MAINTENANCE MANUAL
IF/AUDIO AND SQUELCH BOARD 19D902492G1-G3

TABLE OF CONTENTS

	Page
DESCRIPTION	Front Cover
CIRCUIT ANALYSIS	Front Cover
PARTS LIST	1
SCHEMATIC DIAGRAM	3
OUTLINE DIAGRAM	4

DESCRIPTION

The IF/Audio and Squelch Board (IFAS) provides 120 dB of IF gain, detects audio and provides squelch control. The IFAS Board operates with an IF frequency of 11.2 or 9.4 MHz, depending on the operating frequency of the radio. IFAS Board 19D902492G1 operates at an IF frequency of 11.2 MHz and is used in radios operating in the following frequency splits:

- 25 - 30 MHz
- 36 - 42 MHz
- 66 - 88 MHz
- 138 - 174 MHz
- 406 - 420 MHz
- 450 - 512 MHz

IFAS Board 19D402492G2 operates at an IF frequency of 9.4 MHz and is used in radios operating in the 29.7-36 MHz and 42-50 MHz frequency bands. IFAS Board 19D902492G3 also operates at an IF frequency of 9.4 MHz and is used in radios operating in the 806-824 MHz frequency band.

CIRCUIT ANALYSIS

CRYSTAL FILTERS, IF AMP/LIMITER

The IF input from the MIF board is applied to a four-pole monolithic crystal filter (FL601 and FL602). The crystal filter provides additional selectivity and is followed by impedance matching network T601 and IF amplifier IC U601. The IC amplifier provides approximately 60 dB of gain.

Final IF selectivity is provided by a two-pole crystal filter FL603. Impedance matching network T602 matches the output impedance of IF amplifier IC U601 to the input of FL603. The IF amplifier output is metered at J601-1 through a metering network consisting of C612, C625, C626, CR601, and CR602. Impedance matching network T603 matches the output impedance of FL603 to the input of Limiter/Detector IC U602.

In addition to providing 60 dB of gain at the IF frequency, Limiter/Detector U602, C617, C619, and L603 comprise a quadrature phase detector to recover the audio from the IF frequency. The quadrature phase detector utilizes a 90 degree phase shift of the IF frequency to detect the audio signal. It compares the phase of the IF signal at U602-4 with the same IF input frequency shifted 90 degrees at U602-2. The resultant signal varies phase linearly as the carrier signal deviates about the center frequency.

AUDIO PREAMPLIFIER

The audio preamplifier consists of transistors Q601, Q602, and Q603. It provides approximately 26 dB of gain.

The output of the Limiter/Detector is coupled to the audio preamplifier through audio level adjust control R609. R609 sets the audio input level to the preamplifier circuit.

The output of the audio preamplifier is coupled through a low pass filter (L604 and C624) to Volume/ Squelch high. The filter attenuates any IF signal remaining in the audio output of the preamplifier.

The detector output is adjusted for maximum audio output by L603 and is metered at J601-2 through R661.

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

Printed in U.S.A.

AUDIO FILTERING AND AUDIO AMPLIFIER

Audio is returned on VOL ARM (P904-13) and is applied to the Channel Guard tone reject filter consisting of U604-A and surrounding circuitry. Audio from the CG tone reject filter is applied to the de-emphasis network consisting of a two-pole low pass filter (U-604B) and a two-pole high pass filter (U604C) and associated circuitry. The de-emphasis filters provide a 6 dB/octave rolloff from 300 to 3000 Hz. R650, R659, and C644 optimize the response at 3000 Hz and aid in setting the overall audio gain level. A buffer amp (U604-D) is need-ed to assure proper interfacing with the intercom option. When the intercom option is used, C653 is re-moved, and the de-emphasized audio is fed to the intercom board via RX PA (P904-16). The intercom audio is then fed back to the IFAS board via INCM INPUT (P904-21). After passing through audio gate switch (U606-A), the signal is amplified by U607 for a nominal one watt output power into an eight ohm load. The feedback loop consisting of R656 and R657 determines the closed loop gain. R658 and C649 provide a stability network to prevent oscillation. U608 provides a regulated +5V for biasing the audio and squelch circuitry.

SQUELCH AND SWITCHING CIRCUITRY

The squelch circuit monitors noise present on the VOL/SQ HI line and determines if an on-channel signal is present. The VOL/SQ HI signal is fed through a variable squelch control exterior to the IFAS board and returned as SQ ARM (P904-10). The squelch control sets the signal level at which the squelch will open. If signal is too weak, the input noise will rise above a threshold level and the audio amp will be squelched.

The squelch circuit consists of two high pass filters, an averaging detector, DC amplifier, and a Schmitt trigger. The high pass filters (U603-A,D) combined are a cascaded three-pole filter with an overall cutoff frequency at around 6300 Hz. They attenuate voice energy in the 300-3000 Hz frequency band to prevent squelch clipping. The filters also attenuate any GE-MARC busy tone at 3051.9 Hz (2918.7 Hz ALT) that could slow down the squelch attack time and prevent proper timing of the handshaking between GE-MARC mobiles and stations. Noise in the 6-8 kHz range is applied to the averaging detector (U603-B), rectified, and filtered by R623 and C632 to provide an averaged DC level proportional to the noise input. The averaged DC level is amplified by U603-C to a level ranging from 0 to 6 volts, and applied to the inverting input of the Schmitt Trigger (voltage comparator U605-A). The Schmitt Trigger provides hysteresis to prevent the squelch from "bubbling". The hysteresis levels are controlled by the ratio of R626 and R627.

The output of U605A is to be considered the output of the noise squelch. If the noise squelch output is low, that is an indication that the noise squelch is closed for that particular squelch control pot setting. If the output is high, then the noise squelch has detected a strong enough on-channel signal to open the noise squelch.

Assume for the following scenarios, that the squelch disable signal (P904-6) is inactive, i.e. at a high level.

If the noise squelch output is low, then the RUS (receiver unsquelched sensor) and CAS (carrier activity sensor) signals, and the RX MUTE signal are all low. The squelch disable switch (U606B) routes the RX MUTE signal to the audio gate switch (U606B). With the "A" input to U606A low, the input to the audio amplifier is routed to +5 volts, resulting in no signal to the local speaker.

If the noise squelch output is high, then the RUS and CAS signals, and the RX MUTE signal are all high. The squelch disable switch (U606B) still routes the RX MUTE signal to the audio gate switch, but now the "A" input to U606A is high. Input audio, present at U606-13, is now routed to audio amp U607 and the audio amp is unsquelched.

The CAS and RUS signals are outputs from the IFAS board indicating status. The RX MUTE line is bi-directional, that is, it can be used as an output signal indicating status, or as an input from an external decoder, such as tone channel guard, digital channel guard, type 99, etc. The external decoder output is high only if the proper signal has been decoded. When an external decoder is connected to the RX MUTE line, the RX MUTE signal becomes a "wired and" function of the decoder output and CAS at the output of U605-C. Therefore, if the CAS line goes high, indicating an on-channel signal, and the external decoder does not decode the proper response, then RX MUTE remains low, and the audio amplifier remains squelched.

The CAS switch will switch high whenever an "on-frequency" signal is present, with or without the proper channel guard tone. The RUS switch will switch high only when an "on-channel" signal with the proper channel guard tone is present.

In the above scenarios, the squelch disable signal was assumed disabled. The squelch disable function is designed to open the squelch under all conditions. It has priority over any noise squelch or external decoder output. Its purpose is to independently activate the audio amplifier for options such as carrier control timer, intercom, and voice guard.

When squelch disable is pulled low, the squelch disable switch (606A) routes the +10 volt signal present at U606-2 through the "Y" output of U606 to the "A" input of audio gate switch U606A. The audio amp remains unsquelched, regardless of squelch conditions.

19D902492G1 - G3

SYMBOL	PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C601	19A700013P5	Phenolic: 0.22 pF ±5%, 500 VDCW. (Used in G1 and G2).
C602	19A700013P10	Phenolic: 0.56 pF ±5%, 500 VDCW. (Used in G1).
C602	19A700013P15	Phenolic: 1.50 pF ±5%, 500 VDCW. (Used in G2 and G3).
C603	19A701624P118	Ceramic: 27 pF ±5%, 500 VDCW, temp coef N80 30 PPM/°C. (Used in G2 and G3).
C604 thru C609	T644ACP333K	Polyester: .033 µF ±10%, 50 VDCW.
C610	19A701602P19	Ceramic: 1000 pF ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C611	19A701624P118	Ceramic: 27 pF ±5%, 500 VDCW, temp coef N80 30 PPM/°C. (Used in G2 and G3).
C612	19A701624P516	Ceramic, disc: 22 pF ±5%, 500 VDCW, temp coef N470 PPM 60.
C613 thru C615	T644ACP333K	Polyester: .033 µF ±10%, 50 VDCW.
C616	19A701602P19	Ceramic: 1000 pF ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C617	19A701624P201	Ceramic, disc: 3.0 pF 0.5 pF, 500 VDCW, temp coef N150 PPM 120.
C618	T644ACP333K	Polyester: .033 µF ±10%, 50 VDCW.
C619	19A701624P223	Ceramic, disc: 43 pF ±5%, 500 VDCW, temp coef N150 30.
C620	T644ACP310K	Polyester: .010 µF ±10%, 50 VDCW.
C621	19A701534P7	Tantalum: 10 µF ±20%, 16 VDCW.
C622	19A700105P32	Mica: 82 pF ±5%, 500 VDCW.
C623	T644ACP310K	Polyester: .010 µF ±10%, 50 VDCW.
C624	19A701602P19	Ceramic: 1000 pF ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C625	19A701624P12	Ceramic, disc: 15 pF ±5%, 500 VDCW, temp coef 0 PPM 30. (Used in G1).
C626	19A701602P7	Ceramic: 150 pF ±20%, 1000 VDCW.
C627 thru C629	T644ACP215J	Polyester: .0015 µF ±5%, 50 VDCW.
C630	T644ACP210J	Polyester: .0010 µF ±5%, 50 VDCW.
C631	19A700233P5	Ceramic: 470 pF ±20%, 50 VDCW. (Used inG1 and G2).
C632	T644ACP410J	Polyester: 0.1 µF ±5%, 50 VDCW.
C633	19A700233P5	Ceramic: 470 pF ±20%, 50 VDCW.
C634	T644ACP215J	Polyester: .0015 µF ±5%, 50 VDCW.
C635	T644ACP368K	Polyester: .068 µF ±10%, 50 VDCW.
C636 and C637	19A701594P1	Polyester: 0.033 µF ±2%, 100 VDCW.
C638	19A701594P2	Polyester: 0.068 µF ±20%, 100 VDCW.
C639	19A701534P2	Tantalum: 0.22 µF ±20%, 35 VDCW.
C640 thru C643	T644ACP310J	Polyester: .010 µF ±5%, 50 VDCW.
C644	T644ACP247K	Polyester: .0047 µF ±10%, 50 VDCW.
C645	19A701624P118	Ceramic: 27 pF ±5%, 500 VDCW, temp coef N80 30 PPM/°C. (Used in G2 and G3).
C646	T644ACP347K	Polyester: .047 µF ±10%, 50 VDCW.
C647	19A700233P5	Ceramic: 470 pF ±20%, 50 VDCW.
C648	19A701534P7	Tantalum: 10 µF ±20%, 16 VDCW.
C649 and C650	T644ACP410K	Polyester: 0.1 µF ±10%, 50 VDCW.
C651 and C652	19A701225P3	Electrolytic: 220 µF, -10+50%, 25 VDCW.
C653	T644ACP410K	Polyester: 0.1 µF ±10%, 50 VDCW.
C654 and C655	T644ACP215J	Polyester: .0015 µF ±5%, 50 VDCW.
C656	19A701534P9	Tantalum: 47 µF ±20%, 6.3 VDCW.
C657	19A701534P7	Tantalum: 10 µF ±20%, 16 VDCW.
		- - - - - - - - - - - - DIODES - - - - - - - - - - - -
CR601 and CR602	4038056P1	Germanium, fast recovery, 20 reverse volts, fwdandcurrent 40 mA.
		- - - - - - - - - - - FILTERS - - - - - - - - - - -
FL601A	19B219573G3	Crystal: Resonator A - 11,200.000; Resonator B-11,196.024 kHz (Quantity 2). (Used in G1).
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
10	19B219573G2	Crystal: Resonator A - 11,200.000; Resonator B-11,196.024 kHz. (Used in G3).
FL601B	19B219574G3	Crystal: Resonator A - 9400.000 kHz, Resonator B - 9396.024 kHz (Quantity 2). (Used in G2 andG3).
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
60	19B219574G2	Crystal: Resonator A - 9400.000 kHz, Resonator B - 9396.024 kHz. (Used in G3).
FL602A		(Used in G1).Part of FL601A
FL602B		(Used in G2 and G3).Part of FL601B
FL603A	19B219573G6	Crystal: Resonator A - 11,200.000; Resonator B-11,200.000 kHz. (Used in G1).
FL603B	19B219574G1	Crystal: Resonator A - 9400.000 kHz, Resonatorb - 9400.000 kHz. (Used in G2 and G3).
		- - - - - - - - - - - - JACKS - - - - - - - - - - - -
J601	19B219374G1	Connector: 9 contacts.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
2	19C317957P1	Connector, Includes: Shell. (Used in G1).
4	19A700237P1	Contact, electrical: sim to Malco 003-0132-001. (Used in G1).
J604 thru J606	19A701785P1	Contact, electrical; sim to Molex 08-50-0404.
J623 and J624	19A116975P1	Contact, electrical.
		- - - - - - - - - - - INDUCTORS - - - - - - - - - -
L601	H343CLP15022	Coil, fixed: 15 uH ±10%, 100V.
L602	H343CLP10022	Coil, Fixed: 10 uH ±10%.
L603	19C311181G13	Coil.Includes: Tuning slug. (Used in G1).

*COMPONENTS, ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	PART NO.	DESCRIPTION
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
L603	19C311181G14	Coil.Includes: Tuning slug. (Used in G2 and G3).
L604	H343CLP15022	Coil, fixed: 15 uH ±10%, 100V.
		- - - - - - - - - - - PLUGS - - - - - - - - - - -
P904	19B219594P1	Contact, electrical: 7 pins.
		- - - - - - - - - - TRANSISTORS - - - - - - - - -
Q601 thru Q605	19A700023P2	Silicon, NPN: sim to 2N3904.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R601	19A702585P91	Composition: 15K ohms ±5%, 150 VDCW, 1/8 w. (Used in G1 and G2).
R602	19A702585P59	Composition: 680 ohms ±5%, 150 VDCW, 1/8 w. (Used in G1 and G2).
R602	19A700184P1	Jumper. (Used in G3).
R603	19A702931P185	Metal film: 750 ohms ±1%, 200 VDCW, 1/8 w.
R604	H212CRP047C	Deposited carbon: 47 ohms ±5%, 1/4 w.
R605	H212CRP151C	Deposited carbon: 510 ohms ±5%, 1/4 w.
R606	H212CRP251C	Deposited carbon: 5.1K ohms ±5%, 1/4 w.
R607	H212CRP215C	Deposited carbon: 1.5K ohms ±5%, 1/4 w.(Used in G1 and G2).
R607	H212CRP168C	Deposited carbon: 680 ohms ±5%, 1/4 w.(Used in G3).
R608	H212CRP210C	Deposited carbon: 1K ohms ±5%, 1/4 w.
R609	19B209358P107	Variable, carbon film: approx 800 to 25K ohms + or - ±10%, 1/4 w; sim to CTS Type X-201.
R610	H212CRP343C	Deposited carbon: 43K ohms ±5%, 1/4 w.
R611	H212CRP282C	Deposited carbon: 8.2K ohms ±5%, 1/4 w.
R612	H212CRP139C	Deposited carbon: 390 ohms ±5%, 1/4 w.
R613	H212CRP115C	Deposited carbon: 150 ohms ±5%, 1/4 w.
R614	H212CRP247C	Deposited carbon: 4.7K ohms ±5%, 1/4 w.
R615	H212CRP218C	Deposited carbon: 1.8K ohms ±5%, 1/4 w.
R616	19A702931P318	Metal film: 15K ohms ±1%, 200 VDCW, 1/8 w.
R617	19A702931P273	Metal film: 5620 ohms ±1%, 200 VDCW, 1/8 w.
R618	19A702931P393	Metal film: 90.9K ohms ±1%, 200 VDCW, 1/8 w.
R619	19B800607P102	Metal film: 1K ohms ±5%, 1/8 w.
R620	19B800607P273	Metal film: 27K ohms ±5%, 1/8 w.
R621	19A702931P301	Metal film: 10K ohms ±1%, 200 VDCW, 1/8 w.
R622	19A702931P401	Metal film: 100K ohms ±1%, 200 VDCW, 1/8 w.
R623	19A702931P445	Metal film: 287K ohms ±1%, 200 VDCW, 1/8 w.
R624	19A702931P301	Metal film: 10K ohms ±1%, 200 VDCW, 1/8 w.
R625	19A702931P401	Metal film: 100K ohms ±1%, 200 VDCW, 1/8 w.
R626	19B800607P223	Metal film: 22K ohms ±5%, 1/8 w.
R627	19B800607P104	Metal film: 100K ohms ±5%, 1/8 w.
R628	19B800607P103	Metal film: 10K ohms ±5%, 1/8 w.
R629	19A702931P318	Metal film: 15K ohms ±1%, 200 VDCW, 1/8 w.
R630	19A702931P273	Metal film: 5620 ohms ±1%, 200 VDCW, 1/8 w.

SYMBOL	PART NO.	DESCRIPTION
R631	19A702931P393	Metal film: 90.9K ohms ±1%, 200 VDCW, 1/8 w.
R632 and R633	19B800607P103	Metal film: 10K ohms ±5%, 1/8 w.
R634	19B800607P102	Metal film: 1K ohms ±5%, 1/8 w.
R635	19B800607P223	Metal film: 22K ohms ±5%, 1/8 w.
R636	19B800607P153	Metal film: 15K ohms ±5%, 1/8 w.
R637	19A702931P321	Metal film: 16.2K ohms ±1%, 200 VDCW, 1/8 w.
R638	19A702931P322	Metal film: 16.5K ohms ±1%, 200 VDCW, 1/8 w.
R639	19A702931P305	Metal film: 11K ohms ±1%, 200 VDCW, 1/8 w.
R640	19A702931P317	Metal film: 14.7K ohms ±1%, 200 VDCW, 1/8 w.
R641	19A702931P284	Metal film: 7320 ohms ±1%, 200 VDCW, 1/8 w.
R642	19A702931P309	Metal film: 12.1K ohms ±1%, 200 VDCW, 1/8 w.
R643	19A702931P169	Metal film: 511 ohms ±1%, 200 VDCW, 1/8 w.
R644	19A702931P355	Metal film:36.5K ohms ±1%, 200 VDCW, 1/8 w.
R645	19A702931P293	Metal film: 9090 ohms ±1%, 200 VDCW, 1/8 w.
R646 and R647	19A702931P369	Metal film: 51.1K ohms ±1%, 200 VDCW, 1/8 w.
R648	H212CRP382C	Deposited carbon: 82K ohms ±5%, 1/4 w.
R649	19B800607P104	Metal film: 100K ohms ±5%, 1/8 w.
R650	19B800607P682	Metal film: 6.8K ohms ±5%, 1/8 w.
R651	19B800607P104	Metal film: 100K ohms ±5%, 1/8 w.
R652	19B800607P103	Metal film: 10K ohms ±5%, 1/8 w.
R653	19B800607P104	Metal film: 100K ohms ±5%, 1/8 w.
R654	19B800607P103	Metal film: 10K ohms ±5%, 1/8 w.
R655	19B800607P104	Metal film: 100K ohms ±5%, 1/8 w.
R656	19B800607P150	Metal film: 15 ohms ±5%, 1/8 w.
R657	H212CRP118C	Deposited carbon: 180 ohms ±5%, 1/4 w.(Used in G1 and G2).
R657	H212CRP127C	Deposited carbon:270 ohms ±5%, 1/4 w.(Used in G3).
R658	19B800607P2R2	Metal film: 2.2 ohms ±5%, 1/8 w.
R659	19B800607P823	Metal film: 82K ohms ±5%, 1/8 w.
R660	19A700018P1	Deposited carbon: 1 ohm ±5%, 1/3 w.
R661	19B800607P184	Metal film: 180K ohms ±5%, 1/8 w.
R662 and R663	19B800607P472	Metal film: 4.7K ohms ±5%, 1/8 w.
R664	19B800607P102	Metal film: 1K ohms ±5%, 1/8 w.
R665	19B800607P182	Metal film: 1.8K ohms ±5%, 1/8 w.
R666	19B800607P102	Metal film: 1K ohms ±5%, 1/8 w.
R667	19B800607P393	Metal film: 39K ohms ±5%, 1/4 w.
		- - - - - - - - - - TRANSFORMERS - - - - - - - -
T601	19A134747P2	Transformer, IF: resonant fre. 10.7 MHz; sim to MHz; sim to TOKO Inc. 154 PC-470073N3.
T603		
		- - - - - - - - - - TEST POINTS - - - - - - - - -
TP601	N503P304F15	Cotter pin.

SYMBOL	PART NO.	DESCRIPTION
		- - - - - - - - INTEGRATED CIRCUITS - - - - - - -
U601 and U602	19A116445P1	Integrated circuit, linear: sim to ULN2111.
U603 and U604	19A701789P1	Linear: Quad Op Amp; sim to LM324.
U605	19A134764P1	Linear: Quad Voltage Comparator; sim to LM339N.
U606	19A700029P38	Digital: CMOS Triple 2 Channel Multiplexer.
U607	19A701830P1	Linear:Audio Power Amplifier; sim to TDA2003.
U608	19A704971P1	Linear: +5 Volt Regulator; sim to MC78L05ACP.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
3	19B232901P2	Support. (Used with U607).
4	19B226648G1	Shield. (Located between T602 & C608).
5	19B219571G1	Shield. (Located at T601).
6	19B219554G1	Can. (Located at L603).
7	19B219555P1	Cover. (Located at L603).
8	19B219727G1	Shield. (Located at L603).
9	19A701883P4	Contact, electrical; sim to AMP 86444-1. (Qty 6).
13	19A702364P208	Machine screw: TORX Drive, M2.5 - 0.45 x 8. (Used to secure U607).
14	19A700033P3	Lockwasher, external tooth: M2.5. (Used to secure U607).
15	19A700034P3	Hex nut, metric: M2.5 x 0.45.
20	19A701278P6	Insulative Sleeving.

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 - IF/AUDIO AND SQUELCH BOARD 19D902492G1-G3

To facilitate manufacturing, changed CR601, CR602 and R620. Added J604.

CR601 was 19A700028P1 - Silicon: 75 mA, 75 PIV.
CR602 was 19A700028P1 - Silicon: 75 mA, 75 PIV.
C620 was 19B800607P823 - Metal film: 82K ohms ±5%, 1/8 w.

REV. B - IF/AUDIO AND SQUELCH BOARD 19D902492G3

To improve the response of GE- MARC repeaters to a mobile's request for channel. Changed C627, C628, C629, C630 and R619. Deleted C631.

C627 was T644ACP215J - Polyester: .0015 µF ±5%, 50 VDCW.
C628 was T644ACP215J - Polyester: .0015 µF ±5%, 50 VDCW.
C629 was T644ACP215J - Polyester: .0016 µF ±5%, 50 VDCW.
C630 was T644ACP215J - Polyester: .0015 µF ±5%, 50 VDCW.
C631 was 19A700233P5 - Ceramic: 470 pF ±20%, 50 VDCW.

REV. B - IF/AUDIO AND SQUELCH BOARD 19D902492G1 & G2
REV. C - IF/AUDIO AND SQUELCH BOARD 19D902492G3

To improve Receiver audio frequency response at the system level. Changed R643 and R650.

R643 was 19A702931P151 - Metal film: 332 ohms ±1%, 1/8 w.
R650 was 19B800607P123 - Metal film: 12K ohms ±5%, 1/8 w.

REV. C - IF/AUDIO AND SQUELCH BOARD 19D902492G1 & G2
REV. D - IF/AUDIO AND SQUELCH BOARD 19D902492G3

To improve performance for GEMARC and PS trunking stations by providing an additional squelch filter section and adding transistor stages to the "RUS" and "RX-PA" lines to make compatible with original IFAS board. Added C654-C657, R663-R666, Q604, Q605 and U608. Changed the following:

In Groups 1 & 2
C627 was T644ACP215J - Polyester: .0015 µF ±5%, 50 VDCW.
C628 was T644ACP215J - Polyester: .0015 µF ±5%, 50 VDCW.
C629 was T644ACP215J - Polyester: .0015 µF ±5%, 50 VDCW.
C630 was T644ACP347K - Polyester: .047 µF ±10%, 50 VDCW.
R619 was 19B800607P273 - Metal film: 27K ohms ±5%, 1/8 w.

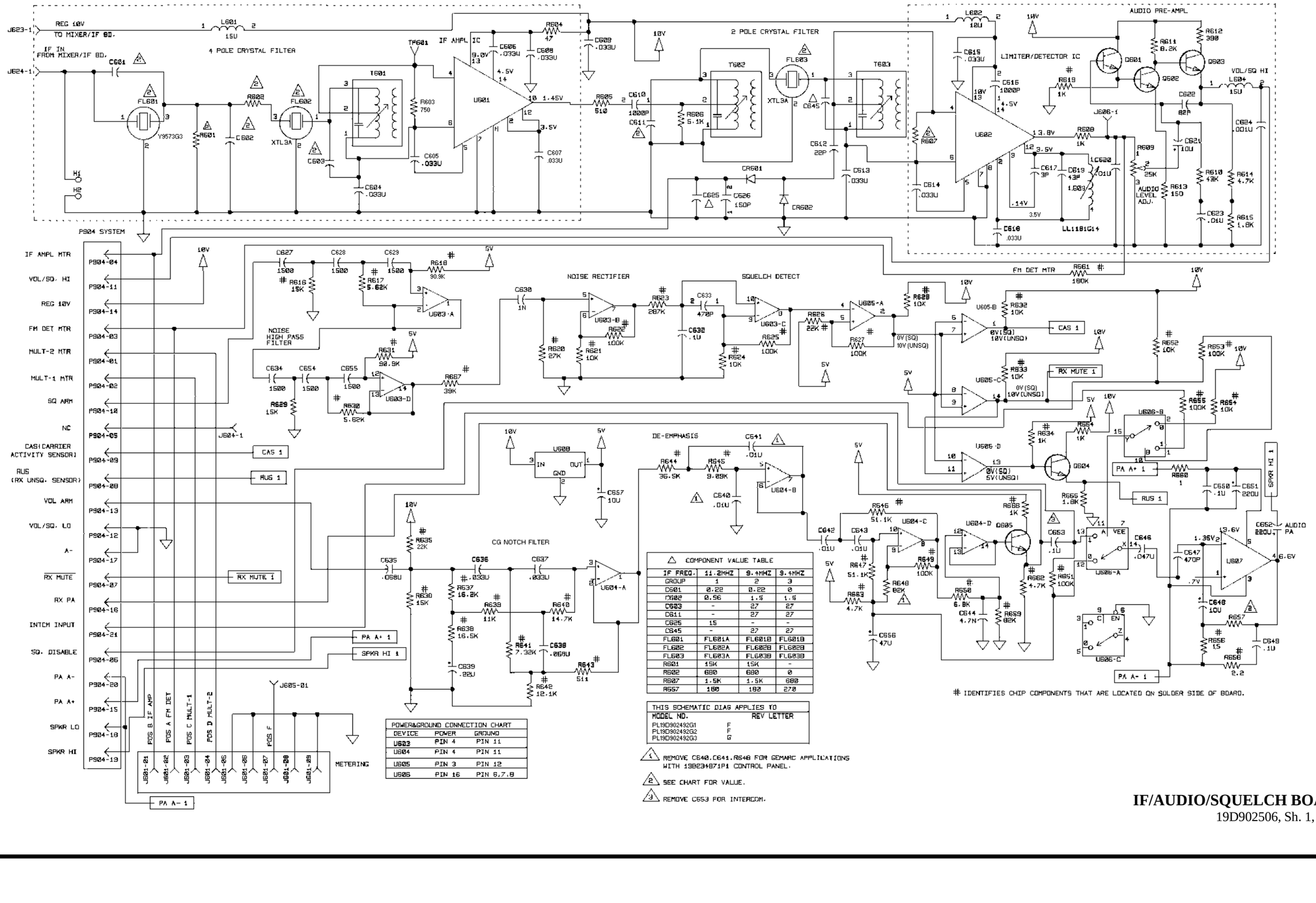
In Group 3
R619 was 19B800607P101 - Metal film: 100 ohms ±5%. 1/8 w.

In Groups 1 2 & 3
C634 was T644ACP347K - Polyester: .047 µF ±10%, 50 VDCW.
C643 was T644ACP310J - Polyester: .01 µF ±10%, 50 VDCW.
R616 was 19A702931P318 - Metal film: 15K ohms ±1%, 1/8 w.
R617 was 19A702931P273 - Metal film: 5620 ohms ±1%, 1/8 w.
R618 was 19A702931P393 - Metal film: 90.9K ohms ±1%, 1/8 w.
R820 was 19B800607P123 - Metal film: 12K ohms ±5%. 1/8 w.
R621 was 19A702931P301 - Metal film: 10K ohms ±1%, 1/8w.
R626 was 19B800607P223 - Metal film: 22K ohms ±5%, 1/8 w.
R627 was 19B800607P104 - Metal film: 100K ohms ±5%, 1/8 w.
R629 was 19B800607P104 - Metal film: 100K ohms ±5%, 1/8 w.
R630 was 19B800607P104 - Metal film: 100K ohms ±5%, 1/8 w.
R631 was 19B800607P102 - Metal film: 1K ohms ±5%, 1/8 w.
R648 was 19B800607P823 - Metal film: 82K ohms ±5%, 1/8 w.
R650 was 19B800607P682 - Metal film: 6.8K ohms ±5%, 1/8 w.
R657 was H212CRP118C - Deposited Carbon: 180 ohms ±5%, 1/4 w.
R662 was 19B800607P103 - Metal film: 10K ohms ±5%, 1/8 w.
U603 was 19A701789P1 - Linear: Quad Op Amp; sim to LM324.

REV. D - IF/AUDIO AND SQUELCH BOARD 19D902492G1 & G2
REV. E - IF/AUDIO AND SQUELCH BOARD 19D902492G3

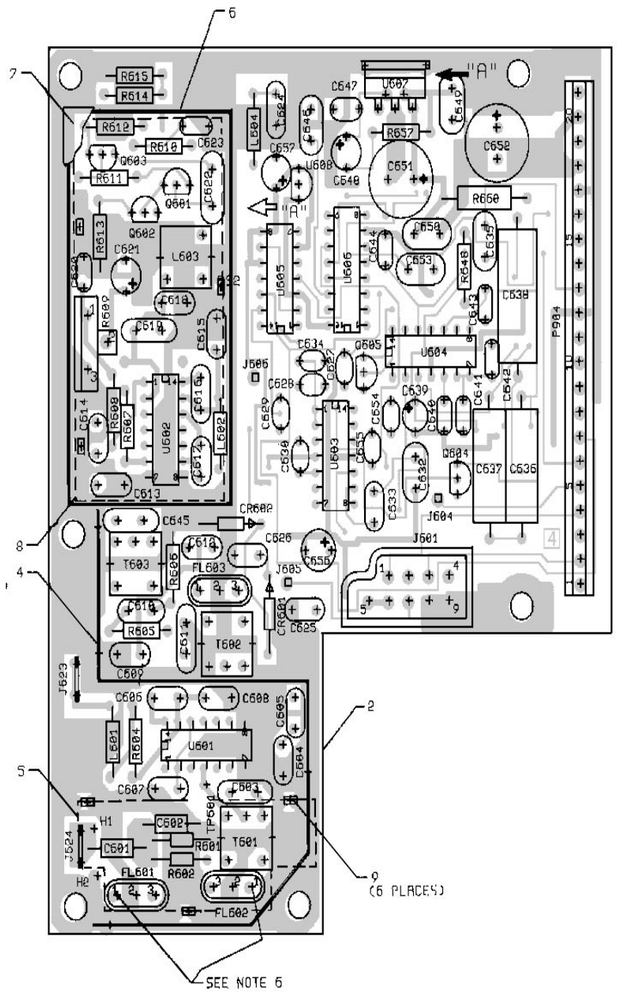
To improve operation of the squelch circuit. Added R667 and changed the following components:

C627 was T644ACP210J - Polyester: .0010 µF ±5%, 50 VDCW.
C628 was T644ACP210J - Polyester: .0010 µF ±5%, 50 VDCW.
C629 was T644ACP210J - Polyester: .0010 µF ±5%, 50 VDCW.
C632 was T644ACP410K - Polyester: 0.1 µF ±10%, 50 VDCW.
C634 was T644ACP210J - Polyester: .0010 µF ±5%, 50 VDCW.
C643 was T644ACP233K - Polyester: .0033 µF ±10%, 50 VDCW.
C654 was T644ACP210J - Polyester: .0010 µF ±5%, 50 VDCW.
C655 was T644ACP210J - Polyester: .0010 µF ±5%, 50 VDCW.
R616 was 19A702931P272 - Metal film: 5490 ohms ±1%, 1/8 w.
R617 was 19A702931P164 - Metal film: 453 ohms ±1%, 1/8 w.
R618 was 19A702931P486 - Metal film: 768K ohms ±1%, 1/8 w.
R620 was 198800607P153 - Metal film: 15K ohms ±5%, 1/8 w.
R621 was 19A702931P285 - Metal film: 7.5K ohms ±1%, 1/8 w.
R623 was 198800607P334 - Metal film: 330K ohms ±5%, 1/8 w.
R626 was 19A702931P321 - Metal film: 16.2K ohms ±1%, 1/8 w.
R627 was 19A702931P385 - Metal film: 75K ohms ±1%, 1/8 w.
R629 was 19A702931P272 - Metal film: 5490 ohms ±1%, 1/8 w.
R630 was 19A702931P164 - Metal film: 453 ohms ±1%, 1/8 w.
R631 was 19A702931P486 - Metal film: 768K ohms ±1%, 1/8 w.
R650 was 198800607P153 - Metal film: 15K ohms ±5%, 1/8w.
R657 was H212CRP127C - Deposited carbon: 270 ohms ±5%, 1/4 w.
U603 was 19A705450P5 - Quad Op Amp; sim MC37074.

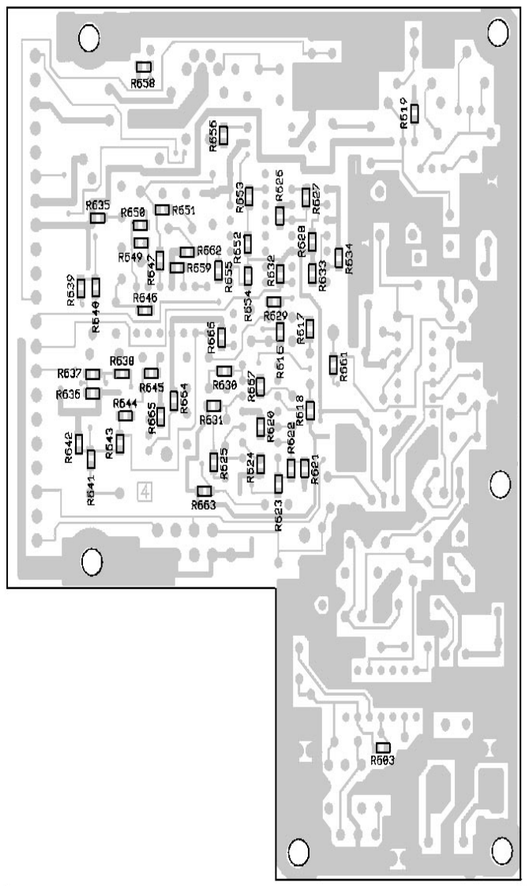


IF/AUDIO/SQUELCH BOARD
19D902506, Sh. 1, Rev.7

COMPONENT SIDE



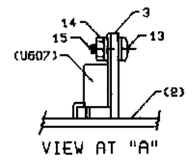
SOLDER SIDE



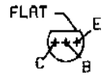
VIEW FROM BACKSIDE

(1) NOTES:

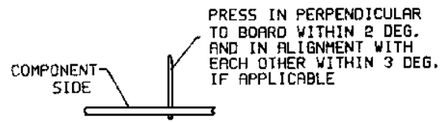
6. PIN 1 OF FL601, FL602, & FL603 CAN BE IDENTIFIED BY MARKING ON SIDES OF CRYSTAL CASE. ALSO PIN 1 CAN BE IDENTIFIED AS THE SIDE WHERE THE SOLDER VENT HOLE IS LOCATED.



LEAD IDENTIFICATION
FOR Q601-Q603



IN-LINE
TOP VIEW
NOTE: CASE SHAPE IS DETERMINING FACTOR FOR LEAD IDENTIFICATION



TYPICAL FOR J604, J605, & J606

IF/AUDIO/SQUELCH BOARD

(19D902492, Sh. 1, Rev. 5)
(19D902491, Sh. 1, Rev. 4)
(19d902491, Sh. 2, Rev. 4)

CAUTION
OBSERVE PRECAUTIONS FOR HANDLING
ELECTROSTATIC SENSITIVE DEVICES

LBI-38507

This page intentionally left blank