ERICSSON

MAINTENANCE MANUAL

LBI-38297

29.7-50 MHz NOISE BLANKER

B19/CFR-89

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DESCRIPTION

The noise blanker option for the RANGER synthesized radio consists of a plug-in printed wire board which plugs into J502 on the Receiver Board. The noise blanker is designed to improve receiver performance by blanking out impulse noise emanating from the alternator, ignition system, etc. This is accomplished by delaying the IF signal for 200 nanoseconds while generating a blanking gate (pulse) having the same characteristics as the noise pulses. These blanking pulses then are used to turn off the delayed IF signal precisely where the noise occurs, resulting in noise-free audio reception.

The noise blanker may be disabled, if desired, by relocating a ground plug P503 on the Receiver board and P706 on the System Control board. An alternate method (if the noise blanker is to be permanently disabled) is to remove the noise blanker board from the radio, reconnect W501 and remove TR502 and TR503 on the receiver board. The alternate method results in improved intermodulation performance.

INSTALLATION

The noise blanker plugs into J502 on the Receiver unit. If the board is installed after the receiver has been aligned (or installed in the field), cut jumper wire W501 on the Receiver board. Be sure that P503 is plugged into J503-2, 3 and P706 is plugged into J706-2, 3 on the System Control board. Refer to Receiver Alignment Procedure in the Service Section of the Maintenance Manual (Preliminary Checks and Adjustment) and tune accordingly.

NOTE

If the noise blanker is installed prior to receiver alignment, simply plug the noise blanker into J502 and perform standard receiver Alignment Procedures. Be sure P503 is plugged into J503-2, 3 on the receiver board and P706 is plugged into J706-2, 3 on the System Control board.

CIRCUIT ANALYSIS

The noise blanker consists of a 200 ns fixed delay line, 20.8 MHz rejection filter, three pulse amplifiers, a pulse amplifier/limiter, AGC amplifier, gate driver and blanker disable switch as shown in Figure 1.

The IF signal from JFET buffer TR501 on the Receiver board is applied to gate 1 of pulse amplifier TR1 through 20.8 MHz rejection filter and to delay line Z1. Z1 delays the IF signal by 200 ns and returns it to the two JFET gating switches on the receiver board. The undelayed IF signal is amplified by pulse amplifier TR1. TR1 provides approximately 20 dB of amplification. Bias for TR1 is established by R1, R2. The IF output of TR1 is further amplified and limited by pulse amplifier/limiter IC1. IC1 provides approximately 50 dB of amplification and is controlled by AGC amplifier TR41, 42, 43.

The output of the limiter is applied to pulse detector TR2. DC bias for TR2 is set at the threshold of conduction so that all noise pulses regardless of magnitude or duration will be detected.

Threshold bias is established by R8-R11, and CD1. R9 is a negative temperature compensating resistor whose temperature characteristics complement IC1 to adjust the threshold level of TR2 with changes in temperature.

The detected pulse is taken from the collector of TR2 and further amplified by pulse amplifiers TR3 and TR5. C14 in the emitter circuit of TR3 provides a low frequency bypass to ground and also maintains a full charge to allow TR3 to be switched on and off more rapidly. The output of pulse amplifier TR5 is applied to gate driver TR6. TR6 provides drive to operate the two JFET switches (TR502 TR503) located just ahead of the crystal filters on the Receiver board. The delayed IF signal from delay line Z1 arrives at TR502 and TR503 at the same time as the gating pulses from the blanker switch. The gating pulse switches TR502 and TR503 on coincident with the noise pulses on the IF signal, shunting all noise pulses to ground.

BLANKER DISABLE

Two blanker disable inputs are provided to assure complete turn off of the noise blanker function while allowing the delayed IF signal to be processed through the receiver. BLKR DIS 1 is applied to pulse amplifier TR1 gate 2. This will nearly turn off TR1. BLKR DIS 2 is applied to the base of TR4 turning it on. TR4 shorts the emitter and collector of pulse amplifier TR3, preventing any remaining noise pulses from passing.

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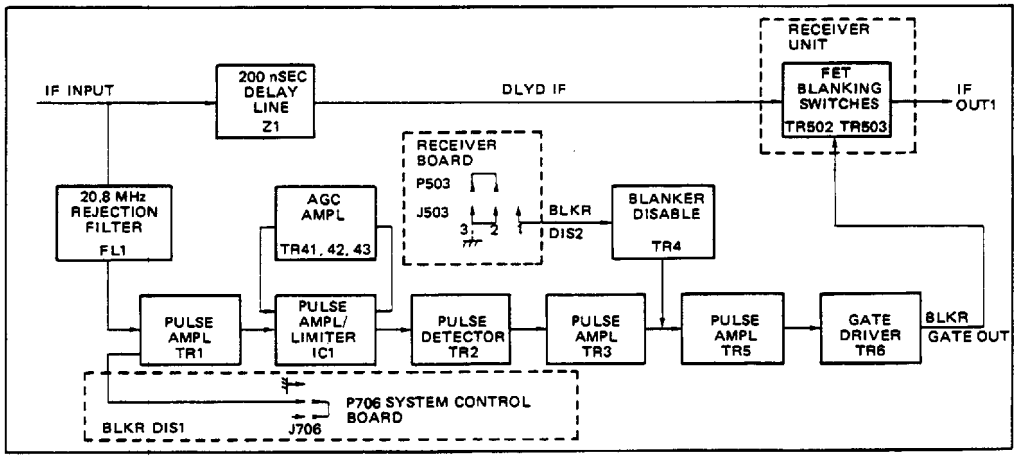
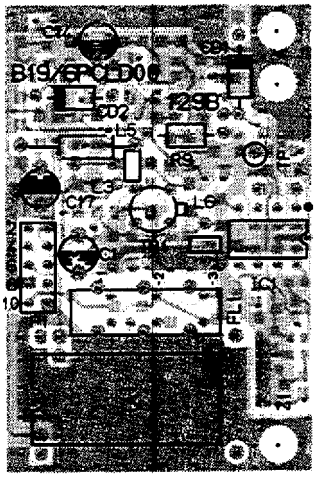
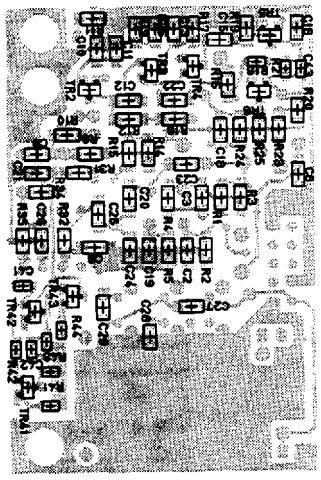


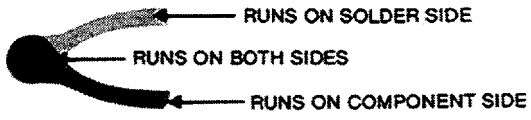
Figure 1

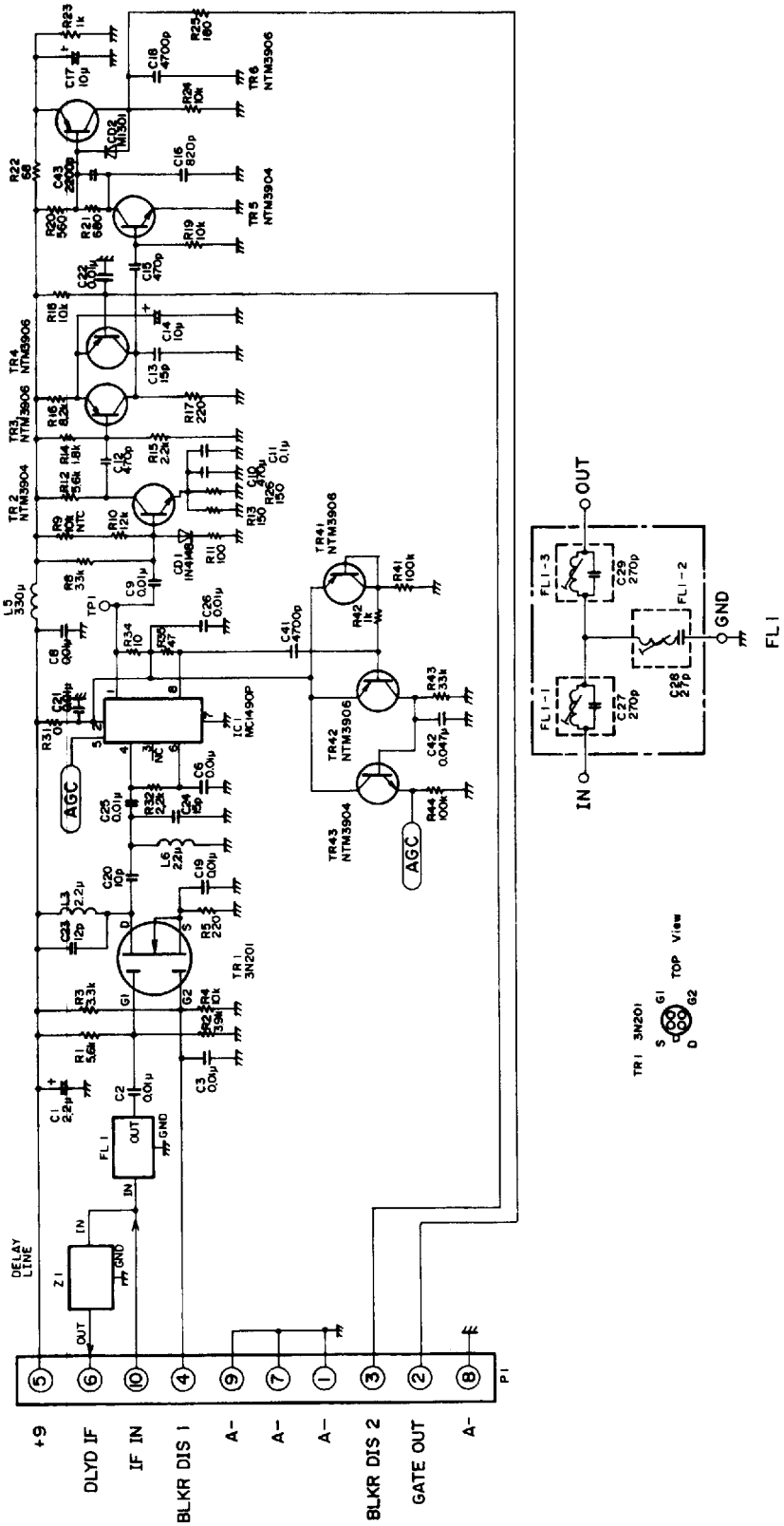


COMPONENT SIDE VIEW



SOLDERING SIDE VIEW





SCHEMATIC DIAGRAM
NOISE BLANKER
ED00-CFR-89

PARTS LIST
NOISE BLANKER
B19/CFR-89

SYMBOL	PART NO.	DESCRIPTION
C1	B19/5CSAC00826	Tantalum: 2.2uF ±20%, 25VDCW
C2 and C3	B19/5CAAD00789	Ceramic: 0.01uF ±10%, 50VDCW, temp coef ±15%.
C6	B19/5CAAD00789	Ceramic: 0.01uF ±10%, 50VDCW, temp coef ±15%.
C8 and C9	B19/5CAAD00789	Ceramic: 0.01uF ±10%, 50VDCW, temp coef ±15%.
C10	B19/5CAAD00797	Ceramic: 470pF ±5%, 50VDCW, temp coef 0±60ppm.
C11	B19/5CAAD01237	Ceramic: 0.1uF ±10%, 25VDCW, temp coef ±15%.
C12	B19/5CAAD00797	Ceramic: 470pF ±5%, 50VDCW, temp coef 0±60ppm.
C13	B19/5CAAD00787	Ceramic: 15pF ±5%, 50VDCW, temp coef 0±60ppm.
C14	B19/5CSAC00326	Tantalum: 10uF ±20%, 16VDCW.
C15	B19/5CAAD00797	Ceramic: 470pF ±5%, 50VDCW, temp coef 0±60ppm.
C16	B19/5CAAD01068	Ceramic: 820pF ±5%, 50VDCW, temp coef +350 -1000ppm.
C17	B19/5CSAC00326	Tantalum: 10uF ±20%, 16VDCW.
C18	B19/5CAAD01138	Ceramic: 4700pF ±10%, 50VDCW, temp coef ±10%.
C19	B19/5CAAD00789	Ceramic: 0.01uF ±10%, 50VDCW, temp coef ±15%.
C20	B19/5CAAD00785	Ceramic: 10pF ±5%, 50VDCW, temp coef ±10%.
C21 and C22	B19/5CAAD00789	Ceramic: 0.01uF ±10%, 50VDCW, temp coef ±15%.
C23	B19/5CAAD00784	Ceramic: 12pF ±5%, 50VDCW, temp coef 0±60ppm.
C24	B19/5CAAD00787	Ceramic: 15pF ±5%, 50VDCW, temp coef 0±60ppm.
C25 and C26	B19/5CAAD00789	Ceramic: 0.01uF ±10%, 50VDCW, temp coef ±15%.
C27	B19/5CAAD00883	Ceramic: 270pF ±5%, 50VDCW, temp coef 0±60ppm.
C28	B19/5CAAD00793	Ceramic: 27pF ±5%, 50VDCW, temp coef 0±60ppm.
C29	B19/5CAAD00883	Ceramic: 270pF ±5%, 50VDCW, temp coef 0±60ppm.
C41	B19/5CAAD00957	Ceramic: 4700pF ±10%, 50VDCW, temp coef ±10%.
C42	B19/5CAAD01072	Ceramic: 0.047uF ±10%, 50VDCW, temp coef ±15%.
C43	B19/5CAAD00946	Ceramic: 2200pF ±10%, 50VDCW, temp coef ±15%.
CD1	B19/5TXDA00001	Silicon, rectifier: sim to Thomson IN4148.
CD2	B19/5TXAR00004	Silicon, RF switching: sim to Mitsubishi: MI301.

SYMBOL	PART NO.	DESCRIPTION
FL1-1	B19/6LALD00050	Coil, RF.
FL1-2	B19/6LALD00049	Coil, RF.
FL1-3	B19/6LALD00050	Coil, RF.
IC1	B19/5DAAJ00341	Linear, Wide band amplifier: sim to Motorola MC1490P.
L3	B19/5LCAA00224	Choke coil: 2.2uH ±10%.
L5	B19/5LCAA00136	Choke coil: 330uH ±10%.
L6	B19/5LCAA00224	Choke coil: 2.2uH ±10%.
P1	B19/5JFAL00010	Connector.
PC1	B19/6PCLD00129	Printed wiring board.
R1	B19/5REAG01747	Metal film: 5.6K ohms ±5%, 200VDCW, 1/8W.
R2	B19/5REAG01745	Metal film: 3.9K ohms ±5%, 200VDCW, 1/8W.
R3	B19/5REAG01744	Metal film: 3.3K ohms ±5%, 200VDCW, 1/8W.
R4	B19/5REAG01750	Metal film: 10K ohms ±5%, 200VDCW, 1/8W.
R5	B19/5REAG01730	Metal film: 220 ohms ±5%, 200VDCW, 1/8W.
R8	B19/5REAG01756	Metal film: 33K ohms ±5%, 200VDCW, 1/8W.
R9	B19/5RZBX00002	Thermistor.
R10	B19/5REAG01751	Metal film: 12K ohms ±5%, 200VDCW, 1/8W.
R11	B19/5REAG01726	Metal film: 100 ohms ±5%, 200VDCW, 1/8W.
R12	B19/5REAG01747	Metal film: 5.6K ohms ±5%, 200VDCW, 1/8W.
R13	B19/5REAG01728	Metal film: 150 ohms ±5%, 200VDCW, 1/8W.
R14	B19/5REAG01741	Metal film: 1.8K ohms ±5%, 200VDCW, 1/8W.
R15	B19/5REAG01742	Metal film: 2.2K ohms ±5%, 200VDCW, 1/8W.
R16	B19/5REAG01749	Metal film: 8.2K ohms ±5%, 200VDCW, 1/8W.
R17	B19/5REAG01730	Metal film: 220 ohms ±5%, 200VDCW, 1/8W.
R18	B19/5RDAC02445	Metal film: 10K ohms ±5%, 200VDCW, 1/10W.
R19	B19/5REAG01750	Metal film: 10K ohms ±5%, 200VDCW, 1/8W.
R20	B19/5REAG01735	Metal film: 560 ohms ±5%, 200VDCW, 1/8W.
R21	B19/5RDAC02472	Metal film: 680 ohms ±5%, 200VDCW, 1/10W.
R22	B19/5REAG01724	Metal film: 68 ohms ±5%, 200VDCW, 1/8W.
R23	B19/5REAG01738	Metal film: 1K ohms ±5%, 200VDCW, 1/8W.

SYMBOL	PART NO.	DESCRIPTION
R24	B19/5REAG01750	Metal film: 10K ohms ±5%, 200VDCW, 1/8W.
R25	B19/5REAG00908	Metal film: 180 ohms ±5%, 200VDCW, 1/8W.
R26	B19/5REAG01728	Metal film: 150 ohms ±5%, 200VDCW, 1/8W.
R31	B19/5REAG01775	0 ohms.
R32	B19/5REAG01742	Metal film: 2.2K ohms ±5%, 200VDCW, 1/8W.
R34	B19/5RDAC02450	Metal film: 10 ohms ±5%, 200VDCW, 1/8W.
R35	B19/5REAG01722	Metal film: 47 ohms ±5%, 200VDCW, 1/8W.
R41	B19/5RDAC02449	Metal film: 100K ohms ±5%, 200VDCW, 1/10W.
R42	B19/5RDAC02446	Metal film: 1K ohms ±5%, 200VDCW, 1/10W.
R43	B19/5RDAC02483	Metal film: 33K ohms ±5%, 200VDCW, 1/10W.
R44	B19/5RDAC02449	Metal film: 100K ohms ±5%, 200VDCW, 1/10W.
TR1	B19/5TCAS00032	N-channel dual gate (MOS FET): sim to Motorola 3N201.
TR2	B19/5TCAB01234	Silicon, NPN: sim to NEC NTM3904.
TR3	B19/5TCAB01233	Silicon, PNP: sim to NEC NTM3906.
TR4	B19/5TCAB01233	Silicon, PNP: sim to NEC NTM3906.
TR5	B19/5TCAB01234	Silicon, NPN: sim to NEC NTM3904.
TR6	B19/5TCAB01233	Silicon, PNP: sim to NEC NTM3906.
TR41 and TR42	B19/5TCAB01233	Silicon, PNP: sim to NEC NTM3906.
TR43	B19/5TCAB01234	Silicon, NPN: sim to NEC NTM3904.
Z1	B19/5NDAB00035	Delay Line JPC SDL300-201T-24S.

SYMBOL	PART NO.	DESCRIPTION

This addendum contains revision letter changes that have not yet been incorporated in the maintenance manual.

REV. B - NOISE BLANKER B19/CFR-89

To improve operation. Changed R34 from a 47 ohm resistor to a 10 ohm resistor.

R34 - B19/5RDAC02450 - Metal Film: 10 ohms ±5%, 200 vdcw, 1/8 w.