

Adjusting Wacom WP-641 2-m Duplexer

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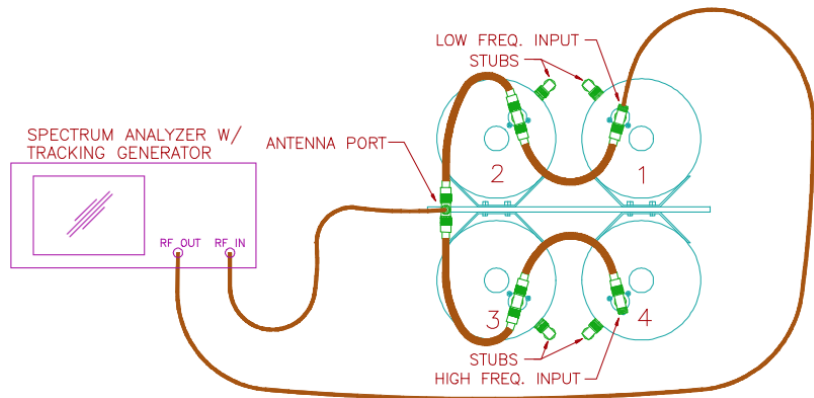
Background

- ▶ K4RY's 2-m duplexer: Wacom WP-641
- ▶ high frequency: 147.84 MHz, low frequency: 147.24 MHz
- ▶ Test location: Broun 228 (Lloyd Rigg's lab)
- ▶ Equipment:
 - ▶ HP 8753C network analyzer
 - ▶ HP 85047A S-parameter test set
 - ▶ 50- Ω dummy load
 - ▶ Excitation: 20 dBm
- ▶ Remec/Wacom, "Field tuning instructions for 4-cavity BpBr circuit duplexer." [Online]:

www.repeater-builder.com/antenna/wacom/wp6xx-vhf-tuning-instructions-remec.pdf

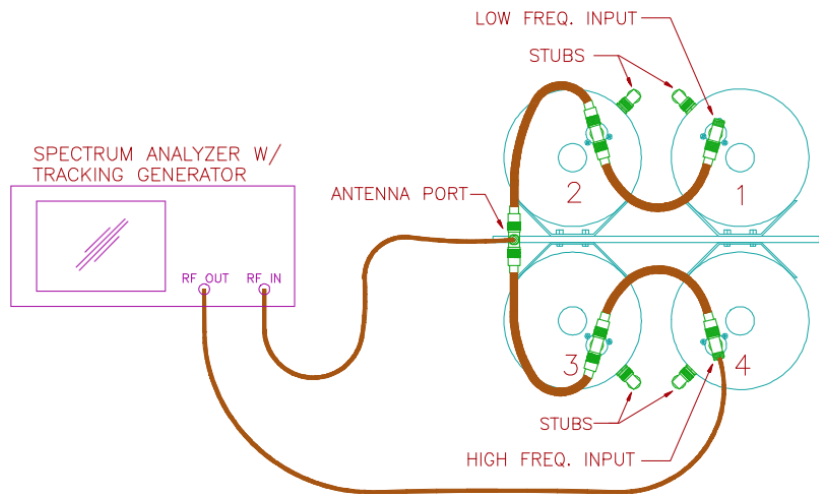
Test setup for low frequency input S_{21} vs. frequency

(from Remec/Wacom manual)



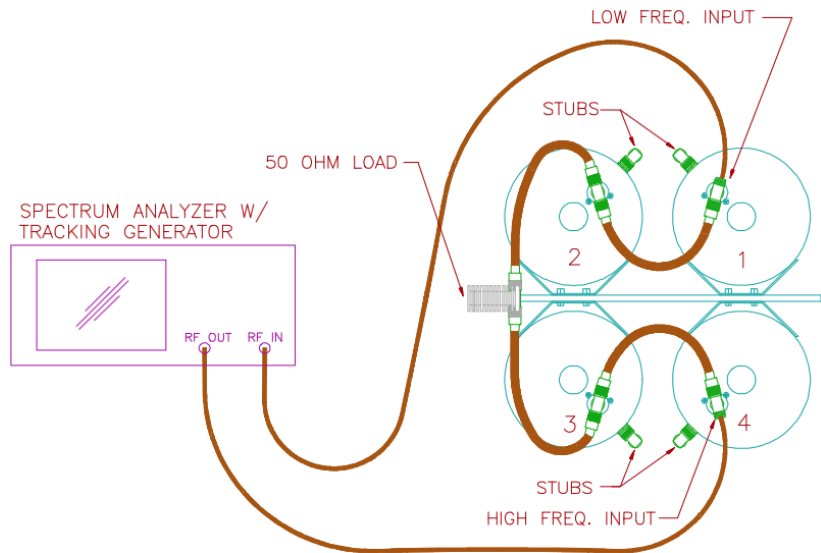
Test setup for high frequency input S_{21} vs. frequency

(from Remec/Wacom manual)

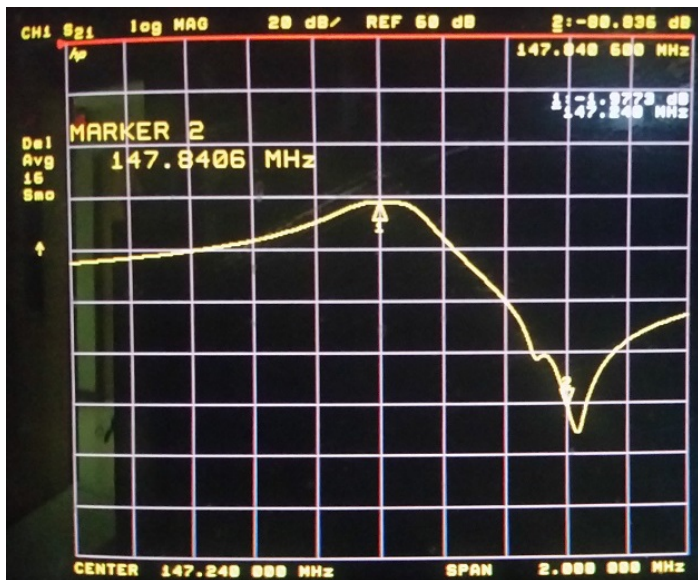


Test setup to measure S_{21} reject notches

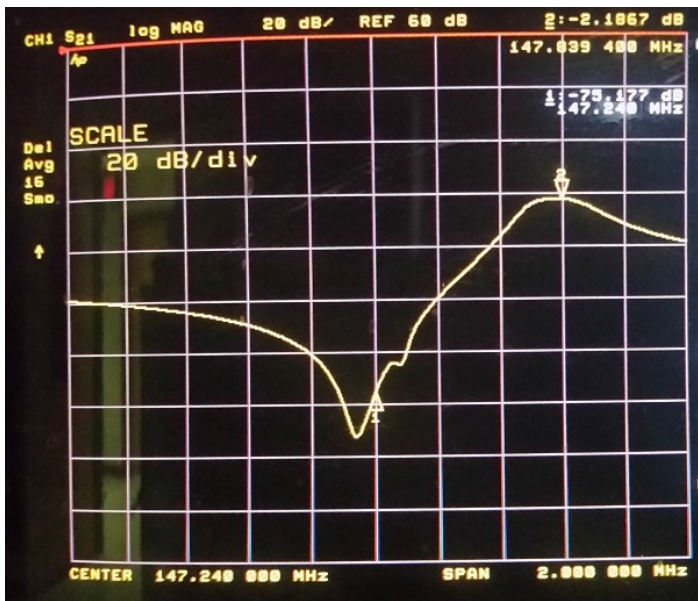
(from Remec/Wacom manual)



Low frequency S_{21} response – before tuning



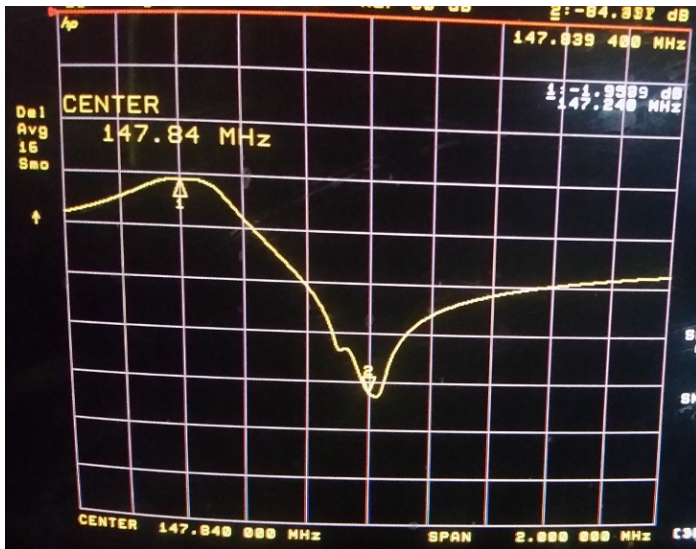
High frequency response – before tuning



What was tuned?

- ▶ Rexolite rods (stubs) on the sides of the cavities, for the notch frequencies. Original positions were first marked with red Sharpie pen.
- ▶ The passband frequencies were NOT touched (Invar threaded rods on top of each cavity).

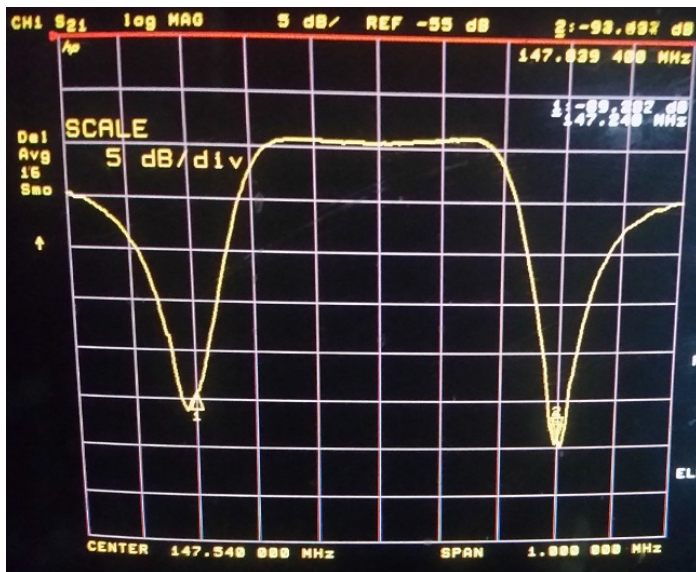
Low frequency response – after tuning



High frequency response – after tuning



Notch response – after tuning



Summary of response characteristics

Characteristic	Before	After
Low freq. passband loss (147.24 MHz)	-1.98 dB	no change
Low freq. notch attenuation	-80.8 dB	-84.4 dB
High freq. passband loss (147.84 MHz)	-2.2 dB	no change
High freq. notch attenuation	-75.2 dB	-83.5 dB