

THE ART OF VERY LOW POWER OPERATING

HW-8 Mods Revisited: CWF-3 Audio Filter

Alas, one of the drawbacks of including commercially produced items in an article is that while the article lives on, the commercial items fade away into oblivion. Thus has it been with the MFJ CWF-3 audio filter featured in the original series of modification articles. Luckily, R.T. Cronau checked with MFJ after purchasing the reprint series and discovered that the CWF-3 has been out of production for several years, and the only filter available in p.c. board form (wired and tested) is the CWF-2 super-filter for \$19.95. This filter could be used in place of the CWF-3, but its four sections far exceed the needs and abilities of the HW-8. So, I had better "fill in" the gap left by the CWF-3 by giving its circuit and a suggested construction approach on the Radio Shack DIP-1 p.c. board brought to our attention by N0ARQ (see the QRP Column, CQ, May 1982, p. 98).

The c.w. filter circuit is shown in fig. 1. It uses the two sections of the popular "747" integrated circuit which comes in a 14-pin dual-in-line package. Two levels of filtering selectivity are available by selecting the filtered output from either one or both of the active sections with SW1. The filter center frequency is 750 Hz, which works well with the filter already in the HW-8. C_{in}/R1 provides input isolation, while C1/C2/R5/R2 and C3/C4/R8/R7 determine the filter center frequency and passband characteristics. Usually, one attempts to use components in these net-



The tidy desktop operating position of Rob Magro, KA2EGO. Rob, age 17, worked WAS and 26 countries in his first 11 months of operation.

works which are matched as exactly as possible, but for the present application exact matching is not a necessity. Five percent tolerance polystyrene capacitors at C1/C2/C3/C4 provide best accuracy, but silver micas will perform adequately. In fact, if the suggested construction approach is followed, silver micas will be necessary (disc ceramics will serve in a pinch) for fitting on the DIP-1 p.c. board. Likewise, 1/4 watt resistors will be appropriate.

A suggested approach to construction is shown in fig. 2, which makes use of the Radio Shack DIP-1 (Archer Cat. #276-159) dual-in-line experimenters p.c. board; the unneeded half of the stock board is simply cut off. Fig. 2 shows the foil side of the DIP-1. Some simple modifications to the stock board are necessary, and consist of scraping away the foil material at the

shaded areas with the sharp tip of a knife, screwdriver, or file. Removing this foil material creates several extra pads at desired points. Second, several jumper wires are used to connect indicated pads. The jumper from pin 13 to R3 can be run on the underside of the board. Alternately, one could eliminate the jumper wire entirely, mounting R3 underside between pin 2 and pin 13 directly. Note that R6 is mounted underside between pin 5 and pin 12 pads. While I have not tested this arrangement, it should work without any problem. The CWF-3 has never been prone to feedback oscillation.

Details for inserting the filter into the HW-8 are covered in the August 1977 issue of CQ. I've had to do more reprints of the series of HW-8 articles, and these are once again available at \$7.00 for the batch. Proceeds above cost of printing and mailing the reprint sets support the cost of the DXCC QRPp Trophy program, as well as the FD Trophy program. The set includes the HW-8 test report (May 1977), modification series (August, October 1977), R.I.T. p.c. board clarification (Jan. 1981), and N0ARQ's R.I.T. p.c.b. approach (May 1982). The HW-8 continues to be a very popular rig indeed, and I'd hesitate to say how many of the guys have modified their units according to the above series of articles, but a heck of a lot have. So far, only about three have contacted me about a problem with the R.I.T. circuit, and those problems were "freaks."

Let's turn over some of this month's space to you operators who have taken the time to send in a report about your activities.

83 Suburban Estates, Vermillion, SD 57069

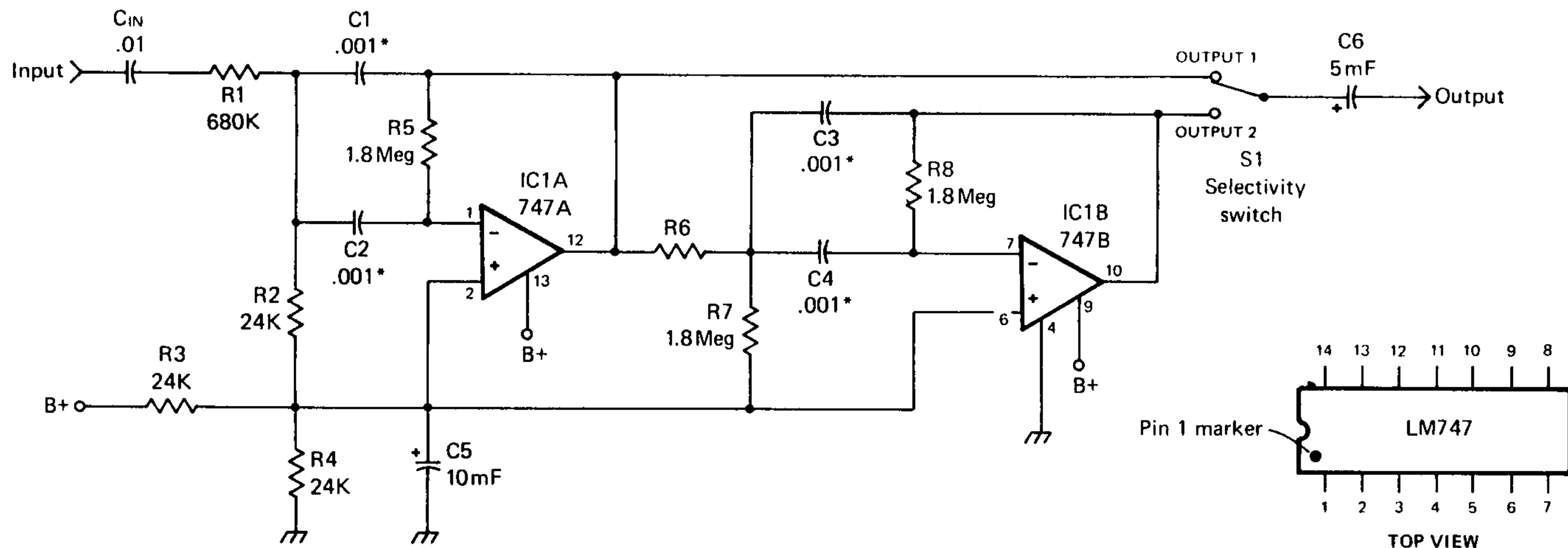


Fig. 1—The CWF-3 audio filter circuit. For best results, use 1000 pF polystyrene capacitors for .001* capacitors (C1-4); silver micas are adequate. C_{in} = .01 disc ceramic; C5, C6, miniature electrolytics. IC1 is CA747, LM747 type. R1-R8 = 1/4 watt carbon.

cluding my own QRP operation as TA2BAV/ QRP while I was in Ankara. As evidenced by the enclosed photo (see elsewhere in this column—ed.), my efforts were rather austere. I used a souped-up version of the HW-8 and a 'half-dipole'—that is, half of the antenna was inside my apartment and half of it was suspended over a convenient tree outside my window. The really amazing thing is that it worked!

"I got bitten by the QRP bug as a result of a QSO with Chris, G4BUE. While I was 599 at G4BUE with 75 watts into an SB-102, Chris was 599 here with 1 watt! In fact, after he lowered power, he was still solid copy in Ankara with 100 mw. That was it. I ordered the HW-8 the following week, assembled and modified the rig (your series of articles acting as my guide), and got on the air. What supreme fun! Within the space of five weeks, averaging one hour per day, I managed to work 27 states (from TA2BAV), 38 countries, and WAC on 20 meters with 1 watt output to my 'half-pole.'

"Gene Tyree, N4ANV, was my QSL manager, and we still have logs if anyone reading this still needs a QSL—legal-size s.a.s.e. please. Others operating QRP out of Turkey include Halit, TA1HY, Kemal, TA1MD, Kadri, TA1KD, and Ruchan, TA2DX. Most of these QRP rigs are homebrew tube-type units, although a few HW-7/HW-8's are in use. It is extremely difficult for a Turk to get a commercial rig or even parts for construction projects. Any transmitter is highly valued by TA amateurs." Our special thanks to Burt for his rundown on TA QRP activity.

De WA3FNK, Tom Rhodes, 29 West Church St., Williamsport, MD 21795: "Felt it was about time to add my story to the ones I've been reading with great interest in the QRP column. CQ's treatment of the subject of low power is excellent, and you are to be congratulated on your efforts. After reading the DX column on a regular basis, I started to wonder if QRP

could hold the same excitement as high-power DXing. Over the years I'd worked 147 countries with about 300 watts input. Well, after three months, let me say that not only is QRP just as much fun, but a great deal like being a Novice again! I still feel a little sad that the old Novice 75 watt power limit went over the hill. It was a great teacher of many a big DXer of today. But that's progress. Novices need power, right?

"My original QRP attempts came during my Novice days after I purchased an old Heathkit AT-1 and Hallicrafter's Skybuddy. My success as a c.w. op was fair. Several months of 80 meter operation netted me about 20 states. I let my license expire for a while, and then my new XYL helped me prepare for my General. Started working DX about a year and a half ago.

"As I mentioned, I felt it was about time to give QRP a fair try about three months ago. My equipment was a Viking Navigator turned back to 2 watts output, and an old NC183D did a good job on receiving. Antennas are dipoles, a longwire, and an MFJ antenna tuner. I also have a TA-33Jr for the high bands. During the April QRP contest, I managed 7 states and 3 Europeans, all with a 40m dipole. I've learned that QRP and DXing have one thing in common—listening is very, very important. At present, totals are 42 states and 10 countries."

De KA4JGV, Jerry C. Bowers, 2516-C Celanese Rd., Rock Hill, SC 29730: "I wanted to drop you note to let you know that QRPp is alive in South Carolina. I purchased an Argonaut about two weeks ago and never dreamed the results would be so satisfying. To date, I've worked 14 states, including California, with 1 watt output. Maybe not very impressive to some, but I'm pleased! My current antenna is a 14AVQ with only two radials, but I hope to lay some more when weather permits."

That's space for reports this month. Let's round out with some notes.

Club and Activity Notes

Correction, QRP ARC I Membership Fee: In the May 1982 issue I erroneously indicated that the membership fee for joining the QRP ARC I is \$4.00. Tom Davis gave me a call and noted that while he appreciated the publicity, he has had to send a lot of applications back, asking for an extra \$2.00! I apologize profusely. The current fee is \$6.00, which includes a subscription to the very worthwhile quarterly newsletter which covers construction articles, club news, activities, etc. At present, address queries/applications to Ed Popp, K5BOT, 2212 Deadwood Drive, Austin, TX 78744.

Incidentally, in case you missed the May 1982 column, the big news from the QRP ARC I is that the 50 watt maximum power limit has been dropped. Before that happened, if you had to run over 5

watts output for e.m.e. work, net work, or whatever, you could not be a member of the QRP ARC I. Now even part-time QRP operators can join and partake in club activities. All club awards (WAS-QRPp, WAC, "Thousand-mile-per-watt," etc.) follow the standard definition of QRP/QRPp: 5 watts maximum r.f. output (10 watts p.e.p.).

QRP activity in the Houston area continues to grow, with the last report showing the Houston Area QRP Club with a membership of around 40! In reading over the club newsletters, I'm envious of the opportunity fellows down there have for getting together at meetings and club luncheons and the like. The newsletter is put out by Leo Delaney, KC5EV, who notes: "It never ceases to amaze me how many amateurs have been turning to QRP for a new world of operating challenges!" Indeed, it seems true of Houston! For more info, write to the Houston Area QRP Club, P.O. Box 383, Spring, TX 77373.

Fred Bonavita, W5QJM, P.O. Box 12072, Capitol Station, Austin, TX 78711, edits and publishes the "Southwest QRPper," a neat little newsletter which includes articles about QRP ("QRP Mobile Operating" and the like), construction items, and news about the QRP Gulf State Net (QRP-GSN). The net can be found during summer months on 7040 kHz, 8 p.m. CDT, and during fall and winter on 3560 kHz, 8 p.m. CST, Wednesdays, with K5BOT as NCS.

The group featured a special QRP workshop on February 20 in Austin, and it was a great success, with a total of 27 hams showing up. Seven drove all the way from Houston, one flew in from Dallas, with the remainder coming from the Austin area. The afternoon events included talks about various aspects of QRP operation which were recorded and will be run in subsequent issues of "The Southwest QRPper." The newsletter has slowly been growing into a little magazine. Fred has been quite active in organizing the QRP Forum for the 1983 ARRL National Convention in Houston. Excellent job on all fronts, Fred!

The following are some of the QRP activities to come:

- (1) Sept. 11/12, 1982, G-QRP-C Activity Weekend.
- (2) Oct. 16/17, 1982, QRP ARC I Fall Contest.
- (3) Oct. 30/31, 1982, CQ WW S.S.B. Contest with special QRP section.
- (4) Nov. 11, 1982, Combined G-QRP-C/QRP ARC I Activity Weekend.
- (5) Nov. 27/28, 1982, CQ WW C.W. Contest with QRP section.
- (6) Dec. 26/31, 1982, G-QRP-C Annual QRP Winter Sports.

Details on these upcoming events usually can be found in CQ's Contest Calendar column, as well as in the newsletters of the sponsoring clubs. Join in the fun with other QRP operators!

73, Ade, WØRSP

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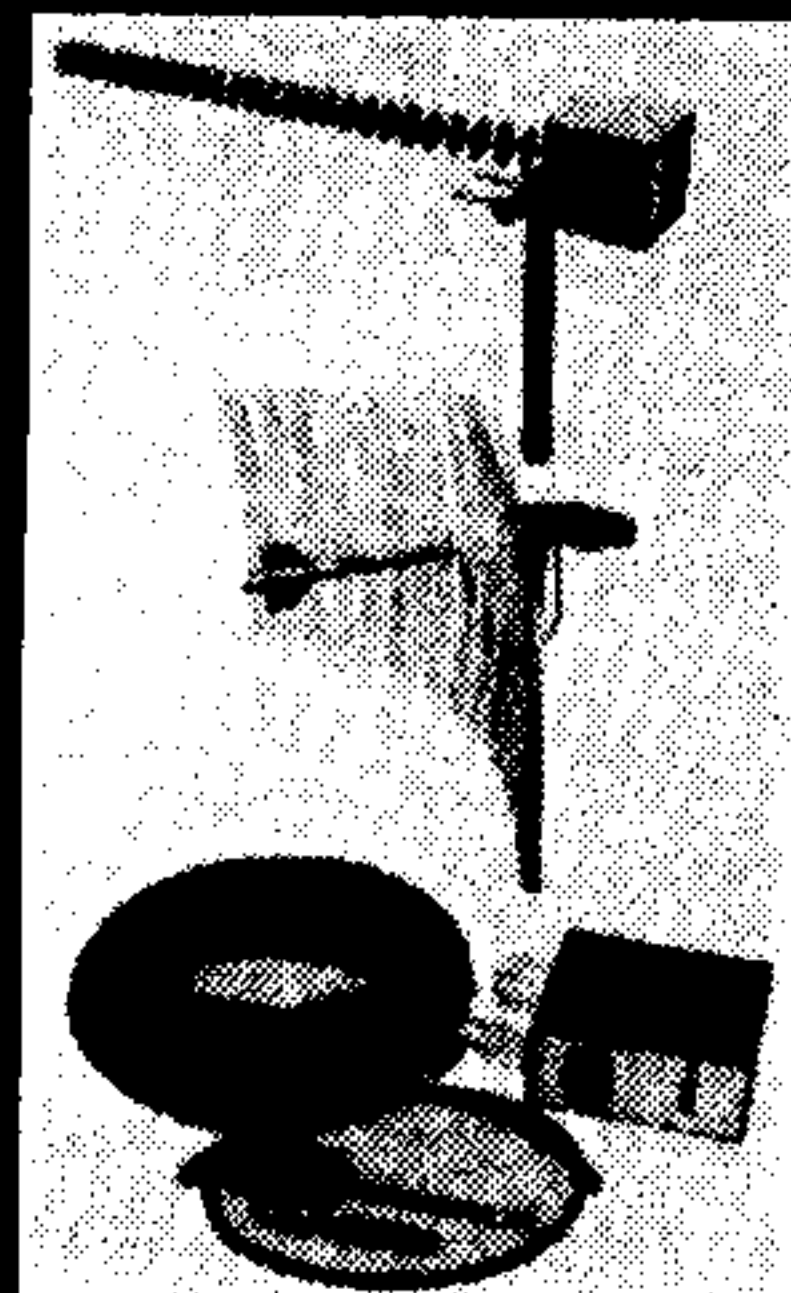
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