CENTRAL OKLAHOMA RADIO AMATEURS
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# E.A.R.S.

HOWDY FOLKS! First off, let me apologize deeply for the fact that there was no EARS article in the last copy of the C&E. I had the article written, typed, and set out on my computer table for several days before it was actually due. Every day on my way to work, I would glance at it and think, "Gee, I'd better turn that in soon." As a matter of fact I was still telling myself that very thing when the last issue of the C&E arrived in my mailbox. I searched high and low for a reasonable excuse, and even tried my best to blame my beloved for my goof, but at last decided to take the blame myself. Sorry guys, it won't happen again.

Ham Holiday has come and gone since I last checked in with you, and I hope everyone enjoyed themselves again this year. I had to work through most of it, but I did sneak out on Sunday morning and stayed for the drawings. I had a great time even though I didn't win anything. Maybe next year they can have a consolation prize for everyone who sits through the entire drawing and comes away empty handed. Call it the EXTREME PATIENCE award ot something... Thanks to all of the EARS members who worked registration this year, your help was deeply appreciated.

Another big thanks to everyone who nelped out on the 4th of July parade again this year. (Yes, I know July 4th was two months ago, but I'm moving slowly, so give me a break.) I missed it again this year because of my stupid work schedule, but I was told by Those Who Were There that it went very smoothly.

The EARS board meeting was held on Wednesday, August 18th. It is becoming pretty obvious that the last four months of this year promise to be extremely busy ones for out club. Stay tuned to the information net every Monday night, folks, because our dance card is very full, and we will need everyone's help in the next few months. Here are just a few of the highlights:

1) September 18th - UCO Homecoming Parade. Our esteemed Emergency Coordinator Mike Mize will soon be recruiting volunteers for this. C'mon folks, we should be able to this in our sleep.

2) September 10th or 24th - We are in the process of scheduling a tour fo the National Weather Service in Norman, OK. This is one you don't want to miss.

3) Don't forget the siren test on September 3rd.

4) October 3rd - EARS will be Helping with the American Diabetes Association Walk-a-thon in the morning and the HOPE Center Crop Walk in the afternoon. Whew- this is a day for the stout of heart.

5) October 16th - EARS dinner meeting. Something special is in the works. I'll have more info as it becomes available.

6) We also have club elections in November and the Christmas Dinner in December, so mark your calendars and brace yourselves.

OH YEAH, before I forget, we are also planning something special for the next club meeting in September, so stay tuned...

Also on the Don't Let Me Forget List is a change to the EARS by-laws. Part of our by-laws require an audit of our books once a year ( a very good idea), but the word "Audit" tend to make an accountant's blood run cold, co a committee was appointed to re-word the by-laws so that the review could be handled internally. This committee did a super job, and these changes have been written out for the club's approval. You will all be receiving a direct mail concerning these changes, which will be voted on at a club business meeting. So be on the lookout for this letter.

OK, now that the club business is taken care of , allow just of few more minutes of your time for a brief editorial comment. There has recently been a great deal of furor over one of out club members and the status of his call sign. Now, it is not my intention to re-hash all

that has been said and done, nor is it my wish to jump on my ever-handy soap box and proclaim oh Things Ought To Be Done. However, I would be extremely dishonest if I didn't admit that I am extremely uncomfortable with some of the ways that this unfortunate situation has been handled. You see, no matter how loud mouthed I can be at times, I am a firm believer in the individual's rights to privacy and to due process. To me, privacy means that we keep out physical, mental and spiritual hands in out won pockets and due process means that we avoid pointing fingers and proclaiming someone's guilt or innocence until they have had their chance to pass though the legal system designed to decide upon their guilt or innocence. It bothers me to think that anyone has been denied these rights, because they seem so basic to me. As the saying goes, there are three sides to every story -yours, mine, and the way things really happened. One of the reasons our legal system is so slow is that it as least tries to find out all aspects of situations before pàssing judgment. I just don't see how you and I can do any less.

That's it - lecture's over. Just on more note, because it doesn't get said often enough. I have never ceased to be impressed with the generosity and open-mindedness of the amateur community as a whole. I have never been around a group of people who were more willing to give of their time and knowledge. It does more than impress me - it inspires me. Thanks.

One more thing - special thanks to all fo the club members who turned out to help Mike and I move into our new house. I won't embarrass you - you know who you are - but in particular thanks to my big-hearted father-in-law, who says little and does a lot. You're one in a million.

Later. Terry, KB5RQT

## IC2i-AUD.MOD
### FIX FOR IC-2i POOR MODULATION

Hello, folks. I bought an IC-2iA last week for my XYL (KB8CZL) to use. I chose this particular HT for its simplicity of operation (after initial setup). However, it wasn't long before we began getting reports of poor XMIT audio. It was described as "muffled and constricted -like talking through a garden hose." As it turns out, the designengineers at Icom left no provision to get the melodious tones of your voice to the mic except THROUGH the case. After I noticed this problem, I returned the radio to the dealer and tried several others. They all sounded alike. Then the salesman called ICOM service. They admitted they knew of the problem and recommended that a hole be drilled in front of the microphone. Here's how to do it. PROCEED CAREFULLY!

1. Shut off radio.
2. Remove battery pack.
3. Remove 4 Phillips-head screws from rear of case.
4. Carefully pull off front of case.
5. Gently remove MIC element from rubber holder.
6. Unscrew 4 Phillips-head screws retaining speaker.
7. Support case on soft surface.
8. Drill hole through center of MIC rubber from inside (I used a 5/64 " drill).
9. Reverse order reassemble.
10. Marvel at FB audio.

That's it, folks. I hope you like your HT as much as we do. ¤73 de Art/K8CIT

K8CIT @ N8NNN.#SEMI.MI.USA Via the Packet BBS System.

Edited for C & E by K2GKK


**Editorial Staff -**
Scott Walsh, N5NYS, Editor
Joe Buswell, K5JB (Thanks Joe!)

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WA5ZNF

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**When you want to change of any sort to your membership, you must fill out completely a subscription slip. Watch fot the date you recieved their money and the date the subcription expires. Have your slips, or list of deletions submitted by the 22nd of each mouth. If there is anything about C&E subscriptions you need to know, please contact us.**

**Story information as well as letters to the Editor should be sent to :**

**Scott Walsh, N5NYS**
**600 Annawood Dr**
**Yukon, OK 73099-2008**

**or left *in their entirety* on the BBS at (405)354-3241, N81, 1200-14.4k. You can also leave your article in N5PHW's packet mailbox on 145.03.**


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## August Meeting

The August 8th meeting was a covered dish dinner at Canton Lake, at the Canadian shelter. It is a nice shelter close to the water with a breeze flowing off the lake, and shaded on the west side with cedar trees which keep it shaded all afternoon. A big thank you to the hosts from Canton and Longdale.

After a fine dinner, enjoyed by 38 members and visitors, the meeting was called to order by our president, AB5Z, Ray.

WA5FLT, Joe, our secretary and treasurer was absent so N5IKN, Tom, filled in for him.

The next meeting, September 12, will l be at the Calumet city hall. Most of you have been there, but for those who haven't: From the stoplight at the center of town, go south one block, turn west one half block. City hall is the white building on the north side of the street.

WA5RLP, Margaret, made a report on the July 22nd meeting.

Meeting adjourned and was turned to WZ5H, Leo, to introduce a couple of park rangers, Tim Coffey, and Mark Eddings. Tim was raised in Canton. After his education he became a park ranger, serving twelve years to date there. Tim was assisted by Mark, who also lives in Canton, having served there for about seven years. (Special note to the ladies: Both Tim and Mark are single!)

Tim enjoys the outdoors. His hobbies are hunting, fishing, and raising game birds. He raises about five different species. Mark had to leave before I could ask about his hobbies.

The duties of the rangers besides patrolling the park, include working with recreation, managing wildlife, and inspecting service contracts. That latter responsibility is larger than most of us imagine.

These rangers' positions are a part of the Corps of Engineers. There are two branches of the Corps, Army and Civil (Civilian), and these rangers are in the Civil branch. As a part of Tim and Mark's program they explained some of the Corps' history. They showed us film that described to us some of the activities of the Corps of Engineers.

General George Washington insisted our country needed an Army Corps of Engineers. At the beginning of the revolutionary war the Corps was organized. It played a more vital part in our history than most of us can imagine. The Corps was involved in the building the first railroads, including the first major railroad, the Cumberland Road.

Congress passed a bill for the Corps to assist in wars, commercial building of roads, airport runways, and other projects.

In 1876 we were at war with Mexico. The Corps of Engineers' contribution was credited for enabling us to quickly win the war with Mexico.

Interestingly, during the Civil War, the Corps built bridges and roads for both sides.

The Corps took upon itself the responsibility for rebuilding the Mississippi river to improve navigation and flood control. For navigation purposes the Mississippi river has to maintain a minimum of nine feet of depth at all times.

Some of the other Corps projects included: The Yellowstone National Park, (It had to be guarded by the Corps while it was being built to prevent vandalism), the Panama Canal, which permitted short cut between the Atlantic and Pacific oceans; many roads and bridges in Europe during World War II (which had to be quickly built!). During the war the Corps built a building to house 5,000 soldiers, and a hospital that held 5,000 beds.

The list goes on and on. The Corps has been a vital part of every war to date. It has been in existence for over 150 years, serving this nation, preserving our country, water resources, parks, and recreation centers.

The film was very interesting. If you would like to see it, contact your nearest office of the Corps of Engineers. After seeing it I appreciate the Corps more than ever before. Thanks again to Tim and Mark. Ralph, WA5PFK

## Ham Holiday 1993

Everyone seemed to have a good time. I would have enjoyed it more if I had met more of the people I have talked to.

The ladies of the Wheatstraw always love to play bingo. WA5RLP, Margaret, won a calculator. KB5FOR, Mary, bingoed twice. The first time she won an ice chest set, a 28 quart one with a smaller one inside, and a thermos jug. With the second bingo, she won a small camping stove.

At the Sunday 1:00 P.M. grand prize drawing WA5PFK, Ralph, won a remote control microphone that fits his IC-2AT hand held.

Our good friend WO5B, Ed, won an Isopole antenna. If it is a 2 meter antenna I would like to know how it works out on the air.

KC5ACS, Terry, of Dover, is a new amateur and he is working on his General Class. Terry is also a new Wheatstraw member. I am real happy for him. Yeah, he won the biggie, an IC-735 HF rig. Congratulations to all of the winners!

I have several years of QST magazines that I am trying to get rid of. I noticed while browsing through the November 1988 issue that the Southwest Division Director was WA6WZO, Fried Heyn. I checked and his name is in my Callbook. That gentleman has a real good reason to

have his name changed -- My opinion, of course!

**W5YI Report**

As of July 15th, the FCC has relaxed some prohibited ham communications. Although there are some exceptions, it appears that the new amateur communications content standards will be essentially the ones suggested by the American Radio Relay League. My understanding now is that commercial transmissions from one amateur to another that were normally serviced by another carriers can now be transmitted on the ham bands. It is a confusing ruling on a subject that seems to have been reversed several times. (Ed note: See the ARRL Bulletin at the end of Ralph's column..)

The ruling still prohibits amateurs from selling radio gear on the ham bands on a regular basis. The effective date, or exact text is not known.

The W5YI Report included an item about the FCC sending Steven Dunifer and his Radio Free Berkeley California a notice of forfeiture (fine) of $20,000, for allegedly broadcasting without a license. Steven thinks the FCC violated the first Amendment right to free speech. I wonder where Mr. Dunifer has been all his life.

**Close Shave**

A man was sitting in the barber chair, getting a shave and having his nails manicured by a pretty young woman.

He struck up a conversation with her and suggested that they meet after she got off work.

"I couldn't do that," she said, "I'm married."

"Well, your husband wouldn't have to know about it," he said, "Couldn't you tell him you had to work late?"

"Why don't you tell him," she suggested, "He's shaving you!"

**Can't Take it With You**

The IRS can really be accommodating. They asked one taxpayer, in for an audit, and when it was done the auditor offered to call him a cab. "No thanks," he told the auditor, "I have a car."

"That's what you think," said the auditor.

**Class Reunion**

At a class reunion, one class member asked another: "Bob, did you ever get around to marrying that beautiful cheerleader you were running around with, or you still making your own meals and doing your own laundry?"

"Yes to both questions," answered Bob.

Drive Safely, so I may see you at the next meeting. 73, WA5PFK, Ralph

**ARRL Bulletin 79**

This is the ARRL Bulletin that refers to the FCC action mentioned in Ralph's column in the W5YI section:

ARRL Bulletin 79 ARLB079
From ARRL Headquarters
Newington CT July 21, 1993
To all radio amateurs
Subj: "Business Rule" to change

The FCC has amended its rules to allow amateur operators more flexibility to provide communications for public service projects and to "enhance the value of the amateur service in satisfying personal communications needs."'

The new rules are based on a Commission proposal announced in a Notice of Proposed Rulemaking in July, 1992, a proposal resulting from an ARRL request. The League at that time suggested that new language for the rules would permit amateurs greater flexibility in providing noncommercial communications while maintaining the traditional character of Amateur Radio by continuing to prohibit routine business communications.

The Commission in announcing the rules change (in PR Docket 92-136) said the new rules would permit amateurs to "facilitate events such as races and parades, to support educational activities, to provide personal communications such as making appointments and ordering food, to collect data for the National Weather Service, and to provide assistance voluntarily even where there are other authorized radio services available."

The FCC stopped short of granting an ARRL request for further definition of acceptable communications, particularly in the difference between a regular and an irregular event, saying that providing such anecdotal examples "would necessitate that the FCC intrude upon the day-to-day functioning of the service to a far greater degree than desired." The FCC said that generating a list of the thousands of possible examples would unduly tax the Commission's staff.

The wording of the new rules is not yet available and thus the new rules are not yet in effect. The full text of the FCC's NPRM is in September 1992 QST, page 62. (Cut and pasted by Joe, K5JB)

**Special Calls in Budget?**

Here is another cut and paste, a bulletin faithfully posted to the BBS network by our very own, (TAA DAA!!) Mac, K2GKK.

HR CW 88 from ARRL HQ
Newington CT August 10, 1993
To All Radio Amateurs

The just passed U.S. budget bill contained several items of interest to radio amateurs, including a provision that would allow the FCC to offer, if it wished. and for a fee, a special call sign request program. For more details, check ARLB088 on data mode bulletins or (sic) various systems.

(ARLB088?, this one had that bulletin identification number. Simple BBS recursion, eh?) Joe, K5JB

VHF Club
*NEWS*

W5LOW
*The Elmer Goekler Memorial Station*

## Minutes of August Meeting

There wasn't one, silly. August is the month we ALWAYS have our watermelon feed. Surely you remembered that? (I didn't when I made up last month's C&E column and calendar. Sorry about that.

Ellard, W5KE, arranged for the watermelons and J, KB0QJ, arranged for the picnic shelter.

Fred, W5NL, supervised the telephone calling and announced the plan on the QCWA net, and as a result there were 12 people present to munch on the melons. Joe, K5JB, Sec'y

## You Buy a Heath Vector Scope?

Ellard, W5KE, wanted to get the word to the guy who bought a Heath Vector Scope, Model 10-1128, at Ham Holiday. The word is that he has your manual. The guy you bought the scope from gave the manual to Ellard in hopes it would eventually find its way to you. Ellard's phone number is 789-6702.

## 9600 Baud Packet Radio

Last month I started an article about my experience using 9600 baud on packet radio. But, in order to catch up on some C&E business I cut the column down to a snippet, intending to do dome more research and have a more complete column ready for the September issue. I haven't done more research and was about to drop the subject, but J.P., KB5OJR, egged me on...

Well, I have had the time, but not the inspiration, so I don't have the conclusion, but what follows is the more complete introduction to 9600 baud packet radio that was snipped our of last month's column. There will probably be more later, too!

Anybody who has been paying attention over the last 20, or so, years knows that I do my experimenting on 146.415, that nice round number that happens to be the first 15 kHz simplex frequency on 2M FM. It also happens to be the International Order of Krazies' calling frequency, so it is suitable for my purposes. Packet operation in Oklahoma started on that frequency, and is still there with the K5JB Apple BBS. Now, the radio is hooked to two TNCs, the 1200 baud and a DRSI 9600 baud one. There is so little activity that I haven't cross linked the TNCs so they don't jam each other, but that can (maybe) come later. I will discuss some of the general problems in getting 9600 baud packet operation going.

First, a little recent history: The first 9600 baud packet operation in the state was started by the guys doing Texnet in the eastern part of the state. The Texnet modem is based on the K9NG modem and does a respectable job. In Oklahoma City, J, KB0QJ, and Steve, N5OWK, toughed it out running TCP/IP with Paccom, Kantronics, and Gracilis gear. Shortly thereafter, Hank, WA5JRH, and Lee, N5KXI, put Kantronics Data Engines on the air. Lee started with a Kantronics D4-10 radio but had some concerns about its frequency stability in an outdoor environment and switched to a commercial radio. He loaned me the D4-10 to try but I never did get it on the air. (The backbone for the Data Engines is in the 430 MHz region and I even bought an antenna to go down to their frequency, but never did get it installed.)

Concurrently, Larry, WB5CQU, from Double Oak TX, converted his ROSE backbone running from north Texas to Pauls Valley OK to 9600 baud. Larry used the G3RUH modems in his installations. Unlike 1200 baud operation, 9600 baud modems have to be connected internally to the radio rather than through the microphone and speaker jacks.

I did make a halfhearted attempt to get on 9600 baud UHF by doing a house call on a Yaesu FT-708R UHF talkie. It has the ideal design in the transmit side for 9600 baud operation, but it is a little small to work on, and low in power. I had pretty good luck on the air once I added a little power amplifier to it.

Now back to the 2M project: On 146.415 I am using a pair of Icom IC-22S transcievers. Both radios were used *long ago* as a remote base and a digipeater. The schematic showed that their transmitters were ideal, having a modulator separate from the frequency synthesizer. What I initially overlooked was that they have very tight receivers, more on that in a minute. I connected the DRSI DPK-9600 modem purchased at Dayton to one rig, and connected a Paccom direct FM TNC (Tiny-2 with G3RUH modem) to the other, and fired up both radios. After some initial diddling with adjustments I concluded that the Paccom wasn't going to receive the DRSI, and I didn't know where the fault was.

After stewing over the problem (ignoring it) a couple of days, I picked up the phone and ordered a second DRSI DPK-9600. It arrived in two days and immediately worked in my test setup. Steve, N5OWK, came to my rescue with an oscilloscope and I tuned the receivers on both modems best that I could and the two radios at my house started communicating quite well with each other. However, Steve, wasn't having much luck. From Moore to Midwest City isn't really a long shot, but we have not been able to do very well at all. I continued pondering over the problem.

What the oscilloscope showed me was that my receivers may be too narrow for 9600 baud packet spectrum. I am guessing that I am running about 2.7 kHz deviation and there appears to be an obvious problem in the receiver's detected output. If I slow the scope's sweep so that the detected output (while the other TNC is sending a calibrate tone) looks like a string of spikes, I see two different size "spikes"; one set is about 2/3 the amplitude of the other.

9600 baud packet modulation is highly modified FSK. Rather than send the data as two different voltage steps, the modem

modifies the modulating voltage in such a way that the transmitted FM spectrum has the desired bandwidth. It could be that the DRSI modem just isn't doing that good a job of modifying the waveform, or it could be that my receiver bandwidth is too narrow to faithfully recover the higher frequency waveform components.

In the 455 kHz path the IC-22S uses two 15 kHz filters in series, which is unusual. This desigu made a lot of seuse for the voice operatiou for which it was designed, but it is causing me some concern for 9600 baud packet operation. There is a dearth of information on bandwidth as it relates to various modems and radios. Most of the 9600 baud modification information is empirical and incomplete. Someone hooks up a modem to a particular radio and if it appears to work, he publishes modification instructions. Some of the modifications I studied were poorly thought out and would have undesirable side effects. My amateur radio intuition tells me that we should be able to reduce modulation level a little and make the 15 kHz radio work, but my engineering intuition tells me that it really should take about 20 kHz to handle the modulation. I took a look at the power distribution of a carrier being modulated with a 4800 Hz sinusoidal voltage, and a 3 kHz deviation, which should be the worst case for data transitions. Indeed it is worse than bad. The modulation index is only .625, which normally would be considered unusable.

The Bessel function for a modulation index of .625 shows that 81.8% of the power is in the carrier, 17.7% is in the first set of sidebands (9.6 kHz bandwidth), 0.44% in the second pair, and negligable power in the remainder.

I am guilty of gross oversimplification because the modulation can't be characterized as sinusodial at all; the waveform has to be one that results in some energy distribution across the bandwidth. I won't further pursue Bessel functions

I reviewed James Miller, G3RUH's paper which was published in the 7th ARRL Networking Conference Proceedings. Fundamentally, he derived a set of numerical tables that would digitally synthesize a modulating waveform that would achieve the desired results in the other receiver's spectrum. Earlier, K9NG, used filters to get similar results. I don't know what DRSI is doing with their little modem. One thing I like better about the DRSI modem is that it has adjustments for correcting some phase distortion in the modem's receive side. The G3RUH modem has provisions for modifying the transmit waveform to match the response for the receiver on the other end of the circuit. This may be okay for point to point work but is the wrong approach for a station that may have multiple stations trying to communicate with it.

Well, the conclusion is yet to come. One thing is certain though: You need significantly better signal to noise ratio and attention to details at 9600 than you do at 1200 baud. I'll keep noodling around with it. Joe, K5JB

**Back to Basics - Volts and Amps**

Twice in the last month I read comments from packeteros that gave me an idea for a basic subject I could cover in the C&E. You can't get much more basic than Ohm's law, so that is what I am going to write about this month.

Amateur radio is sadly becoming quite non-technical. Many new (and some older) amateurs scorn technology and those who understand it, but I believe they are actually phobic because they don't have sufficient understanding of the fundamental principles, and how more fundamental can you get than understanding Ohm's law?

Ohm's law is an abstraction for most people. If they aren't mathematically inclined, memorizing and reciting the formula that describes the law are meaningless. With some examples I would like to give you a clearer understanding of Ohm's law, and how it applies to amateur radio in general and how it applies to your radio station, in particular.

The only reason you have to demonstrate an elementary knowledge of radio technology to get a legitimate amateur license is to show that you aren't going knowingly do something stupid that will hurt yourself of disrupt other's peaceful enjoyment of the hobby. Not knowing the effects of violating Ohm's law isn't going to disrupt anybody else, but it may disrupt your own enjoyment of the hobby. What we are going to talk about is voltage and current. and what they are, and how they are different from each other.

Voltage used to be called *electromotive force* and is exactly analologous to mechanical force. Force is kind of like pressure (but not exactly). Since water has pressure, and it also flows like electricity, we will pretend that water pressure can be a suitable anology for voltage. When the water faucet on your sink is closed, there is water pressure behind it, but no water flow. If there is nothing plugged into an electrical convenience outlet on your wall, there *is* electric pressure behind that outlet, and *no* current flow. The water faucet analogy gets pretty weak when we open the faucet, because electricity doesn't just pour out of that convenience outlet like water pours out of the faucet when you open it. But maybe with some modification and imagination, we can make the analogy work. Let's go to the sill cock outside where you hook up your garden hose for watering the lawn. Let's pretend we connect a hose and a water sprinkler to that sill cock and then open it up. As we start opening the faucet, the sprinkler starts to squirt, let's say, 6 feet high. Suppose that if we open it full open and we notice that the sprinkler is quirting 10 feet high. We *may* be able to close the faucet down half a turn and see that the sprinkler is still squirting 10 feet high. If this is the case, the sprinkler and hose is presenting more resistance to the water flow than the sill cock valve.

*RESISTANCE*? Did I say *RESISTANCE*? Oops, didn't mean to get too technical, heh!

So far, we have observed (or imagined)

that the flow of water is regulated by the valve, or maybe by the sprinkler, whichever one has the most resistance to the water flow. If there was no friction loss in the pipes feeding your house, the water pressure at the faucet wouldn't have changed with the flow, but of course, the pressure will drop a little. (Surely you have experienced water temperature change in the shower if someone in the house flushes a toilet?) Let's think about the electrical outlet in the context of our water experiment. When we plug an appliance (our radio transmitter, for example) into the convenience outlet, and turn it on, we will start drawing current from that outlet. The amount of current we will draw depends on the design of the appliance. Our electric toothbrush won't draw much, but that 2 KW amplifier will draw a bunch! Like the water faucet, the pressure will drop a little at the outlet when we draw current from it. The toothbrush will cause such a small drop we probably can't measure it, but the KW amplifier may cause the voltage to drop enough that not only can we measure it, we may be able to see the room lights dim a bit on voice peaks.

What I am describing is a typical use of the terms, voltage and current; voltage is a pressure (force), current is a flow. The outlet voltage is pretty much constant, the current depends on characteristics of the connected circuit and demand placed on the energy source by the appliance.

Now, for the hard core fact of life: Voltage is not current (and the corollary: current is not voltage). 120 Volts is not "House Current". Unfortunately the terms, "Volts AC", or "VAC", and "Volts DC", or "VDC" are used to designate alternating voltage and constant polarity voltage, respectively, and perhaps have contributed to the confusion and mixing of these electrical properties' names.

When we connect an appliance to the electrical outlet, we will draw current without significantly affecting the voltage at that outlet, until we trip a breaker or blow a fuse. This source of electrical power is called "stiff" meaning that it will supply a wide range of current without changing voltage much. However, if we put a 100 foot long extension cord into that outlet, and then connect out appliance to the other end, the source of power is no longer "stiff". The reason is that the small wires in the extension cord have sufficient resistance that they perform the same throttling action as our sill cock.

Sometimes we depend on the power source to be "stiff", and sometimes we depend on it to be "soft". For example, a simple Nickel Cadmium (NiCd) battery charger might only contain a resistor to regulate the current. In this case, the power supply for charging batteries is intended to be soft so that it will deliver an almost constant current regardless of the voltage across the battery. A soft supply like this is unlikely to cause any harm even if some of the cells of the NiCd battery are shorted.

Lying somewhere between "stiff" and "soft" are the 13.8 VDC power supplies used to operate mobile transceivers in out homes. If it is a car battery, it is stiff. If it is a regulated supply it is stiff until you approach its design limit. If it is an unregulated supply consisting of a transformer, rectifier, and capacitor, it is pretty soft.

Now, one of the comments that I heard that prompted me to write this was: "I was going to put the 10 Amp power supply on it but the owner's manual says that it needs 6 Amps, and I was afraid I would burn it up!" OK, All Right, Gotcha!

Folks, this guy could have hooked his radio appliance to a 10,000 Amp supply and it wouldn't have hurt it if the voltage was proper, and he didn't hook it up backwards. The radio will only draw the current from the supply that it needs, and no more. I sense that this guy had the terms voltage and current confused.

Ohm's law states that the current that flows through a device is proportional to the voltage applied across it and inversely proportional to the resistance of the device. What does this mean? Well, proportional is a mathematical term that can be best explained in this instance by some examples. If we double the voltage, we will double the current; if we triple the voltage, we will triple the current; and so on. That is what proportional means.

Here are some inverse proportion examples: If we cut the resistance of the device in half, we will double the current; if we cut the resistance to one third, we will triple the current. See whatimean jellybean?

Ohm's law simply states this in mathematical notation: I = E/R (or I = V/R if you prefer "V" to "E")

Since there are three components to Ohm's law, it can be stated three ways. The other two ways are just "back door" ways to figure out an unknown value when the other two are known. Even if you don't intend to master the meaning of Ohm's law, for heaven's sake, learn the difference between voltage and current. When you master resistance, I will let you in on conductance, and maybe even impedance! Joe, K5JB

**Famous Tomato Gardener**

VHF Club member Ken, K5VVZ, was featured in a nice article and had his picture in the August 13, 1993 Daily Oklahoman. The article described the unusual method Ken uses to grow tomatoes. He grows them upside down, the plants growing out of the bottoms of hanging planters! Rosemary, his tolerant wife, was even quoted, and managed convey her mirth over Ken's antics.

One thing wasn't clear to me. The article said that Ken lets the plant grow to about six inches and then he punches a hole in the bottom of the planter and inverts it. I am curious how the plant then knows to start growing out of that hole if it already has six inches of plant growing elsewhere. I think I have it figured out but I will let Ken explain it to me sometime. Congratulations for the recognition you deserve, Ken! Joe, K5JB

## Unusual MODS Message

Most of the "MODS" messages on the packet BBSs are pure garbage. (Mostly they consist of either requests on how to make talkies transmit illegally or modifications of dubious quality.) Here is a mod that I didn't delete on sight! It was titled, The Truth About the HTX-202. I didn't check the accuracy of the Radio's design heritage cited in the message, so with that caveat, here it is (Joe, K5JB):

Greetings HTX-202 Fans:

It seems that human nature dictates that every major item we purchase be "hot rodded" into something other than what the manufacturer intended. Our first car, our first radio, and now: the HTX-202. Regardless of the total lack of necessity for most owners, everyone wants to broadband the 202.

Perhaps in our evolution, there is a little CB radio mentality left under the surface. Who knows? But hopefully, I can answer a few questions which have yet to be answered to the ham community.

The HTX-202 is based on the ICOM 02AT with certain design modifications based on Tandy's specs. These variations include encode/decode, additional memories, and a full width LCD display. Contrary to rumor, no part of the radio is Kenwood or Yaesu! ICOM sold the rights to their design to Tandy to do with what they would.

When Tandy sought to produce the unit, they went to their usual Korean source for cheap gadgetry: MAXON. Maxon then built the 202 for Tandy, under license from Icom. The HTX-202 is surprisingly sturdy, and well constructed, considering that Maxon has the worst quality control in the industry.

Nevertheless, before Tandy would produce the 202, certain specs had to be met. Foremost, after the repercussions from their 10-meter rig, Tandy insisted that the 202 *NOT BE CAPABLE OF MODIFICATION*! Period.

This worked out well, as the tighter bandpass gives the 202 it's exceptional selectivity and immunity to intermod. When you brag to your friends about your tight front-end, just remember that the cost of this important function, is the lack of ability to kerchunk your local police department's repeater. Why complain anyway?

Most 202's will not take a BP-7 Icom pack. The BP-8 usually works well. If the Zener diode in the bottom-feed circuit is bad, only a 9.6-vdc pack or less will work. A minor headache at the very least.

ALWAYS: Slide off your NiCad pack when using external DC power from your vehicle or a power supply! Leaving the pack on while mobile puts too much burden on the Zener diodes, and generates heat at twice the normal rate. Save your radio... Take off the pack!

Unlike it's Icom brother, the 202 will not top charge an Icom pack while on external DC power. Refer to the warning above!

HIDDEN FUNCTION: Holding the <F>unction button while depressing the <L>ight button will cause the display lighting to remain on until the <L>ight button is pressed again.

HELPFUL HINT: Discard your belt clip... Install a commercial H.T. "D-swivel" available at any FM 2-way Business Radio dealer. Add the mount to your belt, and VOILA... No more dropped radios.

WARNING: Do not attempt to bottom-charge the stock NiCd pack in an Icom BC-35, or clone, charger, Never, Never, Never!

DESIGN FLAW: Some early production (S/N 2500 and down) radios had the NiCad Zener Diode located too close to the finals, causing final transistor failure when used on external DC with the pack in place. This was remedied in production, and Tandy will remedy under warranty.

Hopefully, this will address all remaining questions and rumors in regard to the HTX-202. It can't be modified. Big deal! It is a sturdy, well-built, dependable radio and a bargain at the price. Be happy with a great deal on a great radio. My HTX-202 got me through in an emergency situation, where my 800-MHz commercial trunked radio failed... That's more than enough for me. 73 de Jim. N9PEK @ WB9SLE.IL.USA.NA

## License Fee Rejected

What follows is a portion of ARRL Bulletin 88, August 10, 1993. The full text of the bulletin is on the packet bulletin boards. A portion of this bulletin dealing with special call signs is included elsewhere in this C&E.

Several items of interest to radio amateurs are related to the just-passed Omnibus Budget Reconciliation Act (H.R. 2264), items shepherded through Washington by the ARRL's capitol team.

One draft version of the bill would have imposed an annual regulatory fee on every licensed ham in the U.S. Through efforts by the League's Washington representatives, the act, minus the fee for amateurs, was reported out of the Budget Reconciliation Conference Committee and passed by the House and Senate late last week.

ARRL President George Wilson III, W4OYI said that, "The regulatory fee issue alone is a big victory, since it would have been an administrative nightmare and would have cost radio amateurs millions of dollars a year. But most important, at a time when ham radio is enjoying a resurgence among young people, a fee might have been a roadblock to that first license."

Wilson credits the success to the efforts of hams in key legislative districts who wrote and called their congressional delegations. Snipped by Joe, K5JB

# O.C.A.P.A. NEWS

Well , the elections are over and a new king has been sworn in along with a newvice-king who will take on the responsibilities of preparing the articles for the C & E in the coming months . This leaves me with no responsibility other than to write articles as I desire. This will be on a sporadic basis and only when I can come up with something which is of interest to me and possibly a few others.

A couple of items which I feel worth relating to others happened recently. I am sure we have all seen billboards stating the affection of an individual to another of the opposite sex telling them they love each other or offering to take their hand in marriage. Until recently I don't think I have ever heard of a father giving his daughter the right to go out on dates on the air in front of hundreds of listeners. However , N5SAM, gave this privilege to his daughter Shannon KBSRBX on the air publicly and with many reading the mail. So Shannon, you have many witnesses who heard this . You have our permission to date any time you feel like it.

We constantly see pictures on television of individuals losing control of their vehicles and crashing through store fronts, Well this doesn't just happen in other_ cities, but Oklahoma City as well. Did everyone hear about a couple of our members who recently tried to dismantle a local fast food restaurant while driving their pickup, namely Jerry & "WHO"?

And, it appears we are losing WHO. Off to Florida he goes to be with his lady friend and get a few meals off his papa and mama. It won't be the same without him around . Good luck WHO and come back to see us .

Hey, has anyone noticed how the "Q" signals are being slaughtered these days? I actually heard someone the other day saying he needed to "QRS" on two meters. I have heard some fast talkers but no one too fast to understand them. I think the guy actually wanted to sign off. I heard a couple of fellows in a heated discussion recently and at the beginning of every transmission it was either "QSL that" or "QSL, QSL on that. Why?

Also , it is amazing how many dual operators there are today . Either that or they are carrying around mice . A conversation might go something like this, "We are on the way to work; we found our parking place; we got us a new radio; etc." Does everyone have two of themselves at all times? What happened to the word "I"?

We who serve as VE's at the local test sessions occasionally receive some bad mouthing as to how difficult some of the code tests are . It seems everyone wants a multiple choice exam so they can guess at the answers. Most of the code tests used are direct from the VEC and given as he sends them, in that case, fill in the answers. If a person is capable of copying the code and prepared to pass the exam, they should be able to fill in the blanks as well as guess at an answer in a multiple choice exam. Personally I would feel I had accomplished more if I had copied a solid minute of code or answered 7 questions of fill in the blanks. It should really be rough on many if it was like the old days when no written exam was given on the code test and it was required to copy one minute solid. I suppose some folks want something for nothing. I suppose one of these days they will come out with study material of all the code test with answers supplied so all one has to do is memorize the answers .

MEET A FELLOW MEMBER

Two or three years ago or maybe longer a fellow moved here from Arkansas I believe, probably realizing that one of his fellow razorbacks was going to run for public office . At that time, he possessed a rather large home and acreage in those hills and he had to dispose of that property prior to purchasing a new residence in the Oklahoma City area. Finding life in an apartment not to his liking, he put a bad rush on realtors to dispose of the Arkansas property so he could set up permanent residency on high land so he could compete in all the contests available on the low bands . He was being outdone by the likes of AD1S and WV5S .

Now this fellow was sorta strange looking at the time. He had long curly locks down the back of his neck and probably over his ears to draw attention from the lack of locks on the top of the noggin. It seems he had done a considerable amount of traveling and working in various locations , none of which lasted for many years. I believe he was originally from Florida, but managed to get his latest call from one of the New England states , which meant he was a "1". Now normally we "5's" are a little reluctant to readily take in a stranger, especially if he possesses a "1" in his call, but this fellow seemed to fit in with the gang. Either that or he wasn't going to take no for an answer and wanted to become part of the

crowd. After finally selling his home in the hills of Arkansas and moving out of the apartment, he and his lovely wife settled down out northwest of Oklahoma City on approximately 10 acres of real estate where he had ample room to erect a couple of lightening rods. With a couple of antenna parties behind him, he waited for the first major storm to come through to test his erections and low and behold, down one came to the ground. After another party, this tower was back in place. He had still not been thoroughly tested for electrical storms. Upon awakening one morning and smelling the aroma of burned plastic, he found he had been properly initiated in what lightening can do . Thereafter , he became known to some of his closest associates as "Sparky" .

He is an avid dxer and contest operator. He has made trips across the wide Pacific to be a DX station and enters every contest known to man. He enjoys sideband, however , his primary interest is continuous wave .

With the last name he has one readily recognizes that his ancestry came from across the pond from an island known as Sicily. He is a lover of pasta, money and can eat his weight in shrimp. Most of all, he loves fast cars and beautiful women. It is a well known fact that he has talked himself out of more speeding tickets than the law allows . His wife would be in hysterics if she only knew how fast her pickup had been driven. Becoming irate at the slow driving of his companions on the way to the Dayton Hamfest, he insisted on taking the wheel. As a result, he sat an all time record in making the trip to Dayton from Tulsa, He probably ran a good race with J.B. in his airplane, He certainly has an eye for beautiful women and is usually the first one to notice the sweet young thing as she walks in the restaurant during the weekly Thursday luncheons. His love for money has caused him to invest funds in some of Oklahoma's Black Gold. Only time will tell as to how lucrative this investment will be. To help support his bobby, he has his wife raising all types of exotic animals for sale on the open market.

One of his greatest assets is being a good listener and go between for those who have problems getting along with each other he has settled more differences than most marriage counselors .

He has served his club well. Working his way up through the ranks as Vice-President and then the Chief Executive Officer he was undoubtedly one of the best leaders the club has ever had, Now that he has retired from this position, he is willing to sit back and draw his retirement aid receive all the junk mail that past leaders get in the mail. You know, I really like the guy.

K5NK

## MINUTES OF THE OCAPA MEETING August 17, 1993

The meeting was called to order by John NJ1V at 7:30pm. The minutes of the last meeting were read by John N5SAM, seconded and passed. Treasurers report was read by Mike N5VIT, seconded and passed.

### TECHNICAL COMMITTEE

Mike N5VIT thanked the tower crew for the help in replacing the upper 650' of feedline on the repeater tower. The new line will be in service in the next week or 2.

### FIELD DAY COMMITTEE

John NJ1V read the letters of gratitud given to the Deer Creek Schoo Superintendent, and to the 33rd Combat Communications Squadron for their support of OCAPA field day.

### EDUCATION COMMITTEE

Mac, K2GKK gave a great presentation covering HF antenna's and feed lines. BradKJ0W wants ideas for future classes.

### EQUIPMENT COMMITTEE

John N5SAM told of some Rohn 25 tower sections available to purchase and add to the club properties. MOTION To have the technical chairman inspect and have discretion the purchase. Seconded and passed.

### SALVATION ARMY

Frank N5FM told us that the Salvation Army services trailer hasn't been in use for 2 years and that with some repairs, it could be available for OCAPA and CORA functions as well as ready for use by the Salvation Army. It has kitchen, generator, and enough space for operating positions.

### NEW BUSINESS

Mac K2GKK told us of interest in the Master-Pro VHF equipment that is no longer in service. MOTION was made to sell the equipment asking $200. Seconded and passed.

In the absence of Jim KA5PSF, BR WA5BQX conducted the election of OCAPA officers. BR announced the nominating committee

recommendations:

'rad KJ0W-President,
Tom WA9AFM-Vice President,
John N5SAM-Secretary, and
Mike N5VIT and Lloyd AB5I for
Treasurer.

Nominations were opened for each office from the floor. Motion was made that nominations cease for each office with no nominations from the floor. Ballots were cast and counted for all offices. The election results are Brad, KJ0W is the new President, Tom WA9AFM is the new Vice President, John N5SAM will remain as Secretary,and Mike N5VIT will as Treasurer. The August prize drawings went to Larry KF5JN a 1987 ARRL Manual and a ARRL repeater directory. Frank N5FM won a Comet triband baby ducky and an ARRL Operating Manual. Don KC5BRO won an Ear-Talk invisible speaker mic and a Comet baby ducky. Fred N5NIO won a wood talkie stand. Bill K5SKA won an outlet strip. Steve N5ZYB won a 93 ARRL handbook. Keith KI5XA won the second grand prize, a computer system. The grand prize, an ICOM 229A 2m mobile went to Ed WA5YDF as well as an outlet strip. Therewere 4 double winners and raised some funds for the club.

ATTENDANCE 54
Meeting adjourned at 8:40pm.

John Brassfield, N5SAM
Secretary

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RE: ISOBAR Manufactured by TRIPP LITE, 500 N. Orleans, Chicago, Il

WARRANTY printed on the Box (Ultimate lifetime insurance) Tripp Lite will repair or replace any equipment damaged by surges INCLUDING DIRECT LIGHTNING STRIKES while protected by this product for life.

Fact: on May 23, 1993 my house took some type of lightning hit. Many pieces of equipment were damaged. Television sets, radios am & fm, microwave oven, telephones, satellite tv receiver, and a computer protected by an Isobar 8 plug power strip. The computer was checked by a local shop and in their estimate it was a complete loss due to lightning damage. The only connection between all the equipment damaged was they were all on the same service leg of the utility company. I called Tripp Lite, at the Chicago office and received a RMA number, to ship the power strip to them for evaluation (by their lab). After about two weeks, I received a different power strip in the mail. The company had sent me a different version then the one I had sent them. In the first part of August Tony called me from Tripp Lite, asking me some particulars about the replacement cost of the damaged computer, with facts given, he said he would get in touch at a later date. On August 18 Tony called again, stating his boss might want the computer for evaluation, asking if I still had the damaged computer, reply was yes it is still here. Again the conversation ended with a "I will get back in touch with you". Later the same day he called and said the claim is refused due to there being no evidence that the isobar failed in its job, Tony states, "...but for some reason the off & on switch and the light do not work." Beware warranties, guarantees and other may not be as they seem.

David Nelson WB5IMT
2602 Fox Drive
Tuttle, OK 73089

An Oklahoma City ham is participating in the National Final Truck Rodeo in Denver, CO. Jerry Tucker KB5SCJ (super crash Jerry) has won the Oklahoma state finals 4 times in the last 6 years. The rodeo consist of four parts. An obstacle course that is more difficult than anything a driver would encounter through daily driving. A written test covering rules and regulations that govern the trucking industry. A physical examination of a tractor trailer rig for safety problems. And a personal interview where you are drilled by a team of judges. Jerry has been employed by Roadway Express in Oklahoma City for just over 20 years, and has been a ham for nearly 2 years. It just goes to show that good truck drivers also make good hams!

John Brassfield, N5SAM

# MORI FoxHunts...

Starting at 1pm in the afternoon on 147.240 simplex and ending at 1pm on Monday September 6th, a simulated conversation shall be interfered with by a simulated jammer. There will be three rounds each lasting 45 minutes with a 15 minute break in between. The only way you are going to be able to catch the rabbits, is to work in teams, however you achieve that. Remember this is not a race to see who can get there first, it is more of an exercise in location skills that may someday save a life of a stranded motorist or even actually help to locate a real jammer whom does not expect you to go to this much effort to keep the air ways clean. Rick Masters, N5WNR

### 1. Aeronautical Center ARC

Meets: First Thursday, Flight Standards Building, FAA, South MacArthur, 7:00 P.M.

| | | |
|---|---|---|
| Pres: | Jack Iman, WB5SVN | |
| Sec/Tr: | Brad Nelson, KJ0W | |
| AstVP: | Harold Todd, WA5VAQ | 685-3685 |
| AstVP: | Charlie Greene, WA5JGU | 943-5631 |
| Editor: | Jack Iman, WA5SVN | |

### 2. Oklahoma Central VHF ARC

Meets: 11:00 A.M. 3rd Sat., Golden Skillet 3401 N. Classen Blvd, OKC

| | | |
|---|---|---|
| Pres: | J Frank Fields, KB0QJ | 789-8469 |
| VP: | Bill Noland, WA5FWD | 354-5018 |
| Sec: | Joe Buswell, K5JB | 732-0676 |
| Treas: | Ellard Foster, W5KE | 789-6702 |
| Editor: | Joe Buswell, K5JB | 732-0676 |

### 3. Mid-Oklahoma Repeator, Inc.

Meets: 1st Tuesday, 7:00 P.M., Favorite's Cafe 36th & S. Western, OKC

| | | |
|---|---|---|
| Pres: | Scott Walsh, N5NYS | 787-3804 |
| VP: | Larry Benedict, N5VYC | 728-7824 |
| Sec: | Tim Hanna, N5USM | 842-3812 |
| Treas: | Robert Moose, N5QKI | 720-0073 |
| Editor: | Dean Ward, N0PAD | 681-4606 |

### 4. OK City Autopatch

Meets: 7:30 P.M. Third Tuesday, Salvation Army N.W. 50th & Penn.

| | | |
|---|---|---|
| PR: | John Guida, NJ1V | 340-6518 |
| VP: | Chuck Wilhite, K5NK | 721-4926 |
| Sec: | John Brassfield, N5SAM | 685-8070 |
| Treas: | Mike Begley, N5VIT | 732-2827 |
| Editor: | Chuck Wilhite, K5NK | 721-4926 |

### 6. Altus Association

Meets: 7:30 P.M. Second Thursday North Main Fire Station (CD), Altus

| | | |
|---|---|---|
| Pres: | Jim Romines, KI5YY | |
| VP: | None | |
| Sec/Tr: | Bob Heron, KE4BN | |
| Editor: | Jim Romines, KI5YY | |

### 9. Wheatstraw ARC

Meets: 2:30 P.M. 2nd Sunday, Location Varies. See club section for details.

| | | |
|---|---|---|
| Pres: | Ray Barnes, AB5Z, Longdale | 274-3334 |
| VP: | Neal Kappus, N5KCO | 262-1551 |
| Sec/Tr | Joe Garland, WA5FLT, Calumet | 893-2660 |
| Editor: | Ralph Wilder, WA5PFK, Watonga | 623-5421 |

### 11. Edmond AR Society

Meets: Odd months, 3rd Sun., 2:00 P.M. Edmond EOC; Dinner Even Months, 3rd Friday

| | | |
|---|---|---|
| Pres: | Ken Stepp, N5DBM | 341-4874 |
| VP: | Terry Tiller, KB5RQT | 373-4141 |
| Sec: | Lynice Hamlin, KB5FOH | 427-2828 |
| Treas: | Ed Granger, KB5DZU | 348-3454 |
| Editor: | Bob Long, N5KUE | 373-2540 |

### 12. Oklahoma Packet Radio Assn.

Meets: At Major hamfests, Green Country, Ham Holiday and Texoma

| | | |
|---|---|---|
| Pres: | Hank Blackstock, WA5JRH | 722-0640 |
| Editor: | Hank Blackstock, WA5JRH | 722-0640 |

Note that the original four clubs that formed CORA were Aeronautical Center ARC, VHF Club, MORI and OKC Autopatch.

### 14. Cimmaron ARS

Meets: 7:30 P.M. second Thurs. WX5Y Playhouse 827 S 13, Fairview Area code 405:

| | | |
|---|---|---|
| Pres: | Terry McColl, N5MLT | 227-3672 |
| VP: | John Medley, N5WVU | 227-3534 |
| Sec: | Dennis Painton, WK5V | 764-3599 |
| Treas: | Nading Painton, N5FMH | 764-3599 |
| Editor: | John Medley, N5WVU | 227-3534 |

### 15. South Canadian ARS

Meets: 9:30 A.M. Second Saturday, Red Cross Bldg. North OU Campus, Norman

| | | |
|---|---|---|
| Pres: | Don Schader, KI5TP | 321-9649 |
| VP: | Mike Winkel, N5SOF | 366-8639 |
| Treas: | David Gates, N5LCL | 392-5677 |
| Sec: | Gary Skaggs, WB5ULK | 799-5363 |
| Editor: | Gary, WB5ULK & Ken Brown, N5KUK | |

### 16. Edmond AR Club

Meets: 7:00 P.M. Second Monday, Various Locations

| | | |
|---|---|---|
| Pres: | Mark Northcutt, WD5DYI | 755-4672 |
| VP: | Wendell Cochran, WB5ISO | 943-4308 |
| Sec/Tr: | Kay Northcutt, WD5DYI | 755-4672 |
| Trustee: | Dennis Orcutt, WB5ISN | 340-0034 |

### 18. Great Plains ARC

Meets: 2:15 P.M. First Sunday, Home of N5LRR 2914 Osage Dr, Woodward

| | | |
|---|---|---|
| Pres: | Bob Bayles, WB0GAX, Wdwrd | 254-3561 |
| VP: | Andy Taylor, N5LRR, Wdwrd | 256-4017 |
| Sec/Tr: | Rod Ford, WB5OVT, Gage | 923-7683 |
| TR: | Freida Patterson, N5EOX, Wdwrd | 256-2111 |
| Editor: | Phillip Perry, N5QCN | 938-2453 |

### Central Okla Radio Amateurs

Meets: 7:30 P.M. 4th Tuesday, Salvation Army, Penn. and NW Highway, OKC (back door)

| | | |
|---|---|---|
| Pres: | Frank Tassone, AA5GI | 341-1124 |
| VP: | Kathy DeGraffenreid, AA5RU | |
| Sec: | Jim Buswell, N5BEQ | |
| Treas: | Tom Mangham, K5LDI | 677-5291 |
| Editor: | Scott Walsh, N5NYS | 787-3804 |

## 19 SEPTEMBER 93

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|---|---|---|---|---|---|---|
| | | | 1 | 2 Aero Center | 3 | 4 |
| 5 Great Plains | 6 Labor Day | 7 MORI | 8 | 9 Altus Cimmaron | 10 | 11 SCARS |
| 12 Wheatstraw Calumet | 13 EARC | 14 | 15 Rosh Hashanah | 16 | 17 | 18 VHF Club Sat. VE Tst |
| 19 EARS | 20 VE Test | 21 OCAPA | 22 C&E Edit | 23 Autumnal Equinox | 24 Yom Kippur | 25 |
| 26 | 27 WA5ZNF B'day | 28 CORA K5JB B'day | 29 | 30 | | |