

surplus mechanical filters

----- by Marc Bergman

This article was inspired from a muse by Dennis Kibbe (Vol 21, #18). He mentioned a local surplus outfit * had mechanical filters for a good price. I had purchased some of these filters and decided to finally test them .

The first filter is a Rockwell Industries (Collins) # 526 9892 020. The numbers available may vary. It is an upper sideband filter rated at 3.2KHz wide at 6dB. It sells for \$15.99.

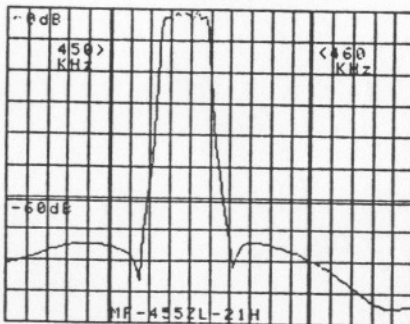
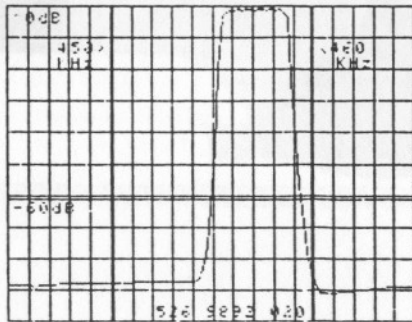
The next filter is a Kokusai MHP 455-ZL 21H. It is a lower side-band filter rated at 2.46KHz at 6dB. It sells for \$15.99.

I also checked a Motorola Frequency 207155 HZ. I had purchased this filter several years ago for \$72. It is a SSB filter rated at 2.1KHz at 6dB.

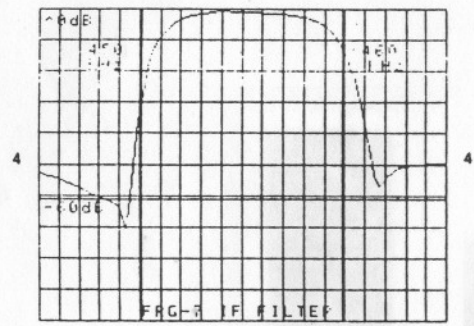
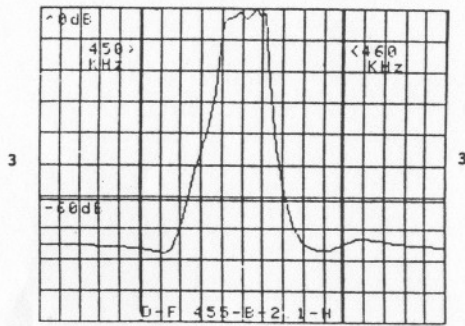
The above filters are a good representation of typical mechanical filters. I also had the original ceramic filter from my Yaesu PRG-7. I thought it would be a good representation of type of selectivity found in most medium priced receivers.

The test set-up consisted of a Hewlett-Packard 3325A Oscillator providing the signal source and a H-P 3386A Selective Level Voltmeter measuring the frequency response. These units were controlled by an H-P 85 computer. The frequency response was checked from 445KHz to 465 KHz. The graph is divided horizontally in 1KHz divisions. The graph is divided vertically in 10 dB steps. This gives a measurement range of 100 dB. The filters were mounted on a printed circuit board.

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160-2-2



The first graph shows the Collins filter. It's center frequency is about 457KHz. It measured 3.3KHz wide at -6dB and 4.4KHz wide at -60dB. This gives a shape factor of 1:1.33. It has an stop-band rejection of 87dB. This is an outstanding measurement.

The second graph shows the Kokusai filter. It's center frequency is 453.5KHz. It measured 2.35KHz wide at -6dB and 3.7KHz wide at -60dB. This gives a shape factor of 1:1.57. It has a stop-band rejection of 75dB.

The third graph shows the Dillmore-Preimuth filter. It's center frequency is at 455KHz. It measured 2.2KHz at -6dB and 4.6KHz at -60dB. This gives a shape factor of 1:2.09. It has a stop-band rejection of 73dB.

The fourth graph shows the original filter from my Yaesu PRG-7. It's center frequency is at 455KHz. At least I think it is. It measured 8KHz wide at -6dB and 12KHz wide at -60dB. It has an stop-band rejection of 50dB. This is a poor figure even for a ceramic filter.

RESULTS

Filter	Center (KHz)	-6dB (KHz)	-60dB (KHz)	SF	SB (dB)
Collins	457	3.3	4.4	1.33	87
Kokusai	453.5	2.35	3.7	1.57	75
D-P	455	2.2	4.6	2.09	73
PRG-7	455	8.0	12 *	1.5	50

* sort of

The measurements show that it is important to look beyond just the -6dB specification when choosing a filter. The D-P filter is the narrowest at the -6dB point but overall is not the best. The shape factor and stop band are just as important and give you an overall look at what you can expect from your filter.

Both the Collins and Kokusai are excellent performers and are at a bargain price. The main problems I see in their usage depends on your receiver. In single conversion receivers there shouldn't be much problems except for physical size and several dB of loss. These filters are about 2.5 inches long and have 6-8dB loss. In multiple conversion receivers you may have a problem since the center frequencies are offset from 455KHz. There may also be problems in receivers with digital readout reading several KHz off.

If you can use these filters in your receiver care must be taken to get the full benefit they offer. Proper mounting and termination must be observed. Amplification may be needed to make up for insertion loss. Be sure that you get the spec sheets and use the data for proper interfacing.

It obvious that the PRG-7 needs help in it's selectivity. I plan to try the Collins filter in my PRG-7. I'm making several other modifications to it. I'll report the results soon.

If anyone has any questions or comments feel free to contact me. I am also running some test on ceramic filters. I am looking for a Murata CPS 455 1 or 3 or a CFR 455 1. I am willing to beg, borrow, or steal or even purchase one. Any help would be appreciated.

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Kanadian Korner! Knows From "The Frozen North" March 1, 1985

- 700 NB CESJ St. John gets a CP for 10kw. U4...ex 1150.
- 770 AB CHQR Calgary gets a CP for 50kw. U2...ex 810. (IS)
- 770 AB CIBQ Brooks denied moving from 1340...Dan via Ted(CEQR).
Now I can hear Ray on KGO clearly. Wow!
- 820 ON CHAM Hamilton won! 50kw. U4...ex 1280. CKMW & CPGM lost.
- 830 ON CPJR Brockville gets a CP 5kw. U2. ex 1450. Also listed as 5/1kw. This is another surprise as many freq. changes are not printed until much later.
- 870 BC CKIR Invermere-Radium is on. NB got'em. "Columbia-Shuswap" slogan replaces "Big R" & "R Country". CKIR is now CKXR-1-FM North Shuswap(Sorrento). Relays CKGR-1400 who twin CKCR-1340 whose mother is CKXR-580. Strongly in Vancouver burbs. So is KIEV/WWW/KORD/KUUY.
- 880 AB CHQT Edmonton got the CP for 50kw. U2 ex 1110. CKSQ lost.
- 910 AB CKDQ Drumheller got the booty prize. CP for 50kw. U2 but lost their bid for 880-CKSQ & 770-CIBQ.
- 1070 AB CKST St. Albert is OFF.
- 1230 AB CILW Wainwright. CRTC lists say CILW not CJLW. and also list CILW-1340 as CHLW-1. Anyway, they still twin 1310.
- 1340 AB CILW Grande Centre is listed as CHLW-1 by CRTC.
- 1370 PQ CFPV denied twinning any FM.
- 1380 NB CHLR Moncton is OFF(Canadian Press).

NHL Toronto Maple Leafs...a bit late, eh!

CJCL-1430 Toronto: CHUC, CKS/CJNR/CKNR, CERO, CHYR, CPMK-FM, CKOB, CKKW, CJTN(CJBQ & CJNE not listed), CKGB-750, CJCS, CJKL/CJTT, CKMP, CPCH, CKBB/CKCB, CPJR-E30, CJRN, CPOR, & CJQE-FM. It's good in 1985.

Re IRCA Oct. 6 Page 1...I didn't say CHQR decided not to move. Ted did.

The big Regina-Saskatoon-Brandon frequency switches should be OK next!