

CROSSTALK -- Official Publication of the
 GLOUCESTER COUNTY AMATEUR RADIO CLUB, W2MMD
 G.C.A.R.C. OFFICERS

President	Joe DiNovi, WA2GFK
Vice President	Ginny Martin, N2FJM
Recording Secretary	Steve Sosson, KR1M
Corresponding Secretary	John Fisher, K2JF
Treasurer	Gurdon Cooper, W2PAX

 DIRECTORS

Art Strong	KA2DOT
Chris Kelly	KC2PC
Al Trueblood	N2FJQ
John Zaruba, Jr.	WB2VOH
Chuck Colabrese	WA2TML

 TRUSTEES

Bill O'Donnell	WA2VRY
Harry Jackson	WB2GSF
Bill Frambes	WB2FJE
Rich Netherby	WB2OCR

 COMMITTEE CHAIRMEN

Program: Ginny Martin, N2FJM	Technical: Chuck Colabrese, WA2TML
Awards: Jack Zaruba, K2ZA	Repeater: Chuck Colabrese, WA2TML
Training: Chic Naylor, WA2USI	Technical Manager
Membership: Art Strong, KA2DOT	House: Jim Bray, N2AKI
Contests: George Munns, KB2GW	Historian: Della Parker, W2AFZ
Hamfest: Ginny Martin, N2FJM	Club
Field Day: Tony Starr, WA2FZB	License: Rose Ellen Bills, N2RE
A.R.E.S.: Harry McCormick, WA2SEA	VHF: Ray Martin, WB2LNR
Legislative: John Fisher, K2JF	L.R.P.: Chic Naylor, WA2USI
Data: Charlie Sketchley, K2PQD	Repeater: Joe DiNovi, WA2GFK
Demo: Walt Ashtor, WB2OYQ	Business Mgr.
	Publicity: John Fisher, K2JF

 CROSSTALK STAFF

Tony Starr, WA2FZB	Editor	John Fisher, K2JF	Circulation
Milt Goldman, K3WIL	Publisher	Jim Mollica, K2OWE	Circulation
Ed Sumek, W2GSN	Printer	Len Kravitz, KD2CR	Circulation

 AREA NETS

GCARC RTTY NET:	Tuesday,	8:00 PM 147.78/18 Rptr
ARES NET:	Sunday,	8:00 PM 147.78/18 Rptr

Club Repeaters: 147.78/18, 223.06/224.66, 447.10/442.10

General Meeting: First Wednesday of each month at the V.F.W. Hall in Woodbury, NJ. Meetings begin at 8:00 pm sharp.

Contributions: CROSSTALK, Tony Starr,
 Deadline: Ten (10) days before each general meeting.

PRESIDENT'S MESSAGE--JUNE 1986

Greetings Members,

It was nice to see so many of you out to the meeting. Those of you who could not attend missed an excellent program by Ray Martin, WB2LNR.

Our club is in need of a DX chairman and a historian. Neither of these would require a lot of time and would be very rewarding. I would like some of you recent members to consider either one of these positions and to volunteer at the next meeting.

Speaking of DX, for the past week 80/40 have been very active in the mornings between 0500 to 0700 CW part of band.

The American Cancer Society Bike-A-Thon will be held on Sunday, July 20th. Please contact Jerry, WB2CAK, or myself if you can lend a hand.

Thank you,
Joe DiNovi, WA2GFK

JUNE PROGRAM

This month, another informative program comes your way from the GCARC programs committee (N2FJM). We are pleased to be welcoming Mr. Joseph Hoffman, our County Clerk, who will be telling us about the County Court system. Mr. Hoffman (Joe, to anyone who has ever known him) has been in office for a good many years and is highly respected by everyone in the circles of our local governments. We hope you will take this opportunity to learn about these important issues. Just come on out to the June Meeting, and enjoy the company of your friends. See you at the meeting!

FIELD DAY REPORT

The FD Committee held the first of its' two meetings at the Woodbury VFW on May 14. The turnout was good and progress was made. It was decided that we should set a goal for total contacts. A goal was set at 10% above our 1984 total (last year's totals were down considerably). The magic number is 2000 contacts. We think this can be easily achieved with a little hard work, and we all agreed that we would not be as gung-ho as the gang at SJRA is. (They had 5000 contacts last year!)

We are tentatively scheduled to operate in the 9A category, but if we don't have enough operators turn out by 1800 UTC, we will possibly enter in a lower class category. I can't stress strongly enough our invitation to every member of the club to come out and join us at our

favorite operating event of the year. The more of you who come out, the better we will do and the more fun we all will have. Even if you don't feel like getting behind the mike, we still need loggers. If you can write a call sign on paper, you can be of assistance at Field Day. This is also great CW practice if that's your bag.

Finally, I took a survey of each of the antennas which will be used. If you like exotic antennas, you shouldn't miss this event: There will be some really interesting ones in use. This will be my last report before Field Day, and I hope that I have convinced some of you non-believers to come out and join us. We guarantee you will have a good time, or we will send you home at once. See you there!

73 Tony Starr, WA2FZB

* * * Attention Field Day Committee * * * The second and final meeting will be held June 11 at the Woodbury VFW. Meeting begins at 7:30 pm. Please attend.

HAMFEST UPDATE

The Hamfest committee held its' first on-site meeting at the 4-H grounds. All went well, and from the plans that were made, Harry Jackson, WB2GSF, will draft a detailed layout of the site showing where our activities will be located. This layout will be reproduced and distributed at the gate to everyone who enters the Hamfest.

Chairperson Ginny, N2FJM, still needs a few more volunteers, so if you still haven't signed up, contact her ASAP. Specifically, a volunteer is needed who has a large station wagon (a rarity these days) or a passenger van (more common) to take people to the VEC Testing site, once in the morning, and once in the afternoon. Also, four people are needed to direct parking; two from 7 am to 9 am, and two from 9 am to 11 am.

Finally, if anyone has anything to sell, please make use of the club table. You can participate in the Hamfest while the club sells your equipment for you. Contact Len Kravitz, KD2CR, for details.

The next committee meeting will be held at the site on June 14. You will be notified if your attendance is required. More news next month -- 73 N2FJM, WA2FZB

DAYTON HAMVENTION REPORT

The 35th annual Hamvention was held in Dayton, Ohio from April 26th through the 28th and among the 28,350 were representatives of BCARC including KR1M, K2JF, WB2DXB, K2PQD, K2QGH, WB2THM, and WB2UVB.

The weather was cloudless with afternoon temperatures of 85-88 degrees. Perfect for browsing the 1,300 booth flea market and getting

started on a tan. Inside it was somewhat cooler while prowling the 200 commercial exhibitor spaces.

Both Kenwood and Icom were displaying new rigs, and dealers were not only selling these two brands, but Yaesu, Santec, and others at a brisk pace as well.

According to Hamvention officials, the Hamvention is expected to put \$6 million DIRECTLY into the local economy. That is, through taxes, motel rooms, meals, gas, etc. exclusive of what's spent at the Hamvention.

The Saturday night banquet featured K6DUE, Roy Neal, of NBC news, who was also the Ham of the year. Helping honor him was Senator John Glenn, who paid a surprise visit. Talk about the "Right Stuff", you should have seen him RUN up to the podium!

We're already laying the groundwork for 1987. If interested, see KR1M. 73 de KR1M/2

A LETTER TO THE EDITOR:

- - - - -

To the Editor:

There has been much ballyhoo amongst the ranks of GCARC recently to the effect that we need to go out to the high schools and proselytize for new converts. Unfortunately, no one seems to have thought through the process once we've given our spiel. I respectfully ask two questions:

1. What do we do once we've got them interested?
2. Why are we only going after high schoolers?

It does not do any good to get people all fired up on our hobby unless we can offer a class in the IMMEDIATE future. Let's get the class organized and structured - then go beat the bushes for conscripts.

As one of the speakers pointed out in a forum at the recent Dayton Hamvention, we need to look at those younger than 26 AND OLDER THAN 45. Ages 26 to 45 are the career building/family raising years. But either side of this span is fertile ground for us to recruit from. Those of mature years can offer a lot to the hobby and may very well have the time and resources to devote to it.

Oh yeah, one more thing. The next time someone says "Oh, are you a ham?" don't just say yes - ask them if they are interested.

73 de KR1M/2

LES BELLES

Best wishes to Della, W2AF7, on a speedy recovery from her recent fall. We are all thinking of you.

Congratulations to Myrt, N2AKC, as Grand Representative of Ohio in the Order of Eastern Star of New Jersey.

All those with hearty appetites at Field Day can relax as Roz, N2AKL and Irma, N2FNF, prepare lots of good food for you. Bring your license if you plan to operate.

How does Ginny, N2FJM, find time to do all Vice Presidential duties, oversee our Hamfest while working full time, taking care of her home, her two little ones as well as WB2LNR?

Marla, N2DWR, is busy doing her part of the Hamfest.

We look forward to seeing Mary, AE2Y, leave the Villas long enough to attend the Hamfest.

Myrtle, N2AKC, displayed the Lancaster County Amish Hand made quilt at Dayton and Rose Ellen, N2RE, displayed it up at Rochester. We will display it at our Hamfest. Chances are only \$1.00 each and the drawing will take place at our "Spring Fling" in April 1987 in Hershey, PA. You do not need to be present to win.

How many Hamfest tickets have you sold? Don't forget to turn in the money to Milt, K3WIL.

The Penn Jersey YL's will meet June 4th at QTH of N2RE. All yl's are welcome to come about noon. About 16 are expected. FJYL Club alternates from shack meetings to public restaurant meetings. Let me know if you can attend.

73 Rose Ellen, N2RE

CONTEST CORNER

The presentation of the W2SUA Trophy will be made at this meeting due to circumstances beyond our control.

The score of the ARRL INTERNATIONAL DX CONTEST were as follows:

PHONE PORTION		CW PORTION	
ENTRY	SCORE	ENTRY	SCORE
NJ2D	84,501	K2OWE	69,300
K2OWE	46,740	N2CC	2,940

Unless I missed someone, or any entry didn't reach me, we only took part in the Phone portion of the contest.

No entries have been received for the CQ WPX contests at all.

I will continue to have forms available at all meetings for as many contests as possible.

As I announced at the last meeting, next year's W2USA TROPHY will be presented to the highest club entry in the ARRL INTERNATIONAL DX CONTEST--BOTH CW AND PHONE WILL COUNT. I'll repeat the notice from time to time.

The following is a list of contests upcoming. Please note the date for the ARRL QSO PARTY (was incorrect on my original list from the ARRL and in this months CQ).

MONTH	DATE(S)	CONTEST
June	7-8	RSGB National Field Day
	14-15	ARRL VHF QSO Party
	14-15	All Asian Phone Contest
	28-29	* * * * FIELD DAY * * * *
July	1	Canada Day Contest
	12-13	IARU HF CONTEST (NOTE RULES CHANGE)
	19-20	CQ Worldwide VHF WPX Contest
August	2-3	ARRL UHF CONTEST
	9-10	European CW Contest
	23-24	All Asian CW Contest
September	13-14	ARRL SEPTEMBER VHF QSO PARTY
	13-14	European Phone Contest
	20-21	CRRL Can-Am Contest, Phone
	27-28	CRRL Can-Am Contest, CW
October	25-26	CQ WW DX CONTEST, PHONE
November	1-2	ARRL SWEEPSTAKES, CW
	15-16	ARRL SWEEPSTAKES, PHONE
	29-30	CQ WW DX CONTEST, CW
December	5-6-7	ARRL 160 METER CONTEST
	13-14	ARRL 10 METER CONTEST

Still looking for the Megapoint Award data. (Tx to ARRL, QST, CQ & 73) DE KB26W

ARRL PETITIONS FCC TO REQUIRE LABELING OF RFI SUSCEPTIBILITY

The ARRL has petitioned the FCC to require the labeling of home electronic equipment relative to its susceptibility to radio-frequency interference. The petition requests that the Commission require that a tag or notice be attached to home electronic devices or their instruction manuals to indicate whether the device incorporates shielding, filtering or circuitry designed to reduce its susceptibility to nearby radio transmitters. The tag or labels also would warn the owner that the device may be subject to radio-frequency interference.
 Tnx ARRL/K2JF

EWING, NEW JERSEY REPEALS ORDINANCE

In the May issue of Crosstalk the "LEGISLATIVE NEWS" article about the Ewing problem was printed. Thanks to the work of the Trenton Hams, ARRL and the FCC, the Township of Ewing committee has agreed to repeal the ordinance. It really pays to stay alert in our area and to report and do things when our hobby is threatened. Tnx K2JF

FCC ISSUES NOVICE ENHANCEMENT NPRM

Read pages 48 thru 51 of June's QST and then write your letter and let the FCC know how you feel; it is PR 86-161. Here is how you address your letter:

FEDERAL COMMUNICATIONS COMMISSION
 William J. Tricarico, Secretary
 Washington DC, 20554

Date

Before the Commission

PR 86-161

Dear Sir: (Now your comments. If you write one letter it will be read to the Commissioners; however, if you make 12 copies each Commissioner will receive a copy. Regardless which way you comment, COMMENT! IT IS IMPORTANT. If you use more than one sheet make sure you put the PR number at the top right hand corner of each sheet of paper.)

Sincerely,

Name and Call

TNX K2JF

SOME DX NEWS

1Z9A BURMA 14227 1430
 (Not good for DXCC but good for CQ awards including WAZ. This is about the only one for zone 26 since HS4AMI has gone home.)

DL7DT/SV/A - Mt. Athos - paper work received by Don Search (ARRL DXCC Mgr.), but in GREEK. It is now being translated. Hope all is well.

KC6HA	Western Carolines	14309	0300
		14227	0000
9H16P	MALTA	14.227	2236
	(Will give CW contact if asked)		
JW0A	Svalbard	14.009	0128
F65GM	GUADELOUPE	14.005	0235
5B4FN	CYPRUS	14.010	2048
VK5QW	AUSTRALIA	14.220	0638
0A4LN	PERU	14.190	0410
NH6FU/KH9	WAKE IS.	14.227	0001
5V7HL	TOGO	14.220	2200
	MONDAY & WEDNESDAYS		
ZK2JB	NIUE	7.249	0305
KX6DX	MARSHALL IS.	7.005	0700
		14.005 OR 14.235	2100
TNX K2JF			

HAMS HELPING THE NATIONAL WEATHER SERVICE: LEGAL OR ILLEGAL?

The question of whether Radio Amateurs may use their radios to help the National Weather Service is not a simple one. Amateurs are all aware that Section 97.110 of the Amateur Rules prohibits "business communications". The current text of the Rule reads:

"Section 97.110 Business communications prohibited. "The transmission of business communications by an amateur radio station is prohibited, except for emergency communications as defined in this Part."

Business communications is defined as:

"Section 97.3 (bb) Business Communications. Any transmission or communication the purpose of which is to facilitate the regular business or commercial affairs of any party.

In veiw of the FCC Private Radio Bureau (PRB), the regular collection of data on the weather in an area "facilitates the regular business affairs" of the National Weather Service. It is further the opinion of the PRB that the term "any party" in Section 97.3 (bb) applies to a non-profit organization, local, state or Federal agency, as well as to a bona fide business entity.

Does this mean that amateurs must stop using their radios in the Skywarn systems as severe-weather spotters? No! According to the NWS officials at Silver Spring, MD, the Skywarn networks are activated only when professional meteorologists--trained scientists--see an immediate threat to life or property from an oncoming weather system. Thus, an emergency exists, and the network then falls under the exemption at the

end of Section 97.110, as quoted above. The NWS has received a letter from the PRB to this effect.

However, the PRB does not feel that nets meeting at regular times to funnel routine weather data to an NWS office fall in the "emergency" category, any more than routine citizen patrols assisting the police department do. The PRB interpretation is that these kinds of activities do indeed violate Section 97.110.

ARRL is in the process of informally clarifying this area of the rules in the hopes that radio amateurs can continue to provide extra eyes and ears for the National Weather Service on a routine basis. Anyone is free to request a waiver of the rules; however, this might upset our informal discussions in that it could force the Commission's hand before all the issues have been fully explored.

In the meantime, radio amateurs should keep a low profile on this issue. Use of amateurs to supplement the NWS observations during a weather emergency is certainly permitted. In order that such assistance can be rendered in an emergency it is also defensible that amateurs be permitted to conduct some "practice drills" during non-emergency conditions.

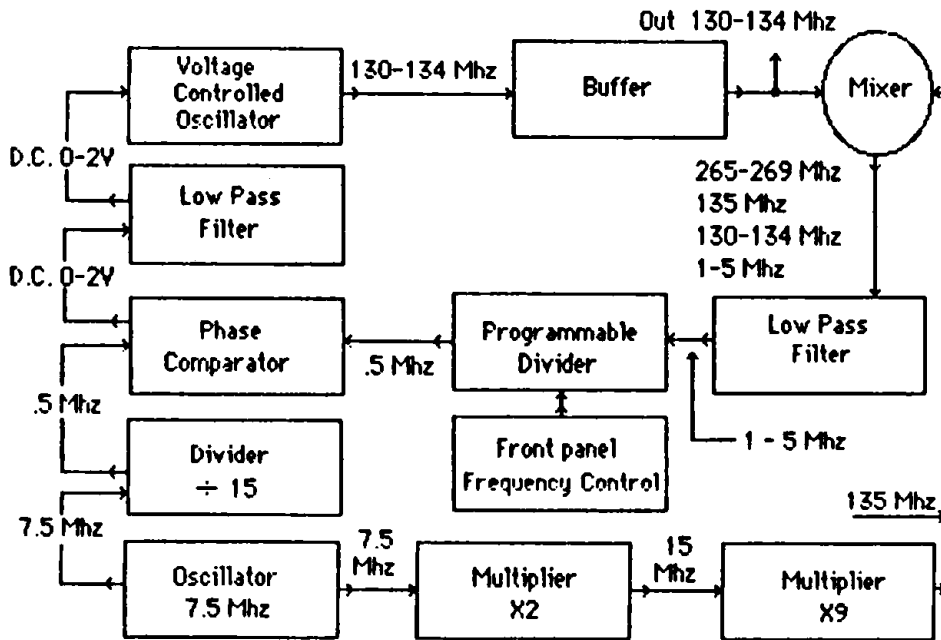
Finally, it should be noted that this is not a legal opinion; it merely constitutes ARRL HQ's current thinking on this issue. Stay tuned for news of development; film at eleven. Tnx ARRL Field Forum

VOLTAGE CONTROLLED OSCILLATORS (VCO'S)

Last month I said that I would discuss VCO's. Specifically, I said it would be "VCO's made easy." What I was really referring to was Phase Locked Loops (PLL's) and Voltage Controlled Oscillators (VCO's). At this juncture, many people will say "that's too complex to understand." I thought so too, until someone explained them to me. Basically a PLL circuit is like a dog chasing its own tail. Let me Explain.

In the idealized block diagram below, you will find all of the necessary parts of PLL. In order to understand what is happening, let's start with the VCO. The VCO is tuned through its range by a DC control voltage acting on a varactor diode, which changes capacitance in accordance with the control voltage applied. This change in capacitance causes the oscillator to change frequency, in this case between 130 and 134 MHz. If we follow the output of the VCO, we find a buffer, which is used solely to isolate the load from the VCO. This buffer is a amplifier operating in the linear, or class A mode, so it presents a constant load to the VCO even though the load on the Buffer may change. The output from the buffer is split. A portion of the buffer output is the PLL output--in this case, supposedly to a heterodyne mixer to be mixed with a crystal oscillator in a receive or transmit stage to come up with the final input or output frequency of

144-148 MHz. We can forget the PLL output for the time being. Of more interest is the signal from the buffer that goes to the mixer. This mixer is fed with a portion of the Buffer output at 130-134 MHz and a 135 MHz, and the sum and difference of these two injection frequencies 265-269 MHz and 1-5 MHz, is fed to the Low Pass Filter (LPF). The LPF filters out all but the 1-5 MHz frequency and the output is fed to the Programmable Divider (P/D). If you are still with me, read on--if not, try visualizing what is going on as you read this far again.



Now on the interesting stuff--The Programmable Divider is controlled, that is it divides by a number that is designated from the front panel controls. When you set a frequency on the front panel, what you are really doing is adjusting the division in the programmable divider. However, in this case the dividend, or answer to the division is 500 kHz or .5 MHz--Exactly! And that is the secret to the PLL! Let me go a little further and explain the rest of the circuit, and I will come back and show you what happens if the output of the P/D is not exactly 500 kHz. The output of the P/D is fed to the Phase Comparator, as is the output of the divide by 15 Divider. The divide by 15 changes the output of the 7.5 MHz reference oscillator to exactly 500 kHz. The reference oscillator signal (500 kHz) is stable and never changes--ever! The Phase Comparator compares the input from the P/D and Reference Oscillator and provides a DC output between 0 and 2 Volts DC. This is then passed through another Low Pass Filter to smooth out any ripples and make changes happen relatively slowly and smoothly. The output of this LPF is the input control voltage of the VCO. So what we really have is a loop--with some extra control signals hanging off of the side.

When this loop is first activated, the control voltage of the Phase Comparator rises, causing the VCO frequency to sweep upward in frequency--this output, goes through the buffer, is mixed down in frequency and divided by the P/D. As the output of the P/D approaches 500 kHz the output voltage RATE OF RISE slows down until the input of

the Phase Comparator sees 500 kHz at the input from the P/D, at which time the output DC voltage becomes a steady voltage. This condition is called LOCK or LOCKUP. Why? Because if the VCO frequency drifts up slightly, ever so slightly, the 500 kHz output of the PD will increase slightly, or in other words the phase angle between the Reference Oscillator input and the P/D input to the Phase Comparator will show the leading edge of the P/D output waveform slightly leading the waveform from the Reference Oscillator. When this happens, the Phase Comparator lowers the control voltage slightly, ever so slightly to cause the VCO to decrease in frequency until the mixed and divided output of the P/D is again exactly 500 kHz. If the VCO frequency drifts down, the P/D waveform lags the reference waveform and the Phase comparator increased the voltage until the VCO is again dead on frequency. The LPF between the Phase Comparator and the VCO makes this a smooth transition and prevents jitter from making the PL continually correct and overcorrect.

There are some limitations to the system. First, it usually takes 1-50 milliseconds for a PLL to reach lock from the time it is activated or the output frequency is changed by any appreciable amount such as for a repeater offset. This is called settling time and quite often manufacturers use heterodyne crystal oscillators to mix with the output of a constantly running PLL set to a frequency which will mix with the crystal oscillators. This gets around the problem of waiting for the PLL to lock up again. Lately, with newer phase comparators, lockup times are becoming short enough that use of heterodyne oscillators is quite often no longer necessary. Another limitation is the lockup range of the phase comparators. The comparator has a limited range over which it can control the VCO, and if the two phase inputs (from the Reference Oscillator and P/D) are too far out, the Phase Comparator cannot bring the VCO to the lock frequency. When this happens, the Phase Comparator puts out an UNLOCK signal which quite often is used to inhibit transmission and blank the frequency display. To troubleshoot a PLL, first you need a dual channel scope to look at the two inputs to the Phase Comparator and see if they are equal. If not, you look to see if there is any output from the VCO (unless the unlock signal shuts the VCO down, in which case you must disable the unlock circuit). If there is output, but it is swinging in frequency, you disconnect the Phase Comparator output and place a well regulated supply in line to feed the VCO with a DC voltage and see if the VCO is stable. Then you can troubleshoot the rest of the way around the loop. Because it is a loop, you MUST break a malfunctioning loop to be able to isolate where the problem is located. Otherwise you keep chasing around and around in circles, unable to get anything to work correctly so that you can see which component is malfunctioning.

Now, wasn't that all easy--wait 'till next month--I'll talk about OHM's Law. 73's-- Bob Kellogg, N3BHZ, Maryland Radio Center.