MAINTENANCE MANUAL
TRANSMIT/RECEIVE ASSEMBLY
19D902727G3 403-440 MHz
19D902727G4 440-470 MHz
19D902727G5 470-512 MHz

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ERICSSON GE

Ericsson GE Mobile Communications Inc.
Mountain View Road • Lynchburg, Virginia 24502

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LBI-38559

DESCRIPTION

The Transmit/Receive Assembly attaches to the Rear Cover and consist of the Transmit/Receive Board, the Side Panel and the Top Cover. The following is a schedule of the assemblies and their part number:

Transmit/Receive Assy	- 19D902727G3	403-440 MHz
	- 19D902727G4	440-470 MHz
	- 19D902727G5	470-512 MHz
Transmit/Receive Board	- 19D902582G1	403-440 MHz
	- 19D902582G2	440-470 MHz
	- 19D902582G3	470-512 MHz
Side Panel	- 19D901089G4	
Top Cover	- 19B800865G7	

The Transmit/Receive Board contains the Logic circuit, Transmit circuit, Receive circuit, Regulator circuits and special circuitry. All controls, switches and the BNC type antenna connector are soldered to the T/R Board. The Synthesizer Board plugs into the top of the T/R Board at J5 and J6.

The side panel contains the plunger for the Push-To-Talk switch, the channel selector switch panel and the side panel shield. The Top Cover mounts to the top of the T/R Assembly.

CIRCUIT ANALYSIS

LOGIC CIRCUIT

The Logic Circuit consist of an 80C51 Microprocessor (U701), a EEPROM (U702) and the associated circuitry.

Microprocessor

The 80C51 microprocessor is a CHMOS 8-bit microprocessor and provides all control signals required by the radio. The microprocessor also generates the Channel Guard tones and detects Channel Guard and Type 99 tones. See Figure 1 for the microprocessor block diagram. The microprocessor port pin definitions are shown on the following pages.

Port Pins: I = Input, O = Output, I/O = Bidirectional

P0.0	(O)	Channel Guard encode bit 0
P0.1	(O)	CG encode bit 1
P0.2	(O)	CG encode bit 2
P0.3	(O)	CG encode bit 3
P0.4	(O)	Synthesizer 5.4V control (active high)
P0.5	(O)	Receive 5.4V control (active high)
P0.6	(O)	Type 99 enable (active high)
P0.7	(O)	Alert tone
P10	(I)	$\overline{\text{Test}}$ (active low)
P1.1		NOT USED
P1.2	(O)	Mic Mute (active high)
P1.3	(O)	$\overline{\text{DPTT}}$ (active low)
P1.4	(O)	Rx Mute (active high)
P1.5	(O)	Receive CG switch (active high)
P1.6	(O)	Band Switch
P1.7	(O)	Squelch Switch
P2.0	(I)	$\overline{\text{Type 99 Reset/Talk Around}}$ (active low)
P2.1	(I)	$\overline{\text{Monitor}}$ (active low)
P2.2	(O)	Hysteresis
P2.3	(I/O)	EEPROM Data
P2.4	(O)	EEPROM Clock
P2.5	(O)	Xtal Switch
P2.6	(I)	Channel Select
P2.7	(O)	$\overline{\text{Mute}}$ (active low)
RXD	(I)	Programmer data in
TXD	(I/O)	Programmer data out/ $\overline{\text{PTT}}$
P3.2	(I)	Tone data in
P3.3	(I)	Lock detect (active high)
P3.4	(O)	Synthesizer enable
P3.5	(O)	Synthesizer data
P3.6	(O)	Synthesizer clock
P3.7	(I)	$\overline{\text{CAS}}$ (active low)

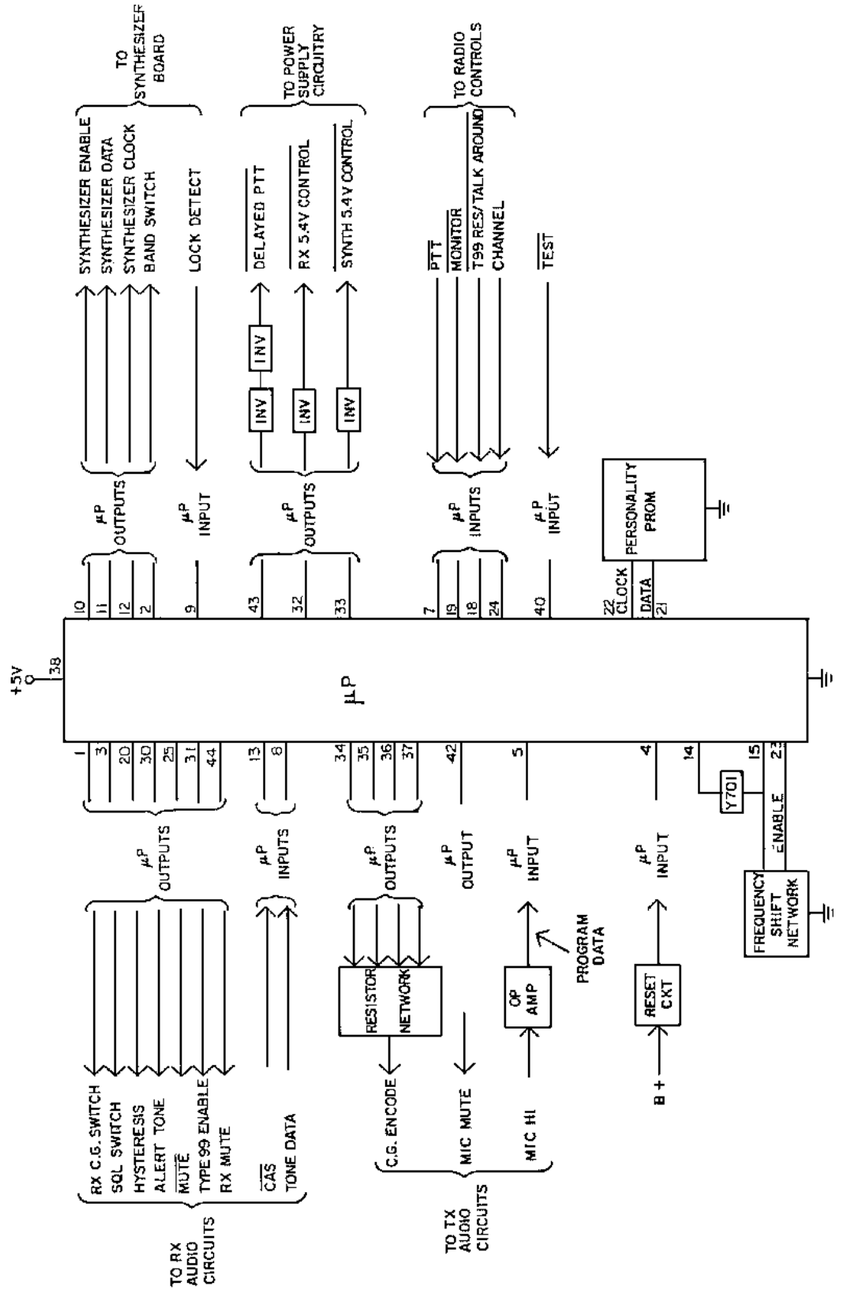

Figure 1 - Microprocessor Block Diagram

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EEPROM

The 256 x 8 - bit EEPROM (U702), commonly referred to as the personality PROM, stores the customer information shown below:

- Customer frequencies
- Customer tones
- Customer Options

Using a EEPROM provides the convenience of programming without opening the radio. Programming of the EEPROM is accomplished by driving the MIC HI lead, which is located at the accessory jack. This is connected to operational amplifier circuit U301.3. With no external signal connected to MIC HI, a voltage level of approximately 2.25 volts is at MIC HI. This causes the output of U301 .3, the program data line, to be high. If the MIC HI is pulled low, the program Data line is pulled low. If this line remains low for 20 milliseconds or more, the microprocessor is put in the programming mode. Once in this mode, the radio will not operate or respond to any of the front case controls. The radio must be turned off and then back on to get the processor out of this mode. If programming is actually done, the processor will be taken out of the programming mode by the proper command from the personal computer programmer. See TQ-3551 for Programming Instructions.

TRANSMIT CIRCUIT

The transmitter circuit begins at the output from the Synthesizer (J5-6) and continues on to the antenna connector J3. See Figure 2 for a block diagram. The circuit consists of five stages of buffering and amplification, a TX/RX RF switch, a low pass filter and several matching networks. Since the Synthesizer output is at the carrier frequency, there is no frequency multiplication. Each stage description, approximate gain and output level are shown in Table 1.

The band-switch voltage for Tx (approximately 4.7V), is dropped to approximately 3.9V by the base-emitter junction of Q101. This band-switch voltage provides the supply for Q102 and the bias for Q106 and Q107. Switched B + provides the supply for transistors Q106, Q107 and Q103. Fixed B + provides the supply for Q104 and Q105.

Buffer/Amplifier

Buffer Q102 provides a fixed gain and reverse isolation. Q102 also reduces amplitude variation in the signal passing from the synthesizer to the transmitter. Cascode buffer/amplifier Q106 and Q107 provides gain, reverse isolation and further reduces amplitude variations. The predriver Q103 also provides fixed gain.

Driver/Final Amplifier

Transistor Q104 is the Driver for Final Amplifier Q105. Q104 and Q105 along with tuning elements C121 and C126 provide the desired signal level. Variable capacitors C121 and C126 are peaked for the output level on the desired channel frequency. Then C121 and C126 are detuned in the lower current direction to obtain the correct output power level (2W/7.5V or 4W/10V).

Table 1 - Transmitter Stages

STAGE	DESCRIPTION	APPROXIMATE GAIN (dB)		APPROXIMATE OUTPUT (dBm/W)	
		7.5V	10V	7.5V	10V
Q102	Buffer	0	0	0/1mW	0/1mW
Q107/106	Buffer/Amp	13	13	13/.02	13/.02
Q103	Predriver	8	9	21/.12	22/.12
Q104	Driver	8	8	29/.8	30/1
Q105	Final Amp	7	8	36/4	38/6
----	Tx Diode/LP Fltr	-1	-1	35/3	37/5

TX/RX RF Switch

In the transmit mode, B + Switched is applied through R114, R115, and the RF choke L113 to Tx diode D101, and through L114 in the quarter wave transformer (C129, C146, C130, L114) to Rx diode D102. Through the quarter wave transformer the short at D102 is reflected to the transmitter output as a very high impedance which does not load the transmitter. The transmitter signal passes through D101, past the input to the parallel branch quarter wave transformer, and through a low pass filter to the antenna connector.

Without bias in the receive mode, D101, D102, D103 are all open. D101, now a capacitance tuned with L111 and C147, isolates the transmitter from the receiver input. As an open circuit D102 now has no effect. The components of the quarter-wave transformer become a low-pass matching network in the receiver. D102 exhibits a low capacitance which, with C130, provides matching to the Rx Input as part of the quarter-wave transformer.

LO Notch Filter

In the receive mode without bias, diode D103 appears as a capacitance in parallel with C136, which, when tuned properly with L117 and C134, becomes a notch reject filter for a conducted LO signal passing to the antenna. When extra attenuation of LO signal is required, C136 is used to tune this filter for maximum attenuation of the LO signal at the antenna connector.

In the transmit mode the LO notch filter is shorted to ground by the application of bias to D103, which is derived from the Switched B + and applied through the bias network to the anode of D103.

Low-Pass Filter

The low-pass filter (L116, L115 and L114) at the antenna connector is a seven element low pass. The lowpass filter has two intermediate poles at 900 MHz and 1300 MHz for a stop band which limits the conducted harmonic output to less than -16 dBm. Its in-band insertion loss is approximately 0.5 dB. The impedance of this filter is approximately 50 ohms as seen by the antenna, and is matched with the output matching network of the final transmitter amplifier Q105.

Transmit DC Switch

The DPTF signal (low) from the Audio/Logic section turns on Q805. Turning on Q805 passes the B + (dropped by VSAT) on to the transmit circuitry (B + SW).

RECEIVE CIRCUIT

The dual conversion receive circuit consist of a receive front end, a 45 MHz first IF and a 455 kHz second IF with an FM detector. See Figure 2 for a block diagram. The output from the FM detector is used for all audio processing and squelch functions.

Front End

The RF signal is coupled from antenna jack J3 to the T/R Board through antenna connector W1. The receive signal is then fed through the transmitter low pass filter composed of inductors L116, L115, and L114, and then to the receiver preselector filter. The preselector filter includes inductors L401 and L402. The output of this filter is coupled by C405 to the input of transistor Q402. Transistors Q402 and Q401 make up the RF cascode amplifier stage, whose gain is approximately 15 dB with low noise figure. The output of amplifier Q401 is connected to pin 3 of mixer Z402 through the second RF filter section composed of L403 and L405. The synthesized local oscillator signal is amplified by LO buffer transistor Q421 and is filtered by the 2-pole filter L421 and L422. The output of this filter is coupled to pin 1 of mixer Z402. The local oscillator drive level to the mixer is + 4 dBm typical. The LO frequency is 45 MHz below the receive frequency (low side injection).

45 MHz IF

The mixer output is connected to transistor Q501. This stage provides gain and matches the low impedance mixer output to the high impedance input of the 45 MHz 4-pole crystal filter Z501 and Z502. The crystal filter output is amplified by transistor Q502, whose output is connected through C508 to the second mixer input circuit of Mixer/ Limiter/FM Detector U501. Inductor L505 sets the 45.455 MHz frequency of the second LO crystal Y501. The second mixer output at 455 kHz is filtered by a 4-pole ceramic filter Z503, and is further amplified and limited within U501. The audio output level from U501 is set by quadrature detector coil L506. The audio output is filtered by R511 and C517, and is routed to the audio processing circuits through VOL SQ HI.

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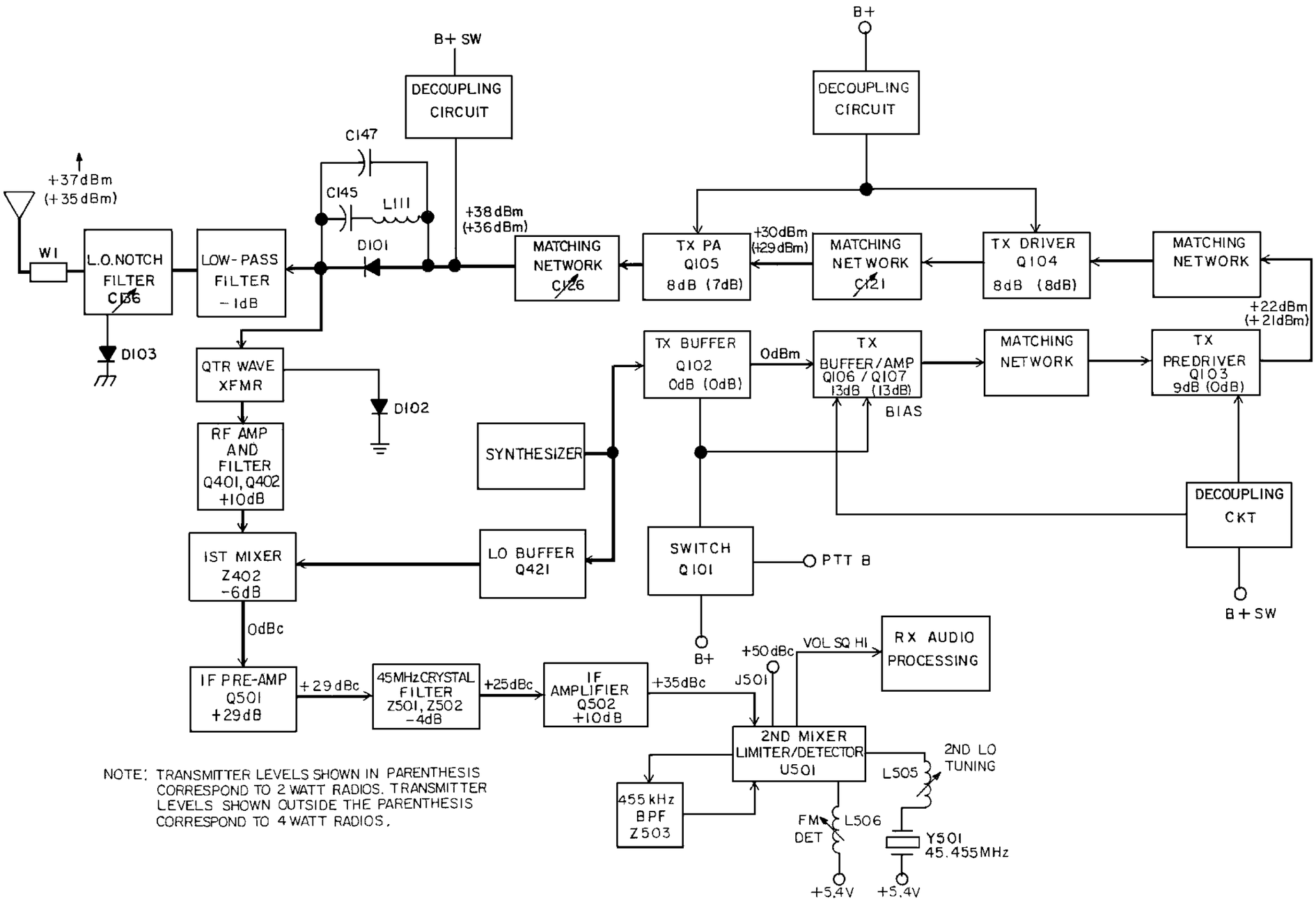

Figure 2 - Transmit/Receive Block Diagram

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TRANSMIT AUDIO PROCESSING

Audio from the microphone is applied to mic preamplifier circuit consisting of Q301 and associated circuitry, which includes a high-pass filter that rolls off frequencies below 300 Hz to prevent voice blocking during channel guard transmissions. The output of Q301 is fed to a 6 dB/octave pre-emphasis network consisting of capacitor C303 and resistor R331 and then to amplifier-limiter U301D. The output of U301D passes through the post-limiter filter U301.1. The Mic Mute switch Q303 is used to keep microphone audio from getting to the Synthesizer Board when not in transmit.

The transmit signal is applied to the low-frequency boost circuit U301B and associated circuitry, which provides an increasing output level as the input frequency decreases below 20 Hz. The shape of the response curve is shown in Figure 3. This shape is intended to be the mirror image of the synthesizer frequency response curve. The combined result of these two curves provide relatively flat modulation below 20 Hz, which is required for Digital Channel Guard modulation. The output of U301B is fed to the synthesizer board at pin J6-2.

RECEIVE AUDIO PROCESSING

Voice Path

Receive audio (VOL SQ HI) enters the audio processing circuitry and includes voice, Channel Guard tones, and higher frequency noise used for squelch. Voice audio takes the path through VOL POT R620 where frequencies below 300 Hz are attenuated by the Channel Guard reject filter consisting of U601-A and associated circuitry.

The voice output from the CG reject filter is coupled through receive mute switch transistor Q603 to the volume pot R620. Here the 500 Hz Alert tone, generated by the microprocessor, can be added to the receive audio. The volume pot output is coupled to audio amplifier device U602B. Power is supplied to the audio amplifier by transistor Q602 and controlled by the MUTE line from the microprocessor. Amplifier U602B drives the speaker and is also connected to the accessory connector on the side of the radio.

Squelch Path

The squelch circuit operates on the noise components contained in the discriminator output. The signal (VOL SQ HI) is applied to a high-pass filter consisting of U501 and associated circuitry. The output at U501-11 is noise above 6 kHz. The noise level is adjusted by squelch pot R619.

The noise output from the squelch pot is rectified and amplified by noise detector U603.4. This signal is compared to a DC reference level by U603.3. The switched output level is connected to squelch switch U603.2. If the rectified noise is more than approximately 220 mVdc the CAS line is high and the microprocessor mutes the audio. R631, R634 and R635 provide about 2 dB of hysteresis. The microprocessor outputs SQ SW and HYST are used to provide rapid carrier detection during Standby operation.

The threshold level is temperature compensated at cold temperatures. This is necessary because of a related drop in the discriminator output noise level. Thermistor R639 has a negative temperature coefficient. At 25C and above, the thermistor has little effect on the amplifier output U603D, pin 14. At temperatures below 25C, the resistor increases exponentially, thereby increasing the gain of the amplifier. This gain approximately tracks the drop at the discriminator output.

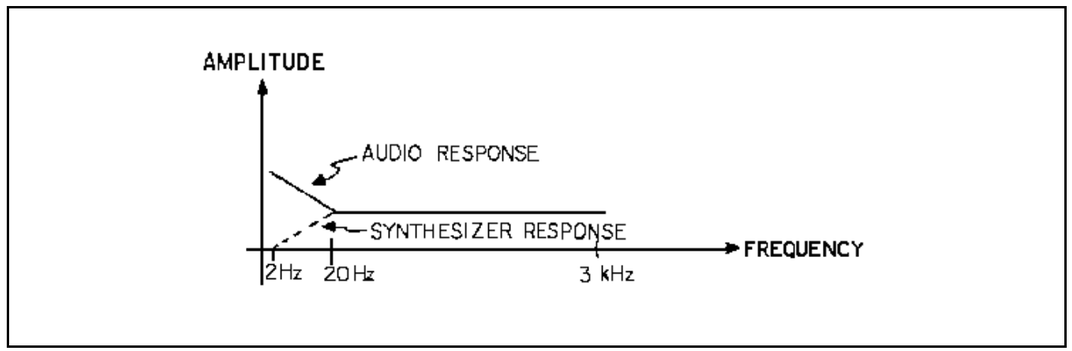

Figure 3 - Audio Response Curve

Limited Tone Data Path

Limited Tone Data is the 5 Volts (Peak-to-Peak) representation of a received tone and is fed to the microprocessor where the actual tone decoding occurs. It is first passed through a low-pass filter (U605. 1 and U605.2) for voice rejection and then to a voltage comparator (Q605 and Q607). The filter has a breakpoint at 210 Hz.

Type 99 tones taken from the output of the Channel Guard Reject Filter in the voice path are fed through Q604 directly to the comparator circuit and subsequent decoding.

REGULATORS

5.4 Volt Regulator

The 5.4 volt regulator circuit supplies a regulated 5.4 volts to all circuits requiring a stable reference voltage. This regulated voltage is generated by voltage reference diode U801 and transistors Q801, Q802. Diode U801 provides 2.5 volts which is stable with both temperature and battery voltage. Pin 1 of U803 is connected to the resistor divider R805 and R806. Pin 3 of U801 will drive the base of Q802 as required to keep the output of pass transistor Q801 at 5.4V.

Receiver 5.4 Volts

The regulated 5.4 volts is switched through transistor Q804 to the Receiver circuitry as RX 5.4V. While in standby, this voltage is switched ON for 25 milliseconds, OFF for 75 milliseconds. Once a carrier is detected, the voltage is switched ON until the carrier is gone. When the radio is in Transmit, the voltage is switched OFF.

Synthesizer 5.4 Volts

The regulated 5.4 volts is switched through transistor Q809 to the Synthesizer Board as SYNTH 5.4V. While in standby, this voltage is switched ON for 25 milliseconds, OFF for 75 milliseconds. Once a carrier is detected, the voltage is switched ON until the carrier is gone. When the radio is in Transmit, the voltage is switched ON.

Switched B +

When in Transmit, the microprocessor pulls the Delayed PTF line low. This turns on transistor Q805, which supplies switched B + volts (7.5V for 2 watt operation, 10V for 4 watt) to the first three stages of the transmitter circuit and antenna switch consisting of D101, D102, and associated circuitry.

+ 5 Volt Regulator

A + 5 volt regulator (U802), working off of the Battery B + , supplies power to the microprocessor and all other circuitry requiring + 5 volts.

Low Voltage Reset

The low voltage reset consists of Q806, Q807 and associated circuitry. This circuit provides the microprocessor with the necessary reset signal during the power up routine and also resets the microprocessor when the battery falls below approximately 4.5 volts.

Synthesizer Programming

After a reset, when toggling between transmit and receive, and any time a new channel is selected, the microprocessor must reprogram the synthesizer through SYN CLK (P3.6), SYN DAT (P3.5) and SYN EN (P3.4). When locked, the LOCK DET line (J6-4) is high.

Microprocessor Xtal Frequency Pull

Port P2.5 of the microprocessor is used to switch a 33 pF capacitor (C730) into the crystal oscillator circuit (Y701). The effect of adding this capacitor is to move or pull the crystal frequency approximately 250 ppm. This feature is to keep harmonics of the microprocessor ALE line away from the receive channel frequency. Programming for this is automatic when channel frequencies are initially programmed.

Alert Tone

The microprocessor generates a 500 Hz ALERT tone (P0.7) used to signal the user of a critical event, such as the synthesizer failing to lock. It is introduced into the voice path at the Volume Pot R620. The ALERT tone can be disabled by the programmer.

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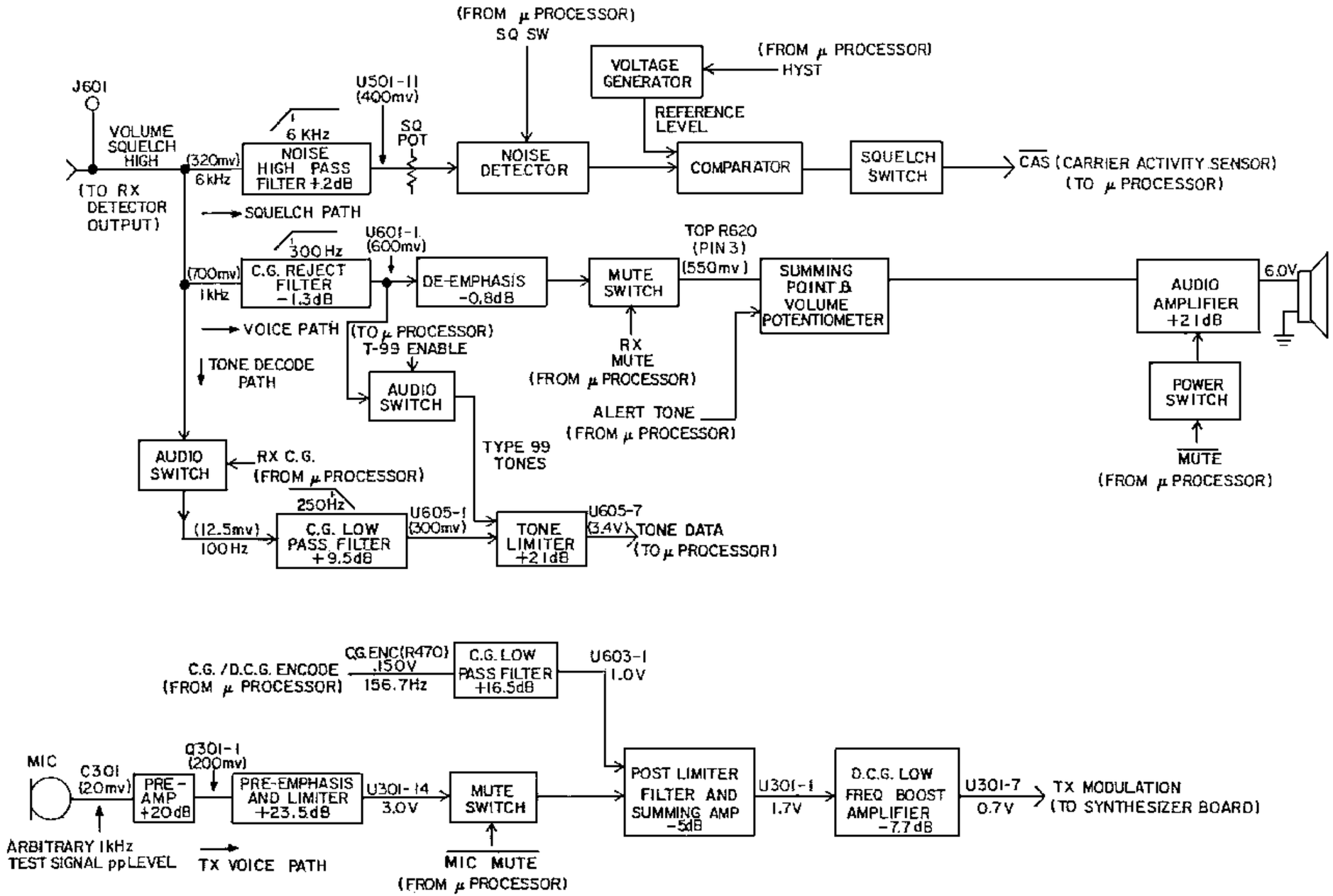
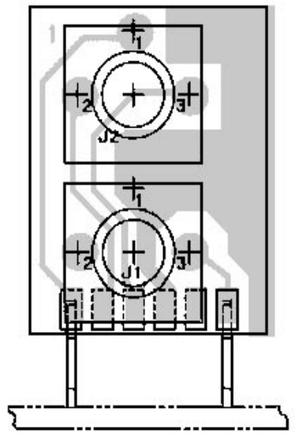


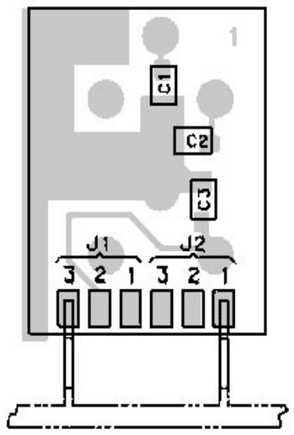
Figure 4 - Audio Processing Block Diagram

JACK COMPONENT BOARD 19C851890G1

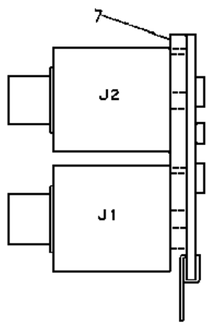
COMPONENT SIDE

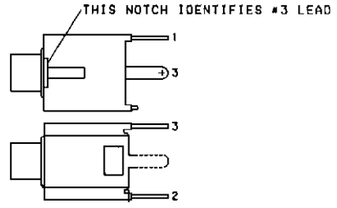


SOLDER SIDE



(19C8511890, Sh. 1, Rev. 1)
(19C8511889, Sh. 1, Rev. 1)
(19C8511889, Sh. 2, Rev. 1)



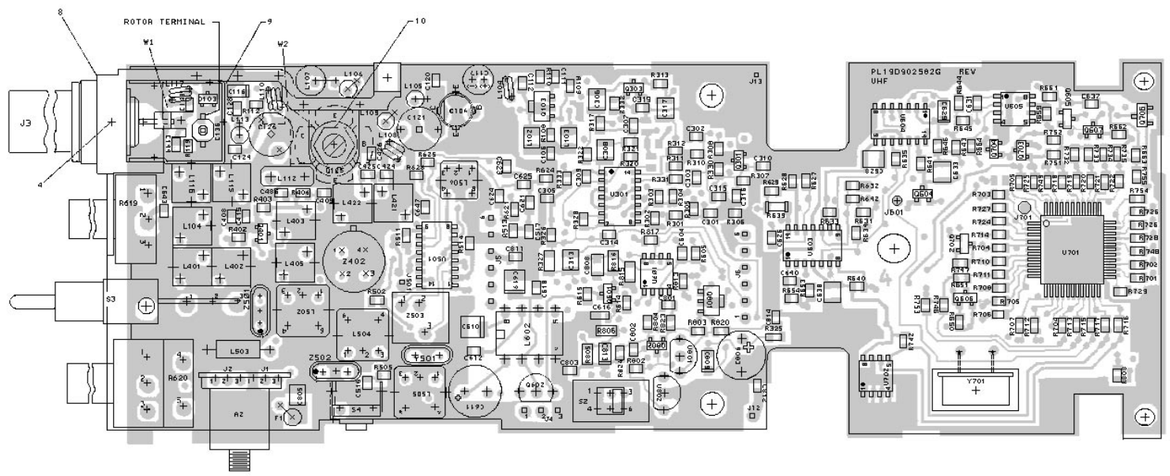


DETAIL "A"
J1 / J2

(19C8511890, Sh. 1, Rev. 1)
(19C8511889, Sh. 2, Rev. 1)

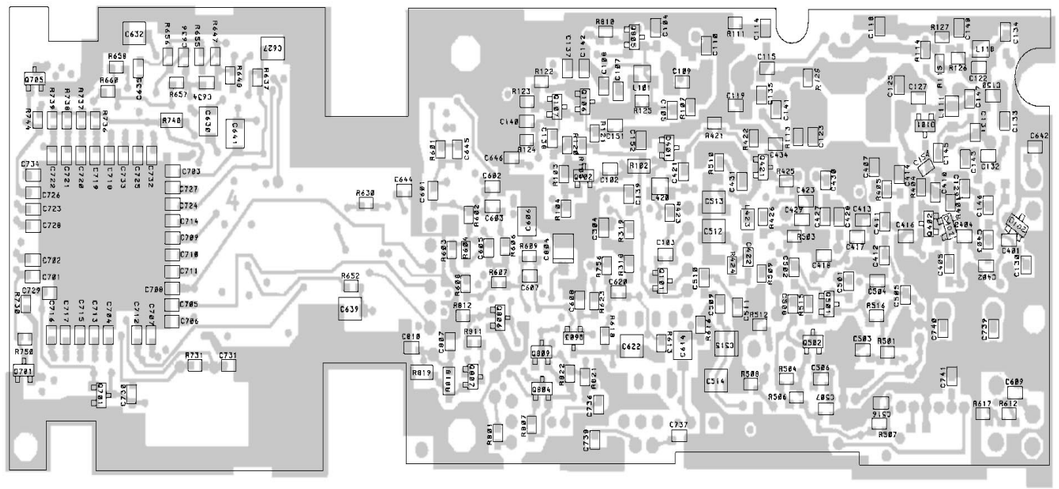
T/R BOARD 19D902582G1, G2 & G3

COMPONENT SIDE



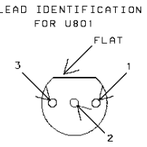
(19D902582, Sh. 2, Rev. 4)
(19D902583, Layer 4, Rev. 4)

SOLDER SIDE



(19D902582, Sh. 1, Rev. 5)
(19D902583, Layer 1, Rev. 4)

LEAD IDENTIFICATION FOR U801

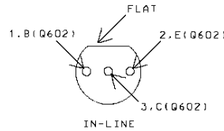


IN-LINE

NOTE: CASE SHAPE IS DETERMINING FACTOR FOR LEAD IDENTIFICATION.

TOP VIEW

LEAD IDENTIFICATION FOR Q602 & U802



IN-LINE

NOTE: CASE SHAPE IS DETERMINING FACTOR FOR LEAD IDENTIFICATION.

TOP VIEW

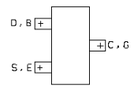
LEAD IDENTIFICATION FOR Q103 AND Q801 (TOP VIEW)

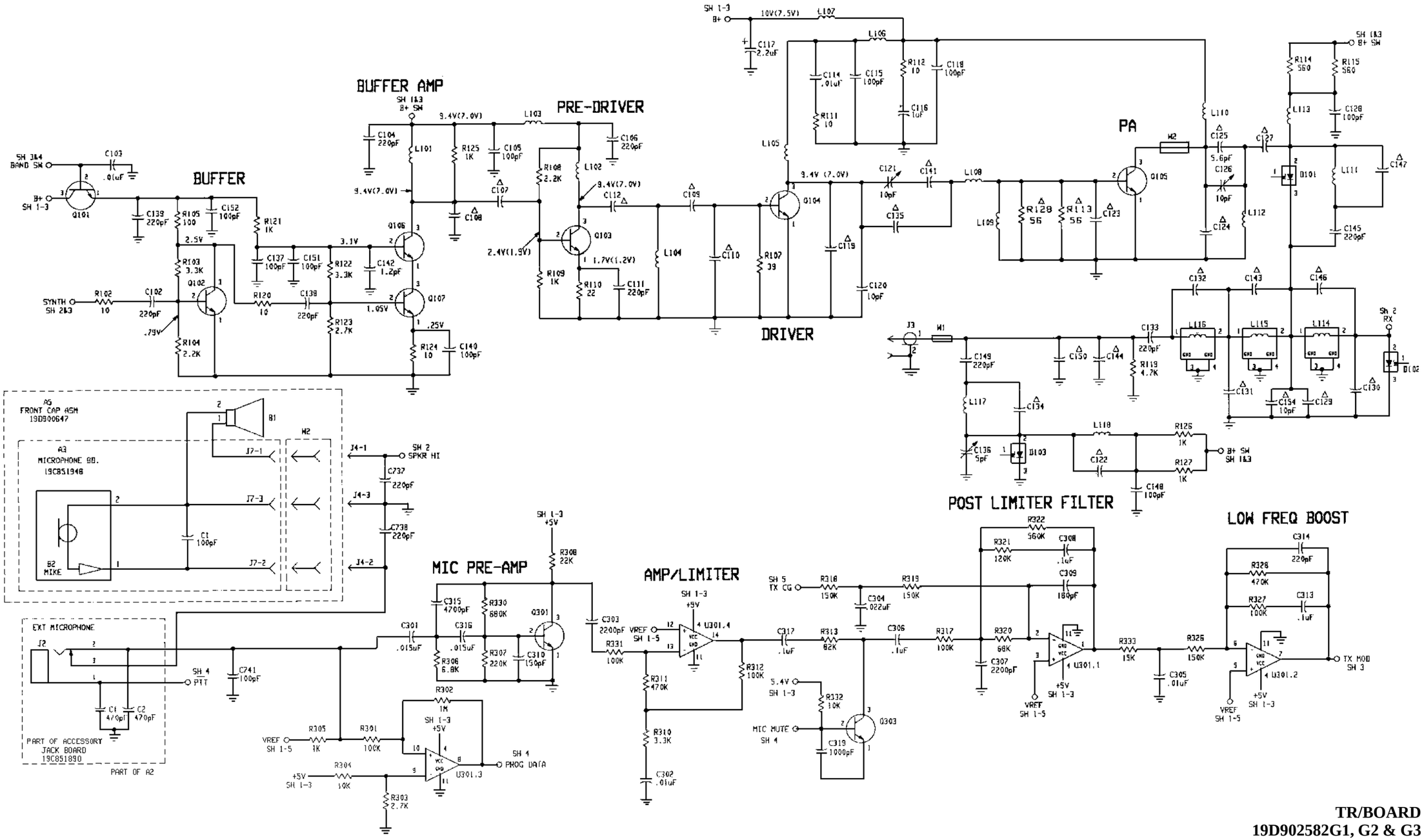
LEAD IDENTIFICATION FOR D102,D103,D301,D701 & D702 (SOT) DIODES

(TOP VIEW)

LEAD IDENTIFICATION FOR Q101,Q102,Q106,Q107,Q401,Q402, Q501,Q502,Q603-Q606,Q701,Q705, Q706,Q804-Q807 & D809 (SOT) TRANSISTORS

(TOP VIEW)

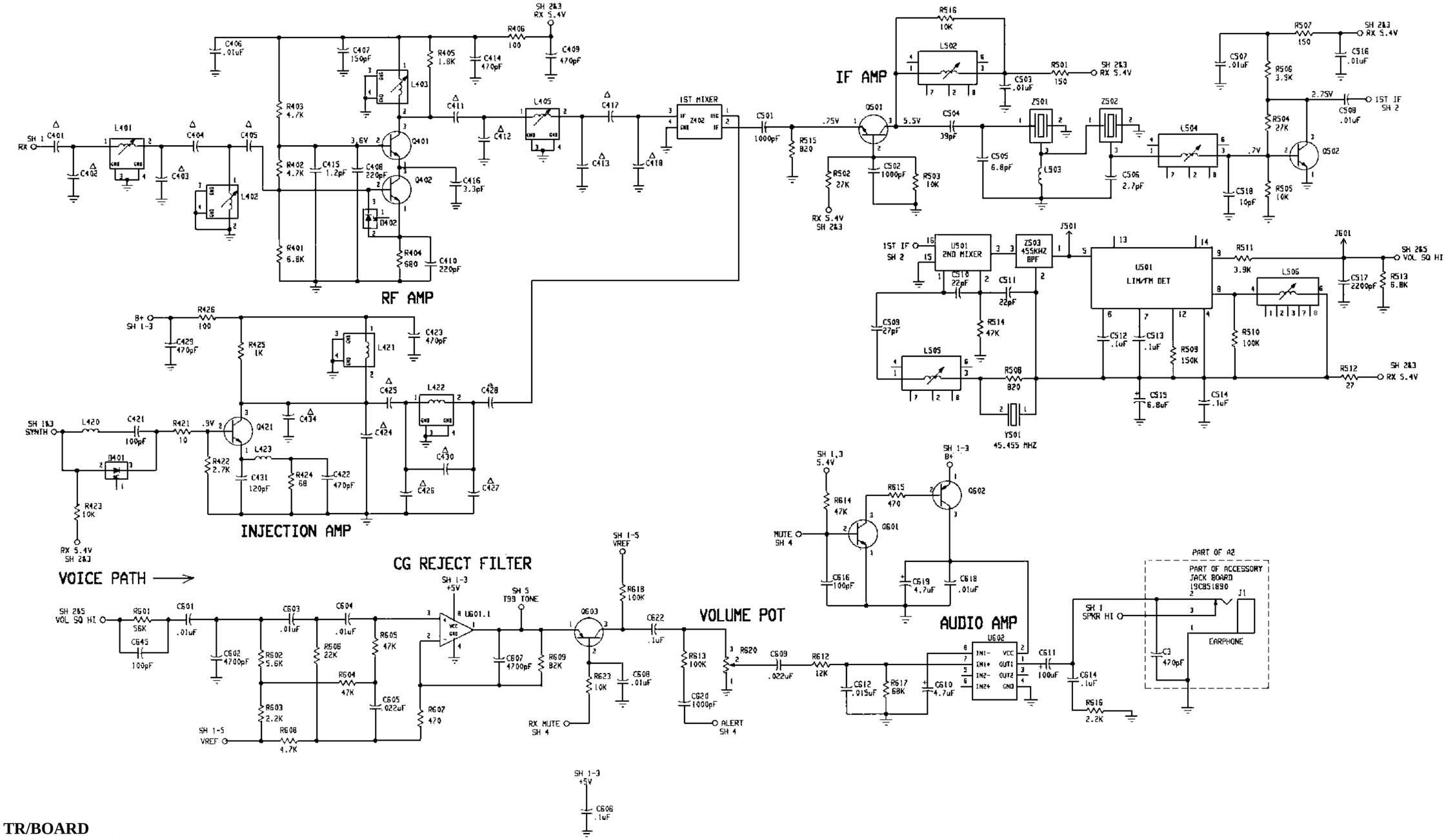




TR/BOARD
19D902582G1, G2 & G3

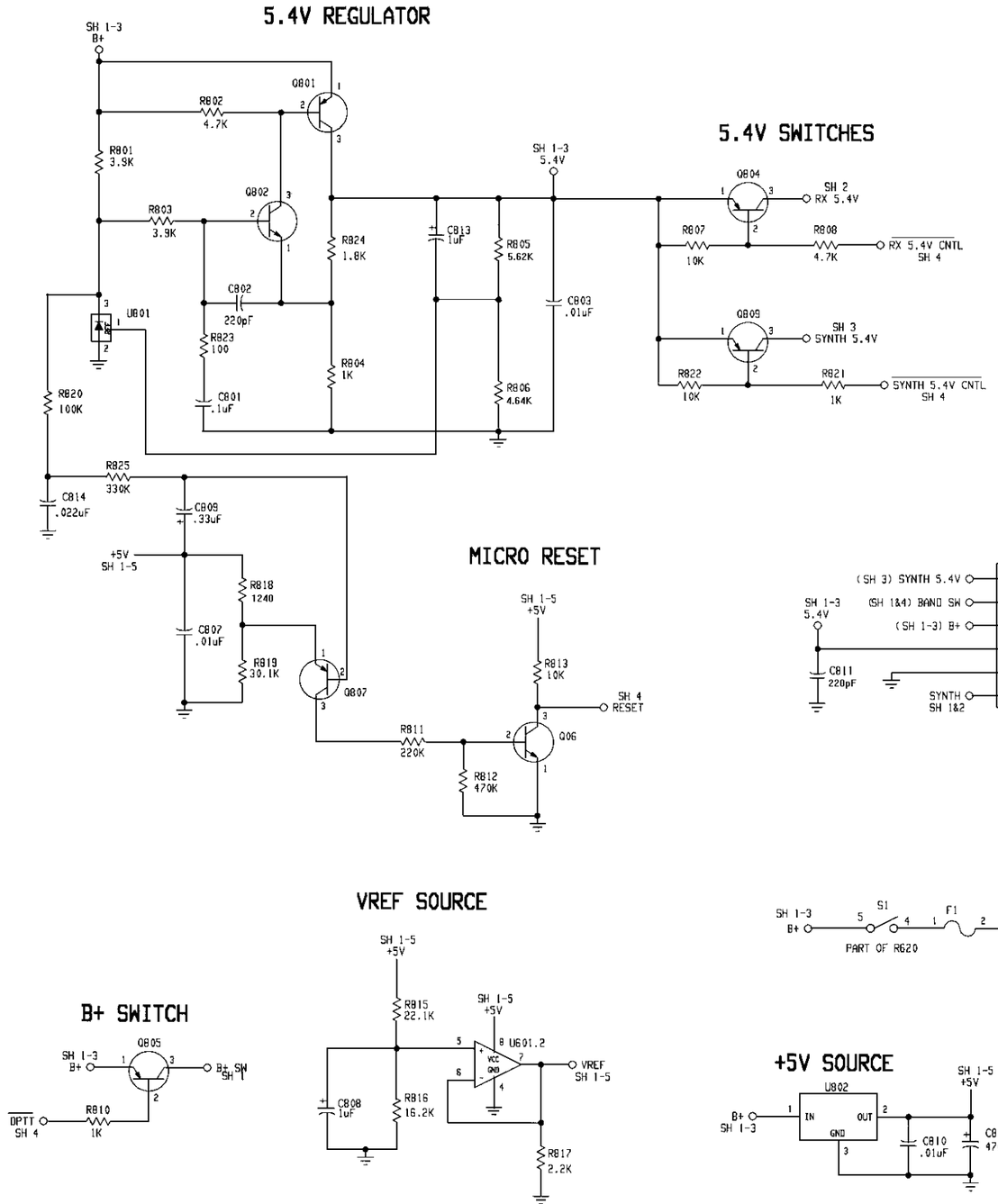
(19D902584, Sh. 1, Rev. 10)

T/R ASSEMBLY



TR/BOARD
19D902582G1, G2 & G3

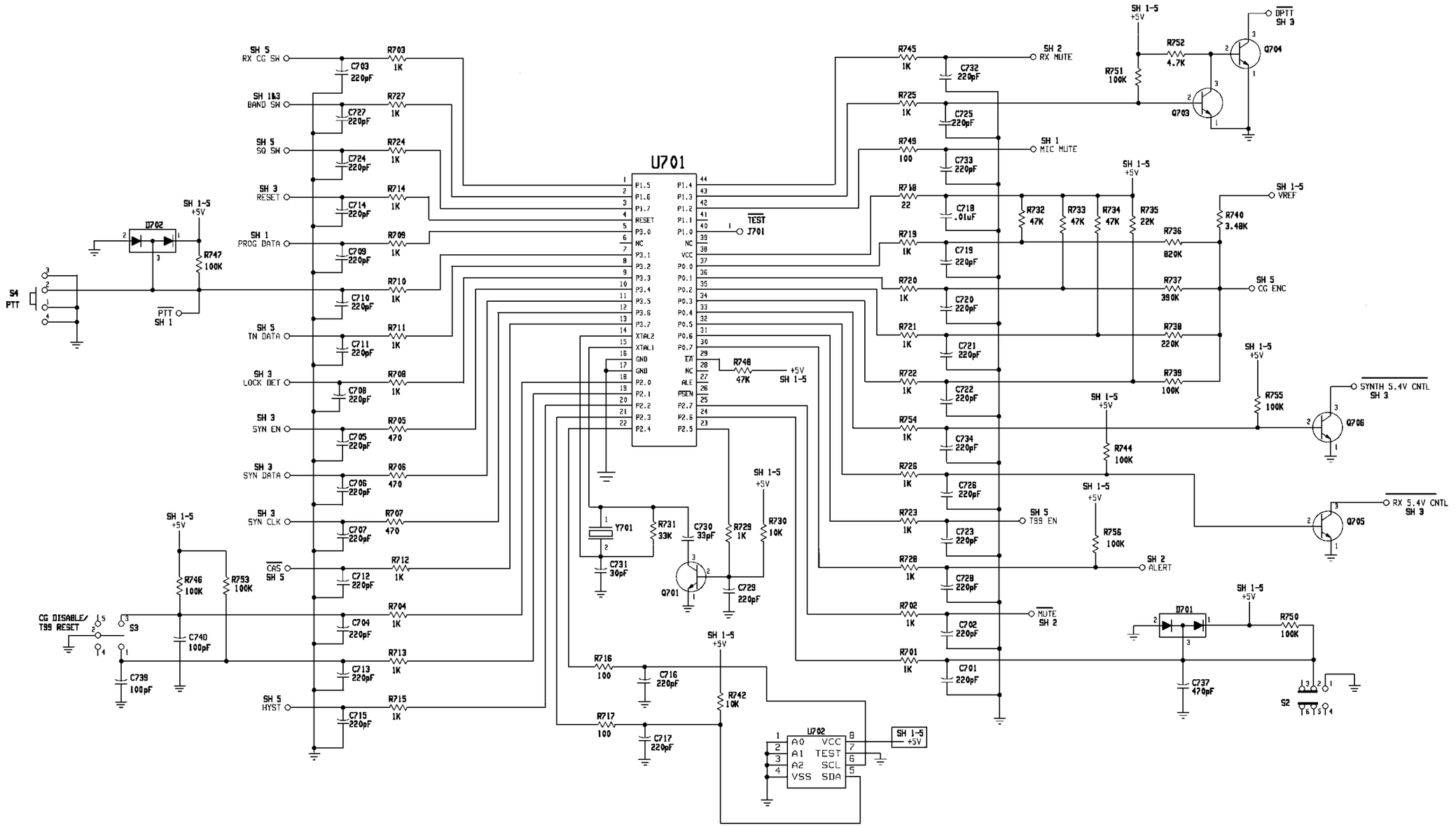
(19D902584, Sh. 2, Rev. 8)



T/R ASSEMBLY

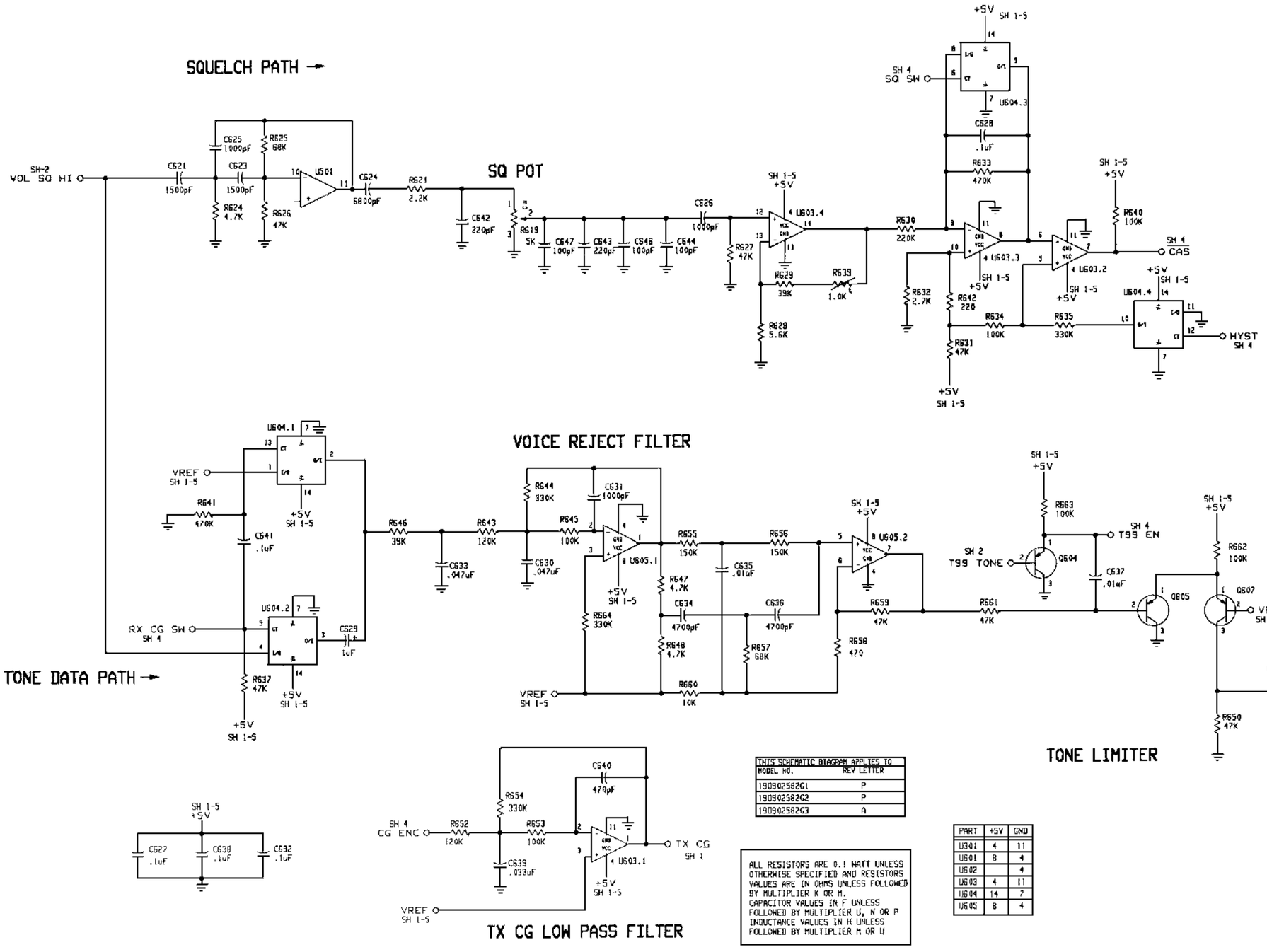
TR/BOARD
19D902582G1, G2 & G3

(19D902584, Sh. 3, Rev. 5)



TR/BOARD
19D902582G1, G2 & G3

(19D902584, Sh. 4, Rev. 2)



THIS SCHEMATIC DIAGRAM APPLIES TO	
MODEL NO.	REV LETTER
19D902582G1	P
19D902582G2	P
19D902582G3	A

PART	+5V	GND
U301	4	11
U601	8	4
U602		4
U603	4	11
U604	14	7
U605	8	4

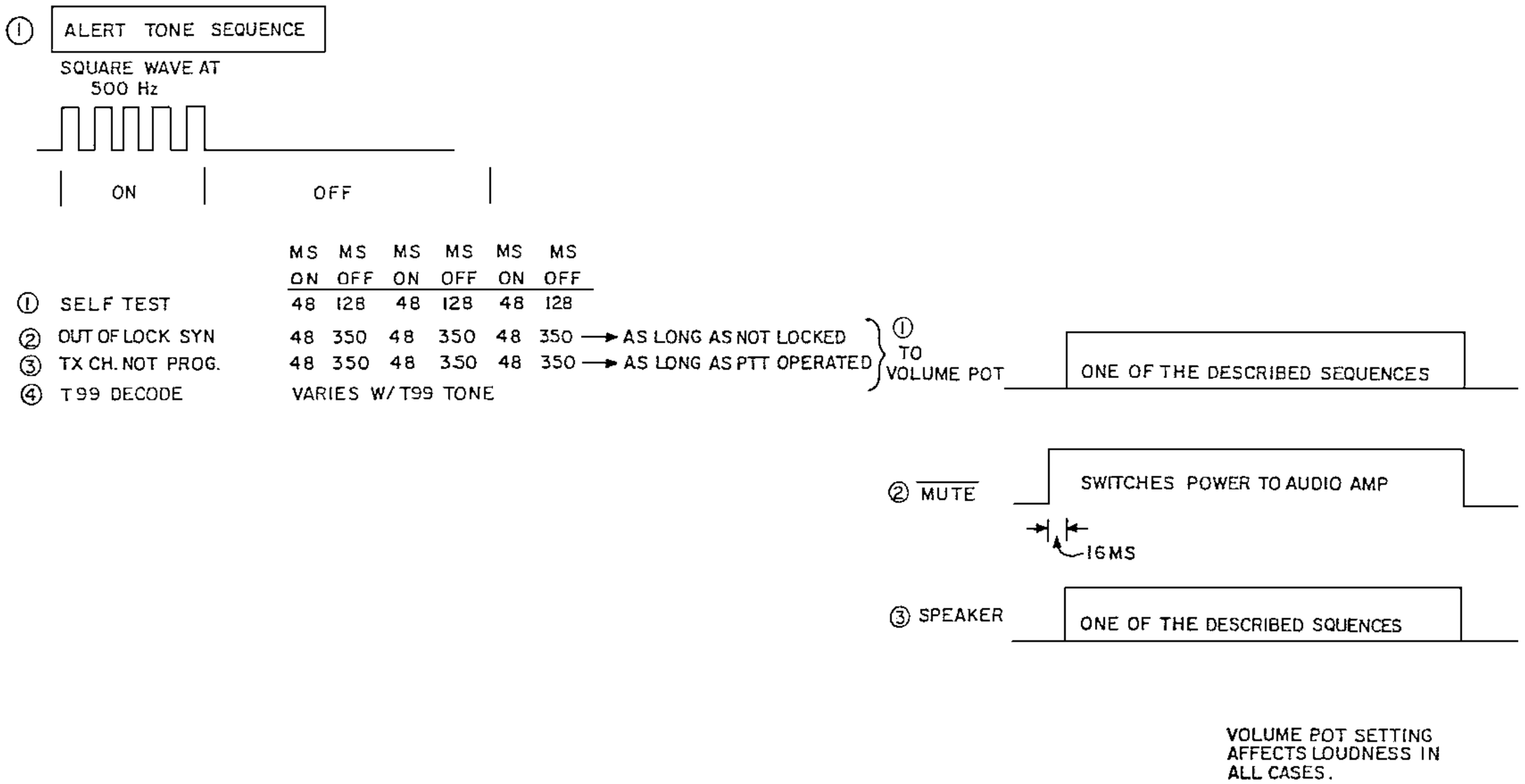
ALL RESISTORS ARE 0.1 WATT UNLESS OTHERWISE SPECIFIED AND RESISTORS VALUES ARE IN OHMS UNLESS FOLLOWED BY MULTIPLIER K OR M. CAPACITOR VALUES IN F UNLESS FOLLOWED BY MULTIPLIER U, N OR P INDUCTANCE VALUES IN H UNLESS FOLLOWED BY MULTIPLIER M OR U

Δ COMPONENT	GROUP 1 403-440 MHZ	GROUP 2 440-470 MHZ	GROUP 3 470-512 MHZ
C107	4.7P	2.7P	2.7P
C108	3.3P	2.7P	1.5P
C109	27P	15P	12P
C110	12P	10P	5.6P
C112	33P	27P	12P
C119	12P	12P	6.8P
C122	3.3P	2.2P	1.8P
C123	47P	39P	33P
C124	15P	15P	10P
C125	8.2P	5.6P	3.9P
C127	12P	8.2P	5.6P
C129	8.2P	5.6P	4.7P
C130	10P	10P	8.2P
C131	5.6P	22P	5.6P
C132	1.5P	——	1.2P
C134	6.8P	5.6P	3.3P
C135	3.3P	4.7P	3.9P
C141	33P	47P	39P
C143	1.8P	——	1.5P
C144	2.2P	2.2P	1.8P
C146	3.9P	2.2P	1.8P
C147	1.2P	1P	0.7
C150	2.2P	8.2P	1.8P
C154	——	10P	——
C401	3.9P	3.3P	3.3P
C402	3.9P	2.7P	2.2p
C403	39P	33P	27P
C404	3.9P	3.3P	2.2P
C405	2.7P	1.8P	2.2P
C411	4.7P	3.3P	2.7P
C412	82P	82P	68P
C413	3.3P	2.2P	1.8P
C417	3.3P	2.7P	2.2P
C418	15P	12P	10P
C424	5.6P	4.7P	4.7P
C425	3.3P	2.2P	2.2P
C426	12P	5.6P	4.7P
C427	12P	8.2P	6.8P
C428	15P	12P	10P
C430	5.6P	5.6P	4.7P
C434	2.7P	1.8P	——
R128	——	56	——
R113	100	56	100

T/R ASSEMBLY

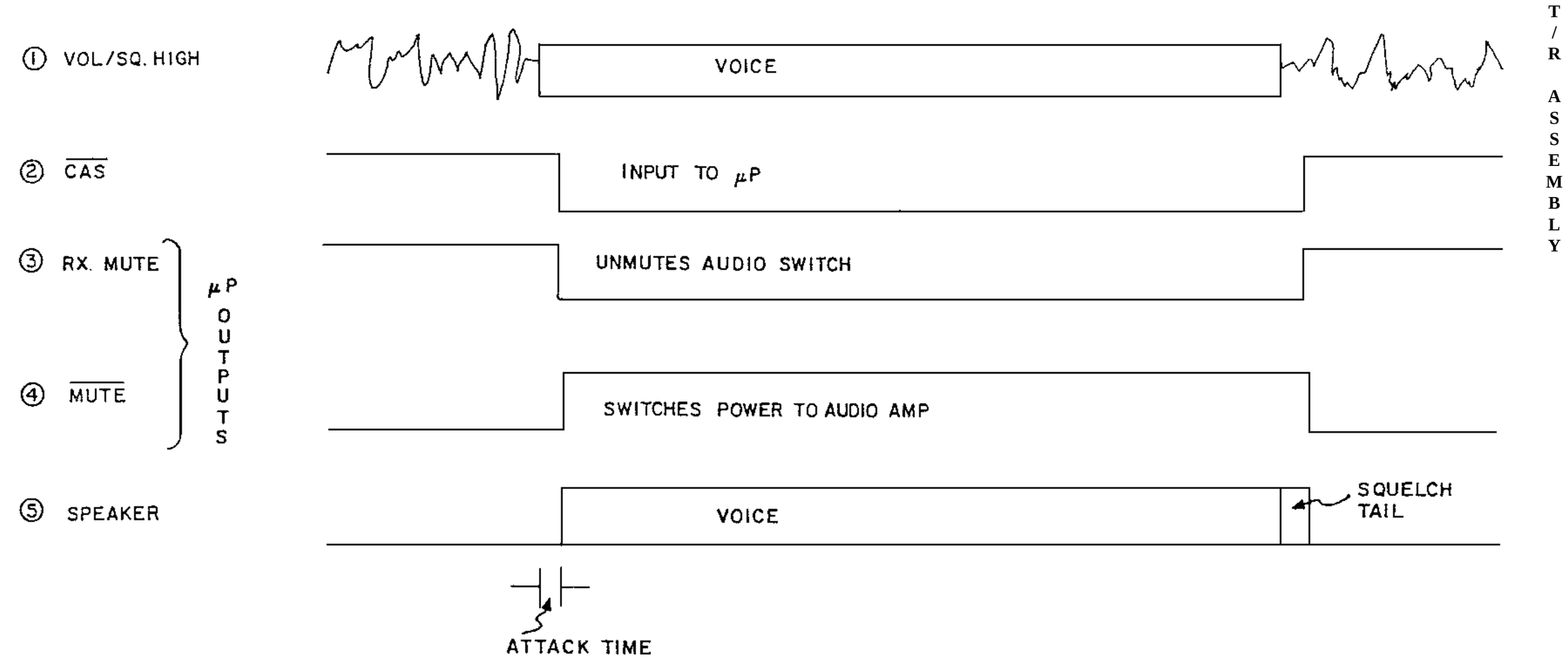
TR/BOARD
19D902582G1, G2 & G3

(19D902584, Sh. 5, Rev. 14)

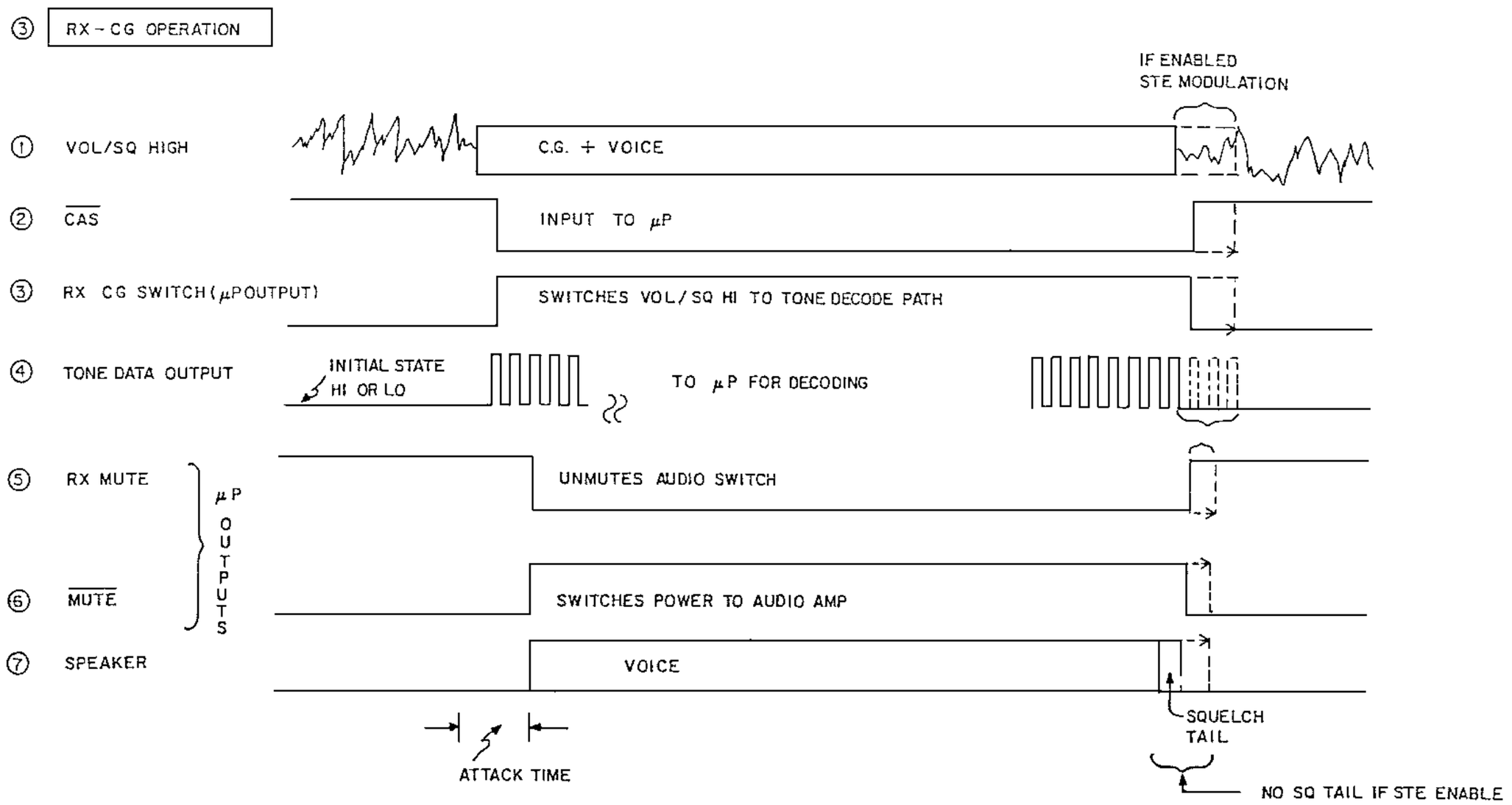


ALERT TONE SEQUENCE

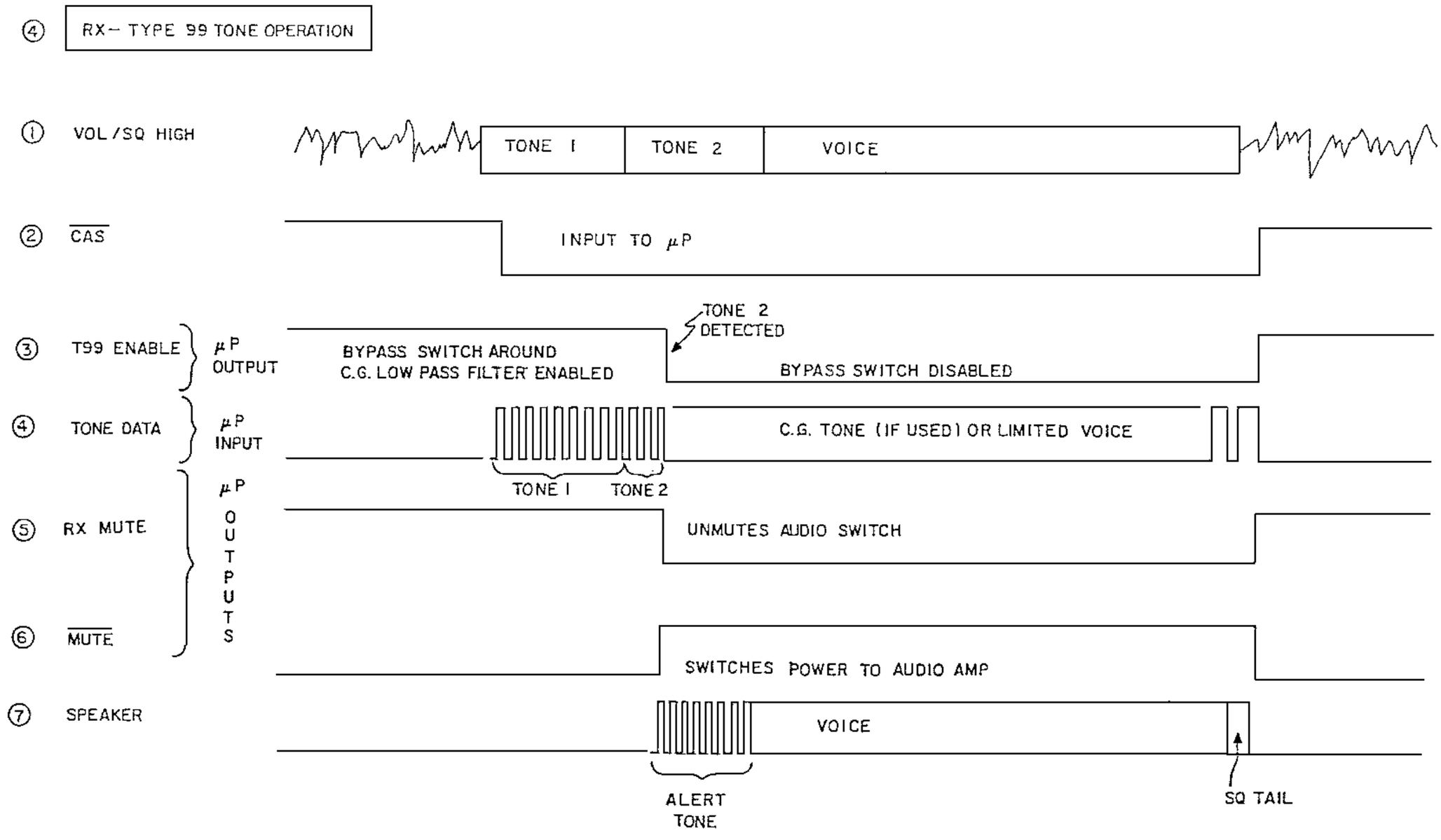
② RX — SQUELCH OPERATION



RX SQUELCH OPERATION

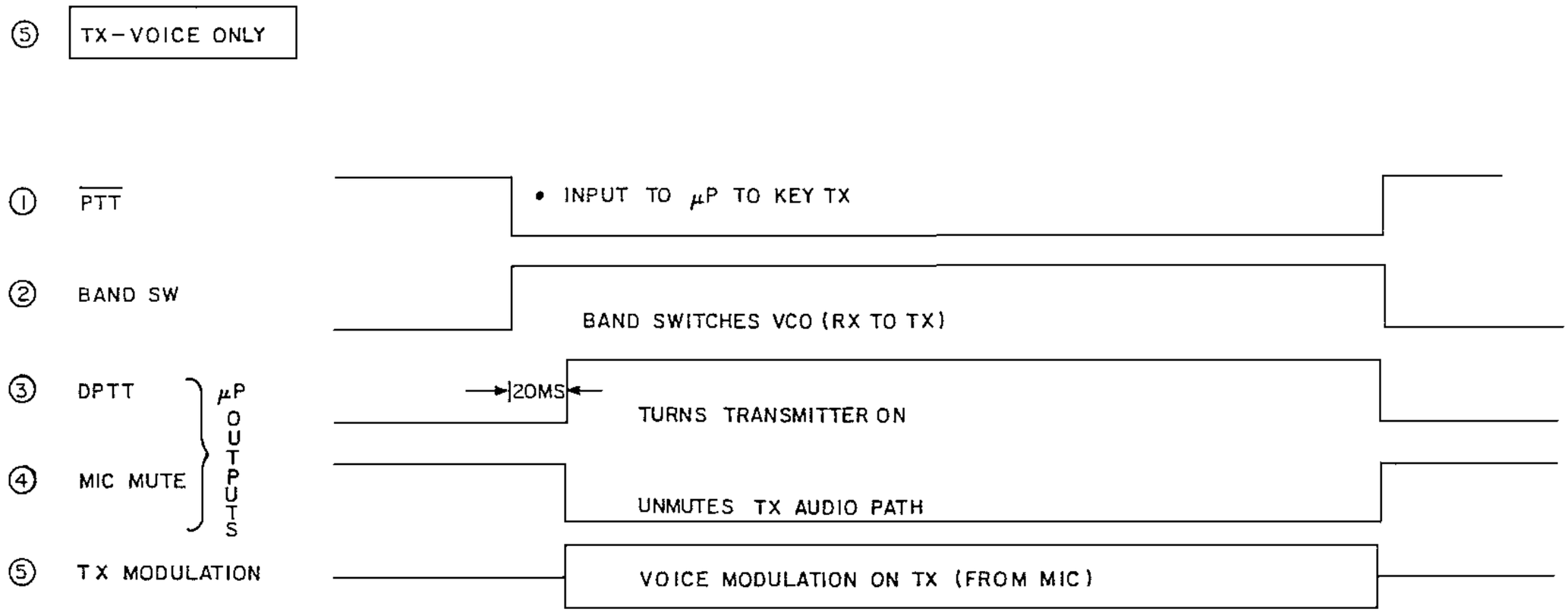


RX CHANNEL GUARD OPERATION

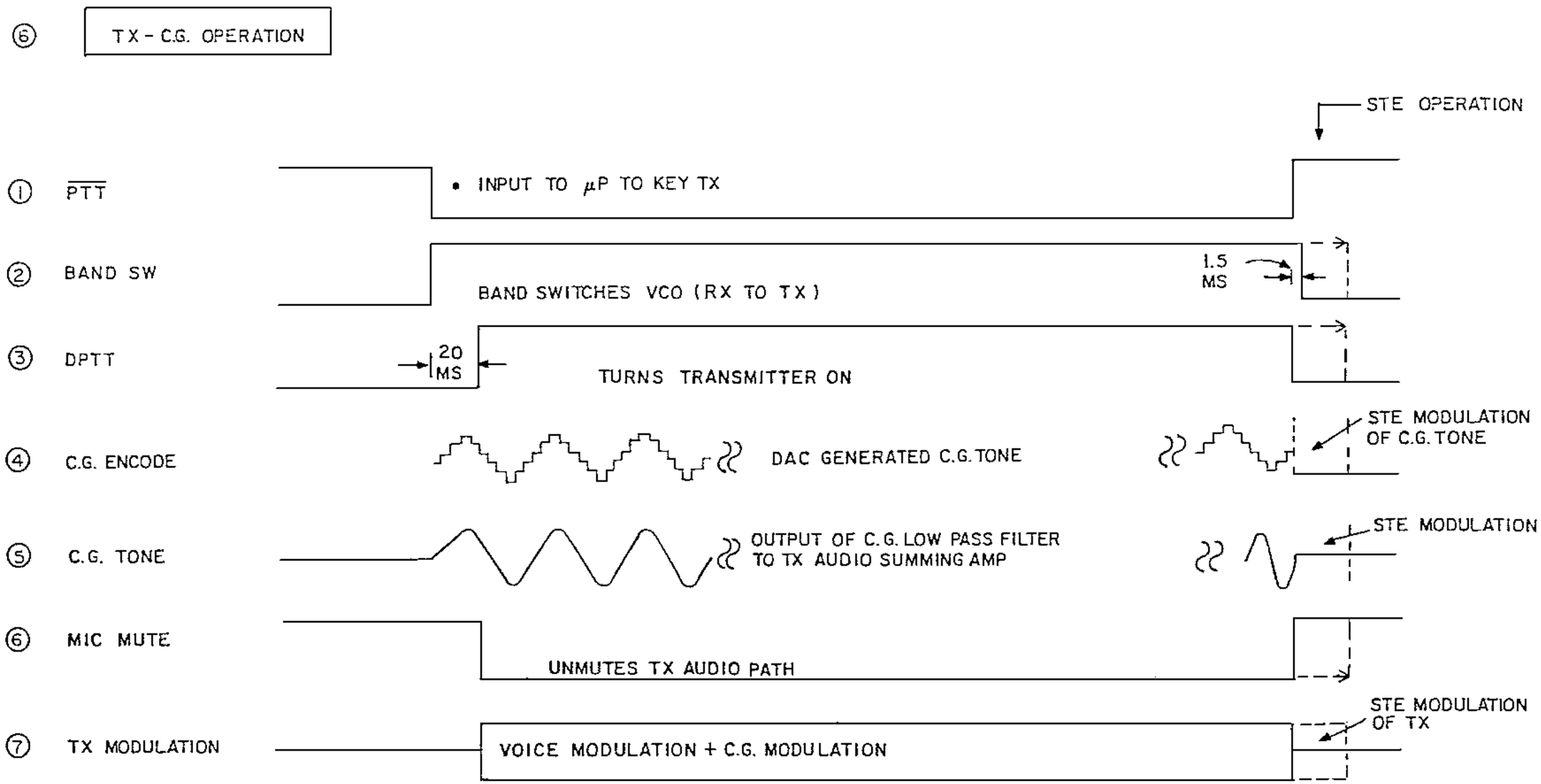


RX TYPE 99 OPERATION

T/R ASSEMBLY



TX VOICE ONLY

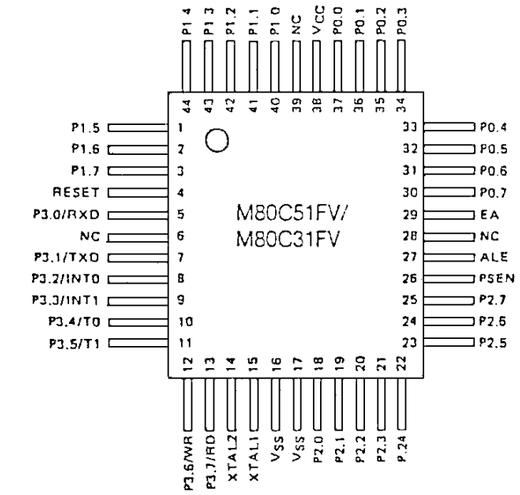


T/R ASSEMBLY

TX CHANNEL GUARD OPERATION

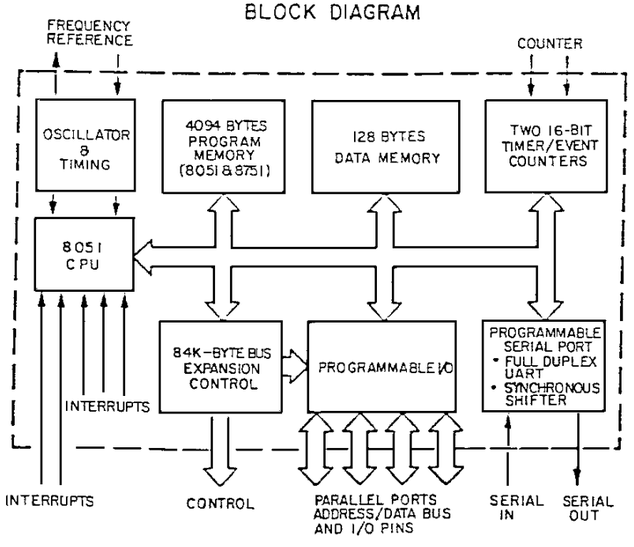
U701:

CHMOS 8-BIT MICROCOMPUTER
19A704345P20,21,30



PIN IDENTIFICATION

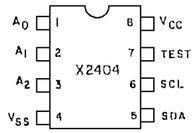
BLOCK DIAGRAM



U702:

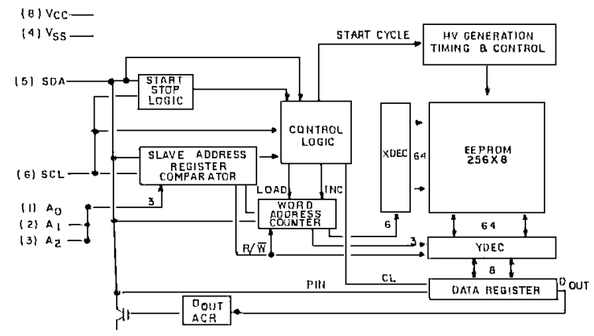
DIGITAL 256X8 EEPROM
19A704724P2 & P204

PIN CONFIGURATION



1 A_0 → TO V_{SS}
2 AND 3 A AND A ADDRESS INPUTS
4 V_{SS}
5 SDA SERIAL DATA — I^2C BUS
6 SCL SERIAL CLOCK — I^2C BUS
7 TEST INPUT — TO V_{SS}
8 V_{CC}

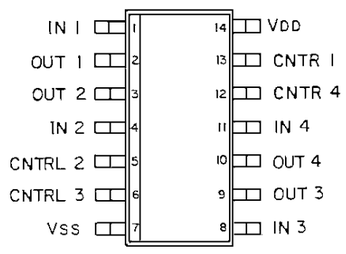
FUNCTION DIAGRAM



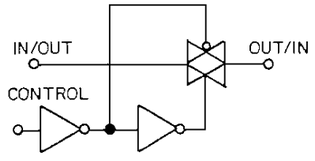
U604:

QUAD ANALOG SWITCH/MULTIPLEXER
19A702705P1,P4
(CMOS)

PIN CONFIGURATION



LOGIC DIAGRAM

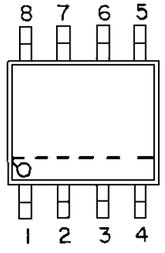


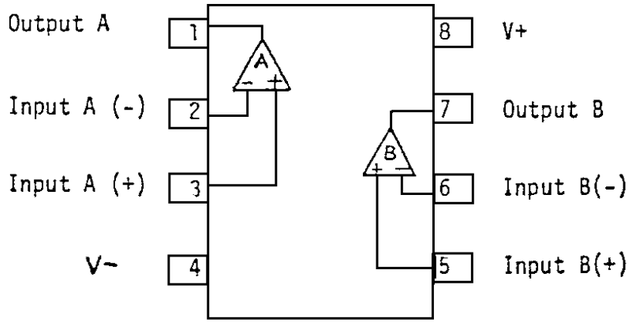
(1/4 OF DEVICE SHOWN)

CONTROL	SWITCH
0	OFF
1	ON

U601, U605:

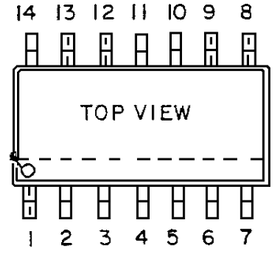
OPERATIONAL AMPLIFIER
19A702293P2 & P3

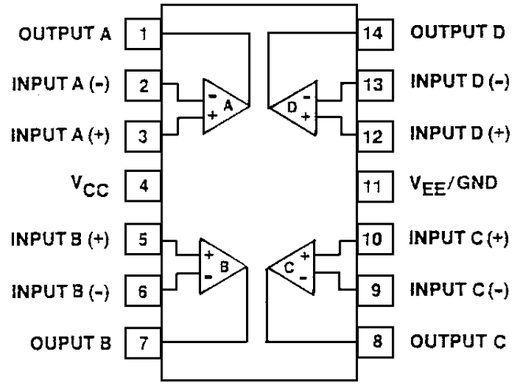




U301, U603:

OPERATIONAL AMPLIFIER
19A702293P1



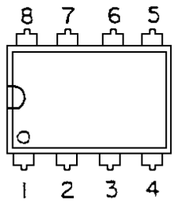


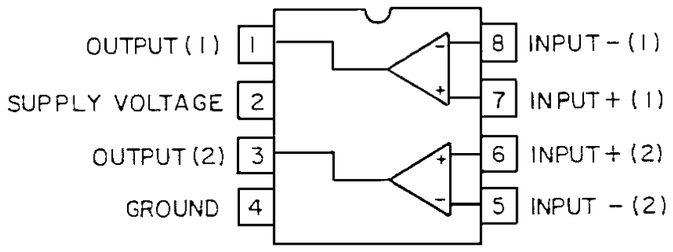
PIN 1 MAY BE IDENTIFIED BY INDENT OR CHAMFER

T/R ASSEMBLY

U602:

AUDIO AMPLIFIER
19A705452P1, P2

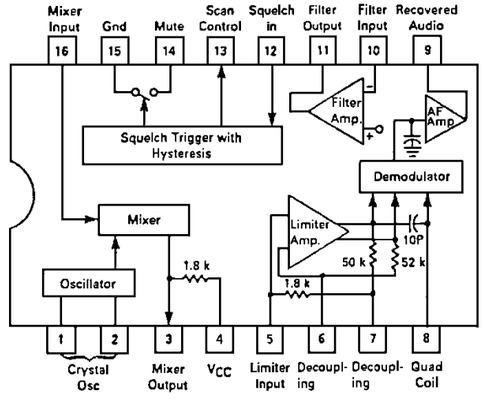




(TOP VIEW)

U501:

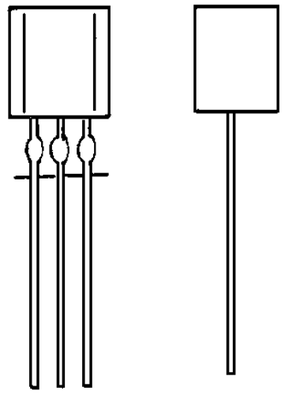
LINEAR IF AMPL & DETECTOR
19A704619P2



PIN IDENTIFICATION (TOP VIEW) AND FUNCTIONAL BLOCK DIAGRAM

U801:

ADJUSTABLE SHUNT REGULATOR
19A702939P1 &P2

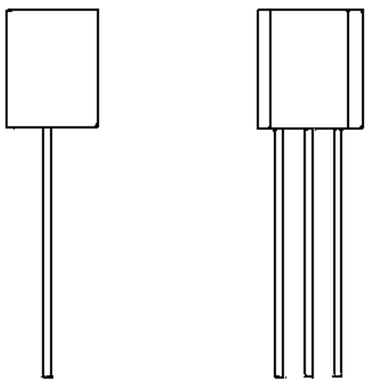


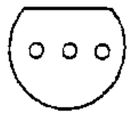
BOTTOM VIEW

TO 92 PACKAGE
PIN 1 - REFERENCE
PIN 2 - ANODE
PIN 3 - CATHODE

U802:

LINEAR
19A702536P1





BOTTOM VIEW

PIN 1 INPUT
PIN 2 OUTPUT
PIN 3 GROUND

TRANSMIT/RECEIVE ASSEMBLY
19D902727G3 403-440 MHz
19D902727G4 440-470 MHz
19D902727G5 470-512 MHz
ISSUE 4

SYMBOL	PART NUMBER	DESCRIPTION
A1		TRANSMIT/RECEIVE BOARD 19D902582G1 403-440 MHz 19D902582G2 440-470 MHz 19D902582G3 470-512 MHz
A2		JACK COMPONENT BOARD 19C851890G2
		——— CAPACITORS ———
C1 thru C3	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
		——— JACKS ———
J1 and J2	19A149973P1	Telephone jack; sim to Hoside HSJO798-01-020.
		——— MISCELLANEOUS ———
7	19A149926P1	Insulator.
		——— CAPACITORS ———
C102	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C103	19A702052P14	Ceramic: 0.01 uF ± 10%, 50 VDCW.
C104	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C105	19A702236P50	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C106	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C107	19A702236P17	Ceramic: 4.7 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C107	19A702236P11	Ceramic: 2.7 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2 and G3).
C108	19A702236P13	Ceramic: 3.3 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C108	19A702236P11	Ceramic: 2.7 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2).
C108	19A702236P8	Ceramic: 1.5 pF ±.25 pF, 50 VDCW. (Used in G3).
C109	19A702236P36	Ceramic: 27 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G1).
C109	19A702236P30	Ceramic: 15 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G2).
C109	19A702236P28	Ceramic: 12 pF ± 5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G3).
C110	19A702236P28	Ceramic: 12 pF ± 5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C110	19A702236P25	Ceramic: 10 pF ±.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G2).
C110	19A702236P19	Ceramic: 5.6 pF ±.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G3).
C111	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C112	19A702236P38	Ceramic: 33 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G1).
C112	19A702236P36	Ceramic: 27 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G2).
C112	19A702236P28	Ceramic: 12 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G3).
C114	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C115	19A702236P50	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C116	19A705205P2	Tantalum: 1 uF, 16 VDCW; sim to Sprague 293D.
C117	19A703324P2	Electrolytic: 2.2 uF ±20%, 50 VDCW.
C118	19A702236P50	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C119	19A702236P28	Ceramic: 12 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1 and G2).
C119	19A702236P21	Ceramic: 6.8 pF ±0.5 pF, 50 VDCW, temp coef 0 ±80 PPM. (Used in G3).
C120	19A702236P25	Ceramic: 10 pF ±.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C.
C121	19B800873P3	Variable, ceramic: 2.5 to 10 pF, 150 VDCW; sim to Johanson 9811.
C122	19A702236P13	Ceramic: 3.3 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C122	19A702236P10	Cera ic: 2.2 pF ±2.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G2).
C122	19A702236P9	Ceramic: 1.8 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G3).
C123	19A702236P42	Ceramic: 47 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C123	19A702236P40	Ceramic: 39 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2).
C123	19A702236P38	Ceramic: 33 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G3).
C124	19A702236P30	Ceramic: 15 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G1 and G2).
C124	19A702236P25	Ceramic: 10 pF ±.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G3).
C125	19A702236P23	Ceramic: 8.2 pF ±.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C125	19A702236P19	Ceramic: 5.6 pF ±.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G2).
C125	19A702236P15	Ceramic: 3.9 pF ±.25 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G3).
C126	19B800873P3	Variable, ceramic: 2.5 to 10 pF, 150 VDCW; sim to Johanson 9811.
C127	19A702236P28	Ceramic: 12 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C127	19A702236P23	Ceramic: 8.2 pF ±.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2).
C127	19A702236P19	Ceramic: 5.6 pF ±.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G3).
C128	19A702236P50	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C129	19A702236P23	Ceramic: 8.2 pF ±.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C129	19A702236P19	Ceramic: 5.6 pF ±.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G2).
C129	19A702236P17	Ceramic: 4.7 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G3).
C130	19A702236P23	Ceramic: 8.2 pF ±.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G3).
C130	19A702236P25	Ceramic: 10 pF ±.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G1 and G2).

SYMBOL	PART NUMBER	DESCRIPTION
C131	19A702236P19	Ceramic: 5.6 pF ±.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G1 and G3).
C131	19A702236P34	Ceramic: 22 pF ±0.25 pF, 50 VDCW. (Used in G2).
C133	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C134	19A702236P21	Ceramic: 6.8 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G1).
C134	19A702236P19	Ceramic: 5.6 pF ±.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G2).
C134	19A702236P13	Ceramic: 3.3 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G3).
C135	19A702236P13	Ceramic: 3.3 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C135	19A702236P17	Ceramic: 4.7 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2).
C135	19A702236P15	Ceramic: 3.9 pF ±.25 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G3).
C136	19B800873P11	Ceramic, variable: 1-5 pF, 150 VDCW.
C137	19A702236P50	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C138 and C139	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C140	19A702236P50	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C141	19A702236P38	Ceramic: 33 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G1).
C141	19A702236P42	Ceramic: 47 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2).
C141	19A702236P40	Ceramic: 39 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G3).
C142	19A702236P7	Ceramic: 1.2 pF ±.25 pF, 50 VDCW, temp coef 0 ±30 PPM.
C144	19A702236P10	Ceramic: 2.2 pF ±2.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G1 and G2).
C144	19A702236P9	Ceramic: 1.8 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G3).
C145	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C146	19A702236P15	Ceramic: 3.9 pF ±.25 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G1).
C146	19A702236P10	Ceramic: 2.2 pF ±2.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G2).
C146	19A702236P9	Ceramic: 1.8 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G3).
C147	19A702236P7	Ceramic: 1.2 pF ±.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C147	19A702236P6	Ceramic: 1.0 pF ±.25 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G2).
C147	19A702236P3	Ceramic: 0.7 pF ±.1 pF, 50 VDCW, temp coef o ±30 PPM. (Used in G3).
C148	19A702236P50	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.

SYMBOL	PART NUMBER	DESCRIPTION
C149	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C150	19A702236P9	Ceramic: 1.8 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G3).
C150	19A702236P10	Ceramic: 2.2 pF ±2.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G1).
C150	19A702236P23	Ceramic: 8.2 pF ±.25 pF, 50 VDCW. (Used in G2).
C151 and C152	19A702236P50	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C154	19A702236P25	Ceramic: 10 pF ± .5 pF, 50 VDCW.
C301	19A702052P16	Ceramic: 0.015 µF ±10%, 50 VDCW.
C302	19A702052P14	Ceramic: 0.01 µF ±10%, 50 VDCW.
C303	19A702052P7	Ceramic: 2200 pF ±10%, 50 VDCW.
C304	19A702052P130	Ceramic: 0.022 µF ±5%, 50 VDCW.
C305	19A702052P14	Ceramic: 0.01 µF ±10%, 50 VDCW.
C306	19A702052P26	Ceramic: 0.1 µF ±10%, 50 VDCW.
C307	19A702052P107	Ceramic: 2200 pF ±5%, 50 VDCW.
C308	19A702052P26	Ceramic: 0.1 µF ±10%, 50 VDCW.
C309	19A702061P67	Ceramic: 180 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C310	19A702236P54	Ceramic: 150 pF ±5%, 500 VDCW, temp coef 0 ±30 PPM/°C.
C313	19A702052P26	Ceramic: 0.1 µF ±10%, 50 VDCW.
C314	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C315	19A702052P10	Ceramic: 4700 pF ±10%, 50 VDCW.
C316	19A702052P16	Ceramic: 0.015 µF ±10%, 50 VDCW.
C317	19A702052P26	Ceramic: 0.1 µF ±10%, 50 VDCW.
C319	19A702052P5	Ceramic: 1000 pF ±10%, 50 VDCW.
C401	19A702236P15	Ceramic: 3.9 pF ±.25 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G1).
C401	19A702236P13	Ceramic: 3.3 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2 and G3).
C402	19A702236P15	Ceramic: 3.9 pF ±.25 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G1).
C402	19A702236P11	Ceramic: 2.7 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2).
C402	19A702236P10	Ceramic: 2.2 pF ±2.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G3).
C403	19A702236P40	Ceramic: 39 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C403	19A702236P38	Ceramic: 33 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G2).
C403	19A702236P36	Ceramic: 27 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G3).
C404	19A702236P15	Ceramic: 3.9 pF ±.25 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G1).
C404	19A702236P13	Ceramic: 3.3 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2).
C404	19A702236P10	Ceramic: 2.2 pF ±2.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G3).
C405	19A702236P11	Ceramic: 2.7 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C405	19A702236P9	Ceramic: 1.8 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2).
C405	19A702236P10	Ceramic: 2.2 pF ±2.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G3).
C406	19A702052P14	Ceramic: 0.01 µF ±10%, 50 VDCW.

SYMBOL	PART NO.	DESCRIPTION
C407	19A702236P54	Ceramic: 150 pF ±5%, 500 VDCW, temp coef 0 ±30 PPM/°C.
C408	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C409	19A702061P77	Ceramic: 470 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C410	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C411	19A702236P17	Ceramic: 4.7 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C411	19A702236P13	Ceramic: 3.3 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2).
C411	19A702236P11	Ceramic: 2.7 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G3).
C412	19A702236P48	Ceramic: 82 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1 and G2).
C412	19A702236P46	Ceramic: 68 pF ±5%, 50 VDCW, temp coef 0 PPM ±30 PPM. (Used in G3).
C413	19A702236P13	Ceramic: 3.3 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C413	19A702236P10	Ceramic: 2.2 pF ±2.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G2).
C413	19A702236P9	Ceramic: 1.8 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G3).
C414	19A702061P77	Ceramic: 470 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C415	19A702236P7	Ceramic: 1.2 pF ±.25 pF, 50 VDCW, temp coef 0 ±30 PPM.
C416	19A702236P13	Ceramic: 3.3 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C417	19A702236P13	Ceramic: 3.3 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C417	19A702236P11	Ceramic: 2.7 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2).
C417	19A702236P10	Ceramic: 2.2 pF ±2.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G3).
C418	19A702236P30	Ceramic: 15 pF ±5%, 50 VDCW, temp coeF 0 ±30 PPM/°C. (Used in G1).
C418	19A702236P28	Ceramic: 12 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2).
C418	19A702236P25	Ceramic: 10 pF ±.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G3).
C421	19A702236P50	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C422 and C423	19A702061P77	Ceramic: 470 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C424	19A702236P19	Ceramic: 5.6 pF ±.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G1).
C424	19A702236P17	Ceramic: 4.7 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2 and G3).
C425	19A702236P13	Ceramic: 3.3 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C425	19A702236P10	Ceramic: 2.2 pF ±2.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G2 and G3).
C426	19A702236P28	Ceramic: 12 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C426	19A702236P19	Ceramic: 5.6 pF ±.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G2).
C426	19A702236P17	Ceramic: 4.7 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G3).
C427	19A702236P28	Ceramic: 12 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).

SYMBOL	PART NO.	DESCRIPTION
C427	19A702236P23	Ceramic: 8.2 pF ±.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2).
C427	19A702236P21	Ceramic: 6.8 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM. (Used in G3).
C428	19A702236P30	Ceramic: 15 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G1).
C428	19A702236P28	Ceramic: 12 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2).
C428	19A702236P25	Ceramic: 10 pF ±.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G3).
C429	19A702061P77	Ceramic: 470 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C430	19A702236P19	Ceramic: 5.6 pF ±.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C. (Used in G1 and G2).
C430	19A702236P17	Ceramic: 4.7 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM. (Used in G3).
C431	19A702236P52	Ceramic: 120 pF, ±5%, 50 VDCW.
C432	19A702236P9	Ceramic: 1.8 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2).
C434	19A702236P11	Ceramic: 2.7 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G1).
C434	19A702236P9	Ceramic: 1.8 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM. (Used in G2).
C501 and C502	19A702052P5	Ceramic: 1000 pF ±10%, 50 VDCW.
C503	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C504	19A702236P40	Ceramic: 39 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C505	19A702236P21	Ceramic: 6.8 pF ±0.5 pF, 50 VDCW, temp coef 0 ±60 PPM.
C506	19A702236P11	Ceramic: 2.7 pF ±0.25 pF, 50 VDCW, temp coef 0 ±30 PPM.
C507 and C508	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C509	19A702236P36	Ceramic: 27 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C510 and C511	19A702236P34	Ceramic: 22 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C512 thru C514	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
C515	19A705205P14	Tantalum: 6.8 uF, 6 VDCW; sim to Sprague 293D.
C516	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C517	19A702052P7	Ceramic: 2200 pF ±10%, 50 VDCW.
C518	19A702236P25	Ceramic: 10 pF ±.5 pF, 50 VDCW, temp coef 0 ±30 PPM/°C.
C601	19A702052P114	Ceramic: 0.01 uF ±5%, 50 VDCW.
C602	19A702052P10	Ceramic: 4700 pF ±10%, 50 VDCW.
C603 and C604	19A702052P114	Ceramic: 0.01 uF ±5%, 50 VDCW.
C605	19A702052P130	Ceramic: 0.022 uF ±5%, 50 VDCW.
C606	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
C607	19A702052P10	Ceramic: 4700 pF ±10%, 50 VDCW.
C608	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C609	19A702052P30	Ceramic: 0.022 uF ±10%, 50 VDCW.

T/R ASSEMBLY

SYMBOL	PART NO.	DESCRIPTION
C610	19A705205P13	Tantalum: 4.7 uF, 10 VDCW; sim to Sprague 293D.
C611	19A703314P15	Electrolytic: 100 uF, +20%, 25 VDCW.
C612	19A702052P16	Ceramic: 0.015 uF ±10%, 50 VDCW.
C614	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
C616	19A702236P50	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C618	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C619	19A705205P13	Tantalum: 4.7 uF, 10 VDCW; sim to Sprague 293D.
C620	19A702052P5	Ceramic: 1000 pF ±10%, 50 VDCW.
C621	19A702052P6	Ceramic: 1500 pF ±10%, 50 VDCW.
C622	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
C623	19A702052P6	Ceramic: 1500 pF ±10%, 50 VDCW.
C624	19A702052P12	Ceramic: 6800 pF ±10%, 50 VDCW.
C625 and C626	19A702052P5	Ceramic: 1000 pF ±10%, 50 VDCW.
C627 and C628	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
C629	19A705205P2	Tantalum: 1 uF, 16 VDCW; sim to Sprague 293D.
C630	19A702052P22	Ceramic: 0.047 uF ±10%, 50 VDCW.
C631	19A702052P5	Ceramic: 1000 pF ±10%, 50 VDCW.
C632	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
C633	19A702052P22	Ceramic: 0.047 uF ±10%, 50 VDCW.
C634	19A702052P10	Ceramic: 4700 pF ±10%, 50 VDCW.
C635	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C636	19A702052P10	Ceramic: 4700 pF ±10%, 50 VDCW.
C637	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C638	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
C639	19A702052P20	Ceramic: 0.033 uF ±10%, 50 VDCW.
C640	19A702061P77	Ceramic: 470 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C641	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
C642 and C643	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C644 thru C647	19A702236P50	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C701 thru C717	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C718	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C719 thru C729	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C730	19A702236P38	Ceramic: 33 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C731	19A702061P35	Ceramic: 30 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C732 thru C734	19A702061P68	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.

SYMBOL	PART NUMBER	DESCRIPTION
C736 thru C738	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C739 thru C741	19A702236P50	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C801	19A702052P34	Ceramic: 0.1 µF ±10%, 25 VDCW.
C802	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C803	19A702052P14	Ceramic: 0.01 µF ±10%, 50 VDCW.
C805	19A702052P26	Ceramic: 0.1 µF ±10%, 50 VDCW.
C806	19A701534P9	Tantalum: 47 µF ±20%, 6.3 VDCW.
C807	19A702052P14	Ceramic: 0.01 µF ±10%, 50 VDCW.
C808	19A705205P2	Tantalum: 1 µF, 16 VDCW; sim to Sprague 293D.
C809	19A705205P12	Tantalum: .33 µF, 16 VDCW; sim to Sprague 293D.
C810	19A702052P14	Ceramic: 0.01 µF ±10%, 50 VDCW.
C811 and C812	19A702061P69	Ceramic: 220 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM/°C.
C813	19A705205P2	Tantalum: 1 µF, 16 VDCW; sim to Sprague 293D.
C814	19A702052P30	Ceramic: 0.022 µF ±10%, 50 VDCW.
		——— DIODES ———
D101 thru D103	19A700155P2	Silicon, fwd current: 100 mA, 35 VIP.
D401	19A702525P2	Silicon, PIN: sim to MMBV3401.
D402	19A700155P2	Silicon: 100 mA, 35 PIV.
D701 and D702	19A700053P2	Silicon: 2 Diodes in Series; sim to BAV99.
		——— FUSES ———
F1	19A702169P9	Enclosed link: rated 3 amps @ 125 v; sim to Littelfuse 255003.
		——— JACKS ———
J3	19A702270P2	Connector, coaxial, BNC series; sim to Amp 413649-1.
J4	19A703248P11	Post: gold plated, 10 mm length.
J5 and J6	19A703248P20	Post: gold plated.
J12 and J13	19A703248P11	Post: gold plated, 10 mm length.
J501	19A703248P11	Post: gold plated, 10 mm length.
J601		Part of printed wire board 19D902583P1.
J701		Part of printed wire board 19D902583P1.
		——— INDUCTORS ———
L101	344A3289P1	Surface mount, coil, fixed: .01 µH 20%.
L102	19A705470P6	Coil: sim to Toko 380NB-27nM. (Used in G1 and G2).
L102	19A705470P5	Coil, Fixed: 22 nH; sim to Toko 380NB-22nM. (Used in G3).
L103	19A705470P25	Coil, fixed: 1 µH ±20%, sim to 38LB-IR0M.

SYMBOL	PART NO.	DESCRIPTION
L104	19A702472P7	Coil.
L105	19A700024P1	Coil, RF: 100 nH ±10%, 0.08 ohms DC res max, 100 v.
L106	19A700024P13	Coil, RF: 1.0 uH ±10%.
L107	19A702473G1	Coil.
L108	19A702472P1	Coil. (Used in G1).
L108	19A702472P7	Coil. (Used in G2).
L108	19A702472P34	Coil. (Used in G3).
L109	19A700024P13	Coil, RF: 1.0 uH ±10%.
L110	19A702472P8	Coil.
L111	344A3289P5	Coil, fixed: .033 uH ±20%; sim to TDK NL252018T-033M.
L112	19B800890P1	Coil, RF: 9.5 nH ±5%; sim to Paul Smith SK-886-1.
L113	19A700024P7	Coil, RF: 330 nH ±10%.
L114 thru L116	19B801493P1	Coil, RF; sim to Toko NE545GNAS-100125.
L117	19A702472P8	Coil.
L118	344A3289P5	Coil, fixed: .033 uH ±20%; sim to TDK NL252018T-033M.
L401 thru L403	19B801493P22	Coil, RF; sim to Toko NE545BNAS-100082.
L405	19B801493P22	Coil, RF; sim to Toko NE545BNAS-100082.
L420	344A3289P10	Coil, fixed: .100 uH ±20%; sim to TDK NL252018T-R10M.
L421 and L422	19B801493P1	Coil, RF; sim to Toko NE545GNAS-100125.
L423	344A3289P10	Coil, fixed: .100 uH ±20%; sim to TDK NL252018T-R10M.
L502	19B801413P4	Coil, 39 MHz.
L503	19A700024P19	Coil, RF: 3.3 uH ±10%.
L504	19B801413P3	Coil, 39 MHz.
L505	19B801413P4	Coil, 39 MHz.
L506	19A703591P1	IF: sim to Toko America P5SVLC-A291EL.
		- - - - - - - - TRANSISTORS - - - - - - - - -
Q101	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
Q102	19A704708P2	Silicon, NPN: sim to NEC 2SC3356.
Q103	19A702108P2	Silicon, NPN: sim to BFQ17.
Q104	19A701940P3	Silicon, NPN: sim to SRF-5116.
Q105	19A702448P1	Silicon, NPN; sim to 2N5945.
Q106 and Q107	19A704708P2	Silicon, NPN: sim to NEC 2SC3356.
Q301	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
Q303	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
Q401	19A134557P3	Silicon, NPN: sim to MMBR5031.
Q402	19A704708P2	Silicon, NPN: sim to NEC 2SC3356.
Q421	19A704708P2	Silicon, NPN: sim to NEC 2SC3356.
Q501 and Q502	19A704708P2	Silicon, NPN: sim to NEC 2SC3356.
Q601	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.

SYMBOL	PART NUMBER	DESCRIPTION
Q602	19A700026P2	Silicon, PNP: sim to BC369.
Q603 thru Q605	19A700059P2	Silicon, PNP: sim to MMBT3906, low profile.
Q606	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
Q607	19A700059P2	Silicon, PNP: sim to MMBT3906, low profile.
Q701	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
Q703 thru Q706	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
Q801	19A134577P2	Silicon, PNP: sim to Phillips BCX51-16.
Q802	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
Q804 and Q805	19A700059P2	Silicon, PNP: sim to MMBT3906, low profile.
Q806	19A134739P2	Silicon, NPN.
Q807	19A700059P2	Silicon, PNP: sim to MMBT3906, low profile.
Q809	19A700059P2	Silicon, PNP: sim to MMBT3906, low profile.
		——— RESISTORS ———
R102	19B800607P100	Metal film: 10 ohms ±5%, 1/8 w.
R103	19B801251P332	Metal film: 3.3K ohms ±5%, 1/10 w.
R104	19B801251P222	Metal film: 2.2K ohms ±5%, 1/10 w.
R105	19B801251P101	Metal film: 100 ohms ±5%, 1/10 w.
R107	19B801251P390	Metal film: 39 ohms ±5%, 1/10 w.
R108	19B801251P222	Metal film: 2.2K ohms ±5%, 1/10 w.
R109	19B801251P102	Metal film: 1K ohms ±5%, 1/10 w.
R110	19B801251P220	Metal film: 22 ohms ±5%, 1/10 w.
R111 and R112	19B801251P100	Metal film: 10 ohms ±5%, 1/10 w.
R113	19B801251P101	Metal film: 100 ohms ±5%, 1/10 w. (Used in G1 & G3).
R113	19B801251P560	Metal film: 56 ohms ±5%, 1/10 w. (Used in G2).
R114 and R115	19B801251P561	Metal film: 560 ohms ±5%, 1/10 w.
R119	19B801251P472	Metal film: 4.7K ohms ±5%, 1/10 w.
R120	19B801251P100	Metal film: 10 ohms ±5%, 1/10 w.
R121	19B801251P102	Metal film: 1K ohms ±5%, 1/10 w.
R122	19B801251P332	Metal film: 3.3K ohms ±5%, 1/10 w.
R123	19B801251P272	Metal film: 2.7K ohms ±5%, 1/10 w.
R124	19B801251P100	Metal film: 10 ohms ±5%, 1/10 w.
R125 thru R127	19B801251P102	Metal film: 1K ohms ±5%, 1/10 w.
R128	19B801251P560	Metal film: 56 ohms ±5%, 1/10 w.
R301	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R302	19B801251P105	Metal film: 1M ohms ±5%, 1/10 w.
R303	19B801251P272	Metal film: 2.7K ohms ±5%, 1/10 w.
R304	19B801251P103	Metal film: 10K ohms ±5%, 1/10 w.
R305	19B801251P102	Metal film: 1K ohms ±5%, 1/10 w.
R306	19B801251P682	Metal film: 6.8K ohms ±5%, 1/10 w.
R307	19B801251P224	Metal film: 220K ohms ±5%, 1/10 w.
R308	19B801251P223	Metal film: 22K ohms ±5%, 1/10 w.
R310	19B801251P332	Metal film: 3.3K ohms ±5%, 1/10 w.
R311	19B801251P474	Metal film: 470K ohms ±5%, 1/10 w.

SYMBOL	PART NO.	DESCRIPTION
R312	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R313	19B801251P823	Metal film: 82K ohms ±5%, 1/10 w.
R317	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R318 and R319	19B801251P154	Metal film: 150K ohms ±5%, 1/10 w.
R320	19B801251P683	Metal film: 68K ohms ±5%, 1/10 w.
R321	19B801251P124	Metal film: 120K ohms ±5%, 1/10 w.
R322	19B801251P564	Metal film: 560K ohms ±5%, 1/10 w.
R326	19B801251P154	Metal film: 150K ohms ±5%, 1/10 w.
R327	19A702931P401	Metal film: 100K ohms ±1%, 200 VDCW, 1/8 w.
R328	19B801251P474	Metal film: 470K ohms ±5%, 1/10 w.
R330	19B801251P684	Metal film: 680K ohms ±5%, 1/10 w.
R331	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R332	19B801251P103	Metal film: 10K ohms ±5%, 1/10 w.
R333	19B801251P153	Metal film: 15K ohms ±5%, 1/10 w.
R401	19B801251P682	Metal film: 6.8K ohms ±5%, 1/10 w.
R402 and R403	19B801251P472	Metal film: 4.7K ohms ±5%, 1/10 w.
R404	19B801251P681	Metal film: 680 ohms ±5%, 1/10 w.
R405	19B801251P182	Metal film: 1.8K ohms ±5%, 1/10 w.
R406	19B801251P101	Metal film: 100 ohms ±5%, 1/10 w.
R421	19B801251P100	Metal film: 10 ohms ± 5%, 1/10 w.
R422	19B801251P272	Metal film: 2.7K ohms ±5%, 1/10 w.
R423	19B801251P103	Metal film: 10K ohms ±5%, 1/10 w.
R424	19B801251P680	Metal film: 68 ohms ±5%, 1/10 w.
R425	19B801251P102	Metal film: 1K ohms ±5%, 1/10 w.
R426	19B801251P101	Metal film: 100 ohms ±5%, 1/10 w.
R501	19B801251P151	Metal film: 150 ohms ±5%, 1/10 w.
R502	19B801251P273	Metal film: 27K ohms ±5%, 1/10 w.
R503	19B801251P103	Metal film: 10K ohms ±5%, 1/10 w.
R504	19B801251P273	Metal film: 27K ohms ±5%, 1/10 w.
R505	19B801251P103	Metal film: 10K ohms ±5%, 1/10 w.
R506	19B801251P392	Metal film: 3.9K ohms ±5%, 1/10 w.
R507	19B801251P151	Metal film: 150 ohms ±5%, 1/10 w.
R508	19B801251P821	Metal film: 820 ohms ±5%, 1/10 w.
R509	19B801251P154	Metal film: 150K ohms ±5%, 1/10 w.
R510	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R511	19B801251P392	Metal film: 3.9K ohms ±5%, 1/10 w.
R512	19B801251P270	Metal film: 27 ohms ±5%, 1/10 w.
R513	19B801251P682	Metal film: 6.8K ohms ±5%, 1/10 w.
R514	19B801251P473	Metal film: 47K ohms ±5%, 1/10 w.
R515	19B801251P821	Metal film: 820 ohms ±5%, 1/10 w.
R516	19B801251P103	Metal film: 10K ohms ±5%, 1/10 w.
R601	19B801251P563	Metal film: 56K ohms ±5%, 1/10 w.
R602	19B801251P562	Metal film: 5.6K ohms ±5%, 1/10 w.
R603	19B801251P222	Metal film: 2.2K ohms ±5%, 1/10 w.

SYMBOL	PART NO.	DESCRIPTION
R604 and R605	19B801251P473	Metal film: 47K ohms ±5%, 1/10 w.
R606	19B801251P223	Metal film: 22K ohms ±5%, 1/10 w.
R607	19B801251P471	Metal film: 470 ohms ±5%, 1/10 w.
R608	19B801251P472	Metal film: 4.7K ohms ±5%, 1/10 w.
R609	19B801251P823	Metal film: 82K ohms ±5%, 1/10 w.
R612	19B801251P123	Metal film: 12K ohms ±5%, 1/10 w.
R613	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R614	19B801251P473	Metal film: 47K ohms ±5%, 1/10 w.
R615	19B801251P471	Metal film: 470 ohms ±5%, 1/10 w.
R616	19B801251P2R2	Metal film: 2.2 ohms ±5%, 1/10 w.
R617	19B801251P683	Metal film: 68K ohms ±5%, 1/10 w.
R618	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R619	19B800762P1	Variable, carbon film: 5K ohms ±20%, 150 VDCW, .1 w; sim to TOCOS RPR124.
R620	19B801350P1	Variable, 5 ohms to 10K ohms ±20%, 1/4 w.
R621	19B801251P222	Metal film: 2.2K ohms ±5%, 1/10 w.
R623	19B801251P103	Metal film: 10K ohms ±5%, 1/10 w.
R624	19B801251P472	Metal film: 4.7K ohms ±5%, 1/10 w.
R625	19B801251P683	Metal film: 68K ohms ±5%, 1/10 w.
R626 and R627	19B801251P473	Metal film: 47K ohms ±5%, 1/10 w.
R628	19B801251P562	Metal film: 5.6K ohms ±5%, 1/10 w.
R629	19B801251P393	Metal film: 39K ohms ±5%, 1/10 w.
R630	19B801251P224	Metal film: 220K ohms ±5%, 1/10 w.
R631	19B801251P473	Metal film: 47K ohms ±5%, 1/10 w.
R632	19B801251P272	Metal film: 2.7K ohms ±5%, 1/10 w.
R633	19B801251P474	Metal film: 470K ohms ±5%, 1/10 w.
R634	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R635	19B801251P334	Metal film: 330K ohms ±5%, 1/10 w.
R637	19B801251P473	Metal film: 47K ohms ±5%, 1/10 w.
R639	19A705813P1	Thermistor: sim to AL03006-824-73-G100.
R640	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R641	19B801251P474	Metal film: 470K ohms ±5%, 1/10 w.
R642	19B801251P221	Metal film: 220 ohms ±5%, 1/10 w.
R643	19B801251P124	Metal film: 120K ohms ±5%, 1/10 w.
R644	19B801251P334	Metal film: 330K ohms ±5%, 1/10 w.
R645	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R646	19B801251P393	Metal film: 39K ohms ±5%, 1/10 w.
R647 and R648	19B801251P472	Metal film: 4.7K ohms ±5%, 1/10 w.
R650	19B801251P473	Metal film: 47K ohms ±5%, 1/10 w.
R651	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R652	19B801251P124	Metal film: 120K ohms ±5%, 1/10 w.
R653	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R654	19B801251P334	Metal film: 330K ohms ±5%, 1/10 w.

SYMBOL	PART NO.	DESCRIPTION
R655 and R656	19B801251P154	Metal film: 150K ohms ±5%, 1/10 w.
R657	19B801251P683	Metal film: 68K ohms ±5%, 1/10 w.
R658	19B801251P471	Metal film: 470 ohms ±5%, 1/10 w.
R659	19B801251P473	Metal film: 47K ohms ±5%, 1/10 w.
R660	19B801251P103	Metal film: 10K ohms ±5%, 1/10 w.
R661	19B801251P473	Metal film: 47K ohms ±5%, 1/10 w.
R662 and R663	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R664	19B801251P334	Metal film: 330K ohms ±5%, 1/10 w.
R701 thru R704	19B801251P102	Metal film: 1K ohms ±5%, 1/10 w.
R705 thru R707	19B801251P471	Metal film: 470 ohms ±5%, 1/10 w.
R708 thru R714	19B801251P102	Metal film: 1K ohms ±5%, 1/10 w.
R715 thru R717	19B801251P101	Metal film: 100 ohms ±5%, 1/10 w.
R718	19B801251P220	Metal film: 22 ohms ±5%, 1/10 w.
R719 thru R729	19B801251P102	Metal film: 1K ohms ±5%, 1/10 w.
R730	19B801251P103	Metal film: 10K ohms ±5%, 1/10 w.
R731	19B801251P333	Metal film: 33K ohms ±5%, 1/10 w.
R732 thru R734	19B801251P473	Metal film: 47K ohms ±5%, 1/10 w.
R735	19B801251P223	Metal film: 22K ohms ±5%, 1/10 w.
R736	19B801251P824	Metal film: 820K ohms ±5%, 1/10 w.
R737	19B801251P394	Metal film: 390K ohms ±5%, 1/10 w.
R738	19B801251P224	Metal film: 220K ohms ±5%, 1/10 w.
R739	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R740	19A702931P253	Metal film: 3480 ohms ±1%, 200 VDCW, 1/8 w.
R742	19B801251P103	Metal film: 10K ohms ±5%, 1/10 w.
R744	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R745	19B801251P102	Metal film: 1K ohms ±5%, 1/10 w.
R746 and R747	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R748	19B801251P473	Metal film: 47K ohms ±5%, 1/10 w.
R749	19B801251P101	Metal film: 100 ohms ±5%, 1/10 w.
R750 and R751	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R752	19B801251P472	Metal film: 4.7K ohms ±5%, 1/10 w.
R753	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R754	19B801251P102	Metal film: 1K ohms ±5%, 1/10 w.
R755 and R756	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R801	19B801251P392	Metal film: 3.9K ohms ±5%, 1/10 w.
R802	19B801251P472	Metal film: 4.7K ohms ±5%, 1/10 w.

SYMBOL	PART NUMBER	DESCRIPTION
R803	19B801251P392	Metal film: 3.9K ohms ±5%, 1/10 w.
R804	19B801251P102	Metal film: 1K ohms ±5%, 1/10 w.
R805	19A702931P273	Metal film: 5620 ohms ±1%, 200 VDCW, 1/8 w.
R806	19A702931P265	Metal film: 4640 ohms ±1%, 200 VDCW, 1/8 w.
R807	19B801251P103	Metal film: 10K ohms ±5%, 1/10 w.
R808	19B801251P472	Metal film: 4.7K ohms ±5%, 1/10 w.
R810	19B801251P102	Metal film: 1K ohms ±5%, 1/10 w.
R811	19B801251P224	Metal film: 220K ohms ±5%, 1/10 w.
R812	19B801251P474	Metal film: 470K ohms ±5%, 1/10 w.
R813	19B801251P103	Metal film: 10K ohms ±5%, 1/10 w.
R815	19A702931P334	Metal film: 22.1K ohms ±1%, 200 VDCW, 1/8 w.
R816	19A702931P321	Metal film: 16.2K ohms ±1%, 200 VDCW, 1/8 w.
R817	19B801251P222	Metal film: 2.2K ohms ±5%, 1/10 w.
R818	19A702931P210	Metal film: 1240 ohms ±1%, 200 VDCW, 1/8 w.
R819	19A702931P347	Metal film: 30.1K ohms ±1%, 200 VDCW, 1/8 w.
R820	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R821	19B801251P102	Metal film: 1K ohms ±5%, 1/10 w.
R822	19B801251P103	Metal film: 10K ohms ±5%, 1/10 w.
R823	19B801251P101	Metal film: 100 ohms ±5%, 1/10 w.
R824	19B801251P182	Metal film: 1.8K ohms ±5%, 1/10 w.
R825	19B801251P334	Metal film: 330K ohms ±5%, 1/10 w.
		——— SWITCHES ———
S1		Part of R620.
S2	19A702244P1	Slide switch: DPDT, contact rating 1 mA @ 10 VDC; sim to Alps SSS02200.
S3	19A702103P7	Switch, toggle; sim to C & K SS1894.
S4	19A149923P1	Push; sim to ITT SCHADOW KSAIV311.
		—— INTEGRATED CIRCUITS —
U301	19A702293P1	Linear: Quad Op Amp; sim to LM324D.
U501	19A704619P2	Linear: Osc/Mixer/IF/Det/Amp; sim to MC3361D.
U601	19A702293P3	Linear: Dual Op Amp; sim to LM358D.
U602	19A705452P1	Linear: Audio Amplifier; sim to TDA 2822M.
U603	19A702293P1	Linear: Quad Op Amp; sim to LM324D.
U604	19A702705P4	Digital: Quad Analog Switch/Multiplexer; sim to 4066BM.
U605	19A702293P3	Linear: Dual Op Amp; sim to LM358D.
U701	19A704345P22	Microcomputer, CHMOS, 8-bit, 44-pin, flat pack.
U702	19A704724P204	EEPROM, DIP; sim to XICOR X24C02.
U801	19A702939P2	Linear: Adjustable Shunt Regulator; sim to TL431CLP.
U802	19A702536P1	Linear positive voltage regulator; sim to LM2931AZ-5.
		——— CABLES ———
W1	19B801682P1	Antenna connector.
W2		Part of printed wire board 19D902583P1.
		——— CRYSTALS ———
Y501	19A705376P5	Crystal, Fixed Frequency: 45.455 MHz ±10 PPM.
Y701	19A702511G30	Crystal, quartz: 8.192 MHz.

T/R ASSEMBLY

SYMBOL	PART NO.	DESCRIPTION
		---------- FILTER ----------
Z402	19A705423P1	Mixer: Double (balanced); sim to Tele-Tech MT45.
Z501	19A705328P1	Monolithic Crystal: 45.000 MHz; sim to Toyocom 45E2B2.
Z502		Part of Z501.
Z503	19A702171P3	Bandpass: 455 (±1.5) kHz; sim to Murata CFU55E2.
		------- MISCELLANEOUS --------
		NOTE: See the Outline Diagram 19D902582 on page 12 for location of the following miscellaneous parts.
4	19A143453P1	Set screw, self locking: 3-48 x 1/8.
8	19D902495P1	Heat Sink.
9	19B801566P4	Shield.
10	N248P15B	Hex nut. (Used with Q105).
		NOTE: See the Assembly Diagram 19D902727 on page 31 for location of the following miscellaneous parts.
2	19B800859P2	Knob, push on.
3	19B800865G7	Top cover.
5	19A702332P1	Nut, slotted: M7 x .75.
6	19A149973P2	Telephone jack; sim to Hosiden HSJ0999-01-030.
7	19A149973P3	Telephone jack; sim to Hosiden HSJ0999-01-200.
8	19A705883P3	Crystal cushion.
10	19D901089G4	Side panel.

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 the descriptions of parts affected by these revisions.

REV. A - TRANSMIT/RECEIVE BOARD 19D902582G2
Incorporated in the initial shipment.

REV. B - TRANSMIT/RECEIVE BOARD 19D902582G2
REV. C To improve transmit stability. Changed C103, C107, C119, C135, C141 and R752. Added C739, C740 and C741.

C103 was 19A702061P69 - Ceramic: 220 pF ±5%, 50 VDCW.
C107 was 19A702236P17 - Ceramic: 4.7 pF ±5%, 50 VDCW.
C119 was 19A702236P25 - Ceramic: 10 pF ±.5 pF, 50 VDCW.
C135 was 19A702236P11 - Ceramic: 2.7 pF ±.25 pF, 50 VDCW.
C141 was 19A702236P19 - Ceramic: 5.6 pF ±.5 pF, 50 VDCW.
R752 was 19B801251P104 - Metal film: 100K ohms ±5%, 1/10 w.

REV. D - TRANSMIT/RECEIVE BOARD 19D902582G2
To improve current capability of 5.4 regulator and to increase sensitivity of Type 99 Decode. Changed R650, R659 and R804.

R650 was 19B801251P104 - Metal film: 100K ohms ±5%, 1/10 w.
R659 was 19B801251P104 - Metal film: 100K ohms ±5%, 1/10 w.
R804 was 19B801251P102 - Metal film: 1K ohms ±5%, 1/10 w.

REV. E - TRANSMIT/RECEIVE BOARD 19D902582G2
To improve Channel Guard decode times. Changed R641.

R641 was 19B801251P474 - Metal film: 470K ohms ±5%, 1/10 w.

REV. F - TRANSMIT/RECEIVE BOARD 19D902582G2
To improve operation, changed the Receiver Front End bandwidth from 30 MHz to 10 MHz. Deleted C130. Changed C129, C134, C146, C403, C404, C405, C411, C412, C413, C417, L401 and L403. Added C432 and C433.

C129 was 19A702236P19 - Ceramic: 5.6 pF ±.5 pF, 50 VDCW.
C130 was 19A702236P9 - Ceramic: 1.8 pF ±.25 pF, 50 VDCW.
C134 was 19A702236P15 - Ceramic: 3.9 pF ±.25 pF, 50 VDCW.
C146 was 19A702236P10 - Ceramic: 2.2 pF ±.25 pF, 50 VDCW.
C403 was 19A702236P19 - Ceramic: 5.6 pF ±.5 pF, 50 VDCW.
C404 was 19A702236P25 - Ceramic: 10 pF ±.5 pF, 50 VDCW.
C405 was 19A702236P36 - Ceramic: 27 pF ±5%, 50 VDCW.
C411 was 19A702236P17 - Ceramic: 4.7 pF ±5%, 50 VDCW.
C412 was 19A702236P11 - Ceramic: 2.7 pF ±.25 pF, 50 VDCW.
C413 was 19A702236P11 - Ceramic: 2.7 pF ±.25 pF, 50 VDCW.
C417 was 19A702236P18 - Ceramic: 5.1 pF ±.5 pF, 50 VDCW.
L401 was 19B801493P2 - Coil, RF.
L403 was 19B801493P2 - Coil, RF.

REV. G - TRANSMIT/RECEIVE BOARD 19D902582G1 & G2
Software update for the Microprocessor U701.

U701 was 19A704345P20 - Microcomputer, CHMOS, 8-bit.

REV. H - TRANSMIT/RECEIVE BOARD 19D902582G1 & G2
To improve Channel Guard Decode time for UHF radios. Changed R641, R805 and R806.

R641 was 19B801251P624 - Metal film: 620K ohms ±5%, 1/10 w.
R805 was 19A702931P334 - Metal film: 22.1K ohms ±1%, 1/8 w.
R806 was 19A702931P330 - Metal film: 20K ohms ±1%, 1/8 w.

REV. J - TRANSMIT/RECEIVE BOARD 19D902582G1 & G2
To improve the microphone and Channel Guard performance. Changed R311.

R311 was 19B801251P274 - Metal film: 270K ohms ±5%, 1/10 w.

REV. K - TRANSMIT/RECEIVE BOARD 19D902582G1 & G2
To improve Synthesizer lock performance. Changed R102.

R102 was 19B800807P101 - Metal film: 100 ohms ±5%, 1/8 w.

REV. L - TRANSMIT/RECEIVE BOARD 19D902582G1 & G2
To make the MPI-II comply with Canadian DOC requirements. Changed J5, J6 and added C434.

J5 was 19A703248P14 - Post: Gold plated, 19 mm length.
J6 was 19A703248P14 - Post: Gold plated, 19 mm length.

REV. M - TRANSMIT/RECEIVE BOARD 19D902582G1 & G2
To facilitate manufacturing, changed C811.

C811 was 19A703314P14 - Electrolytic: 330 uF ±24%, 6.3 VDCW.

REV. N - TRANSMIT/RECEIVE BOARD 19D902582G1 & G2
To decrease Channel Guard decode time, to change the supply for the audio circuits from 5.4V to 5V, to improve the Transmitter and to facilitate manufacturing the following changes were made:

GROUP 1

Components Changed
C401 was 19A702236P30 - Ceramic: 15 pF.
C403 was 19A702236P21 - Ceramic: 6.8 pF ±.5 pF, 50 VDCW.
C404 was 19A702236P28 - Ceramic: 12 pF, ±5%, 50 VDCW.
C405 was 19A702236P36 - Ceramic: 27 pF, ±5%, 50 VDCW.
C411 was 19A702236P21 - Ceramic: 6.8 pF ±.5 pF, 50 VDCW.
C412 was 19A702236P25 - Ceramic: 10 pF ±.5 pF, 50 VDCW.
C413 was 19A702236P6 - Ceramic: 1.0 pF.
C417 was 19A702236P23 - Ceramic: 8.2 pF ±.25 pF, 50 VDCW.
C418 was 19A702236P21 - Ceramic: 6.8 pF ±.5 pF, 50 VDCW.
R406 was 19B801251P152 - Metal film: 1.5K ohms.

GROUP 2

Components Changed
C129 was 19A702236P6 - Ceramic: 1.0 pF, 50 VDCW.
C132 was 19A702236P7 - Ceramic: 1.2 pF ±.25 pF, 50 VDCW.
C144 was 19A702236P15 - Ceramic: 3.9 pF ±.25 pF, 50 VDCW.
C146 was 19A702236P19 - Ceramic: 5.6 pF ±.5 pF, 50 VDCW.
C401 was 19A702236P25 - Ceramic: 10 pF ±.5 pF, 50 VDCW.
C403 was 19A702236P54 - Ceramic: 150 pF, ±5%, 500 VDCW.
C404 was 19A702236P10 - Ceramic: 2.2 pF, ±.25 pF, 50 VDCW.
C405 was 19A702236P25 - Ceramic: 10 pF ±.5 pF, 50 VDCW.
C411 was 19A702236P19 - Ceramic: 5.6 pF ±.5 pF, 50 VDCW.
C412 was 19A702236P23 - Ceramic: 8.2 pF ±.25 pF, 50 VDCW.
C413 was 19A702236P5 - Ceramic: .9 pF, 50 VDCW.
C417 was 19A702236P21 - Ceramic: 6.8 pF ±.5 pF, 50 VDCW.
C418 was 19A702236P19 - Ceramic: 5.6 pF ±.5 pF, 50 VDCW.

GROUPS 1 & 2

Components Changed
C310 was 19A702061P77 - Ceramic: 470 pF ±5% pF, 50 VDCW.
C402 was 19A702236P23 - Ceramic: 8.2 pF ±.25, 50 VDCW.
C801 was 19A702052P14 - Ceramic: .01 uF ±10%, 50 VDCW.
C802 was 19A702061P73 - Ceramic: 330 pF ±5%, 50 VDCW.
C809 was 19A702052P26 - Ceramic: .1 uF ±10%, 50 VDCW.
L401 was 19B801493P2 - Coil, RF.
L405 was 19B801493P23 - Coil, fixed: .100 uH, ±20%.
R804 was 19B801251P471 - Metal film: 470 ohms ±5%, 1/10 w.
R816 was 19B801251P315 - Metal film: 14K ohms ±1%, 1/8 w.
R818 was 19B801251P315 - Metal film: 14K ohms ±1%, 1/8 w.
R820 was 19B801251P474 - Metal film: 470K ohms ±5%, 1/10 w.

Components Added
C130, C149, C150, C151, C152, R119, C845-C847, C814, R823-R825

Components Deleted
Q803 was 19A700076P2 - Silicon, NPN.

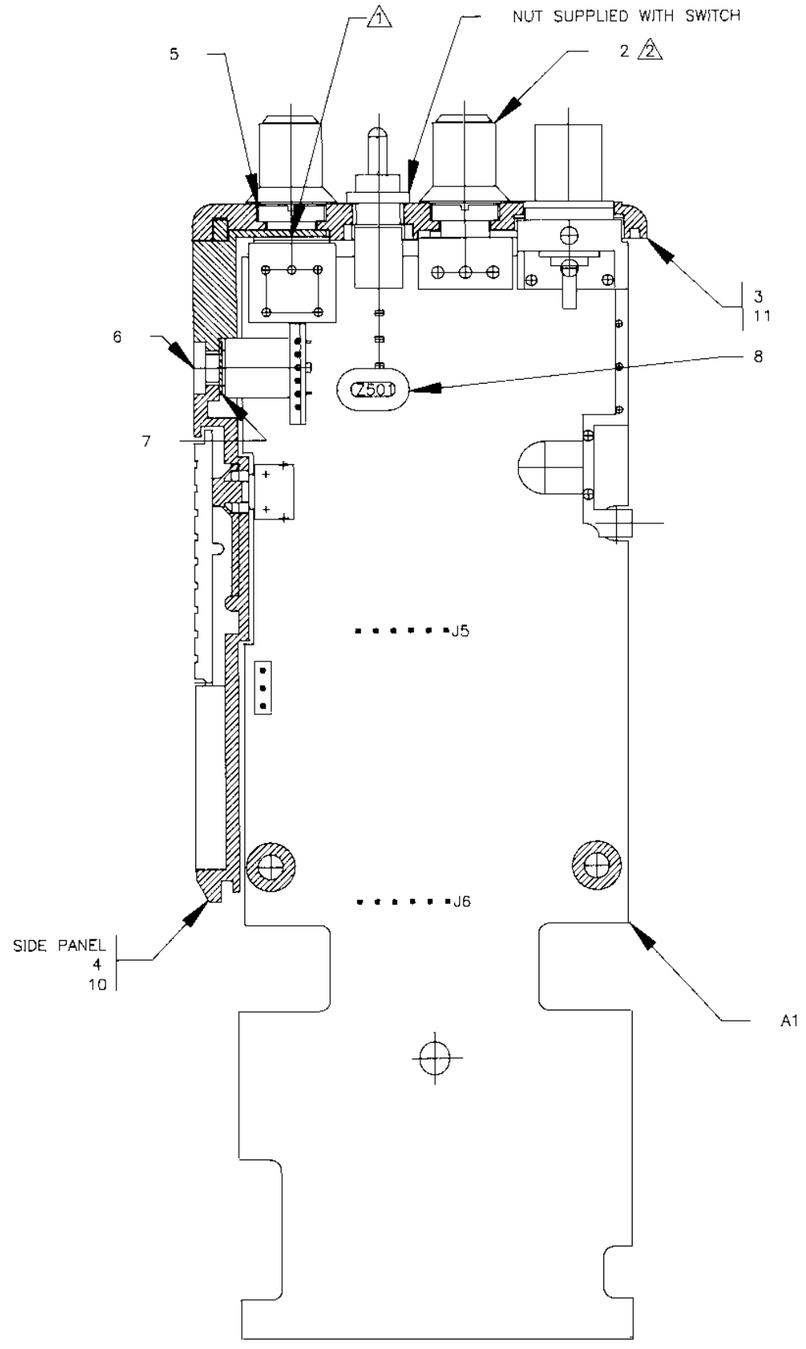
REV. P - TRANSMIT/RECEIVE BOARD 19D902582G1 & G2
REV. A - TRANSMIT/RECEIVE BOARD 19D902582G3
To improve the 5.4V Regulator. Changed C801 and R823. On Group 2 boards C131, C150 and R113 were also changed.

19D902582G1, G2 & G3

C801 is 19A702052P34 - Ceramic: .1 uF ±10%, 25 VDCW.
R823 is 19B801251P101 - Metal film: 100 ohms ±5%, 1/10 w.

19D902582G2 Only

C131 is 19A702236P34 - Ceramic: 22 pF ±5%, 50 VDCW.
C150 is 19A702236P23 - Ceramic: 8.2 pF ±.25 pF, 50 VDCW.
R113 is 19B801251P569 - Metal film: 56 ohms +5%, 1/10 w.



T/R ASSEMBLY

T/R ASSEMBLY
19D902727G3, G4, & G5