FRONT END

Corrections

28 JULY 2004

1   Remember the corrections that must be done on the solder side of the board.

2   RFC10 is not on the schematic or the parts list. Should also be approx. 1 uH.

3   C68 and C69 has no ground connection on the board. Must be done. C68 is SMD

4   Roofing circuitry, a few changes have been done on my board. These changes could be caused the deviating parameters of the x-tals (I guess). The corrections were all done with the purpose of getting the filter curve to look good-meaning low inserting loss, minimum ripple and symmetrical with an acceptable bandwidth.

      A C112 and C95are now in the range of 68-78pF.
      B C117 and C90 are now appr. 22pF.

        After these modifications have been done, the results are shown on the following pages.

5   During the testing of the frontend board I found that the relay RLY2A had the coil reversed. The + end of the coil should in fact go to +12V and not to the ULN2803.
RLY2´s + end should also go to +12V and not to to pin 18 of the ULN2803.
Now I got the relays to activate - but in a wrong way. The track to pin 16 should go to pin 17 and the track to pin 17 should go to pin 16.
Doing this means that the displayed attenuation o-6-12-18 dB and S-meter readings now works.

A lot of measurements have been done on the roofing filter. I was not satisfied with the symmetry and the ripple. Trying to change values was not a success. It seems difficult to adjust in general. I did not measure the x-tals, so I do not know how accurate they are. I assume they are not of the highest quality.
One trick that – for me – solved all problems was to eliminate the x-tal Co (or most of it) be means of a choke and then adjust the capacitors. Now it is possible to change everything. The center frequency, the passband and the ripple can now - with some patience - be adjusted to optimum for both channels. The chokes I used were 68uH from Farnell (513-519). I tried other chokes, but this one worked ufb. The chokes were soldered directly across every x-tal .
The values I have found may not be optimum with your x-tals   To adjust the filter it is a must to have a good and accurate networks tester. I am using the networks tester that was described in FunkAmateur a few years back. (Or you could use the N2PK VNA).
See "measured response" below…………….

Measured response (OZ9FW) through the Combiner + Roofing filter + Combiner
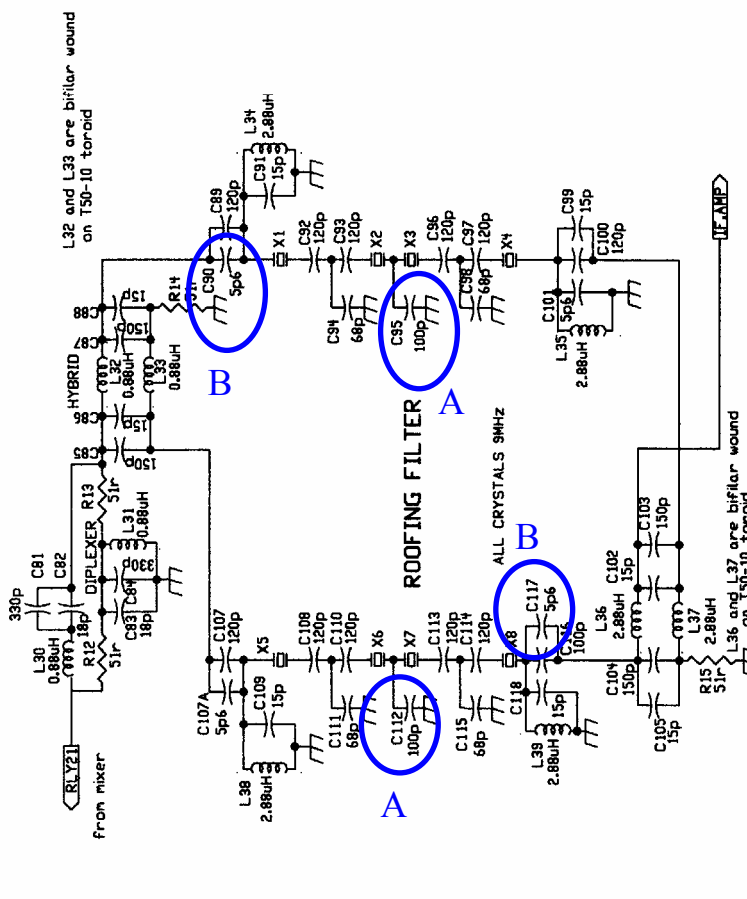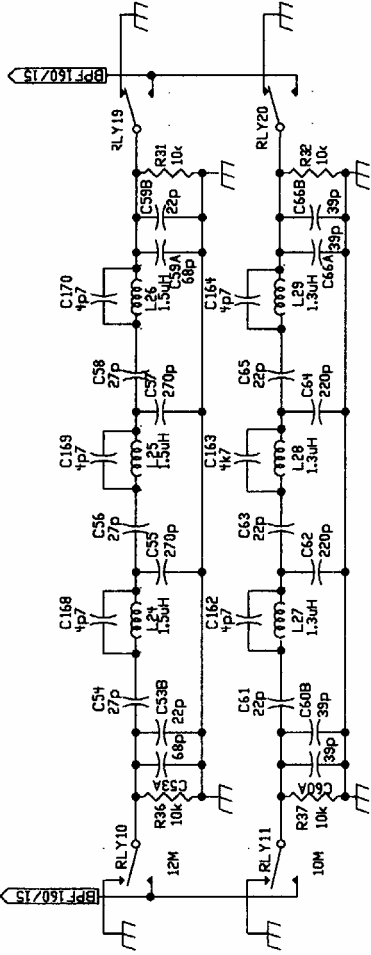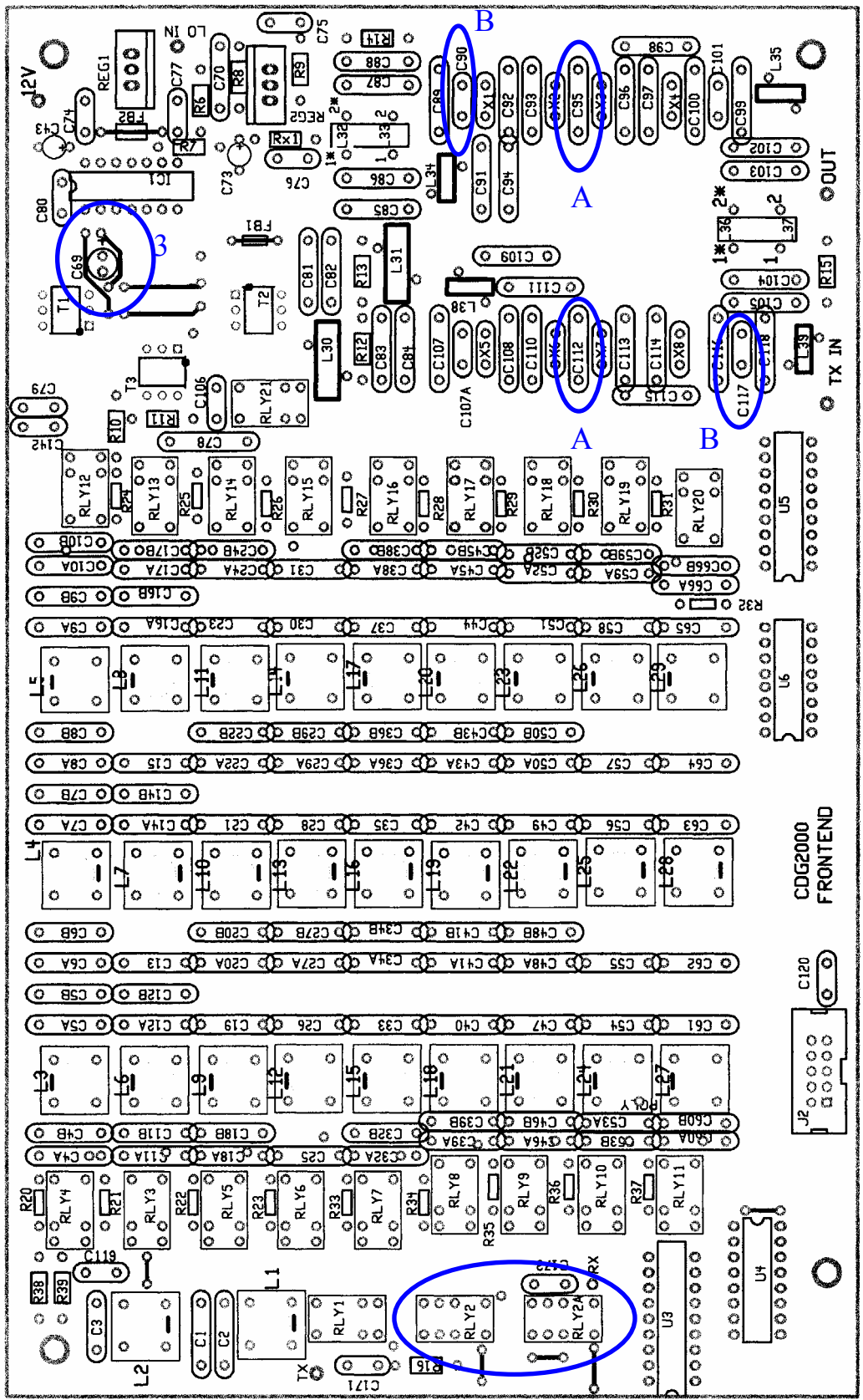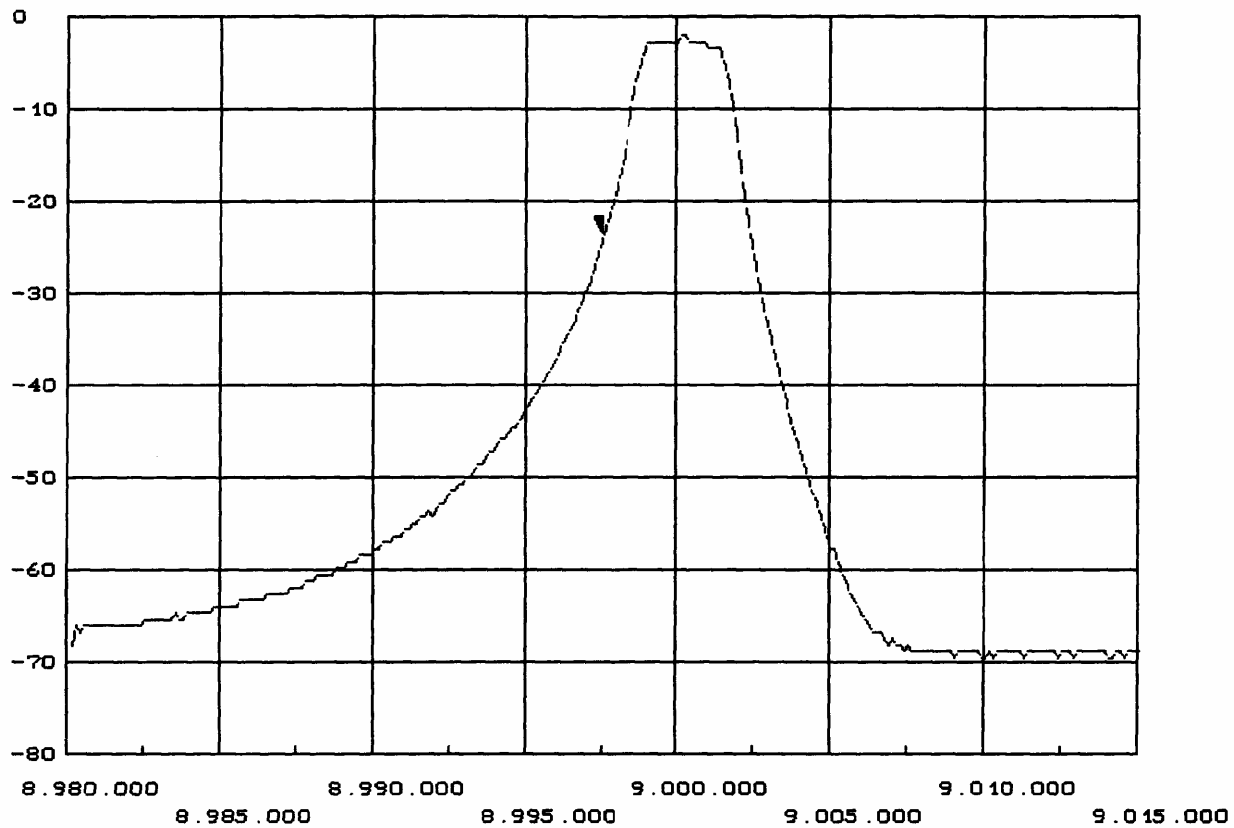Top picture log vertical scale – Bottom picture linear scale!
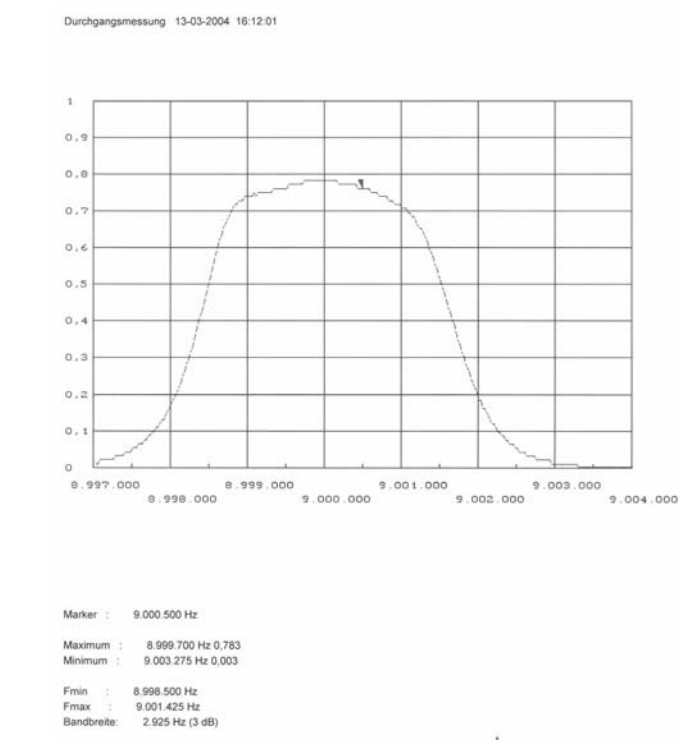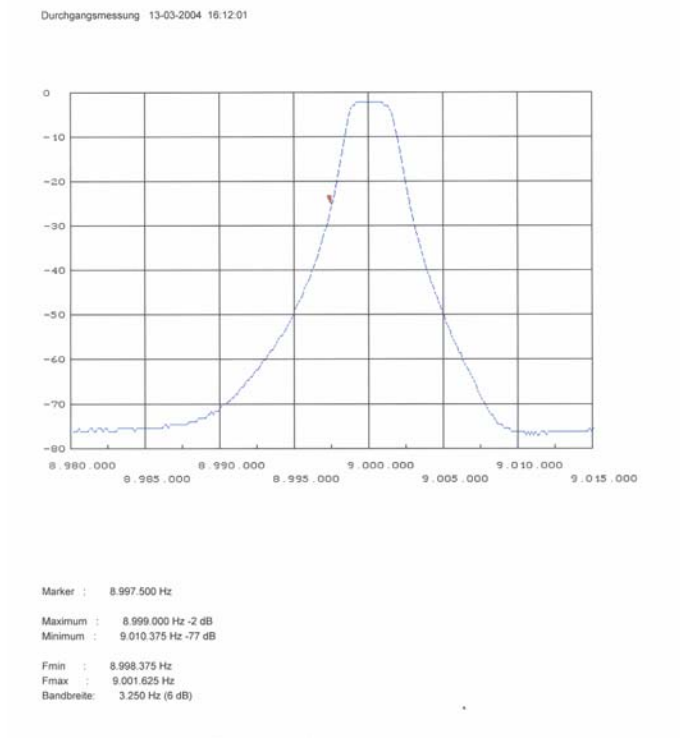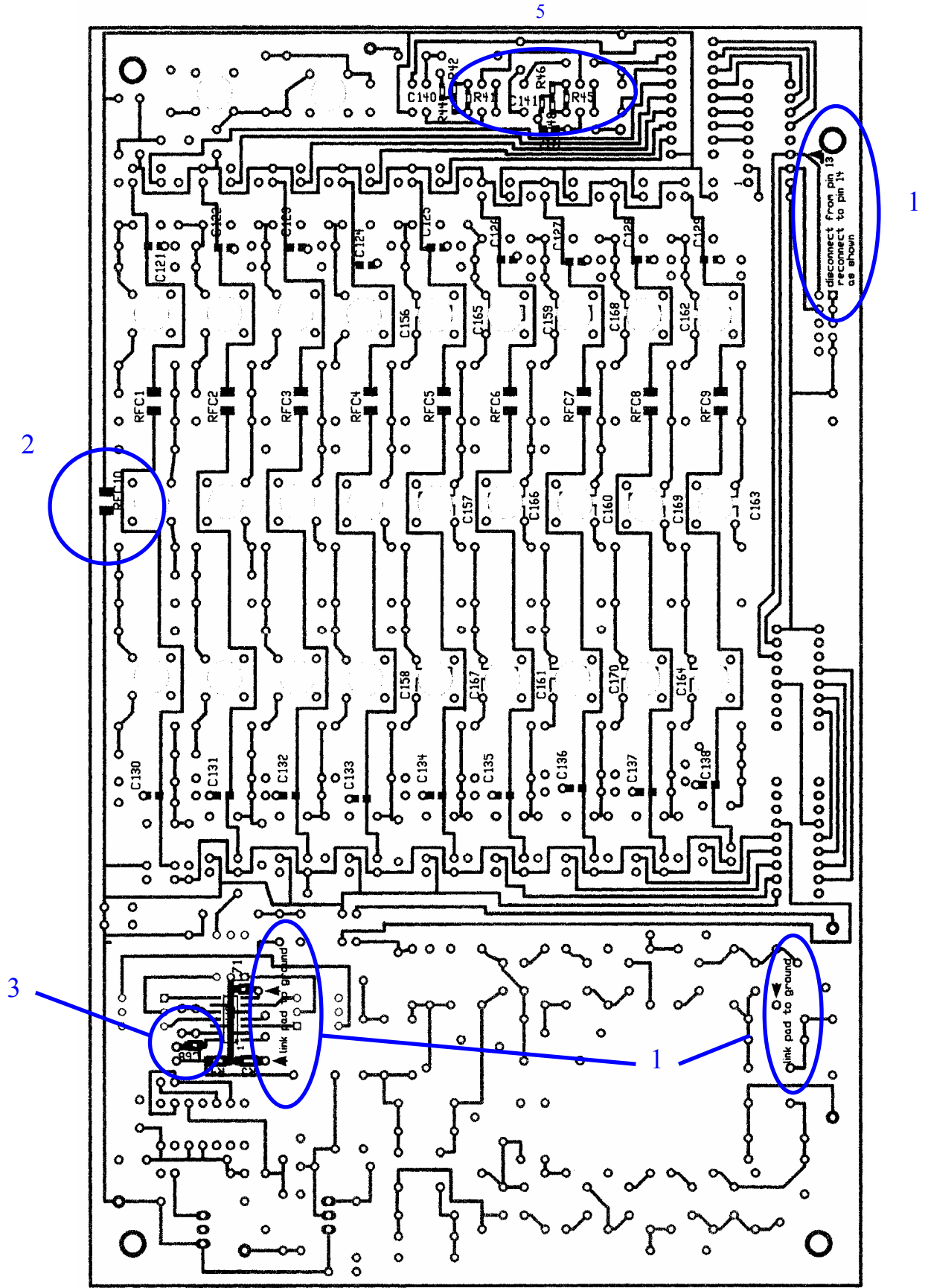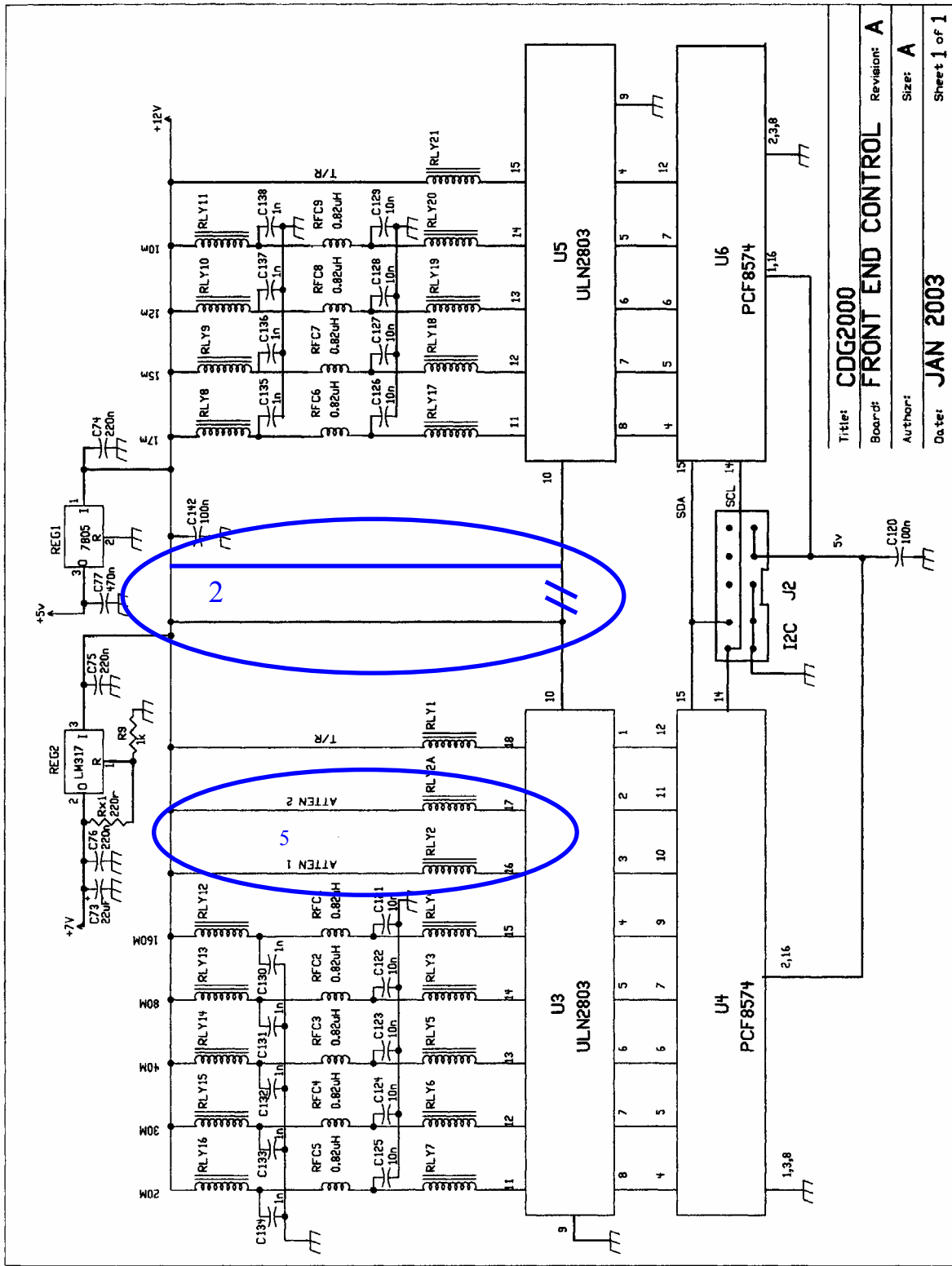
Durchgangsmessung 13-03-2004 16:12:01

Marker :   8.997.500 Hz

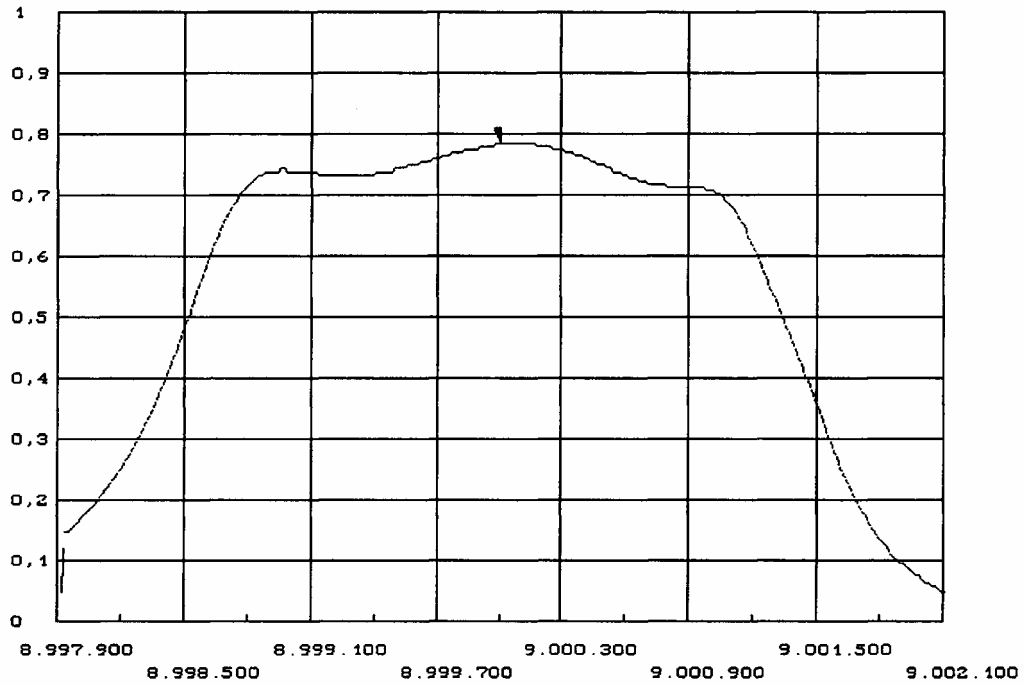Maximum :   8.999.000 Hz -2 dB
Minimum :   9.010.375 Hz -77 dB

Fmin   :   8.998.375 Hz
Fmax   :   9.001.625 Hz
Bandbreite: 3.250 Hz (6 dB)

Durchgangsmessung 13-03-2004 16:12:01

Marker :   9.000.500 Hz

Maximum :   8.999.700 Hz 0,783
Minimum :   9.003.275 Hz 0,003

Fmin   :   8.998.500 Hz
Fmax   :   9.001.425 Hz
Bandbreite: 2.925 Hz (3 dB)

12 and 10m BAND PASS FILTERS

L32 and L33 are bifilar wound on T50-10 toroid

ROOFING FILTER

ALL CRYSTALS 9MHz

L36 and L37 are bifilar wound on T50-10 toroid

From mixer

A

B

IF AMP

BPF 160/15

RLY19 RLY20 RLY10 RLY11 RLY21

12M 10M

Title: CDG2000	Revision: A
Board: FRONT END PART 3	Size: A
Author:	
Date: JAN 2003	Sheet 1 of 1

FRONT END 28072004.doc

5

Marker   :   8.997.500 Hz

Maximum :   9.000.000 Hz -2 dB
Minimum   :   9.008.875 Hz -70 dB

Fmin   :   8.998.500 Hz
Fmax   :   9.001.625 Hz
Bandbreite: 3.125 Hz (6 dB)

Marker   :   9.000.000 Hz
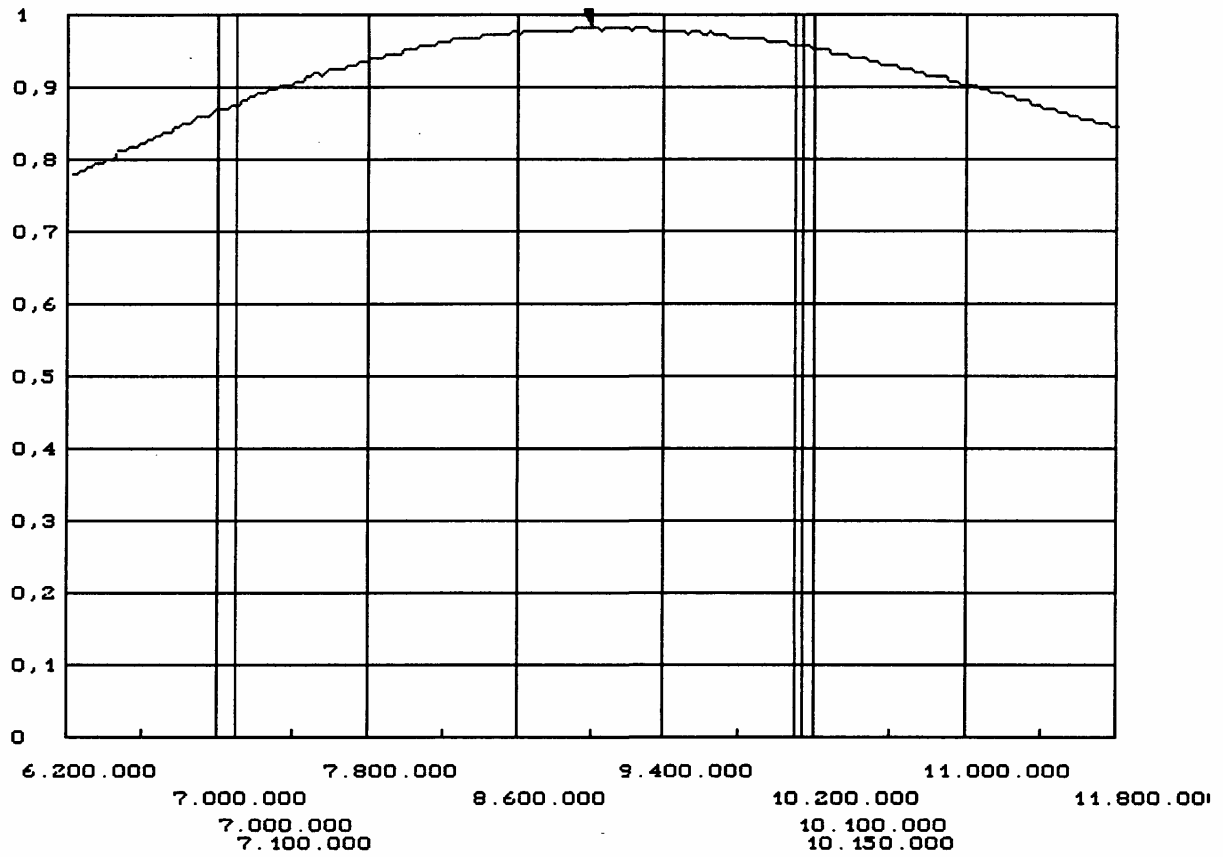
Maximum   :   8.999.955 Hz 0,785
Minimum   :   8.997.900 Hz 0,048

Fmin   :   8.998.545 Hz
Fmax   :   9.001.260 Hz
Bandbreite: 2.715 Hz (3 dB)

Marker   :   9.000.000 Hz

Maximum   :   8.880.000 Hz 0,983
Minimum   :   6.200.000 Hz 0,780

Fmin   :
Fmax   :
Bandbreite: