SPECIAL SERVICE CLUB

the RaRa Rag

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VOL. 38 DECEMBER 1985 NO. 4

RDXA TO PROVIDE PROGRAM FOR DECEMBER RaRa MEETING AT KODAK PARK DECEMBER 6th

The December RaRa meeting will be hosted by the Kodak Park Amateur Radio Club and will be held in the Camera Club auditorium starting at the usual time of 8 p.m.

For the program, the Rochester DX Association will present a visual overview of some of the Ham Radio interests and activities of its members.

RDXA was founded in 1947 to encourage the pursuit of DX and since then its members have engaged in that quest from many different angles. Members have earned recognition for accomplishments in DX hunting and contesting and have themselves traveled far to help other Amateurs in the pursuit of the rare prefix. The organization has also engaged in Field Day in recent years and has been quite successful.

This program will hopefully foster more interest and understanding of DX and show that it isn't limited to a few rich *frequency hogs* but show how much fun it can be for the average operator.

Remember, this meeting will be held at the Kodak Park Recreation Building (building 28) on Ridge Road, two lights west of Lake Avenue. Park in the lot directly in front of and across the street from the entrance. Kodak ARC members will direct you to the meeting room.

RRRA MEETS AT PLANETARIUM

The Rochester Radio Repeater Association will present its 5th annual *Family Night at Strasenburgh* Friday, December 20th at 8 p.m. Come around 7:30 to get your tickets in time. There will be no business meeting this month. The star show this year will be about the biggest event of the winter, the return of Halley's Comet, so don't miss this one! Admission is $2.50 for adults, and normal child and student prices will prevail. There are even plans for a small group going out for pizza afterward.

This should prove to be a good Christmas outing for the family – Let's see a good turnout!

TELECONFERENCE RADIO NETWORK ABOUT ACSSB

Will amplitude companded single-sideband (ACSSB) obsolete your 2-meter FM equipment? Will it become the voice mode of choice for amateur satellite communications? Just what is ACSSB anyway? These questions and more will be answered on the next North American Teleconference Radio Net (NTRN) Friday, December 13th, 1985. The speaker will be one of amateur radio's foremost technical leaders: Paul Rinaldo, W4RI, Editor of *QST*. Paul has closely followed the development of ACSSB and was instrumental in obtaining the ACSSB transceiver boards recently made available to experimenters by ARRL.

ACSSB is just beginning to be used by the commercial land mobile radio services because of its spectrum efficiency. ACSSB uses 5 KHz channels versus 15 to 20 KHz used by conventional FM. And, unlike its cousin single-sideband, ACSSB provides the benefits usually associated with FM such as receiver squelch, automatic frequency control (AFC), and capture effect. Given these features, shouldn't we be talking about a 5 KHz channel plan for 2-meters rather than 15 vs. 20 KHz?

The second half will be live from the F.C.C. monitoring station in Grand Island, Nebraska. An interview with the engineer in charge James Berry, Mr. Berry will brief us on the historical aspect of the Monitoring Station from the viewpoint of its as a facility as well as the change in responsibility accompanying the change in technology. In addition we will discuss how and where they listen and what Amateurs can do when experiencing radio frequency interference or observing a violation.

This TRN will be heard on 146.79 K2SA Repeater starting at 9 p.m.

SILENT KEY

KA2RYG
William Lewis
October 13, 1985

the RaRa RAG

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AS I SEE IT . . .

by Ronald J. Jakubowski, K2RJ
Editor, RaRa RAG and President, RaRa

I would sure like to thank all those club members who took up the slack in my absence the last two weeks of October. I performed my annual Army Reserve active duty in Atlanta, Georgia, again this year and had to depend upon my staff and friends to get out the November *RAG* and take care of the annual auction. Many thanks especially to my Associate Editor Don Taylor, KB2BU, who did the paste-up and mailing.

Because I was gone, I did not have an opportunity to help out with the K2JD open house and DX contest weekend but hear that it was a pretty dismal failure. The turn-out of members was very sparse, and to make matters worse, the beam was stuck pointing towards VU6-land all weekend with nary an opening.

Our club equipment custodian, Ed Gable, K2MP, worked many hours trying to get the rotor working in time for the contest. The problem seemed to be low voltage at the brake solenoid caused by the 300 some odd feet of cable connecting it to the control box in the station. One, then a second, booster transformer was placed in the line to bring the voltage up far enough to make the solenoid work, all to no avail. Even with 40 volts on the solenoid, it would not release. So, it turns out that the initial assumption was wrong – the problem is really something mechanically hindering brake release. Unfortunately we could not get delivery on a new rotor and install it in time for the contest. Ol' Murphy had won again!

So, I wish to apologize to the RDXA members who tried so valiantly and promise that we will be willing to try it again soon with all equipment working properly!

PREVIEW OF UPCOMING RaRa MEETINGS

December	RDXA, Joint meeting at Kodak Park
January	Lightning & Electro-Static Discharge, Gil Chapin, WB2UTI
February	*Home Brew Night*
March	Packet, 1 Year Later
April	*Old Timer's Night* & Nominations
May	Cable Leakage, a 2-Way Street, Earl Housekneicht, V.P. of Greater Rochester Cablevision
June	Annual Picnic

AMATEUR RADIO EXAMS DECEMBER 21st

RaRa, under the auspices of METROPLEX-VEC provides Amateur Radio Exams the third Saturday of the month September through April and at the Rochester Hamfest in May. The next scheduled exams are December 21st. They are held at the Monroe County Social Services Building (home of the K2JD club station) and start at 9 a.m.

Pre-registration at least 10 days in advance is requested to allow the VE team to adequately prepare for the exam session. Walk-in's are permitted if the candidate arrives by 8:30 a.m.

Pre-registration must include a completed form 610 (*new form only*) and a copy of your current amateur radio license (if you have one). If you need a form 610, write to the address below with an SASE and one will be mailed the next day. The charge for taking an exam is $4.00 which is payable *on the date of the exam.* Check or money order should be made payable to *METROPLEX-VEC.*

Send all correspondence to:

A. G. "Albert" de Blieck, KW2X
59 Bay Knoll Road
Rochester, NY 14622

Items Needed For Hospitalized Vets

Bill Landon, K2CBD, tells us that there is always a need for the following items to help those at the Bath Veterans Administration Hospital:

Socks
Shirts
Pants
Summer Jackets
Winter Coats
Boots, Rubbers
Any toilet articles
Baby powder for hot weather
Hats
Mittens, Scarves
Any ceramic hobby supplies
Cloth in sections ¾ to 1 yard
Pieces of leather at least 5 x 6 inches
Pocket books
Current magazines
Word-find and Crossword puzzle books

If you have any of these items you would like to donate, call Bill at 663-0429. Bill also serves as Chaplain of the American Legion Post in Rochester.

DECEMBER RAG CALENDAR

6 - Annual RaRa - Kodak Park ARC Joint Meeting, 8 p.m., Kodak Park Recreation Building 28

6 - January *Rag* Deadline to KB2BU

8 - **HAPPY HANUKKAH!**

11 - RaRa Board of Directors Meeting, 7:30 p.m., K2JD Club Station

12 - Rochester Packet Group meeting, Monroe County Social Services Building, 111 Westfall Road

13 - VHF Group meeting, 8 p.m., Monroe County Social Service Building, 111 Westfall Road

17 - RDXA meeting, 8:15 p.m., Colonial Hotel, 1127 Empire Boulevard

20 - RRRA *Family Night at the Planetarium,* 7:30 p.m., Strasenburgh Planetarium

21 - VE Exams, 9 a.m., Monroe County Social Service Building, 111 Westfall Road

25 - **MERRY CHRISTMAS!**

LETTER TO THE EDITOR

Much has been printed in the *RAG,* RRRA publications and discussed at meetings of both organizations about the proper procedures when using the FUZZ-BUZZ.

I spend a considerable amount of time in the listen mode and find that almost without exception Hams reporting accidents, incidents or dangerous conditions follow these procedures faithfully.

Many citizens have received prompt emergency service because a Ham observed and reported, especially in isolated areas and expressways where immediate access to land-lines is not readily available.

Recently on two consecutive days I heard Hams report accidents via the FUZZ BUZZ. Shortly thereafter I heard the Emergency Dispatcher advise the police car that the accident was called-in by a *CB* radio operator. That's like calling a peach a lemon!

R. McConnell, NF2Z

Amateur Radio News Service

FEBRUARY IS "HOME BREW NIGHT"

How would you like to take your wife or girlfriend out to a nice dinner and have RaRa pay the bill? Well, if you are one of the three lucky people to win in the "*Home Brew Contest*" you can do just that.

The program committee has purchased three $30.00 gift certificates at well known Rochester restaurants. These will be awarded to the winner in each of the three classes. Additional prizes will be awarded in each class depending on the number of entries.

To qualify for the prizes you must let us know IN ADVANCE that you will be presenting your project at the February meeting. Please fill out the entry form below and return it no later than January 25, 1986. This will give the committee time to plan the setup for the big evening.

Remember you can't win if you don't enter. So, start thinking and building that project now. It doesn't have to be complicated it just has to work and has to be your own construction. It may be built from an idea of your own or one you got from a magazine or another ham. The only thing it can't be is a commercially manufactured item that is sold as a kit (i.e., Heathkit, Hamtronics, etc.). Start building, the dinners are waiting.

RaRa 1985-1986 HOME BREW CONTEST ENTRY

NAME

CALL

ADDRESS

PHONE

CLASS:

____ 1. Transmitters, receivers, preamps, tuners
____ 2. Computers & Accessories for AMTOR, RTTY-CW, PACKET
____ 3. Test equipment for use around the hamshack.

You may enter more than one class in the contest. Please return the entry to:

RaRa Program Committee
Richard A. Goslee, K2VCZ
24 Elaine Drive
Rochester, NY 14623

FOR SALE: Ringo Ranger II-ARX2B. Four element quad beam for 2 meters. Both brand new. Heathscope like new. Call Al Dobbs, KA2OMT, 473-1180 or evenings 473-4262.

FOR SALE: Heath IM-17 Voltmeter, New. 244-2333 after 5 p.m. Geoff Tilga, WA2YIX.

UNCLE AUGIE'S CORNER

by Bob, N8ADA

ALL DUMMIES AREN'T IN CANS

The other night I decided to check in and see what some of my cronies on 75 were doing but when I called in, no one recognized me. Finally after several calls someone said, "*Is that you, Augie? I can just barely hear you. Turn on your kicker.*" I hollered, "*I got it on*" and he said, "*Something's wrong, you're way down in the soup.*"

Oh! Oh! I thought, my relay is dirty. Since I hate open relays, I tore into the rig. I'll just clean those contacts says I. Well you know, when I tried to get some crocus cloth on those points, I found the smart alec that designed that relay had put plastic stiffeners just where you have to slide the cloth so it wouldn't work. Aha! you can't top old Augie, I'll loosen the screws just enough to separate the parts and clean the contacts and then retighten. So, I loosen the screws, not enough, just a little more, not enough, just a little more --- then plink, plink, plink as 25 washers, spacers, screws, etc. spread all over the inside of the cabinet. (Several sentences were censored here, Ed.)

After two hours of sorting and reassembly work, (got it together wrong three times) I finished. Then it struck me, I forgot to clean the points when I had it apart. So, once more it came apart. I finally got the dag nab thing reassembled and called George down the road on the land line to listen for me. He came on and said "*Boy, Augie I can hardly hear you, take it off the dummy load and put on an antenna.*" "*Dag gone it, George, you know I wouldn't do a stupid thing like leaving it on a dummy load, see, I switch it --- Well I'll be a !¶ ?°*%$+.*"

See you next month if I can get this red off my face.

Tnx RF CARRIER

IDENTIFYING HAZARDOUS MATERIALS

As Amateur Radio operators, we occasionally find ourselves providing emergency communications when we happen upon an accident scene. Many times, radio amateurs are the first to report road or highway accidents to the authorities. In these cases, there is a tendency to check the vehicle to assess the number of injuries, if any, before or while making the emergency call. The authorities need this information to gauge their response accordingly. There is risk, of course, especially since many vehicles on the highways are carrying some form of Hazardous Materials (Haz Mat). In the event one of these vehicles is involved in an accident, your knowledge of Haz Mat will help you protect yourself and everyone involved and to relay important information to authorities.

Four-Digit Key

Determine if any Maz Mat is involved before approaching the vehicle(s).

Vehicles carrying 1000 pounds or more of Haz Mat are required by Federal regulations to display a placard bearing an identification number. A four-digit number, such as 1203 can be found either on a diamond-shaped sign or separately on a rectangular-shaped card just below a diamond-shaped sign. It is very important to look for these signs when you come upon an accident, particularly on vehicles which are likely to be carrying hazardous materials (e.g. trailer trucks).

These four-digit numbers will indicate exactly what is being carried on that vehicle. For example, 1203 is simple gasoline. How do we know what these numbers mean? The U.S. Department of Transportation publishes an *Emergency Response Guidebook (ERG)* which lists every ID number and its corresponding substance. The *ERG* also explains the specific dangers posed by the substance, how best to handle the situation, specific first-aid information, and suggested evacuation procedures.

100 Pound Rule

Vehicles that carry less than 1000 pounds of hazardous material such as chain store trucks are not required to display a placard. Nonetheless, these trucks may carry small amounts of Haz Mat of some type. In addition, they often carry such items as toilet cleaner and household bleach. If you've ever read the label on one of these products, you'll know that if these two products are mixed together, they produce cyanide gas. Hence, if one of these trucks is involved in an accident and these containers are mixed, you have a hazardous material incident even though no placards are visible on the truck. Whenever a truck is involved in an accident, take heed to the possibility it may be carrying less than 1000 pounds of Haz Mat!

There are certain shipments of less than 1000 pounds, like explosives, that are still required to display some type of placard. Any vehicles carrying any amount of explosives is required to display a placard bearing that information. Also, a shipment of materials that can produce toxic substances when wet must bear a placard.

Protect Yourself First

The best action for you to take as an Amateur on the scene of a hazardous material incident is to stay back at a safe distance and report the information including the placard number. Under no circumstances should you risk approaching the vehicle(s), even if to aid the injured. Rescue personnel are taught a very important lesson during their training: protect yourself first. This might draw criticism from the public, but please understand: if rescue personnel are incapacitated in any way, who will help the people who are injured? Moreover, if you approach the vehicle(s) and become injured or overcome yourself, then the rescue personnel will have one more person to treat when they arrive. This is the last thing they need. Please be cautious. It may save your life.

(Continued on next page)

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446 CEDARWOOD TERR. ROCHESTER, NY 14609

MANAGING EDITOR (Name and Complete Mailing Address)
SAME AS ABOVE (EDITOR)

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11. I certify that the statements made by me above are correct and complete — SIGNATURE AND TITLE OF EDITOR, PUBLISHER, BUSINESS MANAGER, OR OWNER: Ronald J. Jakubowski Editor

PS Form 3526, July 1984 (See instruction on reverse)

HAZ-MAT

(Continued from previous page)

Education and Training

Your best protection is knowledge. I suggest that all radio amateurs, particularly those actively involved in emergency services, obtain some type of training in this subject from local agencies. Those in Indiana may enroll in the "*Warning and Evacuation Specialist*" course taught by instructors from the Indiana Department of Civil Defense and Emergency Management. This particular course shows what to do when working with Haz Mat incidents and how to evacuate an area when necessary because of impending danger. Perhaps it would be possible to develop a video-taped program dealing with problems that Amateur Radio operators may face when working in various emergency situations. Your comments and input regarding this are welcome.

Emergency Response Guide

Those of you who would like a copy of the *Emergency Response Guide* can request copies from the Materials Transportation Bureau, in care of the U.S. Department of Transportation, ATTN: DMT-11, Washington, D.C. 20590. Ask for the *Emergency Response Guidebook*, DOT P 5800.3. Your request should be on ARRL, ARES, or other "official" letterhead as copies are not normally distributed to the public at large.

If you are unable to obtain the *ERG* directly from the DOT, you may send a large s.a.s.e. with 69 cents postage affixed (one envelope for each *ERG* requested) to Jeff E. Howell, WB9PFZ, R.R. 16, Box 423, Bedford, IN 47421-9426. I'll secure the books and forward them to you.

– Jeff E. Howell, WB9PFZ

(Editor's Note: Jeff has been an Indiana-certified Emergency Medical Technician since 1978 and has received extensive training in handling Hazardous Materials from the Indiana Department of Civil Defense and Emergency Management. He knows whereof he speaks.)

Tnx ARRL FIELD FORUM

FOR SALE – HW12A 75 Mtr SSB xcvr, HP13A DC power supply, HS24 Mobile speaker, Hustler 75 Mts Mobile ant. and mount - $160. W2DBU, 637-6926.

WANTED: Norelco Minicorder. Ned Junker, KA2DZC, 544-4012.

ST. JOSEPH'S VILLA UPDATE

by Tim Wettach, N2TW

This year I had the good fortune to be in a position to partly return a large favor granted to me.

Thanks to Bob Mann, W2PNS (now Silent Key); Ron Lillie, WA2UIG; plus my father and brother, I was introduced to ham radio at approximately eight years of age. And thanks to Ed Losey, WB2QGC; Russ McKay, WA2CBU; and Irv Goodman, AF2K; I received my novice at eleven and Extra at thirteen.

Ham radio has been responsible for nearly all the successes in my life. Besides years of on-the-air enjoyment, it has influenced my career choice, employment opportunities, and awareness of the growing technological world around me.

I have had the rewarding experiences of introducing a group of five youngsters at St. Joseph's Villa to this wonderful hobby. A listen on the bands, a touch of Morse code, a few electronic experiments, and field trip visit to the K2JD RaRa club station facility has been the agenda. However, much more needs to and can be accomplished. Unfortunately, due to college commitments, I will be unable to continue; therefore, substitutes are needed! Perhaps there are some of you who would care to return a favor of your own. As with all things of this nature, the return for the small effort required is tenfold.

These are bright children, yearning for knowledge and direction. Please don't deny them this. If you will help, please call me at 461-3398 or leave message at 671-4430. I will be glad to provide any assistance I can, including ideas and electronic supplies. Thank you.

PRESIDENT CLARIFIES HIS POSITION ON CONSTITUTIONAL REFORM

Aug.28;– Frank L. Widmann, Lawyer, and the 1985 President of the South Jersey Radio Association made the following statement to the press in order to clear up any misunderstanding that they may have had on this very controversial issue.

" I know you believe you understood what you think I said but I am not sure you realize that what you heard is not what I meant."

N2FGF

Tnx SJRA HARMONICS

SOME REFLECTIONS ON STANDING WAVES

by Paul, VE3ICV

THE SCENARIO – FIELD DAY, 1985 . . .

I wander over to the 80/20 phone tent a half hour or so before the contest starts. Noticing that the 20m beam is up and all the equipment is operational, I casually ask how they are getting out. "*Don't know . . .*" comes the reply from the operator, "*we haven't even tried to make any contacts yet. The SWR is too high, it's 1.7 to 1*". "*Does the rig load up, can you get a dip in plate current?*", I ask innocently. "*Sure it does, but all that reflected power is no good for the rig.*" However, before I can say anthing else an antenna matching unit is put in the line, the SWR at the rig is reduced to 1 to 1 exactly, and everybody is happy. I walk off, not bothering to ask the obvious question – What has happened to all the reflected power that was on the transmission line? Is it now being dissipated in the antenna matching unit? But, how can this be so, since the antenna matching unit contains only inductance and capacitance, which by definition, cannot dissipate energy? Back at the 80/20 cw stations, a few hours later, I casually check the SWR on 20m. It's about 2 to 1. We continue making contacts at a fast clip.

In the evening, accompanied by a friend, I take a look at the 40/15 cw station. We are both surprised to find that the station is not operating, since this should be prime time for 40m. It turns out that the young owner of the rig has just arrived and is worried about the high SWR. Closer questioning reveals that the rig will load, however, and has been in operation all afternoon. A spirited discussion/argument ensues between the owner of the rig, and the two of us regarding the true ramifications of reflected power. This discussion is abruptly terminated when the owner declares that he had a Master's degree in Physics and knows all about these things. At this point, my friend and I walk off, not bothering to tell him that between the two of us, we have over 50 years of experience, both as licensed amateurs and professional engineers.

The above scenario is not new. In fact, it is repeated in more or less the same format every Field Day, and a considerable number of possible contacts are thereby lost. No doubt much useful dx is lost in the same way throughout the rest of the year. It seems that of all the technical aspects of amateur radio, antennas and transmission lines in general, and standing wave ratio in particular, are the least understood. This is not entirely surprising, since fundamental antenna theory can get very involved. Nevertheless, numerous myths abound about SWR which tend to obscure the real issue. Let's examine some of these myths, in the context of the Field Day scenario.

1. An SWR of anything but 1 to 1 means that power will be reflected back into the transmitter, to be dissipated in the finals. NOT TRUE. The origin of the myth seems to be the emphasis in the literature on reflected power on a transmission line. In actual fact, although the concepts of separate incident and reflected waves on a transmission line are useful in explaining its operation, the power transmitted along the line is the resultant (i.e., taking into account the magnitude and phase) of the two waves. The amount of power delivered to the load is exactly the amount supplied by the generator, less any line loss. The apparent power in both the forward and reflected waves merely adjust themselves to satisfy the above criterion, depending on the amount of mismatch between the line and the load. A good example of this is the case of a loss-less line terminated in either an open or short circuit. By definition, no power can be dissipated in such a load, and this is explained by the fact that in both cases, the incident wave is perfectly reflected at the load so that the power in the reflected wave is exactly equal to that in the incident wave and no power is drawn from the generator.

The important point to note is that the existence of the reflected wave merely modifies the input impedance of the line from its nominal characteristic impedance. As long as the generator can match this new impedance, there is no difficulty at all. In the case of the Field Day example, this was achieved by using the antenna matching unit, but it could easily have been achieved using the pi-tank circuit in the transmitter itself!

2. A high SWR is to be especially avoided if your rig uses TV sweep tubes. NOT TRUE. As already stated, the only effect of a mis-matched transmission is to modify the input impedance at the generated end. Assuming the pi-tank matching circuit can match this new impedance, there should be no difficulty. Premature failure of the TV sweep tubes used in finals is more likely to be due to over-driving or operation with the plate circuit off-resonance.

3. An antenna with a low SWR is more efficient than one with a high SWR. NOT TRUE. The only thing that determines antenna efficiency is the relative value of the radiation resistance compared to the antenna loss resistances. The

(Continued on page 8)

REFLECTIONS

(Continued from previous page)

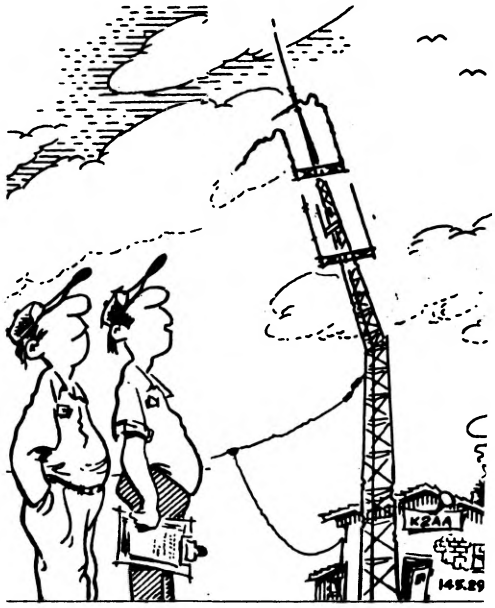
only useful aspect of antenna SWR is an indication of how rapidly the antenna reactance increases on either side of resonance, i.e., as a measure of the bandwidth.

4. A high SWR on a transmission line means that most of the power is being lost. NOT TRUE. As stated earlier, the effect of standing waves on a transmission line is to modify the values of voltage and current along the line from their values in the matched condition. It *is* true that an increase in current will cause a power loss due to additional heating of the conductors and an increase in voltage will cause a power loss due to additional dielectric losses, but the effect is usually small compared to the inherent loss in the line itself. As an example, a transmission line having a matched loss of 1dB (e.g., 100 ft. of RG-8 at 30MHz) would incur an additional loss of only 0.5dB for a 3 to 1 SWR.

So, should SWR be completely neglected? Well, not entirely. As already pointed out, operation at anything but a 1 to 1 SWR means that the voltage and current will be higher, for a given amount of transmitted power, than in the matched case. In particular, the higher voltage can cause arcing or breakdown problems, if high power operation is attempted. Another consideration for operating at a low value of SWR is when a low-pass filter is included in the line. By definition, if the SWR deviates too far from 1 to 1, then the filter will no longer see the expected load impedance and its harmonic attenuation may suffer.

So there you have it! You can easily live with a high SWR if you understand what is going on.

Tnx THE GROUNDWAVE



Ed: It bent in the middle after repeated use. No wonder it's not working!

Fred: Hmm.....A not uncommon malady!

Tnx SJRA HARMONICS

PROGRAMMING THE BEARCAT 250

For those of you who, like me, have a scanner that won't allow you to program in the sub-band repeaters (the Bearcat 250 only convers the 146-148 mhz region of two meters) there is still hope. I ran across this info in one of our trade newsletters. This trick should also let you beat the other limits, namely, below 30 mhz and the 406-420 mhz government band are not covered by the Bearcat 250.

Ready, here we go. Select "*Slow Scan Speed*", select the channel you wish to program, press "AUX" and "STORE" to erase any stored memories on this channel. Now set search limits 146 to 147 mhz and search "*up*", make search stop by opening the squelch (doesn't matter what frequency you stop on, except that if you want 145.45 don't stop on 146.055 stop on 146.050 as when you search down it is going to do 10 khz steps downward because of the 30-50 mhz band set up) press "LOCKOUT", "AUX", "RECALL". Now enter a new limit, say 34 mhz, don't forget to press the limit switch (this new limit must be within the normal scanning range allowed). Press "RECALL" and reset the squelch knob (counterclockwise). Next press search scan "DOWN" and your Bearcat will scan down to and below 14 mhz if you wish.

When the scanner gets near the frequency you want to have entered into this channel open the squelch clockwise to stop the scan. The exact frequency can be stepped to manually with the "UP" and "DOWN" buttons if you miss. When you have the frequency desired with the squelch still open turn off the scanner and wait for a few seconds. Then turn on the scanner and "*viola*" there is the frequency that you wanted.

There is some loss of sensitivity of course but this method is far superior to the method I had tried previously which was to utilize the I.F. images. (*tnx to Jay Ward, NG6O and the MT. WILSON REPEATER ASSOC NEWSLETTER, via NARC NEWSETTE)*

COHERENT CW ON LONGWAVE

Have you heard of the 1750-meter band? It spans 160-190 kHz, and U.S. experimenters there are allowed unlicensed operation with no more than 1 watt DC input and a 15-meter antenna. (Don't get out your calculators; that's like having QSOs on 80 meters with just a wire just a hair longer than *two feet!*) It *is* possible to make electromagnetic hay on 1750, though – especially if you jump into the experimental spirit of the band and its users. More and more 1750-meter experimenters, or LOWfers, as they're nicknamed, are turning to uncommon technologies in their guest to span greater distances on the band. One such technology is coherent CW (CCW). What's coherent CW? There's quite a bit on the technique on pages 21-9 to 21-12 of the *The ARRL 1985 Handbook for the Radio Amateur.* Simplistically put, it's a method wherein transmit and receiver frequencies, keying speed, and receiver bandwidth are synchronized, allowing something like a 20dB improvement in signal-to-noise ratio at 12 WPM over non-coherent CW systems at similar signalling rates. From the September issue of *QEX*, the ARRL Experimenter's Exchange, comes this report on 160-190 kHz CCW:

Mike Mideke, WB6EER, and I have been experimenting with coherent CW in the 1750-meter experimental band. My CCW beacon is located in Morro Bay, California, transmitting 10-baud CCW, while Mike is receiving with a Petit PCF-3 coherent CW filter (*QST*, May 1981). A digital dot is precisely 0.1 second, while dashes, space and blanks between elements are 0.3 second long. A 32-bit memory is used, making the entire ID 10.7 seconds. All experiments have been conducted on 176 kHz, as sufficient RF stability occurs with ordinary crystal control. 166.66667 kHz was planned, but carrier accuracy is far less stringent than first thought!

"Phase-locking to 10-MHz WWV was discarded after the discovery that 100-kHz LORAN C signals were received while transmitting on the same antenna, using a simple 100kHz tuned circuit. A basic 100-kHz receiver is now needed with only a sample and hold output such that a phase lock can be achieved with a 1MHz crystal. A commercial LORAN C unit was used for this initial try.

"It is becoming more apparent that stabilities and complexities first though necessary are not required when the communication experiment lasts for a few hours, or can be optimized by the operator on the spot. Both Mike and I are now looking for an experimenter in, say, the Hawaiian islands, to show what coherent CW and one watt of power can really do" – *Cliff Buttschardt, W6HDO*, 950 Pacific Street, Morro Bay, CA 93442.

The Longwave Club of America (45 Wildflower Road, Levittown, PA 19057) publishes the *Lowdown*, a monthly bulletin covering DXing and experimenting on frequencies below 550 kHz.

THE RaRa RAG 20 YEARS AGO – DECEMBER 1965

by Ed Gable, K2MP

Do you remember what happened 20 years ago about this time? Do you remember when the lights went out? Yes, it was the great black out and Rochester Hams were there. Power began to fail at 5:17 p.m. on November 9th. Within 30 minutes Bill Kirkbright, WA2HWC, had the 6 Meter RACES net activated. At 8:15 the Monroe County Control Center was fully operational with Chuck Brelsford, K2WW: Bob Mc Carty, W2RUJ; Jack Morse, K2KFN; and Harold Smith, WA2KND. Telephone communications remained intact remarkably well and RACES remained an important and ready backup throughout the period.

Frank Slaymaker of General Dynamics was announced as the guest speaker for the evening with a program on wave propagation. Linc Cundall, W2QY, reported on the 3rd Annual AWA meet in Mason, Ohio, where a trip to WLW and the Gray Wireless Museum were featured. Chuck Oneske, K2YCO, presented a talk on UHF equipment to the Rochester VHF group. Included were slides of equipment operated by Doug Armes, K2ACQ, and Tom Ball, WA2THS, both of Lockport. Chuck Witmann, WB2FZB, reported that new Peanut Whistle Net certificates were awarded to Dan Hadfield, WB2PCP, and Paul Meyer, W2AEH.

Eddie Meath's Christmas Fund was in full swing again with critical amateur support to pull it all together. General Chairman was Ed Perkins, WB2MAC, with Dave Hassett, K2SQI, heading the 10 Meter team. Vic Carozza, WA2STJ, ran the 75 Meter group, and Bill Kirkbright, WA2HWC, netted the 6 Meter bunch. A brand new RF-301 Transceiver was loaned to the operation by the new radio company in town, RF Communications, Inc.

Barbara Ellers, WA2YSC, was a featured cover girl on the front of the *Guide for Leisure Living* supplement of the Rochester T/U. Many Ham Radio related articles were included.

FOR SALE:

Kenwood TS 520 S 80-10 meter CW filter	$500.00
Kenwood antenna tuner AT 200	$ 75.00
Kenwood speaker SP 520	$ 50.00
Shure mike Model #444	$ 40.00
Hy-gain TH6-DXX 6 element beam 10-15-20 meters	$130.00
Ringo ranger ARX-2	$ 20.00
Eleven element 2 meter antenna	$ 40.00
CDE Ham IV Rotor system	$125.00

Nick Neusatz, N2BQH – phone 225-4721 or 663-9533.

BALUNS, BALUNS, BALUNS

by Dick Weber, K5IU

Some number of years ago, I had a Hy-gain 10 meter Long John which had 1.5 to 1 as its lowest VSWR. One day, I decided to improve this by tweaking on the Beta rods and the driven element. The lowest VSWR I could obtain was 1.5.

The Beta match was fed through a Hy-Gain BN-86 balun, and I became suspicious of it, so I decided to take it off the antenna and test it. With a 50 ohm non-inductive resistor across the balanced terminals, I measured the VSWR to be 1.5 to 1 at 28 MHz using a Bird wattmeter.

I then decided to feed the beam with a coiled line choke. Using an HP4815A RF Victor Impedance meter, my choke exhibits about 1000 ohm reactance to shield currents at 28 MHz. After installation on the ten meter beam, the VSRW was 1.15 to 1 with no pattern change that I could detect.

Over the holidays, I was going through my "*junk box*" and noticed all the baluns that I had acquired over the years. In view of my prior experiences, I began to wonder about their performance and decided to test them as I did with the BN-86. Again, I used the HP RF Vector Impedance meter to measure the impedance at the unbalanced port of the balun with a 51.8 ohm non-inductive resistor across the balanced port. The chart below shows the measured impedance of the various baluns at frequencies of interest:

BALUN/BAND	160	80	40	20	15	10
Bencher (hi freq)	25	38	50	60	70	84
Ultra-Bal 2000	50	52	55	63	78	98
Unadilla (W2AU)	50	52	55	60	70	78
Cushcraft (ATB-4)	40	48	52	58	63	67
Hy-gain	46	50	54	60	70	78

The test condition I used was a non-reactive load, which is often not what is seen in the real world over the bandwidth of the antenna. Recently, AA5C replaced a Bencher (hi freq) balun on his TH7 at 90 feet with an BN-86, which greatly improved the VSWR on 21 MHz. However, the chart shows no difference between the two on 15 meters.

One point is clear, 1:1 baluns are not necessarily 1:1 over their advertised frequency range....

The North Texas Contest Club