



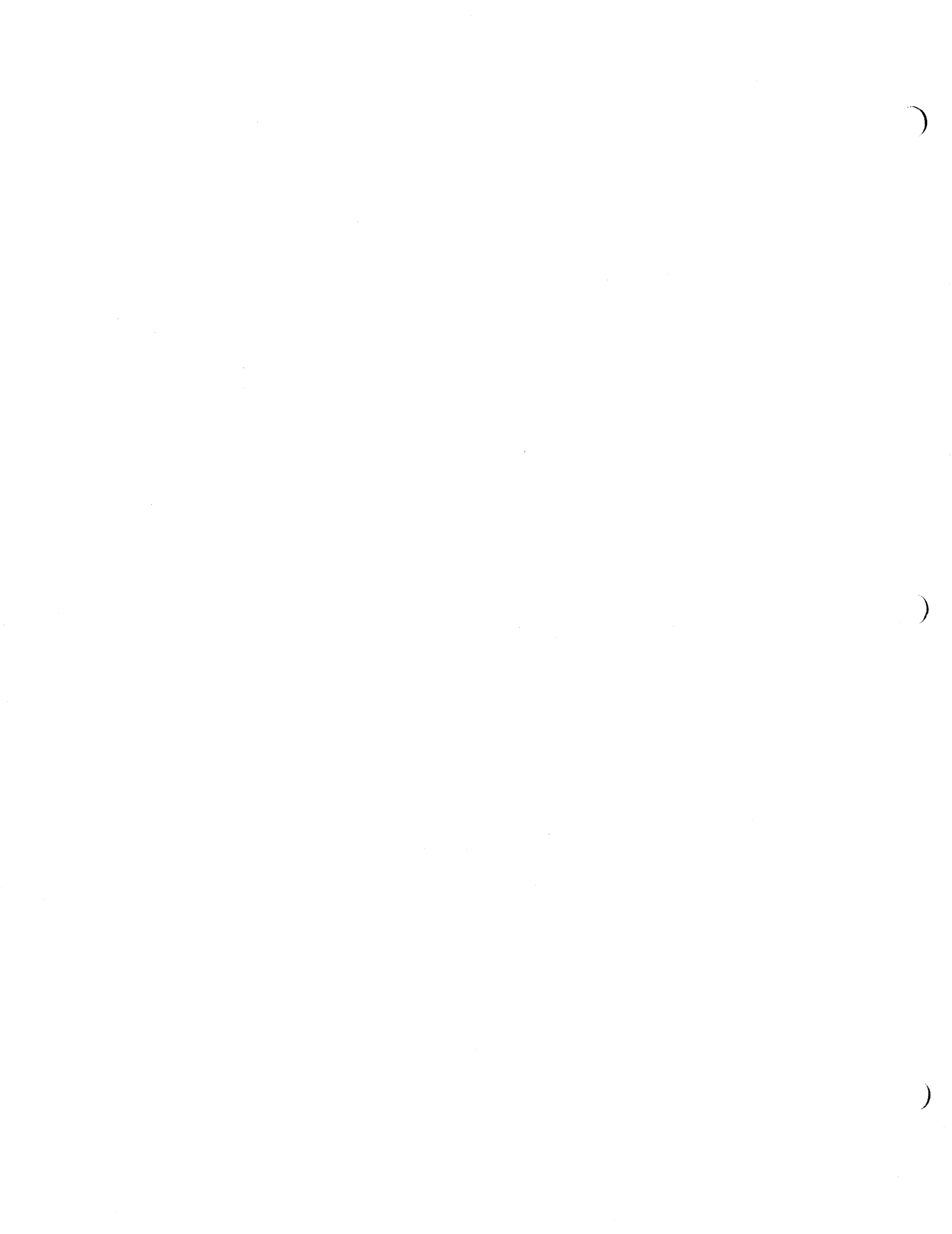
***MAINTENANCE MANUAL***

***BENDIX/KING<sup>®</sup>***

***KMA 24***

***AUDIO PANEL MARKER  
BEACON RECEIVER***

***MANUAL NUMBER 006-05180-0001  
REVISION 1, DEC. 1981***



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## SECTION IV THEORY OF OPERATION

### 4.1. GENERAL

The KMA 24 is an audio selector panel with both speaker and headphone isolation amplifiers and a marker beacon receiver. The separate isolation amplifiers provide complete independence of speaker and headphone selection. This allows the same audio input to be selected for both headphones and speaker and still retain isolation between inputs.

#### 4.2 general theory of operation

The general block diagram is shown in Figure 4-1.

### 4.2. GENERAL

The 75MHz marker beacon receiver is a single conversion superheterodyne receiver with a crystal controlled Local Oscillator (L.O.) frequency of 85.7MHz. The Intermediate Frequency (IF) is therefore  $85.7 - 75 = 10.7\text{MHz}$  which allows the use of commercially popular 10.7MHz crystal filters to satisfy the IF bandwidth requirements.

Automatic Gain Control (AGC) is derived from the detected IF and is used to control the gain of the single IF amplifier. Three active filters are used to differentiate between the three modulation frequencies (400Hz, 1300Hz, and 3000Hz) that are used on marker beacon signals. The output of these active filters is amplified and sent to the audio selector switches as marker audio. Also, each of the active filter outputs is detected and causes the corresponding lamp driver to illuminate the appropriate lamp.

#### 4.2.2. AUDIO ISOLATION AMPLIFIERS

In order to achieve isolation between audio inputs, it is necessary to attenuate the audio inputs with a resistor network. After this attenuation, the signal must then be amplified to provide an output equal to the input. This is exactly how the headphone amplifier is aligned at the factory. An input of 1 volt will produce an output of 1 volt and since the input and output impedances are both nominally 500 ohms, the overall power gain for the headphone amplifier is  $1 = 0\text{dB}$ .

The speaker amplifier is also adjusted to provide 1 volt of output for 1 volt of input. However, since the output impedance is 4 ohms while the input impedance is 500 ohms, a power gain ( $V^2/R$ ) is realized in the speaker amplifier. This power gain is the output power ( $1^2/4$ ) divided by the input power ( $1^2/500$ ) or  $1/4 \times 500/1 = 125 = 21\text{dB}$ . Therefore the speaker amplifier provides 21dB more gain than the headphone amplifier, plus the output impedance of the speaker amplifier is much lower.

Both amplifier gains can be adjusted independently if the one-to-one voltage ratio is found to be unsatisfactory.

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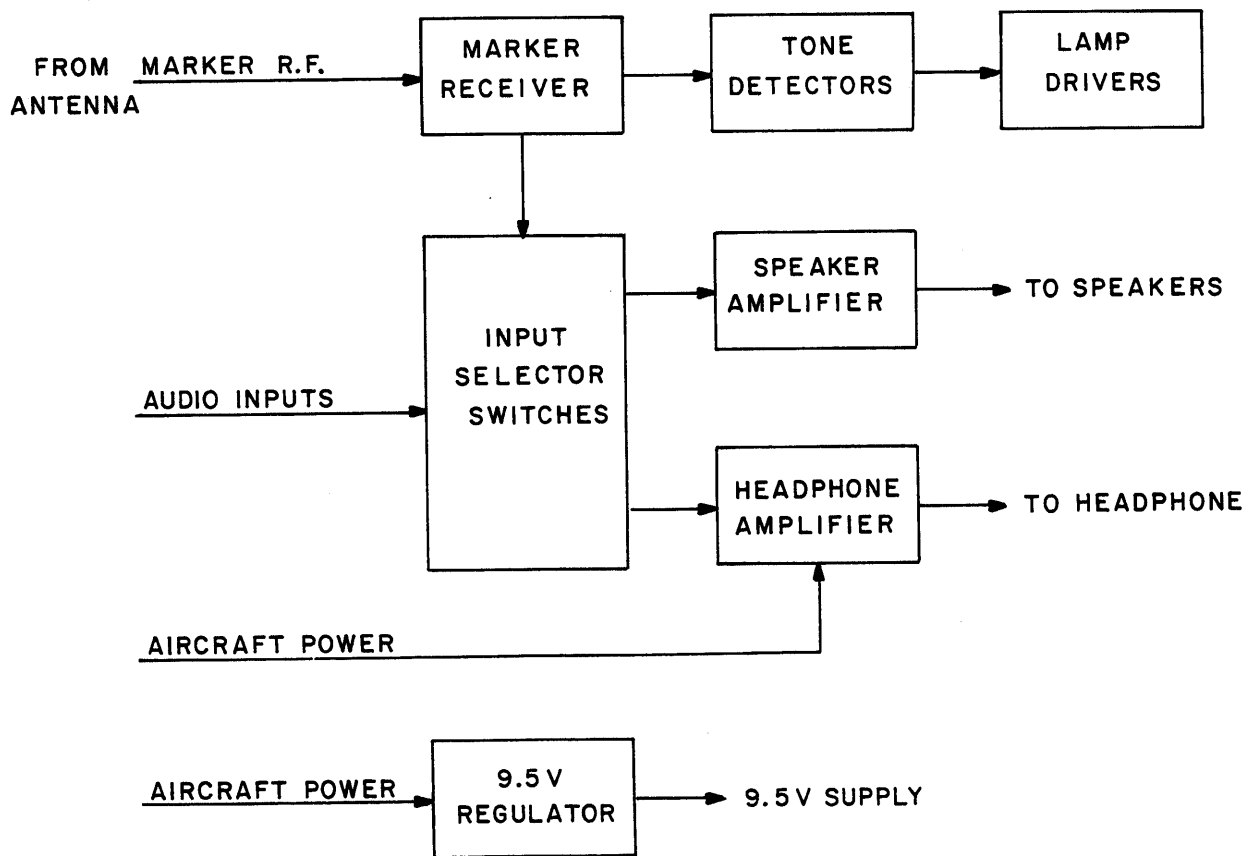


FIGURE 4-1 BLOCK DIAGRAM  
(Dwg. No. 696-0151-00)



### 4.3. DETAILED CIRCUIT THEORY

The detailed block diagram of the KMA 24 is shown in Figure 4-2.

#### 4.3.1. MARKER BEACON RECEIVER

The 75MHz marker beacon signal is received from the marker beacon antenna and immediately attenuated to the desired amplitude by pots R101 and R102. R101 is used to set the HI sensitivity threshold at 200uv and R102 to set the LO sensitivity threshold at 1000uv. Switch S101B selects the threshold desired.

The RF preselector consists of three tuned circuits T101, T102, and T103, each of which is center tuned to 75MHz. This preselector will provide about 70dB of attenuation at the image frequency (96.4MHz) and beyond.

The local oscillator (L.O.) utilizes a fifth overtone crystal, Y101 to provide 85.7MHz injection to the mixer. This injection is mixed with the received frequency of 75MHz at the dual gate FET, Q101. The mixer output is the difference frequency of 10.7MHz which is selected by T104 and the four pole crystal filter FL101. R163 and L102 ensure proper impedance matching at the output of the crystal filter which wants to see a resistive 5K. The 3dB bandpass of FL101 is at least +15KHz to allow for variations in ground station frequency. The response at  $\pm 200$ KHz is at least 40dB down to satisfy TSO selectivity requirements.

I101 is an integrated circuit broadband amplifier which provides about 55dB of gain at 10.7MHz. The differential output of I101 is applied across the primary of T105 which is tuned to 10.7MHz providing more IF selectivity. The secondary of T105 drives an active detector consisting of Q103 and Q104. Q103 provides the base to emitter bias voltage of about 0.7V which keeps Q104 right on the verge of conduction with no signal in. Any signal is then detected by Q104 since any negative going voltage causes Q104 to conduct while any positive going voltage shuts off Q104.

All the Automatic Gain Control (AGC) action required by the receiver is performed by I101 which has a minimum of 60dB of AGC. Maximum gain is attained when the AGC terminal (pin 5) is held low. Minimum gain results when pin 5 is held high. This AGC voltage is determined by the differential amplifier, Q105 and Q106. R113 and C111 have an RC of about twenty times the period of the lowest frequency of modulation (400Hz). This effectively wipes the modulation off of the detected IF signal, providing a DC voltage at the base of Q105 that is equal to the DC voltage at TP101 plus the average of the AC voltage at TP101. Since the DC voltage never changes, the voltage at the base of Q105 is therefore proportional to the AC or signal voltage at TP101 with a DC step offset. The DC offset is controlled by R159 which was chosen to provide a convenient voltage level at the base of Q105 when the desired signal voltage is present. The signal voltage is allowed to increase until the voltage at the base of Q105 is equal to the fixed voltage at the base of Q106. When these two voltages are equal, Q105 begins to conduct, robbing current from Q106 which allows the AGC voltage at TP104 to rise, thereby decreasing the gain of I101. Therefore, the AGC voltage provides the negative feedback required to keep the signal at the input to the detector constant at about 1V peak to peak.

It is desirable to have an AGC loop with a "fast attack and slow decay". In other words, a good AGC loop will respond to a sudden burst of input signal but will not respond rapidly to a sudden fading of input signal. This type response is provided by CR101, C112, and R161. A negative going change in voltage at TP104 will be conducted by C112 through CR101 to the base of Q106 which will reduce its collector current thereby tending to reduce the voltage at TP104. Therefore we have negative feedback through this network when the voltage at TP104 is decreasing and which will be the case when the received signal is decreasing, thus we have "slow decay". On the other hand, a positive going change in the voltage at TP104 will not be passed on to the base of Q106 since CR101 will block a positive going impulse. This allows the voltage at TP104 to increase as rapidly as is required to react to a sudden burst of input signal thereby providing a "fast attack". R161 simply keeps a steady state current in CR101 so that a small negative going signal at TP104 (less than one diode drop) will provide immediate feedback at Q106.

The marker audio is buffered by the emitter follower Q108 to provide a low impedance source of audio for the tone filters.

The tone filters are active filters with a closed loop center frequency voltage gain of 5 and a Q of 2. The 400Hz filter consists of I102A, C113, C114, R121, R122, and R123. The 1300Hz filter is composed of I102B, C115, C116, R125, R126, and R127. The 3000Hz filter consists of I103A, C117, C118, R129, R130, and R131.

The outputs of the active filters are summed by R133, 134, and 135 then amplified by I103B sent to the audio panel as the marker receiver audio. CR102 and CR103 provide a 1.4V threshold to prevent noise and small signals from being heard. R137 determines the closed loop gain until CR102 and CR103 start conducting. The ultimate gain can be set by adjusting R149.

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Q109, Q110, and Q111 are the tone detectors. The emitters of all three of these transistors are connected to a common point. This tends to ensure that only the strongest tone gets detected at any given time since when any one of these transistors conducts, it raises the voltage at all three emitters, thus effectively raising the threshold for the other two detectors.

The current passed by one of the detector transistors causes its associated lamp driver to turn on and light the appropriate lamp. Q112, Q113, and Q114 are the lamp drivers. R150 and C119 provide a slight delay in triggering Q112 on to prevent noise spikes from lighting the blue lamp. Identical RC delays are located in the other two lamp circuits.

Marker lamp dimming is provided by V101 and Q115. V101 is a light sensitive resistor that decreases in resistance as the intensity of light falling on it increases. With no light at all, its resistance is very high such that the base voltage of Q115 is virtually determined only by R146 and R147. The emitter voltage of Q115 will then be that required to cause DS101, 102, and 103 to glow dimly in a dark environment. As the ambient light increases, the resistance of V101 decreases, raising the base voltage of Q115. The emitter voltage of Q115 is also raised causing any lamp that is illuminated to put out more light.

The current supplied to the lamp drivers will never exceed about 600ma since at this current a voltage drop of 0.6V will exist across R138 causing Q107 to conduct base current away from Q115. This current limiting is to prevent damage to circuitry should one of the external marker lamp lines become shorted to ground.

Middle marker sense is simply the middle marker (amber) lamp voltage supplied through R162 except that Q116 holds this line low when lamp test is activated since during lamp test the blue lamp voltage will be high causing Q116 to turn on. This line is intended to be used for autopilot coupling since flight control systems cue off the middle marker to reduce the gain of the system as the range decreases. Providing the separate line in the KMA 24 prevents the autopilot gain from being stepped down when lamp test is activated.

Lamp test is provided by S101T when the pushbutton is depressed by shorting R143, 144, and 145 to ground, causing all three lamp drivers to conduct at the same time.

### 4.3.2. ISOLATION AMPLIFIERS

The 18 vertical pushbuttons on the front panel of the KMA 24 control the selection of a maximum of 9 audio inputs (including the internal marker receiver audio), or 8 audio inputs if the AUTO function is utilized. In addition, 2 direct wired audio inputs are provided that bypass the input switches. All eleven of these audio inputs are loaded with 510 ohm resistors contained in U201. The inputs see this load at all times, whether or not they are selected by the panel.

Pushbutton switches S201B (bottom) through S209B are used to select the audio to be heard on the headphones while S201T (top) through S209T provide speaker audio selection. Physically the top and bottom switches are paired up with each pair consisting of two double pole-double throw switches, both of which are mounted on the same set of six pins. Electrically, however, the top and bottom switches are single pole-double throw because the top switches have a shorting bar on the right side only (looking at the switches from the front of the unit) and the bottom switches have the shorting bar on the left side only. This unique construction provides the electrical capability of two switches while using the PC board space of only one switch and requires no special mechanical support for the top row of switches.

The audio inputs selected for the headphone amplifier are summed by the 51K resistor module U202. Likewise, U203 is a 51K resistor module that sums the audio inputs selected for the speaker amplifier. Each summing resistor is connected to ground when its associated switch is in the "out" (unselected) position and to 250 ohms (510 ohms in parallel with a 500 ohm source) when its switch is in the "in" position. This configuration provides maximum isolation between inputs and amplifiers with a minimum of attenuation to the desired input and very little change in output level when additional inputs are selected and unselected.

The headphone amplifier consists of I201 and the auto-transformer T201. I201 is an audio amplifier with a fixed voltage gain of 50. R202 and C204 load the output to prevent high frequency oscillations. R201 is provided to adjust the output amplitude. The output is rated at 50mw into 500 ohms. Supply voltage for I201 is provided by its own separate power supply consisting of the 15V zener diode CR202, current limiting resistor R207, pass transistor Q202 and the filter capacitor C202. For 13.75V operation, CR202 does not conduct and Q202 operates in a saturated mode. With a 27.5V supply, CR202 provides Q202 with a base bias of 15V. Therefore about 14.3V will be supplied to I201.

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The speaker amplifier utilizes the same audio amplifier integrated circuit (I202) as the headphone amplifier. Q203 is an N-channel junction field-effect transistor (J-FET) that functions as audio transmission gate. The source of Q203 is normally shorted to its drain allowing audio to pass from U203 to I202. However, anytime the microphone is keyed, the gate of Q203 is pulled low causing the source to drain impedance to increase dramatically thereby muting the audio by at least 55dB to prevent feedback that could cause oscillation during transceiver transmission. The altimeter warning audio line bypasses this mute circuit to allow it to be heard at all times including when the mic is keyed. R213 adjusts the volume of the 500 ohm audio inputs on any speaker that happens to be selected but this pot is normally used to set the cabin speaker volume since that is the speaker of primary interest in connection with these inputs. R214 adjusts the volume of the internal (passenger address) and external (ramp hail) speakers only during the time that the mic is keyed. In other words, R214 controls the amplification of microphone audio. Microphone bias is supplied by the transceiver selected, but with the mic switch in the INT or EXT positions the mic bias must be supplied by the KMA 24. This is the function of R212 along with the filter R211 and C210. The microphone audio is passed by C211 to the resistor divider R225 and R214, then to pin 2 of I202.

The output of I202 is fed to the primary of T202. The secondary of T202 is center tapped to allow the application of supply voltage to the bases of Q204 and Q205. Q206 and Q207 are the power amplifier transistors in a grounded collector, emitter follower configuration. The grounded collectors allow simple heatsinking and the emitter follower, push-pull configuration provides an audio output that is very low in distortion. The primary of the output transformer, T203 is center tapped to provide aircraft power to the emitters of Q206 and Q207. Q208 is physically mounted to the same heatsink as Q206 and Q207 and therefore senses their temperature. The base-emitter voltage drops of Q206 and Q207 change with temperature, but the base-emitter drop of Q208 will track this change, thereby keeping crossover distortion and idle current drain to a minimum.

The secondary of T203 has two taps on it. The 8 ohm tap provides 1.414 times the voltage supplied by the 4 ohm tap. Therefore, for any given amplifier output, the power delivered by the 8 ohm tap to an 8 ohm speaker will equal the power delivered by the 4 ohm tap to a 4 ohm speaker. However, to simplify output switching, only one tap can be used in any installation. The 4 ohm tap should be used whenever any of the speakers to be driven are 4 ohm. In most cases this tap will provide adequate power to an 8 ohm speaker (about 1/2 that delivered to a 4 ohm speaker). However, if all the speakers to be driven are 8 ohms then F202 can be changed to the 8 ohm tap to increase the power delivered to the 8 ohm loads. This tap should not be used to drive a 4 ohm load.

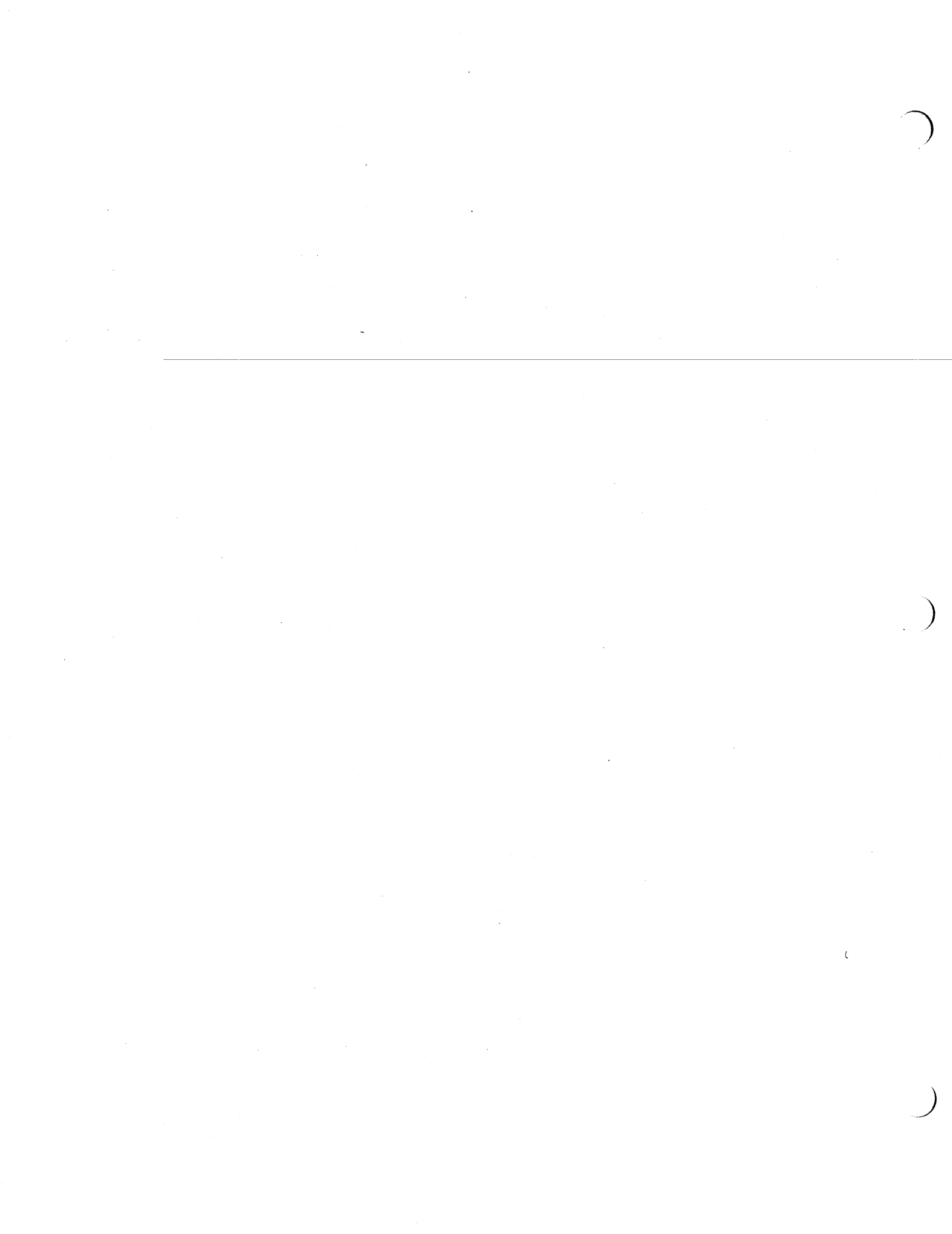
A regulated voltage of 9.5V is supplied to the speaker preamplifier and the marker receiver by I203 and the pass transistor Q201. I203 is a voltage regulator programmed to supply 9.5V by the precision resistors R203 and R204. The regulated voltage is monitored at pin 10 of I203 through R205 and CR201. Current limiting will result before this voltage reaches 12V. The base current of Q201 is also monitored and when it becomes excessive, current limiting will result. R206 determines the point at which current limiting begins.

Mic switch S210 is a six position five pole rotary switch used to control five functions. Deck 1 (the closest to the front of the unit) routes the microphone audio to the selected transceiver, or to the KMA 24 speaker amplifier if either INT or EXT are selected. Four lugs on top of deck 1 serve as the mount for one of the panel lamps. Deck 2 routes microphone key to the proper transceiver. P.A. mute (passenger address mute) is merely mic key when S210 is in the INT position to be used to mute the normal audio on the passenger address system. Deck 3 selects the audio input corresponding to the transceiver in use and routes it to the AUTO switches. The top half of deck 3 is a separate pole and is used to turn power on and off. Deck 3 is the only deck of the switch that has shorting contacts. Deck 4 routes the output of the speaker amplifier to the proper speaker.

CR206 is a 3V zener provided to eliminate high voltage spikes induced onto the mic key line by transmitter relay coils.

Six panel lamps are used to illuminate the front panel. They are all connected in parallel for 13.75V lighting and three in series with the other three for 28V lighting.

Three speaker load resistors are provided, R226, 227, and 228. They are used to load the 4 ohm outputs of transceivers with speaker amplifiers and also to load the KMA 24 external and internal speaker outputs if these speakers are not used.



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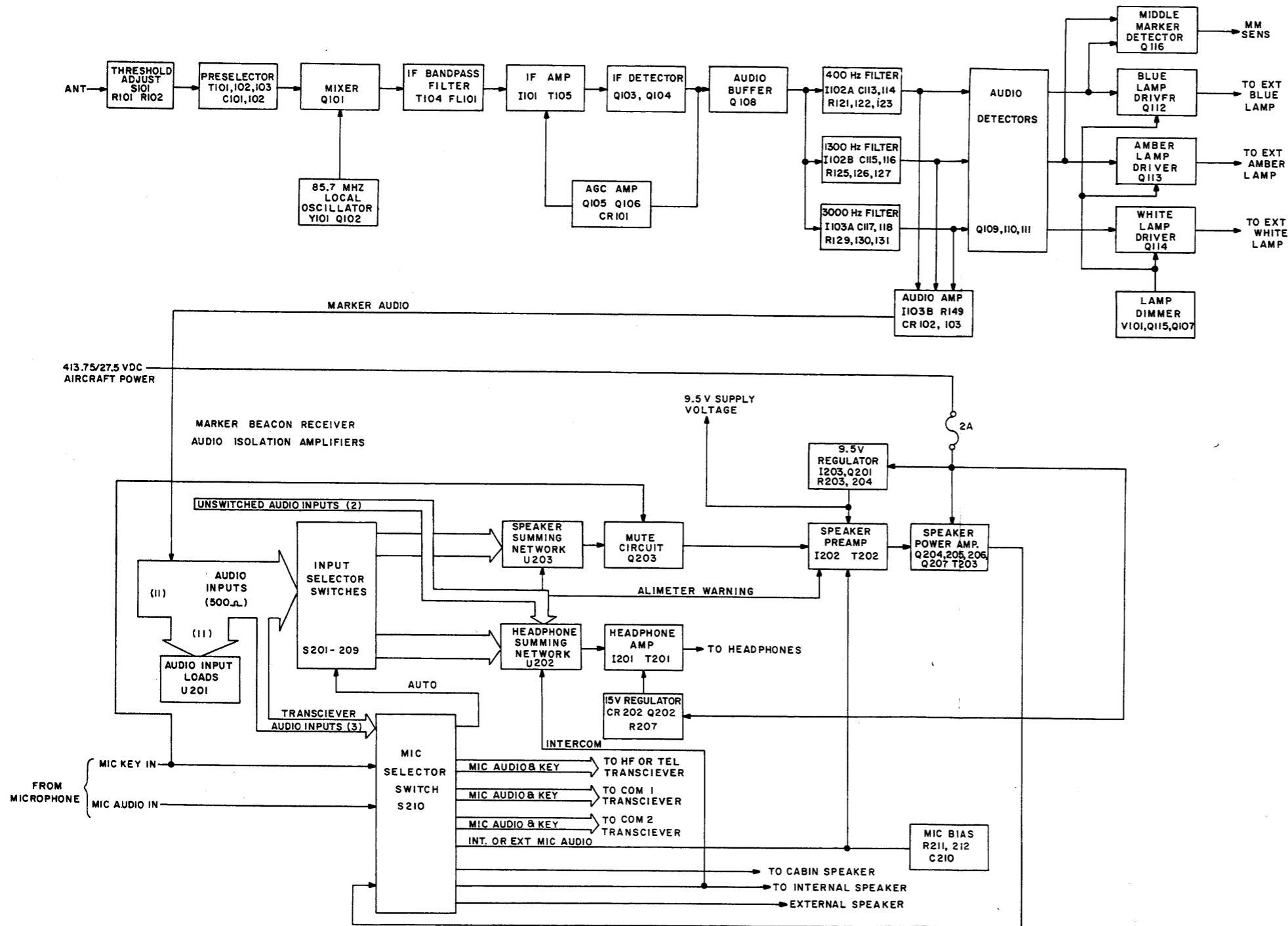


FIGURE 4-2 BLOCK DIAGRAM  
(Dwg. No. 696-0152-00)

## SECTION V MAINTENANCE

### 5.1. GENERAL INFORMATION

The maintenance section contains test and alignment procedures for an operational KMA 24. Also included in this section are overhaul and troubleshooting procedures. Before maintenance is attempted on the KMA 24 it is advisable to have a thorough understanding of the theory of operation.

### 5.2. TEST AND ALIGNMENT

#### 5.2.1. GENERAL INFORMATION

The following section (5.2.2) lists all of the test equipment required to test and align the KMA 24. If alignment does not produce the result desired then the troubleshooting procedures (section 5.4) should be used.

#### 5.2.2. TEST EQUIPMENT REQUIRED

Items A through E are required to test and align the audio isolation amplifiers and items C through I are required for marker receiver test and alignment.

In addition to the equipment listed, a KMA 24 rear connector (KPN 030-1094-58) and pins (KPN 030-1107-46) are required to connect the KMA 24 to the equipment.

FUNCTION	SUGGESTED MODEL
A. Audio Signal Generator	HP200CD
B. Audio Power Meter	Eico 261
C. AC Voltmeter	Ballantine 314A
D. Power Supply	10 to 33VDC @ 1.5A
E. Oscilloscope	Tektronix 465
F. RF Signal Generator (75MHz)	HP 608
G. 6dB Pad	
H. Frequency Counter (75MHz)	
I. DC Voltmeter	

#### 5.2.3. TEST AND ALIGNMENT PROCEDURES

- A. Unless otherwise specified, all tests are to be performed under ambient conditions.

The supply voltage shall be either 13.75 or 27.5VDC.

- B. Definitions

1. RF Input Voltage

The RF input voltage is defined to be the voltage at the signal generator with a 6dB pad connected between the signal generator and the KMA 24 (hard microvolts.) The transmission line shall be RG-58A/U.

2. Standard Test Signal

A standard test signal is a 75MHz  $\pm 0.005\%$  carrier that is amplitude modulated 95  $\pm 3\%$  successively at 400  $\pm 1\%$ , 1300Hz  $\pm 1\%$ , and 3000Hz  $\pm 1\%$ .

3. Receiver Threshold

Receiver threshold is that RF input voltage of a standard test signal that just produces a lamp on condition with the signal level increasing.

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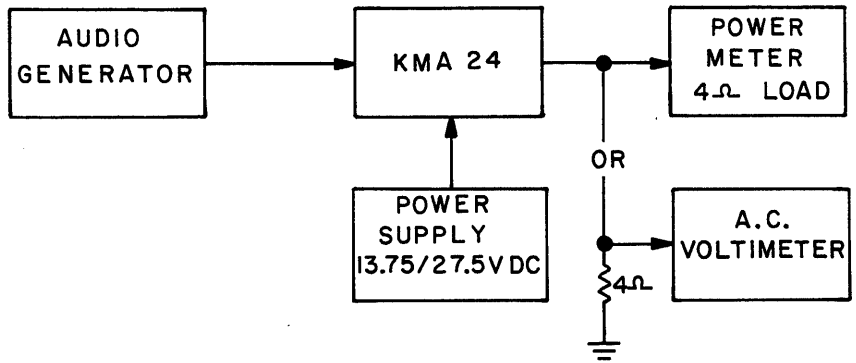


FIGURE 5-1 AUDIO AMPLIFIER TEST SETUP

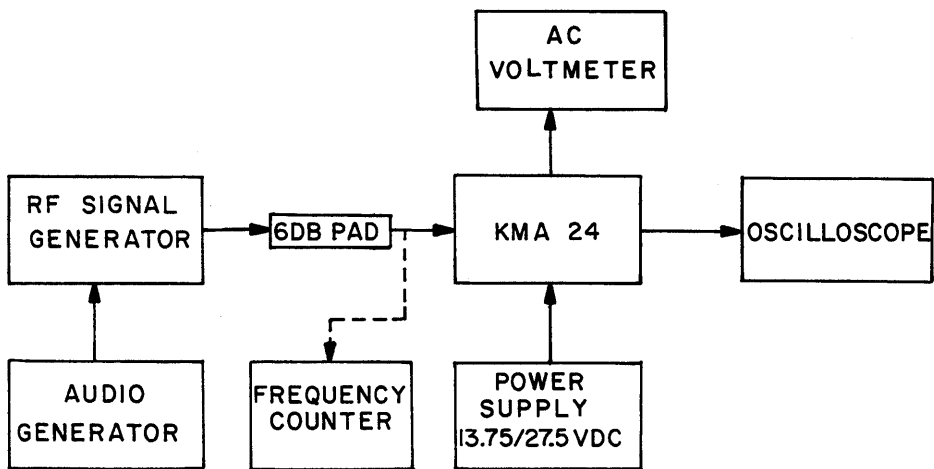


FIGURE 5-2 MARKER BEACON RECEIVER TEST SETUP

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5.2.3.1 Isolation Amplifiers Test and Alignment

Connect equipment as shown in Figure 5-1.

a. Speaker Amplifier

**NOTE**

If the cabin speaker in a particular installation is known to be a single 8 ohm speaker, then F202 should be placed in the 8 ohm position and the cabin speaker output should be terminated with an 8 ohm load for the following tests. When this is done, the same results should be obtained with the 8 ohm load that is specified for the 4 ohm load in paragraphs 3 and 4.

- (1) Terminate the cabin speaker output with a 4 ohm load.
- (2) Apply a 1VRMS, 1KHz signal at the COM 1 audio input and select COM 1 for the speaker.
- (3) With the MIC select switch in any of the three transceiver positions, the cabin speaker output should be  $1 \pm 0.25$ VRMS across the 4 ohm load. If not, adjust R213 for a 1VRMS output.
- (4) Monitor the speaker amplifier output on an oscilloscope (TP207) and check that the output is not clipped when the audio input is increased to provide rated output. (7 watts with a 13.75V supply and 12 watts with a 27.5V supply).
- (5) Check that the speaker amplifier operates with either a 13.75 or 27.5VDC supply.

b. Microphone Amplification

- (1) Terminate the external speaker output with a 8 ohm load.
- (2) Apply a 0.5VRMS, 1KHz signal at the mic audio input.
- (3) With the MIC select switch in the EXT position, the external speaker output should be  $5.5 \pm 1.0$ VRMS across the 8 ohm load. If it is not, adjust R214 for a 5.5VRMS output.

**NOTE**

This adjustment is designed to provide maximum volume without clipping from the external and internal speakers when talking loudly into the microphone. This setting can be modified to suit individual requirements. For example, if intercom is to be used, R214 should be set to provide the desired listening level on the headphones while talking normally into the microphone.

c. Headphone Amplifier

- (1) Terminate the headphone output with a 500 ohm load.
- (2) Apply a 1VRMS 1KHz signal to the COM 1 audio input and select COM 1 for the headphones.
- (3) With the MIC select switch in any position, the headphone output should be  $1 \pm 0.25$ VRMS across the 500 ohms load. If not, adjust R201 for a 1VRMS output.
- (4) Monitor the headphone output on an oscilloscope (TP205) and verify that the output is not clipped when the input signal is increased to provide the rated output of 50mW (5VRMS across 500 ohms).
- (5) Check that the headphone amplifier operates with either a 13.75 or 27.5VDC supply.



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d. Audio Mute

- (1) Terminate the cabin speaker output with a 4 ohm load.
- (2) Apply a 5VRMS, 1KHz signal at the COM 1 audio input and select COM 1 for the speaker (no other inputs selected).
- (3) With the MIC switch in any of the three transceiver positions and with the microphone keyed, the cabin speaker output should be no more than 10mV into 4 ohms (400uW).

e. Frequency Response

- (1) Terminate the cabin speaker output with a 4 ohm load.
- (2) Apply an input signal at the COM 1 audio input and select COM 1 for the speaker. Adjust the level of this input signal to provide an output of 2VRMS into a 4 ohm load at 1KHz (1 watt).
- (3) Vary the frequency of the input signal and verify that the output does not vary more than 6dB over the frequency range of 350-6000Hz. (The output voltage must not drop to less than 1VRMS into 4 ohms over this frequency range).

5.2.3.2 Marker Receiver Test and Alignment

Connect the equipment as shown in Figure 5-2.

a. Marker Receiver Test

- (1) With a standard test signal applied, the receiver threshold shall be 200uV  $\pm$ 3dB with the sensitivity switch in the HI position and 1000uV  $\pm$ 3dB with the sensitivity in the LO position. These specifications should be met with each modulation frequency. The HI sensitivity threshold is adjusted with R101 and the LO sensitivity threshold with R102.
- (2) The marker audio output at TP102 shall be 1VRMS  $\pm$ 6dB.
- (3) Lamp test should light all three marker lights.
- (4) The proper marker lamp will be on with the other two lamps off when the amplitude of a standard test signal is varied from 2000uV to 50,000uV. This specification should be met in both the HI and LO sensitivity positions and with each of the three modulation frequencies.
- (5) Middle marker sense should go high in synchronism with the middle marker line (amber lamp). It should not go high when lamp test is activated.
- (6) The marker lamps shall dim when light is blocked from striking the photo resistor V101.

b. Marker Receiver Alignment

- (1) Connect a temporary jumper between TP104 and ground.
- (2) Apply a standard test signal of sufficient strength to cause an audio signal of about 0.5V peak-to-peak at TP101 with the marker sensitivity switch in the HI position.
- (3) Adjust T101, T102 and T103 to produce maximum signal at TP101. Reduce the input signal strength as required to prevent clipping.
- (4) Adjust T104 and T105 for maximum response at TP101.
- (5) With the marker sensitivity switch in the HI position, adjust R101 for receiver threshold while applying a standard test signal of 200uV with 1300 Hz modulation. Adjust R149 for 0.5VRMS at TP102.

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- (6) Place the marker sensitivity switch in the L0 position and adjust R102 for receiver threshold while applying a standard test signal of 1,000uV with 1300 Hz modulation.
- (7) Place the marker sensitivity switch in the HI position. Remove the temporary jumper between TP104 and ground. Apply a standard signal level of 50mV. Adjust R229 for 1.0VRMS at TP102.

## 5.3 OVERHAUL

### 5.3.1 INSPECTION

This section contains instructions to assist in determining, by inspection, the condition of 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. Chassis

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

#### C. 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.

#### D. Covers and Shields

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

#### E. Potentiometers

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

#### F. Resistors, Fixed

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

#### G. Terminal Connections Soldered

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

KING  
KMA 24  
AUDIO PANEL/MARKER BEACON RECEIVER

H. 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.

I. Wiring

Inspect wiring for breaks in insulation, conductor breaks, 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 regular cleaning detergent, remove the 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 card-edged connector by rubbing contacts lightly with pencil eraser.

5.3.3 DISASSEMBLY/ASSEMBLY

Disassembly of the KMA 24 is rather simple; therefore the final assembly drawing provided in Section VI of this manual should be sufficient for disassembly/assembly instructions.

**NOTE**

Switches S201 through S209 and S101 are each treated as a single part and are supplied as such. Disassembly of the top portion of the switch from the bottom portion should not be attempted. If either the top or the bottom portion should go bad, the entire assembly should be replaced.

**5.4 TROUBLESHOOTING**

Two troubleshooting flowcharts are provided - one for the marker receiver and one concerning all audio panel functions. The only overlap is the +9.5V supply used on both. The troubleshooting procedure for this supply is contained in the audio panel troubleshooting procedures.

The flowcharts should be self-explanatory, therefore no written comments are given. The detailed theory of operation should be read before troubleshooting is attempted.

Once started, the troubleshooting procedures should be continued until the top row of boxes is completed from left to right.

KING  
KMA 24  
AUDIO PANEL/MARKER BEACON RECEIVER

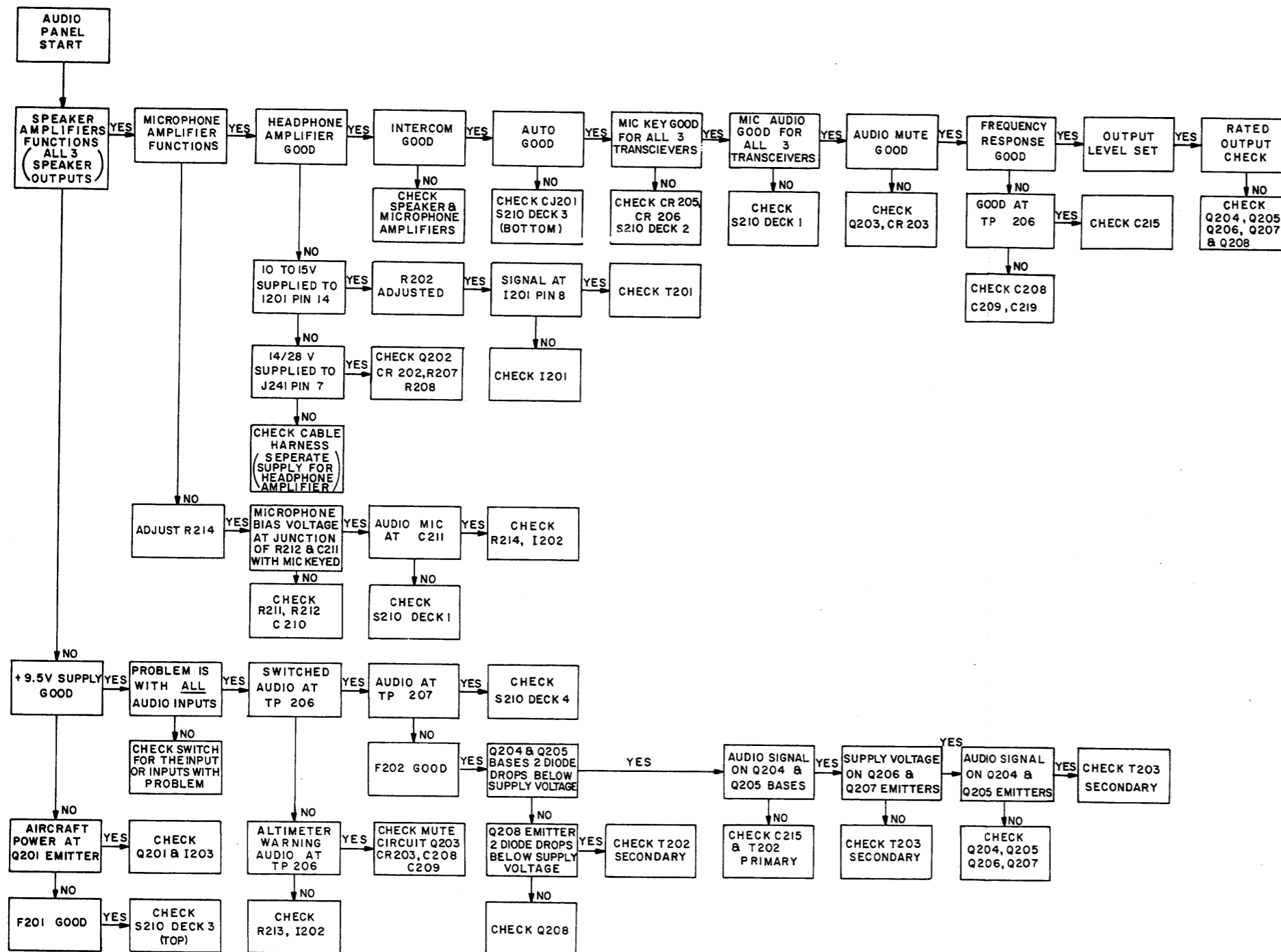


FIGURE 5-3 AUDIO PANEL TROUBLESHOOTING FLOWCHART  
(Dwg. No. 696-0155-00, R-0)

KING  
KMA 24  
AUDIO PANEL/MARKER BEACON RECEIVER

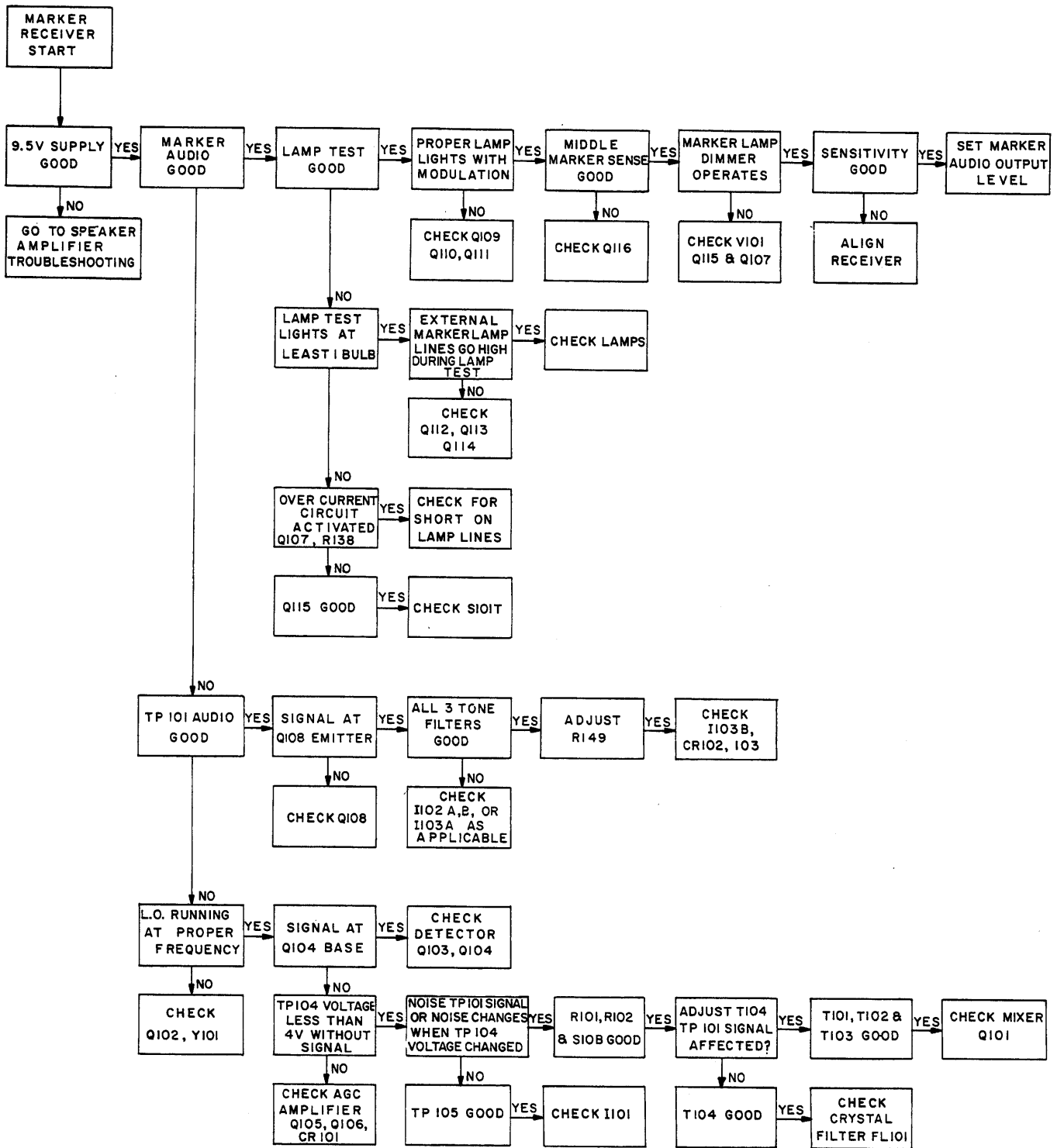
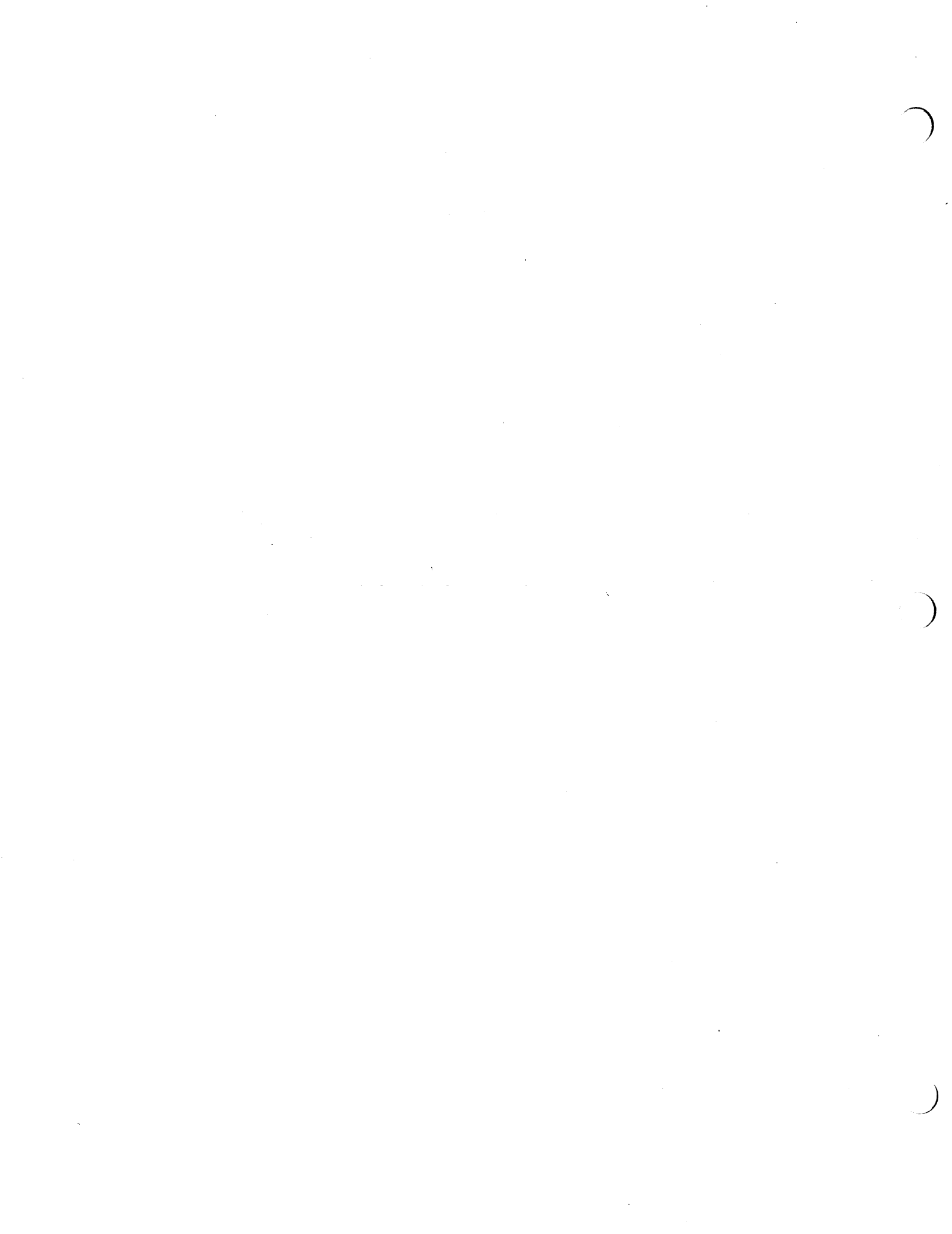


FIGURE 5-4 MARKER RECEIVER TROUBLESHOOTING FLOWCHART  
(Dwg. No. 696-D1560-00, R-0)



KING RADIO CORPORATION  
PARTS LISTING

NAME: MKR AUDIO

UNIT: KMA0024

ASSY NO: 066-1055-00/03

REV NO: 13 13 13 13  
LAST FC0:  
ECN DATE: 6/12/1 6/12/1 6/12/1 6/12/1

SYMBOL	PART NUMBER	DESCRIPTION	CODE UM	-			
				-00	-01	-02	-03
	066-1055-00	MKR AUDIO		X			
	066-1055-01	MKR AUDIO			X		
	066-1055-02	MKR AUDIO				X	
	066-1055-03	MKR AUDIO					X
	012-1127-00	TAG CVR	EA	7	7	7	7
	012-1161-00	BOTTOM CVR	EA	1	1	1	1
	012-1192-01	TAPE PRES SEN .400	AR	AR	AR	AR	AR
	016-1082-02		AR	AR	AR	AR	AR
	035-1361-1R	PROTECTIVE COVER	EA	1	1	1	1
	047-4938-01	TOP CVR	A EA	1	1	1	1
	047-4939-01	RTM CVR	A EA	1	1	1	1
	047-4940-04	MTG RACK	A EA	1	1	1	1
	047-5508-02	CHASSIS W/HDW	A EA	1	1	1	1
	057-2234-00	S/N TAG	EA	1	1	1	1
	057-2274-00	LENS DECAL	EA	1	-	-	-
	057-2274-01	LENS DECAL	EA	-	1	-	-
	057-2274-02	LENS DECAL	EA	-	-	1	-
	057-2274-03	LENS DECAL	EA	-	-	-	1
	073-0412-02	FRONT PANEL	A EA	1	1	1	1
	076-1069-00	HOLD DOWN SCR	EA	1	1	1	1
	088-0655-00	LENS	EA	1	1	1	1
	088-0884-01	PSHRTN HORIZ	EA	2	2	2	2
	088-0885-01	PSHRTN VRT	EA	18	18	18	18
	088-0887-51	LENS W/TRANSFER	A EA	1	1	1	1
	088-0918-03	KN08 W/H	A EA	1	1	1	1
	089-2140-00	NUT HEX FSNA 4-40	EA	2	2	2	2
	089-5569-03	SCR THP 2-56X3/16	EA	9	9	9	9
	089-5573-03	SCR THP 4-40X3/16	EA	4	4	4	4
	089-5573-05	SCR THP 4-40X5/16	EA	2	2	2	2
	089-6368-03	SCR FHP 4-40X3/16	EA	4	4	4	4
	089-8036-30	WSHR	EA	1	1	1	1
	090-0176-04	RING RTNR .125	EA	1	1	1	1

KING RADIO CORPORATION

PARTS LISTING

NAME: MKR AUDIO

UNIT: KMA0024

ASSY NO: 066-1055-00/03

REV NO: 13 13 13 13

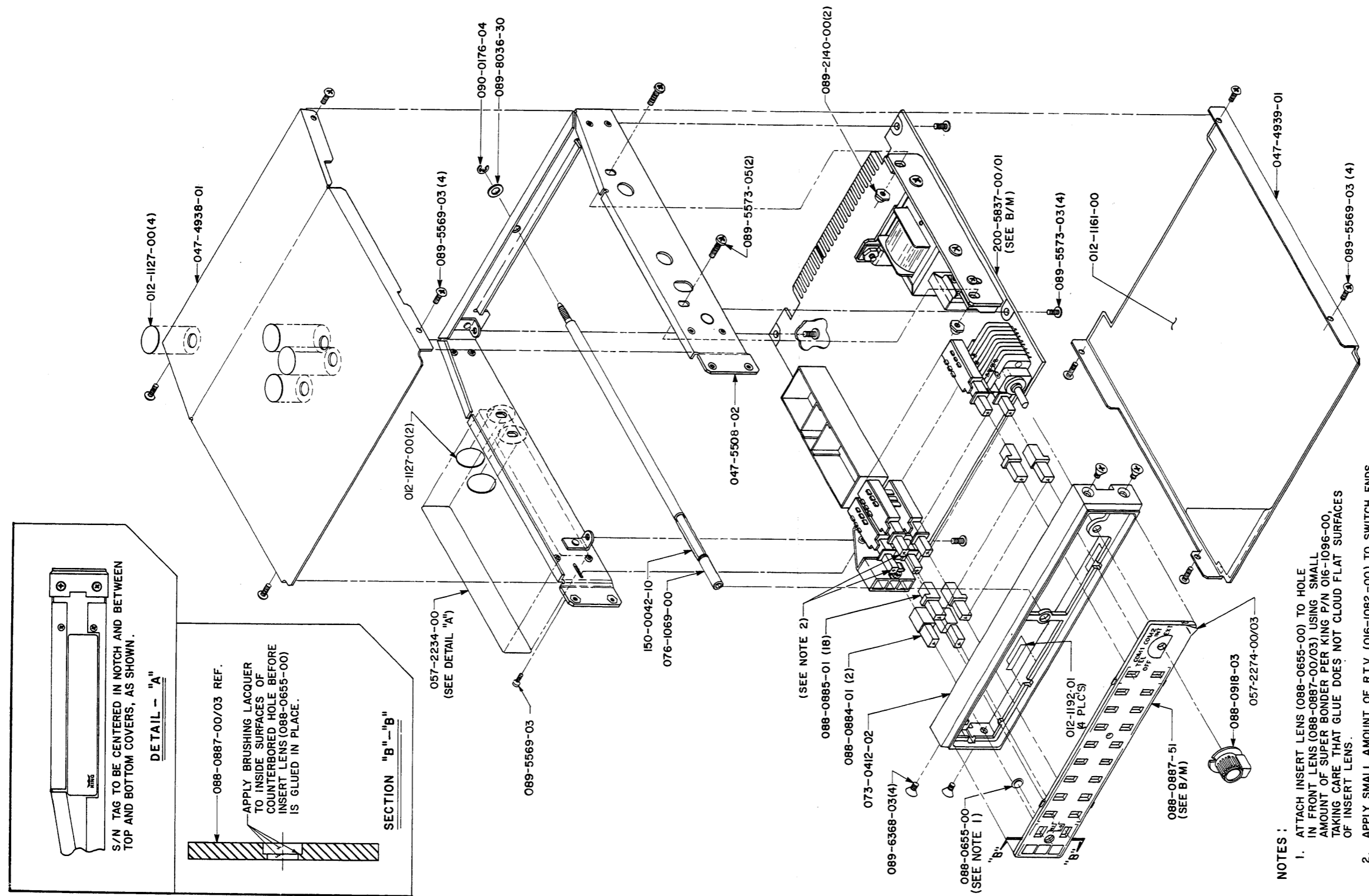
LAST ECO:

ECO DATE: 6/12/1 6/12/1 6/12/1 6/12/1

SYMBOL	PART NUMBER	DESCRIPTION	CODE	UM	-00	-01	-02	-03
					6/12/1	6/12/1	6/12/1	6/12/1
	150-0042-10	TUBING SHNK .187		FT	.1	.1	.1	.1
	200-5837-00	BOARD ASSY	A	EA	1	1	-	-
	200-5837-01	BOARD ASSY	A	EA	-	-	1	1



KING  
KMA 24  
AUDIO PANEL/MARKER BEACON RECEIVER



NOTES :

1. ATTACH INSERT LENS (088-0655-00) TO HOLE IN FRONT LENS (088-0887-00/03) USING SMALL AMOUNT OF SUPER BONDER PER KING P/N 016-1096-00, TAKING CARE THAT GLUE DOES NOT CLOUD FLAT SURFACES OF INSERT LENS.
2. APPLY SMALL AMOUNT OF R.T.V. (016-1082-00) TO SWITCH ENDS BEFORE INSTALLING PUSH BUTTONS.

FIGURE 6-1 FINAL ASSEMBLY  
(Dwg. No. 300-2487-00, R-4)

KING RADIO CORPORATION  
PARTS LISTING

NAME: BOARD ASSY

UNIT: KMA0024

ASSY NO: 200-5837-00/01

REV NO: 20

20

20

ECD DATE: 11/01/1 11/01/1

SYMBOL	PART NUMBER	DESCRIPTION	CODE	UM	ECD DATE	
					11/01/1	11/01/1
					-00	-01
	200-5837-00	BOARD ASSY			X	
	200-5837-01	BOARD ASSY				X
	008-0038-01	TERM RIFUR .084L		EA	3	3
	009-5837-10	PC RD MKR RCVR		EA	1	1
	012-1174-00	INSUL		EA	1	1
	012-1192-00	TAPE PRES SEN .125		AR	AR	AR
	025-0003-02	WIRE 22G RED		AR	AR	AR
	025-0018-44	WIRE 26G YEL		AR	AR	AR
	025-0018-66	WIRE 26G BLU		AR	AR	AR
	025-0018-99	WIRE 26G WHT		AR	AR	AR
	026-0001-00	WIRE COP TIN 26G		AR	AR	AR
	026-0011-00	CA COAX 316U		AR	AR	AR
	047-2601-00	COVER GRND ENGR		EA	1	1
	047-4935-01	DBLR PLT	A	EA	1	1
	047-4937-01	FENCE	A	EA	1	1
	047-5401-02	LAMP HSG BRKT	A	EA	1	1
	088-0886-00	LAMP HSG		EA	1	1
	089-2188-22	NUT HEX FSNA 4-40		EA	2	2
	089-2191-22	NUT HEX ESNA 6-32		EA	2	2
	089-5573-05	SCR THP 4-40X5/16		EA	1	1
	089-5903-05	SCR PHP 4-40X5/16		EA	1	1
	089-5907-05	SCR PHP 6-32X5/16		EA	2	2
	090-0296-00	FUSE CLIP		EA	2	2
	091-0156-00	WSHR STEP NYL		EA	1	1
	091-0286-02	INSUL XSTR .687		EA	1	1
	150-0005-10	TURING TFLN 20AWG		AR	AR	AR
	150-0006-10	TURING TFLN 18AWG		AR	AR	AR
	150-0101-00	SLDR SLEEVE		EA	3	3

KING RADIO CORPORATION

PARTS LISTING

NAME: BOARD ASSY

UNIT: KMA0024

ASSY NO: 200-5837-00/01

REV NO: 20

20

ECD DATE: 11/01/1 11/01/1

SYMBOL	PART NUMBER	DESCRIPTION	CODE	UM	-	
					-00	-01
C101	106-0001-17	CAP FC .51PF10%500	EA		1	1
C102	106-0001-17	CAP FC .51PF10%500	EA		1	1
C103	999-9999-98	NOT USED	EA		-	-
C104	114-7502-00	CAP DC 5KPF 100V	EA		1	1
C105	114-7104-00	CAP DC .1UF 16V	EA		1	1
C106	113-5101-01	CAP DC 100PF 500V	EA		1	1
C107	113-3270-00	CAP DC 27PF 500V	EA		1	1
C108	113-3180-00	CAP DC 18PF 500V	EA		1	1
C109	114-5222-01	CAP DC 2200PF 500V	EA		1	1
C110	113-5102-00	CAP DC .001UF 500V	EA		1	1
C111	097-0068-11	CAP AL 4.7UF 25V	EA		1	1
C112	097-0068-00	CAP AL 10UF 16V	EA		1	1
C113	108-5028-06	CAP PC .015UF3%50V	EA		1	1
C114	108-5028-06	CAP PC .015UF3%50V	EA		1	1
C115	108-5028-05	CAP PC.0047UF3%50V	EA		1	1
C116	108-5028-05	CAP PC.0047UF3%50V	EA		1	1
C117	108-5028-04	CAP PC .0027UF3%50	EA		1	1
C118	108-5028-04	CAP PC .0027UF3%50	EA		1	1
C119	097-0068-10	CAP AL 1UF 25V	EA		1	1
C120	097-0068-10	CAP AL 1UF 25V	EA		1	1
C121	097-0068-10	CAP AL 1UF 25V	EA		1	1
C122	097-0068-00	CAP AL 10UF 16V	EA		1	1
C123	097-0068-00	CAP AL 10UF 16V	EA		1	1
C124	109-0007-03	CAP DC .05UF 25V	EA		1	1
C125	114-5222-01	CAP DC 2200PF 500V	EA		1	1
C126	097-0068-10	CAP AL 1UF 25V	EA		1	1
C127	097-0068-10	CAP AL 1UF 25V	EA		1	1
C128	097-0068-10	CAP AL 1UF 25V	EA		1	1
C129	097-0068-00	CAP AL 10UF 16V	EA		1	1
C130	097-0068-00	CAP AL 10UF 16V	EA		1	1
C131	113-3100-00	CAP DC 10PF 500V	EA		1	1
C132	109-0007-03	CAP DC .05UF 25V	EA		1	1
C133	097-0068-10	CAP AL 1UF 25V	EA		1	1
C134	111-0001-05	CAP CR .0068UF 50V	EA		1	1
C201	109-0007-05	CAP DC .1UF 25V	EA		1	1
C202	097-0068-11	CAP AL 4.7UF 25V	EA		1	1
C203	097-0068-00	CAP AL 10UF 16V	EA		1	1
C204	109-0007-03	CAP DC .05UF 25V	EA		1	1
C205	097-0068-21	CAP AL 33UF 25V	EA		1	1
C206	114-6472-00	CAP DC 4700PF 500V	EA		1	1
C208	114-7104-00	CAP DC .1UF 16V	EA		1	1
C209	114-7104-00	CAP DC .1UF 16V	EA		1	1
C210	097-0068-24	CAP AL 100UF 16V	EA		1	1
C211	111-0001-00	CAP CR .01UF 50V	EA		1	1
C212	096-1082-10	CAP TN 10UF 35V	EA		1	1
C213	097-0068-00	CAP AL 10UF 16V	EA		1	1
C214	109-0007-03	CAP DC .05UF 25V	EA		1	1
C215	097-0068-11	CAP AL 4.7UF 25V	EA		1	1
C216	109-0007-05	CAP DC .1UF 25V	EA		1	1
C217	109-0007-00	CAP DC .01UF 25V	EA		1	1

KING RADIO CORPORATION

PARTS LISTING

NAME: BOARD ASSY

UNIT: KMA0024

ASSY NO: 200-5837-00/01

REV NO: 20

20

ECD DATE: 11/01/1 11/01/1

SYMBOL	PART NUMBER	DESCRIPTION	CODE UM	-	
				-00	-01
C218	114-7104-00	CAP DC .1UF 16V	EA	1	1
C219	114-7502-00	CAP DC 5KPF 100V	EA	1	1
C220	113-5102-00	CAP DC .001UF 500V	EA	1	1
C221	113-5102-00	CAP DC .001UF 500V	EA	1	1
C222	097-0057-29	CAP AL 150UF 63V	EA	1	1
C223	109-0007-05	CAP DC .1UF 25V	EA	1	1
C224	113-7203-00	CAP DC .02UF 12V	EA	1	1
C225	097-0068-00	CAP AL 10UF 16V	EA	1	1
C226	114-5222-01	CAP DC 2200PF 500V	EA	1	1
CJ101	026-0018-01	WIRE CKTJMPR 24AWG	EA	1	1
CJ201	026-0018-00	WIRE CKTJMPR 22AWG	EA	1	1
CR101	007-6016-00	DIO S 1N4154	EA	1	1
CR102	007-6016-00	DIO S 1N4154	EA	1	1
CR103	007-6016-00	DIO S 1N4154	EA	1	1
CR201	007-6016-00	DIO S 1N4154	EA	1	1
CR202	007-5011-17	DIO Z 11V 1W 5%	EA	1	1
CR203	007-6046-05	DIO S 1N916A	EA	1	1
CR205	007-6025-00	DIO S 1N4003	EA	1	1
CR206	007-5011-25	DIO Z 36V 1W 5%	EA	1	1
DS101	037-0028-05	LMP 634 T1-1/4 6V	EA	1	1
DS102	037-0028-04	LMP 2114 T1-1/4 6V	EA	1	1
DS103	037-0028-04	LMP 2114 T1-1/4 6V	EA	1	1
DS201	037-0013-00	LMP 7219 T1 12V	EA	1	1
DS202	037-0013-00	LMP 7219 T1 12V	EA	1	1
DS203	037-0013-00	LMP 7219 T1 12V	EA	1	1
DS204	037-0013-00	LMP 7219 T1 12V	EA	1	1
DS205	037-0013-00	LMP 7219 T1 12V	EA	1	1
DS206	037-0013-00	LMP 7219 T1 12V	EA	1	1
F201	036-0058-03	FUSE AGA 32V 3A	EA	1	1
F202	036-0057-10	FUSE 275 125V 5A	EA	1	1
FL101	017-0075-00	FLTR 10.7MHZ 4P	EA	1	1
I101	120-3020-00	IC MC1350P	EA	1	1
I102	120-3022-00	IC LM1458NR833B	EA	1	1
I103	120-3022-00	IC LM1458NR833B	EA	1	1
I201	120-3129-02	IC LM386N-3	EA	1	1
I202	120-3129-02	IC LM386N-3	EA	1	1
I203	120-3023-00	IC UA723C883B	EA	1	1
L101	019-2084-06	CH .27UH 5%	EA	1	1

KING RADIO CORPORATION

PARTS LISTING

NAME: BOARD ASSY

UNIT: KMA0024

ASSY NO: 200-5837-00/01

REV NO: 20

20

ECD DATE: 11/01/1 11/01/1

SYMBOL	PART NUMBER	DESCRIPTION	CODE UM	ECD DATE	
				-00	-01
L102	019-2084-54	CH 27UH 5%	EA	1	1
L103	019-2084-05	CH .22UH 10%	EA	1	1
L201	013-0006-03	FERR BEAD	EA	1	1
L202	013-0006-03	FERR BEAD	EA	1	1
L203	013-0006-03	FERR BEAD	EA	1	1
L204	013-0006-03	FERR BEAD	EA	1	1
L205	013-0006-03	FERR BEAD	EA	1	1
L206	013-0006-03	FERR BEAD	EA	1	1
L207	013-0006-03	FERR BEAD	EA	1	1
L208	013-0006-03	FERR BEAD	EA	1	1
L209	013-0006-03	FERR BEAD	EA	1	1
L210	013-0006-03	FERR BEAD	EA	1	1
L211	013-0006-03	FERR BEAD	EA	1	1
L212	013-0006-03	FERR BEAD	EA	1	1
L213	013-0006-03	FERR BEAD	EA	1	1
L214	013-0006-03	FERR BEAD	EA	1	1
L215	013-0006-03	FERR BEAD	EA	1	1
L216	013-0006-03	FERR BEAD	EA	1	1
L217	013-0006-03	FERR BEAD	EA	1	1
L218	013-0006-03	FERR BEAD	EA	1	1
L219	013-0006-03	FERR BEAD	EA	1	1
L220	013-0006-03	FERR BEAD	EA	1	1
L221	013-0006-03	FERR BEAD	EA	1	1
L222	013-0006-03	FERR BEAD	EA	1	1
L223	013-0006-03	FERR BEAD	EA	1	1
L224	013-0006-03	FERR BEAD	EA	1	1
L225	013-0006-03	FERR BEAD	EA	1	1
L226	013-0006-03	FERR BEAD	EA	1	1
L227	013-0006-03	FERR BEAD	EA	1	1
L228	013-0006-03	FERR BEAD	EA	1	1
L229	013-0006-03	FERR BEAD	EA	1	1
L230	013-0006-03	FERR BEAD	EA	1	1
L231	013-0006-03	FERR BEAD	EA	1	1
L232	013-0006-03	FERR BEAD	EA	1	1
Q101	007-0452-00	XSTR 3N212	EA	1	1
Q102	007-0195-00	XSTR S MP5H10	EA	1	1
Q103	007-0238-00	XSTR S PNP FPN4917	EA	1	1
Q104	007-0238-00	XSTR S PNP FPN4917	EA	1	1
Q105	007-0078-00	XSTR S NPN 2N3415	EA	1	1
Q106	007-0078-00	XSTR S NPN 2N3415	EA	1	1
Q107	007-0078-00	XSTR S NPN 2N3415	EA	1	1
Q108	007-0078-00	XSTR S NPN 2N3415	EA	1	1
Q109	007-0078-01	XSTR S NPN 2N3417	EA	1	1
Q110	007-0078-01	XSTR S NPN 2N3417	EA	1	1
Q111	007-0078-01	XSTR S NPN 2N3417	EA	1	1
Q112	007-0245-00	XSTR S PNP MPSU95	EA	1	1
Q113	007-0245-00	XSTR S PNP MPSU95	EA	1	1
Q114	007-0245-00	XSTR S PNP MPSU95	EA	1	1

KING RADIO CORPORATION  
 PARTS LISTING  
 UNIT: KMA0024  
 REV NO: 20

NAME: BOARD ASSY

ASSY NO: 200-5837-00/01  
 20

ECO DATE: 11/01/1 11/01/1

SYMBOL	PART NUMBER	DESCRIPTION	CODE	UM	-	
					-00	-01
Q115	007-0208-01	XSTR NPN MJE800	EA		1	1
Q116	007-0078-00	XSTR S NPN 2N3415	EA		1	1
Q201	007-0292-00	XSTR S PNP 2N6109	EA		1	1
Q202	007-0244-00	XSTR S MPSU05-3	EA		1	1
Q203	007-0267-01	XSTR FET J113	EA		1	1
Q204	007-0161-00	XSTR S PNP MPSA56	EA		1	1
Q205	007-0161-00	XSTR S PNP MPSA56	EA		1	1
Q206	007-0335-02	XSTR S PNP TIP42B	EA		1	1
Q207	007-0335-02	XSTR S PNP TIP42B	EA		1	1
Q208	007-0333-00	XSTR S NPN HS5305	EA		1	1
R101	133-0110-17	RES VA 100 1W 20%	EA		1	1
R102	133-0110-17	RES VA 100 1W 20%	EA		1	1
R103	130-0101-13	RES FC 100 TW 5%	EA		1	1
R104	999-9999-98	NOT USED	EA		-	-
R105	999-9999-98	NOT USED	EA		-	-
R106	130-0273-13	RES FC 27K TW 5%	EA		1	1
R107	130-0331-13	RES FC 330 TW 5%	EA		1	1
R108	130-0153-13	RES FC 15K TW 5%	EA		1	1
R109	130-0471-23	RES FC 470 QW 5%	EA		1	1
R110	130-0473-13	RES FC 47K TW 5%	EA		1	1
R111	130-0101-13	RES FC 100 TW 5%	EA		1	1
R112	130-0472-13	RES FC 4.7K TW 5%	EA		1	1
R113	130-0103-13	RES FC 10K TW 5%	EA		1	1
R114	130-0511-13	RES FC 510 TW 5%	EA		1	1
R115	130-0123-13	RES FC 12K TW 5%	EA		1	1
R116	130-0473-13	RES FC 47K TW 5%	EA		1	1
R117	130-0512-13	RES FC 5.1K EW 5%	EA		1	1
R118	130-0123-13	RES FC 12K TW 5%	EA		1	1
R119	130-0561-13	RES FC 560 TW 5%	EA		1	1
R120	130-0561-13	RES FC 560 TW 5%	EA		1	1
R121	131-0273-13	RES CF 27K EW 5%	EA		1	1
R122	136-2871-72	RES PF 2.87K EW 1%	EA		1	1
R123	136-2673-72	RES PF 267K EW 1%	EA		1	1
R124	131-0274-13	RES CF 270K EW 5%	EA		1	1
R125	131-0273-13	RES CF 27K EW 5%	EA		1	1
R126	136-2871-72	RES PF 2.87K EW 1%	EA		1	1
R127	136-2613-72	RES PF 261K EW 1%	EA		1	1
R128	131-0274-13	RES CF 270K EW 5%	EA		1	1
R129	131-0203-13	RES CF 20K EW 5%	EA		1	1
R130	136-2051-72	RES PF 2.05K EW 1%	EA		1	1
R131	136-2003-72	RES PF 200K EW 1%	EA		1	1
R132	131-0204-13	RES CF 200K EW 5%	EA		1	1
R133	130-0333-13	RES FC 33K TW 5%	EA		1	1
R134	130-0333-13	RES FC 33K TW 5%	EA		1	1
R135	130-0333-13	RES FC 33K TW 5%	EA		1	1
R136	130-0113-13	RES FC 11K TW 5%	EA		1	1
R137	130-0514-13	RES FC 510K TW 5%	EA		1	1
R138	130-0010-33	RES FC 1 HW 5%	EA		1	1

KING RADIO CORPORATION

PARTS LISTING

NAME: BOARD ASSY

UNIT: KMA0024

ASSY NO: 200-5837-00/01

REV NO: 20

20

ECD DATE: 11/01/1 11/01/1

SYMBOL	PART NUMBER	DESCRIPTION	CODE	UM	-	
					-00	-01
R139	130-0103-13	RES FC 10K TW 5%	EA		1	1
R140	130-0103-13	RES FC 10K TW 5%	EA		1	1
R141	130-0103-13	RES FC 10K TW 5%	EA		1	1
R142	130-0472-13	RES FC 4.7K TW 5%	EA		1	1
R143	130-0753-13	RES FC 75K TW 5%	EA		1	1
R144	130-0753-13	RES FC 75K TW 5%	EA		1	1
R145	130-0753-13	RES FC 75K TW 5%	EA		1	1
R146	130-0103-23	RES FC 10K QW 5%	EA		1	1
R147	130-0133-23	RES FC 13K QW 5%	EA		1	1
R149	133-0113-24	RES VA 100K 20% A	EA		1	1
R150	130-0302-13	RES FC 3K TW 5%	EA		1	1
R151	130-0302-13	RES FC 3K TW 5%	EA		1	1
R152	130-0302-13	RES FC 3K TW 5%	EA		1	1
R153	130-0103-13	RES FC 10K TW 5%	EA		1	1
R154	130-0103-13	RES FC 10K TW 5%	EA		1	1
R155	130-0103-13	RES FC 10K TW 5%	EA		1	1
R156	130-0101-13	RES FC 100 TW 5%	EA		1	1
R157	130-0473-13	RES FC 47K TW 5%	EA		1	1
R158	130-0103-13	RES FC 10K TW 5%	EA		1	1
R159	130-0623-13	RES FC 62K TW 5%	EA		1	1
R160	130-0101-13	RES FC 100 TW 5%	EA		1	1
R161	130-0104-13	RES FC 100K TW 5%	EA		1	1
R162	130-0472-13	RES FC 4.7K TW 5%	EA		1	1
R163	130-0152-13	RES FC 1.5K TW 5%	EA		1	1
R201	133-0113-16	RES VA 5K 20% A	EA		1	1
R202	130-0100-23	RES FC 10 QW 5%	EA		1	1
R203	136-2371-72	RES PF 2.37K EW 1%	EA		1	1
R204	136-7151-72	RES PF 7.15K EW 1%	EA		1	1
R205	130-0471-13	RES FC 470 TW 5%	EA		1	1
R206	130-0560-13	RES FC 56 TW 5%	EA		1	1
R207	130-0182-35	RES FC 1.8K HW 10%	EA		1	1
R208	130-0100-23	RES FC 10 QW 5%	EA		1	1
R209	130-0103-13	RES FC 10K TW 5%	EA		1	1
R210	130-0104-13	RES FC 100K TW 5%	EA		1	1
R211	130-0101-13	RES FC 100 TW 5%	EA		1	1
R212	130-0391-23	RES FC 390 QW 5%	EA		1	1
R213	133-0113-16	RES VA 5K 20% A	EA		1	1
R214	133-0113-16	RES VA 5K 20% A	EA		1	1
R215	130-0100-23	RES FC 10 QW 5%	EA		1	1
R216	130-0513-13	RES FC 51K TW 5%	EA		1	1
R217	130-0473-13	RES FC 47K TW 5%	EA		1	1
R218	999-9999-98	NOT USED	EA		-	-
R219	130-0103-13	RES FC 10K TW 5%	EA		1	1
R220	130-0224-13	RES FC 220K TW 5%	EA		1	1
R221	130-0153-13	RES FC 15K TW 5%	EA		1	1
R222	130-0153-13	RES FC 15K TW 5%	EA		1	1
R223	130-0301-13	RES FC 300 TW 5%	EA		1	1
R225	130-0333-13	RES FC 33K TW 5%	EA		1	1
R226	132-0107-33	RES WW 16 3.25W 5%	EA		1	1
R227	132-0107-33	RES WW 16 3.25W 5%	EA		1	1

KING RADIO CORPORATION

PARTS LISTING

NAME: BOARD ASSY

UNIT: KMA0024

ASSY NO: 200-5837-00/01

REV NO: 20

20

ECD DATE: 11/01/1 11/01/1

SYMBOL	PART NUMBER	DESCRIPTION	CODE	UM	ECD DATE	
					11/01/1 -00	11/01/1 -01
R228	132-0107-33	RES WW 16 3.25W 5%	EA		1	1
R229	133-0113-19	RES VA 10K 20% B	EA		1	1
S101	031-0385-01	SWITCH PAIR	A	EA	1	1
S201	031-0385-00	SWITCH PAIR	A	EA	1	1
S202	031-0385-00	SWITCH PAIR	A	EA	1	1
S203	031-0385-00	SWITCH PAIR	A	EA	1	1
S204	031-0385-00	SWITCH PAIR	A	EA	1	1
S205	031-0385-00	SWITCH PAIR	A	EA	1	1
S206	031-0385-00	SWITCH PAIR	A	EA	1	1
S207	031-0385-00	SWITCH PAIR	A	EA	1	1
S208	031-0385-00	SWITCH PAIR	A	EA	1	1
S209	031-0385-00	SWITCH PAIR	A	EA	1	1
S210	031-0393-00	ROTARY SW		EA	1	1
T101	019-3047-00	XFMR 75MHZ BLU		EA	1	1
T102	019-3047-00	XFMR 75MHZ BLU		EA	1	1
T103	019-3047-01	XFMR 75MHZ YEL		EA	1	1
T104	019-8076-00	XFMR IF		EA	1	1
T105	019-8076-00	XFMR IF		EA	1	1
T201	019-5078-00	XFMR OUT 500		EA	1	1
T202	019-5093-00	XFMR SPKR AMP IN		EA	1	1
T203	019-5092-00	XFMR AUD OUT		EA	1	1
TP101	008-0096-01	TERMINAL TEST PNT		EA	1	1
TP102	008-0096-01	TERMINAL TEST PNT		EA	1	1
TP103	008-0096-01	TERMINAL TEST PNT		EA	1	1
TP104	008-0096-01	TERMINAL TEST PNT		EA	1	1
TP205	008-0096-01	TERMINAL TEST PNT		EA	1	1
TP206	008-0096-01	TERMINAL TEST PNT		EA	1	1
TP207	008-0096-01	TERMINAL TEST PNT		EA	1	1
U201	015-0050-00	RES MOD		EA	1	1
U202	015-0059-00	RES MOD		EA	1	1
U203	015-0059-00	RES MOD		EA	1	1
U204	015-0049-00	*NTWK CAP 220PF 20%		EA	1	1
U205	015-0049-00	*NTWK CAP 220PF 20%		EA	1	1
V101	134-5005-04	PHOTODETECTOR		EA	1	1
Y101	044-0045-00	XTAL 85.700MHZ		EA	1	1





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KMA 24  
AUDIO PANEL/MARKER BEACON RECEIVER

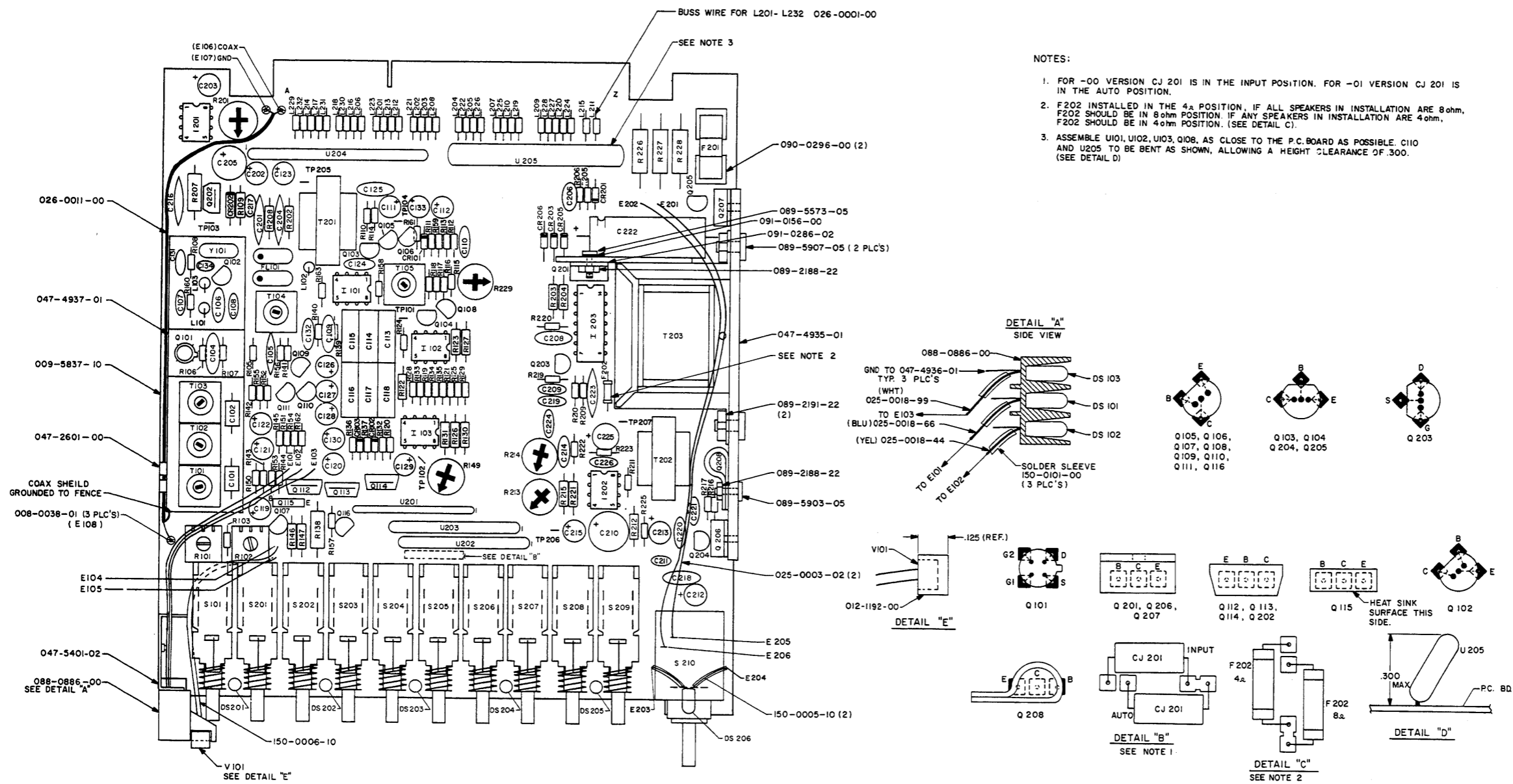


FIGURE 6-2 P.C. BOARD ASSEMBLY  
(Dwg. No. 300-5837-00, R-15)



KING  
KMA 24  
AUDIO PANEL/MARKER BEACON RECEIVER

MKR RCVR SCH

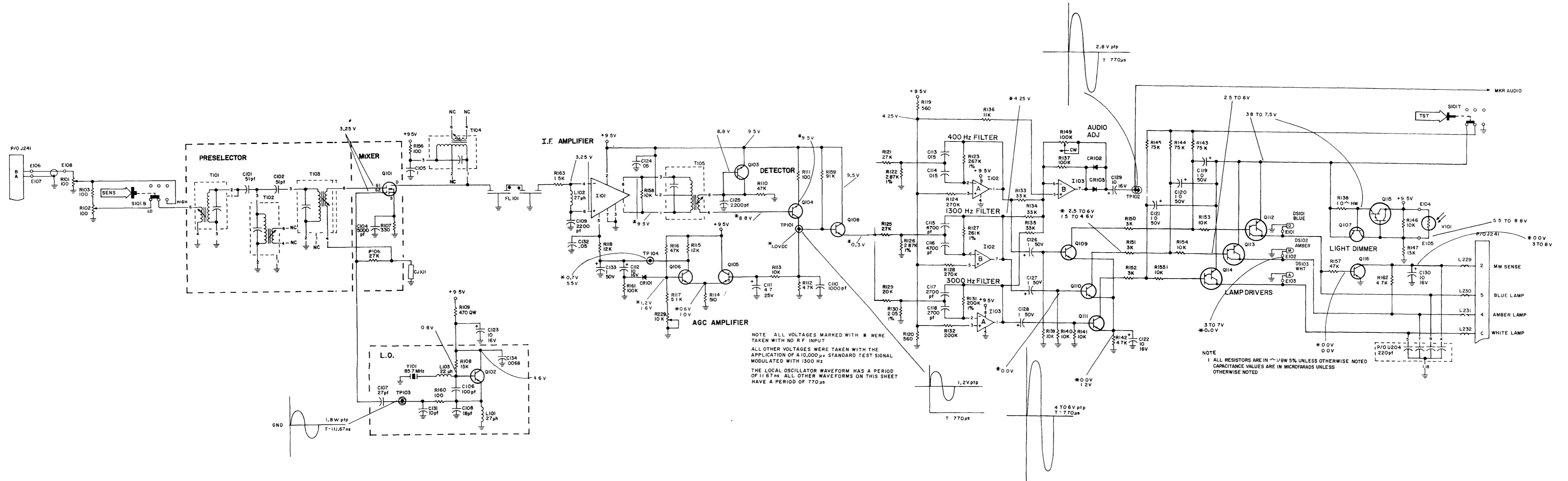
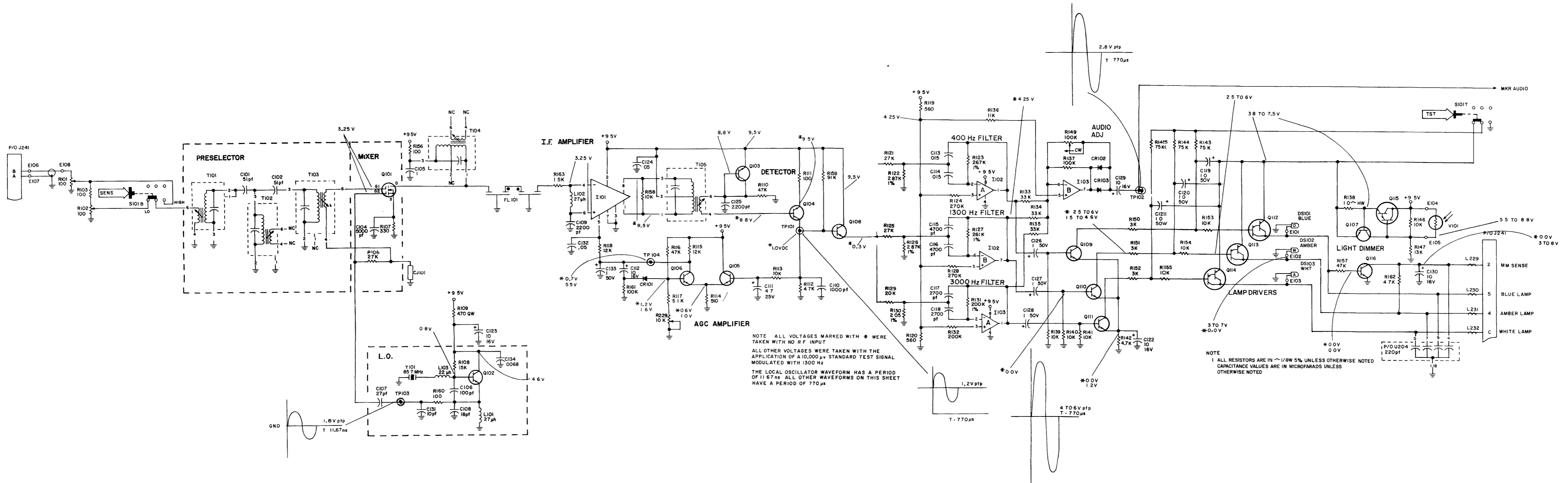


FIGURE 6-3 MARKER RECEIVER  
(Dwg. No. 002-5837-00, R-9)  
(Sheet 1 of 2)

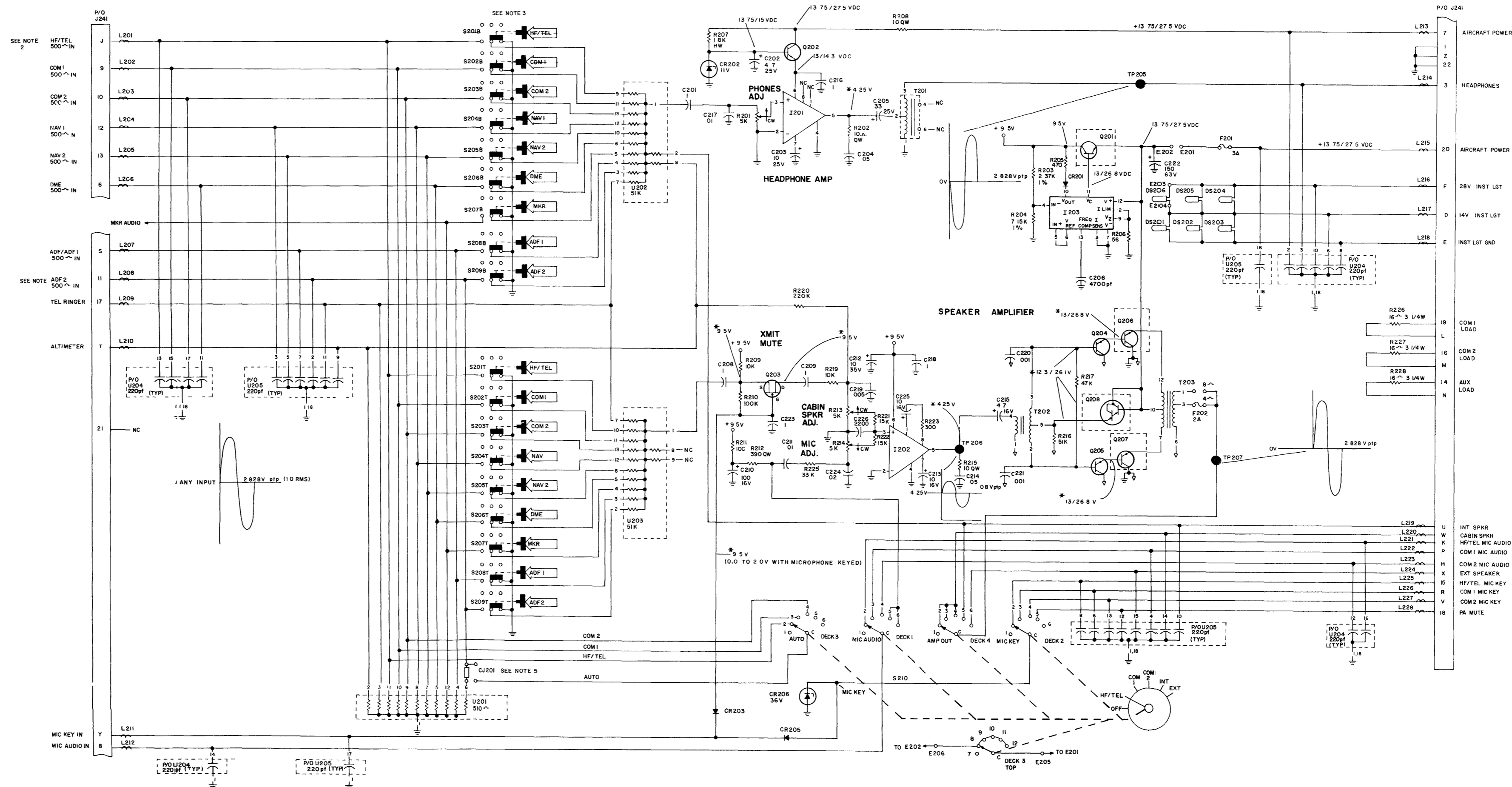
KING  
KMA 24  
AUDIO PANEL/MARKER BEACON RECEIVER



NOTE ALL VOLTAGES MARKED WITH \* WERE TAKEN WITH NO RF INPUT  
ALL OTHER VOLTAGES WERE TAKEN WITH THE APPLICATION OF A 10,000 µV STANDARD TEST SIGNAL MODULATED WITH 1300 Hz  
THE LOCAL OSCILLATOR WAVEFORM HAS A PERIOD OF 11.67 ns ALL OTHER WAVEFORMS ON THIS SHEET HAVE A PERIOD OF 770 µs

NOTE 1 ALL RESISTORS ARE IN Ω/ΩW 5% UNLESS OTHERWISE NOTED  
CAPACITANCE VALUES ARE IN MICROFARADS UNLESS OTHERWISE NOTED

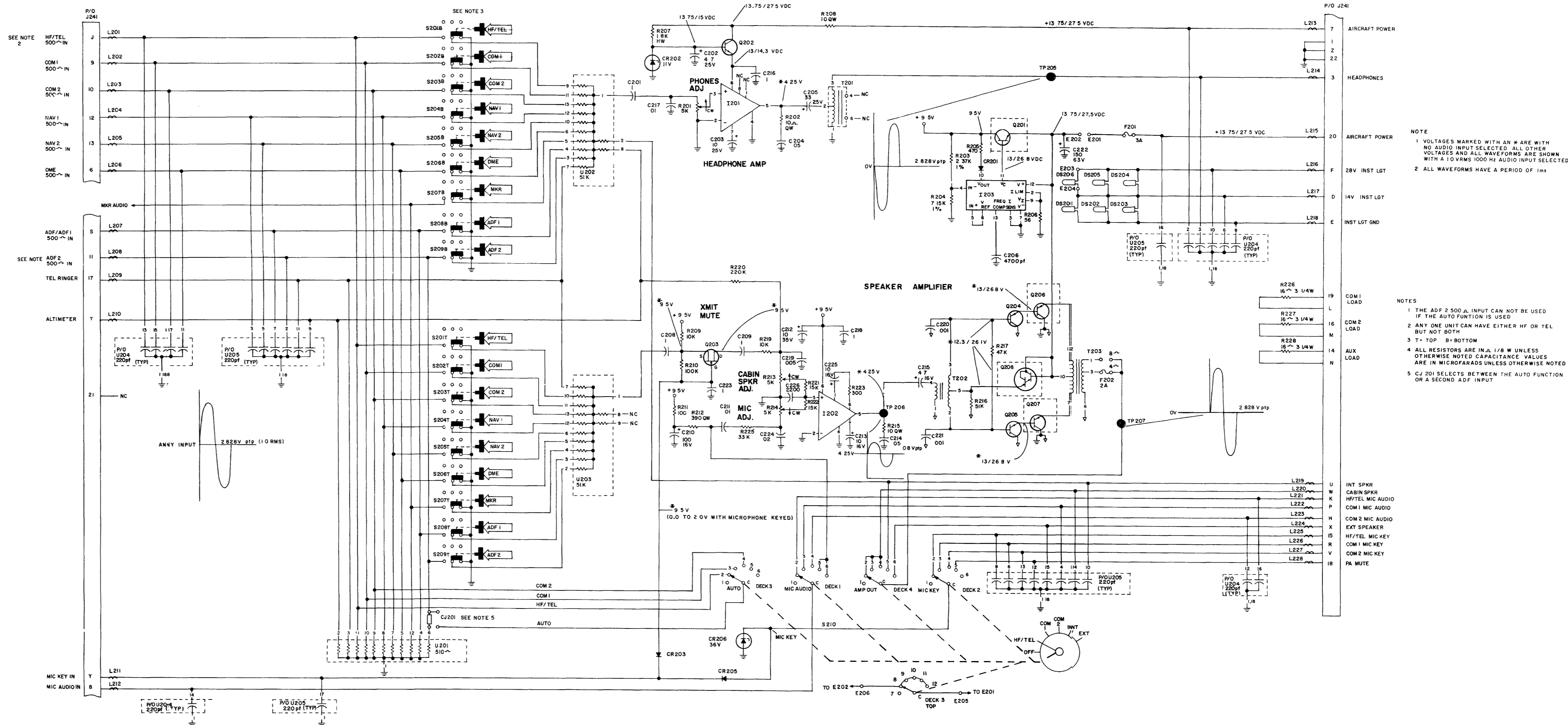
FIGURE 6-3 KMA 24 MARKER RECEIVER  
(Dwg. No. 002-5837-00, R-0)  
(Sheet 1 of 2)



NOTE  
1 VOLTAGES MARKED WITH AN \* ARE WITH NO AUDIO INPUT SELECTED ALL OTHER VOLTAGES AND ALL WAVEFORMS ARE SHOWN WITH A 10 VRMS 1000 Hz AUDIO INPUT SELECTED  
2 ALL WAVEFORMS HAVE A PERIOD OF 1ms

NOTES  
1 THE ADF 2 500 $\mu$  IN INPUT CAN NOT BE USED IF THE AUTO FUNCTION IS USED  
2 ANY ONE UNIT CAN HAVE EITHER HF OR TEL BUT NOT BOTH  
3 T+ TOP B= BOTTOM  
4 ALL RESISTORS ARE IN  $\frac{1}{8}$  W UNLESS OTHERWISE NOTED CAPACITANCE VALUES ARE IN MICROFARADS UNLESS OTHERWISE NOTED  
5 CJ201 SELECTS BETWEEN THE AUTO FUNCTION OR A SECOND ADF INPUT

FIGURE 6-3 MARKER RECEIVER  
(Dwg. No. 002-5837-00, R-9)  
(Sheet 2 of 2)



NOTE  
1 VOLTAGES MARKED WITH AN \* ARE WITH NO AUDIO INPUT SELECTED. ALL OTHER VOLTAGES AND ALL WAVEFORMS ARE SHOWN WITH A 10 VRMS 1000 HZ AUDIO INPUT SELECTED.  
2 ALL WAVEFORMS HAVE A PERIOD OF 1ms

NOTES  
1 THE ADF 2.500 A INPUT CAN NOT BE USED IF THE AUTO FUNCTION IS USED.  
2 ANY ONE UNIT CAN HAVE EITHER HF OR TEL BUT NOT BOTH.  
3 T = TOP B = BOTTOM  
4 ALL RESISTORS ARE IN A 1/8 W UNLESS OTHERWISE NOTED. CAPACITANCE VALUES ARE IN MICROFARADS UNLESS OTHERWISE NOTED.  
5 CJ 201 SELECTS BETWEEN THE AUTO FUNCTION OR A SECOND ADF INPUT.

FIGURE 6-3 KMA 24 MARKER RECEIVER  
(Dwg. No. 002-5837-00, R-0)  
(Sheet 2 of 2)