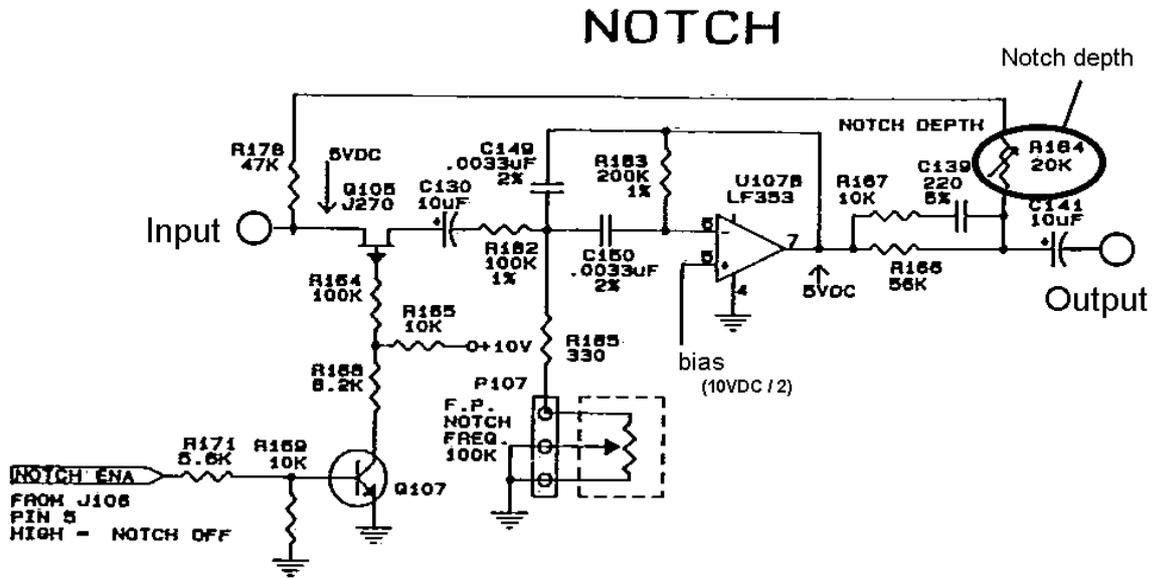
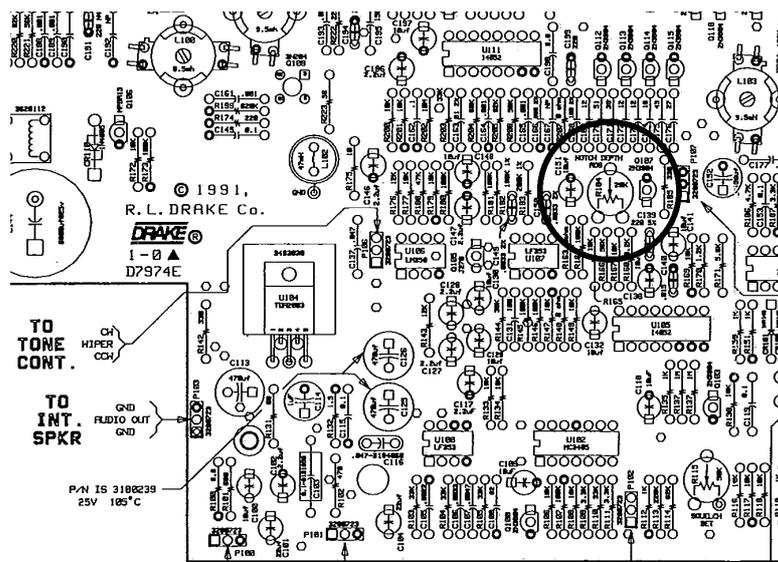


Alignment and Hints for the Notch in the Drake R8

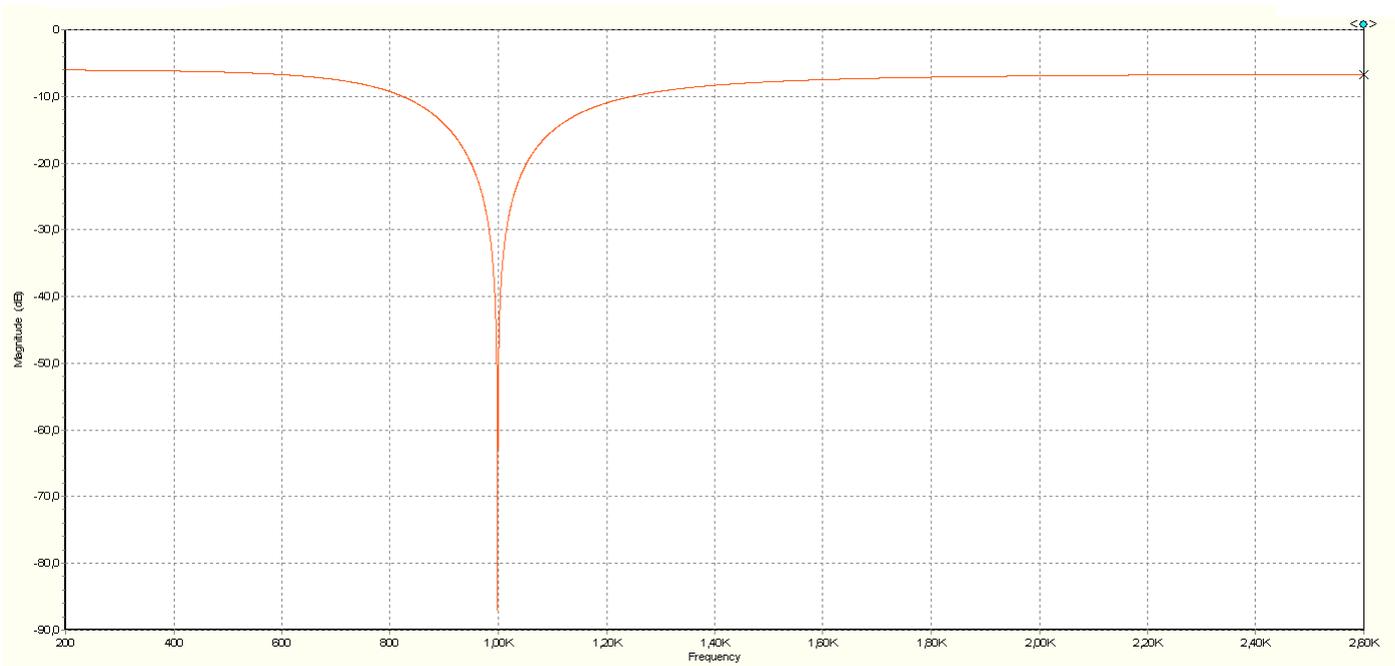
The notchcontrol in the R8 suffers sometimes with a lack of notch-depth. Picture 1 and 2 show the notch circuit, R184 determines the notch-depth /1/. The adjustment of this trimpot is very difficult, because a small variation of this trimpot causes a big variation of the depth. A simulation with 5spice /2/ of the circuit shows this effect (pictures 3 and 4).



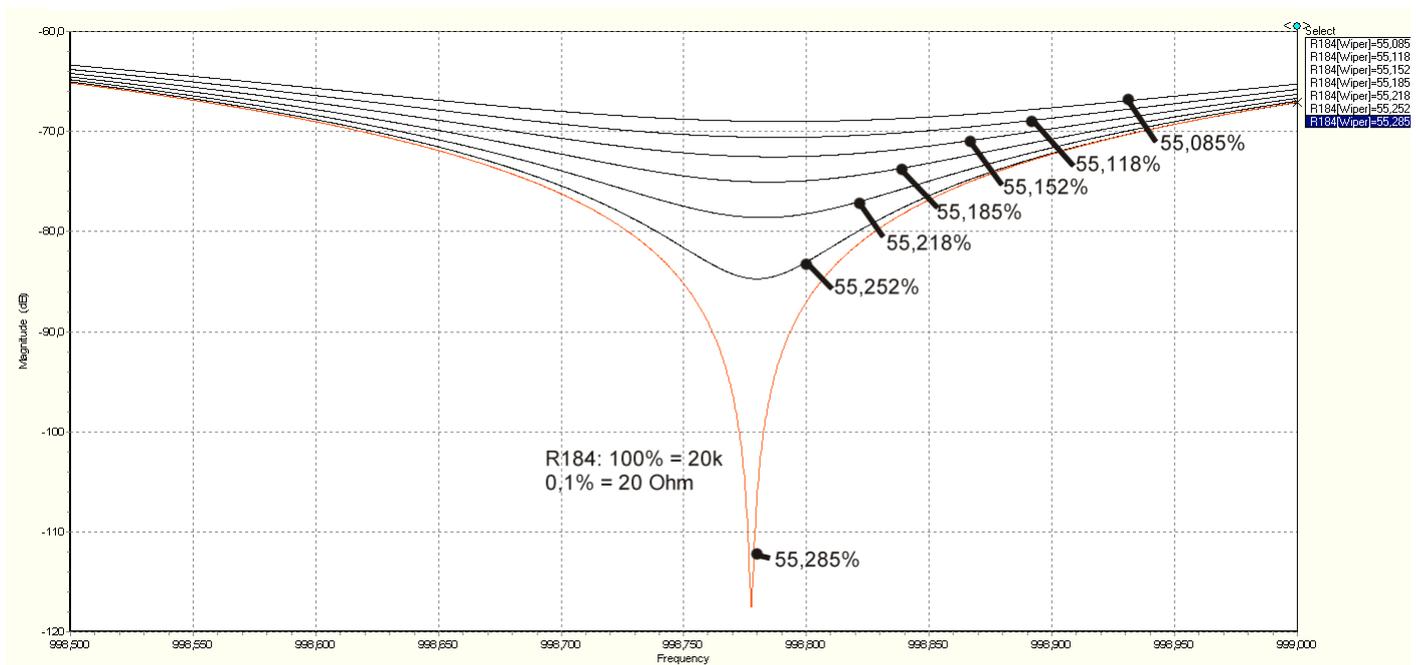
Picture 1 Notch Control circuit in the R8



Picture 2 Second IF Board Layout



Picture 3 Simulation of Notch



Picture 4 Simulation of Notch-Null (fine)

Whereas picture 3 illustrates the overall frequency response of the notch (notch tuned to 1kHz), gives us picture 4 a much more detailed information regarding the notch-depth. The optimum of R184 (20k) is app. at 55,285% of it's value (55,285% equals 11,057k); see red curve in picture 4. A variation of R184 from 55,285% to 55,185% (only 0,1%, which equals 20Ohms!) reduces the depth from -128dB to -75dB !

Note 1:

The depth with -118 dB is purely theoretical, because this value will never be reached in practice. The reasons are

- nonlinearity of the OpAmp
- tolerances of R's and C's
- temperature drift

But even at other values the result will be similar and adjustment of R184 stays very difficult.

Solution:

Rotate R184 quickly cw and ccw to clean the trimpot's rotating contacts inside. Then try a new and very careful adjustment /1/ – see also attachment which includes a copy of /1/ for notch-alignment.

It's necessary to repeat the alignment steps 2 and 3 according to /1/ until a maximum notch-depth is obtained.

The front panel Notch control and the trimpot R184 interact !

The best is to have the left hand at the front panel Notch control and the right hand simultaneously with a screwdriver at R184.

Then tune both for maximum notch depth; -40dB can be obtained.

Note 2:

The R8's notch is an audio-notch, which is a compromise between costs and efficiency.

Carriers with high levels are forcing the AGC to react; notching them in the AF-stage can't prevent this. Therefore it's senseless to increase the notchdepth beyond -40dB.

An IF-notch at 50kHz before demodulation would be better at higher carrier levels, because such carriers can be notched out before they reach the demodulator and the AGC (look at the older R7 and R-4C).

Attachment

Extract from Servicemanual R8:

62 Alignment cont'd.

F. Notch Null Adjustments

Prerequisites

- (1.) Place unit in SSB mode and tune in an external signal generator signal for a beat note at 1.5 KHz.
- (2.) Enable Notch.

1. With the above 1.5 KHz sinewave displayed on an oscilloscope connected to the audio output, and the front panel NOTCH control fully clockwise, adjust the level so that the signal spans the 8 vertical divisions of the oscilloscope.

2. Notch out the signal with the front panel NOTCH control.

3. Adjust the Notch Depth pot (R-184) to further reduce the signal.

4. Repeat steps 2 and 3 for maximum null. The signal should be less than 1/5 of one of the 8 major divisions which corresponds to > 32 dB of attenuation.

5. Check notch at 500 Hz and 3 KHz modulation where attenuation should be greater than 30 dB.

6. Notch attenuation for modulation above 2.5 KHz should be at least 30 dB.

/1/ Servicemanual Drake R8

/2/ www.5spice.com

If you want to contact the author:

Stefan Steger, DL7MAJ, eMail: dl7maj@darc.de

Homepage: www.dl7maj.de

•-•-• ••• -•-