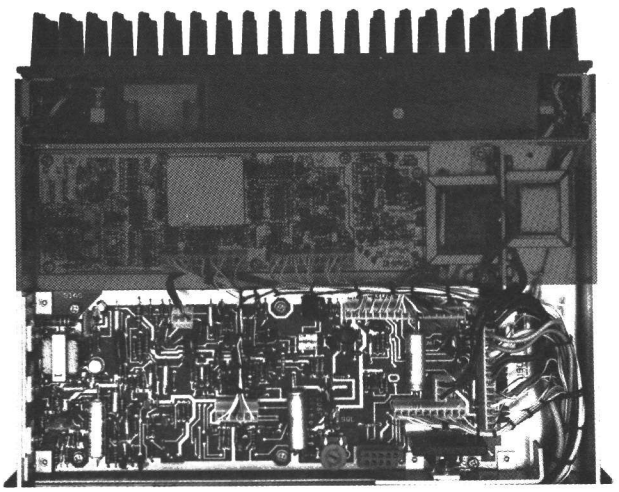
MOBILE RADIO

GE-MARC V™ MAINTENANCE MANUAL

SYSTEM-AUDIO & SQUELCH BOARD 19D430992G1



SPECIFICATIONS *

USED WITH	GE-MARC V CONTROL STATION
INPUT VOLTAGE	15.5 VDC (Nominal Receive) 13.0 VDC (Nominal Transmit)
OUTPUT VOLTAGE	Regulated 10 Volts DC at 0.1 to 0.35 Amperes
MAXIMUM CURRENT DRAIN	0.30 Amperes (Squelched) 1.40 Amperes (Unsquelched)
AUDIO OUTPUT	5 Watts
CAS OUTPUT	<0.3 Volts DC (Squelched) 10 Volts DC (Unsquelched)

*These specifications are intended primarily for the use of the serviceman. Refer to the appropriate Specification Sheet for the complete specifications.

GENERAL ELECTRIC

Maintenance Manual LBI30923A

SYSTEM-AUDIO & SQUELCH BOARD 19D430992G1

TABLE OF CONTENTS

DESCRIPTION

The System-Audio-Squelch (SAS) Board mounts on the underside of the radio chassis and is accessible when the radio chassis is pivoted out of the frame. The board provides interconnection between the control and radio modules. Molex pins on the board protrude through slots to make connections to the IF/Detector board. Molex pins on the top of the board provide connections to the station harness plugs.

The System-Audio-Squelch (SAS) Board contains two 10 VDC power regulators, one for the synthesizer and one for the receiver, the transmit/receive switching controls, a microphone preamplifier and the station audio amplifier and squelch circuits. The board also provides interconnection to the Tone and the Logic Boards.

CIRCUIT ANALYSIS

MICROPHONE PRE-AMPLIFIER

Microphone pre-amplifier Q922 provides an additional 20 dB gain for use with a desk-type or service microphone. Audio from the microphone is connected to the MIC LEVEL control R988. Q922 amplifies the adjusted audio.

Operating the LOCAL PTT circuit applies ground to J907-3 of the System Board. If the Radio is in the READY mode, the logic board provides a positive voltage to Mic Enable J907-12. Emitter follower Q911 conducts supplying B+ to microphone pre-amp Q922, which passes the mike audio to the station transmitter.

+10 VOLT REGULATORS

One of the +10 Volt Regulators provides a closely-controlled supply voltage for the receiver and Tone Logic board. The 13.8 VDC from the station power supply is applied to the choke input filter composed of L901 and C920. The output of this filter is then applied to the regulator circuit which consists of Q901, Q902, Q903 and zener diode VR901.

When the output of the regulator starts to increase, Q903 conducts harder. Q902 conducts less, causing Q901 to conduct less. This increases the voltage drop across Q901, keeping the output voltage constant. Potentiometer R906 is used to set the base voltage of Q903 for the desired 10 Volt output.

The +10 Volt Regulator for the synthesizer is made up of C963, C964, Q923 and U901.

SYSTEM CONTROL

Operating the PTT switch applies ground to J907-3 of the System Board. If the Radio is in the READY mode, a ground is provided by the logic board to P908-6 of the System Board which grounds the base of Q904 in the receiver muting and delay circuit, turning the transistor on. Operating Q904 turns on Q905, causing its collector to drop. When Q904 is operating, the receiver squelch and audio control circuits are turned on, muting the receiver.

With the PTT switch operated, C925 changes to the +10 Volt line. When the PTT switch is released, C925 discharges through R909, keeping Q904 and Q905 on for approximately 75 milliseconds as the capacitor discharges. This delays the turn-on of the receiver audio for 75 milliseconds.

TRANSMITTER KEYING AND DELAY

Operating the PTT switch on the microphone (or the remote control unit) applies A- to the base of Q906 via the logic board. Capacitor C926 starts to charge through R916 and R917. In approximately 30 milliseconds, C926 has charged to a voltage high enough to allow time delay switch Q906 to turn on. This causes transmitter oscillator control switch Q907 to turn on. Operation of Q907 applies voltage to the transmitter oscillator, keying the transmitter. The collector voltage of Q907 turns off Q908, removing the supply voltage from the receiver oscillator.

The 30 millisecond time delay in the transmitter oscillator keying circuit allows the antenna relay to energize before RF is applied to the relay. When the PTT switch is released, CR903 delays the antenna relay from de-energizing until the RF is removed from the contacts.

TRANSMITTER DISABLE

The station is equipped with a Carrier Control Timer. The TX DISABLE lead from the Carrier Control Timer on the logic board is connected to the base of Q906. When the timing cycle on the Carrier Control Timer times out, A- is applied to the base of Q906, turning off the transmitter oscillator control voltage and disabling the transmitter. After two minutes of Controlled Carrier, a twenty second interrupted tone alert will be heard in the speaker prior to shut-down.

AUDIO AMPLIFIER AND DRIVER

The audio signal from the VOLUME control is fed to J907-1 on the Tone Board

through the Tone Reject Filter and out through J907-7 to the de-emphasis network consisting of C933, C935, R931, R932. The signal is then fed to the base of audio amplifier Q914. The output of Q914 is coupled to audio driver Q915. The two stages of audio gain have their turn-on, turn-off time controlled by time-constant circuitry to reduce objectionable thumps.

AUDIO BIAS ADJUST trimmer R945 sets the bias on the audio output stage. The trimmer is adjusted for a reading of 20 mA at metering jack J910. The output of Q915 is applied through transformer T901 to the push-pull audio PA stage. The transformer provides phase inversion for the push-pull stage.

Q916 and Q917 operate as a push-pull Class AB audio PA stage. The PA output is coupled through audio transformer T1901 to the loudspeaker. The yellow and white tertiary winding of T1901 supplies balanced feedback to the collector of Q915. This feedback winding minimizes distortion and prevents pick-up of external electrical noise.

SQUELCH

Audio is applied to the SQUELCH ADJUST control R953. The control setting determines the squelch opening sensitivity. High-pass filter R981 and C946 reduces the effects resulting from high settings of the SQUELCH CIRCUIT. Diodes CR914 and CR915, together with amplifier Q920, prevent squelch clipping.

The compensator circuit composed of Q918, RT902 and RT903, insures that the squelch will tighten at both temperature extremes. The circuit compensates for gain changes by shunting less of the noise to ground with temperature changes. Below approximately 40°C RT902 keeps Q918 turned on; the impedance of RT903 increases and less noise is shunted to ground. Above 40°C, RT902 turns Q918 off. This removes the shunting effect of RT903.

C953, C954 and L902 form a high-pass filter for preventing audio signals from reaching the detector (CR916 and CR917). Positive filtered DC from the detector is fed to the base of Q909, turning the transistor on. The collector of Q909 drops to near zero, turning Q913 off and removing the bias from audio amplifiers Q914 and Q915. The receiver is squelched.

A hysteresis action is provided by the positive DC feedback from the collector of Q909, and from the collector of Q914 to the base of Q909. As Q909 and Q914 are switched on and off, noise amplifier Q920 gain is changed in such a way as to assist this action and provide positive switching.

NOISE MUTE

Noise mute transistor Q910 is turned on either when the transmitter is keyed and forward biases CR920 or the squelch is disabled and CR922 is forward biased. Either condition turns on Q910 increasing the voltage at the Vol/Sq high from 4-4.5 Volts to 7.5 Volts which allows the tone burst to be heard in the speaker but the noise from the descriminator is rejected or biased off.

GENERAL ELECTRIC COMPANY • MOBILE COMMUNICATIONS DIVISION
WORLD HEADQUARTERS • LYNCHBURG, VIRGINIA 24502 U.S.A.

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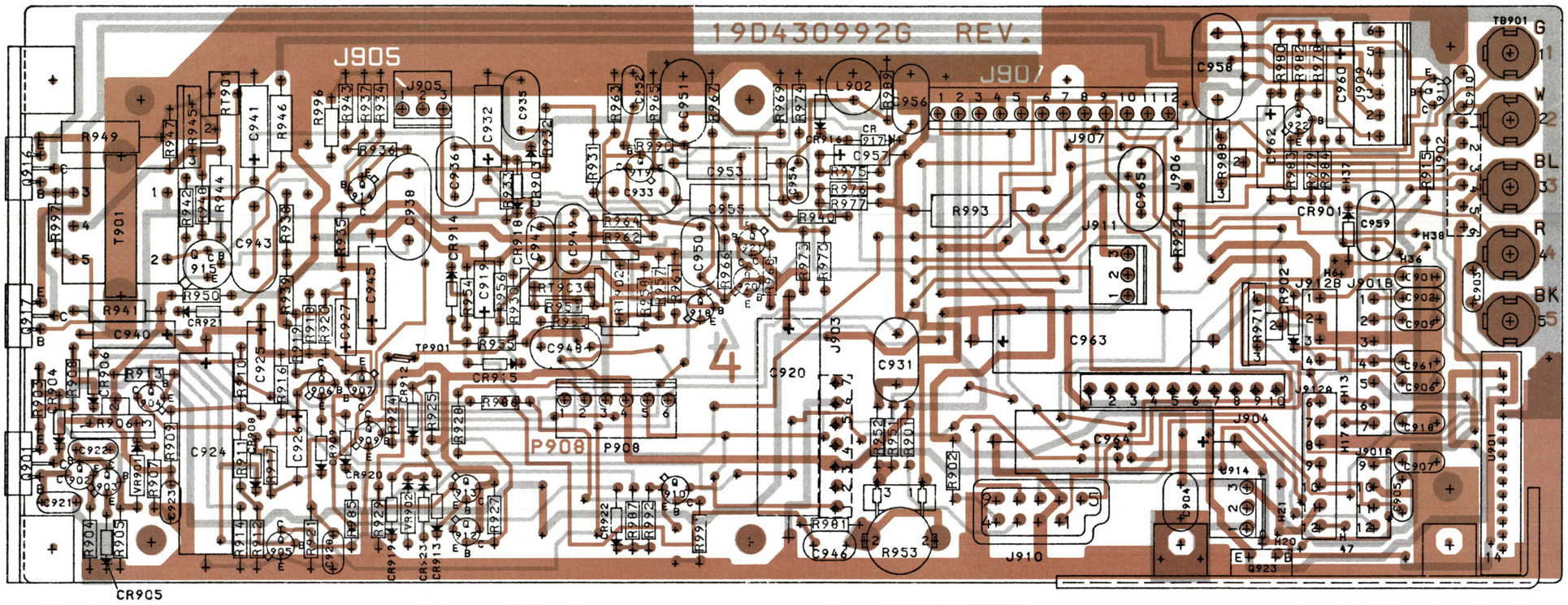
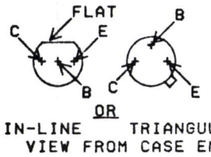


TYPICAL MOUNTING FOR
Q901,Q916,Q917,AND Q923

LEAD IDENTIFICATION
FOR Q902-Q907,
Q909-Q915
& Q918-Q923

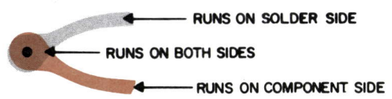


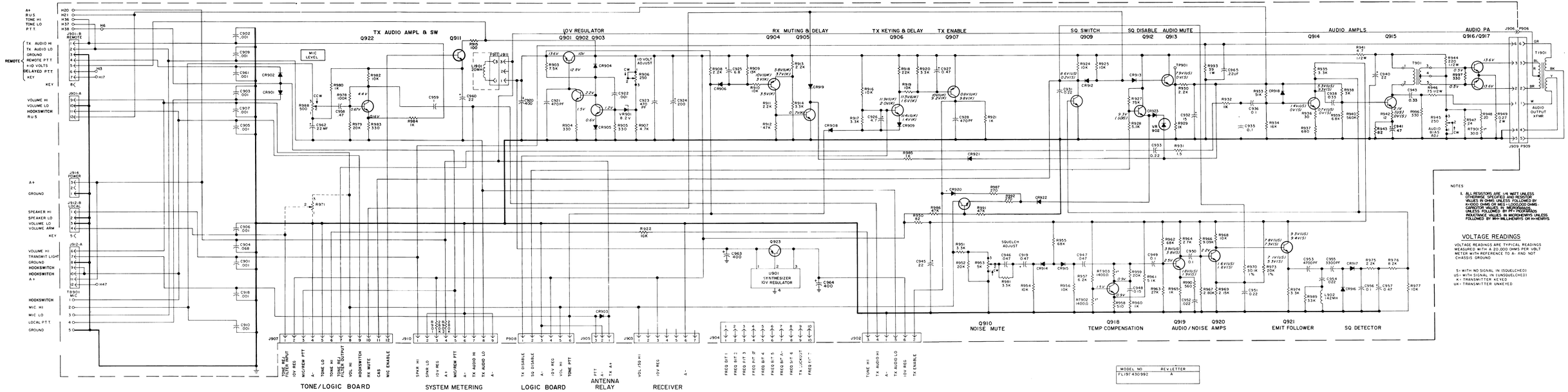
NOTE: LEAD ARRANGEMENT, AND NOT CASE SHAPE, IS DETERMINING FACTOR FOR LEAD IDENTIFICATION. THE B INDICATES EMITTER LEAD.

(19D430994, Rev. 4)
(19A143115, Sh. 1, Rev. 4)
(19A143115, Sh. 2, Rev. 4)

OUTLINE DIAGRAM

SYSTEM-AUDIO & SQUELCH BOARD
19D430992G1





MODEL NO.	REV.LETTER
FLY97430992	A

(19B622459, Rev. 4)

SCHEMATIC DIAGRAM

SYSTEM-AUDIO & SQUELCH BOARD
19D430992G1

Issue 2

PARTS LIST

GE MARC V STATION
SYSTEM AUDIO SEQUENCE BOARD
SYNTHESIZER CONTROL
19D430992G1
150US 2

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C901 thru C903	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C904	19A116080P106	Polyester: 0.068 µf ±10%, 50 VDCW.
C905 thru C907	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C909 and C910	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C918	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C919	5496267P28	Tantalum: 0.47 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C920	19A115680P24	Electrolytic: 400 µf +150% -10%, 18 VDCW; sim to Mallory Type TTA.
C921	5494481P107	Ceramic disc: 470 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C922	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C923	5494481P107	Ceramic disc: 470 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C924	19A115680P10	Electrolytic: 200 µf +150% -10%, 18 VDCW; sim to Mallory Type TTA.
C925	5496267P218	Tantalum: 6.8 µf ±10%, 35 VDCW; sim to Sprague Type 150D.
C926	5496267P5	Tantalum: 4.7 µf ±20%, 10 VDCW; sim to Sprague Type 150D.
C927	5496267P28	Tantalum: 0.47 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
Cxxx	5494481P107	Ceramic disc: 470 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C931	19A116080P109	Polyester: 0.22 µf ±10%, 50 VDCW.
C932	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C933	19A116080P109	Polyester: 0.22 µf ±10%, 50 VDCW.
C935 and C936	19A116080P107	Polyester: 0.1 µf ±10%, 50 VDCW.
C938	19A116080P110	Polyester: 0.33 µf ±10%, 50 VDCW.
C940	5496267P10	Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C941	5496267P2	Tantalum: 47 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
C943	19A116080P110	Polyester: 0.33 µf ±10%, 50 VDCW.
C945	5496267P10	Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C946 and C947	19A116080P105	Polyester: 0.047 µf ±10%, 50 VDCW.
C948	19A116080P108	Polyester: 0.15 µf ±10%, 50 VDCW.
C949 and C950	19A116080P107	Polyester: 0.1 µf ±10%, 50 VDCW.
C951	19A116080P109	Polyester: 0.22 µf ±10%, 50 VDCW.
C952	19A116080P103	Polyester: 0.022 µf ±10%, 50 VDCW.
C953	5491656P46	Polyester: 4700 pf ±5%, 100 VDCW; sim to GE Type 61F.
C954	19A116080P103	Polyester: 0.022 µf ±10%, 50 VDCW.
C955	5491656P73	Polyester: 3300 pf ±5%, 100 VDCW; sim to GE Type 61F.
C956	19A116080P107	Polyester: 0.1 µf ±10%, 50 VDCW.
C957	5496267P228	Tantalum: 0.47 µf ±10%, 35 VDCW; sim to Sprague Type 150D.
C958	19A116080P111	Polyester: 0.47 µf ±10%, 50 VDCW.
C959	19A116080P107	Polyester: 0.1 µf ±10%, 50 VDCW.
C960	5496267P10	Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C961	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C962	5496267P10	Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C963 and C964	19A115680P24	Electrolytic: 400 µf +150% -10%, 18 VDCW; sim to Mallory Type TTA.
C965	19A116080P109	Polyester: 0.22 µf ±10%, 50 VDCW.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR901 and CR902	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR903	4037822P1	Silicon, 1000 mA, 400 PIV.
CR904 thru CR906	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR908 and CR909	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR912 and CR923	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		- - - - - - - - JACKS AND RECEPTACLES - - - - -
J901A	19A116659P65	Connector, printed wiring: 4 contacts; sim to Molex 09-64-1041.
J901B	19A116659P86	Connector, printed wiring: 7 contacts; sim to Molex 09-64-1072.
J902	19A116659P28	Connector, printed wiring: sim to Molex 09-64-1043.
J903	19B219594P1	Contact, electrical: 7 pins.
J904	19A116659P164	Connector, printed wiring: 10 contacts; sim to Molex 09-67-2102.
J905	19A116659P55	Connector, printed wiring: 3 contacts; sim to Molex 09-64-1031.
J906	19A700090P3	Contact, electrical: sim to Molex 08-50-0404.
J907	19A116659P111	Connector, printed wiring: 12 contacts; sim to Molex 09-64-1121.
J909	19A116659P50	Connector, printed wiring: 6 contacts; sim to Molex 09-64-1061.
J910	19B219374G2	Connector: 9 contacts.
J911	19A116659P55	Connector, printed wiring: 3 contacts; sim to Molex 09-64-1031.
J912A	19A116659P86	Connector, printed wiring: 7 contacts; sim to Molex 09-64-1072.
J912B	19A116659P85	Connector, printed wiring: 4 contacts; sim to Molex 09-64-1042.
J914	19A116659P55	Connector, printed wiring: 3 contacts; sim to Molex 09-64-1031.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L902	19B209405P1	Reactor, audio freq: 142 mh ±5%, at 0.1 v thru 0.27 v; sim to Aladdin 405-101.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P906	19A116659P50	Connector, printed wiring: 6 contacts; sim to Molex 09-65-1061.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q901	19A116373P1	Silicon, PNP.
Q902 and Q903	19A115910P1	Silicon, NPN; sim to Type 2N3904.
Q904	19A115853P1	Silicon, PNP; sim to Type 2N3906.
Q905 and Q906	19A115910P1	Silicon, NPN; sim to Type 2N3904.
Q907	19A115852P1	Silicon, PNP; sim to Type 2N3906.
Q909	19A115910P1	Silicon, NPN; sim to Type 2N3904.
Q910	19A115852P1	Silicon, PNP; sim to Type 2N3906.
Q911 thru Q914	19A115910P1	Silicon, NPN; sim to Type 2N3904.
Q915	19A115300P4	Silicon, NPN.
Q916 and Q917	19A116741P2	Silicon, NPN.
Q918 thru Q922	19A116774P1	Silicon, NPN; sim to Type 2N5210.
Q923	19A116942P1	Silicon, PNP.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R901 and R902	19C314256P23803	Metal film: 280K ohms ±1%, 1/4 w.
R903	3B152P552J	Composition: 7.5K ohms ±5%, 1/4 w.
R904 and R905	19A700106P51	Composition: 330 ohms ±5%, 1/4 w.
R906	19B209358P101	Variable, carbon film: approx 25 to 250 ohms ±10%, 0.2 w; sim to CTS Type A-201.
R907	19A700106P79	Composition: 4.7K ohms ±5%, 1/4 w.
R908	19A700106P71	Composition: 2.2K ohms ±5%, 1/4 w.
R909	3B152P153J	Composition: 15K ohms ±5%, 1/4 w.
R910	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R911	19A700106P71	Composition: 2.2K ohms ±5%, 1/4 w.
R912	19A700106P103	Composition: 47K ohms ±5%, 1/4 w.
R913	19A700106P71	Composition: 2.2K ohms ±5%, 1/4 w.
R914	19A700106P75	Composition: 3.3K ohms ±5%, 1/4 w.
R915	19A700106P39	Composition: 100 ohms ±5%, 1/4 w.
R916	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R917	19A700106P75	Composition: 3.3K ohms ±5%, 1/4 w.
R918	19A700106P95	Composition: 22K ohms ±5%, 1/4 w.
R919	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R920	19A700106P75	Composition: 3.3K ohms ±5%, 1/4 w.
R921	19A700106P63	Composition: 1K ohms ±5%, 1/4 w.
R924 and R925	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R927	3B152P753J	Composition: 75K ohms ±5%, 1/4 w.
R928	3B152P513J	Composition: 5.1K ohms ±5%, 1/4 w.
R929	19A700106P63	Composition: 1K ohms ±5%, 1/4 w.
R930	19A700106P71	Composition: 2.2K ohms ±5%, 1/4 w.
R931	19A700106P67	Composition: 1.5K ohms ±5%, 1/4 w.
R932	19A700106P93	Composition: 1K ohms ±5%, 1/4 w.
R933	3B152P513J	Composition: 51K ohms ±5%, 1/4 w.
R934	3B152P163J	Composition: 16K ohms ±5%, 1/4 w.
R935	19A700106P75	Composition: 3.3K ohms ±5%, 1/4 w.
R936	3B152P300J	Composition: 30 ohms ±5%, 1/4 w.
R937	19A700106P59	Composition: 680 ohms ±5%, 1/4 w.
R938	3B152P302J	Composition: 3K ohms ±5%, 1/4 w.
R939	19A700106P83	Composition: 6.8K ohms ±5%, 1/4 w.
R940	3B152P564J	Composition: 560K ohms ±5%, 1/4 w.
R941	19A700113P7	Composition: 4.7 ohms ±5%, 1/2 w.
R942	19A700106P17	Composition: 12 ohms ±5%, 1/4 w.
R943	19A700106P37	Composition: 82 ohms ±5%, 1/4 w.
R944	19A700113P47	Composition: 220 ohms ±5%, 1/2 w.
R945	19B209358P101	Variable, carbon film: approx 25 to 250 ohms ±10%, 0.2 w; sim to CTS Type A-201.
R946	19A700113P36	Composition: 75 ohms ±5%, 1/2 w.
R947	3B152P240J	Composition: 24 ohms ±5%, 1/4 w.
R948	3B152P200J	Composition: 20 ohms ±5%, 1/4 w.
R949	19A700050P6	Wirewound: 0.27 ohms ±10%, 2 w.
R950	19A700106P37	Composition: 82 ohms ±5%, 1/4 w.
R951	19A700106P75	Composition: 3.3K ohms ±5%, 1/4 w.
R952	3B152P203J	Composition: 20K ohms ±5%, 1/4 w.
R953	19B209358P5	Variable, carbon film: approx 200 to 5K ohms ±20%, 0.25 w; sim to CTS Type H-201.
R954	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R955	19A700106P107	Composition: 68K ohms ±5%, 1/4 w.
R956	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R957	3B152P622J	Composition: 6.2K ohms ±5%, 1/4 w.
R958	3B152P511J	Composition: 510 ohms ±5%, 1/4 w.
R959	3B152P203J	Composition: 20K ohms ±5%, 1/4 w.
R960	19A700106P63	Composition: 1K ohms ±5%, 1/4 w.
R961	3B152P512J	Composition: 5.1K ohms ±5%, 1/4 w.
R962	19A700106P107	Composition: 68K ohms ±5%, 1/4 w.
R963	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R964	19A700106P73	Composition: 2.7K ohms ±5%, 1/4 w.
R965	19A700106P63	Composition: 1K ohms ±5%, 1/4 w.
R966	19C314256P2P091	Metal film: 9.09K ohms ±1%, 1/4 w.
R967	19C314256P22801	Metal film: 2.8K ohms ±1%, 1/4 w.
R968	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R969	19C314256P22151	Metal film: 2.15K ohms ±1%, 1/4 w.
R970	19C314256P23012	Metal film: 30.1K ohms ±1%, 1/4 w.
R973	19C314256P22002	Metal film: 20K ohms ±1%, 1/4 w.
R974	19A700106P75	Composition: 3.3K ohms ±5%, 1/4 w.
R975	19A700104P71	Composition: 2.2K ohms ±5%, 1/4 w.
R976	19A700106P85	Composition: 8.2K ohms ±5%, 1/4 w.
R977	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R978	19A700106P111	Composition: 0.10 megohm ±5%, 1/4 w.
R979	3B152P203J	Composition: 20K ohms ±5%, 1/4 w.
R980	19A700104P63	Composition: 1K ohms ±5%, 1/4 w.
R981	19A700106P75	Composition: 3.3K ohms ±5%, 1/4 w.
R982	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R983	19A700106P51	Composition: 330 ohms ±5%, 1/4 w.
R984 and R985	19A700106P63	Composition: 1K ohms ±5%, 1/4 w.
R986	19A700106P103	Composition: 47K ohms ±5%, 1/4 w.
R987	19A700106P93	Composition: 270 ohms ±5%, 1/4 w.
R988	19B209358P102	Variable, carbon film: approx 25 to 500 ohms ±10%, 0.2 w; sim to CTS Type A-201.
R989	19A700106P99	Composition: 33K ohms ±5%, 1/4 w.
R990	19A700106P57	Composition: 560 ohms ±5%, 1/4 w.
R991	19A700106P103	Composition: 47K ohms ±5%, 1/4 w.
R992	19A700106P49	Composition: 270 ohms ±5%, 1/4 w.
R993	19A700112P29	Composition: 39 ohms ±5%, 1 w.
R994 and R997	19A700106P51	Composition: 330 ohms ±5%, 1/4 w.
		- - - - - - - - - - THERMISTORS - - - - - - - - - -
RT901	5490828P41	Thermistor: 30 ohms ±30%, color code black and white; sim to Carborundum Type B12112-4.
RT902 and RT903	5490828P38	Thermistor: 1.4K ohms ±5%, color code green and white; sim to Carborundum Type 723H-2.
		- - - - - - - - - - TRANSFORMERS - - - - - - - - - -
T901	19A116040P1	Audio freq: 300- 4000 Hz, Pri Cond. A: 325 ohms ±5% imp, +0.3-0.75 dB at 400 cps. Pri Cond. B: 315 ohms ±5% imp, +0.3-0.9 dB at 400 cps. Sec: 480 ohms imp.
		- - - - - - - - - - TERMINAL BOARDS - - - - - - -
TB901	19A116667P3	Plate mtd. (Quantity 5).
		- - - - - - - - - - TEST POINTS - - - - - - - - - -
TP901	19B211379P1	Spring (Test Point).
		- - - - - - - - - - REGULATORS - - - - - - - - - -
U901	19D416504G4	Regulator, 10 v.
		- - - - - - - - - - VOLTAGE REGULATORS - - - - - - -
VR901	4036887P40	Zener: 500 mw, 8.2 v. nominal.
VR902	4036887P1	Zener: 500 mw, 2.3 v. nominal.
		ASSOCIATED ASSEMBLIES
		REACTOR ASSEMBLY 19A130864G1
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1901	19B209345P1	Reactor: 0.20 mH min, 0.5 ohms DC res max, 15 VDC operating.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P911		Connector. Includes:
	19A116659P14	Shell.
	19A116781P5	Contact, electrical: wire range No. 18-24 AWG; sim to Molex 08-50-0106. (Quantity 2).
		TRANSFORMER ASSEMBLY 19B226864G2
		- - - - - - - - - - PLUGS - - - - - - - - - -
P906	19A127042P2	Terminal, solderless: sim to Malco 12093-10.
P909		Includes:
	19A116659P80	Shell: sim to Molex 09-50-7061.
	19A116781P5	Contact, electrical: wire range No. 18-24 AWG; sim to Molex 08-50-0106.
T1902	19A143309P1	- - - - - - - - - - TRANSFORMERS - - - - - - - - - - Audio freq: 300 to 4000 Hz, Pri: 23.3 ohms ±5% imp, Sec: 3.5 ohms at 1 KHz.
TP901	19B211379P1	- - - - - - - - - - TEST POINTS - - - - - - - - - - Spring (Test Point).
		- - - - - - - - - - MISCELLANEOUS - - - - - - - - - -
	19A134016P1	Insulator, bushing. (Used with Q901, Q916, Q917).
	19A116023P1	Insulator, plate. (Used with Q901, Q916, Q917).
	19A130036P1	Heat sink. (Used with Q901, Q916, Q917).
	19A143241P1	Heat sink. (Used with Q923).
	4036550P1	Insulator, washer: nylon. (Used with Q915).
	19B200052SP180	Rivet, tubular. (Secures transistor heat sink).
	19B201074P304	Tap screw, Phillips POZIDRIV®: No. 6-32 x 1/4. (Secures TB1 plate nuts).

PRODUCTION CHANGES

Changes in the equipment to improve performance or to simplify circuits are identified by a ' Revision Letter ' which is stamped after the model number of the unit. The revision stamped on the unit includes all previous revisions. Refer to the Parts List for descriptions of parts affected by these revisions.

REV. A - To increase transmit deviation of collect and group tones.
Added R922.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES