Scuttlebutt

February 2011 **Issue 207**

YCCC Elections at April Meeting!

Captain's Cabin

As we know, the snow, ice and winds took a small toll on our February meeting date. The officers decided to cancel the meeting and look toward the April meeting to get caught up on many activities in the YCCC. This includes Elections and Jim, K1IR is heading up the nominating committee to insure a good group driving our club forward. Recent changes in my life are dictating a change for this writer, your president for the past several years. Jim will be reaching out to the membership for suggestions and nominees for my office and perhaps others that have served us so well for so long.

We have an Awards Program now and details are described elsewhere in this issue. Dale, AA1QD was gracious enough to put some time into the development of this program and I think he has done a tremendous job. Of course it will take a group within the club to make it successful, and we all look forward to that support.

Hey team, we have a big time contest fast approaching – the ARRL DX Competition with CW up first starting February 18 at 7 PM local time through the 20th. You DO NOT want to miss this weekend nor the SSB weekend, March 5 & 6. We need everyone to make an effort, a big one or a small one but we NEED EVERYONE on for this. We won the unlimited club competition last year and I am expecting a similar result this year. So get the final tweaks done to the station and check everything in advance so you encounter no surprises (hate that!).

Next meeting is planned for either the 1st or 2nd weekend in April at the Sturbridge Host Hotel (check the web site for the details and any changes). Good luck everyone in the ARRL test, plan lots of chair time, have fun, max out your station and oh yeah, have some fun!

73, Mark, K1RX

One more point: The April meeting is expected to have some great presentations on some new receive antenna designs and a potential for a club project – stay tuned!

Yankee Clipper Contest Club

President (603) 778-1222	Mark Pride, K1RX President@YCCC.org
Vice President	Richard Feola, W1STT VicePresident@YCCC.org
Activities Manager	Mark Watson, W1MAW mark@w1maw.com
Secretary	George Harlem, W1EBI Secretary@YCCC.org
Treasurer	Ed Parish, K1EP Treasurer@YCCC.org
Scuttlebutt Editor (413) 593-6554	Steve Rodowicz, N1SR Editor@YCCC.org
Scuttlebutt Publisher	Ken Miller , WB1DX Publisher@YCCC.org
Webmaster (315) 829-5291	Mike Gilmer. N2MG Webmaster@YCCC.org
Scorekeeper (978) 443-3603	Dave Hoaglin, K1HT Scores@YCCC.org
W1 QSL Bureau Manager	Art Holmes, W1RZF W1QSL@YCCC.ORG
Technical Assistance Manager	Dave Jordan, K1NQ YCCCTA@YCCC.ORG
New Members Manager	S. Khrystyne Keane, K1SFA K1SFA@ARRL.ORG

Area Managers

ME	Mike Russo, K1EU	(207) 883-9524	k1eu@maine.rr.com
ENH	Jerry Muller, K0TV	----------	k0tv@arrl.net
WNH/SVT	**OPEN**	----------	----------
NE MA (978)	Scott Andersen, NE1RD	(978) 263-9617	bsandersen@mac.com
SE MA (508)	Greg Cronin, W1KM	(508) 428-4205	w1km@capecod.net
Boston (617/781)	Joe Fitzgerald, KM1P	(617) 325-6767	jfitzgerald@alum.wpi.edu
WMA (413)	Tom Homewood, W1TO	(413) 743-7342	w1to@arrl.net
CT (860)	Dick Pechie, KB1H	----------	kb1h@arrl.net
CT (203)	Dave Arruzza, W1CTN	----------	Darruzza@adelphia.net
	& Mike Loukides, W1JQ	(203) 458-2545	MikeL@oreilly.com
RI (401)	Nat Henrickson, NG1Z	(401) ----------	ng1z@nsradio.org
NNY	**OPEN**	----------	----------
NYC/LI (718)	Tom Carrubba, KA2D	(631) 422-9594	ka2d@arrl.net
SNY/NJ/PA (914)	Hank Kiernan, KF2O	(914) 235-4940	hankkier@aol.com
NVT (802)	Al Frugoli, KE1FO	(802) 893-8388	ke1fo@arrl.net

The editorial deadline for the Scuttlebutt is the 10th of every odd month.

Flotsam & Jetsam

Barnacle Jack (BJ) Schuster, W1WEF **w1wef@arrl.net**

Ahoy Maties!

I hope that by the time you're reading this we've returned to Global Warming and the ice is out. I just fired up the rig and with the antennas coated with ice and high SWR. No warming is forecast before BJ's favorite contest this weekend, the CW NA Sprint.

We just returned from a Dxpedition to 10 Caribbean Entities...but I didn't work a single club member...probably because I didn't have a rig. I recall W1JR telling me he once brought a handheld FT817 (think that was it) on a cruise with a whip antenna and Joe made one contact. If it wasn't for a back problem, I would have figured a way to stay in Fl or stow away on another cruise ship, rather than come home to 4 feet of snow. There was a time I would have been overjoyed with 4 feet of snow in my gungho skiing days, but no more.

Speaking of getting older, you may recall I set a goal for myself last year to operate in 58 contests in my 58th year of ham radio. I had to scratch for the last few, but my call made it into logs for 58 different contests.

In the last FJ column, I mentioned that Vin, K1RM covered his antenna traps with cloth screening. Vin corrected me...it was fibreglass mesh.

Last month Vin had a coax problem which he isolated to a point in the coax in under ground conduit. It turned out the length of new coax he had on hand was too short to make it all the way, and the weather window was too short to wait, so he made a splice with PL259's and a barrel that landed in the middle of the conduit. The challenge was to seal it well because despite drain holes in the conduit it could be under water at times. Vin discovered that Home Depot sells a variety of shrink tubing made by Tyco/Raychem with a liner that is intended to seal underwater cable. They had one perfect for a coax splice.

One of the highlights of our cruise this year was a day spent with Peter Cross, 8P9NX on board his sailboat in Barbados. The day started out rainy when he picked us up, but as we arrived at his slip the sun came out and it was a perfect day. Peter retired to Barbados to escape winters after retiring from Mayo Clinic in Minnesota.

Ham radio (with sunspots) shrinks the world we live in, but we had a couple small world experiences on our cruise to reinforce how small it really is. We were on the biggest cruise ship in the world our first week, Oasis of the Seas, with 6300 passengers plus 2150 crew. I should mention we loved the ship...feel free to ask. At breakfast one day in the main dining room, I overheard someone a couple tables away mention Springfield Ma. to the couple sitting between us and them. The next couple down the line overheard them too, and said they were from Springfield. I had to join in, and said “Tech High Class of '55”. The couple three tables away said “That's our class”! It turned out they were not only classmates, it was my college roommate who I had no contact with for 50 years! Small world?

Back to ham radio. Our next two weeks were on Celebrity Constellation. Standing in line waiting for my poached eggs, a voice behind me said “Is that you Jack?” It was K2VUI who it turned out was on that cruise for the seventh year in a row!

Good Luck to all in ARRL DX.

Hopefully we'll be thawed out by then.

73,
Barnacle JACK - W1WEF

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January’s Contest Tip – de K1AR

When using SSB close to a band edge, it is important to keep all of your signal inside the band. The frequency displayed by your radio is the *carrier* frequency, so your sidebands extend above (USB) or below (LSB) that frequency. How far do they extend? The FCC considers an SSB signal's bandwidth to be between the points at which the sidebands are 26 dB below the signal's average power. For contest-grade signals, that is anywhere from 2.5 to 3 kHz - assuming that your signal is clean and not distorted, which increases bandwidth. So let's just say it's safe to assume you have a 3 kHz-wide signal and should stay 3 kHz above the band edge on LSB and 3 kHz below the band edge on USB. For example, 14.347 kHz and 7.128 kHz would be the highest and lowest displayed frequencies Extra class operators should use on 20 and 40 meter phone. And DX stations - please call for US stations inside our bands if you want to get the highest rate!

Taking Stock of Scores

Dave Hoaglin, K1HT

This article takes the place of the presentation that Dave would have made at the February meeting.

2010 ARRL DX

In February and March our main events are the CW and Phone weekends of the ARRL International DX Contest. Last year our efforts were rewarded with a comfortable win over FRC, 234,062,475 to 191,205,708. Our margin of victory was smaller than I expected from the claimed scores, and some aspects of the difference may help us to do better this year.

My claimed totals for YCCC and the claimed totals from the FRC Newsletter are shown in the table.

2009 ARRL International DX Contest

		Score	Entries
YCCC claimed			
	CW	165,307,073	101
	Phone	82,889,156	76
	Total	**248,196,229**	**177**
FRC claimed			
	CW	89,559,861	49
	Phone	77,677,051	57
	Total	**167,236,912**	**106**
Published (ARRL results database)			
YCCC		***234,062,475***	***203***
FRC		***191,205,708***	***139***

Our published total is some 14 million points lower than our claimed total, even though it is based on more entries (203 vs. 177). Surprisingly, FRC's published total is 24 million points higher than their claimed total. Their number of entries went from 106 to 139. The 33 additional entries (net) included some large CW scores, which didn't make it into their March newsletter.

The ARRL's database of contest results makes it straightforward to account for the difference in the number of entries. (The calculations for the score totals have to take into account the changes in the individual scores from claimed to final. Those will have to wait until later.) The table below shows the results for YCCC.

The explanations of the three intermediate categories are instructive:

Not in results database. If a claimed score that I was counting isn't in the ARRL results database, the most common reasons that are the log was not submitted or was submitted without Yankee Clipper Contest Club on the CLUB line. If the log doesn't mention YCCC, you can be sure that it won't count toward the Club's total!

In results database and eligible, but not reported to K1HT. I keep asking that members who do not post their claimed scores on the YCCC Reflector or the 3830 Reflector report them to scores@yccc.org, but a number still do not. These entries sent in their logs, and they were eligible, so the scores count for YCCC, but not knowing about them makes it hard for me to produce an accurate estimate of our claimed total.

Relation of claimed and final YCCC entries, 2010 ARRL International DX Contest

	CW	Phone	Total
In K1HT's tally	101	76	177
Not in results database	–3	–7	–10
In results database and eligible, but not reported to K1HT	+14	+19	+33
In results database but not eligible	+1	+2	+3
Number in results database	113	90	203

In results database but not eligible. This category is a mixture. An entry goes here when a former member who is in arrears on dues (and hence not on the eligibility list) lists the Club in the log. Also, each year a few operators who have no connection with YCCC list the Club in their logs. Thus, even if the operator is not on our eligibility list, the score may be included in our total. (We submit the list, but it's not clear how often it is actually used.) Another, less common, possibility is that the log for a multi-op entry lists the Club, but fewer than the required 50% of the operators are eligible members. All three of these reasons have occurred in recent years. If scores that we were not entitled to affected the standings, we would disclaim those scores. Fortunately, this has not happened.

If all this is a bit technical, the summary messages are not. Please make sure that you put Yankee Clipper Contest Club in your log and submit it before the deadline, and at least report your claimed score to scores@yccc.org.

2010 CQWW DX

At the time of the December meeting my information on our claimed scores for the CW contest was far from complete, and the December FRC Newsletter, which contained their list of claimed scores for SSB, was not yet available. I now have a better picture of where the two clubs stand.

The YCCC totals take into account the claimed scores in the lists of logs submitted, on the cqww.com website. The FRC total for SSB is my rough estimate, based on the list in their December newsletter, and the FRC total for CW comes from their January newsletter. We spotted FRC a 7-million-point lead on SSB, but the CW weekend turned things around, and we appear to be ahead by 34 million points. I hope we can hold onto that lead!

Totals of claimed scores, 2010 CQWW DX Contest			
		Score	**Entries**
YCCC			
	SSB	145,227,721	121
	CW	264,859,013	110
	Total	410,086,734	231
FRC			
	SSB	152,000,000	67
	CW	224,000,000	71
	Total	376,000,000	138

I'd like to recognize the important contribution that the DXpedition scores make to the YCCC club score.

SSB DXpedition scores			**SSB DXpedition scores**	
FP/KV1J	903,224		GJ2A (K2WR)	1,820,620
KH7CW (K2WR = ¼)	4,682,055		N2WQ/VE3	273,744
PJ4X (K1QX + WA1Z = 2/4)	14,406,910		PI4DX (K1CC = 1/7)	9,192,240
VA1TM (W1EQO)	47,998		VP2E/K1XM	10,857,600
VP9/N1SV	1,785,498		VY2ZM (K1ZM)	9,754,515
VY2ZM (K1ZM)	10,507,222			
Total	**21,617,911**		**Total**	**24,019,656**

Thanks to everyone for a good effort in CQWW, and good luck in ARRL DX!

Dave Hoaglin, K1HT – YCCC Scorekeeper

YCCC Regular Meeting,

12 December 2010 - Sturbridge, MA

The YCCC 2010 Holiday Party was called to order at 1:00 pm by Mark, K1RX, at the Sturbridge Host Hotel. The business meeting followed an enjoyable buffet lunch, partly subsidized by the club, and attended by nearly 50 members. Informal chatter indicated this might be a welcome way to end future years.

Mark reviewed the meeting agenda and initiated a round of self-introductions. George, W1EBI, gave the secretary's report. Active membership rose to 392 following a number of area meetings prior to the CQWW contests, which generated 14 new crew.

Paul, K1XM, gave a summary of his operation as VP2E/K1XM in CQWW CW. Paul logged 11,000 QSO's, including a 221-hour, using 100 watts and a G5RV.

Scorekeeper Dave, K1HT, gave a preview of the club's claimed scores for CQWW:

SSB	145.2M	102 scores / 150 members
CW	228.5M	79 scores / 109 members

Both contests produced substantially higher totals vs. 2009. Dave reminded all to include YCCC on their submitted logs and also to copy scores@yccc.org. Dave raised a question of which club (YCCC or FRC) actually won the Unlimited Club competition in CQWW 2009, as there is some concern about the transparency of how club scores are computed. Did a club member submit a score with a different callsign? Are DXpedition and multi-op logs computed correctly? Dave agreed to add information to the website regarding what to include in the Cabrillo log prior to submission.

Mladen Bogdanov, NU5Y and YT6W, became a new member of YCCC. Mladen was the HST (High Speed Telegraphy) World Champion in 2005 and 2007.

Rich, K1CC, discussed his experience as an op at PI4DX in CQWW CW. Rich joined six other ops, none of whom he knew, at this contest station in a windy location near the North Sea coast. Rich illustrated his talk with photos, showing the station and its three towers, two at 75' and one at 50'.

The final agenda item was a classic Yankee swap, giving those who participated a chance to go home with something they might be able to use—or maybe not.

The meeting was adjourned amid full tummies, post-contest chit-chat, and pre-holiday cheer.

Respectfully submitted,
George Harlem, W1EBI, secretary

YCCC Awards Program

The YCCC is reinvigorating our awards program with the goal of recognizing member contribution and creating an incentive to produce larger scores with the goal, as always, to win major contests in the unlimited club category.

"Part I" of the awards program will recognize high scores and improved scores from stations and operates at all levels in both CQWW and ARRL DX (phone and CW).

To be eligible for an "improvement" award, you must have contributed an official score of at least 50K for the same contest the previous year. Improvement awards would be based on official published results using the following scale:

For previous year scores 50k-100k you must improve by 100%
For previous year scores from 100-250k, you must improve by 50%
For previous year scores from 500k-1meg you must improve by 25%
For previous year scores 1meg-2meg, you must improve by 15%
For previous year scores 2meg + you must improve by 5%

The top 3 most improved (highest percentage of score change) in each category would receive a special award (personalized mug, plaque, something more than just a piece of paper)

"Part II" of the awards program is intended to recognize other efforts by YCCC members that contribute to increasing the club's total scores through special efforts or acts.

Part II of the awards program requires Area Managers to nominate club members for Special Recognition Awards.
These awards, normally given each contest season, are intended to focus on contributions such as:

First Contest
Station improvements
Time in the chair
Furthest travelled guest op
Noteworthy DX operations
Significant operator skill improvement
Exception contribution by a guest op

Each contest season Area Managers should nominate (NLT April 1st) at least one club member for a Special Recognition Award. Nominations must include a justification that will be used by the club officers to rank the nominees' efforts.

Nominations are to be submitted by email to the awards committee. Club officers will assign a relative ranking of the nominations and assign a cutoff point where any obvious break in the level of significance dictates.

These awards are not intended to create a competition between areas and, as such, Area Managers should make recommendations to other Area Managers when they know of a member outside of their area worthy of nomination. Furthermore, individual club members are encouraged to make recommendations to their Area Managers.

Nominations should not be limited to the above examples but should include any special effort or act of a member that directly or indirectly helps the club improve our aggregate score.

Email address for the Awards Committee: mark@w1maw.com

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Elements of SO2R featuring Randy Thompson, K5ZD

Download the 270M YCCC SO2R Video at: http://www.cape-vision.com/wayg/yccc/SO2R-V2.mpg

Or, if you'd prefer a more manageable download, it's available in segments on YouTube starting at:

http://www.youtube.com/user/Geoffrey7b#p/a/u/0/kHCveAeju_A

Thanks to Geoffrey Way, KA1IOR

Becoming an Improved Contest Operator

John Dorr - K1AR

Let's be honest with ourselves and admit that nothing improves a contest score more than good old-fashioned experience and outstanding station hardware. Despite that reality, there is still hope for those of us who want to improve. Many of the ways we can enhance our results have nothing to do with the size of our antennas or the number of years we have been contesting. Hopefully, you will gain something from this month's suggestions.

I have broken down my thoughts into several categories that include preparation, physical considerations, operating, station design, food/drink, and other. As you read on, consider your own tricks that have been picked up over the years. At the risk of letting a few secrets out (even though we know there really aren't any!), your insight may help your fellow contester—if you only share!

Preparation

Being properly prepared for a contest is the single most important contributor to improving your contest score. Successful marathon runners don't just show up for their races. Rather, they prepare for months and years. A contest is not unlike a marathon. Although everyone isn't a winner, successful participants excel based on their mental AND physical preparation.

The improving contester can:

* Prepare so that all you need to do at the beginning is to sit down and operate.
* Understand propagation before and during the contest.
* Work the bands vigorously during the week before the contest to understand who's on and their game plans.

Review Internet summaries of same.

* Have a plan for spare equipment (including PCs) if something fails during the contest.
* Plan the contest as if you were attempting to run the Boston Marathon.
* Use two alarm clocks set 5 mins apart as a backup during rest periods, especially if you are prone to oversleeping.
* Use alarms that are battery powered to avoid the impact from power disruptions.
* Have a good understanding of last year's efforts, especially where you made good band decisions.
* Set goals for yourself and try to exceed them—not everyone wins!
* Excel at band changing in your station.
* Know the rules inside and out (e.g., ten minute rule, multiplier credits, etc.).
* Practice various operating scenarios with your radio (setting up a "quick" split on 80M, doing an A=B with your VFOs to tell a guy the frequency is busy, etc.).

Physical

There are few specialties in amateur radio more physically grueling than slugging it out for 48 hours in a major DX contest. Serious contesters don't take physical preparation lightly and consider this aspect to be as important as the station itself. For example:

* Be sure to get a good nap on Friday afternoon.
* Try operating while standing for short stretches during the contest.
* Don't be afraid to take short breaks. Try going for a 5-minute walk to clear your head.
* Wear loose/comfortable clothes. Dress enough to stay warm NOT hot.
* Change into fresh clothes periodically.
* If practical, open the windows from time to time.
* Take one or more showers during the weekend.

Operating

While there is some merit to the concept that operating ability is partly natural, the truth is that the majority of good operators have learned their skills through experience. Operating ability is more than being able to copy the information you are being asked to receive. It's also a function of aggressiveness and operating with common sense. For example:

* Don't listen to/worry about your competition.
* Transmit the minimum amount of data necessary to complete the QSO. Don't be a chatty contester!
* Use your RIT, especially on CW, but make sure that station you hear is calling/working YOU!
* Dig for weak signals; sometimes poor copy is just QSB.
* Split your operating into different parts of the band. Don't get stuck in a narrow frequency range for the entire contest.
* Consider special frequencies: Slightly up from nets (while not QRM-ing them!), way up into bands,

especially if you're not operating at a superstation.

* Don't get stuck trying to run guys when you can't. Search and pouncing can produce good rates.
* Track your QSO/MULT ratios. This can be a guide in determining the time you should spend calling in pileups. Learn to cut your losses
* Pass your brains out, even as a single operator!!
* Be aggressive when operating without being obnoxious. Don't build a reputation as someone who calls without listening first, doesn't know when to stand-by, and is a generally poor operator.
* Don't be caught "DX-ing" when you should be running guys.
* Never miss easy multipliers. Always be aware of what you have and what you need.
* Use your VFO memories and/or your logging software to store sked frequencies, pileups, etc.
* Operate where others aren't from time-to-time.
* Don't be afraid to start moving needed multipliers to other bands in the beginning of the contest. There is no perfect time to start.

Station Lay-out and Design

The old aphorism is that the internal layout of your station plays an incredible role in reducing Sunday afternoon fatigue. For example, why compromise the advantage of phased verticals by labeling them poorly? You should not have to hop into your car to get to your antenna switch. And, there are others:

* Label everything in your shack (e.g., antenna switches, remote switches, etc.)
* Label your amplifier settings per band.
* Review your station setup. Everything should be positioned for maximum comfort and reduced back strain.
* Use a comfortable operating chair (not TOO comfortable).
* Ensure good lighting.
* Evaluate your headphones. They can ruin the advantage of a good receiver.
* Use a boom microphone/headset.
* Clean up your shack for psychological advantages.

Food/Drink

The choice of food and drink during a contest is largely one of personal choice. The advantage comes from developing a plan. In most cases:

* Avoid a big meal right before the contest starts.
* Coffee, caffeinated energy drinks...choose your weapon.
* Consider your meal plan for the weekend. Focus on high energy foods.
* No BOOZE!!
* Drink lots of fluids during the contest.
* Consider food choices that are quick to prepare. Crockpot dishes (e.g., stew, soups) are good choices as are microwave dinners and sandwiches. A handy box of munchies works well, too.

Other

There are countless other thoughts about improved contest scoring that include:

* Record your operation and listen for areas of improvement the next time.
* Operate in small contests during the year to develop your skills.
* Try and find a friend to operate with; exchange ideas from time-to-time.
* Try to identify and fix potential TVI/RFI problems BEFORE the contest.
* Have a plan established to deal with possible problems (e.g., pre-made power cords with torroids).
* Answer QSL requests from all sources – paper and electronic. DX stations REALLY DO remember.

Final Comments

When you actually stop and think about it, it's amazing what you can do to prepare for a contest that has little to do with the size of your antennas or how much power you're running. Give it some thought. I guarantee it will make you an improved contester!

See you in the next contest!
73, John, K1AR

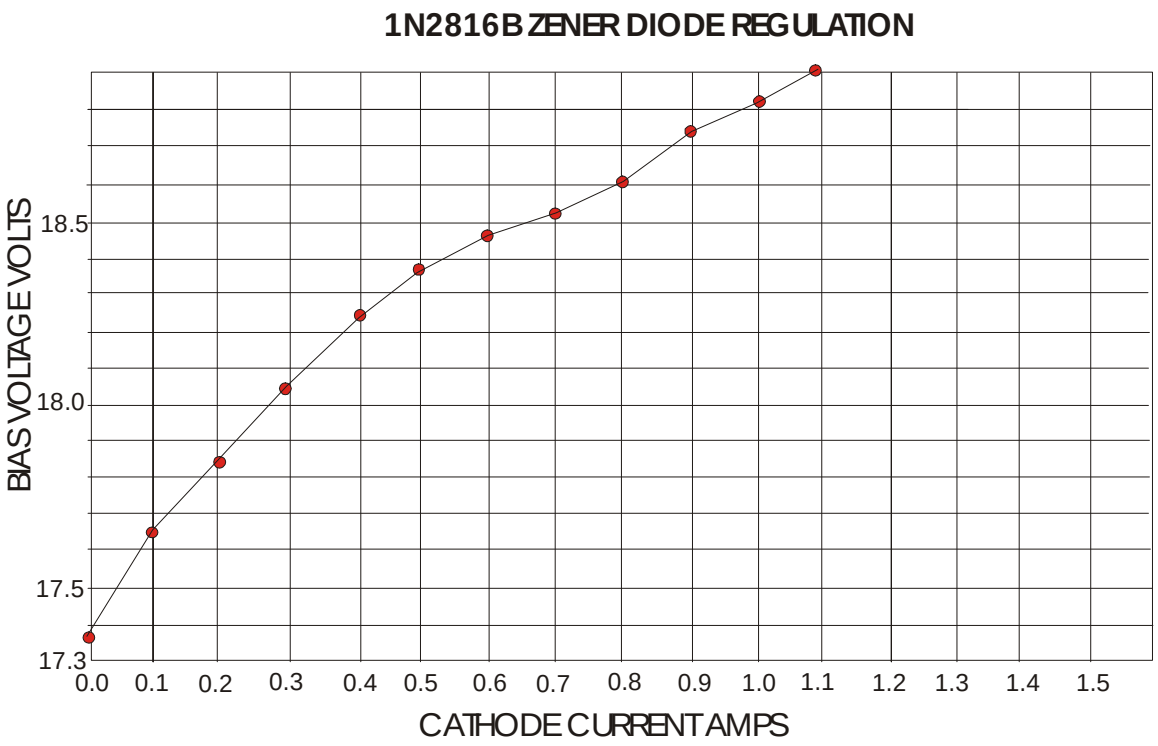
A COMPARISON OF VARIOUS TUBE AMPLIFIER BIAS CIRCUITS

By David Olean K1WHS January 2011

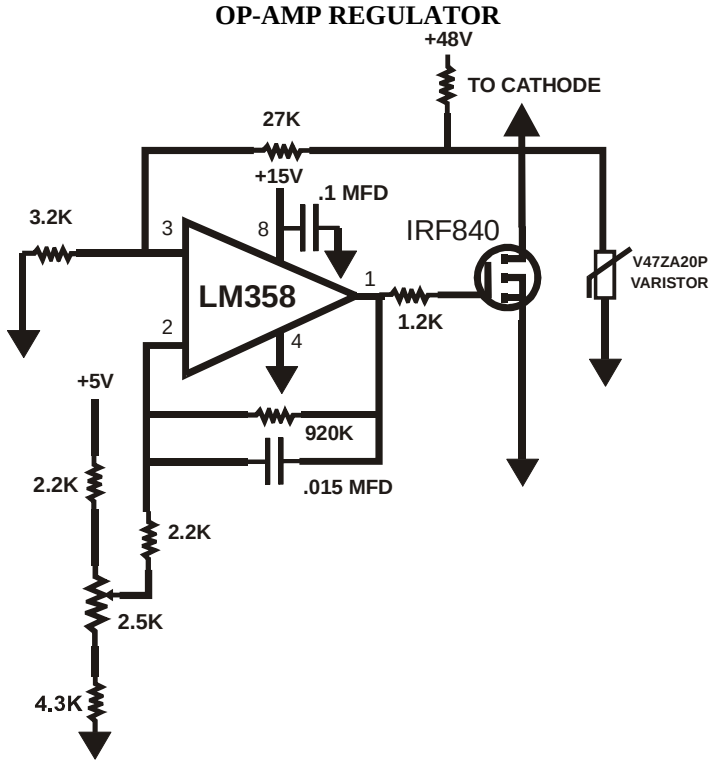
I recently undertook a project to evaluate a few different t circuits for controlling the cathode bias on larger transmit vacuum tubes. In the past I have had pretty good luck with 50 watt zener diodes in series with the cathode line to the B- terminal. Zener diodes are simple and effective way to set cathode bias, but they do have problems. One of the recent problems observed is that such large capacity zeners are getting hard to find. Another obvious problem is that you are stuck with the zener voltage of the part available. There is no easy way to adjust a 50 watt zener diode. There is no way to trim the voltage easily with a zener diode. Adding diode junctions reduces the regulation drastically and is not a good option.

In 2009, I built up a single band 10 meter amplifier[1.] for use primarily during contests. You know the drill. A few guest ops show up who are great at running cw pileups. The may or may not be great at finessing along your power amplifier however. You might find that they worked several new mults, but neglected to see that the high voltage supply died and they damaged the tube by exceeding the grid dissipation of the expensive ceramic tube that you traded your first born son for. A suitable contest amplifier must be forgiving of operator errors, and it must also be reliable, producing clean output power, and running well within its ratings so as not to cause problems during extended use. The YC156 Eimac triode that I chose for the 10 meter amplifier fills the bill nicely. It will run at 1500 watts output all day with no problems. In fact the tube has a 5000 watt plate dissipation with a 2" height of water produced by the blower. I used a smaller blower, but the tube is still capable of some serious power output even with the smaller blower. In building up the amplifier, I was surprised at the amount of operating bias that was needed as compared to an 8877. I had to put two 14 volt 50 watt zener diodes (1N3313B) in series to achieve 28 vdc bias for class AB service. Plate voltage was about 3800 volts idling at about 150 milliamps or so. The amplifier worked very well and would produce 1500 watts output with 45 watts of RF drive. Plate voltage would sag to about 3500-3600 volts.

In December of 2010, in the ARRL 10 Meter Contest, I tried running the amplifier at my remote hilltop shack where I have a very heavy duty 3 phase 208 volt HV supply. It delivers about 5300 volts and I figured that the YC156 would work very well at the higher voltage with less drive required than at the lower plate voltage level. The amp did work quite fine, with full output available with 18 or 19 watts, but the idling current was ½ amp! Now it did not take a genius to realize that ½ amp idling current at 5300 volts is quite a lot of heat. We turned off the heat in the shack and relied on the amplifier to heat the room. We even turned on the exhaust fans to push the hot air outside the building, so we would not get too warm. Every time we keyed the rig, 3000 watts of heat was generated and blown into the room. We were toasty warm all weekend. The solution to this dilemma was a new bias circuit that does not rely on zener diodes. I also had concerns that a zener diode is not the stiffest regulator around. Any variations in the bias voltage would introduce potential distortion products as the bias voltage would climb at higher currents causing the operating point of the tube to shift. I tried a few different bias circuits and measured the performance of each. The first circuit tried was adapted from a YC156 amplifier built by WV7U.[2.] Hank, WV7U had used a high power OP AMP in the YC156. The part is no longer available, so I looked at a similar circuit that he used in a smaller 2 X 3CX800 HF amplifier. This time he utilized a LM358 OP AMP driving an IRF840 enhancement mode FET as a shunt regulator. The circuit looked intriguing. I also studied another circuit used by both G3SEK and WD7S in triode bias board kits that they each produce.[3. 4.] I have known Ian, G3SEK for many years and know that he always does top notch work in any of his endeavors. His tetrode circuit boards are incredible for controlling tetrodes. His familiarity with European bias and screen circuit development convinced him to develop a commercial tetrode circuit board that has produced results where transmit vacuum tubes will deliver less distortion than the manufacturer specifies under ideal conditions! The secret is in very stiff regulated bias and screen supplies. With tetrodes, the screen supply is the often overlooked key element that determines how linear your amplifier will be. If the screen voltage is rock solid, the amplifier will sound very good. The same holds true with triodes and their bias circuits. A triode is much easier to get running than a tetrode, but they still want a stiff bias source in the cathode circuit! Holding the cathode bias voltage constant will produce lower distortion products than with a non stabilized source. I decided to measure the typical regulation of a 50 watt zener diode commonly used in triode amplifiers. The voltage across an 18 volt zener, a 1N2816B, varied by over 1.5 volts as current flow ramped up from 0 to 1.0 amp. This is the typical current variation for a large external anode triode such as an 8877.



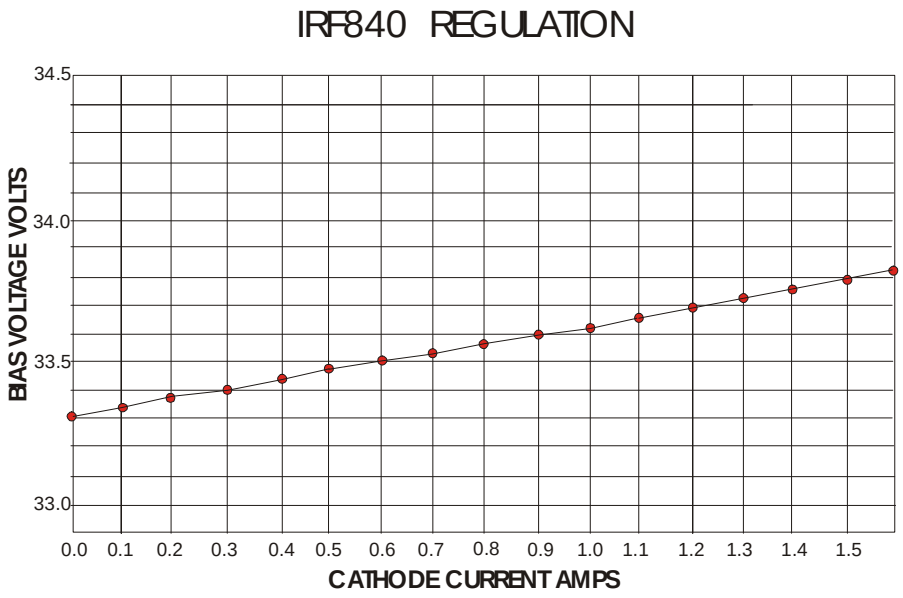
Over a range of 0 to 1.5 amps, the 50 watt zener will only maintain a 10% regulated voltage. Data for the 1N2816B indicates a 2.0 ohm impedance at a 700 ma test current. Clearly there are better solutions. The WV7U circuit for his monster YC156 amplifier used a PA46 power op amp shunt regulator. The PA46 is long obsolete, so current circuits make use of a small OP AMP driving an enhancement mode FET such as an IRF540 or IRF840. I chose an IRF840 for my YC156 ten meter amplifier. It is capable of controlling several amperes of current at several hundred volts with a suitable heatsink and judicious design to control dissipation. Here is the circuit I ended up using. The +15 and +5 volt sources were obtained from small three terminal regulators.



The YC156 needs around 34 or 35 volts of bias to limit plate current to reasonable levels with 5 KV plate voltage. WV7U tried 280 ma and 200 ma. Bias settings. He also rigged up a sophisticated two tone test setup to measure IMD. His findings with his PA46 bias circuit showed IMD levels of –45 or –46 dB with the two bias settings of 200 and 280 ma. and a plate voltage of 5500 volts with 4000 watts output. Clearly this is much better than needed in amateur circles. Many amplifiers struggle to produce distortion products better than –30 dB. He used heavy plate loading to produce these numbers. At 1500 watts the IMD levels should be even lower with everything else being equal.

My first effort with the IRF840 was encouraging. I adjusted the circuit to provide a range close to 34 volts of shunt regulation, which is over twice the voltage of the single 50 watt zener diode that I measured. If you compare two zeners in series with a single zener diode, you get only one half the regulation performance of a single diode! While two diodes might sag by 3.0 volts or more at 28 volts of bias between zero current and 1 amp, the OP AMP design holds the bias to within about 0.3 volts or ten times better regulation than the zener diode pair.

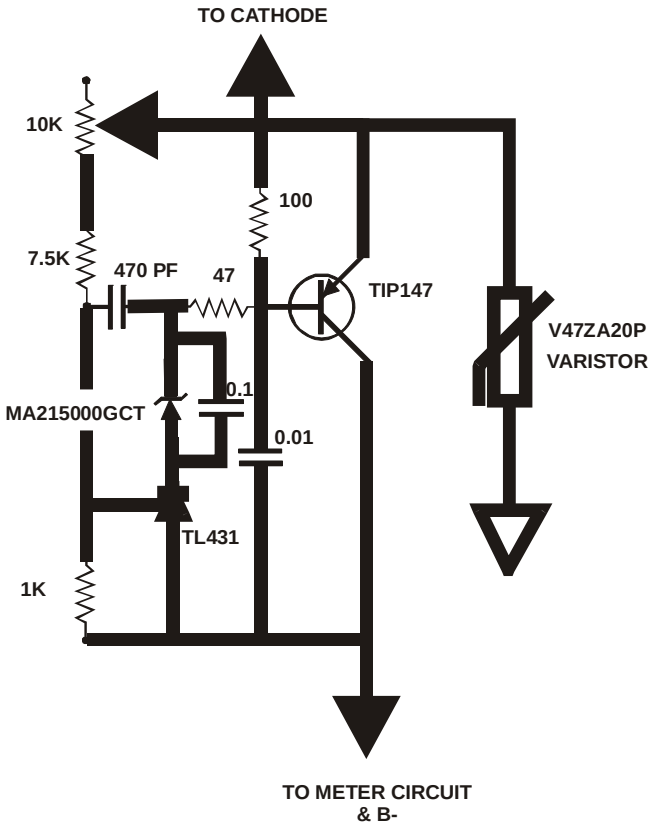
Choosing a higher voltage 50 watt zener such as the 1N2825B (36 volts) will result in worse regulation than available from a lower voltage zener, but slightly better than two zeners in series. The 1N2825B is spec'ed at 3.5 ohm impedance at 350 ma test current. The OP AMP and MOSFET combination on the other hand, has a 0.285 ohm impedance at twice the test current!



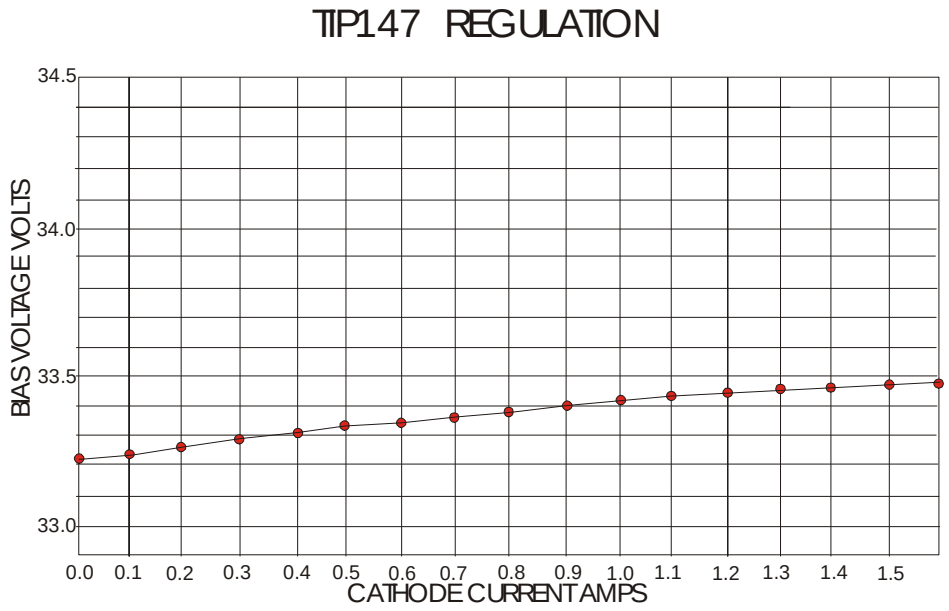
WD7S and Ian, G3SEK/GM3SEK use a different circuit to achieve precise control of triode bias. Both of these gentlemen provide kits that are very handy for building high performance amplifiers of the triode and tetrode variety. Their circuits for a bias shunt regulator are quite similar, and dispense with the discrete OP AMP in favor of a TIP147 PNP out darlington pair and a precision TL431 reference voltage source. The TL431 has it's own internal OP-AMP in a TO-92 package. Ian claims very precise shunt regulation with little variation under varying loads.

Next I tried the G3SEK/ WD7S TIP147 darlington circuit and adjusted the component values for a 33 volt bias setting similar to my OP AMP design. The TIP147 circuit utilizes a TL431 shunt regulator to drive the darlington pair. The small TL431 has a built in op amp and internal 2.5 volt reference voltage source and is capable of very good performance in such circuits. For my breadboard design, I used a more robust heatsink for the TIP147 to allow more time to take voltage readings! I also modified the design to accommodate bias voltages above 30 volts. The goal of this entire process was a better bias circuit for my YC156 amplifier, and the YC156 needs fairly high bias. (Similar to the GS35B Russian triode.) The final version will have a large heatsink to dissipate the almost 50 watts of heat generated by the shunt bias supply. I can install it in the air path of the tube blower as well, for cooler operation.

DIAGRAM OF TIP147 REGULATOR



The regulation performance of the TIP147 bias circuit modified for high cathode bias similar to the IRF840 circuit, is as follows:



The TIP147 circuit seems to have a bit better shunt regulation performance than the MOSFET version. Impedance of the TIP147 design was about 0.2 ohms at 1 amp of current. Possibly the op amp gain in the MOSFET design could be adjusted for

improved performance. I suspect that more loop gain will improve the regulation, but there is a lot of component juggling required. I tried increasing the shunt current on the TIP147 circuit up to 2 amps and it seemed fine, holding at 33.5 volts. At 3 amps it decided to short out and die. I am not sure if it was a voltage spike from my old adjustable $5 flea market power supply, or that 3 amps was just too much for it. In looking at the safe operating area curves, with 34 volts, about 2.5 amps is all that it can handle safely. It is also very prudent to install some form of surge protection in the event of high voltage arcs etc. My final designs utilize 43 volt MOVs as well as ceramic spark gaps from the top of the regulator to ground. This path will bypass the grid meter. Any excessive surges will, hopefully be blunted by these protection devices.

In any case, either of these two circuits are so much better than the simple zener diode arrangements as popularized in many Eimac 8877 and 3CX800 construction articles over the years. These “active” bias designs are a bit more complex than zeners, but the actual parts cost is actually quite low when compared to the cost of a single 50 watt zener diode. The last time I checked, 50 watt zeners cost $11 each or more, while the FETs and darlingtons are in the $2 price range. Other components needed are very cheap or already laying in your junkbox. As I see it, there is no reason to be using zener diodes these days for amplifier bias. I plan to make a few of these boards, and drop them into my new and existing tube amplifiers.

References

1. http://www.directivesystems.com/YC156.htm
2. http://www.wv7u.com/yc156amp/yc156amp.html
3. http://home.earthlink.net/~wd7s/triode_control.htm
4. http://www.ifwtech.co.uk/g3sek/boards

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George Tranos, N2GA, Named CQ Magazine Contesting Editor:

from CQ Communications on February 9, 2011

(Hicksville, NY February 8, 2011) – George Tranos, N2GA, of Long Island, New York, has been named Contesting Editor of CQ Amateur Radio magazine, Editor Rich Moseson, W2VU, announced today. Tranos succeeds John Dorr, K1AR, who stepped down after writing the magazine's contesting column for nearly 22 years.

Tranos has two decades of contesting experience in a variety of station settings, and has several top scores to his credit, both as a single operator and as part of contesting teams. He has operated extensively from the Caribbean as well as from his home station in New York, and has been a referee at three World Radio Teamsport Championship competitions, in 2000, 2006 and 2010.

George is a member of the Yankee Clipper Contest Club and the New York-based Order of Boiled Owls contest club. He is also a former ARRL Section Manager and past Chairman of Ham Radio University, a day of amateur radio seminars and fellowship on Long Island.

Professionally, Tranos is president of a software and management consulting firm, vice president of a school for professional motorcycle riders, and a freelance journalist. He is married to Diane Ortiz, K2DO, an accomplished contester herself and a former columnist for CQ Contest magazine, which was published in the 1990s.

CQ Editor Rich Moseson said, “I am confident that George will uphold the high standards for this column established by K1AR and will bring his to it his own perspective. I look forward to working with him over the coming years."

"I am honored to have been asked to contribute to CQ magazine," said Tranos. "The contesting column is always the first thing I read. I hope to be able to keep up the great standards and traditions that compel me and many others to look forward to each issue."

George's first column will appear in the March 2011 issue of CQ.

YCCC Elections are Coming: It's Your Time!

Jim Idelson – K1IR

At the next General YCCC meeting in April, a new crew of officers will be elected to take on our next season of club leadership. And, word 'on-the-street' is that some of our current officers would like to move into new (non-leadership) roles this coming year.

So this is your time!

Do you have ideas about where your club should be heading? Got a secret plan to make YCCC even more dominant in the world of club competition?

This is going to be a great year for YCCC. With climbing solar numbers, planning for WRTC underway, and an economy on-the-mend, there are plenty of great things to look forward to in contesting in 2011-2012!

But, we need a great crew at the helm to steer the ship.

The elected positions in YCCC are:

* President
* Vice President
* Activities Manager
* Treasurer
* Secretary

As officers, you don't have to shoulder the burden of all the work involved in running the club. You have a team of volunteers taking care of local activities, getting the Scuttlebutt written, published and distributed, working on the website, etc. Past officers are always there to offer their experience and advice to help you make great choices. Many of the core processes that keep the club engine running are already in place. And, when you have a great project that the membership will like, you can always motivate a few members to step up and pitch in to make it happen.

Here is how we run YCCC elections:

/4. Elections. Elections of Officers shall be scheduled pursuant to Article II of the Constitution. A super quorum must be present and voting. Nominations will be submitted by members from the floor, be properly seconded, and shall be received by the President. All nominees must consent to the nomination. Upon close of nominations, a secret or open ballot shall be conducted by the Secretary; this ballot shall be repeated, the nominee receiving the least votes being dropped from the ballot, until a nominee has received a majority of votes cast. This process shall be repeated until the offices of President, Vice President, Activities Manager, Secretary, and Treasurer are filled. [as amended 12 April 1980][as amended 6 April 1997 and 5 February, 2005] /

Mark has asked me to help ensure that we have some nominees for next year. Please talk to your club colleagues and think about where you might like to contribute. If you'd like to be on a slate with certain others, please communicate that to me. If there are a couple of positions you'd consider, but not others, let me know.

Let's build a great team for the coming year!

--
73,
Jim K1IR

YCCC CLUB RESOURCE INFORMATION

DUES AND MEMBERSHIP STUFF Dues are payable as of the April election meeting, which begins our club "contest year". The YCCC has adopted a multi-tiered membership format as follows: Please note that payment of dues IS NOT a prerequisite for contributing scores to the Club aggregate, but IS for the various YCCC Awards Programs

Full Member - $20 ($35/2 yr) (Eligible for YCCC awards programs and paper delivery of Club newsletter)

Full Member - $15 ($25/2 yr) (Eligible for YCCC awards programs and electronic "Ebutt" delivery of Club newsletter)

Family Member - $0 (Grants full membership to all amateurs residing at one domicile on payment of one member's "Full Member" annual dues and entitlement to one Club Newsletter sent to one domicile or email address. All members of said family are eligible for YCCC awards programs.)

Student Member - $10 (Grants full membership to students at a reduced level. Eligible for YCCC awards programs and paper or electronic delivery of the Club Newsletter.)

Subscription - $** (A "friend of YCCC" - not a member but a possible candidate for future membership. Receives club newsletter only in paper or electronic form. Fee basis is $20 for overseas paper delivery, $15 for domestic paper delivery and $10 for electronic "Ebutt" delivery domestically or overseas.)

Club members who move out of club territory and so are not eligible to contribute to club aggregate scores automatically become subscribers. New members who join at the February meeting are credited with dues for the year beginning the following April. You can tell if you owe dues by checking your 'Butt mailing label. **Mail your dues to the club treasurer, Ed Parish, K1EP, 9 Spoon Way, N. Reading, MA 01864**

SCUTTLEBUTT ARTICLES should be sent to the Scuttlebutt editor, Steve Rodowicz N1SR, preferably by E-mail at **n1sr@arrl.net** or on 3½" disk (in MS-Word format or text file) by snail mail to Steve Rodowicz, 809 Pendleton Avenue, Chicopee, MA 01020. The deadline for each issue is the 10th of the preceding month..

Scuttlebutt Advertising: Nominal Business Card sized ad, $50 per year (6 appearances)

CONTEST SCORES should be sent to the club scorekeeper, Dave Hoaglin, K1HT, preferably by E-mail at **scores@yccc.org**. Please include details such as numbers of QSOs, QSO points (if appropriate), and multipliers (all types); entry category; and power.

CLUB GOODIES

BADGES YCCC badges are available from Ric, KV1W. Send $2, name and call desired on the badge, and your mailing address to: Ric Plummer - YCCC Badge, PO Box 1158, Berlin, MA 01503-2158.

APPAREL Contact Bob Rogers **KB1LN@yahoo.com**

YCCC LOGO ITEMS http://www.cafepress.com/n1ik

QSL CARDS are ordered through Burt Eldridge, W1ZS. To order, send Burt an email at **w1zs@arrl.net**, detailing card information per "QSL Request" form available at http://www.yccc.org/members/yccc_qsl.htm. You will receive a proof by email. Approve the proof, making any corrections, and return to Burt *with payment* (make checks out to Burt, not YCCC). Current price is $50 (delivered) for 1,000 cards. Also available is the glossy version for $70/1000.

MEMBERSHIP ROSTER is posed on the YCCC website. Updates are published in 'Movers and Shakers' when members move or change callsigns.

COMPUTER STUFF *INTERNET REFLECTOR* There is an Internet mailing list for YCCC members. To subscribe, send mail to yccc-REQUEST@yccc.org. Insert only the word "subscribe " in the subject of the mail message. (Do not send messages to the reflector that have file attachments, HTML formatting, use boldface or other fancy fonts, etc.)

WWW HOME PAGE Come visit us at http://www.yccc.org Our Webmaster is Mike Gilmer, N2MG.

ADMINISTRATIVE STUFF *The W1 QSL BUREAU* is sponsored by the YCCC. Keep your account up to date by sending a check. Stamps are sold at face value, envelopes are 20 cents each. Address: W1 QSL Bureau, PO Box 7388, Milford, MA 01757-7388. Email address: **w1qsl@yccc.org**.

ARRL COMMITTEE REPS are**:**

CAC: New England Dick Green, WC1M **Hudson** George Wilner, K2ONP **Atlantic** Michael Gilmer, N2MG

DXAC: New England Bob Beaudet, W1YRC **Hudson** John Sawina, NA2R **Atlantic** Chris Shalvoy, K2CS

VUAC: New England Ed Parish, K1EP **Hudson** Frederick Lass, K2TR **Atlantic** Joe Taylor, K1JT

ARRL LIAISON: Tom Frenaye, K1KI.