Protective Cover – QRP Quarterly
JOURNAL OF THE QRP AMATEUR RADIO CLUB, INTERNATIONAL
April, 1985 – Volume XXIII – Number 2

SPECIAL ANTENNA ISSUE

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Skelton Cone – Field Day Antennas – Tuner

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FIRST HW–9 MODIFICATIONS

APRIL 1985

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1 SWN–80	2 SEN	3 GSN–GLN	4	5	6 NWN–NEN–SWN	7 FIRST SUNDAY QSO PARTY TCN
8 SWN–80	9 SEN	10 GSN–GLN	11	12	13 NWN–NEN–SWN	14 TCN
15 SWN–80	16 SEN	17 GSN–GLN	18	19	20 QRP ARCI SPRING CONTEST NWN–NEN–SWN	21 TCN
22 SWN–80	23 SEN	24 GSN–GLN	25	26	27 NWN–NEN–SWN	28 TCN
29 SWN–80	30 SEN	GSN–GLN			NWN–NEN–SWN	TCN

MAY 1985

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
SOUTHERN INDIANA QRP CONTEST – ALL MONTH SWN–80	SEN	1 GSN–GLN	2	3	4 G–QRP SSB ACTIVITY NWN–NEN–SWN	5 FIRST SUNDAY QSO PARTY TCN
6 SWN–80	7 SEN	8 GSN–GLN	9	10	11 NWN–NEN–SWN	12 TCN
13 SWN–80	14 SEN	15 GSN–GLN	16	17	18 NWN–NEN–SWN	19 TCN
20 SWN–80	21 SEN	22 GSN–GLN	23	24 CQ W–W WPX CONTEST	25 NWN–NEN–SWN	26 TCN
27 SWN–80	28 SEN	29 GSN–GLN	30	31	NWN–NEN–SWN	TCN

JUNE 1985

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
SWN–80	SEN	GSN–GLN			1 HOOTOWL SPRINT NWN–NEN–SWN	2 FIRST SUNDAY QSO PARTY TCN
3 SWN–80	4 SEN	5 GSN–GLN	6	7	8 NWN–NEN–SWN	9 TCN
10 SWN–80	11 SEN	12 GSN–GLN	13	14	15 NWN–NEN–SWN	16 TCN
17 SWN–80	18 SEN	19 GSN–GLN	20	21	22 ARRL Field Day NWN–NEN–SWN	23 TCN
24 SWN–80	25 SEN	26 GSN–GLN	27	28	29 NWN–NEN–SWN	30 TCN

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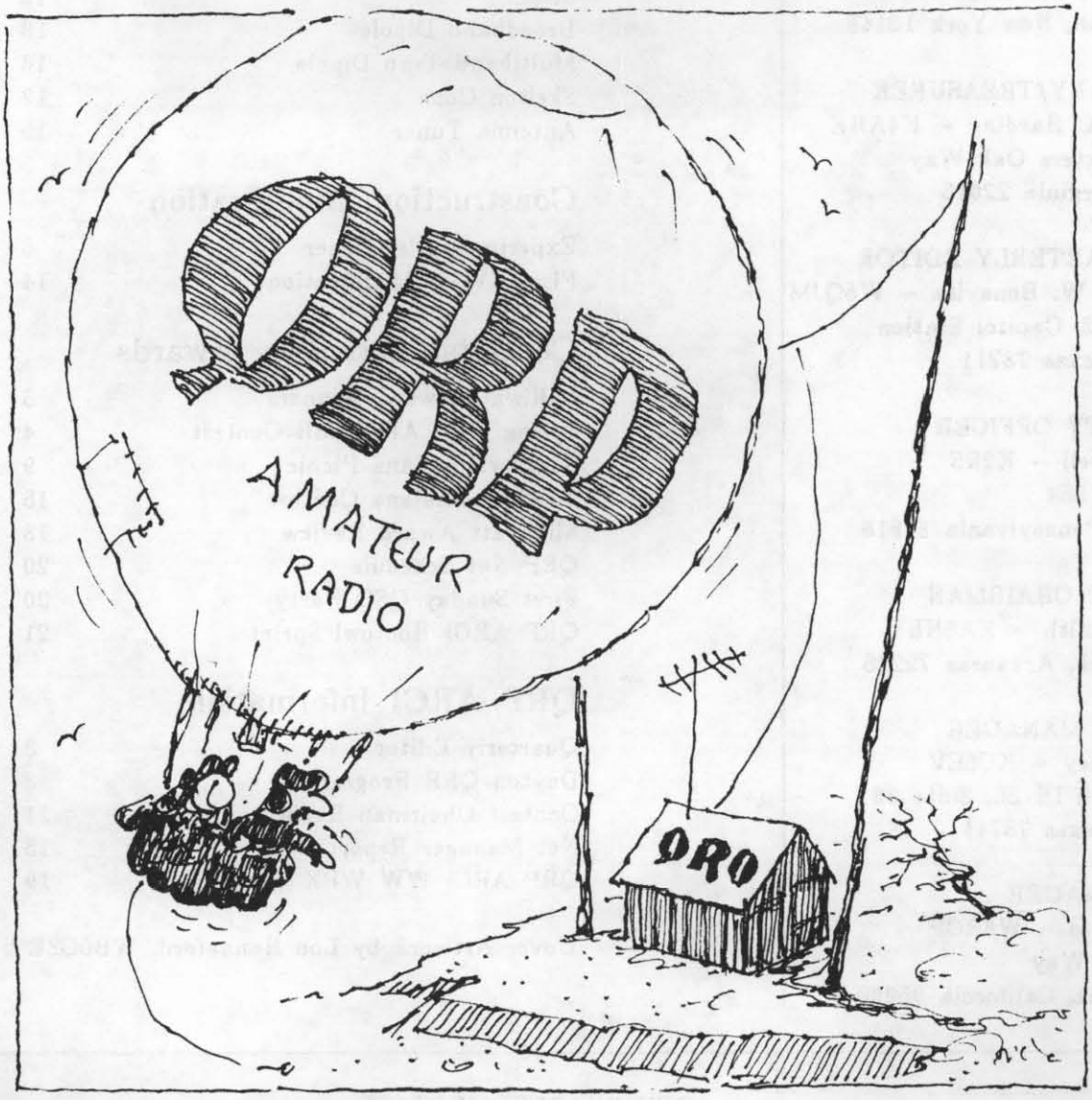
QRP Quarterly



"HE HASN'T BELIEVED US YET - DO YOU THINK HE WILL WHEN WE GIVE HIM OUR QTH?"

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).

Membership information is printed on the back cover.

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Cover Artwork by Lou Hannaford, WB0CZE

QRP EDITOR

Fred Bonavita, W5QJM

The Quarterly is again making a little history with this issue.

On page 14 you will find what is believed to be the first modification article for the HW–9 ever published. Its author, Dick McIntyre, K4BNI, is very enthusiastic about the rig, and he offers some good suggestions.

We predict this will be the first of a series of mods for the HW–9 –– just as there were many for the HW–8 –– and we hope to publish most of them in these pages.

Somehow I managed to stick my foot in it last issue when I referred to Colin Turner, G3VTT, as a QRP ssb enthusiast. I have been properly upbraided by no less than Chris Page, G4BUE, and George Dobbs, G3RJV, both of whom advise me that Colin is an avid CW fan and a member of the First Class Operators Club, among other things.

Proper apologies will be issued to Colin in person when he reaches Texas in mid–May as part of his U.S. tour with Chris. Included in that trip will be a visit to the Dayton Hamvention, where a QRP ARCI function is well along in the planning stages by our vice president, Les Shattuck, WB2IPX. See details published below.

A crucial election date for the club is fast approaching and deserves prompt attention. Four positions on the club's board of directors are to be filled for three–year terms, and the election is open to any member of the club.

Candidates for the board should submit their names, addresses, membership numbers, a brief biography and a statement of plans and objectives for the club. The material MUST be received by August 1 by Bill Harding, K4AHK, the secretary–treasurer. The ballot will appear in the October issue of The Quarterly, and the results will be announced in January.

Finally, we hope you enjoy this special antenna issue of the Quarterly. Plans are underway now for an issue devoted to solar powered equipment, so shower down those articles for us.

ROSE, COLLINS GRAB NEW mW AWARDS

Roger Rose, W5LXS, of Midland, Texas, and John Collins, KN1H, of Newport, N.H., have won first place in the Milliwatt Achievement program sponsored by Adrian Weiss, WØRSP.

Rose walked off with back–to–back first place wins in the QRP ARCI Spring and Fall 1984 QSO Parties to qualify for his certificate, while Collins logged 281 mW QSOs in the 1984 ARRL Field Day to capture top honors in that category.

Other winners in the Spring QSO Party were Zach Lau, KH6CP/3; Chris Page, G4BUE; and Mike Michael, W3TS. Fall Qso Party honors also went to Chris Brakhage, WB5FKC; Mike Bryce, WB8VGE; and Joe Garzik, AA4CO.

Rules for the 1985 version of the Milliwatt Achievement program are given on Page 18 in this issue of The Quarterly.

QRP PROGRAM SET FOR DAYTON

Officials of the Dayton Hamvention have confirmed a QRP Forum on the program for the 1985 session, and a block of ten motel rooms has been set aside for club members on a first–come basis.

Les Shattuck, WB2IPX, club vice president who is heading up arrangements for the weekend, says a spot on the program was assured by John Camp, WB8UGD. The club also is sponsoring a hospitality suite and will distribute club literature and membership forms.

The block of rooms was arranged through the special efforts of Jim Fitton, W1FMR, a member of the board of directors. They are doubles at the Days Inn for the nights of April 25, 26 and 27, with check out by the morning of the 28th.

All requests for rooms must be sent to Jim at P.O. Box 58, Ward Hill, Mass. Ø183Ø. Other information about the weekend may be obtained from Les (see address on Pg. 2). Volunteers to help with the weekend's activities are still needed and should get in touch with Les.

QRP ARCI SPRING SSB CONTEST

DATES & TIMES: 1200 UTC saturday, April 20, 1985 to 2400 UTC Sunday, April 21, 1985. Participants may operate a maximum of 24 hours.

EXCHANGES: Members give RS, state/province/country and QRP ARCI membership number. Non-members give RS, state/province/country and power output.

Stations may be worked once per band for QSO points. Each member contact 5 points, regardless of location. Each non-member contact, same continent, 2 points. Each non-member contact, different continent, 4 points.

MULTIPLIERS: State/Province/Country. The U.S. and Canada *do not count as countries* (count states and provinces only for W/VE). A state/province/country may be worked only once per band for s/p/c multiplier credit. Add s/p/c's separately for each band, 1 point each, then add up s/p/c points for all bands to arrive at total s/p/c multiplier.

POWER: The power multiplier is based on peak envelope power (PEP) as follows:

8 to 10 watts output X 2
6 to 8 watts output X 4
4 to 6 watts output X 6
2 to 4 watts output X 8
Less than 2 watts output X 10

More than 10 watts output counted as check logs only. The highest power used for any contact, any band, will determine the multiplier to be used for scoring the whole log.

BONUS MULTIPLIER: Natural power (solar, wind, etc. – with or without storage) X 2. With storage, storage cells must be charged by the natural power source within 48 hoaurs preceeding the start of and/or during the contest. Battery power X 1.5. No other source of power may be used at any time during the contest to qualify for these multipliers.

SUGGESTED FREQUENCIES: 1810, 3985, 7285, 14285, 21285, 28885, 50385 KHz; Novice and Technicians 3710, 7110, 21110, 28110, and 28110 KHz. (Novice /Technician – use one-half pf PEP powers shown to determine CW power multipliers & multipliers & Milliwatt award scores.)

CALLING METHOD: CQ QRP CONTEST FROM (CALL SIGN).

SCORING: QSO points (total all bands) times s/p/c multiplier (remember, s/p/c may be worked on more than one band and counts once on each band for s/p/c multiplier points) times power multiplier times bonus multiplier (if none use 1) equals claimed score. Use of the summary sheet will help avoid errors; summary sheets may be obtained by sending a large SASE or 2 IRC's to the contest chairman.

LOGS: Separate log sheets for each band is suggested for ease of scoring. Send full log data plus separate worksheet showing details and time(s) off the air. No log copies will be returned. All entrants desiring results and scores please include a large SASE or 2 IRC's. It is a condition of entry that the decision of the QRP ARCI contest chairman is final in case of dispute.

AWARDS: Certificates to the highest scoring station in each s/p/c with two or more entries. All entries are automatically considered for the Triple Crowns of QRP Award.

In addition, Adrian Weiss, WØRSP, is sponsoring a special MILLIWATT certificate to the highest scoring station in the less than 2 watt category, provided there are two or more entries in that category.

DEADLINE: Logs must be received by May 21, 1985. Logs received after that date or missing information will be used as check logs.

SEND LOGS TO:

QRP ARCI Contest Chairman
Eugene Smith, KA5NLY
P.O. Box 55010
Little Rock, Arkansas 72225 U.S.A.

QRP TOUTS – New Antenna Available !

Since this is a special issue devoted to antennas, it's appropriate to call attention to the new h.f. vertical antenna -- the HF2V -- being offered by Butternut Electronics. In keeping with the company's tradition of building no-nonsense antennas, the HF2V is 32 feet of deadly serious radiator. It comes in a basic model for 80 and 40 meters, and there are options for 20 or 30 meters as add-ons.

Drop a line to Don Newcomb, NØDN, Butternut Electronics, 425 East Market Street, Lockhart, Texas 78644, and ask for a folder on the HF2V. While you're at it, tell Don you'd like a flyer on his new vestpocket triband beam, which is soon to be announced.

EXPERIMENTER'S CORNER
Variable Crystal Oscillators

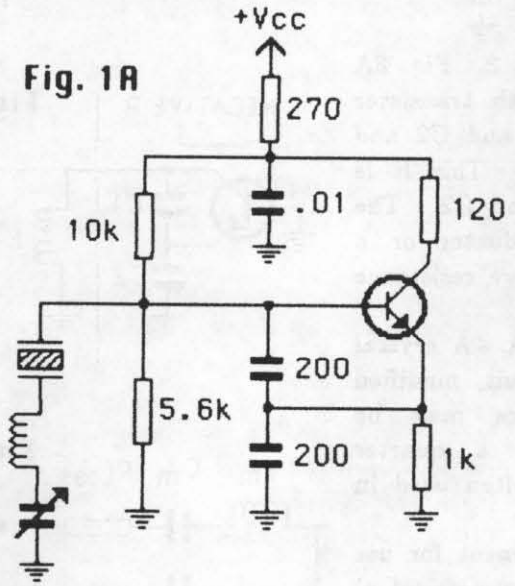
by Wes Hayward, W7ZOI
7700 SW Danielle Avenue
Beaverton, OR 97005

This quarter's column will attack the problem of the problems of the mainstay of the QRP experimenter, the Variable Crystal Oscillator, or VXO. This is a crystal oscillator capable of a small amount of tuning.

A VXO exhibits the stability of a simple crystal oscillator but much of the flexibility of a good vfo. The circuit is not without problems, the most common being a severly restricted tuning range. Tuning is often very non–linear. If you try to pull the crystal too far, the VXO is subject to "mode jumps" (i.e., oscillation occurs at an undesired frequency). Crystal characteristics will have a dramatic effect on performance, making it difficult to duplicate published circuits exactly.

Figure 1 shows two common VXO circuits. The first, Fig. 1A, is a Colpitts crystal oscillator, modified with the addition of a series L and C.

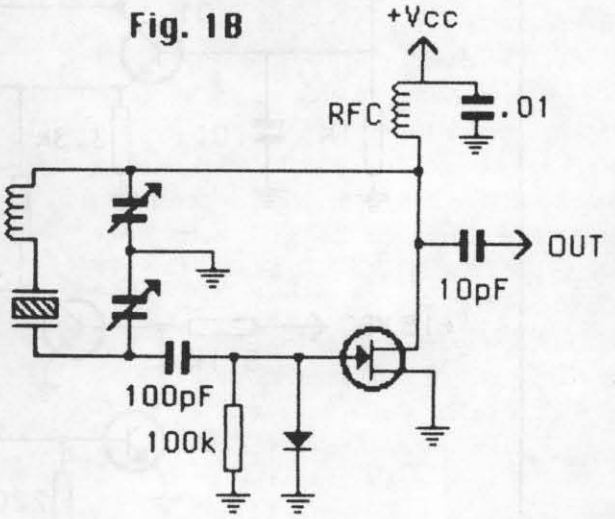
Fig. 1A



The inductor value must be determined experimentally: if it's too small, the tuning range will be correspondingly small; if L is too large, the circuit will change modes, may be unstable and may oscillate at a frequency unrelated to the crystal. Still, the circuit is very simple. This circuit was used at 14 Mhz. (with a frequency doubler) in a very successful little 10 meter CW rig. The tuning range at 14 Mhz. was about 25 Khz. using crystals from International Crystal (GP type). Tuning was very non–linear. (See QST, May, 1979, page 28.)

Figure 1B shows another "standard" VXO circuit. This one provides rather constant output, a result of the AGC provided by the diode and capacitor in series with the gate.

Fig. 1B



A dual–section capacitor is required. The diode should be either a germanium or hot–carrier silicon type to prevent conduction in the FET gate diode. (See DeMaw's paper on this circuit in QST, May, 1972.) Tuning is again wuite non–linear, and empirical component selection is required.

The consequences of non–linear tuning can be significant for the builder. A fixed capacitance change will produce very different frequency shifts at the extremes of the tuning range, making the circuit very difficult to use in a direct–conversion transceiver. The offset that would be included then, is not constant.

The maximum tuning range available from the simple VXO circuits is approximately 0.1 percent. It's usually easier to build a functioning VXO at the higher frequencies. (For example, a 14 Mhz. VXO is more practical than one for 7 Mhz.) Tuning is usually from the marked crystal frequency downward with both circuits of Fig. 1. Crystals operate best on their fundamental modes in VXO applications. Con't next page

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See Page 21

–Exp. Corner con't.

Fig. 2 shows a more elaborate VXO circuit capable of a very wide tuning range, and often, reasonable tuning linearity. It is especially useful for voltage tuning applications, a VCXO.

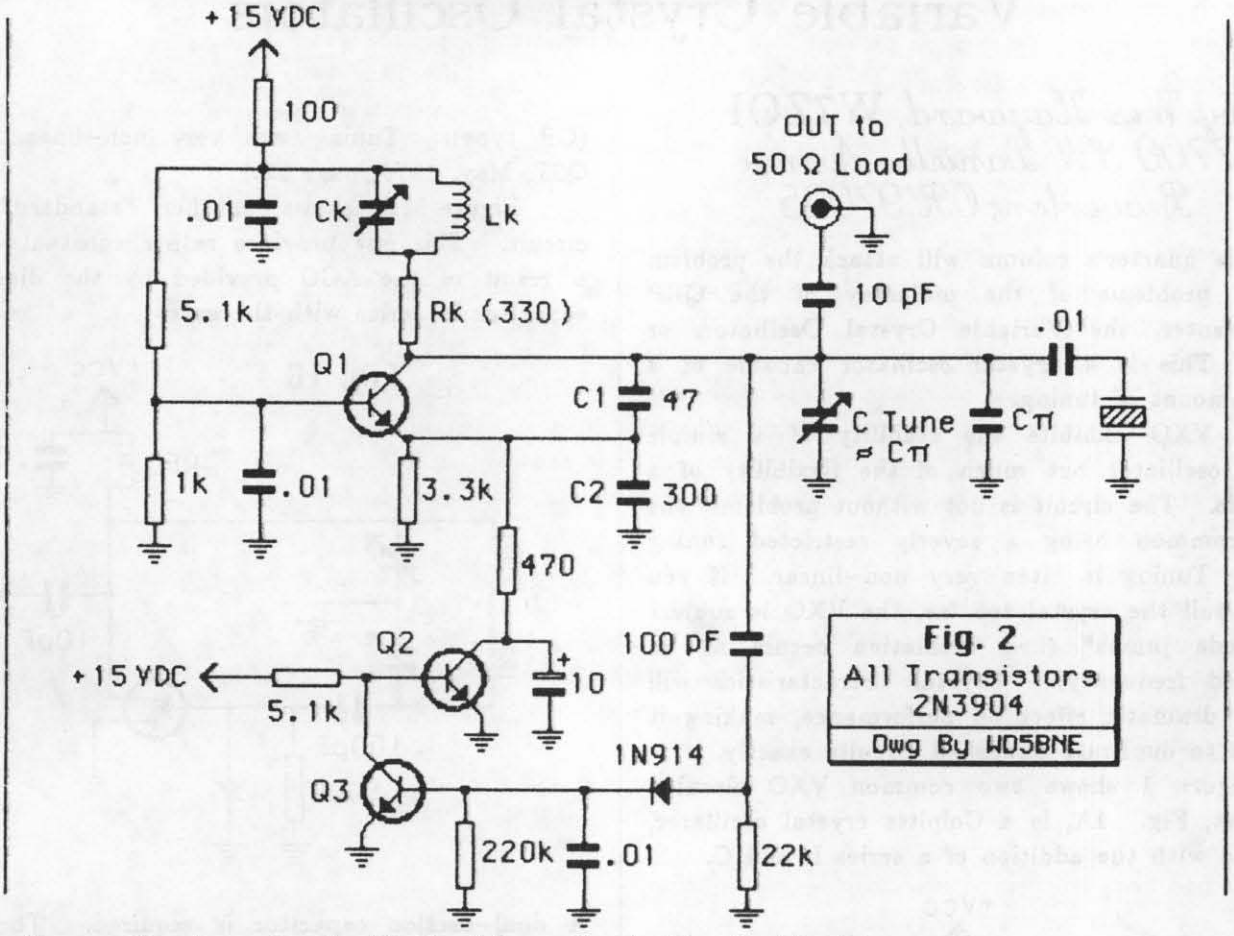


Fig. 2
All Transistors 2N3904
Dwg By WD5BNE

Circuit operation is analyzed with the information in Fig. 3. Fig. 3A shows a basic Colpitts oscillator in "small signal" form with transistor biasing details omitted. The combination of capacitors C1 and C2 and the transistor form a network with a negative resistance. This R is paralleled by a capacitance, the series combination of C1 and C2. The circuitry to the right of the dotted line may be an inductor or a parallel–tuned circuit. The circuit will oscillate if the negative resistance dominates the inductor losses.

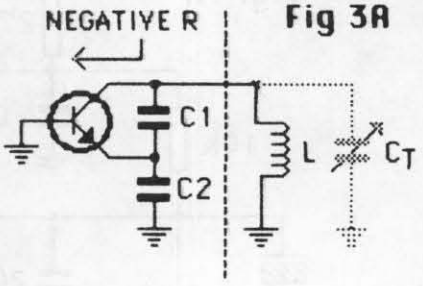


Fig 3A

A parallel resonator is needed for the circuit of Fig. 3A. A crystal has the equivalent circuit of Fig. 3B, a SERIES–tuned circuit, modified slightly by a parallel capacitance. A series resonance may be transformed to behave like a parallel resonance with a quarter wavelength of transmission line. Such a "transformer" is often used in antenna matching.

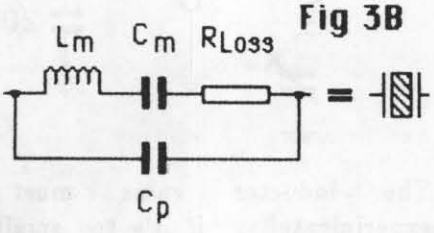


Fig 3B

A quarter–wave line is not the most convenient component for use at HF. The behavior of a line is easily simulated with the symetrical pi network shown in Fig. 3D. The simulation is exact and includes all of the transforming effects of a real transmission line. The composite parallel–tuned circuit is presented in Fig. 3E, with the frequency adjusted by varying C–T.

QRP ARCI NAME BADGES

Get ready for the summer hamfest season, order your QRP ARCI name badge today. The club logo, your call and first name on an attractive white plastic badge with black engraved lettering. Order from Hot Pantograph, George Collier, W0EG, 1816 Third Avenue South, Anoka, MN 55303. $4.50. ppd. Make checks or money orders payable to Hot Pantograph.

–Exp. Corner con't.

A "synthetic" transmission line section is not without problems. It's exactly like the actual transmission line only at one design frequency. Behavior is complicated at other frequencies by other resonances. They can be very close to the desired resonance if the characteristic impedance of the line is chosen to be too high (ZØ of Fig. 3D). We can "kill" the Q of the stray resonance with the addition of a resistor, R–K, and a parallel–tuned circuit, L–K and C–K. This is shown in Fig. 3F. The "killer" tuned circuit is resonant at the desired operating frequency.

The VXO of Fig. 2 should now begin to make some sense. The "killer" network also serves the role of biasing the transistor collector. Output is obtained directly from the collector through a small value capacitor to a 50–ohm termination. The synthetic transmission line is designed for the ZØ = 150 to 250 ohms. The "killer" inductor, L–K, should have a reactance of from 50 to 100 ohms at the oscillation frequency, with C–K chosen for resonance. The circuit also contains a gain–control loop to maintain oscillation and to ensure a constant output. This is required, owing to a tank impedance that varies dramatically over the tuning range.

How well does it play? The circuit of Fig. 2 was built for 14 Mhz. using the same crystal used in the circuits of Fig. 1. With C–T of 10 to 400 pF., a 200 Khz. range was obtained with good stability! The circuit was then rebuilt and aligned for 7 Mhz. operation, again with an available crystal from International Crystal, type GP in an HC–6 holder. More than 100 Khz. of tuning was obtained. The linearity was suitable for direct–conversion transceiver applications.

The range may be controlled to a surprising extent through adjustment of the pi–network capacitor at the crystal end. This behavior has been confirmed with computer modeling.

A word of warning: This is not one of those easily applied "cookbook" circuits we like to garner from the publications. Rather, it's a subtle circuit that depends upon the crystal characteristics, careful design and proper adjustment. However, it can provide rather spectacular performance. This circuit is not new, and is often found in commercial instrumentation. (See the book on Frequency Synthesizers by Manassewitsch, Wiley Interscience, 1976.)

Fig 3C Series Tuned Circuit

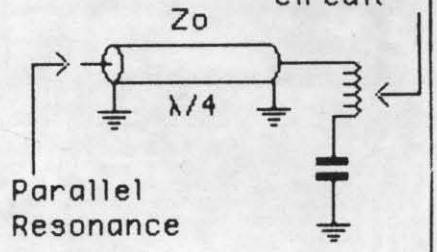
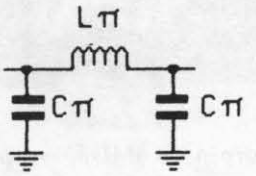


Fig 3D



$X_{C\pi} = X_{L\pi} = Z_o$

Fig 3E

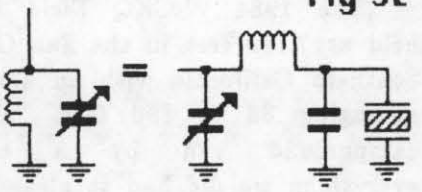
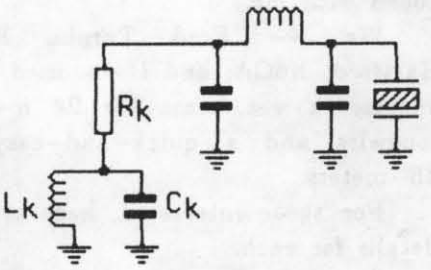


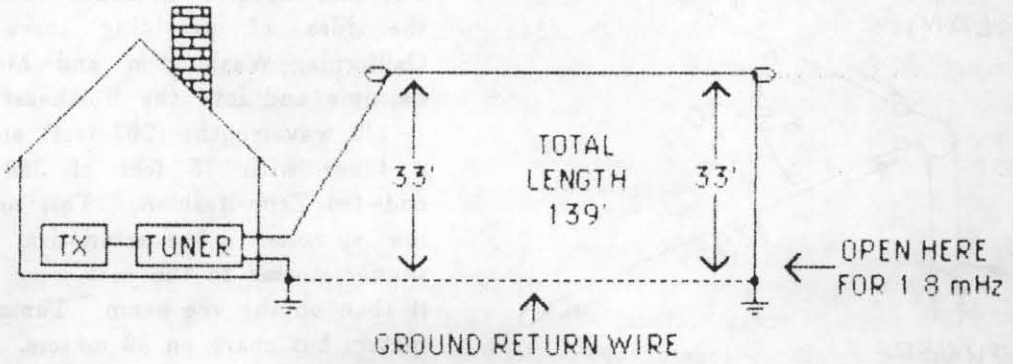
Fig 3F



GROUNDED HALF DELTA LOOP

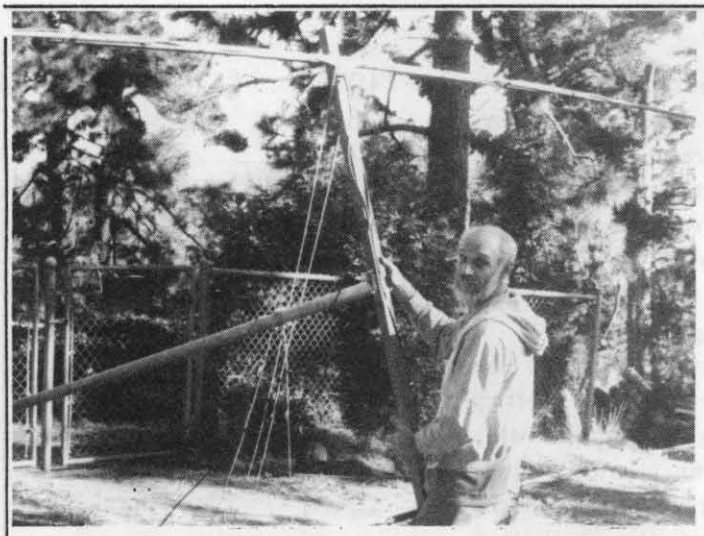
by Mike Michael, **W3TS**
Rt. #1, Box 144, Lykens, PA 17048

The following circuit has been seen before in QST and CQ. It workd very well for its simplicity for all ham bands from 7.0 to 30 Mhz. with a simple antenna tuner. As described, on 1.8 and 3.5 Mhz., it can be operated with no tuner.



W6SKQ FIELD DAY OPERATIONS

by Bob Spidell, W6SKQ
45020 N. Camolin Avenue
Lancaster, California 93534



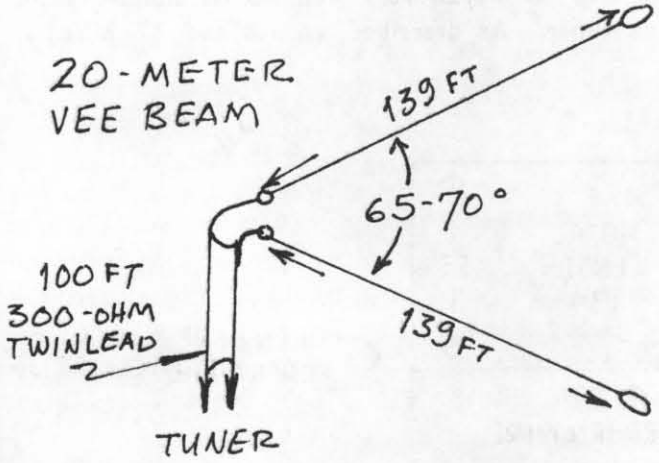
Fred Turpin, K6MDJ, prepares to hoist the ZL Special into place.

The 1984 W6SKQ Field Day operation was held at 7,100 feet in the San Gabriel Mountains of Southern California with an abudance of tall pines averaging 80 to 100 feet. Our site was in a campground run by a concessionaire, and everything we did had to please him and the other campers as well. (We are planning a return trip for 1985 FD, and anyone interested ought to get in touch with me.)

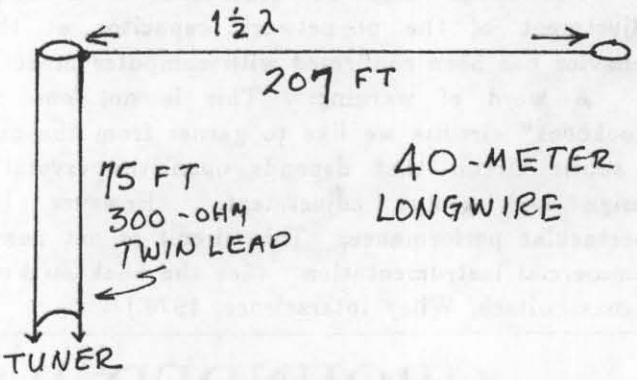
We -- Fred Turpin, K6MDJ; Cameron Hartford, N6GA; and I -- used three antennas to success: a vee beam for 20 meters, a 40-meter longwire and a quick-and-easy ZL Special for 15-meters.

For those interested, here are the construction details for each.

The 20-meter vee beam was two wavelengths on a leg (139 feet) with an apex angle of 65 to 70 degrees and hauled into the pines to a height of 50 feet. It was aimed directly at the point-rich East Coast and had a gain of about 5.5 dB. The vee beam was found to have very low noise characteristics, even though there were thunderstorms some 75 miles to the east, and the tuning was quite broad.



Bob Spidell, W6SKQ, tapes 300-ohm twinlead to element supports. Note coax feedpoint.

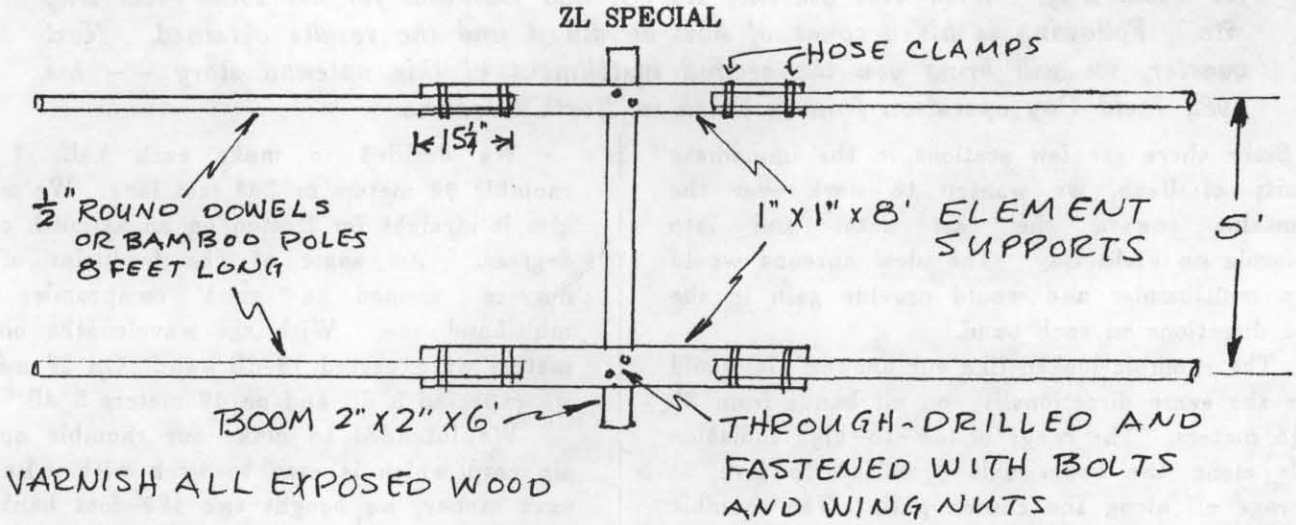


We fed it with about 100 feet of 300-ohm twinlead through a tuner, and the antenna was made of No. 15 Formcar obtained from an electronics surplus store ($15 for 3,000 feet). We loaded this beam on 40 meters for testing purposes, but the 40-meter longwire outperformed it.

The 40-meter longwire also was hoisted to 50 feet and oriented at about 75 to 80 degrees with the idea of providing lobes that would hit California, Washington and Montana during the daytime and into the Northeast at night. It was 1-1/2 wavelengths (207 feet) and was fed through a tuner with 75 feet of 300-ohm twinlead in end-fed Zepp fashion. This antenna also offered low noise characteristics, although the thunderstorms to the east were more noticeable on it than on the vee beam. Tuning was broad on 40 meters but sharp on 80 meters. Con't. next page

–Field Day Con't.

The ZL Special, which was very popular in the 50's but is generally overlooked these days, proved to be a great performer. It has been used for the past five FD's and can be built on site with scrap lumber, RG–59/U coaxial cable and 300–ohm twinlead. Dimensions for the support mechanism are shown in the diagram. It's easiest to cut and assemble the antenna before FD arrives, leaving only the assembly of the support.



The dimensions for 15–meters are: 20 feet, 9 inches for the driven element, 21 feet, 2 inches for the reflector and 5 feet, 2 inches for the phasing line -- all cut from 300–ohm ribbon. Trim an inch of insulation from both ends of the pre–cut pieces. Twist the exposed wires together on one end of the driven element and solder them. Do the same for the other end. Now twist the exposed wires together on one end of the reflector and solder; do the same at the other end of the reflector. Find the center of the driven element and cut one side of the twinlead; do the same with the reflector. Peel back an inch of insulation from the cuts.

Take one end of the phasing line and twist the exposed wires with the exposed wires of the reflector. Fasten one side of the phasing line to one side of the reflector and the remaining side to the other side. Solder both and seal with electrical tape.

Peel back about three inches of insulation from one end of the RG–59/U coax and separate the inner conductor and braid. Now twist together the exposed wire on one side of the driven element center with one side of the phasing line and either the center conductor or the braid of the coax. Solder. Do the same with the remaining wires and solder. Inspect these carefully and then seal to keep out moisture and dirt. NOTE: Make sure the phasing line between the driven element and reflector is twisted once. These elements are fed 180 degrees out of phase. The maximum signal is in the direction of the feed point, and gain is about 5 dB.

Attach the support mechanism and lay the twinlead out on the elements. The elements should be 5 feet apart, so the phasing line might droop slightly. Now attach the twinlead to the wood supports with electrical tape, attach a mast and hoist the thing into place. Rotation is by the "armstrong" method.

SOUTHERN INDIANA PICNIC

The Southern Indiana QRP Group will hold an informal gathering and picnic Sunday, May 4, at the west end of Lake Monroe, some ten miles south of Bloomington.

The affair, set for 1500Z to 2400Z, is planned as a family outing and a chance for QRPers to meet and talk. No formal program is planned, and the event is open to all.

The site is off the Harrodsburg exit from Hwy 37. Talk–in will be on 146.04/64 or 147.78/18 repeaters in Bloomington. A shelter with restrooms is available on the site, and recreational facilities are nearby.

For additional information, send and SASE to: Russ Ryle, N9DHX, P.O. Box 2466, Bloomington, Indiana 47402.

A FIELD DAY ROMBIC

by Jim Stevens, KK7C
2996 Cherokee Lane, Provo, UT 84604

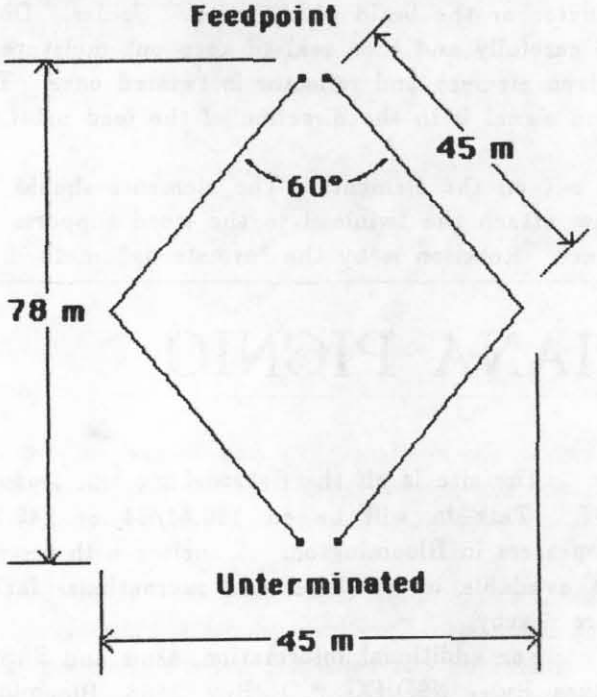
***Technical Editor's Note:** Many of us dream of a "death-ray antenna," especially for Field Day. Well, Jim Stevens, KK7C, had just that for his 1983 Field Day site. Following is his account of how he did it and the results obtained. Next quarter, we will bring you the second installment of this antenna story -- his 1984 Field Day operation from a beach in North Carolina.*

Since there are few stations in the immediate vicinity of Utah, we wanted to work over the mountains toward the east coast and into California on Field Day. The ideal antenna would be a multibander and would provide gain in the same directions on each band.

The rhombic looked like our answer. It would have the same directionality on all bands from 80 to 15 meters. The range of low-to-high radiation angle along the beam axis promised to give us coverage all along the chosen path. The rhombic was also ground independent, and it promised to be uncomplicated to assemble.

We found an orchard in nearby Mapleton about 300 feet square with trees well enough spaced that we could put our antenna up with any orientation. The only drawback was that the rhombic would be only 15 feet above the ground and resting on branches. We decided to find our whether a rhombic would work under those conditions.

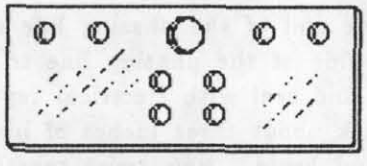
FIGURE 1



We decided to make each half of our rhombic 90 meters or 300 feet long. We would aim it straight for Boston on an azimuth of 60 degrees. An angle at the feedpoint of 60 degrees seemed a good compromise for multiband use. With six wavelengths on 15 meters we expected 10 dB gain. On 20 meters we expected 8 dB and on 40 meters 5 dB.

We intended to make our rhombic out of zip cord which is easy to work with. But to save money, we bought two 100-foot hanks of three-conductor flat rotor cable at Radio Shack for less than $8. We made our rhombic out of that without even measuring. Our feedline was 20 feet of 450-ohm line. We made the feedpoint insulator by drilling eight holes in a scrap of discarded plexiglas.

FIGURE 2



Feedpoint Insulator
Plexiglass

Dave, KA7GIP, paced off 80 meters on a 60-degree compass heading, located a tree, and threw a line over it to support the far end of the antenna. While he did that, his buddy, Helaman Ferguson, and I began soldering together the separated 100-foot segments (2 lengths of 3 conductor into 6 conductors each 100 feet long) using flux and a Bic lighter. Dave and Helaman took a new bearing and proceeded to throw the wire over tree after tree, using nylon cord, a rock and two long poles to clear limbs.

The free ends of the 300-foot antenna halves were threaded through holes in the feedpoint insulator, twisted with the feedline and soldered. I attached a nylon cord and threw it over the tree behind me. We attached cords at the four antenna corners and stretched it into shape. Con't. next page

CONTEST CHAIRMAN NEEDS YOUR HELP

Because of space limitations the contest chairmans report had to be held over until the next Quarterly. He did have two very important points that are listed briefly below.

Certificates for recent contest winners are in the mail. Our apologies for the delay, and assurance that future contest winners will receive their certificates in a timely manner.

Please use the summary scoring sheet when submitting an entry in a QRP ARCI contest. They are available from the contest chairman for an SASE or 1 IRC. Using the summary will help to expedite the scoring process and reduce the possibilty of errors.

–Rhombic Con't.

With the rhombic in the air, we assembled the rest of the station consisting of Helaman's generator, an FT–707 transceiver and its companion tuner. Somehow the 16:1 balun I had intended to use could not be found, so I hooked one side of the feedline to the tuner's coaxial connector with a banana plug and clamped the other side under the chassis ground wing nut. Our tuning indicator was a field strength meter made from a diode and a pocket VOM capacitively to the feedline. The antenna loaded equally well on 80, 40, 20 and 15 meters.

At 1858Z the generator began its muffled rumble, and the 20–meter signal of WC4M came over the speaker with a silky clear background. One call, and we were 599 in Tennessee. We hadn't thought to peak the tuner, and the power meter showed only 3 watts out. Euphoria! We were soon under way.

We started on 20 meters, then worked 15 meters for a long time. Before closing down the station, we jumped back up to 20, then briefly on 40 meters. Finally we tuned up on 80, and made one QSO. Our CQ's generally produced a response and at times brought long runs. But in general, we got a faster QSO by just drifting down 1 kHz. to pick up someone calling QRZ.

On receive we heard more stations than we had ever heard before, and the noise floor was extremely low. The rhombic's pattern was evident while operating. The best signals were heard from the directions and distances the rhombic was expected to favor. On 15 meters, 95 percent of our QSO's were within a beam pattern of 50 degrees forwards and backwards. On 20 meters, 89 percent of the QSO's were within a wedge 70 degrees wide. I didn't have enough QSO's on 40 or 80 meters to measure the pattern. Only 10 percent of the QSO's were with stations located within a 1000–KM. radius. All but five of these were from California.

I had expected QRM from California, but on 15 meters, California stations were weaker by one to three S–units than the more distant Hawaiian stations. They were also weaker on 20 meters, but not by so much. The strongest part of our signal simply skipped over California. In the opposite direction and from St. Louis eastward, however, we had a potent signal.

TABLE 1 – SUMMARY OF OPERATIONS

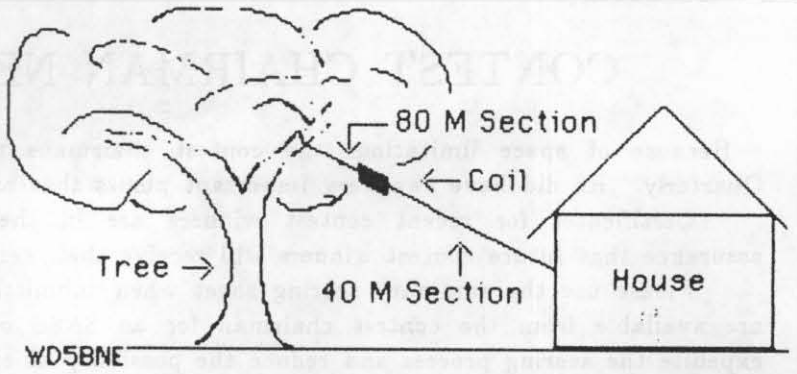
	15 Meters		20 Meters		40Meters	80 Meters	Total
	CW	SSB	CW	SSB	CW	CW	
QSO's	83	16	53	22	6	1	181
TIME (minutes)	301	41	146	57	14	1	560
INTERVAL (min's/QSO)	3.73	2.56	2.75	2.61	2.33	–	3.01
QSO RATE (QSO's/hr.)	16.1	23.4	21.8	23.0	25.8	–	19.9

When the clock struck midnight on Saturday, we closed the station. We had logged only 9 hours and 20 minutes of operation, but we had completed 181 contacts. As we packed up the equipment by the light of the stars, I realized that this was the first time I had ever been heard by nearly everyone I could hear, no matter how much power I was running.

Perhaps we hear so little about rhombics for Field Day because most amateurs think they are difficult to install or to use. Our experiment suggests the contrary. Excellent results were obtained even though optimum design criteria were only approximated. Based on our results, I believe that any QRPer operating Field Day from the central states or from one of the four corners should give serious consideration to trying a rhombic.

THIS SLOPER NEEDS NO TUNER

by Jerry Bartachek, KD0CA
1114 DeForest Street
Iowa City, Iowa 52240

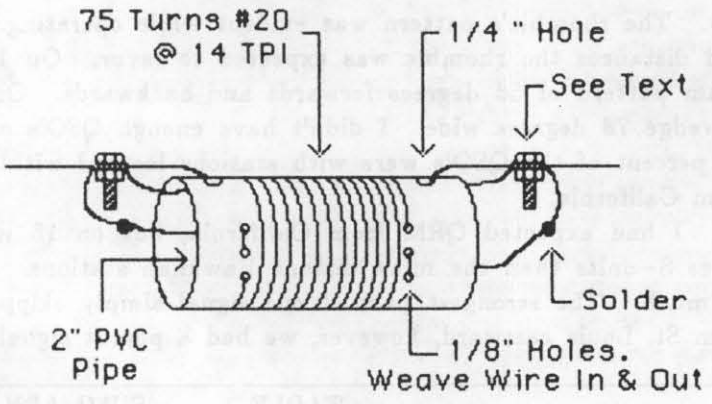


If you do not own a tower but want to erect a sloper, take heart! My ground fed sloper for 80 and 40 meters runs from the back of my house up to a large maple tree. I got the idea from the promotional literature of W9INN antennas. He says you can feed the quarter wave sloper from the end closest to the ground and obtain good results if an adequate ground is used.

Last autumn I thought I'd experiment by throwing a 33 foot insulated wire over a limb of our large maple tree. I brought the feed end into a hole in my house wall 7 feet above ground where my coax cables used to exit. I fed the antenna with FG-8 coax and connected the shield pigtail to a cold water pipe which passed horizontally by the hole. The shield pigtail is clamped to the water pipe with a hose clamp after the pipe is sandpapered clean. The center conductor of the coax is soldered to the antenna wire and is protected from contacting surrounding material.

The wire slopes up on the Northwest end and down on the Southeast end. Directivity is strong off the lower end and Florida. Carribean and South American stations are 3 to 4 S-units stronger with the sloper than with an inverted vee dipole up 26 feet at its apex. Also there is much more vertical polarization with the sloper evidenced by the noise level which is much higher on the sloper than the dipole.

Borrowing another idea from W9INN, I wound a loading coil of 75 turns of #20 bell wire on 2 inch I.D. PVC plumbing pipe and added an end section of about 5 1/2 feet of wire to create an 80/40 meter two band sloper. After much cut and try, I obtained an SWR of 2:1 or less over a 70 kHz. spread on 80 meters with resonance at 3530 kHz. The entire 40 meter band seems to be inside the 2:1 SWR limits. Please note that you should assemble the antenna with about 34 or 35 feet for the inner section of the sloper and trim it for proper resonance on the higher band first. Then you can trim the end section of wire for resonance on the lower band. If your coil has more inductance than the one I made, the 80 meter end section will be shorter at resonance and bandwidth will be narrower. Conversely, if the coil is a bit smaller, the end section will be longer and the bandwidth will be broader.



This antenna seems less directive on 80 than on 40 but still retains the low angle/high noise vertical characteristics. This is the first resonant antenna for 80 meters I've ever owned in 15 years of hamming, so you can imagine my surprise and awe to hear Japanese SSB stations down in our CW band. This is the first DX I've evver heard on 80 meters. Heretofore, my random wires and feedlines-tuned-against-ground only allowed reception of domestic 80 meter stations. Con't. next page

JULY QUARTERLY PREVIEW

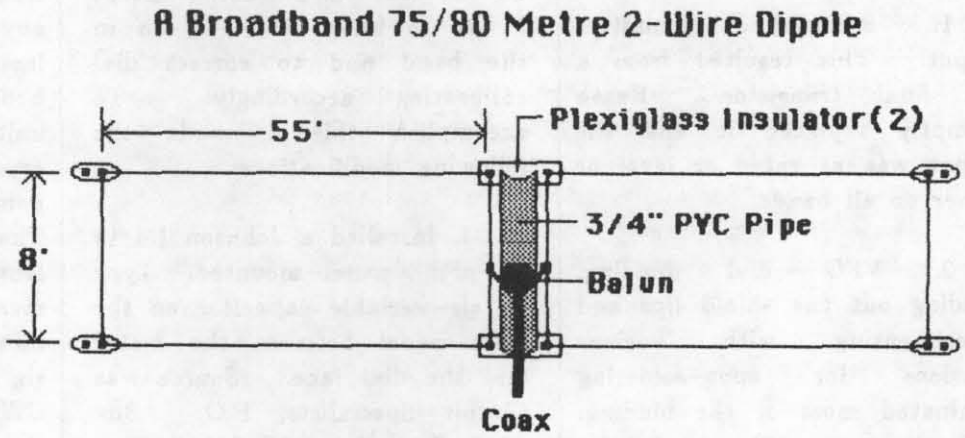
Natural power will be the feature articles in the July, 1985 issue. All information that you have concerning any aspect of natural power applications will be appreciated. Send your contributions to the technical editor, address on page 2.

B R O A D B A N D
75/80 METER 2 WIRE DIPOLE

by Frank Lamb, K4ADI
102 Somerset Drive, Lyman, SC 29365

The antenna described resulted from experimenting with cage dipoles that have been featured in amateur publications over the last several years. Three and four wire cages are mechanical monsters that are difficult to keep in the air. The two wire antenna described is easily constructed and stays in the air very well. Several of the locals use this antenna and have had good luck keeping them in the air.

The antenna has been used as an inverted vee and as a sloper with about the same performance and bandwidth. Two wires are separated horizontally 8 feet and fed through a 1:1 balun with 52 ohm coax. The overall length of the "fat dipole" is only 110 feet, another attractive feature if you are short on space. The performance is good and the bandwidth is amazing.



I cut the center insulators from plexiglass and secured each one at the end of a piece of 3/4 inch PVC with hose clamps. The balun is attached to the PVC in the center and insulated wire is run from it to each wire on the same side of the PVC. At the ends the parallel wires are also connected. I used 18 gauge galvanized wire.

The antenna is broadbanded enough to permit rapid QSY's without having to use a tuner on the 3.5 to 4.0 Mhz. bands. The SWR is no more than 1.6 at band edges.

–Sloper Con't.

If rolling your own seems formidable for this type of antenna, you are in luck. W9INN makes a wide varity of slopers with resonant/reactor coils in them. They come sully assembled and cut to your choice of resonant frequency. They work by loading a length of wire with lumped inductances to establish resonance on the lowest bands. The subsequently higher bands are derived by divorcing the end section(s) via large inductive reactances. An equation to use in designing a 2–band sloper (or dipoles for that matter) can be found in the article, "Designing a Two Band Loaded Vertical antenna", by Philip Rand, W1DBM, in the April, 1984 CQ Magazine. I hope you have as much fun with your new sloper as I've had with mine.

Technical Editor's Note: In his diagram, Jerry makes reference to a Burndy Connector for strain relief at either end of the coil. This type of connector is probably foreign to many of our readers. If you visit your local electrical supply house, you will find a type of compression clamp, usually copper plated brass, that is used for clamping ground wires together. They go by a variety of names, but consist of two halves of the clamp, held together and tightened by a bolt and nut. A verbal description will probably get you what you want, and you will probably want the smallest size they stock.

EXPERIENCES WITH AND MODIFICATIONS TO THE HEATH HW–9

by Dick McIntyre, K4BNI, *611 Coral Drive, Cape Coral, FL 33904*

Like many of you, I could not wait to get my hands on the HW–9, having graduated up through the HW–7 and HW–8 ranks. My kit was fun to build and went together per instructions, but as is inevitable, I did have some problems upon completion:

1. Reduced transmitter output. This resulted from a bad final transistor. Heath promptly replaced it and the output was at rated or level or higher on all bands.

2. VFO dial binding. Bending out the shield lips and experimenting with various locations for spot–soldering eliminated most of the binding. I finally removed the entire shield with no apparent spurious radiation problems. heath confirms the same experience when the shield was removed.

3. Random VFO drift, both quantity and direction. Leaving the rig on constantly did not help. The drift had a mind of its own. Replaced all VFO components as resupplied by Heath.

Tried my own polystyrene capacitors in the VFO circuit and purchased some new Sprague NPO disc ceramic capacitors, but the problem persisted. I concluded either the coil form and/or the slug was the source of the drift. Poured wax on the slug after setting it (Elmers Glue probably would work too). This idea was thanks to a memory–jogger from W1FB. NOTE: Don't seal the slug if you plan the mods described below until the mods are completed. Drift settled down to acceptable limits.

The HW–9 has just about all the features I wanted except I like to know where I am in the band and to correct dial calibration accordingly. To accomplish this I made the following modifications:

1. Installed a Johnson 1.4 to 13–pFd, panel–mounted, Type V, air–variable capacitor on the front panel between the meter and the dial face. (Source was Circuit Specialists, P.O. Box 3047, Scottsdale, AZ 85257, part # 193–0004–001, pg. 31, 1985 catalog.) Carefully remove two plates from the rotor and the stator. I used a hobby razor saw for the job. Unless you have a knob that will fit the small shaft, you will have to build it up to accept a standard 1/4" knob. I used a Radio Shack, blue insert knob which is not only small but attractive with its blue insert. (R.S. part #274–403) Connect the rotor and stator to Point E and GND on the oscillator board and in parallel with C1. Carefully rempve the trimmer from the VFO tuning capacitor, C1. Set your new panel variable to half scale and slightly adjust the slug in the VFO coil, L118, to bring WWV 10 mHz. or your frequency–counter setting of 5.9993 mHz. to correspond with zero on the tuning dial. Your panel variable will now compensate for exact frequency calibration up and down the band.

2. I feel naked without a frequency calibration oscillator in any gear II use, and I have installed one in the HW–9. I bought a Ten–Tec Model 226 unit which uses a 3.2 mHz. crystal dividing down to 25 kHz. points well into the HF range. The unit is – 1 3/4" wide X 3" long X 1" high, and will fit nicely in the HW–9. I mounted mine on the bottom side of the rig in the area just behind the CW–level control. I removed the 6–32 nut adjacent to the audio output coax connector and mounted a threaded metal spacer on the screw from which the nut was removed. The spacer is one inch high and is just right for the calibration oscillator to clear other components. The oscillator PCB is drilled in three places for mounting, and I used the rear hole for the other point of attachment. There I fabricated from PCB a bracket which I glued to the side chassis of the HW–9 and soldered to the oscillator board. Part of this fabrication included two pads to accomodate a 100–ohm, 1/2–watt resistor which drops the 9 volts from the HW–9 to the 7.35 volts used by the oscillator. From this resistor I ran a lead to a panel–mounted,

Con't. next page

QRP ARCI FIRST SUNDAY QSO PARTIES

April 7 – May 5 – June 2

-HW-9 Con't.

miniature toggle switch to control the on/off of the calibration oscillator. I mounted the switch on the left side of the meter balancing the aforementioned variable. Actually both the switch and variable knob look attractive and complement the orginal panel layout. Use caution in locating the holes for these items and drill carefully to avoid scratching the panel and to insure proper balance. Since there is an inner chassis and outer panel, I mounted the variable and switch on the chassis and drilled a corresponding hole through the panel through which the switch and variable shaft protrude. From the toggle switch I picked up 9 volts from the green wire that runs right behind it to P101 on the oscillator board.

3. Miscellaneous mods include replacement of the phono socket for the key with a standard 1/4", open-frame jack. I have not changed the speaker socket yet since I don't use a speaker, but that may be a future mod. Obviously, I do not like phono sockets since I have had problems with them over the years. Another mod for those of you with the PSA-9 power supply is to add another 2200 pF WVDC electrolytic capacitor across C1 in the original unit. this brought the hum level down noticably in my unit. (R.S. part #272-1020)

I don't think I'll put in any more mods, since the rig seems pretty complete as is, but who knows? Correspond if you wish, S.A.S.E. appreciated. Good luck.

1984 NET ACTIVITY SETS RECORD

by Jim Holmes, W6RCP

A record 1,902 check-ins were reported for the club's system of regional and national nets for 1984.

Stations ranged from one to 123 times in their check-ins with the various nets throughout the year.

Fifteen QRPers earned QNI-25 awards and/or gold seals: N7DGZ, W6RCP, W1FMR, WD6DMY, K3TKS, WB2IPX, NJ7M, KV7X, W5LXS, and W6JHQ. The award is given for 25 check-ins to any one net during a year.

The Transcontinental Net (TCN) continued to lead the pack with 533 check-ins for the year, followed by the 40-meter Southwest Net (SWN) and the Northwest Net (NWN at 334.

If anyone has any regional net records prior to 1984, I would like to have copies for the club's permanent records.

SOUTHERN INDIANA CONTEST

The Southern Indiana QRP Group has announced a month-long contest to promote contacts between Indiana hams and those in the rest of the world -- QRP and/or QRP.

It begins at 0001Z May 1 and ends at 2400Z May 31, 1985. The objective is to be the first non-Indiana station to work 500 Indiana contacts or the Indiana station reporting the most QSO's, explained Russ Ryle, N9DHX.

The following rules apply:

-- Single operators only. No cross mode, 30 meter or repeater contacts. Stations may be worked once per band per mode.

-- Awards: Certificates to the top 33 non-Indiana and top 33 Indiana stations. Endorsements for all-SSB, all-CW, all-QRP (five watts or less output) and others, if warranted by entries received. Special certificates will go to any station working all 92 Indiana counties; any Indiana station achieving WAS, WAC, DXCC: and any novice/technician stations reporting more than 33 contacts. Certificates will be awarded to the 33 non-Indiana stations reporting the most QSO's with Indiana stations if fewer than 33 entries reporting 500 contacts are received. Date and time in GMT of last contact will be used to break ties.

-- Entries: Send a copy of log, dupe sheet for more than 200 QSO's, and score sheet are to be sent to the address below. Send a business-size SASE (or IRC's) for return mailing of results and/or certificates, please. Log deadline is June 30, 1985.

An official score sheet (optional) and a checklist of Indiana counties is available for an SASE (IRC's). Send all logs and inquiries to: Russ Ryle, N9DHX, Southern Indiana QRP Group, P.O. Bow 2466, Bloomington, Indiana 47402.

IS IT TIME TO RENEW ?

Check your mailing label. If your membership number is followed by "2/85" this is your last issue of the Quarterly. Use the subscription renewal form inside the back cover.

A MULTIBAND TRAP DIPOLE

by Ed Popp, K5BOT
2212 Deadwood, Austin, TX 78744

In an effort to cut down on the amount of equipment that I take on camping trips, I decided to replace the antenna tuner and roll of wire with a trap dipole. The bands of operation would be the CW portion of 40, 30, 20, and 15 meter bands.

Doug DeMaw's, W1FB, article "Lightweight Trap Antennas – Some Thoughts", (June 1983, QST) was the basis for the design. Doug states that the key to trap design is that the reactance for the traps be approximately 200 ohms although they could be as high as 300 ohms. Since toroids would be used for the inductors, the capacitor values were calculated and selected. The toroids were then wound–to–fit with the appropriate value of inductance.

As an example, for 15 meters, a value of 33 pf has a reactance of 229 ohms at 21.060 MHz., the design frequency. The value of inductance for resonance at this frequency is 1.73 uh.

The inductors were wound on T50–6 cores. These cores are made by Micro–metals and sold by Amidon and Radio Kit, to name a couple. The cores have an "AL" value of 40 as shown in the information sheet from Amidon. Using this value, the number of turns was 20.8 using the formula Turns $= 100\sqrt{1.73/40}$. Since fractional turns are hard to wind, 21 turns were wound using #26 AWG magnet wire. The capacitor, 33 pf., was then connected across the toroid with the leads as short as possible.

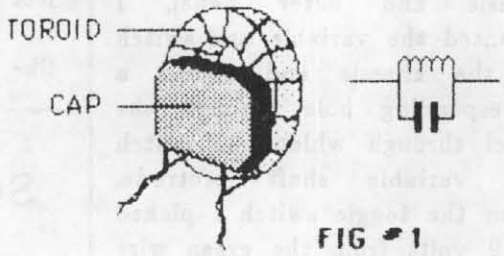


FIG #1

The trap is then tuned to the desired frequency using a grid dip meter and receiver. The resonance point is found with the grid dip meter and the receiver is used to determine the exact frequency of the meter. The turns are then compressed or spread apart to tune the circuit to the desired frequency, as in this case, to 21.060 MHz. Once the trap is tuned to the desired frequency, a liberal coat of "Q" dope is placed on the toroid and capacitor. Since the antenna would be a dipole, tow traps are required for each band. Traps were made with center frequencies of 21.060 MHz, 14.060 MHz, 10.125 MHz and 7.060 MHz.

The housings for the traps were made from 7/8" OD, thick walled PVC pipe. Eight pieces were cut, each 1 1/2 inches long. Then 1/8" holes were drilled through, 1/4" from each end. The purpose of the housings was to provide a little protection and to eliminate the strain on the traps. A PVC "T" coupling is used as a center support and to provide a strain relief for the 50 feet of RG58/U coax feedline.

Using the formula, 2808/freq. MHz., the quarter wavelength for 15 meters was calculated. Two lengths of 22 AWG stranded wire was cut to 134 inches. Using the "T" coupling, the 15 meter section was connected to the feedline. A trap housing was connected to each end without the traps. The antenna was then tuned and pruned to 21.060 MHz. using a noise bridge. Once the pruning was completed, the SWR was checked and found to be about 1.2:1. Then the 15 meter traps were installed.

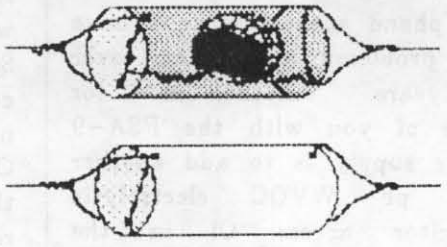


FIG #2

Using the formula again, the length for 20 meters were calculated. From this length of 199.7 inches (15 meter section) was subtracted. Two pieces of 22 AWG stranded wire was cut to 70 inches. One end of each piece was connected to the 15 meter traps. The antenna was again checked for SWR on the 15 meter band. This would show if the traps had been properly tuned to begin with. Since no change could be noted to the 15 meter section, tuning and pruning of the 20 meter section began.

It must be noted that traps will cause the antenna to be shorter for the remaining bands than if individual dipoles had been cut. The total length for the 20 meter section ended up being 48 inches. The 20 meter traps were then installed.

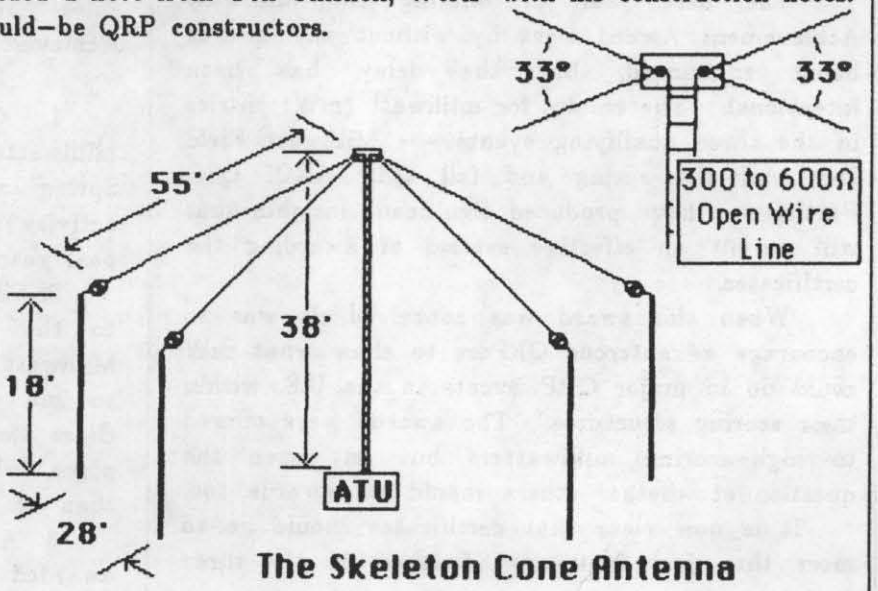
In like manner, the 30 meter section is installed and when completed, the 40 meter section. Once the trap dipole is completed, SWR checks were made on all bands at the design frequency centers. Highest SWR noted was a little over 1.2:1. Total lengths for the trap dipole are shown in Fig. #3.

(Con't. next page)

THE SKELTON CONE ANTENNA

by The Staff and others

This article on the Skeleton Cone is presented because several people have contributed notes about its performance. Last fall I received a letter from Bob Spidell, W6SKQ (#3135). In it, he told of his success with the Skeleton Cone antenna and included a note from Ton Chisnell, W6XF with his construction notes. I will summarize their information for would–be QRP constructors.



The Skeleton Cone Antenna

The Skeleton Cone antenna can be traced back to the RSGB Handbook (3rd Edition, pp. 387–88). and to a 73 Magazine article, "The Skeleton Cone Antenna", from August, 1969, pg. 133, by Eddy Shell, W5ZBC. Upon close observation, it becomes apparent that the basic idea is the well known G5RV multiband dipole. By adding a second element and spreading the ends from 15 to 30 feet apart, a broadband version is created. Tom uses a 600 ohm homebrew feedline consisting of #14 wire spaced 4 inches. Almost any balanced transmission line could be used, but beware of TV twinlead. It is cheap and readily available and for a temporary antenna, like Field Day, would probably work just fine. It can really become a problem in wet weather, though, and should be avoided for a permenant installation.

Bob notes that his is mounted with the ends about 14 feet above ground instead of 18 feet, with no problems. He has worked DX on 40 meters and KL7's on 80. As he says in his letter, "...there is no other antenna for the space I have here, typical city lot, that I would consider using, at least for 80 and 40 meter operation." Bob has a TH6DXX for 20 – 10 meters. I can see why he prefers that to the Skeleton Cone!

That's about it. If you would like more information, like claims for gain on all bands and far away DX worked, check out the referenced quotes above.

–Trap Dipole Con't.

The end result is a trap dipole that covers the entire 30 meter band and covers the first 100 KHz. of the 40, 20, and 15 meter bands. The SWR remains below 1.5:1 over this 100 KHz. It also takes up less space and weighs less than the antenna tuner and roll of wire. Using my modified HW–8, band changing is now a simple push–button affair.

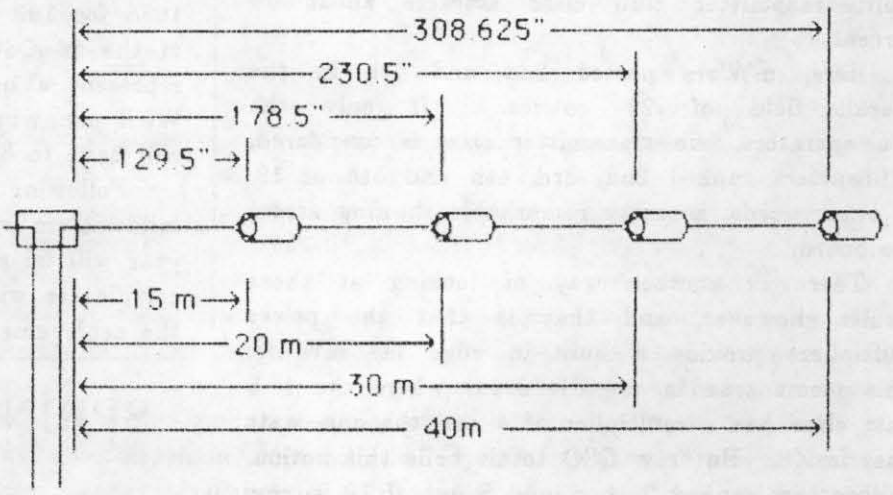


FIG #3

NEW MILLIWATT QRP AWARDS

by Adrian Weiss, WØRSP
83 Surburban Estates
Vermillion, SD 57069

The first year of offering the Milliwatt Achievement Award went by without any awards being announced, but the delay has been intentional. The results for milliwatt (mW) entries in the three qualifying events -- Milliwatt Field Day and the spring and fall QRP ARCI QSO Parties -- have produced significant insights that will permit an effective system of awarding the certificates.

When the award was conceived, it was to encourage adventerous QRPers to show what mW could do in major QRP events in the U.S. within their scoring structures. The awards were offered to high-scoring milliwatters but left open the question of whether others should get awards, too.

It is now clear that certificates should go to more than just first-place finishers in the three contests.

Consider results of the 1984 spring and fall QSO parties: mW entries were 21 of the 111 (19 percent) in the spring and 14 of the 74 (19 percent) in the fall. Seven of the 29 1984 FD entries -- 24 percent -- were mW'ers. In other words, the mW class accounted for about 20 percent in all three contests.

The surprise came in the rankings of the mW entries: They accounted for positions 1, 2, 3, 5 and 9 of the 111 entries in the spring party and 1, 2, 3, 4 and 9 of the 74 in the fall! FD is a bit more complicated, since a multi-operator multi-transmitter club class attracts about 30 percent.

Here, mW'ers posted 2nd and 7th in the overall field of 29 entries. If only the two-operators, one-transmitter class is considered, milliwatters ranked 2nd, 3rd, 4th and 5th of 19. In other words, a pretty remarkable showing across the board.

There is another way of looking at those results, however, and that is that the power multipliers provide a built-in edge for mW'ers. This seems true in the FD event where the 1-5 watt class has a multiplier of 4 and the one-watt class is X8. But raw QSO totals belie this notion. Milliwatters ranked 2, 4, 6 and 8 out of 19 in raw QSO totals, so they're pulling their weight not in terms of power multipliers alone but in the number of contacts as well. The same pattern holds true in the QRP ARCI QSO parties.

It's obvious, then, that mW'ers are making substantial achievements which merit recognition. this will be implemented by a clarification of the rules regarding the number of Milliwatt Achievement Awards to be awarded annually:

1. Certificates will be awarded to any milliwatters scoring in the top five places in the Spring and Fall QSO Parties, assuming that activity remains at roughly the same level as in past years.

2. Since the One-Watt FD Trophy is awarded to the top milliwatter for annual Field Day, Milliwatt Achievement certificates will be awarded to 2nd and 3rd places, provided the One-Watt Class shows 12 or more entries; or only to 2nd place, when entries are more than 6 and fewer than 12.

3. A Milliwatt Achievement certificate will be awarded to any entrant in one of the three qualifying events who shows at least 60 QSO's initiated and completed will 100 milliwatts or less. To be considered for the certificate, the entry must include an indication of the method used to measure the r.f. output of 100 mW or less. Since 100 mW is usually less than the levels for which typical wattmeters provide reasonable accuracy, it is suggested that the wattmeter be cross-calibrated using an attenuator, or that an accurately measurable r.f. output from the transmitter be fed to the antenna via an attenuator.

Note that category (3) is being tried during 1985 for 100 milliwatts and under. The selection of the 60 QSO's is arbitrary and is considered to represent a noteworthy achievement at this point. We'll see what happens -- perhaps the number will have to be increased.

Following the Fall QSO party results, a list of milliwatters who will receive certificated for the year will be published in the QRP Quarterly. The certificates will be appropriately endorsed to show the achievement involved.

SPRING SSB CONTEST
April 20-21
Details on page 4

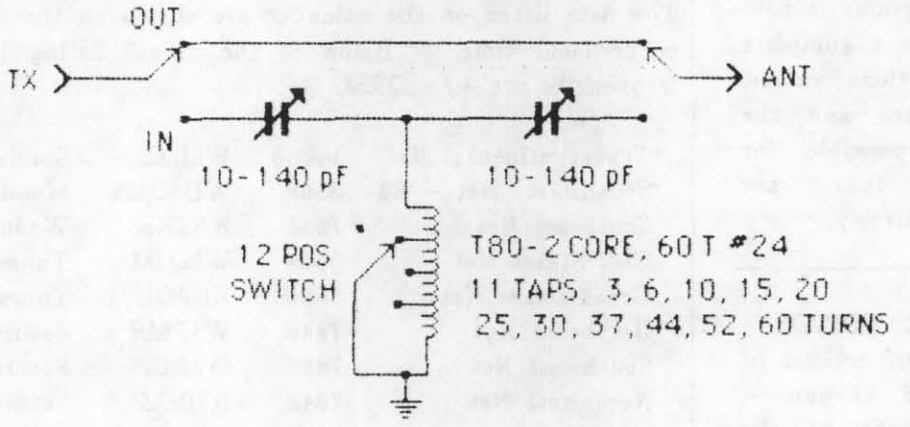
A MINIATURE ANTENNA TUNER FOR 3.5 TO 29 Mhz.

by Mike Michael, W3TS
Rt. #1, Box 144, Lykens, PA 17048

This antenna tuner, received from Mike, W3TS, may be just the thing for the traveling of backpacking QRPer. It uses a few small parts and can be built into a very tiny package.

This circuit will tune a 33" long wire on 3.5 to 29 Mhz. against ground. For hotel or motel portable with an Argonaut, HW–8 or home–brew rig it takes 5 watts output ok. It will also work with other antennas, such as the G5RV, long wires, beams, verticals or the Grounded Half Delta Loop, described above.

This circuit is an unbalanced configuration, but it would be easy to add a small 4:1 ferrite toroidal balun to the output if you wanted to feed balanced feedlines common to antennas like the G5RV.



The trimmer capacitors used in the tuner are small poly–insulated ones with 1/4" diameter by 1/2" long fiber stand–offs epoxied onto the screw drive shaft. The rotary switch used was a small one available at Radio Shack. The DPDT switch is a miniature toggle switch.

There is your sub–miniature tuner. Now who has the perfect micro–miniature bridge to go with it?

QRP ARCI SPONSORING WPX QRP CW TROPHY

QRP ARCI is sponsoring the QRP trophy for the CW section of the 1985 World Wide WPX Contest run by CQ magazine.

The club's board of directors approved sponsorship of the QRP trophy after learning none was offered for the contest, which is set for May 25–26. The Dayton ARC sponsors the QRP trophy for the ssb section of the contest, which was held March 30–31.

The club–sponsored award will be a nine–inch octagonal wood plaque, engraved with the club's name and that of the winner, plus the CQ logo and decorative items, according to Stephen D. Bolia, N6BJQ, director of the CQ WPX contests.

It will be presented to the top–scoring, single–operator, all–band station in the world. Since the contest is staged by and scored by others, the officers and directors of QRP ARCI are not prohibited from entering the contest.

Rules for the contest appear in January CQ and likely will be repeated for the May issue.

QRP ARCI MEMBERSHIP

The initial membership fee of $6 ($7 for DX) covers lifetime membership plus the first four issues of the Quarterly. Membership information is available from the Secretary/Treasurer.

QRP QUARTERLY SUBSCRIPTON RENEWAL

Subscription renewals are $5 ($6 for DX) for four issues. Notice of expiration will be stamped on the cover of your final QRP Quarterly. The subscription renewal date appears on the mailing label following the QRP membership number, i.e. 4174–1/85, means that member number 4174's subscription will expire with the 1st Quarterly (January) in 1985. Renewal and new member applications must be received by the 1st of the month prior to the next months publication to receive that issue, otherwise service will not begin until publication of the next Quarterly.

TECHNICAL ARTICLES

Submit all technical articles to the Technical Editor. They should be typed, double–spaced and all circuit diagrams should be clear and include a complete list of parts and their values. The Technical Editor and the Club are not responsible for testing projects that are published in the Quarterly.

LETTERS TO THE EDITOR

Letters to the Editor, articles of general interest and announcements should be sent to the Editor. Not every letter can be published and the Editor reserves the right to edit letters to conform to space limitations. Photographs of your station, construction projects, antennas, etc. are welcome. Black and white photos are preferred.

Requests for the return of materials submitted for publication must be accompanied by a self–addressed, stamped envelope.

If you write to one of the Officers and request an answer, please include a SASE. Please include your name, call, address and a telephone number on all material submitted for publication and correspondence.

QRP ARCI NET SCHEDULE

The nets listed on the calendar are shown on the day on which they occur local time. Below is the offical listing in UTC. All net frequencies are +/– QRM.

*Transcontinental Net	14060	W5LXS	Sunday	2300 UTC
Southwest Net – 80	3560	WD6DMY	Monday	0400 UTC
Southeast Net	7030	K3TKS	Wednesday	0100 UTC
Gulf States Net	3560	W5QJM	Thursday	0200 UTC
Great Lakes Net	3560	K5VOL	Thursday	0200 UTC
Northeast Net	7040	W1FMR	Saturday	1300 UTC
Southwest Net	7030	W6RCP	Saturday	1600 UTC
Northwest Net	7040	N7DGZ	Saturday	1800 UTC

***Weekends of major contests TCN will meet one hour later.**

QRP ARCI FIRST SUNDAY QSO PARTY

UTC	CW	SSB	NOVICE
1500–1600	14.060	14.285	
1600–1700	21.060	21.385	21.110
1700–1800	28.060	28.885	28.110
1800–1900	7.040*	7.285	7.110
1900–2000	14.060	14.285	
2000–2100	21.060	21.385	21.110
2100–2200	28.060	28.885	28.110
2200–2300	7.040*	7.285	7.110
2300–0000	14.060**	14.285	
0000–0100	7.040*	7.285	7.110
0100–0300	3.560	3.985	3.710

*** Many foreign countries use 7.030 – check both.**
**** Transcontinental Net – Join Us**

LET'S ALL PARTICIPATE IN THE SPRING SSB CONTEST
APRIL 20 & 21, 1985

QRP ARCI HOOTOWL SPRINT
SATURDAY, JUNE 1, 1985 – 0200 UTC to 0800 UTC

EXCHANGE: QRP ARCI members – RST, state/province/country (s/p/c), membership number. Nonmembers – RST, S/P/C, power output.

CONTACTS: Stations may be worked once per band for QSO points. Each member contact counts 5 QSO points regardless of location. Nonmember contacts count 2 QSO points if in same continent. Nonmember contacts count 4 QSO points if in a different continent.

MODE/CALLING METHOD: This is a CW contest. Call "CQ CQ QRP DE (your call sign).

MULTIPLIERS: 4 to 5 watts output X 2; 3 to 4 watts output X 4; 2 to 3 watts output X 6; 1 to 2 watts output X 8; less than 1 watt output X 10; over 5 watts output will be counted as check logs only. Highest power used for any contactt, any band determines power multiplier.

BONUS MULTIPLIIERS: Natural power (solar, wind, hydroelectric, etc., with or without storage) X 2. With storage, storage cells must be charged by the natural power source for at least 8 of the 48 hours preceeding the coontest. Battery power X 1.5. No other power source may be used at any time during the contest.

SUGGESTED FREQUENCIES: 1810, 3560, 7040, 14060, 21060, 28060 and 50360 KHz. Novice and Technicians 3710, 7110, 21110 and 28110 KHz. No 30 meter band contacts will be counted.

SCORING: QSO points (all bands) times total number of S/P/C (give state or province for W/VE, do not count also as countries). An S/P/C may be counted once for multiplier credit on each band where it is worked, times multiplier, times bonus multiplier (if any) equals claimed score. It is strongly urged that all entrants utilize the QRP ARCI Scoring Summary Sheet. Send a large letter size SASE or 1 IRC to the contest chairman for a summary sheet.

LOGS: Separate logs are required for each band utilized and will not be returned. All entrants requesting results please enclose an SASE or 1 IRC with your logs. The decision of the QRP ARCI Contest Chairman is final in case of dispute.

AWARDS: Certificates will be awarded to the highest scorer in each S/P/C with 2nd place awards in S/P/C's with 5 or more entries and third place in S/P/C's with over 10 entries. The contest chairman will also present plaques to the first, second and third place finishers overall.

DEADLINE: Logs must be received by July 1, 1985. Logs received after that date or missing information will be used as check logs.

SUBMIT ALL MATERIAL TO : QRP ARCI Contest Chairman, Gene Smith, KA5NLY, P.O. Box 55010, Little Rock, Arkansas 72225, USA

QRP ARCI MEMBERSHIP APPLICATION/RENEWAL

Please use this form or a reasonable facsimile to renew your subscription, report change of address or call
Send to the Secretary/Treasurer:

William K. Harding, K4AHK 10923 Carters Oak Way, Burke, Virginia 22015

[ ] Renewal for___yr(s) (U.S. $5, DX $6) [ ] Change of Address
[ ] New Member___yr(s) (U.S. $5, DX $6) [ ] Change of Call – New Call:_____

Amount enclosed $____ QRP ARCI #_____ Call _____

Name_____ **Address**_____

City_____ **State**_____ **Postal Code**_____ **Country(if DX)**_____

PLEASE MAKE YOUR CHECK OR MONEY ORDER PAYABLE TO:
QRP Amateur Radio Club, International
* * * * * PLEASE DO NOT SEND CASH * * * * *

QRP ARCI SPRING CONTEST

April 20–21, 1985. Details on page 4 of this issue. Please participate, even if its only for a short time period.

CQ WORLD–WIDE WPX CONTEST

CW May 21–26 from 0000Z to 2400Z. Same rules as those used last year which were published in the January 1985 *CQ*.

Deadline for submitting your CW entry is July 10, 1985. Be sure to indicate CW on the envelope. All logs go to CQ Magazine, WPX Contest, 76 North Broadway, Hicksville, NY 11801.

SOUTH AFRICAN QRP AWARD

This award is available to all QRP operators using a maximum input power to transmitter final stage of 5 watts, or equivalent power. Applicants must have made contact with at least one amateur in each of the branches of the S.A. Radio League which are in existance at the time of the application. Contacts must be made on or after January 1, 1984 and may be made on any amateur band. Contacts may be made on CW, SSB, FM or AM, and the certificate will be suitably inscribed.

Application must be made on the proper application form which is available from the Award Manager and must be accompanied by R1 (One Rand) or equivalent and QSL cards confirming the contacts. The QSL cards must have the name of the branch to which the amateur belongs clearly marked. All stations must have been situated within a radius of 100 kilometers of their branch meeting place at the time of contact.

Send application and fee to: The Awards Manager, Worked All Branches, Algoa Branch, S.A. Radio League, P.O. Box 10050, Linton Grange, Port Elizabeth 6015, South Africa.


Worked All Branches

This is to certify that _____ call sign _____
has established contact with all branches of the
South African Radio League
using a maximum transmitter input power of 5 watts
in mode _____

Worked All Branches QRP, South African Radio League.

QRP ARCI
FIRST SUNDAY QSO PARTIES

April 7, 1985
May 5, 1985
June 2, 1985

See page 19 of this issue for details. Don't forget the TCN Net that is on every Sunday. A complete QRP Net schedule is also on page 19 of this issue.

R.S.G.B LOW POWER CONTEST

April 21, 1985 on 3.5 and 7 MHz. No other details available at this time.

AGCW–DL QRP CW CONTEST

May 1 1985. QRP CW contest, no other details available at this time.

G–QRP CLUB ACTIVITY

The G–QRP Club announces the following schedule for 1985. SSB: May 4–5. CW: September 28–29. CW: December 26 to January 1. The following times (UTC) and frequencies will be used for CW activities:

0900–1100 14060/21060/28060
1100–1300 3560/7030
1300–1400 10106
1400–1700 14060/21060/28060
1700–1900 3560/7030
1900–2100 14060
2100–2300 3560/7030

Following for SSB operation:

0900–1100 14285/21285/28885
1100–1300 3690/7090
1300–1700 14285/21285/28885
1700–1900 3690/7090
1900–2100 14285
2100–2300 3690/7090

In addition to the above, the G–QRP Club has weekly activity periods on Sundays between 1100Z and 1230Z and again from 1400Z to 1530Z on the above frequencies.

This is not a contest, but QRPers are invited to participate and report their activities to: Christopher Page, G4BUE, Alamosa, The Paddocks, Upper Beeding, Steyning, West Sussex, BN4 3JW England.

Details for membership in the G–QRP Club can be obtained from Fred Garratt, G4HOM, 47 Tilsnead Close, Bruics Heath, Birmingham, B14 5LT England.