

MODEL 4-NB NOISE BLANKER

The Model 4-NB is a solid-state noise blanker for use with the R-4C Receiver. Unlike noise clippers or limiters commonly found in communications equipment, the 4-NB is an advanced noise blanker which actually mutes the receiver for the duration of the noise pulse. Between noise pulses, full receiver gain is restored. Receiver AGC is affected only by the desired signal and not by noise. The 4-NB is most effective on strong, periodic impulse noise such as ignition noise. It is least effective on random noise. Random noise is continuous in time and the information it masks cannot be recovered by either blanking or limiting techniques.

To install the 4-NB, perform the following: Unplug the R-4C line cord. Remove the top row of three screws on each side of the R-4C Receiver. Remove the cabinet top. Remove the jumper plug from the noise blanker socket; see the R-4C Manual figure 5-1 for the location of the 4-NB noise blanker socket. Retain the jumper plug for alignment purposes, and in case the blanker is ever removed from the R-4C. The 4-NB mounts on the four plastic printed circuit board stand-off insulators, which are on the metal mounting bracket-shields on either side of the VFO; refer to the R-4C Manual, figure 5-1. On receivers with the metal dust cover, remove this cover by removing the three mounting screws. Two screws are located at the top of the rear panel. The third cover mounting screw is located at the top front corner of the inner 4-NB mounting bracket-shield. Position the 4-NB so that the four holes in the corners of the 4-NB board are aligned with the plastic stand-off insulators. The cable from the 4-NB should be toward the rear of the R-4C. Carefully push the 4-NB circuit board onto the plastic stand-off insulators until it snaps firmly into place. Dress the 4-NB cable toward rear of the R-4C along side the power transformer and then along the rear panel. Plug the 4-NB cable into the socket on the R-4C. Re-install the dust cover. Before replacing the top cover, turn on the R-4C and follow the alignment procedure mentioned below. After alignment, reinstall the cabinet top and the six screws.

The 4-NB can be easily removed if it is necessary to gain access to the crystal calibrator. Compress the locking tab on each mounting insulator with a pair of long-nose pliers, and pull upward on the corner of the 4-NB board. Repeat at each corner until board is free.

The 4-NB is controlled by the R-4C function switch. Blanking action occurs with the switch in the NB position. When strong signals are received, some distortion may be noticeable with the blanker switched on.

4-NB NOISE BLANKER ALIGNMENT.

WARNING

Always turn off the R-4C before plugging in or unplugging the 4-NB.

The 4-NB blanker is pre-aligned; however, alignment should be checked to assure optimum performance in your receiver. For initial setup, alignment of C3, C6, and R12 should be all that is necessary. Tune in a crystal calibrator signal at 28.5 MHz. Adjust C3 and C6 for maximum S meter reading. Remove the NB cable from NB socket and reinstall jumper plug. While receiving calibrator signal, detune the preselector control until the S meter reading is around S-5 to S-7, and note the exact reading. Without disturbing any control settings, remove jumper plug and plug in the 4-NB. If S meter reading has changed, adjust R12 (blue potentiometer in corner of 4-NB board) for the same S meter reading as with jumper plug installed. This completes setup alignment.

If for some reason complete alignment is necessary the following procedure is used: Connect a VTVM which will measure positive 15 volts DC full scale, between the chassis and R45. Tune the R-4C to 28.5 MHz while using the crystal calibrator as a signal source. With the function switch in CAL position, adjust C3 and C6 for maximum S meter reading. With the function switch in the NB position and the RF gain control fully CCW, adjust R28 for maximum positive voltage on R45. Connect a jumper from pin 2 of the calibrator socket to ground. This will allow operation of the crystal calibrator and noise blanker simultaneously. Adjust the RF gain control to maintain 10 volts on R45 while adjusting C19 and C25 for minimum positive voltage on R45. Remove the jumper from pin 2 of the calibrator socket and return the RF gain to full CW. With the calibrator turned on, adjust R12 so that the S meter has the same reading with the 4-NB installed as it does with the jumper plug installed.

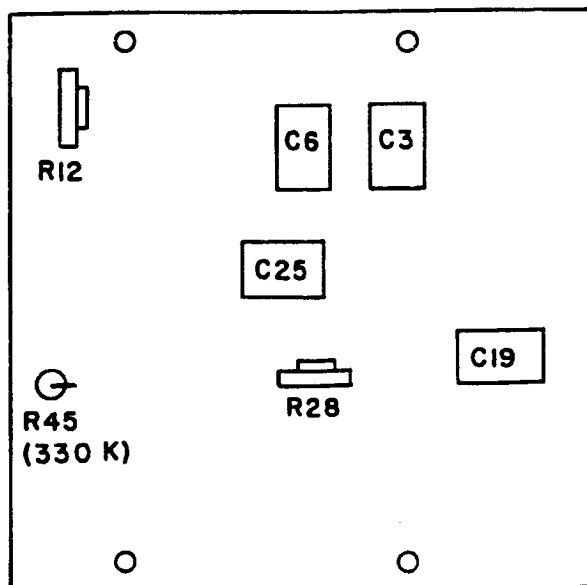
4-NB Voltage Chart

REF DES	EMITTER/SOURCE	BASE/GATE	COLLECTOR/DRAIN
Q1	1.6	2.4	6.3
Q2	1.5	2.3	9.1
Q3	8.3	9.1	12.6
Q4	7.3	7.9	13.2
Q5	0	0	7.9
Q6	3.3	4.0	13.5
Q7	1.6	0	13.7
Q8	1.4	0	13.7
Q9	3.4	4.0	10.5
Q10	3.4	4.0	3.4
Q11	3.6	4.2	9.9
Q12	0	0.22	6.7
Q13	6.3	6.7	13.8
Q14	5.8	6.3	13.8
Q15	3.8	3.2	3.2
Q16	4.2 (0)	3.5 (1.3 V)	9.2 (2.9 V)

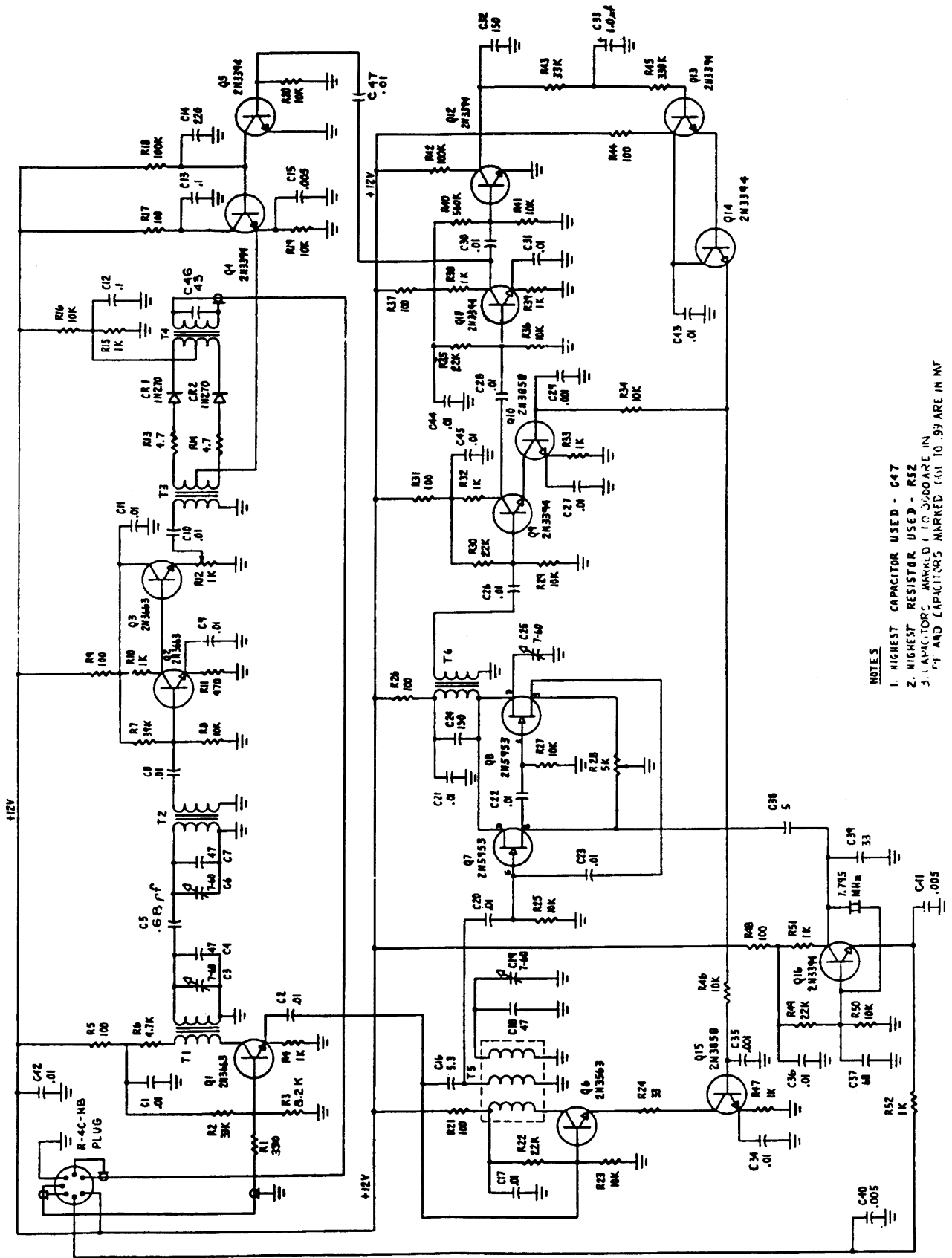
MEASUREMENT CONDITIONS:

Conditions are the same as the R-4C voltage chart except the R-4C FUNCTION switch was in the NB position. Measurements were taken with an 11 Megohm VTVM and a Boonton 91C RF voltmeter.

Measurements in parenthesis are RF voltages.



Model 4-NB Noise Blanker Alignment Locations



NOTES

1. HIGHEST CAPACITOR USED - C47
2. HIGHEST RESISTOR USED - R52
3. CAPACITORS MARKED 1 TO 3000 ARE IN μ F
4. AND CAPACITORS MARKED C51 TO 99 ARE IN M μ F

Model 4-NB Noise Blanker Schematic Diagram