

If you want the station you're working on to sound like the only station on the band, N4QB says the SCAF-1 Audio Filter from Idiom Press should perk up your ears.

CQ Reviews:

The Idiom Press SCAF-1 Audio Filter

BY JOE VERAS,* N4QB

My search for a compact, easy-to-use, and relatively inexpensive means of enhancing the selectivity of my vintage receivers/transceivers ended when I discovered Idiom Press's SCAF-1 filter. Those of you who read *CQ* regularly know I collect classic radios and use many of them on the air. After trying this audio filter with a variety of gear, new and old, I found it a beneficial accessory for nearly any radio, regardless of vintage or price class.

Heading the list of the SCAF-1's attributes is its ease of connection and set-up. Using the unit for the first time, one follows a short procedure from the instruction manual involving the adjustment of two PC-board-mounted pots. This equalizes the audio level with the filter in or out of the circuit and minimizes white noise. With the setup complete and the top cover back on, all further operation is done with two front-panel controls, a knob and toggle switch. The two-position switch controls whether the filter is in or out of the circuit. The knob sets the low-pass filter's cutoff frequency, which ranges from 450 Hz to 3.5 kHz. The SCAF-1 rolls off, or attenuates, audio signals at 96 dB per octave (audio frequency doubles or halves by octaves) above whatever cutoff frequency is set. Also of importance to me is the filter's small size. It measures 3¹⁵/₁₆" W × 1¹/₂" H × 5¹/₁₆" D. Only one connection between the SCAF-1 and radio is required. A shielded cable from the radio's headphone or speaker out-



The SCAF-1 Audio Filter from Idiom Press. (Photo © Joe Veras)

put plugs into an RCA jack on the filter. That's it!

Power is supplied to the filter through a 2.5 mm coaxial jack (plug supplied). It requires 12–14 VDC @ 300 mA from a well-regulated source. The ubiquitous wall transformer is *not* suitable in this application. The final two connectors are 1/4 and 1/8 inch stereo jacks for

headphones and speaker audio output, respectively. All connections mentioned are on the rear panel. Though the function of each might be obvious to most users, none is marked.

If SCAF-1 appears to be an acronym, you're right. This *Switched-Capacitor-Audio-Filter* uses technology developed in the telecommunications indus-

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try a quarter-century ago, and it was used in several amateur homebrew and commercial circuits in the mid-1980s. Switched capacitor filters may be configured as high-pass, low-pass, band-pass, or notch devices. The SCAF-1 is the low-pass filter variety. How do SCFs work? Even a concise explanation would take half-a-dozen pages of text, equations, and diagrams . . . more space than I'm allotted here. If you're curious, though, W1JF and W3MT did a good job of explaining basic switched cap filter principles in a 1984 article leading up to a filter construction project.¹ Right after how they work, the important question is: *Do they work?* In the case of Idiom's SCAF-1, the answer is, most assuredly, yes.

The first radio I used with the filter was my Altas 210X, a compact, solid-state classic that is my favorite take-along rig for trips to our QTH at the beach. It has only a sideband filter and no way to add CW selectivity internally . . . at least not without more microsurgery than I care to contemplate. I powered the SCAF-1 from the transceiver's accessory socket, made the audio connection, and plugged my headphones into the filter's output jack. After the initial setup adjustment, the cover went back on the filter. Europe was coming through on 20 meters. My first impressions were strong and immediate. This unit is both very effective and extremely easy to use.

A review can be either on-the-bands subjective or just-the-facts laboratory style. My curiosity led me to combine a little of both with this one. One of the European stations on 20 CW was a DL6 with a weak, but consistent, signal. I parked my Hewlett-Packard 8640B signal generator 600 Hz away from his frequency and, using a short piece of wire for an antenna, set its output to produce an S9 + 20 dB reading on the Atlas's S-meter. Solid copy on the Hewlett-Packard.

Then I tuned back to the DL6, now blocked by the signal generator, and flipped on the SCAF-1. The signal generator heterodyne disappeared and I could easily copy the German as if he were the only station on the band. I should point out that my S-meter was still reading well up-scale, since the 8940B's now inaudible signal was within the transceiver's 2.7 kHz passband. Depending upon your radio's AGC characteristics, a strong signal you can't hear may push the weak station you *do* want to copy down into the noise. Based on this quickly put together test, as well as the hours spent operating, the manufacturer's claim of 96 dB roll-off per

octave is easy to accept at face value.

The impression of absolute selectivity, of being able to pick out that one signal, may be less on SSB than CW, but the SCAF-1 brings additional dimensions to the voice modes. Being able to turn the filter's front-panel knob to dial out extraneous noise or off-frequency chatter does much to make one's hours in the shack more pleasurable. Suddenly you're in a cozy room having a conversation with one person instead of trying to communicate in a crowd, being jostled about and having your feet stepped on. No matter which mode is being used, the SCAF-1's ability to eliminate white noise is almost worth the price of admission by itself. I did not use the filter on any voice mode other than SSB.

I found it easy to move the SCAF-1 from radio to radio, needing only a source of 12 VDC power when using it with one of my boatanchor receivers. Changing headphones or speakers generally required doing the initial setup procedure again, though.

If you have a PC, soundcard, and an internet connection, Idiom Press provides the next best thing to hands-on experience without actually hooking a SCAF-1 to your radio. On its homepage at <www.idiompres.com> is a link for more information on the SCAF-1. On the next page is a panel inviting you to hear it in action. Following that link brings up a menu of .WAV files demonstrating the filter's being used during on-the-air operation for both CW and SSB QSOs.

With the SCAF-1, I not only met my original goal of finding additional selectivity for my vintage gear but also found a great companion piece for my modern radios, as well. The latest and greatest transceivers in the marketplace come equipped with many tools; the SCAF-1 provides yet another very effective one.

The SCAF-1 is available in kit form (\$89.95) or assembled and tested (\$134.95). I opted to go with the already assembled filter from Idiom. Amateurs who have built the SCAF-1 kit report assembly times ranging from two to five hours. It may be ordered from Idiom Press, PO Box 1985, Grants Pass, OR 97528; telephone 541-474-0293; e-mail: <sales@IdiomPress.com>; or online at <www.idiompres.com>.

Note

1. Schellenbach, Richard, W1JF and Noble, Frank, W3MT. "Switched-Capacitor Filters—An Emerging Technology for Amateur Radio Use," *QST*, March 1984, pp. 19–25. ■