

WB4GCS	Repairing N3SH Bandpass Filters	31. Jul. 2016	1/3
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Initiation Date:

31 July 2016

Participant(s):

WB4GCS

Initial Symptoms:

Failed 40m and 20m bandpass filters as measured on 30 July.

Actions:

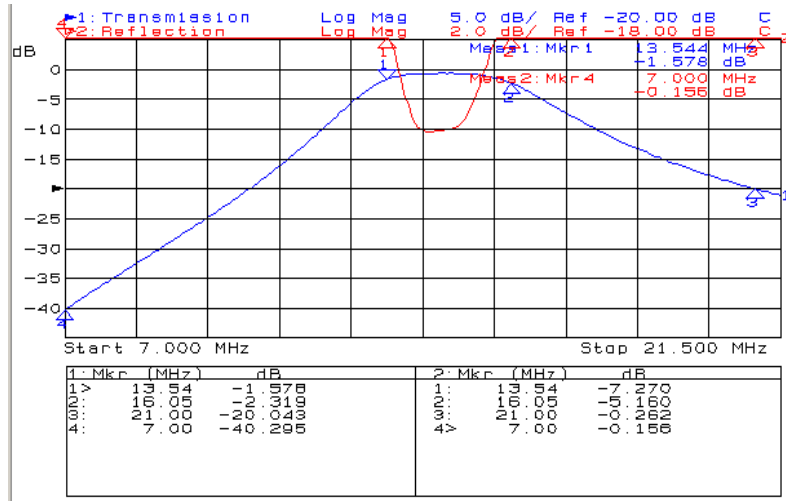
Ordered capacitors to fix failed 40m filter.

Found caps in junk box to replace overheated 82pf cap in W3WH 20m filter. Had to parallel two to get measured value of 81 pF in place of 82pF +/- 20% cap, which measured at 80pF.

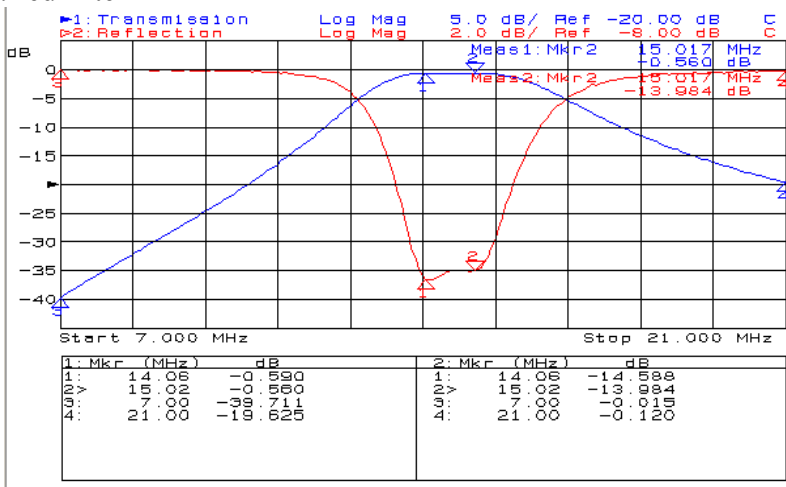
Repeat measurements.

Observations:

Original measurement of failed filter



Measurement of repaired filter

**Analysis:**

The repair obviously made a difference in return loss; nothing much in transmission.

Original return loss of 5-7 db equates to SWR of 2.5 – 3.5 – UNSAT.

Repaired return loss of 15 db equates to SWR of 1.4; better but not great.

Markers are at return loss of 10db, which corresponds to SWR = 2+. Not great for passband. Future passband measurements will look for return loss of 20db, SWR = 1.2.

Hypothesis:

The 82 pF capacitor was damaged due to overheating.

Plan:

Repair the 40m filter when ordered caps arrive.

Results:

1. The 20m filter is repaired and usable, if not great.

Conclusion:

Make future passband measurements based on 20db return loss, rather than 10db. Since return loss has turned out to be a much more sensitive indicator than S21 (transmission), tune future filters for symmetry and performance based on return loss.