscillator

1. Verify that LO level is more than 1.5V p-p with oscilloscope at the junction of C361 and C330. An oscilloscope with a vertical bandwidth greater than 140MHz is required or a diode detector in conjunction with a voltmeter will give approximate indication.

2. Verify that LO is 11.4MHz above desired frequency with counter.

C. Audio

With 100uV, 30% modulated at 1KHz in the audio output should be 100mW minimum with the volume control clockwise.

D. VCO Voltage

NOTE

COMPONENT DESIGNATIONS IN PARENTHESES RELATE TO KY 196/196E'S HAVING MOD 13 AND KY 197/197E'S HAVING MOD 14.

1. With the "USE" frequency at 135.975MHz receive, the voltage at TP301 should be approximately 8.0 volts.

2. With the "USE" frequency at 118.000MHz receive, the voltage at TP301 should be approximately 4.0 volts.

3. With the "USE" frequency at 118.000MHZ transmit, the voltage at TP301 should be approximately 2.5 volts.

4. With the "USE" frequency at 126.50MHz receive, the voltage at TP301 should be approximately 6.00 volts.

5. The voltage at the cathodes of CR301, CR302, CR303, and CR304 (or CR301A/B/C/D) should be near 6.00 volts at 126.50MHz.

E. AGC Amplifier

1. The voltage at TP303 is typically 5.51V with 100uV signal.

2. The voltage at TP304 is typically 4.83V with 100uV signal.

3. The voltage at TP304 is typically 7.54V with no RF input.

F. Detector

Verify approximately 2V p-p at TP302 with 100uV, 30% modulation at 1KHz.

G. Squelch Gate

NOTE

COMPONENT DESIGNATIONS IN PARENTHESES RELATE TO KY 196/196E'S HAVING MOD 13 AND KY 197/197E'S HAVING MOD 14.

Verify approximately 1V at pin 3, I301 (emitter Q309) with 100uV, 30% modulation at 1KHz.

H. Transmitter (connect to 50 ohm load)

1. Verify 60mW (typical) from transmitter buffer at E129.

2. Verify correct frequency at buffer output (E129).

3. Verify E602 at +8V.

4. Verify E601 at 11.0VDC (13.75VDC on KY 197).

5. Verify E605 at 10.0VDC (7.50VDC on KY 197).

I. Synthesizer Frequency

1. Verify correct switch code (See Section IV).

2. Verify reference frequency (25KHz square wave) at TP102.

3. Verify variable frequency (25KHz square wave) at TP101.

J. Remote Transfer/Remote Channel Increment (if applicable)

1. Verify that applying a ground at E165 (KY 196/E pin 6 or KY 197/E pin 7) causes the "USE" and "STANDBY" frequencies to interchange.

2. With the radio programmed for memory channel operation, verify that applying a ground at E164 (KY 196/E, KY 197/E pin E) causes the memory channel to increment and the associated frequency to be displayed in the "STANDBY" window.

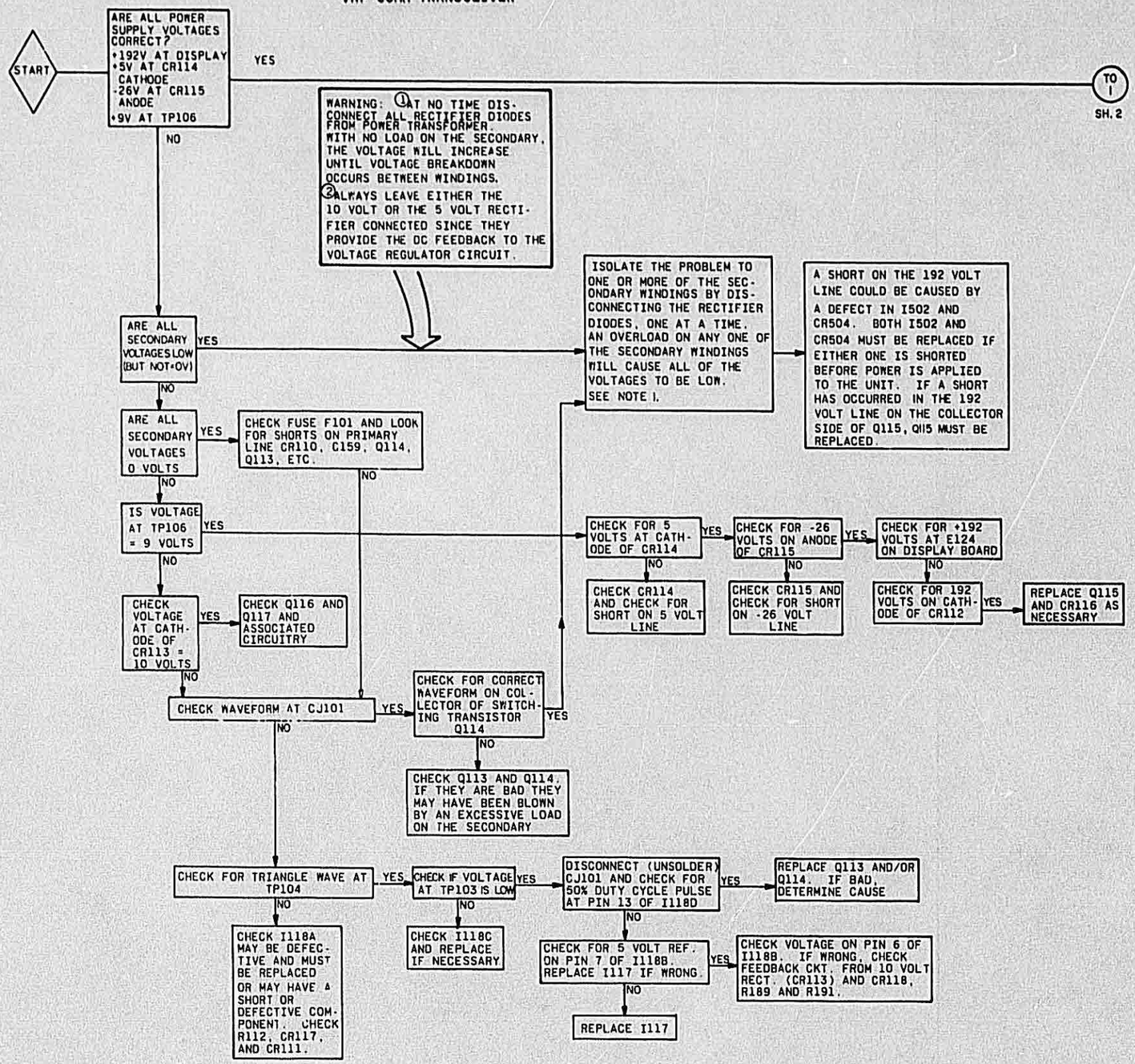
CONDITIONS	5 VOLT SUPPLY (V)	9 VOLT SUPPLY (V)	10 VOLT SUPPLY (V)	-26 VOLT SUPPLY (V)	192 VOLT SUPPLY (V)
5 Volts to GND	0	1.64	2.32	-13.3	78.9
9 Volts to GND	0.7	0	0	-14.7	52.0
10 Volts to GND	0.2	0	0	-12.7	70.3
-26 Volts to GND	3.1	5.8	6.7	0	162.8
192 Volts to GND	0	0	0	-11.9	0
5 Volts to 9 Volts	5.5	5.5	5.5	-16.7	136.3
5 Volts to 10 Volts	5.5	4.7	5.5	-15.0	123.3
5 Volts to -26 Volts	0.7	2.3	3.0	0.7	98.7
5 Volts to 192 Volts	1.8	0.1	0	-12.2	1.8
9 Volts to 10 Volts	5.0	10.0	10.0	-23.5	179.8
9 Volts to -26 Volts	0.8	0.7	1.5	0.7	78.8
9 Volts to 192 Volts	0.3	4.7	1.1	-12.2	4.7
10 Volts to -26 Volts	0	0.2	0.2	0.8	0.8
10 Volts to 192 Volts	0	4.6	5.7	-10.4	5.5
-26 Volts to 192 Volts	0	0.2	0.1	0.8	0.8

WARNING

THE VOLTAGE LEVELS IN THE ABOVE CHART ARE INTENDED FOR USE IN DIAGNOSING SHORT CIRCUIT CONDITIONS. DO NOT SHORT VOLTAGE SUPPLY LINES DURING TESTING.

TABLE 5-1 POWER SUPPLY VOLTAGES

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER



NOTES:

1. EXCESSIVE LOADING ON THE SECONDARY WILL CAUSE EXCESSIVE EMITTER CURRENT IN THE SWITCHING TRANSISTOR, Q114. IF THIS PRODUCES A VOLTAGE DROP ACROSS R205 THAT EXCEEDS THE REFERENCE LEVEL ON PIN 9 OF I118C, THE CURRENT LIMIT COMPARATOR I118C WILL FORCE THE INPUT OF THE PULSE MODULATOR (PIN 11 OF I118D) LOW, THUS REDUCING THE DRIVE TO THE SWITCHING TRANSISTORS. THIS CURRENT LIMITING OCCURS IN SHORT PULSES AND MAY BE THE EFFECT AND NOT THE CAUSE OF THE PROBLEM.

FIGURE 5-8 KY 196/E, KY 197/E TROUBLESHOOTING FLOWCHART
(Dwg. No. 696-5907-00, R-1)
(Sheet 1 of 5)

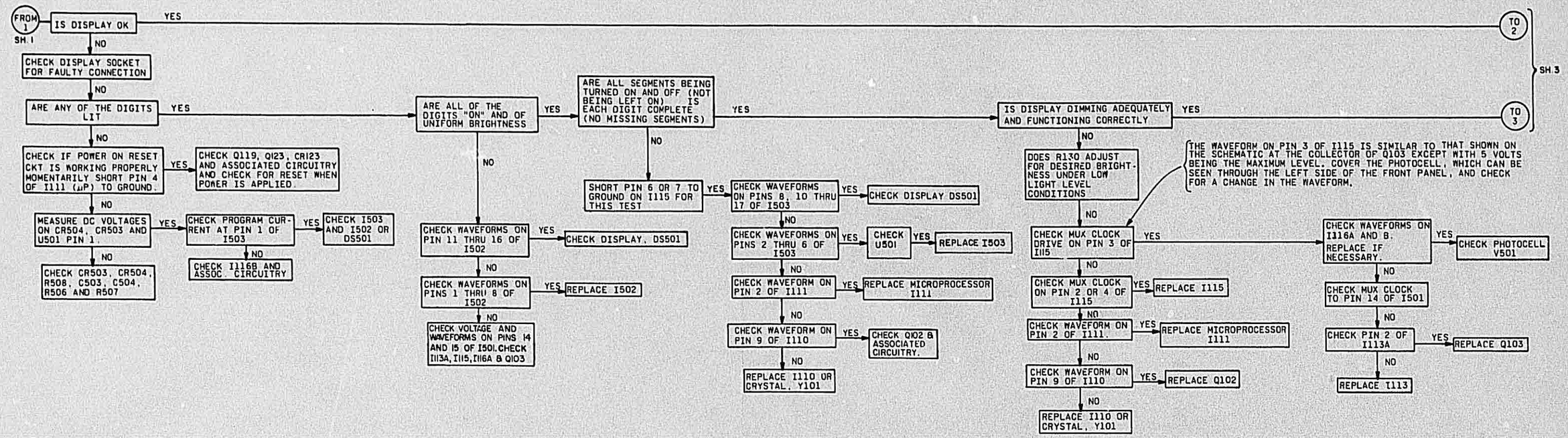


FIGURE 5-8 KY 196/E, KY 197/E TROUBLESHOOTING FLOWCHART
(Dwg. No. 696-5907-00, R-1)
(Sheet 2 of 5)

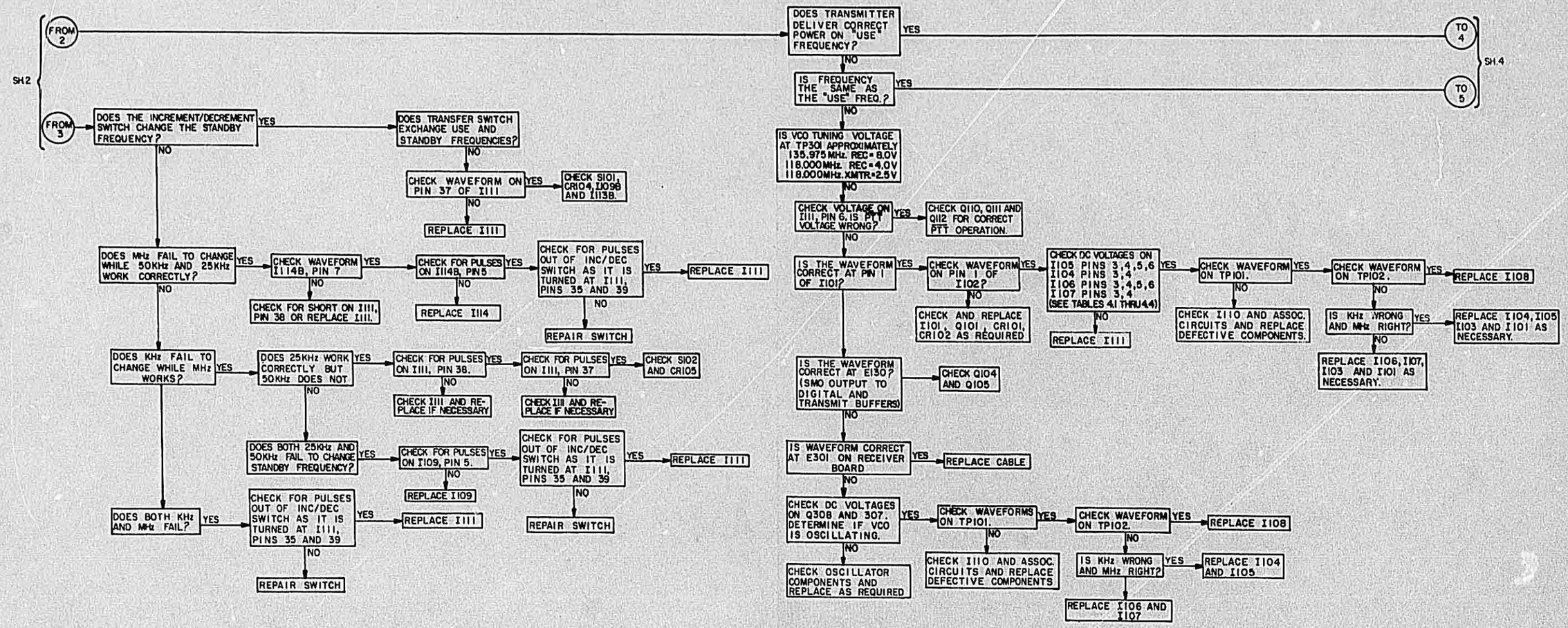


FIGURE 5-8 KY 196/E, KY 197/E TROUBLESHOOTING FLOWCHART
(Dwg. No. 696-5907-00, R-1)
(Sheet 3 of 5)

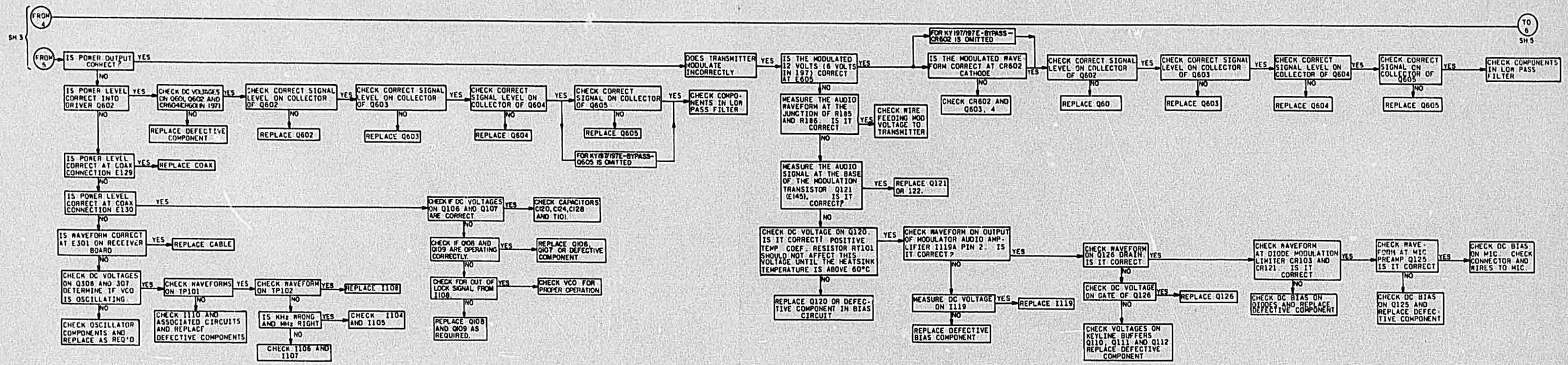
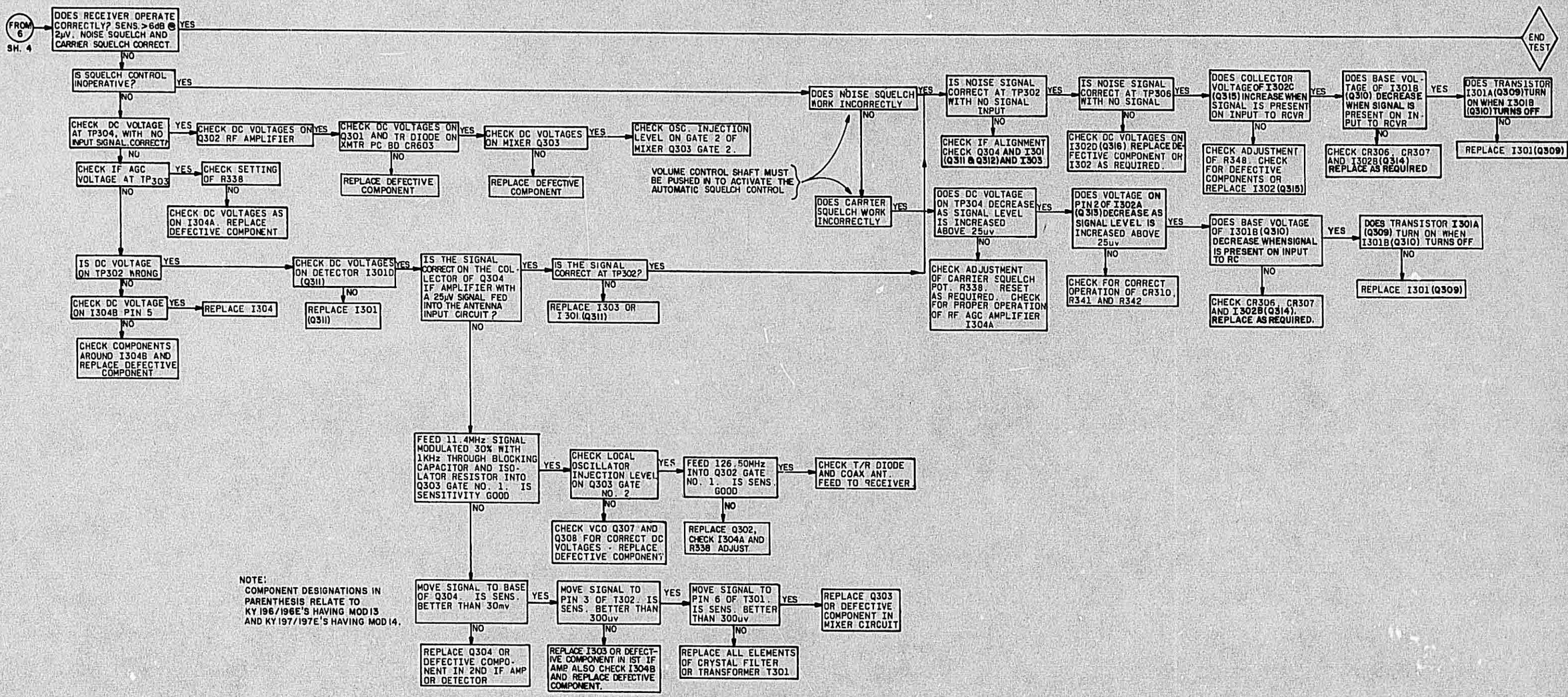


FIGURE 5-8 KY 196/E, KY 197/E TROUBLESHOOTING FLOWCHART
(Dwg. No. 696-5907-00, R-1)
(Sheet 4 of 5)



NOTE:
COMPONENT DESIGNATIONS IN PARENTHESIS RELATE TO KY 196/196E'S HAVING MOD 13 AND KY 197/197E'S HAVING MOD 14.

FIGURE 5-8 KY 196/E, KY 197/E TROUBLESHOOTING FLOWCHART
(Dwg. No. 696-5907-00, R-1)
(Sheet 5 of 5)

CHAPTER

06

CONTENTS

SECTION VI
ILLUSTRATED PARTS LIST

LIST OF ILLUSTRATIONS

ILLUSTRATED PARTS LIST INTRODUCTION

INTRODUCTION

The purpose of this parts list is for identification and requisition of parts. Part numbers listed in this Illustrated Parts List meet critical equipment design specification requirements. Use only those part numbers specified in this section for replacement of parts. Whenever a "caution" is posted concerning the use of a particular part, adherence to the appropriate replacement must be followed.

EXPLANATION OF ILLUSTRATED PARTS LIST

Terminology used on the parts list(s) is listed below.

1. Symbol-Denotes the component reference for both schematic diagrams and mechanical drawings. Example: CR401, whereas CR means Diode device and 401 is its assigned numerical code. The following designators are used by King Radio.

Circuit Designation	Component
C	Capacitor
F	Fuse
I	Integrated Circuit/IC
J	Fixed Connector
L	Inductor
Q	Transistor
P	Plug
R	Resistor
S	Switch
T	Transformer
U	Resistor/Capacitor Network
V	Photocell/tube
Y	Crystal
CJ	Circuit Jumper
CR	Diode
DS	Lamp
FL	Filter
TP	Test Point
WG	Waveguide

2. Part Number-The part number is assigned by King Radio Corporation. The first three digits denote the type of device. Example: 007-1200-00; the 007 denotes a discrete device. The following list are some of the prefixes commonly used by KRC.

Prefix	Component
007	Transistor/Diode
017	Filter
019	Transformer
019	Inductor
030	Connector
111/096/102/106	Capacitor
120	Integrated Circuit
13X	Resistor

3. Description-Defines minimum specification of the component/part. Example: XSTR S NPN SRF2325 is Transistor, Silicon, NPN and the vendor part number is SRF2325. Example: CAP EL 150UF 50V is Capacitor, Electrolitic, value is 150 microfarad and voltage rating is 50 volts. Following are some of the abbreviations used under Description.

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

4. Code UM- Unit of measure, Example: EA for each. The following units are used through the Illustrated Parts List.

Abbreviation	Word
EA	Each
FT	Foot
AR	As Required

5. BOM- Bill of Material is a breakdown of units or parts used to assemble one item.

6. Assy No.- Assembly Number is the assigned number used to identify a mechanical drawing.

ILLUSTRATED PARTS LIST

The Illustrated Parts List (IPL) is organized basically in the following three divisions, Bill of Material (200-XXXX-XX), Parts Layout (300-XXXX-XX), and the Electrical Schematic Diagram (002-XXXX-XX). The IPL may also contain the Final assembly or sub-assembly drawings.

The Assembly drawings reference their mechanical parts with a King Part Number (KPN). Electrical parts are referenced by their circuit designators (i.e. CR402, R908, etc.). Each Assembly parts list is assembled so that mechanical parts are first, in numerical part number order and electrical parts are second in circuit designation order.

The following unusual numbers may appear at times on the BOM and are for commentary purposes only.

Example 1:

CR401 999-9999-99 DO NOT USE

The component designator CR401 had been previously used on the assembly and then deleted; therefore, it cannot be reassigned.

Example 2:

CR401 999-9999-98 NOT USED

The component designator CR401 is available for future assignment and is not presently a part of the PC board/Final assembly.

Example 3:

CR401 999-9999-97 SEE NEXT ASSEMBLY

The component designator CR401 is used as part of the electrical circuit assembly but because of assembly or testing requirements may be part of another assembly.

CR401 999-9999-96 RESERVED

The component designator CR401 is reserved for future usage.

UNIT/BOARD VERSIONS

The BOM is arranged to show the Unit or Board version from left to right across the top of the BOM starting with the version -00.

The -00 through -XX are variants of a particular board assembly. Those parts that are peculiar to that particular board or assembly are shown in a vertical column directly below the -00 through -XX version.

(Optional -99)

The -99 version is a listing of all the parts that are common to a board or unit assembly(-00 through -99 versions). See the examples below.

Example 1: Board Versions

Transmitter Board	-00	-01	-99	
007-2050-01	1	-	-	Part only on -00 board
007-2051-01	-	1	-	Part only on -01 board
007-2052-01	-	-	1	Part on both -00 and -01 boards

Example 2: Unit Versions

Nav/Comm	-00	-01	-99	
200-1234-01 VOR BD	1	-	-	Bd only on -00 Version
200-1234-02 VOR BD	-	1	-	Bd only on -01 Version
200-4321-01 GS BD	1	-	-	Bd only on -00 Version
200-4321-02 GS BD	-	1	-	Bd only on -01 Version
200-2222-00 PWR SUP	-	-	1	Bd in both -00/-01 Versions
200-1111-00 CHS ASSY	-	-	1	Assy in both -00/01 Versions

B/M NUMBER

UNIT/ BOARD NAME

200-6320-10 MICROPROCESSOR BD R: 2
200-6320-11 MICROPROCESSOR BD R: 2
200-6320-99 COMMON BOM R: 9

VERSION OF UNIT/ BOARD

SYMBOL		PART NUMBER	DESCRIPTION	A	UM	QUANTITY 10	11	99
		009-6320-10	PC BD M/PROC		EA	1.00	1.00	.
		012-1174-00	INSULATOR		EA	.	.	1.00
		016-1040-00	COATING TYPE AR		AR	.	.	0.00
		033-0083-04	SCKT IC DIP 18C TG		EA	.	.	2.00
		033-0083-08	SCKT IC DIP 40C TG		EA	.	.	1.00
		200-6320-99	COMMON BOM	A	EA	1.00	1.00	.
C	201	096-1043-00	CAP TN 2.2UF 20V		EA	.	.	1.00
C	202	111-2331-31	CAP MC 330PF200V10		EA	.	.	1.00
C	203	111-2331-31	CAP MC 330PF200V10		EA	.	.	1.00
C	204	111-0001-63	CAP CR .022UF 200V		EA	.	.	1.00
C	205	096-1053-00	CAP TN 6.8UF 35V		EA	.	.	1.00
C	206	111-0001-63	CAP CR .022UF 200V		EA	.	.	1.00
CJ	201	026-0018-00	WIRE CKTJMPR 22AWG		FT	.	1.00	.
CR	201	007-6016-00	DIO S 1N4154		EA	.	.	1.00
CR	202	007-6016-00	DIO S 1N4154		EA	.	.	1.00
CR	203	007-5011-36	DIO Z 100V 1W 5%		EA	.	.	1.00
CR	204	007-5045-15	DIO Z 1/4W9.1Z5		EA	.	.	1.00
CR	205	007-6016-00	DIO S 1N4154		EA	.	.	1.00
CR	206	007-6016-00	DIO S 1N4154		EA	.	.	1.00
CR	207	007-6105-00	DIO HV FDH444		EA	.	.	1.00
CR	208	007-6105-00	DIO HV FDH444		EA	.	.	1.00
CR	209	007-6085-00	DIO HC 1N5711		EA	.	.	1.00
I	201	120-2094-02	M/PROC N/C CONT		EA	.	.	1.00
I	202	120-6045-01	IC SCL4022ABC+		EA	.	.	1.00
I	203	120-0095-00	IC UDN6184A		EA	.	.	1.00
I	204	120-0163-00	IC DS8884AN		EA	.	.	1.00
I	205	120-2028-01	IC ER1400		EA	.	.	1.00
I	206	120-6058-01	IC MM54C906J+		EA	.	.	1.00
I	207	120-0125-00	IC DS88L12N		EA	.	.	1.00
I	208	120-6025-01	IC SCL4049ABC+		EA	.	.	1.00
I	209	120-0136-00	IC SN74LS156N		EA	.	.	1.00
J	201	030-1117-00	RECEPTACLE		EA	.	.	16.00
J	202	030-2424-02	HDR RTANG DBL 8 S		EA	1.00	1.00	.
J	203	030-2217-09	HEADER RTANG 9P		EA	1.00	1.00	.
Q	201	007-0261-00	XSTR S PNP 2N2907A		EA	.	.	1.00
R	201	131-0823-13	RES CF 82K EW 5%		EA	.	.	1.00
R	202	131-0124-13	RES CF 120K EW 5%		EA	.	.	1.00
R	203	131-0913-13	RES CF 91K EW 5%		EA	.	.	1.00
R	204	999-9999-98	NOT USED		EA	.	.	0.00
R	205	999-9999-98	NOT USED		EA	.	.	0.00
R	206	999-9999-98	NOT USED		EA	.	.	0.00
R	207	999-9999-98	NOT USED		EA	.	.	0.00
R	208	131-0103-13	RES CF 10K EW 5%		EA	.	.	1.00
R	209	131-0103-13	RES CF 10K EW 5%		EA	.	.	1.00
R	210	131-0103-13	RES CF 10K EW 5%		EA	.	.	1.00
R	211	131-0103-13	RES CF 10K EW 5%		EA	.	.	1.00
R	212	131-0103-13	RES CF 10K EW 5%		EA	.	.	1.00
R	213	131-0103-13	RES CF 10K EW 5%		EA	.	.	1.00
R	214	131-0472-13	RES CF 4.7K EW 5%		EA	.	.	1.00
R	215	131-0473-13	RES CF 47K EW 5%		EA	.	.	1.00
R	216	131-0472-13	RES CF 4.7K EW 5%		EA	.	.	1.00
R	217	131-0132-13	RES CF 1.3K EW 5%		EA	.	.	1.00
R	218	131-0132-13	RES CF 1.3K EW 5%		EA	.	.	1.00
R	219	131-0132-13	RES CF 1.3K EW 5%		EA	.	.	1.00
U	201	015-0046-01	NTWK RES/DIO		EA	.	.	1.00
U	202	015-0041-01	RES MOD 220K150V2%		AR	.	.	0.00
Y	201	044-0106-00	XTAL 3579.545KHZ		EA	.	.	1.00

COMPONENT DESIGNATOR

COMPONENT PART NUMBER

DESCRIPTION OF COMPONENT

UNIT OF MEASURE

QUANTITY COMPONENTS ON BOARDS

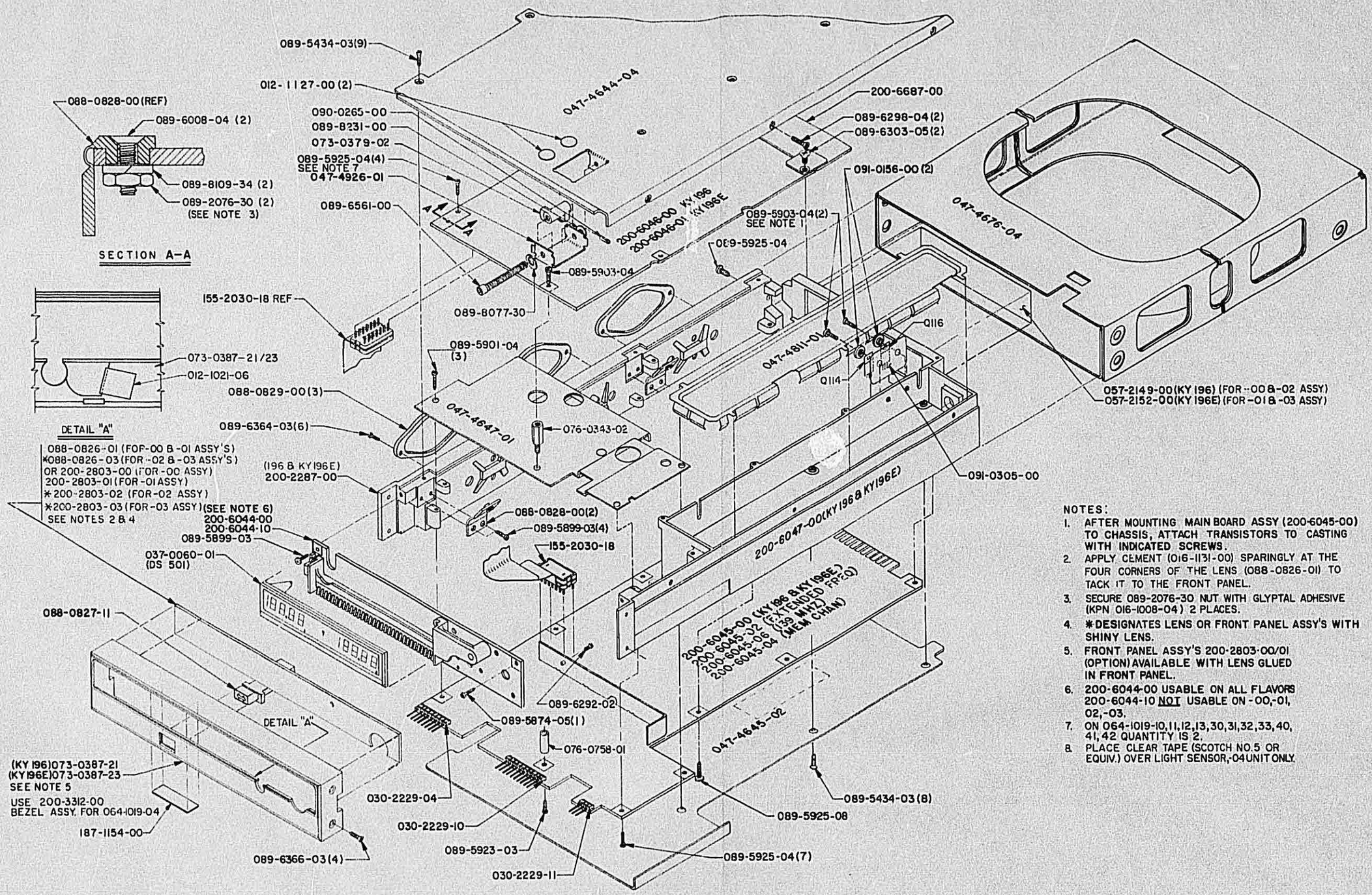
064-1019-00	XCVR KY 196	R: 25
064-1019-01	XCVR KY 196E	R: 25
064-1019-02	XCVR KY 196 SH LEN	R: 26
064-1019-05	196/MEM CHNL	R: 3
064-1019-06	196E/MEM CHNL	R: 3
064-1019-07	196SL/MEM CHNL	R: 3
064-1019-10	196/MEM RE TR	R: 4
064-1019-11	196E/MEM RE TR	R: 4
064-1019-12	196SL/MEM RE TR	R: 4
064-1019-99	COMMON BOM	R: 14

SYMBOL	PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00	01	02	05	06	07	10	11	12	99
	012-1021-06	TAPE ELEC 3/8 WD		AR	.	.	.	.	.	.	.	.	.	0.00
	012-1127-00	TAG COVER		EA	.	.	.	.	.	.	.	.	.	2.00
	016-1008-04	GLYPTAL 7526 BL		AR	.	.	.	.	.	.	.	.	.	0.00
	016-1131-00	CNTCT CMT BND 1055		AR	.	.	.	.	.	.	.	.	.	0.00
	025-0005-02	WIRE 18 RED		IN	.	.	.	.	.	.	.	.	.	12.00
	025-0005-12	WIRE 18 RD/WH		IN	.	.	.	.	.	.	.	.	.	12.00
	025-0018-44	WIRE 26 YEL		IN	.	.	.	.	.	.	.	.	.	9.60
	026-0004-00	WIRE COP TIN 20G		AR	.	.	.	.	.	.	.	.	.	0.00
	026-0013-00	CA COAX RG178BU		IN	.	.	.	.	.	.	.	.	.	12.00
	030-2229-04	RGT ANG HDR 8P		EA	.	.	.	.	.	.	.	.	.	1.00
	030-2229-10	RGT ANG HDR 10P		EA	.	.	.	.	.	.	.	.	.	1.00
	030-2229-11	RGT ANG HDR 3P		EA	.	.	.	.	.	.	.	.	.	1.00
	047-4644-04	TOP CVR	A	EA	.	.	.	.	.	.	.	.	.	1.00
	047-4645-02	BTM CVR	A	EA	.	.	.	.	.	.	.	.	.	1.00
	047-4647-01	DGTL CVR	A	EA	.	.	.	.	.	.	.	.	.	1.00
	047-4676-04	MTG RACK	A	EA	.	.	.	.	.	.	.	.	.	1.00
	047-4811-01	COVER XMTR W/F	A	EA	.	.	.	.	.	.	.	.	.	1.00
	047-4926-01	SPREADER HD W/F		EA	.	.	.	.	.	.	.	.	.	1.00
	047-6406-01	BRACKET LEFT	A	EA	.	.	.	.	.	.	1.00	1.00	1.00	.
	047-6406-02	BRACKET RIGHT	A	EA	.	.	.	.	.	.	1.00	1.00	1.00	.
	057-2149-00	S/N TAG		EA	1.00	.	1.00	1.00	.	1.00	1.00	.	1.00	.
	057-2152-00	S/N TAG		EA	.	1.00	.	.	1.00	.	.	1.00	.	.
	064-1019-99	COMMON BOM	A	EA	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	.
	073-0379-02	HOLD DOWN 80		EA	.	.	.	.	.	.	.	.	.	1.00
	073-0387-21	FRONT PANEL		EA	1.00	.	1.00	1.00	.	1.00	1.00	.	1.00	.
	073-0387-23	FRONT PANEL		EA	.	1.00	.	.	1.00	.	.	1.00	.	.
	076-0343-02	SPACER .425		EA	.	.	.	.	.	.	.	.	.	1.00
	076-0758-01	SPACER SHIELD W/F		EA	.	.	.	.	.	.	.	.	.	1.00
	088-0826-01	LENS W/SS N/GLARE	A	EA	1.00	1.00	.	1.00	1.00	.	1.00	1.00	.	.
	088-0826-03	LENS S/SS STD	A	EA	.	.	1.00	.	.	1.00	.	.	1.00	.
	088-0827-11	PUSHBUTTON	A	EA	.	.	.	.	.	.	.	.	.	1.00
	088-0828-00	HINGE FLEXIBLE		EA	.	.	.	.	.	.	.	.	.	2.00
	088-0829-00	INSL		EA	.	.	.	.	.	.	.	.	.	3.00
	089-2076-30	NUT HEX 4-40		EA	.	.	.	.	.	.	.	.	.	2.00
	089-2136-00	NUT HEX ESNA 2-56		EA	.	.	.	.	.	.	2.00	2.00	2.00	.
	089-5434-03	SCR FHP 3-48X3/16		EA	.	.	.	.	.	.	.	.	.	17.00
	089-5874-05	SCR PHP 2-56X5/16		EA	.	.	.	.	.	.	.	.	.	1.00
	089-5899-03	SCR PHP 2-56X3/16		EA	.	.	.	.	.	.	.	.	.	5.00
	089-5901-04	SCR PHP 3-48X1/4		EA	.	.	.	.	.	.	.	.	.	3.00
	089-5903-04	SCR PHP 4-40X1/4		EA	.	.	.	.	.	.	.	.	.	3.00

064-1019-XX

SYMBOL	PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00	01	02	05	06	07	10	11	12	99
	089-5923-03	SCR BHP 2-56X3/16		EA	.	.	.	.	.	.	.	.	.	1.00
	089-5925-04	*SCR PHP 3-48X1/4		EA	12.00	12.00	12.00	12.00	12.00	12.00	10.00	10.00	10.00	.
	089-5925-08	*SCR PHP 3-48X1/2		EA	.	.	.	.	.	.	.	.	.	2.00
	089-6008-04	SCR FHP 4-40X1/4		EA	.	.	.	.	.	.	.	.	.	2.00
	089-6292-02	SCR PHP 2-56X1/8		EA	.	.	.	.	.	.	.	.	.	1.00
	089-6298-04	SCR FHPH 3-48X1/4		EA	.	.	.	.	.	.	.	.	.	2.00
	089-6303-05	SCR FHP 3-48X5/16		EA	.	.	.	.	.	.	2.00	2.00	2.00	.
	089-6364-03	*SCR PHP 2-56X3/16		EA	.	.	.	.	.	.	.	.	.	6.00
	089-6366-03	*SCR PHP 2-56X3/16		EA	.	.	.	.	.	.	.	.	.	4.00
	089-6561-00	RETAINING SCREW		EA	.	.	.	.	.	.	.	.	.	1.00
	089-8077-30	WASHER		EA	.	.	.	.	.	.	.	.	.	1.00
	089-8109-34	WSHR SPLT LK #4		EA	.	.	.	.	.	.	.	.	.	2.00
	089-8231-00	WASHER FLAT		EA	.	.	.	.	.	.	.	.	.	1.00
	090-0265-00	GROOVE PIN TYPE 5		EA	.	.	.	.	.	.	.	.	.	1.00
	091-0072-00	CABLE CLAMP 0		EA	.	.	.	.	.	.	1.00	1.00	1.00	.
	091-0109-00	CABLE TIE .234		EA	.	.	.	.	.	.	.	.	.	5.00
	091-0156-00	BUSHING		EA	.	.	.	.	.	.	.	.	.	2.00
	091-0305-00	INSULATOR		EA	.	.	.	.	.	.	.	.	.	1.00
	150-0048-10	SHRNK TUBING WHT		AR	.	.	.	.	.	.	.	.	.	0.00
	150-0049-10	TUBING SHRINK WHT		AR	.	.	.	.	.	.	.	.	.	0.00
	150-0103-00	SLDR SLEEVE		EA	.	.	.	.	.	.	.	.	.	1.00
	155-2030-18	JMPR CABLE 3.55	A	EA	.	.	.	.	.	.	.	.	.	1.00
	187-1154-00	PAD		EA	.	.	.	.	.	.	.	.	.	1.00
	200-2287-00	MOD HEATSINK KY196	A	EA	.	.	.	.	.	.	.	.	.	1.00
	200-6044-00	DISPLAY BD ASSY	A	EA	1.00	1.00	1.00	.	.	.	.	.	.	.
	200-6044-10	DISPLAY BOARD	A	EA	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	.
	200-6045-00	MAIN BD KY 196	A	EA	1.00	1.00	1.00	.	.	.	.	.	.	.
	200-6045-04	MAIN BD KY 196	A	EA	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	.
	200-6046-00	RCVR KY196/197	A	EA	1.00	.	1.00	1.00	.	1.00	1.00	.	1.00	.
	200-6046-01	RCVR KY196E/197E	A	EA	.	1.00	.	.	1.00	.	.	1.00	.	.
	200-6047-00	XMTR BD KY 196	A	EA	.	.	.	.	.	.	.	.	.	1.00
	200-6687-00	MOD BD ASSY	A	EA	.	.	.	.	.	.	1.00	1.00	1.00	.
DS	501	037-0060-01	DISPLAY		EA	.	.	.	.	.	.	.	.	.	1.00
L	114	013-0006-01	FERR BEAD		EA	.	.	.	.	.	.	.	.	.	1.00
L	115	013-0006-01	FERR BEAD		EA	.	.	.	.	.	.	.	.	.	1.00
Q	114	007-0381-02	XSTR NPN X44E236		EA	.	.	.	.	.	.	.	.	.	1.00
Q	116	007-0205-00	XSTR PNP X45C613		EA	.	.	.	.	.	.	.	.	.	1.00

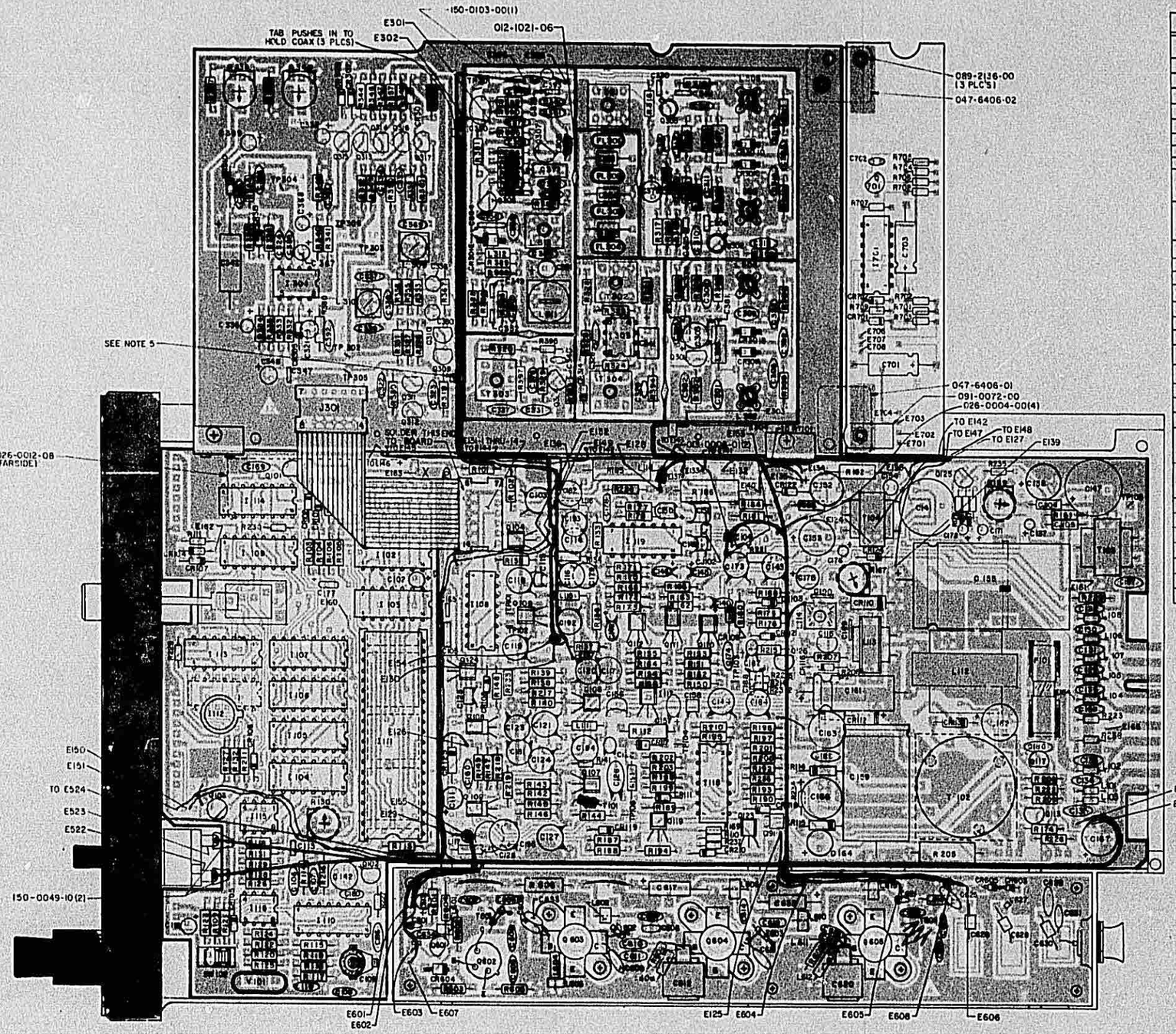
KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER



NOTES:

1. AFTER MOUNTING MAIN BOARD ASSY (200-6045-00) TO CHASSIS, ATTACH TRANSISTORS TO CASTING WITH INDICATED SCREWS.
2. APPLY CEMENT (016-1131-00) SPARINGLY AT THE FOUR CORNERS OF THE LENS (088-0826-01) TO TACK IT TO THE FRONT PANEL.
3. SECURE 089-2076-30 NUT WITH GLYPTAL ADHESIVE (KPN 016-1008-04) 2 PLACES.
4. *DESIGNATES LENS OR FRONT PANEL ASSY'S WITH SHINY LENS.
5. FRONT PANEL ASSY'S 200-2803-00/01 (OPTION) AVAILABLE WITH LENS GLUED IN FRONT PANEL.
6. 200-6044-00 USABLE ON ALL FLAVORS 200-6044-10 NOT USABLE ON -00,-01, 02,-03.
7. ON 064-1019-10,11,12,13,30,31,32,33,40, 41,42 QUANTITY IS 2.
8. PLACE CLEAR TAPE (SCOTCH NO.5 OR EQUIV.) OVER LIGHT SENSOR,-04 UNIT ONLY.

FIGURE 6-1 KY 196/196E COMMUNICATIONS TRANSCEIVER FINAL ASSEMBLY
(Dwg. No. 300-2371-00, R-33)
(Sheet 1 of 2)



FROM	TO	DESCRIPTION	KPN	LENGTH	SEE NOTE
E122	E522	18AWG RED	025-0005-02	10"	
E123	E523	18AWG RED/WHT	025-0005-12	10"	
E124	E524	26AWG YEL	025-0018-44	9.5"	
E125	E604	20AWG BLK	025-0004-00	1.5"	2
E126	E602	26AWG GRY/WHT	025-0018-89	3.25"	2
E127	E140	20AWG TINNED COPPER	026-0004-00	2.50"	1
E138	E146	20AWG TINNED COPPER	026-0004-00	2.30"	1
E128	E605	26AWG ORN/WHT	025-0004-13	7.5"	2
E139	E147	20AWG TINNED COPPER	026-0004-00	1.65"	1
E129 E155	E603 E607	COAX CABLE RG 178 B/U	026-0013-00	2.75"	2
E130 E154	E301 E302	COAX CABLE RG 178 B/U	026-0013-00	8.75"	
E131-1/14	P301	JUMPER CABLE	155-2030-18	3.55"	
E142	E144	20AWG TINNED COPPER	026-0004-00	1.25"	1
E132	E142	20AWG TINNED COPPER	026-0004-00	1.20"	1
E145	E148	20AWG TINNED COPPER	026-0004-00	5.75"	1
E133	C141	20AWG TINNED COPPER	026-0004-00	80"	1
E149	E150	26AWG GRN	025-0018-55	7"	3
E134	RT101	POSISTOR 470 OHM	134-1027-00		4
E135	RT101	POSISTOR 470 OHM	134-1027-00		4
E136	E148	20AWG TINNED COPPER	026-0004-00	1.40"	1
E151	E152	26AWG GRN/BLK	025-0018-50	7"	3
E137	E143	20AWG TINNED COPPER	026-0004-00	50"	1
E153	E601	20AWG ORN	025-0004-03	9.25"	2
E303 E304	E606 E608	COAX CABLE RG 178 B/U	026-0013-00	11"	2
E157 E154	E305 E306	COAX CABLE RG 178 B/U	026-0013-00	8.75"	
TP105	E704	26 AWG RED	025-0018-22	7.25"	6
E160	E708	26 AWG BLK	025-0018-00	8.0"	6
E161	E703	26 AWG WHT	025-0018-99	4.5"	6
E162	E707	26 AWG YEL	025-0018-44	8.0"	6
E163	E706	26 AWG ORN	025-0018-33	8.0"	6
E164	E702	26 AWG BRN	025-0018-11	5.5"	6
E165	E701	26 AWG BLU	025-0018-66	5.75"	6

NOTES:
1. REQUIRES 20 NAT. TEFLON TUBING 150-0005-10 THESE ITEMS ARE PART OF 200-2287-00
2. THESE ITEMS ARE PART OF 200-6047-00
3. THESE ITEMS ARE PART OF 200-6045-00
4. THESE ITEMS ARE PART OF 200-2287-00 THEY REQUIRE 22 NAT TEFLON TUBING 150-0004-10.
5. SOLDER GROUNDED SHIELD TO FENCE HERE.
6. FOR REMOTE MEMORY INCREMENT/TRANSFER PART OF 200-6687-00.
7. CUT PATH TO ISOLATE PAD BOTH NEARSIDE AND FARSIDE. TERMINATE ORANGE WIRE (025-0018-33) IN ISOLATED PAD. RUN MAGWIRE FARSIDE FROM ISOLATED PAD TO PIN 10 OF J114. THIS NOTE PERTAINS TO 064-1019-10,11,12,13,30,31,32,33,40, 41,42.

FIGURE 6-1 KY 196/196E COMMUNICATIONS TRANSCEIVER FINAL ASSEMBLY
(Dwg. No. 300-2371-00, R-22)
(Sheet 2 of 2)

SEE BLOW UP FICHE NO. KR2661. ITEM A

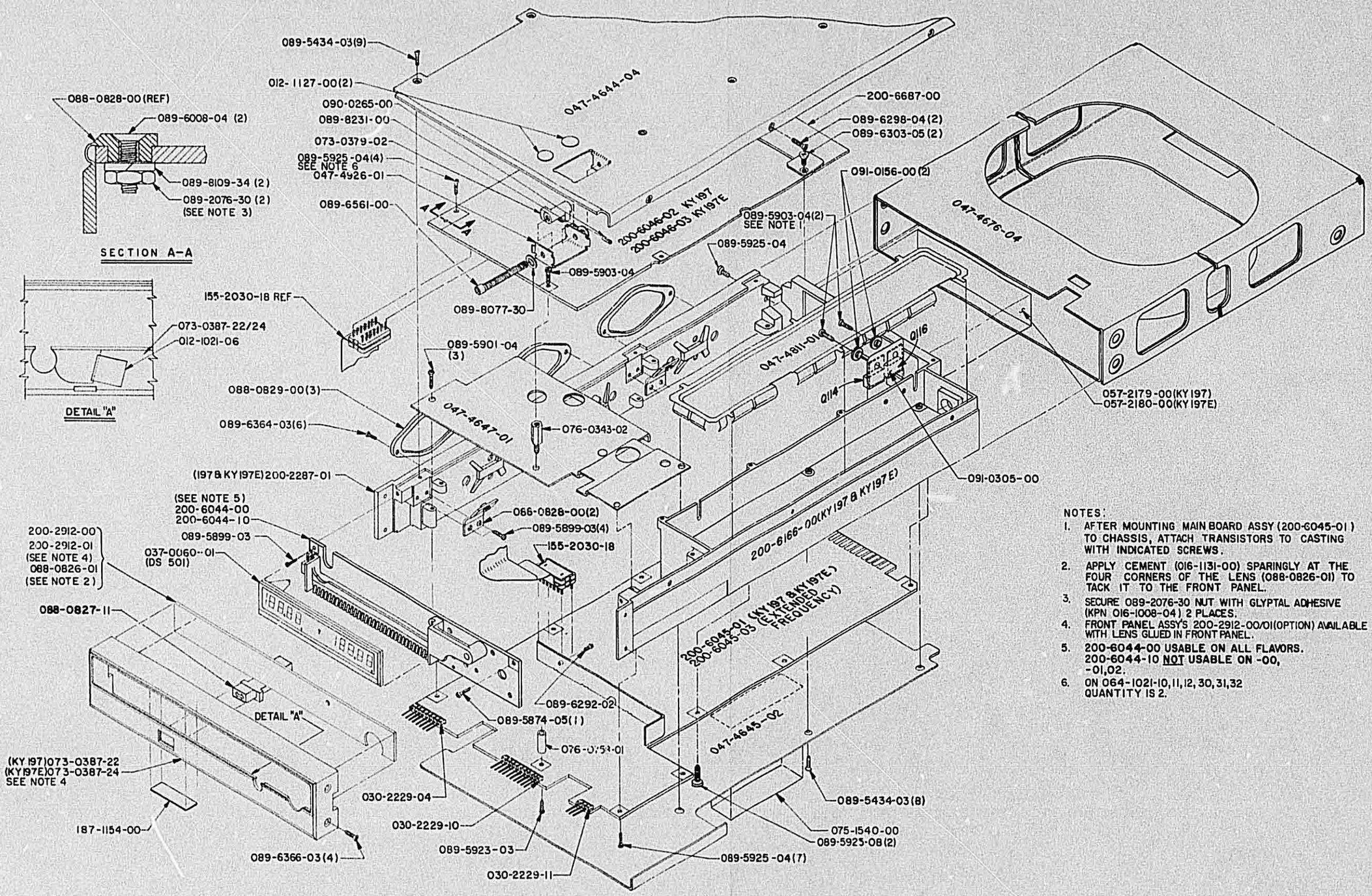
064-1021-00	197/MEM RE TR	R: 28
064-1021-01	XCVR KY 197E	R: 28
064-1021-05	197/MEM CHNL	R: 4
064-1021-06	197E/MEM CHNL	R: 4
064-1021-10	XCVR KY 197	R: 5
064-1021-11	197E/MEM RE TR	R: 4
064-1021-99	COMMON BOM	R: 15

SYMBOL	PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00	01	05	06	10	11	99
	012-1021-06	TAPE ELEC 3/8 WD		IN	.	.	.	.	.	.	3.60
	012-1127-00	TAG COVER		EA	.	.	.	.	.	.	2.00
	016-1008-04	GLYPTAL 7526 BL		AR	.	.	.	.	.	.	0.00
	016-1131-00	CNTCT CMT BND 1055		AR	.	.	.	.	.	.	0.00
	025-0005-02	WIRE 18 RED		IN	.	.	.	.	.	.	12.00
	025-0005-12	WIRE 18 RD/WH		IN	.	.	.	.	.	.	12.00
	025-0018-44	WIRE 26 YEL		IN	.	.	.	.	.	.	9.60
	026-0004-00	WIRE COP TIN 20G		IN	.	.	.	.	.	.	2.40
	026-0013-00	CA COAX RG178BU		IN	.	.	.	.	.	.	12.00
	030-2229-04	RGT ANG HDR 8P		EA	.	.	.	.	.	.	1.00
	030-2229-10	RGT ANG HDR 10P		EA	.	.	.	.	.	.	1.00
	030-2229-11	RGT ANG HDR 3P		EA	.	.	.	.	.	.	1.00
	047-4644-05	TOP CVR	A	EA	.	.	.	.	.	.	1.00
	047-4645-02	BTM CVR	A	EA	.	.	.	.	.	.	1.00
	047-4647-01	DGTL CVR	A	EA	.	.	.	.	.	.	1.00
	047-4676-04	MTG RACK	A	EA	.	.	.	.	.	.	1.00
	047-4811-01	COVER XMTR W/F	A	EA	.	.	.	.	.	.	1.00
	047-4926-01	SPREADER HD W/F		EA	.	.	.	.	.	.	1.00
	047-6406-01	BRACKET LEFT	A	EA	.	.	.	.	1.00	1.00	.
	047-6406-02	BRACKET RIGHT	A	EA	.	.	.	.	1.00	1.00	.
	057-1540-00	WARNING HV TAG		EA	.	.	.	.	.	.	1.00
	057-2179-00	S/N TAG		EA	1.00	.	1.00	.	1.00	.	.
	057-2180-00	S/N TAG		EA	.	1.00	.	1.00	.	1.00	.
	064-1021-99	COMMON BOM	A	EA	1.00	1.00	1.00	1.00	1.00	1.00	.
	073-0379-02	HOLD DOWN 80		EA	.	.	.	.	.	.	1.00
	076-0343-02	SPACER .425		EA	.	.	.	.	.	.	1.00
	076-0758-01	SPACER SHIELD W/F		EA	.	.	.	.	.	.	1.00
	088-0827-11	PUSHBUTTON	A	EA	.	.	.	.	.	.	1.00
	088-0828-00	HINGE FLEXIBLE		EA	.	.	.	.	.	.	2.00
	088-0829-00	INSL		EA	.	.	.	.	.	.	3.00
	089-2076-30	NUT HEX 4-40		EA	.	.	.	.	.	.	2.00
	089-2136-00	NUT HEX ESNA 2-56		EA	.	.	.	.	2.00	2.00	.
	089-5434-03	SCR FHP 3-48X3/16		EA	.	.	.	.	.	.	17.00
	089-5874-05	SCR PHP 2-56X5/16		EA	.	.	.	.	.	.	1.00
	089-5899-03	SCR PHP 2-56X3/16		EA	.	.	.	.	.	.	5.00
	089-5901-04	SCR PHP 3-48X1/4		EA	.	.	.	.	.	.	3.00
	089-5903-04	SCR PHP 4-40X1/4		EA	.	.	.	.	.	.	3.00
	089-5923-03	SCR BHP 2-56X3/16		EA	.	.	.	.	.	.	1.00
	089-5925-04	*SCR PHP 3-48X1/4		EA	12.00	12.00	12.00	12.00	10.00	10.00	.
	089-5925-08	*SCR PHP 3-48X1/2		EA	.	.	.	.	.	.	2.00
	089-6008-04	SCR FHP 4-40X1/4		EA	.	.	.	.	.	.	2.00
	089-6292-02	SCR PHP 2-56X1/8		EA	.	.	.	.	.	.	1.00
	089-6298-04	SCR FHPH 3-48X1/4		EA	.	.	.	.	.	.	2.00

064-1021-XX

SYMBOL	PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00	01	05	06	10	11	99
	089-6303-05	SCR FHP 3-48X5/16		EA	.	.	.	.	2.00	2.00	.
	089-6364-03	*SCR PHP 2-56X3/16		EA	.	.	.	.	.	.	6.00
	089-6366-03	*SCR PHP 2-56X3/16		EA	.	.	.	.	.	.	4.00
	089-6561-00	RETAINING SCREW		EA	.	.	.	.	.	.	1.00
	089-8077-30	WASHER		EA	.	.	.	.	.	.	1.00
	089-8109-34	WSHR SPLT LK #4		EA	.	.	.	.	.	.	2.00
	089-8231-00	WASHER FLAT		EA	.	.	.	.	.	.	1.00
	090-0265-00	GROOVE PIN TYPE 5		EA	.	.	.	.	.	.	1.00
	091-0072-00	CABLE CLAMP 0		EA	.	.	.	.	1.00	1.00	.
	091-0109-00	CABLE TIE .234		EA	.	.	.	.	.	.	5.00
	091-0156-00	BUSHING		EA	.	.	.	.	.	.	2.00
	091-0305-00	INSULATOR		EA	.	.	.	.	.	.	1.00
	150-0048-10	SHRNK TUBING WHT		AR	.	.	.	.	.	.	0.00
	150-0049-10	TUBING SHRINK WHT		AR	.	.	.	.	.	.	0.00
	150-0103-00	SLDR SLEEVE		EA	.	.	.	.	.	.	1.00
	155-2030-18	JMPR CABLE 3.55	A	EA	.	.	.	.	.	.	1.00
	187-1154-00	PAD		EA	.	.	.	.	.	.	1.00
	200-2287-01	MOD HEATSINK KY197	A	EA	.	.	.	.	.	.	1.00
	200-2912-00	FRONT PANEL ASSY	A	EA	1.00	.	1.00	.	1.00	.	.
	200-2912-01	FRONT PANEL ASSY	A	EA	.	1.00	.	1.00	.	1.00	.
	200-6044-00	DISPLAY BD ASSY	A	EA	1.00	1.00	.	.	.	.	.
	200-6044-10	DISPLAY BOARD	A	EA	.	.	1.00	1.00	1.00	1.00	.
	200-6045-01	MAIN BD KY 197	A	EA	1.00	1.00	.	.	.	.	.
	200-6045-05	MAIN BD KY 196	A	EA	.	.	1.00	1.00	1.00	1.00	.
	200-6046-00	RCVR KY196/197	A	EA	1.00	.	1.00	.	1.00	.	.
	200-6046-01	RCVR KY196E/197E	A	EA	.	1.00	.	1.00	.	1.00	.
	200-6166-00	XMTR BD KY 197	A	EA	.	.	.	.	.	.	1.00
	200-6687-00	MOD BD ASSY	A	EA	.	.	.	.	1.00	1.00	.
DS 501	037-0060-01	DISPLAY		EA	.	.	.	.	.	.	1.00
L 114	013-0006-01	FERR BEAD		EA	.	.	.	.	.	.	1.00
L 115	013-0006-01	FERR BEAD		EA	.	.	.	.	.	.	1.00
Q 114	007-0381-02	XSTR NPN X44E236		EA	.	.	.	.	.	.	1.00
Q 116	007-0205-00	XSTR PNP X45C613		EA	.	.	.	.	.	.	1.00

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER

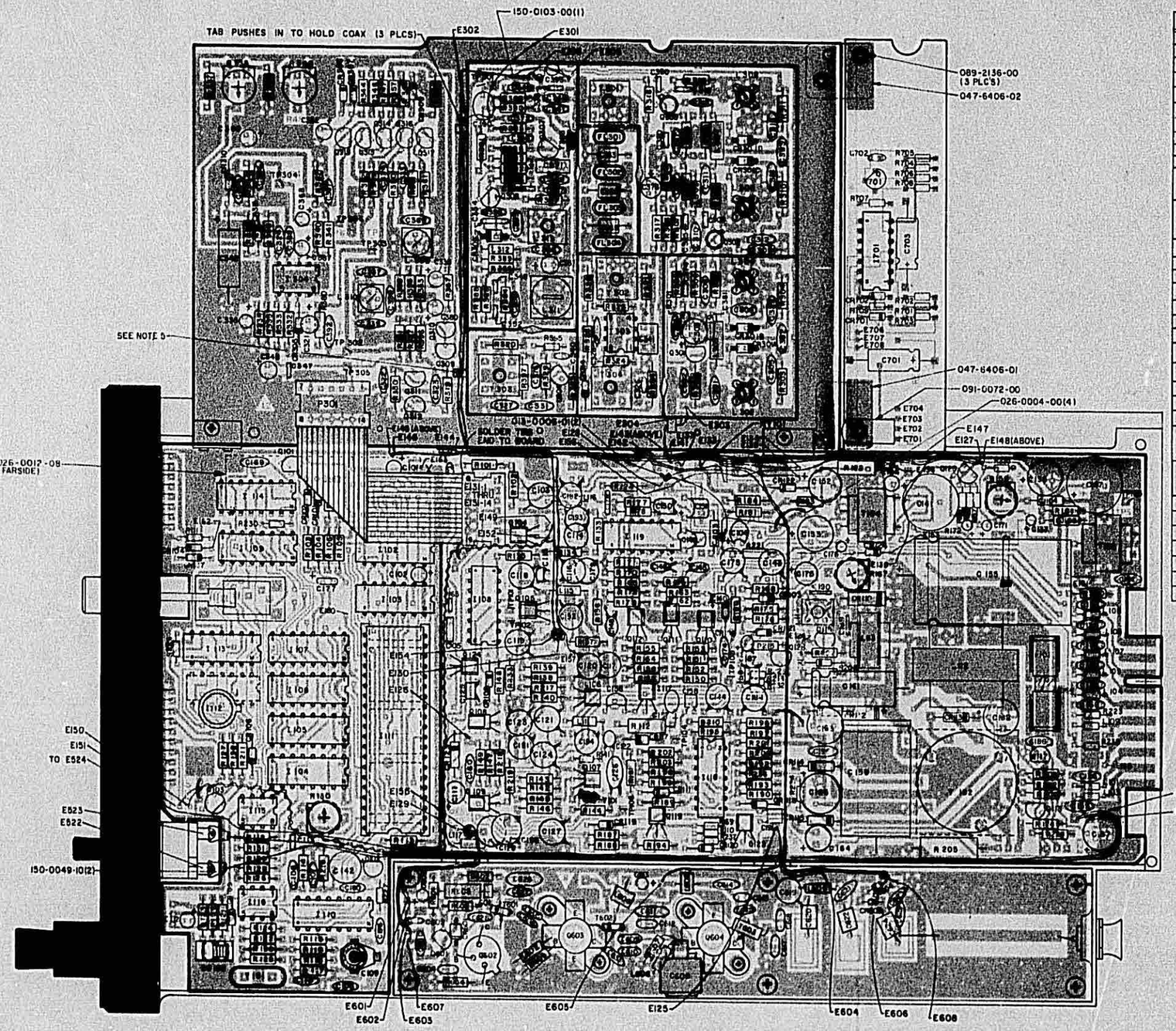


NOTES:

1. AFTER MOUNTING MAIN BOARD ASSY (200-6045-01) TO CHASSIS, ATTACH TRANSISTORS TO CASTING WITH INDICATED SCREWS.
2. APPLY CEMENT (016-1131-00) SPARINGLY AT THE FOUR CORNERS OF THE LENS (088-0826-01) TO TACK IT TO THE FRONT PANEL.
3. SECURE 089-2076-30 NUT WITH GLYPTAL ADHESIVE (KPN 016-1008-04) 2 PLACES.
4. FRONT PANEL ASSY'S 200-2912-00/01(OPTION) AVAILABLE WITH LENS GLUED IN FRONT PANEL.
5. 200-6044-00 USABLE ON ALL FLAVORS. 200-6044-10 NOT USABLE ON -00, -01,02.
6. ON 064-1021-10,11,12,30,31,32 QUANTITY IS 2.

FIGURE 6-2 KY 197/197E COMMUNICATIONS TRANSCEIVER FINAL ASSEMBLY
(Dwg. No. 300-2371-01, R-24)
(Sheet 1 of 2)

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER



FROM	TO	DESCRIPTION	KPN	INCHES	SEE NOTE
E122	E522	18AWG RED	025-0005-02	10	
E123	E523	18AWG RED/WHT	025-0005-12	10	
E124	E524	26AWG YEL	025-0018-44	9.5	
E125	E604	20AWG BLK	025-0004-00	3	2
E126	E602	26AWG GRY/WHT	025-0018-89	3.25	2
E127	E139	20AWG TINNED COPPER	026-0004-00	1.95	1
E156	E147	20AWG TINNED CUPPER	026-0004-00	2.65	1
E128	E605	20AWG ORN/WHT	025-0004-13	7.5	2
E146	E147	20AWG TINNED COPPER	026-0004-00	5.15	1
E129 L155	E603 L607	COAX CABLE RG 176 B/U	024-0013-00	2.75	2
E130 E154	E301 E302	COAX CABLE RG 178 B/U	026-0013-00	8.75	
E131-1/14	P301	JUMPER CABLE	155-2030-18	3.55	
E148	E144	20AWG TINNED COPPER	026-0004-00	4.9	1
E132	E142	20AWG TINNED COPPER	026-0004-00	1.8	1
E145	E136	20AWG TINNED COPPER	026-0004-00	6.00	1
E133	E141	20AWG TINNED COPPER	026-0004-00	0.8	1
E149	E150	26AWG GRN	025-0018-55	7	3
E134	RT101	POSISTOR 470 OHM	134-1027-00		4
E135	RT101	POSISTOR 470 OHM	134-1027-00		4
E127	E142	20AWG TINNED COPPER	026-0004-00	3.45	1
E151	E152	26AWG GRN/BLK	025-0018-50	7	3
E137	E143	20AWG TINNED COPPER	026-0004-00	0.5	1
E153	E601	20AWG ORN	025-0004-03	9.25	2
E303 E304	E606 E608	COAX CABLE RG 178 B/U	026-0013-00	11	2
E157 E154	E305 E306	COAX CABLE RG 178 B/U	026-0013-00	8.75	
TP106	E704	26 AWG RED	025-0018-22	7.25	6
E160	E708	26 AWG BLK	025-0018-00	8.0	6
E161	E703	26 AWG WHT	025-0018-99	4.5	6
E162	E707	26 AWG YEL	025-0018-44	8.0	6
E163	E706	26 AWG ORN	025-0018-33	8.0	6
E164	E702	26 AWG BRN	025-0018-11	5.5	6
E165	E701	26 AWG BLU	025-0018-66	5.75	6

NOTES

1. REQUIRES 20 NAT. TEFLON TUBING 150-0005-10. THESE ITEMS ARE PART OF 200-2287-01
2. THESE ITEMS ARE PART OF 200-6166-00
3. THESE ITEMS ARE PART OF 200-6045-01.
4. THESE ITEMS ARE PART OF 200-2287-01 THEY REQUIRE 22 NAT TEFLON TUBING 150-0004-10
5. SOLDER SHIELD CABLE TO FENCE
6. FOR REMOTE MEMORY INCREMENT/TRANSFER PART OF 200-6687-00
7. CUT PATH TO ISOLATE PAD BOTH NEARSIDE AND FARSIDE. TERMINATE ORANGE WIRE (025-0018-33) IN ISOLATED PAD. RUN MAGWIRE FARSIDE FROM ISOLATED PAD TO PIN 10 OF I114. THIS NOTE PERTAINS TO 064-1021-10,11,12,30,31,32.

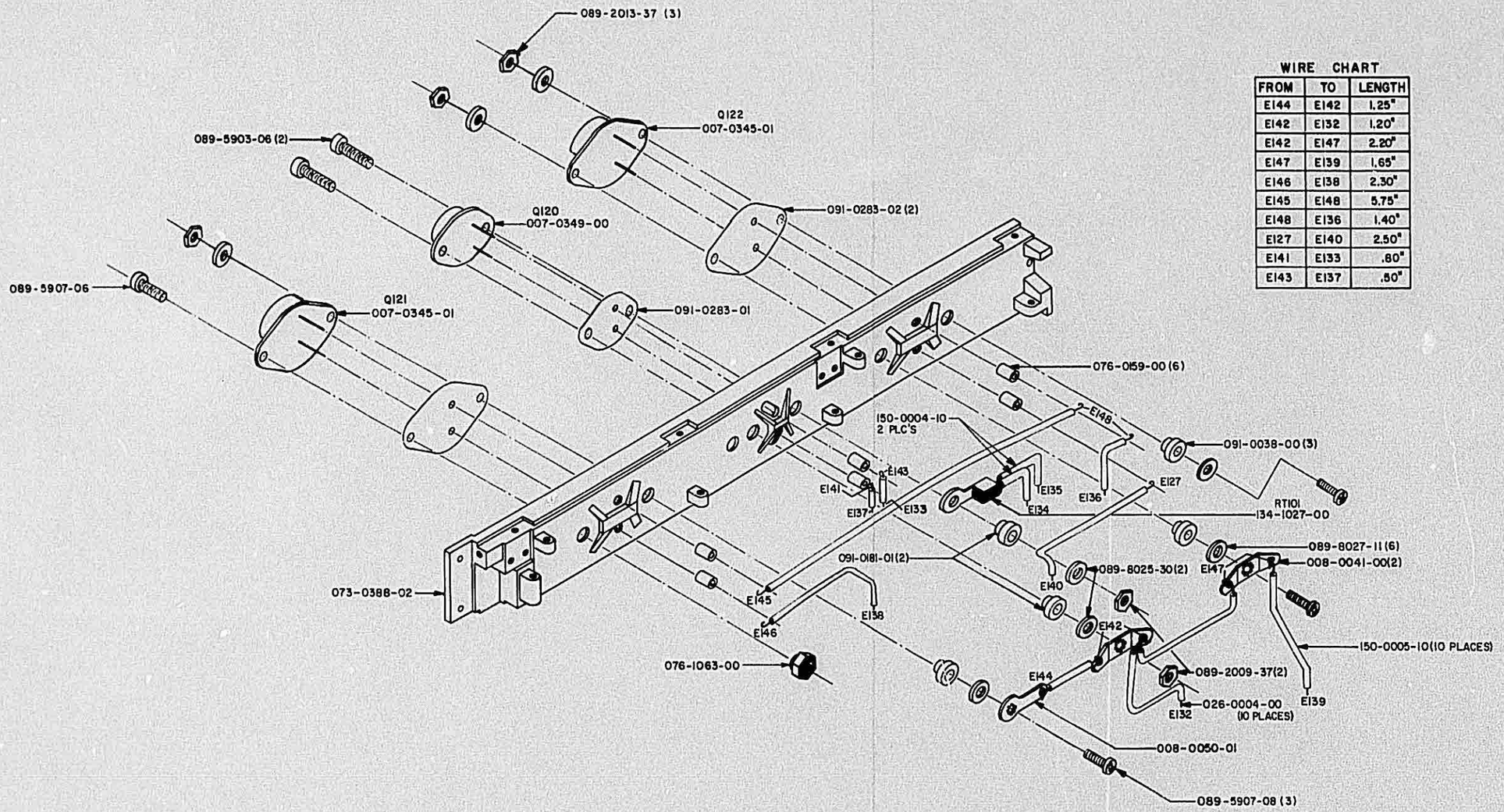
FIGURE 6-2 KY 197/197E COMMUNICATIONS TRANSCEIVER FINAL ASSEMBLY
(Dwg. No. 300-2371-01, R-24)
(Sheet 2 of 2)

SEE BLOW UP FICHE NO. KR2661 ITEM B

200-2287-00 MOD HEATSINK KY196 R: 10
200-2287-01 MOD HEATSINK KY197 R: 10
200-2267-99 COMMON BOM R: 1

SYMBOL		PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00	01	99
		008-0041-00	SLDR LUG, DUEL		EA	.	.	2.00
		008-0050-01	GND LUG		EA	.	.	1.00
		026-0004-00	WIRE COP TIN 20G		FT	.	.	1.70
		073-0388-02	HEAT SINK 196	A	EA	.	.	1.00
		076-0159-00	SPACER INSUL		EA	.	.	6.00
		076-1063-00	NYLON HEX NUT		EA	.	.	1.00
		089-2004-37	NUT HEX 4-40		EA	.	.	2.00
		089-2013-37	NUT HEX 6-32		EA	.	.	3.00
		089-5903-06	SCR PHP 4-40X3/4		EA	.	.	2.00
		089-5907-06	SCR PHP 6-32X3/8		EA	.	.	1.00
		089-5907-08	SCR PHP 6-32X1/2		EA	.	.	3.00
		089-8025-30	WSHR FLT STD #4		EA	.	.	2.00
		089-8027-11	WSHR FLT STD #6		EA	.	.	6.00
		091-0038-00	WASHER EXTRD NYLON		EA	.	.	3.00
		091-0161-01	BUSHING INSUL		EA	.	.	2.00
		091-0283-01	TO-3 INSULATOR		EA	.	.	1.00
		091-0283-02	TO-3 INSULATOR		EA	.	.	2.00
		150-0004-10	TUBING TFLN 22AWG		FT	.	.	0.50
		150-0005-10	TUBING TFLN 20AWG		FT	.	.	1.00
		200-2267-99	COMMON BOM	A	EA	1.00	1.00	.
Q	120	007-0349-00	XSTR S PWR 2N6300		EA	.	.	1.00
Q	121	007-0058-01	XSTR 2N3055		EA	.	1.00	.
Q	121	007-0345-01	XSTR S NPN 2N6058		EA	1.00	.	.
Q	122	007-0201-02	XSTR NPN 2N5879		EA	.	1.00	.
Q	122	007-0345-01	XSTR S NPN 2N6058		EA	1.00	.	.
RT	101	134-1027-00	POSISTOR BE		EA	.	.	1.00

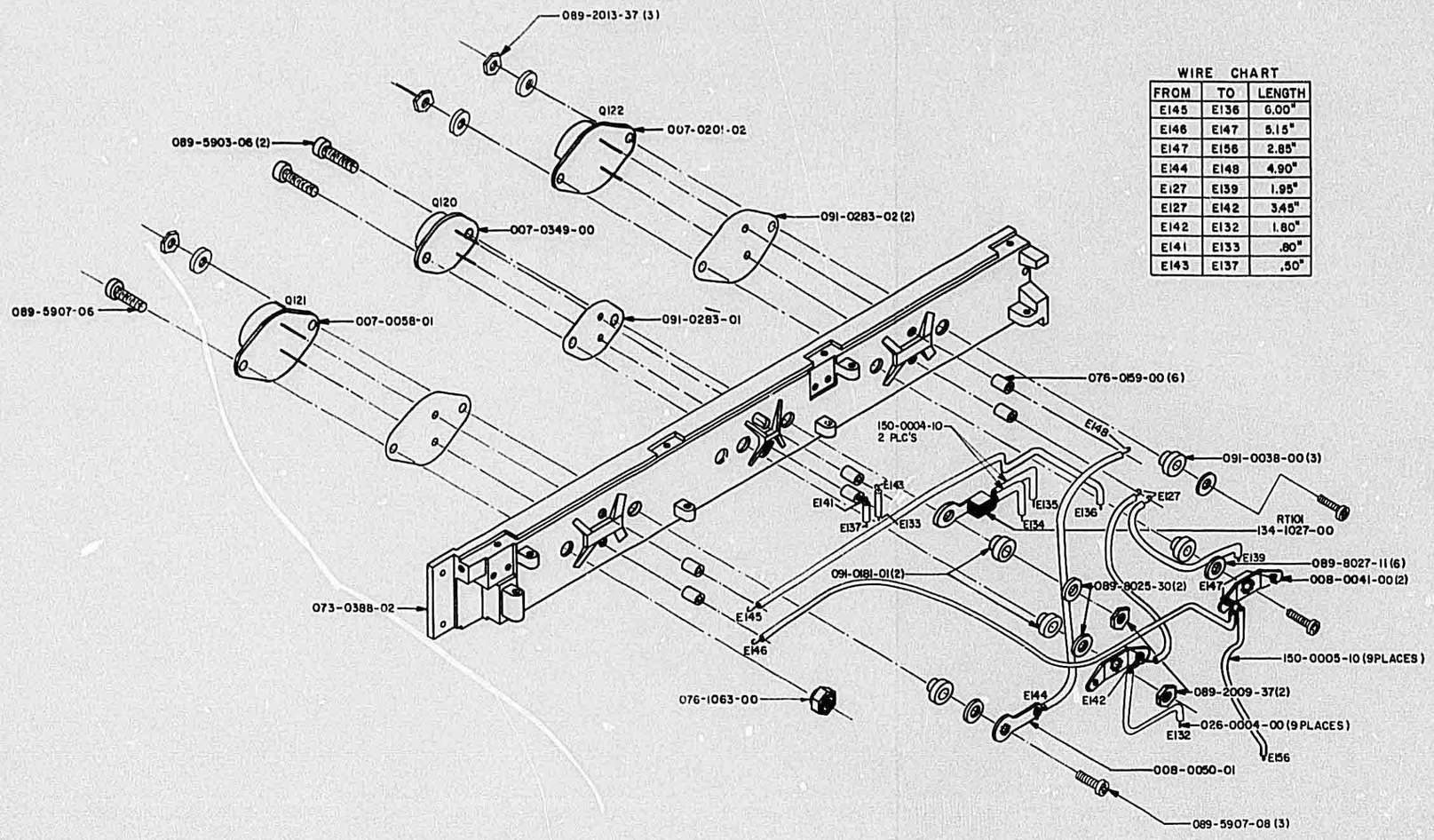
KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER



WIRE CHART

FROM	TO	LENGTH
E144	E142	1.25"
E142	E132	1.20"
E142	E147	2.20"
E147	E139	1.65"
E146	E138	2.30"
E145	E148	5.75"
E148	E136	1.40"
E127	E140	2.50"
E141	E133	.80"
E143	E137	.50"

FIGURE 6-3 KY 196/196E MODULATOR HEATSINK ASSEMBLY
(Dwg. No. 300-2287-00, R-5)



WIRE CHART

FROM	TO	LENGTH
E145	E136	6.00"
E146	E147	5.15"
E147	E156	2.85"
E144	E148	4.90"
E127	E139	1.95"
E127	E142	3.45"
E142	E132	1.80"
E141	E133	.80"
E143	E137	.50"

FIGURE 6-4 KY 197/197E MODULATOR HEATSINK ASSEMBLY
(Dwg. No. 300-2287-01, R-5)

200-6045-00 MAIN BD KY 196 R: 49
200-6045-01 MAIN BD KY 197 R: 50
200-6045-04 MAIN BD KY 196 R: 5
200-6045-05 MAIN BD KY 196 R: 5
200-6045-99 COMMON BOM R: 17

SYMBOL	PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00	01	04	05	99
	008-0011-01	TERM SPLIT TURR		EA	.	.	.	.	2.00
	008-0038-01	TERM BIFUR .084L		EA	.	.	.	.	2.00
	009-6045-01	PC BD MAIN		EA	.	.	.	.	1.00
	012-1142-00	INSUL REG SHLD		EA	.	.	.	.	1.00
	016-1040-00	COATING TYPE AR		AR	.	.	.	.	0.00
	025-0018-50	WIRE 26 GN/BK		AR	.	.	.	.	0.00
	025-0018-55	WIRE 26 GRN		AR	.	.	.	.	0.00
	026-0002-00	WIRE COP TIN 24G		AR	.	.	.	.	0.00
	026-0004-00	WIRE COP TIN 20G		AR	.	.	.	.	0.00
	047-4648-01	DIGITAL FENCE W/F	A	EA	.	.	.	.	1.00
	047-4652-01	REG SHIELD W/F	A	EA	.	.	.	.	1.00
	047-4655-01	MTG BRKT W/F		EA	.	.	.	.	1.00
	088-0831-00	SW HLDR		EA	.	.	.	.	1.00
	090-0213-00	FUSE CLIP 1/4"		EA	.	.	.	.	2.00
	091-0109-03	CABLE TIE .195		EA	.	.	.	.	1.00
	091-0196-00	STANDOFF BEAD		EA	.	.	.	.	3.00
	150-0017-10	TUBING SHRINK 24G		AR	.	.	.	.	0.00
	200-6045-99	COMMON BOM	A	EA	1.00	1.00	1.00	1.00	.
C 101	096-1082-47	CAP TN 1UF 20V		EA	.	.	.	.	1.00
C 102	096-1082-47	CAP TN 1UF 20V		EA	.	.	.	.	1.00
C 103	113-3100-01	CAP DC 10PF 500V		EA	.	.	.	.	1.00
C 104	096-1082-05	CAP TN 10UF 20V		EA	.	.	.	.	1.00
C 105	111-0001-13	CAP CR .1UF 50V		EA	.	.	.	.	1.00
C 106	113-3330-00	CAP DC 33PF 500V		EA	.	.	.	.	1.00
C 107	113-3150-00	CAP DC 15PF 500V		EA	.	.	.	.	1.00
C 108	113-3150-00	CAP DC 15PF 500V		EA	.	.	.	.	1.00
C 109	102-0029-00	CAP VA2.5-20PF500V		EA	.	.	.	.	1.00
C 110	113-5331-00	CAP DC 330PF 500V		EA	.	.	.	.	1.00
C 111	096-1082-05	CAP TN 10UF 20V		EA	.	.	.	.	1.00
C 112	096-1082-47	CAP TN 1UF 20V		EA	.	.	.	.	1.00
C 113	111-0001-00	CAP CR .01UF 50V		EA	.	.	.	.	1.00
C 114	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 115	111-0001-00	CAP CR .01UF 50V		EA	.	.	.	.	1.00
C 116	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 117	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 118	113-3100-01	CAP DC 10PF 500V		EA	.	.	.	.	1.00
C 119	113-5022-00	CAP DC 2.2PF 500V		EA	.	.	.	.	1.00
C 120	113-3100-01	CAP DC 10PF 500V		EA	.	.	.	.	1.00
C 121	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 122	096-1082-47	CAP TN 1UF 20V		EA	.	.	.	.	1.00
C 123	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 124	113-3150-00	CAP DC 15PF 500V		EA	.	.	.	.	1.00
C 125	111-0001-13	CAP CR .1UF 50V		EA	.	.	.	.	1.00
C 126	096-1082-47	CAP TN 1UF 20V		EA	.	.	.	.	1.00
C 127	113-5301-00	CAP DC 300PF 500V		EA	.	.	.	.	1.00

200-6045-XX

SYMBOL	PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00	01	04	05	99
C 128	113-3390-00	CAP DC 39PF 500V		EA	.	.	.	.	1.00
C 129	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 130	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 131	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 132	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 133	113-3221-00	CAP DC 220PF 500V		EA	1.00	.	1.00	.	.
C 134	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 135	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 136	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 137	096-1082-47	CAP TN 1UF 20V		EA	.	.	.	.	1.00
C 138	096-1082-08	CAP TN 100UF 15V		EA	.	.	.	.	1.00
C 139	113-3221-00	CAP DC 220PF 500V		EA	.	1.00	.	1.00	.
C 140	096-1082-12	CAP TN 3.3UF 15V		EA	.	.	.	.	1.00
C 141	097-0081-44	CAP AL 100UF 25V		EA	.	.	.	.	1.00
C 142	096-1082-01	CAP TN 220UF 10V		EA	.	.	.	.	1.00
C 143	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 144	113-5102-00	CAP DC .001UF 500V		EA	.	.	.	.	1.00
C 145	096-1082-14	CAP TN .68UF 20V		EA	.	.	.	.	1.00
C 146	096-1082-13	CAP TN .33UF 20V		EA	.	.	.	.	1.00
C 147	097-0068-16	CAP AL 150UF 35V		EA	.	.	.	.	1.00
C 148	096-1082-47	CAP TN 1UF 20V		EA	.	.	.	.	1.00
C 149	111-0001-13	CAP CR .1UF 50V		EA	.	.	.	.	1.00
C 150	096-1082-47	CAP TN 1UF 20V		EA	.	.	.	.	1.00
C 151	111-0001-02	CAP CR .015UF 50V		EA	1.00	.	1.00	.	.
C 151	111-0001-11	CAP CR .047UF 50V		EA	.	1.00	.	1.00	.
C 152	096-1082-28	CAP TN 47UF 20V		EA	.	.	.	.	1.00
C 153	097-0068-17	CAP AL 150UF 16V		EA	.	.	.	.	1.00
C 154	096-1082-33	CAP TN .47UF 50V		EA	.	.	.	.	1.00
C 155	097-0070-04	CAP AL 2200UF 25V		EA	.	1.00	.	.	.
C 155	097-0072-00	CAP AL 1KUF 50V		EA	1.00	.	.	.	.
C 155	097-0092-22	CAP EL 2200UF 25V		EA	.	.	.	1.00	.
C 155	097-0095-20	CAP EL 1KUF 50V		EA	.	.	1.00	.	.
C 156	111-0001-13	CAP CR .1UF 50V		EA	.	.	.	.	1.00
C 157	096-1082-47	CAP TN 1UF 20V		EA	.	.	.	.	1.00
C 158	111-0001-34	CAP CR 1500PF 50V		EA	.	.	.	.	1.00
C 159	097-0057-37	CAP AL 680UF 40V		EA	.	.	.	.	1.00
C 160	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 161	097-0074-03	CAP AL 2UF 350V		EA	.	.	.	.	1.00
C 162	096-1082-07	CAP TN 68UF 20V		EA	.	.	.	.	1.00
C 163	096-1082-01	CAP TN 220UF 10V		EA	.	.	.	.	1.00
C 164	097-0068-22	CAP AL 4.7UF 50V		EA	.	.	.	.	1.00
C 165	111-0001-00	CAP CR .01UF 50V		EA	.	.	.	.	1.00
C 166	096-1082-08	CAP TN 100UF 15V		EA	.	.	.	.	1.00
C 167	096-1082-08	CAP TN 100UF 15V		EA	.	.	.	.	1.00
C 168	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 170	113-5471-00	CAP DC 470PF 500V		EA	.	.	.	.	1.00
C 171	096-1082-47	CAP TN 1UF 20V		EA	.	.	.	.	1.00
C 172	096-1082-47	CAP TN 1UF 20V		EA	.	.	.	.	1.00
C 173	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 174	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 175	096-1082-09	CAP TN 15UF 20V		EA	.	.	.	.	1.00
C 176	096-1082-49	CAP TN 1UF 50V		EA	.	.	.	.	1.00
C 177	096-1082-05	CAP TN 10UF 20V		EA	.	.	.	.	1.00
C 178	111-0001-03	CAP CR .22UF 50V		EA	.	1.00	.	1.00	.
C 178	111-0001-13	CAP CR .1UF 50V		EA	1.00	.	1.00	.	.
C 179	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 180	113-5102-00	CAP DC .001UF 500V		EA	.	.	.	.	1.00
C 181	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 182	113-3121-00	CAP DC 120PF 500V		EA	.	.	.	.	1.00
C 184	113-5331-00	CAP DC 330PF 500V		EA	.	.	.	.	1.00
C 185	113-5471-00	CAP DC 470PF 500V		EA	.	.	.	.	1.00

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SYMBOL	PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00	01	04	05	99
C 186	113-3221-00	CAP DC 220PF 500V		EA	.	.	.	.	1.00
C 187	096-1082-05	CAP TN 10UF 20V		EA	.	.	.	.	1.00
C 188	111-0001-09	CAP CR .15UF 100V		EA	.	.	.	.	1.00
C 189	111-0001-11	CAP CR .047UF 50V		EA	.	.	.	.	1.00
C 190	111-0001-09	CAP CR .15UF 100V		EA	.	.	.	.	1.00
C 191	111-0001-66	CAP CR 33PF 50V		EA	.	.	.	.	1.00
C 192	113-3120-00	CAP DC 12PF 500V		EA	.	.	.	.	1.00
C 193	113-3047-00	CAP DC 4.7PF 500V		EA	.	.	.	.	1.00
C 194	113-3150-00	CAP DC 15PF 500V		EA	.	.	.	.	1.00
C 195	113-5330-00	CAP DC 33PF 1KV		EA	.	.	.	.	1.00
C 196	111-0001-13	CAP CR .1UF 50V		EA	.	.	.	.	1.00
C 197	111-0001-22	CAP CR .1UF 100V		EA	.	.	.	.	1.00
CJ 102	026-0018-00	WIRE CKTJMPR 22AWG		EA	1.00	.	1.00	.	.
CJ 103	026-0018-00	WIRE CKTJMPR 22AWG		EA	.	1.00	.	1.00	.
CJ 104	026-0018-00	WIRE CKTJMPR 22AWG		EA	.	.	.	.	1.00
CJ 105	026-0018-00	WIRE CKTJMPR 22AWG		IN	.	.	.	.	12.00
CR 101	007-6016-00	DIO S 1N4154		EA	.	.	.	.	1.00
CR 102	007-6016-00	DIO S 1N4154		EA	.	.	.	.	1.00
CR 103	007-6016-00	DIO S 1N4154		EA	.	.	.	.	1.00
CR 104	007-6016-00	DIO S 1N4154		EA	.	.	.	.	1.00
CR 105	007-6016-00	DIO S 1N4154		EA	.	.	.	.	1.00
CR 106	007-6016-00	DIO S 1N4154		EA	.	.	.	.	1.00
CR 107	007-6016-00	DIO S 1N4154		EA	.	.	.	.	1.00
CR 108	007-6016-00	DIO S 1N4154		EA	.	.	.	.	1.00
CR 109	007-6105-00	DIO HV FDH444		EA	.	.	.	.	1.00
CR 110	007-5039-00	DIO Z 33.3V		EA	.	.	.	.	1.00
CR 111	007-6105-00	DIO HV FDH444		EA	.	.	.	.	1.00
CR 112	007-6091-04	DIO MR818		EA	.	.	.	.	1.00
CR 113	007-6091-02	DIO MR811		EA	.	.	.	.	1.00
CR 114	007-6091-01	DIO MR810		EA	.	.	.	.	1.00
CR 115	007-6025-00	DIO S 1N4003		EA	.	.	.	.	1.00
CR 116	007-6106-00	DIO 1N4156		EA	.	.	.	.	1.00
CR 117	007-5011-24	DIO Z 33V 1W 5%		EA	.	.	.	.	1.00
CR 118	007-6016-00	DIO S 1N4154		EA	.	.	.	.	1.00
CR 119	007-6105-00	DIO HV FDH444		EA	.	.	.	.	1.00
CR 120	007-6105-00	DIO HV FDH444		EA	1.00	.	1.00	.	.
CR 120	007-6111-00	DIO 1N4157		EA	.	1.00	.	1.00	.
CR 121	007-6016-00	DIO S 1N4154		EA	.	.	.	.	1.00
CR 122	007-6105-00	DIO HV FDH444		EA	.	.	.	.	1.00
CR 123	007-6023-00	DIO G 1N277		EA	.	.	.	.	1.00
CR 124	007-6105-00	DIO HV FDH444		EA	.	.	.	.	1.00
F 101	036-0058-07	FUSE AGA 32V 10A		EA	.	.	.	.	1.00
I 101	120-4006-01	IC SP8647B		EA	.	.	.	.	1.00
I 102	120-0123-00	IC SN74LS113N		EA	.	.	.	.	1.00
I 103	120-0079-00	IC SN74LS00N		EA	.	.	.	.	1.00
I 104	120-0088-00	IC SN74LS163N		EA	.	.	.	.	1.00
I 105	120-0087-00	IC SN74LS162N		EA	.	.	.	.	1.00
I 106	120-0088-00	IC SN74LS163N		EA	.	.	.	.	1.00
I 107	120-0087-00	IC SN74LS162N		EA	.	.	.	.	1.00
I 108	120-6038-01	IC CMOS MC14046BCL		EA	.	.	.	.	1.00
I 109	120-6062-00	IC CD40109BFX		EA	.	.	.	.	1.00
I 110	120-6055-01	IC SCL4060ABC+		EA	.	.	.	.	1.00
I 111	120-2032-01	M/COMPUTER P8048		EA	1.00	1.00	.	.	.
I 111	122-0024-01	KY196/197 CNTRL PR		EA	.	.	1.00	1.00	.
I 112	120-2028-01	IC ER1400		EA	.	.	.	.	1.00
I 113	120-0125-00	IC DS88L12N		EA	.	.	.	.	1.00
I 114	120-6062-00	IC CD40109BFX		EA	.	.	.	.	1.00

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SYMBOL	PART NUMBER	DESCRIPTION	A UM	QUANTITY 00	01	04	05	99
I 115	120-3040-01	IC NE555P	EA	.	.	.	.	1.00
I 116	120-3053-00	IC LM358N	EA	.	.	.	.	1.00
I 117	120-3094-32	IC LM340LAZ-5.0	EA	.	.	.	.	1.00
I 118	120-3048-00	IC LM339N	EA	.	.	.	.	1.00
I 119	120-3190-00	AUDIO AMP LM1877N	EA	.	.	.	.	1.00
L 101	013-0006-03	FERR BEAD	EA	.	.	.	.	1.00
L 102	013-0006-03	FERR BEAD	EA	1.00	.	1.00	.	.
L 103	013-0006-03	FERR BEAD	EA	.	.	.	.	1.00
L 104	013-0006-03	FERR BEAD	EA	.	.	.	.	1.00
L 105	013-0006-03	FERR BEAD	EA	.	.	.	.	1.00
L 106	013-0006-03	FERR BEAD	EA	.	.	.	.	1.00
L 107	013-0006-03	FERR BEAD	EA	.	.	.	.	1.00
L 108	013-0006-03	FERR BEAD	EA	.	.	.	.	1.00
L 109	013-0006-03	FERR BEAD	EA	.	.	.	.	1.00
L 111	019-2084-01	CH .15UH 10%	EA	.	1.00	.	1.00	.
L 112	019-2209-00	CHOKE FILTER	EA	.	.	.	.	1.00
L 113	019-2279-00	CHOKE 500UH	EA	.	.	.	.	1.00
L 114	019-8078-00	COIL TUN 20MH	EA	.	.	.	.	1.00
L 115	019-2084-01	CH .15UH 10%	EA	.	.	.	.	1.00
L 116	019-2084-01	CH .15UH 10%	EA	.	.	.	.	1.00
L 117	019-2084-01	CH .15UH 10%	EA	.	.	.	.	1.00
Q 101	007-0238-00	XSTR S PNP FPN4917	EA	.	.	.	.	1.00
Q 102	007-0078-00	XSTR S NPN 2N3415	EA	.	.	.	.	1.00
Q 103	007-0078-00	XSTR S NPN 2N3415	EA	.	.	.	.	1.00
Q 104	007-0195-00	XSTR S MPSH10	EA	.	.	.	.	1.00
Q 105	007-0195-00	XSTR S MPSH10	EA	.	.	.	.	1.00
Q 106	007-0195-00	XSTR S MPSH10	EA	.	.	.	.	1.00
Q 107	007-0195-00	XSTR S MPSH10	EA	.	.	.	.	1.00
Q 108	007-0078-00	XSTR S NPN 2N3415	EA	.	.	.	.	1.00
Q 109	007-0078-00	XSTR S NPN 2N3415	EA	.	.	.	.	1.00
Q 110	007-0238-00	XSTR S PNP FPN4917	EA	.	.	.	.	1.00
Q 111	007-0078-00	XSTR S NPN 2N3415	EA	.	.	.	.	1.00
Q 112	007-0238-00	XSTR S PNP FPN4917	EA	.	.	.	.	1.00
Q 113	007-0211-02	XSTR S X38D5559	EA	.	.	.	.	1.00
Q 115	007-0254-00	XSTR S PNP MPSA92	EA	.	.	.	.	1.00
Q 117	007-0260-00	XSTR S NPN MPSA18	EA	.	.	.	.	1.00
Q 119	007-0078-01	XSTR S NPN 2N3417	EA	.	.	.	.	1.00
Q 123	007-0238-00	XSTR S PNP FPN4917	EA	.	.	.	.	1.00
Q 124	007-0238-00	XSTR S PNP FPN4917	AR	.	.	.	.	0.00
Q 125	007-0078-00	XSTR S NPN 2N3415	EA	.	.	.	.	1.00
Q 126	007-0280-01	XSTR E175/J175	EA	.	.	.	.	1.00
R 101	130-0271-23	RES FC 270 QW 5%	EA	.	.	.	.	1.00
R 102	130-0821-23	RES FC 820 QW 5%	EA	.	.	.	.	1.00
R 103	130-0221-23	RES FC 220 QW 5%	EA	.	.	.	.	1.00
R 104	130-0182-23	RES FC 1.8K QW 5%	EA	.	.	.	.	1.00
R 105	130-0331-23	RES FC 330 QW 5%	EA	.	.	.	.	1.00
R 106	130-0331-23	RES FC 330 QW 5%	EA	.	.	.	.	1.00
R 107	130-0681-23	RES FC 680 QW 5%	EA	.	.	.	.	1.00
R 108	130-0681-23	RES FC 680 QW 5%	EA	.	.	.	.	1.00
R 109	130-0473-23	RES FC 47K QW 5%	EA	.	.	.	.	1.00
R 110	131-0103-13	RES CF 10K EW 5%	EA	.	.	.	.	1.00
R 111	130-0473-13	RES FC 47K TW 5%	EA	.	.	.	.	1.00
R 112	130-0681-33	RES FC 680 HW 5%	EA	.	.	.	.	1.00
R 113	130-0102-23	RES FC 1K QW 5%	EA	.	.	.	.	1.00
R 114	130-0223-23	RES FC 22K QW 5%	EA	.	.	.	.	1.00
R 115	130-0475-23	RES FC 4.7M QW 5%	EA	.	.	.	.	1.00
R 116	130-0471-23	RES FC 470 QW 5%	EA	.	.	.	.	1.00
R 117	130-0753-23	RES FC 75K QW 5%	EA	.	.	.	.	1.00

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SYMBOL	PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00	01	04	05	99
R 118	136-1622-72	RES PF 16.2K QW 1%		EA	.	.	.	.	1.00
R 119	130-0204-23	RES FC 200K QW 5%		EA	.	.	.	.	1.00
R 120	130-0683-23	RES FC 68K QW 5%		EA	.	.	.	.	1.00
R 121	130-0273-23	RES FC 27K QW 5%		EA	.	.	.	.	1.00
R 122	130-0823-23	RES FC 82K QW 5%		EA	.	.	.	.	1.00
R 123	130-0204-23	RES FC 200K QW 5%		EA	.	.	.	.	1.00
R 124	130-0683-23	RES FC 68K QW 5%		EA	.	.	.	.	1.00
R 125	130-0302-23	RES FC 3K QW 5%		EA	.	.	.	.	1.00
R 126	130-0394-23	RES FC 390K QW 5%		EA	.	.	.	.	1.00
R 127	130-0394-23	RES FC 390K QW 5%		EA	.	.	.	.	1.00
R 128	130-0104-23	RES FC 100K QW 5%		EA	.	.	.	.	1.00
R 129	130-0104-23	RES FC 100K QW 5%		EA	.	.	.	.	1.00
R 130	133-0150-02	TRIMMER RESISTOR		EA	.	.	.	.	1.00
R 131	136-2801-72	RES PF 2.8K QW 1%		EA	.	.	.	.	1.00
R 132	130-0472-23	RES FC 4.7K QW 5%		EA	.	.	.	.	1.00
R 133	130-0511-23	RES FC 510 QW 5%		EA	.	.	.	.	1.00
R 134	130-0622-23	RES FC 6.2K QW 5%		EA	.	.	.	.	1.00
R 135	130-0821-23	RES FC 820 QW 5%		EA	.	.	.	.	1.00
R 136	130-0621-23	RES FC 620 QW 5%		EA	.	.	.	.	1.00
R 137	130-0333-23	RES FC 33K QW 5%		EA	.	.	.	.	1.00
R 138	130-0242-23	RES FC 2.4K QW 5%		EA	.	.	.	.	1.00
R 139	131-0103-23	RES CF 10K QW 5%		EA	.	.	.	.	1.00
R 140	130-0301-23	RES FC 300 QW 5%		EA	.	.	.	.	1.00
R 141	130-0220-13	RES FC 22 TW 5%		EA	.	.	.	.	1.00
R 142	130-0332-23	RES FC 3.3K QW 5%		EA	.	.	.	.	1.00
R 143	131-0912-23	RES CF 9.1K QW 5%		EA	.	.	.	.	1.00
R 144	130-0470-23	RES FC 47 QW 5%		EA	.	.	.	.	1.00
R 145	130-0182-23	RES FC 1.8K QW 5%		EA	.	.	.	.	1.00
R 146	130-0331-23	RES FC 330 QW 5%		EA	.	.	.	.	1.00
R 147	130-0103-23	RES FC 10K QW 5%		EA	.	.	.	.	1.00
R 148	130-0104-23	RES FC 100K QW 5%		EA	.	.	.	.	1.00
R 149	130-0103-23	RES FC 10K QW 5%		EA	.	.	.	.	1.00
R 150	130-0511-23	RES FC 510 QW 5%		EA	.	.	.	.	1.00
R 151	130-0103-23	RES FC 10K QW 5%		EA	.	.	.	.	1.00
R 152	130-0302-23	RES FC 3K QW 5%		EA	.	.	.	.	1.00
R 153	130-0103-23	RES FC 10K QW 5%		EA	.	.	.	.	1.00
R 154	130-0681-23	RES FC 680 QW 5%		EA	.	.	.	.	1.00
R 155	130-0302-23	RES FC 3K QW 5%		EA	.	.	.	.	1.00
R 156	130-0162-23	RES FC 1.6K QW 5%		EA	.	.	.	.	1.00
R 157	131-0102-13	RES CF 1K EW 5%		EA	.	.	.	.	1.00
R 158	131-0753-13	RES CF 75K EW 5%		EA	.	.	.	.	1.00
R 159	133-0150-02	TRIMMER RESISTOR		EA	.	.	.	.	1.00
R 161	131-0511-23	RES CF 510 QW 5%		EA	.	.	.	.	1.00
R 162	131-0221-23	RES CF 220 QW 5%		EA	.	.	.	.	1.00
R 163	130-0221-23	RES FC 220 QW 5%		EA	.	.	.	.	1.00
R 164	130-0103-23	RES FC 10K QW 5%		EA	.	.	.	.	1.00
R 165	130-0361-23	RES FC 360 QW 5%		EA	.	.	.	.	1.00
R 166	130-0912-23	RES FC 9.1K QW 5%		EA	.	.	.	.	1.00
R 167	133-0150-06	TRIMMER RESISTOR		EA	.	.	.	.	1.00
R 168	136-1051-72	RES PF 1.05K QW 1%		EA	1.00	.	1.00	.	.
R 168	136-1151-72	RES PF 1.15K QW 1%		EA	.	1.00	.	1.00	.
R 169	130-0754-13	RES FC 750K TW 5%		EA	.	.	.	.	1.00
R 170	130-0471-23	RES FC 470 QW 5%		EA	.	.	.	.	1.00
R 171	130-0243-23	RES FC 24K QW 5%		EA	.	.	.	.	1.00
R 172	136-1003-72	RES PF 100K QW 1%		EA	.	.	.	.	1.00
R 173	136-1003-72	RES PF 100K QW 1%		EA	.	.	.	.	1.00
R 174	130-0120-23	RES FC 12 QW 5%		EA	.	.	.	.	1.00
R 175	136-1001-72	RES PF 1K QW 1%		EA	.	.	.	.	1.00
R 176	136-1072-72	RES PF 10.7K QW 1%		EA	.	1.00	.	1.00	.
R 176	136-4421-72	RES PF 4.42K QW 1%		EA	1.00	.	1.00	.	.
R 177	136-5361-72	RES PF 5.36K QW 1%		EA	.	1.00	.	1.00	.

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SYMBOL	PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00	01	04	05	99
R 177	136-9311-72	RES PF 9.31K QW 1%		EA	1.00	.	1.00	.	.
R 178	136-4753-72	RES PF 475K QW 1%		EA	.	.	.	.	1.00
R 179	131-0102-13	RES CF 1K EW 5%		EA	.	.	.	.	1.00
R 180	136-1001-72	RES PF 1K QW 1%		EA	1.00	.	1.00	.	.
R 180	136-1301-72	RES PF 1.3K QW 1%		EA	.	1.00	.	1.00	.
R 181	136-4531-72	RES PF 4.53K QW 1%		AR	.	0.00	.	0.00	.
R 181	136-4871-72	RES PF 4.87K QW 1%		AR	.	0.00	.	0.00	.
R 181	136-5361-72	RES PF 5.36K QW 1%		AR	.	.	.	.	0.00
R 181	136-5491-72	RES PF 5.49K QW 1%		AR	.	0.00	.	0.00	.
R 181	136-5621-72	RES PF 5.62K QW 1%		AR	0.00	.	0.00	.	.
R 181	136-5901-72	RES PF 5.9K QW 1%		AR	.	.	.	.	0.00
R 181	136-6341-72	RES PF 6.34K QW 1%		AR	.	.	.	.	0.00
R 181	136-6811-72	RES PF 6.81K QW 1%		AR	0.00	.	0.00	.	.
R 181	136-7321-72	RES PF 7.32K QW 1%		AR	0.00	.	0.00	.	.
R 182	134-0132-43	RES CC 1300 1W 5%		EA	.	.	.	.	1.00
R 183	130-0113-23	RES FC 11K QW 5%		EA	.	.	.	.	1.00
R 184	136-7501-72	RES PF 7.5K QW 1%		EA	.	.	.	.	1.00
R 185	132-5051-00	RES WW .15 2W 5%		EA	1.00	.	1.00	.	.
R 186	132-5051-00	RES WW .15 2W 5%		EA	1.00	.	1.00	.	.
R 187	130-0102-23	RES FC 1K QW 5%		EA	.	.	.	.	1.00
R 188	130-0912-23	RES FC 9.1K QW 5%		EA	.	.	.	.	1.00
R 189	136-2492-72	RES PF 24.9K QW 1%		EA	.	.	.	.	1.00
R 190	130-0223-23	RES FC 22K QW 5%		EA	.	.	.	.	1.00
R 191	136-2492-72	RES PF 24.9K QW 1%		EA	.	.	.	.	1.00
R 192	130-0363-23	RES FC 36K QW 5%		EA	.	.	.	.	1.00
R 193	130-0681-23	RES FC 680 QW 5%		EA	.	.	.	.	1.00
R 194	130-0472-23	RES FC 4.7K QW 5%		EA	.	.	.	.	1.00
R 195	130-0911-23	RES FC 910 QW 5%		EA	.	.	.	.	1.00
R 196	130-0433-23	RES FC 43K QW 5%		EA	.	.	.	.	1.00
R 197	130-0393-23	RES FC 39K QW 5%		EA	.	.	.	.	1.00
R 198	130-0104-23	RES FC 100K QW 5%		EA	.	.	.	.	1.00
R 199	130-0104-23	RES FC 100K QW 5%		EA	.	.	.	.	1.00
R 200	130-0822-23	RES FC 8.2K QW 5%		EA	.	.	.	.	1.00
R 201	136-4022-72	RES PF 40.2K QW 1%		EA	.	.	.	.	1.00
R 202	136-5621-72	RES PF 5.62K QW 1%		EA	.	.	.	.	1.00
R 203	130-0104-23	RES FC 100K QW 5%		EA	.	.	.	.	1.00
R 205	132-5046-00	RES WW .05 2W 5%		EA	.	.	.	.	1.00
R 206	130-0270-23	RES FC 27 QW 5%		EA	.	.	.	.	1.00
R 207	136-2213-72	RES PF 221K QW 1%		EA	.	.	.	.	1.00
R 208	130-0102-23	RES FC 1K QW 5%		EA	.	.	.	.	1.00
R 209	130-0223-23	RES FC 22K QW 5%		EA	.	.	.	.	1.00
R 210	130-0201-23	RES FC 200 QW 5%		EA	.	.	.	.	1.00
R 211	130-0203-23	RES FC 20K QW 5%		EA	.	.	.	.	1.00
R 214	130-0473-13	RES FC 47K TW 5%		EA	.	.	.	.	1.00
R 215	136-1331-72	RES PF 1.33K QW 1%		EA	.	.	.	.	1.00
R 216	130-0223-23	RES FC 22K QW 5%		EA	.	.	.	.	1.00
R 217	130-0182-23	RES FC 1.8K QW 5%		EA	.	.	.	.	1.00
R 218	130-0103-23	RES FC 10K QW 5%		EA	.	.	.	.	1.00
R 219	130-0102-23	RES FC 1K QW 5%		EA	.	.	.	.	1.00
R 220	130-0101-23	RES FC 100 QW 5%		EA	.	.	.	.	1.00
R 221	131-0221-23	RES CF 220 QW 5%		EA	.	.	.	.	1.00
R 222	130-0102-23	RES FC 1K QW 5%		EA	.	.	.	.	1.00
R 223	130-0101-13	RES FC 100 TW 5%		EA	.	.	.	.	1.00
R 224	136-3013-72	RES PF 301K QW 1%		EA	1.00	.	1.00	.	.
R 224	136-4023-72	RES PF 402K QW 1%		AR	.	0.00	.	0.00	.
R 224	136-4123-72	RES PF 412K QW 1%		AR	.	0.00	.	0.00	.
R 224	136-4223-72	RES PF 422K QW 1%		AR	.	0.00	.	0.00	.
R 224	136-4323-72	RES PF 432K QW 1%		AR	.	0.00	.	0.00	.
R 224	136-4523-72	RES PF 452K QW 1%		AR	.	0.00	.	0.00	.
R 224	136-4723-72	RES PF 472K QW 1%		AR	.	0.00	.	0.00	.
R 224	136-4993-72	RES PF 499K QW 1%		AR	.	0.00	.	0.00	.

200-6045-XX

SYMBOL		PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00	01	04	05	99
R	226	131-0103-13	RES CF 10K EW 5%		EA	.	.	.	.	1.00
R	227	130-0101-13	RES FC 100 TW 5%		EA	.	.	.	.	1.00
R	228	130-0270-23	RES FC 27 QW 5%		EA	.	.	.	.	1.00
R	229	131-0103-13	RES CF 10K EW 5%		EA	.	.	.	.	1.00
R	230	131-0103-13	RES CF 10K EW 5%		EA	.	.	.	.	1.00
R	232	130-0202-13	RES FC 2K TW 5%		EA	.	.	.	.	1.00
R	233	130-0510-23	RES FC 51 QW 5%		EA	.	.	.	.	1.00
R	234	130-0104-13	RES FC 100K TW 5%		EA	.	.	.	.	1.00
R	235	130-0363-13	RES FC 36K TW 5%		EA	.	.	.	.	1.00
R	236	130-0332-23	RES FC 3.3K QW 5%		EA	.	.	.	.	1.00
R	237	131-0103-13	RES CF 10K EW 5%		EA	.	.	.	.	1.00
R	238	131-0102-13	RES CF 1K EW 5%		EA	.	.	.	.	1.00
SW	101	031-0370-00	SLIDE SWITCH SPDT		EA	.	.	.	.	1.00
SW	102	031-0343-02	SWITCH		EA	.	.	.	.	1.00
T	101	019-3082-00	XFMR BFLR RF 4T		EA	.	.	.	.	1.00
T	102	019-6019-00	XFMR SW REG		EA	.	.	.	.	1.00
T	103	019-5083-00	XFMR AUD		EA	.	.	.	.	1.00
T	104	019-5084-00	XFMR MOD 675T		EA	.	.	.	.	1.00
TP	101	008-0096-01	TERMINAL TEST PNT		EA	.	.	.	.	1.00
TP	102	008-0096-01	TERMINAL TEST PNT		EA	.	.	.	.	1.00
TP	103	008-0096-01	TERMINAL TEST PNT		EA	.	.	.	.	1.00
TP	104	008-0096-01	TERMINAL TEST PNT		EA	.	.	.	.	1.00
TP	105	008-0096-01	TERMINAL TEST PNT		EA	.	.	.	.	1.00
TP	106	008-0096-01	TERMINAL TEST PNT		EA	.	.	.	.	1.00
Y	101	044-0053-05	XTAL 3.2000MHZ		EA	.	.	.	.	1.00

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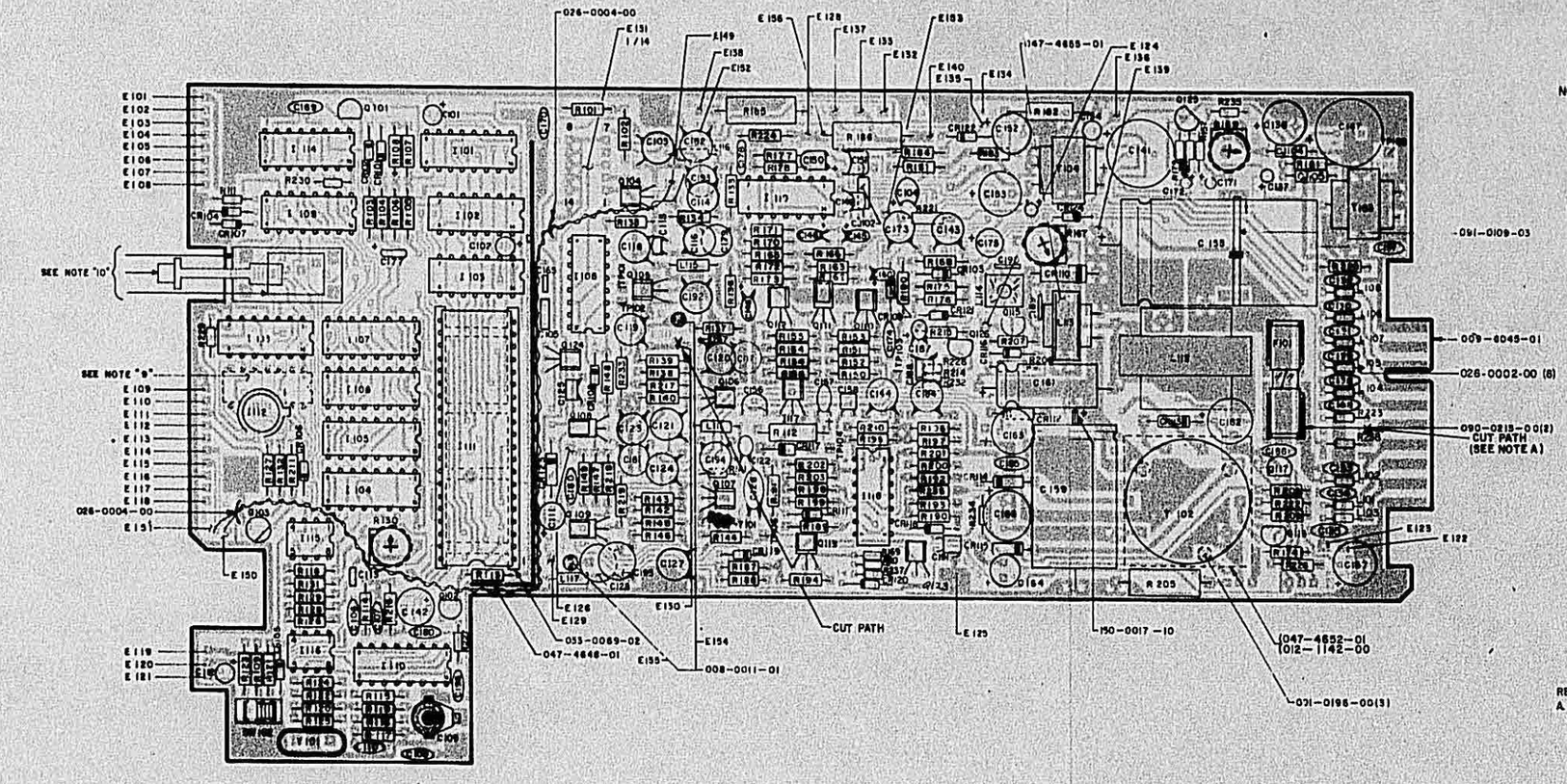
PAGE 6-31 THRU PAGE 6-35

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER



NOTES:

1. PRIOR TO POST COATING BOTH SIDES OF ASS'Y WITH CLEAR URETHANE COATING (016-1040-00), MASK OFF THE FOLLOWING: ALL MOUNTING AREAS, TP101 THRU TP106, C109, R130, R159, R187, F101 & FUSE CLIPS CONNECTOR FINGERS, I.C. SOCKET FOR I111, ALL "E" NUMBERS, SW101 & SW102.
2. TRAN. Q126, SEE DETAIL "A".
3. TRANS. Q101, Q113, Q117, Q115, SEE DETAIL "B".
4. TRANS. Q102, Q103, Q125, SEE DETAIL "C".
5. TRANS. Q104, THRU Q107, SEE DETAIL "D".
6. TRANS. Q110, Q112, Q123, Q124, SEE DETAIL "E".
7. TRANS. Q108, Q109, Q111, Q119, SEE DETAIL "F".
8. I.C. I117, SEE DETAIL "G".
9. I112 (120-2028-03) MAY BE EITHER AN 8 PIN I.C. OR A 14 PIN I.C.
10. FREQ. TRANSFER SWITCH AND PUSHBUTTON HAS TWO DIFFERENT CONFIGURATIONS.

KY 196 S/N 3699 AND BELOW AND KY 196E S/N 60149 AND BELOW:

031-0357-02	SLIDE SW. SPDT
068-0827-01	PUSHBUTTON

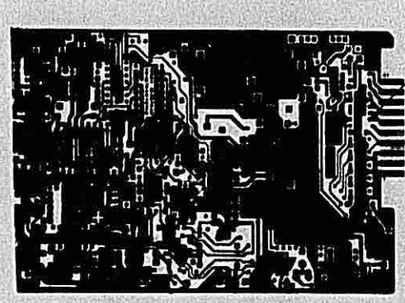
KY 196 S/N 3600 AND ABOVE AND KY 196E S/N 60150 AND ABOVE:

031-0370-00	SLIDE SW. SPDT
068-0831-00	SW. HOLDER
068-0827-11	PUSHBUTTON

WIRING CHART

FROM	TO	KING PART NO	DESCRIPTION
E149	E150	025-0018-55	26 AWG GREEN
E152	E151	025-0018-50	26 AWG GRN/BLK

REWORK NOTES.
A CUT PATH FOR FLAVORS 064-1019-10/11/12/13/30/31/32/33/40/41/42 AS INDICATED ON BOTH OF BOARD.



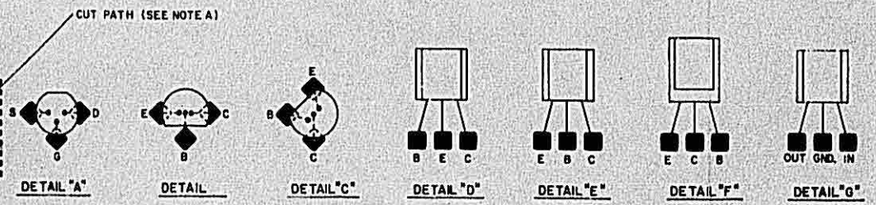


FIGURE 6-5 KY 196/196E MAIN BOARD ASSEMBLY
(Dwg. No. 300-6045-00, R-22)

SEE BLOW UP FICHE NO. KR2661 ITEM E

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER

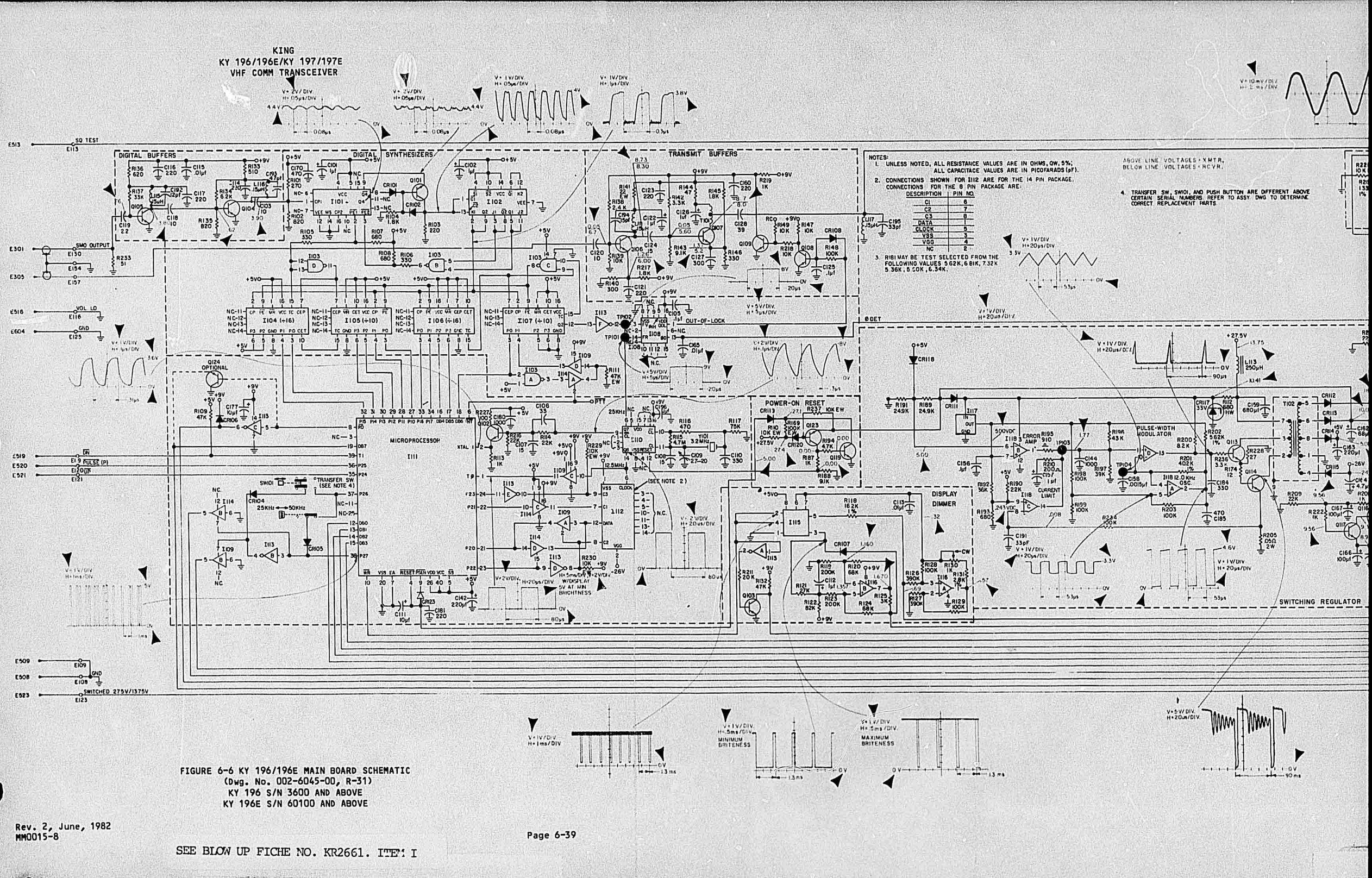
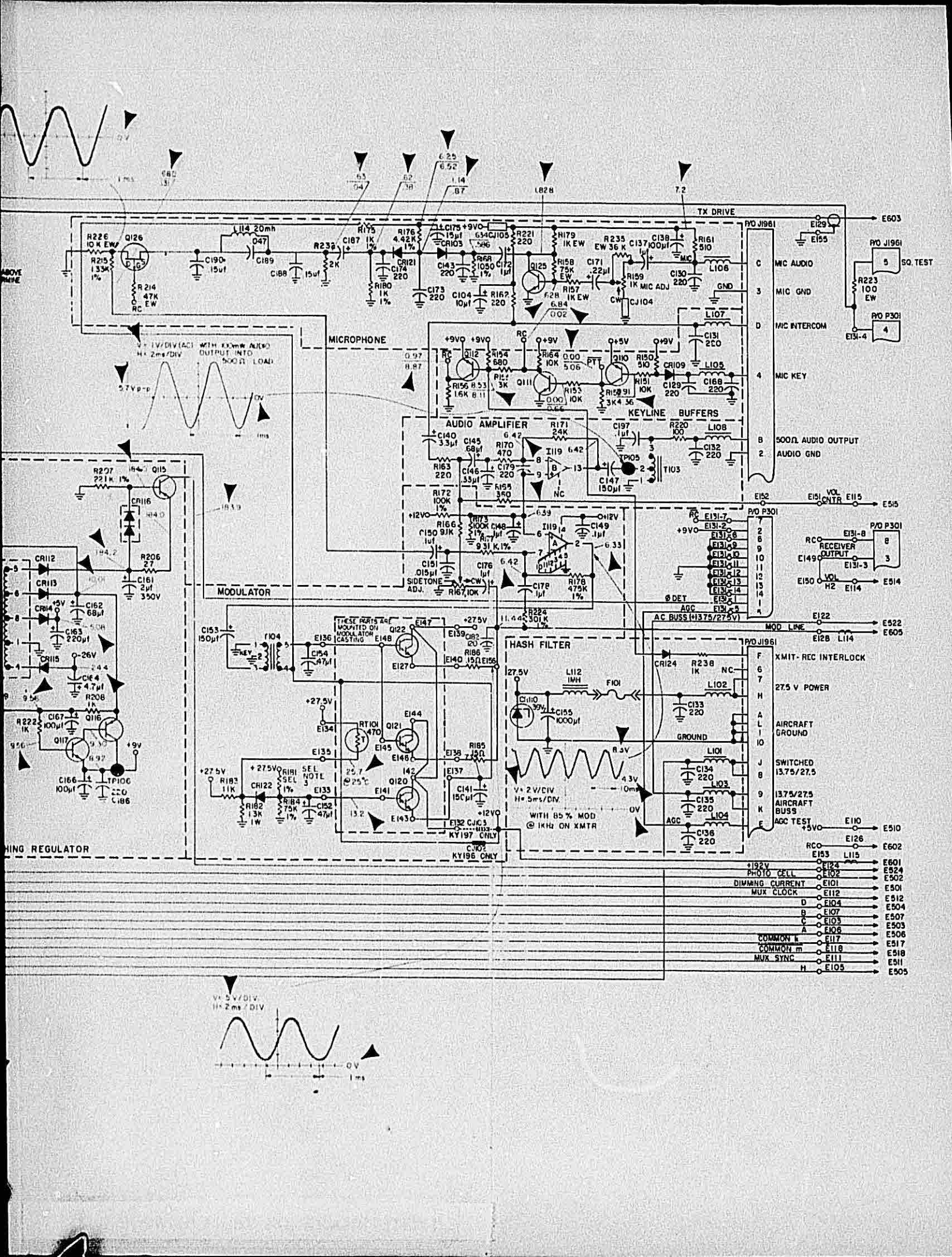
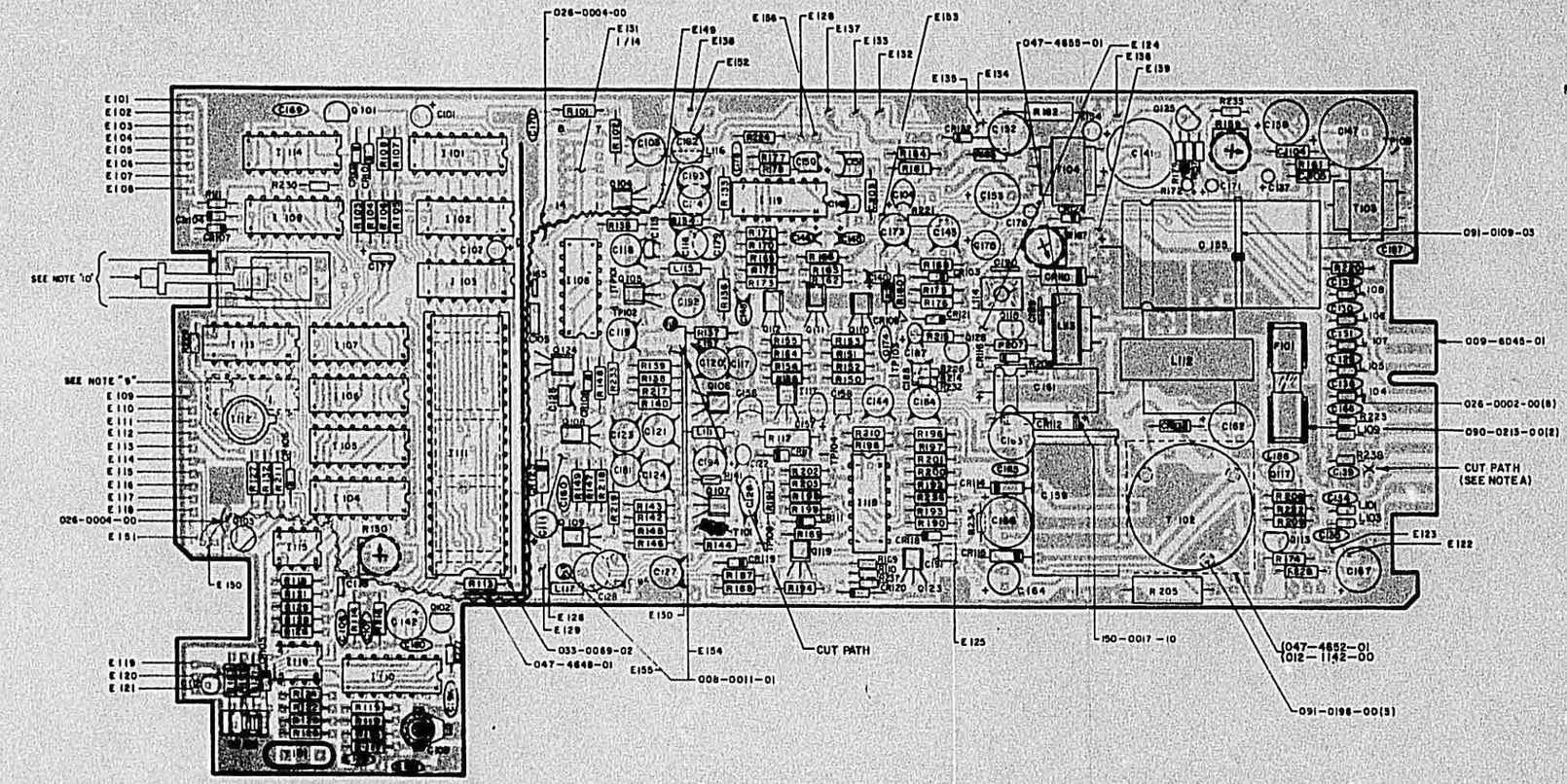


FIGURE 6-6 KY 196/196E MAIN BOARD SCHEMATIC
(Dwg. No. 002-6045-00, R-31)
KY 196 S/N 3600 AND ABOVE
KY 196E S/N 60100 AND ABOVE

SEE BLOW UP FICHE NO. KR2661. ITEM I


TX DRIVE
MICROPHONE
AUDIO AMPLIFIER
KEYLINE BUFFERS
MODULATOR
HASH FILTER
P/O J1961
P/O P301
E603
E129
E155
SQ. TEST
MIC AUDIO
MIC GND
MIC INTERCOM
MIC KEY
500Ω AUDIO OUTPUT
AUDIO GND
E152
VOL CNTR
E151
E115
E515
RECEIVER OUTPUT
E149
E150
VOL H2
E114
E514
MOD LINE
E122
E522
E128
L114
E605
XMIT-REC INTERLOCK
27.5 V POWER
AIRCRAFT GROUND
SWITCHED 13.75/27.5
13.75/27.5 AIRCRAFT BUSS
AGC TEST
+5VO
E110
E510
RCO
E126
E602
E153
L115
+192V
PHOTO CELL
DIMMING CURRENT
MUX CLOCK
MUX SYNC
COMMON k
COMMON m
E601
E524
E502
E501
E512
E504
E507
E503
E506
E517
E518
E511
E505
THESE PARTS ARE MOUNTED ON MODULATOR CASTING
HING REGULATOR

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER



NOTES:

1. PRIOR TO POST COATING BOTH SIDES OF ASS'Y WITH CLEAR URETHANE COATING (016-1040-00), MASK OFF THE FOLLOWING: ALL MOUNTING AREAS, TP101 THRU TP106, C109, R130, R159, R167, F101 & FUSE CLIPS CONNECTOR FINGERS, I.C. SOCKET FOR I111, ALL "E" NUMBERS, SW101 & SW102
2. TRAN. Q126, SEE DETAIL "A"
3. TRANS. Q101, Q113, Q117, Q115, SEE DETAIL "B"
4. TRANS. Q102, Q103, Q125, SEE DETAIL "C"
5. TRANS. Q104, THRU Q107, SEE DETAIL "D"
6. TRANS. Q110, Q112, Q123, Q124, SEE DETAIL "E"
7. TRANS. Q108, Q109, Q111, Q119, SEE DETAIL "F"
8. I.C. I117, SEE DETAIL "G"
9. I112 (120-2028-03) MAY BE EITHER AN 8 PIN I.C. OR A 14 PIN I.C.
10. FREQ TRANSFER SWITCH AND PUSHBUTTON HAS TWO DIFFERENT CONFIGURATIONS.

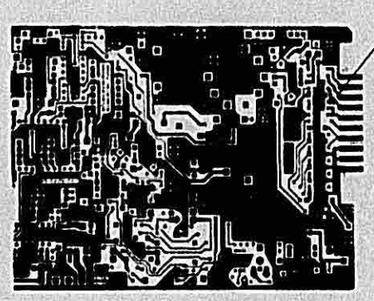
KY 197 S/N 71799 AND BELOW AND KY 197E S/N 80099 AND BELOW:
031-0357-02 SLIDE SW. SPDT
088-0827-01 PUSHBUTTON

KY 197 S/N 71800 AND ABOVE AND KY 197E S/N 80100 AND ABOVE:
031-0370-00 SLIDE SW. SPDT
088-0831-00 SW. HOLDER
088-0827-11 PUSHBUTTON

WIRING CHART			
FROM	TO	KING PART NO.	DESCRIPTION
E149	E150	025-0018-55	26 AWG GREEN
E152	E151	025-0018-50	26 AWG GRN/BLK.

REWORK NOTES:

A. CUT PATHS FOR FLAVORS 064-1021-10/11/12/30/31/32 AS INDICATED ON BOTH SIDES OF BOARD.



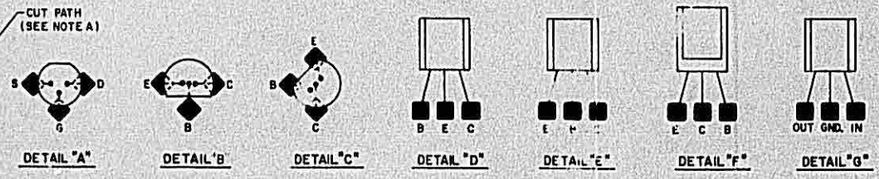
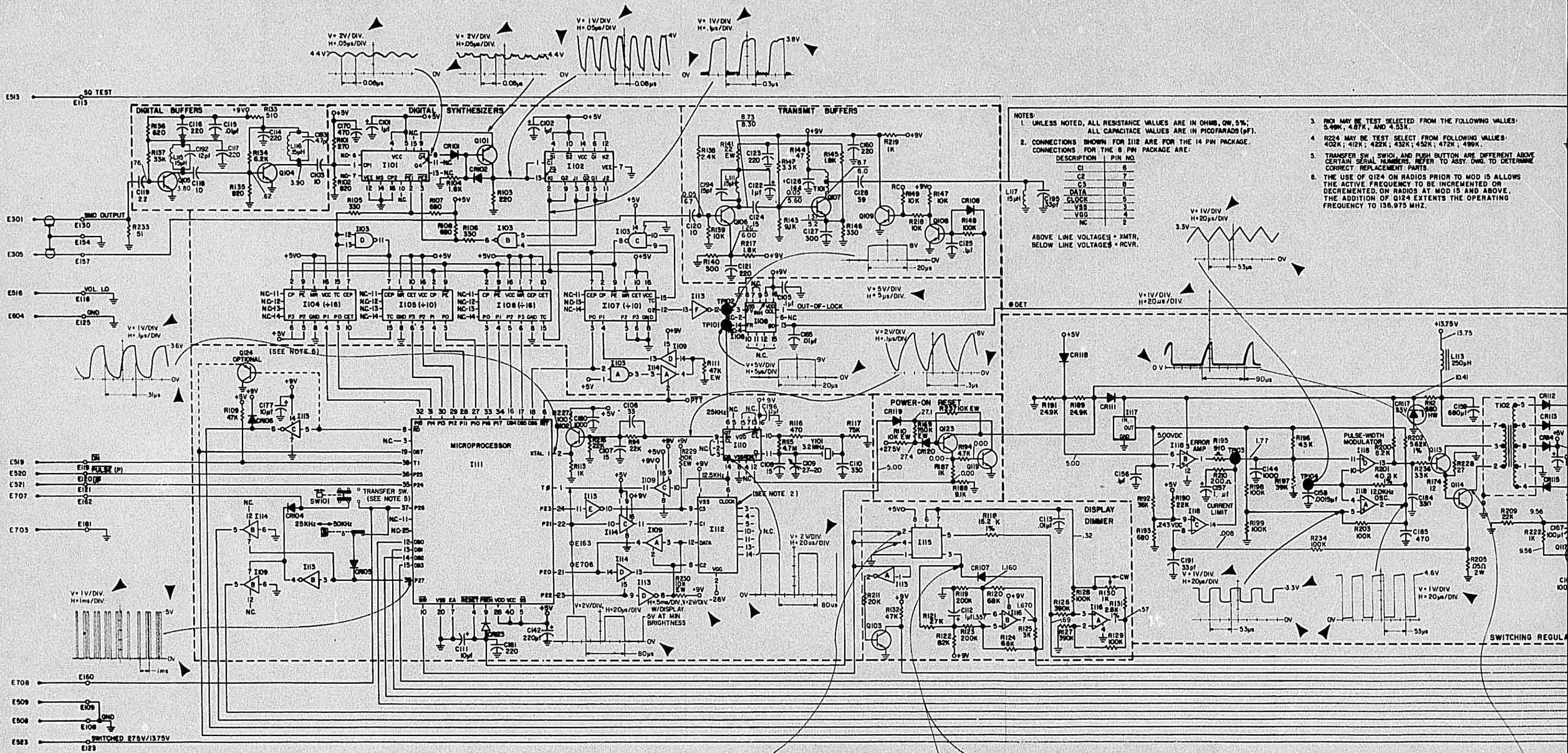


FIGURE 6-7 KY 197/197E MAIN BOARD ASSEMBLY
(Dwg. No. 300-6045-01, R-23)

SEEBLOW UP FICHE NO. KR2661 ITEMC

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER



NOTES:

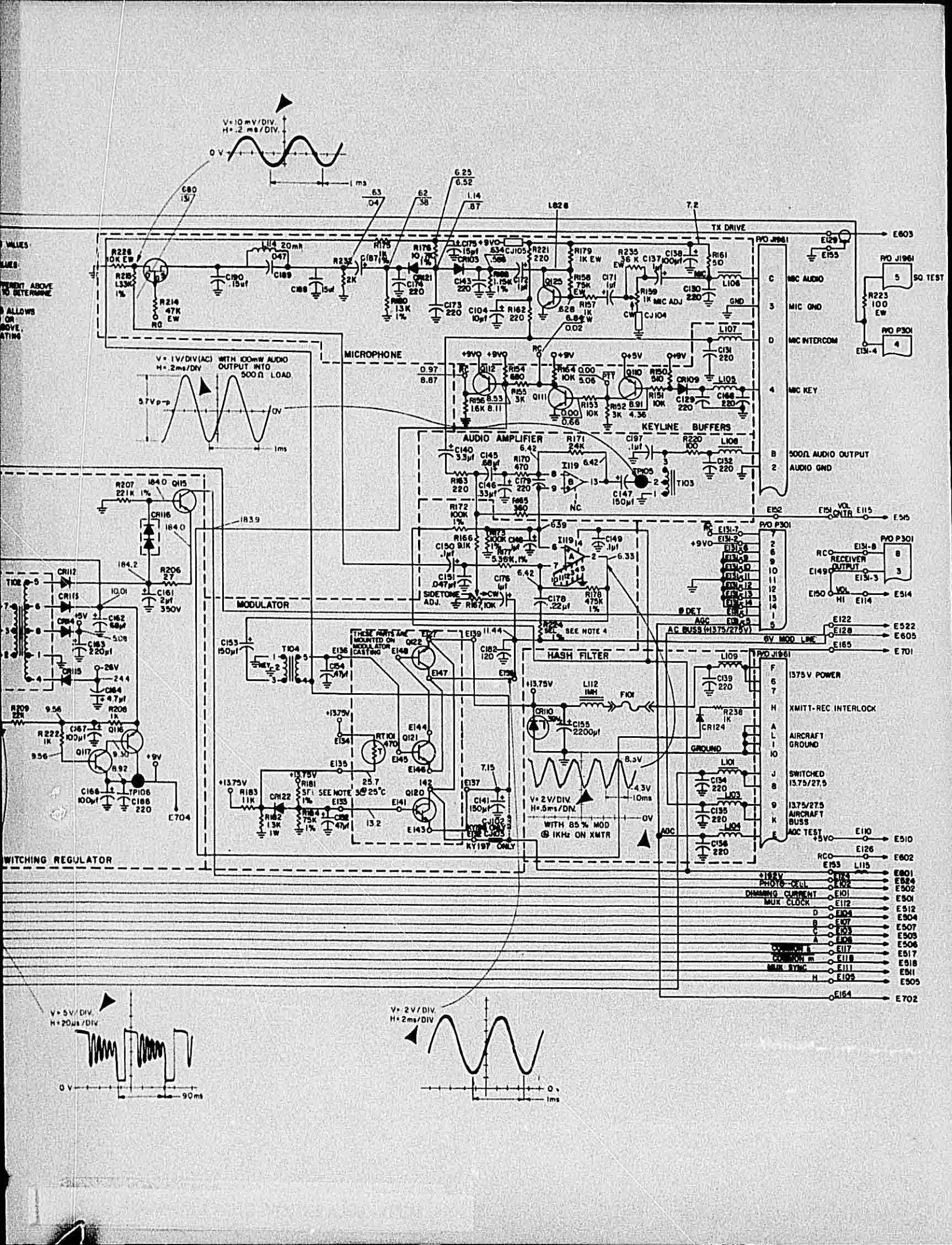
1. UNLESS NOTED, ALL RESISTANCE VALUES ARE IN OHMS, 0W, 5%; ALL CAPACITACE VALUES ARE IN PICOFARADS(pF).
2. CONNECTIONS SHOWN FOR I112 ARE FOR THE 14 PIN PACKAGE. CONNECTIONS FOR THE 8 PIN PACKAGE ARE:

DESCRIPTION	PIN NO.
C1	6
C2	7
C3	8
DATA	1
CLOCK	5
VSS	3
VDD	4
NC	2

3. RI01 MAY BE TEST SELECTED FROM THE FOLLOWING VALUES: 5.49K, 4.87K, AND 4.53K.
4. R224 MAY BE TEST SELECT FROM FOLLOWING VALUES: 402K; 412K; 422K; 432K; 452K; 472K; 499K.
5. TRANSFER SW, SWI01, AND PUSH BUTTON ARE DIFFERENT ABOVE CERTAIN SERIAL NUMBERS. REFER TO ASSY. DWG. TO DETERMINE CORRECT REPLACEMENT PARTS.
6. THE USE OF Q124 ON RADIOS PRIOR TO MOD 15 ALLOWS THE ACTIVE FREQUENCY TO BE INCREMENTED OR DECREMENTED. ON RADIOS AT MOD 15 AND ABOVE, THE ADDITION OF Q124 EXTENTS THE OPERATING FREQUENCY TO 136.975 MHZ.

FIGURE 6-8 KY 197/197E MAIN BOARD SCHEMATIC
(Dwg. No. 002-6045-01, R-35)

SEE BLOW UP FICHE NO. KR2661 ITEM G


MICROPHONE
AUDIO AMPLIFIER
KEYLINE BUFFERS
MODULATOR
HASH FILTER
SWITCHING REGULATOR
TX DRIVE
MIC AUDIO
MIC GND
MIC INTERCOM
MIC KEY
500Ω AUDIO OUTPUT
AUDIO GND
SQ TEST
1375 V POWER
XMITT-REC INTERLOCK
AIRCRAFT GROUND
SWITCHED 13.75/27.5
13.75/27.5 AIRCRAFT BUSS
AGC TEST
6V MOD LINE
AC BUSS (1375/275V)
PHOTO-CELL
DIMMING CURRENT
MUX CLOCK
MUX SYNC
SIDETONE ADJ.
MIC ADJ
RECEIVER OUTPUT
VOL HI
VOL CNTR
THESE PARTS ARE MOUNTED ON MODULATOR CASTING
SEE NOTE 4
WITH 85% MOD @ 1KHz ON XMTR
KY197 ONLY

200-6046-00 RCVR KY196/197 R: 36
200-6046-01 RCVR KY196E/197E R: 36
200-6046-99 COMMON BOM R: 9

SYMBOL	PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00	01	99
	009-6046-00	PC BD RECEIVER		EA	.	.	1.00
	012-1021-06	TAPE ELEC 3/8 WD		AR	.	.	0.00
	012-1139-00	INSUL VCO SHLD		EA	.	.	1.00
	012-1140-00	INSUL PRSEL SHLD		EA	.	.	1.00
	012-1141-00	INSUL MXR SHLD		EA	.	.	1.00
	012-1174-00	INSULATOR		EA	.	.	4.00
	016-1040-00	COATING TYPE AR		AR	.	.	0.00
	047-2154-00	CAN CHOKE		EA	.	.	1.00
	047-4649-01	MIXER SHIELD W/F	A	EA	.	.	1.00
	047-4650-01	PSEL SHLD	A	EA	.	.	1.00
	047-4651-01	VCO SHLD	A	EA	.	.	1.00
	047-4653-01	RECEIVER FENCE	A	EA	.	.	1.00
	047-4654-01	RCVR CVR	A	EA	.	.	1.00
	047-4812-01	COVER OSC W/F	A	EA	.	.	1.00
	057-2172-00	RECEIVER DECAL		EA	.	.	1.00
	089-6484-04	SCREW		EA	.	.	4.00
	091-0015-00	RUBBER GRMT 3/16		EA	.	.	1.00
	091-0055-01	SCR RH 2-56X1/4		EA	.	.	3.00
	200-6046-99	COMMON BOM	A	EA	1.00	1.00	.
C 301	113-3047-00	CAP DC 4.7PF 500V		EA	1.00	1.00	.
C 302	113-3221-00	CAP DC 220PF 500V		EA	.	.	1.00
C 303	096-1082-45	CAP TN 2.2UF 35V		EA	.	.	1.00
C 305	111-0001-17	CAP CR 180PF 50V		EA	.	.	1.00
C 306	113-3027-00	CAP DC 2.7PF 500V		EA	.	.	1.00
C 307	113-3221-00	CAP DC 220PF 500V		EA	.	.	1.00
C 308	113-3221-00	CAP DC 220PF 500V		EA	.	.	1.00
C 309	111-0001-12	CAP CR .047UF 50V		EA	.	.	1.00
C 310	113-3221-00	CAP DC 220PF 500V		EA	.	.	1.00
C 311	113-3068-00	CAP DC 6.8PF 500V		EA	.	.	1.00
C 312	113-3221-00	CAP DC 220PF 500V		EA	.	.	1.00
C 313	999-9999-98	NOT USED		EA	.	.	0.00
C 314	111-0001-17	CAP CR 180PF 50V		EA	.	.	1.00
C 315	111-0001-17	CAP CR 180PF 50V		EA	.	.	1.00
C 316	999-9999-98	NOT USED		EA	.	.	0.00
C 317	113-3221-00	CAP DC 220PF 500V		EA	.	.	1.00
C 318	113-3056-00	CAP DC 5.6PF 500V		EA	.	.	1.00
C 319	111-0001-12	CAP CR .047UF 50V		EA	.	.	1.00
C 320	111-0001-10	CAP CR .0039UF 50V		EA	.	.	1.00
C 321	096-1082-47	CAP TN 1UF 20V		EA	.	.	1.00
C 322	113-5102-00	CAP DC .001UF 500V		EA	.	.	1.00
C 323	113-7503-00	CAP DC .05UF 12V		EA	.	.	1.00
C 324	113-3221-00	CAP DC 220PF 500V		EA	.	.	1.00
C 325	111-0001-12	CAP CR .047UF 50V		EA	.	.	1.00
C 326	111-0001-12	CAP CR .047UF 50V		EA	.	.	1.00
C 327	113-7503-00	CAP DC .05UF 12V		EA	.	.	1.00
C 328	113-7503-00	CAP DC .05UF 12V		EA	.	.	1.00
C 329	111-0001-17	CAP CR 180PF 50V		EA	.	.	1.00
C 330	111-0001-12	CAP CR .047UF 50V		EA	.	.	1.00
C 331	113-7503-00	CAP DC .05UF 12V		EA	.	.	1.00
C 332	096-1082-45	CAP TN 2.2UF 35V		EA	.	.	1.00
C 333	113-5102-00	CAP DC .001UF 500V		EA	.	.	1.00

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SYMBOL	PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00	01	99
C 334	113-5102-00	CAP DC .001UF 500V		EA	.	.	1.00
C 335	096-1082-12	CAP TN 3.3UF 15V		EA	.	.	1.00
C 336	096-1082-47	CAP TN 1UF 20V		EA	.	.	1.00
C 337	111-0001-03	CAP CR .22UF 50V		EA	.	.	1.00
C 338	113-7503-00	CAP DC .05UF 12V		EA	.	.	1.00
C 339	111-0001-03	CAP CR .22UF 50V		EA	.	.	1.00
C 340	111-0001-12	CAP CR .047UF 50V		EA	.	.	1.00
C 341	096-1030-08	CAP TN 100UF20X15V		EA	.	.	1.00
C 342	096-1024-00	CAP TN 47UF 20V		EA	.	.	1.00
C 343	999-9999-98	NOT USED		EA	.	.	0.00
C 344	999-9999-98	NOT USED		EA	.	.	0.00
C 345	999-9999-98	NOT USED		EA	.	.	0.00
C 346	113-3221-00	CAP DC 220PF 500V		EA	.	.	1.00
C 347	111-0001-12	CAP CR .047UF 50V		EA	.	.	1.00
C 348	096-1082-31	CAP TN 4.7UF 35V		EA	.	.	1.00
C 349	111-0001-12	CAP CR .047UF 50V		EA	.	.	1.00
C 350	113-5821-00	CAP DC 820PF 500V		EA	.	.	1.00
C 351	096-1082-40	CAP TN 3.3UF 35V		EA	.	.	1.00
C 352	111-0001-12	CAP CR .047UF 50V		EA	.	.	1.00
C 353	113-3221-00	CAP DC 220PF 500V		EA	.	.	1.00
C 354	111-0001-07	CAP CR .022UF 50V		EA	.	.	1.00
C 355	113-3068-00	CAP DC 6.8PF 500V		EA	.	.	1.00
C 356	113-3100-00	CAP DC 10PF 500V		EA	.	.	1.00
C 357	113-3100-00	CAP DC 10PF 500V		EA	.	.	1.00
C 358	113-3560-00	CAP DC 56PF 500V		EA	.	.	1.00
C 359	111-0001-12	CAP CR .047UF 50V		EA	.	.	1.00
C 360	113-3221-00	CAP DC 220PF 500V		EA	.	.	1.00
C 361	113-3121-00	CAP DC 120PF 500V		EA	.	.	1.00
C 362	113-3220-00	CAP DC 22PF 500V		EA	.	.	1.00
C 363	106-0001-12	CAP FC .75PF5%500V		EA	1.00	.	.
C 363	999-9999-98	NOT USED		EA	.	0.00	.
C 364	106-0001-12	CAP FC .75PF5%500V		EA	1.00	.	.
C 364	999-9999-98	NOT USED		EA	.	0.00	.
C 365	106-0001-12	CAP FC .75PF5%500V		EA	1.00	.	.
C 365	999-9999-98	NOT USED		EA	.	0.00	.
C 366	999-9999-98	NOT USED		EA	.	.	0.00
C 367	096-1082-14	CAP TN .68UF 20V		EA	.	.	1.00
C 368	096-1082-14	CAP TN .68UF 20V		EA	.	.	1.00
C 369	113-7203-00	CAP DC .02UF 12V		EA	.	.	1.00
C 370	999-9999-98	NOT USED		EA	.	.	0.00
C 371	096-1030-28	CAP TN 47UF20X20V		EA	.	.	1.00
C 372	113-3082-00	CAP DC 8.2PF 500V		EA	.	.	1.00
C 373	111-0001-12	CAP CR .047UF 50V		EA	.	.	1.00
C 374	111-0001-10	CAP CR .0039UF 50V		EA	.	.	1.00
C 375	096-1082-09	CAP TN 15UF 20V		EA	.	.	1.00
C 376	111-0001-13	CAP CR .1UF 50V		EA	.	.	1.00
C 377	999-9999-98	NOT USED		EA	.	.	0.00
C 378	999-9999-98	NOT USED		EA	.	.	0.00
C 379	999-9999-98	NOT USED		EA	.	.	0.00
C 380	096-1082-34	CAP TN 4.7UF 20V		EA	.	.	1.00
C 381	113-3221-00	CAP DC 220PF 500V		EA	.	.	1.00
C 382	113-3221-00	CAP DC 220PF 500V		EA	.	.	1.00
C 383	113-3221-00	CAP DC 220PF 500V		EA	.	.	1.00
C 384	113-3221-00	CAP DC 220PF 500V		EA	.	.	1.00
C 385	113-3221-00	CAP DC 220PF 500V		EA	.	.	1.00
C 386	113-3221-00	CAP DC 220PF 500V		EA	.	.	1.00
C 387	113-3221-00	CAP DC 220PF 500V		EA	.	.	1.00
C 388	113-3221-00	CAP DC 220PF 500V		EA	.	.	1.00
C 389	096-1082-47	CAP TN 1UF 20V		EA	.	.	1.00
C 390	096-1030-08	CAP TN 100UF20X15V		EA	.	.	1.00
C 391	999-9999-98	NOT USED		EA	0.00	0.00	.

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SYMBOL	PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00	01	99
C 392	113-3220-00	CAP DC 22PF 500V		EA	.	.	1.00
C 393	111-0001-66	CAP CR 33PF 50V		EA	.	.	1.00
C 394	113-5022-00	CAP DC 2.2PF 500V		EA	.	.	1.00
C 395	111-0001-17	CAP CR 180PF 50V		EA	.	.	1.00
CR 301	007-4020-02	DIO V SMV1163M5		EA	.	.	1.00
CR 305	007-6106-00	DIO 1N4156		EA	.	.	1.00
CR 306	007-6016-00	DIO S 1N4154		EA	.	.	1.00
CR 307	007-6016-00	DIO S 1N4154		EA	.	.	1.00
CR 308	999-9999-98	NOT USED		EA	.	.	0.00
CR 309	007-6016-00	DIO S 1N4154		EA	.	.	1.00
CR 310	007-6016-00	DIO S 1N4154		EA	.	.	1.00
CR 311	999-9999-98	NOT USED		EA	.	.	0.00
CR 313	007-6016-00	DIO S 1N4154		EA	.	.	1.00
CR 314	007-6016-00	DIO S 1N4154		EA	.	.	1.00
FL 301	017-0069-00	FLTR XTAL 8P		EA	1.00	.	.
FL 301	999-9999-98	NOT USED		EA	.	0.00	.
FL 302	017-0069-00	FLTR XTAL 8P		AR	0.00	.	.
FL 302	999-9999-98	NOT USED		EA	.	0.00	.
FL 303	017-0069-00	FLTR XTAL 8P		AR	0.00	.	.
FL 303	999-9999-98	NOT USED		EA	.	0.00	.
FL 304	017-0069-00	FLTR XTAL 8P		AR	0.00	.	.
FL 304	999-9999-98	NOT USED		EA	.	0.00	.
FL 305	017-0076-00	FLTR XTAL 11.4MHZ		EA	.	1.00	.
FL 305	999-9999-98	NOT USED		EA	0.00	.	.
FL 306	017-0076-00	FLTR XTAL 11.4MHZ		AR	.	0.00	.
FL 306	999-9999-98	NOT USED		EA	0.00	.	.
FL 307	017-0076-00	FLTR XTAL 11.4MHZ		AR	.	0.00	.
FL 307	999-9999-98	NOT USED		EA	0.00	.	.
FL 308	017-0076-00	FLTR XTAL 11.4MHZ		AR	.	0.00	.
FL 308	999-9999-98	NOT USED		EA	0.00	.	.
I 303	120-3020-00	IC MC1350P		EA	.	.	1.00
I 304	120-3053-00	IC LM358N		EA	.	.	1.00
J 301	033-0053-01	IC SOCKET 14P		EA	.	.	1.00
L 302	019-3081-00	COIL RF		EA	.	.	1.00
L 303	019-2082-16	CH 1.5UH 5%		EA	.	.	1.00
L 304	019-3087-00	XFMR RF		EA	.	.	1.00
L 305	019-2084-29	CH 2.2UH 10%		EA	.	.	1.00
L 306	019-3081-00	COIL RF		EA	.	.	1.00
L 307	019-2082-25	CH 3.3UH 10%		EA	.	.	1.00
L 308	019-3081-00	COIL RF		EA	.	.	1.00
L 309	019-8078-00	COIL TUN 20MH		EA	.	.	1.00
L 310	019-8078-00	COIL TUN 20MH		EA	.	.	1.00
L 311	019-8071-00	COIL TUN BLK		EA	.	.	1.00
L 312	019-2084-00	CH .15UH 5%		EA	.	.	1.00
L 313	019-3080-00	COIL VCO		EA	.	.	1.00
Q 301	007-0254-00	XSTR S PNP MPSA92		EA	.	.	1.00
Q 302	007-0317-01	XSTR SD306DE		EA	.	.	1.00
Q 303	007-0452-00	XSTR 3N212		EA	.	.	1.00
Q 304	007-0220-00	XSTR S MPS6568A		EA	.	.	1.00
Q 305	999-9999-98	NOT USED		EA	.	.	0.00
Q 306	999-9999-98	NOT USED		EA	.	.	0.00
Q 307	007-0195-00	XSTR S MPSH10		EA	.	.	1.00
Q 308	007-0195-00	XSTR S MPSH10		EA	.	.	1.00
Q 309	007-0187-00	XSTR S NPN 2N5089		EA	.	.	1.00
Q 310	007-0187-00	XSTR S NPN 2N5089		EA	.	.	1.00

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SYMBOL	PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00	01	99
Q 311	007-0187-00	XSTR S NPN 2N5089		EA	.	.	1.00
Q 312	007-0187-00	XSTR S NPN 2N5089		EA	.	.	1.00
Q 313	007-0187-00	XSTR S NPN 2N5089		EA	.	.	1.00
Q 314	007-0187-00	XSTR S NPN 2N5089		EA	.	.	1.00
Q 315	007-0187-00	XSTR S NPN 2N5089		EA	.	.	1.00
Q 316	007-0187-00	XSTR S NPN 2N5089		EA	.	.	1.00
Q 317	007-0187-00	XSTR S NPN 2N5089		EA	.	.	1.00
R 301	130-0123-23	RES FC 12K QW 5%		EA	.	.	1.00
R 302	130-0122-23	RES FC 1.2K QW 5%		EA	.	.	1.00
R 303	130-0513-23	RES FC 51K QW 5%		EA	.	.	1.00
R 304	130-0513-23	RES FC 51K QW 5%		EA	.	.	1.00
R 305	130-0433-23	RES FC 43K QW 5%		EA	.	.	1.00
R 306	130-0513-23	RES FC 51K QW 5%		EA	.	.	1.00
R 307	130-0470-23	RES FC 47 QW 5%		EA	.	.	1.00
R 308	130-0563-23	RES FC 56K QW 5%		EA	.	.	1.00
R 309	130-0151-23	RES FC 150 QW 5%		EA	.	.	1.00
R 310	130-0513-23	RES FC 51K QW 5%		EA	.	.	1.00
R 311	130-0513-23	RES FC 51K QW 5%		EA	.	.	1.00
R 312	130-0393-23	RES FC 39K QW 5%		EA	.	.	1.00
R 313	130-0563-23	RES FC 56K QW 5%		EA	.	.	1.00
R 314	999-9999-98	NOT USED		EA	.	.	0.00
R 315	130-0563-23	RES FC 56K QW 5%		EA	.	.	1.00
R 316	130-0104-23	RES FC 100K QW 5%		EA	1.00	.	.
R 316	999-9999-98	NOT USED		EA	.	0.00	.
R 317	130-0220-23	RES FC 22 QW 5%		EA	.	.	1.00
R 318	130-0101-23	RES FC 100 QW 5%		EA	.	.	1.00
R 319	130-0473-23	RES FC 47K QW 5%		EA	.	.	1.00
R 320	130-0100-23	RES FC 10 QW 5%		EA	.	.	1.00
R 321	130-0220-23	RES FC 22 QW 5%		EA	.	.	1.00
R 322	999-9999-98	NOT USED		EA	.	.	0.00
R 323	130-0153-23	RES FC 15K QW 5%		EA	.	.	1.00
R 324	999-9999-98	NOT USED		EA	.	.	0.00
R 325	130-0104-23	RES FC 100K QW 5%		EA	1.00	1.00	.
R 325	999-9999-98	NOT USED		EA	.	0.00	.
R 326	130-0132-23	RES FC 1.3K QW 5%		EA	.	.	1.00
R 327	131-0432-23	RES CF 4.3K QW 5%		EA	.	.	1.00
R 328	130-0123-23	RES FC 12K QW 5%		EA	.	.	1.00
R 329	130-0471-23	RES FC 470 QW 5%		EA	.	.	1.00
R 330	131-0181-23	RES CF 180 QW 5%		EA	.	.	1.00
R 331	131-0472-23	RES CF 4.7K QW 5%		EA	.	.	1.00
R 332	130-0683-23	RES FC 68K QW 5%		EA	.	.	1.00
R 333	136-2152-72	RES PF 21.5K QW 1%		EA	.	.	1.00
R 334	136-3242-72	RES PF 32.4K QW 1%		EA	.	.	1.00
R 335	130-0132-23	RES FC 1.3K QW 5%		EA	.	.	1.00
R 336	130-0103-23	RES FC 10K QW 5%		EA	.	.	1.00
R 337	136-3162-72	RES PF 31.6K QW 1%		EA	.	.	1.00
R 338	133-0150-05	TRIMMER RESISTOR		EA	.	.	1.00
R 339	136-2742-72	RES PF 27.4K QW 1%		EA	.	.	1.00
R 340	130-0104-23	RES FC 100K QW 5%		EA	.	.	1.00
R 341	130-0362-23	RES FC 3.6K QW 5%		EA	.	.	1.00
R 342	130-0432-23	RES FC 4.3K QW 5%		EA	.	.	1.00
R 343	999-9999-98	NOT USED		EA	.	.	0.00
R 344	136-1002-72	RES PF 10K QW 1%		EA	.	.	1.00
R 345	136-3012-72	RES PF 30.1K QW 1%		EA	.	.	1.00
R 346	136-2102-72	RES PF 21K QW 1%		EA	.	.	1.00
R 347	130-0431-23	RES FC 430 QW 5%		EA	.	.	1.00
R 348	133-0150-01	TRIMMER RESISTOR		EA	.	.	1.00
R 349	130-0472-23	RES FC 4.7K QW 5%		EA	.	.	1.00
R 350	130-0911-23	RES FC 910 QW 5%		EA	.	.	1.00
R 351	130-0513-23	RES FC 51K QW 5%		EA	.	.	1.00

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SYMBOL	PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00	01	99
R 352	130-0113-23	RES FC 11K QW 5%		EA	.	.	1.00
R 353	130-0102-23	RES FC 1K QW 5%		EA	.	.	1.00
R 354	130-0103-23	RES FC 10K QW 5%		EA	.	.	1.00
R 355	130-0201-23	RES FC 200 QW 5%		EA	.	.	1.00
R 356	130-0102-23	RES FC 1K QW 5%		EA	.	.	1.00
R 357	130-0681-23	RES FC 680 QW 5%		EA	.	.	1.00
R 358	130-0152-23	RES FC 1.5K QW 5%		EA	.	.	1.00
R 359	130-0202-23	RES FC 2K QW 5%		EA	.	.	1.00
R 360	130-0103-23	RES FC 10K QW 5%		EA	.	.	1.00
R 361	130-0472-23	RES FC 4.7K QW 5%		EA	.	.	1.00
R 362	130-0220-23	RES FC 22 QW 5%		EA	.	.	1.00
R 363	130-0470-23	RES FC 47 QW 5%		EA	.	.	1.00
R 364	999-9999-98	NOT USED		EA	.	.	0.00
R 365	999-9999-98	NOT USED		EA	.	.	0.00
R 366	130-0104-23	RES FC 100K QW 5%		EA	.	.	1.00
R 367	130-0162-23	RES FC 1.6K QW 5%		EA	.	.	1.00
R 368	130-0152-23	RES FC 1.5K QW 5%		EA	.	.	1.00
R 369	999-9999-98	NOT USED		EA	.	.	0.00
R 370	999-9999-98	NOT USED		EA	.	.	0.00
R 371	999-9999-98	NOT USED		EA	.	.	0.00
R 372	999-9999-98	NOT USED		EA	.	.	0.00
R 373	999-9999-98	NOT USED		EA	.	.	0.00
R 374	999-9999-98	NOT USED		EA	.	.	0.00
R 375	999-9999-98	NOT USED		EA	.	0.00	.
R 376	999-9999-98	NOT USED		EA	.	0.00	.
R 377	999-9999-98	NOT USED		EA	.	0.00	.
R 378	999-9999-98	NOT USED		EA	.	0.00	.
R 379	999-9999-98	NOT USED		EA	.	0.00	.
R 380	130-0103-23	RES FC 10K QW 5%		EA	.	.	1.00
R 381	130-0220-23	RES FC 22 QW 5%		EA	.	.	1.00
R 382	999-9999-98	NOT USED		EA	.	.	0.00
R 383	130-0820-23	RES FC 82 QW 5%		EA	.	.	1.00
R 384	130-0182-23	RES FC 1.8K QW 5%		EA	.	.	1.00
R 385	130-0472-23	RES FC 4.7K QW 5%		EA	.	.	1.00
R 386	130-0821-23	RES FC 820 QW 5%		EA	.	.	1.00
R 387	130-0181-23	RES FC 180 QW 5%		EA	.	.	1.00
R 388	130-0331-23	RES FC 330 QW 5%		EA	.	.	1.00
R 389	130-0473-23	RES FC 47K QW 5%		EA	.	.	1.00
R 390	130-0101-23	RES FC 100 QW 5%		EA	.	.	1.00
R 391	130-0103-23	RES FC 10K QW 5%		EA	.	.	1.00
R 392	130-0470-23	RES FC 47 QW 5%		EA	.	.	1.00
R 393	130-0392-23	RES FC 3.9K QW 5%		EA	.	.	1.00
R 394	130-0752-23	RES FC 7.5K QW 5%		EA	.	.	1.00
R 395	130-0152-13	RES FC 1.5K TW 5%		EA	.	.	1.00
R 396	131-0204-23	RES CF 200K QW 5%		EA	.	.	1.00
R 397	131-0512-23	RES CF 5.1K QW 5%		EA	.	.	1.00
T 301	019-8079-00	XFMR IF		EA	.	.	1.00
T 302	019-8080-00	XFMR IF 15PF		EA	.	.	1.00
T 303	019-8070-00	XFMR IF		EA	.	.	1.00
T 304	019-8081-00	XFMR IF		EA	.	.	1.00
T 305	019-3082-00	XFMR BFLR RF 4T		EA	.	.	1.00
TP 301	008-0096-01	TERMINAL TEST PNT		EA	.	.	1.00
TP 302	008-0096-01	TERMINAL TEST PNT		EA	.	.	1.00
TP 303	008-0096-01	TERMINAL TEST PNT		EA	.	.	1.00
TP 304	008-0096-01	TERMINAL TEST PNT		EA	.	.	1.00
TP 305	008-0096-01	TERMINAL TEST PNT		EA	.	.	1.00
TP 306	008-0096-01	TERMINAL TEST PNT		EA	.	.	1.00

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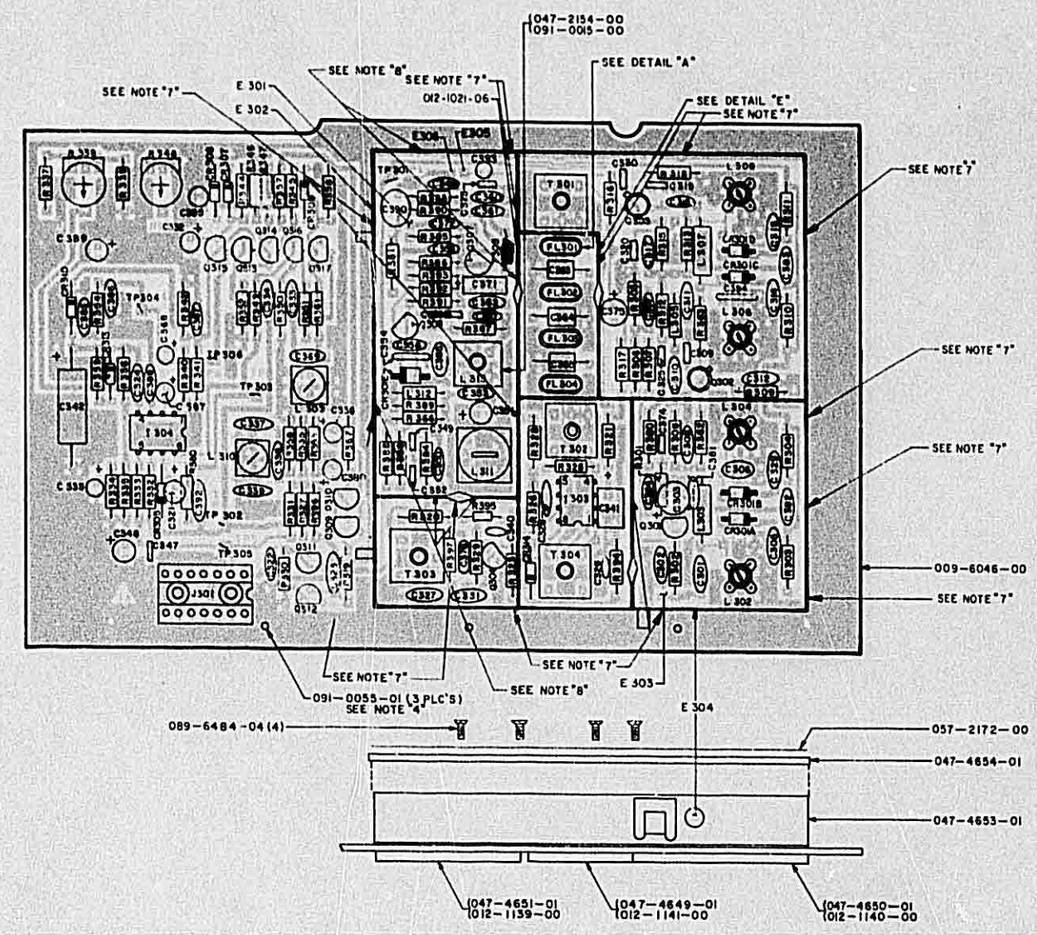
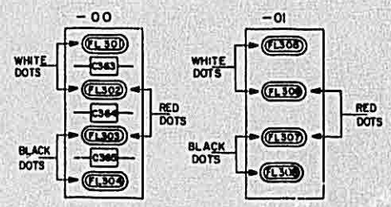
PAGE 6-51 THRU PAGE 6-52B

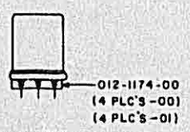


1. TRANSISTORS Q301, Q309, Q310, Q311, & Q313 THROUGH Q317, SEE DETAIL "B".
2. TRANSISTORS Q 304, Q 307 & Q 308, SEE DETAIL "C".
3. TRANSISTORS Q 302 & Q 303, SEE DETAIL "D".
4. INSERT NYLON SCREW THROUGH FARSIDE OF P.C. BOARD, AND HEAT-STAKE TO HOLD IT IN THE BOARD.
5. PRIOR TO POST COATING BOTH SIDES OF ASS'Y WITH CLEAR URETHANE COATING (016-1040-00) MASK OFF THE FOLLOWING: ALL MOUNTING AREAS, E302, E303.
6. ALL CAPACITOR LEADS TO BE NOT MORE THAN .060 FROM SURFACE OF BOARD TO DISC TANGENT ON DISC CERAMICS, AND .100 FROM SURFACE OF BOARD TO BOTTOM OF BODY ON EPOXY DIPPED CAPACITORS.
7. MUST BE SOLDERED BOTH SIDES OF BOARD AT FENCE GUIDE POS.
8. VCO FENCE MUST BE SOLDERED ALL THE WAY AROUND.
9. CR301A,B,C,D,E, ARE A MATCHED SET IF ONE IS REPLACED THEY MUST ALL BE REPLACED.
10. TRANSISTOR Q312 SEE DETAIL "F".



DETAIL "E"

DETAIL "F"



DETAIL "A"

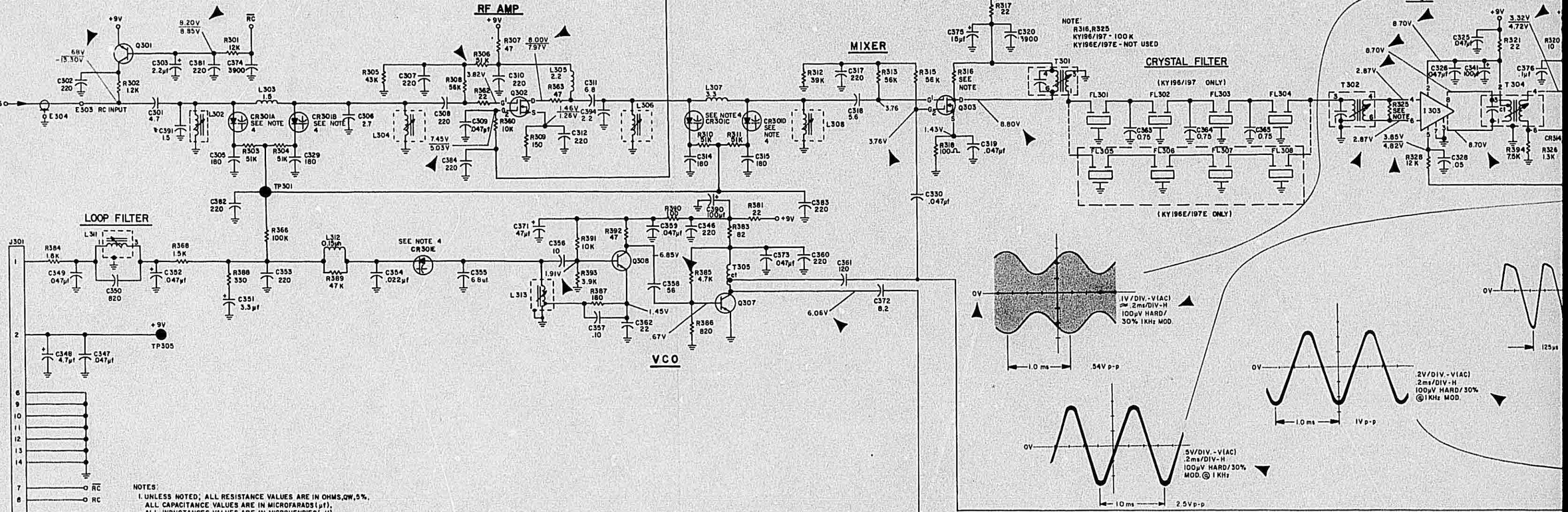
DETAIL "B"

DETAIL "C"

DETAIL "D"

FIGURE 6-9 RECEIVER BOARD ASSEMBLY
(Dwg. No. 300-6046-00/01, R-25)

SEE BLOW UP FICHE NO. KR2661 ITEM K



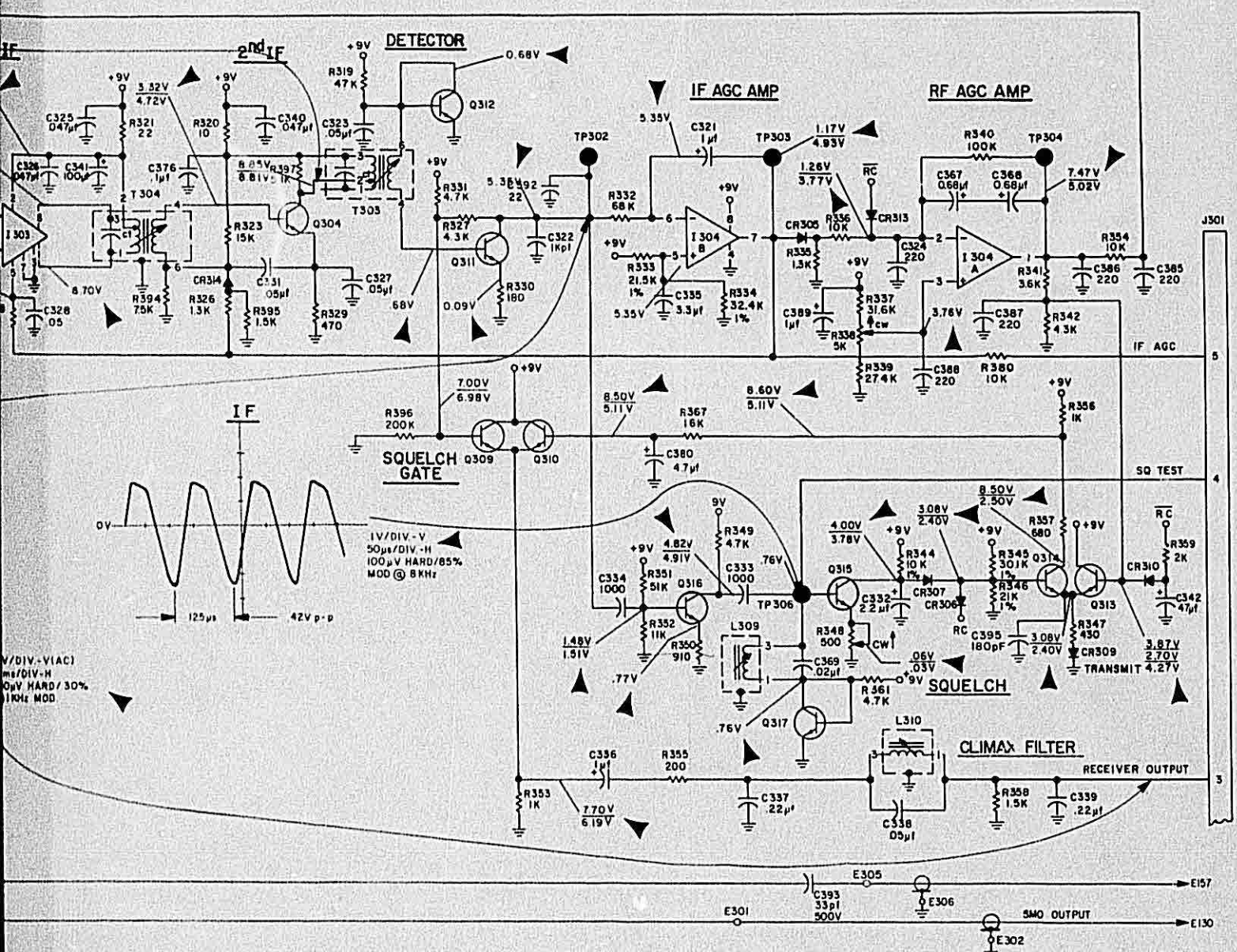
NOTES:
1. UNLESS NOTED; ALL RESISTANCE VALUES ARE IN OHMS, ΩW, 5%, ALL CAPACITANCE VALUES ARE IN MICROFARADS (μf), ALL INDUCTANCES VALUES ARE IN MICROHENRIES (μH).

2. VOLTAGES ABOVE - NO SIGNAL
   VOLTAGES BELOW - 100μV HARD/30% 1KHz MOD.

4. CR301A, B, C, D, AND E ARE A MATCHED SET OF FIVE AND SHOULD ALL BE REPLACED AT THE SAME TIME.

FIGURE 6-10 RECEIVER BOARD SCHEMATIC
(Dwg. No. 002-6046-00, R-24)

SEE BLOW UP FICHE NO KR2661. ITEM M


2nd IF
DETECTOR
IF AGC AMP
RF AGC AMP
IF
SQUELCH GATE
SQUELCH
CLIMAX FILTER
IF AGC
SQ TEST
RECEIVER OUTPUT
TRANSMIT
J301
TP302
TP303
TP304
Q312
Q304
Q311
Q309
Q310
Q316
Q315
Q314
Q313
Q317
T303
T304
L309
L310
CR313
CR305
CR314
CR307
CR306
CR310
CR309
1V/DIV-V
50µs/DIV-H
100µV HARD/65%
MOD @ 8KHz
125µs
42V p-p
E305
E306
E301
E302
E157
E130
SMO OUTPUT

200-6044-00 DISPLAY BD ASSY R: 17
200-6044-10 DISPLAY BOARD R: 3

SYMBOL	PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00	QUANTITY 10
	009-6044-00	PC BD DSPLY		EA	1.00	.
	009-6044-10	PC BD DSPLY		EA	.	1.00
	016-1040-00	COATING TYPE AR		AR	0.00	0.00
	016-1122-00	EPOXY DEVCON 14250		AR	0.00	0.00
	026-0002-00	WIRE COP TIN 24G		AR	0.00	0.00
	047-5018-00	SPRING SW 8 POS		EA	1.00	1.00
	088-0720-00	SPOOL SWITCH		EA	1.00	1.00
	088-0765-00	HOUSING SWITCH		EA	1.00	.
	088-0765-01	HOUSING SWITCH		EA	1.00	.
	088-0766-01	DETENT WHEEL 53/80		EA	2.00	.
	088-0767-01	KNOB	A	EA	1.00	1.00
	088-0768-04	KNOB		EA	1.00	.
	088-0769-00	SLEEVE LOCKING		EA	1.00	1.00
	088-0770-00	HOUSING SWITCH		EA	.	1.00
	088-0770-01	HOUSING SWITCH		EA	.	1.00
	088-0773-01	KNOB	A	EA	1.00	1.00
	088-0803-01	SWITCH HOUSING		EA	1.00	1.00
	088-1022-01	CONTACT ASSY	A	EA	.	2.00
	088-1057-05	KNOB STAMPED	A	EA	.	1.00
	089-5895-03	SCR PHP 0-80X3/16		EA	2.00	2.00
	089-6292-03	SCR PHP 2-56X3/16		EA	2.00	2.00
	089-6292-06	SCR PHP 2-56X3/8		EA	2.00	2.00
	090-0019-05	RING RTNR .188		EA	2.00	2.00
	090-0036-04	RING RTNR .051		EA	1.00	1.00
	150-0003-10	TUBING TFLN 24AWG		AR	0.00	0.00
C 501	111-0001-33	CAP CR 330PF 200V		EA	1.00	1.00
C 502	111-0001-33	CAP CR 330PF 200V		EA	1.00	1.00
C 503	096-1082-17	CAP TN 6.8UF 15V		EA	1.00	1.00
C 504	111-0001-63	CAP CR .022UF 200V		EA	1.00	1.00
C 505	111-0001-63	CAP CR .022UF 200V		EA	1.00	1.00
CR 501	007-6016-00	DIO S 1N4154		EA	1.00	1.00
CR 502	007-6016-00	DIO S 1N4154		EA	1.00	1.00
CR 503	007-5045-15	DIO Z 1/4M9.1Z5		EA	1.00	1.00
CR 504	007-5046-07	DIO Z 1N5271B		EA	1.00	1.00
CR 505	007-6105-00	DIO HV FDH444		EA	1.00	1.00
CR 506	007-6105-00	DIO HV FDH444		EA	1.00	1.00
I 501	120-6045-01	IC SCL4022ABC+		EA	1.00	1.00
I 502	120-0161-00	HIGH VOLT DSPLY DR		EA	1.00	1.00
I 503	120-0163-00	IC DS8884AN		EA	1.00	1.00
J 501	030-2296-00	CONNECTOR DISPLAY		EA	1.00	1.00
Q 501	007-0078-01	XSTR S NPN 2N3417		EA	.	1.00
R 501	131-0824-13	RES CF 820K EW 5%		EA	1.00	1.00
R 502	131-0824-13	RES CF 820K EW 5%		EA	1.00	1.00
R 503	131-0824-13	RES CF 820K EW 5%		EA	1.00	1.00
R 504	131-0824-13	RES CF 820K EW 5%		EA	1.00	1.00

200-6044-00
200-6044-10

SYMBOL	PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00	10
R 505	133-0134-00	RES VA 15K QW 20%		EA	1.00	1.00
R 506	131-0134-23	RES CF 130K QW 5%		EA	1.00	1.00
R 507	131-0913-23	RES CF 91K QW 5%		EA	1.00	1.00
R 508	131-0823-23	RES CF 82K QW 5%		EA	1.00	1.00
R 509	131-0183-13	RES CF 18K EW 5%		EA	.	1.00
S 502	031-0343-03	SWITCH		EA	1.00	1.00
U 501	015-0046-01	NTWK RES/DIO		EA	1.00	1.00
V 501	134-5005-02	PHOTODETECTOR		EA	1.00	1.00

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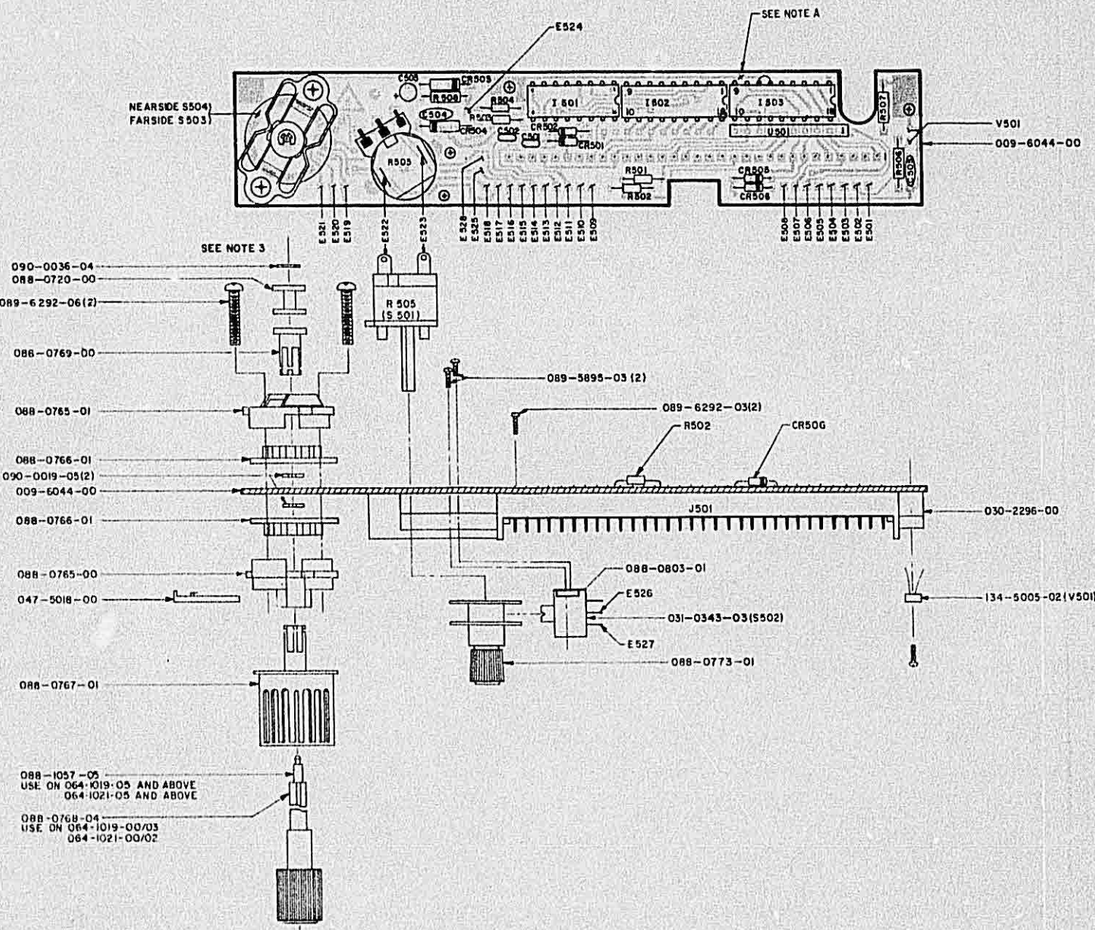


NOTES:

1. INSTALL SPRING (047-5018-00) ON HOUSING (088-0765-00) AFTER SWITCH IS ASSEMBLED ON THE P.C. BOARD.
2. PRIOR TO POST COATING BOTH SIDES OF ASS'Y WITH CLEAR URETHANE COATING (016-1040-00) MASK OFF THE FOLLOWING: ALL MOUNTING AREAS, E 501 THRU E 528, S 501 THRU S 504, J 501, V 501.
3. AFTER ASSEMBLY, APPLY A SMALL AMOUNT OF EPOXY (016-1122-00) TO THE RETAINING RING (090-0036-04) TO SECURE IT TO THE SHAFT (088-0768-02).

REWORK NOTES:

A. ON RADIOS 064-1019-05 AND ABOVE AND 064-1021-05 AND ABOVE, CUT TRACE BETWEEN PIN 7 & PIN 9 OF I503 BOTH SIDES OF BOARD. ADD MAGWIRE BETWEEN PINS 6 & 7.

WIRING CHART			
FROM	TO	KING PART NO.	LENGTH
E 526	E 525	025-0001-00	.250
E 527	E 528	025-0001-06	.400

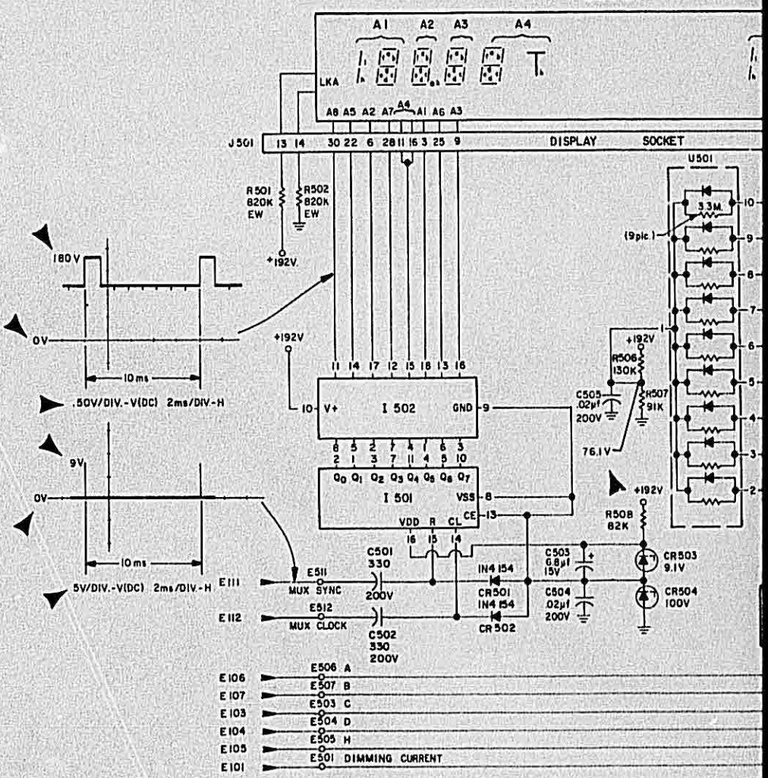
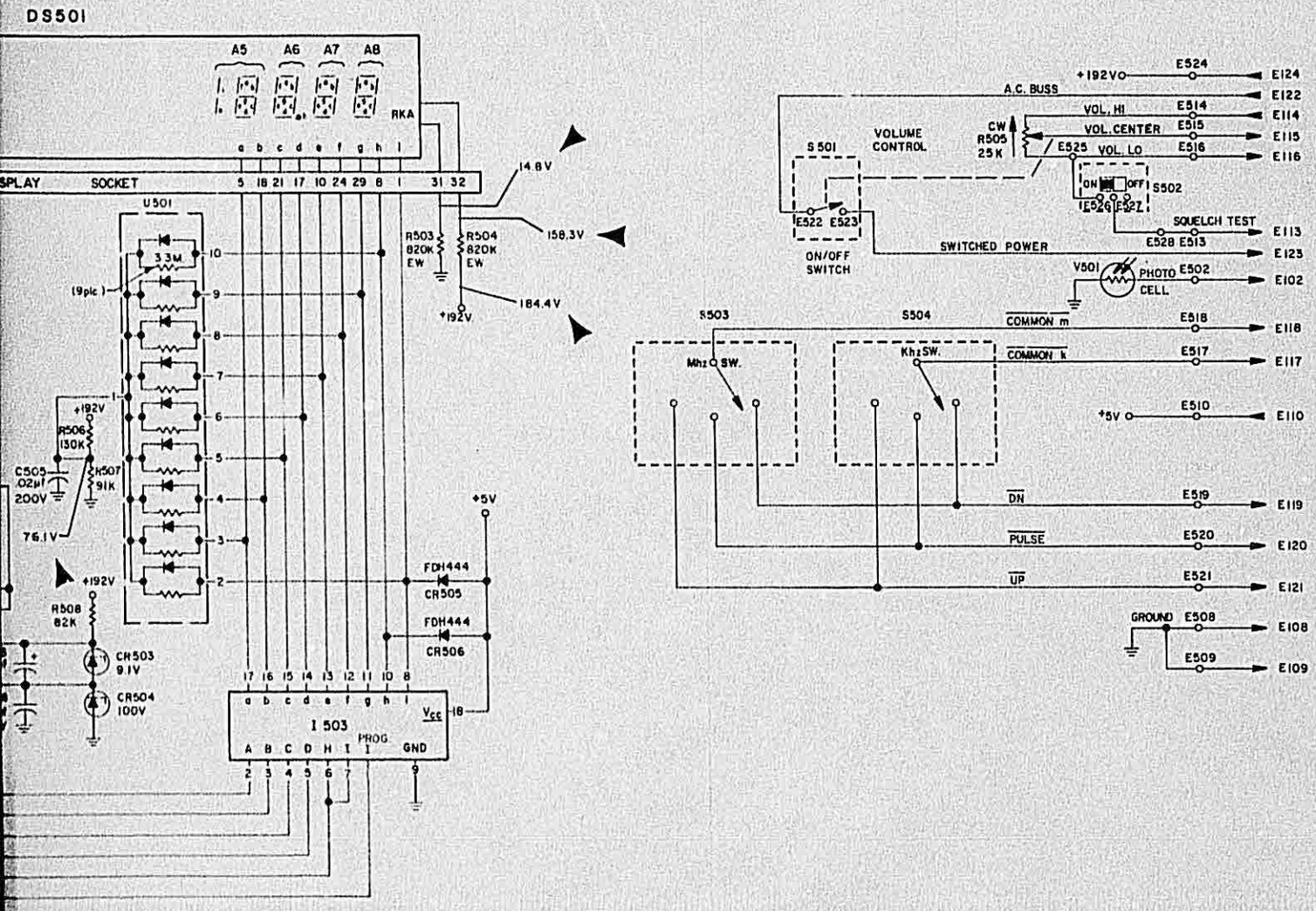
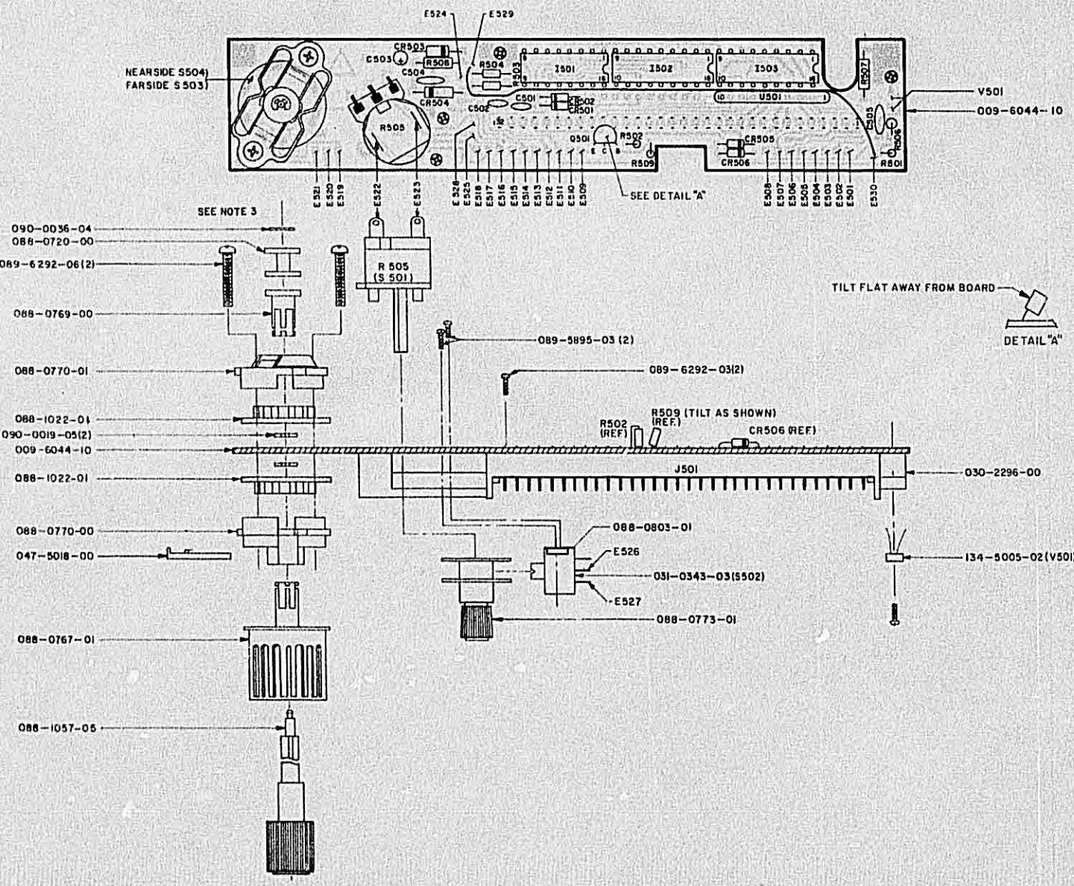


FIGURE 6-11 DISPLAY BOARD ASSEMBLY AND SCHEMATIC
(Dwg. No. 300-6044-00, R-12)
(Dwg. No. 002-6044-00, R-2)

SEE BLOW UP FICHE NO. KR2661. ITEM Q


DS501
A5
A6
A7
A8
RKA
a b c d e f g h i
SPLAY SOCKET 5 18 21 17 10 24 29 8 1 31 32
U501
14.8V
158.3V
184.4V
R503 820K EW
R504 820K EW
+192V
3.3M
(9plc)
10
9
8
7
6
5
4
3
2
1
+192V
R506 130K
C505 .02μf 200V
R507 91K
76.1V
+192V
R508 82K
CR503 9.1V
CR504 100V
+5V
FDH444 CR505
FDH444 CR506
17 16 15 14 13 12 11 10 8
a b c d e f g h i
I 503
PROG
Vcc
18
A B C D H I J GND
2 3 4 5 6 7 9
+192VO
E524
E124
A.C. BUSS
E122
VOL. HI
E514
E114
VOL. CENTER
E515
E115
VOL. LO
E516
E116
VOLUME CONTROL
S 501
CW
R505 25K
E525
ON
OFF
S502
E526 E527
SQUELCH TEST
E528 E513
E113
SWITCHED POWER
E123
E522 E523
ON/OFF SWITCH
V501
PHOTO CELL
E502
E102
S503
S504
COMMON m
E518
E118
Mhz SW.
Khz SW.
COMMON k
E517
E117
+5V
E510
E110
DN
E519
E119
PULSE
E520
E120
UP
E521
E121
GROUND
E508
E108
E509
E109

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER



NOTES:

1. INSTALL SPRING (047-5018-00) ON HOUSING (088-0770-00) AFTER SWITCH IS ASSEMBLED ON THE P.C. BOARD.
2. PRIOR TO POST COATING BOTH SIDES OF ASS'Y WITH CLEAR URETHANE COATING (016-1040-00) MASK OFF THE FOLLOWING: ALL MOUNTING AREAS, E 501 THRU E 528, S 501 THRU S 504, J 501, V 501.
3. AFTER ASSEMBLY, APPLY A SMALL AMOUNT OF EPOXY (016-1122-00) TO THE RETAINING RING (090-0036-04) TO SECURE IT TO THE SHAFT (088-1057-05).

WIRING CHART			
FROM	TO	KING PART NO.	LENGTH
E 526	E 525	025-0001-00	.250
E 527	E 528	025-0001-06	.400
E 529	E 530	025-0002-00	4.0

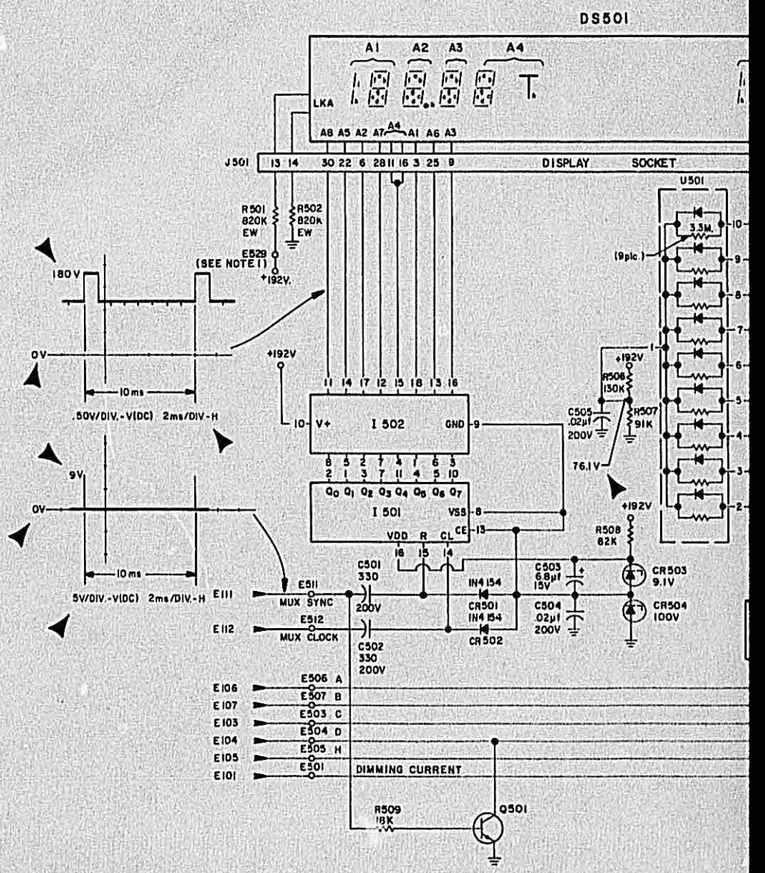
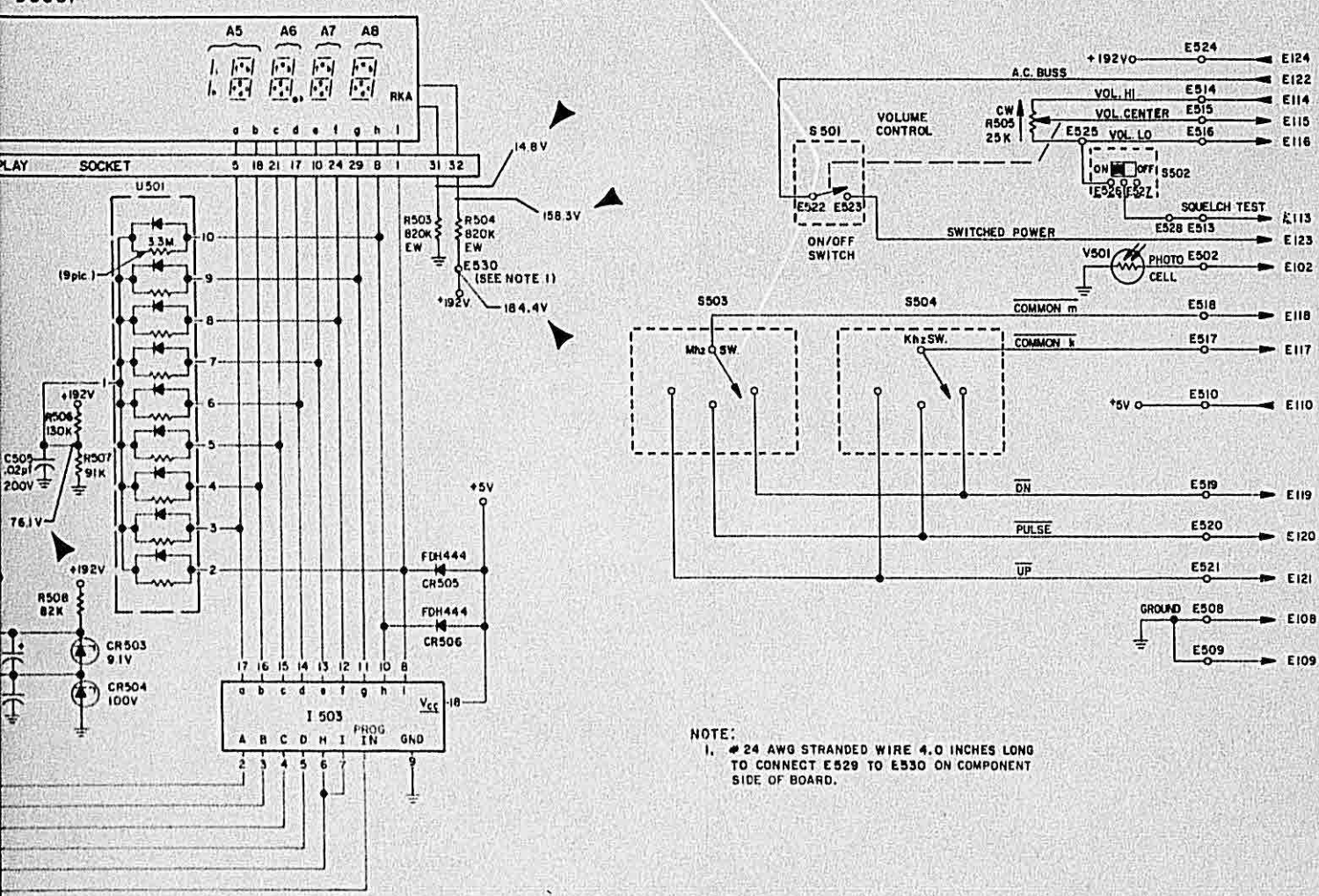


FIGURE 6-11A DISPLAY BOARD ASSEMBLY AND SCHEMATIC
(Dwg. No. 300-6044-10, R-1)
(Dwg. No. 002-6044-10, R-0)

SEE BLOW UP FICHE NO. KR2661 ITEM U



NOTE:
1. # 24 AWG STRANDED WIRE 4.0 INCHES LONG TO CONNECT E529 TO E530 ON COMPONENT SIDE OF BOARD.

200-6047-00 XMTR BD KY 196 R: 19

SYMBOL	PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00
	009-6047-01	PC BD TRANSMITTER		EA	1.00
	016-1004-00	COMPOUND THRML JNT		AR	0.00
	025-0004-00	WIRE 20 BLK		AR	0.00
	025-0004-03	WIRE 20 ORN		AR	0.00
	025-0004-13	WIRE 20 OR/WH		AR	0.00
	025-0018-89	WIRE 26 GY/WH		AR	0.00
	026-0003-00	WIRE COP TIN 22G		AR	0.00
	026-0004-00	WIRE COP TIN 20G		AR	0.00
	026-0013-00	CA COAX RG178BU		AR	0.00
	030-0152-00	CONN BNC HEX		EA	1.00
	047-4980-01	SHIELD W/F		EA	1.00
	073-0389-02	XMTR HEATSINK	A	EA	1.00
	089-2013-37	NUT HEX 6-32		EA	1.00
	089-5901-04	SCR PHP 3-48X1/4		EA	6.00
	089-5903-04	SCR PHP 4-40X1/4		EA	6.00
	089-8016-37	WSHR INTL LK #6		EA	1.00
	089-8033-30	WSHR INTL LK .391		EA	1.00
	090-0091-00	HEAT SINK XSTR		EA	1.00
	150-0003-10	TUBING TFLN 24AWG		AR	0.00
	150-0005-10	TUBING TFLN 20AWG		AR	0.00
C 601	111-0001-10	CAP CR .0039UF 50V		EA	1.00
C 602	113-5301-00	CAP DC 300PF 500V		EA	1.00
C 603	104-0001-22	CAP SM 330PF 100V		EA	1.00
C 604	113-3047-00	CAP DC 4.7PF 500V		EA	1.00
C 605	104-0001-23	CAP SM 270PF 100V		EA	1.00
C 606	104-0001-35	CAP SM 68PF 500V		EA	1.00
C 607	113-5102-00	CAP DC .001UF 500V		EA	1.00
C 608	104-0001-23	CAP SM 270PF 100V		EA	1.00
C 609	113-3200-00	CAP DC 20PF 500V		EA	1.00
C 610	104-0001-09	CAP SM 47PF 100V		EA	1.00
C 611	104-0001-09	CAP SM 47PF 100V		EA	1.00
C 612	100-0002-17	CAP MC 300PF 250V		EA	1.00
C 613	096-1082-02	CAP TN 1UF 35V		EA	1.00
C 614	104-0001-23	CAP SM 270PF 100V		EA	1.00
C 615	113-3047-00	CAP DC 4.7PF 500V		EA	1.00
C 616	111-0001-22	CAP CR .1UF 100V		EA	1.00
C 617	096-1056-00	CAP TN 1.0UF 75V		EA	1.00
C 618	104-0001-44	CAP SM 56PF 100V		EA	1.00
C 619	104-0001-35	CAP SM 68PF 500V		EA	1.00
C 620	100-0002-19	CAP MC 500PF 250V		EA	1.00
C 621	111-0001-21	CAP CR .0068UF 100		EA	1.00
C 622	113-5102-00	CAP DC .001UF 500V		EA	1.00
C 623	104-0001-14	CAP SM 33PF 100V		AR	0.00
C 623	104-0001-17	CAP SM 39PF 100V		AR	0.00
C 623	104-0001-29	CAP SM 36PF 500V		AR	0.00
C 623	104-0001-45	CAP SM 43PF 100V		AR	0.00
C 624	104-0001-09	CAP SM 47PF 100V		EA	1.00
C 625	113-3120-00	CAP DC 12PF 500V		EA	1.00
C 627	113-3220-00	CAP DC 22PF 500V		EA	1.00
C 628	106-0001-42	CAP FC 9.1PF5%500V		EA	1.00
C 629	113-3220-00	CAP DC 22PF 500V		EA	1.00

200-6047-00

SYMBOL		PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00
C	630	106-0001-34	CAP FC 6.8 5% 500V		EA	1.00
C	631	113-3120-00	CAP DC 12PF 500V		EA	1.00
C	632	096-1056-00	CAP TN 1.0UF 75V		EA	1.00
C	633	104-0001-17	CAP SM 39PF 100V		EA	1.00
C	634	113-5101-00	CAP DC 100PF 500V		EA	1.00
CR	601	999-9999-98	NOT USED		EA	0.00
CR	602	999-9999-98	NOT USED		EA	0.00
CR	603	007-6099-00	DIO UM9401		EA	1.00
CR	604	007-6070-00	DIO S MPN3401		EA	1.00
CR	605	007-6099-00	DIO UM9401		EA	1.00
L	601	013-0006-01	FERR BEAD		EA	1.00
L	602	013-0006-01	FERR BEAD		EA	1.00
L	603	999-9999-98	NOT USED		EA	0.00
L	604	019-2084-01	CH .15UH 10%		EA	1.00
L	605	013-0006-01	FERR BEAD		EA	1.00
L	606	013-0006-01	FERR BEAD		EA	1.00
L	607	999-9999-98	NOT USED		EA	0.00
L	608	019-2084-01	CH .15UH 10%		EA	1.00
L	609	999-9999-98	NOT USED		EA	0.00
L	610	013-0006-01	FERR BEAD		EA	1.00
L	611	013-0006-01	FERR BEAD		EA	1.00
L	612	019-2099-00	CHOKE .047UH 10%		EA	1.00
L	613	999-9999-98	NOT USED		EA	0.00
L	614	019-2084-29	CH 2.2UH 10%		EA	1.00
L	615	013-0006-01	FERR BEAD		EA	1.00
Q	601	007-0195-00	XSTR S MPSH10		EA	1.00
Q	602	007-0066-00	XSTR S NPN 2N3866		EA	1.00
Q	603	007-0337-00	XSTR RF PWR SD1220		EA	1.00
Q	604	007-0338-00	XSTR RF SRF2417		EA	1.00
Q	605	007-0249-01	XSTR RF SRF2325		EA	1.00
R	601	130-0333-23	RES FC 33K QW 5%		EA	1.00
R	602	130-0222-23	RES FC 2.2K QW 5%		EA	1.00
R	603	131-0471-23	RES CF 470 QW 5%		EA	1.00
R	604	130-0100-23	RES FC 10 QW 5%		EA	1.00
R	605	130-0100-23	RES FC 10 QW 5%		EA	1.00
R	606	132-0106-24	RES WW 7.5 2.25W5%		EA	1.00
R	607	999-9999-98	NOT USED		EA	0.00
R	608	130-0150-23	RES FC 15 QW 5%		EA	1.00
R	609	134-0150-33	RES CC 15 HW 5%		EA	1.00
T	601	019-3026-00	XFMR TW BIFLR 3T		EA	1.00
T	602	019-3026-00	XFMR TW BIFLR 3T		EA	1.00
T	603	019-3026-02	XFMR TW BIFLR		EA	1.00
T	604	019-3124-00	XFMR BIFILAR RF 3T		EA	1.00

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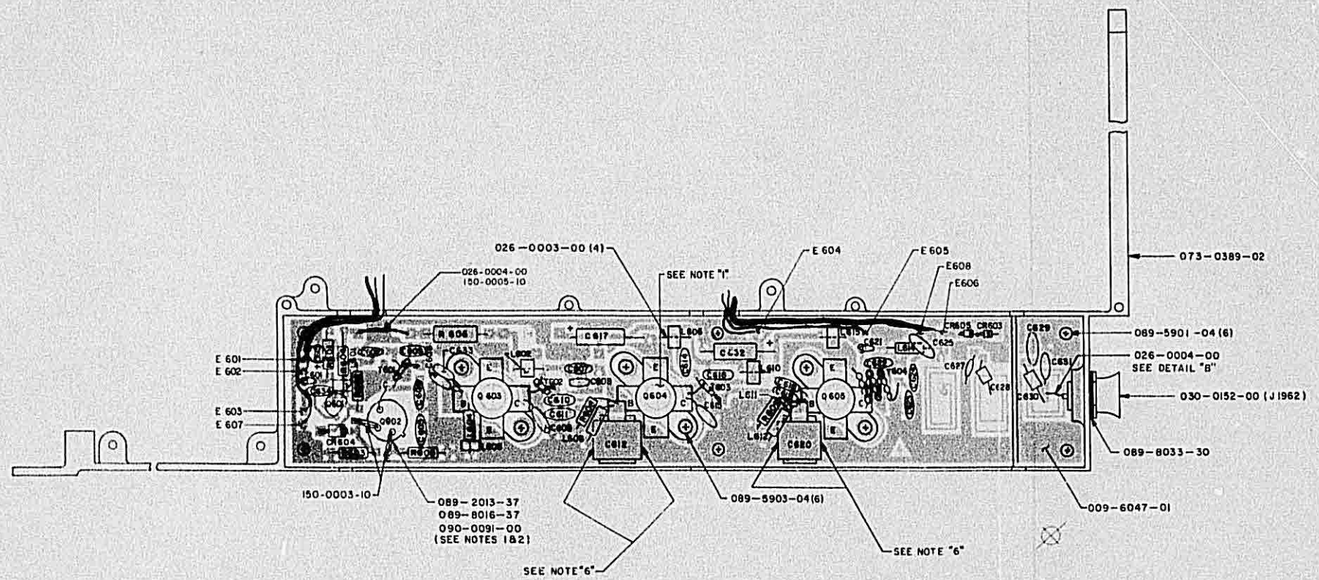
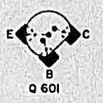
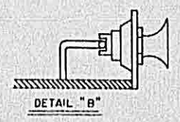
PAGE 6-65 THRU PAGE 6-66A

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER







NOTES:

1. APPLY THERMAL COMPOUND (016-1004-00) TO BACK SIDE OF TRANSISTORS, Q 603, Q 604, Q 605 ONLY AND TO BACK SIDE OF HEATSINK. ON Q 602 ADD THERMAL COMPOUND TO TRAN. CASE AND THE STUD SIDE OF THE HEATSINK.
2. TORQUE NUT ON FAR SIDE OF Q 602 TO 7 IN. POUNDS AND APPLY GLYPTAL.
3. ALL LEAD LENGHTS MUST BE AS SHORT AS POSSIBLE. SOLDER JOINTS ON CAPACITOR LEADS SHOULD EXTEND ALL THE WAY TO THE BODY OF THE CAPACITOR WHERE POSSIBLE.
4. ENTIRE ASS'Y MUST BE ESPECIALLY CLEAN AND FREE OF FLUX DEPOSITS.
5. MAINTAIN MINIMUM LEAD LENGTHS ON C 604, C 605, C 606, C 609, C 610, C 611, C 615, C 618, C 619, C 623, C 624, C 633, C 644.
6. UNDERWOOD CAPS MUST BE SOLDERED ON BOTH SIDES.

WIRING CHART		
FROM	TO	PART NO.
E 601	E 153	025-0004-03
E 602	E 126	025-0018-89
E 603 E 607	E 129 E 155	026-0013-00
E 604	E 125	025-0004-00
E 605	E 128	025-0004-13
E 606 E 608	E 303 E 304	026-0013-00

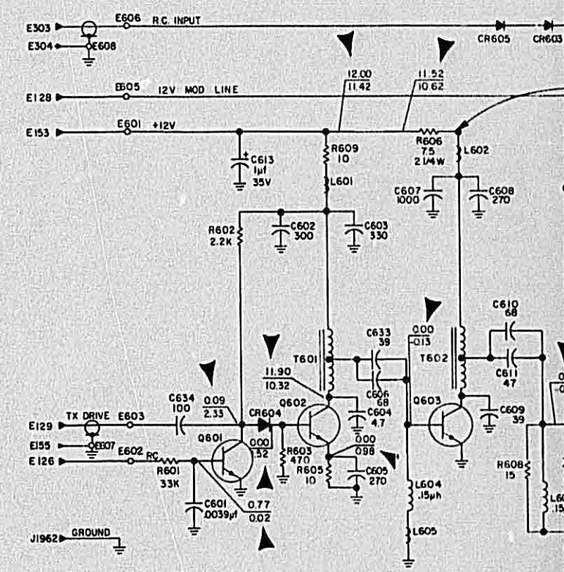
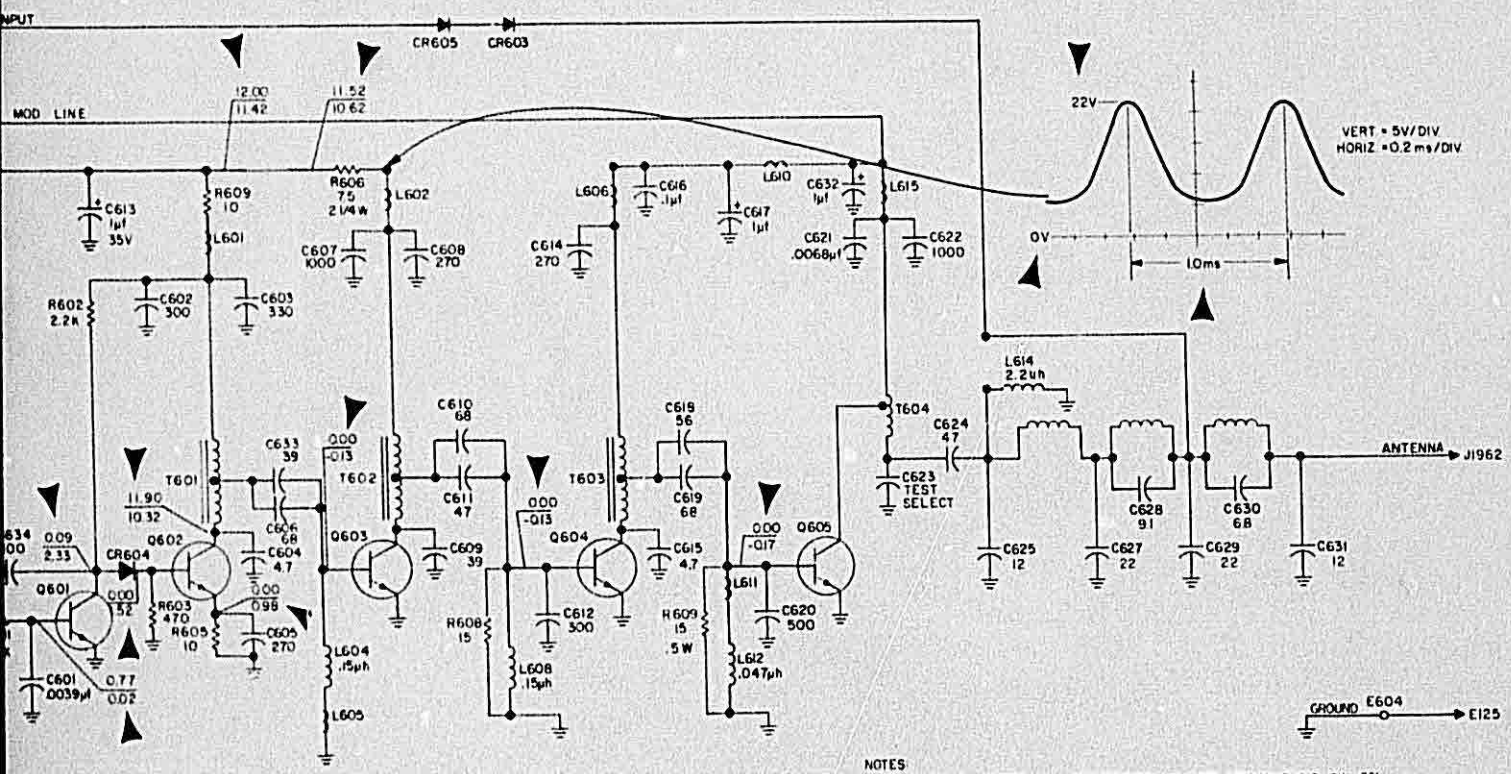


FIGURE 6-12 KY 196/196E TRANSMITTER BOARD ASSEMBLY AND SCHEMATIC
(Dwg. No. 300-6047-00, R-13)
(Dwg. No. 002-6047-00, R-5)

SEE BLOW UP FICHE NO. KR2661. ITEM O



NOTES:

1. UNLESS NOTED; ALL RESISTANCE VALUES ARE IN OHMS, QW, 5%;
   ALL CAPACITANCE VALUES ARE IN PICOFARADS (pf).
2. VOLTAGES ABOVE LINE, REC MODE
   VOLTAGES BELOW LINE, XMIT MODE
   VOLTAGES TAKEN WITH FLUKE 2000A.

200-6166-00 XMTR BD KY 197 R: 12

SYMBOL	PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00
	009-6166-01	PC BD TRANSMITTER		EA	1.00
	016-1004-00	COMPOUND THRML JNT		AR	0.00
	025-0004-00	WIRE 20 BLK		AR	0.00
	025-0004-03	WIRE 20 ORN		AR	0.00
	025-0004-13	WIRE 20 OR/WH		AR	0.00
	025-0018-89	WIRE 26 GY/WH		AR	0.00
	026-0003-00	WIRE COP TIN 22G		AR	0.00
	026-0004-00	WIRE COP TIN 20G		AR	0.00
	026-0013-00	CA COAX RG178BU		AR	0.00
	030-0152-00	CONN BNC HEX		EA	1.00
	073-0389-02	XMTR HEATSINK	A	EA	1.00
	089-2013-37	NUT HEX 6-32		EA	1.00
	089-5901-04	SCR PHP 3-48X1/4		EA	6.00
	089-5903-04	SCR PHP 4-40X1/4		EA	4.00
	089-8016-37	WSHR INTL LK #6		EA	1.00
	089-8033-30	WSHR INTL LK .391		EA	1.00
	090-0091-00	HEAT SINK XSTR		EA	1.00
	150-0003-10	TUBING TFLN 24AWG		AR	0.00
C 601	113-5101-00	CAP DC 100PF 500V		EA	1.00
C 602	111-0001-10	CAP CR .0039UF 50V		EA	1.00
C 603	096-1082-02	CAP TN 1UF 35V		EA	1.00
C 604	104-0001-23	CAP SM 270PF 100V		EA	1.00
C 605	104-0001-35	CAP SM 68PF 500V		EA	1.00
C 606	104-0001-35	CAP SM 68PF 500V		EA	1.00
C 608	100-0002-19	CAP MC 500PF 250V		EA	1.00
C 609	104-0001-35	CAP SM 68PF 500V		EA	1.00
C 610	104-0001-44	CAP SM 56PF 100V		EA	1.00
C 611	104-0001-22	CAP SM 330PF 100V		EA	1.00
C 612	104-0001-23	CAP SM 270PF 100V		EA	1.00
C 613	096-1082-02	CAP TN 1UF 35V		EA	1.00
C 615	104-0001-23	CAP SM 270PF 100V		EA	1.00
C 617	104-0001-29	CAP SM 36PF 500V		EA	1.00
C 618	104-0001-29	CAP SM 36PF 500V		EA	1.00
C 619	113-3120-00	CAP DC 12PF 500V		EA	1.00
C 620	106-0001-03	CAP FC 1.5PF5%500V		EA	1.00
C 621	113-3220-00	CAP DC 22PF 500V		EA	1.00
C 622	106-0001-42	CAP FC 9.1PF5%500V		EA	1.00
C 623	113-3220-00	CAP DC 22PF 500V		EA	1.00
C 624	106-0001-34	CAP FC 6.8 5% 500V		EA	1.00
C 625	113-3120-00	CAP DC 12PF 500V		EA	1.00
C 626	104-0001-22	CAP SM 330PF 100V		EA	1.00
C 627	113-5301-00	CAP DC 300PF 500V		EA	1.00
C 628	113-3100-00	CAP DC 10PF 500V		EA	1.00
C 629	111-0001-15	CAP CR 330PF 50V		EA	1.00
C 631	104-0001-49	CAP SM 33PF 500V		EA	1.00
C 632	104-0001-41	CAP SM 22PF 500V		EA	1.00
CR 601	007-6070-00	DIO S MPN3401		EA	1.00
CR 603	007-6099-00	DIO UM9401		EA	1.00
CR 604	007-6099-00	DIO UM9401		EA	1.00

200-6166-00 XMTR BD KY 197 R: 12

SYMBOL	PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00
L 601	013-0006-01	FERR BEAD		EA	1.00
L 602	019-2084-05	CH .22UH 10%		EA	1.00
L 604	013-0006-01	FERR BEAD		EA	1.00
L 606	019-2084-05	CH .22UH 10%		EA	1.00
L 608	013-0006-01	FERR BEAD		EA	1.00
L 609	019-2084-29	CH 2.2UH 10%		EA	1.00
L 610	013-0006-01	FERR BEAD		EA	1.00
Q 601	007-0195-00	XSTR S MPSH10		EA	1.00
Q 602	007-0250-00	XSTR RF PWR 2N4427		EA	1.00
Q 603	007-0360-00	XSTR RF SD1145-5		EA	1.00
Q 604	007-0361-00	XSTR RF SE1430-2		EA	1.00
R 601	130-0333-23	RES FC 33K QW 5%		EA	1.00
R 602	130-0202-23	RES FC 2K QW 5%		EA	1.00
R 603	132-0106-35	RES WW 22 2.25W 5%		EA	1.00
R 604	130-0100-23	RES FC 10 QW 5%		EA	1.00
R 605	130-0200-23	RES FC 20 QW 5%		EA	1.00
R 607	130-0200-23	RES FC 20 QW 5%		EA	1.00
R 608	130-0681-23	RES FC 680 QW 5%		EA	1.00
T 601	019-3026-02	XFMR TW BIFLR		EA	1.00
T 602	019-3026-00	XFMR TW BIFLR 3T		EA	1.00
T 603	019-3124-00	XFMR BIFILAR RF 3T		EA	1.00

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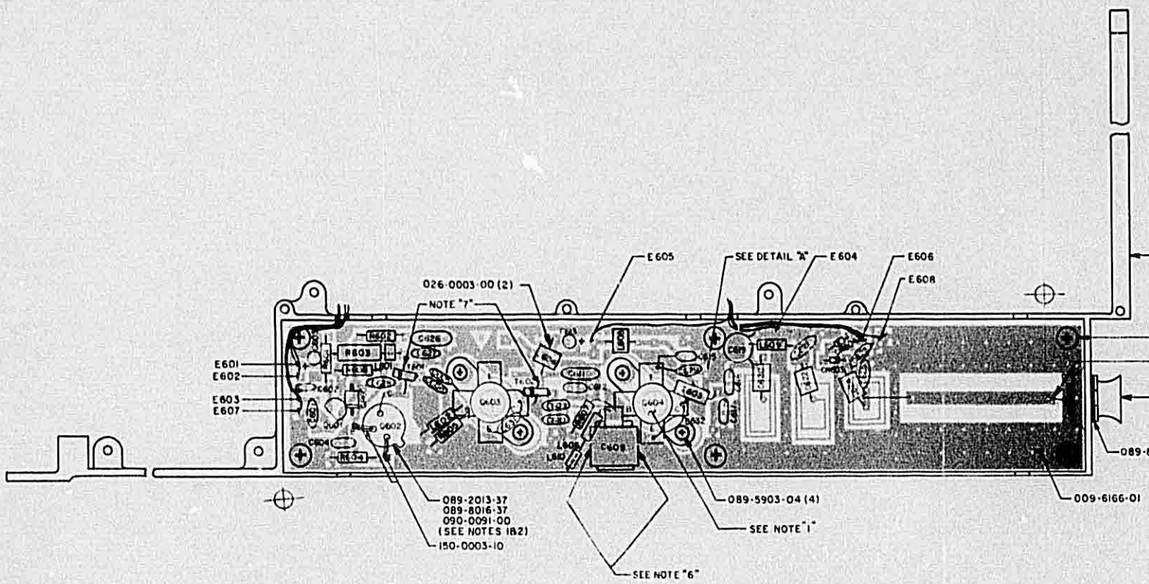
KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER



NOTES

1. APPLY THERMAL COMPOUND (016-1004-00) TO BACK SIDE OF TRANSISTORS, Q603, Q604 ONLY AND TO BACK SIDE OF HEATSINK. ON Q602 ADD THERMAL COMPOUND TO TRANSISTOR CASE AND THE STUD SIDE OF THE HEATSINK.
2. TORQUE NUT ON FAR SIDE OF Q602 TO 7 IN. POUNDS AND APPLY GLYPTAL.
3. ALL LEAD LENGTHS MUST BE AS SHORT AS POSSIBLE. SOLDER JOINTS ON CAPACITOR LEADS SHOULD EXTEND ALL THE WAY TO THE BODY OF THE CAPACITOR WHERE POSSIBLE.
4. ENTIRE ASS'Y MUST BE ESPECIALLY CLEAN AND FREE OF FLUX DEPOSITS.
5. MAINTAIN MINIMUM LEAD LENGTHS ON C605, C606, C609, C610, C617, C618, AND C628.
6. UNDERWOOD CAPS MUST BE SOLDERED ON BOTH SIDES.
7. MAKE SURE LEADS ARE SEPERATED.

WIRING CHART		
FROM	TO	PART NUMBER
E601	E153	025-0004-03
E602	E126	025-0018-89
E603 E607	E129 E155	026-0013-00
E604	E125	025-0004-00
E605	E128	025-0004-13
E606 E608	E303 E304	026-0013-00

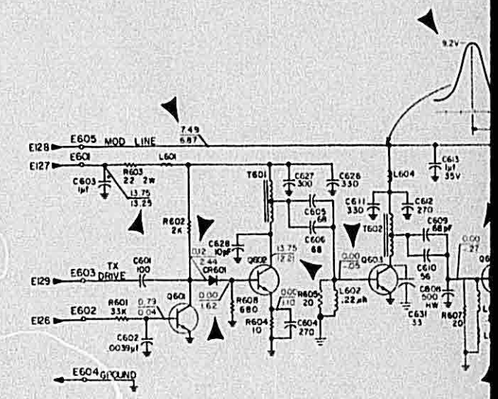
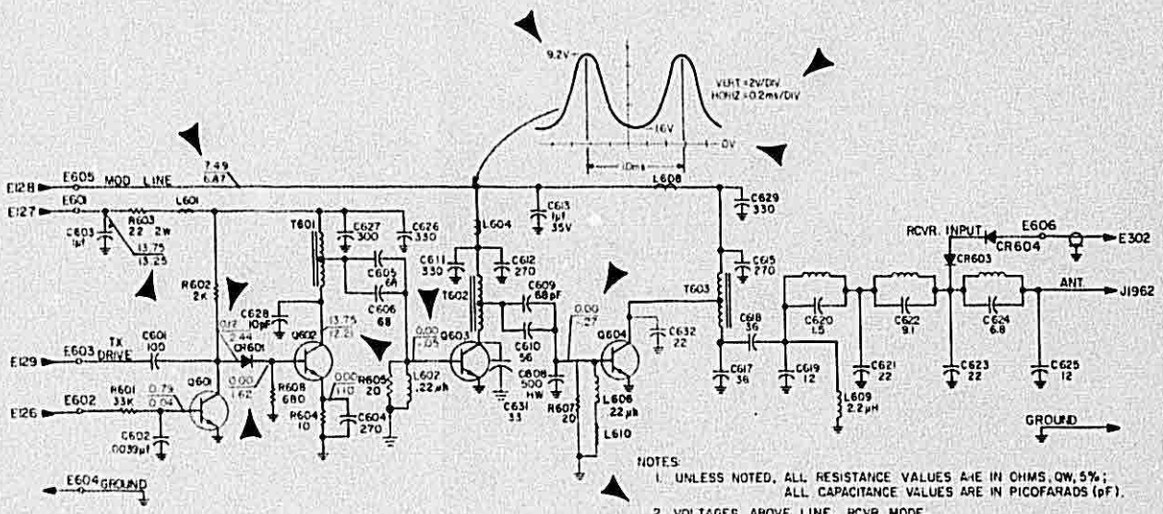


FIGURE 6-13 KY 197/197E TRANSMITTER BOARD ASSEMBLY AND SCHEMATIC
(Dwg. No. 300-6166-00, R-15)
(Dwg. No. 002-6166-00, R-9)

SEE BLOW UP FICHE NO. KR2661 ITEM S

E OF TRANSISTORS,
N Q602 ADD THERMAL
OF THE HEATSINK.
AND APPLY GLYPTAL
E SOLDER JOINTS
TO THE BODY OF
OF FLUX DEPOSITS
09, C610, C617, C618,



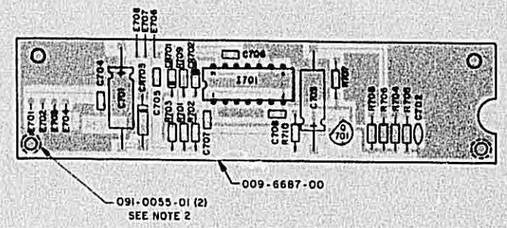
NOTES:
1. UNLESS NOTED, ALL RESISTANCE VALUES ARE IN OHMS, ΩW, 5%; ALL CAPACITANCE VALUES ARE IN PICOFARADS (pF).
2. VOLTAGES ABOVE LINE, RCVR. MODE;
VOLTAGES BELOW LINE, XMTR. MODE;
VOLTAGES TAKEN WITH FLUKE 2000A.

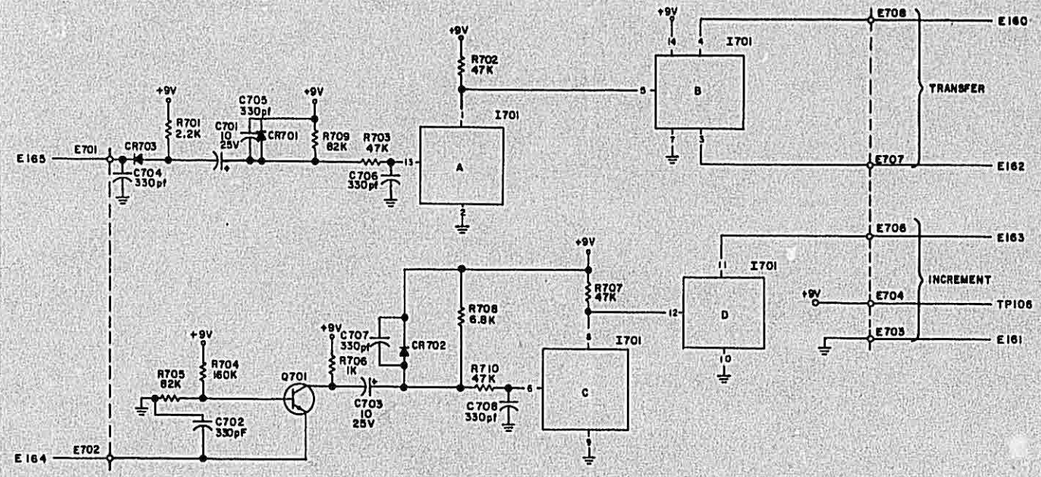
200-6687-00 MOD BD ASSY R: 7

SYMBOL		PART NUMBER	DESCRIPTION	A	UM	QUANTITY 00
		009-6687-00	PC BD MOD		EA	1.00
		016-1040-00	COATING TYPE AR		AR	0.00
		025-0018-00	WIRE 26 BLK		AR	0.00
		025-0018-11	WIRE 26 BRN		AR	0.00
		025-0018-22	WIRE 26 RED		AR	0.00
		025-0018-33	WIRE 26 ORN		AR	0.00
		025-0018-44	WIRE 26 YEL		AR	0.00
		025-0018-66	WIRE 26 BLU		AR	0.00
		025-0018-99	WIRE 26 WHT		AR	0.00
		091-0055-01	SCR RH 2-56X1/4		EA	2.00
C	701	097-0092-08	CAP EL 10UF 25V		EA	1.00
C	702	111-0001-33	CAP CR 330PF 200V		EA	1.00
C	703	097-0092-08	CAP EL 10UF 25V		EA	1.00
C	704	111-0001-33	CAP CR 330PF 200V		EA	1.00
C	705	111-0001-33	CAP CR 330PF 200V		EA	1.00
C	706	111-0001-33	CAP CR 330PF 200V		EA	1.00
C	707	111-0001-33	CAP CR 330PF 200V		EA	1.00
C	708	111-0001-33	CAP CR 330PF 200V		EA	1.00
CR	701	007-6016-00	DIO S 1N4154		EA	1.00
CR	702	007-6016-00	DIO S 1N4154		EA	1.00
CR	703	007-6025-00	DIO S 1N4003		EA	1.00
I	701	120-6083-01	IC SCL4066BC		EA	1.00
Q	701	007-0078-01	XSTR S NPN 2N3417		EA	1.00
R	701	131-0222-13	RES CF 2.2K EW 5%		EA	1.00
R	702	131-0473-13	RES CF 47K EW 5%		EA	1.00
R	703	131-0473-13	RES CF 47K EW 5%		EA	1.00
R	704	131-0164-13	RES CF 160K EW 5%		EA	1.00
R	705	131-0823-13	RES CF 82K EW 5%		EA	1.00
R	706	131-0102-13	RES CF 1K EW 5%		EA	1.00
R	707	131-0473-13	RES CF 47K EW 5%		EA	1.00
R	708	131-0682-13	RES CF 6.8K EW 5%		EA	1.00
R	709	131-0823-13	RES CF 82K EW 5%		EA	1.00
R	710	131-0473-13	RES CF 47K EW 5%		EA	1.00

NOTES:

1. PRIOR TO POST COATING BOTH SIDES OF P.C. BOARD WITH CLEAR URETHANE (016-1040-00), MASK OFF THE FOLLOWING: ALL MOUNTING AREAS, ALL "E" NUMBERS.
2. INSERT 091-0055-01 SCREW IN EACH HOLE AND HEATSTAKE ON COMPONENT SIDE OF BOARD.





NOTES:
1. UNLESS OTHERWISE NOTED, ALL RESISTANCE VALUES ARE IN OHMS, EW, 5%.
2. UNLESS OTHERWISE NOTED, ALL CAPACITANCE VALUES ARE IN MICROFARADS.

FIGURE 6-14 KY 196/197 REMOTE MEMORY INCREMENT/TRANSFER ASSEMBLY AND SCHEMATIC
(Dwg. No. 300-6687-00, R-5)
(Dwg. No. 002-6687-00, R-5)

SEE BLOW UP FICHE NO. KR2661. ITEM W

APPENDIX

TABLE OF CONTENTS

SEMICONDUCTOR AND INTEGRATED CIRCUIT DATA

1.1 GENERAL

Due to the wide utilization of semiconductors in this electronic equipment, somewhat different techniques are necessary in maintenance procedures. In solid state circuits the impedances and resistances encountered are of much lower values than those encountered in vacuum-tube circuits. Therefore, a few ohms discrepancy can greatly affect the performance of the equipment. Also, coupling and filter capacitors are of larger values and usually are of the tantalum type. Hence, when measuring values of capacitors, an instrument accurate in the high ranges must be employed. Capacitor polarity must be observed when measuring resistance. Usually more accurate measurements can be obtained if the semiconductors are removed or disconnected from the circuits.

1.1.1 SEMICONDUCTOR TEST EQUIPMENT

Damage to semiconductors by test equipment is usually the result of accidentally applying too much voltage to the elements. Common causes of damage from test equipment are discussed in the following paragraph.

A. Transformerless Power Supplies

Test equipment with transformerless power supplies is one source of high current. However, this type of test equipment can be used by employing an isolation transformer in the AC power line.

B. Line Filter

It is still possible to damage semiconductors from line current, even though the test equipment has a power transformer in the power supply, if the test equipment is provided with a line filter. This filter may function as a voltage divider and apply half voltage to the semiconductor. To eliminate this condition, connect a ground wire from the chassis to the test equipment to the chassis of the equipment under test before making any other connections.

C. Low-Sensitivity Multimeters

Another cause of semiconductor damage is a multimeter that requires excessive current to provide adequate indications. Multimeters with sensitivities of less than 20,000 ohms-per-volt should not be used on semiconductors. When in doubt as to the amount of current supplied by a multimeter, check the multimeter circuits on all scales with an external, low-resistance multimeter connected in series with the multimeter leads. If more than one milliampere is drawn on any range, this range cannot be safely used on small semiconductors.

D. Power Supply

When using a battery-type power supply, always use fresh batteries of the proper value. Make certain that the polarity of the power supply is correct for the equipment under test. Do not use power supplies having poor voltage regulation.

1.1.2 SEMICONDUCTOR VOLTAGE AND RESISTANCE MEASUREMENTS

When measuring voltage or resistance in circuits containing semiconductor devices, remember that these components are polarity and voltage conscious. Since the values of capacitors used in semiconductor circuits are usually large, time is required to charge these capacitors when they appear. Thus, any reading obtained is subject to error if sufficient time is not allowed for the capacitor to fully charge. When in doubt it may be best in some cases to isolate the components in question and measure them individually.

1.1.3 TESTING OF TRANSISTORS

A transistor checker should be used to properly evaluate transistors. If a transistor tester is not available, a good multimeter may be used. Make sure that the multimeter meets the requirements outlined in the preceding paragraph.

A. PNP Transistor

To check a PNP transistor, connect the positive lead of the multimeter to the base of the transistor and the negative lead to the emitter or collector. Generally, a resistance reading of 50,000 ohms or more should be obtained. Reconnect the multimeter with the negative lead to the base. With the positive lead connected to the emitter or collector a resistance value of 500 ohms or less should be obtained.

B. NPN Transistor

Similar tests made on an NPN transistor should produce the following results:

With the negative lead of the multimeter connected to the base of the transistor the value of resistance between the base and the collector or emitter should be high. With the positive lead of the multimeter connected to the base, the value of resistance between the base and the collector or emitter should be low. If these results are not obtained, the transistor is probably defective and should be replaced.

CAUTION

IF A TRANSISTOR IS FOUND TO BE DEFECTIVE, MAKE CERTAIN THAT THE CIRCUIT IS IN GOOD OPERATING ORDER BEFORE INSTALLING A REPLACEMENT TRANSISTOR. IF A SHORT CIRCUIT EXISTS IN THE CIRCUIT, PUTTING IN ANOTHER TRANSISTOR WILL MOST LIKELY RESULT IN BURNING OUT THE NEW COMPONENT. DO NOT DEPEND UPON FUSES TO PROTECT TRANSISTORS.

C. Always check the value of the bias resistors in series with the various elements. A transistor is very sensitive to improper bias voltage; therefore, a short or open circuit in the bias resistors may damage the transistor.

1.1.4 REPLACING SEMICONDUCTORS

Never remove or replace a semiconductor with the supply voltage turned on. Transients thus produced may damage the semiconductor or others remaining in the circuit. If a semiconductor is to be evaluated in an external test circuit, be sure that no more voltage is applied to the semiconductor than normally is used in the circuit from which it came.

A. Use only a low heat soldering iron when installing or removing soldered-in semiconductors. Grasp the lead to which heat is applied between the solder joint and the semiconductor with long nosed pliers.

This will dissipate some of the heat that would otherwise be conducted into the semiconductor from the soldering iron. Make certain that all wires soldered to semiconductor terminals have first been properly tinned so that the necessary connection can be made quickly. Excessive heat will permanently damage a semiconductor.

B. In some cases, power transistors are mounted on heat-sinks that are designed to dissipate heat away from them. In some power circuits, the transistor must also be insulated from ground. This insulating is accomplished by means of an insulating washer made of mica. When replacing transistors mounted in this manner, be sure that the insulating washers are replaced in proper order. After the transistor is mounted, and before making any connections, check from the case of the transistor to ground with a multimeter to see that the insulation is effective.

1.2 INTEGRATED CIRCUIT MAINTENANCE

1.2.1 GENERAL

A knowledge of integrated circuit fundamentals is as necessary in testing digital logic circuits involving IC's as a knowledge of rectification fundamentals is needed to test a power supply.

1.2.2 TERMINOLOGY

Several terms are used whenever logic circuits are discussed:

A. A logic state is defined as a high or low level voltage applied to the input or seen at the output of a device. A high level voltage is called a logic "1". A low level voltage is called a logic "0". Logic threshold voltage of a device is the input voltage required at an input to change the output state.

B. A truth table is a list of input logic states that will yield certain output logic states. A digital logic element should be thought of as a circuit element with its output level being either HI or LO as programmed by the levels present on its inputs.

A logic element may be tested by verifying that it is performing per the Truth Table of that logic element.

C. Logic elements which have multiple inputs and a single output are known as gates. The OR gate produces a HI output when one or more of the inputs are HI. With all inputs LO, the output is LO. The AND gate produces a HI output only when all inputs are HI. When any input is LO the output is LO. A small circle at the output of a gate on the schematics indicates "negation", which means that the sense of the gate logic is reversed. An OR gate with negation is called a NOR gate and an AND gate with negation is called a NAND gate. A NOR gate produces a LO output when one or more of the inputs are HI and a NAND gate produces a LO output only when all inputs are HI.

D. The Flip-Flop logic element is the basic data storage element of digital logic. It has two outputs that are always at opposite logic levels. That is, when one output is HI the other is LO. The Flip-Flop will remain in a particular state until that state is changed by an input signal.

The operation of these Flip-Flops is controlled by the signals on their inputs, and is best understood by a careful study of their Truth Tables. It should be kept in mind that a small circle on either the input or the output indicates negation. Also, a circle on a clock input indicates that a HI to LO transition causes the Flip-Flop to function.

E. Besides the gates and Flip-Flops, two other commonly used logic elements are inverters and expanders. Inverters are merely switching transistors such that if a logic "1" is the input to a device, a logic "0" will be the output and vice-versa. An expander is a set of parallel switching transistors that depends upon another resistor to provide their supply voltage. Generally, these devices are used to expand the number of inputs available to a standard gate.

1.2.3 INTEGRATED CIRCUIT TEST EQUIPMENT

As with semiconductors, damage to integrated circuits by test equipment is usually the result of applying too much current or voltage to the elements. The same precautions as discussed in Paragraph 1.1.1 apply here.

1.2.4 VOLTAGE MEASUREMENTS

Precise voltage measurements are not needed in testing digital IC's other than to see that the voltage is a HI or a LO level. An oscilloscope is needed where the input levels are of short duration, either HI or LO. For instance, if a 10 microsecond pulse going from LO to HI was applied to one input of a NOR gate, while the other input stayed LO, the output would go LO for 10 microseconds and then return HI. This, of course, could not be seen without an oscilloscope.

1.2.5 TESTING INTEGRATED CIRCUITS

The fully loaded guaranteed minimum high and maximum low for the digital logic output levels are:

TTL (V_{cc} = +5V)		ECL (V_{cc} = +5.2V)	
High	Low	High	Low
2.4	0.5	4.25	3.48

The minimum high and maximum low input levels which are guaranteed to be correctly interpreted are:

TTL (V_{cc} = +5V)		ECL (V_{cc} = +5.2V)	
High	Low	High	Low
2.0	0.8	4.06	3.75

When checking input and output levels of a logic element under question it should be remembered that an input or output may not agree with its truth table not because it has malfunctioned but because some other component connected to the same point has shorted to ground or to the supply voltage (V_{cc}). This is not common when an output on one element is connected to an input of another. A majority of digital IC failures can be grouped into threee categories:

A. Input(s) or output shorted to ground pin of IC.

B. Input(s) or output shorted to V_{cc} pin of IC.

C. Open input(s) or output.

An input or output shorted to ground would be a constant LO and an input or output shorted to V_{cc} would be a constant HI.

Other failures common in digital IC's are:

A. Ground pin open.

B. V_{cc} pin open.

C. Inputs shorted together.

An open ground pin would not allow a LO on the output. An open V_{cc} pin would not allow a HI on the output. (Remember to isolate the device from other components connected to it). Two or more inputs shorted together can be checked by grounding one of the inputs under question. If the other input also goes to ground they are probably shorted.

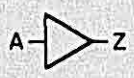
CAUTION

IF AN IC IS FOUND TO BE DEFECTIVE, VERIFY THAT PROPER POWER SUPPLY VOLTAGES ARE PRESENT BEFORE INSTALLING A REPLACEMENT IC.

1.2.6 REPLACING INTEGRATED CIRCUITS

If an IC is known to be defective, the easiest way to remove it is to cut off each of its pins, remove the case, and then unsolder the remaining pins from the integrated circuit card one by one. This is preferrable over removing the IC intact because attempts to remove the IC intact may result in damage to the printed circuit board.

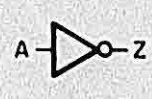
FIGURE 1. BUFFER



$Z = A$

A	Z
0	0
1	1

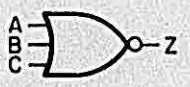
FIGURE 2. INVERTER



$Z = \overline{A}$

A	Z
0	1
1	0

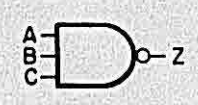
FIGURE 3. NOR GATE



$Z = \overline{A+B+C}$

A	B	C	Z
0	0	0	1
1	0	0	0
0	1	0	0
0	1	1	0
1	0	1	0
1	1	0	0
0	1	1	0
1	1	1	0

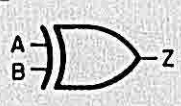
FIGURE 4. NAND GATE



$Z = \overline{ABC}$

A	B	C	Z
0	0	0	1
1	0	0	1
0	1	0	1
0	1	1	1
1	0	1	1
1	1	0	1
0	1	1	1
1	1	1	0

FIGURE 5. EXCLUSIVE OR GATE

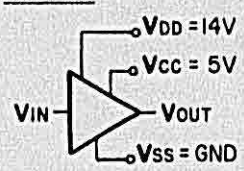


$Z = A \oplus B$

A	B	Z
0	0	0
1	0	1
0	1	1
1	1	0

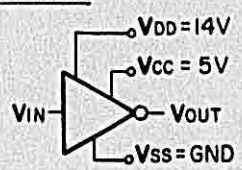
FIGURE 6. TTL TO CMOS VOLTAGE LEVEL TRANSLATORS

BUFFER



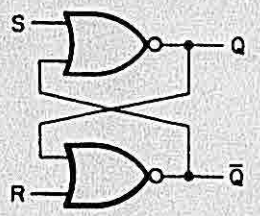
VIN	0V	14V
VOUT	0V	5V

INVERTER



VIN	0V	14V
VOUT	5V	0V

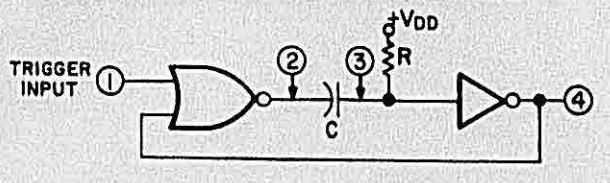
FIGURE 7. NOR GATE FLIP-FLOP



S	R	Next Q	$\bar{Q}$
1	1	0	0
0	1	1	0
0	0	NC	NC
1	0	0	1

NC = NO CHANGE

FIGURE 8. MONOSTABLE MULTIVIBRATOR (ONE-SHOT)



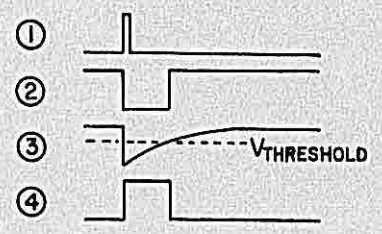
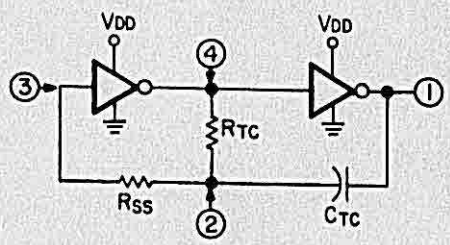
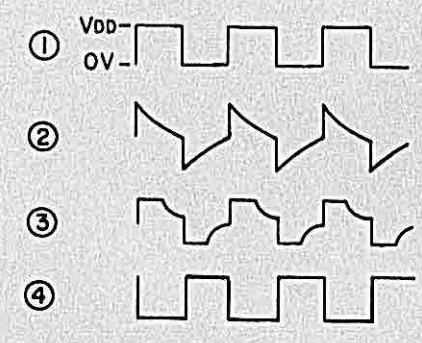


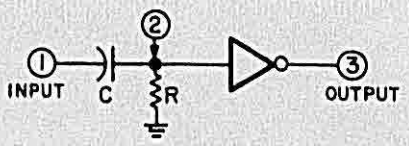
FIGURE 9. ASTABLE MULTIVIBRATOR (FREE-RUNNING)

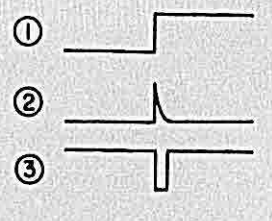




FREQUENCY OF OPERATION IS DETERMINED BY R_{TC} AND C_{TC}.
A NOR OR NAND GATE MAY BE USED IN PLACE OF THE FIRST INVERTER TO PERMIT GATING OF THE MULTIVIBRATOR.

FIGURE 10. DIFFERENTIATOR



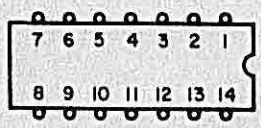


OFTEN USED TO CHANGE A STEP SIGNAL TO A SHORT PULSE SIGNAL.

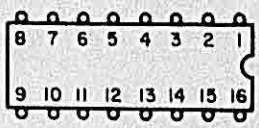
INTEGRATED CIRCUIT PIN LOCATION DIAGRAMS

(Viewed From TOP of IC)

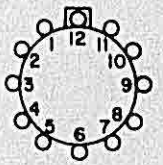
(1)



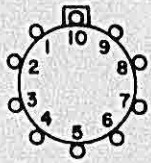
(2)



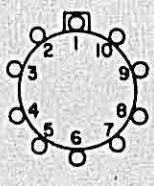
(3)



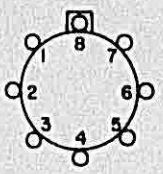
(4)



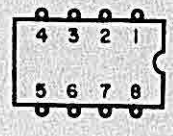
(5)



(6)



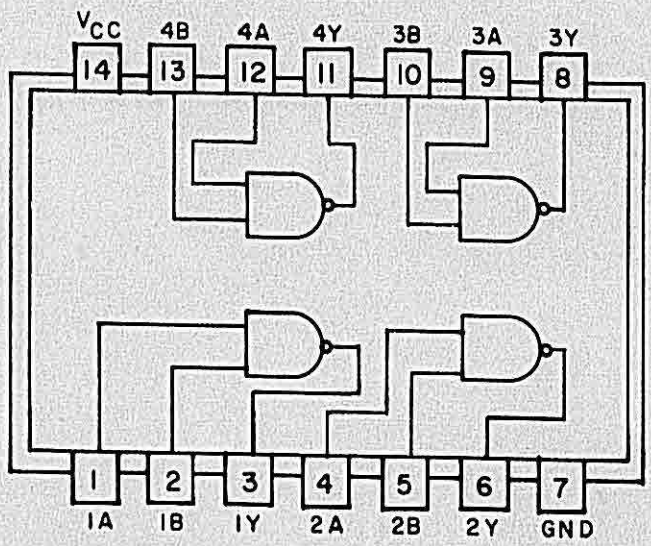
(7)



KING

74LS00

120-0079-00



POSITIVE LOGIC $Y = \overline{AB}$

QUADRUPLE 2-INPUT POSITIVE-NAND GATES

DESCRIPTION

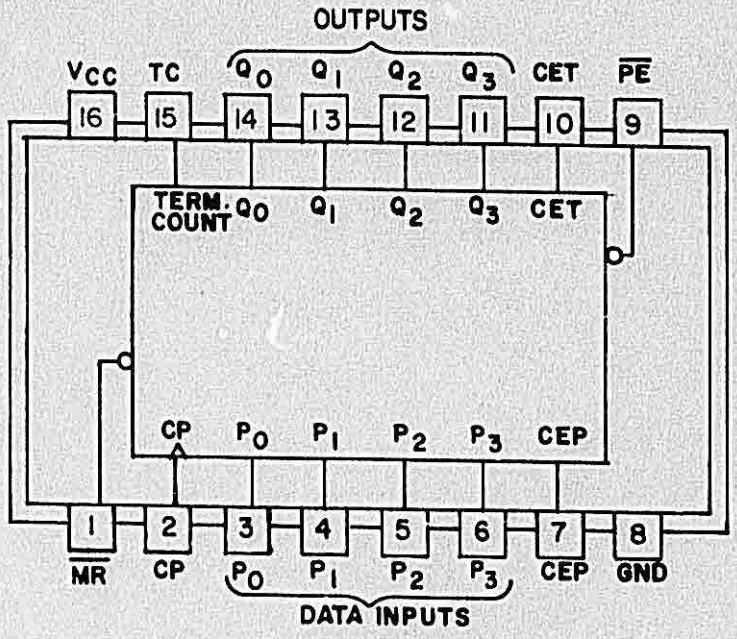
The transistor-transistor-logic (TTL) family of high-performance bipolar digital integrated circuits comprises five distinct series of compatible produce lines. These product lines offer the digital systems designer a full spectrum of performance ranges in order to optimize system cost and performance. The available choices range from the very high performance of the Schottky-clamped* functions for systems operating typically up to 125 megahertz to low-power functions with power consumption of only one milliwatt per gate.

74LS162

120-0087-00

74LS163

120-0088-00



BCD DECADE COUNTER/4-BIT BINARY COUNTER

FUNCTIONAL DESCRIPTION

The 74LS162 is a high speed BCD decade counter, and the 74LS163 is a high speed binary counter. Both counters are fully synchrounous will the clock pulse driving four master/slave flip-flops in parallel through a clock buffer.

The three control inputs, Parallel Enable ($\overline{PE}$), Count Enable Parallel (CEP), and Count Enable Trickle (CET), select the mode of operation as shown in the tables below. When the conditions for counting are satisfied, the rising edge of a clock pulse will change the counters to the next state of the count sequence shown in the State Diagram on the previous page. The Count Mode is enabled when CEP and CET inputs and $\overline{PE}$ are HIGH.

The 74LS162 and 74LS163 can be synchronously preset from the four Parallel inputs, (P_{0-3}) when $\overline{PE}$ is LOW. When the Parallel Enable and Clock are LOW, each master of the flip-flops is connected to the appropriate parallel input (P_{0-3}) and the slaves (outputs) are steady in their previous state. When the clock goes HIGH, the masters are inhibited and this information is transferred to the slaves and reflected at the outputs. The parallel enable input overrides both count enable inputs, presetting the counter when LOW.

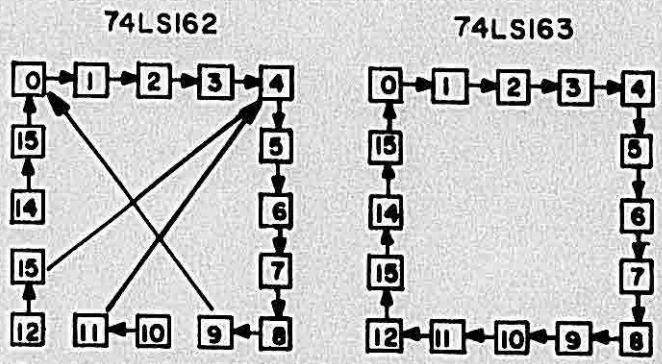
Terminal count is HIGH when the counter is at terminal count (state 9 for 74LS162, and state 15 for 74LS163), and Count Enable Trickle is HIGH, as is shown in the logic equations. When LOW, the asynchronous master reset overrides all other inputs resetting the four outputs LOW.

74LS162

120-0087-00

74LS163

120-0088-00



LOGIC EQUATIONS

COUNT ENABLE = CEP·CET·PE

TC FOR 74LS162 = $CET \cdot Q_0 \cdot \overline{Q_1} \cdot \overline{Q_2} \cdot Q_3$

TC FOR 74LS163 = $CET \cdot Q_0 \cdot Q_1 \cdot Q_2 \cdot Q_3$

PRESET = PE·CP + (RISING CLOCK EDGE)

RESET = $\overline{MR}$

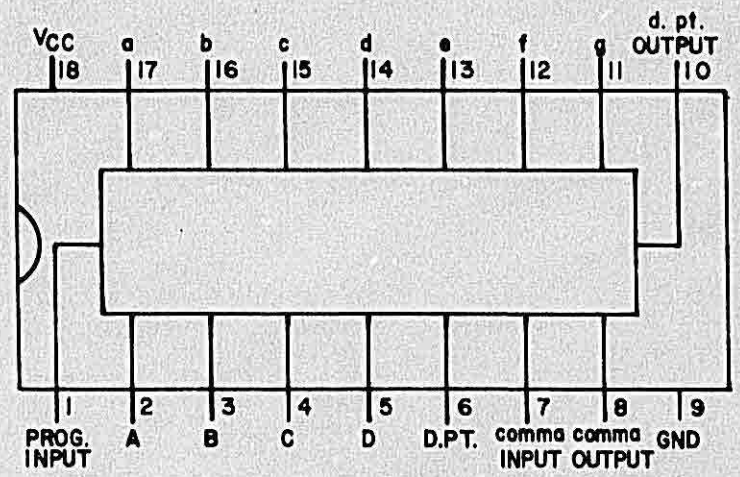
PIN NAMES

$\overline{PE}$	Parallel Enable (Active LOW) Input
P_0, P_1, P_2, P_3	Parallel Inputs
CEP	Count Enable Parallel Input
CET	Count Enable Trickle Input
CP	Clock (Active HIGH Going Edge) Input
$\overline{MR}$	Master Reset (Active LOW) Input
Q_1, Q_2, Q_3, Q_4	Parallel Outputs
TC	Terminal Count Outputs

KING

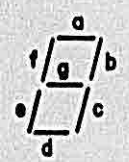
DS8884

120-0089-00



TOP VIEW

FUNCTION	D.P.T.	COMMA	D	C	B	A	a	b	c	d	e	f	g	DISPLAY
0	1	1	0	0	0	0	0	0	0	0	0	0	1	
1	1	1	0	0	0	1	1	0	0	1	1	1	1	
2	1	1	0	0	1	0	0	0	1	0	0	1	0	
3	1	1	0	0	1	1	0	0	0	0	1	1	0	
4	1	1	0	1	0	0	1	0	0	1	1	0	0	
5	1	1	0	1	0	1	0	1	0	0	1	0	0	
6	1	1	0	1	1	0	0	1	0	0	0	0	0	
7	1	1	0	1	1	1	0	0	0	1	1	1	1	
8	1	1	1	0	0	0	0	0	0	0	0	0	0	
9	1	1	1	0	0	1	0	0	0	0	1	0	0	
10	1	1	1	0	1	0	1	1	0	0	0	1	1	
11	1	1	1	0	1	1	1	1	0	0	0	1	0	
12	1	1	1	1	0	0	0	0	1	1	1	0	0	
13	1	1	1	1	0	1	0	1	1	0	0	0	0	
14	1	1	1	1	1	0	1	1	1	1	1	1	0	
15	1	1	1	1	1	1	1	1	1	1	1	1	1	
* D.P.T.	0	1	X	X	X	X	X	X	X	X	X	X	X	
* Comma	0	0	X	X	X	X	X	X	X	X	X	X	X	



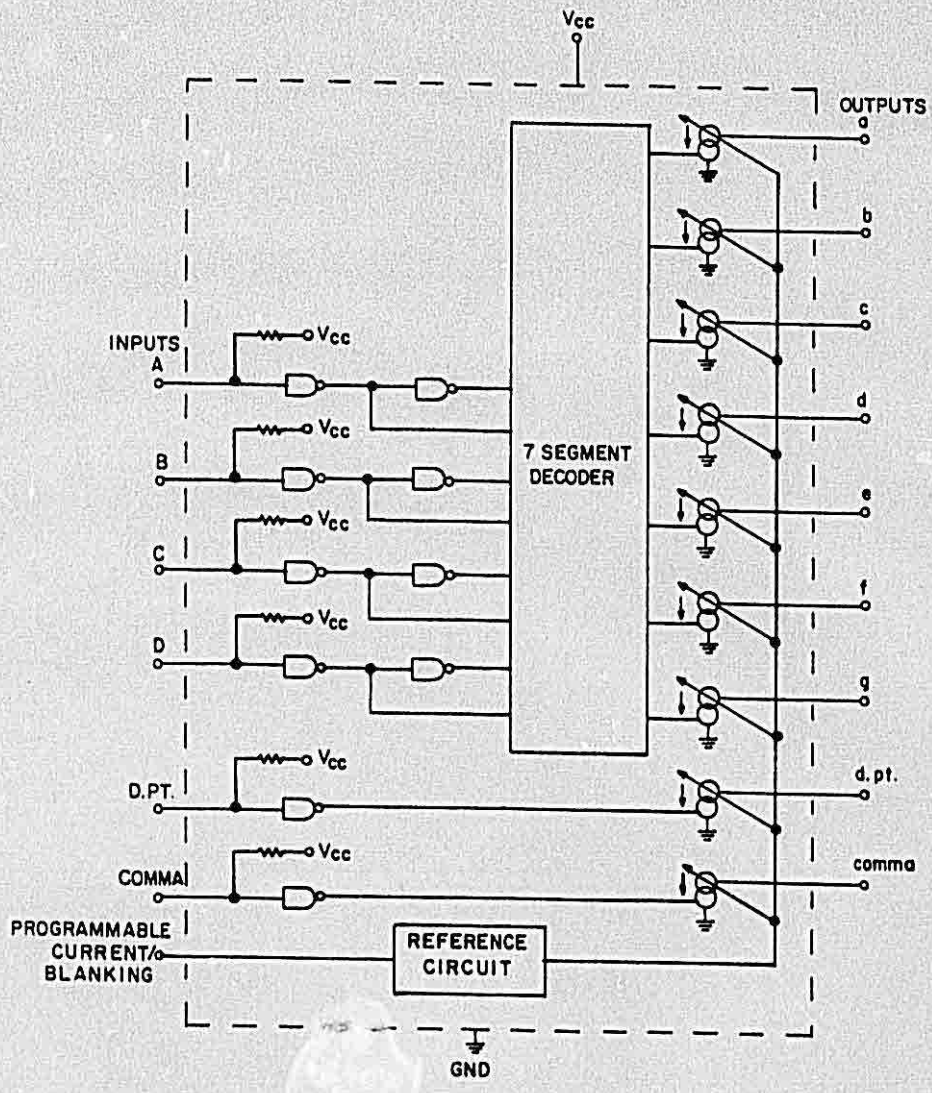
DECIMAL POINT

COMMA

* DECIMAL POINT AND COMMA CAN BE DISPLAYED WITH OR WITHOUT ANY NUMERAL.

DS8884

120-0089-00



LOGIC DIAGRAM

HIGH VOLTAGE CATHODE DECODER/DRIVER

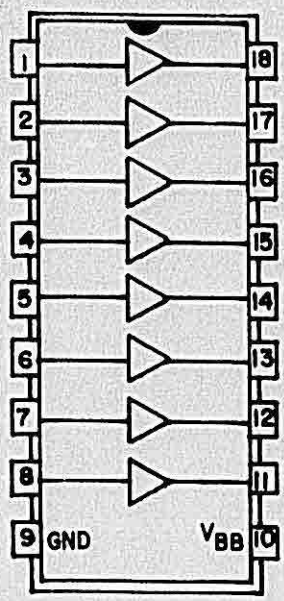
GENERAL DESCRIPTION

The DS8884A is designed to decode four lines of BCD input and drive seven-segment digits of gas-filled readout displays. Two separate inputs are provided for driving the decimal point and comma cathodes.

All outputs consists of switchable and programmable current sinks which provide constant current to the tube cathodes, even with high tube anode supply tolerance. Output currents may be varied over the 0.2 to 1.2ma range for multiplex operation. The output current is adjusted by connecting an external program resistor (R_D) from Vcc to the program input in accordance with the programming curve.

UDN6184A

120-0095-00



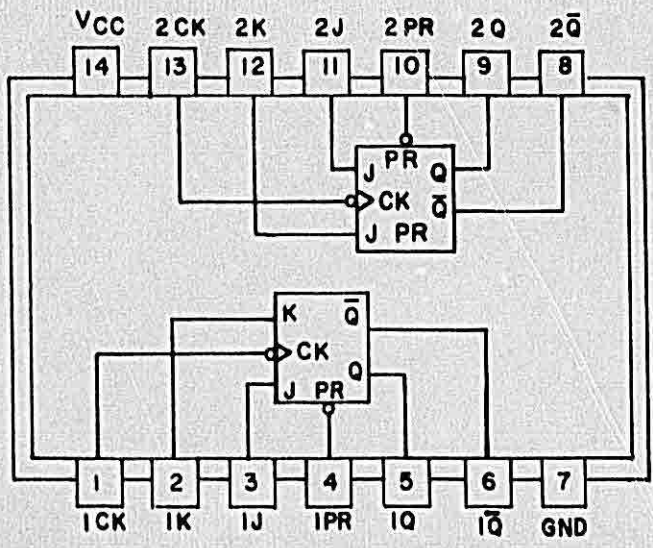
GAS DISCHARGE DISPLAY DIGIT DRIVERS

DESCRIPTION

Designed for interfacing between MOS, or other low-voltage circuitry, and the anode of gas discharge display panels, these monolithic high-voltage bipolar integrated circuits dramatically reduce the number of discrete components previously required. Each driver contains appropriate level shifting, signal amplification, output off state voltage bias, and 70ma output current sourcing for the sequential addressing of display panel anodes. The inputs include pull-down resistors for direct connection to open drain PMOS logic.

74LS113

120-0123-00



FUNCTION TABLE

INPUTS				OUTPUTS	
PRESET	CLOCK	J	K	Q	$\bar{Q}$
L	X	X	X	H	L
H	↓	L	L	Q_0	Q_0
H	↓	H	L	H	L
H	↓	L	H	L	H
H	↓	H	H	TOGGLE	
H	H	X	X	Q_0	$\bar{Q}_0$

74LS113

120-0123-00

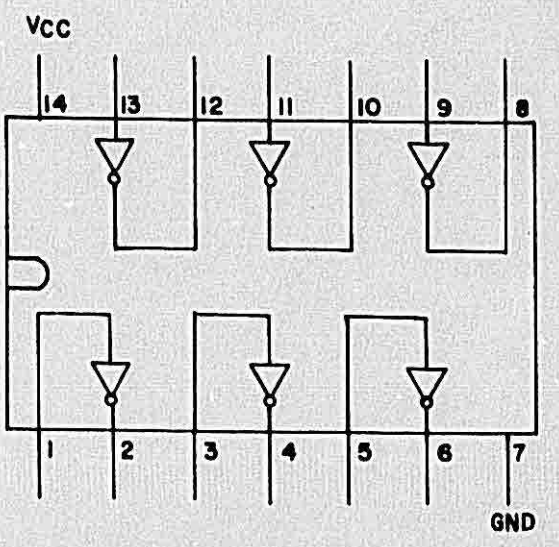
DUAL J-K FLIP-FLOPS WITH PRESET AND CLEAR

DESCRIPTION

The transistor-transistor-logic (TTL) family of high-performance bipolar digital integrated circuits comprises five distinct series of compatible product lines. These product lines offer the digital systems designer a full spectrum of performance ranges in order to optimize system cost and performance. The available choices range from the very high performance of the Schottky-clamped functions for systems operating typically up to 125 megahertz to low-power functions with power consumption of only one milliwatt per gate.

88L12

120-0125-00



TOP VIEW

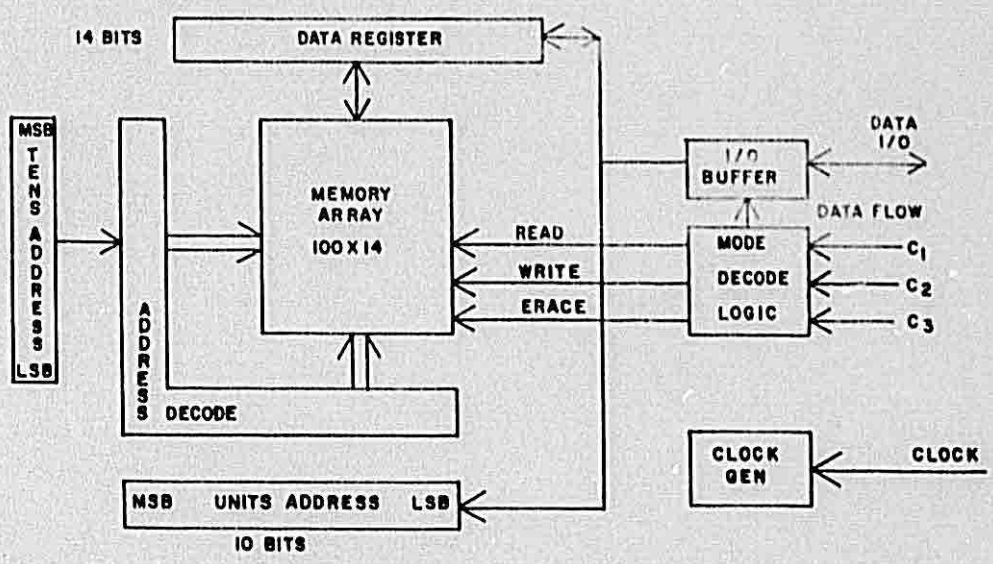
TTL-MOS HEX INVERTER/INTERFACE GATE

GENERAL DESCRIPTION

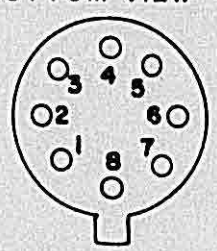
The DS78L12/DS88L12 is a low power TTL to MOS hex inverter element. The outputs may be "pulled up" to +14V in the logical "1" state, thus providing guaranteed interface between TTL and MOS logic levels. The gate may also be operated with V_{CC} levels up to +14V without resistive pull-ups at the outputs and still providing a guaranteed logical "1" level of V_{CC} - 2.2V with an output current of -200ua.

ER1400/1400T

120-2028-00

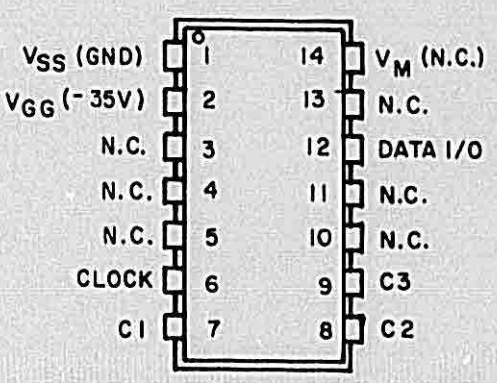


BOTTOM VIEW



1. DATA I/O
2. V_M
3. V_{SS}
4. V_{GG}
5. CLOCK
6. C1
7. C2
8. C3

TOP VIEW



1400 Bit Electrically Alterable Read Only Memory

DESCRIPTION

The ER1400 is a serial input/output 1400 bit electrically erasable and reprogrammable ROM, organized as 100 words of 14 bits each. Data and address are communicated in serial form via a one-pin bidirectional buss.

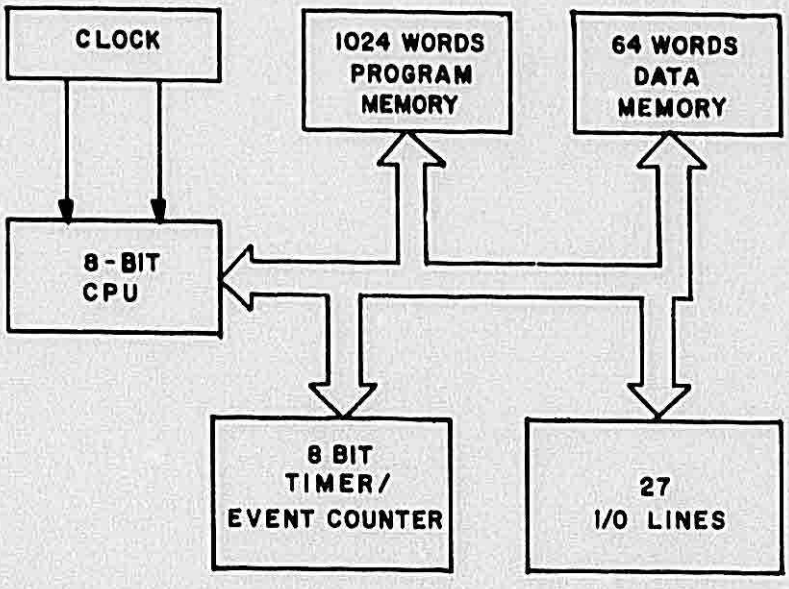
Addressing is by two consecutive one-of-ten codes.

Mode selection is by a 3 bit code applied to C1, C2 and C3.

Data is stored by internal negative writing pulses that selectively tunnel charge into the oxide-nitride interface of the gate insulator of the 1400 MNOS memory transistors. When the writing voltage is removed the charge trapped at the interface is manifested as a negative shift in the threshold voltage of the selected memory transistors.

8048

120-2032-00



8048 SINGLE COMPONENT 8-BIT MICROCOMPUTER

DESCRIPTION

This device is a totally self-sufficient 8-bit parallel computer fabricated on a single silicon chip using an N-channel silicon gate MOS process.

The 8048 contains a 1K x 8 program memory, a 64 x 8 RAM data memory, 27I/O lines, and an 8-bit timer/counter in addition to on board oscillator and clock circuits. For systems that require extra capability, the 8048 can be expanded using standard memories and peripherals.

This microprocessor is designed to be an efficient controller as well as an arithmetic processor. The 8048 has extensive bit handling capability as well as facilities for both binary and BCD arithmetic. Efficient use of program memory results from an instruction set consisting mostly of single byte instructions and no instructions over two bytes in length.

MC1350P

120-3020-00

MONOLITHIC IF AMPLIFIER

...an integrated circuit featuring wide range AGC for use as an IF amplifier in radio and TV over the temperature range 0 to +75°C. The MC 1352 is similar in design but has a keyed-AGC amplifier as an integral part of the same chip.

Power Gain - 50dB typ. at 45MHz,
- 48dB typ. at 58MHz

AGC Range - 60dB min, DC to 45MHz

Nearly constant input and output admittance over the entire AGC range

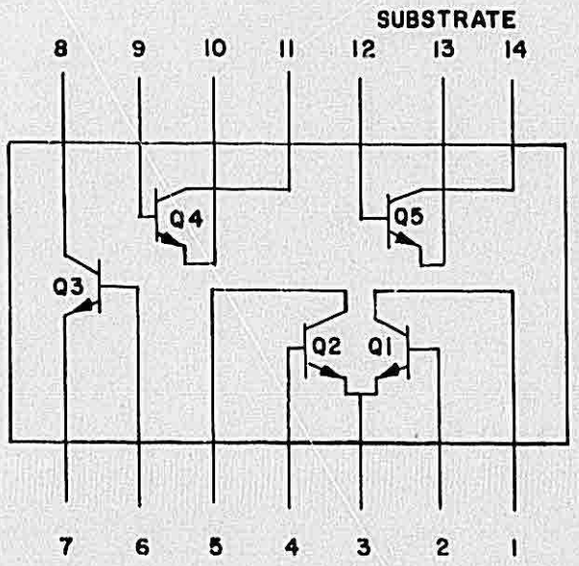
Y_{21} Constant (-3.0dB) to 90MHz

Low Reverse Transfer Admittance - 1.0umho typ.

12-Volt Operation, Single-Polarity Power Supply

CA3086

120-3029-000



GENERAL PURPOSE NPN TRANSISTOR ARRAY

Three Isolated Transistors and One Differentially-Connected Transistor Pair

For Low-Power Applications from DC to 120MHz

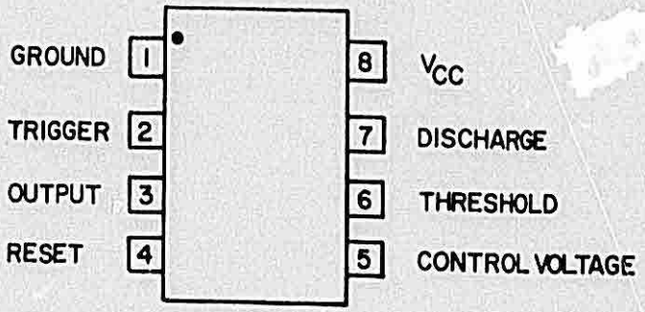
This device consists of five general purpose silicon NPN transistors on a common monolithic substrate. Two of the transistors are internally connected to form a differentially-connected pair.

The transistors are well suited to a wide variety of applications in low-power systems at frequencies from DC to 120MHz. They may be used as discrete transistors in conventional circuits. However, they also provide the very significant inherent advantages unique to integrated circuits, such as compactness, ease of physical handling and thermal matching.

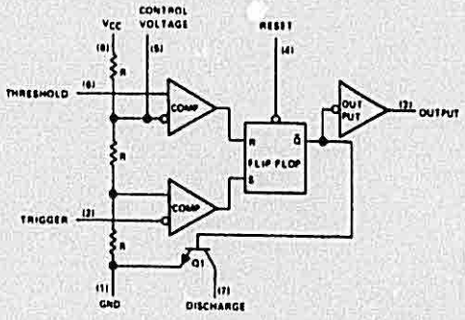
NE/SE555

120-3040-00/01

TOP VIEW



functional block diagram



LINEAR INTEGRATED CIRCUITS

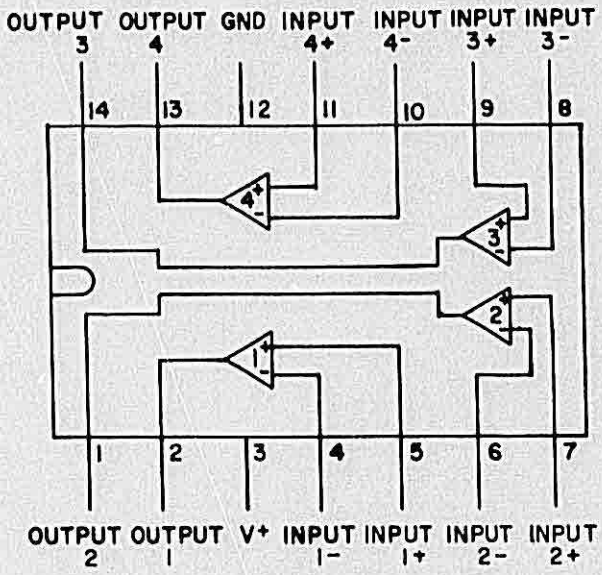
DESCRIPTION

The NE/SE 555 monolithic timing circuit is a highly stable controller capable of producing accurate time delays, or oscillation. Additional terminals are provided for triggering or resetting if desired. In the time delay mode of operation, the time is precisely controlled by one external resistor and capacitor. For a stable operation as an oscillator, the free running frequency and the duty cycle are both accurately controlled with two external resistors and one capacitor. The circuit may be triggered and reset on falling waveforms, and the output structure can source or sink up to 200ma or drive TTL circuits.

LM339

120-3048-00

DUAL-IN-LINE AND FLAT PACKAGE



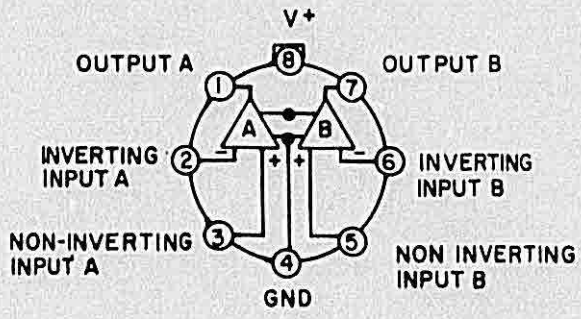
LOW POWER LOW OFFSET VOLTAGE QUAD COMPARATORS

The LM339 consists of four independent voltage comparators which were designed specifically to operate from a single power supply over a wide range of voltages. Operation from split power supplies is also possible and the low power supply current drain is independent of the magnitude of the power supply voltage. These comparators also have a unique characteristic in that the input common-mode voltage range includes ground, even though operated from a single power supply voltage.

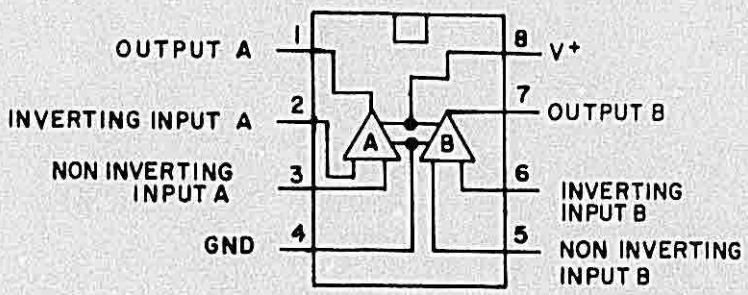
LM358

120-3053-00

METAL CAN PACKAGE



DUAL-IN-LINE PACKAGE

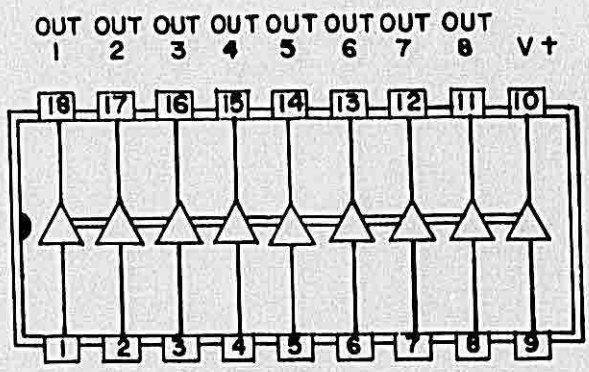


LOW POWER DUAL OPERATIONAL AMPLIFIERS

The LM358N consists of two independent, high gain, internally frequency compensated operational amplifiers which were designed specifically to operate from a single power supply over a wide range of voltages. Operation from split power supplies is also possible and the low power supply current drain is independent of the magnitude of the power supply voltage.

D1512

120-3083-00



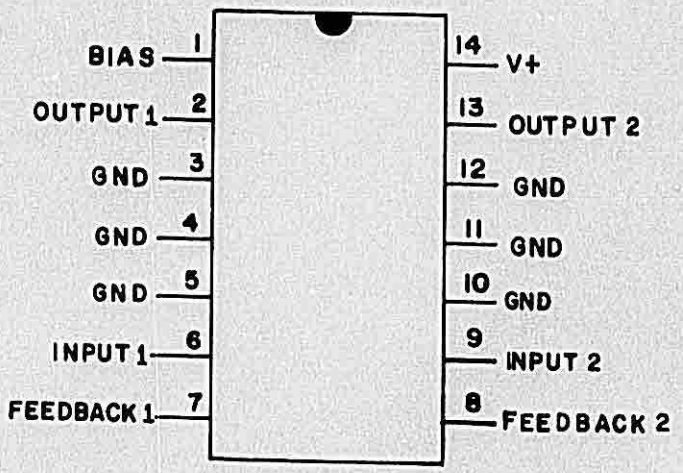
PIN CONNECTIONS

Level-Shifted Gas Discharge Display Digit Drivers

The DIONICS DI-502/507/512 series circuits are designed for interfacing between MOS or TTL circuitry and gas discharge display panels. Each section of these devices is made up of a switched constant current level shifter - capable of high voltage operation - and a PNP-NPN driver transistor pair. The constant current operation of the level shifter stage results in low power dissipation. Input circuitry is suitable for open drain PMOS, CMOS, open-collector or standard TTL.

LM378

120-3088-00



Dual 4 Watt Audio Amplifier

TOP VIEW

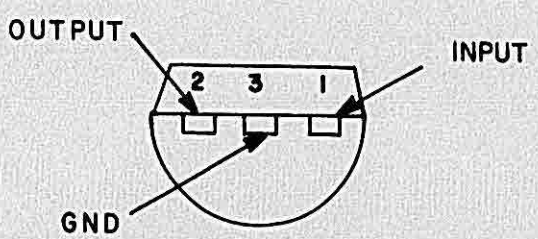
GENERAL DESCRIPTION

The LM378 is a monolithic dual power amplifier which offers high quality performance for stereo phonographs, tape players, recorders, and AM-FM stereo receivers, etc.

The LM378 will deliver 4W/channel into 8 or 16 ohm loads. The amplifier is designed to operate with a minimum of external components and contains an internal bias regulator to bias each amplifier. Device overload protection consists of both internal current limit and thermal shutdown.

LM340

120-3094-32



BOTTOM VIEW

3-TERMINAL POSTIVE REGULATORS

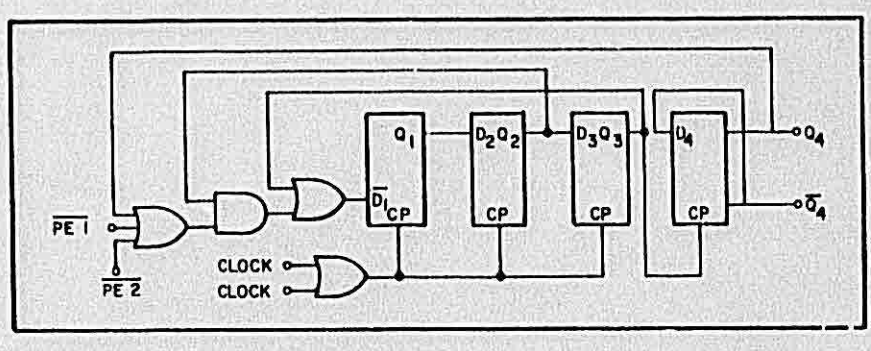
GENERAL DESCRIPTION

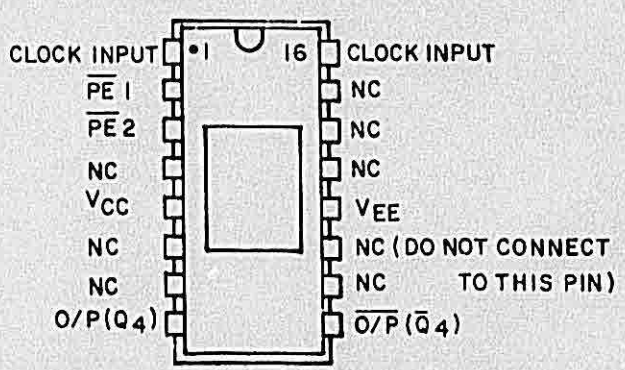
This series of three terminal positive regulators is available with several fixed output voltages making them useful in a wide range of applications. The regulators have $\pm 2\%$ V_{OUT} specification, 0.04%/V line regulation, and 0.01%/ma load regulation. When used as a zener diode/resistor combination replacement, the regulator usually results in an effective output impedance improvement of two orders of magnitude, and lower quiescent current. These regulators can provide local on card regulation, eliminating the distribution problems associated with single point regulation. The voltages available allow it to be used in logic systems, instrumentation, HI-FI, and other solid state electronic equipment. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents.

With adequate heat sinking the regulator can deliver 100ma output current. Current limiting is included to limit the peak output current to a safe value. Safe area protection for the output transistor is provided to limit internal power dissipation. If internal power dissipation becomes too high for the heat sinking provided, the thermal shutdown circuit takes over, preventing the IC from overheating.

SP8640B

120-4006-01





NOTE: UNUSED PINS (EXCEPT 8 AND 9) MAY BE CONNECTED TO V_{EE}. THIS WILL REDUCE CLOCK BREAKTHROUGH ON THE OUTPUTS. PINS 8 AND 9 SHOULD BE LEFT OPEN-CIRCUIT WHEN NOT IN USE PIN 11 IS INTERNALLY CONNECTED AND MUST ALWAYS BE LEFT OPEN-CIRCUIT

UHF PROGRAMMABLE DIVIDERS ÷10/11

In frequency synthesis it is desirable to start programmable division at as high a frequency as possible, because this raises the comparison frequency and so improves the overall synthesizer performance.

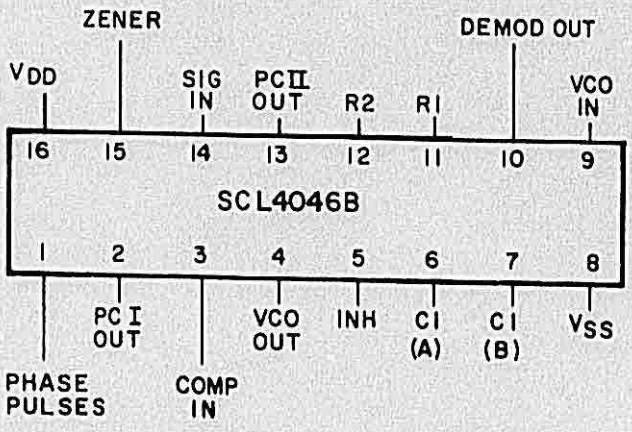
The SP8640 series are UHF integrated circuits that can be logically programmed to divide by either 10 or 11, with input frequencies up to 350MHz. The design of very fast fully programmable dividers is therefore greatly amplified by the use of these devices and makes them particularly useful in frequency synthesizers operating in the UHF band.

All inputs and outputs are ECL-compatible throughout the temperature range: the clock inputs and programming inputs are ECL III-compatible while the two complementary outputs are ECL II-compatible to reduce power consumption in the output stage. ECL III output compatibility can be achieved very simply, however.

The division ratio is controlled by two $\overline{PE}$ inputs. The counter will divide by 10 when either $\overline{PE}$ input is in the high state and by 11 when both inputs are in the low state. Both the $\overline{PE}$ inputs and the clock inputs have nominal 4.3K pulldown resistors to V_{EE} (negative rail).

SCL4046

120-6038-01



CMOS PHASE-LOCKED LOOPS

DESCRIPTION

The SCL4046B and SCL4446B phase-locked loops contain two phase comparators, a voltage-controlled oscillator (VCO), source follower, and zener diode. The comparators have two common inputs. The Signal input can be used directly coupled to large voltage signals, or indirectly coupled (with a series capacitor) to small voltage signals. The self-bias circuit adjusts small voltage signals in the linear region of the ampliifer. Phase comparator I (an exclusive-OR gate) provides a digital error signal PCI_{out}, and maintains 90^{o} phase shift at the center frequency between Signal and Comparator inputs (both at 50% duty cycle). Phase comparator II (with leading edge sensing logic) provides digital error signals $PCII_{out}$ and Phase Pulses, and maintains a 0^{o} phase shift between input signals (duty cycle is immaterial). The linear VCO produces an output signal VCO_{out} whose frequency is determined by the voltage of input VCO_{in} and the capacitor and resistors connected to pins $C1_{A}$, $C1_{B}$, R1, and R2. The source follower output, Demod Out, with an external resistor is used where the VCO_{in} signal is needed but no loading can be tolerated. The inhibit input Inh, when high, disables the VCO and source follower to minimize standby power consumption. The zener diode can be used to assist in power supply regulation.

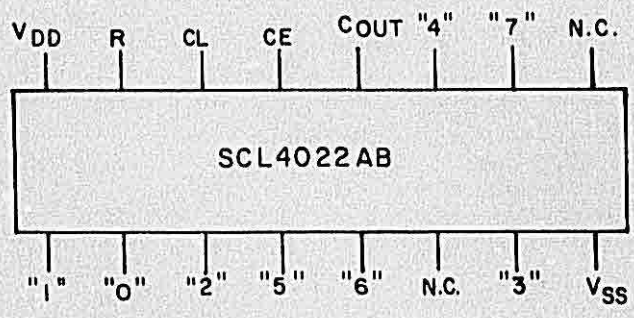
SCL4022AC+

120 6045-01

POSITIVE LOGIC

CLOCK	CLOCK ENABLE	RESET	OUTPUT = n
0	X	0	n
X	1	0	n
↓	0	0	n + 1
	X	0	n
1	↓	0	n + 1
X	↓	0	n
X	X	1	"0"

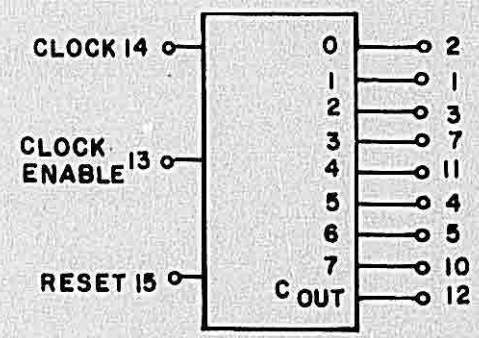
X DON'T CARE IF n < 4 CARRY = 1, OTHERWISE = 0



ADD SUFFIX FOR PACKAGE:

C 16 PIN CERDIP
D 16 PIN CERAMIC
E 16 PIN EPOXY
F 16 PIN FLAT
H CHIP

BLOCK DIAGRAM



V_{DD} = PIN 16

V_{SS} = PIN 8

CMOS Octal Counter/Divider

DESCRIPTION

This device consists of a 4-stage Johnson Divide-by-8 Counter and an Output Decoder. Inputs include Clock, Reset, and Clock Enable signals.

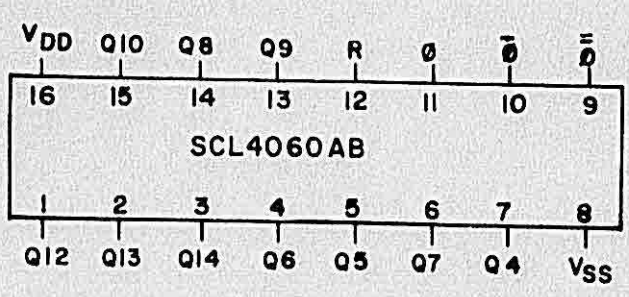
The counter has interchangeable Clock and Clock Enable lines for incrementing on either a positive-going or negative-going transition, respectively. A high Reset signal clears the counter to its zero count.

Use of the Johnson divide-by-eight counter configuration permits high-speed operation, 2-input decode gating, and spike-free decoded outputs. Anti-lock gating is provided, thus assuring proper counting sequence. The 8 decoded outputs are normally low and go high only at their respective decoded time slot. each decoded output remains high for one full clock cycle. A Carry-out (C_{OUT}) signal completes one cycle every 8 clock input cycles and is used to directly clock the succeeding counter in multi-stage applications.

This part can be used in frequency division circuits as well as octal counter or octal decode display applications.

SCL4060ABC

120-6055-01



TRUTH TABLE

CLOCK	RESET	OUTPUT STATE
⌐	0	NO CHANGE
⌐	0	ADVANCE TO NEXT STATE
X	1	ALL OUTPUTS ARE LOW

X = DON'T CARE

DESCRIPTION

The SCL4060AB consists of an oscillator section and 14 ripple-carry binary counter stages. The oscillator configuration allows design of either R-C or crystal oscillator circuits. A Reset input is provided which resets the counter to the all-0's state. A high level on the Reset line accomplishes the reset function. The state of the counter is advanced one step in binary order on the negative transition of the Clock input Ø. All inputs and outputs are fully buffered. Outputs are available from stages 4 through 10 and 12 through 14.

CD40109

120-6062-00

COS/MOS QUAD LOW-TO-HIGH VOLTAGE LEVEL SHIFTER

High-Voltage Types (3 to 20-Volt Rating)

The CD40109B contains four low-to-high-voltage level-shifting circuits. Each circuit will shift a low-voltage digital-logic input signal (A,B,C,D) with logical 1 = V_{CC} and logical 0 = V_{SS} to a higher-voltage output signal (E,F,G,H) with logical 1 = V_{DD} and logical 0 = V_{SS}.

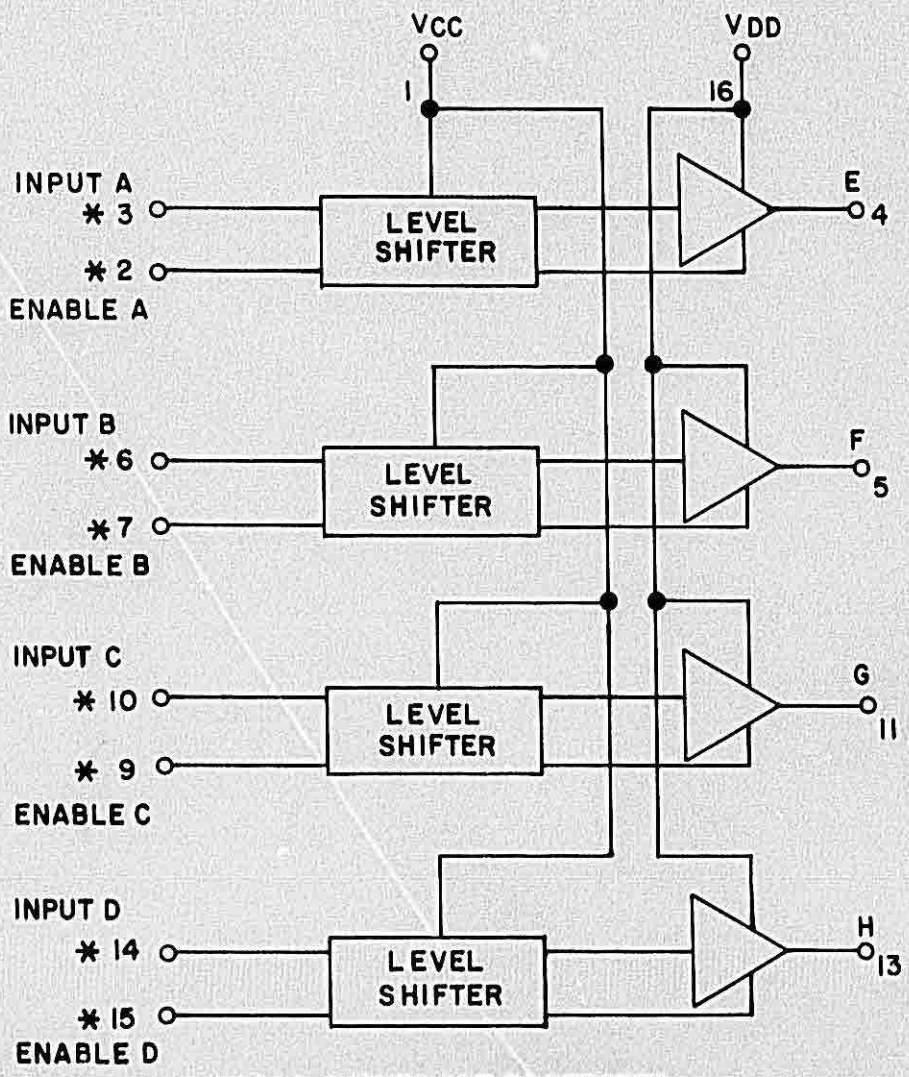
The CD40109, unlike other low-to-high level-shifting circuits, does not require the presence of the high-voltage supply (V_{DD}) before the application of either the low-voltage supply (V_{CC}) or the input signals. There are no restrictions on the sequence of application of V_{DD}, V_{CC}, or the input signals. In addition, there are no restrictions on the relative magnitudes of the supply voltages or input signals within the device maximum ratings; V_{CC} may exceed V_{DD}, and input signals may exceed V_{CC} and V_{DD}. When operated in the mode $V_{CC} > V_{DD}$, the CD40109 will operate as a high-to-low level-shifter.

The CD40109 also features individual three-stage output capability. A low level on any of the separately enabled three-state output controls produces a high-impedance state in the corresponding output.

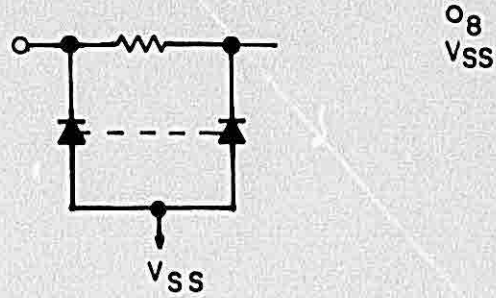
The CD40109B-Series types are supplied in 16-lead ceramic dual-in-line packages (D,F, and Y suffixes), 16-lead dual-in-line plastic packages (E suffix), 16-lead ceramic flat packages (K suffix), and in chip form (H suffix).

CD40109

120-6062-00

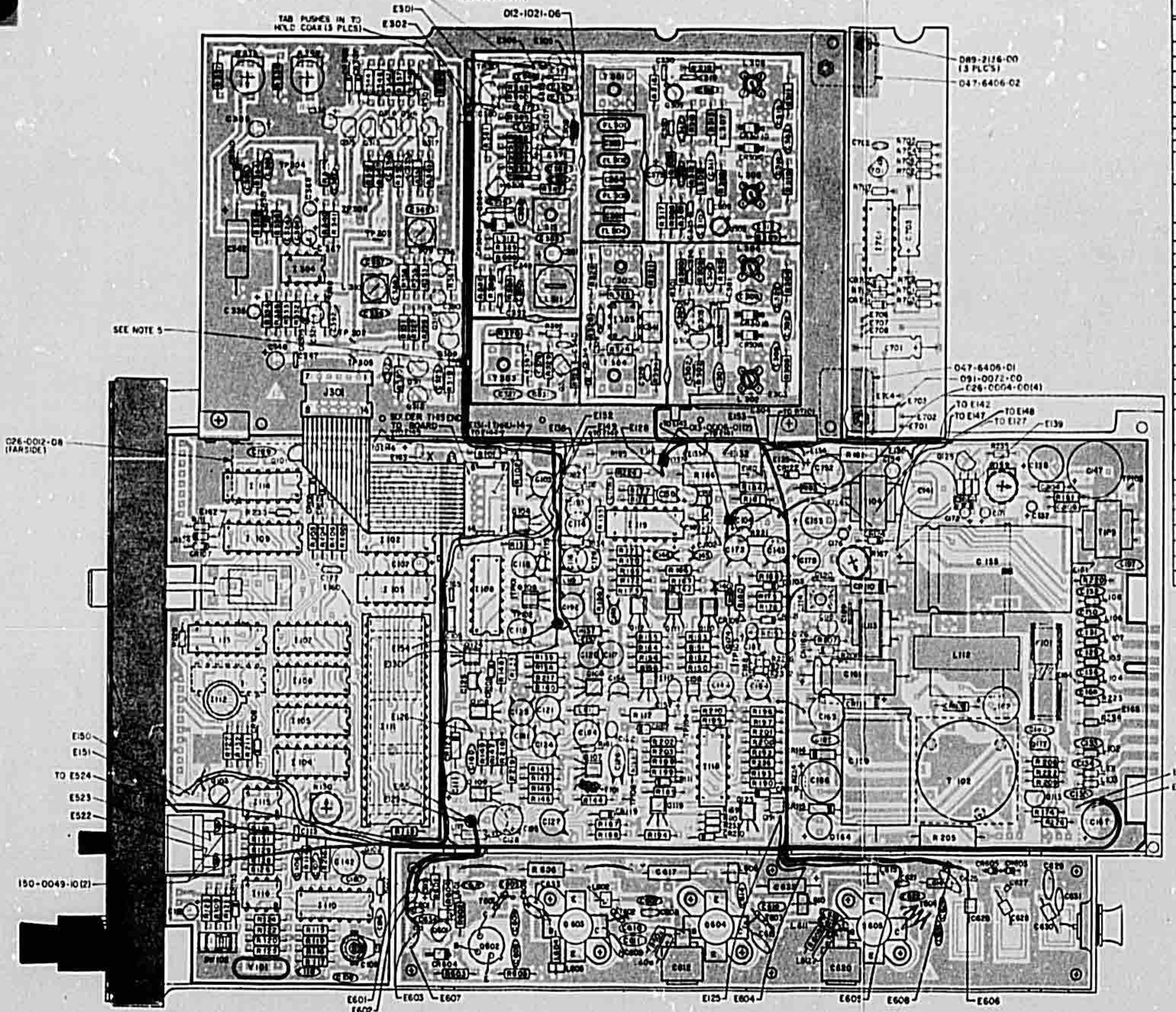


* ALL INPUTS ARE PROTECTED
BY COS/MOS PROTECTION NETWORK



A

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER



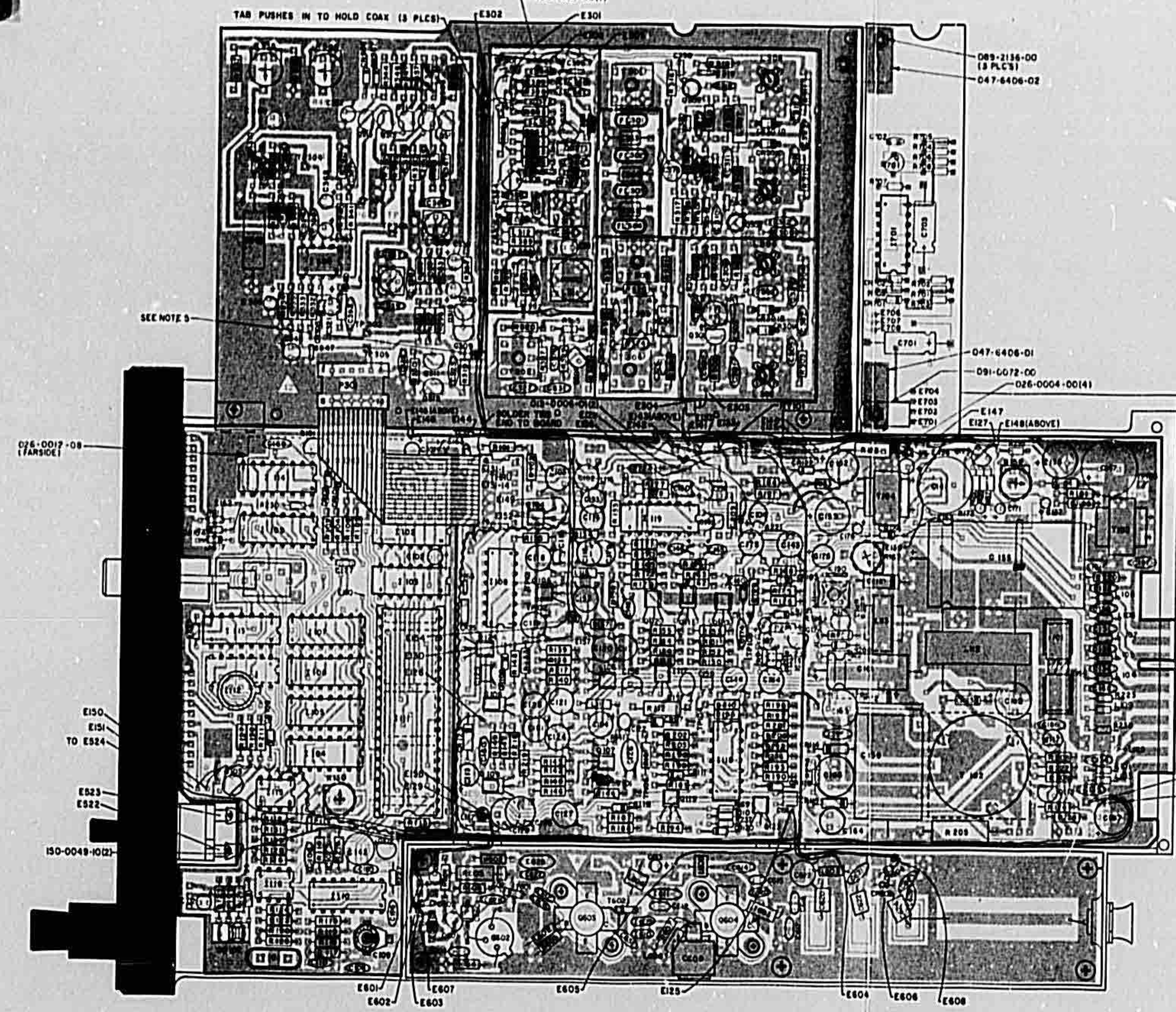
FROM	TO	DESCRIPTION	KPN	LENGTH	SEE NOTE
E122	E522	18AWG RED	025-0005-02	10"	
E123	E523	18AWG RED/WHT	025-0005-12	10"	
E124	E524	26AWG YEL	025-0018-44	9.5"	
E125	E604	20AWG BLK	025-0004-00	1.5"	2
E126	E602	26AWG GRY/WHT	025-0018-89	3.25"	2
E127	E140	20AWG TINNED COPPER	026-0004-00	2.50"	1
E138	E146	20AWG TINNED COPPER	026-0004-00	2.30"	1
E128	E605	20AWG ORN/WHT	025-0004-13	7.5"	2
E139	E147	20AWG TINNED COPPER	026-0004-00	1.65"	1
E129 E155	E603 E607	COAX CABLE RG 178 B/U	026-0013-00	2.75"	2
E130 E154	E301 E302	COAX CABLE RG 178 B/U	026-0013-00	8.75"	
E131-1/14	P301	JUMPER CABLE	155-2030-18	3.55"	
E142	E144	20AWG TINNED COPPER	026-0004-00	1.25"	1
E132	E142	20AWG TINNED COPPER	026-0004-00	1.20"	1
E145	E148	20AWG TINNED COPPER	026-0004-00	5.75"	1
E133	E141	20AWG TINNED COPPER	026-0004-00	.80"	1
E149	E150	26AWG GRN	025-0018-55	7"	3
E134	RT101	POSISTOR 470 OHM	134-1027-00		4
E135	RT101	POSISTOR 470 OHM	134-1027-00		4
E136	E148	20AWG TINNED COPPER	026-0004-00	1.40"	1
E151	E152	26AWG GRN/BLK	025-0018-50	7"	3
E137	E143	20AWG TINNED COPPER	026-0004-00	.50"	1
E153	E601	20AWG ORN	025-0004-03	9.25"	2
E303 E304	E606 E608	COAX CABLE RG 178 B/U	026-0013-00	11"	2
E157 E154	E305 E306	COAX CABLE RG 178 B/U	026-0013-00	8.75"	
TP105	E704	26 AWG RED	025-0018-22	7.25"	6
E160	E708	26 AWG BLK	025-0018-00	8.0"	6
E161	E703	26 AWG WHT	025-0018-99	4.5"	6
E162	E707	26 AWG YEL	025-0018-44	8.0"	6
E163	E706	26 AWG ORN	025-0018-33	8.0"	6
E164	E702	26 AWG BRN	025-0018-11	5.5"	6
E165	E701	26 AWG BLU	025-0018-66	5.75"	6

NOTES:
1 REQUIRES 20 NAT. TEFLON TUBING 150-0005-10 THESE ITEMS ARE PART OF 200-2287-00
2 THESE ITEMS ARE PART OF 200-6047-00
3 THESE ITEMS ARE PART OF 200-6045-00
4 THESE ITEMS ARE PART OF 200-2287-00 THEY REQUIRE 22 NAT TEFLON TUBING 150-0004-10
5 SOLDER GROUNDED SHIELD TO FENCE HERE
6 FOR REMOTE MEMORY INCREMENT/TRANSFER PART OF 200-6687-00
7 CUT PATH TO ISOLATE PAD BOTH NEARSIDE AND FARSIDE. TERMINATE ORANGE WIRE (025-0018-33) IN ISOLATED PAD. RUN MAGWIRE FARSIDE FROM ISOLATED PAD TO PIN 10 OF I114. THIS NOTE PERTAINS TO 064-1019-10,11,12,13,30,31,32,33,40, 41,42.

FIGURE 6-1 KY 196/196E COMMUNICATIONS TRANSCEIVER FINAL ASSEMBLY
(Dwg. No. 300-2371-00, R-22)
(Sheet 2 of 2)

B

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER



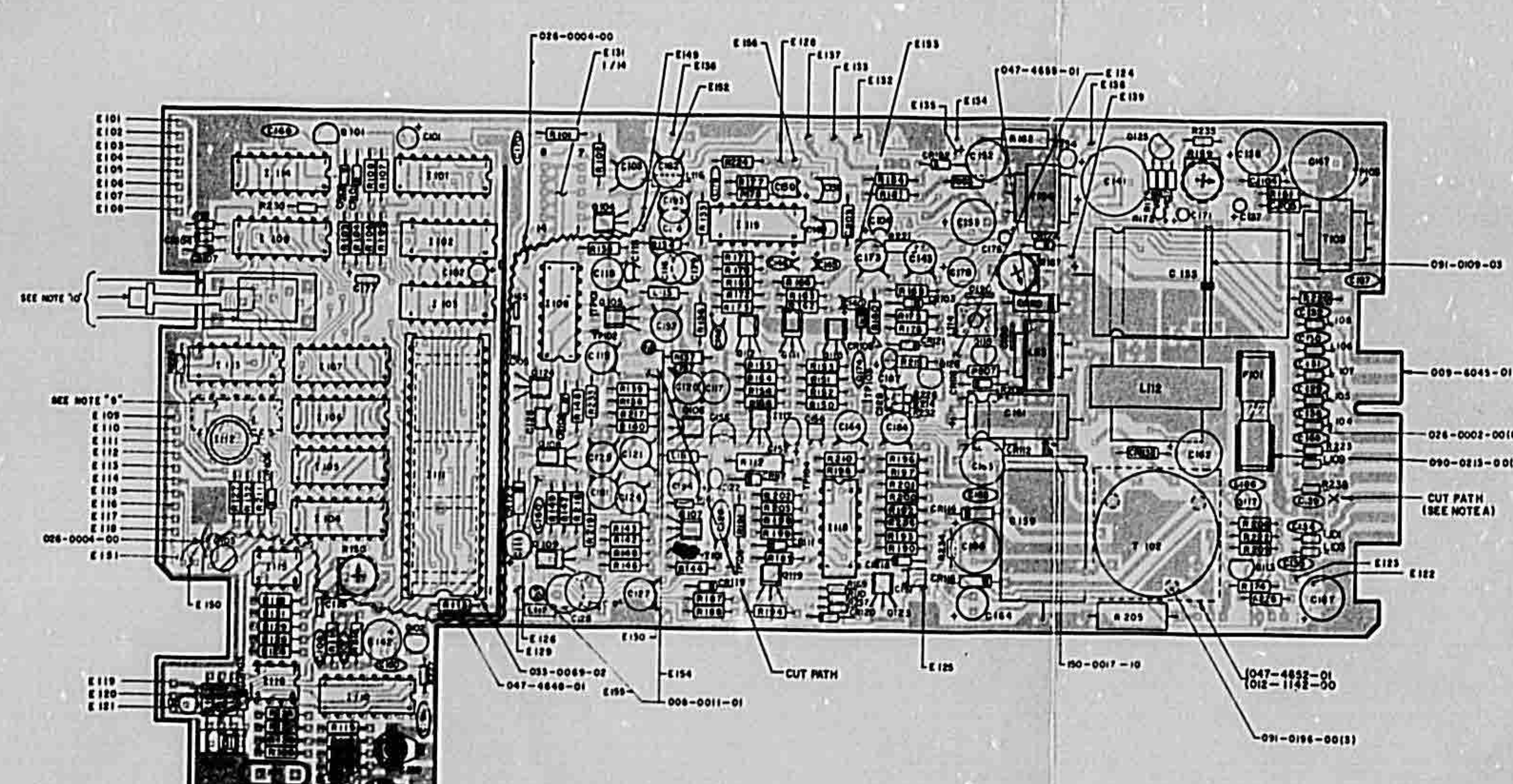
FROM	TO	DESCRIPTION	KPN	INCHES	SEE NOTE
E122	E522	18AWG RED	025-0005-02	10	
E123	E523	18AWG RED/WHT	025-0005-12	10	
E124	E524	26AWG YEL	025-0018-44	95	
E125	E604	20AWG BLK	025-0004-00	3	2
E126	E602	26AWG GRY/WHT	025-0018-89	325	2
E127	E139	20AWG TINNED COPPER	026-0004-00	195	1
E156	E147	20AWG TINNED COPPER	026-0004-00	285	1
E128	E605	20AWG ORN/WHT	025-0004-13	75	2
E146	E147	20AWG TINNED COPPER	026-0004-00	515	1
E129 E155	E603 E607	COAX CABLE RG 178 B/U	026-0013-00	275	2
E130 E154	E301 E302	COAX CABLE RG 178 B/U	026-0013-00	875	
E131-1/14	P301	JUMPER CABLE	155-2030-18	355	
E148	E144	20AWG TINNED COPPER	026-0004-00	49	1
E132	E142	20AWG TINNED COPPER	026-0004-00	18	1
E145	E136	20AWG TINNED COPPER	026-0004-00	600	1
E133	E141	20AWG TINNED COPPER	026-0004-00	0.8	1
E149	E150	26AWG GRN	025-0018-55	7	3
E134	RT101	POSISTOR 470 OHM	134-1027-00		4
E135	RT101	POSISTOR 470 OHM	134-1027-00		4
E127	E142	20AWG TINNED COPPER	026-0004-00	345	1
E151	E152	26AWG GRN/BLK	025-0018-50	7	3
E137	E143	20AWG TINNED COPPER	026-0004-00	05	1
E153	E601	20AWG ORN	025-0004-03	925	2
E303 E304	E606 E608	COAX CABLE RG 178 B/U	026-0013-00	11	2
E157 E154	E305 E306	COAX CABLE RG 178 B/U	026-0013-00	875	
TP106	E704	26 AWG RED	025-0018-22	7.25	6
E160	E708	26 AWG BLK	025-0018-00	80	6
E161	E703	26 AWG WHT	025-0018-99	4.5	6
E162	E707	26 AWG YEL	025-0018-44	80	6
E163	E706	26 AWG ORN	025-0018-33	8.0	6
E164	E702	26 AWG BRN	025-0018-11	5.5	6
E165	E701	26 AWG BLU	025-0018-66	5.75	6

NOTES
1 REQUIRES 20 NAT. TEFLON TUBING 150-0005-10 THESE ITEMS ARE PART OF 200-2287-01
2 THESE ITEMS ARE PART OF 200-6166-00
3 THESE ITEMS ARE PART OF 200-6045-01
4 THESE ITEMS ARE PART OF 200-2287-01 THEY REQUIRE 22 NAT TEFLON TUBING 150-0004-10
5 SOLDER SHIELD CABLE TO FENCE
6 FOR REMOTE MEMORY INCREMENT/TRANSFER PART OF 200-6687-00
7 CUT PATH TO ISOLATE PAD BOTH NEARSIDE AND FARSIDE. TERMINATE ORANGE WIRE (025-0018-33) IN ISOLATED PAD. RUN MAGWIRE FARSIDE FROM ISOLATED PAD TO PIN 10 OF I114. THIS NOTE PERTAINS TO 064-1021-10,11,12,30,31,32.

FIGURE 6-2 KY 197/197E COMMUNICATIONS TRANSCEIVER FINAL ASSEMBLY
(Dwg. No. 300-2371-01, R-24)
(Sheet 2 of 2)

C

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER



NOTES
1. PRIOR TO POST COATING BOTH SIDES OF ASS'Y WITH CLEAR URETHANE COATING (016-1040-00), MASK OFF THE FOLLOWING: ALL MOUNTING AREAS, TP101 THRU TP106, C109, R130, R159, R167, F101 & FUSE CLIPS CONNECTOR FINGERS, I.C. SOCKET FOR I111, ALL "E" NUMBERS, SW101 & SW102
2. TRAN. Q126, SEE DETAIL "A"
3. TRANS. Q101, Q113, Q117, Q115, SEE DETAIL "B".
4. TRANS. Q102, Q103, Q125, SEE DETAIL "C".
5. TRANS. Q104, THRU Q107, SEE DETAIL "D"
6. TRANS. Q110, Q112, Q123, Q124, SEE DETAIL "E"
7. TRANS. Q108, Q109, Q111, Q119, SEE DETAIL "F"
8. I.C. I117, SEE DETAIL "G"
9. I112 (120-2028-03) MAY BE EITHER AN 8 PIN I.C. OR A 14 PIN I.C.
10. FREQ. TRANSFER SWITCH AND PUSHBUTTON HAS TWO DIFFERENT CONFIGURATIONS.
KY 197 S/N 71799 AND BELOW AND KY 197E S/N 80099 AND BELOW
031-0357-02 SLIDE SW. SPDT
088-0827-01 PUSHBUTTON
KY 197 S/N 71800 AND ABOVE AND KY 197E S/N 80100 AND ABOVE
031-0370-00 SLIDE SW. SPDT
088-0831-00 SW. HOLDER
088-0827-11 PUSHBUTTON

WIRING CHART			
FROM	TO	KING PART NO.	DESCRIPTION
E149	E150	025-0018-55	26 AWG GREEN
E152	E151	025-0018-50	26 AWG GRN/BLK

REWORK NOTES:
A. CUT PATHS FOR FLAVORS 064-1021-10/11/12/30/31/32 AS INDICATED ON BOTH SIDES OF BOARD.

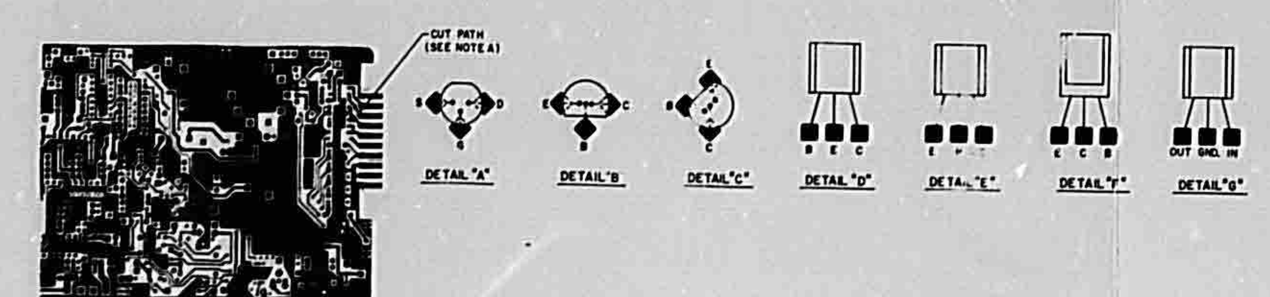
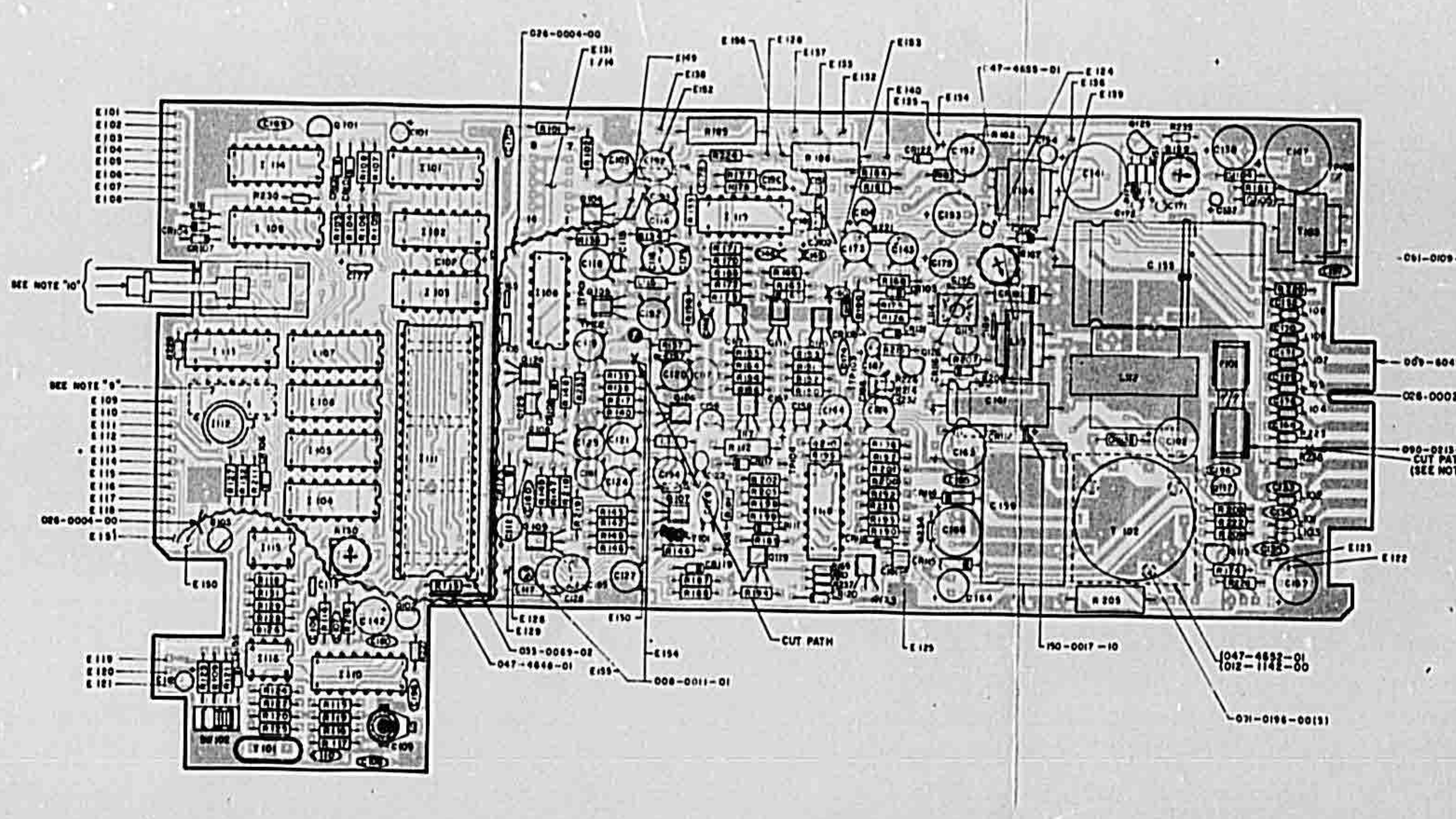


FIGURE 6-7 KY 197/197E MAIN BOARD ASSEMBLY
(Dwg. No. 300-6045-01, R-23)

E

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER



NOTES

1. PRIOR TO POST COATING BOTH SIDES OF ASS'Y WITH CLEAR URETHANE COATING (016-1040-00), MASK OFF THE FOLLOWING: ALL MOUNTING AREAS, TP101 THRU TP106, C109, R130, R159, R167, F101 & FUSE CLIPS CONNECTOR FINGERS, I.C. SOCKET FOR I111, ALL "E" NUMBERS, SW101 & SW102.
2. TRAN. Q126, SEE DETAIL "A".
3. TRANS. Q101, Q113, Q117, Q115, SEE DETAIL "B".
4. TRANS. Q102, Q103, Q125, SEE DETAIL "C".
5. TRANS. Q104, THRU Q107, SEE DETAIL "D".
6. TRANS. Q110, Q112, Q123, Q124, SEE DETAIL "E".
7. TRANS. Q108, Q109, Q111, Q119, SEE DETAIL "F".
8. I.C. I117, SEE DETAIL "G".
9. I112 (120-2028-03) MAY BE EITHER AN 8 PIN I.C. OR A 14 PIN I.C.
10. FREQ. TRANSFER SWITCH AND PUSHBUTTON HAS TWO DIFFERENT CONFIGURATIONS.
    KY 196 S/N 3599 AND BELOW AND KY 196E S/N 60149 AND BELOW:
    031-0357-02 SLIDE SW SPDT
    088-0827-01 PUSHBUTTON
    KY 196 S/N 3600 AND ABOVE AND KY 196E S/N 60150 AND ABOVE:
    031-0370-00 SLIDE SW SPDT
    088-0831-00 SW. HOLDER
    088-0827-11 PUSHBUTTON

WIRING CHART			
FROM	TO	KING PART NO.	DESCRIPTION
E149	E150	025-0018-55	26 AWG GREEN
E152	E151	025-0018-50	26 AWG GRN/BLK

REWORK NOTES.

A. CUT PATH FOR FLAVORS 064-1019-10/11/12/13/30/31/32/33/40/41/42 AS INDICATED ON BOTH OF BOARD.

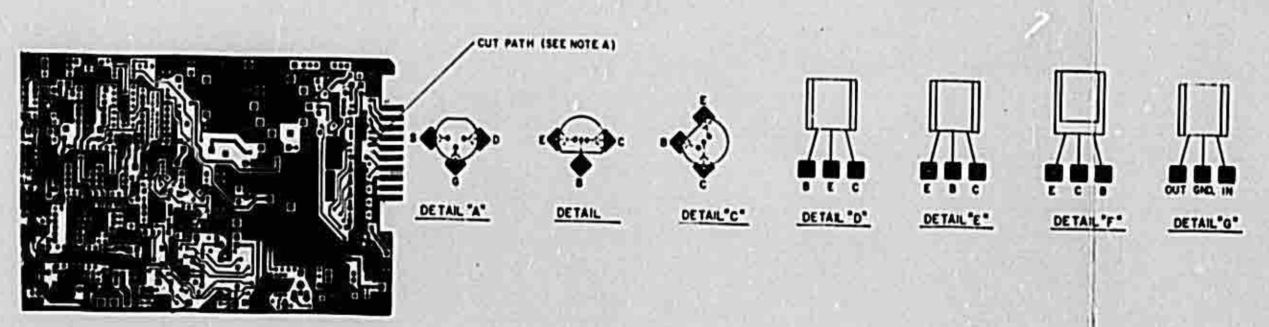
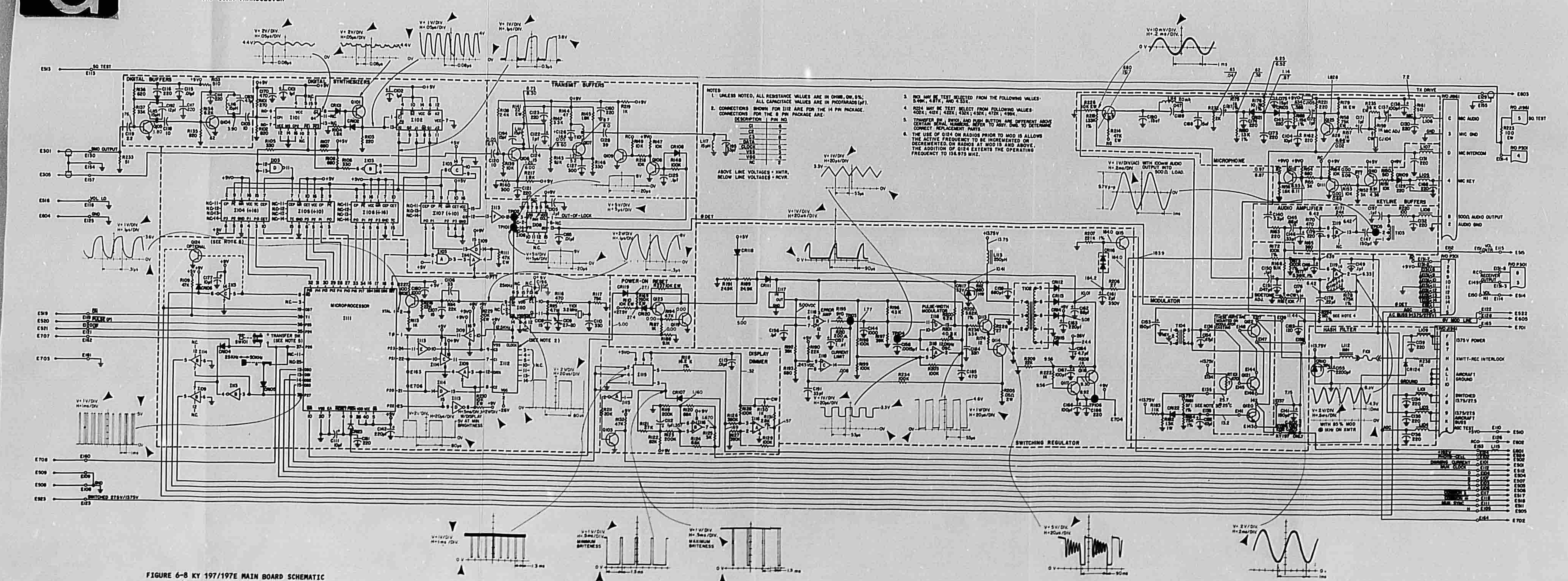


FIGURE 6-5 KY 196/196E MAIN BOARD ASSEMBLY
(Dwg. No. 300-6045-00, R-22)

G

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER



MAIN BD SCH KY 197/197E

FIGURE 6-8 KY 197/197E MAIN BOARD SCHEMATIC
(Dwg. No. 002-6045-01, R-35)

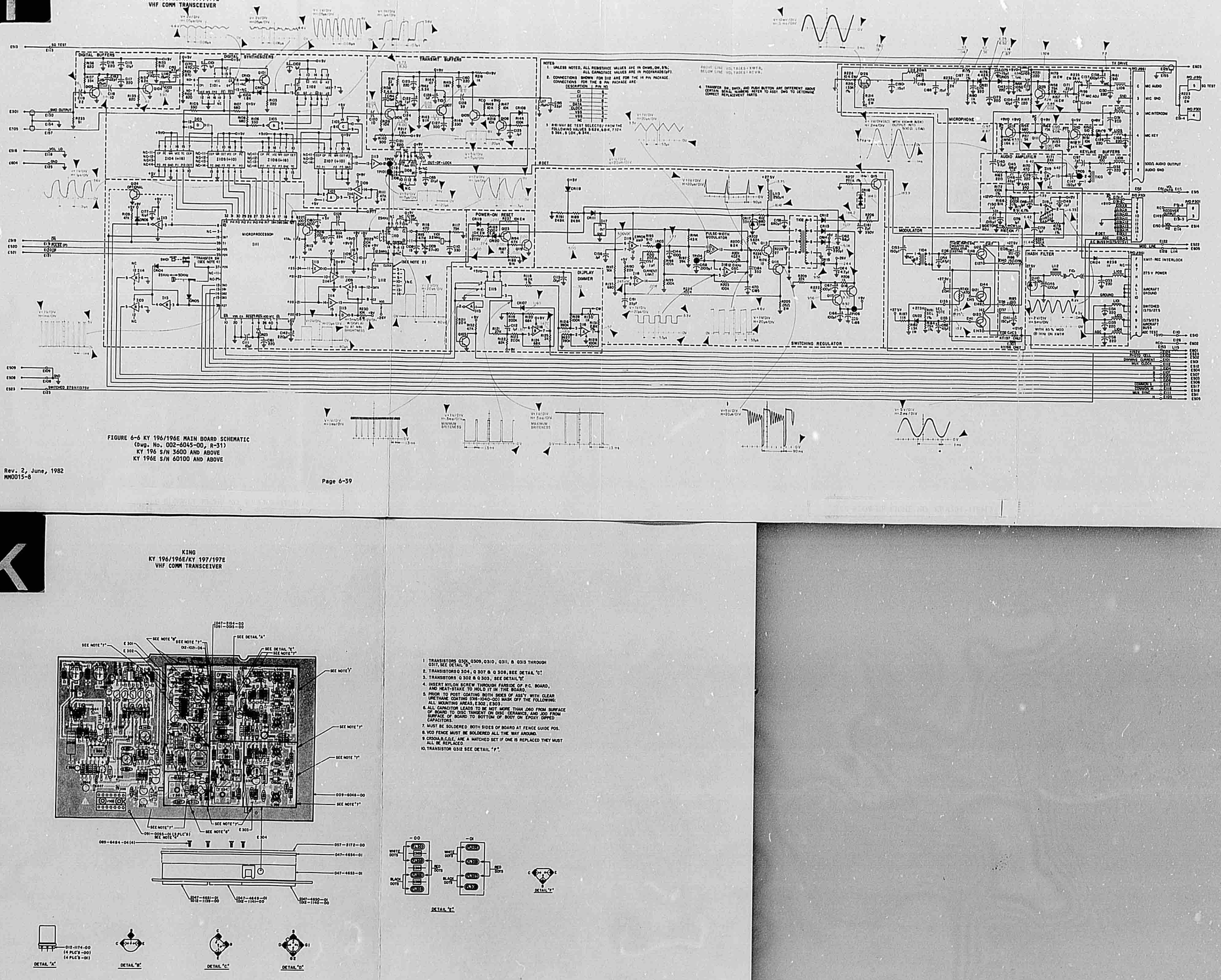


FIGURE 6-6 KY 196/196E MAIN BOARD SCHEMATIC
(Dwg. No. 002-6045-00, R-31)
KY 196 S/N 3600 AND ABOVE
KY 196E S/N 60100 AND ABOVE

1. TRANSISTORS Q309, Q309, Q310, Q311, & Q313 THROUGH Q317, SEE DETAIL "B".
2. TRANSISTORS Q 304, Q 307 & Q 308, SEE DETAIL "C".
3. TRANSISTORS Q 302 & Q 303, SEE DETAIL "D".
4. INSERT NYLON SCREW THROUGH FARSIDE OF P.C. BOARD, AND HEAT-STAKE TO HOLD IT IN THE BOARD.
5. PRIOR TO POST COATING BOTH SIDES OF ASS'Y. WITH CLEAR URETHANE COATING (016-1040-00) MASK OFF THE FOLLOWING: ALL MOUNTING AREAS, E 302, E 303.
6. ALL CAPACITOR LEADS TO BE NOT MORE THAN .060 FROM SURFACE OF BOARD TO DISC TANGENT ON DISC CERAMICS, AND .100 FROM SURFACE OF BOARD TO BOTTOM OF BODY ON EPOXY DIPPED CAPACITORS.
7. MUST BE SOLDERED BOTH SIDES OF BOARD AT FENCE GUIDE POS.
8. VCO FENCE MUST BE SOLDERED ALL THE WAY AROUND.
9. CR304 A,B,C,D,E, ARE A MATCHED SET IF ONE IS REPLACED THEY MUST ALL BE REPLACED.
10. TRANSISTOR Q312 SEE DETAIL "F".

DETAIL "G"

DETAIL "F"

DETAIL "A"

DETAIL "B"

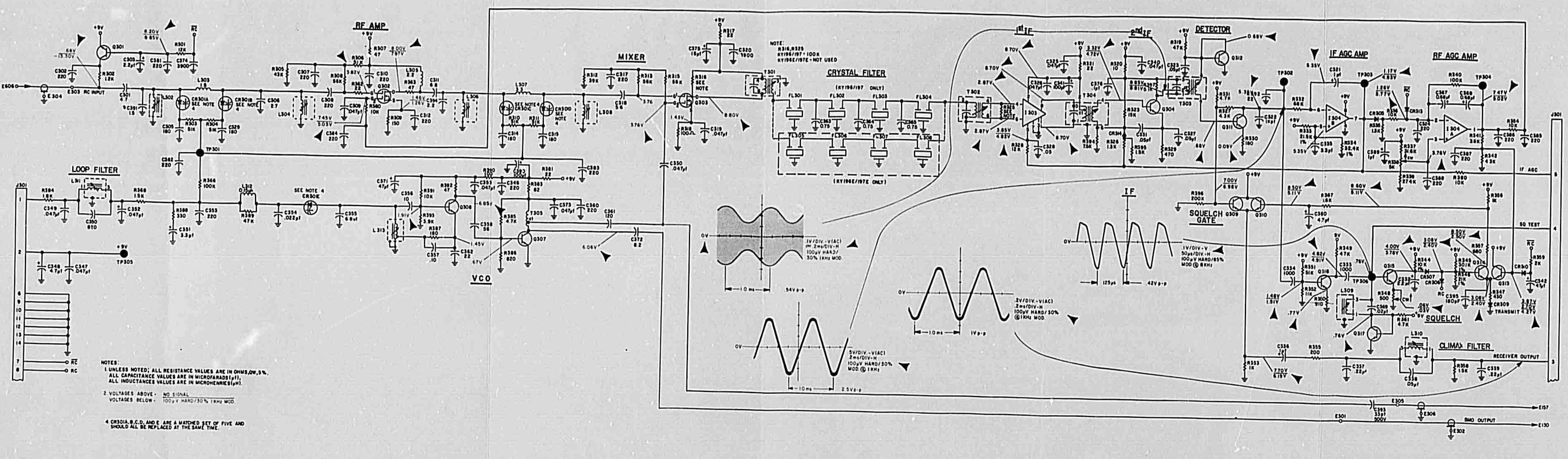
DETAIL "C"

DETAIL "D"

FIGURE 6-9 RECEIVER BOARD ASSEMBLY
(Dwg. No. 300-6066-00/01, R-25)

M

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER



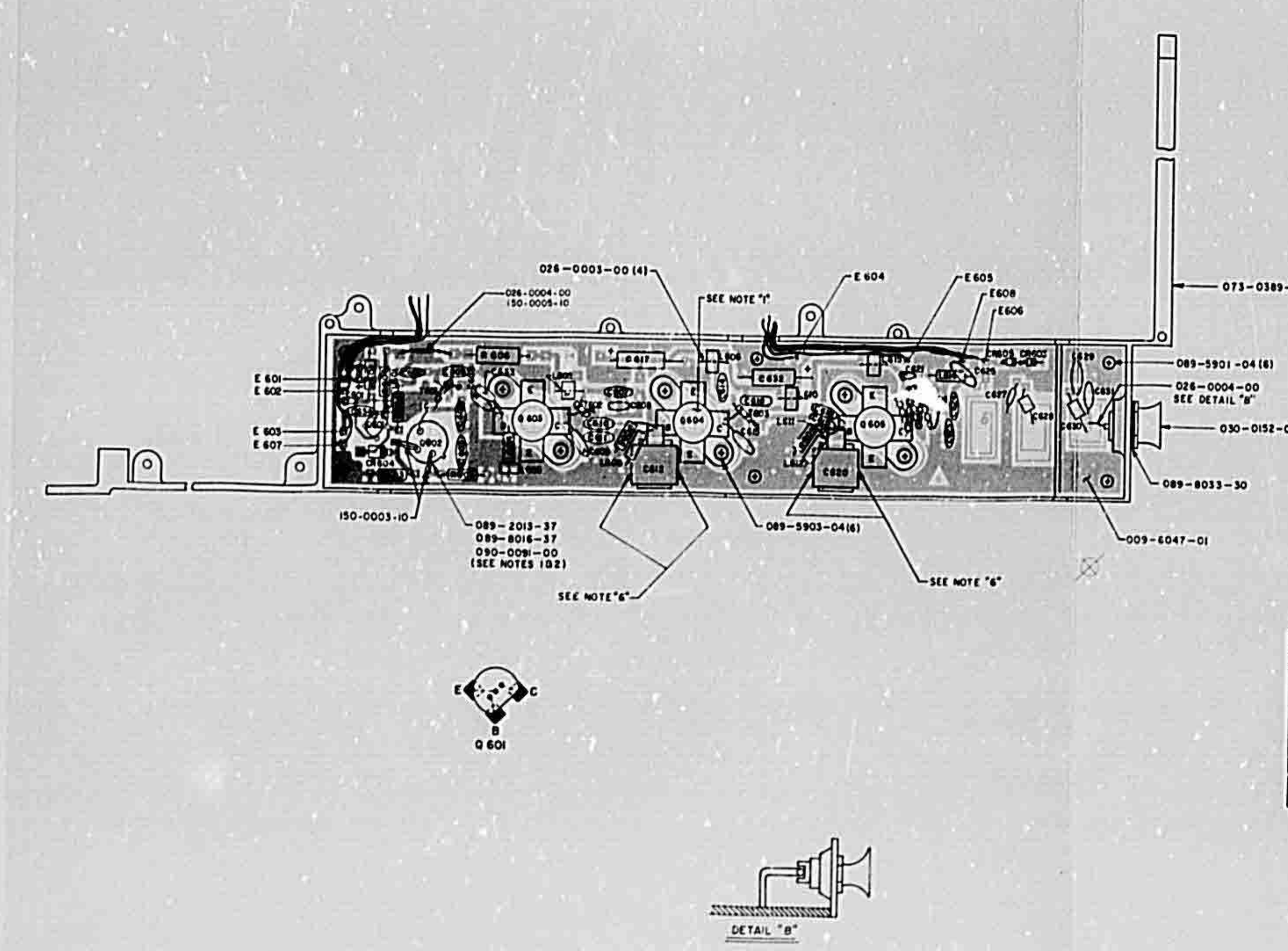
NOTES:
1. UNLESS NOTED; ALL RESISTANCE VALUES ARE IN OHMS,QW,5%. ALL CAPACITANCE VALUES ARE IN MICROFARADS(µf). ALL INDUCTANCES VALUES ARE IN MICROHENRIES(µH).
2. VOLTAGES ABOVE - NO SIGNAL
VOLTAGES BELOW - 100µV HARD/30% 1KHz MOD
4. CR301A,B,C,D, AND E ARE A MATCHED SET OF FIVE AND SHOULD ALL BE REPLACED AT THE SAME TIME.

FIGURE 6-10 RECEIVER BOARD SCHEMATIC
(Dwg. No. 002-6046-00, R-24)

RECEIVER BD SCH

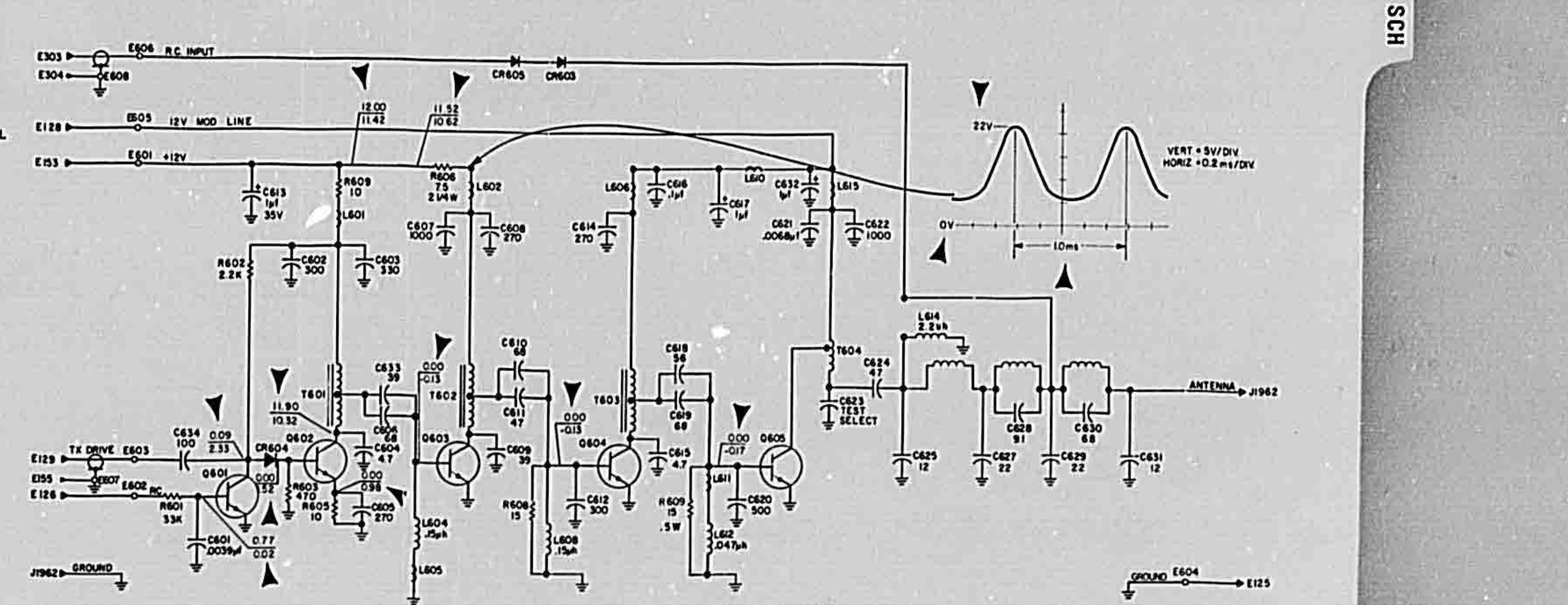
O

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER



NOTES:
1. APPLY THERMAL COMPOUND (016-1004-00) TO BACK SIDE OF TRANSISTORS, Q603, Q604, Q605 ONLY AND TO BACK SIDE OF HEATSINK. ON Q602 ADD THERMAL COMPOUND TO TRAN. CASE AND THE STUD SIDE OF THE HEATSINK.
2. TORQUE NUT ON FAR SIDE OF Q602 TO 7IN. POUNDS AND APPLY GLYPTAL.
3. ALL LEAD LENGHTS MUST BE AS SHORT AS POSSIBLE. SOLDER JOINTS ON CAPACITOR LEADS SHOULD EXTEND ALL THE WAY TO THE BODY OF THE CAPACITOR WHERE POSSIBLE.
4. ENTIRE ASS'Y MUST BE ESPECIALLY CLEAN AND FREE OF FLUX DEPOSITS.
5. MAINTAIN MINIMUM LEAD LENGTHS ON C604, C605, C606, C609, C610, C611, C615, C618, C619, C623, C624, C633, C644.
6. UNDERWOOD CAPS MUST PE SOLDERED ON BOTH SIDES.

WIRING CHART		
FROM	TO	PART NO.
E601	E153	025-0004-03
E602	E126	025-0018-89
E603 E607	E129 E155	026-0013-00
E604	E125	025-0004-00
E605	E128	025-0004-13
E606 E608	E303 E304	026-0013-00



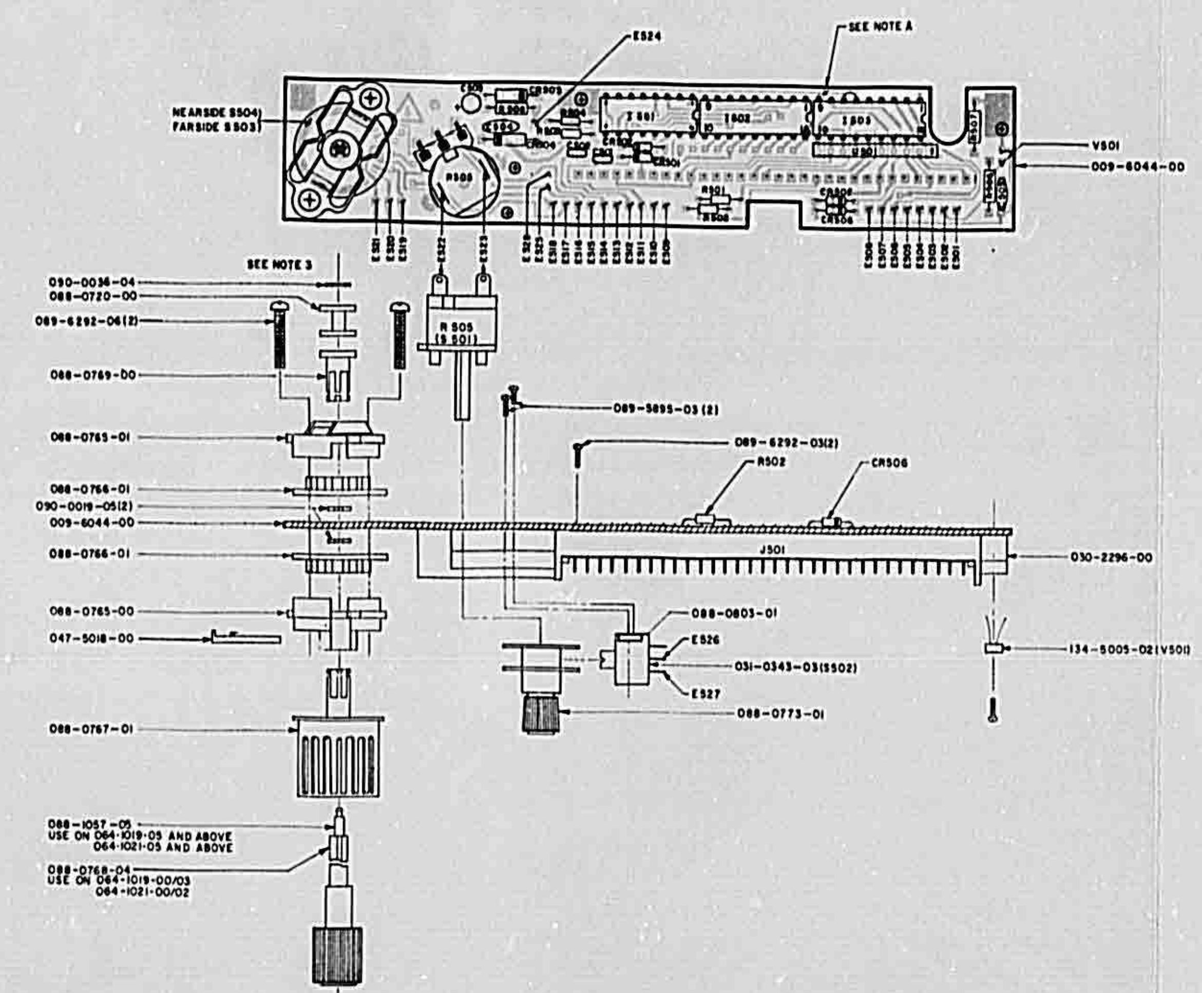
NOTES:
1. UNLESS NOTED; ALL RESISTANCE VALUES ARE IN OHMS, QW, 5%; ALL CAPACITANCE VALUES ARE IN PICOFARADS (pf).
2. VOLTAGES ABOVE LINE, REC MODE
VOLTAGES BELOW LINE, XMIT MODE
VOLTAGES TAKEN WITH FLUKE 2000A.

FIGURE 6-12 KY 196/196E TRANSMITTER BOARD ASSEMBLY AND SCHEMATIC
(Dwg. No. 300-6047-00, R-13)
(Dwg. No. 002-6047-00, R-5)

TRANSMITTER BD ASSY & SCH
KY 196/196E

Q

KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER



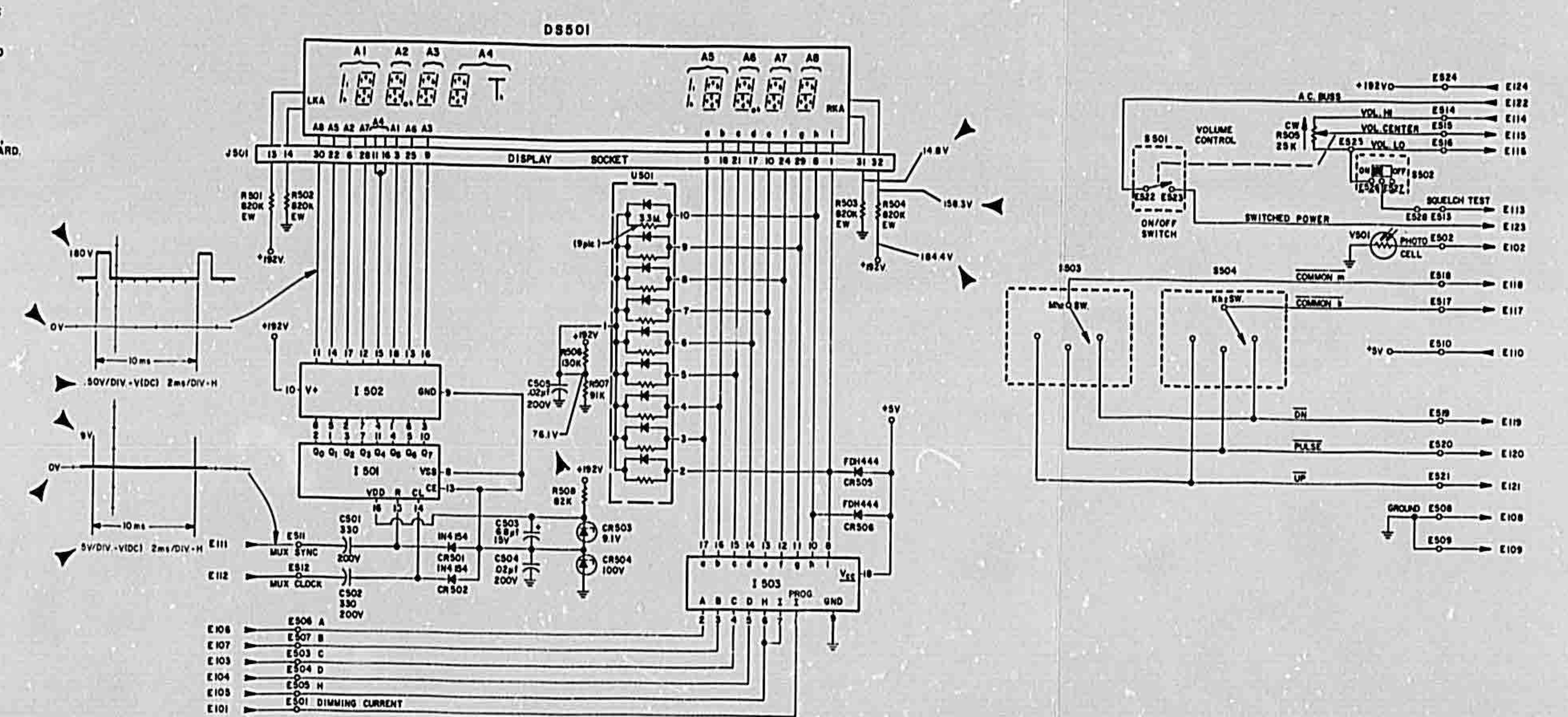
NOTES:

1. INSTALL SPRING (047-5018-00) ON HOUSING (088-0765-00) AFTER SWITCH IS ASSEMBLED ON THE P.C. BOARD.
2. PRIOR TO POST COATING BOTH SIDES OF ASS'Y WITH CLEAR URETHANE COATING (016-1040-00) MASK OFF THE FOLLOWING: ALL MOUNTING AREAS, E 501 THRU E 528, S 501 THRU S 504, J 501, V 501.
3. AFTER ASSEMBLY, APPLY A SMALL AMOUNT OF EPOXY (016-1122-00) TO THE RETAINING RING (090-0036-04) TO SECURE IT TO THE SHAFT (088-0766-02).

REWORK NOTES:

A. ON RADIOS 064-1019-05 AND ABOVE AND 064-1021-05 AND ABOVE, CUT TRACE BETWEEN PIN 7 & PIN 9 OF I503 BOTH SIDES OF BOARD. ADD MAGWIRE BETWEEN PINS 6 & 7.

WIRING CHART			
FROM	TO	KING PART NO.	LENGTH
E 526	E 525	025-0001-00	250
E 527	E 528	025-0001-06	400

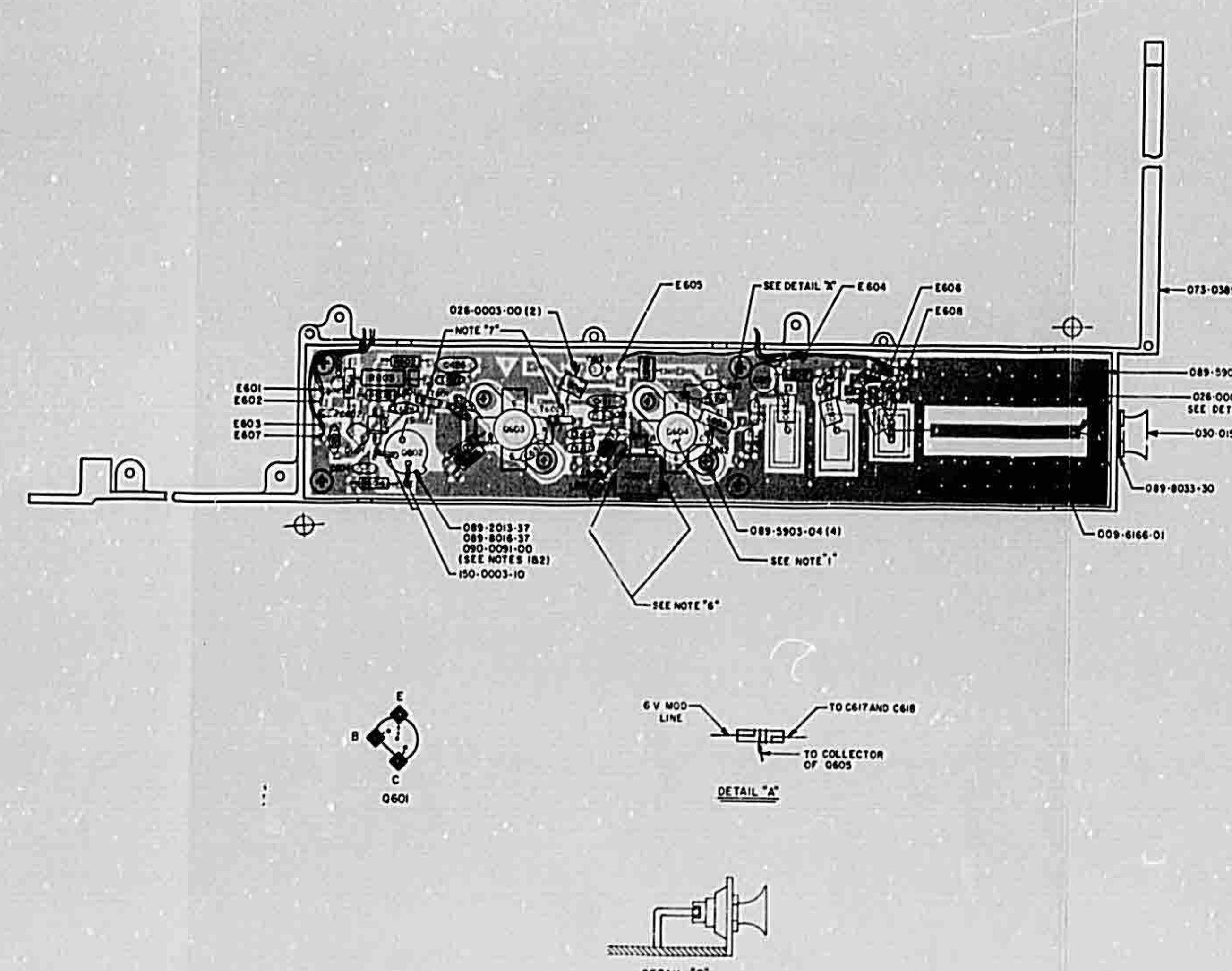


DISPLAY BD ASSY & SCH

FIGURE 6-11 DISPLAY BOARD ASSEMBLY AND SCHEMATIC
(Dwg. No. 300-6044-00, R-12)
(Dwg. No. 002-6044-00, R-2)

S

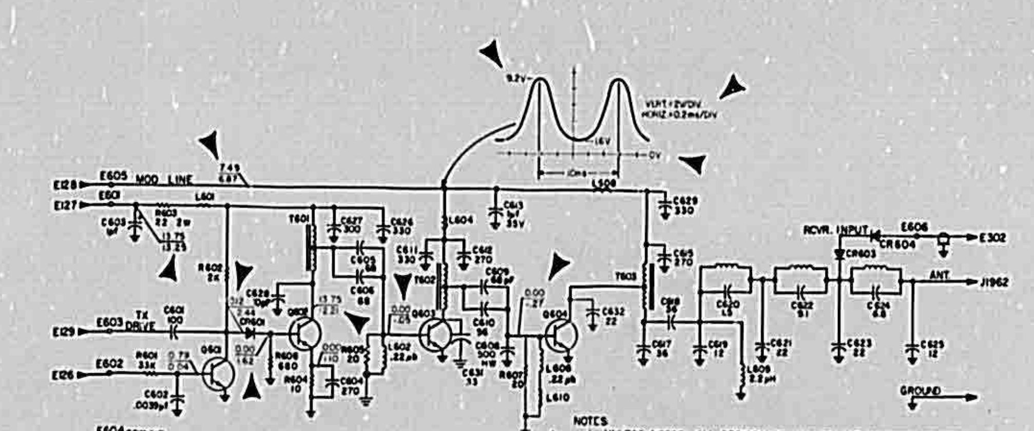
KING
KY 196/196E/KY 197/197E
VHF COMM TRANSCEIVER



NOTES

1. APPLY THERMAL COMPOUND (016-1004-00) TO BACK SIDE OF TRANSISTORS, Q603, Q604 ONLY AND TO BACK SIDE OF HEATSINK. ON Q602 ADD THERMAL COMPOUND TO TRANSISTOR CASE AND THE STUD SIDE OF THE HEATSINK.
2. TORQUE NUT ON FAR SIDE OF Q602 TO 7 IN. POUNDS AND APPLY GLYPTAL.
3. ALL LEAD LENGTHS MUST BE AS SHORT AS POSSIBLE. SOLDER JOINTS ON CAPACITOR LEADS SHOULD EXTEND ALL THE WAY TO THE BODY OF THE CAPACITOR WHERE POSSIBLE.
4. ENTIRE ASS'Y MUST BE ESPECIALLY CLEAN AND FREE OF FLUX DEPOSITS.
5. MAINTAIN MINIMUM LEAD LENGTHS ON C605, C606, C609, C610, C617, C618, AND C628.
6. UNDERWOOD CAPS MUST BE SOLDERED ON BOTH SIDES.
7. MAKE SURE LEADS ARE SEPERATED.

WIRING CHART		
FROM	TO	PART NUMBER
E601	E153	025-0004-03
E602	E126	025-0018-89
E603 E607	E129 E155	026-0013-00
E604	E125	025-0004-00
E605	E128	025-0004-13
E606 E608	E303 E304	026-0013-00



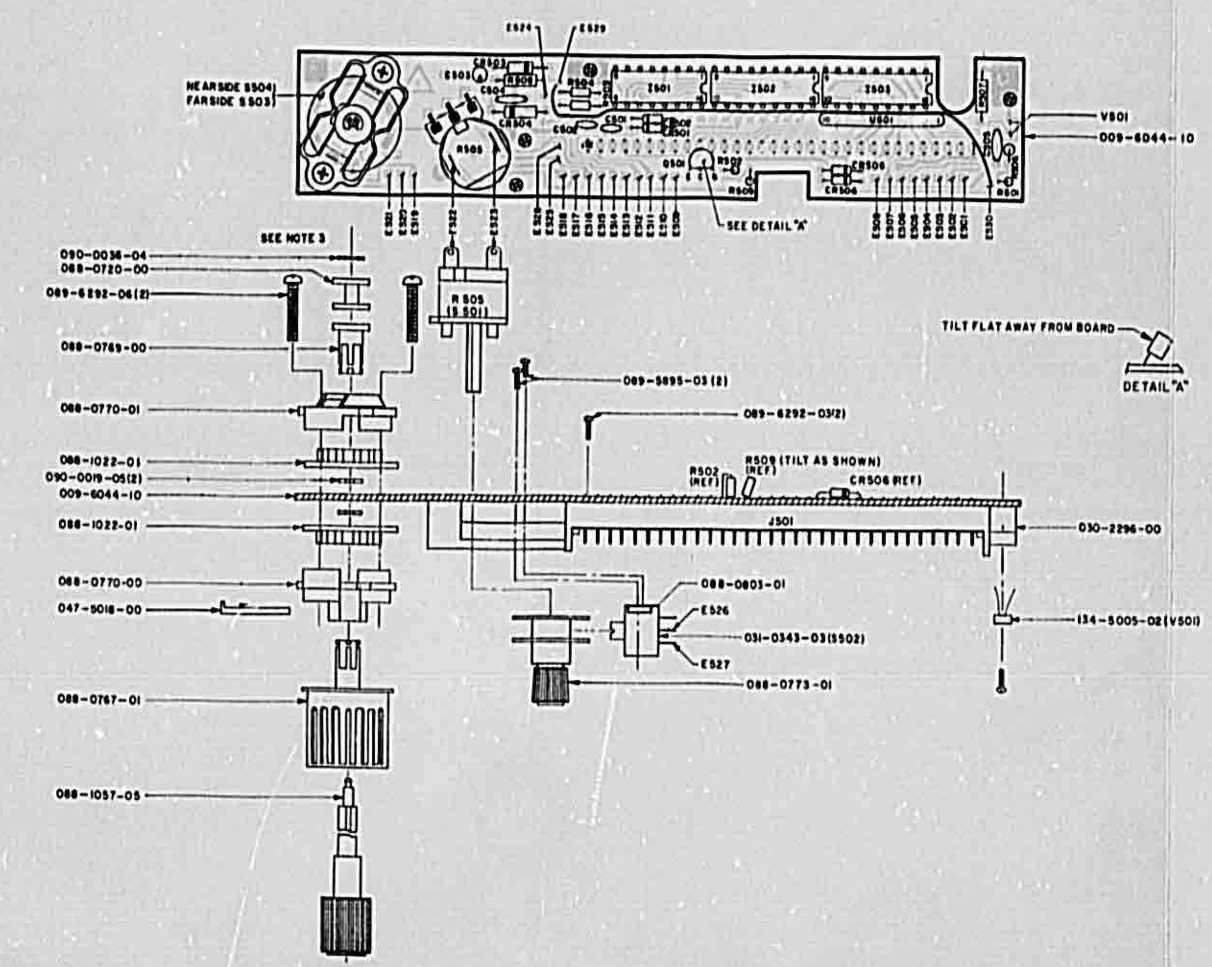
NOTES:

1. UNLESS NOTED, ALL RESISTANCE VALUES ARE IN OHMS, QW, 5%; ALL CAPACITANCE VALUES ARE IN PICOFARADS (pF).
2. VOLTAGES ABOVE LINE, RCVR. MODE; VOLTAGES BELOW LINE, XMTR MODE; VOLTAGES TAKEN WITH FLUKE 2000A.

TRANSMITTER BD ASSY & SCH
KY 197/197E

FIGURE 6-13 KY 197/197E TRANSMITTER BOARD ASSEMBLY AND SCHEMATIC
(Dwg. No. 300-6166-00, R-15)
(Dwg. No. 002-6166-00, R-9)

U

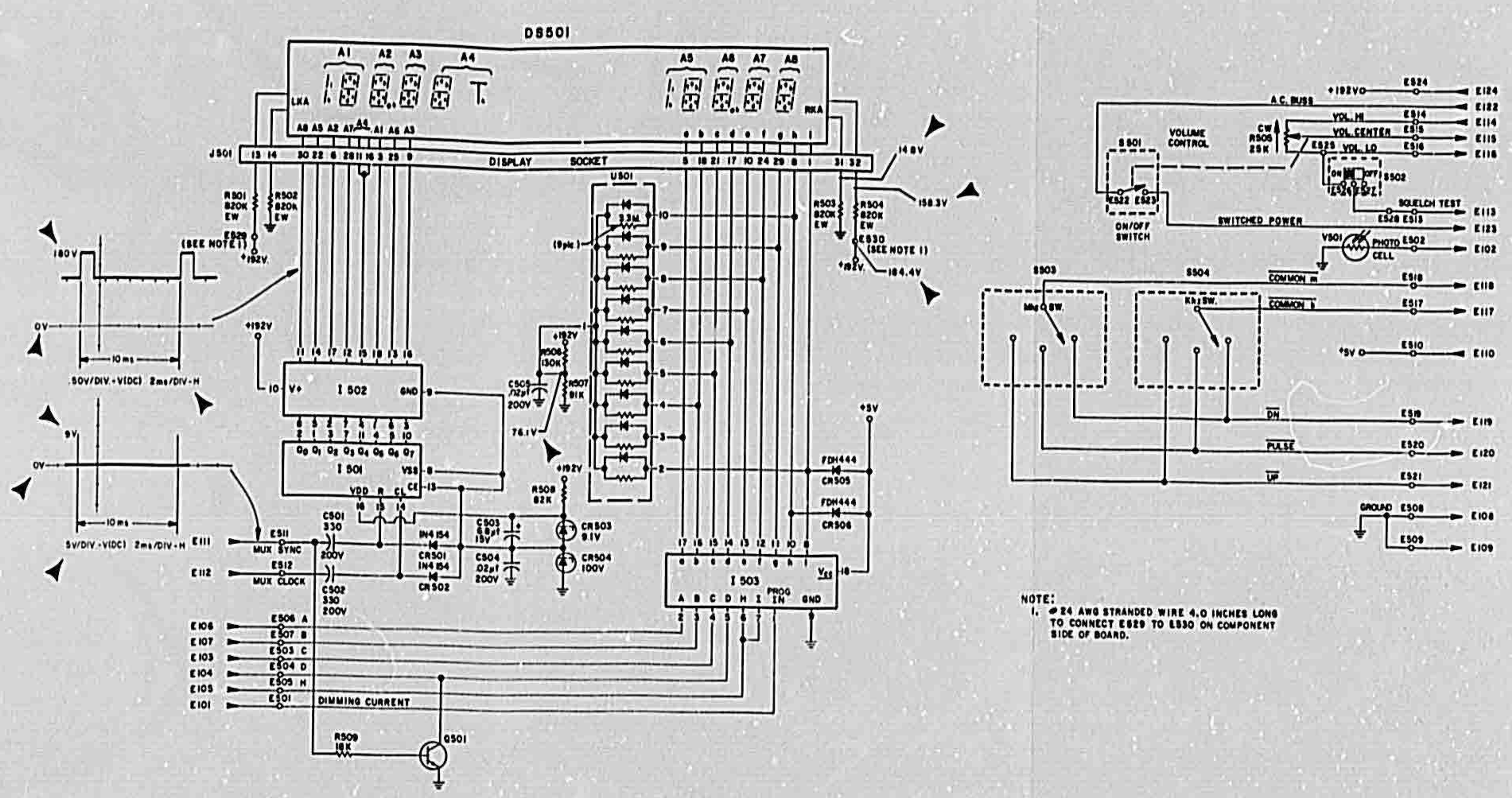


NOTES:

1. INSTALL SPRING (047-5018-00) ON HOUSING (088-0770-00) AFTER SWITCH IS ASSEMBLED ON THE P.C. BOARD.
2. PRIOR TO POST COATING BOTH SIDES OF ASS'Y WITH CLEAR URETHANE COATING (016-1040-00) MASK OFF THE FOLLOWING: ALL MOUNTING AREAS, E 501 THRU E 528, S 501 THRU S 504, J 501, V 501.
3. AFTER ASSEMBLY, APPLY A SMALL AMOUNT OF EPOXY (016-1122-00) TO THE RETAINING RING (090-0036-04) TO SECURE IT TO THE SHAFT (088-1057-05).

WIRING CHART

FROM	TO	KING PART NO.	LENGTH
E 526	E 525	025-0001-00	250
E 527	E 528	025-0001-06	400
E 529	E 530	025-0002-00	4.0



NOTE:

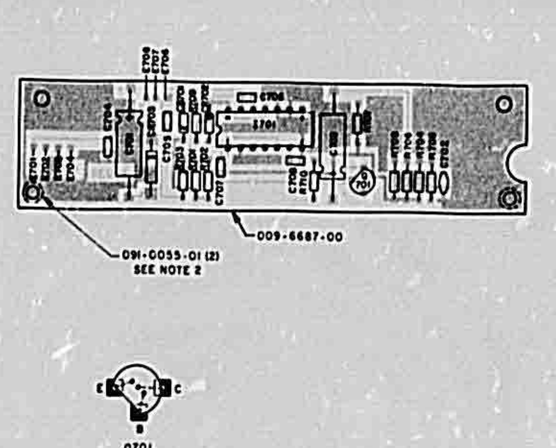
1. #24 AWG STRANDED WIRE 4.0 INCHES LONG TO CONNECT E529 TO E530 ON COMPONENT SIDE OF BOARD.

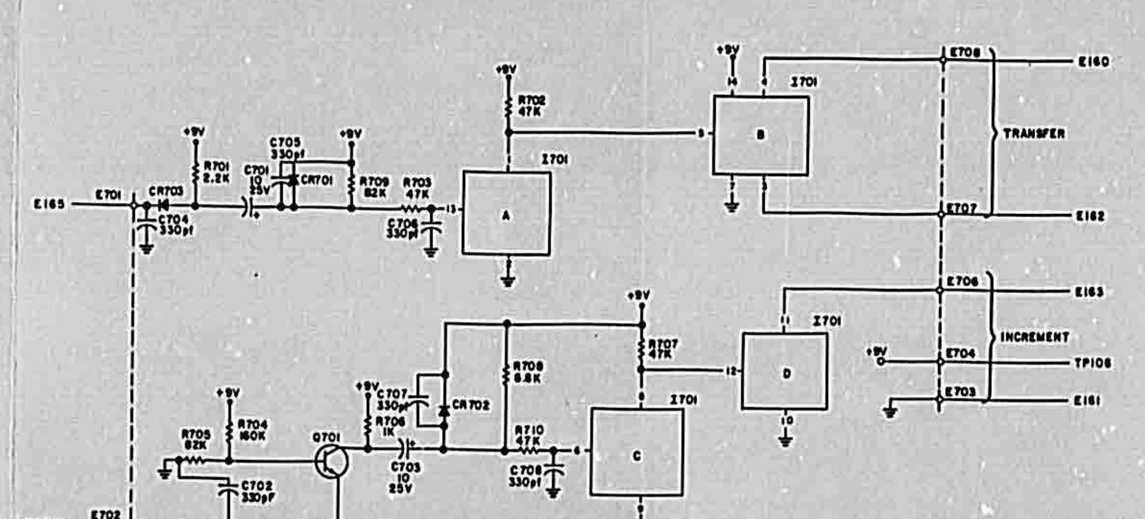
FIGURE 6-11A DISPLAY BOARD ASSEMBLY AND SCHEMATIC
(Dwg. No. 300-6044-10, R-1)
(Dwg. No. 002-6044-10, R-0)

W

NOTES:

1. PRIOR TO POST COATING BOTH SIDES OF P.C. BOARD WITH CLEAR URETHANE (016-1040-00), MASK OFF THE FOLLOWING: ALL MOUNTING AREAS, ALL "E" NUMBERS
2. INSERT 091-0055-01 SCREW IN EACH HOLE AND HEATSTAKE ON COMPONENT SIDE OF BOARD.





NOTES:

1. UNLESS OTHERWISE NOTED, ALL RESISTANCE VALUES ARE IN OHMS, 1/8W, 5%.
2. UNLESS OTHERWISE NOTED, ALL CAPACITANCE VALUES ARE IN MICROFARADS.

FIGURE 6-14 KY 196/197 REMOTE MEMORY INCREMENT/TRANSFER ASSEMBLY AND SCHEMATIC
(Dwg. No. 300-6687-00, R-5)
(Dwg. No. 002-6687-00, R-5)