THE FLASH

Vol. VII #9 April 1987

BIG FISH

This being my last splash, I'll try to make it a big one! From this side of the keyboard, it's been a very successful year for the Mad River Club. Our Sprint teams aren't yet up to speed, but they are running and will improve in time. New high levels of activity have been observed in the DX contests. I predict a very good showing in the ARRL & CQ tests. And, I have it on good authority that MRRC has won the medium club GAVEL for the Sweepstakes in 1986--our first! Congratulations to those who helped make it possible & thanks for making it happen on my shift.

The victory is sweetened by a solid trouncing of the Socity of Midwest Contesters. THEM: 3.1 megapoints. US: 3.6 megapoints. We were never able to agree on a scoring system which would allow their planned Unlimited category entry to compare to our own Medium category, so they have no payoff to make. But, our 36 entries bested their 56 entries! However, in the finest spirit of MRRC sportsmanship, let's congratulate them on winning the Unlimited Club GAVEL. We all won.

About the Hamvention. Wow! What a pain. After a lengthy struggle I succeeded in revising our meeting time. In spite of very well coordinated efforts by N8ET, we were assigned an unacceptable hour, which I attempted to change for quite a while, without success. At 1010 EDT on April 11, I received a call advising me that our MRRC meeting will be at 4:00 PM in Room #7.

Congratulations to our Suite Chairman & Room Coordinator, Chris Kinzel, N8DET. Chris has handled that tough job for the past two years & has done an outstanding job. Dealing with "that hotel" in Dayton, and the Hamvention Committee, is not an easy task. Chris has now taken a job in Jacksonville, FL & will not be at Dayton. All the arrangements are made & we have asked N8CXX to ramrod the suite activities. Please complete the enclosed questionnaire & return it to K8CC who will then communicate your data to John or some other involved person. Sorry to be so vague, but, the situation changes by the minute. Let's all help out & guarantee success.

At this Dayton meeting, we will elect a new BIG FISH & a new Treasurer. KU8E will not stand for re-election due to the pressures of work & college. Be thinking about nominations.... The results of SS will not be known in time to prepare plaques for the winners in each category of our MRRC competition, but rest assured that W8LNO will carry through with this responsibility & that those worthy SS combatants who are co-recipients of the GAVEL will be rewarded for their efforts. GO MAD RIVER!

Dave Pruett, K8CC, has graciously agreed to chair our Dayton meeting. Anyone with an item of business for this meeting should notify Dave ahead of time, or plan to present his/her issue from the floor. K8AQM & his large Michigan friends will be responsible for maintaining order.

By the time you read this, W8LNO's request for a callsign change on Form 610 will be in the hands of the FCC. Future operations will be conducted as AA6?? from the San Diego area. My business partners have seen fit to ask me to move to our office there & I have accepted. The frequent contact with my many FB friends here in 8-land will be sorely missed, but you can count on a big signal from Southern California. Being your BIG FISH has been an experience which I've greatly enjoyed. If the club benefited by my leadership, it's been a well-spent year. My thanks to all of you for your support, friendship & counsel. *73 de 'LNO*

Let me publically thank Joe for his efforts on behalf on MRRC. And wish he & Jane the very best in their move to California. I'll miss them.

It's been a hectic time here in Athens. With a trip to XF4DX. Lots of work on the Dayton slide-show & articles about the trip. Loans. The University eliminating my job at the end of this academic year. Looking for a new job. Wondering where all my Russian QSLs are for 80 & 160 meters. Answering the cards & letters about the CQ article on QSLing. Designing XF4 QSLs. Creating a new layout for The Flash. Working free-lance & putting together a new sample reel of film & video work. I'm looking forward to meeting some new MRRC members at Dayton. I hope many of you can see the XF4 show; this trip was certainly a highlight of my 24 years in ham radio.

I look forward to more articles & information for the newsletter. Please submit technical and/or informational materials which DX & contest-oriented hams might find useful. *73 de 'MAZ*

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NEWS FROM THE CONTEST ADVISORY COMMITTEE

Believe it or not, the ARRL CAC has actually had a few of its recommendations accepted & adopted by the folks at Headquarters. Many of you have seen the questionnaires which circulated last spring & summer from the CAC. Based on responses of the contest community to them, the CAC made a number of recommendations to the Board of Directors & the Awards Committee, as follows:

1) Preserving the present three-tier club competition system but changing the meeting requirements from the current 50% to two meetings per year, to apply to all members. This recommendation has been referred to the Membership Services Committee, which meets April 3rd. (Keep your fingers crossed on this one!)

2) Keeping the ARRL DX Test a world-works-W/VE affair, but, moving CW to one weekend earlier in February. This recommendation was initially adopted but may be reconsidered since it has been brought to the attention of W1XX that it would conflict with a number of long-standing contests--including the Phone Sprint. (For the record, I voted against this)

3) VY1CW becomes a multiplier in the DX Test, but not Sweepstakes.

4) CAC recommended that a QRP category be adopted for SS, & it's been implemented for '87. If you run 5 watts or less, your precedence will be Q.

5) The rule against telephone arrangement of contest QSOs will be dropped for VHF/UHF contests. It was never the intention of the CAC for this rule to apply to these frequencies when it was recommended for adoption in late 1985.

6) CAC's recommendation that multiple single-band entries by one station or one operator be permitted has been rejected pending further study by the CAC. As it now stands, the language contained in this year's DX Contest announcement clearly prohibits this. The Award Committee's contention that permitting multiple single-band entries could lead to such things as a multi-multi becoming several single-band entries after a contest is over has definite merit. At least we now have an unambiguous interpretation of what constitutes a "station." (I'm sitting the fence on this one. Sorry Jeff!)

7) CAC voted against mandating "off-limits" frequencies for contests & disqualifications of "window violators" on 160. In light of the adoption of ARRL band plan, the CAC will reconsider the disqualification issue in 1987.

This summarizes most of what the CAC has been up to for the past year or so. Other than those items held over from last year, we have a pretty empty slate in 1987. If you have any ideas or gripes about the ARRL contest program, please let me hear from you. The CAC can only be effective if active contesters make their views known. *73 de W8FN*

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SCORES

	ARRL DX TEST	
KS8S	1743/328	CW 2 TX Multi
K8AZ	1480/257	CW M/S
W8UA	1191/217	CW s/o
K8CC	848/216	CW s/o
N8CXX	268/101	CW s/o low power
K3JT	341/138	CW s/o
W8LNO	550/176	CW s/o
WD8LLD	787/81	CW 20 mtrs
N8CXX	642/161	SSB s/o
K3JT	215/114	SSB s/o
K8NZ	445/179	SSB s/o low power
WB8JBM	1371/127	SSB 20 mtrs N8DCJ op
N8ATR	40/30	SSB 160 mtrs
KW8N	113/53	SSB 75 mtrs KC8MK op
K3TUP	1926/318	SSB M/S
	WPX	
NE8T	1902/709	N8CXX NE8T N8BTU K8JM KA8MVV ops
KW8N	4029/970	M/M
	SPRINT	
N8CXX	172/33	
	CQ WW 160	
KS8S	772/100	Multi-op

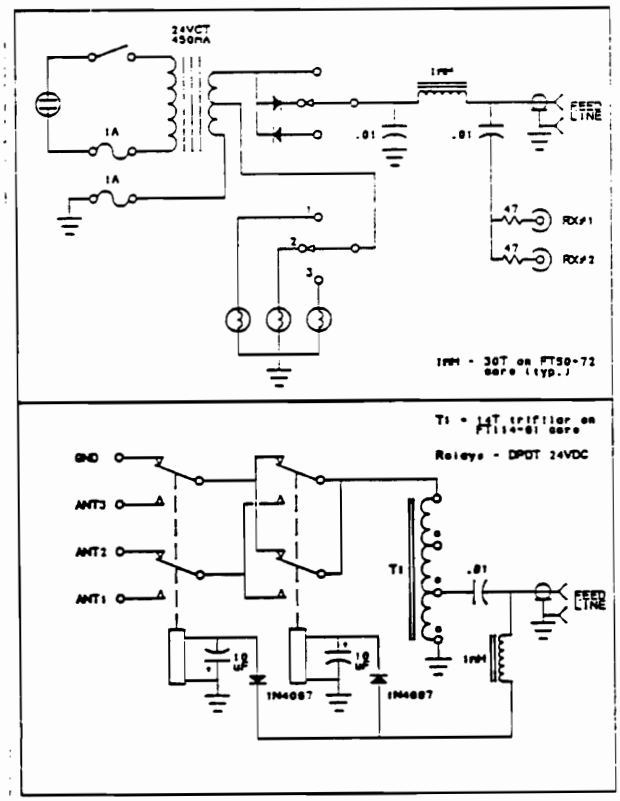
PRACTICAL BEVERAGE HINTS

At this point in the sunspot cycle, the low bands are crucial in any all-band DX contests. After the CQWW last November, it was apparent that improvement in my low band receiving capabilities would be useful, so I chose to pursue a system of beverage receiving antennas for use on 80 & 160. Over the years, I have known many people who have put up beverage antennas. Some of these systems were worthless; others seemed to possess magical receiving abilities. At K8CC, I hoped to achieve the latter status by careful planning & sound engineering.I began with careful research, reading every article I could find in my magazine archives which offered specific information on beverage systems. In addition, I talked to fellow contesters K3LR, N4AR, K5GO, & W8UA, who offered their insights & experiences. My design owes a debt to all of the above, for it enabled me to build a system which worked the first time it was connected.

The first questions for beverage builders are: how long, & how high should the antenna be? It IS possible to make a beverage TOO long, because as the length increases beyond a certain wavelength, the efficiency decreases. The prevailing opinion is that a length of 500 to 1500 feet is best. The shorter length seem to favor 80, while the longer lengths might be better on 160, although W8UA has had good results with a 350 foot beverage on 160. Height seems to be more a matter of available supports than anything else. Common sense dictates that the antenna be high enough to walk under, up to about 10 feet. At K8CC, the antennas are about 500 feet long, constrained by available space in the EU & SA directions. They are supported by trees & underbrush, & are about six to eight feet off the ground.

Beverages exhibit feedpoint impedances of approximately 500-600 ohms, the exact value depending on height, soil conductivity, etc. Direct feed with coax is possible, but, there will be around 20 db of signal loss due to the impedance mismatch. Matching the antenna to the feedline can be done with a tuned network (Pi or L, for instance), which limits the antenna to the band for which the network is tuned. A more useful method is an untuned auto-transformer, allowing the beverage to be used on several bands. However, W8UA's first auto-transformer, wound on a small receiving-type toroid, would only work down to 40 meters. He later re-wound it on a large ferrite toroid, liked those used in KW baluns, which made his beverage come alive. Armed with this clue, I set out in search of a more economical & compact alternative, & in the process I learned a little about auto-transformers & ferrous cores.

Auto-transformers work due to the mutual inductance between the primary part of the winding & the secondary part. To achieve this, we use a coil form with high PERMEABILITY, & by winding the coil with a quad-filar or tri-filar winding. Powdered-iron cores typically have insufficient permeability to work on 160. Look for a ferrite toroid with a permeability of 125 or higher (61 mix materials) & which is physically large enough to allow sufficient windings on the core. I ordered an FT114-61 core from Radiokit, which has an ID of .748 inches. A tri-filar wound auto-transformer has a 9:1 impedance ratio, which nicely matches my 75 ohm RG59 feedline to a 600 ohm antenna. To make the transformer, I used some 4-conductor ribbon cable (Radio Shack **278-757) from which I stripped off one conductor. This solid-wire ribbon cable made winding the 14 tri-filar turns a snap., while the color-coded wires made hooking the windings together in correct polarity easy. Eg: the end of the first winding is connected to the beginning of the second, & the end of the second is connected to the beginning of the third. The beverage is connected to the end of winding three, with the low tap at the junction of winding one and two (See diagram).



After winding your transformer, it's a good idea to guarantee it will work on the bands of interest--before installation. The best way to check is with a noise bridge. (I recommend you buy one, or cultivate the friendship of someone who owns one.) Connect a 560 or 620 ohm resistor from the beverage end of the auto-transformer to ground, & connect the UNKNOWN port of the bridge from the feed tap to ground. The bridge should show a good null at an impedance which corresponds to a 9:1 transformation from the load resistor on the output. If the bridge shows a low impedance (less than 50-75 ohms), then either your toroid has insufficient permeability or you need more turns on the coil. (Even with the good cores, the ON4UN design in his 80 Meter DX Handbook worked only on 80, but it only had five windings in the coil. My design appears good with the bridge from 160 through 40, & has proven itself in field tests.)

Now that you have an antenna 500 to 1500 feet long, & a matching transformer, you are all set for some low band DXing, almost. It is very important to provide a ground at the beverage feedpoint for your feedline & matching transformer. A ground rod helps, but what you really need are radials. These need NOT be a full 1/4-wavelength. Experience has shown that a few 15 to 20 foot radials are sufficient. (I used three 66 foot pieces of wire left over from an old 80 meter vertical, splicing two together for a single 160 radial & using the other as-is. Granted, this was the day of the ARRL DX CW test & I was pressed for time, but it does work. Undoubtedly, there is room for improvement.) If you choose to make your beverages uni-directional by terminating the far end with a 560-620 ohm resistor to ground, add a similar number of radials at that end also to make the termination work correctly.

Now you have an antenna, a matching transformer, & a ground system--all the requirements of a beverage receiving antenna. At K8CC, since all my beverages were to be fed at a common point, I decided to use relays to remotely select the desired antenna. The control sytem I used is shown in the lower diagram. The top diagram is the schematic for the control box at the rig, which allows the operator to select one of the three beverages: NE, S, W. The three position switch directs AC, positive DC or negative DC to be superimposed upon the feedline through the 1 mH RF choke. This system eliminates the need for a separate control cable. A .01 uF capacitor keeps received RF out of the power supply, & the other .01 uF capacitor isolates the control voltage while coupling the RX onto the feedline. The 47 ohm resistors are a crude way to allow two receivers to share the beverage without one loadng down the other (an RF splitter would be a better solution; one that will be explored later). One fuse protects the power supply in case the coax should accidently be shorted (in which case the indicator lights wouldn't work, alerting the operator). The lower diagram is the remote switching box which contains the matching transformer, antenna selection relays & supporting components. The relays are general purpose 24 VDC DPDT types. (Potter & Brumfield KAA11DG suitable)

In position #1, the control voltage is AC which causes both relays to pull in. In position #2, the control voltage is positive, which causes the right relay to pull in. In position #3, the control voltage is negative DC, which causes the left relay to pull in. When the control voltage is off, both relays are open, grounding the feedline. The .01 uF cap & the 1 mH RF choke couple the auto-transformer to the feedline while isolating the control voltage to the relays. The 10 uF electrolytics act as filters for the control voltages, but may not be necessary in every case.
Construction hints: Beverages are prone to collecting static electricity, to the point that N4AR says he has burned open #28 wire in the matching transformer. The ribbon cable used here is PVC insulated #24, which should hold up well. The relays I used have 10 amp contacts & are wired to minimize lead lengths. All diodes are 1000 PIV @ 2.5 amps--overkill, yet hardly more expensive than the little 50 PIV ones. And they should be more resistant to static discharges. The 1 mH RF chokes are 30 turns of #28 on FT50-72 cores. I made my own chokes because 1 mH chokes which can handle 250 mA of relay current are not common, & it was a cheap solution. RG59 feedline is inexpensive, available in a double-shielded version, & the F connectors used in CATV work make good, inexpensive connections possible. And these connectors are easily weather-proofed.

How's it work? For the '87 ARRL DX Test, only unterminated EU & W antennas were installed. On CW, the system worked good on 160, & very good on 80. It also proved valuable on 40, while running EU with a 2L fixed quad for transmit. On SSB, we seemed to hear as well or better than other area contesters, working EA9, VK & ZL on 160. If nothing else, having beverages for EU & the Pacific spoiled us for NOT having one for SA, but, that's a summer project.... *73 de K8CC*

I agree with the outline Dave presented here; it's very similar to what we put together at N4ZC, except I used the Heath switchbox. Another point to consider is his reference to his use of archival materials--before beginning this project. I strongly suggest that you keep such files. I know storage is often a problem, but, good bibliographic references can save you countless hours. My largest file is "Antennas." Let's see similar articles like this for *The Flash*.

I 'm interested in your comments on the new "look" for *The Flash* I'm also looking for articles and/or pieces to publish--things which other DX & contests ops might find useful. It doesn't have to be long or technical or incredibly well polished. The journal is YOUR vehicle for editorial comments, too, so submit what's on your mind. Please.

Best regards de 'MAZ