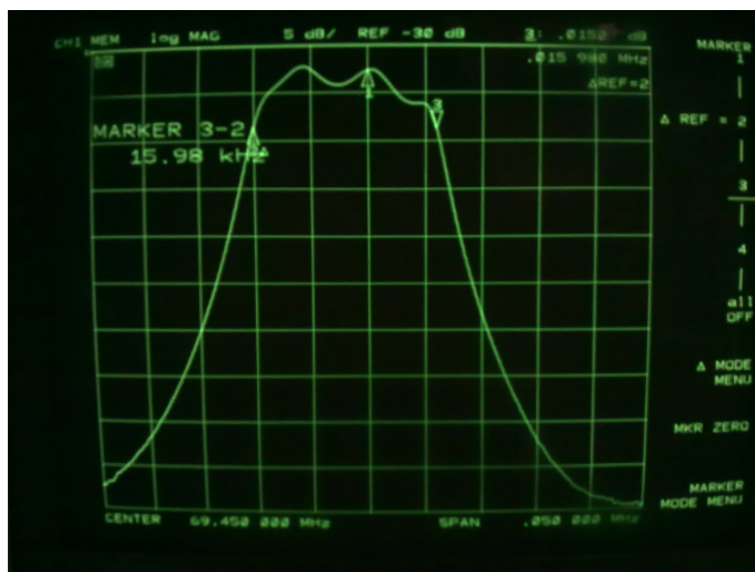


## Measurements of the roofing filters of a FT-950

All measurements are taken between TP 1066 and J 1028 (Scope (H)) on the main pcb of the FT-950. The scope output is terminated with 50 ohms. The signal to the TP is applied via a high impedance probe. This results in a much higher measured insertion loss than it is in reality and in a reduced dynamic range of the NWA.

### a) Originally equipped filters

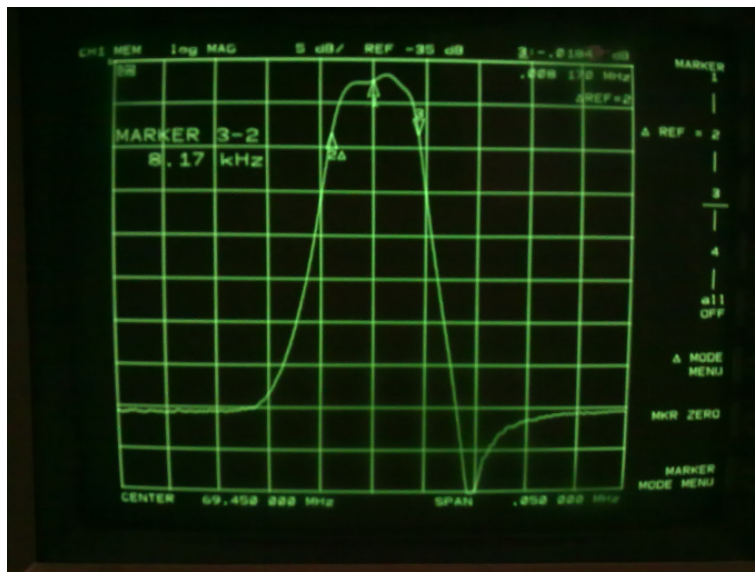
#### 15 kHz filter



centre freq: 69.450 MHz    horiz: span    5 kHz/div  
reference value: -30dB    vert:    5 dB/div

=> Bandwidth @ -6dB points: 15.98 kHz

### 6 kHz filter



centre freq: 69.450 MHz    horiz: span    5 kHz/div  
reference value: -35dB    vert:    5 dB/div

=> Bandwidth @ -6dB points: 8.17 kHz

### 3 kHz filter



centre freq: 69.450 MHz    horiz: span    5 kHz/div  
reference value: -35dB    vert:    5 dB/div

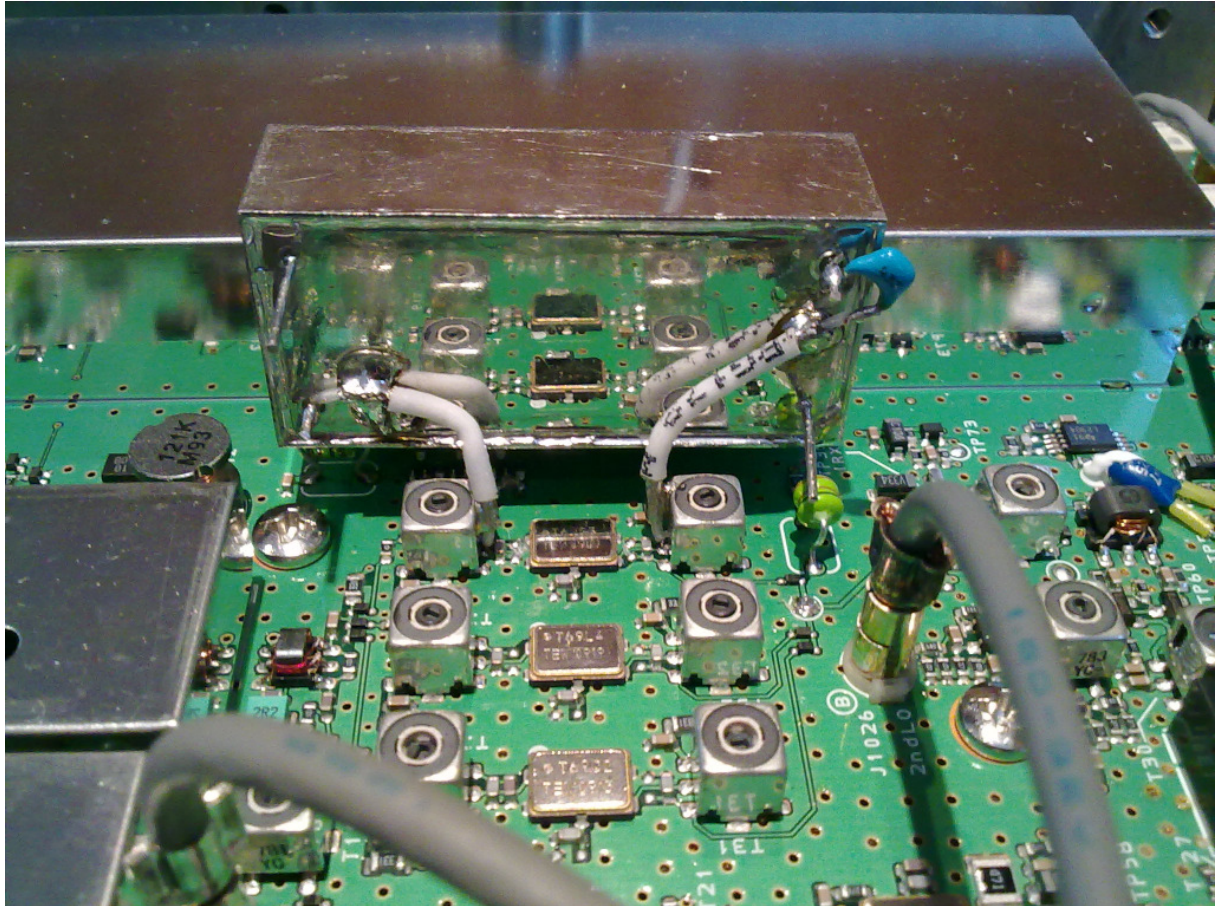
=> Bandwidth @ -6dB points: 6.145 kHz

Note:

- The insertion losses of the 6 kHz and 3 kHz filters are about 5 dB higher than the loss of the 15 kHz filter.

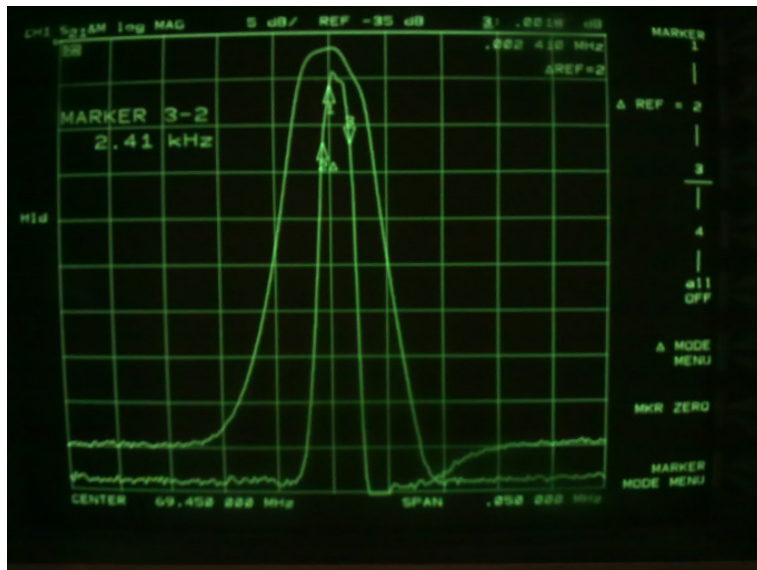
**b) Replacing the original 3 kHz roofing filter with the NS 3 kHz filter (“AC0C filter”)**

The filter was replaced more or less according to the instructions from Jeffs home page ([www.ac0c.com](http://www.ac0c.com)).



The picture shows the modified section of the main pcb of the FT-950.

c) Comparison between the original 3 kHz filter and the NS filter



centre freq: 69.450 MHz    horiz: span    5 kHz/div  
 reference value: -35dB    vert:    5 dB/div

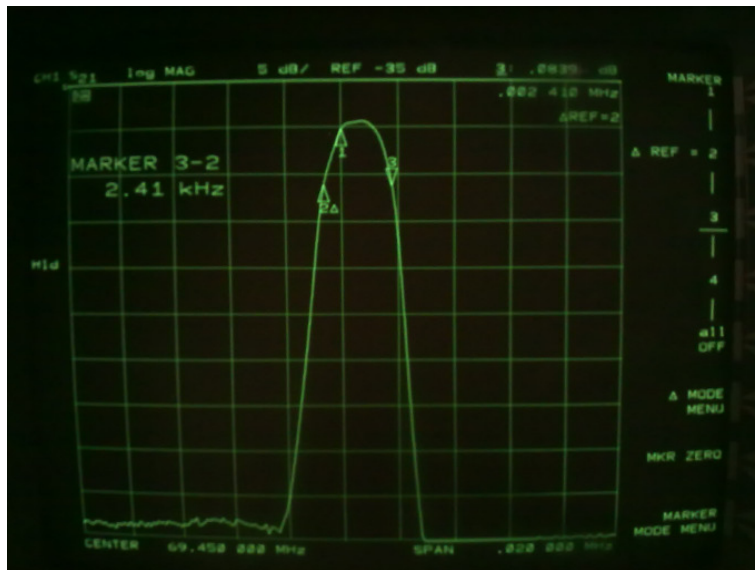
Results:

Original 3 kHz filter: => Bandwidth @ -6dB points: 6.145 kHz

NS 3 kHz filter:        => Bandwidth @ -6dB points: 2.410 kHz

The measurements were taken with the same settings of the transformers T1026 and T1033.

#### d) The 3 kHz NS filter in the FT-950



centre freq: 69.450 MHz    horiz: span    2 kHz/div  
reference value: -35dB    vert: 5 dB/div

=> Bandwidth @ -6dB points: 2.410 kHz

The measurement was taken after a slight tuning of the transformers T1026 and T1033.

Notes:

- The optimized insertion loss of the NS filter is about 2 dB higher than the loss of the originally equipped 3 kHz roofing filter.
- From the measurement one could assume that the filter is out of centre. But checking the frequency of the NWA HP8753A in use with a counter equipped with a GSP locked reference source revealed that the centre frequency was 440 Hz too low. Applying this correction to the measurement shows that the filter is nicely centred.

A special thank goes to Jeff AC0C who made available to the ham world a great 3 kHz roofing filter for the FT-950 and FT-2000. Thanks again.

73 de HB9ERU Bruno

PS. The first SSB QSO using the NS 3 kHz filter was a new one (9500 km). Mere chance or not?