Central Oklahoma Radio Amateurs

COLLECTOR AND EMITTER

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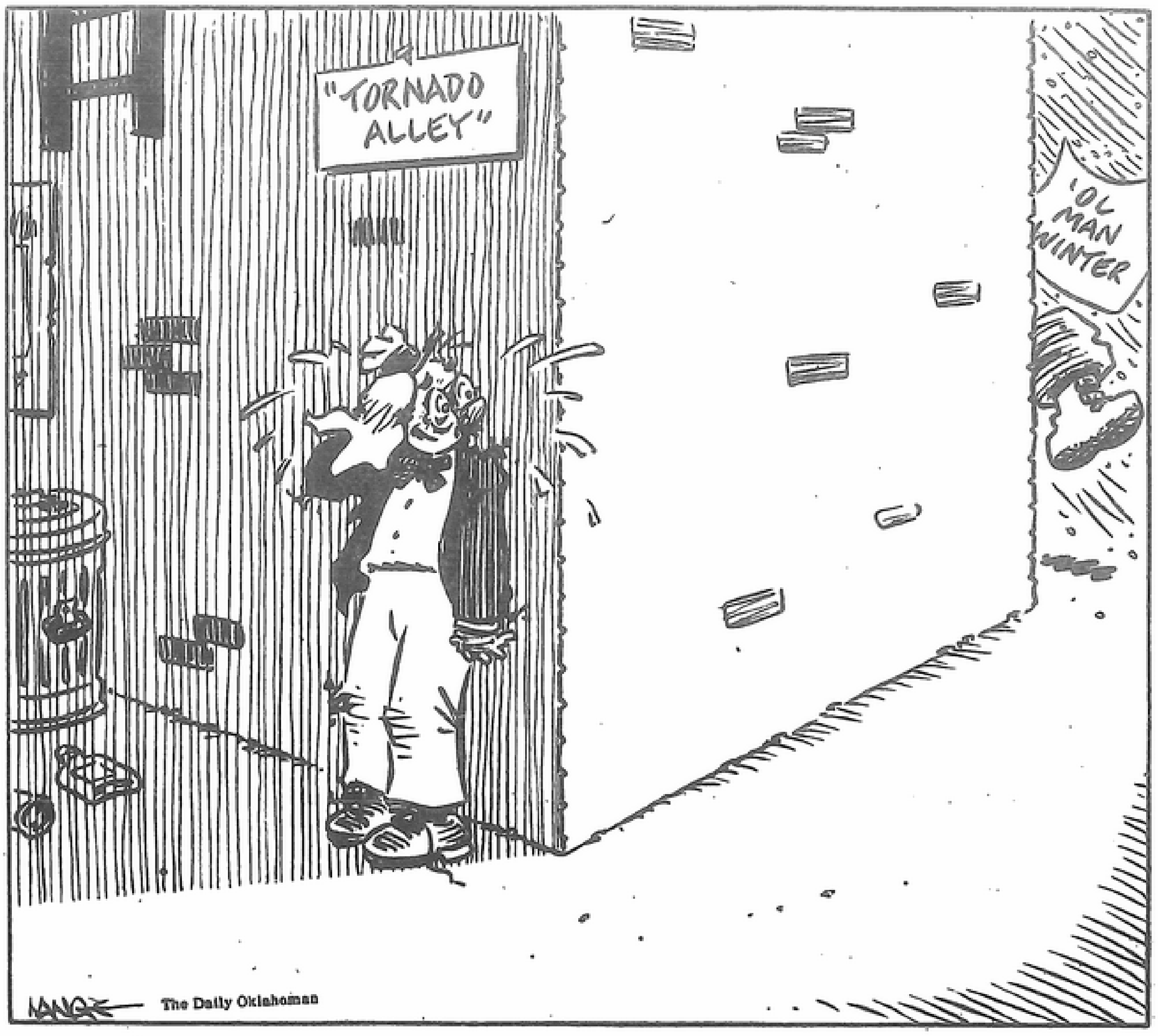
AN INFORMATIVE MAGAZINE PUBLISHED MONTHLY BY AND FOR OKLAHOMA RADIO AMATEURS

AND ANYONE INTERESTED IN LEARNING ABOUT IT

Volume 5 APRIL 1979 Number 51

'Whew! — I Think I've Finally Shaken Him!!'



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

MEETING

Our last meeting was called to order by Frank, AB5H, at 7:09 p.m. March 8,1979.

We had a good round of introductions and then went right into our old business. That took up zero time as we didn't have any old business.

After that we had a short discussion of our amateur classes. As of now, we have at least one person -- Bob Tulley -- anxiously awaiting his ticket. Having completed the code test sometime back and then finally getting the written test from the F.C.C. I really expect Bob will upgrade in the near future. Anyway, Congratulations Bob!!

Tony, WB5[illegible], made a suggestion to start an informal C.W. net on 40 meters. The object of this is to help us slow fellows to speed up and the fast fellers to slow down (ARE, I'M I catch the drift, huh?) Normal procedures dictate you can go as fast or as slow as you want, but you can't use a pencil. Now that sounds exciting. (Note: A motion was made and seconded that Tony be net control!!)

PROGRAM

The meeting adjourned at 8:07 p.m. followed by coffee and a discussion on tea. Then it was turned over to Bill Skipper, WB5BS, for a program on DF -- Direction Finding to some of us new ones. We started with a discussion of stolen equipment, boot-leggers, and then Bill went into the "hows" of DFing. I personally found the program very interesting and judging from the response so did everyone else. Thank you Bill!

TALK AROUND

Just heard that Gary. WB5WHF, caught a crappie. Guess he was going to eat it, but he didn't say what size it was. Fishin' Fever inflicted anyone else yet?

Also heard that Frank, AB5W, had been working some "rare and unusual" DX in Scotland, Yugoslavia, and other assorted goodies. However, I think the one all of us enjoyed the most was when he showed us a QSL card that was actually a handwritten letter. It turned out to be from a most sought after DX station-- Downtown Oklahoma City. Well after a lot of fun he finally produced the real thing. Ask him about it sometime.

Richard, KA5ALO

EQUIPMENT

Astatic D104, ceramic element microphone. $25.00 Frank, AB5H, 391-3394

TS-520, SM-220 scope w/ps, Swan 1200X, excellent condition. $1200. Call Bill, KB5BS, 734-7074

WANTED: BACKWAVE AMPLIFIER FOR SB-34. CONTACT CHARLIE, WA5J-UH-GU

Central Oklahoma Radio Amateurs

COLLECTOR AND EMITTER

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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.

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PARTICIPATING CLUBS FOR CORA COLLECTOR & EMITTER:

AERONAUTICAL CENTER AMATEUR RADIO CLUB
Postal Station 18, Okla City OK 73169
MEETS: 8:00 PM First Friday each month
Flight Standards Bldg, FAA Aero Center

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MEETS: 8:00 PM First Tuesday of Month.
Okla City EOC, 4600 N Eastern

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V-P	Bill Atkins	N5AH	737-6984
Sec/Tr	Jim Jones	K5PER	634-5235

Dues: Sid Gerber, 829 Bouse, MWC 73110

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Rm 449, Carson Engineering Center.

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V-P	Dan Orr	WD5GKZ	325-6951
Sec	Peter Richeson	KA5COI	325-3015
Treas	Nathan Kirby	KB5BF	364-7979

ALTUS AREA AMATEUR RADIO ASSOCIATION
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North Main Fire Station [CD]

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V-P		
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MEETS: 2nd Sunday, 2:30 PM. Location varies. See Calendar on back page.

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V-P	Ted Vanlangham	WD5JNT	262-1675
Sec/Tr	Ralph Wilder	WA5PFK	623-5421
Act	Joe Hyatt	WA5GHK	375-3783

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323 NW 10th, Okla City OK 73103
MEETS: 8:00 PM Third Friday each month.
American Red Cross, 10th & Hudson

Pres	Ken Ford	WB5KHU	528-8770
V-P	Al Prince	WB5KCU	
Sec	Joe Buswell	K5JB	732-0676
Treas	Ellard Foster	W5KE	789-6702

OKLAHOMA CITY AUTOPATCH ASSOCIATION
MEETS: 7:30 PM 3rd Tuesday of each month
Oklahoma Military Academy, 36th & Grand

Pres	Frank McCollom	N5FM	751-3577
V-P	Henry Isreal	N5IH	722-3848
Sec/Tr	Hobe Burgan	WB5MLN	751-1646

BICENTENNIAL AMATEUR RADIO CLUB [76'ers]
MEETS: 7:00 PM, 2nd Tuesday each month
Air National Guard, Will Rogers Airport

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V-P	Joe Ramage	WB5TDW	685-4814
Sec	Joe Couch	WD5BMP	282-4353
Treas	Don Duck	AE5N	

CHOCTAW AMATEUR RADIO CLUB
MEETS: 2nd Thursday, 7:00 PM
Indian Meridian School Cafeteria

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

CENTRAL OKLAHOMA RADIO AMATEURS
MEETS: 7:30 PM. *Normally* on last Tuesday, but see caleadar. Red Cross Bldg.

CORA officers listed above.

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Club
NEWS

WSLOW
The Elmer Geddes Memorial Station

MINUTES OF MARCH MEETING

MEETING WAS CALLED TO ORDER AT 8:05 PM BY PRESIDENT KEN, WB5KHU WITH 15 MEMBERS AND GUESTS PRESENT.
JIM. K5VRL, AND HELEN WERE CELEBRATING THEIR WEDDING ANNIVERSARY.
MY BROTHER JIM ANNOUNCED RECEIPT OF HIS NOVICE LICENSE, KA5EET.
BOB, W5HXL, GAVE THE CORA REPORT. JIM, KA5EET, AND PAUL, WA5HTL, WILL EVALUATE FEASIBILITY OF PARTICIPATING IN FIELD DAY WITH AERO CENTER CLUB JUNE 23 AND 24.

KEN, WB5KHU, REMINDED THOSE WHO ARE IN CHARGE WHEN CLUB STATION IS OPENED SHOULD KEEP THE LOG ON THE DOOR CURRENT.

CY, WB5TKG, PRESENTED A WELL PREPARED PROGRAM ON HOW TO COMPUTE WIND LOADING AND STRENGTH OF A GUYED MAST. HE WENT THROUGH ALL THE TEDIOUS CALCULATIONS AND MADE TABLES WHICH HE OFFERED AS HANDOUTS.

MEETING WAS ADJOURNED AT 9:15 AND THE GROUP MOOVED TO THE RADIO ROOM FOR COFFEE AND DONUTS. JOE, K5JR, SEC'Y

"BREAK-BREAK"

WHEN YOU HEAR "BREAK-BREAK" YIELD THE FREQUENCY INSTANTLY NOT JUST IMMETIATELY, BUT INSTANTLY.

THE DOUBLE BREAK IS USED WORLDWIDE ON AMATEUR FREQUENCIES AS NOTICE OF AN EMERGENCY. THE ONLY VOICE SIGNAL THAT DESERVES HIGHER PRIORITY IS MAYDAY.

OH, I KNOW-YOU HAVE HEARD IT WHEN THERE WAS NO EMERGENCY, BUT, IF YOU YIELD AND IT IS NOT AN EMERGENCY THEN HE IS THE DUMMY. BUT IF IT IS AN EMERGENCY AND YOU DON'T YIELD INSTANTLY, YOU MAY BE CAUSING DELAY IN HELP THAT IS NEEDED IN A HURRY. C. Y., WB5TKG

DUPLEXERS--HOW DO THEY WORK?

IN THE COURSE OF WORKING ON DUPLEXERS USED ON REPEATERS, I LEARNED SOME INTERESTING THINGS ABOUT HOW DUPLEXERS WORK AND AT THE RISK OF OVERSIMPLIFICATION I'LL OUTLINE WHAT I LEARNED.

THREE TYPES OF DUPLEXERS I STUDIED ARE BAND PASS, BP, BAND REJECT, BR, AND BAND PASS-BAND REJECT, BPBR. THESE TYPES ARE NAMED FROM THE TYPES OF FILTERS USED. REMEMBER THAT THE DUPLEXER HAS TO FILTER TRANSMITTER ENERGY OUT OF THE CIRCUIT GOING TO THE RECEIVER AND STEER SIGNALS FROM THE ANTENNA TO THE RECEIVER WITHOUT ALLOWING THE TRANSMITTER CIRCUITS TO HAVE AN EFFECT ON THEM. PRIMARILY WE ARE INTERESTED IN PREVENTING RECEIVER OVERLOAD FROM THE TRANSMITTER FUNDAMENTAL AND PREVENT NOISE ENERGY FROM THE TRANSMITTER, WHICH IS PRESENT ON THE RECEIVER FREQUENCY, FROM REACHING THE RECEIVER.

ALL DUPLEXERS I EXAMINED USED SOME FORM OF CAVITY AS PART OF THE FILTER DESIGN. REMEMBER THAT THE INCLOSED VOLUME OF A CAVITY REPRESENTS AN INDUCTOR. ALSO REMEMBER THAT THERE ARE TWO BASIC TUNED CIRCUIT CONFIGURATIONS. A SERIES TUNED CAPACITOR AND INDUCTOR, FIGURE 1, HAS A LOW IMPEDANCE AT RESONANCE AND A PARALLEL TUNED CAPACITOR AND INDUCTOR HAVE HIGH IMPEDANCE AT RESONANCE, FIGURE 2.

FIGURE 1

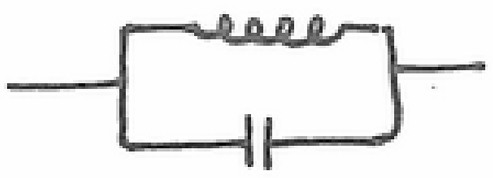


FIGURE 2

A CAVITY IS A TUNED CIRCUIT WHICH CAN BE REPRESENTED BY LUMPED INDUCTOR AND CAPACITOR. A CAVITY USED IN A BAND PASS CIRCUIT LOOKS PHYSICALLY AND SCHEMATICLLY LIKE FIGURE THREE.

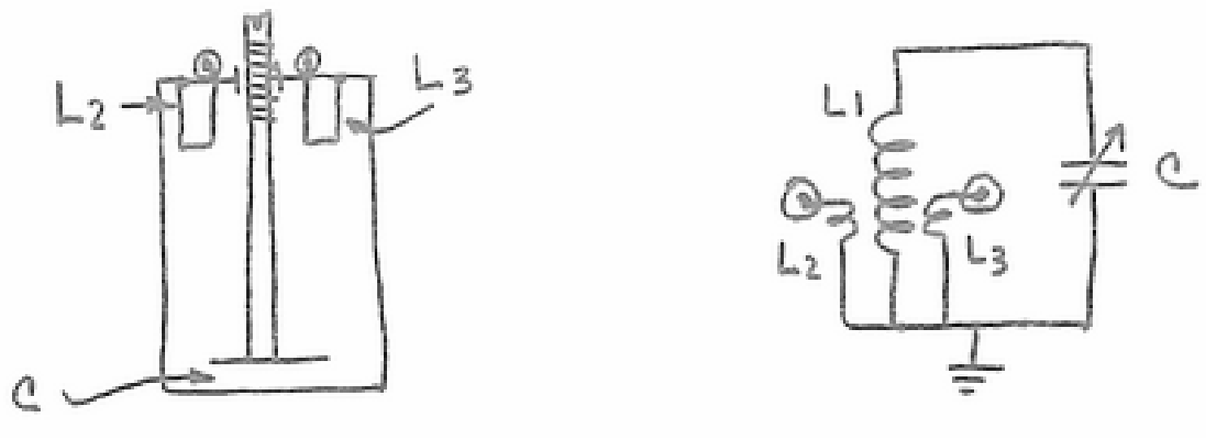


FIGURE 3. BAND PASS FILTER

L1 IS THE INDUCTANCE OF THE CONTAINER AND TUNING SHAFT. L1 AND C FORM A PARALLEL TUNED TANK CIRCUIT. L2 AND L3 ARE COUPLING LOOPS WHICH ARE DESIGNED TO REPRESENT 5Ø OHMS TO THE TRANSMISSION LINES. THEY ARE PLACED IN THE CONTAINER IN SUCH A WAY AS TO GET A SPECIFIC DEGREE OF COUPLING WITH THE MAGNETIC FIELD IN THE CONTAINFR. THE LIGHTER THE COUPLING, THE SHARPER THE TUNING OF THE FILTER BUT THE GREATER THE LOSS OF SIGNAL THROUGH THE FILTER. TYPICAL DESIGN LOSSES ARE Ø.5, 1.Ø, AND 1.5 DB REPRESENTING Q'S OF 34Ø, 65Ø, AND 92Ø RESPECTIVELY ON A TYPICAL LOADED 45Ø MHZ DUPLEXER.

TO TUNE THIS FILTER, A SIGNAL GENERATOR IS CONNECTED TO ONE TERMINAL AND A RECEIVER CONNECTED TO THE OTHER. BY WHATEVER METHOD IS CHOSEN, SWITCHABLE ATTENUATOR OR VARIABLE OUTPUT GENERATOR, THE FILTER IS TUNED FOR MAXIMUM SIGNAL TRANSFER. IT IS NECESSARY TO TERMINATE THE TRANSMISSION LINES WITH 5Ø OHM PADS AT THE CAVITY CONNECTORS TO PREVENT WILD RESPONSES FROM THE GENERATOR CAUSED BY REACTIONS FROM THE CAVITY INTERACTING WITH THE TRANSMISSION LINES.

A BAND REJECT FILTER LOOKS LIKE FIGURE 4.

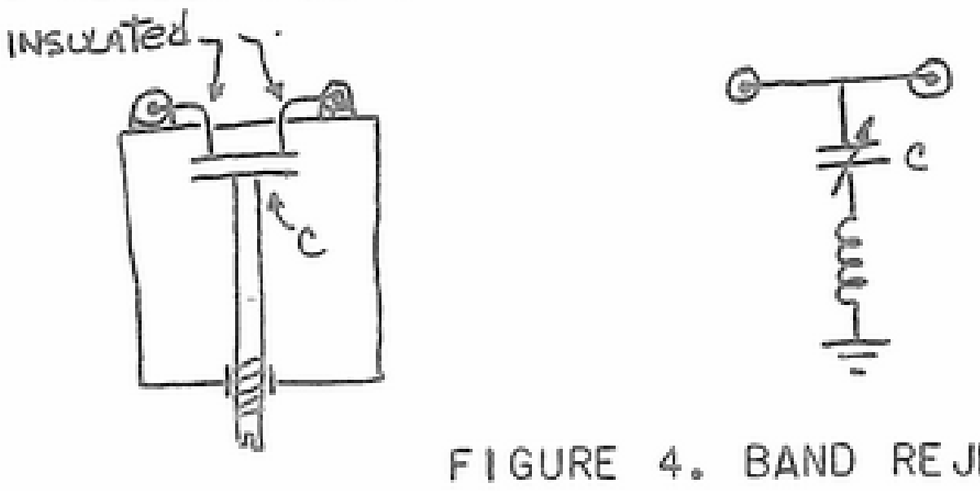


FIGURE 4. BAND REJECT FILTER

HERE AGAIN, THE WALL AND TUNING SHAFT OF THE CAVITY IS EQUIVALENT TO L. THE CAPACITOR IS ADJUSTABLE BY CHANGING LENGTH OF THE TUNING ROD. THE FIXED CAPACITOR PLATE IS ATTACHED TO THE CAVITY TERMINALS. WHEN TUNED TO RESONANCE, THE L-C CIRCUIT REPRESENTS A SHORT CIRCUIT TO SIGNALS AT THE RESONANT FREQUENCY.

THE RUB WITH THIS DESIGN IS THAT IT HAS TO BE PLACED IN THE PROPER PLACE IN A CIRCUIT. THE IMPEDANCE DOES NOT GO TO ZERO BECAUSE OF IMPERFECTIONS IN THE CIRCUIT. SIMPLY PLACED ACROSS A TRANSMISSION LINE, THIS TYPE OF FILTER WOULD BE UNPREDICTABLE UNLESS LENGTHS OF TRANSMISSION LINE, AS RELATED TO MULTIPLES OF QUARTER WAVELENGTHS, ARE CONSIDERED. WHEN A TRANSMISSION LINE TERMINATES IN ANYTHING OTHER THAN ITS CHARACTERISTIC IMPEDANCE, IT ACTS FLAKEY. ONE QUARTER WAVELENGTH AWAY FROM A SHUNT, THE IMPEDANCE OF A LINE IS VERY HIGH. THIS FEATURE IS USED BY A DESIGNER TO STEER SIGNALS AWAY FROM DIRECTIONS WHERE THEY AREN'T WANTED. IT MUST BE CONSIDERED ALSO THAT UNDESIRABLE CIRCUITS MIGHT DEVELOP IF, FOR EXAMPLE, A SERIES TUNED CIRCUIT, TUNED TO THE TRANSMITTER FREQUENCY, WOULD APPEAR ONE HALF WAVELENGTH AWAY FROM THE TRANSMITTER, OR A PARALLEL TUNED CIRCUIT SHOULD TERMINATE A LINE ONE QUARTER WAVELENGTH FROM THE TRANSMITTER. EITHER WOULD APPEAR AS A SHORT CIRCUIT.

THE DUPLEXER I HAVE WAS PICKED UP IN A FLEA MARKET. IT WAS DESIGNED

FOR MOBILE USE IN THE 45Ø MHZ BAND. IT HAS THREE CAVITIES ON THE TRANSMIT SIDE AND ONE CAVITY ON THE RECEIVE SIDE. IT IS BASICALLY A BAND REJECT DUPLEXER BUT DOES HAVE PROVISIONS TO TUNE OUT RESIDUAL REACTANCES ON THE FREQUENCIES IT IS DESIGNED TO PASS. FOR EXAMPLE, THE TRANSMITTER SIDE OF THE DUPLEXER LOOKS LIKE FIGURE 5.

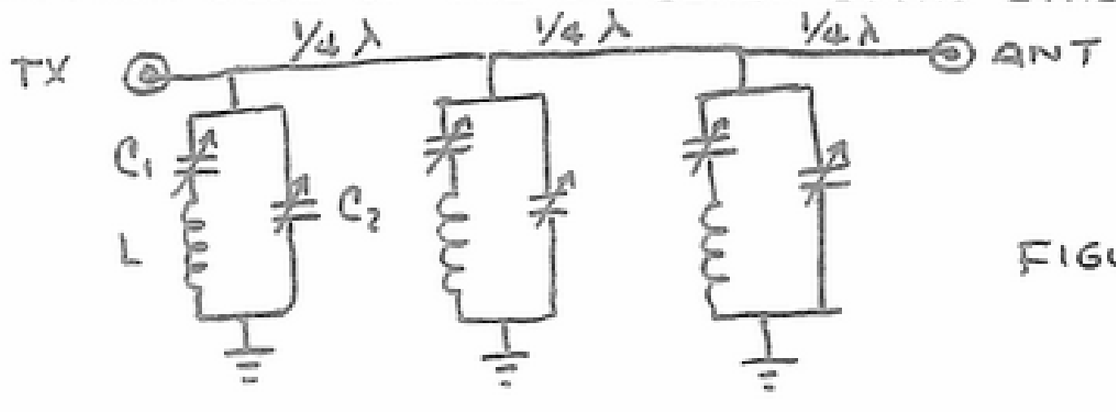


FIGURE 5.

THE THREE FILTERS ARE IDENTICAL. C1 AND L ACT AS A SERIES TUNED CIRCUIT AS DESCRIBED IN FIGURE 4. BELOW RESONANCE, THIS PAIR BECOMES CAPACITIVE AND, WHEN COMBINED WITH C2, SIMPLY COMBINE A SHUNT CAP-ACITANCE ACROSS THE TRANSMISSION LINE. THIS, NO DOUBT, ACTS IN CONJUNCTION WITH THE TRANSMISSION LINE LENGTHS BETWEEN CAVITIES TO HAVE SOME EFFECT ON THE SYSTEM BUT WHAT IS MORE IMPORTANT IS WHAT HAPPENS ABOVE RESONANCE.

ABOVE RESONANCE, THE COMBINATION OF L AND C1 BECOME INDUCTIVE. THIS INDUCTANCE IN COMBINATION WITH C2 FORMS A PARALLEL RESONANT CIRCUIT. C2 IS ADJUSTABLE AND THE FREQUENCY OF THE COMBINATION IS ADJUSTED TO THE TRANSMIT FREQUENCY. THE BANDPASS CHARACTERISTICS LOOK LIKE FIGURE 6.

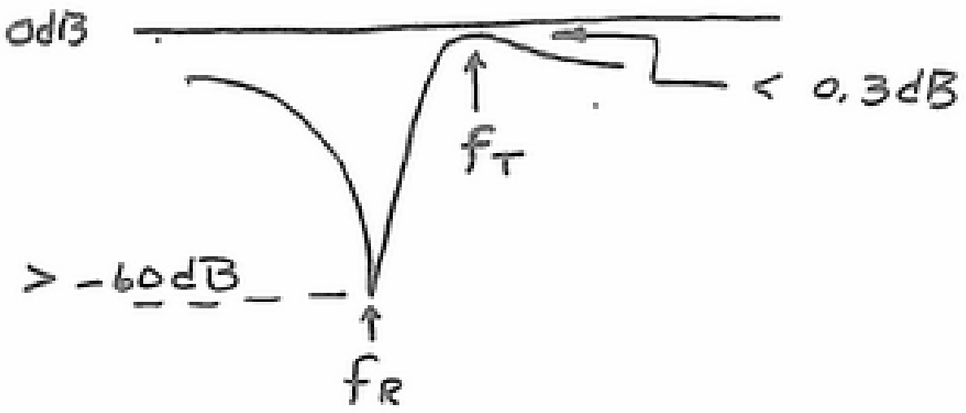


FIGURE 6. FREQUENCY RESPONSE OF DUPLEXER, TRANSMIT SIDE.

THE SHUNT CAPACITOR, C2, DOES NOT APPEAR TO HAVE MUCH EFFECT ON THE FILTER WHEN IT IS OPERATING AT THE REJECT FREQUENCY. THE FILTER CAN THEREFORE BE TUNED BY FIRST ADJUSTING C1 THEN TUNING THE PASS FREQUENCY BY ADJUSTING C2. GOING BACK AND RETUNING C1 HAS LITTLE EFFECT ON THE REJECTION.

THE RECEIVE FILTER IN THIS DUPLEXER USES A SHUNT COIL RATHER THAN A CAPACITOR AND IT IS NOT ADJUSTABLE. BECAUSE OF THE RELATIVELY LOW Q OF THE SHUNT COIL, THE PASS FREQUENCY IS RATHER BROAD AND IS LIMIT-ED TO A FREQUENCY APPROXIMATELY 5 MHZ LOWER THAN THE REJECT FREQUENCY.

MOST BAND PASS-BAND REJECT DUPLEXERS USE A DIFFERENT PRINCIPLE FROM MY DUPLEXER TO GET A PASS AND REJECT CURVE WHICH LOOKS LIKE FIGURE 7. ALSO, SHOWN IN FIGURE 7 IS A SKETCH SHOWING A CAPACITOR ADDED TO THE BASIC BAND PASS DUPLEXER. THE INPUT AND OUTPUT COUPLING LOOPS ARE POSITIONED IN ORDER TO GET SOME DEGREE OF MUTUAL MAGNETIC COUPLING. AT THE REJECT FREQUENCY, THERE IS A CERTAIN AMOUNT OF ENERGY BEING TRANSFERRED BETWEEN COUPLING LOOPS BY MAGNETIC COUPLING, CAPACITIVE

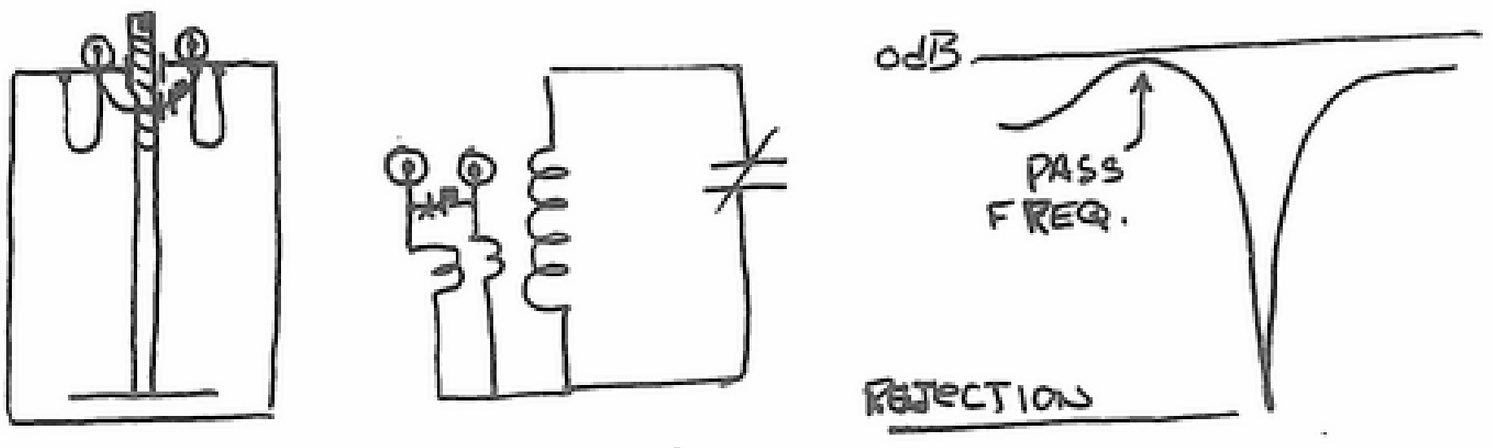


FIGURE 7. BAND PASS-BAND REJECT FILTER

COUPLING AND TRACE TRANSFER OF ENERGY THROUGH THE CAVITY ITSELF. THE ADDED CAPACITOR COUPLES ENERGY DIRECTLY BETWEEN COUPLING LOOPS IN THE PROPER PHASE AND MAGNITUDE TO CANCEL ENERGY AT THE REJECT

FREQUENCY.

THIS LATTER TYPE DUPLEXER IS THE ONE IN COMMON USE ON THE REPEATERS AROUND TOWN. ON THE 444.1 UHF REPEATER, THE 6 CAVITY DUPLEXER HAS A PASS LOSS OF LESS THAN ONE DB AND ISOLATION OF APPROXIMATELY 120DB.

A BANDPASS DUPLEXER WOULD BE BETTER BUT RECEIVER SENSITIVITY WOULD BE SACRIFICED. BAND REJECT DUPLEXER WILL NOT WORK IN A DENSE RF ENVIRONMENT. THE BEST COMPROMISE IS THE BPBR TYPE. ON TWO METERS, THE TYPICAL SIX CAVITY DUPLEXER HAS A TOTAL INSERTION LOSS OF LESS THAN 0.8 DB AND ISOLATION IN EXCESS OF 90 DB WITH 600 KHZ SEPARATION BETWEEN RECEIVER AND TRANSMITTER FREQUENCIES.

AMATEURS ARE SOMEWHAT STUCK WITH HIGH PRICED COMMERCIAL DUPLEXERS BECAUSE OF ONE PROBLEM IN DESIGN AND CONSTRUCTION. IF A DUPLEXER IS NOT COMPENSATED FOR THERMAL EXPANSION IT WOULD GO OUT OF TUNE WITH TEMPERATURE VARIATION. THE DEVICES ARE FAIRLY SIMPLE TO MAKE EXCEPT FOR THERMAL COMPENSATION.

ANDY GUMP, K5KZV, GAVE ME A CAVITY FILTER HE MADE OUT OF AN EMPTY REFRIGERANT CONTAINER. I INTENDED TO WRITE AN ARTICLE ABOUT IT SOMEDAY WHEN I UNDERSTOOD MORE ABOUT IT BUT UNTIL THE THERMAL PROBLEM IS LICKED, I WOULD NEVER BE SATISFIED WITH MY KNOWLEGE OF IT.

JOE, K5JB

A POWERFUL GOOD IDEA

WHILE IN THE PROCESS OF STUDYING THE TEN METER CONVERSION OF A CB SINGLE SIDE BAND RIG, MIKE, N5MS, AND I WERE LOOKING AT WHAT WAS REQUIRED TO TUNE THE POWER AMPLIFIER STAGE. MIKE, WHO HAS A MORE SOPHISTICATED ACADEMIC BACKGROUND THAN I, NOTICED THE POWER AMPLIFIER WAS VERY LOW IMPEDANCE, SINCE IT WAS SOLID STATE. HE SUGGESTED THAT THE VOLTAGE SWING OF THE OUTPUT WOULD BE RELATIVELY UNEFFECTED BY VARIATIONS IN THE LOAD PLACED ON IT.

WITH THE RADIO CONNECTED TO WATTMETER AND DUMMY LOAD, WE MEASURED 8 WATTS OUTPUT WHEN WHISTLING INTO THE MIKE. IT OCCURRED TO US THAT IF WE COULD LOWER THE RESISTANCE OF THE LOAD, THE VOLTAGE WOULD REMAIN CONSTANT AND POWER WOULD BE INCREASED BY INVERSE PROPORTION TO THE CHANGE IN RESISTANCE SINCE THE CIRCUIT WOULD FOLLOW THE POWER FORMULA $P=V^2/R$

TO TEST THE THEORY, I FABRICATED A TRANSFORMER USING A FERRITE TOROID OUT OF MY JUNK BOX. THE CIRCUIT WAS LIKE FIGURE 1.

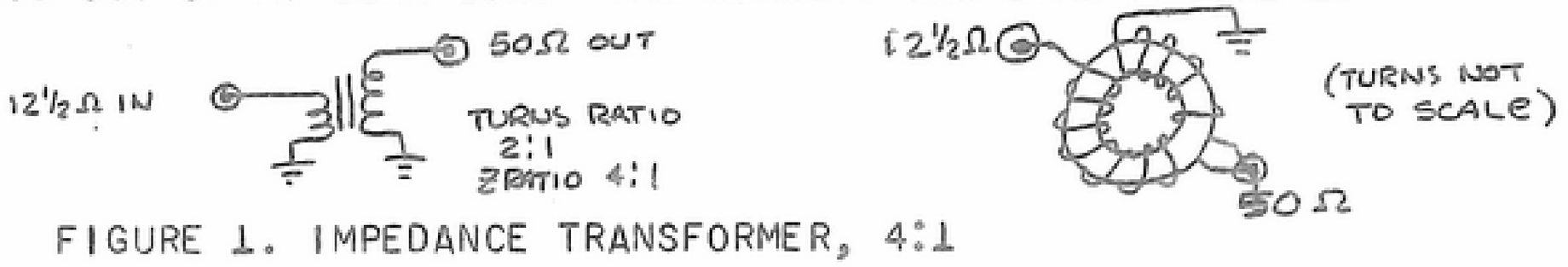


FIGURE 1. IMPEDANCE TRANSFORMER, 4:1

THE TRANSFORMER WAS WOUND WITH TWO WINDINGS HAVING A TURNS RATIO OF 2:1. ONE WINDING HAD 12 1/2 TURNS, THE SECOND HAD 25 TURNS. FOLLOWING THE IMPEDANCE FORMULA $Z1/Z2 = N1/N2^2$, THE IMPEDANCE RATIO IS FOUR TO ONE. WITH THE 25 TURN SIDE CONNECTED TO A 50 OHM LOAD, THE 12 1/2 TURN SIDE PRESENTS AN IMPEDANCE OF 12 1/2 OHMS TO THE TRANSMITTER. IF WE REDUCE THE RESISTANCE IN THE POWER FORMULA TO 1/4 ITS PREVIOUS VALUE, THE POWER WOULD INCREASE TO FOUR TIMES ITS PREVIOUS VALUE. IN THEORY, THE TRANSMITTER WOULD BE ABLE TO PUT 32 WATTS INTO THE DUMMY LOAD.

TO FURTHER ILLUSTRATE THE THEORY, CONSIDER A 100 WATT LIGHT BULB CONNECTED TO THE 120 VOLT MAINS. THE BULB HAS A RESISTANCE OF 144 OHMS. IF FOUR BULBS WERE WIRED IN PARALLEL, THEY WOULD HAVE A COMBINED RESISTANCE OF ABOUT 36 OHMS FROM THE FORMULA:

$$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \frac{1}{R_4}$$

THE POWER CONSUMED, FROM THE FORMULA $P = \frac{V^2}{R}$ WOULD BE ABOUT 400 WATTS.

THIS MAKES SENSE WHEN YOU CONSIDER THAT FOUR 1ØØ WATT BULBS WILL CONSUME FOUR TIMES AS MUCH POWER AS A SINGLE BULB.

ENOUGH OF THE THEORY. WE HOOKED IT UP AND TRIED IT. THE WATTMETER NOW SHOWED 3Ø WATTS. WE FIGURED THE TWO WATT DIFFERENCE BETWEEN THEORY AND PRACTICE WAS ACCEPTABLE SINCE THE TRANSFORMER COULDN'T BE 1ØØ PERCENT EFFICIENT.

A LITTLE DEEPER RUMMAGE THROUGH THE JUNK BOX TURNED UP ANOTHER TOROID. WINDING A SECOND TRANSFORMER JUST LIKE THE FIRST AND CONNECTING IT BETWEEN THE FIRST TRANSFORMER AND THE WATTMETER JUST TOOK A FEW MINUTES. A WHISTLE NOW SHOWED 11Ø WATTS. BUT WAIT, ONE CAN'T GET SOMETHING FOR NOTHING. WHAT ARE THE DRAWBACKS?

THE TRANSISTOR IN THE AMPLIFIER, WHEN DEVELOPING 8 WATTS OUTPUT IS PROBABLY OPERATING WITH A MAXIMUM EFFICIENCY OF 6Ø%. TOTAL INPUT POWER WOULD HAVE TO BE 8/.6 OR 13.3 WATTS AND DISSIPATION WOULD HAVE TO BE 5.3 WATTS. AT THE 1ØØ WATT LEVEL, DISSIPATION WOULD BE 67 WATTS. WE VERIFIED THIS BY FEELING THE HEAT SINK WHICH WAS QUITE WARM. THE DRAWBACK IS THAT THE TRANSISTOR COULD BE EASILY OVERHEATED UNLESS TRANSMISSIONS WERE KEPT SHORT.

SINCE THE TRANSFORMERS WERE BROADBANDED WE TOOK A SHOT AT TESTING THE CIRCUIT ON TWO METERS. FIRST TESTING THE OUTPUT OF THE IC-23Ø SHOWED 1Ø WATTS WITHOUT THE TRANSFORMERS. WITH THE TRANSFORMERS CONNECTED, THE RIG WAS KEYED AND THE WATTMETER JUMPED TO 12Ø WATTS. THIS WAS A BIT LOW FROM THE VALUE THAT THEORY TELLS US WOULD BE AROUND 16Ø WATTS, LESS THE TRANSFORMER LOSS, OF COURSE. MIKE AND I FIGURED THE TOROIDS MUST BE 1ØØ WATT TOROIDS AND TO IMPROVE EFFICIENCY WE WOULD HAVE TO GET SOME BETTER ONES.

FOR YOU WHO WOULD LIKE TO DUPLICATE OUR EXPERIMENTS, MY BEST GUESS ON THE TOROIDS IS THAT THEY WERE ARMIDON 4-1-79. A BETTER TRANSFORMER WOULD BE ONE WHICH USED QUARTER WAVE SECTIONS OF TRANSMISSION LINES TO PERFORM THE IMPEDANCE MATCH. TWO SECTIONS OF 5Ø OHM COAX CONNECTED IN PARALLEL WOULD HAVE AN IMPEDANCE OF 25 OHMS. A Q SECTION OF 25 OHMS CHARACTERISTIC IMPEDANCE WOULD TRANSFORM THE 5Ø OHM ANTENNA IMPEDANCE DOWN TO 12 1/2 OHMS. A SECOND SECTION OF 6 1/4 OHM CHARACTERISTIC IMPEDANCE WOULD MAKE THE SECOND TRANSFORMATION JUST LIKE THE SECOND TOROID.

MORE DETAILS WILL FOLLOW IN THE APRIL 198Ø C&E JOE, K5JR

FOR SALE: Brand new Icom IC-211 multi-mode 2 meter transceiver complete with michrophone, in box, with warranty card. Price new $980 sell for $700, negotiable. Robby, AAØO, phone 373-1818.

FOR SALE: Icom IC-20 10w/1w 2m mobile with crystals for most local repeaters. Complete w/mobile bracket, cables & Mic. $125.00. Ray, WB5WCL, 794-2286/794-1573.

FOR SALE: Motorola HT-220 2w slimline. Crystals for 34/94, 07/67, 94/94, 22/82. one blank. Nearly new battery. Telescop antenna, rubber duck & PL-259 adapter cable.Battery charger, test adapter, misc parts and manuals. $350 takes all. Hottest receiver I've heard. Ray, WB5WCL, 794-2286 or 794-1573 (office).

FOR SALE: FT-101E Yaesu, late model, like new. $675. HR2B Regency full of xtals. used very little, mint, $210. TA33 Mosley beam, good condition, $150. All of this equipment guaranteed in prrfect condition. Harry Watts, WB5DGT, Vici OK 73859, Phone (405) 995-4761.

Want 14 elements on 2 meters? I have a pair of Cushcrft 7s, with harness and hardware, for sale. $25. Or maybe you would like a Hammarlund HQ-145 general coverage receiver, truly mint, $150. WB5TZZ, Jack, 329-1311 in Norman.

FOR SALE: Heath SB-102 transceiver, HP-233 power supply, SB-600 speaker, $370.00 for all three. Heath HP-13B DC power supply, $40.00, Hammerlund SP-600 receiver, broadcast thru 6m, $150.00. All manuals included. Art,W5PTM, 732-8401.

Central Oklahoma Radio Amateurs Inc.

All Clubs Co-operating To Advance Amateur Radio

COMMENTS ON RADIO ACTIVITIES

The February 1979 meeting of Central Oklahoma Radio Amateurs was called to order at 1940S on the 27th by President Mark WD5DYI with 28 members and guests.

Copies of the Minutes of the January meeting were distributed to the Representatives and published in the March issue of Collector and Emitter. Minutes were approved as written.

The Treasurer's report was approved as read.

Old Business: Paul WA5HTL, moved, Bob WB5NSV seconded to repay Joe WA5ZNF $3.98 over estimated cost of ID buttons and stamp machine (to be used for HH79 registration) and the motion passed without discussion.

Each club's representatives reported little interest in establishing a "QSO OKLAHOMA PARTY" but stated that, generally, their members would assist in an existing program - any takers?

Bob WB5NSV reported that the floppy diskette memory system was on order and as of this writing has arrived and only awaiting minor assembly. (And between Bob WB5NSV, Bob WA5CJG and incalculable aid of Joe WD5BMP, the printer is working!)

Official vote was taken accepting Wheatstraw Amateur Radio Club into CORA membership, unanimously.

Committee Reports: Mark WD5DYI reported that ARRL has approved Ham Holiday 79 for State Convention time and site (27-29 July 79, Lincoln Plaza, 4445 Lincoln Blvd, Oklahoma City, in case you weren't sure).

Facilities: Merrill WB5PTQ reported that the flea market in Lincoln Plaza's Western room will be open from 0700 to 2200 Saturday, 28 Jul 79, and will not close at 1700 as was erroneously rumored last year, causing scatter. Also, there will be absolutely no commercial exhibitors in the Flea Market, they will all be in suites on the second floor. Lincoln Plaza has made an offer on facilities in writing and we have as good a deal as '78: meeting rooms, flea market, banquet room, Exhibitors' rooms and no requirement for guests to occupy rooms at Lincoln. Committee chairpeople and CORA officers will meet 17 March to firm committments on facilities, etc. Minutes of this meeting will be found elsewhere.

Programs: The OU Club anxiously requests any and all assistance established amateurs may provide their rejuvenating club in providing a good HH79 program for us all -- notify your officers, CORA officers, or your CORA rep, or James KA5DHF Gardner, Norman or Nathan KB5BF if you can help, have a program lined up or an idea to share---

Ladies': Bob WA5CJG presented a complete Ladies' program including fashion shows, microwave cooking, solar energy and others. Bob WB5NSV moved, Paul WA5HTL seconded that CORA buy bingo equipment and 300 cards for HH79 and interim use by member clubs in the future. Motion passed unanimously.

Prizes: WILL BE SURPRISES! (And good ones, too... Ed.)

Publicity: Bob W5HXL said the committee will send a publicity flyer to Lawton Hamfest, 24, 25 March, and Carl W5JJ has volunteer labor lined up to write a dozen or more letters as soon as he has a letterhead provided, if one exists, which it does.

New Business: Joe WA5ZNF reported CORA was short on paper stock for C&E but he was comparing sources for better deals and would report on his results at a later date.

CORA COMMENTS

CONTINUED:

Edmond Amateur Radio Society (EARS), through its members present, Howard WD5IDB, Ken WD5HXK and Bill WA5ZLW, sought information from CORA about becoming affiliated. Much questioning provided them many answers to take back to their club meeting 18 Mar at 1400 S, Rm 205 Science Bldg., CSU campus, Edmond. They will return to CORA 27 Mar with their results.

Remainder of the meeting was taken up deciding on particulars of the budget for HH79 in order to keep the treasury balanced, resulting in an income after expenses of $195.00. Those desiring copies and/or explanations of the budget may query their CORA reps or its officers as space precludes their inclusion here.

Meeting was adjourned for coffee, donuts and departures at 2200 S.

Respectfully submitted,
For the secretary,

Jim Buswell

JIM BUSWELL

P.S.:

Committee Chairmen for Ham Holiday '79 convened at 1605Z at Oklahoma Central Red Cross on St. Patrick's Day with 13 representatives present.

It was determined that there will be only two meals provided under auspices of HH79: QCWA breakfast Sunday Morning (Ham, Eggs, etc: $5.10) and Concluding Banquet (full-course dinner for $7.25). There will be no ladies' luncheon.

The address for Pre-Registration ($4 fee for all attendants) was announced as P.O. Box 14424, Oklahoma City, OK 73113. The suggested form and requested information for pre-registration may be found elsewhere in this issue: Name, Call and $4-fee for each person attending and number of your party desiring the meal reservations (QCWA Breakfast and the Banquet).

The Programs committee requests your assistance in a presentation of Amateur T.V. and "Narrow Band." Contact your CORA representative or CORA officers if you can assist in any way.

The Prize committee is being mysterious!, but assures us that all prizes will be worth the suspense!

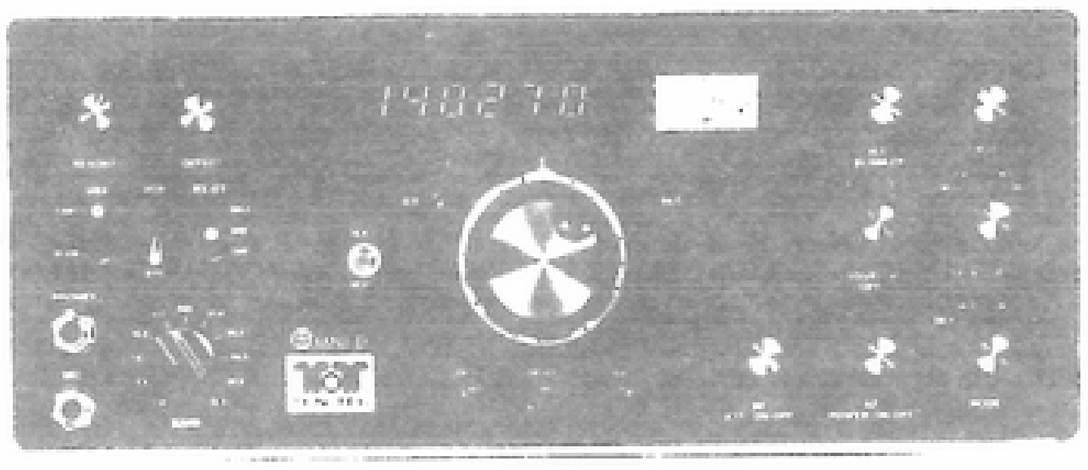
Publicity flyers are being provided to Lawton's Ham Fest and Wichita Falls' amateur radio clubs, among others.

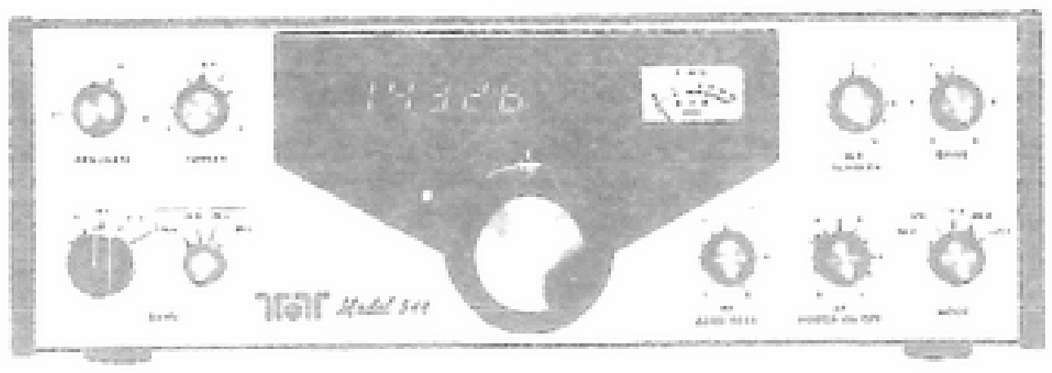
In other business, it was also announced that the dual-drive floppy-disk system for our computer is fully operational and being loaded with the mailing list (and probably made the label on the issue you're now reading).

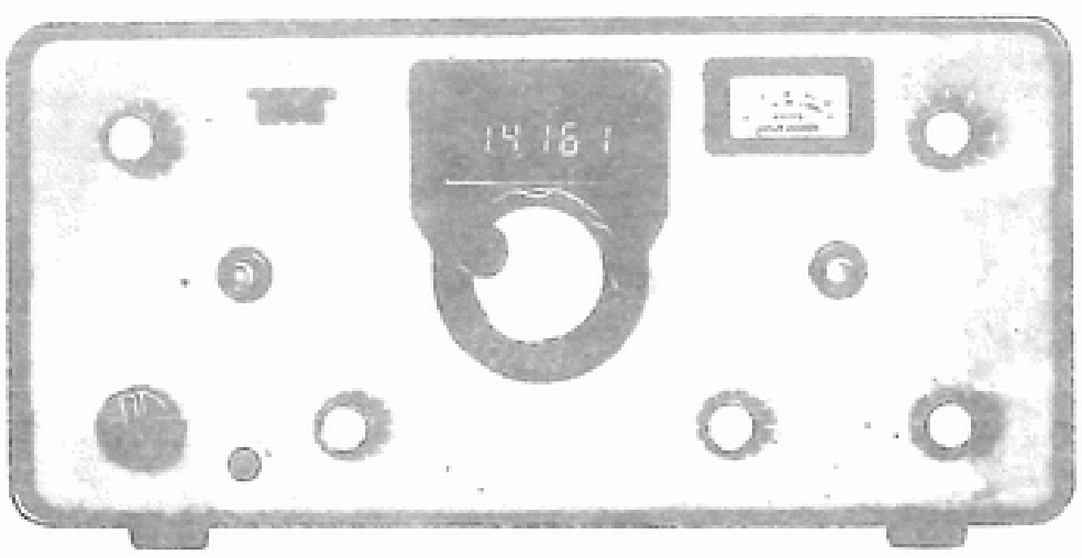
Meeting adjourned at 1745Z.

Respectfully submitted
FOR THE SECRETARY
JIM KA5EET

GET THE BEST QUOTE FIRST







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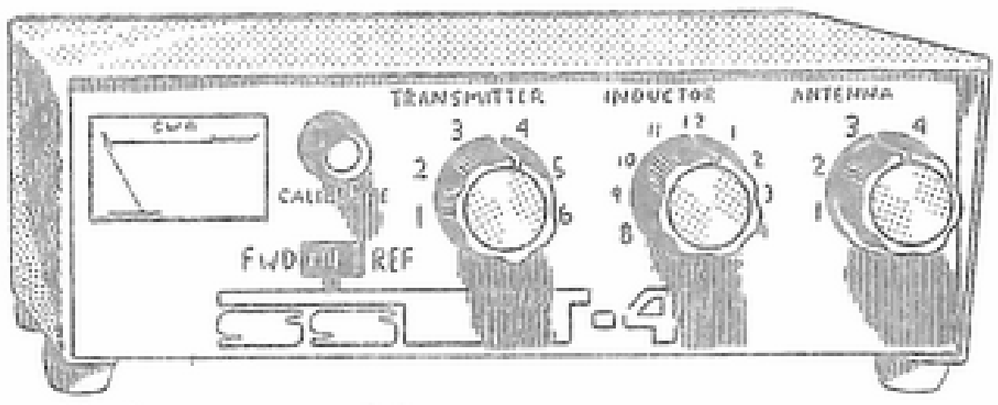

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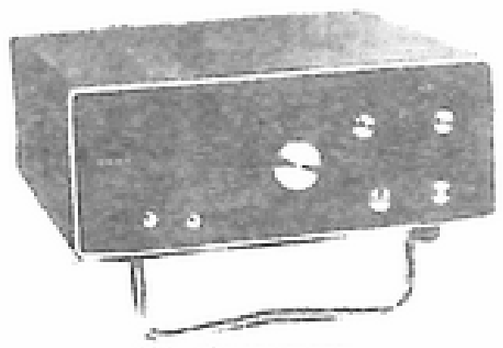

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NI-CAD BATTERIES--A POTENTIALLY ELECTRIFYING SUBJECT (Part II)

When last we left our intrepid discussion concerning Ni-Cad batteries, we had just finished a brief discussion concerning the discharge characteristics of these most interesting batteries. Incidentally, before I forget, I need to diagram the answer to the series charge-parallel discharge circuit for three batteries. There wasn't that much interest, but I drew the circuit out anyway. Anyway, the circuit is as follows:

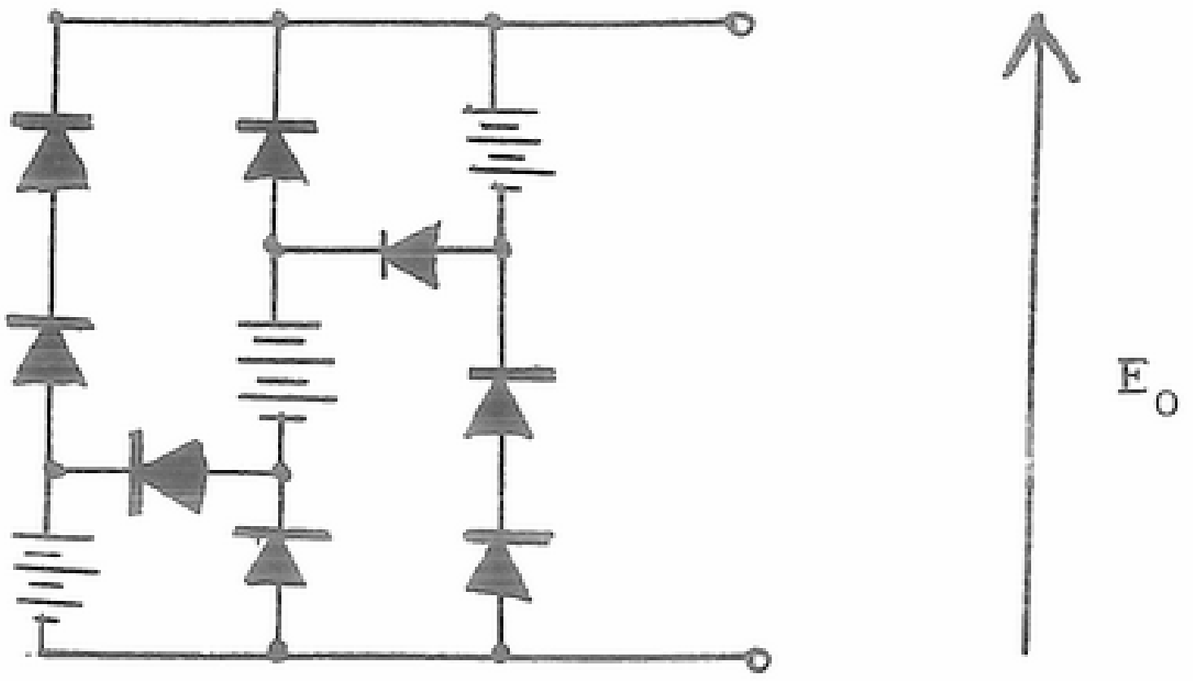


Figure 1. Series Charge-Parallel Discharge for Three batteries

Yeh, Yeh. You knew anyway. In any case, the extra diodes are used to compensate for the difference between each leg of the discharge paths. Remember, the output voltage for the discharge path will be reduced .7 Volt for each diode in the discharge path. (.34 Volt if you use germanium diodes instead of silicon).

To digress briefly before continuing the discussion concerning the charge characteristics of ni-cads, Remember that the discussion presented last month and the continuation this month concerned sealed cell type ni-cads. Ni-cads also come in a vented variety which find many uses in high current industrial uses. I have seen large aircraft ni-cad batteries rated above 25 amps that could provide hundreds of amps for cranking large engines. The chemical equation for vented cells is different during overcharge conditions. The net result is that continous overcharge is allowable because the electrolyte is renewable. The rate of electrolyte loss is controllable by controlling the rate of overcharge. This is generally done by using a constant voltage charge method much as for the basic lead acid cell. Electrolyte level is kept at an excess, but much be watched as part of a regular maintenance schedule where de-ionized water is added at regular intervals. Continued use of vented cells in an overcharge condition and insufficient electrolyte level may result in low capacity, depressed voltage during discharge, and cell degradation due to overheating during charging and discharging.

Charging Characteristics

There are essentially two methods of charging nicad batteries, constant voltage and constant current. The charging method selected is generally determined on the basis of the type of service and the battery characteristics. In any case, the charging voltage must be greater than the terminal voltage of the battery being charged. Factors such cost, cyclic or float operation, depth of discharge, recharge time, battery service life, operating temperature range, available power sources, and other requirements will influence the selection of the charging system.

Constant Voltage Charging. The constant voltage charger may be as simple as the transformer and diode shown in Figure 2. This is essentially a taper current charger. That is, when the battery being charged begins its cycle, its

voltage will generally be much lower than the open circuit voltage of the output from the charger. Since the resistance of the battery is very low, the charge current will be limited only by the resistance of the transformer secondary winding, the internal resistance of the battery, and other "stray" resistance.

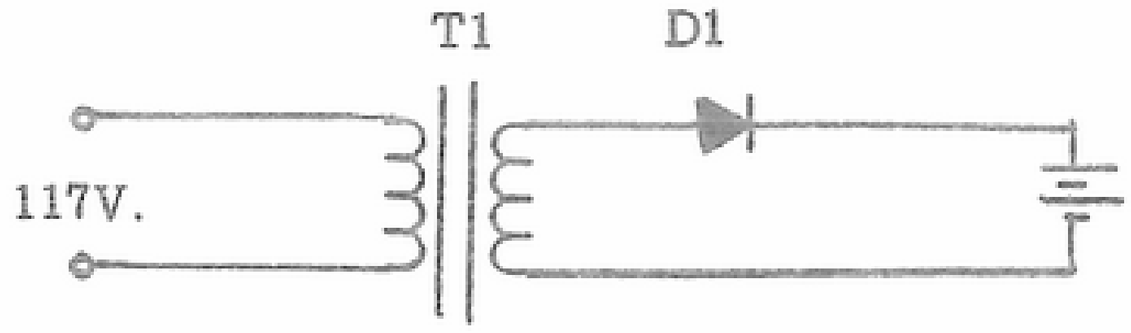


Figure 2. A simple constant voltage charger.

The voltage that appears across the battery is a function of the secondary voltage of the transformer and the line voltage applied. Odviously, it would be an improvement if the voltage were regulated. This can be done by the use of a zener diode or other type of voltage regulator. Or if you are charging a single cell, you can use three diodes in series to provide a constant voltage potential across the cell as shown in Figure 3. A constant voltage charger with a zener diode and a pass transistor is shown in Figure 4. Another simple constant voltage charger using a LM309 appears in Figure 5. In this circuit, the ground terminal of the regulator is floated above ground by the use of the voltage divider network R2 and R3. The regulator will work to keep the voltage between Pin 2 and Pin 3 of the regulator at 5 volts. The charging voltage is then the voltage from the wiper of R3 to ground plus 5 volts. Remember, the ground of the LM309 (or the ground terminal Pin 3) is now above ground potential and its case must be isolated in its heat sink mounting. The LM309 is capable of supplying about 1 amp for charging. If more is needed, then an additional pass regulator can be added from the output of the LM309 to increase the current handling capabilities. For most HT batteries, the 1 amp output should be more than sufficient.

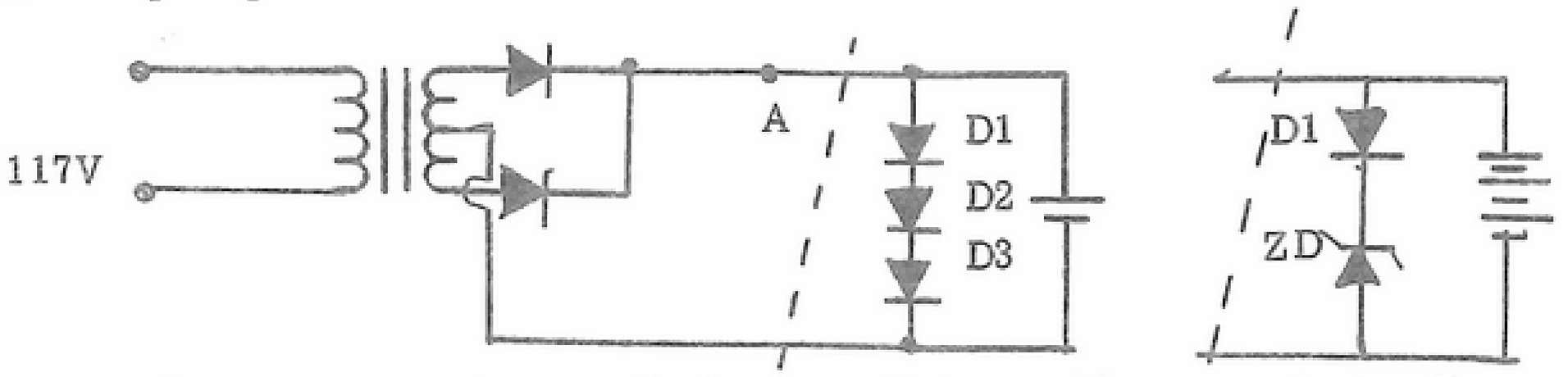


Figure 3. A simple single cell charger which provides a constant voltage output across a single cell for charging. Voltage drop will be approximately 3 x .7V or about 2.1 volts. This will represent a slight overcharge when the charge cycle is finished. This circuit can be extrapolated to as many cells as you like by just adding additional diodes or even a zener diode to keep the voltage just slightly above the fully charged voltage of the cells. It might be a good idea to ad some type of resistance in series with the output from the full wave center tap at point A to limit the maximum charge current to some value which will not overheat the diodes from excessive current. A zener circuit is also shown. Diodes such as D1 can be added to "fine tune" the voltage to that needed.

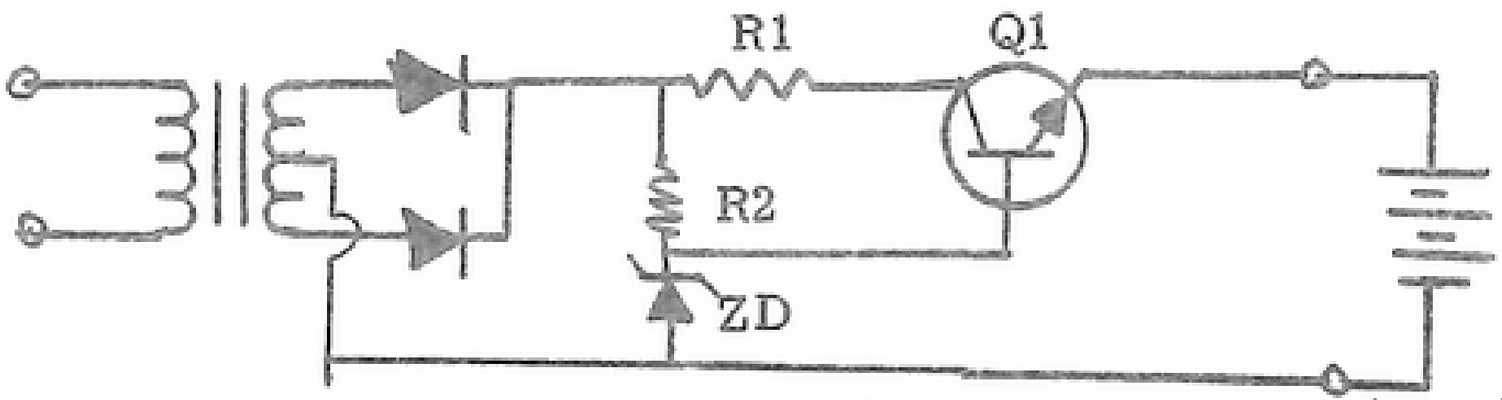


Figure 4. A constant voltage charger using a pass transistor to increase current handling capability. Q1 can be a 2N3055 or similiar type.

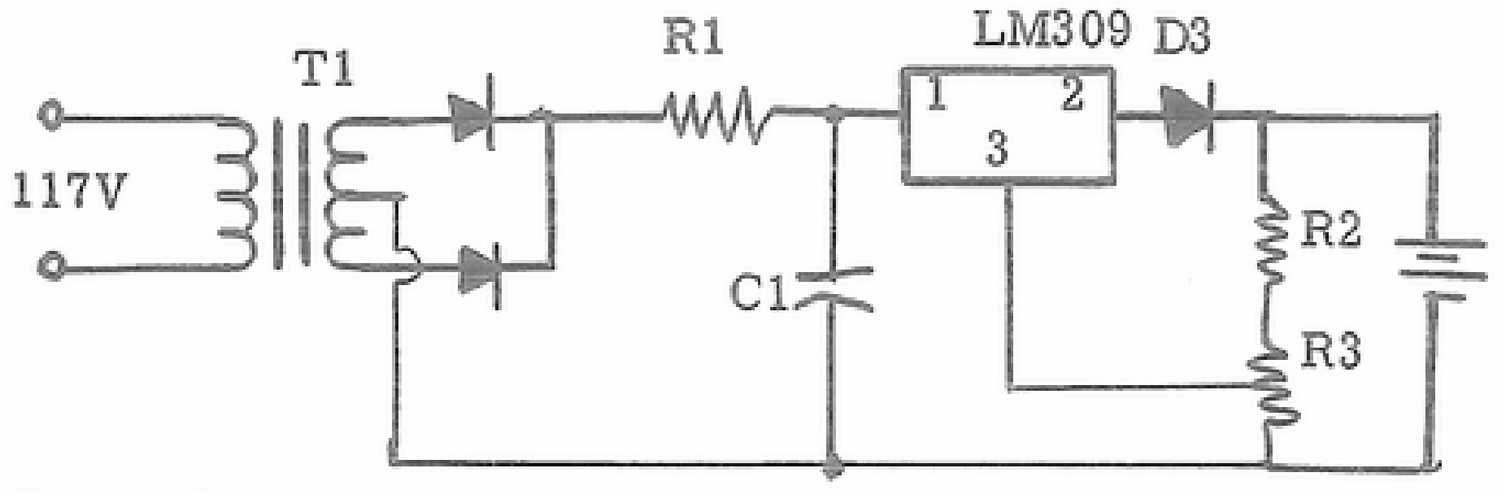


Figure 5. A constant voltage charger adjustable by raising the case ground of an LM309 above battery ground. D3 prevents the battery from acting as a current source should the AC power be turned off and damaging the regulator.

Parts List:
C1 - .22 Mfd
D1, etc - 1N4001 or equ.
R2 - 220 Ohm, 1/2 watt
IC - LM309
T1 - Transformer 28.8VAC or higher
R1 - 3.75 Ohm, 12 Watt
R3 - 1K trimpot

The circuit in Figure 5 is a rather common configuration for a simple power supply of 1 amp capability with the addition of R1 to limit the charging current. The circuit will work for just about any voltage and battery combination by juggling the values of T1 and the R2, R3 combination. R2 limits the maximum voltage that you can raise the case ground of the LM309 and provides a greater adjustment capability for R3.

Adjustment of a constant voltage regulator-charger is made by inserting a fully charged battery into the charging sleeve with an ampmeter in series with it. Adjust the charging current so that it it between .05 to .1 of the Capacity of the battery. For a 450 ma battery (a common HT size), this would be from 22ma. to 45 ma. When the battery has finished charging, the current rate should be this value. Typical ni-cad batteries can sustain this amount of overcharge for a day or so before any substantial heating occurrs. Remember that if the battery is just about completely discharged, the initial charging current can be quite high. It will taper off somewhat as the battery comes up to terminal voltage. Under the circumstances, the battery should reach full charge (depend-upon its capacity and the charging current) within 4 or 5 hours. This beats the usual constant current charging rate of a standard 15 hours. Also remember that when a battery reaches its fully charged state, the additional current that flows into the battery is converted directly to heat. That is why sustained overcharge is discouraged. Charging itself is inefficient in that part of the energy that flows into the battery during the charge cycle is converted to heat. This is however, dependant upon the internal resistance of the battery which for the typical ni-cad is quite low. Thus ni-cads can take some pretty heavy currents during charging. This is further discussed in the next section on constant current charging.

Constant Current Charging - As indicated, during constant voltage charging, the initial charging current may start out quite high, then taper off as the terminal voltage of the battery comes up. A ni-cad can also be charged by constant current application until the charging cycle is complete. The typical cycle of constant current charging is to charge the battery at .1 of its capacity for a period of 15 hours, thus accounting for an overcharge of approximately 50%. Most of this energy constituting the overcharge is converted to heat. At the end of the charging period, the battery is switched to a .01 of its capacity charge rate. A typical Motorola charger circuit for this type of cycle is shown in Figure 6. DS1 is a Neon NE51 bulb. Along with R1 and R2 and a 90 volt secondary voltage between the Brown and Red-Yellow, it provides a typical trickle rate of .01 C. DS2 is an 1819 bulb for slim chargers and the voltage between the Brown and Brown-Yellow wires is approximately 28 volts, greater than the 15 volt Battery it charges. DS2 is an 1829 bulb for the omni batteries

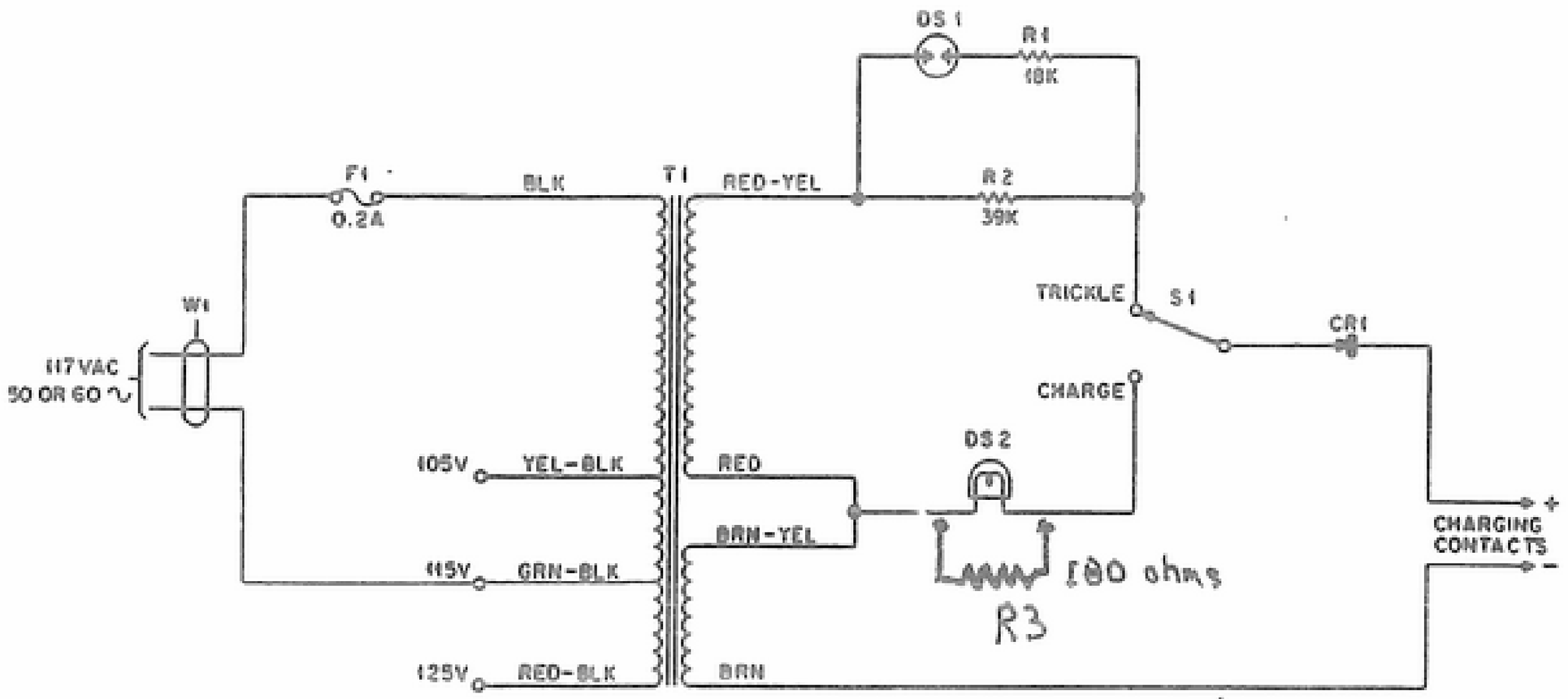


Figure 6. Typical Motorola Constant Current Charger featuring .1C and .01C regular and trickle rates. The omni battery charger has an additional resistor (R3) of 180 ohms to provide additional current for charging the higher capacity (450 ma versus 235 ma for slimline batteries) omni batteries.

(text)
which along with the 180 ohm resistor (R3) supplies about 45 ma for charging the bigger batteries. Both the 1819 and 1829 bulbs are 28 volt bulbs rated for approximately twice the charging current for their respective batteries. When placed in series with a 15 volt battery, the bulbs glow dimly and reduce the crrent passing through them to approximately half their rated value. For the value of the battery voltage that normally appear across the battery terminal, this will approximate a constant current source for the purpose of recharging.

You don't have to be limited to the 15 hour charge cycle for ni-cads. As indicated, the low internal resistance of the ni-cad means that you can draw a lot of current out of the battery without substantial voltage drop across the battery and internal heating. (not counting short circuits, these batteries can explode because of the extremely high short circuit currents they are capable of). This also means that you can recharge with large amounts of current approaching and exceeding the capacity of the battery. This means that one hour or less charge rates are entirely possible. After the battery has reached a fully charged capacity, the energy is then converted into heat which raises the temperature of the battery. Motorola uses this phenomenon to detect a fully charged battery during a rapid charge sequence. A tiny thermistor is placed in the Motorola battery which changes resistance with temperature. The temperature rise of a motorola battery upon charge completion is quite rapid and drastic as the case begins to heat up. This change in resistance is detected and used to switch the charge rate from a 1 hour rate to a 10 hour rate "trickle." Incidentally, Motorola claims that you can leave one of its rapid charge batteries indefinitely in a rapid charger at the 10 hour rate. I wouldn't do it and encourage it. It doesn't seem conducive to extended battery life. It might be all right in a commercial context where every battery is tax deductible, but I have trouble enough getting ahold of these batteries without cooking them in my rapid charger. I alway check to when the battery has switched to its 10 hour rate and remove the battery upon completion of the charge cycle.

Another method of rapid charging ni-cads is to dump a specified amount of energy into the battery in a specified period of time. This would involve a charge rate from two to five times the charge rate. This technique is presented in detail in an article in a recent issue of ham radio magazine (those people must think they are e. e. cummings the way they never capitalize

the name of my favorite hobby.) for February 1979 (excuse me that should be february) at Page 32 (darn, that's page). Simplistically, the technique is to discharge each cell in the batterycompletely (you have to discharge each cell individually to prevent cell reversal by discharging the entire battery with various cells of differing capacity). The author suggests that discharging can be accomplished at 4 times the rated one hour A-H current rating with a maximum of safety. Recharging can be done at the same rate. The author attaches an all to brief caveat at the last suggesting that lower charge rates might be safer and may prevent the ruin of a battery. I don't think that I will ever try his technique above 2 C for the simple reason that I am a chicken. Let's say that you have a battery which has developed a high internal resistance and you start putting a lot of current through it to charge it up. That internal resistance may lead to some big bad heating problems.

The Motorola rapid charger is too complicated to reproduce here. Motorola has added all kinds of complicated goodies to their circuit for a 1C rapid charger which detects the resistance change of the thermistor.

Incidentally, in some constant current charging applications, there is a growing conviction that a little bit of reverse current discharging the cell between charging cycles of a half wave charger such as the circuit shown in Figure 6. The theory here is that the process of chemical reformation is aided when a slight (about 10%) discharging current is applied during the alternate half cycles of the charging mechanism. This can be easily accomplished by adding a capacitor across the diode, CR1. This current should be adjusted by changing the value of the capacitor until about 10% of the current on charge is also being discharged. Since the capacitor also allows about 10% on the charge half cycle, the charge rate is actually .11C and .01 reverse which actually averages out to .10C. I haven't had the opportunity to experiment much with reverse charge during charge.

Another brief note to remember when building chargers, try to start out with a transformer value voltage of at least 1.5 times the voltage of the battery you are trying to charge. What with voltage drops and series resistances, you will approximate a constant current charger over much of the useful voltage range of the battery to be charged. As long as there is a sufficient resistance in series with the battery to limit the current, the battery should not be hurt in normal charging (.1C to .01C) except for extreme overcharge. These resistance values may be determined experimentally or you may wish to calculate them using a simple loop equation. Motorola's idea of using a simple lamp in series is good because the bulb has nonlinear characteristics for voltage versus current. The light bulb also offers a good indication that the battery is charging.

As indicated, standard 15 hour charge rates are .1C while trickle charge is .01C. Trickle charge is useful where a battery is allowed to stand on open circuit for extended periods of time. Most batteries lose their stored energy during such extended periods due to the fact that the active materials in the battery are in a thermally unstable state. The rate of self discharge is dependent upon the chemistry of the system and the temperature at which it is stored. While the performance of ni-cads at temperature extremes is superior to that of most other battery systems, a few precautions are in order for best cell life and safety. Try to charge and discharge batteries at room temperature. Low temperature charging may lead to a build up of hydrogen in the cell. Extended low temperature overcharge may cause this buildup to vent the safety valve in a sealed cell. Never attempt a rapid charge or a timed "dump" charge at low temperature unless you expect to see the inside of the battery the hard way. If it is necessary for you to have periodic charging at low temperature, use a charger that reduces the charge rate with temperature. Converta Com consoles installed in cars should be watched just in case you install a cold battery in a radio and drop it in your charger. Take care.

Constant voltage recharge is to be avoided unless you monitor the overcharge characteristics. This is for sealed cells. If you decide to build and use one of the constant voltage chargers described in this article use care when establishing the overcharge value and in fact you might tailor it for each different battery you use. In other words, there is a lot of difference in the amount of current that will flow in an overcharge condition for a 12 Volt battery than for a 15 Volt battery. One solution is to watch the charge and monitor the sealed cells charge progress. Constant current charging is generally not sensitive to voltage variations of the cell or battery being charged. In other words, I have charged 9 volt batteries, 1.25 Volt Cells, and 15 Volt HT-220 batteries all from the same charger. The current difference for a properly designed constant current charger from 1.25 volts to 15 Volts was insignificant.

Motorola chargers and big and bulky and not conducive to throwing in the suitcase when travelling. Accordingly, . I got a small nicad charger and put a minature jack in the side of my VHF HT which was paralleled across the battery with a suitable diode to prevent accidental shorting through the jack when plugging in the charger. This minature charger just plugs into the wall and then into the HT. To make sure that no voltages of a potentially (pun intended) dangerous nature were present when the charger was plugged in, I opened it up and verified that an isolation transformer was used to produce the charging voltage. This charger provides about 22 mils of charging current, about half of that needed for an omni battery, but more than adequate to refresh the battery overnight unless the usuage was particularly heavy. The normal plan is to take two or more batteries when traveling and leave one on charge while out during the day.

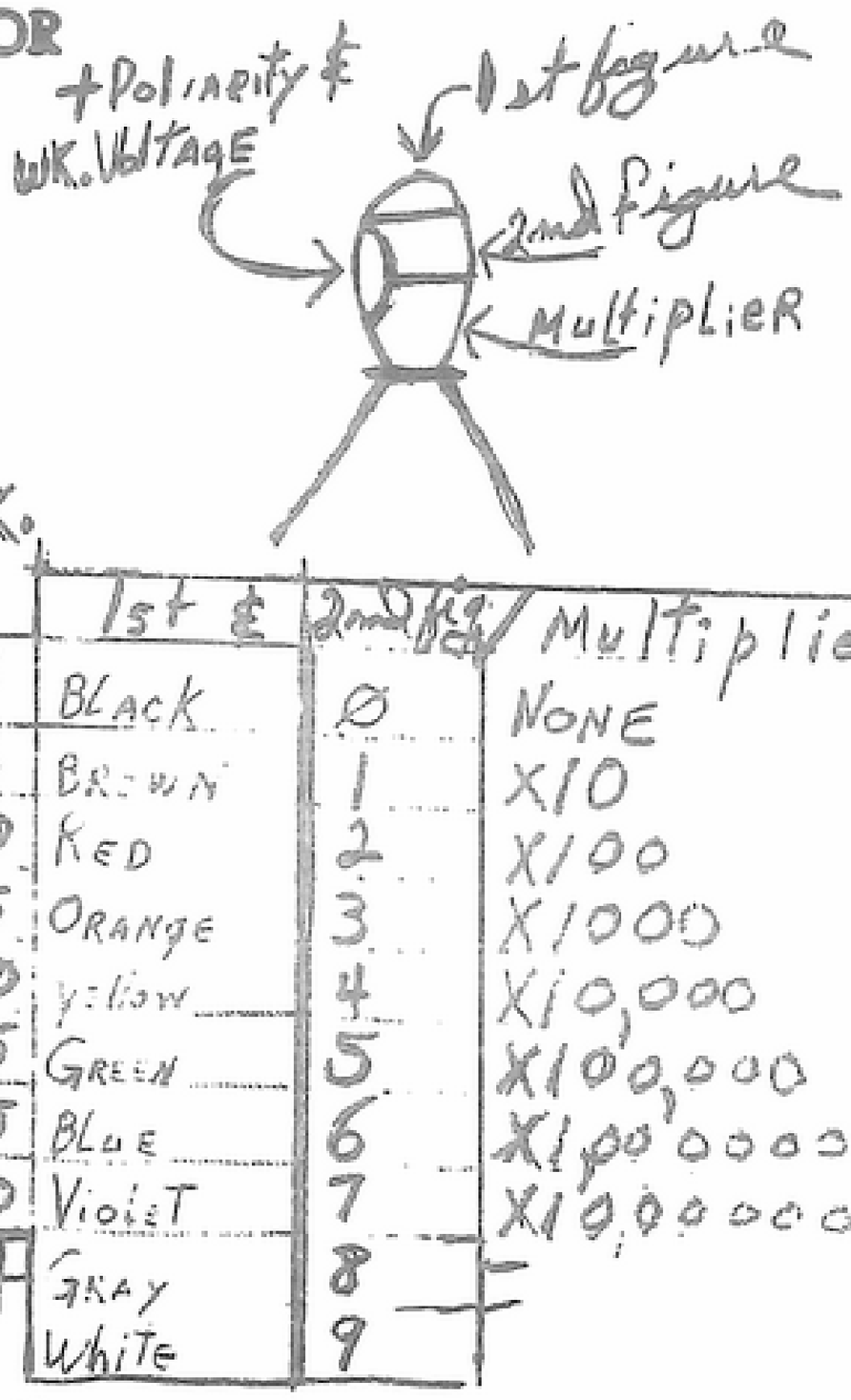
Motorola has come out with a new generation of batteries to go along with their new generation of MT-500 Handie Talkies. These batteries are identical to the older yellow rapid charge batteries except that they are orange and do not specify their capacity. In looking over the instruction manual for the MT-500, you get the hint that they have greater capacity than the older batteries (450 ma.) I calculated up the duty cycle for the MT-500 one time and determined that the batteries had a 20 % greater capacity than the older batteries. Considering the conservative Motorola ratings, it may be higher than that. Personal experience with one of the batteries purchased in Dallas indicates that they are indeed better. This appears to be especially true with the higher power 5 watt radios. Motorola, incidentally doesn't have a trickle charge rate for the new batteries on their new MT-500 chargers. Apparently they have designed these new batteries with heavy overcharge capabilities and don 't feel like a trickle charge position is necessary. Motorola tells you that you can use the older batteries in the new MT-500 radios, but with a lower duty cycle, another indication of increased capacity. These new batteries are not cheap, almost $60.00 user price, but very good. There is a rumor that Motorola will abandon the manufacture of the older battery. Maybe some of the new batteries will turn up on the surplus market soon.

This brief review should get a few of you in the ball park when dealing with ni-cad batteries. Perhaps, K5JB will diagram his new circuit for a rapid charger using a NE555 in the next issue. I saw it and it looks good on paper. Check in with me if you have any specific questions and maybe it might be fodder for another article.

Micheal Salem N5MS

FOR SALE- WILSON 1405 Handie Talkie with 2 battery packs,tone pad,leather case, desk charger. X-tals for 07/67, 34/94, 52/52. $200.00 Don AE5N 681-0133 947-4442.

MID-OKLAHOMA REPEATOR



Submitted, herewith is a color code chart for tantalum capacitors that was given to me by a mwmber, with a request that he be unidentified - he thought that the chart might be useful to someone. I personally, never heard of them - yeah, I'm showing my ignorance. It was mailed to me once by the gentlemen and rrturned to him by the postal service - and, it was correctly addressed - how about that? It was hand delivered to me at the club meeting - efficiency!! Reminds me of other instances of mail being lost, but they never bothered to return it.

The March meeting opened at 8:05pm. Sid took care of dues and requested that expired dues be paid. It takes money to make the wheels goround & round. Everyone introduced himself, and the financial statement was read by Jim, K5PER, and accepted.

Unfinished business was disposed of, and there was a club property report by Jim. Sid suggested getting rid of it. There was a discussion on whether to throw it away or sell it. At the way prices are escalating, some of that old stuff might be put to use by some ingenious ham - who knows. It was decided to move the stuff, with some club members volunteering services and pickups, to another location. That storage is costing! Date of disposal to be advertised on club repeater.

There was a CORA report by Paul, WB5HTL, about HAM HOLIDAY - State ARRL Convention is to be held at same time and place. Reports on ill members was made - our best wishes and sympathy to those afflicted. It happens to all of us - no one is immune to misfortune, accidents, falls, illness, equipment rip-offs, or whatever! I've had my share of trouble with that gentleman (?) Mr. Murphy.

It seems that one of the officers had to grow a new set of ears - his old ones were knawed down to a set of nubs by the people where we meet. They were unhappy over the condition of the room after last meeting; which was the largest crowd I believe we exer had. Due to weather dictated postponments we had to meet in a Monday night which messed up schedules about janitorial services, or something. The club officers cought"what for" so it is suggested that each of us appoint himself as a committee of one to clean up his own litter, and maybe that of someone who forgot. Aside from the obvious ethics of the situation, we might be needing another place to meet. Our tenure at the EOC is entirely dependent on the good will of the mamagement. We got to keep them happy; or else!

There was a suggestion for changing the meeting time, but the time remains at 8:00 PM. Sid, W5KOZ, suggested revising the by-laws, and a committee was appointed: Sid, Charlie, WA5JGU, Marvin, K5HQP, Jim Buswell, KA5EET & Paul, WA5HTL. Questions are, were they volunteers or volunteered? Sid talked himself into that one, guess it didn't make him too mad, though; it was his suggestion.

There were some comments about blue language on the repeaters: Those too rare words words shouldn't ought to be! They are outlawer by the FCC, common decency - and, above all, by the good Lord, himself. He is the supreme law of all! Not inplying that all of us don't wear horns, occasionally.

Adjourned for refreshments at 9:00 PM - Back at 9;32.- - Program was by Jerry Brody, W5MCJ, about history of radio telegraphy. It was quite interesting to me to see some of the things I had read about in years past. - Thanks, Jerry.

I could see some of the old timers expressions as they read the code that Jerry was sending - at those speeds, both in American Morse and International Morse. I thought he was sending Greek. Some of them could read it though.

There was a flurry of activity at the end of the meeting in cleaning up: Educational about what a bunch of guys can accomplish when they pitch in and work at something. Honestly, Chuck, we didn't mean to be bad, we just didn't think. Not thinking, ahead of time, can sure get a guy into a peck of trouble, though.

George, WB5NMK

I HEARD: OLO has a new dream shack - a pontoon boat.....HFN giving OLO advice on new shack.....AEB's shack is a pickup.....ETB and ABM threatening lawsuits.....OZE and all that.....AUP figuring out a dipole..... CUX advertising business on the radio.....ZKY and TDW are experts when it comes to mules.....IH creaming nice old ladies out on Northwest Highway.. EYV was told to clean up his act.....EVO bouncing signals off some strange planets.....FXP is seeing better these days.....TKG is a signal sapper... NKC telling someone to QRS ??????.....AUP talking 90 m.p.h.....a purple dog house mobiling down I-40.....FRQ was sipping tea.....ETB was a big Kaddiddlehopper.....VZU burned up his oven.....CZN was rich.....VRL was not the weather man.....JNT lives on and on.....a WJ5.....ZKY has chains on his wheelchair.....OHK looking for steel traps.....SVN has some new cheaters.....ZKY blew a transformer.....TMW out pulling 18 wheelers up hills.....SJX working on more projects.....INZ got his truck towed off by the police.....SVN hehehehehehehehehe.....ZKY has one of those deals and everything like that.....FXP by golly.....FKF was a Yahoo man who badmouths male geese.....TDW was a squeezer and not a 2-fingerer..... WM chasing bootleggers.....BMP out in Texas.....MCJ has a broken dot spring NYX was a 73 celebrity.....SJV out running his dog.....TDW likes turnip greens./.....VVZ still looking for phonetics.....and a whole lot more....

RAMBLINGS FROM THE PRESIDENT

We are indebted to Jerry, W5MCJ for a most interesting program which he presented at the March meeting. Jerry is one of the finest cw operators in this area. He brought some of his collection of antique keyers, sounders, and the like and gave an interesting talk on some of the history of Morse Telegraphy. Tapes were heard on great events in history when telegraphy was used. Jerry has quite a collection of Morse equipment and is always happy to show and tell about his collection. He is very active in the Morse Telegraph Club, Inc., and is the Secretary-Treasurer of the local chapter. Thanks Jerry for the fine program.

As happens most often, positions are filled by the railroading method. This happened to be the case when I asked Jerry, W5MCJ and Fred, K5HFN if they would serve as program chairmen for the club. They have agreed to take on this responsibility and I know we will enjoy some interesting programs in the coming months from these two men. I know they would appreciate suggestions from any of you as to what you would like to have for programs. Perhaps some of you have something of interest that you would like to pass along to other members. Get your thinking caps on and help these gentlemen.

I am amazed and disappointed at some of the things I have been hearing on the repeaters lately. I do not speak as an authority as to the recent relaxations by the FCC, if any, as to language used on the air. More and more I hear some four letter words which I do not think belong on the air. I realize some of the things heard on broadcast radio and TV contain foul language, but I have as yet to see where language of this type helped any program. Also, I see no benefit in using this language on our amateur bands. When a group is together, if you desire to "damn it" or "hell it", fine, that is your business, but I certainly don't think it belongs on our local repeaters. It might not offend me or the

next person to hear this, but keep in mind that not only amateurs are listening. As an example, my wife listens to two meters a lot, and she doesn't like to hear this and I know there are others.

And, how about all those criminal band terms which keep popping up? And from folks who are certainly old enough and have been around long enough to know better, at least that's what they say. I won't name any specific calls, but in the last few days, I have heard 10-4 tossed around like it's the everyday thing to say. This hasn't come from a KA5, N5, WD5 or WB5, or any recently assigned call. But, I hear it from W5's. I am assuming these gentlemen are active on the criminal band and forget which mike they have in their hand at the time. There is no FCC regulation that says you can not use 10 signals on two meters that I know of, and perhaps this is common in some parts of the country, but I certainly hope those of us who have been around for some time will set a good example for our more recently licensed amateurs and not use this type of operating. Enough said?

Let's remember our next meeting on April 3 at the E.O.C. K5NK

The regular monthly meeting of the Tinker AFB MARS Base Support Team was conducted on 12 March 1979 at 7:00 pm in building 4002 (Base MARS Station) Oklahoma City Air Force Station. Mr Carl Lesley (WB5DJQ), Support Team Manager, presided. The support for a planned exercise was discussed. We also discussed the planned Base Station Antenna rehabilitation, and acquisition of a VHF Radio for repeater access. The Region 4 MARS Conference at Lake Texoma was also discussed. We had two guests in attendance. The next meeting will be on 9 April, same place and time.

A note from the Base MARS Director:

This is one of the few articles you've seen in the Collector and Emitter on our Military Affiliate Radio System (MARS) Program here at Tinker. I hope its not the last. We have a young and growing program with a few old heads to keep us all straight, but we would like to invite y'all to come visit us. So, if you can make it to the next meeting, we'd love to have ya! Oh, by the way, if you should pick up some traffic addressed to a service member or Defense Department civilian employee, maybe we can help you. Call the Base Station at 734-4114 during normal duty hours or contact one of our affiliate members.

DAVID E. BAUGH, Capt, USAF
WB7ODC/5

THE BIG SIGNAL NEWS
OKLAHOMA CITY AUTOPATCH ASSOCIATION, INC.

MARCH MEETING HIGHLIGHTS

Once again the meeting night falls one day after paste-up, so there is nothing to report as of yet. But, it is expected that the meeting will be a successful swap-meet. And some lucky soul walking off with half of the cash drawing pot.

FEBRUARY MEETING HIGHLIGHTS
(From the President)

The annual Central Oklahoma Severe Storm Warning seminar was held February 20,1979, at KWTV, channel 9 with approximately 350 amateurs, civil defence, and interested citizens within the viewing area in attendance. Frank McCollum, N5FM, OCAPA president; opened the meeting by presenting, Hobe Burgan, WB5MLN, program chairman.

Hobe introduced Henry Israel, N5IH, who will be the net control operator for the storm warning net this year. Henry presented the proceedures for check-ins and outlined how the net is to be operated. Back up personnel for the alternate NCO were introduced: Mac K2GKK/5, Randy WB5QMP, and Zack WB5QPI. Radar control will be manned by Lloyd, WB5ZOI, and Chuck, WB5YLZ, and backed up by Hobe and Zack.

It is the purpose of the Central Oklahoma Severe Storm Warning Net to provide a public service,and to disseminate reports of severe weather as sighted by radar, confirmed by spotters in the field, and to relay reports to radar of sightings not seen by radar.

Hobe then introduced our co-host,Mr. Gary England, chief meteorologist for KWTV 9, who had a message for the group. He presented two films detailing for the spotter what to look for and where to look. Excellent films.

Mr. England did and on behalf of KWTV 9 present plaques of appreciation for services rendered to Frank McCollum,N5FM, Hobe Burgan, WB5MLN, Robby Runyon, AAØO, Chuck Sullivan, WB5YLZ, and Lloyd Wright, WB5ZOI.

The recipients of the awards would like to express their heartfilled thanks to channel 9 and to all the amateurs that have participated in the storm warning net. Every Spotter should receive such a beatiful award. Thank you very much Gary England and KWTV.

The Oklahoma City Autopatch Association wishes to express their thanks to KWTV 9 for hosting the Central Oklahoma Severe Weather Warning Net and seminar again this year. 73 es Good Spotting.

APRIL MEETING

It has been relayed to me that the April meeting is one in which you will not want to miss. Chuck (WB5YLZ) has come up with a program that will be of interest to all. So be sure YOU are there.

FOR SALE: Complete Drake "C" line, R4C, TX4C and L4b (10 meters), seven crystals for out of band listening and one for 160 meters. All in good to fine condition, John C. McGinty, K5HMI, phone 721-5651.
(The following note was attached to his request.)
Have upgraded to the TR7. Have not lost onterest in amateur radio, but have gone RTTY with a vengance. Hi. The "C" line was very good for RTTY but the TR7 has many advantages added for TTY. Thanks and I will try to get to the next meeting but I do not drive much after dark. - Too scary for an old man of 82 years. (K5HMI)

HAM '79 Holiday AND ARRL STATE CONVENTION

At The Beautiful

LINCOLN PLAZA FORUM

OKLA CITY JULY 27·28·29

4345 NORTH LINCOLN BLVD OKC

TECHNICAL PROGRAMS

INTERESTING AND TIMELY TOPICS - HF, 2 METER, RTTY, COMPUTER, QRPP ????

DEALER - EQUIPMENT DISPLAY

SEE THE LATEST EQUIPMENT AND MEET THE DEALERS .

SUNDAY BANQUET & AWARDS DRAWING

GOOD FOOD - GOOD AWARDS

QCWA BREAKFAST ~ EYEBALL QSO'S

COME PREPARED TO SEE YOUR OLD & NEW FRIENDS

DOOR AWARDS GALORE

PRE REGISTRATION AWARD - A SUPER 2 METER RIG
GRAND AWARD - - A FANTASTIC H F RIG

10,000 SQ FT FLEA MARKET

PRE-REGISTRATION FOR OKLA. HAM HOLIDAY & STATE ARRL CONVENTION
Make check to CORA. Mail to CORA, box 14424, Okla City OK 73113
Must be received by July 20 1979. Tickets held at desk. Send s.a.s.e if confirmation desired.

Name__ _____ Call _____

Street _____

City__ _____ State _____ Zip _____

Others _____

Others _____

_____ Total pre-registrations @ $4.00 _____

_____ QCWA Breakfast Tickets @ $5.10 _____

_____ Sunday Banquet Tickets @ $7.25 _____
Tax and tip included.

Reserve me a table for Flea Market (NON Commercial) /___/

EDMOND AMATEUR RADIO SOCIETY, INC. founded 1959 American Radio Relay League affiliated, Incorporated in 1962.
We would like to take this opportunity to thank all members of C.O.R.A. for excepting us into their fine organization.

This years E.A.R.S. officers are:

President: Howard Wise-WD5IDB-341-2510
Vice President: Ken Stepp-WD5HXK
Sec./Treasurer: Bill Wright-WA5ZLW
Program Chairman: Joe Nize-WD5FHR
Publicity Chairman: Henry Just-K5SAM
Asst. Publicity Chairman: Rob Brandenburg-KA5AES

E.A.R.S. meets on the 3rd Sunday of every month at 2:00 p.m. room 205 in the Science Building at Central State University.

Present activities are plans for up coming field day and getting the E.A.R.S. Certificate started again. The club scrapbook and certificate record book has been misplaced some how over the years. Anyone knowing the location of these items, please contact one of the club officers. Also anyone who now holds a E.A.R.S. Certificate please contact the club president so that you maybe recorded again.

The antenna's for the clubs 2 meter repeater (K5PL) are being installed on C.S.U. small tower by David Medders K5PL and Chuck Holbrook WD5BKT. Hopefully will be in operation soon. XMTR 147.93 and rec. 147.33.

The last meeting was a rather small group, to many other activities, dx contest etc. HiHi. Those who missed the meeting missed the 8mm film shown by Bill DeMand K5SKA on the big tower construction at C.S.U.

New members of E.A.R.S., Clarence Dollmeyer, who is presently waiting for Novice ticket from F.C.C. Welcome aboard Clarence.

Vistors present:

John Keeling-WA5ZGC
Lewis Keeling
Jim Buswell-KA5EET (Vistor from C.O.R.A.)

Glad to have you Jim, sorry you missed the DF hunt.

E.A.R.S. will strive to support fully all of C.O.R.A.'s ideals and activities.

FOR SALE: Hi-Gain 18AVQ 10-80 meter trapped vertical antenna, with instructions and in good condition, $75.00. Conrac television monitor, monochrome, as is, $50.00. Conrac television tuner, as is, $50.00. Both items are broadcast quality. Regency HR-212 with GLB synthesizer (as is), will sell together or seperately. Last but not least, box full of coax, connectors, wires, antenna material and what have you. Many good parts here, $30.00 takes it. Fred, WB5KRD, 794-1573 (work) or 685-6220 (home).

BICENTENNIAL AMATEUR RADIO CLUB

"To Promote Radio Communications"

Sponsored by Oklahoma Air National Guard
Will Rogers World Airport

Minutes

Meeting called to order at 7 p.m. by Mark, WD5DYI, and self introductions followed. There were 51 members and guests present. Most of the meeting was concerning field day. Sites were discussed and also class of operation. Motion was made by Dennis, WD5CSM, seconded by Bill, KB5BS, to operate class 3A (Club station 3 transmitters plus novice). Motion lost 17 to 6. Motion then by Don, K5UAB, seconded by Ron, WD5FRQ to operate class 2A (Club station 2 transmitters plus novice). Motion carried 17 to 6.

Bill, KB5BS, was elected (railroaded) to find a source for more club tee shirts. Coy, N5OK, discussed getting more club patches. Assistant treasurer will get information and report back later.

Ron, WD5CSK, back from San Antonio, gave a program on the 10/10 club and the awards given by them.

Don, K5UKP, Bill, KB5BS, and others are having hidden transmitter hunts almost every Sunday. Get a DF antenna and join them.

Joe, WD5BMP

MEMORY SAVER FOR YAESU MEMORIZER

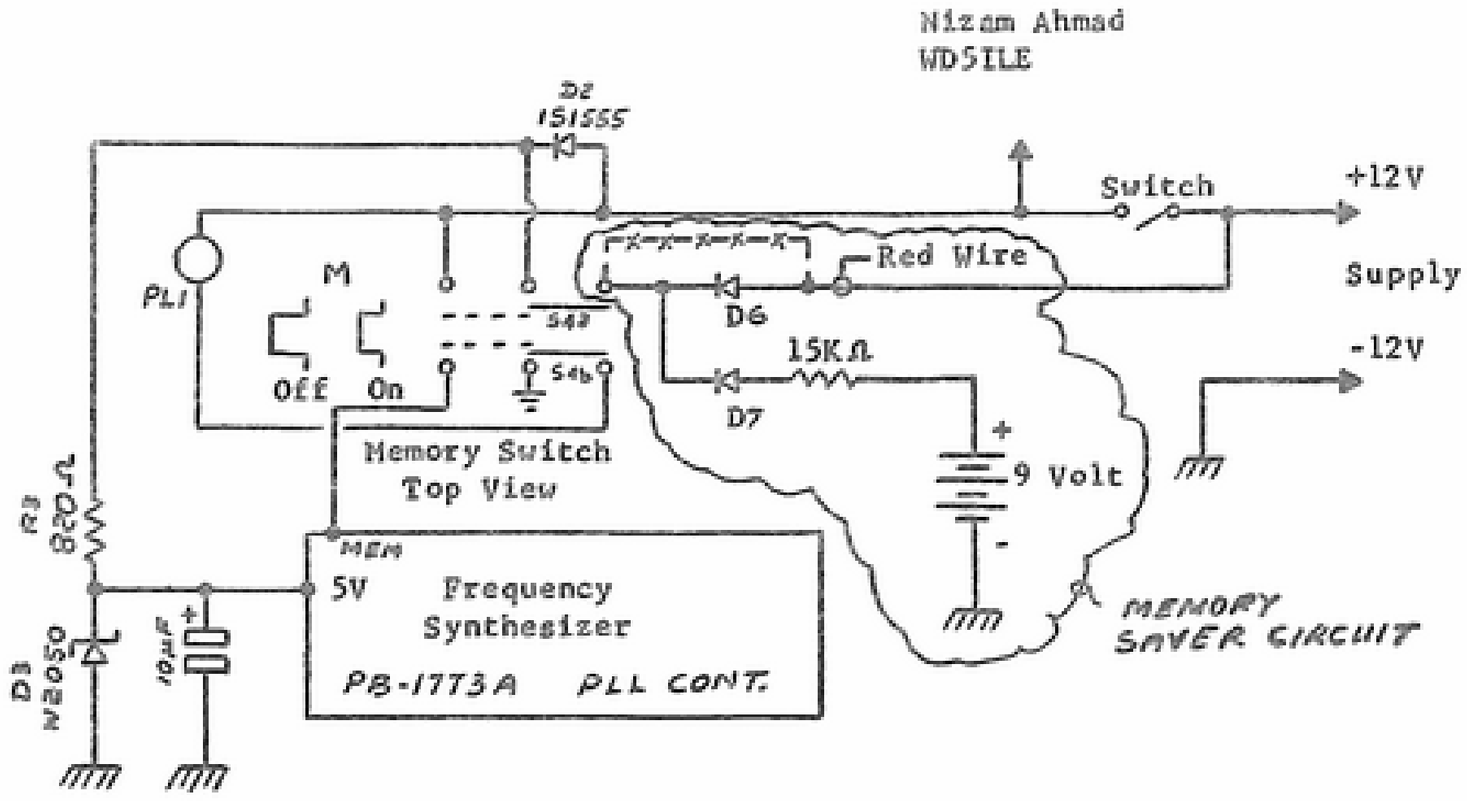
Anyone using Yaesu FT-227R Memorizer 2M mobil rig knows how irritating it is to dial up the frequency everytime the battery is disconnected, especially someone like me who has only one rig for car and home and has to carry it back and forth. So here is the permanent memory saver you were looking for.

Parts required: two diodes (1N60 etc), one 15K Ohm 1/4 watt carbon resistor, a 9 volt transistor battery and a battery supply lead with snap-on clips.

Remove top cover of memorizer by removing five screws. You will see the synthesizer printed circuit board towards the top front of the rig (has cardboard for protection). Remove three screws which hold the board and carefully turn it upside down leaving all wiring intact. Now remove the red wire going to the end terminal of the memory switch and install diode D6 as shown. Next install diode D7 in series with 15K Ohm resistor and the 9 volt battery leads as shown. Battery can be installed inside the rig in the vacant place for tone squelch board. And if the tone squelch board is already in place, then using two terminals of the auxiliary plug and socket the 9 volt source could be rigged up from outside.

There are a couple of things to remember. Use a cellophane cover for the battery in case it leaks and use diodes with high reverse resistance in the order of 1 Meg Ohm or better. The battery drain is less than 1 milliampere and any alkaline cell should last about a year. If you plan to use a 9V rechargeable battery then omit the D7 diode.

Nizam Ahmad
WD5ILE



BICENTENNIAL AMATEUR RADIO CLUB

"To Promote Radio Communications"

Sponsored by Oklahoma Air National Guard
Will Rogers World Airport

FROM YOUR CLUB EDITOR

The club plans for Field Day '79 were the major discussion topic at the last meeting of The '76ers. We decided to operate with two stations again this year and also from Woodson Park again, too. Our Field Day coordinator for the club is Dick, WB5TMW. If you desire any information or wish to assist, contact him.

Last month, I stated that the club now has 96 paid members --- well, I'm pleased to report that the number is actually in excess of One hundred. I received a note from Bill, WA5RAQ, asking for a breakdown in terms of YL's who are active in our organization. We have approximately twenty at this time. I contacted Don, AE5N, in an effort to get a precise number, so I promise you an exact club census in next month's column.

Our rather caustic BOOTLEGGER OF THE MONTH feature seems to draw all sorts of reactions from readers each month -- everything from angry approval to humorous wisecracks. Several other amateurs like Bob, WD5EVP, have told me that they feel it is serving its purpose very well --- and I guess that's correct --- it gets harder each month to find one of these clowns to present with this dubious distinction. This month, however, I'd like to honor (please excuse that word) WA5TXS, "Johnny", as our BOOTLEGGER OF THE MONTH. Once in a great while, you can hear "Johnny" access the autopatch on the MORI .67 machine and call his dad. Next time you hear him -- and you have to listen closely because he slurs the call sign and certainly doesn't use phonetics -- wish him well by pulling the plug on his phone call.

Last month, I mentioned the wife (YF) of Mac, K2GKK, and credited her with the non-schematic of the Voltswagon and Mobile Ohm. I got her call sign correct (KA5BJS), but said her name was Barbara. Correction -- She's JUDY -- Barbara is Mac's daughter. I knew that I really blew it when I saw Judy at class wearing a large cardboard sign around her neck that said "My name is <u>not</u> Barbara", or something like that! (Please, Judy, don't hassle me if I misquoted the sign!) --- But please note that I did call call her Mac's YF, not an ex-YL and I didn't wish her "seven<u>ty</u> three<u>s</u> or call her a good buddy.

This month's non-schematic comes from Leon, WB5WTR, the manager of the Heathkit store:

Hence, we can thank him for this truly outstanding representation of an Ohm-eater!!!

As this is the April (Fools) issue of the C & E, I thought I would submit about three pages of pseudo-engineering garbage, but I just couldn't seem to make it as convincing as some of that stuff which Mike, N5MS, has prepared in past years April issues. I had a whole line on a new oscillator which I had perfected -- sort of an Armstrong configuration with a split-capacitor feedback network as in the Colpitts design. As a hybrid of both of these well-known circuits, I called mine an Armpitts Oscillator.

In my comments last month about CORA's newest member club, the highly-respected and well-known Wheatstraw Amateur Radio Club, I failed to mention the name and call sign of their vice-president.

The vice-pres of the Wheatstraw bunch is Ted, WD5JNT, El Reno. He and his wife Venus are also active with the '76ers. Special thanks to both of them for submitting this cartoon which they bagged from an edition of the Phoenix Sun in October of '78. Here we will rededicate this one to those resident computer-freaks of the '76ers: Tom, N5GE; Don, AE5N; Lloyd, WB5HUP; Joe, WD5BMP; and Al, WD5DHX.

"We used to worship the gods of the mountain, river, wind and sun until we saw what one of these babies could do."

On a recent trip back into Oklahoma City, I noticed an automobile bearing an unusual Texas license plate. The car had no visible communications antenna sprouting from it, so I assume this was a random chance issue of a normal Texas tag. The letter/number combination on it read: "SWR 11". For a minute, I thought the guy might be bragging. After countless tedious hours on one of my antenna and tower systems, I sometimes think I would pay ten bucks to wear a plate like that on my car.

That duplexer for the club's .76 autopatch repeater has been on order for approximately three weeks. Again, thanks to Jack, WB5VAE for his generous $100 donation for its purchase. His call sign was printed incorrectly in last month's issue.

73 (seven three)

Bill Riddles, N5WM
'76ers Club Editor

FOR SALE; AUTO HORNS THAT PLAY "BOOMER-SOONER" SLIGHTLY DAMAGED AT NEBRASKA-ARKANSAS GAME. CALL MIKE, N5MS

UNIVERSITY OF OKLAHOMA W5TC WR5AFW

Alpha Sigma Delta Radio Society since 1931 146.28/88

Student Congress Lends Helping Hand - An Editorial Comment

Each semester, each student upon enrolling, pays an activity fee. This fee is used to pay for medical care, student union activities, and other campus activities of interest and benefit to students. Student clubs and organizations are supported with appropriations from a portion of these fees. Examples of support are expenses for announcements of campus events, fees for speakers of national prominence, and other costs in helping clubs serving a wide variety of student interests. The Oklahoma State University Amateur Radio Club W5YJ has bought a well equipped club station with such appropriations from the OSU student congress. The activity fee at both universities is 100 percent student money. No tax dollars are involved. The money is paid each semester by the students for the benefit of all students. We know Amateur Radio benefits the whole campus so why not ask the Student Congress to help W5TC? We help at the football games with borrowed equipment, so why not ask our Congress for help?

Well, we did ask in the form of a formal appropriations request. The request was only for equipment. We divided the request into short range needs (VHF) and long range needs (HF). Since only a limited amount of money was available for the Congress to appropriate, they asked us to choose between the short and long range. Although, we have no working VHF equipment, the heart of any club station is its HF equipment. For this reason, we asked a priority be put on updating our HF equipment.

At any rate, the student congress gave us a vote of confidence and voted to appropriate W5TC a complete Kenwood TS-820S station. The club members have been ecstatic about this to say the least. We have started a purchase order to buy a complete Kenwood TS-820S station. As of this date, the money has not been deposited to our account but we are hopeful it soon will be.

(Editorial) The O.U. Amateur Radio Club plans to use this equipment to enhance the club's ability to participate in emergency communications. When I made an announcement of the approval of the appropriations request at a Saturday morning meeting at the other Amateur Radio Club in Norman (of which I am a member), the President of the club merely said "Is there any other new business?" Not even a favorable comment was offered by the President of this club. I still do not understand this cool reaction to our clubs good fortune. Even more puzzling, was the action of the American Radio Relay League (ARRL) Oklahoma Section Emergency Coordinator (SEC) after the above meeting broke up. Since the appropriations request dealt with our clubs plan to participate in emergency communications, I assumed a courtesy copy given to the Oklahoma SEC may be of interest to him. The SEC glanced at the front page briefly and then tossed the appropriations request into the trash can. I really cannot understand why an ARRL official would do such a thing without even a word of explanation. (I retrieved the copy from the trash can) At any rate, the O. U. Amateur Radio Club is, for the present, still affiliated with ARRL. There are many things I do not understand, but, I know the club is quite happy the student congress believes in our struggling club, and the members are going to do their best to make the O. U. Club viable and useful on-campus organization no matter what the obstacles.

Upgrades

James Gardner received his novice license - KA5DHF

Nathan Kirby KB5BF

For Sale: Cushcraft Ringo Ranger - $20. Call Wade KB5EK 794-5144.

TODAY I SAW A ROBIN

CAN SPRING BE FAR BEHIND!!

It surely can't the way Ralph WA5PFK and Goldie SPRUNG it on us Sunday announcing their new 2x2 call letters WD2KS (Wendi Diana & Kevin Scott) born Wednesday March 7 to Frank and Carol WA5ZKW Sissons of Duncan. The big event transpired at Chickasha, however on Saturday the babies were moved to Children's Hospital in OKC and at this writing we are happy to report they are much improved. Little Jeff is spending a few days re-educating his Grandma & Grandpa Wilder while Mommy and the twins recuperate. It was also reported that Leona Stults WA5LTJ is doing great with her new implant - the club wishes all of these a big dose of "instant well".

To those of you who read the newsletter last month and expected Ralph WA5PFK to be net controller and got Ralph WB5PFW riding the air waves were on the right frequency - just victims of a double error. However this month you really are hearing WA5PFK, and a dozen apologies and 2 shillelah's to WB5PFW for the misprint.

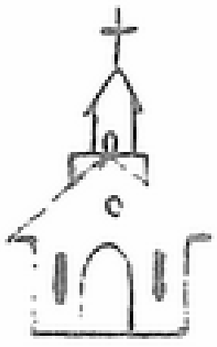
32 members and guests turned the Citizens National Bank into a Ham Shack on March 11, and as predicted more blarney than business accrued but enough of both to make the afternoon well worth while. Leonard WA5FSN gave an update on some FCC regulations with expectations of a more conclusive report at our next meeting, which will be at the Okarche Highschool (1 block west of the Dairy Boy) on April 8 @ 2:30 PM. Gary WB5LLZ gave us a session on some everyday uses for the computer in the home as well as businesses. We tend to think of computers handling inventories, payrolls etc: but had you ever thought of them as log books, doing budgets or energy saving devices? Technical advancements seem to be phenominal. Now when they "fine tune" that little fellow to running money to the bank at the first hint of an overdraft I'll be #1 in line for the whole system.

Another goody for the afternoon was Jim K5VRL coming through with his promise to bring his "Model A" Continental to share with us. If you havn't seen this little piece of restoration you have missed a work of art.

RIDES AND DEMONSTRATIONS NEXT TIME JIM!!!

And to make the day complete the El Reno group came with cookies and cake to go along with the gab fest.

George K5GGl will be in charge of the program for April so make plans to attend and see what kind of he pulls out of his hat for the occasion.



HAPPY EASTER

73

WB5WTN Reporter

WHEATSTRAW ARC

AERONAUTICAL CENTER AMATEUR RADIO CLUB, INC. W5PAA

RANDOM WORDS FROM THE PRESIDENT:

There was a very good turn out for the march meeting 67 members and guest,thank you for comming out,even in the heavy rain. Everyone enjoyed the program presented by Mr. Ken Sliger And Martin M^{c}Cormic from High Technology. The program was about the APPLE II Microprocessor and some of it's useses. The program was very good thank you Ken & Martin for putting it on for us.

Joe WD5BMP also helped us out last month at our meeting by bringing his computer video termnial and floppy disk system,so that the clubs computer system could be lo--aded with a program that Joe had,that allows the computer to copy CW, a fair number of those present tried their hands at sending CW to the computer,thank's JOE....

Next months program will be presented by Mr. Leon Miller from HEATHKIT. The program will be on the latest Amateur equipment Heath has, Leon will also bring out some la--te test equipment, everybody come on out and see the goodies.....

You still have time to comment on FCC docket no. 78-369 (RFI PROBLEMS), see march QST for more info.. Your comments, orignal plus five copies should be sent to the Secretary, Federal Communications Commission, Washington D.C., 20554...

HAM HOLIDAY 1979,.....LADIES ACTIVITIES .....

SAT. JULY 28,,,..... Program.....
09:00-09:45am How to make ceramics +++++++ DOOR PRIZES....
10:00-10:45am Strech and Sew Fashion show +++DOOR PRIZES...
11:00-11:55am Microwave Cooking Show +++++ DOOR PRIZES.....
12:00- 1:15pm Open Lunch no tickets.....
1:15-- 2:00pm How to make cosmetics. +++++ DOOR PRIZES.....
2:30- 4:30pm "B I N G O" Plenty of cards,and lots of good prizes,this year if you bingo you will get a prize.....

SUN. JULY 29.
09:15--11:00am "B I N G O" GOOD PRIZES AND LOTS OF FUN.....

HOPE TO SEE ALL THE LADIES AT HAM HOLIDAY. --- -.-

Bob WB5NSV has finished wiring the dual floppy disk drive,and has it and the printer termnial working fine now,Bob is working hard on the new program that will allow us to run the C & E labels program with the disk system. Thanks BOB (and Sandy for your-- understanding),we sure could'nt get along without all the hard work Bob has done..

Build a project this month for yourself and your station..You will enjoy it.....

73,BOB PACE, WA5CJG.

FOR SALE: Brand new Wilson System I antenne, 10-15-20 meters, in original carton. Balun. $225. Glen Watkins, WØRTM, 787-1814.

For Sale: 30 ft. Self Supporting Breakover Tower. Trade? Contact Henry, N5IH, 722-3848.

AERONAUTICAL CENTER AMATEUR RADIO CLUB, INC.

W5PAA

MINUTES OF THE MARCH MEETING OF THE ACARC

THE MEETING WAS CALLED TO ORDER AT 8:05 BY PRESIDENT BOB PACE, WA5CJG. THERE WERE 67 MEMBERS AND GUESTS PRESENT. FOLLOWING THE USUAL ROUND OF SELF-INTRODUCTIONS, BOB GAVE A REPORT ON THE STATUS OF THE WR5AVM REPEATER. HE IS ADDING A SELECTIVE PREAMP TO TRY TO IMPROVE THE REPEATER'S SENSITIVITY.

BOB GRAHAM, WB5NSV, GAVE A REPORT ON THE LATEST CORA ACTIVITIES, AND ALSO REPORTED ON THE STATUS OF OUR CLUB COMPUTER. IT HAD BEEN INOPERATIVE, BUT (AT THIS PRINTING) IS NOW FULLY OPERATIONAL.

PRESIDENT PACE ASKED THAT WE BEGIN TO THINK ABOUT THE UPCOMING "FIELD DAY" ACTIVITIES. BOB THEN BROUGHT UP THE RECENT ARRL DUES CHANGE, AND A VERY SERIOUS AND MUCH NEEDED DISCUSSION FOLLOWED. THIS RECENT INCREASE IN ARRL DUES SEEMED TO CALL FOR A REVIEW OF OUR 100 PERCENT ARRL CLUB STATUS. A MOTION WAS MADE BY BOB ASHBY, W5HXL, AND THE VOTE CARRIED TO CONTINUE OUR 100 PERCENT ARRL STATUS, AND THAT WE FULLY SUPPORT THEIR EFFORTS. BOB ASHBY THEN RECOMMENDED THAT THE CLUB "BOARD OF DIRECTORS" DISCUSS THE FEASABILITY OF ELIMINATING OUR REQUIREMENT THAT NON-AMATEUR MEMBERS ALSO BE ARRL MEMBERS.

AFTER ASKING FOR AND RECEIVING VOLUNTEERS TO FOLD THE NEXT ISSUE OF THE "COLLECTOR AND EMITTER," BOB PACE, ASKED IF THE CLUB WANTED TO RENEW ITS MEMBERSHIP IN THE PERSONEL COMMUNICATIONS FOUNDATION. CARL DRUMEULLER, W5JJ, MADE A MOTION THAT WE CONTINUE TO SUPPORT THIS FOUNDATION. THE MOTION PASSED.

BOB THEN INTRODUCED KEN SLIGER AND MARTIN MCCORMIC FOR "HIGH TECHNOLOGY." THEY PRESENTED A VERY GOOD PROGRAM ON THE "APPLE" COMPUTER SYSTEM.

BOB GRAHAM, WB5NSV, SECRETARY

WHAT GIVES!!!

NOTICE ANYTHING UNUSUAL ABOUT THE ABOVE MINUTES?

THEY WERE TYPED ON THE AERONAUTICAL CENTER AMATEUR RADIO CLUB'S COMPUTER. NOTICE THE NICE STRAIGHT RIGHT-HAND BORDER. THIS IS JUST ONE OF THE MANY USES FOR OUR CLUBS COMPUTER. ALL MEMBERS ARE INVITED TO MAKE USE OF THIS MACHINE.

BOB GRAHAM, WB5NSV, SECRETARY

OPTICAL COMMUNICATIONS

The January issue of Amateur Radio carries an interesting article on the background and also the current status of optical communication for radio amateurs. It's in considerable detail, and is well worth your reading it in the ACARC's clubroom. Did you know the first optical communication was made over 700 feet in 1881? And by 1916 the range had been extended to several miles? Read the article in full. You'll find it fascinating!

W5JJ

CORA Collector & Emitter

AERONAUTICAL CENTER AMATEUR RADIO CLUB, INC.

W5PAA

Aeronautical Center Amateur Radio Club
Annual Financial Statement 12/31/77 to 12/31/78

Cash on hand				
Cash on hand	12/31/77	118.72		
Cash on hand	12/31/78	52.95		
			65.77 decrease	
Bank Statement	12/31/77	259.74		
Checks not deposited		85.00		
Checks outstanding		221.00		
			123.74 true	
Bank Statement	12/31/78	418.66		
Checks not deposited		0.00		
Checks outstanding		10.50		
			408.16 true	
				284.42 increase
				218.65 increase

RECEIPTS			
Dues ACARC & ARRL	860.00		
Employees ASSOC.	2650.00		
Other	2894.42		
Union Bank Error	11.00		
Sale of equip.	126.50		
Dividend	10.65		
Misc.	0.07		
C. U. Error	0.06		
		6552.70	
DISBURSEMENTS			
Equipment	4325.27		
Collector & Emitter	249.90		
Periodicals	153.36		
ARRL dues	541.50		
W5PAA station maint.	375.71		
Postage	86.09		
Insurance	130.00		
Other	276.96		
Refreshments	42.19		
Telephone	153.07		
		6334.05	
			218.65 increase

Billy J. Oliver
sec. & treas.

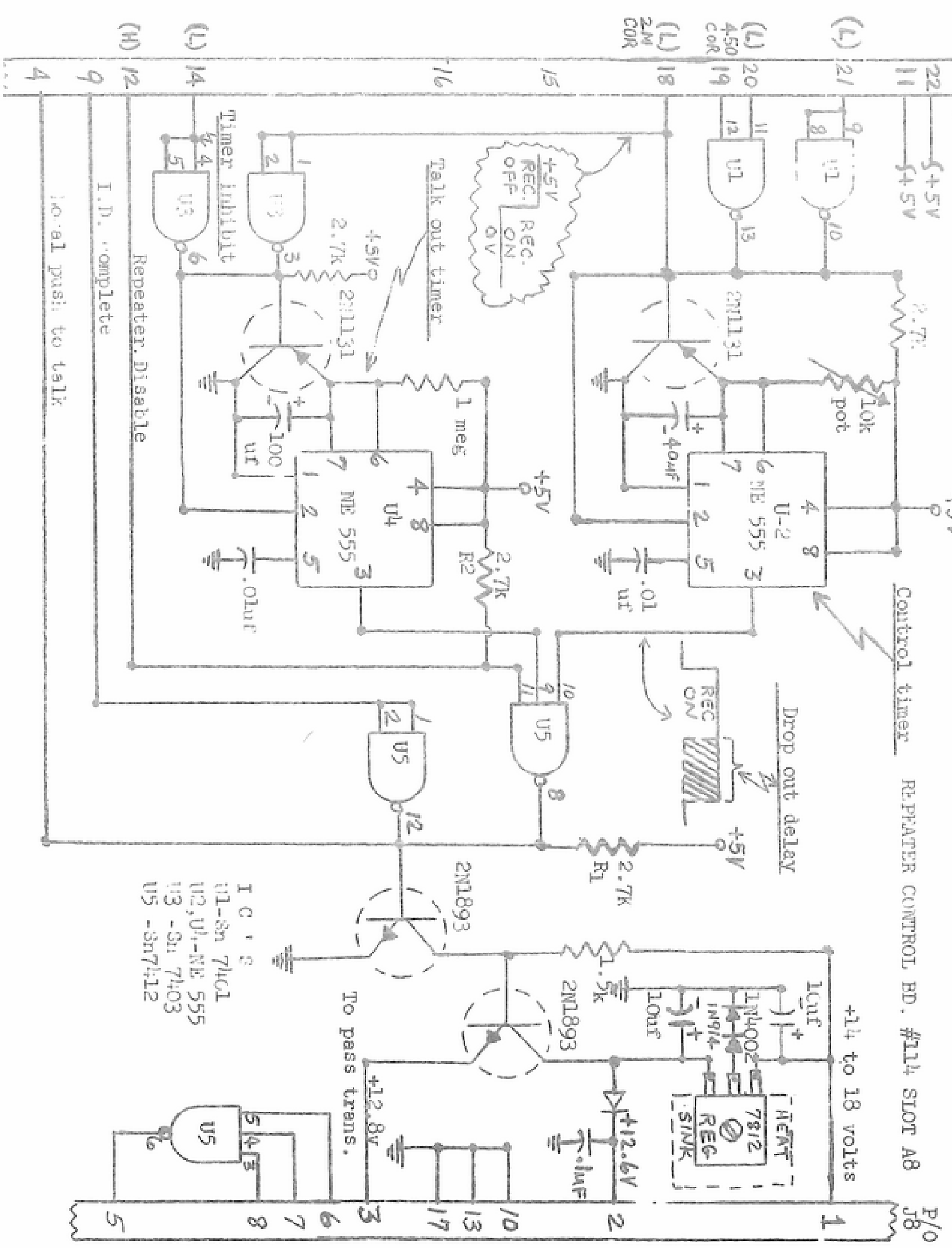
TRADE-NOVICE MICROPHONE FOR RIGHT-FOOTED KEY. SONNY, W5JCW

AERONAUTICAL CENTER AMATEUR RADIO CLUB, INC.

W5 PAA

REPEATER CONTROL SYSTEM:

Shown in the circuit below is a repeater control unit.The circuits contains the COR drop out delay,the talk out timer,the repeater inhibit circuits,and the transmitter power switch.If you are planning to put a repeater on the air this control unit may be of some help.I have circuit boards if you need them.



73, BOB, WA5CJG

CONVERSION CHART FOR CYCLES PER SECOND TO HERTZ
(It Doesn't Hertz to Teach an Old Dog New Tricks Department)

The conversion from the old favorite cycles per second to hertz caught me in mid educational experience. Accordingly, the trauma experienced by a lot of the old dogs (ahem, nobody in my block included) was actually only a slight inconvenience to me. Oh, true, I occassionally slip in a "cycles per second" for an intended "hertz" and accidentally reveal my existence during the conversion, but for the most part, I managed the conversion with apparent ease. For others, the havoc wreaked by the international organizations constituted a torment worse than a catastrophic earthquake.

To the ultimate relief of those hardliners who still insist on "cycles per second" and a few uninitiated neophytes in electronics, I reproduce below a conversion chart for cycles per second to hertz. As can be readily seen, the relationship between cycles per second and hertz is a smooth exponential curve on a semi-log graph. For those of you with access to a programmable calculator (such as the HP-25), I have reproduced the formula for the curve in figure 1. In addition, I have written a program for the HP calculator for those who are interested.

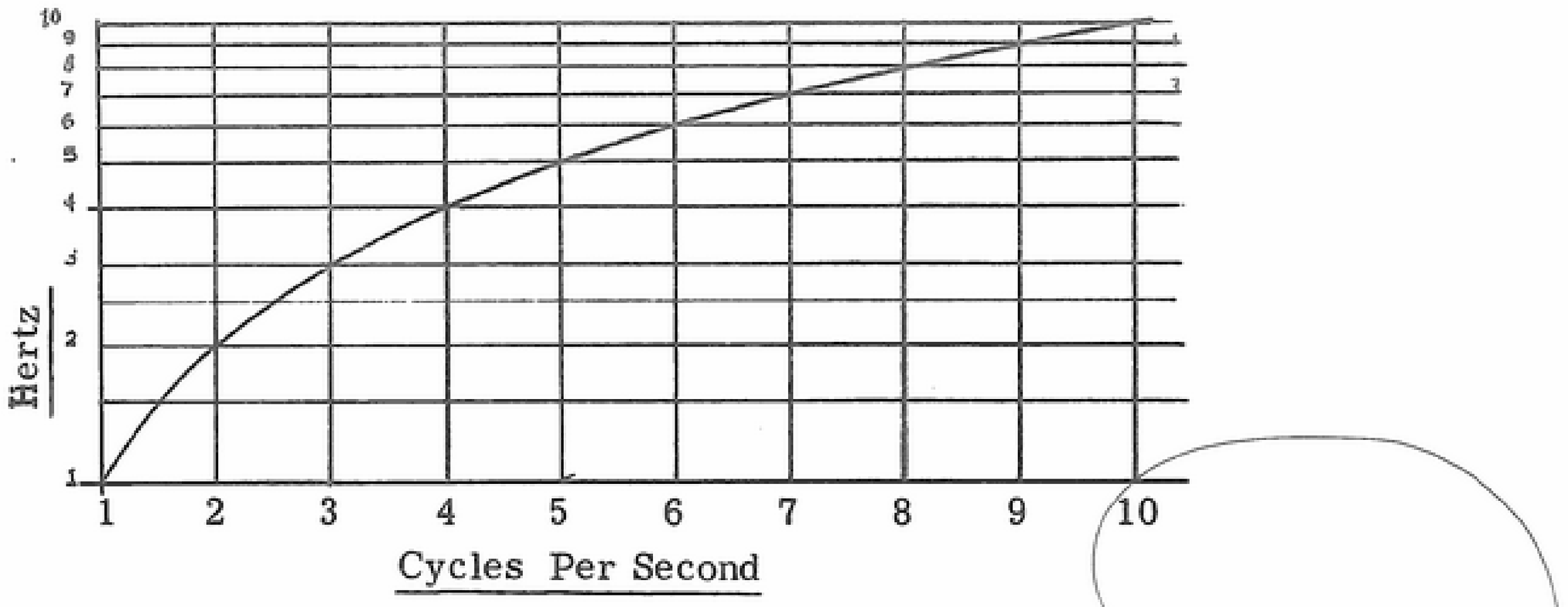


FIGURE 1. Conversion Chart for "Cycles Per Second" to "Hertz."

The chart is simple to use. I have reproduced an example for 4 cycles per second on the graph. Simply look for the 4 on the cycles per second scale, then go up to the curve and move directly over to the Hertz scale and read the value directly off of the Hertz scale. For values other than 1 to 10, multiply both scales by the appropriate powers of ten. The scale thus is good for any frequency range. The graph is based on the formula:

$$CPS = \frac{2\,(\mathrm{Log}_{10}\,10)\,Hz \times 5}{10} \qquad (1)$$

Equation (1) may be readily entered into a HP 25 by means of the following program. All that is necessary is to enter the appropriate value of Hz, then push the R/S key. The frequency in cycles per second can then be read directly from the display:

		Display Will Read:			
00					
01	Enter	01		31	Enter Hertz
02	5	02		05	Put 5 in the X register
03	X	03		61	Multiply Hertz by 5
	Store			23	Store result in
04	0	04	23	00	the 0 register.
05	1	05		01	Enter the 1 for
06	0	06		00	the 10 of the formula.

Conversion Chart for Cycles Per Second to Hertz - continued

07	Enter	07		31	Enter 10 to the X Register
	f			14	f function key to take
08	Log	08	14	08	the common log.
	RCL			24	Recall from
09	0	09	24	00	the Zero Register
10	X	09		61	Multiply
11	2	11		02	Enter a 2
12	X	12		61	Multiply
13	1	13		01	Enter a 1
14	0	14		00	Enter a 0 to make 10
15	÷	15		71	Divide

The program appears to work for any value that the HP-25 is capable of handling. The calculator appears to take about .75 to 1.0 second to run through the calculations. The program is not written in the most efficient manner, such as recalling some of the constants from storage instead of entering them directly and using an extra step, but it takes time to enter constants into the storage registers and some time I forget what is where. Besides, with only 15 steps of program space taken, there is a considerable amount of storage space left for those of you who would like to add bells and whistles to the program. The result can be limited only by your imagination. Those of you with such imaginations might consider reporting your results next issue in the C & E.

Micheal Salem N5MS

FOR SALE: Hey all you ATVers, why not have the ultimate in QSL's for those TV QSO's, a black and white reproduction of the contact. I have a Concord VTR-800 half inch EIAJ-1 Standard Black and White Video Tape Recorder. This machine works, but is presently demonstrating some head aches and might need a head transplant. I also have about 15 rolls of tape (including some of my vintage Mash and Startreck if you drive a hard bargain). You can have the recorder and the tape for just $250.00 or negotiable if you have something interesting to trade. Micheal Salem N5MS. Phone 321-5453 or 360-1302 for further details.

FOR SALE: Swan 350 Transceiver (late model) with VX-1 Vox and 117XC Power Supply. Used infrequently, but in very good condition. One owner. You can drive it off the lot for just $400. Micheal Salem N5MS. Phone 321-5453 or 360-1302 for further details.

GIVEAWAY: It's true, you can get something for nothing. The perfect gift for some enterprizing and ambitious ham, a 450 transmitter strip complete with 2C39 finals. This is a refugee from the vaunted K5HMD collection on permanent loan and gift to me. It appears to be a two frequency version and might squeeze out a couple of watts. What can you say? It's half a repeater. Micheal Salem N5MS. Phone 321-5453 or 360-1302.

GIVE ME YOUR TUBES, YOUR POOR . . . . WR5AFW has acquired a standby repeater which is in the process of rejuvenation by John Stehr and Dean Waddell. Unfortunately, the machine is a tube eater (vintage progress line) and John and Dean (sounds almost like a singing group) need a few of the following types of tubes (preferably in good condition) to breath life into this old Prog's weary chassis. 6BH6, 12AT7, 12AX7, 12AU7. The system really cleaned up well and the guys have done an excellent job rewiring some of the interconnections. Some desense, though. We may try to put it in service within a month or so with the new duplexer. Also, this two man station committee has reworked the Club's (OU Radio Club) KWS-1 transmitter and got it in proper working condition. They could use some 4CX250's though. Contact John or Dean at 321-5210.

CORA C & E
PO Box 15013
Oklahoma City OK

Gentlemen:-

Referring to W5JJ article in the February, 1979 issue. I was interested on account of a relative with a severe hearing problem. I wrote to the company for information and brochures . . I received an informative letter and brochure.

In a sense it could be called a hearing aid, because it increases the volume of any electronic unit it is attached to. The Los Angeles County Sheriff's Special Weapons Team, is using the unit, "Ear Com". It can be attached to any portable two-way radio. Then several officers can communicate in whispers, so as not to alert the subjects they are trying to aprehend. They are the parent company of "Auditone of Okla., (Belphone). This company furnished most of the electronic equipment used in a recent ear operation at a local hospital. They implanted a electronic device, which replaced the damaged *Cochlea*. It's wonderful what they can do electronically.

The article in the February issue, "Early Radio in Frederick Okla." reminded me of my first radio that I built in 1922 Or 23. It was a one tube power with a dre cell battery. Later I installed another tube with a wet battery. I extended a wire to the garage with a plug in the car dash. We left Kansas and moved to Oregon. While I was road surveying for the federal government on Mt. Ranier, Wash. I hooked up the radio using 6 volts of a 12 volt car battery. They told me that this was the first radio that could receive at that altitude. I later sold it to a radio student.

There have been numerous manufactured radios since that time!

TNX, WB5VCA
Eugene Perry
5220 N Miller Place
Okla City OK 73112

N O W, T O T H E N E T S ----

There are a number of nets operating in Oklahoma, all of them welcoming newcomers. We'd like to give you the sked for the major nets operating on 75-80 meters.

C W

Oklahoma Area Net (OAN) *especially Novices* - 3705 kHz @ 1830 hours.
Oklahoma Liaison Net (OLZ) - 3682.5 kHz @ 1900 hours.

V O I C E:

Oklahoma Five O'clock Net (OFON)	3900 kHz @ 1700 hours
Sooner Traffic Net (STN)	3850 kHz 2 1730 hours
Okla Traffic & Weather Net (OTWXN)	3900 kHz @ 1745 hours
Oklahoma Phone Emergency Net (OPEN)	3900 kHz @ 0800 SUNDAY

All of these nets handle traffic and are liaison with the National Traffic System (RN5). All but OPEN and OFON operate Monday through Saturday. OFON is Monday through Friday. OPEN is Sunday only.

Picked up from the Enid ARC Light

FOR SALE- ICOM 22S with VIP Engineering switch installed. $225.00 Charlie WA4PLG

632-4653 or 682-7548

FOR SALE: Heathkit HM-15 SWR meter. $15. Also, Drake MS-r speaker with cabinet power also. $17. Bill, K5KDR, in Norman.

OKLAHOMA UNIVERSITY BASKETBALL FIELD TRIPS
(Following the Bouncing Ball with HT's in Hand)

At last, the University of Oklahoma has a Basketball Team that the Football Team can be proud of. The only problem is that people like me who have been attending Basketball games for the past four years now have trouble getting seats in the General Admission section without making it to the game at least an hour and a half before it starts. The front row seats in the General Admission section we used to walk up to 20 minutes before the game are now filled with rabid,fanatical Sooner come lately's. Oh, perhaps my history of attendance might not be most exemplary, but there are few games that me and a loyal band of fans have missed in the past four years.

I attended my first basketball game my first year at OU. I was working as an engineer for one of the campus radio broadcasts and it was my job to see that proper mike levels were fed to the studio and that the mike gain was not turned up when one of the announcers said a dirty word or two during commercials. The station was the old KUVY and was strictly carrier current off the power line. There was a transmitter located in each dorm and with a good North wind, the station could occassionaly be heard South of the Towers student housing. That was the last game I went to. I took in a couple of other athletic events during my stay in college including wrestling (saw the last OU win over OSU ten years ago before this year's triumph) and occassionally, a gymnastics meet. Generally, academic studies kept me to myself. And what about Baseball? Never. The stuff is almost as boring in person as it is on Television.

Well, every story has at least one great conversion. Some point, just like in the movies, where the hero realizes a complete change of attitude, much like Scarlett finally realizing that it was actually Colonel Butler she loved. Or Victor Mature in "The Robe" figuring out whose cloak everybody was interested in. My conversion to Sooner sports came came at the hands of a good friend of mine, Bobby Campbell. I started working for WNAD (at that time a commercial radio station owned by the University of Oklahoma) in their offices in the Student Union in August of 1968. I met Bobby who worked at the Mart, a candy and cigarette store in the basement, while attending school. Bobby was and is a true Sooner loyalist. I use to run down and visit him during one of the 20 minute news programs from CBS every evening (no reason to hang around the station). Because I worked on Saturday afternoon, I was never able to attend an OU football game until I saw just one in 1969 (at OSU, no less, Steve Owens ran for 255 yards on 55 carries) and just a couple each year until the station was sold by the University in 1972 or so. After that, my attendance became steadier and steadier under constant prodding from Bobby and now Glenn WD5FVI, who had come down to OU to school from OSU. It didn't take long for the symptoms to manifest and the disease was fatal. Salivating at the mere mention of a Texas-OU game in Dallas, cardiac arrest every time I considered that great classic battle between OU and Nebraska in 1971 (the first home game I ever saw), and the treck every other year to Missouri for the Columbia Classic. I have detailed the battle at Armaggedeon that occurred in Columbus, Ohio September 24, 1977 with Ohio State in a previous issue of C & E.

I didn't attend a basketball game until late in my career upon Bobby's urging on evening while hanging around the Mart. He had an extra ticket, so I went. It was there that I discovered that Basketball as a social event could be a lot of fun. I also determined that noisy fans were desirable to the home team and loathed and hated by the referees and opposing teams. This was actually great sport! Well, within the next couple of years or so, Glenn, Bobby, and myself had begun to chalk up good home game attendance. The crowd grew to last year when we saving the entire front row for Glenn, Bobby, Ronald, Paul

and various guests who showed up from time to time. Another advantage with sitting on the front row (besides its perfect position to heap abuse on the referees and opposing team's broadcast crew) was the televised games. We would also get a couple of seconds of TV exposure during the crowd shots (especially when Mark WD5DYI was running the floor camera. Thanks, Mark, your check is in the mail).

The crowd this year has grown until one game we found that we were attempting to rope off about three rows in one section. Roger, Ed, Judy, Lee, Lucille and Reg all were with us. Toward the end of the season, this became impossible. So we just stuck with the original Dirty Dozen minus 3 and everybody was admonished to get there early or forever sit higher in the crowd.

Another aspect of the increasing interest in basketball has been the willingness of various local commercial concerns to organize trips to out of town games. Last year, a local restaurant organized a trip down to Stillwater for the annual Bedlam Basketball shootout. The charge was only $10.00 and for that you got a round trip bus ride, a marguerita, and a basketball ticket. It also just so happened that about a foot of snow fell on Norman that day. The bus ride was great. So when the opportunity arose again this year, we couldn't turn it down. The price went up to $12.00 and they no longer offered a marguerita. Hum, well at least we still had a foot of snow the day of the game. Glenn, Judy and myself showed up for the ride. Bobby had decided to ride up to Stillwater with a friend and go early to case the joint.

A recent addition to the various paraphernalia that I carry to the games (including various HT's and on occasions, a sign or two of Bobby's creation) has been a set of Boomer Sooner air horns. These are refugees from an auction I went to about a year ago. When I got them, they were unoperational. Also, they didn't have the right tune disc to play. I took them all apart and cleaned the brushes and armature, but alas, no dice. The brushes needed replacement and I was certain that a part or two was missing. I had already invested about $40 in the things and had hoped to get them for a song (what?), but decided to throw what I considered good money after bad and sent them back to Jubilaire in Omaha, Nebraska and asked them to place them in working order. This they did for a nominal fee and a five dollar charge for the air disc for Boomer Sooner. Worked great. I got them back in the middle of football season and persuaded Roger and Tim to take to the game along with a 12 volt Gel Cell and let um cut loose a couple of times. They brought them back saying that a couple of fans in front of them almost got into a fight after having them pop off in his ear. This didn't stop me from carrying them to a couple of the home games and I had them in the sack for the bus ride to Stillwater. I have no desire to put these horns in my car. Anybody can do that. And they won't let you drive your car into the fieldhouse, so the only way to get anything done is wire up a battery and sling them over your shoulder. They draw a considerable amount of current (in excess of 20 amps), so I had to find a pretty stout Gel Cell (about 4.5 ampere hours) in my collection with a low internal resistance. I figure I could get about 50 toots or so out of the battery, enough to drive the Cowboys mad.

As we drove through town, I grabbed the UHF HT and called a friend who had wanted to go to the game with us and told her to listen for the horns on the radio broadcast. I still wasn't sure whether they would let me in the fieldhouse or not with the horns, so I brought along one of my high priced covering cases to disguise the horns (a Safeway paper sack, its also disposable). We reached Stillwater and Glenn, Judy and I unloaded, got our tickets and rushed the door. No problem, I guess they thought the sack was full of potato chips.

Our seats were up in the balcony two rows from the top. I talked to Jim Buswell sitting with the Posse Club a few rows below us and told him that if he didn't

know the tune to Boomer Sooner, he would before the game was over.

The game was a lot of fun and the horn created a lot of spirit. There were several veiled and not so veiled threats against my life, my horns, and my unbroken arm (I had the right wing in a cast at the time). Under heavy guard, we exited the fieldhouse. Before boarding the bus, I played a brief symphony and a cheerleader came over and tried to throw a snowball at us.

Sometime Glenn complains when I carry a HT. This time he might have been right. I was toting two HT's, binoculars, and the horns. I didn't even have room for a program. The bus ride back was a lot of fun. We called Lucille and Reg and found out that OU was still in first place in the Big Eight.

All of this activity was leading somewhere and that was to Kansas City for the Big Eight Post Season Tournament. The showdown came in Norman on the last regular game of the season against Kansas State. OU had beaten K-State twice previously and the Sooners were to prevail again. With an outright title and a first round tournament game with Colorado scheduled for the next Tuesday, Glenn and I both called Kansas City for hotel reservations for the group. The game against Colorado in Norman was a first round breather. The opponent on Friday night in Kansas City at Kemper Arena would Kansas State again.

Bobby had not planned to with us, but an early call from him on Friday morning before taking off left his original plans in doubt. We all finally arrived at Glenn's house and Bobby piled into the car muttering something about revenge for OU's poor performance at the tournament two years ago. The trip north was not bad, and we outraced some bad weather following us into Kansas. I had checked the NOAA continous weather broadcast and found that K. C. was cloudy and 56 degrees. We stopped for lunch at noon at a Buffet in Blackwell right off Interstate 35. I wasn't quite as hungry as I could have been since I had prepared some oatmeal cookies and brownies for the trip. These items were to keep me fortified on the way back when Glenn insisted on stopping at a Hardies. This is just not my kind of place.

The trip was just a little over six hours driving time or so. We stayed at the Continental Hotel in downtown K. C. This is one of those old fashioned places with real furniture and nifty fixtures. The Kansas City Athletic Club was down on the Sixth floor, but we found out that even though hotel guests had access to it, it was closed on Saturday and Sunday. Oh well, I didn't need the bathing suit that I packed. I ran a quick check with the HT's from the 19th floor room and found that the IMTS Bell Mobile Telephones provided enough intermod to give me receiver outputs on just about every receive frequency I had. I was able to key only a couple of repeaters, and my calls fell on deaf ears. I don't remember, but it seems to me that I could key one UHF repeater. I had put a direct frequency in Glenn's UHF radio so we could talk between the rooms without the benefit of the local telephone system. This was the first time that I had been charged for every local call whether or not the call was completed.

We got some good news upon arrival when I called John Shideler and talked to his wife and found that Larry Stewart WB5POW had started talking to Dennis WB5ISN, for the first time since he was severely injured in a plane crash. The news was so good that I called the hospital and talked to Larry's mother who confirmed the story. I passed the word to the others and we decided to stop by the hospital on the way back to Norman on Sunday. Apparently this conversation took place shortly after we had driven through OKC that morning. Stan WB5UIY and I had talked during that time on 444. 2 and he tried to call me on the Stillwater repeater later. Jim Shideler WB5YWO heard him and call his brother John in Kansas City who relayed the message to me when I called.

In great spirits, we drove out to the Kemper Arena for the first game with K-State.

Kansas had beaten Missouri for the right to meet the winner of the OU-K-State game for the finals on Saturday nite. This arena is gigantic. We settled in with airhorns, binoculars (pom pom girl watching is a genuine part of our pre-game warmup) and my Polaroid camera. Judy had brought a 35 mm for all the serious shots. I used the Polaroid to satisfy our instant gratification photographic needs.

The first bit of looniness occurred when some apparently rabid K-State fan walked up to us and started harassing us after hearing the horns. He looked like a purple fruitcake. The best insult he could manage was that he would see us on the football field next year. Is this guy crazy? What is he talking about? Glenn told him that OU had tougher games in the spring during practice than what K-State gives them in the fall. Bobby unleashed a similiar barrage regarding the heritage and tradition of K-State football. Under such an onslaught and quickly realizing that he had erred in mentioning the subject, the purple breasted fan beat a quick retreat. I later suggested to Glenn, Bobby, and Judy that he odviously had been a transfer student who missed the first semester. Forgive him for he knows not what he says.

For some reason, the high holinesses of the Big Eight had decided to put the OU Band clear down on the other end of the arena from the OU section of fans. I am sure that the Missouri fans didn't appreciate the bands playing Boomer Sooner near as much as we did. The horns were certainly needed in the crowd. As an additional bit of fallout, since the pom pom squad follows the band, we didn't get to see them either. harrumph. Man oh man, the game was exciting and OU finally managed a convincing win over the K-Staters. Bobby started a cheer, "Four in a Row," signifying the first time that any team had beaten K-State four times in one year. I must admit that the team looked pretty good.

We scurried out of the Arena with the horns and headed for the car. The City of Kansas City had left us a nice note regarding the extra special parking space that they had saved for us on the curb of the highway. I don't understand why they gave us a ticket. We parked right next to a sign that said "Fine for Parking." Looked OK to me. Since the game had started late, we decided to head back for the Hotel and find someplace downtown to eat. We did and it was great. The Italian Gardens was only about one half block north of the hotel and the Fettucini was excellent. We got in just before they closed, ate quickly, and left so that nobody had to stay late. Steve Martin was on TV when we got back. I watched part of it and turned in. Had to get up early for sightseeing the next day and, of course, get ready for the finals Saturday nite. My last official act was to put the battery for the horns on charge before turning in.

The official plan the next day was to get up early and head out for a little sight seeing. We got up at the crack of midmorning and regrouped for a trip to the Crown Center. It was cloudy and rainy, so the totally enclosed environment of the Center hit the spot. The place is amazing. When Glenn found out that the pom pom squad was staying at the Crown Center Hotel, he wanted to make our reservations for next years tournament. We ate in the International Cafeteria on the ground floor which features about six serving lines, each with a different international style of food. I opted for chinese food, but couldn't find a fortune cookie that predicted the score for that night. I decided to eat the egg foo while it was still young and gave up looking for cookies. It was all delicious.

The shops in the Crown Center went on forever. This place is not a discount house, however. The variety is amazing. We shot across the street and took a turn around the old Kansas City train station. This beautiful old classic building died when the airplane took over mass transportation, but still supports a few Amtrack lines. It was practically deserted. We walked back to the Crown Center and checked out the waterfall. Bobby, Glenn, and I heaved a

a couple of pennies into the fountain for good luck and then proceeded back toward the shopping area. The evening was beginning to wind down and Glenn wanted to visit Houlihan's Old Place, á nifty bar down in the original shopping area of KC. Afterwards, we went back to the hotel to plan strategy for the evening after the game. The plan was to have dinner at Stephenson's Apple Farm Restaurant located east of KCon 40 highway and Lee's Summit Road. I have fond memories of this place from the previous time I was there during a trip to Columbia for the Missouri football game. I called John Shideler and told him that we would give him a call when we left the arena so he could meet us there for a visit.

The nice thing about staying in a downtown Hotel was that we were close to most of the places we went, including the arena. It was just a quick 15 minute drive to Kemper and most of that was spent waiting in traffic. We opted for public parking this evening instead of the cherished parking spot from the nite before. The hike, carrying horns, HT's and binoculars was a little brisk, especially through the rain, but we made the arena and our seats in plenty of time for the tipoff. If we thought that the K-State fans were obnoxious, the Kansas fans had no peers. For one Jayhawker who sat next to us, the airhorns were too much. I heard some comment about "of all the seats in the arena, he had to sit here." He disappeared and about 5 minutes later, here comes an usher who told us that they had some complaints and we would have to put them up. I asked him if he knew what "fat chance" meant because if he did, then that was the possibility of not boomer soonering to our hearts content during the game. Glenn, meanwhile, was explaining to him that there was nothing on our tickets that said "no airhorns allowed" and that if he tried to put us out, all we needed was nis name and badge number to get him in a lot of trouble. He finally agreed that there was no authority for him to give us such trouble and quietly went away claiming that if he had further complaints, he would be back. We poopawed that statement and went about the business of blowing our horns. I don't recall seeing him again. Meanwhile, the Jayhawk down the row could do nothing but grin and swear at it. Later in the game, some Kansas people behind us started heaving some ice at us, but that didn't force us from our original game plan.

The game ended with . OU winning the tournament in a convinci ng win and Bobby charged the center of the Court and joined in the general melee, making a few choice comments about the fact that Kansas fans had started to leave early. Glenn asked me if I wanted him to stay and protect me and the horns or should he go down to the floor to keep Bobby from getting killed. I told him that someone had to protect the flank. Meanwhile, a couple of OU fans came down and told us they overheard some Kansas fans making dire threats against the horns and anybody associated with them. They very kindly offered to escort us out of the arena under a safe conduct passage. I accepted and the retreat from the Arena went without further incident. We zapped out to Stephenson's and I called John from there to let him know that we had arrived. The hurried exit from the Arena changed the plan a little bit.

Dinner was great. Stephenson's also features apple butter and other items made from apples from there own orchard out back. I had some cider and bought a couple of bottles of apple butter for my mother. They also feature great steaks and other meals. John showed up in the middle of the dinner and we had a lively discussion. I just remembered that I need to send him a crystal and haven't got that in the mail yet.

It was an easy trip back and the sun broke out of the sky somewhere near Wichita. We autopatched a friend in OKC and found that Oklahoma would be paired with Texas in the NCAA second round. However, a funny thing happened in Cincinnati at the hands Larry Bird while OU was on its way to the NCAA finals in Utah. Oh, well. I'll just sit back and wait for Football season and check into Basketball season Tickets next year.

Micheal Salem N5MS

ALTUS AREA AMATEUR RADIO ASSOCIATION

President - Steve Norris W5KI

Sec/Treas. - Mike Schenkel W5VXU

I've been a fairly happy owner of a Yeasu FT 101EE for two years. During this time I've lived with the fact the rig has some design problems and limitations. You get what you pay for; so you must consider you bought the deficiencies with the money you saved.

The biggest complaint was the receiver. A CW rag chewer lives three blocks from my QTH. When Marty, WA5WYN and I are on the same band the cross modulation wipes out my receiver. In fact, even 25 KHZ of his harmonic had to be avoided when he was on a different band. Many nights DXing was abandoned when the band was open because I couldn't copy anything but Marty. The problem didn't get worse but my tolerance of it sure did.

Help was needed to find a cure because I'm not the greatest technical expert. Just the opposite. One of the major fund raising events of the Altus Club is selling tickets to watch me build something. The Fox-Tango club came to my rescue.

The club has over 4,000 members in 44 countries. Their purpose is to enhance the effectiveness of member's Yaesu equipment by exchanging information. The group contains considerable expertise with very respectable credentials. They have been working the cross modulation problem and others for years. Cures to most FT ills are refined and kits are available through the club at reasonable prices.

According to the Club Newsletter, and my experience, most of the cross modulation problems are solved with two small pre-assembled modules available from Fox Tango. All kits were complete and included very detailed step by step instructions.

The first replaces the receiver second detector FET with an MA1496 double balanced mixer. The module includes a diode switching arrangement and voltage dividers etc, necessary for proper biasing. A gain amp is added to compensate for insertion losses. Installation required pulling the FET from its socket and soldering six leads.

The second Mod is on an opamp which changes the slope of the AGC characteristics during strong signals. Installing this one was a challenge. A lead is removed from a circuit board socket, moved to a vacant pin and the four leads from the new mini-board are soldered in place.

It's difficult to tell how long the operation took because three improvements were also accomplished while I was in the rig. Everything was finished in three hours. Most of the time was spent installing a 250 Hz CW filter and its diode switching board. That's another two pages that will come after the filter is battle tested in a few contests.

When the rig was put back together, everything worked as advertised. It's almost as if I'm using a new receiver. The cross modulation is gone! Last night I worked a fairly weak DX station within 2 KHz of Marty with no problems. The solution was so simple and the improvement so remarkable I'll spend the next two years kicking myself for not modifying the rig sooner.

I strongly recommend any FT owner to investigate the Fox Tango organization. They helped cure my rigs problem so surely they can help solve yours. Write: International Fox Tango Club, 248 Lake Dora Drive, West Palm Beach, FL, 33411.

Dave Horn, KØJPX (WBØVKF)

The regular monthly meeting of the Altus Area Amateur Radio Association was called to order just after 7.30 PM thursday March 8th by Club President Steve,W5KI.

Steve turned the meeting over to Dwight, WB5KRH who gave a brief update on the upcoming weather watch meeting scheduled to be held in the City Blue Room, March 22 at 7.00 PM. It was also learned that the Weather Service will not tone up the local weather alert radios in Jackson and surrounding counties. It appears they have no real idea how many of these sets are in use and how well they work so they do not want to cause confusion and excitement in the area.

Mike, W5VXU, named off a list of Telco films available to fill out a Club program and it was decided to try to obtain 'Voice of Mercury' for next month's meeting.

There being no further business the meeting was closed.

SHORTS: Congratulations are in order to Mr&Mrs Loren Simms, especially Mrs Simms, for presenting the Club with a future ham named Christopher Clayton Simms.

ALTUS AREA AMATEUR RADIO ASSOCIATION (CONT.)

Joe, WB5LAF is working overtime trying to upgrade and Chuck, WB5MJS has been virtually locked out of his garage since he started going into the birdraising business. It seems that the hens are very picky about noise while they are incubating their eggs so caution and quiet are the watch words around his house. I dont think that RF bothers them any though.

Mike, W5VXU

BOOK REVIEW

HOME COMPUTERS by The Editors of Consumer Guide

Published by Beekman House, a Division of Crown Publishers, Inc.,
One Park Avenue, New York, N. Y. 10016

Hardbound. My copy cost $2.98+postage. 256 pages, 37 diagrams, charts and illustrations and 52 photographs

The book contains:

- Personal Computer Glossary
- Directory of Manufacturers
- List of books and magazines on home computers
- Eleven chapters on these subjects:
  - What a personal computer is, how it works, and what can be done with it.
  - Getting started and deciding whether to buy a consumer, appliance or hobby computer.
  - Buying a personal computer.
  - Increasing the capability of and adding extras to a personal computer.
  - Obtaining ready-made programs.
  - Doing your own programming.
  - A look into the future.

The book HOME COMPUTERS serves two purposes. It is a computer buyer's guide and it explains the fundamental operation of microcomputers.

As an aid in helping the buyer, it provides much advice on avoiding pitfalls and disappointment. The book explains those words, acronyms and phrases that computer advertisers use. Various basic pieces of equipment and add-ons are discussed. The information contained in this book along with some manufacturer's literature should be all one needs in order to make a wise choice in purchasing a home computer.

Not to be diminished by placing it second in this review is the other purpose served by HOME COMPUTERS. The book provides the nitty-gritty fundamentals of how computers work. If you are beginning in the technical or programming area this book will get you started. Further study is facilitated by a list of books and magazines along with comments, prices and addresses of publishers.

+ + + Bill, WA5RAQ - - -

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Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3 MORI	4	5 OU	6 ACARC	7
8 WHEAT-STRAW PALM SUNDAY	9	-F.C.C.- 10 "76ers	-EXAMS- 11	12 ATV ALtus CARC	13 GOOD FRIDAY	14 HOLY SATURDAY
15 EARS EASTER SUNDAY	16	17 AUTO-PATCH	18	19 OU	20 OCARC (VHF)	21
22	23 Edit C&E	24:CORA	25	26	27	28
29	30 OCARC MAILS C&E					

See Page 4 and/or club sections for details.