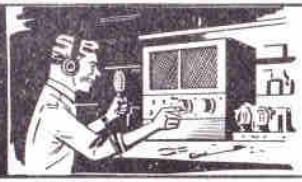

HAM HUM

Published by
AK-SAR-BEN RADIO CLUB, INC. - Omaha, Nebr. 68101
Post Office Box 291 - Downtown Station

June 1969

Vol. XIX
No. 6

NEXT MEETING

WHEN: Friday, June 13, 1969

TIME: 8:00 P.M.

WHERE: Red Cross Chapter House – Club Room
39th and Dewey

WHAT: Preparation and plans for Field Day.

Eyeball QSOs and refreshments.

****

HAM HUM is the official organ of the Ak-Sar-Ben Radio Club, Inc., of Omaha, Nebraska, mailed monthly to all members and to others upon request.

Next copy deadline: June 27th

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HELP WANTED

Do you really read this magazine? Have you given any thought to what is involved in time and money in publishing it monthly? HAM HUM is one of the finest club magazines published. If you have access to other club papers you will find that most of them are typewritten or mimeographed, and without pictures. If you checked into it you would find that with most clubs the reason for this is time and money (mostly money). The actual cost of printing this magazine would be very close to the total dues paid to the Club each year. Without getting into naming names, you and I know who has carried this load for years.

I think we have been "free-loaders" long enough and we must start picking up all or most of the actual costs involved. The one commercial ad we have helps some toward carrying the load, but we need more. Commercial ads may be hard to come by due to the limited circulation we have, but space is available. Rates for advertising are listed on page 17. If you are in business or can talk to someone who is, we sure need the ad. It does not have to be an ad for electronic products as, regardless of what some people might say, hams are people. If the opportunity presents itself you might mention to Leo that you have noticed his ad in our paper.

Three ways to help this problem are: to sell ads, get more members, or raise dues. The first two sound pretty good to me!

Let's all make an effort to have this magazine self-supporting.

73,
Royce E. Johnson, WAØKIL
President

****

May 16, 1969

Ham Hum:

I have a number of older (1955–1956, etc.) issues of Radio and TV News magazines. I would like to give these to any interested party. These contain lots of info. on TV circuitry as well as other electronic amateur radio, too.

John Snyder, WØWRT
3221 So. 45 St., Omaha
556-1538

****

MARS News
– Air Force

On April 14 a state meeting of district #1 staff members was held in the home of Royal Enders (AFAØLYO). The following net times were established (times are local): Monday – 8 P.M. to 9 P.M., technical disc.; Tuesday – 7:25 P.M. to 8:30 P.M., teletype; Wednesday – 7 P.M. to 8 P.M., C.W., and 8 P.M. to 9 P.M., phone; Thursday – 8 P.M. to 9 P.M., phone; Friday – 8 P.M. to 10 P.M., liaison with Iowa 3L26; Sunday – 8 A.M. to 9 A.M., phone liaison with 3S3, and 8 P.M. to 9 P.M., phone.

Also discussed was the 2 meter F.M. repeater being installed at Beaver Crossing, Nebraska. The repeater will transmit at 142.155 MHz and receive at 143.460 MHz. Arrangements are being made to secure transceivers at a reasonable cost.

Gordon Wilson (AFBØUBQ) of Plattsmouth has installed a new inverted "V" tuned for 7315. He was unable to get the vertex 30' off the ground as the book recommends. But by cutting the elements to 29.6' each and raising the vertex to 30', he was able to produce a 1.3 to 1 SWR. We'll be listening for Gordie next Sunday morning.

Bob Lockwood (AFBØDHU) and Harold McClenahan (AFBØDGA) have installed the 2½ k.w. generators they received from the MARS program and are now able to operate via emergency power only. Bob was going to give it a test one net night, but says his extension cord was too short!!? We'll be hearing them on emergency power soon, I'm sure.

Bob Lockwood (AFBØDHU) has invited all non-MARS members to copy the C.W. net from 7 o'clock to 8 o'clock on Wednesday nights. Speed is not a prime factor for the members checking into the net and it should be interesting copy for all hams.

Marty Griffin (AFBØGEH) and pilot Denny Brown (KØWYH) are planning to go aeronautical mobile on Saturday, May 10, at 7 P.M., weather permitting. They will be on 6 meters at 50.4 MHz and will be experimenting with DX, trailing antennas, stationary vertical antennas and low power. They will QSL any station requesting a QSL.

Marty Griffin (AFBØGEH)

****

HIGHLIGHTS OF MAY MEETING

Our sincere thanks to Mr. Jim Miners of Airkaman of Omaha, Inc. for a most interesting program at our May meeting. His talk and demonstration on the use of servos in aircraft control was thoroughly enjoyed by all in attendance.

Lloyd McElhaney, KØDKM, was the lucky winner of the $3.00 attendance drawing.

****

WE GOOFED!

The Heterodyne VFO article by W3KKN which appeared in the May 1969 issue of Ham Hum was copied from Pack Rats Cheese Bits. Sorry we overlooked giving proper credit line.

Ye Editor

****

1.

MOTHER'S DAY RELAY OF RADIOGRAMS TO SERVICEMEN A SUCCESS

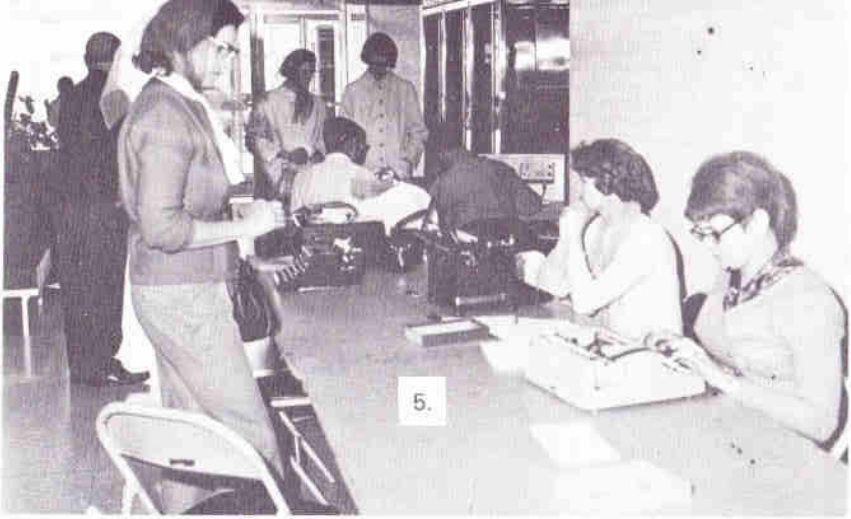
Members of the Ak-Sar-Ben Radio Club, Inc. moved their club station WØEQU portable to the Southroads Shopping Center (picture #1) on Saturday, May 10th, to give mothers, wives and sweethearts a chance to send free messages to servicemen stationed anywhere in the world.

2.

3.

Erv Heinz, WAØEEM, this year's chairman (left in picture #2) along with Bruce White and Jr. Op Bobby McClenahan take their turns at the mike relaying messages. Cecil DeWitt, WØRMB (left in picture #3) brought out his 2-meter FM equipment for Club use. Bob Lockwood, WAØDHU, and Harold McClenahan, WAØDGA, (picture #4) were the spark plugs in setting up the station and tower.

4.



5.

6.

7.


8.

Susan Johnson, (daughter of WAØKIL and WAØNCO) and Kathleen Droege, WAØUXE (XYL of WØYCP) (pictures #5 and #6) take the messages from the mothers, wives and sweethearts for relay. Eva McClenahan even got in on some baby tending while the mother made out her message (picture #7).

Jim Anderson, KØDNE and XYL Sharlene, (picture #8) helped extend the cordial service from our club. Contact was even made with one of our space martians, John Ebright, WAØQGZ, (picture #9) who gave tremendous assistance all afternoon.

A huge "thank you" to all the hams, XYLs and Jr. Ops, especially the relay stations Royce Johnson, WAØ-KIL, Lou Pickert, WØCCD, Fred Fischer, WØEGP, Bob Andrus, KØ-UG, Paul Lilly, K4STE/O, and others who were behind the scene operators.

Very special thanks goes to Mrs. Elizabeth Burris, Promotion Director, Southroads Shopping Center Merchants Association, for the fine hospitality and cooperation. Sandwiches and soft drinks were enjoyed by all the crew who put in time relaying messages at the Southroads.

****


9.

THANK YOU FOR THE MESSAGE, MOM

"Dear Mom and Dad,

I was standing guard on the boat in Danang and a message came over the radio. 'Moore, L. C. report to MARS station and call number 2332.' A man read the Mother's Day message over a telephone to me. Sure made me feel good to have you do something like that for me."

These are the words of thanks and appreciation we received from our son in the Navy. I also want to thank the HAM operators for allowing me to send this message to our son. That is something he will never forget.

Mr. & Mrs. Donald Moore
Council Bluffs, Iowa

****

OFFICIAL BULLETIN NR 222 FROM ARRL HEADQUARTERS NEWINGTON CONN MAY 29 1969 TO ALL RADIO AMATEURS BT

During the summer travel season many amateurs stop by to visit ARRL Headquarters and the Maxim Memorial Station, W1AW. The League Headquarters building is open to visitors Monday through Friday, eight thirty to four EDST, without appointment. Other times can be covered by writing and arranging for a tour. Printed directions to ARRL are available without charge. Send an addressed stamped envelope to ARRL, 225 Main Street, Newington, Connecticut 06111 AR

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S.W.R. METERS

There are some errors inherent in the reflectometer type SWR, some too small to worry about and some that need to be taken into account. It is possible also to introduce error in results by misuse of the meter. One error is in the microammeter used. This is a DC meter and has a linear scale. Unless you have paid much more than the average price for your instrument the meter is a 5 percent meter. If the meter is a 100 microammeter, it may give a reading that is 5 microamperes high or five microamperes below the indicated reading. If the sensitivity is set for full scale in the forward position and reads half scale in the reflected position, a SWR of 1 to 3 is indicated; however, due to the inaccuracy of the meter the actual ratio may lie between 1/3.4 and 1/2.6.

If a SWR of ½ is indicated, the actual ratio may lie between 1/1.8 to 1/2.2.

Another source of error in these instruments arises from the nonlinearity of the diode detectors. All of the instruments that I have seen (except the one in the Johnson Match Box) are calibrated as though the diodes were linear detectors. Actually, the response turns out to be between a square law detector and a linear detector and varies some with transmitter power and frequency. An experimental curve with an instrument using IN69 diodes showed a SWR of 1/3.8 with reflected indication of half scale, but if calibrated as a linear detector would have indicated a SWR of 1/3.

These errors do not actually render the instrument any less useful, but it

may point out that we may have at various times reported findings that are questionable when we consider the accuracy of our SWR meter.

The SWR read at the transmitter end of the line always looks better than the SWR read at the antenna end of the line but, unless the line is long or lossy or both, this difference is small and can be ignored. The difference comes about because with the meter at the input end the forward power is read before the line losses attenuate the power and the reflected power is read after the line losses attenuate the power. This makes the SWR look better. With the SWR at the antenna end, both the forward and reflected components are measured before attenuation and SWR is more nearly correct.

Losses due to standing waves if the SWR is 1 to 2 or better are quite small compared to line loss. The Heathkit assembly manual for their reflected power meter has a graph in which line loss is plotted against additional loss due to standing waves for standing waves from 1/1.5 to 1/20. Let us assume 100 feet of RG8U with a loss of 0.9 db at 21 mg. With a SWR of 1/2 the additional loss would be 0.45 db.

The Handbook has a plot of power ratio versus decibels and by referring to it or to a table of logarithims, we can convert this to watts loss in the line. If a transmitter delivers 100 watts output to a line which is matched at the antenna, there will be a loss in the line of approximately 20 watts.

If the SWR at the antenna is 1 to 2, eleven percent of the power is reflected, so of the 73 watts delivered to the antenna, approximately 8 watts is reflected back to the line and six of this is delivered back at the transmitter end. This loss of reflected power is the reason that the SWR at the transmitter looks better than it really is, but unless the line is very long or very lossy or both, this is not serious and can very well be ignored.

In fact, in the case of this 100 watt transmitter and 100 foot feed line we are talking about, the total loss turns out to be 27 watts or approximately a power ratio of 1/4, which is a 6 db loss, one S unit at the receiving end. You cannot get all of that S unit back, but a matched feeder will get you 7 watts and you can get some of the 20 watts due to line loss by using a shorter line or a line with less loss.

When you struggle to get your SWR below 1 to 2 and your line loss below 0.7 db you are fighting the law of diminishing returns.

The following are the source of this material and are listed for those who would like to follow the subject in more detail:

The Radio Amateurs Handbook, ARRL

The Antenna Handbook, ARRL

Single Sideband, Collins Radio Co.

Bonny and Staff

Accuracy of SWR Measurements, Hall, QST, Nov. '64.

Smith Chart Calculations for the Radio Amateur, Hall QST Jan. and Feb. '66.

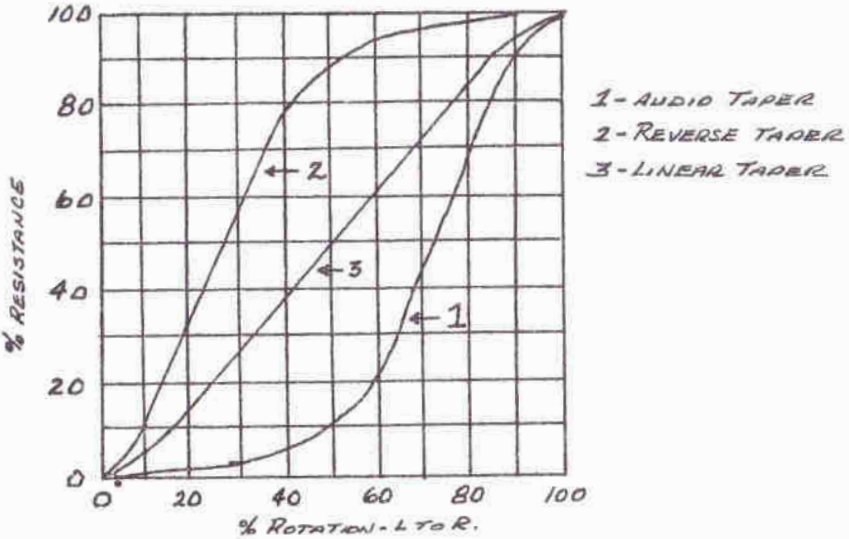
de W4RUN / SPARC-GAP

****

WANTED

Wanted to buy or borrow – novice xmitter. Call 553-3405 after 4:00 P.M. Ask for Rick Brown.

****

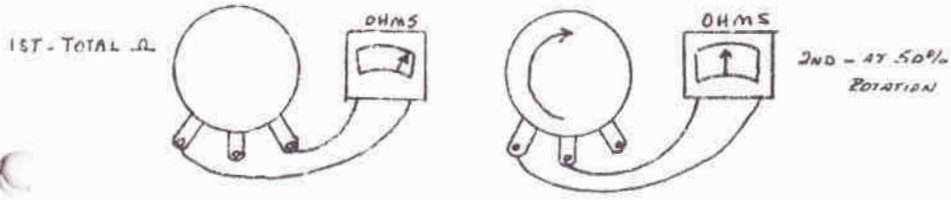


What is meant by reverse, linear and audio tapers as applied to a potentiometer?? Most of us just stick in any "ole" pot that seems to work. However, to define the above is simple. It is the way the resistance of the potentiometer changes as the shaft is rotated. Reverse taper provides a large change in resistance in the first half of the shaft rotation and very little in the last half. This taper is used as TV contrast and many bias voltage controls. Linear taper is where the resistance change is exactly proportional to shaft rotation. Standard wire-wound controls have linear tapers. Carbon controls with linear tapers are commonly used in tone controls, sweep controls and other straight voltage-division uses.

Audio taper gives a small increase in the resistance at the beginning of the shaft rotation and a faster increase toward the end. The response of the human ear is matched and is the reason audio tapers are used in volume controls and similar shunt circuits.

The above graph illustrates taper. To measure for taper, first measure the total resistance. Then turn the shaft to 50% of rotation. If resistance is 50% of total, you have a linear taper. If it is 10% to 20% of total you have an audio taper. If it is around 80% of the total you have a reverse taper.

Ed: – We would like to give credit and will later when we find which paper carried this article.



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NOTES ON FIELD DAY 1969

This is it. The big event of the year is upon us. Field Day 1969 is going to be entirely different than previous years. Many changes have been made in an effort to make this year's event the most enjoyable Field Day this Club has had in many a year.

Once again your committee has visited the site. It wasn't quite as cold as the last time we stood on the hill. This time we gazed upon the Platte River and surrounding countryside and our eyes opened to the beauty of it – way out in the country where the air is fresh and clean. We have a site which we firmly believe is the ideal site for this event.

Field Day will be on the weekend of June 28 and 29. The event starts officially at 1900 GMT June 28 to 2300 GMT June 29. CDT 2:00 P.M. June 28 to 5:00 P.M. June 29.

Come to the June 13 meeting of the Ak-Sar-Ben Radio Club, for at this meeting final plans will be made for the contest. Those interested can sign for the bands they would like to work and the time they feel they can be at the site. Also, we want to sign up individuals for logging and other general help. We want to know who can supply covered dishes for either the Saturday evening or Sunday afternoon meal. Every Club member and anyone else who wishes to participate in this event is urged to come to this important meeting and to sign up.

(See map showing location of Field Day site - pages 12 & 13.)

We thank Norval Bowen, WAØNPF, and Connie Bowen, WAØMYF, for the use of their newly acquired land for our site.

This year more than ever, Field Day is what you make it. Field Day is a positive test of our Club's ability to supply emergency communications under adverse conditions. It is a true test of our ability to rise as a unit, as a working team. Field Day is a test of our strength or our weakness. In the past, our record has shown the best in us. We hold a trophy we can be proud of. We earned it. We can hold it in '69, but we will have to keep the rigs going and the loggers busy making entries to do it. The Bellevue Radio Club is planning big for this year's event. They want that trophy. Last year it was a close race. We can show our strength in 1969. WØEQU will come out victorious!

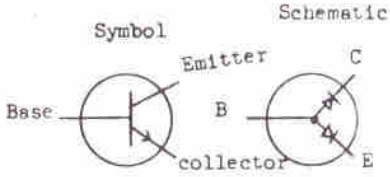
****

Hi School
RR
RR
108
96
90
84
78
72
66
60
48
42
36
30
25
13
1 mi
1/4 Mi
PAPILLION
1 mi
1 mi
1 mi
1 mi
1 mi
1 mi
1 mi
1 mi
3/4 mi
3/4 mi
1 mi
1 mi
6 3/4 mi to Harrison
3 1/4 mi to Hiwy 370
Rock Island
LA VISTA
Raleton
Access Road
Sign
Hill
PLATTE RIVER
MUD
Golf Course
Hwy 370
RR
UP RR
HARRISON
N
CAPEHART
USA
UP RR
Hi-Way 73-75

TRANSISTOR CHECKING

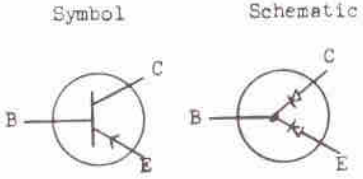
By W6HHC

You can test transistors without any fancy instruments by simply using only a VOM or VTVM. The following technique will determine if the junctions are good or will detect shorted or open junctions.



NPN TRANSISTOR

Figure 1



PNP TRANSISTOR

Figure 2

All bipolar transistors (that's the common type) look like two diodes connected as shown in Figures 1 and 2. To test the transistor, simply take a VOM or VTVM and set the function to resistance X10.

Test #1 – Place the "common" probe on the base lead of the transistor and place the "ohms" probe on the emitter lead. Check the meter reading; it should either be around 50 ohms (between 30 and 70) or near ∞ (above 10,000 ohms).

Test #2 – Reverse the meter probes and check the meter reading.

For **most** VTVM's and VOM's (some are backwards*), if you had a reading of 50 ohms in Test #1 and a reading of ∞ in Test #2, your transistor is a PNP and the base-emitter junction is okay. If you had a reading of ∞ in Test #1 and a reading of 50 ohms in Test #2, then your transistor is an NPN and the junction is okay. If the readings in Tests #1 and #2 were both low (less than 500 ohms), then the junction is shorted and the transistor is bad. Likewise, if both readings were high (above 1,000 ohms), the junction is open.

Test #3 – Now place the "common" probe on the base and put the "ohms" probe on the collector. Check the meter reading.

Test #4 – Reverse the meter probes and check the meter reading.

*Ed. Note: Most of the popular Triplett and Simpson VOM's I have had experience with have opposite polarity on the Ohmmeter leads e.g. POS. on the black lead or COM. lead and vice-versa. – WØWRT

The results of Tests #3 and #4 should be the same as for #1 and 2, except now you are checking the base-collector junction. If either junction is open or shorted, the transistor is bad.

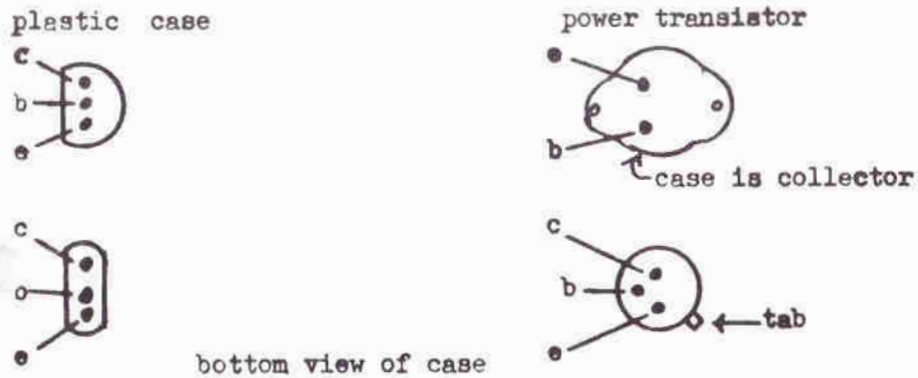
The table below summarizes the tests and can be used as a guide.

Test No.	VOM Probe		VOM Reading	VOM Reading	VOM Reading	VOM Reading
	common	ohms				
1	Base	Emitter	50 ohms	∞	50 ohms	∞
2	Emitter	Base	∞	50 ohms	50 ohms	∞
3	Base	Collector	50 ohms	∞	50 ohms	∞
4	Collec-tor	Base	∞	50 ohms	50 ohms	∞
			indicates good NPN transis-tor	indicates good PNP transis-tor	indicates both junction shorted	indicates both junction open

NOTE: The above readings were based on a meter having positive voltage on the "ohms" probe. If your meter has the positive voltage on the "common" probe, then the readings for a PNP and a NPN are just the opposite of those shown.

* * * * *

LEAD LOCATION OF DIFFERENT TRANSISTOR CASES



de "RF," Orange Co. Radio Club

****

REFLECTED and DIRECTED

George H. Goldstone, W8AP
1010 Burnham Road
Bloomfield Hills, MI 48013

FM LOGICAL LOCAL EMERGENCY SYSTEM

Amateur Radio has worn the laurels of public service for many decades. Looking at these laurels more closely, we find that they are wearing thin in spots; and as a matter of fact, they may no longer fit. Have you examined our capability lately?

Most amateur radio emergency work centers in two areas: (1) Furnishing local communication at the scene of a disaster, natural or otherwise; and (2) Furnishing communications between individuals and organizations inside the area of emergency. (The latter class of communications is accurately termed "agony traffic" when it relates to messages concerning the welfare of individuals.) This discussion pertains only to LOCAL communications; the "agony traffic" problem can be discussed separately.

The natural disaster most commonly calling for amateur radio communications would be a flood, sleet or hail storm, or tornado. In our own locality, the incidence of tornadoes is not inconsequential; several suburbs, and even a small part of the downtown area, have felt the impact and horrible power of tornadoes. On two occasions when the "AREC Net" was going strong, supposedly well-organized, we listened in on 10 meters – and what did we hear? Only a superabundance of QRM. When tornado alerts have been called, listening on 75 meters brings in more of the same. Experience indicates that tornadoes and really severe electrical storms are fellow travelers. With this observation behind us, where should we look for emergency communications? The answer, we believe, is 2 meter FM. It is made for the job.

We will not dwell on the advantage FM has over AM in combating QRM. That subject was talked out long ago – and you will note that police, fire, and the emergency services all went to FM over 20 years ago. As a practical matter, during severe electrical interference, 2 meter FM equipment will give reliable communication on the local scene where AM (and SSB) run into trouble.

But the advantage in FM readability is not the only reason for utilizing FM for emergency use. Nearly all FM equipment in amateur bands is crystal controlled, both for receiving and transmitting. The establishment of a definite "Emergency Net" frequency on 2 meter FM means that equipment owners will be on-frequency ready to go, by simply turning on the rig. No problem on tune up, or trying to zero in on a Net Control who can't come within 10 kc. of the assigned spot! Yes, in that respect the equipment used is similar to CB equipment – but that crystal controlled characteristic is the sole reason why the CB watch operation on Channel 9 has been so successful. We can certainly profit by their example.

This brings us to the newest and most compelling reason for 2 meter FM: The development of FM repeaters. By placement of one or more repeaters on the perimeter of a metropolitan area, 2 meter FM

mobiles (and even suitably located hand packed rigs) can utilize the power and antenna capabilities of the repeater station. Communication from the area of a disaster can thus be RELAYED to destination, or put on RTTY circuits, or phone patched, all as the case may require.

FM equipment is becoming more and more available to amateurs. The need for amateurs to participate in emergency communications plans is more necessary than ever before, if our use of ALL amateur frequencies is to be justified in the public interest. Rather than think about CW communication in the floods of 1936, or 10 meter AM nets of the late 1940's, we should be building a workable FM system in 1969.

W8AP

* * * * *

WHY I HAVE AN ULCER .....
I am insecure
Frustrated
Mal-adjusted
Nervous
Ill at ease
And I drink.
de Ham Monitor

****

CORRECTION IN CALL

Please refer to article re auction in May issue of Ham Hum. Donor of items contributed to the Club was Ernest H. Erickson, WØLXM (not WØLXN). Ernie, formerly of Omaha, now resides at 1492 Sebring Street, Pomona, California.

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ADVERTISING RATE SCHEDULE HAM HUM

	Per Issue
Full page	$15.00
One-half page	8.00
One-fourth page	4.50
One-eighth page	2.50
One-twelfth page	2.00

Specials

Front (three-fourths page)	20.00
Inside front cover	18.00
Inside back cover	17.00
Center spread	32.00

Above prices are for camera ready copy.

Hams ads free, subject to space limitation.

****

NEED – WANTED

One capacitor 3½ microhenry or up 5000V

Please call Norval Bowen, WAØ-NPF, 391-4859.

****

FOR SALE

Johnson Viking Valiant with Johnson Viking SSB adapter ready to go. $300.00.

Joe Roberts, KØKEO
Phone: 455-0190

****

BASIC TRANSISTOR OPERATION

By W6HHC

The editor (of RF) plans to have monthly articles on operation of solid state devices. The emphasis will not be so much on solid state physics as on practical understanding and use of different devices. The first few articles will be on understanding transistor operation and how to design simple circuits. Later the use of Integrated Circuits will be discussed.

JUNCTIONS

The semiconductor junction is the heart of all solid state devices. Semiconductor material is usually germanium or silicon. The basic material is electrically neutral, but foreign material can be added to charge the semiconductor material. If the semiconductor is charged positively it is called P-material. Negatively charged material is called N-material. The junction is formed when P-material is located adjacent to N-material.

The current can then flow from the P-material into the N-material. The junction is then said to be forward biased. Current can not normally flow from the N-material to the P-material (this junction would be back-biased). When current flows through a forward biased junction, a voltage drop called the junction voltage is developed. This voltage is usually 0.25 volts for germanium and 0.6V for silicon. Thus a diode is formed by attaching leads to both sides of a junction.

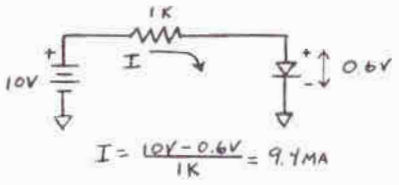


Figure 1 - Forward Biased Diode

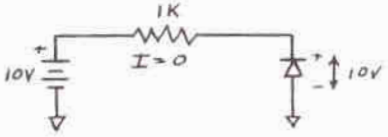


Figure 2 - Back Biased Diode

Figure 1 shows how to determine the current through a simple forward biased silicon diode. Figure 2 shows that no current flows through a back biased diode.

TRANSISTOR CONSTRUCTION

The NPN transistor is formed by sandwiching some P-material between two layers of N-material. The transistor then appears electrically as two diodes as shown in Figure 3.

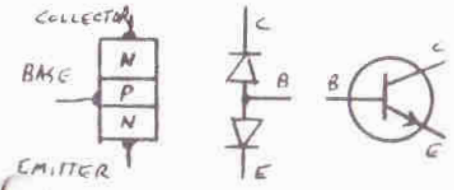


Figure 3 NPN transistor

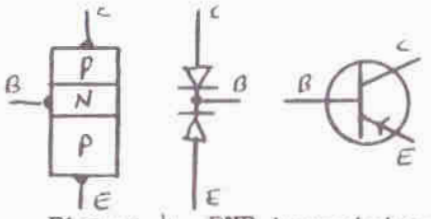


Figure 4 PNP transistor

The PNP transistor is made by sandwiching the N-material between two layers of P-material as shown in Figure 4. The base lead is attached to the sandwiched layer and the emitter and collector leads are attached to the two other layers.

HOW IT AMPLIFIES

Most "ham operators" are familiar with how a vacuum tube operates as a voltage amplifier. The transistor is a current amplifier. The small base current is used to control a large collector current. The gain of a transistor is called beta or β. This gain means a change of one ma in the base current will result in (β)x(1 ma) change in the collector current.

Let's use an example to show what we mean. First, let's produce a known base current.

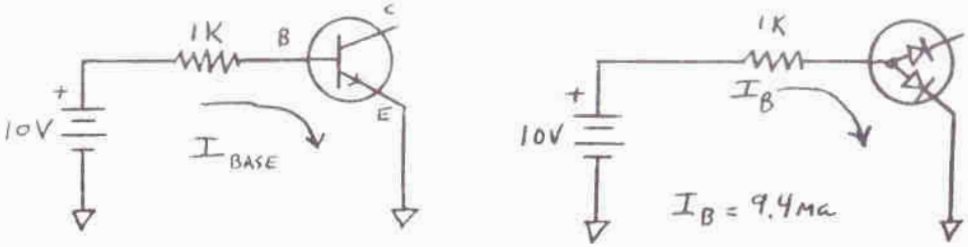


FIGURE 5

If a NPN transistor is connected as in Figure 5, the circuit looks identical to the diode circuit in Figure 1. The base current is 9.4 ma. The voltage measured from the base to the emitter is 0.6 volts. Now let's connect a 50 ohm resistor from another 10V battery to the collector, as shown in Figure 6. The transistor action occurs and current can flow into the collector lead to the emitter lead.

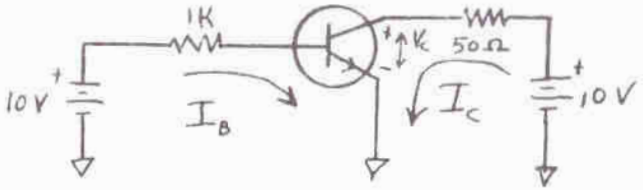


FIGURE 6

Dayton L. Phifer, WØVEA
East Tryon Route
North Platte, Neb. 69101

May 2, 1969

Ham Hum
Editor

Hi:

Last fall I wrote about building a Field Strength Meter, pick-up unit cabled to a sensitive meter. Then winter beat me out of doing any real testing with it.

With pick-up unit set as far away as I can get a minimum reading from a dipole, driven with a 2'er, start in trying for improvements. When you get close to pinning the meter, move the unit further away, and keep working at it.

I find that building by the book does get you somewhere close; calculating velocity factor and measuring the transmission line for full wave lengths, plus or minus ¼ wave, helps. But when you test this out, it is the minor adjustments that make the difference between radiating a signal and getting more efficiency out of the rig. Also built up a few short lengths of coax that I can couple into the line, and find improvements over my measured lengths. Get readings up to 100' away from antenna.

WAØCKH tells me he built his beam for 300 feedline, and uses ¼ wave bars to match the 52 ohm output from his rig to the transmission line.

With the 2'er, you do not have the pi-net for flexible tuning or other aids that come with a better rig, but you are not putting out much power, and you do have the opportunity to really test and find out what can be done for improvements with your antenna, transmission line system.

73, Dayton

****

HOW TO DEAL WITH RADIO FREQUENCY INTERFERENCE

Ed. A. Bibbins, KA2EB

DON'T LET ELECTRICAL AND RF NOISE GET YOU DOWN

This article has been prepared to assist personnel who experience interference to Hi-Fi equipment, Tape Recorders, Record Players, Television Sets, and other audio devices.

Interference to such equipment can be caused in many ways; loose electrical connections within the household, fluorescent lamp hash, diathermy and X-ray equipment, powered mowers, electric motors, and Amateur Radio Equipment, are to mention a few. There are ways to eliminate interference if it does occur. Much of the interference can be traced to the equipment in use; how it has been installed in the home, and how it has been connected together.

To purchase a piece of Hi-Fi equipment off the shelf, carry it home, hook it up, then sit back and wait for the beautiful sounds to come out just isn't possible. Components must be connected together properly. Shielded wire or cable must be used. Leads should be short, especially leads from main amplifiers to tape recorders to speakers. No loops or loose wires between units. Excess cable acts as an antenna and picks up "Garbage."

If you experience interference, and you have a BX item, it is suggested

that you contact the Hi-Fi technician at the BX and make arrangements for one of the servicemen connected with the name brand of the equipment you purchased, (Sony, Akai, etc.) to call at your home and look over the installation job. He may be able to cure your troubles in a matter of seconds, or make a few adjustments to the equipment. Stubborn cases, of course, will require perhaps additional shielding or bypassing with capacitors the 110 volt input to your equipment.

A good ground is necessary. This may be a water pipe or a rod driven into the ground. The lead must be short, as a long ground wire will also act as an antenna and pick up "Hash." In some cases, interference can be eliminated by just reversing the electric plug that's in your wall outlet.

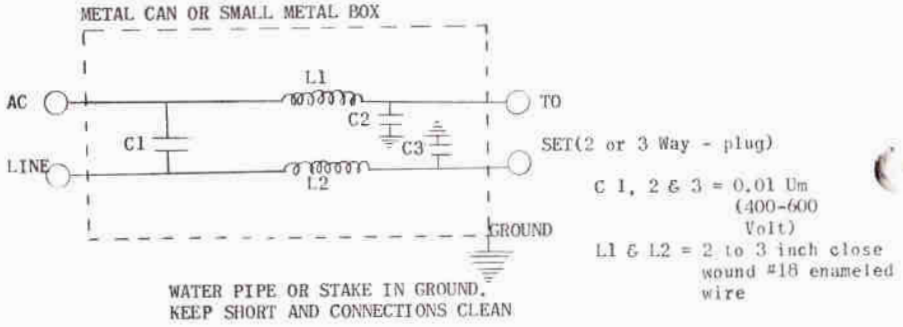
Real stubborn cases can be eliminated by using a "Brute Force Filter." It's very easy to make, or filters of different types can be obtained on the local economy at very reasonable prices. A good investment and will improve your equipment 100%.

Brute Force Filters can be made by a radio technician. It is not suggested that anyone attempt to construct one unless he has a knowledge of the working principles. If not properly constructed, they can overheat and cause fires or blow fuzes.

Instructions on how to make a Brute Force Filter may be obtain from any radio engineering handbo ARRL Handbook, etc. Your selected serviceman can assist you in this matter.

If you experience interference from an Amateur radio station, contact the Amateur and request his assistance. He may **not** be the Amateur causing the interference. Just because you observe an antenna in your area, don't be too quick to accuse. Amateurs located within a radius of 25 miles or more can cause interference to Hi-Fi and audio devices.

Amateurs spend thousands of dollars on equipment. If it's a commercial product, it must meet Government specifications and has built-in suppression to eliminate interference. Just because you hear noises coming out of your equipment, it's not always the Amateur's fault. The cause of interference may be right in your own set. If you are certain that an Amateur is causing the interference, then contact one in the neighborhood.



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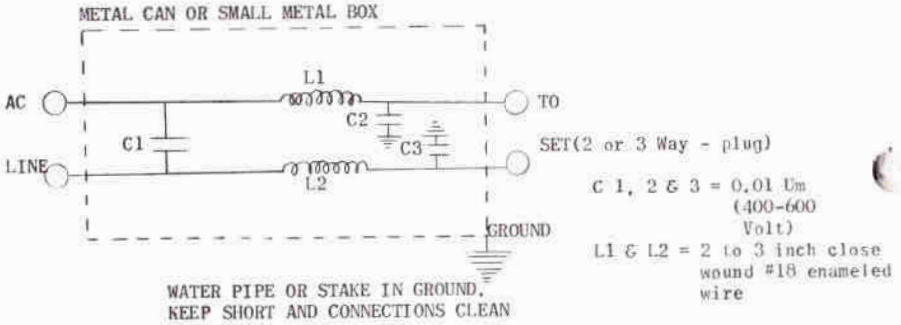

He can help you if you approach him in the proper manner. You are not going to get him run off the air because you hear noises in your equipment. Amateur radio stations are auxiliary Military stations and assist in emergencies. Your manner of approach can save the day. Most "Hams" are cooperative and want to see you enjoy your hobby as much as they enjoy theirs.

The diagram is a "Brute Force Filter" and can be constructed in a coffee can or a small metal box. It will work wonders towards eliminating all sorts of power line interference, including Amateur interference.

An additional factor to eliminate interference is to bond all units in your Hi-Fi and recording equipment together to a common ground. Keep leads as short as possible.

de FEARL News, Japan

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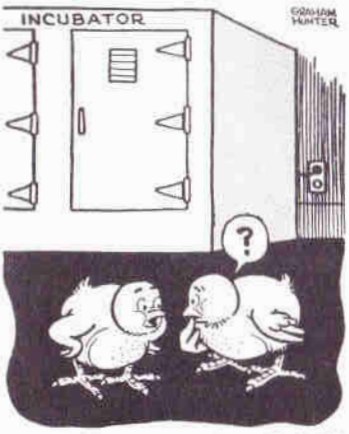

"Is your mother A.C. or D.C.?"

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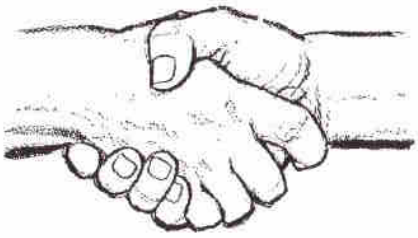

We're looking forward to
seeing you at the
National A.R.R.L. Convention
June 20, 21 and 22
at the
Fort Des Moines Hotel
in Des Moines, Iowa

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