Receiver Modification for Nouveau 75

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This kit is issued to customers of the first revision of the 4 State QRP Group Nouveau 75 AM transceiver. Early customer reviews indicated shortcomings with the receiver performance, with inadequate AGC range and objectionable distortion. This was attributed to the AM detector IC U3, a TA7642. A drop-in replacement daughter board was designed to replace this IC and provide superior gain, dynamic range, and linearity.

The TA7642 is a three-pin IC, descended from the well-known ZN414 and MK484 ICs. These devices combine RF amplification, AM detection, and AGC into a single part, and permits building a simple AM receiver from a minimum of components. The replacement daughter board duplicates the functions of U3 with superior performance, and mounts to the Nouveau 75 PCB with a minimum of rework.

CHECK INVENTORY

Open the anti-static bag of parts, and verify that the contents match the following table. The 1/8 watt resistors may be either 5% or 1%. Also included in the bag is the small PCB.

Ref	Value	Markings
C1	0.1	104
C2	0.1	104
C3	100p	101
C4	10	10u
C5	0.1	104
C6	0.1	104
C7	10	10u
D1	1N4148	glass diode
Q1	2N3904	2N3904
Q2	2N3904	2N3904
Q3	2N3904	2N3904
Q4	2N3904	2N3904
R1	39k	orange-white-orange OR orange-white-black-red
R2	10k	brown-black-orange OR brown-black-black-red
R3	10k	brown-black-orange OR brown-black-black-red
R4	1.0k	brown-black-red OR brown-black-black-brown
R5	1.0k	brown-black-red OR brown-black-black-brown
R6	100k	brown-black-yellow OR brown-black-black-orange
R7	1.0k	brown-black-red OR brown-black-black-brown
R8	220k	red-red-yellow OR red-red-black-orange

Table 1: Kit Contents

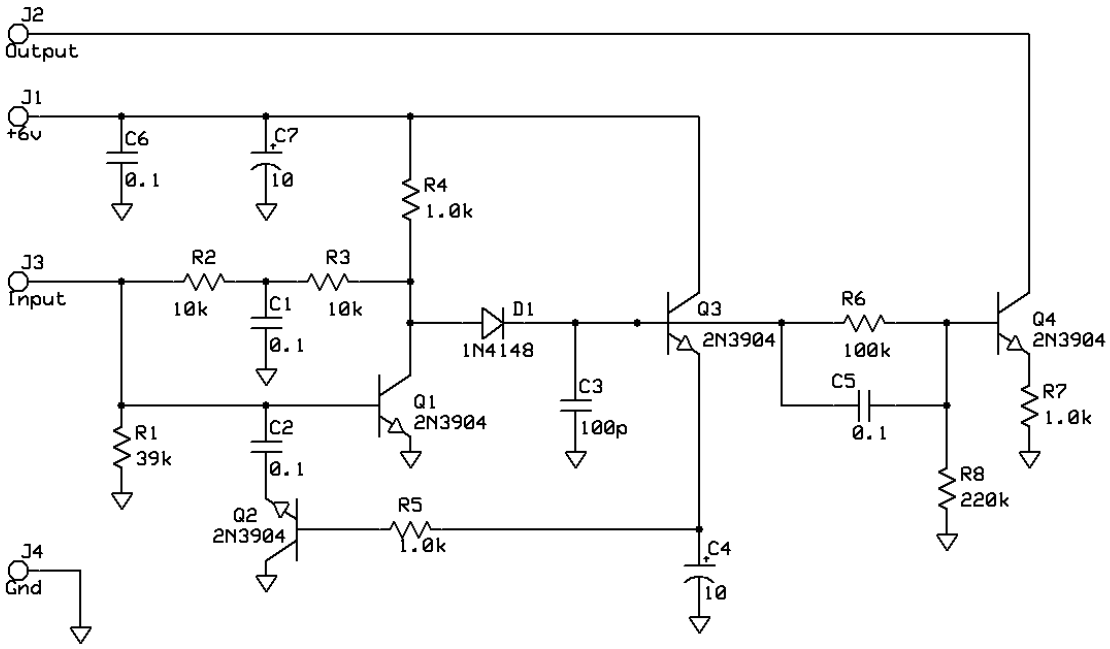

Figure 1: AM Detector Circuit with AGC.

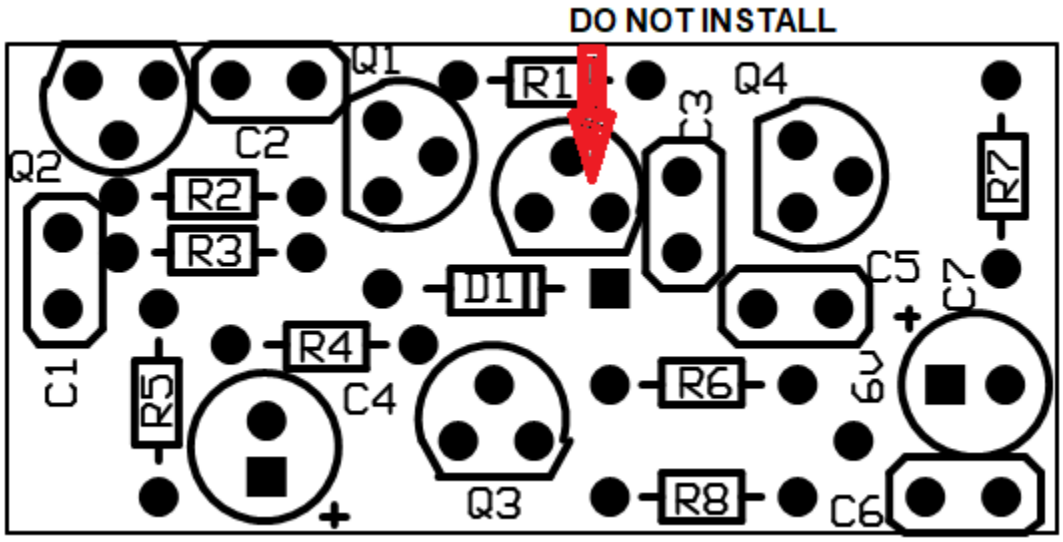

Figure 2: Board Layout.

BOARD ASSEMBLY

Insert the components from the parts list into the board, solder and trim off the leads flush with the board using diagonal cutters. Mark off the components from the parts list as you go. Pay attention to the polarity of the electrolytic capacitors, the diode, and the transistors. There is a transistor footprint with no reference designator. No part is to be installed here, rather, this is where the wire connections are installed to connect to the Nouveau 75 PCB.

Save four resistor leads for later.

The transistor footprint below R1 is where the wire connections go that connect to the old U3 footprint on the Nouveau 75 PCB. Be careful not to get solder on these holes. There is also a connection to bring 6v onto the board.

PREPARATION FOR MODIFICATION

To add the new detector board to the Nouveau 75, a number of steps must be taken to modify the PCB.

First remove R2 from the board. This may be done by heating up one of the solder pads with a soldering iron until the part is hot enough to melt the solder at both pads. Push the part out of the way with the soldering iron, and clean up any stray solder.

If you have already installed U3, it is necessary to remove it. This can be done by inverting the PCB, and adding sufficient solder to permit heating all three leads of the IC simultaneously, while pulling the IC through the board from the component side.

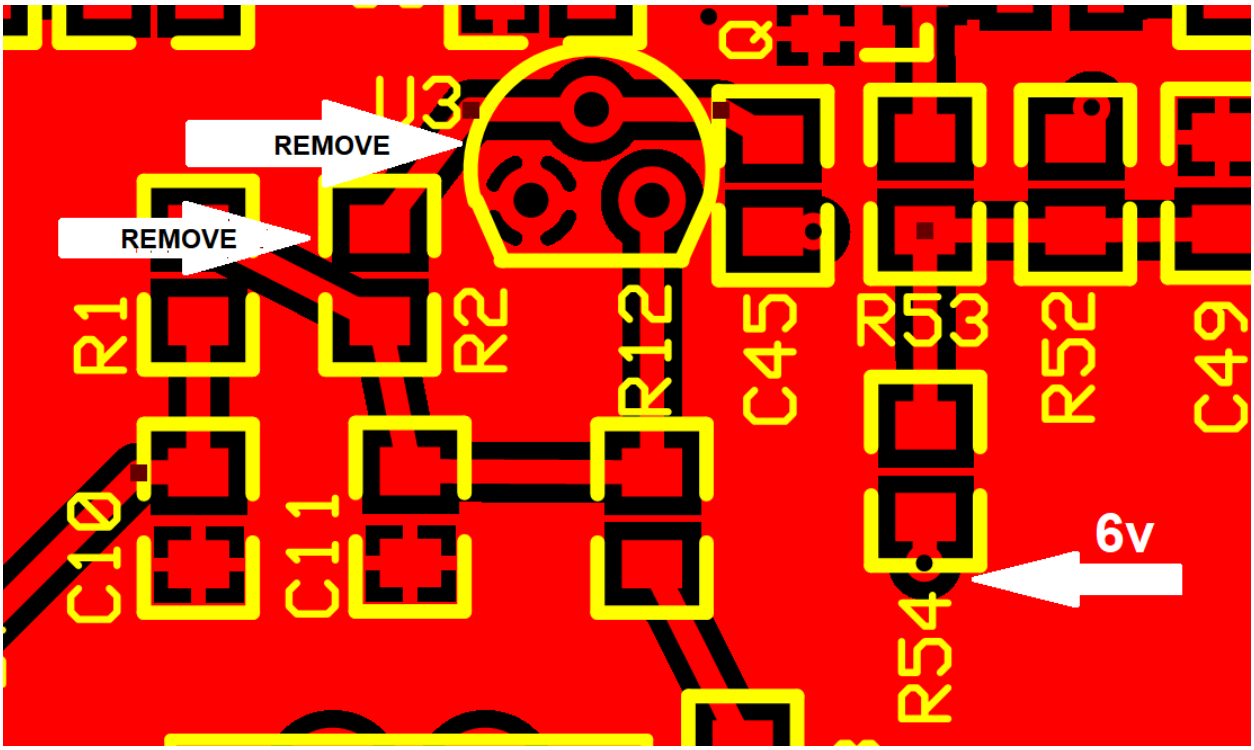

Figure 3: Modifications of the Nouveau 75 PCB.

Next, insert three of the resistor leads into the holes left in the removal of U3. Setting the transceiver on its side, using your soldering iron, heat the bottom side of each hole, and push the resistor lead through until it protrudes through the bottom of the board slightly. Add a slight amount of solder to guarantee a good joint.

It is necessary to pick up 6 volts to power the daughter board. This is obtained at the bottom of R54, at a via hole that passes through the board. The hole may be too small for the resistor lead to pass though, so put a small right angle bend at the tip of the resistor lead, the width of R54, and solder into place on the bottom terminal of R54. Bend each of these four wires so that they extend vertically from the PCB.

Finally, take the assembled daughter board and place it over the four wires so that they line up with and pass through the matching holes in the daughter board PCB. Position the board so that it rests ¼ to ½ inch (6 to 12 mm) above the surface of the Nouveau 75 PCB. Solder each of the 4 wires at the top of the daughter board, and trim the wires to length. Be careful that the 6v wire does not separate from the main PCB.

With this, the modification is complete. Enjoy the improved performance of the radio.