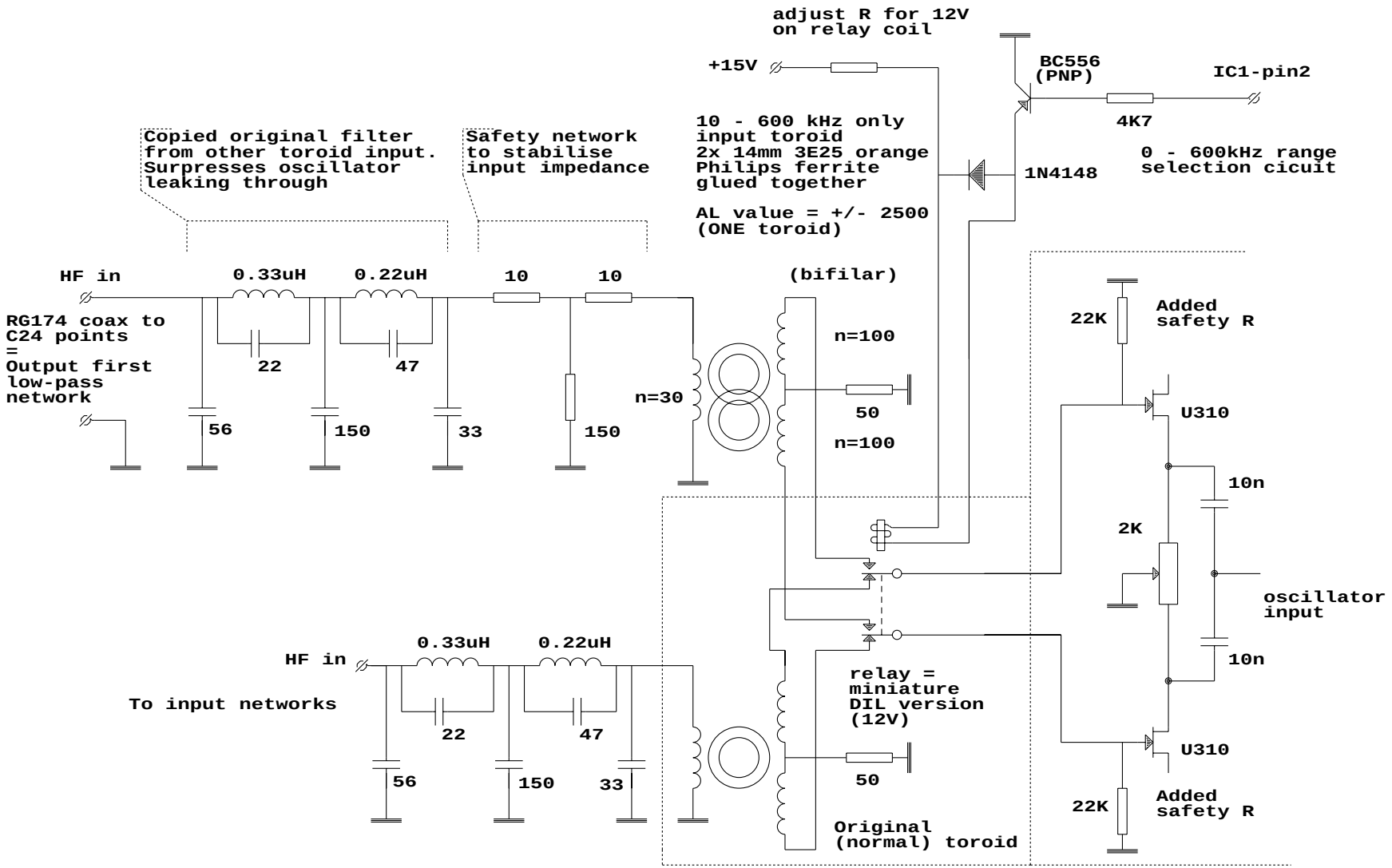

Input filter, toroid and relay on a small piece of board,
placed on the solder side of the Rx board.
Make mixer input wiring as short and compact as possible.
DON'T blow your mixer FET's during soldering !!

Also see a text file for additional information to change
the first low-pass network and other series capacitors.

Without those changes, the upgrade on this sheet won't work.

VLF upgrade mixer input for NRD-515		
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Text file belongs to the 515_mix2 circuit. A mixer circuit change for the JRC NRD-515 receiver.

This text is about additional component changes that help to improve the performance under 100kHz. Most of them are in the signal path from the aerial input to the mixer toroid.

The added (extra) mixerinput toroid increases performance and usable Rx range to < 10 kHz.
This only works together with the following additional component changes.
If you don't want to change your NRD-515 so rigorously, only the mentioned component changes alone gives also some Rx improvement and can be easily made undone. Usable Rx range than from about 50 kHz.
The add-on capacitors could be soldered in place of the original ones, or could be added underneath on the solder side.

ref.	value now		change to
C15	0.1uF	==>	1uF (or 2.2)
C16	0.01uF	==>	0.47uF
C17	0.1uF	==>	1uF (or 2.2)
C25	0.01	==>	0.47uF
C150	0.1uF	==>	1uF (or 2.2)
L7	470uH	==>	2.2mH ("R"-type) (or 4.7mH)
L11 **	470uH	==>	2.2mH ("R"-type) (or 4.7mH)

**) L11 is only needed WITHOUT the extra toroid circuit. WITH the extra toroid it is not needed at all. Remove it! Together with diode CD2. (It is wise to lift on one side and leave it in.)
Input signal is fed by miniature coax from C24 to the extra input circuit. Ground at both sides.
Switching over for 0 - 600kHz is now realised with the relay, see circuit diagram.

Between the R4/L11/C25 connection point and the path to IC1-pin2 an extra resistor of 33 Ohm should be added to reduce discharge currents peaks from the enlarged C25 (and C16) in IC1. That could cause malfunction of this device otherwise.

Now you still have the Rx board taken out it is wise to check some other capacitors. Check C333, located near IC3, the audio buffer amp. On some revisions (c) it is 1nF, this is totally wrong, it gives a too hissy, unclean sound. On the first versions it was 33nF, this is just too much, too bassy sound. 22 nF appeared to be a right value.
The side tone input capacitor C330 is 0.01uF. If you plan to use an outboard FM detector, you could use this input for feeding the audio back in. If C330 is made 0.47uF, it will work fine.

Success with the rebuild of the NRD-515 input circuit.

Walter Geeraert
PE1ABR

WARNING

By the way: I DON'T feel responsible for any receiver ruins. YOU do it at your own risk!
My receiver is working great with it. Before they disappeared I could receive the Omega systems between 10 - 13 kHz, now only some Russians.

Mind the following remarks before complaining about disappointing results: the receiver is a low impedance input device. A 50 Ohm low Z input is absolutely normal, you can't transport the signal with a 5KOhm cable. AND: you can't screen a high Z input properly against interference. Every long wire aerial will be much too short and become a very HIGH Z source without special measures. Except a special active aerial device. I've made one.
Watch for man-made interference, there will be a lot. Not from your home alone, but from the whole street. You could receive every power supply, even adapter transformers!! (YES, no joke, put 10nF C's over every (low voltage) mains rectifier diode). You are going to hate switch supplies!! 30 - 35 kHz

You could also use a loop aerial, tuning will be a problem, much too high frequency range. Use an untuned NON resonant loop, signal will be very, very low. So: make it very, very big. I made one: 150 square meters 25 to 30 meters long, 6 meters high, a screened coaxial loop. DON'T place a rotten TV set nearby, you could light a bulb with it. 15 kHz and third harmonic.
You will also need an amplifier to add some needed gain. It will have to be an amp with a very, very high intercept point. Again: I designed one. You could find a pdf file overhere. On the output transistor collector, you can measure 10V peak-peak undistorted signal (with a modulated HF-generator, or a twin tone device connected)
If possible, add some pre-tuning before any amplification. (That is easily switchable inside the building)

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