GLOUCESTER COUNTY AMATEUR·RADIO·CLUB NEW JERSEY

# CROSSTALK

JULY 1963

VOL.5 NO.7

Editor W2LVW James Peck .
Publisher W2LVW James Peck .

Again with a big hand from my yl Kathie and the Jr. op Ted. And they wanted to know why they didnt get any credit last month. So just to keep them working I had to give the m some credit. They really are a big help, though, Hi.

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DONT FORGET,... NO MEETING THIS MONTH... SEE YOU AT LAKE GARRISON ON THE SIXTH... LETS ALL COME OUT AND HAVE A BALL. SO COME ONE COME ALL AND THE MORE THE MERRIER. THERE WILL BE OUTLETS FOR THOSE HAMS THAT CANT STAY OFF OF THE AIR Hi.....

Well first of all let me say that if you were looking for another II pager this time you will be disappointed. For a while there it looked like there wouldnt be an issue at all this month. After these past three or four sweltering days(and nites) I am wondering why there is an issue also. Hi. Right at this moment it is 85 here in the cellar and this is the best spot in the house. But anyway here is our effort for this month and I hope that next month comes back up to our par. There is still a need for articles on 'Ham Profiles' so fellas get them into the mail, or hand them to me at the meeting in August. Just a few words will sure get ur name into Crosstalk and also let the rest of the members have a slight insight on another club member. So get them up, fellas. If there is no response then you have seen the last one in this issue.So if you liked it at all and from the reaction at the meetings I got that feeling, why drop me a postal card.
Also while I am at it here let me tell you that I was slightly disappointed at the club response at the Field Day. Those that took part, did a swell job and I think that we had our best Field Day ever. But the rest of the members could have come around just to say hello, and of course some did, but most of the members didnt come around and a lot didnt even give the club a point on any of the bands. Well enuf of this lets get back to Crosstalk.

Official ARRL Bulletin Nr 901 ....Due to the reactivation of Loran chain on 1900 KCs FCC has devised a sharing arrangement for amateur 160 meter operation. So if you do operate on 160 meters check the JULY QST for details.

Official ARRL Bulletin Nr 902.....At dedication ceromonies in the administration building of the 1964 New York Worlds Fair, ARRL representitives expressed their great pleasure at the welcome announcement that the Coca Cola Co. will provide prominent exhibition space in their pavilion for the installation of an elaborate amateur radio station. The Hudson Amateur Radio Council will supervise and provide operating personnel for the station, which will further acquaint the general public with activities of the amateur radio service. In addition a lounge will be provided in the pavilion for the use of visiting amateurs. AR.

Profile of a ham####### W2YNR..Paul Walton Who is presently our Coresponding Sec. and who has taken an active part in many of the club activities. Paul is married and his xyl's name is Matilda. He has two harmonics, David who he hasnt as yet converted into a ham, and Eric, who is WA2FMO in his own right.
Paul was first licensed in 1932 as W8FPK, Class C and had a regenerative receiver and a breadboarded transmitter, battery powered.
He then was relicensed in 1940 as W3IHH, and had a 6L6 and a sky buddy. Then in the year 1950 Paul was again relicensed as W2YNR, and of course is still active with this call. He said that he came back with power, Hi. An 807 and a home brew super In 1958 when Eric got his license it shook Paul up and he went and got his General, just so that he could say that Eric didnt beat him out. Hi.
Paul has lately gone classy and is now operating an Apache and a NC270 receiver. He is home brew on six meters. Paul is a chemical engineer and works for Sacony.

SWR-is Murder ?

The June issue of Crosstalk asked for articles on SWR. Well, as the books say-"Its beyond the scope of this article". But its effects arent.

Most hams know a high SWR is bad, but how bad? Do we lose 90% of our power, or 10%. Calculations to determine just what effect SWR has on power output are not hard to do, and might save you the trouble of taking down your beam, which is hard to do.

With the help of the ARRL handbook, power lost due to SWR can be easily calculated. Here's an example: Suppose your transmitter had a power output of 100 watts, and the feedline is 100 feet of RG-8/U, operating on 40 meters. From fig 13-11 in my 1959 handbook,the loss in the feedline is .8 db. ;

Since db equals 10 log p2/p1, then log P2/P1 equals .08

From the log table P2/PI equals I.2 , and since P2 equals I00 watts, PI equals 83 watts to the antenna when the SWR is I.0

Now suppose our SWR is 3, from figure I3-I2 the added loss is .4 db., so our overall loss is .8 + .4 or I.2 db. Then log P2/PI equals .I2 and P2/PI equals I.32, so PI equals 75 watts.
The additional power loss due to the SWR is 83 - 75 or 8 watts.
(This is a revelation to me, Hi. Ed.)

Incidently, since one s-unit is 6 db the effect at the receiver of the added loss is negligible. (Such big words, I can understand three quarters of that last word)

Using this pattern of calculations the following chart was prepared to show the additional power loss due to SWR, in the I00 watt transmitter.

| Frequency MC's | Loss in Feed Line (Watts) SWR I to I | Additional loss due to SWR (Watts) SWR 3 to I | SWR 5 to I |
|---|---|---|---|
| 3.5 | II | 5 | I2 |
| 7.0 | I7 | 8 | I6 |
| I4.0 | 20 | II | 22 |
| 28.0 | 34 | I2 | 23 |
| 50.0 | 44 | I3 | 24 |

It's interesting to note, that at 28 MC's the effective power with a perfectly matched line (SWR I to I) is 66 watts while with a 5 to I SWR the power 44 watts. Again;

DB loss equals I0 x Log of P2/PI or I.75
Since I s-unit equals 6 db the received signal is down about I/3 s-units.

Try these conclusions and calculations on your rig, you may reach some new conclusions.

W2YNR Paul.

ED's Comments... Well first of all I want to thank Paul for the effort and the article. Since this is a sort of controversial subject I hope that there are many comments and possible questions. So get them in here. The same goes for the next article on SWR by W2PAX. It has been very enjoyable sitting here reading four articles on the same subject SWR. All four of the articles treat the same subject (SWR) in four different ways. So there will be more of these in the coming months and we all will learn something about SWR I'm sure even if it is only the other fellos viewpoint.

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S W R

The expression SWR (Standing Wave Ratio) describes a condition that exists on or in a transmission line that is transferring power from an RF amplifier to an antenna or other power consuming device (Such as a GG Linear Amplifier). When the impeadance looking into the point of connection of the antenna is of a different value than the characteristic impeadance of the transmission line, some of the power will not be used or consumed by the antenna, but will be reflected back to the source, combining with the outgoing power to form points of minimum and maximum currents and voltages. The ratio between the maximum and minimum currents and the maximum and minimum voltages is the SWR. Since all of the standing wave instruments commonly used respond to voltage, we think of the SWR as a voltage standing wave ratio , or VSWR.

The result of a high SWR (over 3 to I ) on a transmission line is loss of power in the line itself. This is the result of heating of the conductors and dielectric composing the transmission line. However, the fact that a SWR exists is not necessarily bad. Whether it is enough to be concerned about is related to the type of transmission line, the lenght of the line, the frequency of operation

SWR (Con't)
and the desired efficiency of power transfer.

The losses in transmission lines are measured in db per 100 feet of line. Since losses in open wire lines are very low at ordinarily used frequencies, we will confine our discussion to coaxial cable lines.

Providing the amplifier will load properly, a loss of a db or two is inconsequential. This will be the case with comparitively short lines ( under 50 to 100 feet), the lower ham frequencies (under 30 MCs), and low SWR ratios ( 3 to 1 or less). Except for the perfectionist who must have everything just right, dont worry about it.

Now we come to the most important single thing to remember about SWR. Any and all adjustments to effect the SWR must be made at the point of connection of the transmission line to the antenna or the transmission line to the matching device being used. In this discussion this will be the the point of connection of the transmission line to the antenna, not the antenna tuner. NOTHING that you can do at the amplifier end of the line will affect the SWR. By juggling the length of the line you may achieve some misleadingmeter readings, but the SWR will remain the same.

SWR is measured by means of an instrument that has the ability to discriminate between the direction that the power is being transmitted along the line. Some are designed to be physically reversed in the line to read forward or reverse power, and others are made with two detectors, one for forward and one for reflected or reverse power, and a single meter to be switched between them. Most are quite reasonable in price, and there are several designs that can be built for for very little money, and a VTVM or VOM used for the indicator. For most accurate results, especially with long lines, the SWR detector should be placed at the antenna end of the line.

Adjustments are always made for the purpose of achieving a low SWR(low reflected power). This is done by the means of a matching device such as a delta, T , Omega, or Baluns, tuning stubs, lumped constants (coils or capacitors) usually inserted between the transmission line and the antenna.

To measure the SWR, the instrument is inserted between the line and the antenna matching device, in the forward power position. Power is then applied and the amplifier output is adjusted for peak output (or the sensitivity of the SWR meter then adjusted for a peak reading=full scale) to give a full scale deflection of the meter. Then the SWR instrument is reversed and the antenna matching device adjusted to give the lowest possible reading or deflection. These adjustments should be made several times to assure accuracy. The instrument may then be left in the line (if it of this type) and will serve as a very useful relative power output indication.

In the antenna section of the handbook there is a graph that shows the increase in transmission line loss as related to increased SWR. A brief study of this graph will show that a SWR of I.00I to I is really not necessary. The guy at the other end will never know the difference.

W2PAX Gurdon Cooper.

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ED's Comments.... well there you have two views and opinions printed for your enlightenment. There will be an additional two articles on this subject in the near future. And any and all other comments are invited. I thank both Paul and Gurdon for the articles. See you all at the outing this coming Sat. at Lake Garrison so come on out and have a real good time. 73's.

Well here is a page that I never thought I would see this month. But at the last minute decided that it wouldnt be too much of a waste of paper to include the results of the field day effort this year. I know that Woody would have never forgiven me if I had forgotten to include this. Bob Sherker WA2EPB came over to give us a hand this month with the sorting and stapling etc. and for good measure he brought along his xyl 'Cookie'. I hope that this will expidite the delivery of this months Crosstalk, but the women havent seen each other for over an hour or so, and one can never tell about these things.

Which reminds me, as long as we have the room, that if you have an xyl on vacation or away from home for any reason, and want her home in a hurry all that you have to do is send her a copy or your local paper. But before you mail it cut out (neatly) one little article. Hi. She will be home that night.

Well here are the field day results and dont forget that you read about it in Crosstalk first...

80 Meters.. 297 contacts Multipliers of 3 and 2 for a total score of 1782 on CW and
58 contacts multipliers of 3 and 2 for a total score of 348 on AM. Grand Total....2130 points.

40 meters.. 178 contacts multipliers of 3 and 2 for a total of 1068 And they had no AM operation.

20 meters.. 212 contacts x 3 x 2 for a total score of 1272 points and they also had no AM operation.

Since six and two meters were operating one one at a time this makes us a four band opeation , and these scores are additive.

6 meters.. 126 contacts + 25 points for sending the club message = 151 x 3 x 3 for a total of 1359 points.

2 meters.. 7 contacts x 3 x 3 for a total of 63 points. So this Grand Total is 1422 points.

The grand total for the entire four bands was

5 8 9 2 points.

I have no way of checking into the past, but I do beleive that this is a new high for the club. Whether it or isnt doesnt make too much difference really as all that were involved agree that it was a lot of fun and they had a good time.

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This space reserved for anyone who sends in a 'ham profile' or any other tidbits in time for the next issue. So lets not let it go to waste.

DONT FORGET THIS COMING SAT... ALL DAY AT THE LAKE GARRISON... FOR THOSE WHO GET LOST EASILY THERE MAY BE TALK-IN BY THE FIRST ONES THERE SO TUNE AROUND AND BE DIRECTED THERE IN A STRAIGHT LINE.

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