



MAINTENANCE MANUAL

PHOENIX-SX 136-174 MHz 40-WATT WIDEBAND TRANSMIT/RECEIVE BOARD 19D901002G13-20

PSX 150-174 MHz 40-WATT WIDEBAND TRANSMIT/RECEIVE BOARD 19D901002G18

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DESCRIPTION

The transmit/receiver board contains the receiver, exciter and power amplifier. The audio processor circuitry for the transmit (microphone) audio is included on the synthesizer/interconnect board. Transmit/receiver RF frequency injection (5-15 milliwatts) is provided by a common VCO on the synthesizer/interconnect board. There are no multipliers in the exciter since the RF injection frequency from the synthesizer VCO is the transmit frequency or the receiver mixer injection frequency.

The transmit/receiver board (Tx/Rx) is located on the bottom of the radio. A block diagram of the Tx/Rx board is shown in Figure 1.

CIRCUIT ANALYSISExciter

The exciter consists of amplifiers Q101-Q104 and operates over the 136-174 MHz frequency range. This wide band exciter requires no tuning.

RF injection from the synthesizer/interconnect board is applied to the base of Class A Ampl Q101 through J151, a 3 dB attenuator pad, and an impedance matching network consisting of C101, C102 and L101. This network matches the base of Q101 to 50 ohms. The 3 dB attenuator pad (R101-R103) provides a constant load for the VCO output when switching to or from the transmit mode to maintain frequency stability. Continuous 8.5V is applied to Q101 through a collector feed network consisting of L102, R106, R109, and C104-C106. Base bias is set by R104 and R105. Continuous 8.5 volts is also

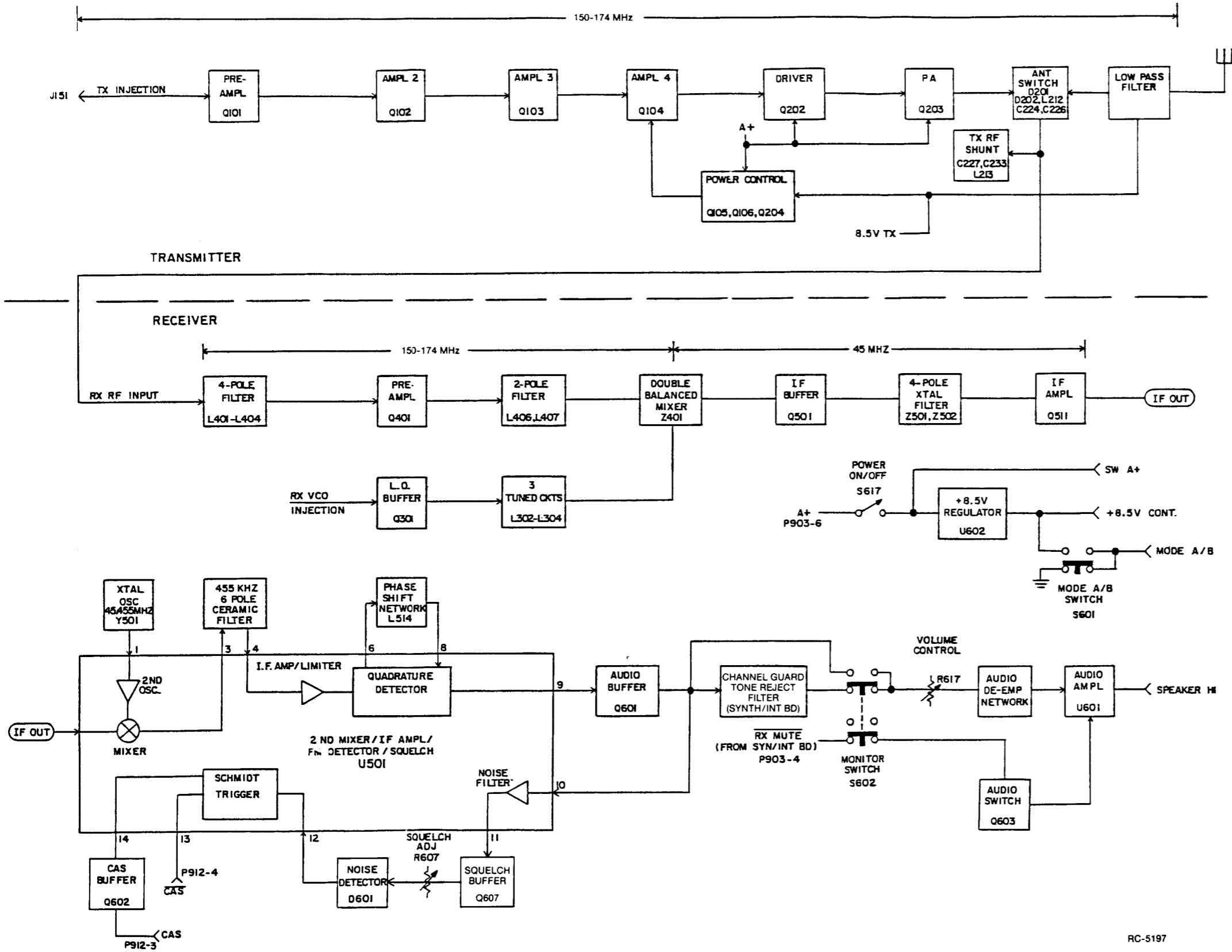
supplied to Q103. Metering for Q101 is provided by TP101 in the emitter circuit.

The output of Q101 is coupled to the base of Class B amplifier, AMPL 2 (Q102), through impedance matching network consisting of C108, C109 and L103. Tx switched 8.5V is provided through a collector feed network consisting of L104, R112, R113, and C110-C112. This switched voltage provides Tx/Rx isolation, preventing Rx VCO frequencies from passing through the exciter. Q202 is turned on only in the transmit mode. Decoupling for the switched 8.5V line is provided by C107, C113 and C122.

The output of Q102 is further amplified by a 2nd Class B amplifier, AMPL 3 (Q103) and applied to the base of the exciter final amplifier Q104. An impedance matching network consisting of L107, L108, C118-C121, and C126 matches the collector circuit of Q103 to the base of Q104. Q104 provides a minimum of 2 watts across the 136-174 MHz band to the PA. The output is coupled through interconnection/test jack J201. J201 can be used when troubleshooting the exciter/PA. It allows the technician to monitor the exciter output or to inject RF frequencies into the power amplifier by removing P201 and installing a test plug into J201-1, 3 or J201-2, 4.

Power Control

The power control circuit allows output power adjustment from 20 to 40 watts and provides overvoltage protection to automatically reduce the output power when the battery voltage exceeds 13 volts. The power control circuit consists of D101, Q105, Q106 and Q204. Q204 controls the collector voltage to exciter final amplifier Q104 which provides RF drive to the power amplifier.



RC-5197

Figure 1 - Transmit/Receive Board Block Diagram

Should the battery voltage exceed 12 volts, D101 will fire and apply base voltage to Q106. (An additional 0.7 volts is required to turn Q106 on.) As Q106 turns on a parallel path is provided around R120, reducing the base voltage of Q105. Q105 decreases the base voltage applied to Q204, causing Q204 to reduce the collector voltage to exciter final amplifier Q104. Reducing the collector voltage to Q104 decreases the RF drive applied to the power amplifier, maintaining near constant RF output power.

When battery voltage is between 12 and 16 volts the RF output power will remain near rated power. Should the battery voltage exceed 16 volts output power is drastically reduced. R120 is set to provide rated output power with battery voltage at 13.6 volts DC.

POWER AMPLIFIER

The power amplifier consists of two Class C broadband, fixed tuned transistor amplifiers that amplify the two watt RF input from the exciter and provide 40 watts RF output power. No tuning is required.

The exciter output from J201 is applied to the base of driver Q202 through a 50 ohm impedance matching network consisting of C201-C203, L201, L202, and R201. The output of Q202 is taken from the collector and applied to power amplifier Q203 through an impedance matching network. This network, consisting of L205, L206, C210-C213, and R203 matches the collector impedance of Q202 to the base of PA Q203.

A+ is supplied to the driver and PA through collector feed networks consisting of C204, L203, L204 and R202 (Q202) and L207, L208, C214 and R104 (Q203). C205-C207 provide decoupling for any transient noises that may be on the line.

In the transmit mode 8.5V Tx switched voltage is applied to Tx/Rx antenna switch by Tx 8.5V switch Q604, turning pin diodes D201 and D202 on. (Q604 is controlled by DPTT.) The PA output is then coupled through impedance matching network L209, L210, C215-C219 and coupling capacitors C220 and C229 and forward bias pin diode D201 to the low pass filter and then to the antenna through J601.

L212, C224, C226, and forward biased pin diode D202 create a 1/4 wave stub across the 136-174 MHz band, presenting an open circuit to the receiver at these RF frequencies, thus directing output power through the low pass filter and out of the antenna.

In the receive mode D201 and D202 are turned off, the AC short is removed and the 1/4 wave stub now presents a 50 ohm impedance to the receiver, allowing the received RF to pass through the low pass filter to the receiver. Pin diode D201 prevents the receive signal from getting into the transmitter.

RECEIVER

The receiver is a dual conversion, superheterodyne FM receiver designed for operation in the 136-174 MHz frequency range. Regulated 8.5 volts is used to power all receiver stages except for the audio PA IC, which operates from the A+ supply.

The receiver has intermediate frequencies of 45 MHz and 455 MHz. Adjacent channel selectivity is obtained by using two tuned circuits, a 4-pole 45 MHz crystal filter and a 455 MHz ceramic filter.

All receiver circuitry except the synthesizer is located on the transmitter/receiver board. The receiver consists of:

- Receiver Front End
- L.O. Buffer and Filter
- 45 MHz 1st Mixer
- IF Buffer and Amplifier
- 2nd Mixer and Oscillator
- 455 kHz 2nd IF circuitry with FM Detector and Squelch
- Audio PA Circuitry

RECEIVER FRONT END

An RF signal from the antenna is coupled through J601, Tx low pass filter, transmit T/R switch, a 4-pole bandpass filter (L401-L404) to gate 1 of RF pre-amplifier Q401. Q401 is a high gain low noise dual gate FET. The output of Q401 is coupled through an additional 2-pole filter (L406, L407), to the input of first mixer Z401. Front end selectivity is provided by these six tuned circuits.

1st MIXER

The 1st mixer is a doubly balanced diode mixer relatively free of inter-modulation products. RF from the pre-amplifier and tuned filters is applied to pin 1 of mixer Z401.

RF injection (181-219 MHz) from the synthesizer VCO is applied to L.O. Buffer Q301 through J351. The input level at J351 is typically +8 dBm (+6 dBm minimum)

at a frequency 45 MHz above the channel receive frequency. R301-R303 and C301 matches the source impedance of Q301 to the VCO output transmit/receive switching circuitry on the synthesizer/interconnect board. The output of the L.O. Buffer is coupled to the mixer through a 3-pole band pass filter (L302-L304) to the 1st mixer L.O. input, Z401-8.

The 45 MHz output of the mixer is coupled to the source input of IF buffer Q501. The output of buffer Q501 is coupled through an impedance matching network (C503, C504, R503 and L503) to a 45 MHz 4-pole crystal filter (Z501 and Z502). The highly-selective crystal filter provides the first portion of the receiver IF selectivity. The output of the crystal filter is direct coupled to G1 of IF amplifier Q511. L512, C509 and R511 matches the output of the crystal filter. The biasing on Gate 2 and the drain load determines the gain of the stage. The amplifier provides approximately 20 dB of IF gain. The output of Q511 is coupled to the input of IC U501 through an impedance matching network comprised of L515, R521, C508, C514 and C515. Diodes D501 and D502 provide limiting for the 45 MHz signal (1.4 Vpp) to prevent high level overload of U501.

U501 and associated circuitry consists of the 2nd converter/mixer, IF amplifier, FM detector, and squelch circuit. The 45 MHz IF input is applied to pin 16 of U501 and mixed with a 45.455 MHz frequency supplied by crystal oscillator Y501. L513 sets the frequency of Y501. High side injection is used. The output of the internal mixer is amplified and applied to a 6-pole ceramic filter, Z503, which provides the 455 kHz selectivity. The output of the 455 kHz filter is reapplied to U501-5. The 2nd IF signal is amplified/limited and the audio detected by an internal FM quadrature detector. L514 is the quadrature detector coil which controls the phase shift to allow audio detection.

AUDIO AND SQUELCH CIRCUITS

The audio output of U501 is applied to the base of audio buffer Q601. The output of the audio buffer is applied to the Channel Guard Tone Reject filter on the synthesizer/interconnect board, then to audio amplifier U601 through the MONITOR switch, and to the squelch input U501-10.

Squelch Circuit

The squelch circuit operates on the noise components contained in the FM detector audio output. The detected audio is applied to the squelch high pass filter. This filter is formed with the

internal operational amplifier and feedback circuit. Thus the filtered noise in the 6-8 kHz frequency band is applied to the squelch buffer consisting of Q607, squelch adjust R607, R608, R641, C606, C621, C624 and diode D601. As the noise increases in magnitude in a negative direction, negative spikes cause D601 to conduct, providing a noise level controlled DC input to the internal squelch circuitry of U501. The charge on C607 varies with the average noise level through D601. This output is reapplied to the Schmidt trigger in U501. The Schmidt trigger output controls CAS buffer Q602. About 4 dB of hysteresis is present in the Schmidt trigger to prevent chatter due to weak signals. Q602 provides drive to operate an optional channel busy light or external relay control. Squelch sensitivity is adjusted by R607 while R629 provides temperature compensation.

Audio Circuits

Detected audio from audio buffer Q601 is applied to the Channel Guard Tone Reject filter on the synthesizer/interconnect board and returned as filtered volume squelch high through P903-7. Filtered audio is then applied to audio amplifier U601 through MONITOR switch S602 and VOLUME control R617. R618 and C615 provide de-emphasis. A+ is applied to U601 through S617. The RX MUTE line is high when a message is received and accompanied by a correct Channel Guard Tone, keeping audio switch Q603 turned off. This enables audio amplifier U601 which provides up to 3 watts of audio output power into a 4 ohm speaker. The feedback loop consisting of R615, R616, and C611 determine the amplifier closed loop gain. R614 and C612 provide the high audio frequency roll-off above 6 kHz.

The audio amplifier is muted (switched off) when RX MUTE is low. When this occurs (no messages being received) audio switch Q603 is turned on, applying approximately 2 volts to the reference input of audio amplifier U601. This turns Q601 off causing it's output to be grounded.

Monitor

When the MONITOR switch is pressed, detected audio from audio buffer Q601 is applied directly to the audio amplifier through S602-5 and R617, bypassing the Channel Guard Tone Reject Filter. S602 also opens the RX MUTE line to Q603, causing it to be turned off and allowing audio amplifier U601 to operate. The detected audio is amplified and applied to the speaker. Channel Guard Tones may be audible when present.

MODE A/B

Mode A/B Switch S601 provides the channel selection capability of the radio by controlling the 8.5V CONT line applied to the Mode A/B input of the microcomputer. 8.5V CONT is applied to the microcomputer thru P912 in Mode B and removed in Mode A.

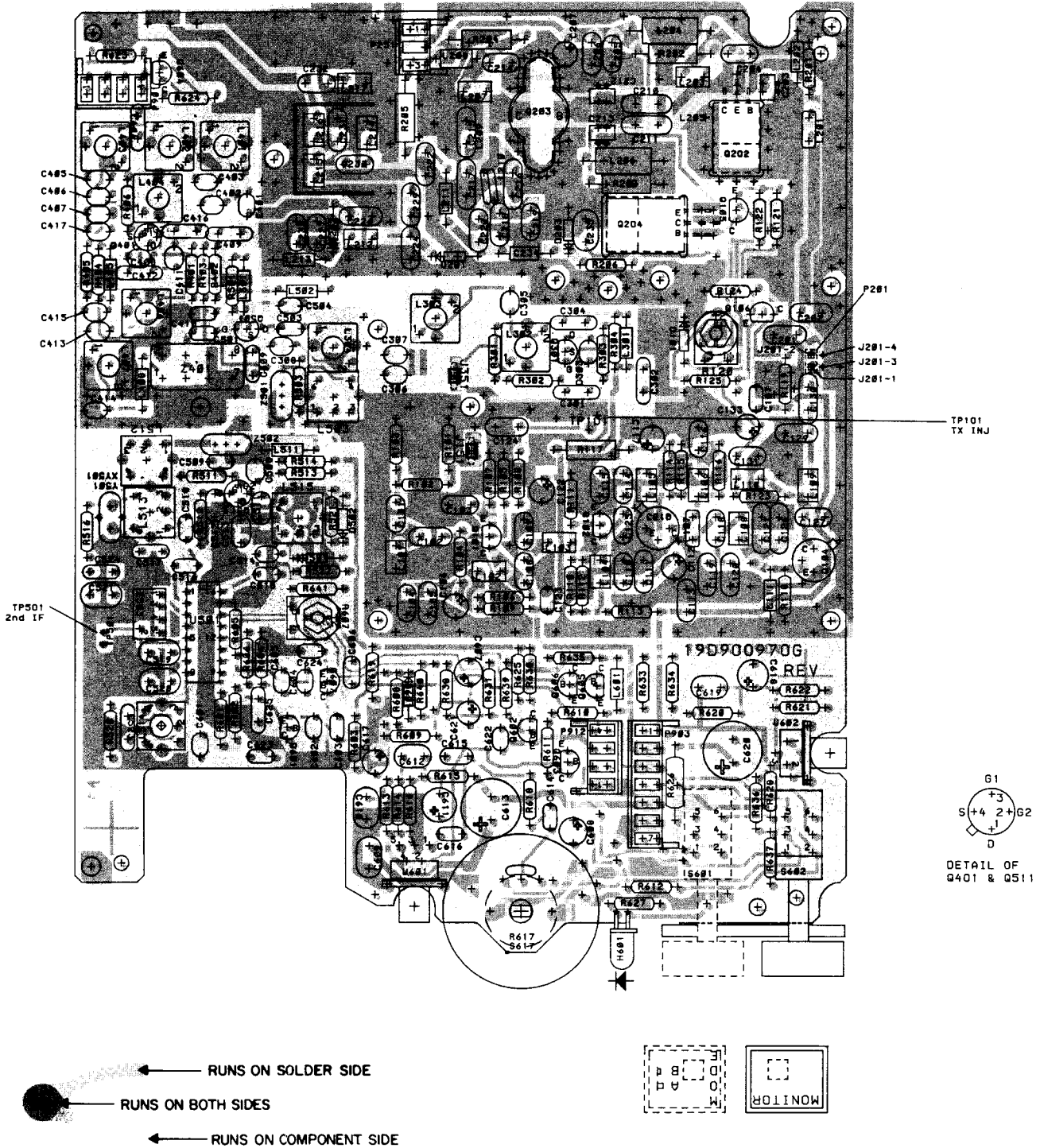
8.5 VOLT REGULATOR

8.5 Volt regulator U602 receives switched A+ from S617 and P903-6 and provides regulated 8.5 Volts to the radio. Switched A+ is available from S617.



GE Mobile Communications

General Electric Company
Lynchburg, Virginia 24502



OUTLINE DIAGRAM

150-174 MHz, 40 WATT WIDEBAND TRANSMIT/RECEIVE BOARD

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FUNCTION	CPNT SERIES
2ND IF	500
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NOTES:

- ⚠ PART OF PWB.
- ⚠ VALUE OF R621 DEPENDS ON COLOR CODE ON U602.

U602 COLOR CODE	R621 VALUE
BROWN	OMIT R621
RED	270
ORANGE	100
YELLOW	47
GREEN	22
BLUE	6.8

- ⚠ SWITCH PRESENT ON 002014,616 ONLY.

- ⚠ VOLTAGE READINGS:

ALL VOLTAGES ARE TYPICAL. VOLTAGES ARE MEASURED WITH A 20,000 OHM PER VOLT DC METER, REFERENCE TO A-, UNLESS OTHERWISE INDICATED.

SHEET 2:
ALL VOLTAGES ARE DC
ALL VOLTAGES ARE IN THE TRANSMIT CONDITION.

SHEET 3:
ALL VOLTAGES ARE DC

SHEET 4:
ALL VOLTAGES ARE DC
VOLTAGES AT U501 AND U601 ARE MEASURED WITH 1 M OHM DC VOLTMETER AND NO SIGNAL INPUT.
S - SQUELCHED RECEIVER
US - UNSQUELCHED RECEIVER

- ⚠ CALLED FOR AT HIGHER ASM.

△ COMPONENT IDENTIFICATION CHART		
PART	97062 150-174 MHZ	97064 136-153 MHZ
C119	22P	27P
C120	22P	27P
C127	6P	18P
C129	18P	27P
C134		27P
C201	18P	24P
C202	18P	24P
C203	180P	220P
C210	56P	75P
C211	56P	75P
C213	150P	220P
C216	39P	56P
C219	15P	20P
C230	10P	9P
C231	24P	27P
C232	13P	8P
C303	3.3P	4.7P
C306	4.7P	5.6P
C307	1.5P	1.0P
C308	5.6P	8.2P
C309	22P	5.6P
C403	6.8P	10P
C404	56P	68P
C405	5.6P	10P
C406	2.7P	1.8P
C407	3.3P	5.6P
C411	2.2P	5.6P
C412	150P	27P
C414	10P	12P
L408	180n	120n
R118	15	10

MODEL NO.	REV. LETTER	FREQ RANGE
PL19D900970G2	B	150-174 MHZ
PL19D901002G13		
PL19D901002G14		
PL19D900970G4	C	136-153 MHZ
PL19D901002G15		
PL19D901002G16		
PL19D901002G17		150-174 MHZ
PL19D901002G18		
PL19D901002G19		
PL19D901002G20		136-153 MHZ
PL19D900970G14	B	150-174 MHZ
PL19D900970G16	C	136-153 MHZ

ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED.
RESISTOR VALUES IN Ω UNLESS FOLLOWED BY MULTIPLIER k OR M.
CAPACITOR VALUES IN F UNLESS FOLLOWED BY MULTIPLIER μ, n OR p.
INDUCTANCE VALUES IN H UNLESS FOLLOWED BY MULTIPLIER m OR μ.

SCHEMATIC DIAGRAM NOTES

150-174 MHz TRANSMIT/RECEIVE BOARD

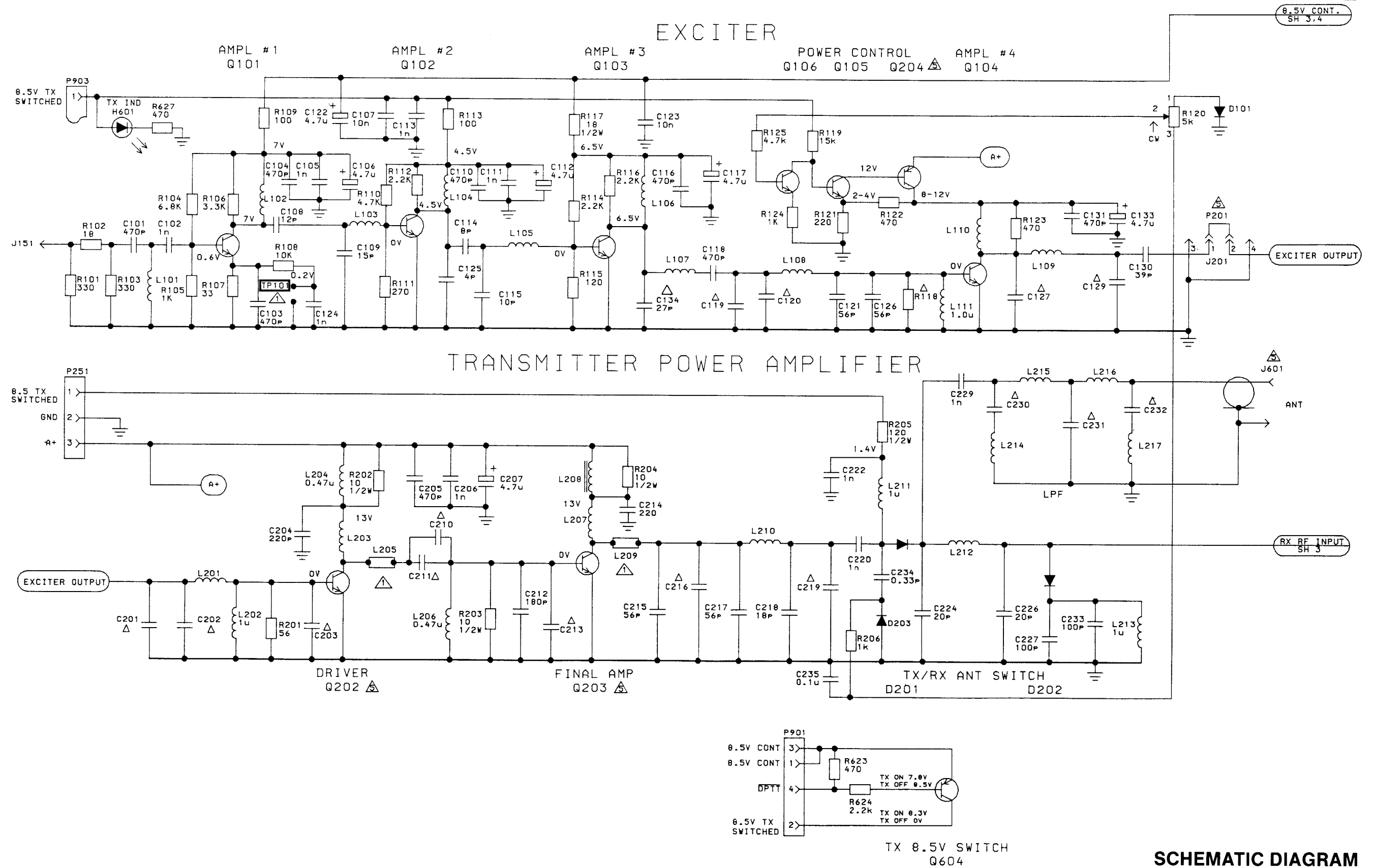
PARTS LIST

136-174 MHz
40 WATT TRANSMIT/RECEIVE ASSEMBLY
(WIDEBAND)
19D901002G13,G17 STD 150-174 MHz
19D901002G14,G18 MODE SWITCH 150-174 MHz
19D901002G15,G19 STD 136-153 MHz
19D901002G16,G20 MODE SWITCH 136-153 MHz
ISSUE 2

SYMBOL	GE PART NO.	DESCRIPTION
A1		NOTE: WHEN REPLACING BOARDS, CARE SHOULD BE TAKEN TO ASSURE THAT BOARDS WITH GOLD CONTACTS ARE NOT INTERMIXED WITH BOARDS HAVING TIN CONTACTS. REPLACE THE BOARD ONLY WITH ONE HAVING THE SAME GROUP NUMBER AS THE ORIGINAL. TRANSMIT/RECEIVE BOARD 19D900970G2 150-174 MHz (TIN CONTACTS) 19D900970G4 136-154 MHz (TIN CONTACTS) 19D900970G14 150-174 MHz (GOLD CONTACTS) 19D900970G16 136-153 MHz (GOLD CONTACTS) EXCITER ----- CAPACITORS ----- C101 19A701602P13 Ceramic: 470 pF + or - 20%, 1000 VDCW; sim to Type JF Discap. C102 19A701602P20 Ceramic: 1000 pF + or -10%, 1000 VDCW. C103 and C104 19A701602P13 Ceramic: 470 pF + or - 20%, 1000 VDCW; sim to Type JF Discap. C105 19A701602P20 Ceramic: 1000 pF + or -10%, 1000 VDCW. C106 19A703314P9 Electrolytic: 4.7 uF -10+50% tol, 50 VDCW; sim to Panasonic LS Series. C107 T644ACP310K Polyester: .010 uF + or -10%, 50 VDCW. C108 19A701624P10 Ceramic, disc: 12 pF + or -5%, 500 VDCW, temp coef 0 PPM + or -30. C109 19A701624P12 Ceramic, disc: 15 pF + or -5%, 500 VDCW, temp coef 0 PPM + or -30. C110 19A701602P13 Ceramic: 470 pF + or - 20%, 1000 VDCW; sim to Type JF Discap. C111 19A701602P20 Ceramic: 1000 pF + or -10%, 1000 VDCW. C112 19A703314P9 Electrolytic: 4.7 uF -10+50% tol, 50 VDCW; sim to Panasonic LS Series. C113 19A701602P20 Ceramic: 1000 pF + or -10%, 1000 VDCW. C114 19A701624P6 Ceramic, disc: 8 pF + or -0.5 pF, 500 VDCW, temp coef 0 PPM + or -60. C115 19A701624P8 Ceramic, disc: 10 pF + or -0.5 pF, 500 VDCW, temp coef 0 PPM + or -30. C116 19A701602P13 Ceramic: 470 pF + or - 20%, 1000 VDCW; sim to Type JF Discap. C117 19A703314P9 Electrolytic: 4.7 uF -10+50% tol, 50 VDCW; sim to Panasonic LS Series. C118 19A701602P13 Ceramic: 470 pF + or - 20%, 1000 VDCW; sim to Type JF Discap. C119A 19A701624P16 Ceramic, disc: 22 pF + or -5%, 500 VDCW, temp coef 0 PPM + or -30. (Used in G2 & G14). C119B 19A701624P18 Ceramic, disc: 27 pF + or -5%, 500 VDCW, temp coef 0 PPM + or -30. (Used in G4 & G16). C120A 19A701624P16 Ceramic, disc: 22 pF + or -5%, 500 VDCW, temp coef 0 PPM + or -30. (Used in G2 & G14). C120B 19A701624P18 Ceramic, disc: 27 pF + or -5%, 500 VDCW, temp coef 0 PPM + or -30. (Used in G4 & G16). C121 19A701624P326 Ceramic, disc: 56 pF + or -5%, 500 VDCW, temp coef N220 PPM + or -30. C122 19A703314P9 Electrolytic: 4.7 uF -10+50% tol, 50 VDCW; sim to Panasonic LS Series. C123 T644ACP310K Polyester: .010 uF + or -10%, 50 VDCW. C124 19A701602P20 Ceramic: 1000 pF + or -10%, 1000 VDCW. C125 19A701624P2 Ceramic, disc: 4 pF + or -0.5 pF, 500 VDCW, temp coef 0 PPM + or -60. C126 19A701624P326 Ceramic, disc: 56 pF + or -5%, 500 VDCW, temp coef N220 PPM + or -30. C127A 19A701624P4 Ceramic, disc: 6 pF + or -5%, 500 VDCW, temp coef 0 PPM + or - 30. (Used in G2 & G14). C127B 19A701624P14 Ceramic, disc: 18 pF + or -5%, 500 VDCW, temp coef 0 PPM + or - 30. (Used in G4 & G16).

SYMBOL	GE PART NO.	DESCRIPTION
C129A	19A701624P14	Ceramic, disc: 18 pF + or -5%, 500 VDCW, temp coef 0 PPM + or - 30. (Used in G2 & G14).
C129B	19A701624P18	Ceramic, disc: 27 pF + or -5%, 500 VDCW, temp coef 0 PPM + or -30. (Used in G4 & G16).
C130A	19A701624P22	Ceramic, disc: 39 pF + or -5%, 500 VDCW, temp coef 0 PPM + or -30. (Used in G2 & G14).
C130B	19A701602P4	Ceramic: 100 pF + or -10%, 1000 VDCW; sim to Radio Materials Type JF Discaps. (Used in G4 & G16).
C131	19A701602P13	Ceramic: 470 pF + or - 20%, 1000 VDCW; sim to Type JF Discap.
C133	19A703314P9	Electrolytic: 4.7 uF -10+50% tol, 50 VDCW; sim to Panasonic LS Series.
C134	19A701624P18	Ceramic, disc: 27 pF + or -5%, 500 VDCW, temp coef 0 PPM + or -30.
D101	19A700028P1	----- DIODES ----- Silicon, fast recovery: fwd current 75 mA, 75 PIV; sim to Type 1N4148.
J151	19A701883P4	----- JACKS ----- Contact, electrical; sim to AMP 86444-1. (Used in G2 & G4).
J151	19A701883P1	Contact, electrical. (Used in G14 & G16).
L101	19B800891P5	----- INDUCTORS ----- Coil, RF: .064 uH; sim to Paul Smith SK-890-1.
L102	19B800891P6	Coil, RF: .084 uH; sim to Paul Smith SK-890-1.
L103	19B800891P5	Coil, RF: .064 uH; sim to Paul Smith SK-890-1.
L104	19B800891P6	Coil, RF: .084 uH; sim to Paul Smith SK-890-1.
L105	19B800891P5	Coil, RF: .064 uH; sim to Paul Smith SK-890-1.
L106	19B800891P6	Coil, RF: .084 uH; sim to Paul Smith SK-890-1.
L107	19B800890P3	Coil, RF: 11.7 uH + or -5%, sim to Paul Smith SK-896-1.
L108	19B800891P1	Coil, RF Choke: sim to Paul Smith SK-890-1.
L109	19B800891P3	Coil, RF Choke; sim to Paul Smith SK890-1.
L110	19B800891P6	Coil, RF: .084 uH; sim to Paul Smith SK-890-1.
L111	H343CLP10922	Coil, RF: 1.0 uH + or -10%.
Q101 and Q102	19A702084P2	----- TRANSISTORS ----- Silicon, NPN: sim to MPS 2369.
Q103	19A116868P1	Silicon, NPN; sim to Type 2N4427.
Q104	19A700063P1	Silicon, NPN.
Q105 and Q106	19A700023P2	Silicon, NPN: sim to 2N3904.
R101	H212CRP133C	----- RESISTORS ----- Deposited carbon: 330 ohms + or -5%, 1/4 w.
R102	H212CRP018C	Deposited carbon: 18 ohms + or -5%, 1/4 w.
R103	H212CRP133C	Deposited carbon: 330 ohms + or -5%, 1/4 w.
R104	H212CRP268C	Deposited carbon: 6.8K ohms + or -5%, 1/4 w.
R105	H212CRP210C	Deposited carbon: 1K ohms + or -5%, 1/4 w.
R106	H212CRP233C	Deposited carbon: 3.3K ohms + or -5%, 1/4 w.
R107	H212CRP033C	Deposited carbon: 33 ohms + or -5%, 1/4 w.
R108	H212CRP310C	Deposited carbon: 10K ohms + or - 5%, 1/4 w.
R109	H212CRP110C	Deposited carbon: 100 ohms + or -5%, 1/4 w.
R110	H212CRP247C	Deposited carbon: 4.7K ohms + or -5%, 1/4 w.
R111	H212CRP127C	Deposited carbon: 270 ohms + or -5%, 1/4 w.
R112	H212CRP222C	Deposited carbon: 2.2K ohms + or -5%, 1/4 w.
R113	H212CRP110C	Deposited carbon: 100 ohms + or -5%, 1/4 w.
R114	H212CRP222C	Deposited carbon: 2.2K ohms + or -5%, 1/4 w.
R115	H212CRP112C	Deposited carbon: 120 ohms + or -5%, 1/4 w.

SYMBOL	GE PART NO.	DESCRIPTION
R116	H212CRP222C	Deposited carbon: 2.2K ohms + or -5%, 1/4 w.
R117	19A700113P21	Composition: 18 ohms + or - 5%, 1/2 w.
R118A	H212CRP015C	Deposited carbon: 15 ohms + or -5%, 1/4 w. (Used in G2 & G14).
R118B	H212CRP010C	Deposited carbon: 10 ohms + or -5%, 1/4 w. (Used in G4 & G16).
R119	H212CRP315C	Deposited carbon: 15K ohms + or -5%, 1/4 w.
R120	19B800784P106	Variable: 5K ohms + or -20%, 1/2 w.
R121	H212CRP122C	Deposited carbon: 220 ohms + or -5%, 1/4 w.
R122 and R123	H212CRP147C	Deposited carbon: 470 ohms + or -5%, 1/4 w.
R124	H212CRP210C	Deposited carbon: 1K ohms + or -5%, 1/4 w.
R125	H212CRP247C	Deposited carbon: 4.7K ohms + or -5%, 1/4 w.
TP101		----- TEST POINTS ----- Part of printed board 19D900969P1. POWER AMPLIFIER ----- CAPACITORS ----- C201A 19A701624P14 Ceramic, disc: 18 pF + or -5%, 500 VDCW, temp coef 0 PPM + or -30. (Used in G2 & G14). C201B 19A701624P17 Ceramic, disc: 24 pF + or -5%, 500 VDCW, temp coef 0 PPM + or -30. (Used in G4 & G16). C202A 19A701624P14 Ceramic, disc: 18 pF + or -5%, 500 VDCW, temp coef 0 PPM + or -30. (Used in G2 & G14). C202B 19A701624P17 Ceramic, disc: 24 pF + or -5%, 500 VDCW, temp coef 0 PPM + or -30. (Used in G4 & G16). C203A 19A701413P41 Mica: 180 pF + or -5%, 100 VDCW. (Used in G2 & G14). C203B 19A701413P44 Mica: 220 pF + or -5%, 100 VDCW. (Used in G4 & G16). C204 19A701602P10 Ceramic: 220 pF + or -10%, 1000 VDCW. C205 19A701602P13 Ceramic: 470 pF + or - 20%, 1000 VDCW; sim to Type JF Discap. C206 19A701602P20 Ceramic: 1000 pF + or -10%, 1000 VDCW. C207 19A703314P9 Electrolytic: 4.7 uF -10+50% tol, 50 VDCW; sim to Panasonic LS Series. C210A 19A701624P326 Ceramic, disc: 56 pF + or -5%, 500 VDCW, temp coef N220 PPM + 30. (Used in G2 & G14). C210B 19A701624P529 Ceramic, disc: 75 pF + or -5%, 500 VDCW, temp coef N470 PPM + or -60. (Used in G4 & G16). C211A 19A701624P326 Ceramic, disc: 56 pF + or -5%, 500 VDCW, temp coef N220 PPM + 30. (Used in G2 & G14). C211B 19A701624P529 Ceramic, disc: 75 pF + or -5%, 500 VDCW, temp coef N470 PPM + or -60. (Used in G4 & G16). C212 19A701413P41 Mica: 180 pF + or -5%, 100 VDCW. C213A 19A701413P38 Mica: 150 pF + or -5%, 100 VDCW. (Used in G2 & G14). C213B 19A701413P44 Mica: 220 pF + or -5%, 100 VDCW. (Used in G4 & G16). C214 19A701602P10 Ceramic: 220 pF + or -10%, 1000 VDCW. C215 19A701624P326 Ceramic, disc: 56 pF + or -5%, 500 VDCW, temp coef N220 PPM + or -30. C216A 19A701624P122 Ceramic, disc: 39 pF + or -5%, 500 VDCW, temp coef N80 PPM + 30. (Used in G2 & G14). C216B 19A701624P326 Ceramic, disc: 56 pF + or -5%, 500 VDCW, temp coef N220 PPM + or -30. (Used in G4 & G16). C217 19A701624P326 Ceramic, disc: 56 pF + or -5%, 500 VDCW, temp coef N220 PPM + or -30. C218 19A701624P14 Ceramic disc: 18 pF + or -5%, 500 VDCW, temp coef 0 PPM + or - 30. C219A 19A701624P12 Ceramic, disc: 15 pF + or -5%, 500 VDCW, temp coef 0 PPM + 30. (Used in G2 & G14). C219B 19A701624P15 Ceramic, disc: 20 pF + or -5%, 500 VDCW, temp coef 0 PPM + or -30. (Used in G4 & G16). C220 19A701602P20 Ceramic: 1000 pF + or -10%, 1000 VDCW. C222 19A701602P20 Ceramic: 1000 pF + or -10%, 1000 VDCW.



(19D901703, Sh. 2, Rev. 1)

SCHEMATIC DIAGRAM

150-174 MHz, 40 WATT WIDEBAND TRANSMITTER BOARD

SYMBOL	GE PART NO.	DESCRIPTION
C224	19A701624P15	Ceramic, disc: 20 pF + or -5%, 500 VDCW, temp coef 0 PPM + or -30.
C226	19A701624P15	Ceramic, disc: 20 pF + or -5%, 500 VDCW, temp coef 0 PPM + or -30.
C227	19A701602P4	Ceramic: 100 pF + or -10%, 1000 VDCW; sim to Radio Materials Type JF Discaps.
C229	19A701602P20	Ceramic: 1000 pF + or -10%, 1000 VDCW.
C230A	19A701624P8	Ceramic, disc: 10 pF + or -0.5 pF, 500 VDCW, temp coef 0 PPM + or -60 PPM. (Used in G2 & G14).
C230B	19A701624P7	Ceramic, disc: 9 pF + or -0.5 pF, 500 VDCW, temp coef 0 PPM + or -60 PPM. (Used in G4 & G16).
C231A	19A701624P17	Ceramic, disc: 24 pF + or -5%, 500 VDCW, temp coef 0 PPM + or -30. (Used in G2 & G14).
C231B	19A701624P18	Ceramic, disc: 27 pF + or -5%, 500 VDCW, temp coef 0 PPM + or -30. (Used in G4 & G16).
C232A	19A701624P11	Ceramic, disc: 13 pF + or -5%, 500 VDCW, temp coef 0 PPM + or -30. (Used in G2 & G14).
C232B	19A701624P6	Ceramic, disc: 8 pF + or -0.5 pF, 500 VDCW, temp coef 0 PPM + or -60. (Used in G4 & G16).
C233	19A701602P4	Ceramic: 100 pF + or -10%, 1000 VDCW; sim to Radio Materials Type JF Discaps.
C234	19A700013P7	Phenolic: 0.33 pF + or - 5%, 500 VDCW.
C235	19A702250P113	Polyester: 0.1 uF + or -10%, 50 VDCW.
----- DIODES -----		
D201 and D202	19J706892P2	Silicon, pin; sim to Unitrode UM9401.
D203	19A700047P3	Silicon: 100 mW; sim to 1N6263.
----- JACKS -----		
J201	19A703248P1	Contact, electrical. (Quantity 4).
----- INDUCTORS -----		
L201	19B800890P6	Coil, RF: 14.7 nH + or -5%, sim to Paul Smith SK-891-1.
L202	H343CLP10922	Coil, RF: 1.0 uH + or -10%.
L203	19B800891P3	Coil, RF Choke; sim to Paul Smith SK890-1.
L204	19A700000P8	Coil, RF: 470 nH + or -12%; sim to Jeffers 4411-4K.
L205		Part of printed board 19D900969P1.
L206	19A700000P8	Coil, RF: 470 nH + or -12%; sim to Jeffers 4411-4K.
L207	19B800891P2	Coil, RF Choke: sim to Paul Smith SK-890-1.
L208	19A701091G1	Coil.
L209		Part of printed board 19D900969P1.
L210A	19A701421P6	Coil. (Used in G2 & G14).
L210B	19A701421P2	Coil. (Used in G4 & G16).
L211	19A700024P13	Coil, RF: 1.0 uH + or -10%.
L212A	19B800891P4	Coil, RF Choke: sim to Paul Smith SK-890-1. (Used in G2 & G14).
L212B	19B800891P5	Coil, RF: .064 uH; sim to Paul Smith SK-890-1. (Used in G4 & G16).
L213	H343CLP10922	Coil, RF: 1.0 uH + or -10%.
L214A	19B800891P2	Coil, RF Choke: sim to Paul Smith SK-890-1. (Used in G2 & G14).
L214B	19B800891P3	Coil, RF Choke; sim to Paul Smith SK890-1. (Used in G4 & G16).
L215 and L216	19B800891P5	Coil, RF: .064 uH; sim to Paul Smith SK-890-1.
L217A	19B800891P2	Coil, RF Choke: sim to Paul Smith SK-890-1. (Used in G2 & G14).
L217B	19B800891P3	Coil, RF Choke; sim to Paul Smith SK890-1. (Used in G4 & G16).

SYMBOL	GE PART NO.	DESCRIPTION
P201	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002.
P251	19A116659P1	Connector, printed wiring: 3 contacts rated at 5 amps; sim to Molex 09-52-3032.
----- RESISTORS -----		
R201	H212CRP056C	Deposited carbon: 56 ohms + or -5%, 1/4 w.
R202 thru R204	19A700113P15	Composition: 10 ohms + or - 5%, 1/2 w.
R205	19A700113P41	Composition: 120 ohms + or - 5%, 1/2 w.
R206	H212CRP210C	Deposited carbon: 1K ohms + or -5%, 1/4 w.
RECEIVER VCO INJECTION		
----- CAPACITORS -----		
C301 and C302	19A700235P27	Ceramic: 150 pF + or -5%, 50 VDCW.
C303A	19A700235P7	Ceramic: 3.3 pF + or -0.25 pF, 50 VDCW, temp coef N150 PPM. (Used in G2 & G14).
C303B	19A700235P9	Ceramic: 4.7 pF + or -0.25 pF, 50 VDCW, temp coef N150 PPM/C. (Used in G4 & G16).
C304	19A700235P27	Ceramic: 150 pF + or -5%, 50 VDCW.
C305	19A700235P3	Ceramic: 1.5 pF + or -0.25 pF, 50 VDCW, temp coef -150 PPM.
C306A	19A700235P9	Ceramic: 4.7 pF + or -0.25 pF, 50 VDCW. (Used in G2 & G14).
C306B	19A700235P10	Ceramic: 5.6 pF + or -0.25 pF, 50 VDCW. (Used in G4 & G16).
C307A	19A700235P3	Ceramic: 1.5 pF + or -0.25 pF, 50 VDCW, temp coef 0 PPM. (Used in G2 & G14).
C307B	19A700235P1	Ceramic: 1 pF + or - 0.25 pF, 50 VDCW, temp coef 0 PPM. (Used in G4 & G16).
C308A	19A700235P10	Ceramic: 5.6 pF + or -0.25 pF, 50 VDCW. (Used in G2 & G14).
C308B	19A700235P12	Ceramic: 8.2 pF + or -0.25 pF, 50 VDCW. (Used in G4 & G16).
C309A	19A700235P17	Ceramic: 22 pF + or -5%, 50 VDCW. (Used in G2 & G14).
C309B	19A700235P10	Ceramic: 5.6 pF + or -0.25 pF, 50 VDCW. (Used in G4 & G16).
----- JACKS -----		
J351	19A701883P1	Contact, electrical. (Used in G14 & G16).
J351	19A701883P4	Contact, electrical; sim to AMP 86444-1. (Used in G2 & G4).
----- INDUCTORS -----		
L301	H343CLP10922	Coil, RF: 1.0 uH + or -10%.
L302 thru L304	19B800965P223	Coil, RF: variable; sim to Paul Smith SK767-2.
----- TRANSISTORS -----		
Q301	19A700060P3	N-Type, field effect; sim to J310.
----- RESISTORS -----		
R301	H212CRP118C	Deposited carbon: 180 ohms + or -5%, 1/4 w.
R302	H212CRP015C	Deposited carbon: 15 ohms + or -5%, 1/4 w.
R303	H212CRP118C	Deposited carbon: 180 ohms + or -5%, 1/4 w.
R304	H212CRP227C	Deposited carbon: 2.7K ohms + or -5%, 1/4 w.
RECEIVER FRONT END		
----- CAPACITORS -----		
C401	19A700235P12	Ceramic: 8.2 pF + or -0.25 pF, 50 VDCW.

SYMBOL	GE PART NO.	DESCRIPTION
C402	19A700235P5	Ceramic: 2.2 pF + or -0.25 pF, 50 VDCW, temp coef -150 PPM.
C403A	19A700235P11	Ceramic: 6.8 pF + or -5%, 50 VDCW. (Used in in G2 & G14).
C403B	19A700235P13	Ceramic: 10 pF + or -5%, 50 VDCW. (Used in G4 & G16).
C404A	19A700235P22	Ceramic: 56 pF + or -5%, 50 VDCW. (Used in G2 & G14).
C404B	19A700235P23	Ceramic: 68 pF + or -5%, 50 VDCW. (Used in G4 & G16).
C405A	19A700235P10	Ceramic: 5.6 pF + or -0.25 pF, 50 VDCW. (Used in G2 & G14).
C405B	19A700235P13	Ceramic: 10 pF + or -5%, 50 VDCW. (Used in G4 & G16).
C406A	19A700235P6	Ceramic: 2.7 pF + or -0.25 pF, 50 VDCW. (Used in G2 & G14).
C406B	19A700235P4	Ceramic: 1.8 pF + or -0.25 pF, 50 VDCW. (Used in G4 & G16).
C407A	19A700235P7	Ceramic: 3.3 pF + or - 0.25 pF, 50 VDCW. (Used in G2 & G14).
C407B	19A700235P10	Ceramic: 5.6 pF + or -0.25 pF, 50 VDCW. (Used in G4 & G16).
C408B	19A700235P9	Ceramic: 4.7 pF + or -0.25 pF, 50 VDCW, temp coef N150 PPM/C.
C409	19A700235P27	Ceramic: 150 pF + or -5%, 50 VDCW.
C410	T644ACP310K	Polyester: .010 uF + or -10%, 50 VDCW.
C411A	19A700235P5	Ceramic: 2.2 pF + or - 0.25 pF, 50 VDCW. (Used in G2 & G14).
C411B	19A700235P10	Ceramic: 5.6 pF + or -0.25 pF, 50 VDCW. (Used in G4 & G16).
C412A	19A700235P27	Ceramic: 150 pF + or -5%, 50 VDCW. (Used in G2 & G14).
C412B	19A700235P18	Ceramic, disc: 27 pF + or -5%, 50 VDCW. (Used in G4 & G16).
C413	19A700235P6	Ceramic: 2.7 pF + or -0.25 pF, 50 VDCW, temp coef N150 PPM.
C414A	19A700235P13	Ceramic: 10 pF + or -5%, 50 VDCW. (Used in G2 & G14).
C414B	19A700235P14	Ceramic, disc: 12 pF + or -5%, 50 VDCW. (Used in G4 & G16).
C415	19A700235P7	Ceramic: 3.3 pF + or -0.25 pF, 50 VDCW, temp coef N150 PPM.
C416	19A700235P27	Ceramic: 150 pF + or -5%, 50 VDCW.
C417	19A700235P5	Ceramic: 2.2 pF + or -0.25 pF, 50 VDCW, temp coef -150 PPM.
----- INDUCTORS -----		
L401 thru L404	19B800965P323	Coil, RF: variable; sim to Paul Smith SK767-2.
L405	H343CLP10922	Coil, RF: 1.0 uH + or -10%.
L406 and L407	19B800965P323	Coil, RF: variable; sim to Paul Smith SK767-2.
L408A	19A700024P4	Coil, RF: 180 nH + or - 10%. (Used in G2 & G14).
L408B	19A700024P2	Coil, RF: 120 nH + or - 10%. (Used in G4 & G16).
----- TRANSISTORS -----		
Q401	19A116818P3	N Channel, field effect; sim to Type 3N1877.
----- RESISTORS -----		
R401	H212CRP315C	Deposited carbon: 15K ohms + or -5%, 1/4 w.
R402	H212CRP322C	Deposited carbon: 22K ohms + or -5%, 1/4 w.
R403	H212CRP022C	Deposited carbon: 22 ohms + or -5%, 1/4 w.
R404	H212CRP212C	Deposited carbon: 1.2K ohms + or -5%, 1/4 w.
R405	H212CRP022C	Deposited carbon: 22 ohms + or -5%, 1/4 w.
R406	H212CRP233C	Deposited carbon: 3.3K ohms + or -5%, 1/4 w.

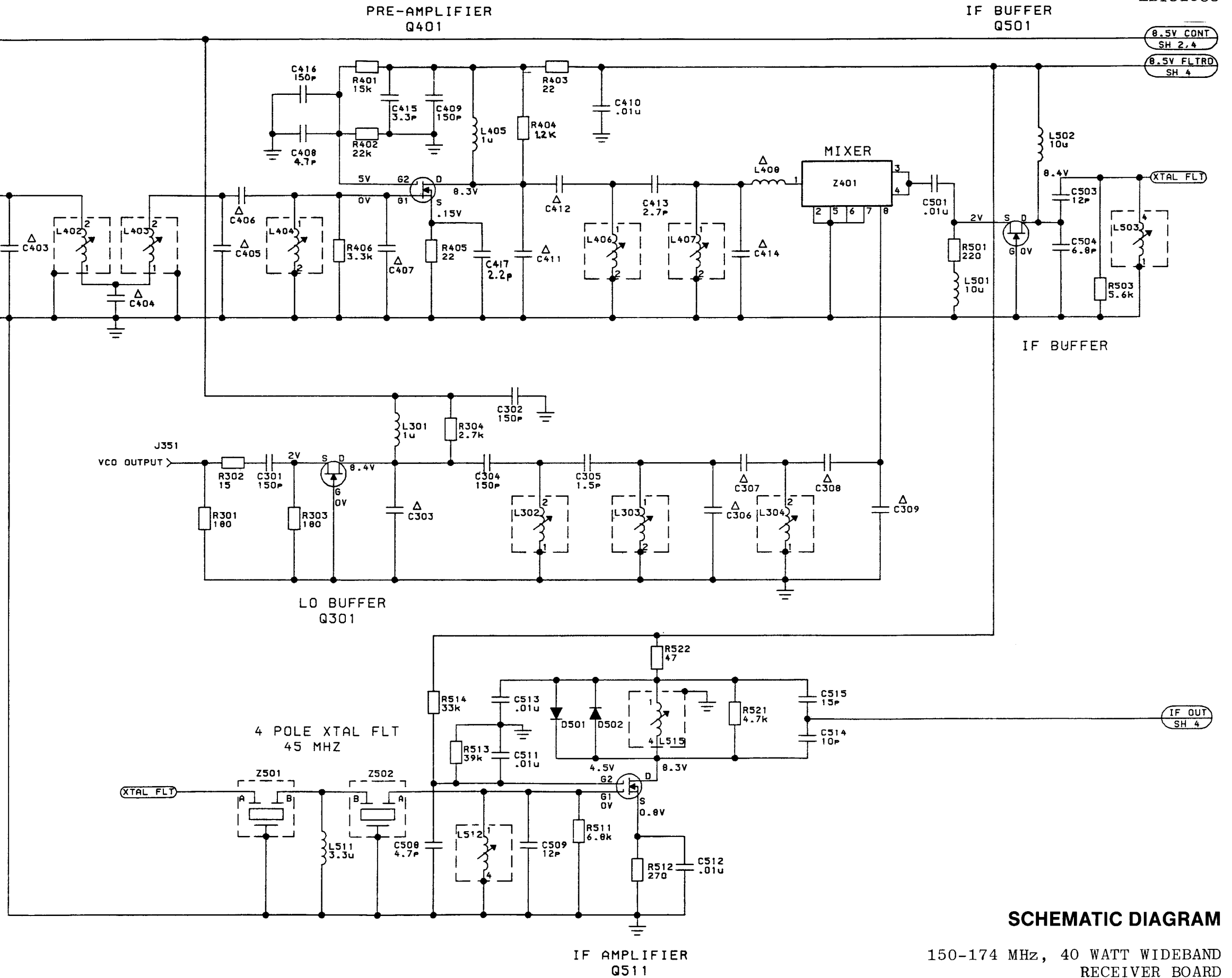
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SH 2,4

8.5V CONT
SH 2,4

8.5V FLTRD
SH 4

RX RF INPUT
SH 2

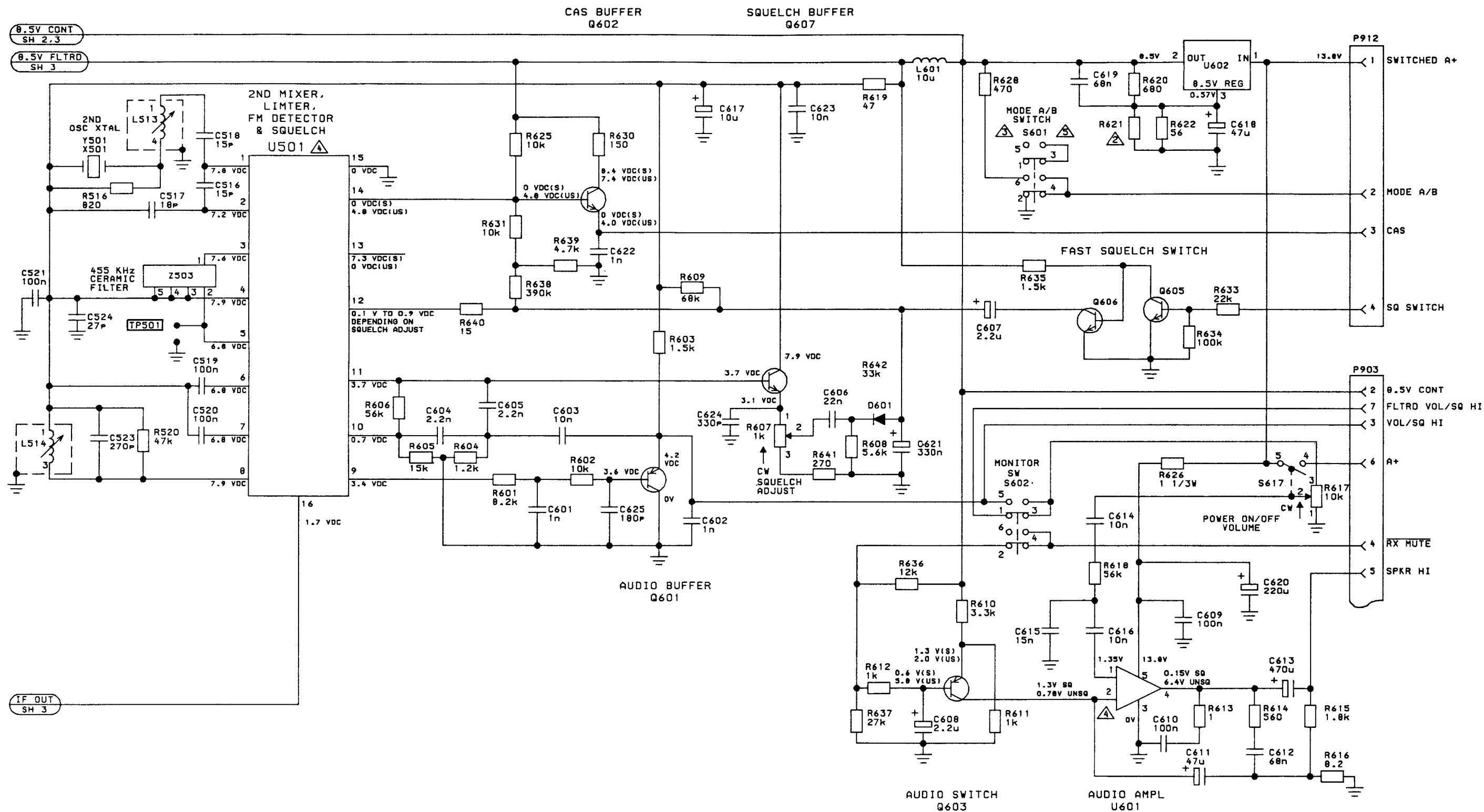
IF OUT
SH 4



SCHEMATIC DIAGRAM

150-174 MHz, 40 WATT WIDEBAND
RECEIVER BOARD

SYMBOL	GE PART NO.	DESCRIPTION	SYMBOL	GE PART NO.	DESCRIPTION	SYMBOL	GE PART NO.	DESCRIPTION
		----- NETWORKS -----			----- SOCKETS -----			
Z401	19B801025P1	Balanced Mixer (Double); sim to Mini-Circuits SBL-1.	X501	19A702742P1	Crystal socket. (Quantity 2).	Q605 thru Q607	19A700023P2	Silicon, NPN: sim to 2N3904.
		IF			----- CRYSTALS -----			----- RESISTORS -----
		----- CAPACITORS -----	Y501	19B233066G8	Crystal: freq range 45.455 MHz.	R601	H212CRP282C	Deposited carbon: 8.2K ohms + or -5%, 1/4 w.
C501	T644ACP310K	Polyester: .010 uF + or -10%, 50 VDCW.	Z501	19A702166G2	Crystal pair, quartz: 45 MHz reference frequenc	R602	H212CRP310C	Deposited carbon: 10K ohms + or - 5%, 1/4 w.
C503	19A700235P14	Ceramic, disc: 12 pF + or -5%, 50 VDCW.	Z502		Part of Z501.	R603	H212CRP215C	Deposited carbon: 1.5K ohms + or -5%, 1/4 w.
C504	19A700235P11	Ceramic: 6.8 pF + or -0.25 pF, 50 VDCW, temp coef N150 PPM.	Z503	19B801021P2	Bandpass filter: 455 kHz + or -1.5; sim to Murata CPW-455E.	R604	H212CRP212C	Deposited carbon: 1.2K ohms + or -5%, 1/4 w.
C508	19A700235P9	Ceramic: 4.7 pF + or -0.25 pF, 50 VDCW, temp coef N150 PPM/°C.			RECEIVE AUDIO	R605	H212CRP315C	Deposited carbon: 15K ohms + or -5%, 1/4 w.
C509	19A700235P14	Ceramic, disc: 12 pF + or -5%, 50 VDCW.			----- CAPACITORS -----	R606	H212CRP356C	Deposited carbon: 56K ohms + or -5%, 1/4 w.
C511 thru C513	T644ACP310K	Polyester: .010 uF + or -10%, 50 VDCW.	C601 and C602	T644ACP210K	Polyester: .0010 uF + or -10%, 50 VDCW.	R607	19B800784P105	Variable: 1K ohms + or -20%, 350 VDCW, .5 w.
C514	19A700235P13	Ceramic: 10 pF + or -5%, 50 VDCW.	C603	T644ACP310J	Polyester: .010 uF + or -5%, 50 VDCW.	R608	H212CRP256C	Deposited carbon: 5.6K ohms + or -5%, 1/4 w.
C515 and C516	19A700235P15	Ceramic: 15 pF + or - 5%, 50 VDCW.	C604 and C605	T644ACP222J	Polyester: .0022 uF + or -5%, 50 VDCW.	R609	H212CRP368C	Deposited carbon: 68K ohms + or -5%, 1/4 w.
C517	19A700235P16	Ceramic: 18 pF + or -5%, 50 VDCW.	C606	T644ACP322K	Polyester: .022 uF + or -10%, 50 VDCW.	R610	H212CRP233C	Deposited carbon: 3.3K ohms + or -5%, 1/4 w.
C518	19A700235P15	Ceramic: 15 pF + or - 5%, 50 VDCW.	C607 and C608	19A701534P5	Tantalum: 2.2 uF, + or -20%, 35 VDCW.	R611 and R612	H212CRP210C	Deposited carbon: 1K ohms + or -5%, 1/4 w.
C519 thru C521	19A702250P113	Polyester: 0.1 uF + or -10%, 50 VDCW.	C609 and C610	19A702250P113	Polyester: 0.1 uF + or -10%, 50 VDCW.	R613	H212CRP910C	Deposited carbon: 1 ohm + or -5%, 1/4 w.
C523	19A700223P80	Ceramic: 270 pF + or -5%, 100 VDCW.	C611	19A701534P9	Tantalum: 47 uF + or -20%, 6.3 VDCW.	R614	H212CRP156C	Deposited carbon: 560 ohms + or -5%, 1/4 w.
C524	19A700235P18	Ceramic, disc: 27 pF + or -5%, 50 VDCW.	C612	19A702250P112	Polyester: .068 uF + or -10%, 50 VDCW; sim to NISSEI TYPE AMZ.	R615	H212CRP218C	Deposited carbon: 1.8K ohms + or -5%, 1/4 w.
		----- DIODES -----	C613	19A701225P8	Electrolytic: 470 uF -10+75%, 16 VDCW; sim to Sprague 5002D477-G016DGIC.	R616	H212CRP982C	Deposited carbon: 8.2 ohms + or -5%, 1/4 w.
D501 and D502	19A700028P1	Silicon, fast recovery: fwd current 75 mA, 75 PIV; sim to Type 1N4148.	C614	T644ACP310K	Polyester: .010 uF + or -10%, 50 VDCW.	R617	19A703313P3	Variable, Carbon: 10K ohm + or - 20%, 0.1 w.
		----- INDUCTORS -----	C615	T644ACP315K	Polyester: .015 uF + or -10%, 50 VDCW.	R618	H212CRP356C	Deposited carbon: 56K ohms + or -5%, 1/4 w.
L501 and L502	H343CLP10022	Coil, Fixed: 10 uH + or - 10%.	C616	T644ACP310K	Polyester: .010 uF + or -10%, 50 VDCW.	R619	H212CRP047C	Deposited carbon: 47 ohms + or -5%, 1/4 w.
L503	19A703311P2	Coil, RF: sim to TOKO AMERICA KON-K6672BA.	C617	19A703314P10	Electrolytic: 10 uF -10+50% tol, 50 VDCW; sim to Panasonic LS Series.	R620	H212CRP168C	Deposited carbon: 680 ohms + or -5%, 1/4 w.
L511	19B209420P19	Coil, RF: 3.3 uH + or -5%.	C618	19A703314P4	Electrolytic: 47 uF -10+50% tol, 16 VDCW; sim to Panasonic LS Series.	R621A	H212CRP127C	Deposited carbon: 270 ohms + or -5%, 1/4 w.
L512	19A703311P1	Coil, RF: sim to TOKO American KON-K6572BA.	C619	19A702250P112	Polyester: .068 uF + or -10%, 50 VDCW; sim to NISSEI TYPE AMZ.	R621B	H212CRP110C	Deposited carbon: 100 ohms + or -5%, 1/4 w.
L513	19A703311P2	Coil, RF: sim to TOKO AMERICA KON-K6672BA.	C620	19A701225P3	Electrolytic: 220 uF, -10+50%, 25 VDCW.	R621C	H212CRP047C	Deposited carbon: 47 ohms + or -5%, 1/4 w.
L514	19B801023P1	Coil, RF: 450 uH + or -6%, sim to TOKO AMERICAN 124LN-A064HM.	C621	19A701534P12	Tantalum: .33 uF + or -20%, 35 VDCW.	R621D	H212CRP022C	Deposited carbon: 22 ohms + or -5%, 1/4 w.
L515	19A703311P1	Coil, RF: sim to TOKO American KON-K6572BA.	C622	T644ACP210K	Polyester: .0010 uF + or -10%, 50 VDCW.	R621E	H212CRP968C	Deposited carbon: 6.8 ohms + or -5%, 1/4 w.
		----- TRANSISTORS -----	C623	T644ACP310K	Polyester: .010 uF + or -10%, 50 VDCW.	R622	H212CRP056C	Deposited carbon: 56 ohms + or -5%, 1/4 w.
Q501	19A700060P3	N-Type, field effect; sim to J310.	C624	19A700235P31	Ceramic, disc: 330 pF + or -5%, 50 VDCW.	R623	H212CRP147C	Deposited carbon: 470 ohms + or -5%, 1/4 w.
Q511	19A116818P3	N Channel, field effect; sim to Type 3N1877.	C625	19A700235P28	Ceramic: 180 pF + or -5%, 50 VDCW.	R624	H212CRP222C	Deposited carbon: 2.2K ohms + or -5%, 1/4 w.
		----- RESISTORS -----			----- DIODES -----	R625	H212CRP310C	Deposited carbon: 10K ohms + or - 5%, 1/4 w.
R501	H212CRP122C	Deposited carbon: 220 ohms + or -5%, 1/4 w.	D601	19A700028P1	Silicon, fast recovery: fwd current 75 mA, 75 PIV; sim to Type 1N4148.	R626	19A700018P1	Deposited carbon: 1 ohm + or -5%, 1/3 w.
R503	H212CRP256C	Deposited carbon: 5.6K ohms + or -5%, 1/4 w.			----- LEDES -----	R627 and R628	H212CRP147C	Deposited carbon: 470 ohms + or -5%, 1/4 w.
R511	H212CRP268C	Deposited carbon: 6.8K ohms + or -5%, 1/4 w.	H601	19A134354P1	Diode, optoelectronic: red; sim to Hew. Packard 5082-4655.	R630	H212CRP115C	Deposited carbon: 150 ohms + or -5%, 1/4 w.
R512	H212CRP127C	Deposited carbon: 270 ohms + or -5%, 1/4 w.			----- INDUCTORS -----	R631	H212CRP310C	Deposited carbon: 10K ohms + or - 5%, 1/4 w.
R513	H212CRP339C	Deposited carbon: 39K ohms + or -5%, 1/4 w.	L601	H343CLP10022	Coil, Fixed: 10 uH + or - 10%.	R633	H212CRP322C	Deposited carbon: 22K ohms + or -5%, 1/4 w.
R514	H212CRP333C	Deposited carbon: 33K ohms + or -5%, 1/4 w.			----- TRANSISTORS -----	R634	H212CRP410C	Deposited carbon: 0.1M ohms + or -5%, 1/4 w.
R516	H212CRP182C	Deposited carbon: 820 ohms + or -5%, 1/4 w.	Q601	19A700022P2	Silicon, PNP: sim to 2N3906.	R635	H212CRP215C	Deposited carbon: 1.5K ohms + or -5%, 1/4 w.
R520	H212CRP347C	Deposited carbon: 47K ohms + or -5%, 1/4 w.	Q602	19A700023P2	Silicon, NPN: sim to 2N3904.	R636	H212CRP312C	Deposited carbon: 12K ohms + or -5%, 1/4 w.
R521	H212CRP247C	Deposited carbon: 4.7K ohms + or -5%, 1/4 w.	Q603	19A700022P2	Silicon, PNP: sim to 2N3906.	R637	H212CRP327C	Deposited carbon: 27K ohms + or -5%, 1/4 w.
R522	H212CRP047C	Deposited carbon: 47 ohms + or -5%, 1/4 w.	Q604	19A702504P2	Silicon, PNP; sim to 2N4403.	R638	H212CRP439C	Deposited carbon: 0.39M + or -5%, 1/4 w.
		----- INTEGRATED CIRCUITS -----				R639	H212CRP247C	Deposited carbon: 4.7K ohms + or -5%, 1/4 w.
U501	19A704619P1	Linear: IF AMPLIFIER AND DETECTOR.				R640	H212CRP015C	Deposited carbon: 15 ohms + or -5%, 1/4 w.
						R641	H212CRP127C	Deposited carbon: 270 ohms + or -5%, 1/4 w.
								----- SWITCHES -----
						S601	19B800563P1	Push, DPDT, 1 station, alternate action; sim to IEEB/Schadow 51281 (P2UBE).
						S602	19B800563P8	Push: DPDT, contacts rated 15 mA at 130 VDC; sim to IEEB/SCHADOW P200A.
						S617		Part of R617.



SCHEMATIC DIAGRAM

150-174 MHz, 40 WATT WIDEBAND RECEIVER BOARD

(19D901703, Sh. 4, Rev. 1)

SYMBOL	GE PART NO.	DESCRIPTION	
U601		HEAT SINK ASSEMBLY 19B801346G2	
	19A702364P208	Machine screw: TORX Drive, M2.5 - 0.45 x 8.	
	19A701830P1	Linear, Audio AMPLIFIER; sim to TDA 2003.	
	19B232901P1	Support.	
	19A700033P3	Lockwasher, external tooth: M2.5.	
	19A700034P3	Hex nut, metric: M2.5 x 0.45.	
U602		HEAT SINK ASSEMBLY 19B801346G3	
	19A700068P1	Insulator, bushing.	
	19A700115P3	Insulator, plate.	
	19A702364P208	Machine screw: TORX Drive, M2.5 - 0.45 x 8.	
	19A138414G1	Regulator: 8.5 V.	
	19B232901P1	Support.	
	19A700033P3	Lockwasher, external tooth: M2.5.	
	19A700034P3	Hex nut, metric: M2.5 x 0.45.	
	19A701312P3	Flatwasher, metric: No. 2.5MM.	
		INTERCONNECT	
		----- PLUGS -----	
	P901	19A116659P15	Connector, printed wiring: 4 contacts rated at 5 amps; sim to Molex 09-52-3042.
	P903	19A116659P83	Connector, printed wiring: 7 contacts rated at 5 amps; sim to Molex 09-52-3072 SPECIAL.
P912	19A116659P15	Connector, printed wiring: 4 contacts rated at 5 amps; sim to Molex 09-52-3042.	
	----- PLUGS -----		
P201	19A702104P1	Receptacle: 2 position, shorting, rated at 3 amps; sim to Berg 65474-002.	
	----- TRANSISTORS -----		
Q202	19A701891P2	Silicon, NPN, UHF Amplifier: 15 watt, 12.5 v.	
Q203	19A134340P4	Silicon, NPN, UHF Amplifier: 45 watt.	
Q204	19A116375P1	Silicon, NPN.	
	----- SWITCHES-----		
S601	19B800563P1	Push, DPDT, 1 station, alternate action; sim to IEEE/Schadow 51281 (F2UEE).	
	----- MISCELLANEOUS -----		
	19A701332P4	Insulator, washer: nylon. (Used with Q103).	
	19B800853P1	Shield, filter. (Located at L216).	
	19C328587P1	Pushbutton. (Used with S602).	
	19C851075P1	Knob. (R617).	
	19A703248P1	Contact, electrical.	
	19A701743P1	Pad. (Located behind S601 & S602 Knobs).	
	19A701706P1	Heat Sink. (Q202).	
	19A701093P4	Strap. (Located on Q202 mounting screw).	
	19A116022P1	Insulator, bushing. (Used with Q204).	
	NP280878P17	Nameplate. (Monitor).	
	NP280878P15	Nameplate. (Mode A-B).	

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 - TRANSMIT/RECEIVE BOARD 19D900970G2,4
Incorporated in initial shipment.

REV A - TRANSMIT/RECEIVE BOARD 19D900970G14,16
To improve receiver sensitivity, changed R404.

R404 was: H212CRP168C Deposited carbon: 680 ohms \pm 5%, 1/4 w.

REV B - TRANSMIT/RECEIVE BOARD 19D900970G2,4,14,16
To improve receiver front end operation, changed C408 and C416 and added C417.

C408 was: 19A700235P27 Ceramic: 150 pF \pm 5%, 50 VDCW.
C416 was: 19A700235P9 Ceramic: 4.7 pF \pm 0.25pF, 50 VDCW.

REV C - TRANSMIT/RECEIVE BOARD 19D900970G4,16
To improve transmitter exciter operation, deleted C127, changed C129B, and added C127A, C127B, and C134.

C127 was: 19A701624P4 Ceramic disc: 6 pF \pm 0.5pF, 500 VDCW.
C129B was: 19A701624P14 Ceramic disc: 18 pF \pm 5%, 500 VDCW.