Central Oklahoma Radio Amateurs

COLLECTOR AND EMITTER

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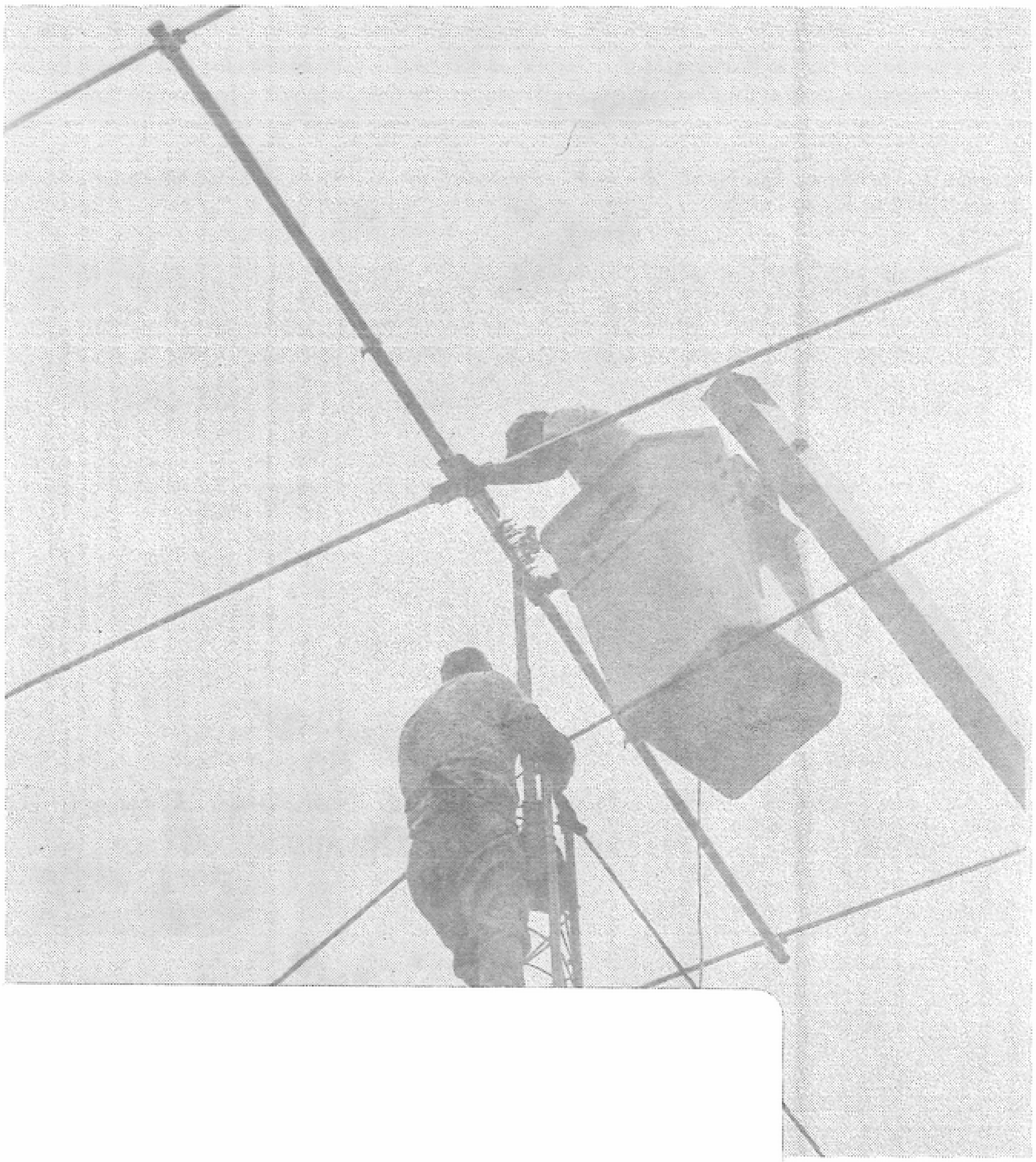
AN INFORMATIVE MAGAZINE PUBLISHED MONTHLY BY AND FOR OKLAHOMA RADIO AMATEURS AND ANYONE INTERESTED IN LEARNING ABOUT IT

Volume 5 AUGUST 1979 Number 55



K5UKP AND WB5TMW INSTALLING A BEAM THE EASY WAY AT THE BICENTENNIAL AMATEUR RADIO CLUB FIELD DAY SITE ... SEE INSIDE FOR SCORES AND MORE PHOTOS

Central Oklahoma Radio Amateurs

COLLECTOR AND EMITTER

Published monthly by CORA Inc 1020 Arthur Dr Okla City OK 73110
ADDRESS ALL COMMUNICATIONS TO:
CORA C&E, P. O. Box 15013, Okla City OK 73155

SECOND CLASS POSTAGE PAID AT OKLAHOMA CITY OK
[USPS 116-150]
Managing Editor Joe Harding, WA5ZNF 737-1044
Subscription: CORA members $1.50 a year. All others $3.00 a year.

Central Oklahoma Radio Amateurs, Inc. (CORA) is a not-for profit association of radio amateurs, founded for the promotion of interest in amateur radio communication and experimentation, for the advancement of the radio art and of the public welfare and operates to enhance the cooperation of member clubs in sponsoring activities of mutual interest to the clubs and all radio amateurs.

Editor Joe Harding, WA5ZNF,
C.O.R.A., Box # 15013,
Oklahoma City, Oklahoma 73155.

Dear Sir:

The RFI (Radio Frequency Interference) was eliminated at W5HFU by installing a shielded telephone line. Please read on.

The local telephone company installed a filter across the microphone in each of the hand sets installed at this address, a heavy double choke filter across the telephone line, installed special telephones with built in filters; all to no avail.

During the time I was waiting for the three special telephones to arrive I installed a low pass filter in the coaxial line from the transceiver to the antenna, installed a brute force power line filter, two General Electric Voltage Spike Minimizers (just in hope that they would help), and the power line filter helped some, but still the problem was not solved.

I talked to several old time Amateurs I asked for their help. All they could tell me was that RFI problem was one I would have to live with. At last I talked to Ralph Wood, W5JCQ and he said Ivan I am convinced that all telephone lines must be in conduit or shielded. I went to work installing this telephone line without delay, and then the local telephone company installer connected this shielded telephone line. There wasn't a whisper on the three telephones, and my wife was very happy. I give all the credit to W5JCQ (a Retired Electronic Engineer) for solving this problem. I want to thank Ralph, and the fact that that we have shielded wire available. Oh! Yes! The telephone installer didn't know what to do with the shield and left it floating. It is so perfect that it will be left that way, but in some cases it might be a good idea to groundone end or both ends (even taking the chance on a ground loop).

Again I would like to repeat that a shielded telephone line with the shield floating got rid of this RFI problem. Some one said the telephone company is only responsible to install a telephone line that is essentially flat, and that is it; how did you get this telephone line installed? Again I said I installed this shielded line myself, and then got in touch with the local telephone company to connect up the shielded telephone line with the shield floating.

73, Ivan S. Miller

Ivan S. Miller
W5HFU.

THE BIG SIGNAL
OKLAHOMA CITY AUTOPATCH ASSOCIATION, INC.
CLUB EDITOR
Henry Isreal, N5IH, 722-3848

MEETS: 7:30 PM 3rd Tuesday each month
Okla Military Academy, 36th & Grand

PRES	Frank McCollom	N5FM	751-3577
V-P	Henry Isreal	N5IH	722-3848
SEC/TR	Hobe Burgan	WB5MLN	751-1646

MEETING HIGHLIGHTS

The July meeting of the Oklahoma City Autopatch Association was held on July 17, at the Oklahoma Military academy. Frank (N5FM) brought to everyone's attention the questions concerning the Constitution and By-Laws of our organazation that had been raised in the past. Frank then read to everyone the entire Constitution so there would be no misunderstanding on how the Constitution reads. After considerable discussion it was decided to accept all business as proper since last August. Then it was decided to suspend, I don't know for how long, sections 3 & 5 Article III of our Constitution. Following this we heard reports from the committees, to include the nomination committee which stated they have decided to place into nomination the names of two people for each office, with a reminder that nominations are incouraged from the floor at the time of the elections. The names that the committee placed in nomination were for President, Randy Foltz, (WB5QMP) and Doc Goodhead, (WA5CZN); for Vice-President, Chuck Wilhite, (K5NK) and Reuben Castleberry, WD5FKF; and for SEC-Tres Karen Recer, (WD5HBX) and Jack Stewart. After the committee reports the meeting was adjourned, and lots of folks went over to Sambo's to enjoy coffee, except for Dave (WB7OAA) who had milk.

NOTE

DON'T FORGET THE AUGUST MEETING AND ELECTION OF OFFICERS

THANKS
(N5IH)

I would like to thank everyone who came by and or called last Monday evening. It is very nice to know there are so many people that will not only offer help, and mean it, but also offer a place to stay. At times like these a person find out not only who your friends really are but also who they are not. I can assure all of you that I am a very blessed person who has more true friends than most people could ever hope for in a lifetime, even collectively. Thanks never seems like enough but I don't know any other way so, THANKS!!! Henry (N5IH)

FROM THE BOARD

This last year has been a very interesting one for all of us to say the least. There have been quite a few things happen that we are proud of, and a few that make us not so happy. Since this is our last month in office we would like to take this opportunity to thank all of those people that have helped, and only hope the club continues in an upward direction.

Some of the things that we are particularly proud of are things like the building emergency power, and the almost doubling of the club membership. As we are sure, everyone knows that the building is complete and ready to move into. The only thing we are waiting for is the storm season to be "over". Should not be long now. As far as the emergency power goes, we have a self starting 4kw power plant that will be installed inside the building and will run off lpg. So we will not have the problems we have hade in the past during the storm net due to power loss from OG&E. We will not comment on the membership growth for it talks for itself.

There is one other accomplishment, that we the board can not take any credit for but can not let it go unmentioned, for it is the direct result of one of the board members, and that being Frank (N5FM). This accomplishment being the Central Oklahoma Emergency Traffic System. As most know it was not only talked about by Frank he actually got off his duff and did something. It has been tried and WORKS! By the way, the mainstay station will have portable towers, beams, and power. I think we all owe Frank a great big THANKS. So, THANKS Frank.

Henry, Hobe, & Frank

THOUGHTS

ADVERTISING- He who has a thing to sell and goes and whispers in a well, is not so apt to get the dollars as he who climbs a tree and hollers.

BUSINESS- We are all manufacturers----some make good, others make trouble, and still others make excuses.

THE BIG SIGNAL NEWS
OKLAHOMA CITY AUTOPATCH ASSOCIATION, INC.

THE SIX-OF-ONE, HALF-A-DOZEN OF THE METERS DEPARTMENT

Activity on the six meter band here and across the Hemisphere continues to increase all the time, much to the delight of many of us who intend to preserve this valuable and broad portion of the VHF spectrum for amateur, not commercial or broadcast use! In the June C&E, I included a short article concerning operations and characteristics of this little-used amateur band and stated that I would continue to submit material for publication if you folks found the information to be of interest. For last issue, I did not write an article -- and several of my brother and sister amateurs asked me why. So, here we go again.

Congratulations this time to Reuben, WD5FKF, for some really fine DX'ing last month. He bought a brand new Yaesu 625 transceiver, took it home from Kryder Electronics, worked Ed, WD5FKG; me; and KH6IAA within two hours of pulling it out of the box! That transceiver runs about 10 watts RF output and, considering it took me all of thirteen years of six meter operation to get Hawaii, I think he (and the six meter band) are both something else this year.

Reuben has already confirmed that Hawaiian QSO and Steve, WB5CTS, and Curtis, KA5AJR have both received their cards from the several South American stations which they picked up in the late spring. That same KH6 has been heard here in OKC no less than three times since Reuben worked him -- and early in July, several stations in New York and New Jersey got him, too. They were hearing him much stronger that our local operators and this is indicative not of "Sporadic E" skip, but of F2 layer skip -- the same stuff that makes the ten meter band span the globe!

Several Pennsylvania operators have been working Alaska on six during the last few weeks at about 0700Z. This information is of special interest to most of us here because only a handful of Oklahomans have ever confirmed a KL7 on six.

SO WHAT'S SO SPECIAL ABOUT SIX METERS, ANYWAY??? OK, I'll tell you. This band is, by comparison with other amateur bands, virgin territory. As of this month, the ARRL has issued only 196 worked-all-states awards on the six meter band (and about 100 of those were issued before KH6 and KL7 were states). Anyone can fire up and work the Carribbean on HF, but to establish 2-way contact with Puerto Rico, the Virgin Islands, Haiti, the Dominican Republic, etc. on what is in many countries around the world a television channel represents a real challenge and an incredible thrill. One operator in California (W6XJ) has worked more than fourty countries on six since the month of February '79 and will probably be the first station in the world to get his DXCC on the six meter band.

SSB transceivers or transverters for six are readily available and reasonably priced. When the band opens up on E or F-layer skip, ten watts will carry quite well. For the antenna experimenter, the six meter band is ideal -- antenna elements are short (appx 9' total), but not tiny and hard to secure like higher frequency systems or huge and bulky like some HF configurations.

On the six meter band, we have a special fellowship among ourselves. We all really work to help our fellow amateurs work new states which they need. Ed, WD5FKG, and Reuben, WD5FKF, were especially impressed by this point. They both told me how pleasantly surprised they were to discover the fellowship on six. Ed is on a little Yaesu xcvr which I loaned him. We just put a Janel preamplifier in it and now he can really hear well. Reuben and Larry, W5NZS, have both been working six for about two months now. They both have worked in excess of thirty states already!

Don't miss the six meter lecture at Ham Holiday. Frank, N5FM, will be assisted by several of us in what we hope will be an impressive showing for a truly unique and superb amateur radio band.

- Bill, N5WM

THE BIG SIGNAL NEWS
OKLAHOMA CITY AUTOPATCH ASSOCIATION, INC.

" . . . . I DON'T KNOW, HENRY . . . . "

By now, most of us have heard about the unfortunate wind damage to the home and tower system of Henry Israel, N5IH, on the evening of July 16th. This damage seems like another bout with Murphy for poor old Henry, as, he is still wearing a neck brace collar following a head-on automobile collision in which he was involved a few weeks ago.

I heard him make a frantic call to the weather net control station immediately after high winds tore shingles from his roof, uprooted his shrubs, scattered debris across his lawn, and turned his antenna system into a mangled mass of useless scrap metal. But here -- for the first time -- are the details of the event which did immediately follow this unfortunate incident:

In utter despair, with the rain soaking him to the skin, Henry stepped through the trash which virtually covered his front lawn. With tears streaming down his cheeks and still wearing the support collar around his neck, he looked up, threw his arms wide apart and exclaimed, "Oh, Lord -- What have I done to deserve all this???"

Almost miraculously, the rain ceased falling, the gray clouds began to part, and a stream of sunlight shown down upon him as a deep voice slowly replied,
" . . . . I DON'T KNOW, HENRY . . . . SOMETIMES YOU JUST REALLY GRIPE ME !!!"

-N5WM

Heathkit SB-220 Linear Amplifier for sale -- excellent condition. Mark, WA5REC, 348-7847.

kay COUNTY AMATEUR RADIO CLUB

MEETS: 7:30 PM 3rd Thursday of month.
Security Bank Basement, Ponca City
PRES Chuck Willis WB5DOT 765-5366
V-P C. L. Hallmark W5ZWM 762-8620
SEC/TR Jay Williams W5TXF 765-9440
CLUB EDITOR Chuck Willis, WB5DOT

Normally I would be writing to you of our monthly club meeting in this space, but our June club meeting was rudely interrupted by a band of vicious looking thundershowers on June 21, before the meeting had a chance to get under way. Fortunately most of the heavy weather went elsewhere, but it never hurts to be prepared.

We did have one interesting event occur at our shortened meeting on June 21. WD4LIG, Joesef Pehan happened to be passing through town from Virginia and stopped in to visit our club meeting. After a short while, Bob Neumann WB5SWZ recognized him as a childhood playmate from a Displaced Persons camp in Salzburg, Austria after WW II. It was quite a reunion for these two who hadn't seen each other in nearly 35 years.

Field Day 1979 has come and gone and our club managed to get two stations and 7 hearty souls out to Lake Ponca park for this years exercise. We had to operate with thunder constantly in the background, but we were sucessful in our endeavor. I would like to thank WB6NBK-Steve Scott, WB5YRN-Delbert Foiles, N5ANV-Vern Trieber, WB5NQT-Pat Burnham, WD5DRD-Ken Brakey, and WB5SWZ-Bob Neumann, for helping with the operating chores. Grady Skillern,WB5SAG, had done a fine job with the generator as it didn't melt this year - just ate gasoline! We discovered a new Field day hazard this year which replaced the bugs of last year---COLD. Undoubtedly, this had to be the coldest June weekend in history for Field Day exercises. Everyone was scrambling for anything with long sleeves or that offered any warmth. Several hams were seen warming their hands over the finals. (That's one plus for tube type rigs!) Also, there is no truth to the rumor that I was sending cw with gloves on--it just sounded that way. All in all we had an enjoyable time and made 229 contacts in 42 states and 5 of the Canadian provinces. Even my young son was sucessful operating a rig consisting of a bamboo pole, string and hook at our Field day site.

All of us are looking forward to the Ham Holiday this month. I have heard a great deal of enthusiasm this year amoung our members, and hope to see a good turnout at this year's event.

I would like to take this closing paragraph to thank one of the unsung heroes of our club--Jay Williams W5TXF. Jay does most of the work on our club repeater and keeps it in tip top condition. Any of you who maintain a repeater know that it is more than a casual effort to keep them going. The repeater knows Murphy's law quite well and never seems to fail between 8 and 5 on weekdays, and when it does fail it is never a simple failure such as a fuse. I know that Jay spends a lot of his time seeing that the club has a top notch repeater serving the north central Oklahoma area. So Jay, on behalf of the club members and all the hamsthat pass our way, many thanks for a job well done.

73's
Chuck WB5DOT

SPECIAL PERSONAL IDENTIFICATION CARD-UPDATE

If anybody should have a special personal identification card from circa 1953 and still remember and much less produce it, I would expect it to be Carl W5JJ. I thank him for his exhibit in the last issue of Collector and Emitter and frankly, I am flattered that Carl read the article and went to the trouble to drag out the card.

For those who are not quite up to full speed on what this is about, a couple of months ago in the C & E, I detailed my efforts to reinstate the issuance of special personal identification cards by the Department of Public Safety. I wondered aloud whether or not any of the cards had ever been issued and how the law was passed by the Oklahoma Legislature in the first place. In reply, I received a phone call from Bill Humphreys W5JYT. In addition, in the last issue of C & E, Carl Drumeller produced his card number 30.

For those interested in the legislative history, Bill told me how the special personal identification card came into being. It began in 1947 with the Woodward tornado. Bill and a couple of other amateurs had loaded up an old army generator and went tooling up to the disaster site with the intent of assisting with communications in and out of the area. Well, they weren't treated too nicely by the Highway Patrol and in fact, were essentially shooed out of the area and told they weren't needed.

Bill's father was Chickasha's state representative I. D. Humphreys who after some prodding from Bill and others became the House author of the license tag and personal identification card bill. Bill remembers being present in the House the day the debate and vote occurred. Bill also recalls that then State Representative George Nigh was present that day and also recorded his vote in favor of the measure. There was apparently quite a crew of fellows who worked on the Bill helping to assure its passage including Russ Sewell W5NLZ and George Ande W5CKQ who worked in public relations and was a personal friend of Governor Johnston Murray.

It is apparent that the hostility of the DPS toward amateurs continued because as fewer cards were issued each year, the Department gradually phased out the program from justifiable (from their point of view) lack of interest. Lack of communications might have also been a problem that kept many amateurs from applying for the cards. The changing face of amateur radio may have also had something to do with the demise of the cards as amateurs seldom had mobile capabilities in any strength like what exists today.

In any case, we may have awakened a sleeping giant. The last time I checked, over 60 or so cards had been issued in the the two short months that the program has been reinstated. I also want to thank the DPS for reissuing my card with the correct spelling of my name.

There were several people who were interested in determining whether or not Technicians would qualify for I. D. Cards. I checked with Gene Thaxton, the Director of Communications for the DPS and he indicated that he would examine the regulations and make a decision soon. The problem may be that we automatically assume that the Technician Class license is inferior to the General Class license and that may not be the case. The only difference between the Technician and General Class license is the code requirement. Technicians pass the same theory requirements as the general class. The purpose of the license for technician privileges is distinctive and separate from the general. The experimentation on vhf and uhf frequencies for the tech serve a definite purpose. I'll report on progress in this area at a later date.

Micheal Salem N5MS

Mid-Oklahoma Repeater Inc.
A NON PROFIT ORGANIZATION
OF RADIO AMATEURS DEDICATED TO PUBLIC SERVICE

CLUB EDITOR
George Lee, WB5NMK, 946-2754

MEETS: 8:00 PM First Tuesday of month
Okla City EOC, 4600 N Eastern
PRES Chuck Wilhite-- K5NK 721-4926
V-P Bill Atkins N5AH 737-6984
SEC/TR Jim Jones K5PER 634-5235
Dues: Sid Gerber, 829 Bouse, WMC 73110

Another 4th of July come and gone - doesn't seem possible that I have seen so many come and go. Sixty years ago, a kid could buy enough fireworks to last way up into the night for a dollar - times change ! Fireworks will still blow your hand off, though-given the chance. I thought I had lost some fingers a time or two, and there were other narrow escapes- ever try to put out a firecracker after it bounced off the car window back into the car? I don't believe I ever saw any pop bottle rockets then, that burn down so many houses now. But, I reckon fireworks caused enough fires, anyway-and, injuries, too.

What's all that got to do with ham radio? Nothing, except a lot of people survived to read another issue of the C&E. By the time anyone reads this HAM HOLIDAY may have come and gone, and a lot of money will have changed hands-there is never enough of it to cover everything. Oh, well, there is always next year. Hope I saw/see you there and that you had/have a good time. You should, anyway, enough hard work went in it.

CORRECTIONS: Rachel, WB5UCM, won last month's door prize-and Susie, KA5FED, was the little lady running the sweeper-apologies, ladies.

Meeting was called to order by Chuck, K5NK, at 8:00 PM, and there was the usual round of introductions-pretty fair crowd. Only crowded like sardines! Chuck commended us on leaving the room in good order-seems like the building management is well pleased - Let's keep every thing in good order, as we should.

It is my understanding that Arlie's ham family is still growing. His wife;s daddy is a ham now, also-good work, Arlie.

Clara, WD5KFT, urged all hams to get their HAM HOLIDAY reservations in early, before it was too late. I got in under the wire, myself, mailed it July 11th.

Jim, K5PER, read the treasurer's report, which was accepted-along with a brief explanation of a slight difference between him and the bank. Jim, you can't win them all-neither can the rest of us-don't feel lonesome. Sometimes. I think the banks use a different kind of arithmetic than the rest of us.

The plaque, previously mentioned, was given to Ron, WD5FRQ, with the club's grateful thanks by Chuck. Jim, K5VRL, gave a report on the 94 machine. Paul, WA5HTL, gave a CORA report. Then Mark, WD5DYI, CORA president, gave a more detailed report-after this, Mrs. Mark, WD5DYJ, had some announcement about the badges, and prize awarding. There was quite a discussion on these subjects. Jim, N5BEQ, made an announcement about the MORI picnic to be held at the north shelter of Will Rogers Park. Bring your own food and equipment. The date is 7 August 1979, the first Tuesday of the month (ED: In lieu of regular meeting.)

Fred, K5HFN, made a motion for the club to buy soft drinks-seconded and passed.

There was an announcement by Sandy,W5AZO, requesting assistance in helping blind and handicapped people learn radio. There is no question in my mind that they would find this a rewarding hobby. There was discussion of this and classes at the Red Cross, etc. Chuck brought out that we aught to get involved with people- radio classes among other things. Greg,WD5INZ, made an announcement concerning emergency procedures-looks like there is a growing awareness of the need of such services, above those already working. By the way, I thought procedures during the last emergency were superb. Announcement was made of emergency and message net practice in 52.

Suggestion was made that in case of repeater breakdown in emergency, one station could reverse frequencies, and the other station could remain on the repeater frequencies. This one station could relay messages to any of the other ststions, and save a lot of confusion, instead of everybody getting into the act.

(Continued on page 14)

Mid-Oklahoma Repeater Inc.
A NON PROFIT ORGANIZATION
OF RADIO AMATEURS DEDICATED TO PUBLIC SERVICE

THE KERCHUNK

How many of us have sat around whiling time away counting KERCHUNKS on our local repeaters? I certainly have, and find this a way to pass away many endless hours. It's truly amazing how many KERCHUNKS one will hear in a given period of time if one will only take the time and effort to count them. No sophisticated equipment is needed. Just check your watch and look at it later to see how much time has passed and how many of these KERCHUNKS you hear in that particular period of time.

A KERCHUNK is made, for those who don't know, by accessing a repeater. Assuming everyone knows what a repeater is, I won't go into detail along this line. At any rate, when a repeater is on the air and someone depresses his microphone button with his radio on and a suitable antenna attached to said radio, a signal is sent out on the crowded airways, picked up by the receiving antenna, and then retransmitted by the repeater. Being the ignorant soul that I am as to how all this works, I will leave that up to someone else.

One day recently, I decided to count the number of KERCHUNKS I would hear during a 15 minute period of time. To my utter astonishment, there were 17 of those rascals. So, I did some contemplating as to why there were so many of those dudes, and came up with some good answers, in my own mind that is.

Although his radio had been on all day and he had enjoyed signal sapping several good conversations, he hadn't said a word to anyone. But, the time came when he had to hit the sandbox, so taking time out to do this, he returned and heard no one on. Huh, the repeater must be off the air. Hitting the mike button, he hears a familiar KERCHUNK. He hits it again. Nope, its working fine. Still, he doesn't talk

One good way of getting in some code practice is hearing repeaters I.D. By and large, most repeaters I.D. in Samuel's method of talking. Speeds vary from repeater to repeater as to how fast this stuff comes across, but most are in the range of 15 to 20 w.p.m. So, while cramming for that Extra, it's good to take time off from the books and have a little code practice. Numbers are a problem though, for in this area, about the only number heard is a 5, so if something else crops up on the exam, you are out of luck. Since most repeaters only I.D. once every few minutes, one can jump from repeater to repeater in jackrabbit fashion and get in lots of good practice. Wouldn't want to miss hearing any of them I.D. I feel some don't take advantage of this opportunity, for now and then, I will hear a local want to use the autopatch and have to ask someone the call of the repeater. Too bad.

Undoubtedly, some folks don't own a key or either it's stashed away in the junk box. Rather than find the old hunk of brass, they improve their fist using the KERCHUNK. Yep, one hears some pretty nice fists. To the trained ear, one can distinquish dits from dahs. Most people have trouble with s'es and h'es. A good way to remember an "h" is to ask yourself who did it. DiDi Did it. That wasn't hard was it? Anyway, by hitting the mike button in rapid succession 3 times, you get an s, or 4 times, an "h". To get a "d", you go KERRRRRRRCHUNK, KERCHUNK, KERCHUNK.

KERCHUNKING the repeater is a good way to signal your friend that you are listening and if he or she wants to talk to you, you are available. Some of these codes get fairly complicated, but by listening enough, you can easily figure them out. Perhaps Mark wants to get hold of Kay, but he doesn't want to come on and call her, giving his call, so to signal her and see if perhaps she is around, he makes 3 KERCHUNKS in rapid succession. Upon hearing this, Kay is fairly sure Mark is signaling her, she KERCHUNKS back 2 times in rapid succession. Hearing this, Mark knows his loving mate got the signal, so he calls her. Easy, isn't it?

I hear tell there are many more signal sappers than talkers. You know, folks who won't talk to anyone but just listen in on others all the time. Well, just in case they ever do want to talk to someone, they have to keep the spring active which helps hold the mike button tight. Never can tell when that thing will stick, so to keep it working fine, a KERCHUNK is needed now and then to keep the old spring limbered up. I hear this will also keep out cobwebs. No need to give a call for something like this, for you don't plan to do any talking now anyway.

Of course, one of the handiest times to KERCHUNK a repeater is while mobiling. We do have areas throughout our state where it is impossible to hit one of the stupid repeaters. To determine when you are close enough to put in a decent signal in the repeater, simply KERCHUNK the thing and see how strong the repeater comes back at you. If it's kinda noisy, undoubtedly you will be noisy into the repeater. Keep KERCHUNKING it until it's fairly quiet and more than likely you will be pretty good into the machine. I know of one local amateur who does this and to remove the guilt from his mind and to disguise himself as the actual KERCHUNKER, he will "QRZed" the KERCHUNKER. Who's the KERCHUNKER? This is WA5--- calling the KERCHUNKER, when all the time he is actually the one doing the KERCHUNKING. Pretty sneaky, isn't it?

There are times though when it is hard to figure out the purpose of a KERCHUNK. It can get kinda scary too. This really bothers me late at night and sometimes makes the hair on the back of my neck stand straight out. During the wee hours of the morning, I might give a call to WA5CZN. Doc doesn't come back to my call, but I hear 2 or 3 different KERCHUNKS. Undoubtedly this person doesn't want to talk to me or he would have given his call. But what is he trying to tell me? I can't figure it out. Makes me wonder who is out there peeping over my shoulder.

You know, it would be very very interesting if all our radios had a little man in them that would I.D. us every time we depressed the mike button. Seems like I saw something like this advertised in one of the ham publications. Something that you could attach to your radio and every time you squeezed the button, your call would come out in Morse. This is supposed to be a good way of identifying your radio in case it gets ripped off and some bootlegger starts using it. Not a bad idea is it? I bet if all radios had this feature, we would hear less and less KERCHUNKING.

These are some of the reasons I KERCHUNK repeaters. I know there are some of you who have better reasons, so let me know and we can all share our reasons. If we can get enough of them, we might print a book on KERCHUNKING. K5NK

PLANTING GROUND RODS

At one time or another, we have all had to drive a ground rod into Mother Earth. This can be a very trying experience to say the least. Especially when your young son has made off with the big hammer and all you can find is a ball peen hammer or a rubber mallet with which to pound the thing in. With my inability to hit the same spot two times in a row with a hammer, I find it very frustrating. It can be very hard on knuckles or shins if you miss slightly or give you a good stinging sensation all through your body if you accidently barely hit the thing. It's always a good idea to have no one around when you're doing this, for in most cases, words are uttered not fit for human ear to hear.

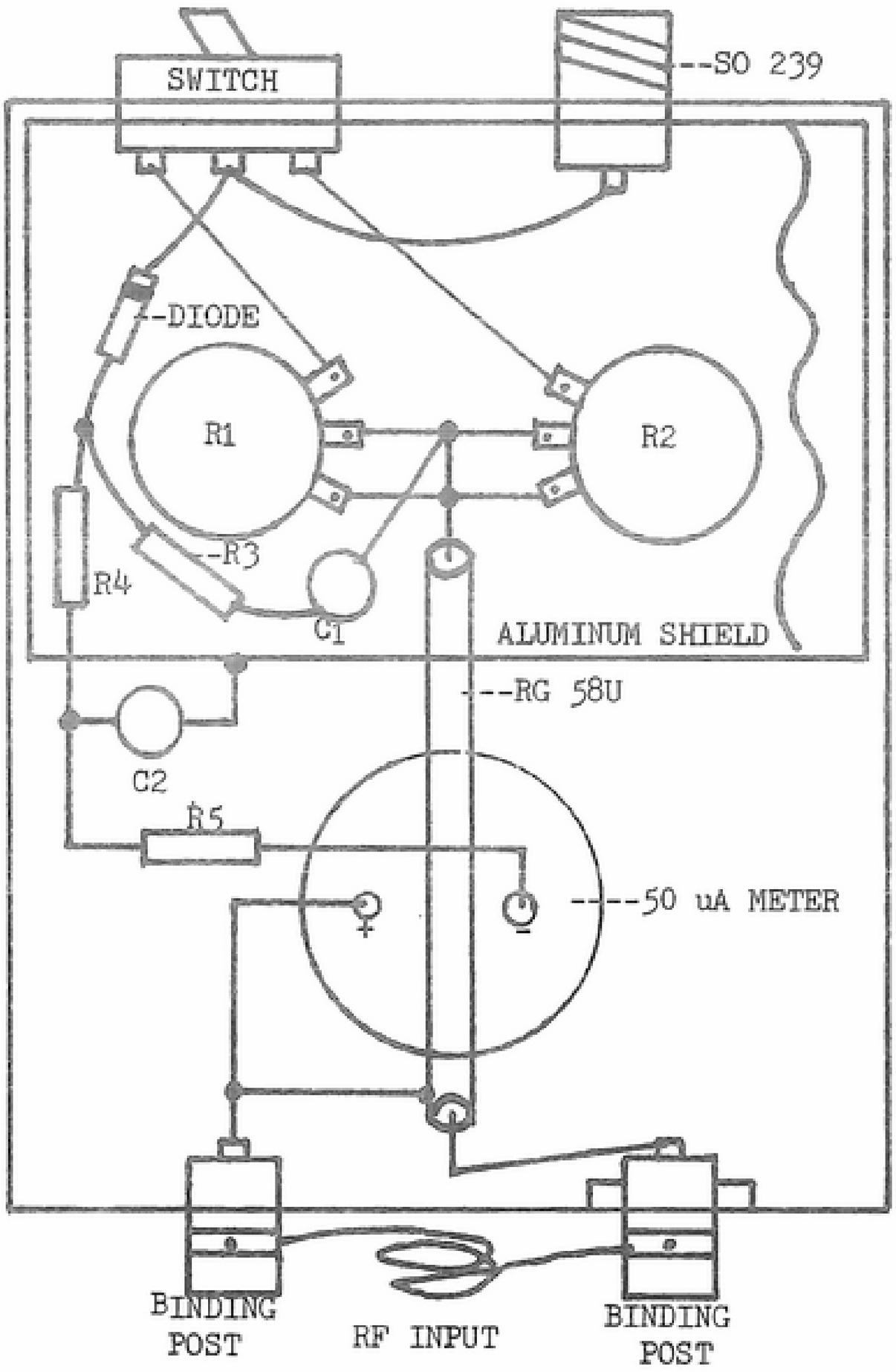
But, there is a simple and easy way to get a ground rod in the toughest of soils in sort order. It doesn't require a hammer or any of those goodies normally used to sink them in. All you need is a little water and your bare hands. Sounds silly I know, but try it and I guarantee it will work. I recently put in a 6 foot, 1/2 inch ground rod with my bare hands in the toughest of soil in probably no longer than 2 or 3 minutes. I know you think old Chuck is off his rocker, but it works folks.

We all know the principal of how a water well is dug. Normally, they are not drilled by auger, but are pounded in by the up and down motion of the drill and with the use of water. The same applies here. After you make the decision of where you want the rod, get your garden hose, or a bucket of water if the hose won't reach, & turn it on slowly at that spot. With the rod, start an up and down motion to start the hole. Keep the water flowing gently, for you don't need a gusher. After you get it going, you will find that you are making good progress and going down from 6 inches to a foot at a time. In no time, you have the rod in the ground. It will be so easy you will wonder why you didn't think of it before. You won't even have any blisters or skinned knuckles or shins.

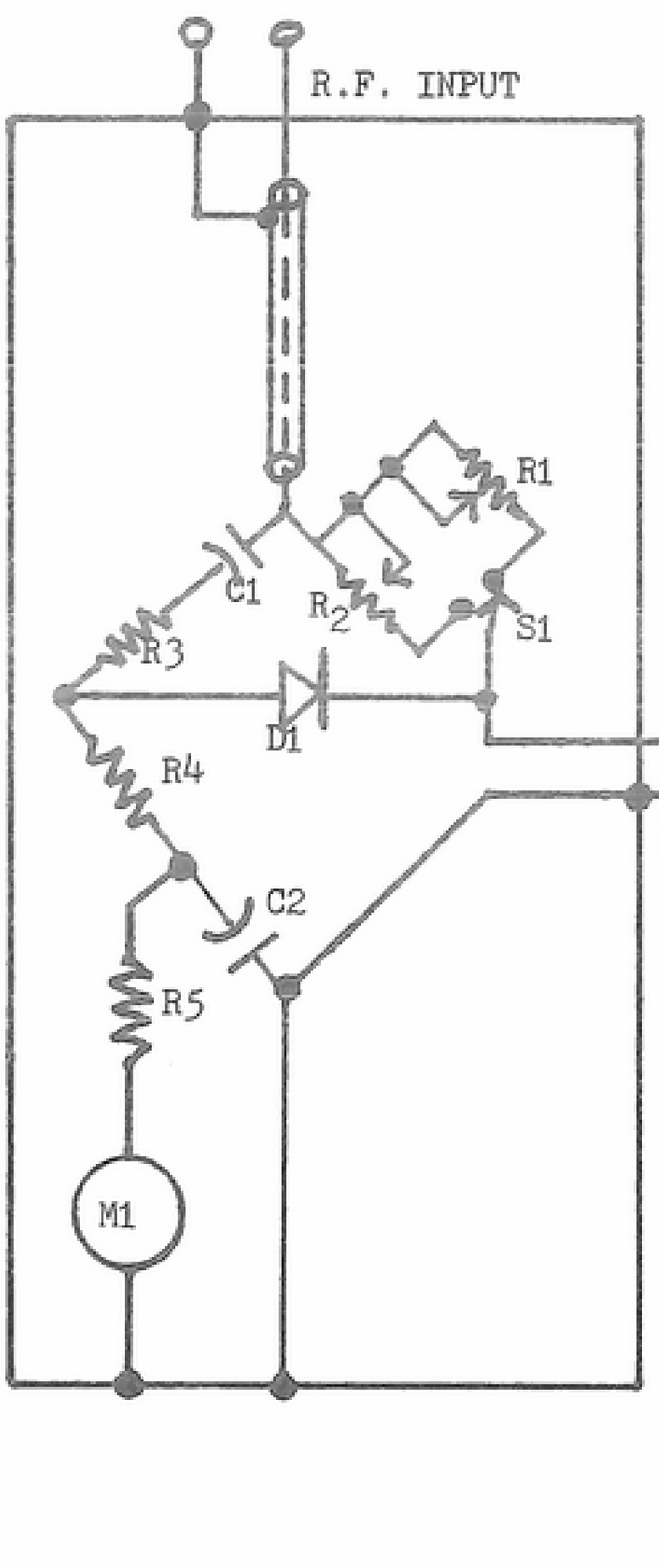
The first time I saw someone do this I didn't believe it, I accused him of already having a hole there. He did it again and then I believed him. The first time I did it I couldn't believe how easy it was. You'll be surprised too. K5NK

THE ANTENNA SCOPE

PARTS LAYOUT



SCHEMATIC



PARTS LIST:

R1 - 100 Ohm Pot Type AB Ohmite
R2 - 500 Ohm Pot Type AB Ohmite
R3, R4 - 180 Ohm 1/2 Watt
R5 - 1000 Ohm 1/2 Watt

C1, C2 - 500 uuFd Ceramic
M1 - 0-100 Microampere Meter
D1 - 1N23A, 1N23B Sylvania or Equivalent
Binding Posts - 1 Red & 1 Black

An article similar to this appeared in one of the amateur magazines several years ago. I believe it was in the early 60's and in a CQ or 73 magazine. I do not know the author. With this in mind, I do not intend to steal anyone's thunder or try to lay claim to someone's prior articles. However, one must realize that each day a new amateur appears on the scene and unless he inherits another's stock of magazines and periodicals, he has missed out on some of these articles which might be of benefit to him. This was certainly true in my case.

The piece of equipment I am about to describe is one that will sit around the shack and gather dust, for it is one you will not use every day. In fact, you may only use it once, but this one time will pay for the cost of building it in saving your transmitter's finals. It was originally called an "Antenna Scope".

One of the first things a new amateur might hear on the air is someone say he should build or buy a matchbox or some type of tuner. So, he runs out and spends his hard earned money for a tuner, puts it in his line and finds he has great difficulty in finding the proper settings on the tuner for various frequencies. The transmitter is put in the Tune position many times and he is busy twisting the control knobs on the tuner trying to get a 1 to 1 swr reading. The tubes get hot, go soft, and he

winds up buying more finals. Everytime he changes his operating frequency, he will go through the entire process and wind up buying several sets of final tubes. With the use of the Antenna Scope, one doesn't have to put the transmitter in the Tune position even once to find the proper settings for controls on any tuner. I will describe this later in this article.

The Antenna Scope can be used with all types of antennas, whether they be fed with coax or open-wire feeders. It is very useful in finding the resonant frequency of any antenna fed with coax. This is especially true in finding resonant frequencies of mobile resonators.

The Antenna Scope is very simple to construct and requires only a minimum of parts. Mine is housed in a 4x5x6" aluminum minibox. A smaller box could be used, however, due to the size of my meter, I had to use the larger size. For those with minimum building experience, you should have no problems at all. The drawing of parts placement is self-explanatory, I trust. A thin piece of aluminum can be shaped to form a shield, separating the meter, C2 and R5 and the binding posts from the rest of the components. The potentiometers, switch and the binding post which is connected to the center conductor of the short piece of coax should be mounted on a piece of plexiglass to prevent grounding against the chassis. Small holes can be drilled in the aluminum shielding to pass the coax and one end of R4 through.

The schematic and parts placement drawings are the same as the original article. I built my Antenna Scope according to this article. I have used two potentiometers, one with a range of 0-100 ohms and the other 100-500 ohms. Only the 0-100 one is necessary. In fact, if one desired to use a fixed resistor instead of the pots, this would also be satisfactory. This can be left up to each individual.

To calibrate the potentiometers after the construction is completed, use a v.o.m. by connecting to the center conductor of the SO 239 and the binding post which is connected to the center conductor of the coax and shielded from ground. Be sure the coil which is made from copper wire is not connected to the binding posts before calibration is started. With the v.o.m. properly connected, rotate the potentiometer until a 50 ohm reading is observed on the v.o.m. I have the 0-100 ohm potentiometer calibrated in 10 ohm increments and the 0-500 ohm one calibrated in increments of 50 ohms.

After all construction and calibration is completed, you are ready to use the new toy. To use the Antenna Scope, a grid-dip meter is used as the rf generator. If you don't have one, beg, borrow, buy or steal one, for this is very important. The coax coming from the antenna or tuner is attached directly to the SO 239 instead of the transmitter. There are many ways you can use the device and I will go into some detail on some of these.

Let's say you are using an antenna that is fed with open-wire feed line and you want to use the antenna on various bands. The open-wire comes into the shack and is attached to the tuner and a piece of coax comes from the tuner to the transmitter. Disconnect the coax from the back of the transmitter and connect this to the SO 239 on the Antenna Scope. Take the Grid Dip Meter coil and place it near the wire coil of the rf input terminals tuned to the desired frequency. Place the G.D.O. coil close enough to get a reading of approximately half scale on the microampere meter. If the calibration on your G.D.O. is not too accurate, be sure you can hear a beat note in your receiver coming from the G.D.O. At this time, adjust the tuning controls of the tuner until a zero reading is shown on the uA meter. This will be the proper setting of the tuner for this particular operating frequency to obtain a 50 ohm load for the transmitter. Continue the process at different frequencies to obtain proper settings. It will be found that more than one setting will obtain the same results. However, after experimentation, it can be found that one particular group of frequencies can be operated with minimum changes having to be made in tuner settings. After experimenting with the different settings for particular frequencies a chart can then be made to show proper settings of your antenna tuner for any certain frequency. To change operating frequencies, simply adjust the tuner settings to correspond with your chart and all the guess work is eliminated. It must be pointed out that the settings obtained by using the G.D.O. might be off just a tad from what they will be when the transmitter is put in the Tune position, but not much. They will be close enough that you will show a very low swr reading.

If, instead of using tuned feeders, one is using coax to feed the antenna, the same procedure is used as above. Once again, connect the coax coming from the tuner to the Antenna Scope instead of the transmitter. Proper settings of the tuner controls can be found for any band and operating frequency using coax as with tuned feeders.

The Antenna Scope is very helpful when you are putting up an antenna fed with coax and you are not using a tuner. The resonant frequency of any antenna can be found quickly with the use of the device. Connect the Antenna Scope up in the same way as before, except without the tuner or matchbox. Connect the coax from the antenna directly to the Antenna Scope. Set the potentiometer on 50 ohms and rotate the calibration dial of the G.D.O. until a null reading is observed on the uA meter. Then find the beat note in the receiver and you have the resonant frequency of the antenna. If the resonant frequency is higher than you want, you will know you need additional wire and if too low, you need to cut off part of the antenna. Continue adjusting the length of the antenna until you obtain a null reading on the uA meter at the frequency you desire your antenna to be resonant.

Resonators on mobile antennas can be a pain in the neck when it comes to setting the desired resonant frequency. You move the stinger up or down a little, throw the rig in Tune, read the s.w.r. and go through the whole procedure several times before you find the right spot. With the use of the Antenna Scope, this procedure is simple and you need not have your rig in the car if you can park close enough to your shack to hear the beat note coming from your receiver of the G.D.O. Tune your receiver to the desired resonant frequency, hook the coax to the Antenna Scope and get a half scale reading on the uA meter with the G.D.O. coil near the coil on the Scope. By changing the frequency of the G.D.O. until you get a null reading on the uA meter, you can find the resonant frequency of the resonator and find out if you need to move the stinger in or out. Keep adjusting the stinger until you get the lowest null at the frequency you desire, and you have the resonator properly set for your desired resonant frequency. It's very easy to do and sure saves lots of hassel and final tubes by not having to throw the transmitter in the Tune position all the time.

I'm sure you will find the Antenna Scope a very useful item to have around your shack. As I say, you won't use it too often, but when you need it, it can be one of the most useful items to have around. I hope some of you will build it and see how easy it is to use. If anyone has any trouble or any questions, my unlisted phone number is listed all over the front of the C & E. CHUCK WILHITE K5NK

MORI Minutes continued from page 9

Adjourned for coffee & dunkers.

Program by Bob, W5HXL, on 2 meters and other VHF use by amateurs and others was very informative and interesting. Thanks, Bob. Bob maintained that we all knew how adverse he was to hard work - don't kid us Bob, we all know a lot about the work you put into ham radio, and the stusies you must have made to obtain your knowledge. If a man avoids some unnecessary work, or work he isn't in the mood for, thats just common sense. Hi!

George, WB5NMK

EXPLORER POST 649 FIRST NIGHTER AND FIELD DAY

TO BE HELD AUGUST 17th, BEGINNING AT 8PM AND CONTINUING FOR 24 HOURS.

ALL LICENSED AMATEURS OR INTERESTED PERSONS BETWEEN THE AGES OF 14 AND 20 ARE INVITED TO PARTICIPATE. WE WILL HAVE AN OPERATING AMATEUR RADIO STATION AND COMPUTOR DEMONSTRATIONS.

THE PURPOSE OF THIS ANNUAL EVENT IS TO INVITE THOSE INTERESTED, TO JOIN OUR POST.

WE WILL SEE YOU AT WILL ROGERS ANG BASE ON S.W. 54th BETWEEN MERIDIAN AND MACARTHUR.

JOIN WD5SHC!

C H O C T A W A M A T E U R R A D I O C L U B

Pres., Frank Carter, AB5H, 391-3394
V-P, Gary Chambers, WB5WHF, 390-8250
Sec./Treas., R.G. Edwards, KA5ALO, 390-8297

EVENTS.

Well, well! How was that exciting experience called Field Day? Sure can't complain to much about all the excess heat, unless of course it was heat generated from lightening striking antennas and such. All joking aside, it was an invigorating experience, enjoyed by all of us in Choctaw A.R.C.--looking forward to next year, with a few changes to be made.

Ham Holiday is almost upon us, and it promises to be both bigger and better than last year. If the effort put forth by Mark (DYI) is indicative of the effort of all the other people involved, Idon't see how it could possibly be anything but--GREAT!

Hear Say.

That Frank AB5H, Frank W5PDH and Jack WB5SVN were planning something at Canton Lake. Couldn't be a fishing trip, could it?

That Tony WD5PNH is out baling hay.

That Mike's (K5UV) wife and new baby are doing fine. Mike's working some VK5's.

That Frank AB5H has been instructing 2 aspiring future hams in code and theory--OK...

That there are at least two new hams in Choctaw--named John and Bill. Don't know their calls yet, but I sure will soon.

That Bob KA5EOS is running around with an HU interim permit. Congratulations Bob.

That Mac W5WZM has been very active on the 34/94 net. Keep up the good work Mac.

That D.L. K5EGQ finally got a weekend to rest. Sur'nuf.

That Jim WD5ITV and his new YL got back from Seattle. They sure are dregging around!

That Gary WB5WHF will resign as V.P. of Choctaw,A.R.C. soon. Going to school soon. Good Luck on your future, Gary.

That Rick KA5Alo talks to much--er, ah, sorry Frank. Guess I'd better stop this part of the article.

But not before some observations though. Benn listening to some local repeaters and I've really been amazed at the number of really good operators present. Of course, to determine what a good operator is, you have to have something to compare them with.

Fortunatly(???) for Okla. City, we have several ops(?) that are more than glad to give a demonstration of their rather sorry abilities. Back where I came from(Okla. City) we considered foul and abusive language as a demonstration of intelligence--and not much at that. Of course, we can always hear the "touch toners" a new musical group that comes on once in a while. What really is obvious though---they are not all children.

I've heard it said,"good habits are as easy to learn as bad ones."

I'm not really picking on Chuck K5NK or Mark WD5DYI when I say this. If you want to be a good operator, you could learn alot from these two as well as a host of others on the air waves.

Well, I'm starting to run out of things to talk about, so we'll go on to the meeting. Now that's always exciting. Last meeting was held at Frank's house at 7:00p.m., July 12,1979.

We had a brief discussion of F.D. and what we needed to do to improve it next year. Then we discussed Ham Holiday coming up. Seems like we're all excited about it.

We then went through several items of old and new business, a little more monkey business, then we adjourned. Our next meeting will be at Al's WB5OHK house and its going to be a cookout(rain depending). My YF finally found a good use for CW, it made me better flipping a spatula. Al's wife too! Do you think there is a conspiracy afoot? TNX.

Rick KA5ALO

FOR SALE

1C-21, 14 channels crystal, AC-DC *P.S. built in,
will reach Mars frequencies. $245.00
Call D.L. K5EGQ at 390-8440
after 8p.m. and before midnight.

A BIG THANK YOU FROM CORA

Along with the board members, committee chairmen, and all the many talented volunteers, I would like to personally thank each and every registrant of Ham Holiday '79.

Success or failure of an organization depends upon the membership, and the membership certainly made Ham Holiday '79 one of the most friendly, informative, and prize-filled hamfests in the country. You, the member of a CORA affiliated club (or a subscribing supporter) are the backbone of our organization, and by golly, we appreciate it!

WHO WON WHAT, AND WHERE ARE THEY FROM?

Next month's issue will contain a list of the award winners at Ham Holiday. Also, as last year, there will be a list of how many came from where. Besides fulfilling idle curiosity, the list will give us valuable information regarding our "market" for pursuading more commercial exhibitors next year.

HOW DID YOU LIKE IT?

We would appreciate hearing your impressions of Ham Holiday '79. Tell us what you liked and didn't like. Was the location satisfactory? Do you have any ideas how we could improve anything?

Please drop a postcard to the Collector and Emitter mailing address with your comments. Response determines our actions. Remember, you are ultimately in control!

SAY AGN UR QTH, OM?

The July edition of Worldradio contained something I just had to pass along. I'm not a contester or a DXpedition hound, but you can bet I'll give this one a try:

In the tradition of the Luckenback, Texas, DXpedition, the Adrian (Mich.) Amateur Radio Club will sponsor a DXpedition to Hell, Michigan, for a 24-hour period beginning 25 August, 1600 UTC.

SSB frequencies will be 3.900, 7.235, 14.285, 21.360 and 28.625 MHz. CW can be found at 3.565, 3.710, 7.065, 7.110, 14.065, 21.065, 21.110 MHz. The club call, W8TQE will be used.

A legal-size SASE to Box 111, Adrian, MI will net you a special certificate of confirmation. Don't pass this one up. It's one of the rarest spots on earth (?). And next time your XYL complains about all that squawkin' and beepin', tell her you and the rig have made it to Hell and back!

Mark Northcutt, WD5DYI
CORA PRESIDENT

Central Oklahoma Radio Amateurs, Inc.

MINUTES

The June Meeting was called to order at 7:40 pm. with 25 people representing six of CORA's present 14 member clubs and visiting guests.

During introductions we were made aware of being honored with the attendance of Mr. Jack Gant W5GM, West Gulf Coast ARRL Director. We heartily thank Jack for coming.

The Minutes of the May meeting as published and the Treasurer's report as read were approved.

Announcements: the program for the Aeronautical Center's 6 July meeting was on Fiber Optics in telephones by Don Bolar from Southwestern Bell;
there was to be a QCWA banquet Monday morning 2 July @ 1130 @ Val Gene's Penn Square with a program on "Solid State" also from Southwestern Bell;
the program for MORI's 3 July meeting was "F.M." by Bob Ashby W5HXL;
the HH79 issue of C&E was to be assembled and mailed 27 June.

Committee Reports: the emergency committee scheduled a simulation and test Saturday morning 30 June and practice nets Monday evenings at 9 pm. on 146.52 direct FM; it works;
it was decided to not attempt a booth at the state Fair this year due to the fee charged exhibitors and current adverse publicity;
HH79 will be history by the time this is published but the committees were ready as of 26 June. We hope we saw you there!

Old Business: with unanimous approval of represented clubs to hold a raffle at HH79 for the expressed purpose of upgrading our computer printer, CORA has moved to hold all raffle receipts till after HH79 with the knowledge they are earmarked and will be disbursed only for that purpose;
the request for CORA rosters by Zip codes was tabled;
a request was made to move either CORA's meeting or the C&E paste-up dates to facilitate currency of input from all organizations: no action was taken.

New Business: our fourteenth club petitioned and was accepted into CORA membership represented by Virgil Kerr W5LIL, 'Hutch' Hutchins K5SUD and Larry Griffin WB5NYX: The Amateur Television Experimental Society (ATV). Welcome!

The next CORA meeting will be (was?) 24 July.

The meeting adjourned at 9:27 pm.

Jim N5BEQ
Secretary

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SMALL BATTERIES EXPLAINED

Are you puzzled by the many types of small batteries available? Which is most economical? Which type is best in a heavy-drain device? Read YOUR BEST BUY IN SMALL BATTERIES, Popular Science, August, 1979, page 78.

+ + + + Bill, WA5RAQ - - - -

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UNIVERSITY OF OKLAHOMA
Alpha Sigma Delta Radio Society

CLUB EDITOR
Nathan Kirby, KB5BF

MEETS: 1st & 3rd Thursday (Sep-May)
Room 449, Carson Engineering Center

PRES	James Gardner	KA5DHF	321-8779
V-P	Dan Orr	WD5GKZ	325-6951
SEC	Peter Richeson	KA5COI	325-3015
TREAS	Nathan Kirby	KB5BF	364-7979

This week I have been attending a management development course at Oscar Rose Junior College. My employer, Oklahoma City Air Logistics Center, is sending me to the course on an all day basis for two weeks. Perhaps they are hoping I can improve my performancé as Program Manager of the Oklahoma City Air Logistics Center and Tinker Air Force Base Precious Metals Program.

With the open market price of fine gold at an all time high of $297 a troy ounce, the Air Force is trying to reclaim all the precious metals it can from scrap electronics and jet engine parts. Gold is widely used in electronic parts on aircraft where a high reliability connection is needed. Gold is practically immune to corrosion and gold flash is widely used on circuit board contacts to insure reliability.

Gold has always held a fascination for man. It has been said most of the gold that has ever been mined in the world is still in use today. Indeed, that gold ring you are wearing may contain the exact same gold that was once Viking plunder or even part of the treasure of the Pharoh's.

Management development courses always contain an abundance of motivational theory to encourage success. One of the primary reasons the United States is so dominant today is due to so many talented individuals in industry that believe they can achieve the impossible dream. It seems we are constantly in a state of flux to make our institutions more effecient. Yet, the usual definition of success is given in material terms. By material terms, I mean the acquisition of expensive homes, cars, furniture, and even ham radios. We Americans consider ourselves successful if we have lots of nice things that make life comfortable and enjoyable.

In these troubled times, when OPEC is gouging our economy that always seems in precarious balance, and when inflation is increasing faster than our income, perhaps we should sit down a moment, relax, and simply be thankful for what is still the highest standard of living in the world and be thankful for those material things we do have. Thinking further, perhaps we should consider not measuring success in acquiring more material things but in other ways.

SUCCESS IS:

To laugh often and love much;

To win the respect of intelligent persons and the affection of children;

To earn the approval of honest critics and endure the betrayal of false friends;

To seek and appreciate beauty wherever it may be found;

To seek and find the best in others and to tolerate the worst;

To give oneself without the slightest thought of return;

To have accomplished a worthy task;

To have played and laughed with enthusiasm and sung with exultation;

To know that even one life has breathed easier or has been made brighter because you have lived;

This is to have succeeded.

Nathan Kirby KB5BF

CLUB EDITOR
Joe Buswell, K5JB
732-0676

MEETS: 8:00 PM Third Friday each month
American Red Cross, 10th & Hudson OKC

PRES	Ken Ford	WB5KHU	528-8770
V-P	Jim Williams	K5VRL	789-0769
SEC	Joe Buswell	K6JB	732-0676
TREAS	Ellard Foster	W5KE	789-6702

CLUB BUSINESS

SINCE THE JULY MEETING WAS CANCELLED IN DEFERENCE TO HAM HOLIDAY, THERE ARE NO MINUTES FOR THIS MONTH. THE AUGUST MEETING WILL BE A WATERMELON FEED HELD IN CONJUNCTION WITH THE AERONAUTICAL CENTER CLUB. K5JB, SEC'Y

PIDDLE PROJECTS - SCANNERS

THIS MONTH'S HOMEBREW WORK HAS BEEN SOMEWHAT UNSUCCESSFUL IN PRODUCING ANYTHING WORTHWHILE FOR THE COLUMN BECAUSE THE PLANNED PROJECTS EITHER FAILED TO WORK OR UNSUFFICIENT TIME WAS EXPENDED TO WORK OUT THE PROBLEMS.

I ACQUIRED A NEW SCANNING RECEIVER AT THE ATLANTA HAMFEST, A BEARCAT 220, AND INTENDED TO WRITE A REVIEW ON IT AND INCLUDE SOME MODIFICATIONS. THE MANUFACTURER IS NOT ABLE TO SUPPLY A SERVICE MANUAL FOR IT YET SO IT MAY BE NEXT MONTH BEFORE I CAN ADD A COUPLE OF MY PET CIRCUITS. AMONG OTHER THINGS, I WANT TO WIRE IT TO ACCEPT MY DIRECTION FINDING EQUIPMENT. ALL I CAN SAY AT THIS POINT IS THAT IT LOOKS PRETTY MYSTERIOUS INSIDE WITHOUT EVEN A SCHEMATIC TO USE FOR CLUES.

ONE THING I CAN REPORT IS IN ADDITION TO SCANNING THE 30 TO 50, 144 TO 174 AND 420 TO 512 MHz BANDS AS WELL AS ANY OTHER SCANNER, THE RECEIVER WORKS QUITE WELL ON THE 118 TO 136 MHz COMMUNICATION PORTION OF THE VHF AM AIRCRAFT BAND. IT IS AS SENSITIVE AS ANY AIRCRAFT BAND RECEIVER I HAVE SEEN. IT IS UNFORTUNATE THAT IT DOES NOT COVER THE 108 TO 118 MHz NAVIGATION PORTION WHERE AUTOMATIC TERMINAL INFORMATION SERVICE IS FOUND GIVING RECORDED LOCAL WEATHER FOR PILOTS. RANGE WOULD BE QUITE LIMITED SO LACK OF THIS FEATURE IS NOT TOO SIGNIFICANT.

THE BC-220 USES LOW SIDE INJECTION ON ALL BUT THE AIRCRAFT BAND. WITH AN I.F. OF 10.8 MHz, THE LOCAL OSCILLATOR TUNES 128.8 TO 147.8 MHz IN 25 kHz STEPS. IMAGE FREQUENCIES ARE 21.6 MHz ABOVE THE SELECTED FREQUENCY AND ARE SOMEWHAT A PROBLEM BECAUSE FRONT END SELECTIVITY IS NOT GOOD ENOUGH TO REJECT STRONG REPEATERS THAT ARE FOUND IN THE 144 TO 174 MHz BAND. (...BUT NOT AS MUCH A PROBLEM AS THE FM BROADCAST BAND WOULD CAUSE IF LOW SIDE INJECTION WERE USED) TUNED STAGES ARE HELD TO A MINIMUM BECAUSE THEY HAVE TO BE ELECTRONICALLY TRACKED WITH THE TUNING TO MAINTAIN REASONABLE SENSITIVITY. ON NONE OF THE EIGHT APPROACH CONTROL FREQUENCIES I HAVE LISTENED TO HAS THERE BEEN ANY INTERFERENCE FROM THE VHF FM BAND.

WITH THE NEW BC-220 IN THE HOUSE, I THOUGHT I HAD BETTER DIVIDE MY ATTENTION A LITTLE AND NOT NEGLECT THE OLD BEARCAT 101 LEST IT GET JEALOUS AND LIE DOWN ON ME. I HAVE DECIDED TO KEEP IT SINCE IT IS PROBABLY NOT WORTH MUCH ANYMORE ON THE USED RADIO MARKET WITH ITS OLD FASHONED ROW OF BLINKING LEDS...NO NUMBERS, NO SEARCHING, NO NOTHING...JUST BASIC RECEIVER. ONE THING THAT ALWAYS PUZZLED ME WAS WHAT FREQUENCIES WERE PROGRAMMED AFTER I LOST THE PIECE OF PAPER THEY WERE WRITTEN ON DURING PROGRAMMING. TO SOLVE THIS PROBLEM, AND EXTEND THE USEFULNESS OF THE RECEIVER AS A SIGNAL GENERATOR, I CONSTRUCTED A BUFFER AMPLIFIER AND WIRED IT BETWEEN THE LOCAL OSCILLATOR AND A BNC CONNECTOR ON THE BACK. HERE IS WHERE MY FIRST PROJECT OF THE MONTH TURNED OUT TO BE SOMEWHAT OF A FLOP.

WHAT I NEEDED MOST OF ALL WAS A GOOD UHF SIGNAL SOURCE BUT I WAS UNABLE TO GET ENOUGH GAIN AT UHF WITH TRANSISTORS ON HAND TO DO ANY GOOD. THE LOCAL OSCILLATOR RUNS AT ONE THIRD THE INJECTION FREQUENCY AND IT APPEARS THAT THE THIRD HARMONIC IS SIMPLY FILTERED OUT OF THE OSCILLATOR SPECTRUM AND INJECTED WITHOUT ASSISTANCE FROM AN ACTIVE MULTIPLIER DEVICE. THE SIGNAL WAS TOO WEAK TO SNIFF OUT WITH THE COUNTER SO I HAD TO BE SATISFIED WITH THE SIGNAL FROM THE OSCILLATOR. I CONNECTED THE AMPLIFIER TO A POINT WHERE BOTH THE LOW BAND AND HIGH BAND OSCILLATORS FED A SIGNAL INTO THE FREQUENCY CONTROLLING CIRCUIT. IF ANYONE IS INTERESTED, I CAN SUPPLY INFORMATION.

THE AMPLIFIER GAVE ME A LOT OF TROUBLE. THE BEST TRANSISTOR I HAD WAS A 2N2222 WHICH HAS A MAXIMUM GAIN-BANDWIDTH PRODUCT OF 450 MHz. THIS MEANS THAT AT HALF THAT FREQUENCY, IT ONLY HAS A CURRENT GAIN OF TWO. ORIGINALLY I TRIED A FAIRLY HIGH IMPEDANCE INPUT COMMON EMITTER STAGE FOLLOWED BY A COMMON COLLECTOR STAGE

DRIVING LOW IMPEDANCE LINE. NEITHER STAGE WORKED TOO GOOD BECAUSE OF LIGHT CURRENT LEVELS I WAS TRYING TO ACHIEVE.

I FINALLY COMPROMISED WITH ONE COMMON EMITTER STAGE SO I COULD GET SOME VOLTAGE GAIN. WITH 50 OHMS ON THE OUTPUT, I CAN GET ABOUT 1 VOLT RMS FROM 40 TO 60 MHz AND ABOUT .1 VOLT RMS FROM ABOUT 132 TO 167 MHz. WITH SUITABLE ATTENUATION, THIS IS PLENTY GOOD FOR MW PURPOSES. I MAY EVEN COOK UP A MIXER AND POWER AMPLIFIER TO MAKE THE OLD BC- 101 PART OF A TRANSCEIVER CIRCUIT. AN IDEAL AMPLIFIER FOR INSTRUMENTENTATION PURPOSES WOULD HAVE BEEN THE CA 2812 WIDEBAND LINEAR HYBRID AMPLIFIER JUST INTRODUCED BY TRW INC. IT HAS 30 dB GAIN FROM 1 TO 520 MHz AND IS CAPABLE OF AN OUTPUT OF OVER 250 mW. I HAVE ONE ON ORDER AND WHEN I GET IT I'LL REPORT ON SOME AMATEUR RADIO APPLICATIONS FOR IT.

THE SECOND MODIFICATION FOR THE BC-101 WAS AN IMPROVED CARRIER OPERATED SWITCH. THE ONE DESIGNED INTO THE RADIO IS PROGRAMMABLE SO THAT ONLY CHANNELS WITH SCAN DELAY ACTUATE THE SWITCH WHEN ACTIVE. UNFORTUNATELY, THE CIRCUIT CONNECTION TO THE OUTSIDE WORLD IS HIGH IMPEDANCE SO AN AMPLIFIER HAS TO BE ADDED TO PERFORM ANY USEFUL FUNCTION. ALSO, ANY LOADING ON IT CAUSES THE SCAN DELAY TO BE DEACTIVATED BECAUSE OF SOME INTERNAL HIGH RESISTANCE CURRENT SOURCES USED TO CHARGE THE TIMING CAPACITOR.

THE CIRCUIT IN FIGURE ONE WAS SUCCESSFUL IN PROVIDING REQUIRED GAIN WITH HIGH ENOUGH INPUT IMPEDANCE TO PREVENT NOTICEABLE REDUCTION OF THE SCAN DELAY. THE DARLINGTONS I USED ARE HOUSE NUMBERED 10 FOR A DOLLAR FLEA MARKET SPECIALS. MPS-A13 WOULD WORK ABOUT THE SAME.

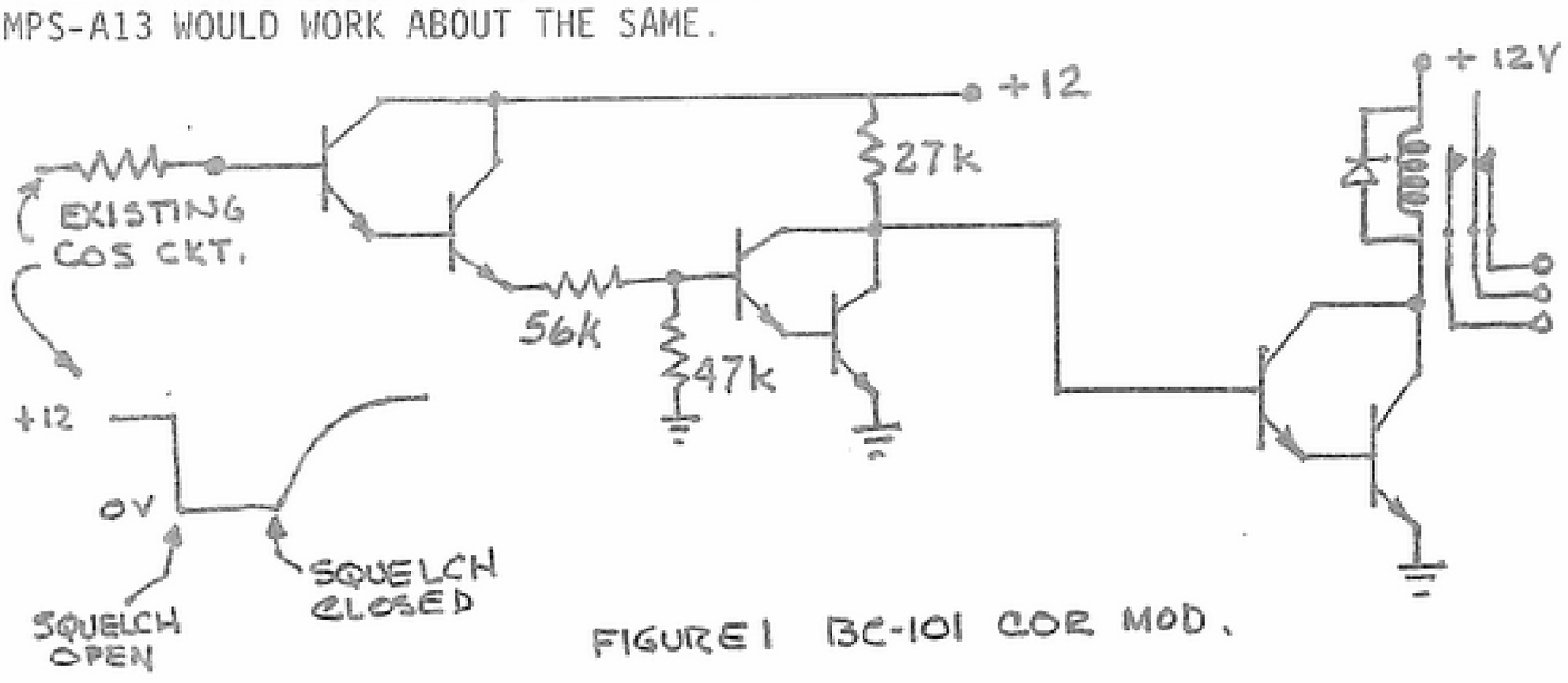


FIGURE 1 BC-101 COR MOD.

THE LAST DARLINGTON WAS NECESSARY ONLY TO INVERT THE SIGNAL TO PULL IN THE RELAY. THE RELAY WAS INSTALLED IN THE RADIO AS AN AFTERTHOUGHT SO THAT DEVICES COULD BE CONNECTED WITHOUT REGARD TO POLARITY AND POWER SOURCE. THE LAST STAGE COULD HAVE BEEN ANY NPN TRANSISTOR SUITABLE FOR THE RELAY COIL BUT I THOUGHT, WHAT THE HECK, DARLINGTONS ARE CHEAP! (BESIDES I THINK IT WOULD NEED A COUPLE OF MORE PARTS TO MAKE SURE THE LAST TRANSISTOR TURNED OFF.) JOE, K5JB

WHISTLE PROJECT.

AS COMMUNICATION OFFICER FOR A CIVIL AIR PATROL SQUADRON AND "SECOND PHONE OR BETTER", I UNDERTOOK A PROJECT TO STRAIGHTEN OUT A CRYSTAL CONTROLLED SSB TRANSCEIVER THAT OPERATES SLIGHTLY ABOVE THE 75 METER BAND. AMONG OTHER THINGS, I HAD TO SET IT ON FREQUENCY WITHIN A TOLERANCE OF PLUS OR MINUS 50 Hz. THERE WAS NO BIG PROBLEM ON THIS RADIO BECAUSE THERE WAS SWITCHING PROVISION TO UNBALANCE THE MIXER TO ALLOW THE THING TO TRANSMIT A CARRIER TO SIMULATE AM. SINCE THERE WAS VERY LITTLE FREQUENCY SHIFT WHEN CARRIER WAS INSERTED, I SET THE CRYSTALS WHILE TRANSMITTING IN THE AM MODE.

AFTER DOING THIS, I STARTED THINKING HOW DIFFICULT IT IS TO MEASURE VIRTUAL CARRIER FREQUENCY OF A SSB TRANSMITTER TO A HIGH DEGREE OF ACCURACY. I HAVE TO AGREE WITH THOSE WHO WOULD SAY "WHO CARES?" BUT IT MIGHT COME IN HANDY SOMETIME AND WIN A BEER IF I HAD A WHISTLE WHICH WAS CALIBRATED TO ONE kHz. A SSB TRANSMITTER WOULD THEN EMIT A SIGNAL WHICH COULD BE READ ON A COUNTER AND THE OFFSET WOULD BE KNOWN. SO I SET OUT WITH DREMEL IN HAND AND PROCEEDED TO CARVE ON A PIECE OF BRASS TUBING. RESULT...NO WORKEE. OH WELL THAT'S HOMEBREW. ANYBODY KNOW HOW TO MAKE A LITTLE BRASS WHISTLE? JOE, K5JB

BICENTENNIAL AMATEUR RADIO CLUB
"To Promote Radio Communications"
Sponsored by Oklahoma Air National Guard
Will Rogers World Airport

MEETS: 7:00 PM 3rd Tuesday each month
Air National Guard, Will Rogers Apt.

PRES	Mark Northcutt	WD5DYI 842-1086
V-P	Joe Ramage	WB5TDW 685-4814
SEC	Joe Couch	WD5BMP 282-4353
TREAS	Don Duck	AE5N

CLUB EDITOR
Charles Kennamer WA4PLG 632-4653

MINUTES
July, 1979

Meeting called to order and self introductions followed. List of new members were read and approved; we now have 151 members. There were 58 members and eight guests at the club meeting.

Motion made by Paul, WA5HTL, seconded by Don to pay for another year in the call book.

CY, WB5TKG, gave a skylab update and report on the emergency committee.

See Greg to order name plates.

Our radio classes will start September 27 at 7:30.

Motion made to have picnic in August instead of meeting, approved.

Secretary
Joe, WD5BMP

FIELD DAY RESULTS

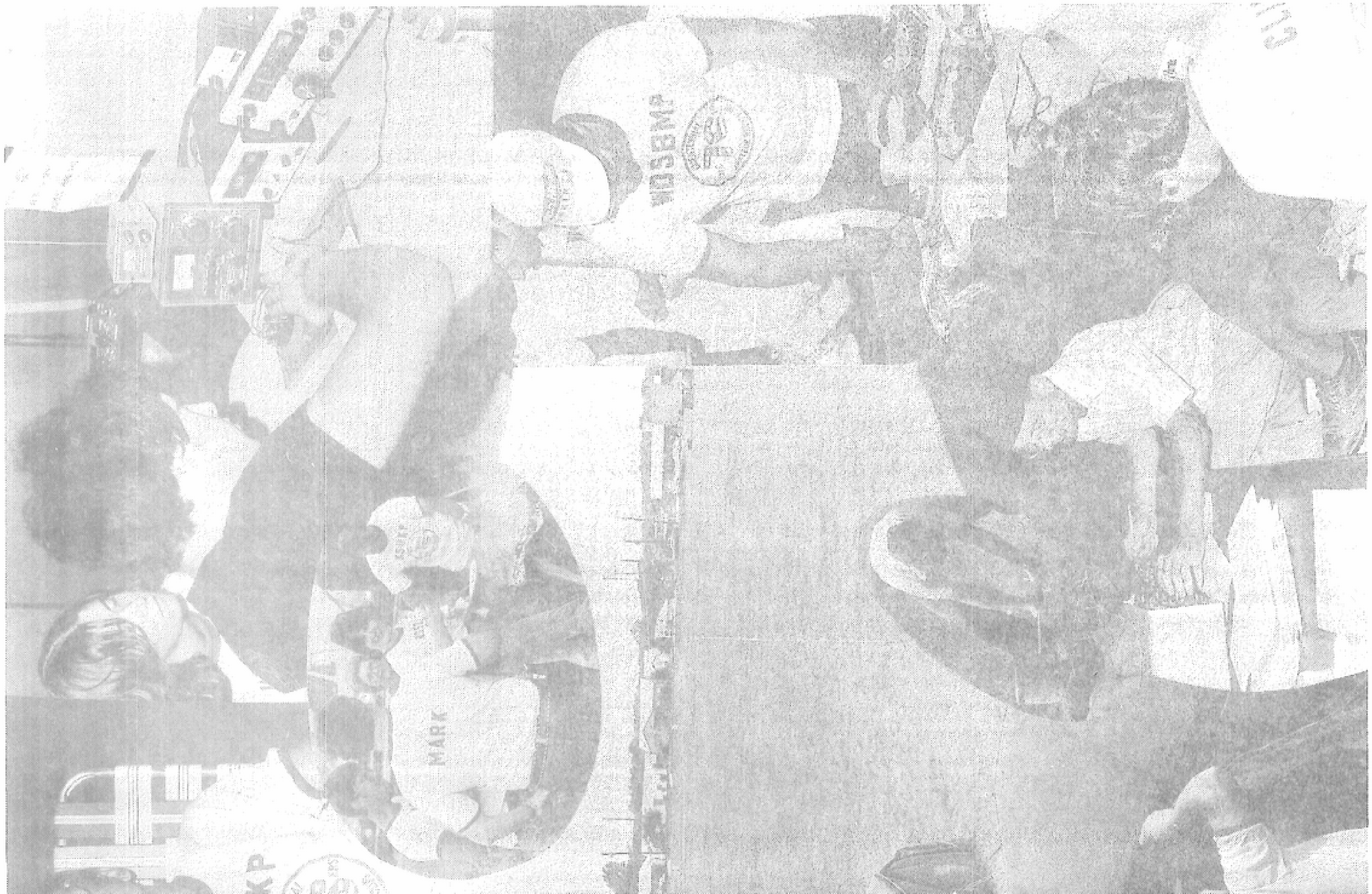
QSO'S	MODE	MODE MULTIPLIER	LOW POWER MULTIPLIER	POINTS
634	CW	2	2	2536
477	PHONE	1	2	954
71	NOVICE	2	2	284
				3774
			EMERGENCY POWER	100
			PUBLIC RELATIONS	50
			MESSAGE	50
			TOTAL POINTS	3974

The total score of 3974 points is less than last years total score of 4176. Our total number of QSO'S for this year was 1182 as opposed to last year's total of 1144. The reason this years score is less, even though we made more contacts, is that a CW contact counts twice as much as a phone contact and our CW contacts were down this year. The percentages of this year's points are as follows: 53.6% CW, 40.4% phone, and 6.0% novice. The total number of contacts per band are as follows:

BAND	80/75	40	20	15	10	6	2
CONTACTS	108	207	582	239	37	7	2

Considering the weather conditions during much of this year's exercise, these figures are rather impressive. We had excellent participation this year in spite of the weather. On one occasion, when the rain flooded out the phone station temporarily, Dick, WB5TMW, attempted to operate CW using a clip lead and a clip board for a key. (see upper left photo on following page) Everyone appeared to have a good time and I know we will all be looking forward to next year.

BICENTENNIAL AMATEUR RADIO CLUB FIELD DAY PHOTOGRAPHS ⟶
- photos by Charlie, WA4PLG



BICENTENNIAL AMATEUR RADIO CLUB
"To Promote Radio Communications"
Sponsored by Oklahoma Air National Guard
ARRL affiliated

DIGITAL LOGIC-Part Two

Due to the rotten print quality of part one of this series, I have included the important portions in this part. As was stated in part one. This series is aimed at those of us that know very little about digital Integrated Circuits. I know that there are many readers for which this material will seem extremely simple and others who will have never heard of most of the terms that will be used.

Please send any comments to me. (WB5HUP). I would like to here any ideas about what you want to hear about. This series only covers TTL chips, however,CMOS could be included if you like. Again send me some ideas.

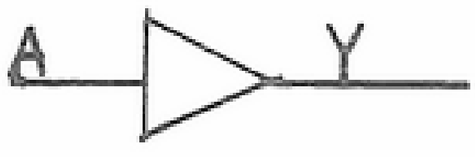
Almost all of the I.C.s covered will be in the 7400 series. The 7400 series is a member of the TTL family. TTL means Transistor-Transistor-Logic. It is really beyond the scope of this series to go into an explanation of the reason its called TTL. However it is important to realize that there ARE other types. Most are similar in operation from our standpoint.
The 7400 series uses a single +5 volt supply. They are very fast and some types,that have a (L) in the type number are low power versions.

Lets see if we can learn something by looking at the term DIGITAL LOGIC. Digital-In our case this is a type of electronics that has only two voltages. Lets define them. A high is a voltage near +5 volts. A high is the same as ON. A low is a voltage near Ø volts. This will also be called the off state. Later when we get into Logic in detail you will see the terms true and false. True can be thought of as a High state. False can be considered a Low state. When we get to truth tables you will see several 1's and Øs. A one means a high,a Ø means a low. Now think about the second word-Logic This means,in our case that certain chips follow set patterns. This will be explained in much detail later. The important thing to remember is there are only two active voltage levels. High (1) and Low (Ø).

The first type of IC we will talk about is the Buffer. A Buffer,like in discrete circuits,is used to provide isolation between stages. It will prevent loading down of certain bus lines. Lets look at the operation of a buffer. A 7417 Hex Buffer. In data books thats the way its called. Hex tells us that there are six seperate buffers in one package.
The 17 means its number 17 in the 7400 series.Actually a 7417 is-Hex Buffers with Open colector High voltage output. Open Collector tells us that the output will not supply a voltage it will only pull a external voltage down. A Buffer has only one input and one output. Lets call the input (A) and label the output (y). The equation for a buffer is- Y=A.All 7400 ICs have an equation. This can tell you what input conditions cause certain output conditions. A buffer will follow these conditions. Whatever input A is, Y will be the same. If A is high (1) then output Y will also be High (1). If A is Low (Ø) then Y will be low (Ø). Lets look at a truth table for a buffer.

A	Y
Ø	Ø
1	1

Here is the schematic symbol for a buffer.



Remember the '76er's PICNIC August 14th
7 p.m., Rotary Park - 15th & S. Blackwelder

Remember we defined all of those 1's and Ø's to mean something. Input A is the column on the left. Output Y is on the right. Look at the first row. A is low(Ø). Y is also low(Ø). The second row shows the results if A is high(1). Truth tables are extremely useful. I'd suggest to those of you who are interested in ICs that you purchase a good data book. I use one put out by Radio Shack. An IC which is similar to the buffer is the INVERTER. 7404 Hex Inverters. This is one of the more common ones. The equation for the inverter is $Y=\overline{A}$. Notice the bar over the A. This shows negation. It is read Y=NOT(A). All it means is that Y is equal to the complement of A. If A is high(1) then Y equals a low(Ø). And if A is low(Ø) then Y will be high(1).Can you see how NOT works now?. Here is the symbol for an Inverter and its truth table.

A	Y
Ø	1
1	Ø

Symbol for An INVERTER-

Notice the circle on the output of the inverter. Except for this the symbols for a Buffer and Inverter are the same. An Inverter can be thought of as a Buffer with an inverter tied on.

The next four chips we will talk about make up the powerful componets of any computer. It just depends on how they are connected. These four can make very basic decisions based on Two logical operations. The first of which is the AND function. A 7408 is a Quad 2-Input AND gate. Quad means that there are four complete 2 input AND gates. Lets label the inputs A and input B. The out put is still Y. The equation is Y=AB. Which is read Y= A AND B. The AND functions like this. Both A and B MUST be high(1) to make Y=(1). If either input is low or both then Y will be low(Ø). Do you see why its call AND? Here is the symbol and truth table for a AND Gate.

A	B	Y
Ø	Ø	Ø
1	Ø	Ø
Ø	1	Ø
1	1	1

Notice that every possible input condition is shown. Also that when Both A and B are (1) or high that Y is high(1). Now lets adapt our thinking to the NAND gate. 7400 Quad 2-Input NAND gate. Its equation is $Y=\overline{AB}$. Notice the bar over A and B?. This statement is read Y= Not(A AND B). Think a minute and try to figure out this. What ever A AND B equals. Y then equals its inverse or complement. For example if both A and B are high(1) then the statement A AND B equals a high (1) But NOT ((1) AND (1)) equals (Ø). I just stuck the values of A and B in there instead of saying A AND B. You would think the NAND gate would have exactly oppissite outputs than a AND gate for the same input conditions. Thats exactly the case Here is the truth table and symbol for the NAND gate.

A	B	Y
Ø	Ø	1
1	Ø	1
Ø	1	1
1	1	Ø

Symbol for a NAND

Notice the circle on the output again. A NAND can be thought of as an AND with an inverter. Which it is!
Now lets tackel the OR function. A 7432 Quad 2-input OR gate.

The OR function works like this. If One or both of the inputs is high(1) then the whole statement is equal to a high(1) only when both inputs are low is it equat to a low(Ø) The equation for an OR looks like this. Y=(A+B). The (+) is read 'OR'. Before I show you the table for an OR remember If A OR B is High(1) then Y will be High(1),otherwise Y will be low(Ø). Here is the symbol and table for a 2 input OR gate.

A	B	Y
Ø	Ø	Ø
1	Ø	1
Ø	1	1
1	1	1

Symbol for an OR-

The last chip is the NOR Gate. This works alot like the difference between AND and NAND.
Here is the formula for a 7402 Quad 2-Input NOR gate. Y= $\overline{A+B}$. Note the bar over A+B. You might have suspected it this time. It is read Y= NOT(A OR B). You,again, might have this one figured out by now. Its just like the OR gate except the outputs are inverted. And yes the only difference between the OR and NOR in the schematic symbol is the circle on the output.
Here is the table and symbol for the NOR gate.

A	B	Y
Ø	Ø	1
1	Ø	Ø
Ø	1	Ø
1	1	Ø

Yes a Nor can be thought of as an OR with an inverter tied on. See the circle on the output?
Next month I'll show you a couple of very simple circuits that are made from these six types. The more complex chips such as a BCD to Decimal Multiplexer is made up of these. Along with many,many types of high density chips are made from these six types. Fortunatly they come as single packaged ICs,so we don't have to hook up 25 different gates to do the same function.

Again I'm hoping for some ideas from some of you. If you cannot reach me then send your ideas to WA4PLG,the 76ers editor. Later when we get to the more complex chips I won't go into the details of how they work but will explain how they work in the 'block' form. In other words "if you input this it will do this". These complex chips are just to difficult to follow internally. And why do it the hard way. Just consider all of these chips as building blocks. It makes it easier.
I hope you have followed most of this,if not,then send me a word and I'll try again. Besides if you want a good article talk to Mike Salem. Everybody tell SUSAN WA4AKB happy birthday this month.

73, Lloyd Kirk WB5HUP

FUNDAMENTALS OF POLICE RADAR--Part II

Last month, I began a discussion of the operating principles behind speed measuring radar used by police. One fact I have noted with interest in the past several months since the completion of the radar speed case in Dade County Florida is the increase in respectability of the messages marketing radar detectors. Ads have appeared in Time Magazine and Playboy. Even JS&A Sales whose unique full page ads have featured radar detectors has jumped on the band wagon with a tale of woe concerning their president who was nabbed at the bottom of the hill by the waiting gendarme with a Gunn oscillator. The energy crisis may prove a more interesting color to this picture should everybody actually start driving 55 mph and the Federal Government threatens cutoff of funds for lack of enforcement. DOT has used a sampling technique to determine average speeds on the highways and has threatened states with appropriate action when those averages were in excess of the federally mandated 55 mph speed limit. Should the actual speed decline and the samples not follow, there could be increased pressure to show enforcement where none might be needed. All very interesting, but I believe that there will always be a certain group who will drive in excess of the speed limit no matter what the reason. There will be legitimate use of police radar as well as those who will take advantage of its fund raising capability.

HOW FAR IS FAR?

One thing I never really understood was how you could start with a 10 mw to 100 mw transmitter, send a signal out into the air and have enough of the signal return to actually measure the frequency shift. I guess you actually have to put a pencil to it to see that it actually works. Dr. Gene Walker at the EE School at OU ran through a few calculations for me and made a believer out of me at least on paper. Its not two difficult to determine once a few simple assumptions are made:

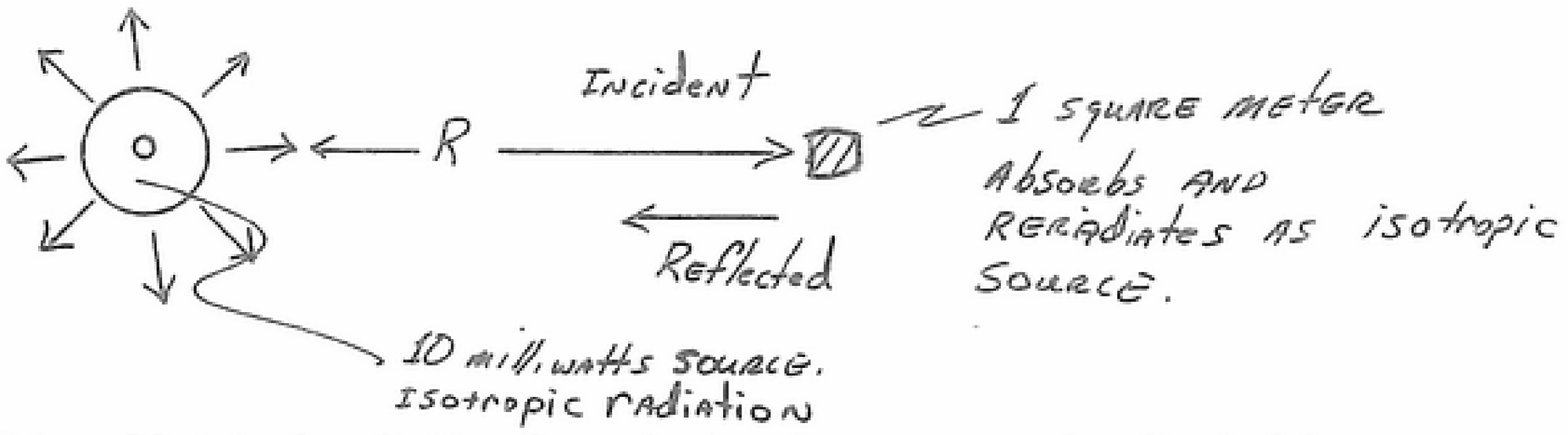


FIGURE 1. Model of radiation from isotropic source and reflected from one square meter a distance of R from the center of radiation. Assumption of no loss and equal power flux density.

Looking at Figure 1, we can see that the assumptions include an isotropic source of radiation, no losses in space and equal power flux density around the isotropic source. If we assume no losses, then the power flux density at R is given by

$$P_d = \frac{P}{4 \pi R^2} \qquad \text{Eq. 1}$$

Now this is really not so hard to understand. P is the power of radiation from the isotropic source, in our example, 10 milliwatts. $4\pi R^2$ is nothing more than the formula for the surface area of a sphere. Odviously, if we were to add up the power per square meter around the isotropic source at any distance R, for the entire spherical surface, it would equal the total power radiated. Now lets make another assumption and that is that all the power that is received at the 1 square meter target is completely absorbed and reradiated isotropically,

that is, equally in all directions, some of which will go back to the source. Dealing with an area of 1 square meter simplifies the equation somewhat, but reapplying Eq. 1 leads to the following result:

$$P_R = \frac{P}{4\pi R^2} \quad \frac{1}{4\pi R^2} \text{ (Area of Rcvr Ant)}$$

If we assume a distance R of 500 meters, and an area of 100 centimeters for the receive antenna leads to the following return power.

$$P_r = \frac{10^{-2}}{16\pi^2 (500)^2} \quad \frac{100}{10^4}$$

$$= 2.53 \times 10^{-12} \text{ watts}$$ returned to 100 square centimeters target ant.

Now dragging out the equation for power, resistance, and voltage:

$$P = \frac{E^2}{R}$$ and rearranging to solve for voltage in a 50 ohm system:

$$E = \sqrt{PR}$$

$$= 11.24 \times 10^{-6} \text{ volts.}$$

What's this? At 500 meters, assuming isotropic sources and 1 square meter receiving and 100 centimeters at the receiving antenna square, we have almost 11 microvolts. Now 500 meters is about 1,640 feet, just over .3 of a mile. I ran the figures out for 1 mile and arrived at 2.44×10^{-13} watts which is 3.5 microvolts. We still have not taken into account antenna gain and path loss. The path loss is given by the equation:

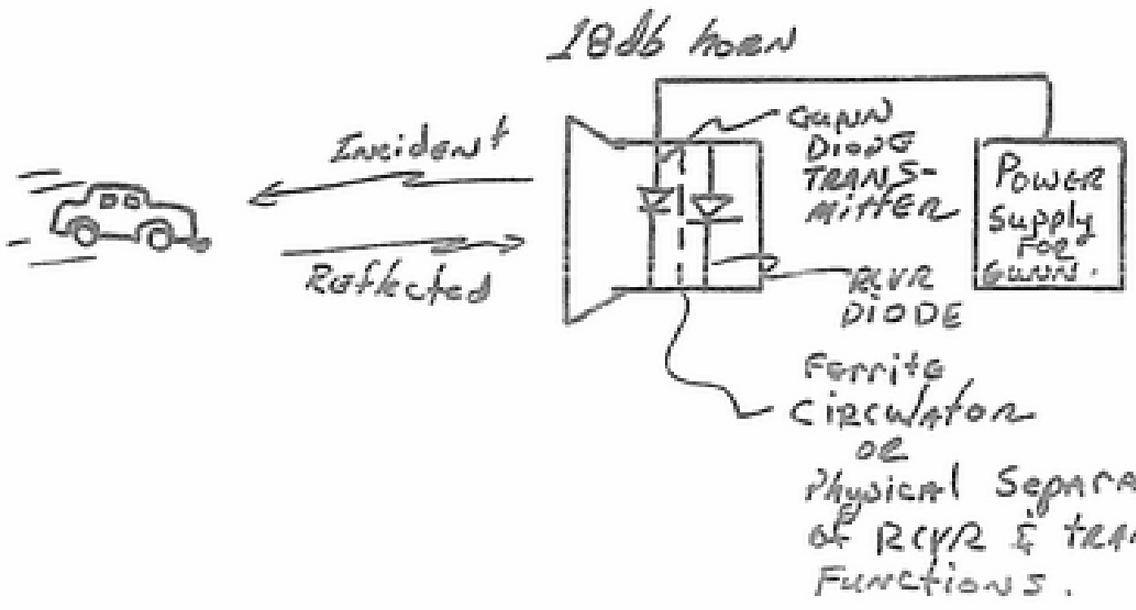
$$A = 96.6 + 20 \text{ Log}_{10} \text{ F (Ghz)} + 20 \text{ Log}_{10} \text{ D (Miles)}$$

At 10.525 Ghz, the path loss is approximately 116 db. If we assume an 18 db gain horn on transmit and since the same horn is used for receive, we have the same gain on receive. We may need to reduce the size of the receive antenna capture area to adjust for the gain increase. That still leaves about 80 db or so to make up. This loss would show up as a number in the denominator of our original equation for reflected signal. For one half mile, the path loss is 91.6 db. and the received voltage is 2.05 microvolts. Looking at the antenna gain means a path loss of 55.5 db or so. At this point, I am afraid that our analysis will fall apart without further information regarding the reflection coefficients at the reflected signal site. Remember our assumption that all the power received by the "target" would be absorbed and reradiated equally in all directions. Now if my analysis offends some of you RF types, don't blame Dr. Walker, I extrapolated on his loss free analysis to the above data. It did lead me to believe that a radar could easily pick off a car at one half mile and a truck perhaps even further. With the fairly narrow beamwidth of a high gain horn, a careful trooper can spot you pretty far off. Range, of course, will be dependant on many factors, but the limitation is probably the optical viewing resolution of the operator. From a stationary location, you could probably be nabbed as you topped a hill a half mile away. In the moving radar position, the care and attention that must be paid to the road probably shrinks this considerably. If you are travelling in a crowd with several cars around you, it may be difficult for the operator of the radar to actually determine your individual speed whether he is stationary or moving. He can only assume that the speed he clocks represents the speed of one of the vehicles in the group and that the relative positions of the cars don't change, then your speed

must be the same.

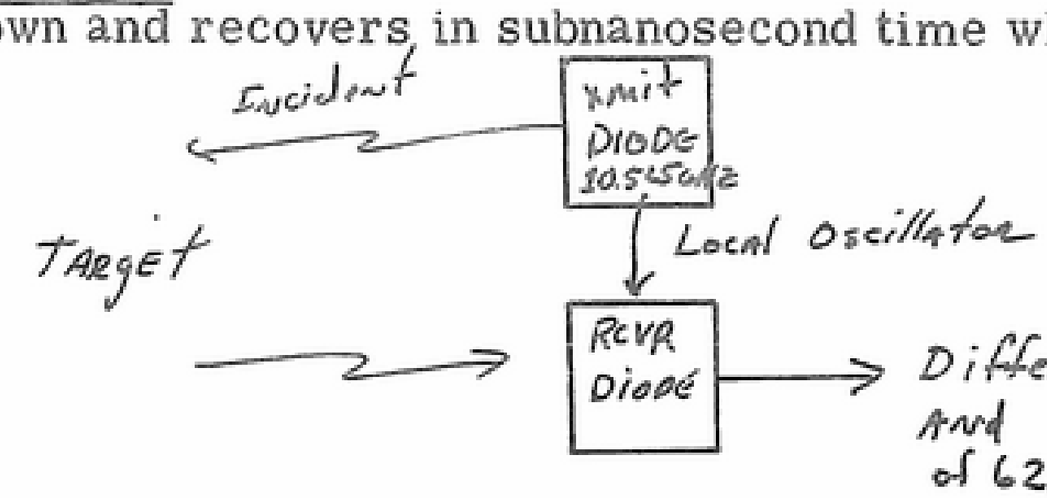
CIRCUIT DESCRIPTION

The radar produces a beat tone by mixing the outgoing 10.525 Mhz signal with the reflected signal that returns.



The outgoing signal is on the order of 100 mw or so depending on the manufacturer. The return signal is mixed with a little of the transmitted signal in a mixer diode and produces a difference frequency in the audio range which is dependant upon the speed of the target. The transmit and receive functions are separated by a ferrite circulator, much like a Gunnplexer.

Figure 2: The Gunn Diode transmitter is an avalanche type device that breaks down and recovers in subnanosecond time when a certain voltage is applied.



When the Gunn Diode is place in a cavity of a particular size, these breakdowns produce oscillations at a frequency dependant upon the physize of the cavity.

Figure 3. Although the transmit and receive functions of the unit may be physically combined into one RF head, the actual receive and transmit functions are separate as shown above. I have seen two different ways in which the separation of the functions is accomplished. One is by a physical separation where the same horn is used, but a metal shield passes down the middle of the antenna with one half dedicated to transmit and one half dedicated to receive. Part of the transmitted carrier is allowed to "leak" into the receiver from a tiny hole in the shield to act as the local oscillator. Another version is like the Gunnplexer which has a tiny ferrite rod placed in the middle of the excitation cavity that acts as an isolator. Once again, part of the signal that is transmitted is allowed to mix with the return signal from the target.

Once the signal is reduced to an audio difference beat, it is ran through a 20 mph high pass filter which filters out any signals below 628 Hz. 20 mph is probably the lowest speed you are interested in since that is the legal speed through school zones. In addition, this keeps a lot of trash out of the tracking filters. Just because this filter is present does not mean that you can't track below 20 mph. The tracking filters use Phase Lock loops to follow the frequency difference and they will follow the target below 20 mph once the signal has been lock onto.

The audio return signal is also ran through a preamp with about 50 db or so of gain. This immediately brings the signal up to usuable strength. In Figure 4, we show a configuration for a radar in the stationary configuration, that is, at rest, shooting pictures down the side of the road at oncoming cars.

The returning signal goes through the 50 db preamp and the 20 mph filter built into it. It then goes through a AGC Amplifier which maintains linearity in the presence of strong return signals. This is interesting since it appears that if the radar is tracking a weak signal a half mile away and a strong return signal from a slower moving vehicle much closer to the radar comes through the beam, the AGC would reduce the gain and the weaker signal would probably be lost.

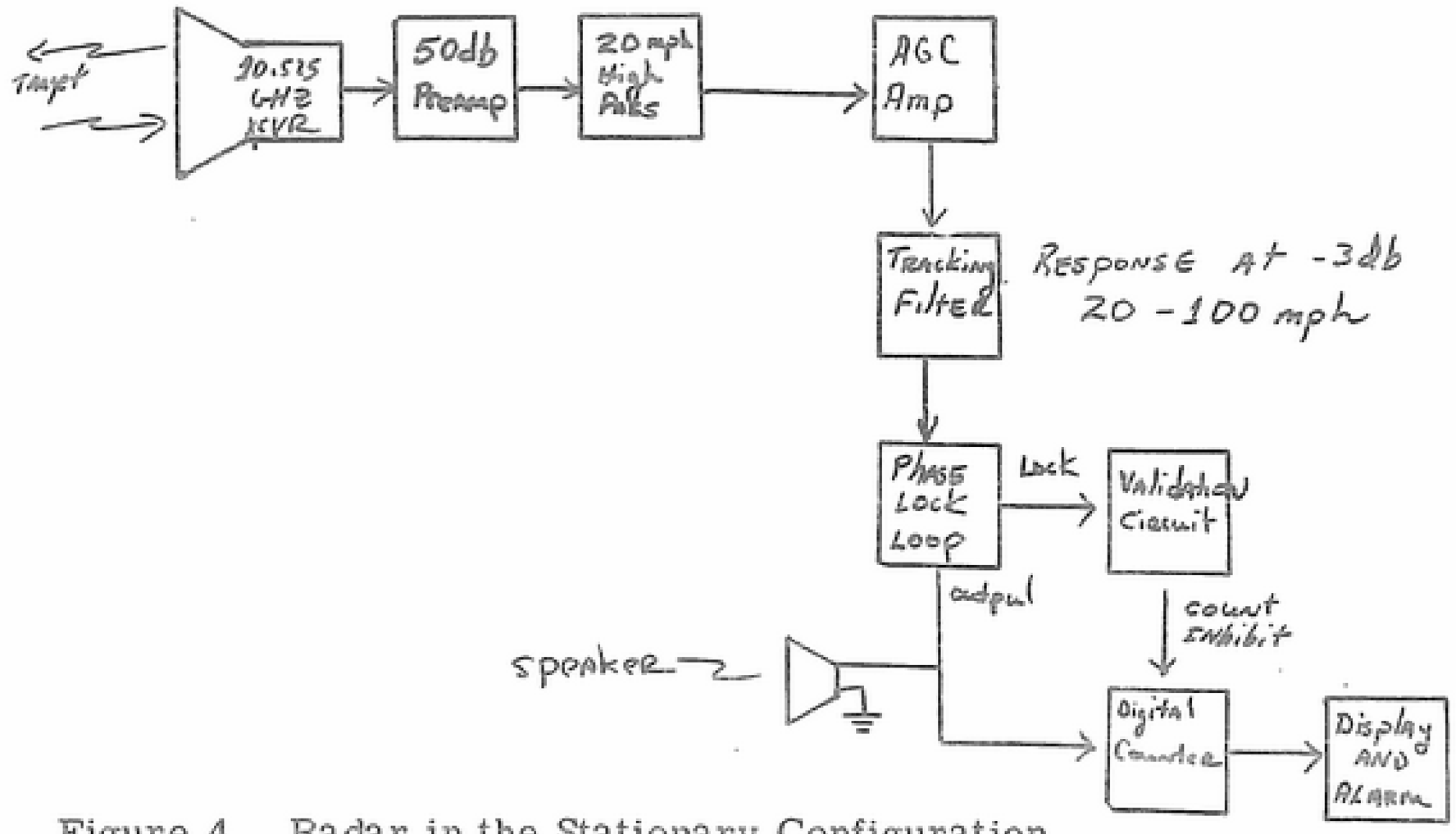


Figure 4. Radar in the Stationary Configuration

Depending upon the response and frequency response of the AGC amp, it is uncertain what speed the device might be measuring in its beamwidth. Stronger reflections would most probably alter the amplification present.

The output of the AGC amplifier is then fed to a tracking filter. This filter has constant bandwidth and adjustable center frequency and "tunes" itself to the in band frequency that is present. When there is no signal present, the filter tunes itself to the geometric mean of the noise in its bandwidth. Now we have processed the incoming signal as to amplitude and frequency. The results are then fed to a Phase Lock Loop which "locks" its output oscillator to the incoming signal's frequency. This results in a square wave being applied to the digital counter circuit. Besides providing a stable output for the counters, the PLL also performs a validation function to ensure that only output is displayed when there is a valid input to the PLL. The PLL will remain "locked" on a particular frequency until there is an abrupt change in frequency, that is, the target moves out of range of the antenna. This "abrupt change" is dependant upon the loop's response to variant signals and could occur if the target vehicle itself changes speed. I have heard many people brag about how they put on their brakes and slowed quickly and avoided a ticket. While there may be many other factors that are involved, such as target resolution, and distance, it is theoritically possible to slow fast enough to throw off the PLL, but this must occur before a valid output has been displayed, which means that you must not be in the range of the radar or just barely into it, which may be a negligible time difference for the radar to produce a valid output. If the PLL is not in lock, the output is inhibited. So what happens if the trooper sees you put your brakes on and your bumper goes to the pavement, meanwhile the PLL has locked onto the car behind you doing 55 mph. He may assume that you must have been doing greater than 55 mph since that is the present speed he is reading and you slowed. Result, you get a zinger. Here, it is possible that the sudden slowing might work against you. But I doubt that an officer would give a ticket unless he actually clocked you at a speed in excess of 55.

From the PLL, the output goes to the digital counter with its attendant validation circuitry. Since the return signal responds to 31.4 Hz for each mile per hour of speed, if you opened the counter for .031847 seconds and counted, each pulse would correspond to 1 mile per hour. Theoritically, you could make 31.4 valid measurements per second. As a practical matter, timing and other factors dictate fewer samples. In certain types of radar, such as those manufacturered

by MPH Industries, (the general ' description I am including in this article) the sampling rate is approximately 12 times a second. 1 good sample out of 12 will keep the timing cycle going and if the counter doesn't receive a valid count for more than a second, a two second one shot is enabled which displays the last valid display for two seconds before resuming looking for valid counts.

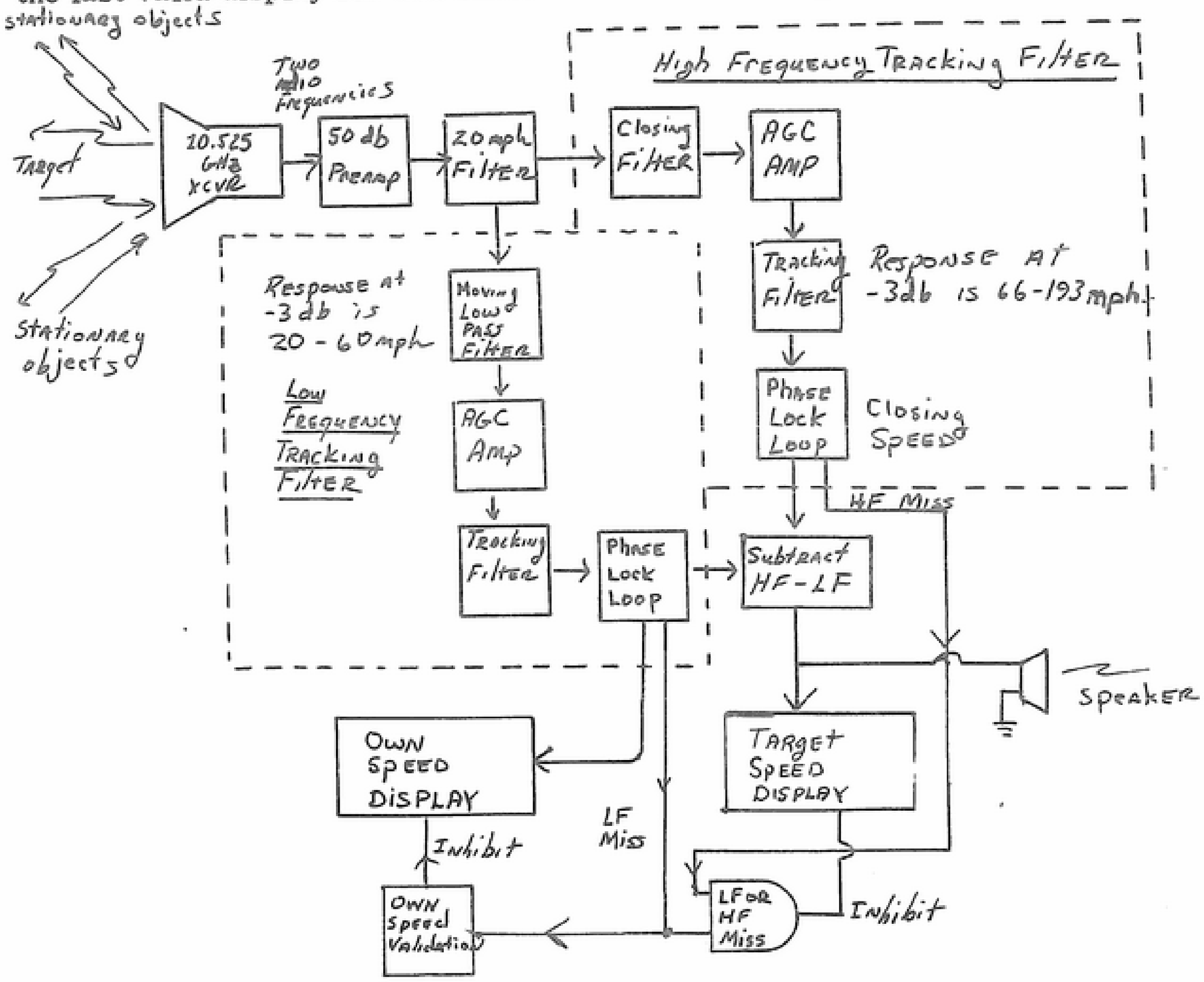


Figure 5. Radar in a Moving Configuration.

The radar when used in a moving configuration is substantially different from the stationary configuration. The filters previously used for processing the signal in the stationary configuration is now used to determine and display the speed of the patrol vehicle. I used to think that moving radar used some type of mechanical connection to the speedometer cable of the car to determine the vehicle patrol speed. This apparently is not true. Rather, the radar uses reflected signal from background objects that it passes to determine its own speed. Doppler shift works the same when the signal is emitted from a moving object or bounced off a moving object. An additional tracking filter is switched into the low frequency Tracking filter. The -3 db point for the Low Frequency Tracking Filter is 60 mph. The High Frequency Tracking Filter has a response that is down 3 db at 66 and 193 mph. This represents the closing speed between the patrol vehicle and the target vehicle. This means that the patrol vehicle can travel up to 60 mph and measure closing speeds of 193 mph.

From this point the signal processing is essentially the same as in the stationary radar except that there is a low frequency section and high frequency section. Each has its own tracking filter and phase lock loops. In this instance, the lock output from each PLL is used to validate the target speed output. If either of the PLL's for closing speed and patrol speed are not in lock, the output is suppressed. The Subtraction of the Low Frequency from the High Frequency is as simple as counting the High Frequency for .031847 seconds and counting down the Low Frequency for the same period to produce a difference frequency which is equal

to the target vehicle .

One thing that should be mentioned is that the radar system generally has an audio output from the audio amplifier that allows the officer to listen to the returning signal after it has beaten against the outgoing signal. The officer-operator then has the ability to use the most complicated computer in the world to help him decipher the incoming signal, his brain. He can also determine whether or not there is interference incoming.

Where do most errors in radar crop? Primarily in operator error. However, there can be trouble from external sources. For example, most of the radar systems that I have seen (though certainly not exhaustive on the subject) have no bandpass filtering of any substantial measure on the outgoing or incoming signal. This could be important in preventing external interference from other sources, yet could add a considerable amount to the cost of the radar. The main problem would be in stabilizing the Gunn Source to a particular frequency band. Shifts of several megacycles per degree Centigrade change is not usual at 10.525 Ghz. The temperature in an automobile could reach 160 ^{o} F in a completely enclosed car. To stabilize the frequency of the oscillator and run it through a band pass filter could mandate a substantial change in design. As a result, the RF portion of a radar is essentially untuned and subject to RF fields from other sources such as CB Radio and Amateur rigs. Now, this interference may not be as substantial as normally claimed by anti radar advocates, but in certain instances, it could be substantial. Frequencies much lower than the radar frequency will be attenuated by the waveguide below cutoff frequency effect of the waveguide. Still an incoming signal could theoritically survive the waveguide, get detected, and if there were substantial audio components in the detected signal, get processed and read out.

How is the radar calibrated? Generally, this is done by reference to an internal clock which is fed into the timing circuits and counters. Calibration by service technicians is done by holding a tuning fork up to the antenna and set it vibrating. The returning signal to antenna receiver diode is modulated (amplitude) by the tuning fork. Would the radar respond to similiar audio vibrations from highway signs, road vibrations, thunder, or factory whistles? The answer is probably yes. Any vibration that falls above 628 Hz and below 3124 hz in the stationary mode and 2072 Hz and 6060 hz in the moving mode might return enough amplitude modulated microwave energy to trigger the counters. It only need be present during the timing cyle (.031874 seconds). to set off the alarm. Of course, all the other validation conditions need to be met with both phase lock loops in lock and valid data lines enabled. What if the wind was vibrating a street sign at a high enough frequency to show a speed greater than 55 mph? It is possible, though it would probably depend upon the size of the sign. What about wind noise and air turbulence as the radar whooshes by a car while clocking another? Well, the varying air densities could cause reflection and vibrations which if they persisted long enough might provide valid data, but incorrect target speed. I presume that the 20 mph high pass filter removes a lot of the low frequency components of this type that might override the AGC amplifier and interfere with the proper operation of the unit.

I should stress that my coverage in this article is by no means comprehensive of all the various radars or even the typical radar system. I have had an opportunity to examine only a couple of units and disassembled one surplus unit in a flea market. Nor does my discussion cover any of the handheld K band type units though I suspect that the operation is essentially the same. I do not know whether any of the handheld units have moving radar attachments or options. I would suspect not, since it is very necessary for the unit to remain stationary or attached to a fairly large object. Anybody out there got any more info, let me know. I would like to see it.

Micheal Salem N5MS

AERONAUTICAL CENTER AMATEUR RADIO CLUB, INC.
W5PAA

MEETS: 8:00 pm First Friday each month
Flight Standards bldg, FAA Aero Center

PRES	Bob Pace	WA5CJG 376-3569
V-P	Bill Oliver	K5KDR 329-6333
SEC	Bob Graham	WB5NSV 677-8685

Club Editor, Bob Graham, WB5NSV

RANDOM WORDS FROM THE PRESIDENT:

Welcome to HAM HOLIDAY 1979.I hope everyone who comes to H.H. this year has a good time, and gets all the goodies they want...

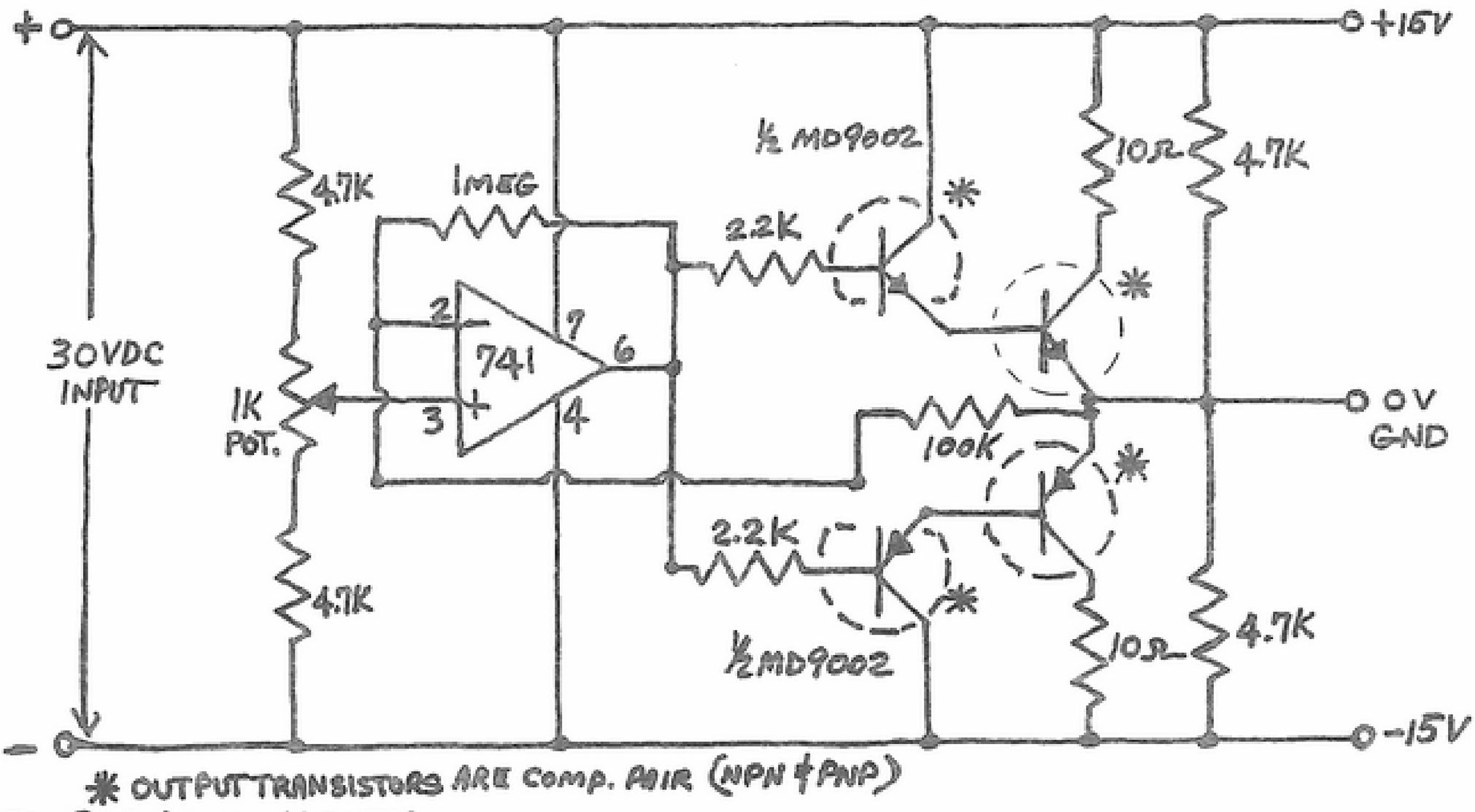
We had a very good turn out at our last club meeting, 52 members and guest showed up to listen to Mr. Don Bolar from Southwestern Bell,who presented a program on the use of FIBER OPTICS in communications.The program was very good,and I would like to thank Don for comming to our club to present it...

The ACARC computer now has a video terminal.The addition of this term--inal will reduce the wear and tear on our printer.When we bought the terminal it was in kit form,and Bob WB5NSV has spent a lot of his own personal time putting it together and making it work,thank's Bob.....

Our club has received a number of quotes on frequency counters,DMM'S and "C"- meters, if you are intrested in any of these items let me hear from you..

The 25/85 Repeater has had some problems the last month,compent's have went bad maybe from old age or from the heat,anyway it's all working for now.

How long has it been since you have built a home project,probly longer than you would like to admit.Here is a project that doesn't take very long to put together and comes in real handy when you need + & - volt--age and only have a single supply....



73, BOB PACE, WA5CJG

AERONAUTICAL CENTER AMATEUR RADIO CLUB, INC.

W5PAA

MINUTES OF THE JULY MEETING OF THE ACARC

MINUTES OF THE JULY MEETING OF THE ACARC

The meeting was called to order at 8:00 P.M. by President Bob Pace, WA5CJG. There was a very good crowd of members and guests present. Following the usual round of self-introductions, Bob asked for reports from each of the areas in which we are active.
The CORA report was given by Jim Buswell, N5BEQ. Jim reported that Ham Holiday '79 looks in good shape, and asked everyone to be sure to preregister. He then read the CORA minutes, announcing that CORA will not be sponsoring a booth at the State Fair, and welcoming the Amateur Television Experimental Society as the newest CORA affiliated club.
Bob Graham, WB5NSV reported on the club computer. It is in excellent shape, especially with the addition of our new video terminal.
President Pace then gave a report on the WR5AVM repeater. Bob reported that we have been experiencing some problems, but we are now on the rode to full recovery. The recent efforts of Holly Holcomb, N5ABL, to provide a cooling system for the repeater has proved to be a very big help to our repeater problems. Thanks, Holly, for a job well done.
George Lagaly, W5NTL, our station manager, gave a station report, and scheduled an antenna party for the following Saturday.
Bob Pace announced that next month on August 17, at the south shelter at Will Rogers Park, we will hold our annual watermelon picnic. This picnic is traditionally a joint event held with the Oklahoma Central Amateur Radio Club, everyone is invited.
President Pace then announced that our treasurer, Sam Gover, WA5WHO, is retiring, and will be moving to Dallas. This means that we must find a replacement as soon as possible. Be thinking about this. Good Luck Sam, in your retirement.
The program for the evening was presented by Don Bollar from Southwestern Bell Telephone company. Don spoke on fiber-optic communications, and presented a fine program. Thanks Don.
Meeting adjourned at 9:46 P.M. for coffee and donuts.

Bob Graham, WB5NSV, Secretary

FOR SALE. Drake TR-4C, lovingly maintained by a retired electronic engineer. Complete with power supply and manual. With it goes a RV-3 remote VFO, also with manual. This VFO is a true spinster: A wee bit old but practically a virgin! Spare set of matched finals for the TR-4C plus spares for most other tube sockets. Also hard-to-find mic plug. $600.00 cash. Carl C. Drumeller, W5JJ, 5824 N.W. 58 St., Warr Acres, Ok, 73122. Phone (405) 789-3788.

FOR SALE. Two Cushcraft Eleven Element stacked yagi beams for 2 meters; $35.00 or $20.00 each. K5YYI, 262-3363, El Reno.

FOR SALE: 400 WATT SHIPBOARD TRANSMITTER IN RACK MOUNT. CONTAINS DANDY POWER SUPPLY. $15.00. MOTOROLA 80D, 110 V, BASE STATION, 2M FM WITH 34/94, 94/94, AND 28/88 CRYSTALS. $45.00. FOUR ELEMENT SIX METER BEAM ANTENNA, $5.00.
STAN, WA5YFI, 733-2239.

CENTRAL OKLAHOMA RADIO AMATEURS, INCORPORATED

AMENDED CONSTITUTION

ARTICLE 1 - NAME The name of this organization shall be the Central Oklahoma Radio Amateurs, Incorporated, a non-profit organization hereafter referred to as CORA.

ARTICLE 2 - PURPOSE The purpose of CORA is to coordinate group activities in the public interest between the amateur radio societies in central Oklahoma. These activities consist of a state-wide meeting of amateur radio operators; better use of communications skills in support of The American Red Cross, Civil Defense and the American Radio Relay League; and to seek solutions to problems facing amateur radio licensees throughout the state.

ARTICLE 3 - MEMBERSHIP Membership in CORA shall be as follows:

a. SUPPORTING - Each of the several constituted amateur radio societies in the central Oklahoma area, indorsing the purposes stated in Article 2 above, and providing financial or other support to this organization shall be a SUPPORTING member of CORA.

b. ASSOCIATE - By virtue of an individual's membership in a supporting member central Oklahoma amateur radio society, he shall be an ASSOCIATE member of CORA.

c. DIRECTORS OF CORA - A Board of Directors shall be established as follows:

1. Each SUPPORTING member of CORA shall duly appoint or elect three Directors to serve on the Board of Directors of CORA for a term of one year, beginning in September of each year. Each Director shall have one vote.

2. The immediate past President of CORA shall serve as an advisory member of the Board of Directors for a period of one year. He shall have a vote.

ARTICLE 4 - OFFICERS AND THEIR DUTIES The Officers of CORA shall be the President, Vice President, the Secretary, and the Treasurer. The Directors of CORA, at the annual September meeting, shall nominate and elect the above officers to serve for a term of one year. Nominees for the above offices are to be only from the members of the CORA Board of Directors. They shall be elected by a majority vote and shall hold office for a period of one year. There is no restriction on the re-election of any individual to an office he has held in the previous year, so long as he remains a Director of CORA.

a. The President shall call and preside at all meetings and represent the organization in all official matters. He shall appoint all committees that may be necessary in the administration of the organization's business.

b. The Vice President shall take over the duties of the President in the President's absence. He shall have all the authority of the President when acting in the presidential capacity. He shall assist the President in performing all activities of the organization.

c. The Secretary shall keep a written record of the minutes of each meeting of CORA and originate correspondence as directed by the President.

d. The Treasurer shall receive and disburse all funds intrusted to CORA and keep an accurate record of such, shall be personally responsible for all funds intrusted to him and shall give an accounting of the disposition of all funds at each meeting of the organization.

ARTICLE 5 - FINANCIAL MATTERS

a. CORA will receive financial support from each financial supporting amateur radio society as approved by each individual society. Funds for a specific activity shall be requested by the President from financial supporting societies upon approval of the Director Membership.

b. Upon final completion of a specific project or activity by CORA, the financial supporting societies will be repaid their financial support if possible. Any liability for loss shall not exceed the amount allocated for that activity.

c. A complete accounting of the financial matters of any CORA activity or project will be made available to the financial supporting societies when funds are returned.

ARTICLE 6 - EXPENDITURE OF FUNDS The President shall authorize any expenditure of funds up to an amount of $25.00. Expenditures of funds above $25.00 require the majority concurrence of CORA's Officers and Board of Directors in attendance.

ARTICLE 7 - VOTING All matters of CORA shall be decided by a majority of the Director Members present at any meeting.

ARTICLE 8 - MEETINGS Meetings of CORA shall be called by the President as may be necessary to conduct activities meeting the several objectives stated in Article 2 above. Advance notice of meetings, including time, date and location, shall be given all Director Members.

ARTICLE 9 - CHANGE OF CONSTITUTION This Constitution may be amended by a majority vote of the Director Members present at any regular meeting, provided Director Members have received thirty days advance notice of the proposed change.

Approved and adopted this 28th day of May, 1976.

And Now... The Latest Word...

(the following is attributed to Lew McCoy, W1ICP, recently retired from ARRL: after a day-long roundtable between ARRL and FCC where similar questions were raised):

Regarding the Commission's bulletin on use of Autopatch on Automatically Controlled Repeators:

the key seems to be the definition of Automatically-Controlled Repeators:

1. if a repeator is designed for use with its control operator on-site, it is NOT automatic, obviously - the control operator has manual control (imagine your control operator 600 feet up Ch.4's tower!);

2. Lew said,"A closed repeator is automatic in that there is no control operator over the member/user, each member is the full control operator at the time of use," meaning: if the repeator's use is restricted to specified amateurs, such as within a club, it IS automatic...each club member with control procedures information is his/her own control operator;

3. Lew: "an open repeator with assigned control stations is NOT automatic:" if the repeator is open for use by the general amateur population with specified control operators as in this area, it is NOT automatic ! Each user becomes the operator at the time of use while being under the control of an identified control operator.

Therefore, if a repeator and/or autopatch is to be considered automatic, its control operator is each of its users at the time of use, and, "the use of auto-patch...is NOT allowed."

It Invites Abuse !

Lew advises that further clarification of this ruling is forthcoming in the next issue of QST.

AND, Lew reminds us, as he passed thru OKC, because of the misuse of auto-patching in many parts of the country, we should be very careful of the way we use it or we could lose the privilege altogether.

Editors.

OKLAHOMA NIGHT OWL NET

The Oklahoma Night Owl Net meets nightly at 10:30 local time (0330 UTC) on the 146.07/67 Repeater (Courtesy of MORI). The purpose of the net is to aid motorists in the field, pass traffic in and out of state, and enhance the Amateur Radio Service. Regular Net Controls are as follows:

Tuesday-----Don, K5SJV, Bethany
Wednesday---Jim, N5BEQ, Oklahoma City
Thursday----Clara, WD5KFT, Guthrie
Friday------Dave, KB5KT, Oklahoma City

Ben, WB5TFX, Holdenville, is net manager. Arley, WB5NKC, OKC, is net secretary. Pat, WB5TFY, (Ben's wife) serves unofficially as assistant net manager and is a regular alternate net control.

Important announcements are made during the net to keep amateurs informed of upcoming events, such as Ham Holiday, Field Day, other nets, flee markets, etc. Membership in any local repeater club is not necessary for net members.

If you enjoy two meters, you will love being a Night Owl. Check in tonight!

Clara, WD5KFT

FRANZENKIT

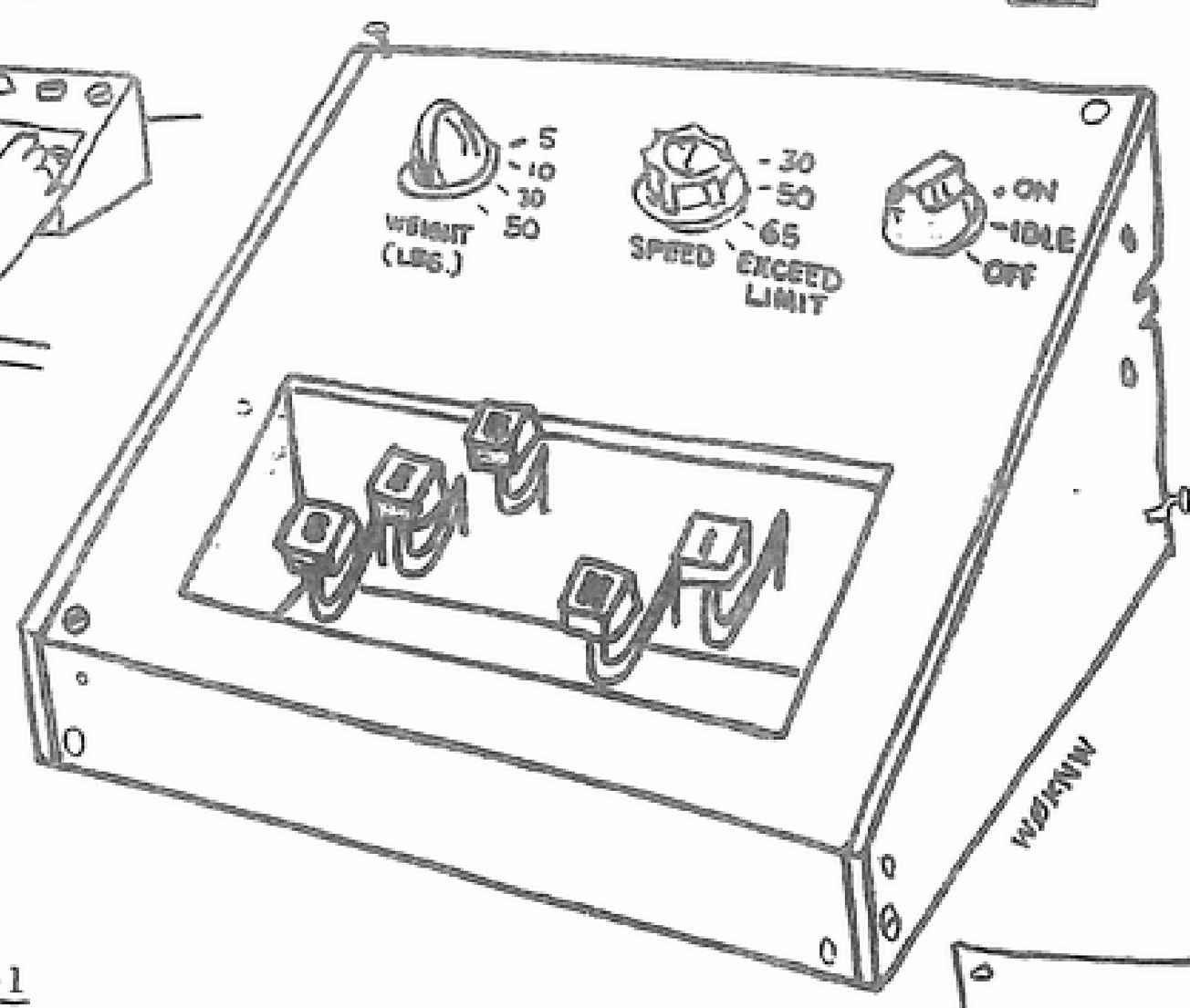
LICKETY SPLITTER

SUPER SENDER

MORSE KEYBOARD

KIT
- or -
ASSEMBLED

WRITTEN UP IN QRS MAGAZINE!



ECONOMY MODEL LSSS-1

Specifications: Variable speed and weight controls. Precise sending of the letters E, I S, H, and the numeral 5. Solid state (plywood and cast iron used whenever possible). Integrated circuit--consisting of both black and white components. Low power consumption--uses less electricity than a typical 1948 model 27 tube communications receiver. Attractive cabinet constructed of 5-ply ½" A/D plywood. Can be stained or painted to match any decor. Prices: $29.95 Kit.....$39.95 Assembled.

DELUXE MODEL LSSS-2 (not shown)

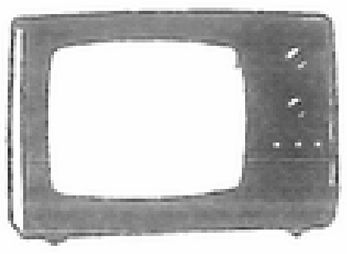
Everything included in LSSS-1, except cabinet constructed of solid 3/4" hardwood. Plus.....the letters T, M, O, and the numeral Ø. Kit: $49.95 Assembled: $64.95

OPTIONAL 10th KEY (Available only with Deluxe version)

Special key allows you to send DAHDAHDAHDAH (4 dashes). Allows you to develop your own secret code! Add $10.79

AVAILABLE ONLY FROM K5NK

DEALERS WANTED



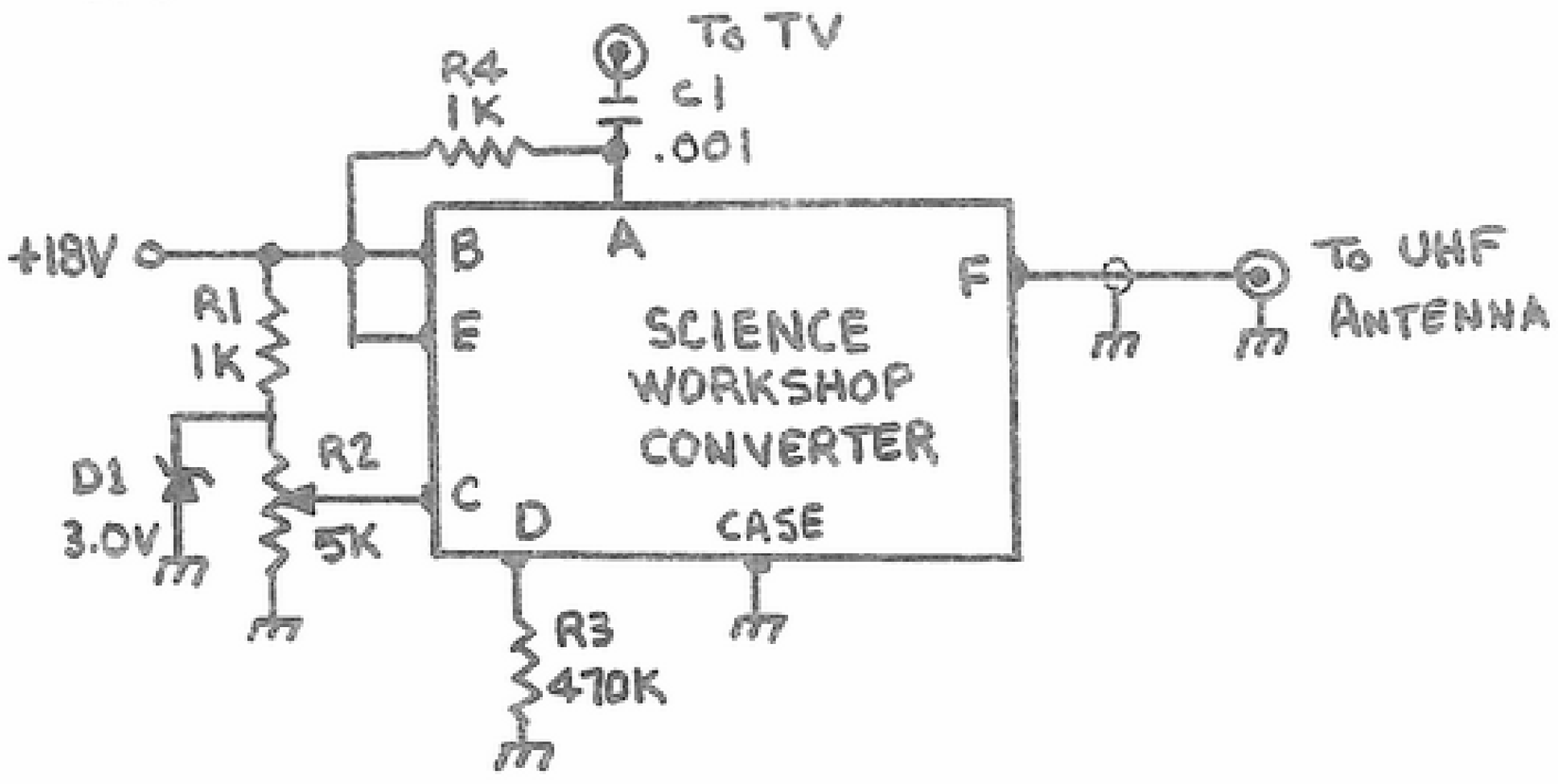
AMATEUR
TELEVISION
SOCIETY

MEETS: 7:30 PM 2nd Thursday each month
American Red Cross, 10th & Hudson OKC
PRES Larry Griffin WB5NYX 733-8110
V-P H. E. Hutchins K5SUD 677-5272
SEC/TR Virgil Kerr W5LIL 787-5834
CLUB EDITOR: Larry Griffin

The A.T.E.S. members are amateur "radio" operators that have a great interest in working fast scan television. Being able to see the person talking to you is very facinating. Some hams operating ATV are using commercially built equipment while others are using rigs they have built from the ground up. You can save a lot of money if you like to home brew, although a commercially built ATV station can be had for about the cost of a good 2M rig.

There are basicly five parts to an ATV station. They are the transmitter, antenna, receive-converter, the camera and of course the TV. Any black and white or color TV can be used for ATV with no modifications.

To receive an ATV signal reqires a receive converter that will tune the 420-450 MHz band. The standard frequency being used in the OKC area is 439.11 MHz. Plans are to have an ATV repeater located in Oklahoma City with and input frequency of 439.11 MHz and and output frequency of 427.25 MHz. As in 2 meter communications the repeater will increase the quality and range of transmitted ATV signals. A receive converter built by Science Workshop is the least exspensive method of receiving ATV signals. It is nothing more than a UHF television tuner but has an RF amp in the front end, it is varactor tuned, and doesn't cost very much. With this converter you can receive ATV stations for about $15, this includes the power supply and hardware.



The diagram shows external component connections to the converter. The supply should be 18-20 volts dc and doesn't have to be regulated. A 12.6 vac transformer, full waved and filtered with 450mf, will provide enough voltage but a sacrifice in gain is aquired with this supply. Tunning is done with varactor diodes. A 5k pot, (R2), is used to vary the voltage on the varactors from 0 to 3 volts. This gives a tunning range of about 300MHz to 500MHz. An AGC voltage may be applied to Pin "D" but R3 sets the front end for maximum gain. The mixer output from the converter is 45MHz. For optimum operation the output from the converter should be connected directly to the I.F. section of the TV being used. This can be done by disconnecting the output from the UHF tuner already in the TV and connecting the output from this converter in its place via a phono plug mounted on the back of the set. The converter can be connected to the VHF antenna terminal on the televison and the TV tuned to channel 2, (55.25MHz). Some loss in gain will be encountered with this set-up.

I would like to give a couple of hints on cameras and what to look for. A new camera can be the most exspensive part of the ATV station. Monitoring type camers, such as those found watching over you in your local quick stop store, will work great for amateur television applications. Another type that is available is one that comes with a video tape recording system. The most important thing to note when shopping for a new or used camera is does it provide a composite video signal output. This signal should be around 1 volt p-p and contain the video elements and the sync signals combined. Some cameras have more than 1 volt p-p output which can be easily attenuated. Another thing to watch for when considering a used camera is "burn-in". This is an image that hase been burned into the surface of the video pick-up tube. Burn-in is caused by the camera being placed in a fixed position so that it sees the same features every day. Be especially concerned about cameras that have been mounted outside. A camera with burn-in is not worthless but find out if it needs to be replaced before purchacing the camera.

If you are interested in ATV try to attend our next meeting, we would be happy to have you join us.

SEE you on the air.... 73, WB5NYX

One night recently, I attended the second half of a double-header meeting at one of the local gathering spots. You know, the place where they all go to eat big donuts and drink coffee and the like. This is usually the best part of the evening, for I think most folks enjoy them more and a lot of good eyeball QSO's are had. Various discussions will come forth from lots of people and some of these are very interesting. Some are interesting to most people, but now and then you find some who get nothing out of these discussions and agitate those who do enjoy them.

This was the case at this particular meeting. There were about 15 or so of these folks sitting around eating their donuts, drinking their coffee or doing whatever they came to do. At one end of the table, there were two individuals, I think, who were explaining the merits of using cw to communicate with other hams around this great wide world. These individuals, although not elderly by any means, did have a couple years or so on some smart aleck kids who were sitting at the other end of the table. I think there were three of these youngsters. I could have my numbers wrong, but the number isn't important.

At this great and glorious discussion was going on, it appeared all enjoyed it, all that is except those 3 young whippersnappers on the other end of the table. I have never seen the lack of respect they gave to those great folks at the other end of the table in my life. They giggled, snickered, joked and did all kinds of things to try to draw the attention of those folks who were enjoying it. This was so very disgusting. Finally, things almost got out of hand. I noted obscene gestures coming from one certain individual. Still more giggling and snickering. It was bad. It's a shame that such an upright, outstanding individual, well skilled in the art of cw, well thought of by his constituents, a good husband and father, a man whom I consider to be a well rounded amateur had to be so humiliated. As great as he is still he had to resort to obscene gestures. That's right, obscene gestures. Not real bad, but bad. But, he did use good common sense and did a good job of camouflaging the gestures. The ones for whom the gestures were intended got the message.

This is a true story. It actually happened. No calls or names have been used for obvious reasons. If you haven't figured it out yet, this was just part of the fun had by all at the second meeting. The next time you attend a club meeting, find out where the second half is going to be and tag along with the group. You'll be surprised how much fun you have and you get to know the others a lot better. K5NK

Edmond Amateur Radio Society, Inc.

MEETS: 2:00 PM 3rd Sunday Room 205
Science Bldg, Central State Univ.
PRES Howard Wise WD5IDB 341-2510
V-P Ken Stepp WD5HXK
SEC/TR Bill Wright WA5ZLW

CLUB EDITOR Howard Wise, WD5IDB, 341-2510

First, we would like to welcome two new members to EARS - Bill DeMand, K5SKA and Chuck Holbrook, WD5BKT. Both have been very important in getting our new repeater on the air. Much thanks to both of you, and welcome to EARS. Anyone else who is interested in joining EARS may contact Howard; WD5IDB, Ken, WD5HXK; or mail a check for $10.00 to Bill Wright, WA5ZLW, 2105 Rambling Road, Edmond, Ok, 73034.

Our club is small, but we have no intension of staying that way. Many changes have taken place during the past 1½ year and the good results are slowly beginning to show. If you're interested in joining the fun (and work) of building a club, get in touch with us. We would love to have you. Even if you don't join, come over to 147.72 - 12 and see if you can wear out our machine.

WD5HXK

Our new 147.72/12 repeater is on the air!!!! It is a low altitude machine giving us excellent coverage of north Oklahoma City and Edmond; with its southern limit of about SW 104th for a 10 watt mobile and a good antenna.

The repeater was constructed entirely with Motorola radio equipment - specifically a 110 watt MHT Motrac series mobile radio which was split in half. The receiver is tower mounted in a weatherproof box at 80 feet with 100 feet of RG-8/U connecting the receiver antenna (a Cushcraft Ringo mounted upside down at 180 ft). 144 feet of ½ inch hardline coax takes our 55 watt tx signal to the Ringo Ranger mounted 60 feet up on the tower. This arrangement gives us a fairly balanced machine; that is (generally speaking) if you can hear it you can hit it. The system is located on the 402 foot tower on the Central State University campus in Edmond. Presently, the transmitter is using a GLB synthesizer and is a bit off frequency. We should be on a channel element (crystal) and on frequency within a few weeks - please bear with us. The CW ID is WD5FEI/R and we would like to hear your call on the system as it is there for everbody to use and enjoy.

I would like to personally thank the following amatuers for their time, effort and materials that make up our repeater:

WB5AHT	Ed Meyer
KA5 ?	Karen Meyer
WD5BKT	Chuck Holbrook
W7LNK	Les Whitaker
WD5FHR	Dee Mize
WD5HXK	Ken Stepp
WB5ISN	Dennis Orcutt
K5SKA	Bill DeMand

Additional thanks goes to the countless others who I could not list - Thanks and see you on 72/12.

Martin Vinson
WD5FEI

FIELD DAY VS MURPHY'S LAW

You take a group of hearty workers who enjoy ham radio and add Murphy's Law to the occasion and you have the symptoms of a field day with certain side affects. However, Dr. Maxim says to remove side affects just keep the generators humming, keys clicking and mikes keyed down with a solid CQ--Field Day and enjoy the fellowship of ham radio. This was ok for the gang but Murphy had to come to our show and put on a display--like causing the generator gas tank eruption and irrating mother nature to the point that she made it rain---but this failed to dampon the spirits of a group of dedicated men of EARS who really enjoyed the field day. To all of those brave spirits who participated we say thank you for your support and will see you next year. Oh by the way Mr. Murphy you are not invited for the next one--we are goimgito do it by ourselves.

73
Dee, WD5FHR

FOR SALE: Heathkit HW101 with power supply and mike. Has just been factory aligned. $375 Ken, WD5HXK, 341-4874

Dear CORA:

Could an old timer radio ham but a newcomer to CORA speak? Ju@t a suggestion. I, along with some other older readers who I am sure no longer have first rate eyesight, two things combine to make CORA Collector & Emitter hard to read. The type is small and on some pages the printing is very faint. I can get along with either small print or dim printing, but not both. I know that lack of funds can dictate the amount spent for paper and printing but an improvement would be appreciated when possible.

I enjoy the articles in C&E and especially some by other old timers. Some of you young hams can't imagine a transmitter consisting of one 201A receiver amplifier tube with 6 volt storage battery dripping on the floor, and lighting the filament and cathode with "B" batteries for the plate voltage. We didn't designate it as QRP because three to five watts was the "in thing" with many of us then. My receiver was a single type 200 receiving tube called a "soft tube" because it slipped into and out of oscillation easily for regenerative detection. I began to understand that electrons had some mass when the plate of the 201 turned cherry red with 180 volts and key down.

I had the same call in 1932 as now, W5CAA, even though I was silent from Pearl Harbor until 1977. I was then in Beaver OK in the heart of the dust bowl and no other ham within 100 miles. When the dust storms came on, static discharges would play between the condenser plates and around the tank coil.

My first QSO was with Plain Dealing LA. I was shaking like a leaf and thought someone had pulled a prank on me since I was sure there was no town by that name. I was reassured when I got his card and had some other contacts. Local QRM was no problem out there. In fact I would have almost welcomed some for company.

So much for the rag chew. I and some others have rigs for CW and AM only. I would like to see a local group on 10 meters above 29 mHz. I have worked both coasts when the skip was on last winter but locals are strangely silent.

Yours for a good CORA group and for a good C&E.

Loyd Mathis, W5CAA

(Editors note: Loyd figured the type size cost, OK. It costs $4.75 for each page that would be required for larger type. As for the printing, it is hard to make a silk purse out of a sows ear, some copy is sent in with faint typing and that is the way it comes out. Hopefully that will be corrected soon--if the raffle goes well. Joe, WA5ZNF)

I HEARD: TFX settling a dog fight.....SJX plays piano by ear.....DYJ actually made a cw contact.....ETB eats what he can and cans what he can't HKM is a regular Chet Atkins.....KFT monitorning.....KFT got her antenna zapped.....KFT got a new frost job.....KT dadgummit.....GKK explaining telephony.....KFT going to a club meeting.....PZW's stomach growling.....TKG more and more.....INZ got his delivery truck going in a good blaze.....OHK hates the new "N" and "A" calls.....FXP tooting his horn about 40 meter antenna.....JGU and his rice paddy.....JVD getting acquainted on 2 meters.....ABF played in the snow.....SJX only takes midnight strolls if the moon is out.....VZU bragging about his dx on cw.....KFT going to a club meeting.....TDW playing Boy Scout from Red Rock Canyon.....SJV grumbling.....HFN pausing.....KFT going to a club meeting.....NKC talking to old Smudge.....PDH and H going fishing.....SLA has the fastest fingers in the west.....BJS and INZ practicing QLF.....???a high speed cw bootlegger.....NKC building up his code speed in the novice band.....AUP and OLO discussing various ways of breaking horses.....WM memorizing callbooks.....the FK boys.....PLG took time out to have a baby.....CZN body portable in a child's sandy area.....DYI is racing FRQ for the extra.....OLO owned the world's ugliest horse.....HXL badmouthing JGU.....WM looking for a KL7.....CTS has tender toes.....and a whole lot more K5NK

THE ZANY NEWS FREQUENCY

By JOE, WA5ZNF

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CLUB EDITORS, YOUR ATTENTION PLEASE ! ! ! ! ! ! ! ! ! ! ! !

This is a suggestion to make a good club magazine even better. Information that may be of interest to most amateurs should be separated from your club business so that it can be easily spotted. Give it a title that is directly related to the subject. Make it stand out from your club business if it is of general interest, but don't waste space. My experience in preparing all the CORA Club indexes so far has revealed that many of the "older" club editors have buried some very choice information by mixing it in with the club announcements and by giving their paragraphs or articles vague, unrelated or no titles. You new editors: WELCOME, but don't pick up our bad habits.

- - 73 and 88 Bill, WA5RAQ + +

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As you may, or may not, know, Bill does a super job of indexing C&E each year and the years index is usually published in the January issue. His contribution is reproduced just the way he sent it to me as it tells it like it is.

While we are at it lets talk about a few other things that will make C&E even better:

As mentioned last month I do not have the facilities formerly available to me so MOST copy needs to be presented, by mail in time to get to me, handed to me or brought to the RED CROSS building on the Wednesday night noted in the calendar as "EDIT" night. If you have a personal ad to buy or sell send it handwritten or any way,say by phone to me or your club editor and it will get in if possible. There is no charge for member's personal want ads.

WHAT IS CAMERA READY? The copy has to be BLACK and white, not gray or other washedout shades using an old, weak, ribbon. Drawings should be in black ink, NO BLUE. If your typewriter has capitals and small letters don't use all CAPS. It is harder to read. Do not double space lines. If everyone did, it would cost twice as much to produce the C&E, or we would have to leave out someone's "gem". We won't leave things out, that was just to make you think. And about how much will be printed from each club, here are the rules:

Each club is GUARANTEED 3 pages per issue - if needed. If you have need for more space and (1) someone else didn"t use their allotment, (2) what you have is technical or of general interest or (3) if I need a page or two to fill out a 4 page section, it will be used this month but if it is not "dated" will be saved for next month but no later.

Blue line copies are available to all editors, the width betreen the blue lines is 7 inches (if you don't have blue lines handy use plain bond paper, just keep the longest line to 7". Start at left and fill the 7". Don't waste space. Length of each page is 11 T/4 inches.

If you have any questions call me at 737-1044.

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Leonard, WA5FSN, sent me a copy of the NEW and REVISED application for Amateur Radio Operator Identification Plates. The same day I received my RENEWAL copy from the ta commission. If you had call sign plates last year you probably have received your application, if not contact the TAX Commission, Motor Vehicle Division, 2501 Lincoln Blvd, Okla City OK 73194. Note that there are several changes in this years form and do it right. They will accept personal checks, I was told. You have until 1 October to apply for Plates.

See individual club sections for times, places & information.

AUGUST HAM HAPPENINGS

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
DID YOU FORGET HAM HOLIDAY ? JULY 27-28-29			1	2	Don't Look Here for ACARC. Look on the 17th 3	4
5	6	MORI Picnic 7	8	ALTUS CHOCTAW A.T.V. 9	10	11
WHEATSTRAW 12	A.F. MARS 7:00 p.m. 13	'76ers Picnic at Rotary Park 14	15	KAY COUNTY 16	ACARC/OCARC WATERMELON FEED 17	EXPLORER SCOUTS FIELD DAY (SEE INSIDE) 18
D F HUNT STARTS AT WOODSON PARK 2:00 19 EARS	20	AUTOPATCH 21	EDIT C&E 22	23	24	25
26	27	CORA 28	AUTOPATCH MAILS C/E AT RED CROSS 29	30	31	Hey, LAWTON ARDMORE DUNCAN ELK CITY..... Look what you're missing!