QRP Quarterly

Journal of the QRP Amateur Radio Club, International

January 1991 Volume XXIX Number 1

The QRP gathering in Rochdale was an international event with several nations represented: (l. to r.) Derry Spittle VE7QK, Paula Franke WB9TBU, Peter Halpen from Holland, Klaus Hanschmann Y24TG, Luke Dodds W5HKA, Rudi Dell DK4UH and Rev. George Dobbs G3RJV. [Photo courtesy Rochdale Observer]

President's Message

by Paula Franke WB9TBU

Lots of things happening these days, both within the QRP community and here on the homefront. Let's get the Illinois litany of disasters out of the way first: the drought in this area finally broke, with a vengeance, this summer with more rainy days than sunny; the worst tornado in 25 years struck in September, and a flash flood two weeks ago (we have a basement just so flood waters have someplace to go besides the living room!) The widely heralded earthquake predicted for Dec. 3 was a bust, so I suppose that's something to be thankful for.

QRP Supplier News

In the QRP community, there are a couple of changes to highlight. Doug DeMaw has sold Oak Hills Electronics to KE8KL; 20879 Madison Street; Big Rapids, Michigan 49307. Send 50¢ for his catalog.

Chris Hethorn, KM8X and Deb, N8DHR have announced that as of Nov. 19, 1990, due to family heath problems, The Small Parts Center will no longer offer kits and components for sale. If for some reason replacement components are needed for any kit and cannot be found through alternate sources, drop them a line and they'll try to help you out. Alternate sources include Oak Hills Research; and RadioKit, P.O. Box 973, Pelham, NH 03076, phone 603-635-2235.

ARCI and GQRP Memberships: Making Life Easier For Members

We do have some good news. Dick Pascoe, GØBPS is now the QRP ARCI agent in the United Kingdom. Dick will accept new memberships and renewals payable in Sterling. New memberships are £7 and renewals are £6 per year. Contact Dick at 3, Limes Road; Folkestone, Kent CT19 4AU U.K.

To reciprocate, ARCI secretary Luke Dodds, W5HKA will act as U.S. agent for the G-QRP Club. Memberships are $12 per year. This arrangement should benefit both clubs. We've know of many people in both countries who were interested in subscriptions but couldn't figure out how to manage payment. The subscription fees may be adjusted from time to time if the exchange rate changes drastically, but for now we're looking at a roughly £1=$2 exchange rate.

Make Your Plans Now, You Don't Want to Miss Dayton 1991

If you've been waffling on whether or not to make it to Dayton this year, maybe we can convince you the trip is worthwhile. The ARCI and GQRP will join forces in April, combining three spaces in the commercial area. We've been assigned three forum times. The Brits will give a talk on homebrewing, an ARCI forum will deal with other aspects associated with homebrewing, and Jim Fitton, W1FMR will moderate the third forum, dealing with QRP operations. In addition, we'll once again have the very popular hospitality suite with a bring-and-brag table, the traditional Friday night QRP dinner, and Saturday night beer and pizza party.

For room information, contact Myron Koyle, N8DHT; 1101 Miles Ave. SW; Canton, Ohio 44710; (216) 477-5717.

Information he needs:

(1) Names, Addresses, Phone Numbers, Calls of everyone in your party.

(2) If you don't have a roommate, do you want one?

(3) What nights?

(4) Room? Suite?

(5) Smoking? Non-Smoking?

(6) Two BUSINESS SIZE SASE's

(7) A check/money order made out to the Country Suites Inn for one night's lodging (Single rooms—$34; Double rooms—$40; Suites—$50).

Wrapping It Up...

Speaking of trips, Like Dodds and I had a very enjoyable time visiting the Brits in October; see the article and LOTS of pictures elsewhere in this issue.

Until next time, TTFN (that's ta-ta for now)!

The QRP ARCI is a non-profit organization dedicated to increasing world-wide enjoyment of QRP operation and experimentation. QRP, as defined by the club, is 5 watts output CW and 10 watts output PEP.

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The ARCI Meets The G-QRP

by Paula Franke WB9TBU

It was a wet, windy October evening in Chicago when I board British Airlines for my first real international trip. The trip was, for the most part, uneventful until the final leg. Approaching the Irish coast, the trip became a roller coaster ride as the plane rocked with a 160 mile wind.

Dick Pascoe, GØBPS met me at Heathrow Airport. Looking askance at my three bags of luggage (hey, I always travel well prepared) we loaded up his car and took off for on the two hour drive to his home in Folkestone near Dover. Even though I hadn't slept on the plane and my internal clock was telling me it was 5 a.m., I didn't want to miss anything during the drive.

As proprietor of Kanga Products, Dick spent the next week busily preparing kits for the QRP gathering in Rochdale. Even so, he still found time to take me around to some tourist sites: Canterbury, Dover Castle and Dover Port.

During my stay, I gave a talk to his club, The Dover YMCA ARC. This is a technically astute group so, since technical subjects are not my best, I thought I'd draw on some other expertise.

Paula WB9TBU speaking at Dover YMCA ARC meeting.

Two nights before the meeting, we had dinner at the home of Ian Keyser G3ROO. As a result of part of the evening's discussion, I hit on the topic of my talk: operating on the dead bands from the black hole of America's midwest. The talk was well received and many questions and comments filled the rest of the evening. After the meeting I made my first visit to a pub. Even though my companions apologized for the bad quality of the brew, it did give me a reference for future comparison.

Smile! Cameras abound when QRPers get together. Jo Dobbs G1IJW and Dick Pascoe GØBPS are no exception. [Photo by WB9TBU]

On Thursday, Oct. 18 we loaded up Dick's caravan and, with Paul, G1PJJ navigating in the back seat, we were off to took off for St. Aidan's Vicarage in Rochdale for the QRP gathering. Arriving at the Vicarage, Rev. George Dobbs G3RJV shepherded us into the kitchen where an authentic Texas chili dinner awaited us, along with an authentic Texan, Luke Dodds W5HKA who had arrived earlier.

Friday was spent setting up the church hall for Saturday's festivities and welcoming more new arrivals. The Vicarage began to resemble a dormitory.

Derek Roy Pearson G3ZOM mans the Jandek booth at Rochdale.

Norman Field, G4LQF had made arrangements earlier for my reciprocal license, so I spent some time filling up the log.

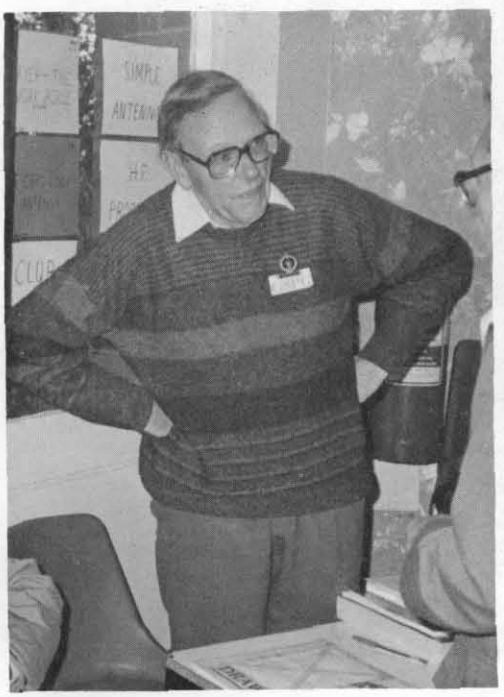
The QRP gathering began bright and early with a bring-and-buy room, selling booths and various other amenities. More than 200 people attended throughout the day, looking, buying, but mostly renewing old acquaintances and making new. The day ended with a huge Chinese feast at the Vicarage and checking out new purchases at the work bench. The ARCI signed up 11 new members that weekend!

During the two weeks I had remaining in England, I enjoyed seeing more of the English countryside: George and his wife Jo showed me the moors and mills; Norman introduced me to the Welsh hills; and I finished up my trip back in Folkestone where Dick and his wife Daphne took a day off to take me to London Zoo.

I arrived home on Halloween in time for trick-or-treating. A 3-1/2 foot stack of mail and a load of phone messages welcomed me home (as well as a husband who missed me *very* much!) I'm grateful for everyone who made my visit so memorable. I've already set up a savings plan to make a return visit next year.

Taking a few minutes to have a chat are (l. to r.) George Dobbs G3RJV, Dave Brayshaw W9NWN and Luke Dodds W5HKA. [Photo by WB9TBU]

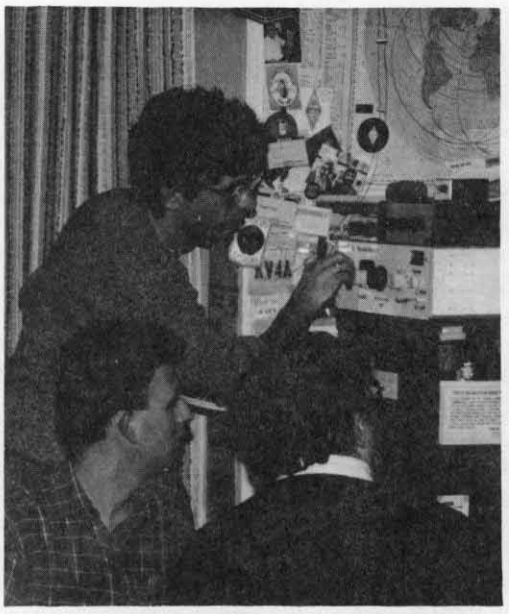
Dick Pascoe GØBPS, proprietor of Kanga Kits, explains product features to a pair of prospective buyers at Rochdale.



Does GQRP communications manager and awards chairman Gus Taylor G8PG always look this stern? He *is* a tough one when it comes to verifying cards submitted for club awards. [Photo by Ben Dobbs]

The QRP Candy Store is a clearing house for all member and ARCI sponsored products such as T-shirts, ball caps, hat pins, stickers, stationery and more. Promote QRP in your area! Send your ideas, suggestions and an SASE to Bob Spidell W6SKQ, 45020 N. Camolin Ave., Lancaster, California 93534, for store flyer.

Conversation was the mainstay during the QRP gathering; at the GQRP table is (l. to r.) David Aizlewood G4WZV, Paula Franke WB9TBU and Bob Hudson G4JFN.



Paul G1PJJ adjusts the matching network at G3RJV to help make the DX easier to net. [Photo by W5HKA]

David Jackson G4HYY, the man who keeps the meticulous GQRP membership records, and Rudi Dell DK4UH prepare equipment at the Rochdale test bench.

More QRP Show and Tells

by Mike Czuhajewski, WA8MCQ
Box 232, Jessup, Maryland 20794

While we can't draw the QRP crowds that Dayton does, we still have fun with our local gatherings. On April 15, 1989, the Maryland Radio Center in Laurel, Maryland once again allowed us to hold a QRP Show and Tell in its ham radio library room.

A nasty, rainy day kept a lot of folks home, but we still had more than 20 people show up for our second session. (The first was back in December 1988.) Six of the eight people promising to bring QRP items were able to attend, giving a good selection.

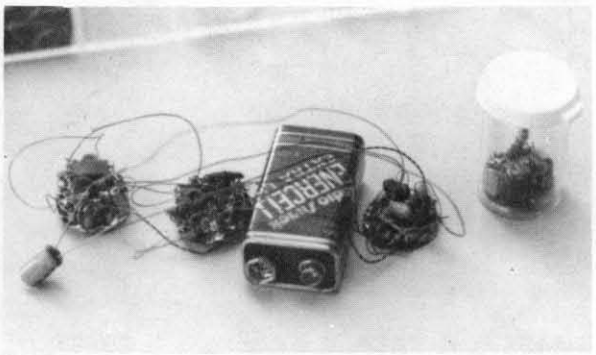
The following QRP ARCI members were present at some time during the day: Marc Johnson N3GTZ, Jim Reid KD3S, Hume McClure KB3WK, Gene Smith KA5NLY, Paul Gerhardt N3GGP, and myself.

Jim KD3S brought in an old homebrew solid state transceiver. Described in the June 1966 issue of CQ as a 40 meter rig, he built a 20 meter version many years ago in preparation for an upcoming job in Australia at a satellite tracking station. He survived the plane trip down under, VK license in hand, but the rig didn't, so it sat on a shelf in the Outback the entire time.

He didn't do a tremendous amount of actual work while he was there and, shortly before his departure nine months later, one of the oldtimers told him the real reason he had been hired. During a previous space shot, the launch was delayed for an hour or so because a capacitor failed in some critical equipment at the tracking station. Some politicians decided that such a thing would never have happened if there had been a high-powered electrical engineer on site. It's a well-known fact that their presence has a mystical effect on electronics, preventing all failures. That was his function—Resident High-Powered Engineer!

Hume NI3A brought in his HW-7 with the KN1H receiver front end mod. His homemade printed circuit board mod looked considerably better than mine. (Now I know why I never pursued a career in art. My boards are made with a proprietary technique known as "chainsaw etching" and the layout resembles a game of 52 card pickup.) An interesting twist he added was not rewiring the old MOSFET mixer into a VFO amp, using instead one of the MAR-series monolithic 50Ω amplifier chips from Mini Circuit Labs. (It was under 1/8 inch diameter.)

A fairly new ham with 23 years of Navy experiences as a radio operator, Dick N3GGP showed off his W7ZOI Universal QRP Transmitter. Built with a variation of the technique introduced in the August 1981 QST, he calls it "Dick's Ugly Construction". (It actually bears a closer resemblance to the WA8MCQ Hideous Construction!) His first electronics project, it took Dick about a month to mount all the parts on the board, over a year to solder the components in the oscillator section, and he hopes to have it on the air by the peak of the **next** sunspot cycle!



The WB3EVS DB25 transceiver, on three discs. The bottle contains an earlier prototype.

Some of the KM8X Small Parts Center kits were shown by Gene KA5NLY; he also had the RF wattmeter, Twofer transmitter and Twofer receiver. He also had a Sardine Sender (October 1978 QST) modified for 160 meters, a 30 meter transmitter from Circuit Board Specialists and an HW-8.

Danny K3TKS and I brought our usual 500 pound assortment of keyers, Twofers, receivers, transceivers, wattmeters, etc. One new item I had this time was my latest project, a tiny 40 meter VFO rig the size of a pack of cigarettes, based on W7EL and W7ZOI articles. I had trouble coming up with a name for it. I considered "Lucky Strike 40" due to the size, and McQRP, a takeoff on my callsign, but discarded them both since I'm a bit paranoid with major companies suing people for trademark infringement all the time. (It's the same reason I didn't bother suggesting a new slogan for the QRP ARCI, "Milliwatts R Us"!) It was later dubbed the Tiny Weekender, due to its roots and the size.

Former QRP ARCI President Les Shattuck, ex-WB2IPX and ex-K4SKS, showed up with his latest call, WN2V. Although he didn't have any QRP gear with him, he left us several copies of the second edition of the Hotwater Handbook to sell.

At our third session in early 1990, we had WB3EVS, AA4ZS, N3FRT, W2KJ, KD3S, K3NCO, KA5NLY, K3TKS, WA8MCQ, NI3A, N3CDR, WA4KAC, KB3WK and W3CQE, plus a variety of non-QRP visitors. Nine folks had QRP equipment on display.

Robbie WB3EVS, one of the originators of the DB25 Challenge (April 1990 QRP Quarterly), had his

AA4ZS and KA5NLY examine a MOSFET rig at a QRP Show and Tell.

rig there, about 95% complete. Just like the WA5JAY rig shown in that article, his is a 40 meter CW transceiver with internal VFO, but it's the most sophisticated of the lot, using a pair of tiny TFM-2 double balanced mixers from MCL to obtain a phasing direct conversion receiver with single signal reception. A few bugs remain to be worked out, but the basic design is sound.

Nov. 10, 1990 produced the fourth invasion of the MRC library. The number of QRP attendees remained at about the same level: KD3S, W3QF, AA4ZS, WA5JAY, AL7LQ, WB3EVS, KA3PSO, K4JSI, N3FRT, KB3HH, K3TKS, WA8MCQ and WA4KAC. The latter has been getting back into ham radio after and absence of more than a decade and is quite interested in QRP and homebrewing. He recently applied for QRP ARCI membership only to be told he already holds member number 1870!

Even non-hams are interested in QRP. Mike Hamilton showed off his Neophyte receivers and VFO controlled transmitter. He's plugging away on the study manuals and code tapes, as he's tired of transmitting into a dummy load. He takes homebrewing a step further than most folks; we admired all the miniature aluminum boxes his rigs were built into, only to find out he made them on the equipment at work during his lunch hours.

WA5JAY, of DB25 fame, is presently working on a 3"x3"x1" QRP 20 meter SSB transceiver, and is refining his circuitry. He does have it receiving signals and generating a powerful one milliwatt so far. AL7LQ brought along his 10 GHz QRP rig, 15 milliwatts from a Gunnplexer, with a dish antenna made from a wok cover. His best DX up there is 85 miles. As for the rest of us, the tables groaned as usual under a heavy load of QRP items, and as always MRC had to throw out a few QRPers when they locked up for the night.

Typical of the QRP Show and Tell, and this is only one table!

One table at a typical MRC QRP Show and Tell.

The scheduling of out Show and Tells? Whenever we feel like it or get around to it, but we'll probably have a couple a year until we get tired or no one comes any more. Anyone within reasonable driving distance of the Washington/Baltimore area is more than welcome to come, either to display or just to talk QRP for a while. Those interested, can call MRC at 301-725-1212 to ask about the next one, or write to me to be put on the list to be notified by mail. If you're no where near us, why not try setting up one of your own and writing about for The Quarterly?

QRP ARCI AWARDS SUMMARY

by Bob Gaye, K2LGJ

QRP-25

Call	Date	Basic	Endorsement
WB5CTS	7-09-88	999	Basic 25, 50 Seal #532
WJ7H	7-09-88	1000	Basic 25, 50 Seal #533
K4BNI	7-24-88	1001	Basic 25, 50 Seal #535
WD2H	8-21-88	1002	Basic 25, 50 Seal #534, 100 Seal #319
KH6JOI	8-27-88	1003	Basic 25
WD5GLO	10-14-88	1004	Basic 25, 50 Seal #536, 100 Seal #32
KF5OW	10-15-88	1005	Basic 25
XE2IOF	10-22-88	1006	Basic 25
WB0RXF	10-29-88	992	100 Seal #320
WB5GLO	11-14-88	1004	200 Seal #108
W5TB	11-18-88	1007	Basic 25, 50 Seal #537, 100 Seal #322
W2PFS	11-25-88	1008	Basic 25, 50 Seal #538, 100 Seal #323, 200 Seal #109
WB5FKC	11-26-88	947	300 Seal #49
KA9JKK	1-12-89	983	50 Seal #539, 100 Seal #324
KH6CP/1	1-12-89	968	400 Seal #23
N9GPF	1-13-89	1010	Basic 25
WB3BDH	2-19-89	998	50 Seal #540
WD2H	3-12-89	1002	200 Seal #110
K2QJ	3-26-89	1011	Basic 25
KB1FK	5-08-89	1012	Basic 25
KA3EOP	6-03-89	1013	Basic 25
NO1R	6-03-89	966	200 Seal #111 (Ex N1BXC)
WB3BDH	7-02-89	998	100 Seal #325
K3TKS	7-02-89	918	400 Seal #24, 500 Seal #17
VE2BLX	7-23-89	1014	Basic 25
KB3WK	8-14-89	1015	Basic 25, 50 Seal #541, 100 Seal #326
N3FYW	12-26-89	1016	Basic 25
N3FYW	12-30-89	1016	50 Seal #542
KF7ET	4-16-90	1017	Basic 25
K4BNI	4-18-90	1001	100 Seal #327
KH6CP/1	4-20-90	968	500 Seal #18
K2QJ	5-20-90	1011	50 Seal #543
VE2BLX	5-20-90	1014	50 Seal #544

QNI-25

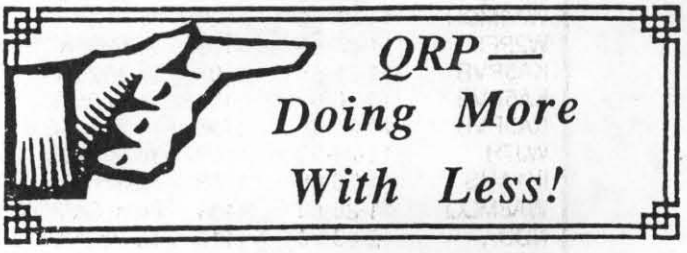
WN2V	7-26-90	22	GLN-80 Seal

QNI-100

WN2V	7-26-90	9	300 Seal

WAS

Call	Date	Basic	Endorsement	Power	Mode	Band
NW8G	6-11-88	270C	10,20,30,40,50	3.0	SSB	MIX
KA4QZJ	6-11-88	264C	30 State Seal	5.0	CW	MIX
W4FRL	7-09-88	271C	10,20,30,40,50	2.0	CW	MIX
VE2ABO	7-17-88	272C	10,20	2.0	CW	MIX
WB5KYK	7-24-88	273C	10,20	5.0	MIX	MIX
KA4TMJ	7-24-88	265C	30,40 Seal	5.0	SSB	MIX
WB5KYK	9-03-88	273C	30 State Seal	5.0	MIX	MIX
W5TTE	9-03-88	245C	50 State Seal	3.0	MIX	MIX
KD8FR	9-04-88	254C	40 State Seal	5.0	CW	MIX
K5DP	8-21-88	274C	10,20,30,40,50	4.0	CW	MIX
KAØUSE	10-14-88	275C	10,20,30	3.0	SSB	10M
KA3RVH	10-15-88	276C	10	5.0	CW	MIX
XE2IOF	10-22-88	277C	10,20,30	3.0	MIX	MIX
N2HOS	11-18-88	278C	10,20,30	5.0	SSB	MIX
KF5OW	11-24-88	279C	10,20,30,40,50	5.0	SSB	10M
KA5PVB	11-26-88	256	30 State Seal	5.0	MIX	MIX
W5WO	2-20-89	280C	10,20	1.0	CW	MIX
NFØR	3-26-89	281C	10,20,30,40,50	5.0	CW	MIX
KA6HGT	4-22-89	282C	10,20,30,40	2.5	MIX	MIX
KB3WK	4-30-89	283C	10,20,30,40,50	2.5	CW	MIX
K3DML	4-30-89	284C	10,20,30,40,50	1.0	CW	MIX
KB4JAZ	4-30-89	285C	10,20	3.0	CW	MIX
KH6JOI	5-03-89	286C	10,20,30,40,50	5.0	CW	MIX
WD2H	5-14-89	287C	10,20,30,40,50	0.9	CW	MIX
WA3EOP	6-03-89	288C	10,20,30: 2X QRP	2.0	CW	MIX
WE2P	6-03-89	289C	10,20,30,40,50	5.0	CW	MIX
KA4TMJ	7-15-89	265C	50 State Seal	5.0	SSB	MIX
OK1DCE	7-22-89	290C	10,20,30	5.0	CW	10M
KAØNAY	8-26-89	291C	10	5.0	MIX	MIX
AA6LM	9-16-89	292C	10	2.0	CW	MIX
UA3EAC	9-16-89	293C	10,20	3.5	CW	MIX
WB2QAP	2-24-90	294C	10,20,30,40,50	5.0	CW	MIX
KH6CP/1	2-24-90	295C	10,20,30,40,50 2X QRP	4.0	CW	MIX
KB2FNU	2-25-90	296C	10	5.0	CW	MIX
KA5PVD	4-15-90	256C	50 State Seal	5.0	MIX	MIX
K3TKS	4-16-90	135	50 State Seal	5.0	CW	MIX
NW2I	5-20-90	297C	50 States	5.0	MIX	MIX
KB4GID	5-20-90	298C	50 States	5.0	CW	MIX
VE6AML	5-20-90	299C	50 States	5.0	CW	MIX
KA2KMU	6-29-90	173C	50 State Seal	2.0	CW	MIX



1,000 MILE/WATT

Call	Date	Basic Band	Note	Miles/Watt	Mode	Power
			(*2 way QRP)			
WB5CTS	7-09-88	1051	To KH6U*	2,982	1.25	CW	15M
KA4TMJ	7-09-88	1052	To VK6VP	3,229	3.5	SSB	10M
KH6JOI	7-17-88	1053	To ZS6BSZ	11,951	1.0	CW	10M
NXØQ	7-17-88	1054	To YV2EZA	2,570	2.5	CW	20M
VE2ABO	7-17-88	1055	To W6HAL	1,234	2.0	CW	20M
KF5OW	7-17-88	1056	To HL9EP	2,123	3.0	SSB	20M
HL9EP	7-17-88	1057	From KF5OW	2,123	3.0	SSB	20M
KF5OW	7-17-88	1058	To AX9LF	1,888	3.0	SSB	20M
KF5OW	7-17-88	1059	To KC4AAC	3,004	3.0	SSB	20M
KF5OW	7-23-88	1060	To F2YT	1,717	3.0	SSB	15M
KF5OW	7-23-88	1061	To 7P8DP	3,255	3.0	SSB	15M
KF5OW	7-23-88	1062	To FOØJM	1,526	3.0	SSB	20M
WA8MCQ	7-23-88	1063	To WA1JXR*	95,430	.00372	CW	40M
SM6PRX	7-23-88	1064	To UI8IAY	2,136	1.25	CW	15M
JE1PMZ	7-24-88	1065	To JF6DJL	58,800	0.01	CW	6M
HB9XY	7-24-88	1066	To JA6ZXR	1,935	3.0	CW	20M
NJ3B	7-24-88	1067	To VK6HQ	4,621	2.5	CW	20M
NG7D	7-24-88	1068	To KA1NKZ	1,349	2.0	CW	15M
K4BNI	7-25-88	1069	To VK4UR	4,723	2.0	CW	20M
W5TB	7-25-88	1070	To 3B8CF	11,822	0.90	CW	20M
K5DP	8-21-88	1071	To JA5DQH	1,676	4.0	CW	40M
WB2CZB	8-27-88	1072	To G3POI	4,883	0.65	CW	6M
VR6ID	9-10-88	1073	From KF5OW	1,476	3.0	SSB	15M
KF5OW	9-10-88	1074	To VR6ID	1,476	3.0	SSB	15M
WJ7H	10-14-88	1075	To VK3BKU	1,688	5.0	CW	20M
VK3BKU	10-14-88	1076	From WJ7H	1,688	5.0	CW	20M
JM1SOX	10-14-88	1077	From AH6EK	1,018	4.0	CW	20M
WD5GLO	10-14-88	1078	To KX3U	11,490	0.10	CW	20M
JH8BOE	10-14-88	1079	To WB2IPX	2,991	2.0	CW	15M
JF1QLX	10-14-88	1080	To CX4BBH	5,889	2.0	SSB	15M
WA3GYW	10-15-88	1081	To G3COJ	1,204	3.0	SSB	6M
NØBQW	10-15-88	1082	To JA2KSO	1,492	4.0	CW	10M
NØBQW	10-15-88	1083	To YD1KKM	2,395	4.0	CW	15M
NØBQW	10-15-88	1084	To 5Z4DU	1,721	5.0	CW	20M
NØBQW	10-15-88	1085	To VK3BKU	1,786	5.0	CW	30M
NØBQW	10-15-88	1086	To VK3CAX	1,786	5.0	CW	40M
KA3RVH	10-15-88	1087	To WA6SFA	2,525	1.0	CW	15M
WA6SFA	10-15-88	1088	From KA3RVH	2,525	1.0	CW	15M
W5WO	10-22-88	1089	To W2KW/KV4	2,483	0.90	CW	20M
W2KW/KV4	10-22-88	1090	From W5WO	2,483	0.90	CW	20M
XE2IOF	10-22-88	1091	To SMØWRE	5,234	3.5	SSB	20M
KAØUSE	10-29-88	1092	To KH6CY	1,084	3.0	SSB	10M
KAØUSE	10-29-88	1093	To JH1LBR	1,949	3.0	SSB	10M
KAØUSE	10-29-88	1094	To ZL1BRX	2,556	3.0	SSB	10M
WB5KYK	11-14-88	1095	To ZS1JO	1,659	5.0	SSB	10M
N5DUQ	11-24-88	1096	To CO7KR		0.40	SSB	15M
N5DUQ	11-24-88	1097	To KC4USU		0.50	SSB	20M
N5DUQ	11-24-88	1098	To NH6MC		2.0	SSB	80M
N5DUQ	11-24-88	1099	To NH6C		2.0	SSB	40M
N2HOS	11-25-88	1100	To YC3HUO	2,011	5.0	SSB	15M
K3IVO	11-25-88	1101	To WØKEA	79,450	0.020	CW	10M
WA8MCQ	11-25-88	1102	To W1BNS	20,727	0.022	CW	30M
W2PFS	11-25-88	1103	To G4JFN	3,719	0.90	CW	10M
KA5PVB	11-26-88	1104	To 3D2ER	1,329	5.0	SSB	20M
KA5PVB	11-26-8	1105	To CE3BFZ	1,012	5.0	SSB	15M
KA5PVB	11-26-88	1106	To ZL1AAS	1,536	5.0	SSB	10M
WJ7H	11-26-88	1107	To IK1AUS	1,107	5.0	CW	20M
IK1AUS	11-26-88	1108	From WJ7H	1,107	5.0	CW	20M
WA8MCQ	11-26-88	1109	From GM3OXX	3,447	1.0	CW	10M
NØDA	12-03-88	1110	To VK7VV*	2,711	3.0	CW	20M

1,000 MILE/WATT

Call	Date	Basic Band	Note	Miles/Watt		Power
	Mode		(*2 way QRP)			
WA8YWK	12-03-88	1111	From WA8MCQ	1,360	0.90	CW 20M
JH3DMA	1-13-89	1112	To JH8UKQ	11,488	0.08	SSB 6M
NH6LT	1-14-89	1113	To ZS4TX	13,172	0.90	SSB 10M
NH6LT	1-14-89	1114	To ZS6BYE	13,294	0.90	CW 10M
GØEIR	1-14-89	1115	To N5DUQ*	7,654	0.50	SSB 15M
KB3WK	2-25-89	1116	To VK6WT	4,618	2.5	CW 20M
K1EXE	2-28-89	1117	From WA8MCQ	4,389	0.09	CW 40M
HI8JH	2-28-89	1118	From AA2U*	30,280	0.008	SSB 20M
WB0RFG	2-28-89	1119	To K8NOQ/OX	1,389	2.0	CW 15M
G4BUE	2-22-89	1120	To K4EWG	41,200	0.10	CW 40M
KA3PVD	3-26-89	1121	To VK3DQS	4,021	2.5	CW 20M
AA2U	4-23-89	1122	To CH9ASJ	851,339	.000613	CW 80M
CH9ASJ	4-23-89	1123	From AA2U	851,339	.000613	CW 80M
KA6HGT	4-23-89	1124	To GM4VCM	2,015	2.5	SSB 15M
AJ1Q	4-23-89	1125	To VK3MR	3,747	2.8	CW 40M
KA1RWT	4-23-89	1126	To GØEIR*	6,452	0.5	SSB 10M
KA1SRZ	4-29-89	1127	To GØEIR*	6,452	0.5	SSB 10M
VE3SCH	4-29-89	1128	From W5TB	1,341	0.9	CW 15M
ZL1BKY	4-29-89	1129	From W5TB	1,485	5.0	CW 10M
N7GQC/PA	5-29-89	1130	To RA9UFH	1,229	1.5	CW 15M
N2HOS	5-29-89	1131	To JA9BFN	53,816	0.125	SSB 15M
KB1MJ	5-29-89	1132	To DF4IQ	4,917	0.75	CW 40M
KB1MJ	5-29-89	1133	To GM3OXX*	1,544	2.0	CW 20M
N7JXS	5-29-89	1134	From JJ3JJL	1,525	4.0	CW 10M
WJ7H	5-31-89	1135	To AX4XA	1,627	5.0	CW 20M
AX4XA	5-31-89	1136	From WJ7H	1,627	5.0	CW 20M
WJ7H	5-31-89	1137	To ZL1AYO	1,417	5.0	CW 10M
ZL1AYO	5-31-89	1138	From WJ7H	1,417	5.0	CW 10M
WA3EOP	6-03-89	1139	To WS6L*	1,197	2.0	CW 15M
WE2P	6-03-89	1140	To 3B8CF	1,847	5.0	CW 20M
KT1H	6-11-89	1141	To YCØJIV	3,953	2.5	SSB 15M
K5WZF	7-02-89	1142	To W4TNF	1,215	0.75	CW 40M
K7OWT	7-02-89	1143	To ZL7BSG	1,651	5.0	CW 15M
GØLCS	7-16-89	1144	To J52US	1,151	2.5	SSB 6M
WA8MCQ	7-16-89	1145	To KP4TIN	129,917	0.012	CW 10M
WA8MCQ	7-16-89	1146	To KO3EH	53,971	.00000672	CW 10M
GWØDYT	7-16-89	1147	To JE6BDR	1,955	3.0	CW 10M
T2ØAA	7-16-89	1148	To W5TB	1,242	5.0	CW 20M
JO1XWH	7-16-89	1149	To JH1MBQ*	134,200,000	.00000005	AM 6M
PE1MHO	7-22-89	1150	To LU9AEA	2,663	2.75	SSB 6M
WJ7H	7-23-89	1151	To PY4MNF	1,207	5.0	CW 20M
KF5OW	8-05-89	1152	To OA8ABI	1,518	2.5	SSB 12M
K7IRK	8-12-89	1153	To VK2ABW	4,151,429	0021	CW 10M
K7IRK	8-12-89	1154	To VK4FM	3,988,810	.0021	CW 10M
AA6MN	8-14-89	1155	To HL5BDS	1,458	5.0	CW 15M
JH6FZN	8-14-89	1156	To JE8FYJ	2,245,614	.000456	AM 6M
AA6MN	8-26-89	1157	To VK5AMA	1,632	10 PEP	SSB 15M
VK5AMA	8-26-89	1158	From AA6MN	1,632	10 PEP	SSB 15M
KI4QH	8-26-89	1159	To N6UJB	2,465	0.8	CW 10M
KAØNAY	8-27-89	1160	To ZP5JCY	2,418	1.9	SSB 10M
KB7GYS	9-02-89	1161	To KB5IQV	2,252	1.0	SSB 10M
N5DUQ	9-02-89	1162	To DU9RG	84,540	0.1	SSB 10M
KA4TMJ	9-03-89	1163	To VK6XA	11,300	1.0	SSB 10M
AA6LM	9-09-89	1164	To KA1RKR	1.263	2.0	CW 15M
AA6LM	9-09-89	1165	To NH6HF	1,294	2.0	CW 15M
N9IHS	9-09-89	1166	To KF7QF	1,709	1.0	CW 40M
OK1DCE	9-10-89	1167	To VK2PIE	1,952	5.0	CW 10M
JH6FZN	9-10-89	1168	To JH1MBQ*	53,100	0.02	AM 6M
JH1MBQ	9-10-89	1169	To JH6FZN*	53,100	0.02	AM 6M
WB2CZB	9-17-89	1170	To EA8/G3JVL	3,302	1.0	CW 6M
WD8DWM	10-06-89	1171	To KC4AAC	2,354	4.125	SSB 10M
JS1BVK	10-21-89	1172	To JN1JIV*	7,912	0.01	SSB 6M

1,000 MILE/WATT

Call	Date	Basic Band	Note (*2 way QRP)	Miles/Watt		Power
NØISL	10-21-89	1173	To G3ZIB*	1,332	6.0 PEP	SSB 10M
WB8NYV	10-22-89	1174	To EA8BEX	2,011	2.0	CW 40M
JH3DMA	10-22-89	1175	To JH8DBJ	7,722	0.1	SSB 6M
JH1SBW/JD	12-30-89	1176	To K3ZO	3,511	2.0	CW 20M
OK1DKW	12-26-89	1177	To OK1OFK	87,875,000	160 nW	SSB 2M
K7IRK	12-30-89	1178a	To WA6YPE*	218,333,333	6.0 µW	CW 10M
WA6PE	12-30-89	1178b	From K7IRK*	218,333,333	6.0 µW	CW 10M
WJ7H	12-30-89	1179	To ZS6BCR	1,980	5.0	CW 10M
JR8DAG	12-31-89	1180	To 8J6APX	6,260	0.15	AM 6M
GM3JIH	12-31-89	1181	To W2HDW	1,124	3.0	CW 20M
NWØO	12-31-89	1182	To F3NB	25,395	0.20	CW 30M
WB2QAP	2-24-90	1183	To VK7CW	2,606	4.0	CW 20M
KB1IFK	2-24-90	1184	To 3B8CF	2,260	4.0	CW 20M
HB9XY	2-24-90	1185	To ZL4IJ	3,916	3.0	CW 20M
KB2FNU	2-25-90	1186	To EA2CAK	1,502	2.5	CW 15M
WAØHYK	2-25-90	1187	To JJ1FSK	6,614	1.0	CW 20M
N8AXA	3-17-90	1188	To KG6DX	1,518	5.0	SSB 247 6M 48
KF7ET	3-17-90	1189	To NK1L	1,020	2.0	CW 860 20M 311
Z4BP	4-08-90	1190	From W9NUB	4,061	2.0	SSB 248 20M 312
N2BYM	4-17-90	1191	To N7JRE*	1,075	2.0	CW 861 10M 152
KB8ICD	5-28-90	1192	From GØDBE	3,747	1.0	SSB 249 10M 153
W5HKA	5-28-90	1193	To PY7FNE*	5,519	0.9	CW 862 20M 313
PY7FNE	6-27-90	1194	From W5HKA*	5,519	0.9	CW 863 20M 314
N7IKC	6-29-90	1195	To ZL2BIT	1,795	4.0	CW 864 15M 384
Y24TG	6-29-90	1196	To VK2BKH	2,187	5.0	CW 865 40M 177
NN1G	7-29-90	1197	To OE2PAL	2,439	1.65	CW 866 40M 178
AA5BT	7-29-90	1198	To JA4YJA	1,389	5.0	CW 867 20M 315

DXCC

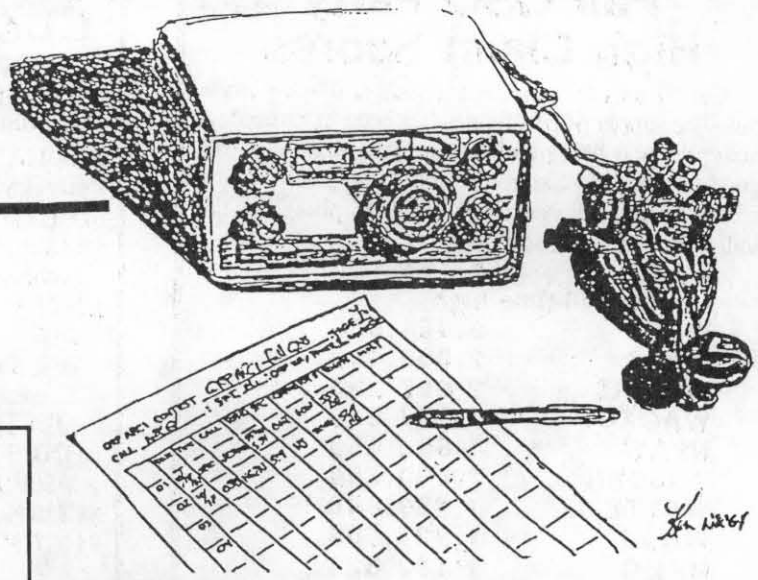
Call	Date	Basic	Endorsement	Power	Mode	Band
HI3JH	7-09-88	85C		5.0	MIX	MIX
K6ZH	8-26-88	86C		5.0	MIX	MIX
SM6KL	10-15-88	87C		5.0	MIX	MIX
N5DUQ	11-18-88	88C	One Mode	5.0	SSB	MIX
KA4TMJ	11-18-88	89C	One Mode/Band	5.0	SSB	10M
KV4B	3-11-89	90C		5.0	MIX	MIX
G8JR	4-29-89	91C	One Mode	5.0	CW	MIX
N2HOS	5-29-89	92C	One Mode/Band	5.0	SSB	15M
WE2P	6-03-89	93C	One Mode	5.0	CW	MIX
WB3HLH	7-02-89	94C		5.0	MIX	MIX
W5TTE	8-14-89	95C		5.0	MIX	MIX
WD5GLO	10-07-89	96C		5.0	MIX	MIX
WB0RXF	10-14-89	97C		5.0	MIX	MIX
AJ1Q	12-30-89	98C		5.0	MIX	MIX
KT1H	1-02-90	99C		5.0	MIX	MIX
OK1CZ	2-13-90	100C	One Mode/ Band	5.0	CW	10M
OK1CZ	2-13-90	101C	One Mode/ Band	5.0	CW	15M
W5TB	4-15-90	102C	One Mode	5.0	CW	MIX
OK2BAT	4-16-90	103C	One Mode	5.0	SSB	MIX
AA2U	5-20-90	104C	One Mode	5.0	MIX	80M

WAC

Call	Date	Basic	Endorsement	Power	Mode	Band
KA4TMJ	10-14-88	468C	One Mode/Band	5.0	SSB	10M
XE2IOF	10-22-88	469C		5.0	MIX	MIX
N2HOS	11-18-88	470C	One Mode	5.0	SSB	MIX
W5TB	2-20-89	471C	One Mode	0.9	CW	MIX
KF5OW	3-11-89	472C	One Mode	5.0	CW	MIX
WE2P	6-02-89	473C	One Mode	5.0	CW	MIX
UA3EAC	7-02-89	474C		5.0	MIX	MIX
OK2BAT	7-22-89	475C		5.0	MIX	MIX
KB3WK	8-14-89	476C		5.0	MIX	MIX
OK1DCE	9-10-89	477C		5.0	MIX	MIX
W4RFL	10-6-89	478C		5.0	MIX	MIX
WJ7H	12-31-89	479C		5.0	MIX	MIX
WB2QAP	2-24-89	480C		5.0	MIX	MIX
HB9XY	2-14-90	481C		5.0	MIX	MIX
DL2HCB	3-17-90	482C	One Mode	5.0	CW	MIX
N8AXA	3-17-90	483C	One Mode	5.0	MIX	6M
KB1FK	3-17-90	484C	One Mode	4.0	CW	MIX
KA9BZM	5-20-90	485C		5.0	MIX	MIX
NN8R	5-20-90	486C	One Mode	5.0	CW	MIX
AA5BT	7-29-90	487C	One Mode	5.0	CW	MIX

Contests

Red Reynolds, K5VOL
835 Surryse
Lake Zurich, Illinois 60047



ALL TIME LEADERS

— CW — (QSO PARTIES)

BAND	CALL	SCORE	CONTEST
ALL	N4BP	3,587,220	Fall 88
160	N8CGY	1,260	Fall 87
80	WK8G	136,800	Fall 88
40	W8MVN	284,720	Fall 89
20	WD71	343,200	Fall 89
15	W6SGJ	103,572	Spring 89
10	WB2CZB	26,100	Fall 88
6			
HI	WG5G	535,542	Spring 90
LO	NNIG	165,894	Spring 90

Upcoming Contests

Jan. 13, 2000-2400Z, Winter Fireside Sprint (SSB)
March 10, 2000-2400Z, Classic Sprint (CW & SSB)
April 13, 1200Z, to April 14, 2400Z, Spring QSO Party (CW)
May 26, 2000-2400 local time, Hootowl Sprint (CW)
July 14, 2000-2400Z, Summer Homebrew Sprint (CW)
Aug. 11, 2000-2400Z, Summer Daze Sprint (SSB)
Oct. 19, 1200Z, to Oct. 20, 2400Z, Fall QSO Party (CW)
Dec. 1, 2000-2400Z, Holiday Spirits Homebrew Sprint (CW)

— CW — (SPRINTS)

BAND	CALL	SCORE	CONTEST
ALL	W3TS	452,380	Holiday Spirits 88
160			
80	WD8DWM	6,770	Holiday Spirits 89
40	W8MVN	80,880	Holiday Spirits 89
20	K5VOL	76,200	Holiday Spirits 89
15	KF7MD	39,514	Holiday Spirits 89
10	TI2QRP	7,600	Holiday Spirits 88
6			
HI			
LO			

— SSB —

BAND	CALL	SCORE	CONTEST
ALL	W8WVR	179,580	Summer Daze 88
160			
80			
40			
20	WB5KYK	50,127	Winter Fireside 90
15	KA6HGT	58,500	Summer Daze 89
10	N7NKG	214,402	Winter Fireside 90
6			
HI	W5TTE	31,960	Winter Fireside 90
LO			

— TEAM —

TEAM - MEMBERS	SCORE	
Colorado QRP Team (KRØU, KIØG, WØKEA, WIXE, W8QZA)	3,825,663	Fall 1989

Fall QSO Party High Claim Scores

Certificates for past contests are still being made out. The supply of certificates has been exhausted. A new printer is being looked into, the old one (with a good price break) has gone out of business.

Claimed high scores (1,000,000 plus) for the Fall QSO Party include:

AA2U	**3,761,100**
(new all-time high)	
WIXE	**3,484,880**
W3TS	**2,303,400**
WØMHS	**2,097,000**
WAØZBT	**1,937,319**
N9AW	**1,894,063**
KH6CP/I	**1,630,780**
W5TTE	**1,339,840**
WG5G	**1,323,504**
NXØQ	**1,152,024**
KB3HH	**1,082,240**
W9LNQ	**1,047,785**

1991 MICHIGAN QRP CLUB 11th ANNUAL CW CONTEST

DATE: 1200Z January 19, 1991 to 2400Z January 20,1991 (36 hours). CW only, 160 through 6 meters (WARC bands excluded). Contest is open to all amateurs and all are eligible for awards.

CLASSES:

- •A - 250 milliwatts or less output.
- •B - One watt to 250 milliwatts output.
- •C - Five watts to one watt output.
- •D - Over five watts output.

EXCHANGE: RST, QTH (State/Province/Country) and MI-QRP Membership Number (non-members send power-output).

FREQUENCIES: 1810, 3560, 7040, 14060, 21060, 28060 and 50060 Khz.

Novice: 3710, 7110, 21110 and 28110 Khz.

SCORING: Stations may be worked once per band for QSO points. Member contacts are 5 QSO points each, non-member contacts are 1 QSO point each. Multiply total QSO points (all bands) by the number of States/Provinces/Countries worked per band, for total points.

BONUS POINTS: Total points x 1.25 for battery or 1.5 for 100% natural power.

AWARD CERTIFICATES: Certificates will be issued for the highest score in each State/Province/Country. A complete log is required for each band, as well as your name, call, address, equipment description and power output.

******

Logs must be received by February 16, 1991. Please send an SASE for a copy of the results.

All logs to: L.T. Switzer, N8CQA; 654 Georgia; Marysville, Michigan 48040 USA

A set of one log sheet and one entry form is available for an SASE to the above address. Help us celebrate our 13th Anniversary.

CLASSIC SPRINT RULES

(Sponsored by M-QRP-C and QRP ARCI)

DATE/TIME: March 10, 1991-2000Z through March 10, 1991-2400Z

EXCHANGE: RST, State/Province/Country, power out

POINTS: 5 points per completed exchange

MULTIPLIER: SPC total all bands; NOTE: the same station may be worked on more than one band for points and S/P/C credit.

ENTRY CLASSES:

A: 0-1 watt out CW (0-2 watts PEP SSB)
B: 1-5 watts out CW (2-10 watts PEP SSB)
C: over 5 watts (10 watts PEP SSB)
MULTI-BAND OR SINGLE-BAND CATEGORY

BONUS POINTS (Classic Equipment used):
+ 200 TX used; + 300 RX used; + 500 TCVR used

SCORE = points * S/P/C + Bonus

SUGGESTED FREQUENCIES:

	CW	PHONE
160M	1810 KHz	
80M	3560, 3710 kHz	3985 kHz
40M	7040, 7110 kHz	7285 kHz
20M	14060 kHz	14285 kHz
15M	21060, 21110 kHz	21385 kHz
10M	28060, 28110 kHz	28385 kHz
6M	50060 kHz	50160 kHz

****

Certificates to the top score in each band for single-band competitors. Certificates will be issued to the top score in the S/P/C and class.

Entry includes a copy of the logs and a separate summary sheet. Include duplicate check sheets with entries of 100 or more QSO's. All entries must be received within 30 days following the contest. Late entries will be counted as check logs. Include a description of homebrew equipment, commercial equipment and antennas used with each entry. Classic bonus points may not be claimed if a description is not included with entry.

Classic equipment is defined as any equipment whose original design is 15 years or older and no longer in production. For homebrew equipment, the original circuit must be 15 yers old or older and comparable components in production 15 years or more as much as possible.

A summary sheet and sample log sheets are available from the contest manager for an SASE with one unit of postage. Include an SASE with one unit of postage in the entry for a copy of the contest results. Results will be published in the next available issues of the QRP ARCI Quarterly and the M-QRP Club's T5W.

Send entries to Buck Switzer, N8CQA; M-QRP Contest Manager; 654 Georgia; Marysville, Michigan 48040 USA.

MILLIWATT FIELD DAY TROPHY COMPETITION

The MILLIWATT FIELD DAY Competition which has been dormant the last two years is being resurrected in 1991. The MWFD sponsored by the MILLIWATT, M-QRP, and QRP-ARCI has now been turned over to the QRP-ARCI contest manager to accept logs, score the same, and report the results in both the QQ and T5W.

Rules will be the same as in the past, the standard ARRL Field Day rules, but with the familiar MWFD scoring scheme.

Official announcement of the MWFD will be in the April issues of the QQ and T5W. Also, negotations have been completed with the ARRL and the MWFD will be published in the Contest Corral in QST.

Watch for the complete rules for this popular event elsewhere this issue of the QQ.

MILLIWATT FIELD DAY TROPHY COMPETITION RULES

Sponsored by "THE MILLIWATT", M-QRP-C, QRP-ARCI

DATE/TIME: June 22, 1991-1800Z through June 23, 1991-1800Z
EXCHANGE: State/Province, Class
See QST Field Day rules, all ARRL rules followed
POINTS: 1 point per completed exchange
MULTIPLIER: X 4 for 1 to 5 watts out, or X 8 for 1 watt or less
AND, X 1.5 for fully battery/natural power
ENTRY CLASSES:

- 1 watt, 1 or 2 operators, 1 transmitter
- 5 watt, 1 or 2 operators, 1 transmitter
- Club, over 2 operators, 1 or more transmitters

BONUS POINTS: Fully Portable Setup: + 150 POINTS
SUGGESTED FREQUENCIES: See QST for CW and Phone Frequencies

SCORE = Points * Power Multiplier * Power Supply + Bonus.

Trophies to the top score in each 1 or 2 operator class. Plaque to the top club score. Trophy or plaque may be won by the same winner only once in a three year period.

Entry includes a copy of the logs and a separate summary sheet. Entry is a duplicate of the required ARRL Field Day entry. Include a list of QSO's by band.

All entries must include a complete name, call and address. All entries must be received within 30 days following the contest. Late entries will be counted as check logs.

Include a description of equipment, power source used and antennas used with each entry. A summary sheet and sample logs are available from the ARRL as per QST.

Include an SASE with one unit of postage with the entry for a copy of the contest results. Results will be published in the next available issues of the QRP-ARCI QUARTERLY AND THE M-QRP-C T5W.

SEND ENTRIES TO: Red Reynolds, K5VOL; QRP-ARCI Contest Manager; 835 Surryse Road; Lake Zurich, Illinois 60047 U. S. A.

Idea Exchange

by Michael Czuhajewski WA8MCQ
Box 232, Jessup, Maryland 20794

"Toroid Cookery"

Chip Owens, NWØO of Boulder, Colo., provided his own title and writes:

Micrometals catalog 3, issue D, contains an interesting statement regarding temperature effects on powdered iron cores. The statement defines the operating range of the cores as -55°C to +125°C and cautions that continued operation above 125°C will result in permanent decrease in both inductance and Q.

For applications requiring good stability, Micrometals recommends pre-baking powdered iron cores at +125°C (257°F) for a minimum of 48 hours. A baking time of 96 hours is recommended for maximum stabilization of the core material. The idea here is that the core should be baked at a temperature that exceeds any temperature it will encounter during operation.

Micrometals manufactures powdered iron cores sold by Amidon Associates. Micrometals publishes a very useful catalog of Q curves as a supplement to their catalog of iron powder cores. They are located at 1190 N. Hawk Circle, Anaheim, Calif. 92807. Call toll free 1-800-356-5977. They do not sell small quantities of cores—generally 100 piece minimum order.

Quickie Audio Oscillator

From **Joe Everhart, N2CX,** of Brooklawn, N.J.:

I love quickies. That is, I like simple little circuits built for special purposes. The first was a simple single transistor RC audio oscillator built for a ham buddy. The breadboard circuit was literally a ball of components. Everything was just tack soldered together without a supporting circuit board.

When my buddy asked for the breadboard, I figured he wanted the parts so he could rebuild the circuit in a more permanent form. Being a frugal Pennsylvania Dutchman, he merely soldered on some connecting leads, plopped the circuit into a cardboard coffee cup and filled it with a foam potting compound. It's probably still working!

The circuit here is a step up from the original quickie. Figure 1 shows the circuit. It's a bare bones twin-tee audio oscillator adapted from a variety of circuits in the last 20 years of hobbyist and ham publications. My wrinkle is that you don't really need to put it on a printed circuit board and enclose it in a fancy case. Mine is built on a scrap of Vector board. See Figure 2 for parts layout. Nothing is critical about the construction. Using a snap-on 9V battery connector eliminates the power switch.

It's been kicking around the shack for better than 10 years. Usually it's used as an audio source for testing homebrew receiver audio stages. The maximum output level is about one volt RMS at 500Hz. My ear peaks at this frequency, so I use it for my testing. Simply scale capacitor values for other frequencies and, for accuracy, measure the output level with a scope or DVM.

To use the quickie, just tack solder on a resistive divider to get the level you need. Reactor values for various levels are given in Table 1. Connect the signal to the circuit you're checking with short leads and a 0.5µf Mylar coupling capacitor.

Start with a level of about 10mv at the input of the audio level of only a microvolt. Try doing that with a commercial AC line powered audio oscillator! To check gain, note the audio chains output level as you go backwards, knowing the calculated quickie voltage. This is very handy for verifying that each audio stage in a direct conversion receiver is working right.

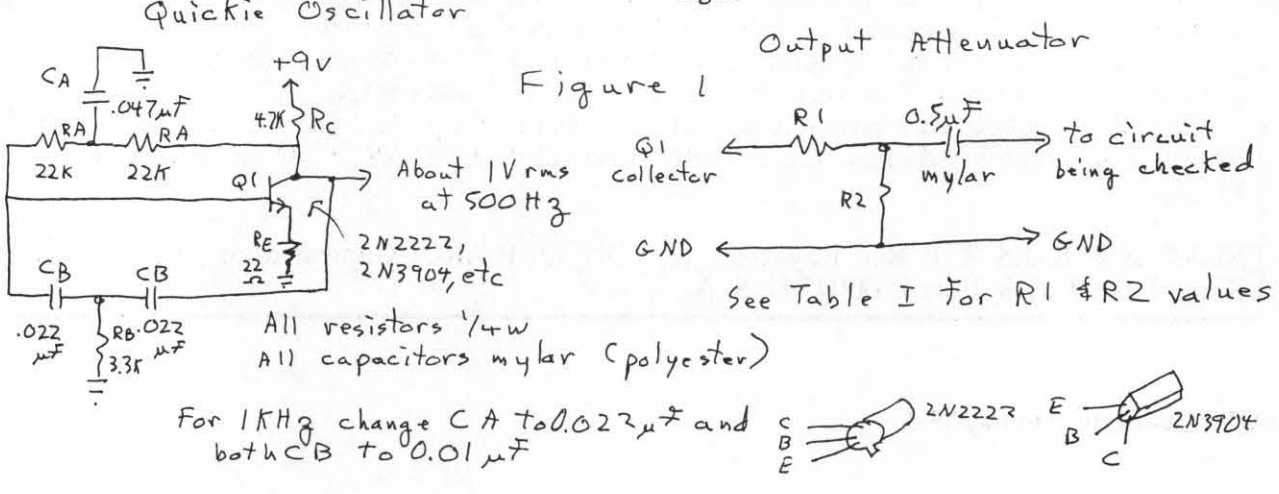


Table 1
Output Attenuator Values
Calculated for an unloaded value of 1V RMS at Rc

R1	R2	Output
47K	5.6K*	98 mv
47K	510	9.8 mv
47K	51	980 µv
47K	5.1	99 µv
100K	1K	9.5 mv
100K	100	950 µv
100K	10	95 µv
1 Meg	1K	990 µv
1 Meg	100	100 µv
1 Meg	10	10 µv
10Meg	1K	100 µv
10 Meg	100	10 µv
10 Meg	10	1 µv

*Using R2 later than 1K or so may cause inaccuracy due to circuit loading.

•••

Attenuator values can be calculated by the formula: Vout = Vin * R2/(4700+R1+R2)

High Performance Passive Audio Filters

Many of you are familiar with the works of **Ed Wetherhold, W3NQN,** who had a large number of articles published over the years on RF and audio filters. The latter, using 88 mh toroids, are excellent. I had the chance to listen to one of his two stack designs (there are five toroids in one stack) and it was almost as good as a crystal filter.

He had an article in the December 1988 issue of QEX, with the design subsequently included in the ARRL Handbook, using only one stack with a pair of 44 mh cores glued on the ends. Depending on the value of the various parts, the filter can be tailored for SSB, broadband CW or narrowband CW.

I got the parts for the narrow CW filter from him and, 23 months later, finally finished it off. Chalk that one up to laziness and procrastination—actual construction time, less chassis mounting, was under an hour. As with the two stack filter I've tried, performance is excellent and my TS-430 sounds about the same with it or with the Kenwood 500 Hz crystal filer. (Naturally, as is the case with any audio filter, performance won't be as good as a crystal filter since strong signals in the IF passband will still affect reception.)

Being a passive design, there is some loss so the audio gain has to be cranked up a bit. Size and weight are also potential drawbacks for miniature gear—imagine taking a toilet tissue core, filling it with coins and installing it in your rig. However, as he pointed out in the QEX article, the passive filters do have some definite pluses. They draw no current from the power supply, they do not add to the noise floor of a receiver as active filters can do, they are less failure-prone than filters with active devices, and construction is simpler.

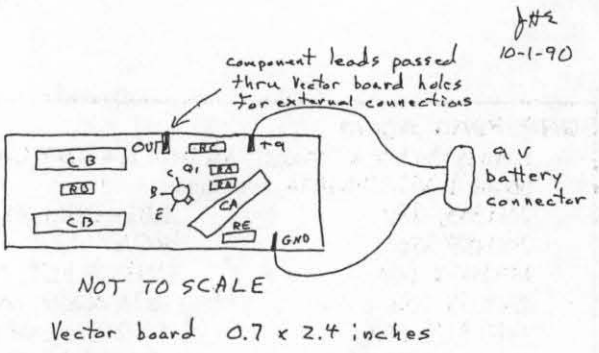


Figure 2 - Quickie oscillator Parts Layout

Quoting from his article he supplies with the toroids, "Five high-Q resonator circuits provide good skirt selectivity that is equal to or better than most commercial active filters costing more than $80. In comparison, this CW filter costs less than $15.

The filter which I built was designed for a center frequency of 750 Hz, but he has another design now with a frequency of 534 Hz, as the lower value is preferred by many hams. That design was to be published in the December 1990 issue of QEX.

Through the cooperation of the C&P Telephone Company of Maryland, Ed is able to obtain free loading coils (which are 88 mh toroids) that are no longer suitable for telephone company use, to be passed onto radio amateurs. He receives them with the stipulation that they are personal, amateur radio use only, with no commercial application, and passes them on free to qualified individuals. He does, of course, charge a nominal sum for packing materials and postage, and includes a filter construction article. When inquiring, give him a brief description of your proposed application, and state that they will be for personal amateur radio use only.

If interested, you can write to Ed at 1426 Catlyn Place, Annapolis, Maryland 21401, and include a business size SASE. He will send information on the filters, as well as a list of other necessary parts which he can supply at low cost is desired. These include matched sets of capacitors to tailor the filter to the desired bandwidth and frequency, transformers to match your audio line to the impedance of the filter and back again, and plastic clips to mount the toroid stack. My order from him in December 1988 was his 1,088th shipment, which gives him a good idea of the popularity of his designs. He has since reached 1,227, but says only about 70% of the requests are ultimately filled since many people do not respond to his initial letter. He requests that only those with a serious interest in building a filter respond.

For those interested in a high performance, low cost filter, I highly recommend his design.

QRP Parts Again

Here is the latest "special" list from KA7QJY Components, Box 7970, Jackson, Wyoming 83001; phone 1-307-739-1634, evenings.

2N3565, 15¢	SBL- DBM, MiniCircuits, $3.40
2N5109 35¢	RCA 4013, 7 watt, 27 MHz (hot 2N3553 equiv.), 80¢
MRF472, 60¢	2N3819 FET, 25¢
2N3053, 25¢	RCA 40822, good sub for the 40673, 60¢
J310 FET, 50¢	FT-243 crystal sockets, 30¢
2N5485 FET, 20¢	T37-2, 5 for $1
MPF105, 15¢	T37-6, 5 for $1
2N3823 FET, 50¢	T50-2, 5 for $1
3N200 MOSFET, 60¢	FT37-43, 5 for $1
3N204 MOSFET, 50¢	FT37-61, 5 for $1
MC1496G, 50¢	FT50-43, 5 for $1
MC1350P, 50¢	FB43-801 beads, $1.25/dozen
UA301AHC, 15¢	78L08, 15¢

Jackson Bros vernier drive, miniature, 10 to 1 ratio; 5/32" shaft. 1/4" output, $2
Jackson Bros vernier drive, same as above, but 5/32 shaft and 3/16" output, $1.75
Dial knobs for these JB drives, 1/2" dia. with 1-3/8" skirt, 30¢ each
Assorted caps; NPO, monolithic, glass, tantalum, etc. 100 for $1
Please add $2.75 for shipping, with most shipped first class or UPS ground. Make check or money order payable to Danny Stevig. Send large SASE for complete list of QRP parts. (Neither the QRP ARCI nor the Quarterly endorse or warrant this offer, although many hardcore QRP homebrewers have spent a lot of money with him and have been very satisfied.)

Wanted: Joy of QRP

Ron Stern, N6BIG, 413 S. Juanita Ave., Redondo Beach, Calif. 90277, is looking for a copy of The Joy of QRP. Written by Ade Weiss, WØRSP, it has been out of print for a couple of years. He is willing to pay full price for a readable copy. Please reply directly to him. I've received several inquiries about the book over the years. If anyone is willing to sell their copies, please put an ad in the Quarterly. There are lots of new QRPers who would like to see it.

WA8MCQ note: according to the latest issue of Radio Communications, the journal of the Radio Society of Great Britain, their bookstore still carries it; a bit expensive and hard to get, perhaps, but available nonetheless.

CLOSING COMMENTS

As always, your inputs to the column are welcome. If you have technical tidbits, pass them on; we'll either use them here if short enough, or pass them on to the technical editor for use as a full article if appropriate. Either way, be sure to share them with us! Write to me at Box 232, Jessup, Maryland 20794.

Problems, Questions, Comments?

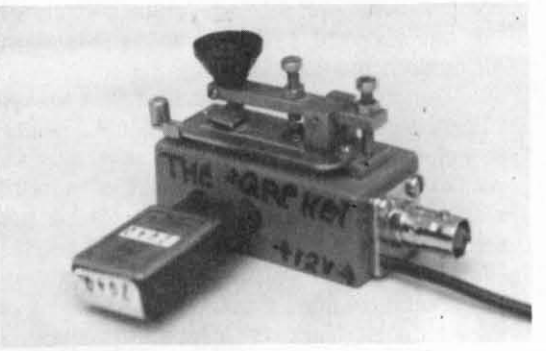
Who To Contact—

PLEASE include an SASE of an appropriate size if you expect a response.

- **Subscriptions, dues, membership problems:** Mike Kilgore, KG5F; 2046 Ash Hill Road; Carrollton, Texas 75007
- **Non-technical articles:** Chaz Wooten, KD4XX; 103 W. 7th St.; Jasper, Tennessee 37347; 615-942-5116
- **Technical articles:** John Devon, KI6DQ; P.O. Box 3236; South Psadena, California 91031; 818-5523
- **QRP Contests:** Red Reynolds, K5VOL; 835 Surryse Road; Lake Zurich, Illinois 60047
- **Nets:** Danny Gingell, K3TKS; 3052 Fairland Road; Silver Spring, Maryland 20904
- **Awards:** Bob Gaye, K2LGJ; 25 Hampton Parkway; Buffalo, New York 14217
- **Club Operations:** Paula Franke, WB9TBU; P.O. Box 873; Beecher, Illinois 60401; 708-946-2198
- **Club information packets** (include $1): Mike Bryce, WB8VGE; 2225 Mayflower, N.W.; Massilon, Ohio 44647

The QRP Key (with a surprise inside!)

by Michael Czuhajewski WA8MCQ
Box 232; Jessup, Maryland 20794



I swap lots of parts and ideas with Danny Gingell, K3TKS. I gave him a neat little Pomona aluminum box, 1-1/8 x 7/8 x 2-1/4, with a BNC socket mounted on one end. He gave me a miniature CW key about two inches long, which came from an ancient Ma Bell telephone relay test set he got at Dayton for $5.

The set had four of them, which are pressed at various times during the procedure. I didn't really have any plans for it until Danny showed up one day with one of the keys mounted on top of his box and said we should build some tiny QRP transmitters with built-in keys.

The challenge was too good to pass up, and I scooped him by getting mine done first. Since Danny already has a CW keyboard with Twofer transmitter built into it, which I call his QRP Keyboard, this project was logically dubbed the QRP key. All but two of the people I worked in the July 1990 QRP Homebrew Sprint talked to this rig. (The other two heard my Tiny Weekender, the subject of another article.)

Construction is pretty much the same as my DB-25 rig (April 1990 QRP Quarterly) in size and type of components used. I made heavy use of monolithic capacitors, quarter inch diameter toroids and 1/8 watt resistors. Fortunately, such miniature parts are widely available nowadays.

The circuit is straight forward for the most part. I used a 2SC2498 for the oscillator due to its very small size; the clearance between the vertically mounted oscillator board and end of the chassis is very limited. If space is not a problem, a 2N3904 could be used. The VXO capacitor is a beautiful little 1/4" diameter Murata Erie trimmer that I bought from Danny Stevig, KA7QJY. There are better VXO's—the oscillator, as built, doesn't give a tremendous amount of frequency swing, but I didn't want to spend a lot of time optimizing it since the important thing was to get a functional rig in the box and beat Danny to it.

The coupling capacitor to the driver is another Murata Erie trimmer. I originally used a 270 pf fixed cap, but later decided I needed a drive control. I could have done that with a potentiometer somewhere in the circuit, but a tiny trimmer cap here saves a great deal of space, as even the smallest PC-mount pots I have are larger than the Murata Erie. Like the VXO capacitor, it is tuned with a jewelers screwdriver stuck through a hole in the box.

The driver started out with a 2N3904 and 24Ω emitter resistor, and drove the final as high as 4 watts output at times. The only problem, as I found out when I held the key down for several seconds, was that the 1/8 watt emitter resistor started to smoke and the 2N3904 ran quite hot. I replaced it with a metal 2N2222A so I could use a clip-on heatsink if needed, and changed the resistance and wattage of the emitter resistor.

The driver is the only keyed stage, controlled by the 2N3906. I chose to let the oscillator run all the time, applying constant voltage to it in transmit mode, to reduce the possibility of some of my old crystals chirping. The keying circuit is pretty much a standard, from circuits by W1FB and others.

The final amp is a Japanese CB output transistor, 2SC799, which I also bought from KA7QJY. It's billed as a good replacement for the 2N3553 in QRP rigs, but a lot cheaper since RF Parts recently raised the price on the latter to $3. It's rated at 3 amps maximum Ic, FT of 150 MHz and maximum Pd of 10 watts. While the 2N3553 has an FT of 500 MHz, the '799 beats it in the other two categories. For use at HF, either one has a high enough frequency rating.

The clip-on heat sink I use does not have fins to dissipate heat directly; rather, it is designed to be mounted on a chassis, which then dissipates the bulk of the heat. There is no room for fins in this rig, as spacing is quite tight all over. The idea was that when the lid was placed on the box, the heat sink would be screwed to it for additional sinking. As it worked out, I leave the cover off all the time, since I'm always showing off the rig, and at the 1.5 to 1.8 watt level the finless sink appears to be adequate by itself.

Note the ubiquitous 33 volt zener diode on the final for SWR protection. I had always intended to install it eventually. One day I put an RF probe on the collector of the final with the load deliberately disconnected, while the rig was still designed to put out 4 watts, and got a read-

ing of 52 volts RMS—that's 73 volts peak! The 2SC799 is rated at 40 volts on the collector, but this one survived. I quit procrastinating and put the diode in immediately.

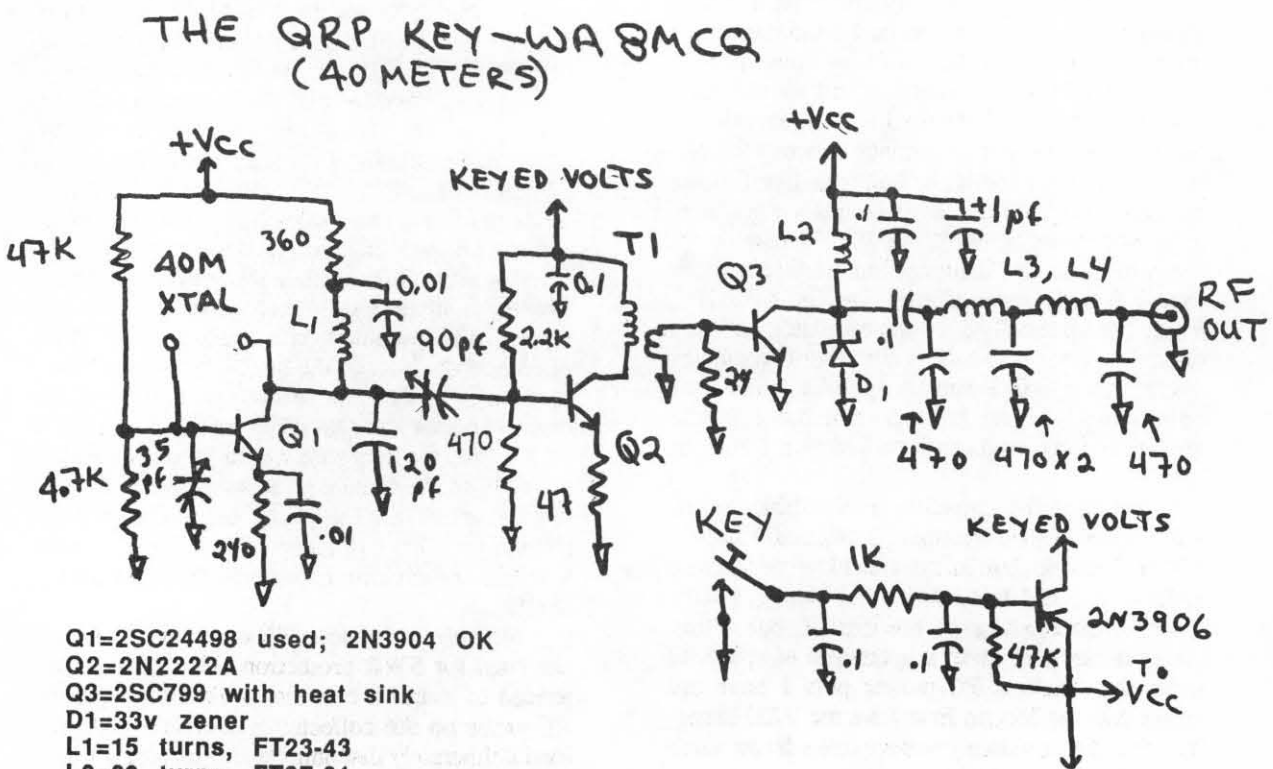
The output net is a standard 50Ω low pass filter. I try to run the transmitter at 1.5 watts or so output, since that's the level at which the final has a 50Ω impedance. If I had left it at the 4 watt level, I would have had to wind a transformer on a ferrite core to match the final to the filter. I wound the coils, on T25-2 cores, to give the nominal value of inductance required, and then built the filter on a breadboard with the components that later went into the rig. I did some testing and adjusting to make sure it performed properly before shoehorning it into the box. For the center capacitor I used two 470 pf monolithic caps stacked on top of each other to save space; I didn't have a single unit with the right value.

For the series coupling capacitor between the final and the filter, I used a physically large 0.1 µf monolithic. Some time ago KB1MJ warned me about the dangers of using monolithic caps to pass significant amounts of power—essentially the same principle as using a half-watt resistor when you should be using five watts.

Danny K3TKS pointed out to me that since the only frequency sensitive part of the rig was the output filter we should leave them out and use plug-in filters for the band in use. We both picked up a number of Pomona boxes with BNC connectors at a local hamfest last year, with that idea as one potential application. In fact, I did build filters for 40 and 20 meters into two of them. I didn't like the idea of using an external filter on this particular rig, though, as an add-on would detract from the visual impact. (I would also have to put everything into the box!) However, I do slap on the 40 meter filter sometimes as additional protection against TVI.

Power is fed into the rig with a piece of RG-174 miniature coax. The BNC output connector is mounted with only three screws; the fourth hole was drilled out a bit and threaded with a 6-32 tap. The coax is screwed into the hole and there is just enough bite from the threads to provide some strain relief.

Building something with this many parts in such a small box is not a trivial matter, as anyone who has actually done will quickly admit. Still, having built a DB-25 rig already, this one would be "just another tiny QRP rig" to me except for the key mounted on top, which gives it a bit of mystique. It should also silence some of the non-QRP hecklers around here who occasionally tell me I should build a QRP rig into the base of a key!



Q1=2SC24498 used; 2N3904 OK
Q2=2N2222A
Q3=2SC799 with heat sink
D1=33v zener
L1=15 turns, FT23-43
L2=20 turns, FT37-61
L3, L4=16 turns, T25-2
T1=primary 15 turns, seconday 3 turns on FT23-43

Power: +12 to 13.8v in transmit

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There may not be a lot of space in the backyard of Dick Pascoe GØBPS, but room enough for a tower and the Kanga Kits workshop. [Photo by W5HKA]

Taking a peek into GQRP stations...

The station at GØBPS. Note the linear just to the right of the Kenwood (!) [Photo by W5HKA]

There's a lot of stuff at G3RJV QRP station to keep visitors busy. [Photo by W5HKA]

The QRP Candy Store

Operated for QRP ARCI by Bob Spidell, W6SKQ 45020 N. Camolin Ave., Lancaster, CA. 93534

The QRP Candy Store is a clearing house for all member or ARCI sponsored, QRP related products. Promote QRP in your area; send your ideas, suggestions and a sase to Bob Spidell, W6SKQ for store flyer.
LOGO: T-Shirts, Ball Caps, Hat Pins, Stickers, Stationary & more.

Exclusive!

QRP'ers

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Note: Renewals must be received 30 days before publication.

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Year 1st Licensed_____
Other Calls Held_____
Rig_____ Ant_____
Bands Most Used_____
Please circle your chief interests:
Ragchewing, DXing, Contests, Traffic, Awards, Homebrew, VHF/UHF, Packet, CW, SSB, RTTY, ATV, Satellite, Other.

	Yes	No	Maybe
Would you like to be an officer/director of club?	[ ]	[ ]	[ ]
Would you help write for the QRP Quarterly?	[ ]	[ ]	[ ]

What subjects_____
What QRP awards/achievements have you won?_____
_____
Why do you run low power? _____

Mail to: Mike Kilgore, KG5F
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Carrollton, TX 75007

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