CENTRAL OKLAHOMA RADIO AMATEURS
COLLECTOR AND EMITTER

50¢

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NOTICE Earlier Time!

Everyone Invited!

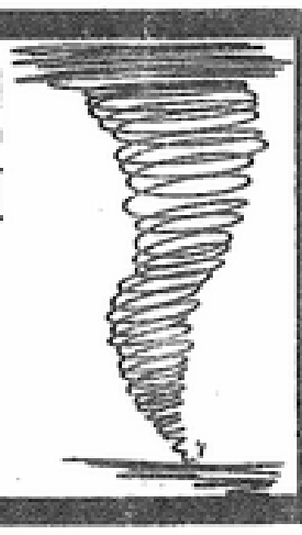
IT'S *TORNADO* TIME AGAIN!

OCAPA Weather Meeting — Feb. 16 at 7 PM

Held at Channel 9 Studios with Gary England

Training for storm spotters and net participants

22-82 Severe Weather Warning Net

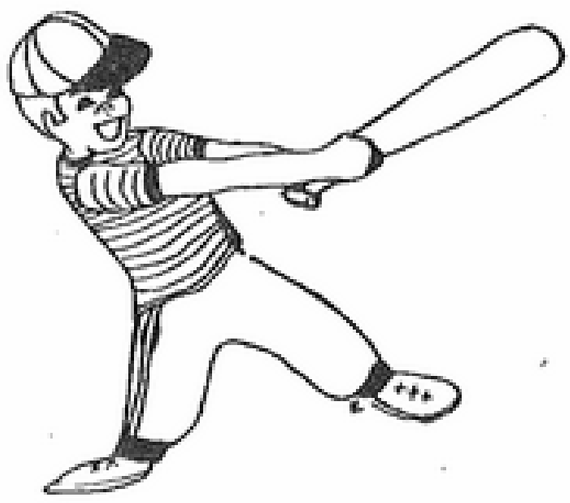


Tri-city Amateur Radio Club

Newuka---Holdenville---Seminole

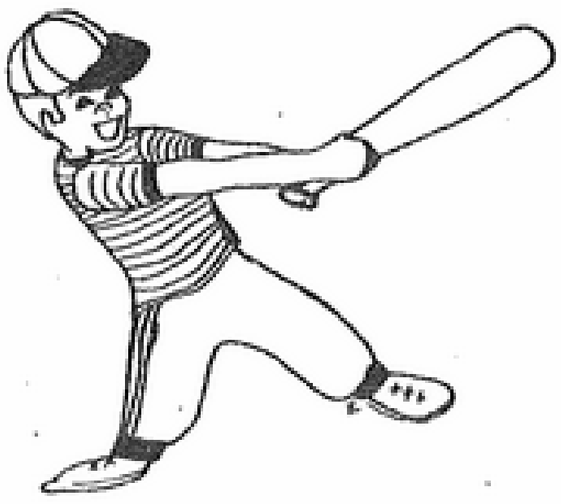
UNIVERSITY OF OKLAHOMA
AMATEUR RADIO CLUB 146.28/.88

STRIKE ONE!



See CORA Policy 2 (A), Page 21, November C&E.

STRIKE ONE!

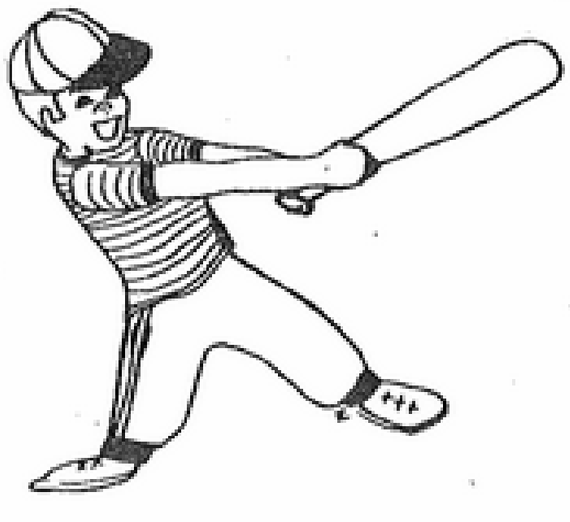


See CORA Policy 2 (A), Page 21, November C&E.

Edmond Amateur Radio Club
P.O. Box 75252 / Okla. City, Ok. 73147

Editor:STAN VAN NORT WB5UIY

STRIKE ONE!



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SOUTHEAST OKLAHOMA AMATEUR RADIO ASSN.
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STRIKE ONE!

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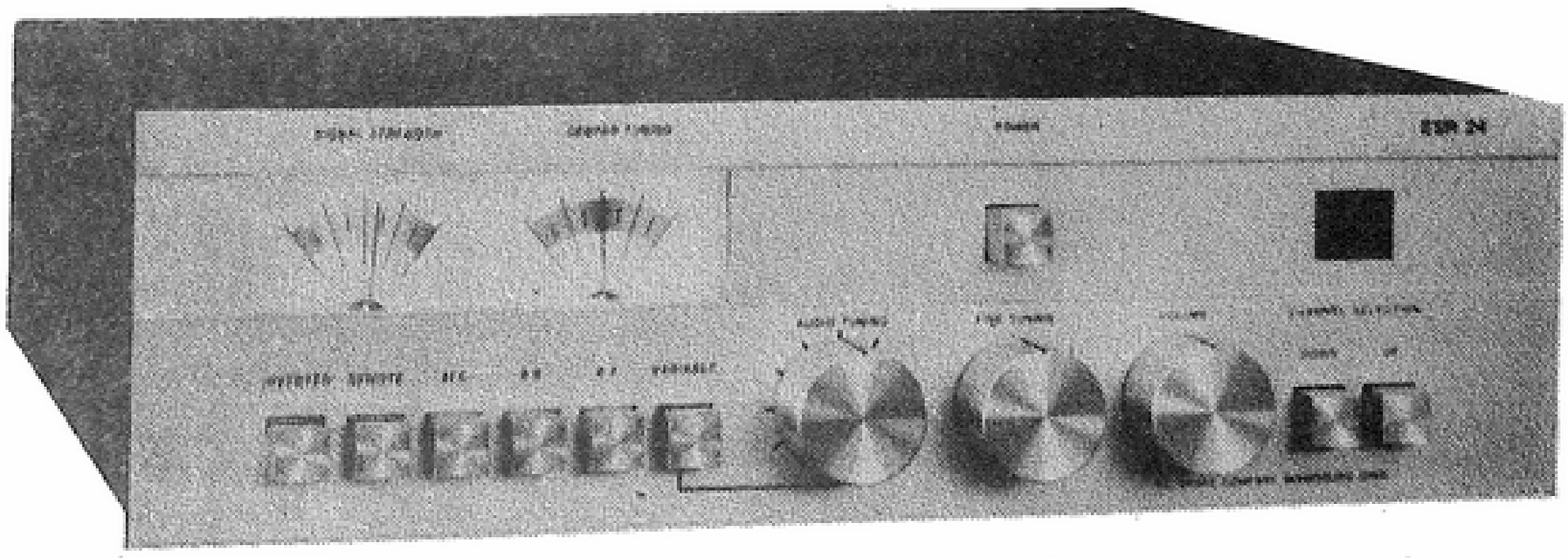

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Chuck Guschke, N5SW

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TUESDAY	10 - 5
WEDNESDAY	10 - 5
THURSDAY	10 - 6
FRIDAY	10 - 7
SATURDAY	10 - 4
SUNDAY	CLOSED
MONDAY	CLOSED

ALL MAJOR BRANDS OF HAM RADIO EQUIPMENT

CENTRAL OKLAHOMA RADIO AMATEURS, INC. (COPA) is a non-profit association of radio amateurs founded for the promotion of 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 statewide.
The opinions and statements made are those of the individual signing the item.

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Circulation Mgr. Bob Graham, WB5NSV 677-8685

PARTICIPATING CORA CLUBS

CENTRAL OKLAHOMA RADIO AMATEURS, INC.

MEETS: 7:30 pm Fourth Tuesday (Except Dec,) Red Cross, Oklahoma City.

PR	AD1S	George Adkins	722-6195
VP	WD5JNT	Ted Van Laningham	262-1675
Se	N5CIJ	Frank Yohe	324-0772
Tr	K5GGL	George Maschino	263-7614

1 AERONAUTICAL CENTER ARC

MEETS: 8:00 pm First Friday at Flight Standards Bldg., FAA Aeronautical Center

PR	AAØO	Robby Runyon	373-1818
VP	N5ABL	Holly Holcomb	799-2539
Se	WB5UHW	Jim Seignious	751-6698
Tr	K5RJR	Larry Vorheis	789-9629
EDITOR:		Bob Graham, WB5NSV	677-8685

2 OKLAHOMA CENTRAL VHF CLUB

MEETS: 8:00 pm Third Friday, Red Cross Bldg., 10th & Hudson, Okla City

PR	W5VCJ	"Steve" Stevens	341-8486
VP	WD5IRB	Ralph Bartow	521-8330
Se	K5JB	Joe Buswell	732-0676
Tr	W5KE	Ellard Foster	789-6702
EDITOR:		Joe Buswell, K5JB	732-0676

3 MID-OKLAHOMA REPEATOR, INC.

MEETS: 8:00 pm First Tuesday, Okla City EOC, 4600 N Eastern

PR	KC5HD	John Clement	943-2467
VP	W5HPR	Don McDown	732-6749
Se	KA5ERZ	Connie Boland	348-0123
Tr	W5KOZ	Sid Gerber	737-1050
EDITOR:			

4 OKLAHOMA CITY AUTOPATCH ASSOCIATION

MEETS: 7:30 pm Third Tuesday, Okla City Fire Dept Training Center. N. Portland

PR	N5IH	Henry Israel	722-3848
VP	AD1S	George Adkins	722-6195
Se	KA5BJS	Judy Macdonald	672-4947
Tr	K5GL	Guy Liebmann	787-9545
EDITOR:		Henry Israel, N5IH	722-3848

5 OKLAHOMA UNIVERSITY AMATEUR RADIO CLUB

MEETS: 8:00 pm (Sep-May) Second Tuesday Carson Engineering Center

PR	WB5RQB	Lee Hardy	325-4545
VP	KA5COI	Peter Richeson	329-3217
Se			
Tr			
EDITOR:			

6 ALTUS AREA AMATEUR RADIO ASSOCIATION

MEETS: 7:30 pm Second Thursday North Main Fire Station (CD)

PR	WB5MJS	Charles Smith	477-1098
VP			
S/T	WA5CBF	Loren Simms	477-0921
EDITOR:		Loren Simms, WA5CBF	477-0921

7 BICENTENNIAL ARC

MEETS: Second Tuesday, Air National Guard Will Rogers Airport.

PR	KH6JTE	John Galway	670-5472
VP	N5BEQ	Jim Buswell	236-0368
Se	N5AUH	Jerry Sproul	354-2061
Tr	WA5RAQ	Bill Rogers	632-4375
EDITOR:		Bruce Goff, KC5CR	751-6276

9 WHEATSTRAW AMATEUR RADIO CLUB

MEETS: 2:30 pm Second Sunday. Location varies. See club section for location.

PR	WA5GLD	Dick Ruhl(Kingfisher)	375-4843
VP	KA5FUU	Tom Johnson(El Reno)	262-5631
S/T	WA5PFK	Ralph Wilder(Watonga)	623-5421
EDITOR:		Ted Vanlaningham(ElReno)	364-5421

12 SHAWNEE AMATEUR RADIO CLUB

MEETS: 8:00 pm Second & Fourth Tuesday Shawnee City Hall (EOC)

PR	WB5ZBA	Earl Couch	598-3212
VP	WD5ETD	Rick Wilson	
S/T	KA5FBC	Jim Sullivan	273-3843
EDITOR:			

13 KAY COUNTY AMATEUR RADIO CLUB

MEETS: 7:30 pm Third Tuesday Security Bank Basement, Ponca City

PR	WA5UBO	Marsh Pronneke	363-2526
VP	WB5NQT	Pat Burnham	765-7229
S/T		Delbert Foiles	
EDITOR:		Marsh Pronneke, WA5UBO	363-2526

15 SOUTH CANADIAN AMATEUR RADIO SOCIETY

MEETS: 9:30 am Second Saturday, Red Cross Bldg., North Campus, Norman

PR	KU5B	Jack Bickham	329-1311
VP	K5KDR	Bill Oliver	329-6333
Se	AF5X	Jess McKinzie	329-1543
Tr	WB5UUX	Charles McCown	321-1061
EDITOR:		Sam Barrett, KA5Rpp	321-2601

16 EDMOND AMATEUR RADIO CLUB

MEETS: 7:45 pm First Monday. See club cestion for location.

PR	WB5UIY	Stan Van Nort	N/L
VP	WB5ISO	Wendall Cochran	943-4308
S/T	WA5BQX	Bob Shaw	341-4874
EDITOR:		Stan Van Nort, WB5UIY	N/L

17 TRI-CITY AMATEUR RADIO CLUB

MEETS: 7:00 pm First Tuesday. Location varies. See club section.

PR	WB5UBB	John Warriner	379-3149
VP	WB5VLT	J. B. Bills	379-3992
S/T	KA5FDA	Nancy Haydon	379-6448
EDITOR:		Yvonne Warriner, WB5TYW	379-6448

18 GREAT PLAINS AMATEUR RADIO CLUB

MEETS: 7:30 pm First Tuesday, Basement Woodward court house

PR	N5CCV	Gerald Bowman	994-5381
VP	WBØPGD	Ron Tice	994-2138
Se	WBØQGW	Carla Tice	994-2138
Tr	KA5KAG	Geery Ford	256-5342
EDITOR:		Carla Tice, WBØQGW	994-2138

19 SOUTHEAST OKLA AMATEUR RADIO ASSN.

MEETS: ? ? ?

PR	WB5TTV	Ron Henson	326-5418
VP	WB5ULI	George Weldon	326-6572
S/T	WD5FUE	Orville Kaley	326-3650
EDITOR:		? ?	

Salem

THE LAZARUS RADIO--AN IC-720 REVIVED

For some time I have admired the sleak lines and push buttons of the latest Icom HF radio--the IC-720A. I even briefly admired the schematic, courtesy of K5JB and studied the advertisement brochures usually obtained free at the local radio emporiums or at Dayton. Sigh, this was a radio to be reckoned with. It could do it all. AM, CW, SSB and RTTY at the touch of a button was only a few of the backflips that it could perform. This baby was ideal for remote control or controllers. The transmitter output circuit consisted of a series of low pass filters that were switched by a stepping relay whose merry clunking bespoke rapid bandchanges. Besides, it was a general coverage receiver and transmitter, so as far as any future WARC was concerned, it would never become obsolete. The receiver was good from an astounding 100 Khz all the way to 30 Mhz, all completely synthesized. And if the truth be known, the radio had sensitivity all the way down to zero (as in hertz) where it would hear its own first oscillator. The sensitivity was somewhat limited below 100 Khz because of white noise from the oscillator and the fact that you were outside the range of the lowest set of filters. Wow! Holy Dipole, Batman, What a radio.

I have stared at this radio for quite some time at Dayton and Ham Holiday, but the $1400 price tag (including the power supply) was just a little steep for me. Instead when it came around to reviving my HF activity a couple of years ago, I ran my trusty rusty Swan 350 for a year or so before succombing to the siren song of the Kenwood TS-130S. Even so, I was still a closet 720A fan (the only difference between the 720 and the 720A was an LDA module that allowed the radio to perform with the new Icom solid state amplifier and automatic band switching antenna). I expected that used 720's would turn up in the flea market, but a quick perusal of the Yellow Sheets convinced me that resale prices would remain above a $1000 and the general coverage nature of the radio would prevent it from being obsoleted very soon. Besides, I was not capable of paying full list price for any piece of radio equipment. I had had several offers from good friends in the business to bring the price down on a discount, but it was still a little rich for me. I could just see the cash reserves for Dayton taking a nose dive after such a purchase. I just couldn't do that to my Dayton cash flow.

Besides, every complains about the "purchase it and plug it in " syndrone. Nobody built anything anymore. I wasn't planning on building a IC-720A, but a novel offer appeared in the C & E several months ago when K5JB told me that Henry N5IH was offering a 720 for sale at an astounding best price over X dollars ad. The only hitch was that it needed fixing. The radio had just one thing wrong with it. It had been hit by lightning. Oh wow. I buzzed Henry on the telephone and began to carefully question him about the radio's problems. Humm. No transmit or receive, no display, no keyboard operation, no nothing except a couple of lights and display quirks. The processor seemed to be a couple of pickles short a barrel. He guessed that the processor and 5 volt supply was bad (Actually, the radio features separate regulators on each subassembly and there were numerous power supply regulators throughout the entire radio). This could be a real challenge. And for $500.00 I could spend a couple of hours and have a working radio or I could spend a 100 hours and still have nothing. It was a gamble, but one that seemed worth taking. I immediately advanced my $500.00 bid which Henry took under advisement and told me to check back with him in a couple of weeks to give the other bidders a chance (I found about the radio from K5JB who peeked at the upcoming C & E at the pasteup and spotted Henry's ad). After about 3 weeks, I called Henry back and was told that I was the highest and best bidder and we made arrangements to hand off the radio at Kryders.

I examined the radio after getting it on the bench. There was no cosmetic damage except some discoloration on the backside where the ground lug was attached. (I later found another burn mark inside under the Main Unit board at a point where the power supply lead came a little close to the chassis. Apparently, another flashover point) Judging where it was located, it was apparent that the lightning had entered the circuit somewhere through the power supply leads (which would be expected since these were the lowest impedence circuits in the radio, the PA output circuits had too much inductance and capacitance to let too much energy go through it). The radio was dead to the world. This could be a tough nut to crack.

My first efforts were directed to a careful inspection of the radio and trying to obtain service information. Henry had a partial schematic and a manual that was not too useful. K5JB supplied me with a schematic of the microprocessor control board and the PLL board. These were Xerox photocopies and I literally carried them with me everywhere I went for about six months so that I could study them in my spare time. They got to be quite worn. WB5FZD gave a manual for the 720A which had a lot more information about tuning up the radio and had a functional block diagram that actually explained much of the parts numbering. Icom uses numbers beginning with 1 on each of the various subassemblies so that it might be possible to have at least 7 or 8 Q1's throughout the entire radio. Very confusing. I tried to sort out the power supplies and those were even more confusing since there were separate regulators on just about every subassembly. The subassemblies were a PA module, RF Module (receiver input filters and transmit pre-driver output filters), Driver Module (takes a low level transmitter signal and amplifies it to about 6 watts), PLL Module(this produces the first oscillator fixed signal and a variable signal for the second conversion), IF Module (Receiver IF amplifieation and Detection, Noise Blanker, Carrier Oscillator and SSB Generator plus mixers), RTTY Module (generates the proper RTTY signals), CPU Board (contains the microprocessor control board plus the microprocessor display driver plus other assorted control signals), Main Module (AF amplification, Power Supply for Receive and Transmit nine volts, mike amplifier, vox circuit, SWR circuitry for protection of the finals, meter drivers, and switching of various inputs and outputs including CW sidetone). Each of these were jampacked with components. The radio exhibited all the characteristics of a power supply failure to certain critical components. I should also mention that Henry had returned the radio to Icom for repair and had been told by them that the radio was hopeless. I had checked the power supply that came with the radio and determined that it was all right. Henry had told me that the antenna was disconnected from the radio and the 117 volts and ground lead were the only wires hooked to the radio beside the memory backup. This did not seem to jive with the fact that the power supply was in good condition and appeared to be unharmed. This would not have been the case if the charge had come in on the power supply and surged through the ground lead out. I called Henry up again (he was quite generous with his time and my questions, probably either felt guilty or sorry for me). This

time I carefully examined Henry about what exactly was connected to the radio. Sure enough, I found that the antenna was connected to the radio, but through a shorting antenna switch. I deduced that the lightning stroke had come down the ground lead of the antenna, passed through the radio and exited through the ground lead connected to the radio chassis or the memory backup power supply. (This possible "side flash" may have accounted for the extensive damage in the 9 volt power supplies that I later found on the Main circuit module and in the fact that numerous 5 volt to 9 volt level converters on the CPU control board had popped). This may have explained why several of the pass regulators had bit the dust.

Chuck at Kryder's had told me that he was experimenting one day and found that the Icom Power Supply PS-15 and the Kenwood Power Supply PS-30 were interchangeable. I checked and found that he was right. About the only difference in the power supplies was that Icom routed 117 volts into the radio to the main power switch while Kenwood only let a control voltage go to the on-off switch to control a relay to switch the 117 Volts inside the power supply.

WB5FZD performed the ultimate act of friendship by lending me a completely working IC-720A for the purpose of disassembly and substitution. After I had some experience with my radio under my belt, this was not so much of a risk anymore. I made good on my promise to John to return the radio to him in as good a condition as when I got it, but I did have to repair a relay failure in the PA filter when the stepping relay coil made a dead short. This happened toward the end of the repair project and after I had been through my radio, repair of John's radio was a snap that took about 1 hour total.

I spent quite a bit of time studying the mechanical and electrical characteristics of the radio. The mechanical complexity of the radio was quite intimidating at first. The radio is actually a bunch of shield printed circuit boards all connected together by what must seems to be millions of molex connectors. I spent many hours familiarizing myself with the physical layout and description of each board and its function. Once I got over my initial shyness with the rig, I boldly disassembled it by removing the four screws on each of the covers, removed the four screws that held the front panel, carefully pulled the front panel of the radio containing the microprocessor slightly away from the radio, then gulped again. Wow, this could really be a big job. Oh, well, might as well check and see if the processor was running. WA5JXX had provided me with a data sheet on the PD650 CMOS processor made by NEC. This four bit processor was nothing but i/o lines. The data information helped me to determine the various input and output ports, but, of course, it did not help with any of the software inside the masked programmable processor. That is known only to God and ICOM and probably only Icom if God can't read Japanese. The clock on the processor was running and there were a variety of signals from the I/O ports and from another processor, a NEC PD549, used to drive the display. I first thought that the processor might have had a couple of I/O lines bad, but after some further experimentation, I decided against that, and turned toward some of the power supply regulators on the main board.

A couple of LEDs on the front were lit all the time. One of these was the dial lock light. The problem was traced to a level converter that was locked in the high output state. The level converter was a BA618 which is used to convert the 5volt CMOS outputs to 9 volts. I later determined that all five of these converters inside the CPU control board were bad because they were associated with the 9 volt supply. They did, however, protect the CPU from almost certain destruction, acting as little fusible links to keep the lightning surge from the central processors.

Parts for repair could be a problem. After I had found two regulators on the main board that were bad, I phoned Icom East in Dallas to determine parts availability. They didn't keep much in stock, but would telex my order to Icom West in Bellevue, Washington, the central parts depository. Just to see what I was up against, I placed an order for a couple of transistors from Dallas. It took them over a month to deliver. Meanwhile, I had pressed on the repairs by using ECG replacements for these noncritical replacements. Fortunately, for my other parts orders I called Icom West directly and got on a first name basis with their parts man. The turnaround time with Bruce was much better averaging about 7 to 10 days via UPS even through the Christmas rush. My first order and subsequent orders included a lot of parts that I really didn't use, but thought should have on hand anyway, anticipating potential trouble spots. I purchased about $100.00 worth of parts, but probably only installed less than $40.00 in the radio. I ordered a PD650 CMOS processor early on before I determined that it would not be needed and it is in the spare parts collection now. I thought about sending it back, but was surprized that this custom programmed chip was only $12.00 instead of what I expected would be about $50.00. After studying the schematic, I determined that Icom uses a lot of common parts such as the 1SS53 diode, a general purpose switching diode similiar to the 1N914. They also have a lot of 2SA1015Y transistors (PNP General Purpose) and 2SC945 (NPN General purpose). So I ordered about 10 of each. I did a lot of the repair before the parts came in and in the instance of where the transistor was a NPN used as a switch, I went ahead and substituted a 2N2222 and soldered it in and it worked just fine.

As I said, the Tranmit 9 volts, Receive 9 volts, and continous 9 volt regulators were all out. I replaced six transistors and a diode in this area alone. Unfortunately, since the transistors had shorted, this drew a lot of current through a couple of 2.2 ohm current limiting resistors that cooked them and increased their resistance values. This accounted for why the regulators didn't work even after replacing the transistors. Sign, if anything can go wrong, . . . Well, you know the rest.

The radio would power up in the transmit position. I never really noticed this until I heard the clicks. Of course, I didn't know that it would do that until I repair the 9 volt supplies. I eventually traced the transmit problem to a shorted diode in the RF attenuator. The diode was designed to switch the RF attenuator into the circuit when the transmitter was on, apparently to prevent it from being overloaded by the transmitter.

After fixing the 9 volt supplies, I decided that the time had come to substitute boards from the working IC-720 to see if I could localize the problems. After carefully disassembling my busted radio down to its electronic underwear, I began to substitute its boards into the good radio. After some determination, I found that the RF Board only appeared to be OK. I thought that the Main Board was OK, but couldn't be sure since a couple of things didn't seem to produce the right signals. I had to replace a couple of other parts in the Main Board including the AF amplifier and a switching transistor that controlled the CW sidetone. When I was doing the substitutions, I didn't check every function and didn't find out these things until after getting my radio back together. I thought that the IF Board was OK, but later determined that it worked OK in receive, but didn't work in transmit. More on this later.

I had problems with the PLL Board, the Main CPU Board and the SWR sensor board. I did not substitute the Driver Board of the PA Board since

this would have been a lot of trouble. Actually, I dreaded the expense if the PA didn't work. I later found out that it was OK after I was noodling around with the main board and something happened and power came out the PA and up the wire of the earphone I was wearing and gave my ear a RF haircut. I had disconnected the coaxial ground from the dummy load and the RF had no where to go but earward. The Driver was also OK after I had replaced a driver transistor that had shorted and taken a lot of current to ground.

The display did not light up and I had hoped that the repair of the 9 volt supplies would take care of the problem. No such luck. I then thought that a couple of bad transistors that switched the cathodes of the display might have been the problem. Nope. Humm. Well, I actually found the problem while tracing the clock signal from the main processor (PD650) to the display driver processor (PD549). The display processor derives its clock signal from the main processor. Because of the way it connects to the 9 volt line there are three transistors that got cooked in the clock amplifier. Replacing these devices brought the display back to life. There was still a little flickering in the display and a couple of blank digits that would also flicker on and off. While I thought that this was a leaky transistor driver, after some experimenting with mechanical stresses on the board, I found that the flicker would go away if I pressed on the board at a certain point. I carefully inspected the board with a magnifying glass and found a couple of solder flecks that had fell into the display traces. Cleaning the solder traces and touching them up with a soldering iron brought the display completely to life.

Even though the display was back to life, certain digits would not light and the keyboard front of the radio was still locked out. The display acted as if the dial lock was still locked even though I had replaced the chip that had caused the light to stay on all the time. I checked the dial lock switch and found that it was operating normally and that some of the signals appeared to be normal (although I was not really sure what was normal since I didn't know what the software was. Remember, only God and Icom). So why was the display still locked up? This, perhaps, was the strangest problem of the entire repair. You would think that the display problem and dial lockup would be related to the display drivers and microprocessor? Not true. The processor appeared to be very busy, yet many of the front panels functions would not work. In the course of troubleshooting the various input and output lines, I found that the RL line which drives the stepping relay in the PA output filter was continously outputting a series of pulses like it was trying to make the relay step. But the stepping relay was not working. I looked at the stepping relay and found that it also drove a diode matrix that sent a group of signals back to the processor to tell the CPU whether it was on the right band or not. As long as the matrix was sending the wrong signal, the relay was suppose to keep stepping. I thought that one of the diodes in the matrix was bad. Nope, they all checked good. The RL signal was present at the base of a power darlington that drove the stepping relay. Either the relay itself was bad or the power darlington had popped. I used a jumper clip to check the relay and it worked normally. Fortunately, a couple of months ago, I had purchased a NPN darlington which would work exactly. It took me about an hour to find it in the parts collection. After replacing the diode and the darlington, the stepping relay came to life and racked up to the right band. Apparently the lightning surge had destroyed the transistor. What was even more amazing was that the front panel came to life. The display showed almost all the digits and the dial unlocked. Apparently, when bandchanging, the radio blanks a couple of digits and locks out the keyboard. As long as the radio filters were on the wrong band, the processor would inhibit all the keyboard functions as well as transmit. The processor would be so busy sending out relay stepping pulses that it would do nothing else. Since the relay was incapable of moving, it always seemed to power up in the wrong band. What is amazing is that the solution to the locked up keyboard and display was in the replacement of a relay driving transistor in the transmitter filter output circuit! I don't think that the fix could have been further located from the problem, but if you think about it, it kinda makes sense. I had one other digit that would not light and the fix was the replacement of a particular transistor. I never understood why Icom did this. I just traced the problem to it and replaced the transistor. Again, they alway seem to use five transistors where one might do.

After the substitution into the good radio, I found that the PLL board did not work. It took me a long time to get up the courage to open it up since it was quite complicated. It was also buried in the lowest recesses of the radio and was an absolute bear to get to. After rearranging the wire molex connectors I was able to get to the PLL board with the scope probe. I first checked the power regulators and pass transistors. and found that the voltages were all screwy. There was no output from either the high injection or low injection outputs. One of the regulators was putting out 9 volts plus instead of 5 volts. I got spare regulators and pass transistors and purchased some spare low power Shotkey IC's in anticipation that they might have gone south with the regulators. Sigh. Another phone call to Bruce and another week and a half wait. When the parts came in, I first replaced the power supply components and voila, the PLL came alive. After making some quick checks to insure that it was operating, I quickly sealed up the PLL and bolted it to the bottom of the radio. By now, the radio was fully operational in receive (I thought until I found that the RF preamp had two blown FETs in the front end). I had substituted John's CPU Board and front until I got the replacement level converters (BA618's) from Icom (coming in on a slow boat from China). At that time, I replaced the two bad chips in my radio and substituted my CPU and front back, then quickly reassembled John's radio. It was at this point that when I plugged John's radio back together that it played for awhile, then took a nose dive. Strangely enough the problem was a shorted stepping relay which was unrelated to any of the repair that I did. I set John's radio aside and ordered a new relay to wait while I was heading down the stretch.

Turning to the transmitter, I found that I was still not getting any signal into the driver. I had already replaced one transistor in the driver. But there was no signal coming from the RF board. The carrier oscillator was in the IF Board which generates the signal and shoves it to the RF input board. These filters double as both receiver and transmitter filters. The carrier oscillator had full output. I checked the audio from the mike amplifier and found that it was down considerably. Could be a bad mike amp. But wait, when I pulled the input to the IF board from the mike amp, the level went back up to normal. The carrier oscillator and the mike output both feed into the balanced mixer. I pulled the balanced mixer out and jumpered past it with a capacitor. Wow, the transmitter had full output, a full 100 watts. So, the mixer was bad, a-a-and another wait of a week and a half. I also took the opportunity to order up a couple of FETs for the front end because I thought that they might be bad (they were).

After replacement of the balanced mixer, the transmitter came to life with full SSB, AM, and CW generation. It was time for a field test. I got K5JB up on 75 meters and we ran a couple of tests back and forth. Sure enough, it seemed that the sensitivity of the receiver was not up to snuff. I had also replaced the audio amplifier because it had gotten snuffed by the stroke. I brought the radio back to the bench and

popped it apart. The attenuator was switching in when the radio was powering up. I disconnected the line that controlled the relay and found that it was still switching in when the radio was powering up. Humm, this was strange. I suspected a diode across the relay coil, but eventually settled on a low voltage 25 volt bypass capacitor from the bottom of the relay coil to ground. It had partially shorted and was conducting enough current to activate the attenuator relay. I replaced the capacitor and reconnected the circuit. Damn, the relay was still activitating when the radio was powered on. I traced the circuit back to the front panel and found another bypass capacitor had shorted. Two capacitors in the same circuit, both partially shorted to ground. I also found that the two FET's in the front end had shorts and I replaced them. At this point, the receiver sensitivity was considerably improved. Having prudently ordered the FET earlier, this fix took only a couple of minutes.

A couple of other small problems with the CW sidetone and some minor diode replacements and I reassembled the radio on a friday evening in time for a regular saturday morning schedule with Hoss WA5ZAI and others. The radio was completely operational at this time, but the signal reports were disappointing. After some tests to adjust the audio levels on transmit, K5JB told me to check the antenna. Hum. My 4Ø meter antenna had blown down and I had been using what I thought was my 75 meter antenna. Not so, except that a little confusion in the antenna switching department when I had borrowed the antenna tuner for another project had me using the 4Ø meter dipole which was running along the ground. Sure explains why it wouldn't load 75 meters very well. I switched to the 75 meter airborne antenna and things came back to normal. I spent a saturday afternoon running through the adjustments in the manual and then I boxed the radio up to use. I ran it for 24 hours continously to check for infant mortality in the parts department and to test it to see if there were any other lightning weakened parts. Apparently not, since it has been working perfectly for about 3 weeks now.

What did it really cost in time and money? Well, the money was not so bad. I spent about $100 or so in parts, but only installed about $40.00 worth in the radio including the relay in John's radio. The rest are spares for future use by me or somebody who might need them. Taking into account my initial investment, I have an IC-720 for about half the regular price. I also invested in an LDA unit (Chuck had a spare that he had purchased for the IC-720) and also a CW narrow filter. This was considerably before I had finished the repair. It might have been a little presumptious, but I had to have an incentive to finish the repair job. The cost in time is a little harder to calculate. I estimate that I would have about 50-75 hours in troubleshooting. Much of this was spent in familiarizing myself with the mechanical and electrical design. I was very conservative in checking before replacing parts. Now, I think that I could effect the same repairs in considerably less time. This was illustrated by the relay repair to John's IC-720A. My repair of my radio took about 6-7 hours, but I fixed John's in about an hour, including replacement of the relay.

Now this doesn't mean that I am in the business of fixing IC-720A's, but if you need a part, I might have it. Besides, this is a complicated radio. If you haven't tried to fix it yourself, don't call me. The radio is electronically intimidating. The Icom people are very clever, but I don't understand much of their design philosophy. Some circuits are quite clever, others are amazingly complicated. K5JB once told me that his IC-701 was a mechanical monster. He disassembled his to make a couple of modifications and had to keep going through the night to reassemble it for fear of forgetting how to get the radio back together. Now, I don't know whether or not he was joking because I cannot seriously entertain the idea that Joe would be intimidated by anything electrical or mechanical, but if the 720 is any test, it is a little easier to work with. As a precaution, I used an indelible laundry pencil to mark all the molex plugs. There were still a few discrepancies between the Icom drawings and the board in my radios, but after a little circuit tracing, I was able to get the radio back together.

The radio is great. I especially enjoy the general coverage feature. The low frequency coverage from 100 Khz to 500Khz is very interesting. There are a few airplane NonDirectional Beacons including some with Transcribed Weather broadcasts. Some careful listening will also produce a wide assortments of bleets and buzzes, and that's just the rock stations in the broadcast bands.

I am not sure that I would ever want to buy another radio that has been hit by lightning unless it was something I definitely want. Unless there is physical damage, lightning usually jumps into the power circuits first since these are generally the lowest impedence circuits. Dean N5AVM, our local Motorola service shop has seen a number of base stations hit by lightning and usually winds up replacing most of the active devices in the radio. Lightning can usually take a number of crazy paths. I would recommend that a person not use a ground lead on the chassis of the radio if you are going to leave the antenna hooked. The best method is to completely disconnect the radio from the antenna. Don't depend upon the shorting switch. This is OK for static bleedoff, but don't depend upon it to handle the lightning stroke. Put a couple of turns in your cable before bringing it into the house. Lightning is a lot of high frequencies and the inductance from even a simple right bend can do a lot to knock down the energy transferred inside the house. The best method may be to put the lightning arrester outside. In the case of this 720, the surge on the ground lead created a large current near the radio and through the chassis. This large current induced large voltages in the 9 volt supplies. If the ground lead to the radio had not been connected and if the 117 volt plug had been pulled, it is possible that the entire radio might have been raised to a high potential voltage and returned to normal unharmed. But since there was a path, potential differences existed between various parts of the radio chassis. This was enough to induce the voltages that harmed the radio.

I don't know whether or not I will keep this radio or the TS.-130S or both. Both have their attributes. The final parts talley was 8 integrated circuits, 5 diodes, 2 capacitors, 16 transistors, 2 Fet's, two resistors and two monolithic regulators and 1 zener. Other than that, there was nothing wrong with the radio.

Micheal Salem N5MS

RADAR RAZZLE DAZZLE--Part 2

I had a couple of comments about the radar transmitter modulator published last month. Will this device jam a radar? Probably. Is it legal? Definitely not to use. Can it be detected? Yes, if the officer is using his audio doppler, he can hear the incoming signal. A regular returning radar echo sounds like a whistle that rapidly changes its pitch as the car changes speed or passes the trooper. The device I described holds a constant pitch which doesn't change as the car accellerates or passes by the trooper. If he hears the constant pitch that is unchanged, he may decide that somebody is carrying a jammer. Besides, if an amateur is caught with a device like this, it could be grounds for revocation of your license. I don't think that it is worth it for anything other than setting off Fuzzbusters.

Micheal Salem N5MS

The South Canadian Amateur Radio Society

SCARS HOLDS JANUARY MEETING.....

The South Canadian Amateur Radio Society began the new year with a meeting on January 9th at the Red Cross in Norman. The following things were discussed during the business portion of the meeting.

-The repeater committee report included a recommendation, which was approved by the club, to have the repeater checked by TD's.
-The club voted to buy 1982 callbooks for the club station.
-Representation to CORA meetings was discussed. It was decided to send a different member each month to the CORA meeting so that the time and travel are not a burden to the same person month after month.
- AF5X was directed to write a letter of purpose to the new director of the Norman Red Cross.
-A classified ad in the newspaper was approved to promote the club to persons interested in amateur radio.
-The club heard a treasurer's report.
-SCARS decided to undertake a project for the Oklahoma Diamond Jubilee. The club has decided to make available to club members, a commerative QSL card. Also, it was decided to offer to allow CORA to take over the project so that all CORA amateurs can join us in the celebration.
-A committee was appointed to repair the dipole antennas at the Red Cross station.

Announcements of the next two meetings were made.

-In February, a CW contest is planned.
-In March, a possible Friday nite dinner meeting is in the works.

JANUARY PROGRAM A SUCCESS.....

SCARS was indeed fortunate to have had a very interesting program at the January meeting through the courtesy of three of the Amateur Television enthusiasts from the OKC area, K5SUD- Hutch, K5HQP-Marvin, and W5ZZG-Griff. Hutch took care of the primary speaking chores as the lucky members who were present were given a guided tour through the world of ATV. Hutch did a good job of explaining how to get started in fast scan TV. SCARS certainly sends thanks to Hutch, Marvin, and Griff.

FEBRUARY CW CONTEST.....

Well, here is what we have all been wishing for. Now we have a chance to see who is the real master of the di-di-dah-dah-ditty. The previously mentioned CW contest will take place during the program portion of the February meeting on 13 Feb. The CW will be keyboard generated from text taken from past issues of C & E. Code speeds will be 10, 15, 20, 25, 30, 35, 40,45 wpm until all entrants drop out. Now, lest you think that the contest is only to see who is the fastest, let me add that each person will be recognized for the speed at which they show proficiency. It is also rumored that if the treasury is able, a couple of prizes will be offered.

NEW RIGS.....

Many members of SCARS are reported to have new equipment at their home stations. There were so many that I'm not sure that I got all of them written down, but here is what I got:

KA5MIZ-xmitter, rcvr
AF5X-xcvr
W5MCJ-xcvr
K5KDR-xcvr
W5MCN-xcvr
AF5X-linear
KB5EK-linear

This certainly seems like a long list, and I don't want to imply that SANTA is partial to SCARS members, but those of you who are drooling over new rigs and havn't yet paid your 1982 dues might want to get in touch with WB5UUx as soon as possible.

It should also be mentioned at this point that the list of those of us who still have the same rigs is too long to be printed here.

-WA5RPP

Zedd's Momma Pays A Call

Mrs. C.W. Zedd, widow of the great pioneer DXer, Zepp Zedd, and mother of Oklahoma's greatest amateur radio operator, the legendary Q.R. Zedd, was in our fair state over the Christmas holidays to visit her son.

Mrs. Zedd actually was en route from Los Angeles, Calif., where she had participated in a high-speed Morse code competition, to her regular abode near Mena, Ark., where she operates a private educational institute for NASA technicians who fall behind the state of the art, PhD candidates in Electrical Engineering who get confused, and such as Nobel prize winners who get mixed up about what electronics is really about, and need a refresher in the Truth.

Mrs. Zedd had sad news for her son and all her other fans in this part of the country.

She did not win the CW contest. She went out at 87 WPM when her pencil caught fire, leaving the field to an IBM 3310 computer which copied 89 before it lost a diode in its main power supply.

"I was just getting warmed up," Mrs. Zedd said modestly. "Of course you have to concentrate some when you get over 75 words a minute CW because you so seldom find anyone to ragchew with at that speed on the bands, and so you lack practice. But while I was just warming up, I had made a mistake. I had neglected to take an asbestos-coated pencil and that was my downfall.

"Maybe next year," added Mrs. Zedd, now 72.

At a reporter's urging, Mrs. Zedd reminisced a bit about her great husband and legendary son. Perched on a bar stool in a local Norman watering hole, her lacquered red hair glowing in the light of a nearby electronic pinball game, the wonderful woman drummed ruby-colored fingernails on the Formica and critically watched a local OU cowboy try to ride the mechanical bull.

"Mechanical bulls," she snorted. "I don't know what the world is coming to. It's like in ham radio. All these appliance operators and list-operation DXCC winners. Wouldn't it just make you SICK?

"There were no mechanical bulls in ham radio when Zepp and I got started, or when Q.R. was growing up. All the bull was genuine!

"Zepp was a wonderful man. Kind and generous to a fault. Always thoughtful. In about 1914 we built a new linear with a special tube we had blown ourselves at the Anchor-Hocking glass works in Lancaster, Ohio, and when we turned it on, it just worked wonderful: blew out the windows of two apartment houses in Hong Kong and fatally electrocuted the poor soul we were trying to work in Rangoon. But the neighbors started complaining right away; the light of that tube set in cement in our back yard kept them awake at night and made chickens lay at the wrong time, them thinking it was daylight when we modulated, and all. So Zepp quit right away, and we took that linear down. We donated the final tube to the Red Cross, which later sold it to the chief of a pygmy tribe in what is today Zaire, but that story ended sadly in 1928 when the chief, sitting on his throne inside the final tube, got mad at one of his wives and threw a rock at her. The tube broke and sixteen people, including the chief, were lacerated to death. I've heard it said that that's how we get the old saying, 'People in glass houses shouldn't throw stones.' I've also heard it said, 'stow thrones,' so I don't know.

"It was a great loss to radio and the universe when poor Zepp died in that avalanche during the China expedition. For a long time I was truly disconsolate. But as you remember from the history books, Q.R. was born to me during one of my stints at the high-speed CW position. Right from the start he gave me lots of reasons for wanting to go on living. (Next page)

"I believe that Q.R. is the world's greatest genius when it comes to ham radio and DXing especially. You know, his first words, at age eight months, were, *"Roger, you're 5-9 in Oklahoma, QSL?"* After that he lapsed into three months of total silence and we were all worried until it dawned on me that he was waiting for a reply, so I said, "QSL!", and he perked up right away, thinking the exchange had been completed, and he's been talking ever since.

"Q.R.'s greatest feat was probably the invention of the plastic milk bottle, which actually came about in his experiments to build stronger final tubes. But a lot of people think his invention of Radar and SSB might be bigger in the eyes of history, I don't know.

"In ham radio? Well, I think his Dxpedition to Bangladesh would have to rank right up there. Just remember that he did 16K in 24 hours, running one transistor to a hairpin, all CW, and the country of Bangladesh hadn't even been invented yet. Of course some would vote for his arctic expedition of 1974. It was certainly truly great. Up there alone on the tundra, the blizzards buffeting his Sears tent, the temperature plunging to 100 below, the only source of heat the 6146s in his transmitter -- well, I don't know what he would have done if he hadn't had his sled dogs. But that experience marked him in ways he won't talk about. To this day his toes are still blue, and he still won't even consider eating dog, even at the world's finest restaurants which specialize in it."

The interview was interrupted twice at this juncture, first by an OU student who asked for, and got, a dance with the great lady. She seemed to know all the latest western steps, lights glittering off the sequins on her green Levi's. She had no sooner returned from dancing when we were interrupted again, this time by a young man who mistook her for Dolly Parton. When he saw whose autograph he had really secured, the young fortunate fainted in ecstasy.

By that time, it became apparent that the lady had to terminate the interview to go meet her son.

Were there any final words Mrs. Zedd wanted to leave for our readers?

"Just a couple," she replied.

"In the first place, I hope everyone realizes how lucky they are to live in America, the land of the free and the home of the brave, and also so close to my son, Q.R. Zedd. Secondly, I would just like to thank all my friends and fans for the mail, which I try to answer. But my own DXing schedule is so hectic, I sometimes fall behind. Thirdly, 73 and 88, and I hope to see all of you on the bands."

It was a fitting closer to an emotional talk. One wishes it could end there.

A few days later, however, we happened to meet again. This time we asked Mrs. Zedd if there was anything unhappy in her life -- anything she had ever regretted or worried about.

"I just wish I could be a grandmaw," she replied instantly, a tear filling her azure eye. "I have spoken to Q.R. about this many times. I know he understands how I feel, because he always says, 'QSL!' But maybe he is just too busy with his DX schedules and hanging around with Bill Blast and Joe Kelly and all those big dogs, or maybe he just hasn't met the right girl yet. But I do so wish he would get married and have a baby...."

Mrs. Zedd sighed profoundly.

"I had hope when he hired Tondelayo Schwartz, his blonde, nubile, 19-year-old QSL secretary," she admitted. "But I fear that proximity and a shared consuming passion for DX will not be enough to light the spark of romance. They just do not seem to relate to one another in that way.

"Perhaps," Mrs. Zedd added sadly, "the Zedd line is doomed to end with this generation."

It was a sobering thought. One can only hope it does not work out that way. As Carl Sagan has pointed out, even with billyuns and billyuns of worlds in the cosmos, we need all the greatness we can get.

(Mrs. Zedd returned to Mena on her Kawasaki 1000 on Jan. 3.)

--KU5B

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ALTUS AREA AMATEUR RADIO ASSOCIATION

The December 10th meeting of the Altus Area Amateur Radio Association occurred at 1900 hrs at the North Main Fire Station. Those attending this last meeting of 1981 were WB5MJS, WB5KRH KA5VUM, KA5MPK, WA5CBF, W5VXU, WB5VUM, N5AIP and WD5BBV with wife Mary.

Old business discussed was ending the search for a company to make cloth patches with the club logo. It has been determined to be too expensive for the number of patches involved.

New business discussed was the annual election of officers. Dwight, WB5KRH, declined to run again for sexy secretary/treasurer and expressed regret because of business matters. Loren, WA5CBF, agreed to accept the responsibility of being secretary/treasurer for 1982. Chuck, WB5MJS, was re-elected by acclamation to continue as club president.

Following election of club officers, Dwight, WB5URH, spoke at length of the new repeater link in operation between WR5ANX (.19-.79) to WR5AHK (.22-.82). The link is accessed by pushing *"Star 587" on the touch-tone pad either on .190.79 or .22-82. "pounds" would decouple the linking system. The linking arrangement is fully controlled by all users. The next leg in a linking system will be from Altus OK to a Wichita Falls TX repeater. Eventusllu a linking leg will be from Altus, .19-.79 to a cross-band repeater at Cement OK into a repeater location in Oklahoma City.

With the conclusion of the new business, the group adjourned to the Friendship Inn for coffee.

The next meeting is scheduled for 14 January at 1930 hours. North Main Fire Station. All are welcome.

73 Loren Simms, WA5CBF

The Altus Area Amateur Radio Association met at 7:30 pm at the North Main Fire Station. Ninteen amateur radio operators were present for the meeting. We had two visitors attend. Those attending were: WB3III, WA5CBF,WD5BBN,WA5ZFI,WB5VUM,KA5MPK,WB5KRH,WA5MCR,WA5MCS, WB5MJS,W5ZDI,W5CCV,K9PNT,KA6RTX,W5VXU,WB5BBO,WB5UMH, and KA5KVU.

The meeting was called to order by Chuck Smith,WB5MJS. Self-introductions of attendees was made. A warm welcome was extended to all newcomers. Loren Simms,WA5CBF, gave the financial report. Loren is the new club secretary for 1982. He pledged that he would work hard to uphold the standards of the office and update all the records.

Under old business to attend to,Chuck told the group that the club Patch Project was Kaput! We could not find a company to work on such a small order as ours for the expense involved. Chuck also spoke on length of the new MARS station to be operated at Altus Air Force Base. He hoped for a resurgence in Air Force MARS activity in the area.

Dwight Dennis, WB5KRH, the Emergency Coordinator for Jackson county, spoke next on the new projects of the Southwestern Oklahoma Repeater Association. Dwight is in charge of the linking project between the WR5ANX (146.190-790 MHz) repeater and the WR5AHK (146.220-.820 MHz) repeater located at Crowell, Texas. He said that the system has proved itself since October with NO down time. To establish a link between the two repeaters an operator must touch-tone 587. "Pounds" will disengage the link. Dwight also spoke on length of the new link between WR5ANX and the Wichita Falls 146.250-.850 MHz repeater. This link will go into operation within two months. Dwight also spoke of the desirability of a linking leg to the Oklahoma City area.

Frank McCollom, N5FM, who is the Emergency Coordinator for Oklahoma county, spoke next of the need for securing a two-way interchange of information concerning severe weather between the two areas of the state. Dwight and Frank met after the club meeting at the Friendship Inn for coffee to discuss this mutual need.

Frank spoke of the availability of a self-contained emergency communications trailer ready for deployment within the state. The trailer has a portable tower with an 11 element 2 meter beam and a 450MHz beam. It has a 5 KW generator with all sorts of lights. The trailer has the capability of providing a mobile repeater on any two meter frequency. He said just call them if the need arises. Frank said the emergency communications trailer was to be used for fun and emergencies.

Frank also passed the information that there will be a "Big Weather-Watch meeting" in Oklahoma City at 7:30 pm on the third Tuesday of February. Everyone was invited to attend.

At 10:30 pm the meeting broke up. The next meeting of the Altus Area Amateur Radio Association is scheduled for the 11th. of February. Everyone is invited to attend.

Loren, WA5CBF

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Club
NEWS

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The Above Satellite Repeater Station

MINUTES OF JANUARY 1982 MEETING

Meeting was called to order at 7:58 P.M. by President Ralph, WD5IRB, with 22 mambers and guests present. Ellard, W5KE, read treasurer's report. Ralph read a thank-you note from Freida Mosley, Director, Volunteer services, Children's Memorial Hospital, regarding the club's donation of Christmas presents for the children.

The nominating commettee chairman Ellard, W5KE, reported on its recommendations and the following were elected to serve as officers this year:

Steve Stevens, W5VCJ, President
Ralph Bartow, WD5IRB, Vice-President
Joe Buswell, K5JB, Secretary
Ellard Foster, W5KE, Treasurer
Bob Ashby, W5HXL, Director
Bill Noland, WA5FWD, Director

The Directors join Jerry, KA5DCM, Jim, K5VRL, and Charlie, WA5JGU, who are carry overs from last year.

The new president Steve, W5VCJ, took the gavel and led the group in thanking Ralph, WD5IRB, for a job well done last year.

The proposed amendment to the by-laws of the club published in the December Collector and Emitter was passed. The club's dues are changed to $6.00 per year and proration for new members is changed to $.50 per month.

Steve said that in the near future he would like a group to get together to review by-laws to update them. He asked everyone to review them and prepare to make suggestions next month.

Carl, W5JJ, reported on publicity activity related to the 25th anniversary celibration. He advised all amateur radio publications and notices should appear in March and April issues.

Joe, WA5ZNF, CORA C&E Managing Editor, led discussion on various type styles, typewriters and production methods for Collector & Emitter. Motion was passed that the production methods for C&E remain unchainged, for reasons of economy.

Meeting was ajourned at 8:54 P.M.
Joe, K5JB, Secretary

NEXT MEETING

President Steve, W5VCJ, advises that the program next month will be on 6 meter DX, presented by several of the DX'ers who have been participating in the current sun spot cycle peak. Should be interesting.

ORS MEETING

The Oklahoma Repeater Society winter meeting is scheduled to be held in Stillwater January 30 at the city administration building. Talk-in will be on the local 2-meter machine, 146.13/73 and the meeting will be from 1:00 to 3:00 P.M.

W5NL/MM

Fred, W5NL, is operating maritime mobile along the west coast of South America from the Santa Elena. He has talked to several of the locals on ten meters using a converted CB (yuk) rig borrowed from Ray, WB5BTT. (Only kidding about the "yuk". They're alright after conversion. Have one myself) Latest contacts have been made around 28.520 MHz between 1700z and 2000z.

Fred reported that his 1/2 wavelength Larsen flex antenna worked great on 2 meters while he was in range of U.S. shores. Joe, K5JB

PRIMARY BATTERY CHARGING

This may be digging out an old dog but it is something I found useful during the last month and thought I would pass it along.

A little monitor receiver that I obtained uses a nine volt transistor radio battery. The first day I had it I played it all day long, of course, and the battery ran down. Oh well, sez I, probably was an old battery. The second day I had it, another battery ran down. Hmm, better look into this. The old trusty ammeter showed 15 ma. squelched. A fresh Mallory Duracell ran 15 hours before the radio went plumb dead. The way I figure it, and you would too, that battery had at least 225 ma-hours capacity.

First solution that came to mind was to put a ni-cd rechargable battery in it but the only ones I have seen only have about 70 mah which would only run the thing for 4.7 hours, hardly what I would call satisfactory.

The second solution, and the subject of this article, was to recharge the Duracell and see how well it would work. Some time ago there was quite a fad in battery rechargers with several manufacturers selling plastic cell-holders with a rectifier and current limiting resistor consisting of a 120 volt appliance light bulb. They had an interlock arrangement in the lid which prevented power from being applied to the yorks when the lid was open. They applied about 40 ma to whatever batteries were installed.

In the literature of the period, the general consensus, as I remember it, was that if a cell was to be used immediately, it could be recharged to some extent. Also popular at the time were the alkaline tv batteries which could be recharged. I believe they had about 8 ampere hours total capacity and if only half was used, they could be recharged for about a hundred useful cycles of 4 ampere hours each. I always wondered if there was any difference between rechargable alkaline batteries and the common garden variety alkaline ones. Here and now was my opportunity to satisfy my curiosity and satisfy my need to power the little monitor receiver.

The Mallory Duracell was my first subject, since I had allowed it to run completely down, it may not have been the ideal candidate for testing but one never knows without trying. The first couple of recharging tries did not bring the battery up to full capacity, judging from the time it took to run down. On about the third try, I had the procedure down pat. With the battery allowed to run the radio until the audio amplifier started motorboating, I had a handy indicator of battery condition, even if the battery was probably exhausted below the point where proper recharging should have started. With about 8 hours on the recharger, which supplied 360 mah of charge, the radio would run from 10 to 13 hours. Some of the variation was due to the amount of activity on the thing and whether it was continuous or intermittent. These types of batteries have much more capacity if they are used for short periods with time in between to refresh themselves.

The first battery, unfortunately, met an premature end when I hooked it to the charger backwards and got an 8 hour decharge. Even though the ends bulged, I took a shot at recharging it but it was definitely 10-7.

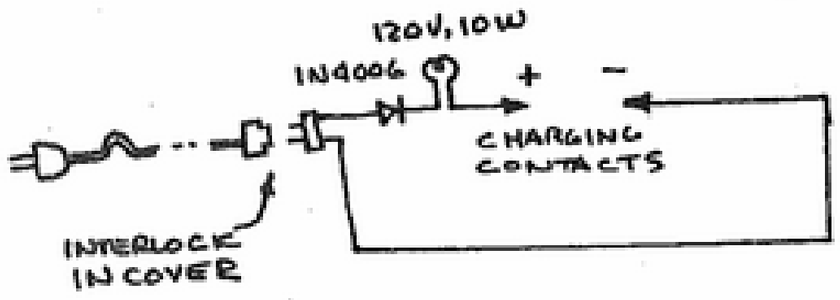
However, it had not given its life in vain. It was discharged 8 times with no certain sign of significant capacity loss. At no time durthis period was the battery allowed to rest for more than a few days so its capacity may not have been useful if the monitor receiver was to only have occasional use. In this particular application, I saved the price of seven batteries, though I have to admit I wouldn't

have left the receiver on so much had I not been playing with the battery.

The second battery being tested is an Eveready Energizer which is identified as an alkaline battery. It is not going through such a vigorous test, only being run a few hours per day. So far, it has been discharged only three times and was not allowed to run as far down as the first victim. Using the design philosophy of the tv batteries mentioned earlier, I intend to let it run about halfway down before recharging each time. There won't be close watch of the voltage, or anything but it will be marked each time it is recharged so when it craps out I will have some idea how worthwhile the procedure might be.

On the first battery, its terminal voltage under load was about 5 volts when the radio started motorboating. I'd say the 9 volt battery was about exhausted at that point. On the current battery, voltage under load is about 7 volts when intuition tells me it is about half run down. At end of charge, terminal voltage is a little over 9 volts under load.

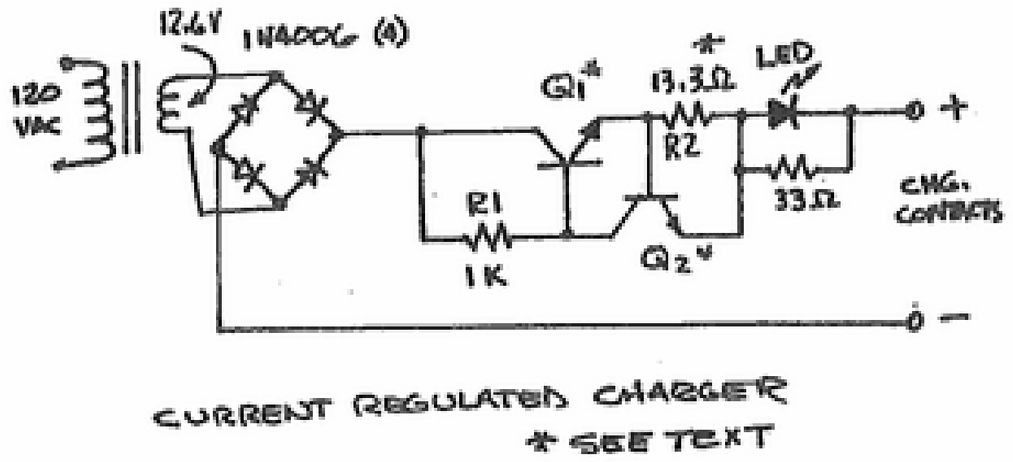
I am a little spoiled by the ni-cd batteries in so much of my equipment and am beginning to take them for granted. During this recent experience, and having to shop for primary batteries, I am beginning to regain my appreciation for rechargables. However, if my first experience is not a fluke, I may be able to reduce the life cycle cost of operating my little radio to a reasonable figure. I don't think I would ever be comfortable enough to put a charging jack on the thing and charge the battery out of sight. I am a bit afraid of acid, or other bad stuff that might leak out of a primary battery some night and screw up the life cycle cost figures on the radio itself.



The charging circuit of my battery charger is shown in the sketch above. It was made by Dynamic Instrument Corp., Plainview NY and I have no idea if the things are still available except perhaps through flea markets. A bad one wouldn't be worth anything to someone who didn't know how to replace a 10 watt light bulb or a 1N4006 diode. If one intends to duplicate the circuit, I emphasize strongly the need to provide suitable insulation between him and the battery under charge;and, an interlock to prevent shock when the battery is not connected. <u>The presence of the 120 volts in this circuit is dangerous</u>.

A much safer homebrew circuit, complicated a little by the addition of a transformer, is shown below. It has one of my favorite current regulator circuits in it. Q1 does the regulation and it needs to be able to dissipate .75 watt if the output is shorted. Any npn transistor that is made to be heat sinked will be big enough. Q2 controls Q1 by sapping current when voltage across R2 exceeds about .6 volts. R2 may have to be "tuned" by starting with a 15 ohm resistor and shunting various higher values across it until 45 ma is realized through the charging circuit. Q2 is any garden variety npn transistor. The LED and R3 are not necessary. They are included to provide an indication that the battery is charging.

Of course, this circuit is ideal size for charging ni-cd batteries also. Likewise, if there are ni-cd batteries around, there may be chargers around also that could be pressed into duty charging primary batteries. Not knowing anything about the chemestry of recharging alkaline batteries, I can't give any advice on how fast they can be recharged before they erupt or otherwise become damaged. At the 45 ma rate of my charger, the battery comes out after 8 hours a little warm but no damage has been noted. I think the manufacturer recommended 5-7 hours on charge for 9 volt batteries. I arrived at the 8 hour figure before I noticed the instructions on the bottom of the thing. (I was looking for the name of the manufacturer for this article or I wouldn't have been aware that there were instructions.



CURRENT REGULATED CHARGER
* SEE TEXT

Only time will tell but I have heard that batteries recharged as described here won't retain the charge for long periods. If this is true, the recharging procedure won't be useful for the batteries used in most of my things because they don't get used before the charge is gone. I tried to recharge an old battery (perhaps 3 or 4 years old) and was unsuccessful. Flashlights around my house are particularly bad about running down without being used. Joe, K5JB

<u>NI-CD BATTERY PLATING</u>

I don't remember how it started but I think it was a combination of two things, watching a plating shop grow globs of chromium on aircraft parts and reading about batteries growing whiskers around edges of plates where current was concentrated. Since electroplating and battery charging are so similar, I reasoned that what was good for one was good for the other.

In the plating process, if dc or single polarity ac is passed through a part being plated, a thin plating can be applied with no problem. However, if the plating is being applied for mechanical reasons to build the surface up, the plating will be porous and weak. If excessive current is used, material will build more quickly around the edges of the part because of "edge effect". Current is more dense around the edges and material is deposited more quickly there.

At the time I bought the charger described in the previous article, I owned a grand total of four Ni-Cd cells, used in an electric razor. Since I wanted to take the best possible care of them, I added a capacitor to the charger, across the diode, calculated to supply about 10 percent reverse charge to the battery under charge. I will never know if it was a good idea or not because I will not live long enough to find out if those cells are better or worse for the experiment. They are 17 years old now. The razor gave out a long time ago. The cells were worked every day for about 7 or 8 years and are still doing miscellaneous duty. I am curious if anyone else has had any experience with this type of charging or has read anything on it.
Joe, K5JB

<u>WANTED TO RENT</u>: Garage Apt. or small house in central or western part of Oklahoma City. Need some storage room (for jungue box, naturally). Call Vic Johnston, KA5KXK, at 239-2466, ext. 252, days or write to PO BOX 26384 Oklahoma City OK 73126

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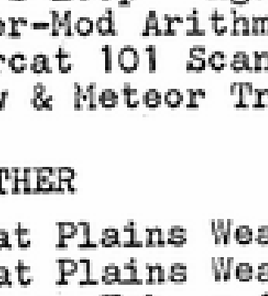
= = = = = = = Bill, WA5RAQ = = = = = = =

FOR SALE: Realistic Pro 45 VHF HI/LO scanning receiver. Eight channels with xtals for Police OHP, Seiling OK area 13/73 & 72/12. $90.00 Ken, N5BEW, 329-4667 after 5 pm.

WANTED: Drake RV-6 remote VFO, also Finco 6&2 meter portable beam. Rod, WB5DSH(405)722-0911.

HOLISTIC CHIROPRACTIC CLINIC



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Oklahoma City

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9-2

TR-2500 IMPRESSIONS

When I bought a Yaesu FT-207R a few years ago, I thought I would probably keep it forever It could do just about anything I ever needed to do. Then, afew months ago I saw an advertisement for the Kenwood TR-2500 -- I felt that old feeling again -- I had to have one!

I did have to wait awhile. Both My budget and the Kenwood delivery schedule were not ready for several months (it seemed like forever). I began to wonder if I might be making a mistake. The Yaesu sure had been good. To make a long story short, it finally came, I picked it up, and haven't regretted selling my old radio for one minute.

The first thing I noticed about the radio was its size - it really is a lot smaller than the 207R. It feels like it was made to be carried around. I haven't actually put it next to an Icom IC-2A yet, but that is the size range it is in.

The Lithium battery memory back-up is a pleasant change, too. No more re-programing the memories every time I turn it on (I usually kept the Yaesu memory back-up off since it would run batteries in a few days). Speaking of batteries - this radio does run quite a bit longer on a battery charge too! Although it's only a 400mah pack, the radio is fairly easy on the battery.

The program features are super! The programmable band scan is much nicer than the comparable feature on the 207R. Now I don't have to sc scan all of the band - only the part I am interested in. The audible "beeps" that sound when a function key is hit are also quite helpful. I can't really think of anything I would want to do that this radio won't do.

The LCD display is easy to read. The auto-resume scan feature is a "have to have" item (I had to add a scan module to my FT-207R to get this function). With the ten channel memory I can finally store all the frequencies that I need.

The only thing I might have wanted in the TR-2500 was extended frequency coverage for MARS. I mentioned this in the comments section of the buyer questionnaire included with the radio. I was quite impressed when I received an envelope from Trio-Kenwood a week later. It contained a simple modification to allow the TR-2500 to operate in the 141.000 to 150.995 mHz range. Now that is being responsive to the consumer! A copy of the modification sheet, as furnished, is reproduced for those of you who are interested in MARS operation.

I usually don't buy any HT accessories except for a spare battery pack. However, I am scared to go back to the store and look at the TR-2500 accessories. If they are engineered anything like the radio, I'll probably have to buy some of them. Will the budget ever be the same?

Just to be fair, I will list my negative findings:

- The case doesn't impress me as being as sturdy as the FT-207R.
- The squelch sounds a little "soft".
- The speaker doesn't sound quite as good as the Yaesu (probably because it's smaller).

I adapted rather quickly and now don't even notice these things.

If any of you out there in radio land have been toying with the idea of trading up to one of the newer hand held radios (or getting a first one), I would strongly recommend taking a a look at this year's crop. If the rest of them are anything like the Kenwood (and I suspect they are all very good) you will find them fully as capable as their larger counterparts. Try one, you'll like it!

Oscar Staudt, WB5GCX

→

WANTED: Collins R-388, 51J4, R-390 or a quality general coverage receiver. Call Gene Nailon, K5DLE, (405) 341-8289.

LEONARD HOLLAR, WA5FSN
SECTION COMMUNICATIONS MANAGER

Take out your Oklahoma map. Draw a line from Logan to Altus, Altus to Idabel and Idabel to Logan. This rough triangle shows the area covered by the Oklahoma Traffic and Weather Net's Weather reports 6 nights a week. You may want to bend the long leg a bit to include Enid. Inside this area are 15 faithful Amateurs, who daily, check with their Co-op observer or other wise obtain information about their local weather conditions. This information includes; Present, High and Low Temperatures, Sky conditions, Precipitation, Wind direction and Velocity, Barometric pressure is also included.

In Oklahoma City, 6 more faithful operators take these Weather Messages and call them to the National Weather Service.

All of this takes place at 5:45 P.M. local on 3900khz. At 7:00 P.M., the N.W.S puts this information out on their hourly TWX to the Wide-World.

How much of this is used by the media is not known. However, We do know that exceptional readings are picked up and used.

Now let us back up and take another look at this hypothetical triangle. The majority of the Reporting Stations can be found south of I-40 and west of I-35. This leaves a lot of Oklahoma uncovered. Why?? Only you who are not participating can answer that.

My thanks to all of you for the fine work done, helping with the Christmas Traffic The message count was up over last year. Al, K5CXP and Ray, W5REC each handled enough traffic to make BPL. The first from Oklahoma for some time.

Oh. Yes, I see that Reagan-nomics hit us hard, with only 2 FCC trips to Oklahoma City and Tulsa each in 1982. Oklahoma City on May 11 and Oct. 26th; Tulsa Feb 23 and Aug. 10th for Amateur Exams. Commercials on the following day in each case.

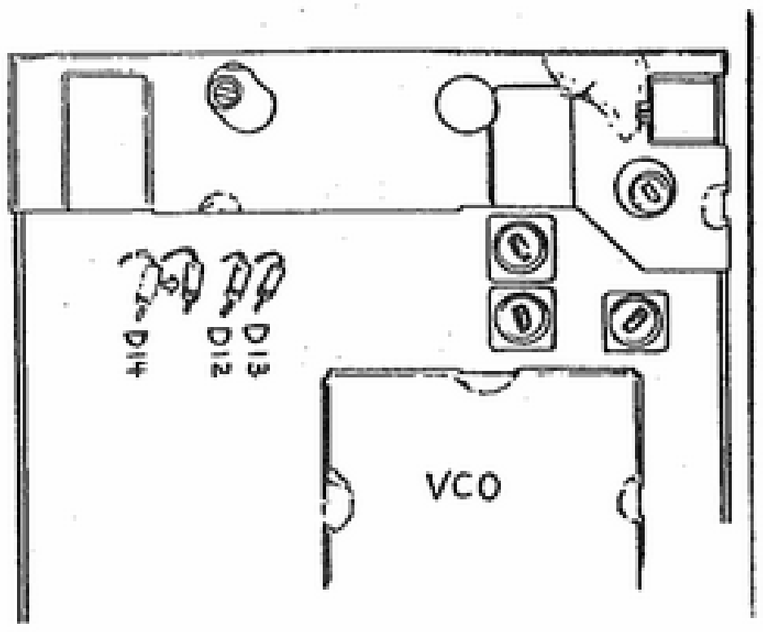
OLZ, Our old faithful C.W. Net that meets each evening at 7:00 P.M. local on 3682khz has a new Net Manager. Russ, W5UYH work schedule interfered, so he has tendered his resignation. Sam, KV5X/WA5RKU has accepted the appointment as Net Manager. He is no stranger to the job and I expect to see a continuation of the growth of this Net.

KA5KPJ has revived the O.A.N. and from last reports is doing fine with it. Both of these Nets can use your help.

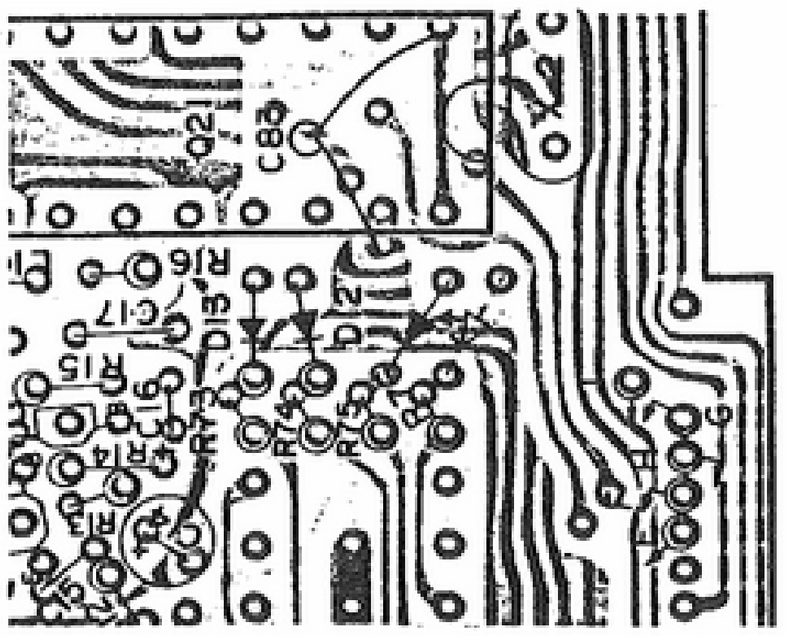
Oklahoma Net Reports on page 18

The TR-2500 is supplied to operate between 143.000 and 148.995 MHz. Frequency coverage may be expanded to 141.000 to 150.995 MHz. Coverage beyond these limits is not possible. All specifications are guarantied only within the supplied operating range. This conversion may be performed by the user. However, we assume no liability for your work.

1. Slide off the battery pack.
2. Remove three small Phillips head screws from therear cover.
3. Remove four countersunk Phillips screws from the case bottom.
4. Remove the rear case, remove the PTT lever and set aside.
5. Desolder the back-up battery top (negative) lead.
6. Remove four small countersunk Phillips head screws, two on each side, securing top to bottom frame halves.
7. Remove two small Phillips screws from the top panel. Use a flat blade screwdriver to pry up the panel. All four knobs will lift with the panel, plus the black Offset mask.
8. Swing the front away to the right and unplug the speaker and mic lead from the RX TX unit. Do not over extend the flex circuits.
9. Remove the felt insulation sheet from the PLL rear.
10. Carefully desolder D14. Use a low power, fine tipped ironand wick material, or a vacuum desoldering machine. Do not pull out the through hole material, burn the PCB, or overheat and lift the foil. Clear the adjacent empty holes and move D14 to this new location. Solder sparingly and do not create a solder bridge.
11. Replace the felt insulation on the PLL unit.
12. Reinstall the PLL assembly. When reassembling, be sure to replace theblack Offset switch mask under the top panel.
13. Reverse steps eight through one to reassemble. When resoldering the backup battery (step five), be sure not to short the battery to the chassis or adjacent shielded compartment.
14. The TR-2500 will now operate anywhere between 141.000 and 150.995 MHz, with any split. Please be sure you are authorized to operate out-of-band before transmitting. The display will show a small zero at 151 MHz in the MHz position. All other frequencies will display normally.



Top View



Bottom View

TR-2500 MARS Conversion

THE BIG SIGNAL NEWS

OKLAHOMA CITY AUTOPATCH ASSOCIATION, INC.

It's been a long time since I had the pleasure of or displeasure of writing the material for the C & E, but for some unknown reason the editor asked the Prez if he could do it this month. It seems the Prez planned a last minute appointment out of the city so he wouldn't have to do it and called to see if I would be so kind to fill in. So, here goes old good natured me.

JANUARY MEETING: At last count, I believe we had 41 members and guests for the meeting. A very good turnout I think. Several items were discussed, some for a short period of time and others took somewhat longer.

One item brought to our attention was that we have had several non-members using the auto-patch on the 450 machine. Although we are an open club and invite all guests to use our repeaters, we do have closed patches and strongly encourage paid up members to watch out for non-members using the patches. Those of you who use the UHF machine should especially be on the look-out for those folks who like our equipment but don't want to join in with the rest of us in supporting them.

It was also pointed out that at times, we have someone use the auto-patch on .21 without giving their call in a manner that it is easily recognized. So, everyone was asked to go a little slower when giving your call.

An informative presentation was given by Frank, N5FM, on making up your own printed circuit boards. Frank does a lot of building and tinkering around and encouraged everyone to do more of this.

Our program co-ordinator, Art, W1GOM, advised us that he has some very interesting things planned for us in the future. EVERYONE, get out your calendars and mark MARCH 16 and APRIL 20, the meeting dates for those two months.

APRIL 20; Art is planning a gigantic auction, so we can pawn off some of our oldies but goodies and get enough money from them that we can afford to buy someone else's oldies but goodies. So, everyone, look for all those things you would rather someone else have and bring them out for the big auction. Tell everyone to come. Anyone and everyone, members and non-members, members of other clubs or non-members of other clubs are encouraged to come out. There will be a small 10% commission charged for the club kitty. Art has advised us that he has acquired the services of one of the best known HAM EQUIPMENT Auctioneers available to be selling the goodies, none other than that renouned W5JYT.

APRIL 20: It has been a couple of years since we had a good old fashioned home-brew antenna contest, so Art has decided it is time to have another one. So, once again, be sure to get your thinking hats on and come up with some genius type of antenna that will win the contest. Hear say that Ron, KE5M is planning to bring a goodie this time and take home all the bacon again. Antennas will be judged on workability, originality and for either 2 meters or 450. 80 if you want to try.

The major item of business discussed at the meeting was the upcoming storm season and the club's preparation for it. Our club trustee, K5JL, has plans for linking up our repeaters with other repeaters in the western part of the state. Both Woodward and Altus have shown an interest in joining in with us during the severe weather season. Henry, N5IH, Frank, N5FM and Merrill, WB5PTQ have attended club meetings at these towns and explained the program to them. Frank has done a considerable amount of work in getting this all together. He was appointed as the Emergency Co-ordinator for the club and has been primarily responsible for the accumulation of the parts to get our emergency trailer constructed. He has had help from many many people other than those mentioned earlier.

It is very important that everyone plan to attend the February meeting. Gary has promised enough coffee for everyone and he has some new slides and pictures for the show this year. Invite all your friends and family to come out. This meeting is certainly not restricted to Auto-Patch members. See you there, 7:00.

K5NK

Many people have volunteered their services for the upcoming storm season. The following is a breakdown of some of these individuals:

N5FM

EMERGENCY CO-ORDINATOR

TRAILER UNIT	NET CONTROLS	RADAR ROOM
WB5PTQ	N5IH	WB5MLN
W5UGM	AD1S	N5DDB
WD5CSM	K5GL	N5GE
N5RC	K2GKK	K5IGB
		WB5ZOI
		WD5CSM
		WA5BQX

AT KTOK	AT KOFM
K5SJV	W1GOM
	KF5E

WEATHER MEETING

KWTV

7:00 P.M.

FEB. 16

EVERYONE PLAN TO COME OUT AND SEE GARY ENGLAND AND HIS NEW SLIDES AND FILMS CONCERNING OKLAHOMA WEATHER. BE SURE TO NOTICE THE TIME AS 7:00 O'CLOCK INSTEAD OF THE NORMAL MEETING TIME OF 8:00 O'CLOCK. THIS IS OUR ANNUAL WEATHER MEETING AND WE ARE PROMISED A GOOD SHOW.

THE FOLLOWING NEW YEAR'S RESOLUTIONS HAVE BEEN HEARD:

I resolve to buy as much new gear this year as I possibly can. JYT

Since I never do anything wrong, I resolve to do as many things wrong this year as possible. GL

Since I always wait until the last possible minute to do the minutes of the last meeting, I resolve to do 'em before the meetings from now on. BJS

Having a better station than IH, I intend and resolve to create as much havoc as I can and cause more TVI than he does. S

In my business, it's either sink or swim, so I resolve to practice holding my breathe a little longer each day just in case I don't swim. GE

In most of my activities, there is little hope. I resolve to create less and less hope for everyone. HPR

I resolve to try and keep the same boss for at least a year. I get tired of training them. FKF

I have about decided that Yaesu equipment is for the birds. I resolve to get something better and I'm open for suggestions. CZN

I resolve to make as little profit this year as possible since everyone is a cheap skate anyway. SW

I resolve to get a calendar so I can keep up with the times and know when New Year's day is next year. GOM

Since I am a calm and collected individual, I resolve to make more and more waves all the time. ZNF

I resolve to be definitely for anything that IH is not for and against anything he is. PTQ

As long as the six meter repeater is working as well as it is, I resolve to just keep on looking for a solid state transmitter. URJ

I resolve to become friends with more trees. NWX

I resolve to stop experimenting with grass. FKF

I resolve to cease confusing M with trash cans. AUE

Since my wife has so much trouble finding her way across town, I resolve to draw her a map for every possible place she wants to go so she won't get lost. GKK

I know how old UGM is, so I resolve to stop calling him an old man. GL

I am getting tired of all the Bobs in town, so I now resolve to stop siding with anyone named Bob. JGU

I resolve to work on my personality traits so that I can influence more people and win more friends. IH

Being one of the top sideband operators in town, the state or possibly the entire nation, I resolve to stay on cw more and get my code speed up. NK

Getting a little on the puny side, I resolve to gorge myself more often so I can gaim some weight. DAU

Knowing that my downfall is my physique, I resolve to do something about it. KDR

Being unable to guess very well, I resolve to go round practicing my guessing. GKK

Having decided that most of my friends have forsaken sideband, it looks like I will have to join them on cw so I resolve to sell my mikes and spend all my time on cw from now on. FKF

Not being happy with being rushed all the time, I resolve to rush madly around all the time. NYX

I know I can do it, I want to do it, so I resolve to have my Extra Class by year's end. NZS

I resolve eh eh eh eh eh eh eh. FKE

Since I am one of those guys who does more listening than talking, I resolve to start me an "I HEARD" column this year, but I will stay clear of NK. JYT

Henry carries his own coffee cup around with him, so I resolve to carry my own spoon around with me so I won't have to stir my coffee with my rubber duck. HTL

I resolve that if someone will twist my arm enough, I will definitely join the Auto Patch this year. EVA

I am probably one of the least co-ordinated individuals there is, so I resolve to take up chewing gum to improve myself. FM

I turned in my advanced license so I could get a teck. So, when I get built back up to Extra, I resolve that I will turn it back for a novice. TKG, alias EDT

Reuben has trained me to eat a lot of new things this year, so I resolve to try goat hocks just once. CZN

I resolve that I will get a petition up and get GKK appointed senior head of road improvements. AQY

I resolve that I will have my income tax returns printed in the C&E so everyone will know how much money I make each year. DBH

I resolve to never again poke fun at anyone, tease 'em or in anyway offend them by writing them up in the "I HEARD", SANTA'S LETTERS, NEW YEAR'S RESOLUTIONS, ETC" until next issue. K5NK

A few fellow hams were saddened last week to learn of the nasty accident which took the lives of two of our most beloved individuals, Mac, K2GKK and Henry, N5IH.

It seems that since neither of them had lived the life they should have while here on this good earth, that both of them were sent to the place down under instead of the place of eternal bliss and happiness.

Shortly after arriving at their home for eternity and longer, they both found themselves out on the dance floor. Most everyone knows they were excellent dancers. Mac could dance most any kind of dance and was especially good at Cowboy dancing, while Henry specialized more in the Square dancing variety.

Here was Henry, with his neat custom fitted western attire and a brand new pair of hand made Hungarian German Gorilla boots on, lively swinging this gal across the dance floor that was undoubtedly the ugliest woman that ever lived. She was so ugly that Henry did not even look at her. Her hair was long and stringy and hadn't been combed in at least a year. She had a figure that you would classify about a minus 8. At any rate, Henry kept swinging her around the dance floor, constantly keeping an eye open for Mac, to see if his punishment was equal to his own.

All of a sudden, who did Henry see all the way across the room? None other than Bo Derek, a famous movie star and a perfect 10 in every way. "Jees", he asked himself, "why couldn't I have wound up with Bo as a dancing partner instead of this creep I'm having to dance with?" "What's that?" "Isn't that Mac dancing with Bo?" "How in the world could Mac be so lucky and get matched up with Bo Derek and here I am having to dance with this ugly hag?"

You should have seen Mac. Talk about two-stepping. Mac had worn a pair of his worn out air force fatigues and the pair of tennis shoes that his friend Guy had gotten for a Christmas present on the day of his accident. He was really cutting a rug.

It was all Henry could do to control himself. Spotting the old Devil himself out directing the dancing, he called, "Hey, Devil, come here."

Over waltzed the old Devil to see what Henry wanted. "Devil," Henry said, "I want to know something." "I want to know just why you stuck me with this old ugly hag and there you matched up Mac with Bo Derek?" "It just doesn't seem fair to me."

The Devil paused a minute and then said, "Well, Henry, it's like this." "You know you weren't a very good boy while you were alive, so now you are having to pay for your sins, and so is Bo Derek." K5NK

AERONAUTICAL CENTER AMATEUR RADIO CLUB, INC.

W5PAA

Minutes of the January Meeting of the ACARC

The meeting was called to order at 8:02P.M. by President Bob Pace, WA5CJG. There were 29 members and guests present. During the usual round of self-introductions, Robby, AAØO reported on Gene Halley,WB5SQC's condition. Gene is currently in Hillcrest Hospital, but doing well. We all wish he and Rosey our best. Jim Buswell, N5BEQ, also reported on Bob White, WB5PWZ, who is also in the hospital. All of our best to Bob as well.

President Pace then reported that the ACARC Christmas dinner was a complete success. Our bill came to $457.63, which was exactly what we collected.

The monthly CORA report was given by Frank Yohe, N5CIJ, who reported on the events of the November CORA meeting.

a) Ham Holiday 1982 will be the same weekend as the ARRL National convention.
b) HH '82 prize winners or their tickets must be present to be eligable.(except for preregistration prize).
c) There will be no Friday night programs held upstairs this year. Any programs on that night will be downstairs.
d) We will use the Ham Holiday Badges this year with serial number only, however, they will be accompanied by printed stubs.
e) An amendment was voted upon and passed to have all CORA officers take office on the first meeting following the annual election, and to have them serve a term of one year.
f) The Choctaw Club has resigned from CORA.
g) The policy regarding mandatory purchase of advertising by clubs was discontinued.

President Pace then reported on recent problems with the repeater, but all is well now. The club computer is still alive and well. Bob also reported that he had received a letter from the QCWA, requesting the use of the ".25-.85" repeater on Wednesdays from 8:00 to 9:00PM for their QCWA net. The use of our repeater for this net was approved.

At this time a motion was made by Carl Drumeller, W5JJ, and seconded by Bob Ashby, W5HXL, that Associate members be allowed to vote in the elections for the evening. The motion carried.
President Pace then turned the meeting over to the nominating committee for the election of new officers. Robby Runyon, AAØO, reported the following nominations.

President -- Robby Runyon,AAØO
Vice-Pres -- Holly Holcomb, N5ABL
Secretary -- Jim Seignious, WB5UHW
Treasurer -- Larry Vorheis, K5RJR

A motion was made by Bob Ashby, W5HXL, and seconded by Ellard Foster, W5KE, that all nominations cease, and that the nominees be elected by acclamation. The motion carried with 4 dissentions.

The incoming President then appointed Dave Holder, KA5CWT, as associate assistant to the President.

The meeting was adjourned for coffee and donuts at 9:20PM.

Submitted by Bob Graham, WB5NSV

FOR SALE--Yaesu 207 in excellent condition, 2 batteries, charger, and 2 antennas. Priced to sell. Lee Lash, W5VZY, 942-0177
1403 N. Purdue, O.K.C.

FORMER ACARC MEMBERS VISIT

Two early members of the ACARC were in OKC over the holiday season.

John H. Ott, W5HEV/4, was a member even before it became a formal club. At the Signal Training Center, Ft. Worth, TX, early in 1946 when the FCC reopened the HF amateur radio bands after the wartime shutdown, John, along with Claude E, Gardner, W5AGM, and Carl Drumeller, WØEHC/5, put a Navy Model TDO transmitter on the amateur HF bands. In mid-1946, after CAA activities were moved to OKC, the same group immediately put the TDO back on the air and organized the ACARC as the first sub-unit sponsored by the Aeronauctical Center Employees Ass'n. It got, after some difficulties, the call W5PAA.

John was the second W5 and the first Oklahoma Radio Amateur to put a SSB rig on the air. He, of course, built it. In fact, his present rig, the Drake Twins, constitutes the first manufactured transmitter John has had in nearly a half-century of Amateur Radio operation!

Gano Dick, the other visitor, was one of the first Associate Members of the ACARC, joining in the early 1950s, when many young Radio Amateurs joined to have the benefit of the technical programs and the use of W5PAA. (Present strict security practices has put an end to Associate Members using W5PAA.)

Gano is a Navy pilot, stationed in the Philippines. On long flights, he has been known to put that Collins HF aircraft transceiver on the Amateur HF bands!

Oklahoma Net Reports December 1981

Net	Sessions	QNI	QTC	WX
O.P.E.N	4	208	31	
O.F.O.N.	23	312	83	
S.T.N.	27	423	103	
O.T.W.N.	27	450	334	297
O.L.Z.	31	233	132	
O.A.N.	10	38	4	
Night Owls	30	495	106	
Q.C.W.A.	4	151	8	
N.W.O.S.N	13	108	12	

ARE YOU READY FOR STORM SEASON ???

RADIOTELEGRAPHY PROCEDURES

"Amateur Radio" for Nov 81, available at the ACARC clubroom, has an excellent article on "CW Procedures and Techniques."

The same issue reminds one of the fact that TVI can be created by the diodes in SWR meters. Daiwa products have been fingered as notable offenders.

RANDOM WORDS:

WELL HERE WE ARE IN THE FIRST MONTH AND ALL IS WELL I THINK. I WOULD LIKE TO SAY WELCOME ABORD TO THE NEW OFFICERS OF THE AERONAUTICAL CENTER AMATEUR RADIO CLUB .I WISH THEM ALL THE BEST,AND I PLEDGE THEM MY SUPPORT AND HELP. I WOULD LIKE TO THANK BILL,K5KDR,BOB WB5NSV,AND LARRY,WB5AAY FOR THEIR HELP DURING THE PAST YEARS,AND I KNOW THEY WILL CONTINUE TO HELP ACARC GROW AND BE THE BEST CLUB IN TOWN....

NOW IT'S TIME TO START TALKING UP HAM HOLIDAY 1982,SO LETS GET WITH AND START INVITING EVERY TO COME TO OKLAHOMA CITY AND HAVE A GOOD TIME

73,BOB PACE,WA5CJG;;

FOR SALE

KENWOOD TS-520 with both power supplies and CW filter.
This is your chance to own a (1) one owner transceiver in excellent condition.
If your intrest is in owning and operating a a fine piece of Amateur equipment give me a call.

JACK WB5SVN
after 5pm 677-8537

GREAT PLAINS A.R.C.

W5HGH Repeater 146.13/73

EDITOR: Carla Tice, WB9QGW

The January meeting was called to order by President Gerald Bowman. We had 20 members and guests present. The secretary and tressurer reports were read and approved. Among the guests were Frank Malcolm N5FM, Merrill Scott WB5PTQ, and Henry Israel N5IH. They represented the Oklahoma Autopatch Association.

The by-laws of the club were passed out to everyone. Gerald requested everyone read them and be ready to go over them at a later date.

The C.O.R.A. yellow slips were passed out to those present and signed enabling each to receive C&E again this year.

The Oklahoma Repeater Society will have their regular Winter meeting Jan. 30 in Stillwater. Talk in will be on 146.13-73.

Gerald read a report from ARRL concerning a higher ARRL affiliation. A committee was appointed to read the December QST article concerning this and report back to the membership.

Larry Ellis KØCIO asked for suggestions for activities. Transmitter hunts, social gatherings such as the continental dinner, and picnics were suggested. It was also suggested that at Christmas we might visit nursing homes to pick up and pass traffic for the elderly.

Our Oklahoma City guests were asked to clerify the director's dutys to C.C.R.A. They gave us valuable information and suggestions and we heartily thank them.

Larry reported that the Pratt, Ks. machine is starting a net on Thursdays at 8:00. The Pratt police department are pushing them to become affiliated with us on the weather watches.

Bill Reid gave the December net report as follows; 13 sessions, 108 check ins, 12 routine messages.

The meeting was then turned over to our guests from Oklahoma City. Henry N5IH said that the Oklahoma City Autopatch Associations runs the weather net on the 22-82 frequency. Their master plan is for linking their system with our system for greater coverage during sever weather. They are also planning on trying to link with Enid, Elk City, Lawton, Altus, Hengum, Ardmore, Ada, and Pauls Valley. This way a storm can be followed over the entire state.

Frank N5FM said that they have a trailer equipped with 12 volt and 110 power. They can pull this trailer to any site they are asked to. They also have quartz lights, mercury lights, and floresent lights. Frank said as emergency coordinator he would be happy to answer any questions. Henry is a net control and will also answer any questions.

After the meeting adjourned 15 of us gathered again at the Pizza Hut for our "after meeting meeting" of good food and good fellowship. Frank, Henry and Merrill joined us. We enjoyed visiting with them and extend an invitation for a repeat visit.

73's WBØGW

FOR SALE::: Regency HRT-2 Handie Talkie 5 Channel w/8 chrystals. Extra batterypack Touch-tone, Rubber Duck $150.00 Don Graham 364-9457

FOR SALE: Kenwood TS 520 S with DG 5 digital read out. MINT condition withmanuals $685.00 Ralph WB5PFW 262-0436

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Food you will enjoy . . .
Service you will appreciate!

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Oklahoma City, Okla.

21 Members and guests arrived at the bank at El Reno on the coldest Sunday afternoon of the new year. I do not know what makes these people come out on such a cold day but when we do, it will be canned and sold. Then we will all be rich.

The El Reno group does appreciate the turn out and we all enjoyed the hot coffee and refreshments.

Ray Barnes AB5Z arrived with some good news and some bad news. First the good news, he brought his daughter and son-in-law with their new grandbaby. Daddy Ray has bribed them into getting their license by offering a new radio to both of them for graduating. Bus W5VVU has consented to start another ham class begining February 8 for them and any other interesting party that may show up. Good luck on the class. You will not find a more patient instructor. He taught me.

Then the bad news. Darla, the xyl of Leo KA5DUO had another severe heart attack. You might remember she had a real bad one last summer. The latest word comming from South Texas via 40 meters is that she has recovered very well and will be released from the hospital by the time we read this.

Ralph WA5PFK has been keeping record on our Wednesday Night Net for the last couple of years and they have proved to be real interesting. This net started back in 1958 on 6 meters and has been a weekly activity ever since. I wish statistics could have been saved since the beginning but they are not available These are compared to last year.
This is a list of the members that checked in at least 70% of the time. Heading the list for the second year is:

Johnny	K5GBN	99%
Ralph	WA5PFK	96%
Ralph	WB5PFW	96%
Leonard	WA5FSN	92%
Butch	K5RMI	88%
Fred	WA5FFE	87%
Ray	K5LLX	85%
Marvin	WA5JHB	85%
George	K5GGL	79%
Teddy	WD5JNT	79%

38% of the members checked in which is a 3% increase over last year. We had 28 visitors giving us a total of 800 checkins for 1981.

Our next meeting will be February 14 in Okarche in the Math Room of the Okarche High School. This is Valintines Day, so please brush your teeth.

MISSIONAIRE NEWS ITEM

From: EARL - WB6ENC, Sunnyvale Ca.

AN INTERESTING WEDDING was performed by Earl, WB6ENC on Dec.20th. The groom, DALE KU6U and bride, ALICE KA6PZS were united in marriage by WB6ENC over the 2 meter repeater, W6ESI. Dale set up rigs in the church chancel area, and just the wedding party and Earl were there, but several hundred were present for the wedding via uplinks and downlinks all the way to Los Angeles. At the conclusion, Earl invited greetings for the couple, and many dozens came back with their call, handle, city, and congrats. It was probable a first in ham radio. The response since has been overwhelming. A reception was held at the home of ham friends, Invitations were HAM TELETYPES, and each ham was to bring a QSL CARD for the Guest Book. DALE and ALICE were tremendously interesting to work with, and the changes in the service were worked out by them. "Will you each keep the others batteries charged?" "Will you stay on the same frequency together?" "I take you to be my XYL," "I take you to be my O.M." Closing words were "73 s 88 s and 99 s" to all the hundreds of guests. How about that for a novel use of ham radio?

Chief of Staff
Donald B. Halverstadt, M.D.

Hospital Administrator
Edwin C. Campbell

Chief, Admissions
Mrs. Arlene J. Baggett
(405) 271-4371

Medical Director
Webb M. Thompson, Jr., M.D.

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and Emergency Services
John H. Stuemky, M.D.

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Harris D. Riley, Jr., M.D.

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Post Office Box 26307, Oklahoma City, Oklahoma 73126

A Teaching Hospital of the University of Oklahoma College of Medicine

December 21, 1981

Wheatstraw Amateur Radio Club
c/o Ralph Wilder
811 N. Burford
Watonga, Ok. 73772

Dear Friends:

When all the Christmas trees and decorations are packed away for another year, grateful thoughts will remain for your tremendous help, so generously given, making possible a happy Christmas day for our young patients.

A very special thank you for your $87 donation, and our best wishes for a joyous and safe holiday season and new year.

Sincerely,

Freida Mosley

Freida Mosley
Director
Volunteer Services

FM:rg

This is the kind of thanks that the Wheatstraw club has received for the last few years bydonating to a good cause at Christmas. We think this type of goodwill could bring some much deserved recognition to Amateur Radio if all the clubs could print a thank you letter next year.

In order to receive the thank-you letter, you do something for which to be thanked.

This is the Wheatstraw CHALLENGE! : if every club reading this would substitute giving to groups or institutions other than just among their own members, especially during the giving season of Christmas, imagine the exposure of amateur radio operators and their good deeds to to the public who don't know we even exist!

WD5JNT Ted

FOR SALE: Heathekit HD 1410 electronic keyer proffeshionally built never used $50.00 Ralph WB5PFW 262-0436

CODE PRACTICE?
NONSENSE!

THAT'S RIGHT, NONSENSE! K5SJV SENDS 5-CHARACTER NONSENSE GROUPS AT 8:00 P.M. (0200Z) ON 3750 KHZ NIGHTLY EXCEPT THURSDAYS AND SATURDAYS THROUGH MARCH 31.

EACH SESSION IS DIVIDED INTO THREE SEGMENTS: 5 TO 9 WPM, 9 TO 13 WPM, AND 13 TO 17 WPM. SEGMENTS ARE ABOUT 10 MINUTES IN DURATION. MAXIMUM SPEED IN EACH SEGMENT IS REACHED IN ABOUT 7 MINUTES. ALL LETTERS, NUMBERS AND COMMON PUNCTUATION ARE INCLUDED.

TAPE A FEW SESSIONS. GET PROFICIENT. BE THE FIRST ON YOUR BLOCK TO UPGRADE!

BICENTENNIAL AMATEUR RADIO CLUB

"To Promote Radio Communications"

Sponsored by Oklahoma Air National Guard
Will Rogers World Airport

76ers January minutes

Meeting called to order by John Galway KH6JTE

]. Introductions followed with seventeen mem= bers and guests present.

2. minutes were read by Jerry N5AUH. motion was made and carried to accept as read.

3. minutes read by Bill Rodgers WA5RAQ. motion mande and carried to accept as read.

4. Membership report. Bill has sent out a questionnaire to delinquent members to see why they have not renewed. Only about half have been returned.

5. Field Day report. By Dick Baker WB5TMW

A. We will comptee in Class 2A again(low power 2 transmitters).
B. Dick also asked for volunteers for the var various duties for Field Day. If you are interested,call Dick Wb5tmw.
C. Dick also has a plan to build up an emergency trailer which would contain all necessary to set up in emergency conditions. Dick has the trailer if someone would help him with the work of putting it together.
D. Tom Webb WA9AFM volunteered for publ= chariman.

6. The President called a break at 7:55

7. Meeting resumed at 8:]5 with two films supplied by the Air Force on antenna theory.

8. New Business.
A. Bill Rodgers told about his work with t he blind and other handicapped people to help them obtain Ham tickets.
B. Discussion on format of Collector and Emmitter Magazine on print size, etc. The club voted to recommend to recommend to Editer Joe Harding to keep the same format.

Meeting adjourned 9:00.

Jerry Sproul N5AUH
Sec.

I would like to remind everyone that the autopatch on 146.76 is finally back up and open for business. The access codes are still * up * down, and the patch is open to all licensed amateurs, Member of 76ers or not. New F.C.C. regulations have dropped the requirement of giving the sign of the call of the station you are talking to, so it is not necessary to give the call of the repeater when you finish your call.

The repeater receiver only needs a tone for about two seconds to bring the patch up or down, but it is more difficult if your tones are off frequency or too hot. Most people should have no problem here. The patch is finally up, so use it!

Bruce, KC5CR

Appointment Preferred

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TOM MANGHAM
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TROY MANGHAM
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1-3

kay COUNTY ARC

MARSH WA5UBO

Where did the year go you ask. I wonder the same thing, but I look back and think about all the things I did, places I've been, happy times and the times of sorrow. A lot more has taken place than you think, as they say, when your having fun the time really flys.

The December meeting is a dinner meeting that will just be history by the time this is read. Everyone should have those extra pounds worked off by now that was put on that night. Looks like we will have a good turn out for the dinner.

We have three more additionas to the Ham pop-= ulation lately:

Don Becker	KA5MGR	Blackwell
Leo Hogard	N5DZO	Ponca City
Paul Callrun	KA5JQO	Newkirk

Also a few upgrades:

David Land	KA5LDS	Adv.
Larry Veach	KD5CU	Adv.

Good work fellows!

The van that was donated to the club has not been delivered yet due to Red Tape I think, every one knows how stickey that stuff can be.

The program last month on lighting protection by Fred, W5VAY was very well given. I wonder how many have rewired there grounding systems in there shacks. A lot of good information was put out & I think everyone got something out of it.

I need to go to work now so I hope everyone's year was as good as mine and your coming years better than the last. My best wishes to you and yours & my Christmas wish may the World come to PEACE & an end to all wars & violence

May Your God Bless

73' Marsh

WANTED: A manual for a Gonset Communicator 2 MT Rig. call Grady WB5SAG 765-3411 PoncaCity. after 5

FOR SALE: Hallicrafters SX=146 rec. & HT-46 xmitter, last set of matching seperates made. All interconnect cables etc. good cond. 300.00 or best offer

Marsh WA5UBO 363-2526
after 5

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3-2

11-2

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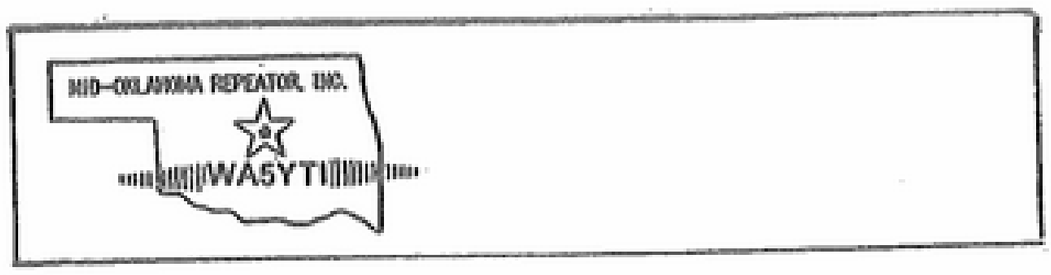

This month the members of MORI will be receiving two important documents in the mail.

The first is a ballot dealing with constitutional amendments. Please read the proposed amendments carefully, vote your conscience, and return the ballot, as directed, before the Feb. 9th meeting.

The second is a survey that deals with the programs of the club. In conversations with individual members, it becomes obvious that our past program has been good, but there is interest in reviving some old programs and starting some new ones. It is vital that the club know where your interests are and if you can donate talent and time for implementation.

The emphasis in our monthly meetings will be on programs that are valuable and of interest to all. We will attempt to limit the time spent on business. We invite all members and the public to attend. See ya there.

John Clement KC5HD
President

Hi

A very good friend of mine and perhaps yours too sent me the following on "Radio Trivia" questions and answers. He will be leaving for Greenland where he will be stationed in the U. S. Air Force. I am talking about "Holly Stewart" which some of you probably know by Stew, KD5DL. I have read his article several times and found it to be very interesting, and so at this time, I want to publish it, with the questions and the answers I will bury some place in C&E (or whereever ZNF will let me.) Before, I begin on the Q&A, I want to say a big thanks to Stew for providing this, and I hope it will be some encouragement or idea that we need articles like this or similiar, so let me know. Also, one other comment, I hope that Stew has very good luck while he is gone, and will be looking for his return.

"RADIO TRIVIA"

Guglielmo Marconi is the accepted inventor of wireless telegraphy. Who invented wireless telephony?

Hiram Percy Maxim, the first president of ARRL and a prolific inventor, is probably better know by the general public for an invention that bears his name. What is it?

Remember the transistor? When was it invented?

Why is the current in the "conventional" flow theory the opposite to current flow in the "electron" flow theory?

Everyone knows that a zinc-carbon dry cell is exactly 1½ volts. Can you be a bit more accurate? Can a zinc-carbon cell be made with a higher emf? -- say 2 volts?

Everyone knows what SOS means -- and the penalties for its misue. What does PAN mean, and and why are those particular letters chosen for the signal?

You are flying to Gander, Newfoundland from OKC, and meet all stateside requirements for operating aeronautical mobile. What penalties can the Canadian government impose if they catch you operating over Canadian airspace?

Again, you're working with a Canadian station, and the QSO is in French. Is it O. K. to ID your station in French, or must you ID in English?

Your junk box has a unipolar semiconductor with black, orange, yellow and brown bands. Know your color codes? What is it?

The Bodo Radio Station, JW8MI is operating on the new 30-meter WARC band, and a Norway station would round out your DXCC needs. Can you answer his CQ and ask for a QSL?

BONUS...

You're tuning across the shortwave spectrum and hear a QUS in telegraphy. Do you know maritime "Q" signals?

Ok, get your thinking caps on, and see how many of these you can answer... I will give you plenty of time and I will also add the comment that Stew made at the bottom of the page.../

"There are no self-grading standards to this test. The questions were designed to be difficult (hopefully), and therefore to prompt you to study and learn more about your hobby. Perhaps your Q&A to C&E can help stimulate the rest of us, and help us better appreciate the history and service of Amateur Radio".

KD5DL

The rest of my article to be published is in connection with the meeting for MORI on January 5, 1982. Due to the fact, Connie, KA5-ERZ was unable to attend, I took the minutes, so I hope that I get all of the information correct. Primarily, it was about the "amendments" made to the Constitution, etc., As you read, you will notice the rest of the meeting too, BUT we really need to focus our viewpoints, comments, etc., concerning these issues. Before I get into the real matters at hand, I will brief you on the meeting and then get on with the other.

Our meeting was January 5, 1982 at the EOC building, the first part went as usual, with everyone in attendance to introduce themselves. We had 47 people. John, KC5HD then called on the committees for reports on the repeators and their operations. K5ELL -- Doing just fine K5VRL -- AOK. Joe (K5JB) was unavailable for comment for the 444.1.
Next, Paul, WA5HTL made a motion for arrangements to have the Blood-mobile-- the majority voted for it to be at the April's meeting, and then he passed around a piece of paper to have anyone volunteering for it to sign up.
Fred, KA5CXW passed around copies of the Member Survey, Amendments for the membership to read over and discuss or make comments, etc. (See John - KC5HD's article)
We took a break, and came back and discussed all of this. Also, we had prize drawings, and our volunteers to call the lucky winners names were John (son of K5ELL) and Chad (son of KC5HD the prizes were furnished by Ellerd, W5KE.
Meeting adjourned at 9:50 P.M.

That is all I have right now, so hope to see ya all at February's meeting on the 2nd, at 8:00 P. M. Prior to meeting will be the Board meeting unless it is announced otherwise.

'73
Susie KA5FED

The program for the March MORI meeting will be on "Computer Disc" and computerized test sets for 2-way radio. John Waldvogel of Mototola will give you the word on the latest.

FREE CODE PRACTICE EVERY DAY
FROM W1AW (NEAR HARTFORD CONN)

S---START SLOW SESSIONS
5-7 1/2-10-13-15 WPM

F---START FAST SESSIONS
35-30-25-20-15-13-10 WPM

CENTRAL TIME ZONE SCHEDULE

	MON	TUE	WED	THU	FRI	SAT	SUN
8AM	S	F	S	F	S		
3PM	F	S	F	S	F	S	S
6PM	S	F	S	F	S	F	F
9PM	F	S	F	S	F	S	S

FREQUENCIES--3,581KHz 7,080KHz
14,080KHz 21,080KHz 28,080KHz
COLLECTOR AND EMITTER

Shawnee Amateur Radio Club

W5SXA

In our first meeting of the new year, The Shawnee Amateur Radio Club elected officers. Earl Couch, WB5ZBA, is president, Rick Wilson, WD5ETD, is vice-president, and Jim Sullivan, KA5FBC secretary-treasurer. We elected a new technical committee also. They are Tommy McDaniel, W5NMN, Ray King, W5LXH, Hub Peery, W5GYX, Bill Warren, WB5TZQ and Rick Wilson, WD5ETD. Good luck, guys!

Jim, KA5FBC, worked on frozen water lines and was too tired to make the meeting, so we railroaded him back into his last year's job.

Congratulations to the officers of 1981 on a job well done.

It is time to be thinking about training for storm watch. In addition to the training session at Channel 9 (16 February), we will conduct two sessions locally. Tony Mullins of Tecumseh will conduct the local sessions. Tony spent his service time in the Air Force weather department and is certainly an asset to our community in storm training.

We have been a little slack in C&E input,but hopefully that will not be so this year. I am just filling in for this month - aren't you glad? I am not full time at the job.

How about teaching or helping in a novice or general class? We need to start one soon.

I saw a few guys at the last meeting that I have been missing for a while. Welcome back.

David, N5CZG, is working on a new repeater. So far everything looks good.

The 31/91 repeater seems to have a little cold WX problem but warm WX will be here soon. It is just too cold to get outside to work on it. Maybe we can upgrade the machine this year.

There will be a discussion in the next few club meetings that will be of interest to all the Pott. County area Amateurs. I would like to take the opportunity to urge all area hams to attend and give your ideas for the new year.

Remember the Tuesday evening ARES net. We need your support.

73, Earl Couch, WB5ZBA

BLIZZARD EXERCISE

The State Civil Defense and Civil Air Patrol are aware of the problems we cause for other emergency response agencies and the media when we schedule a blizzard exercise and then call it off because of weather that appears to be the same as the exercise is planned to mitigate.

First, let's look at the purpose of the exercise from the Civil Air Patrol standpoint. It is intended to provide winter training for Civil Air Patrol pilots--all Civil Air Patrol pilots. It is the primary means of enabling the lease experienced pilots in the Civil Air Patrol to become acquainted with the problems of winter operation and to learn how to operate in a Civil Air Patrol/Civil Defense organization during a time of emergency. Obviously, if you expect the most inexperienced members to go up and fly in adverse weather of the kind that would create the problems we train to meet, some of them would have to be eliminated from the training program or take a chance in not living long enough to gain the experience they need in a real live blizzard. If we should have an actual blizzard right now, the Civil Air Patrol could call on its more experienced pilots, using their heavier aircraft and they could go out and operate safely in low ceilings and high winds. But you cannot send out the less experienced crews, in lighter aircraft that Civil Air Patrol members own, and operate them safely in marginal weather. It is equally true that unless we pick a time when all Civil Air Patrol members can fly that we will not be training the experienced pilots we need in years ahead for real emergencies. The amount of money made available for such Civil Air Patrol training exercises by the United States Air Force is limited and it is necessary to fly in weather that allows all pilots to fly safely if the Civil Air Patrol is to receive maximum benefit from the funds made available to them. It should also be noted that the scenario for the training exercise presumes that the most adverse weather has passed through the exercise area and that the Civil Air Patrol missions will be flown as aerial reconnaissance to locate problems such as stranded motorists, downed power lines, drift plugged roads and highways, isolated towns and isolated ranch problems.

We regret we cause consternation for all the other players including amateur radio operators, civil defense directors, county commissioners, highway engineers and other volunteers who take part in the exercise. We still believe it is a valuable exercise that has a life-saving potential. We will attempt to do it again. Please bear with us.

Norris Price
State Civil Defense Director

Central Oklahoma Radio Amateurs

HAM HOLIDAY plans, Facilities, Programs and the 1982 budget were acted on at the February CORA meeting. First, the BUDGET:

EXPENDITURES		INCOME	
Facility	$4,000	Pre-register(900)	$5,400
Prizes	2,500	Door " (200)	1,400
Publicity	1,000	Dealers	1,500
Ladies	800	Bingo	300
Registration	200	C & E	300
Programs	200		
Dance	200		
	$8,900		$8,900

Less than last year so more for last minute prizes should be available.

The Facilities Committee (ACARC) has a contract with the Myriad for Fri-Sat-Sun, 23-25 July. Friday evening for dealer and fleamarket setup, informal programs, registration and eyeballing there and at the Sheraton hospitality room. Areas similar to last year will be used but at less expense due to re-arrangement and scheduling. Full story later.

CORA, with president George, AD1S, as chairman, will handle the programs. Several were discussed but all Directors were asked to get input from their clubs as to what programs are desired AND get volunteers to conduct them. Letter input from the outlying clubs are solicited. Have it all ready for the February meeting.

Registration prices to remain at: Pre-registration, $6.00. Door registration, $7.00. The Saturday night banquet will be a buffet, $8.00. The dance following banquet will be included in the registration fee.

No special arrangements on parking were possible. Everyone is on his/her own.

SCARS has a special OKLAHOMA DIAMOND JUBILEE QSL card which CORA is investigating as to it taking the project and furnishing the cards to all amateurs in the state to use in their contacts.

Every CORA meeting is important. Have your club representatives attend every meeting.

Joe, WA5ZNF

HAM HAPPENINGS REFER TO CLUB SECTION FOR SPECIFICS

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	USAF MARS 1	MORI Thursday Nature Radio Club GP 2	3	4	5	6
7	CHOCTAW ARC 8	9 Shawnee	10	ALTUS AREA 11	12	13
ARC 14	ARES 15	WEATHER MEETING AT CHANNEL 9 7:00 PM THE EDS SIERRA 16	EDIT 17	kay 18	19	20
EARS 21	22	CORA 23	24	25	26	27
28						

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