Central Oklahoma Radio Amateurs

COLLECTOR AND EMITTER

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

Central Oklahoma Radio Amateurs

COLLECTOR AND EMITTER

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Managing Editor Joe Harding, WA5ZNF 737-1044

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

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Postal Station 18, Okla City OK 73169
Meets: 8:00 PM First Friday each month
Flight Standards Bldg, FAA Aero Center
Club Station W5PAA

Pres	Al Prince	WB5KCU	789-1160
V-P	Bill Hulse	K5UGZ	376-2125
Sec/Tr	Bill Oliver	K5KDR	329-6333

MID-OKLAHOMA REPEATOR
Meets: 8:00 PM Tuesday of first full week in month. Okla City EOC, 4600 N Eastern
WR5AJP 34/94 WR5ADF 07/67

Pres	Chet Hazelwood	W5GDL	427-1439
V-P	John Huckaby	K5QDR	672-4706
Sec/Tr	Richard Zanni	WB6FYL	732-6778

Dues: Sid Gerber, 829 E Bouse MWC 73110

OKLAHOMA UNIVERSITY AMATEUR RADIO CLUB
202 W Boyd, Room 219, Norman OK 73069
Meets: 7:30 PM Alternate Tuesday STUDENT UNION Rm 161. W5TC WR5AFW 146.28/88

Pres	Paul Thompson	WB5EEY	321-6265
V-P	Wayne Smith	WB5FEX	325-6391
Sec	James Koerner	WA5JTJ	634-3713
Treas	Mike Salem	WA5EPK	321-5453

BICENTENNIAL AMATEUR RADIO CLUB
Meets: 3rd Tuesday each month Air National Guard, Will Rogers Airport

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V-P	John Oltmans	WB5PZG	525-6066
Sec	Jim Townsend	WB5VCB	632-5445
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OKLAHOMA CENTRAL VHF AMATEUR RADIO CLUB
323 NW 10th, Okla City OK 73103
Meets: 8:00 PM third Friday each month
American Red Cross Bldg, 10th & Hudson
Club Station W5LOW

Pres	Tom Stinson	W5OZE	942-3714
V-P	Ken Ford	WB5KHU	528-8770
Sec	Joe Buswell	WA5TRS	732-0676
Treas	Ellard Foster	W5KE	789-6702

OKLAHOMA CITY AUTOPATCH ASSOCIATION
Meets: 7:30 PM 3rd Tuesday, Bi-Monthly
Oklahoma Military Academy 36th & Grand
WR5ACB 22/82 147.81/21

Pres	Gary McCormick	WA5ETV	946-2898
V-P	Guy Liebmann	K5GL	787-9547
Sec/Tr	Jim Denman	WB5EOL	681-6048

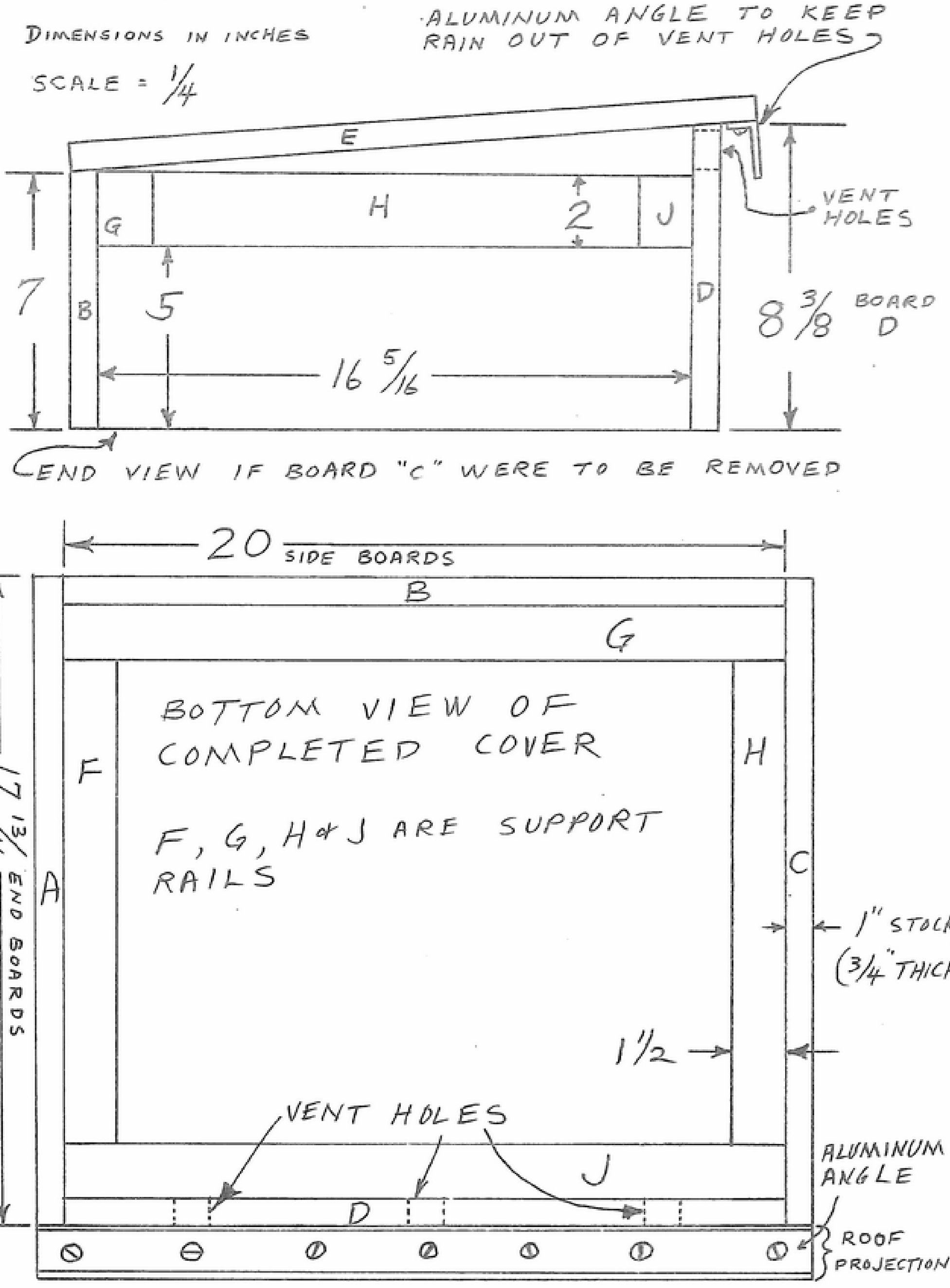
7705 S Charlotte Dr OKC 73159

EDMOND AMATEUR RADIO CLUB
WR5AHG 147.63/03
Meets: 10:00 AM first Saturday of odd numbered month, 3220 N Santa Fe (GE)

Pres	Larry Dillard	WB5CWB	685-4065
V-P	Bart Wortham	WA5JUU	751-9536
Sec/Tr	W. H. Thompson	W5UVI	348-1475

Contributions to this department are solicited.

THE BATTERY HOUSE, Part II. A foundation and base for a battery house was described in November C & E, page 16. A cover for the battery house is described in this concluding article. Instead of using a hinged door for access to the battery, I decided to make a cover that would set down over the base, and be lifted off for access. See the illustrations.



The cover is not fastened down, but the sides extend down around the base. The support rails F,G,H and J provide the support for the cover by resting on the top edge of the base. There is a space of about ¼ inch between the outside wall of the base and the inside of the cover, so the cover does not scrape along the base as it is raised or lowered. In fact, I have a bead of silicone rubber around the inside lower edge of the cover and also around the edge of the support rails where it contacts the base.

Cut the side boards and end boards out of 1" pine, redwood or whatever you may already have. Cut a notch in the bottom of the appropriate side or end board if necessary to clear the battery wires. Bore about three one-inch holes along the top edge of side board D. These holes are for ventilation. Tack a screen over the outside of these holes to help keep out bugs. The vent holes are placed between the top of rail J and the top edge of board D. Fasten the side and end boards together. Fasten the rails in place.

Set the assembly upside down on a piece of 3/4" plywood and mark around the outside edge except along board D. On this side of the roof allow extra to protect the vent holes from rain. I used a piece of aluminum angle, so I needed an amount equal to the narrow side of the angle plus 1/16" for clearance. Cut out the plywood roof. Fasten the vent hole protector to the roof. I would provide a vented, outside place for one of the new sealed batteries until such time that I am convinced that it would not break, leak or corrode things.

Before fastening the roof to the rest of the cover assembly, apply the paint. Here is the process I followed. After each step below, allow sufficient drying time.

1. Apply Plastic Wood to the larger cracks & holes that don't belong.
2. Paint screw heads, bolts and screen with metal primer.
3. Apply several coats of wood preservative to all surfaces, inside and out. Here is a brand name that came from TGY: Seal-Treat. Also I have used Wood Life in the past.
4. Apply two coats of outside house paint to all surfaces except top and edges of roof.
5. Fasten the roof in place.
6. Apply asphalt roof coating to the top and edges of the roof. This has the consistancy of thick paint.
7. Apply asphalt plastic cement to the same surfaces as step 6. Spread it on about 1/8" thick with a suitable flat blade like a putty knife. The cement is much thicker. You may wish to put a roofing material on instead of the cement.

This completes the project. I hope that what is given here will help you toward a NEATER HAM SHACK if yours aint neat already.

+-+-Bill, WA5RAQ-+-+

RAFAEL ELIAS, CP1GM/W5, got an emergency call at 9 PM one night recently on 20 meters from XC1MZ in Mexico City who needed some medicine that was not available anywhere in Mexico. A little girl was born 4 months premature and was given two operations. The medicine might help save her life. Rafael, with assistance from Frank, W5PDH, spent the next day searching for ways to obtain the medicine and arrange for its delivery to Mexico City. A prescription was needed. The first doctor contacted wouldn't help, but from then on things went more smoothly. Dr. Gorena gave the prescription, Medic Pharmacy supplied the drug, and Braniff International flew it to Mexico City. Others involved were the local Red Cross and the Consul of Mexico, Bob Buchanan.

The father of the little girl picked the medicine up at the Mexico City airport at 7:20 PM, less than 24 hours since the original call. Rafael cut through red tape to speed delivery that would have taken

MID-OKLAHOMA REPEATOR INC.

Amateur Radio and all those who helped for the service. He says any other amateur would have done the same. He thinks it's a great service that Amateur Radio can provide in such instances as this. How is the little girl? We don't know at this time, but will try to find out and pass this along in a future issue.

+++++++ WA5RAQ

MINUTES OF THE NOVEMBER MORI MEETING

The meeting for November was called to order by H. O., AA5MLT at 2000. It started out by self introductions and welcome by H. O. The announcements for the nite were given. First was a letter from WA5CBF about the latest edition of their callbook. They are expressing their wishes to see if we would like to get our club members names in that publication. The club decided not to give them our membership roster because that might give some of the wrong people names and addresses not needing to be distributed to everyone. The other announcement was from the police department about a base station by Clegg they have and are trying to find out whose it is so they can prosecute the burgler.

Chet, W5GDL gave the report that our MORI Christmas party and dinner will be held at the Bonanza Steak House located at N. W. 23rd and Council Road, December 3 at 7:00P. M. There will be some door prizes given at this time also. (There will be live entertainment-Ed)

Frank, W5PDH, gave a very good report from CORA about HAM HOLIDAY upcoming for the next year. The need for 4 members from each club to form the committees for the next HAM HOLIDAY.

Then the election committee gave its report to the club. They recommended that Chet, W5GDL for President, John, K5QDR for Vice President, and Rich, WB6FYL for secretary/treas. There were no nominations from the floor, so the were accepted by motion that we accept the committees recomendations by acclamation. Passed...

H. O. then went about the business of getting volunteers for the 4 member committee for the CORA. The following members were agreed upon. Program Comm..Mack K2GKK, Prize Comm. Frank, W5PDH, Regist. H. O. , WA5MLT (and Ladies Comm. to be chosen later - Ed). Then a motion by Fred, K5HFN to set aside $25 for phone bills or other expenses made for the hunt of the stolen equipment reported to Bill, WA5STC as our man go between and seconded by Tim, WA5LTM. This motion was passed by all present.

And at this time I would like to thank the members for being theirSec/Treas for the last year and hope to do well as your Vice Presidentand all the other officers will do their best I am sure. We have had a very successful year and a lot of thanks were given last night at the meeting by different ones.

We only had 25 members there last night and even had 1 new member sign up in the club.

Thanks again and will be seeing many of you again any time you hear us on. --- signed: John W. Huckaby, K5QDR, Secretary/Treas

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DEFINITION: A committee is a group of the unable delegated by the unwilling to do the unnecessary. - - - Frank, W5PDH

$$$$$65,000 worth of CB gear, test equipment and amateur transceivers was seized in a raid by FCC investigators and U. S. Marshalls in a raid on illegal CB operators in Baltimore recently, according to the November 5th HR REPORT.

FOR SALE Swan 1210A completely loaded with crystals (includes auto patch frequencies). Independent transmit and receive, 12 frequencies. Includes touchtone pad. With snap-in rack. Ron, WA5EAI. 681-0896.

FOR SALE Swan FM-2X. Fifteen sets of crystals with AC power supply and mobile mounting bracket. Four channels are direct, the rest are on local repeater frequencies. Sid, W5KOZ, 737-1050.

ELECTRONICS GARAGE SALE. HICKOK TUBE TESTER, OLD TR[illegible]ITTER AND RECEIVERS, CAPACITORS, SOLID STATE AMPLIFIERS, AND PARTS OF ALL KINDS. MRS. JOYCE PULTS, 2512 N. DONALD, 495-0879 or 495-1143. (ABOUT 6 BLOCKS WEST & 2 BLOCKS NORTH OF N.W. 23 & MacARTHUR).

MID-OKLAHOMA REPEATOR INC.

The Long WIRE

h. o. townsend, AA5MLT
president MORI

It's that time again boys and girls, moms and dads. It is time for shinny toys, gright lights, and the fat ole fellow with the white beard. Incidently, this does not describe any Amateur in the Oklahoma City area.

However, it is December and our BiCentennial year 1976 is drawing to an unforgetable end. This year we have seen special television programs, many beautiful events of theFourth of July celebration, and last but not least, a simple peanut farmer become our new President!

Amateur Radio has seen many changes this year. For example, John Johnston is the new head of the FCC's Amateur and Citizen's Division, a general deregulation of the FCC Rules and Regulations, special ARRL BiCentennial contests, a new ARRL education program, the unexpected election of a new West Gulf Division Director, and special station calls NCØARL, N6V, and prefixes AC5, AD5, AA5, and AB5.

In addition to these events, I want to sincerely say thanks to the fellow officers for the support they have given to the Club. Chet W5GDL, Vice-President, for standing in under the television lights when I could not make the meetings; John K5QDR, Secretary/Treasurer, for handling these duties very well; Tim WA5LTM, Program Chairman, for the fine programs we have had this year; Bill WA5RAQ, MORI/CORA Editor, for the contributions he has made each month to our section in the Collector-Emitter; the trustees: Sid W5KOZ, Ken K5VVZ, Ron WA5EAI, Merwin K5ELL, Wayne WA5AOB. Also, I want to thank Frank W5PDH for the outstanding job he has done as our CORA Representative. He has always had a positive attitude about Amateur Radio. And Jerry W5MCJ deserves a hearty thanks from all of us for furnishing the fat pills and coffee at each meeting.

This year our club has made some real advances. For example, a new receiver has been installed at the .34/94-MHz site, our membership is stable, the bank account is up, and the repeaters have had very, very little down time. In addition, the limited access autopatch has been installed on the .07/67-MHz machine.

The setbacks or things that the club might have accomplished include: acting more positively on the .16/76-MHz offer from the WE club, and a stronger publicity program.

Beyond all of this, there is one thing more important. That is the willingness of our club members to participate. While some members are very active, other members are not. We need to put aside old thoughts of letting someone else do the work or having had our feelings hurt in the past. If all of us are to enjoy our hobby and present a good attitude to the community, we all need to share the responsibilities. We are living today; let's take a positive look at the future. After all, Amateur Radio is our hobby.

Congratulations to Chet W5GDL, John K5QDR, and Rich WB6FYL for being elected President, Vice-President, Secretary/Treasurer respectively for next year. We need to be sure and support them.

Let me say again, "Thank you," for allowing me to serve the club and Amateur Radio this year. It has been a pleasure and a rewarding experience. I appreciate the opportunity. Until...I will be QRX.

Completing DX Contacts Through Amateur Radio

Completing Dx contacts through Amateur Radio depends on several factors. For example, the primary factors are interplanetery relationships and atmospheric conditions, the operating frequency, and the mode of transmission. The successful or unsuccessful completion of DX contacts depend on the total effect these factors have on the propagation of radio-frequency waves.

Interplanetary relationships have strong effects on DX contacts. These relationships act as a catalyic agent by causing changes in atmospheric conditions. As an example, the Earth revolves around the Sun, causing the layers of the atmosphere to ionize. The ionization causes the number of atmospheric layers to increase and decrease. It is during this changing of layers when the atmosphere is the most unstable that the best chances of completing DX contacts can be made.

The operating frequency is the next factor contributing to the completion of DX contacts. As a general rule, the operating frequency needed to complete DX contacts is lower while the atmosphere is reduced to one basic layer. However, the operating frequency will increase as the layers in the atmosphere increase.

The last major factor affecting the completion of DX contacts is the mode of transmission. Of the various types of transmission, single-sideband seems to be the best for phone operation. This type of transmission employing a surpressed carrier forces all of the radio-frequency energy into one sideband. With all of the energy in one sideband, the energy is used efficiently as compared to frequency modulation.

In summary, these are some of the major factors governoring the completion of DX contacts. Although these factors are independent, it is the total effect they produce that determines the successful completion of DX contacts through Amateur Radio.

H. O. Townsend, AA5MLT

FOR SALE Transmitter, Knight T-150, 80 - 6 meters. 150 Watts input. AM & CW, Built in VFO. $60 Sam Barrett, WA5RPP, 364-5915, Norman.

FOR SALE Tennelec Programable Scanner with AC & DC supplies. Works fair. $150. Sam Barrett, WA5RPP, 364-5915, Norman.

FOR SALE: Allied AX 190 Receiver $175.00. Bill WA5YGX, Home 721-9796; work 525-7537.

SAM, W5HAZ

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THE BICENTENNIAL AMATEUR RADIO CLUB

Minutes of the meeting November 16, 1976. Meeting was called to order by President Ken Newberry at 7:10 pm.
Coy Day presented a patch for Club membership consideration. Motion made and seconded that the decal patch be accepted and used as the Club patch. Motion carried. Discussion was held to go ahead and start taking orders for these patches.
President Ken Newberry discussed the letters that was sent out to delinquent members. He reported that two members had called him about their membership.
President Ken Newberry appointed three delegates to the C.O.R.A. meetings to represent the Club. These delegates are: Coy Day, Joe Schilling and alternate Bob Wall. Ken Burdick stressed the importance of our Club being represented at C.O.R.A. meetings.
Coy Day gave a report on the school progress.
Ken Burdick reported on C.O.R.A. starting organization of committees for the 1977 Ham Holiday. The 76-ers Club is on the committee for prizes, and venders. Our job is to get the prizes from different stores, business or sponsers and to help the people who sell and display Amateur Radio equipment at the Ham Holiday. December 1, 1976 is the date for the Club to report to C.O.R.A. about the committees progress.
Suggestion was made and considered for the Club to set up a demonstration rig being operated at some public site.
New memberships opened at this time. Three members were voted in and cards were issued.
Club adjourned for coffee at 8:00 pm.
Club reconvened at 8:30 pm.
A film on Heart Emergency treatment was shown to the Club. Club discussed C.P.R. and best way of emergency treatment for heart attacks or arrests. The film and discussion was presented by Dick Baker, Club Activity Director.
Meeting adjourned at 9:15 pm.

Jim Townsend, Sec.

Operating News

Greg, WB5PNV, has been doing some DXing on 15 meter c.w. this last month with his newly aquired SB-102. He's pulled in some good ones, Gambia, Canal Zone, Iceland, Venezuela, Japan, Bermuda, Argentina and way out there to Prince Edward, Marion Island south of Africa. Greg is using a half wave dipole and having alot of fun. He says ham radio is a good way to "unwind" after a hard day at school. He recently passed his General and is eagerly awaiting for the official word from the F.C.C. Congratulations on passing your General and all the F.B. DX Greg!
As for myself and Ken, WB5PYN, we haven't been operating much lately. We've both been bitten by the Accu-memory Keyer bug. Bill, K5OCX gave some construction pointers and a demonstration of his at our September meeting. Since that time Ken and I both have been burning the midnight oil. I finished mine in time to make a few contacts in the sweepstakes but then surrendered my I.C.s to Ken so he could check his out. He called me the evening of the seventeenth and said he had it going with the help of Bill, K5OCX. I may never see my I.C.s again.

73 Coy, K5LMG

FREE CODE PRACTICE FROM W1AW

As a public service, for those that wish to increase their ability to copy code, the American Radio Relay League broadcasts code practice from their amateur radio station W1AW, which is located near Hartford, Connecticutt, on each of the following frequencies: 1.820 MHz, 3.580 MHz, 7.080 MHz, 14.080 MHz, 21.080 MHz and 28.080 MHz.
The signal may be offset very slightly from these exact frequencies to get away from interference. At least one of these frequencies should be received easily during each broadcast. Maximum power allowed is used on each frequency.
These broadcasts are identified in code as follows:

dah dah dit dah ditidit dah (QST) repeated three times
dahditi dit (from) times
dit dah dah dit dah dah dah dah ditdah dit dah dah (W1AW) repeated three

W1AW SCHEDULE

Centrl Time Zone	Days Of Week	Speed (WPM)
7:40 AM	M-Tu-W-Th-F	18 (Oscar data)
8:00 AM	M-W-F	5-7½-10-13-20-25
8:00 AM	Tu-Th	35-30-25-20-15
1:00 PM	M-Tu-W-Th-F	18 (Oscar data)
3:00 PM	M-Tu-W-Th-F	10-13-15
3:00 PM	Su	18 (Oscar data)
3:30 PM	M-Tu-W-Th-F	18 (Bulletins)
6:30 PM	Su-M-Tu-W-Th-F-Sa	10-13-15
7:00 PM	Su-M-Tu-W-Th-F-Sa	18 (Bulletins)
8:30 PM	Su-Tu-Th-Sa	5-7½-10-13-20-25
8:30 PM	M-W-F	35-30-25-20-15
11:00 PM	M-Tu-W-Th-F-Sa	10 (Bulletins)

W1AW also broadcasts bulletins by voice at 8:00 PM and 10:30 PM on the following frequencies: 1.820 MHz, 3.990 MHz, 7.290 MHz, 14.290 MHz, 21.390 MHz and 28.590 MHz. Any emergency announcements will be made for voice frequencies on the hour and code frequencies on the half hour.
For complete details see "Operating News" in any QST magazine.

73 "C.Y." AB5TKG

AMATEUR FAST SCAN TV IN CITY AREA

Recently in the Oklahoma City Area, a couple of Hams have been working on Fast Scan TV, Doc Goodhead, WA5CZN, and Paul Adams, WB5EVO. Doc has completed his station, however Paul is still working on his transmitter, both have been experiencing difficulty with the sensitivity of their UHF converter, if you decide to get a converter and have the same problem, you can build a preamp to correct the problem, a very good schematic and parts list may be found in the ARRL League Publication, Specialized Communications Techniques for the Radio Amateur, 1975 Edition 1, located on page 13, this schematic was compliments of Thomas R. O'Hara W6ORG, 2522 S. Paxon Lane, Arcadia, California, 01006. If you need any information you may send him a S.A.S.E.

For you people that were born after the "1950's" you probably don't know what a UHF TV Converter is, back in the "50's" Oklahoma City had two TV Stations that went higher than 13 channels, they were channel 19 and channel 25, your standard TV would not reach that high, so various manufactures built these little converters that went from your antenna to your TV so that you could go from channel 14 to channel 84, now and for the past 10 or 15 years or so all TV's that are and have been built have UHF built into them and there was no need for the converters, and the Stations went off the air, and the converters came off of the TV sets and probably went into the attic. So if you are interested in Fast Scan TV, and are not made of money, look around in your attic and you may come up with a converter for yourself. If you have any problems with your converter, Paul and Doc have offered their assistance, Doc 787-9027 and Paul 348-1414.

By the way I almost forgot the most important item, I guess it would not do anyone any good without knowing what frequency they are going to operate on: 439.25 MHz.

73's and good hunting,
Bill WA5YGX

FOR SALE: ITC/KLM MULTI-2000 2 meter SYNTHESIZED FM-SSB-CW TRANSCEIVER AC/DC, Power cords, Book and box. $525. Jay Curry, WB5QXU Phone 681-2668. Also SBE Model 34. 15-80 meters Sideband only. $225.

FOR SALE: HyGain 204BA, 4 element 20 meter Mono Band Beam. $100.00. Call W5UNF 794-8672 after 5 P.M.

FOR SALE: Drake SSR-1, General coverage receiver, serial No. 52658. Bought new 5/14/76. Used about 6 hours. $285.00.
Radio Shack 3 ft. tripod mount and 3 each 10 ft steel sections antenna mast for $15.00. Jim Kerr, WB5SIK 947-7098, 4109 NW 31st, OKC

AERONAUTICAL CENTER AMATEUR RADIO CLUB, INC.

W5PAA

MINUTES OF THE AERONAUTICAL CENTER AMATEUR RADIO CLUB
November 5, 1976

The meeting was called to order at 8:04 p.m. by President Prince. There were 39 members and guests present. Some comments overheard during self-introductions were:

Jerry, W5MCJ, picked up on antique radio at Texhoma. Ellard, W5KE, said his XYL won a prize there. Carl, W5JJ, reported he bought a few items at Texhoma. Gil, W5RB, said he put the Governor's congratulatory message to the President into the traffic pipeline. Charlie, WA5JGU, had a relaxing visit to Padre Island. Bob, WB5BVG, got his new Novice call. Henry, WB5NHZ, passed his advanced class exam. Susan, WA4AKB, received her Technician License. Lloyd, WB5HUP, reported the 37-97 repeater would be linked up to a repeater in the Boston area via land line. J.W., WA5KFT, had his motorhome at Texhoma. Steve, K6BYV, was a visitor from Boron, California. Bill, W5UGZ, has been listening to a professor expound on Atomic Physics. Howard, W5WSW, went to Texhoma and on the return trip had car trouble - ended up spending a cold night in the car. Abe, WB5AUF, had plenty of people in his room at Texhoma. They were viewing his demonstration on Slo-Scan TV. Jef, WB5GWB, has been busy in school at OU. Pat, AB5JYK, said he is gainfully employed. Gaylene, WB5VWB, is a new member attending her first meeting. Robby, W5JES, is back on the bands after a long absence. Gene, WB5SQC, bought a new travel trailer and broke it in on the trip to Texhoma. Rosie, W5BSQC XYL, is still working on conquering the Morse Code. Chuck, WB5SKE, passed his extra class - he went from no license to extra class in seven months. He also has a new Drake TR33 2M TXCUR. Don, WB5RAX, has been working in the Novice portion of the HF bands.

Dave, WuYDY, has an IC 230 2M rig. Bob, WB5PWZ, is attending his first meeting here. Paul, WB5EEY, is working setting up antennas for a contest to be held this weekend. Al, WB5KCU, attended Texhoma with his XYL.

The December meeting will be held December 3 at Dodson's Cafeteria at 6:30 p.m.

George, W5NTL, was the high bidder on the Drake DC Power Supply.

A very interesting program on Slo-Scan TV was presented by Abe, WB5AUF

The meeting was adjourned at 9:50 p.m. for refreshments.

Billy J. Oliver K5KDR
Secretary/Treasurer

AERONAUTICAL CENTER AMATEUR RADIO CLUB, INC.

W5PAA

A PROPOSAL FOR EXPANSION OF CLUB INTEREST

"Signal sapping" and "eye ball" QSO's over the past several months revealed a lot of serious amateur radio activities by individuals or small informal groups. Are we missing something by not having these interests incorporated into one or more of the club's activities? On the hypothesis that repeater related activities are adequately covered by the various repeater clubs; the logical choice for additional specialized activity would appear to be the Aeronautical Center and/or the VHF Club.

Special interest groups could be formed within the framework of an existing club. Each special interest group could elect a chairman, and conduct meetings separate from the parent club or assume the program for the parent club at alternate meetings on a rotating basis, or some combination of both.

It appears that an opportunity to advance the activity and interest in specialized activities, while at the same time furthering the cause and interest of all Central Oklahoma Amateurs, is within our grasp.

If this concept is accepted, achievement in specialized activities could be recognized by:

a. Establishing minimum qualifications for "full" membership in a specialized group.
b. Awarding certificates for achievement in a specialized group.
c. Publishing an "honor roll" in Collector and Emitter, for special achievement in one of the specialized groups.

If this concept appeals to you, please complete the questionnaire indicating the "special interests groups" that you would be interested in joining and which club you believe should sponsor it.

→

AERONAUTICAL CENTER AMATEUR RADIO CLUB, INC.

W5PAA

THE PRESIDENT'S CORNER

As the great Bicentennial year 1976 draws to a close, let's take a few minutes to look back over what we as ACARC contributed to Amateur Radio. It has been a great year with our members supporting CORA as well as ACARC.

ACARC was able to dispose of some unneeded equipment and update with a new counter and a gasoline engine generator, as well as some other items for use in field day or emergency operation. Also, some equipment is still for sale, with the hope of updating one of the operating positions with new equipment that can also be used for portable operation.

The support to CORA with Oklahoma Ham Holiday and Texoma Hamarama and other activities in the area, which also include this fine journal printed each month. This Collector and Emitter, you are reading now, is well known and widely read in the Amateur ranks. We wish to extend our best to the new CORA club officers and to Joe, WA5ZNF, Managing Editor of this C&E.

The January meeting will be held on January 7, 1977 for the election of new club officers of ACARC. Bob, W5HXL; George, W5NTL; Gene, W5GC are serving as the nominating committee.

The December meeting will be a dinner meeting at Dodson's Cafeteria, SW 59th and Pennsylvania, at 6:30 p.m., December 3, 1976.

73
Al WB5KCU

ASTRO 200 HF TRANSCEIVER

Advertised in England (but probably manufactured in Japan) now, which means it may be available here in 1978, the Astro 200 looks like a honey. Only 2.8" x 9.5" x 12.3", it puts out 100 watts on the amateur bands from 10 to 80 meters inclusive. It's wholly solid-state, has digital readout, drifts less than 20 Hz an hour, is electronically tuned (a pushbutton....no dial), has semi-breakin CW with sidetone, and just one hexx of a lot of other goodies.

W5JJ

DRAKE EQUIPMENT FOR SALE

TR-4 10-80 Meter Transceiver
AC-3 Power Supply
MS-4 Speaker

ALSO

TR-4C 10-80 Meter Transceiver
AC-4 Power Supply
MS-4 Speaker

A1 - WB5KCU 789-1160

	SPECIAL INTEREST GROUP	SPONSORING CLUB: ACARC	VHF
1.	___ VHF, UHF, MICROWAVE EQUIPMENT	___	___
2.	___ VHF, UHF, MICROWAVE OPERATION	___	___
3.	___ SLOW SCAN TV	___	___
4.	___ FAST SCAN TV	___	___
5.	___ RTTY	___	___
6.	___ FACSIMILE	___	___
7.	___ AUTOMATED CW	___	___
8.	___ HOMEBREW (GROUP PROJECTS)	___	___
9.	___ ANTENNAS	___	___
10.	___ DX	___	___
11.	___ TRAFFIC HANDLING	___	___
12.	___ CONTESTS (OPERATING)	___	___
13.	___ AMATEUR RV TRAVEL	___	___
14.	___ TEST EQUIPMENT	___	___
15.	___ OTHER (Write in)	___	___

Yes, I am interested as checked above:

Name_____ Call_____

Address_____ Zip_____ Phone_____

Mail to: ACARC, Postal Station 18, Oklahoma City, OK 73169

TECHNICAL REVIEW
-W5JJ-

POPULAR ELECTRONICS, Dec, passes on info on active filters and on RC circuits, also a bit on neon tubes.

HAM RADIO, Nov, highlights wideband RF autotransformers, AF filters, VLF receiving converters, and electronic switching of bias supplies for RF amplifiers.

73, Dec, has two articles on RF power and VSWR, both good but one a bit controversal. Be sure to read both! It also tells how to build a receiver based upon a BC receiver, mentions an unusual beam antenna, and shows building instructions for a cheap counter.

ELECTRONIC PRODUCTS, Oct, tells about optical waveguides and buried superconductor power cables. Its main stress is on hybrid circuits.

QST, Nov, has a frequency divider for a VFO, a Wheatsone bridge, a novel form of homemade key, a stark low-voltage power supply, and a host of other interesting items.

CQ, Sep, presents W6SAI's good ideas on antennas, K3EZ's noise bridge, and W9EGQ's comment on changes of rules for Novices.

SHORT WAVE MAGAZINE, Oct, has a comb generator for spikes at 20 kHz or 100 kHz intervals from 1 to 50 MHz, an inexpensive antenna for 432 MHz, and a really outstanding article on measuring PEP output from an SSB transmitter. (Not at all difficult, in contrast to the nearly impossible undertaking of measuring PEP input!)

IEEE SPECTRUM, Oct, in its review of things that went wrong, reveals what happened to the Navy's "Big Dish" and also its Extremely Low Frequency transmitter program.

AMATEUR RADIO, Sep, describes an experimental (but suitable for amateur construction) system of transmission and reception by use of pulse position modulation. Because of bandwidth, it's suitable (or legal) only for UHF. Also, there's a novel method for teaching Morse Code.

ELECTRONIC TECHNICIAN/DEALER, Oct, courtesy of W5KE, in its section on servicing CB equipment offers many ideas useful to radio amateurs.

RADIO COMMUNICATION, Oct, in addition to Technical Topics, has an article on building a powerful amplifier for 432 MHz and one on a reduced size quad for 14 MHz.

NO PORTABLE OR MOBILE DESIGNATOR REQUIRED

Effective 26 Nov 76, the FCC deleted its requirement for the use of portable or mobile identification. Previous requirement related only to the station doing the calling, never the station being called!

Under the new Regs, no notification of temporary location is required. Note one very important aspect, though: Your current mailing address always must be on file with the FCC! Don't overlook Section 97.42(a); sneer at it, and you may lose your license!

ARRL probably will ask the use of portable or mobile designators during its contests that need location identifiers.

W5JJ

Effective November 2, two-letter calls with "X" as the first letter of the suffix will be available for assignment. Also on November 2 the "N" prefix block will be available for 2-letter calls only. These are available only to Extra Class licensees who qualify and other two letter calls are available also.

DEAR AB5BY
% Collector and Emitter

I have a problem and need your (readers) advice. Please don't give me your stock answer "seek professional counselling". I am too embarrassed to discuss this situation, face to face, with anyone.

My problem is a recurring nightmare that always ends with my becoming the filling in a sandwich consisting of two large (and very heavy) granite slabs.

Attempting a little amateur self-psychoanalysis yields the following postulation: Its apparent origin was the Hamarama Happy Hour (don't know why they call it happy hour; I timed it at four hours from a late start!) The raffle tickets I bought, on $50 worth of bra-less straps, is probably unrelated, but may have significance in setting the stage. During a "4 happy hour" conversation with "Lead Foot Janie", we agreed on a Carribean Cruise next February. Supplementing the background information, in addition to "Lead Foot's" OM being endowed with a fullback's physique, one of his many business enterprises is a granite quarry and monument works.

I can't continue living with these nightmares. Please advise how I can end this terror and seek your reader's advice.

Sincerely yours in trouble,

Anonymous

P.S. Don't suggest cancelling the Carribean Cruise, "Lead Foot" is an extremely desirable woman, therefore cancellation is not a viable alternative.

P.P.S. How can I keep this from my MYL?

EDITOR'S NOTE: Please address all correspondence to Collector and Emitter, File IV-Q, to protect the identity of "Ananymous".

W5HXL

THE L - O - O - O - N - G HELICAL WHIP

The idea of the helical wound whip for 75 meters has intrigued me for years. The "Handbook" alledges it is more efficient than a center loaded whip. Some five years back, while browsing through a discount store, I acquired a 14' fiberglas fishing pole. It tapered from 3/4" to nothing. After a few years of collecting dust, it finally got wound with (one helluva lot) #18 wire spaced the wire diameter, except near the top, where the pitch stretches out to one turn per inch to avoid corona discharge, i.e., I got tired of winding it.

Mounting this on the "porta-shak", I found it would tune to an SWR less than 1.5:1 by changing the tap on the helix and be under 2:1 over $\pm$ 50 kHz. Later adding a 250 pf variable inside the "porta-shak", in series, enabled tuning 3800 to 4000 with an SWR less than 1.5:1, without going outside to change taps.

Results? It's the old vertical vs horizontal again. Compared with a full dipole, strung between trees at about 25 feet, some stations report them about equal, while others give the horizontal a 10 to 20 db edge. In any event, it is much easier to put up after parking the trailer. (Your right, I am a coward and stow it while in motion - there aren't many underpasses with 22 foot clearance!)

I am still waiting for WA5XXX to complete winding the 2000 turns on an 8 foot fishing pole, so Joe and I can compare results against a center loaded whip in a conventional mobile installation. If you haven't already guessed, I really like it. Suggest you try one.

W5HXL

FEDERAL COMMUNICATIONS COMMISSION
Safety and Special Radio Services Bureau
Washington, D. C. 20554

SS BULLETIN 1035a
February 1976

STUDY GUIDE FOR ELEMENT 4(B) EXAMINATION FOR AMATEUR EXTRA CLASS RADIO OPERATOR LICENSE

Advanced amateur practice involving advanced radio theory and operation as applicable to modern amateur techniques, including, but not limited to, radiotelephony, radiotelegraphy, and transmissions of energy for measurements and observations applied to propagation, for the radio control of remote objects and for similar experimental purposes. (The topics in the following outline are the general subjects which form the basis for the examination questions. In addition to these subjects, the applicant should be knowledgeable of the subject matter as outlined in the Element 2, Element 3, and Element 4(A) Study Guides).

A. RULES AND REGULATIONS

A.4(B).1. Amateur Extra Class operator privileges

(1) Exclusive frequency privileges
(2) Emission privileges
(3) Special call signs

A.4(B).2. Station operation
(1) Amateur television (fast scan)
(a) Frequencies of operation
(b) Bandwidth

A.4(B).3. Sample question

Which one of the following conditions does not apply to the operation of a remotely controlled station?

A. A copy of the system network diagram on file with the Commission must be retained at each control point.
B. Provisions must be incorporated to automatically and immediately shut down a remotely controlled station in the event a malfunction occurs in the control link.
C. The transmitting antenna, transmission line, or mast, associated with the remotely controlled transmitter, must be identified.
D. In the event unauthorized emissions occur, operation of the remotely controlled station must cease.
E. Control stations associated with a particular remotely controlled station may not transmit on a frequency between 435 and 438 MHz.

B. RADIO PHENOMENA

B.4(B).1. Definitions

(1) Radio-path horizon
(2) Geometric or true horizon
(3) Guided propagation

B.4(B).2. Wave propagation

(1) Tropospheric propagation
(2) Duct formation

B.4(B).3. Propagation modes

(1) Tropospheric bending
(2) Transequatorial scatter
(3) Stratospheric reflection

B.4(B).4. Sample question

Tropospheric propagation takes place as a result of
A. ionized layers of the atmosphere.
B. irregularity of terrain over which signals pass.
C. sharp or rapid changes in the density and humidity of air.
D. the earth's dielectric constant.
E. ultraviolet radiation from the sun.

C. OPERATING PROCEDURES

C.4(B).1. Remotely controlled station operation

(1) Control stations
(2) Repeater stations
(3) Auxiliary link stations

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C.4(B).2. Sample question

Which one of the following statements regarding the operation of a repeater station, is correct?

A. All transmissions at the receiver input must be repeated.
B. All emissions from the transmitter must be discontinued within three (3) seconds after cessation of the input signal.
C. Provisions to limit the access to a repeater input must be incorporated.
D. Both the input and output frequencies for a particular repeated transmission must be within the same frequency band.
E. Only the repeater input frequency need be monitored.

D. EMISSION CHARACTERISTICS

D.4(B).1. Definitions

(1) Low-level amplitude modulation
(2) Speech clipping
(3) Speech compression
(4) Modulation factor

D.4(B).2. Classification of emissions

(1) A4 (2) F4 (3) P

D.4(B).3. Phase modulation

(1) Deviation versus modulating frequency
(2) Odd-harmonic distortion

D.4(B).4. Sample question

The transmission of a slow-scan television signal requires

A. a 20 kHz bandwidth for satisfactory operation.
B. that such transmission be limited to A5 emissions.
C. a 100 watt minimum transmitter power output.
D. that such transmission be limited to the 15 meter band.
E. a sync pulse duration of 5 milliseconds.

E. ELECTRICAL PRINCIPLES

E.4(B).1. Definitions

(1) Time constant
(2) Voltage gradient
(3) Phase angle
(4) Impedance diagram

E.4(B).2. Circuit theory, (a.c.)

(1) Ohm's Law for complex quantities
(2) Series and parallel RLC circuit analysis
(3) RC differentiation and integration
(4) Variation of Q with frequency
(5) A.C. voltage division

E.4(B).3. Series and parallel resonance

(1) Determination of resonant frequency
(2) Characteristics of resonant circuits

E.4(B).4. Nonsinusodial waves

(1) Sawtooth waves (2) Square waves

E.4(B).5. Sample question

Which one of the following statements is incorrect?

A. An inductor represents a parallel tuned circuit, resonant at a frequency where its inductance and distributed capacitance have the same reactance.
B. A capacitor represents a series tuned circuit, resonant at the frequency where its capacitance and inductance have the same reactance.
C. At frequencies well above their natural resonant frequencies, a capacitor acts like an inductor and an inductor acts like a capacitor.
D. At a frequency near the natural resonant frequency, an inductor will have its highest impedance and a capacitor will have its lowest impedance.
F. The amount of capacitance or inductance that may be used in a given circuit is independent of frequency.

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F. PRACTICAL CIRCUITS

F.4(B).1. Amplifiers/amplifier circuits

(1) Phase inverters
(2) Power amplifiers
(3) D.C. amplifiers

F.4(B).2. Filter circuits/filter sections

(1) Constant-k section
(2) Ripple filter circuits
(3) m-derived section

F.4(B).3. Rectifier circuits

(1) Thyristor controlled rectifier circuits

F.4(B).4. Power supplies

(1) Electronic voltage regulation
(2) Current limiting

F.4(B).5. Amateur television (fast scan)

(1) ATV reception
  (a) Pre-amplification
    (b) Unbalanced input
(2) Functional block diagrams

F.4(B).6. Repeater control systems

(1) Functional block diagrams and design characteristics

F.4(B).7. High frequency transmitting circuits

(1) Frequency multiplication
(2) Amplifier design and operation
(3) Oscillator circuits

F.4(B).8. Circuits above 1215 MHz

(1) Klystron amplifiers and oscillators
(2) Parametric amplifiers

F.4(B).9. Sample question

Which one of the following would not be utilized as part of a repeater control system?
A. Transmission limiter.
B. Carrier operated relay.
C. "Crowbar" circuit.
D. Encoder.
E. De-emphasis network.

G. CIRCUIT COMPONENTS

G.4(B).1. Solid state components

(1) Diodes
  (a) Point contact
    (b) Varactors
(2) Transistors
  (a) Analysis of resistance, voltage and power gains
  (b) Bias calculations

G.4(B).2. Vacuum tubes

(1) Vidicons
(2) Lighthouse tubes
(3) Cathode Ray tubes
  (a) Precautions for use or replacement

G.4(B).3. Sample question

In a transistor, the ratio of a change in DC collector current to a change in emitter current, is known as
A. the alpha cutoff frequency
B. beta.
C. the maximum average forward current.
D. the current amplification factor.
E. the maximum reverse current.

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H.4(B).1. Antennas

H. ANTENNAS AND TRANSMISSION LINES

(1) VHF and UHF antennas
  (a) Yagi beam antennas
  (b) Long Yagi antennas
  (c) Log-periodic antennas
  (d) The Discone antenna
  (e) Horizontal Rhombic
  (f) Parabolic reflectors

(2) UHF and VHF antenna requirements
  (a) Parallel conductor versus coaxial line
  (b) Feed system versus radiation angle
  (c) Antenna polarization
  (d) Choice of insulators at UHF

H.4(B).2. HF rotary-beam antennas

(1) Types
(2) Spacing of elements
(3) Length of elements

H.4(B).3. Antenna coupling

(1) Reduction of harmonic coupling
(2) Coupling systems
  (a) Variable-link coupling
  (b) Pi-Network coupling
(3) Antenna couplers
  (a) Types
  (b) Functions

H.4(B).4. Transmission lines

(1) Transmission line measurements
  (a) SWR measurements
  (b) Bridge measurements
(2) Transmission line matching
  (a) "T" and "gamma" matching
  (b) Direct matching
  (c) Delta matching
(3) Balancing
  (a) Linear baluns
  (b) Toroidal baluns
  (c) Coil baluns

H.4(B).5. Sample question

A given antenna is found to have a maximum field strength of 25.0 uv per meter at a distance of 25 miles. What is the field intensity at the half power points?
A. 15 uv/meter.
B. 1.0 uv/meter.
C. 17.6 uv/meter.
D. 47 uv/meter.
E. 11.75 uv/meter.

I. RADIO COMMUNICATION PRACTICES

I.4(B).1. Systems

(1) Amateur television (fast scan)
  (a) Sychronization techniques
  (b) FM subcarriers
(2) Repeater systems with auxiliary link and control stations
(3) Systems for use above 1215 MHz
  (a) UHF receiving techniques

I.4(B).2. Test equipment, measurements and adjustments

(1) R-F impedance bridge
(2) Sweep generator
(3) Oscilloscope patterns
  (a) Modulated-wave pattern
  (b) Trapezodial pattern
(4) I.F. alignment
(5) Linearity tracer

I.4(B).3. Sample question

An auxiliary detector to be used with an oscilloscope for quick observation of amplifier adjustments and parametric variations, is
A. a Wobbulator.
B. a transducer.
C. a Linearity Tracer.
D. a lissajous figure.
E. none of the above.

EXTRA

Club
NEWS

W5LOW
The Elmer Geddes Memorial Station

MINUTES OF MEETING

MEETING WAS CALLED TO ORDER BY PRESIDENT TOM, W5OZE, 8:Ø7 PM WITH 18 MEMBERS AND GUESTS PRESENT. MINUTES OF PREVIOUS MEETING WERE ACCEPTED. IT WAS ANNOUNCED THAT A PYE 2-METER RIG WAS DONATED TO THE CLUB BY PAUL KOVAR, W5CDG.

AN OVERHAUL TEAM FOR THE PE-75 GENERATOR WAS FORMED.

FOR HAM HOLIDAY, THE FOLLOWING VOLUNTEERS ARE TO JOIN THE COMMITTEES REPRESENTING THE VHF CLUB: ELLARD, W5KE, PRIZES; CARL,W5JJ,PUBLICITY; MARVIN, K5HQP, LADIES' PROGRAMS; AND JOE WA5TRS, PROGRAM.

IT WAS ANNOUNCED THAT THERE IS A NEW 6-METER SSB NET ON MONDAY NIGHT, 8:ØØ PM, 5Ø.15Ø. BOB, WA5RBI, ENID, IS NCS. W5KE ANNOUNCED ALSO THAT THERE IS NOW AN AMATEUR RADIO CLUB AT CLINTON, OK. ITS FORMAL NAME HAS BEEN FORGOTTON BUT IT MEETS AT 2:ØØ PM ON THE SECOND SUNDAY OF EACH MONTH AT THE CLINTON CITY HALL.

HAROLD, WA5VAQ, PRESENTED THE CLUB WITH FOUR CUSTOM BUILT ASHTRAYS WITH THE CALL W5LOW PERMANENTLY MARKED. WHY TODD, WE SMOKERS AREN'T THIEVES! ...BEAUTIFUL HANDI-WORK. THANK YOU TODD.

MEETING WAS AJOURNED AND DEMONSTRATION OF MORSE CODE CONVERSION FROM AUDIO TO VIDEO FOLLOWED. NORM JESSUP, W5EHR, SHOWED HIS MORSE CODE READER MANUFACTURED BY INFO TECH. THE READER AUTOMATICALLY SYNC'S WITH INCOMING CODE AND GENERATES VIDEO CHARACTERS THAT ARE DISPLAYED ON A CRT. MEMBERS GOT TO SEE WHAT W1AW WAS REALLY SENDING AND GOT TO TRY THEIR HANDS AT SENDING, BOTH ON THE PUMP HANDLE AND ON THE KEYBOARD CODE GENERATOR NORM BROUGHT. FB NORM. JOE, WA5TRS,SEC'Y

THE AMERICAN RADIO RELAY LEAGUE, INC.

OFFICE OF THE
SECTION COMMUNICATIONS MANAGER

KINGFISHER, OKLA

QST
OFFICIAL ORGAN

C.O.R.A. COLLECTER-EMITTER

SIX EVENINGS A WEEK, THE NATIONAL WEATHER SERVICE TELETYPE CARRIES AMATEUR RADIO WEATHER REPORTS. THEY COME FROM THE OKLAHOMA TRAFFIC AND WEATHER NET WHICH MEETS ON 3900 KHZ, 5:45 PM LOCAL TIME. IN 1969, WHEN THESE REPORTS STARTED, THEY AVERAGED 16 REPORTS DAILY. AT THIS TIME, THE REPORTS NOW AVERAGE 6 PER DAY.

BUT, THAT IS NOT THE BIG PROBLEM. I HAVE NOTICED SEVERAL EVENINGS, WHEN A NET CONTROL WAS MISSING (AND NO PROVISION FOR A BACK-UP) OR A LOGGER WAS MISSING. O.C., WA5OUV AND MYSELF ARE OPEN FOR SUGGESTIONS FOR ADDITIONAL HELP FOR THIS NET. I DO NOT WANT TO SEE THIS NET "DIE ON THE VINE," BUT IT CAN HAPPEN.

I HAVE NO WAY OF KNOWING HOW MUCH THE NEWS MEDIA USES OUR INFORMATION. I DO KNOW THAT WHEN IT IS USED, WE DO NOT GET THE CREDIT I WOULD LIKE FOR US TO HAVE. THIS CAN AND WILL BE WORKED ON. BUT, WE MUST DO OUR BEST TO IMPROVE THE CONTINUITY FIRST AND PARTICIPATION, SECOND.

WE HAVE A NUMBER OF FAITHFUL OPERATORS IN THE GREATER OKLAHOMA CITY AREAS, WHO HAVE DONE YEOMAN SERVICE. HOW ABOUT A FEW MORE COMING FORWARD AND HELPING OUT. HOW ABOUT IT GANG???

LEONARD HOLLAR, WA5FSN

FALL FOLIAGE TOUR

MY ANNUAL VACATION IN THE MOUNTAINS OF COLORADO IS NOW A MEMORY. FOR THE FIRST TIME IN THE SEVERAL YEARS I HAVE MADE THE TRIP, I HAVE NO GUILT FEELINGS ABOUT PRETENDING TO GO HUNTING AND LYING ABOUT MY LOAFING. MY PUBLIC STATEMENT IS THAT I WAS ON A PROTEST MISSION, ABSORBING THE COLORADO SCENERY WITHOUT CONTRIBUTING TO TO THE STATE COFFERS. THE COLORADO LEGISLATURE (UNDER PROTEST FROM THE STATE GAME PEOPLE, I MIGHT ADD) RAISED THE DEER LICENSE FEE FROM $50.00 (WHICH WAS HIGH) TO $90.00 (WHICH IS PREPOSTEROUS) FOR OUT OF STATE HUNTERS (SUCKERS).

I DID GO INTO THE WOODS ONCE IN SEARCH OF GAME. EQUIPPED WITH A 135MM LENSE ON A 35MM CAMERA, I "SHOT" FOUR DOE. IT WAS SATISFYING TO KNOW I CAN SKULK AROUND AS GOOD AS EVER.

THE CAMP WAS AS FUN AS EVER: OVEREATING, OVEREXERTING AT THE WOOD PILE, AND DX'-ING FOR OKLAHOMA FOOTBALL TEAMS ACTIVIES USING A LOOP WOUND AROUND A BC RECEIVER AND CONNECTED IN SERIES WITH MOTHER EARTH AND MY TRANSMITTING ANTENNA. ELECTION NIGHT SAW THREE OF US HUDDLED IN FRONT OF A SNOWY TV PICTURE AND ONE OF US (ME) FUSSING OVER TRASH EXTENDING EVERY 15 KHZ UP THROUGH 40 METERS. IT SEEMS THE TV HORIZONTAL OSCILLATOR WAS CAUSING THE RFI. TOOK CARE OF THAT THE NEXT DAY WITH SOME ALUMINUM FOIL, 3M TRIM CEMENT AND A GROUND WIRE TO THE KITCHEN SINK. HAD TO MARK THE LINE CORD PLUG AND OUTLET WITH POLARITY MARKS TO KEEP FROM GETTING THE DISH WASHER EXCITED.

A COUPLE OF YEARS AGO I DISCOVERED A CLANDESTINE TELEVISION TRANSLATOR UP IN THE MOUNTAINS. IT RECEIVED A SIGNAL FROM A TOWN ABOUT 150 MILES AWAY AND BEAMED A SIGNAL INTO A VALLEY WITH ABOUT FOUR OCCUPANTS. ONLY ONE OF THE OCCUPANTS HAS THE FINANCIAL WHERE-WITH-ALL TO BE RESPONSIBLE FOR SUCH A THING. LUGGING THE TV RE-CEIVER UP TO THE CABIN THIS YEAR CONFIRMED MY SUSPICIONS.

OVER THE PAST YEAR I SLOWLY CONSTRUCTED AN "ULTIMATE TRANSMATCH" TO BE USED ON RIDICULOUS ANTENNAS I MIGHT WANT TO TRY. I CAN REPORT SOME SUCCESS ON AN ANTENNA WHICH WORKED BETTER, UNDER THE CONDITIONS TESTED, THAN THE OLD STANDBY INVERTED VEE (AT 35 FOOT APEX). AS I HAD EXPECTED, A CURRENT FED QUARTER WAVELENGTH VERTICAL ANTENNA WORKED AGAINST GROUND WAS NOT AS GOOD AS THE REFERENCE ANTENNA BECAUSE MY GROUND LOSSES WERE TOO GREAT. A HALF WAVE ANTENNA WORKED PRETTY WELL BECAUSE GROUND LOSSES WERE NEGLIGABLE. ABOUT 150 FEET OF WIRE WAS SUSPENDED IN AN INVERT-ED L CONFIGURATION WITH ONE END COMING RIGHT INTO THE SHACK. SUSPENSION WAS ACCOM-PLISHED BY SLING SHOT, FISHING SINKER AND TEN POUND TEST FISHING LINE. THE LINE WAS USED TO HAUL A STRONGER LINE OVER THE TREES AND THE ANTENNA WAS ATTACHED THERE-TO.

ONE TRICK WAS LEARNED AND I'LL PASS IT ALONG NOW. THE FISHING LINE ALWAYS SEEMED TO GET FOULED AS THE SINKER SAILED RIGHT INTO THE MIDDLE OF A TREE. RESULTING JERK ON THE LINE WOULD IMPART A FANTASTICALLY COMPLICATED MOTION TO THE SINKER CAUSING A KNOT IN THE LINE THAT WOULD MAKE A BOYSCOUT DROOL AND EFFECTIVELY TER-MINATING THE SINKER'S, AND A GOODLY PORTION OF THE LINE'S FUTURE IN HAM RADIO. HERE IS THE TRICK: REELING A LENGTH OF LINE FROM THE SPOOL ON WHICH IT IS BOUGHT ONTO AN EMPTY BEVERAGE CONTAINER IMPARTS A TWIST TO THE LINE JUST LIKE IT WOULD HAVE ON AN OPEN FACE SPINNING REEL. HOLDING THE CAN ON THE GROUND WITH THE FEET AND WITH ITS END POINTED OVER THE TOP OF THE TREE ALLOWS THE LINE TO PAY OFF THE END OF THE CAN WITH VIRTUALLY NO RESISTANCE WHEN THE SINKER IS FIRED FROM THE SLINGSHOT. THE END OF THE LINE MUST BE TIED TO THE CAN LEST IT SAIL ON INTO ORBIT AND NOT BE AVAILABLE FOR ITS ULTIMATE INTENDED USE. I FIRED 100 YARDS OF LINE OFF THE CAN TWICE WITH THE GREATEST OF EASE. (THE TREES WERE OVER 100 FEET TALL.) BEFORE I FIGURED OUT THIS METHOD I PUT PREMATURE CHRISTMAS DECORATIONS CONSISTING OF ABOUT 100 YARDS OF LINE AND TWO SINKERS ON ONE TREE.

QUESTION: WHY DIDN'T I USE A FISHING REEL? ANSWER: I DON'T KNOW ANY MORE ABOUT FISHING THAN I DO ABOUT HUNTING BUT I DO KNOW THERE ARE A LOT OF USES FOR COORS CANS!

JOE, WA5TRS

BATTERY ACID? WHERE? (OR HOW TO HOUSEBREAK A BATTERY)

I FOUND BY ACCIDENT THAT THE YELLOW DYE USED IN PAPER TOWELS TURNS PURPLE IN PRE-SENCE OF SULPHURIC ACID. THREE BRANDS I HAPPENED TO HAVE ALL RESPONDED THE SAME WAY. I WRAPPED SOME PAPER TOWEL AROUND THE END OF THE VENT TUBE ON A MOTORCYCLE BATTERY. IF SOME ACID ESCAPES OR CONDENSES ON THE PAPER TOWEL I WILL HAVE A VISUAL INDICATOR OF THE SITUATION. ADAPTATION OF THIS TECHNIQUE SHOULD WORK ON AN AUTOMOBILE BATTERY. SURE BEATS STICKING YOUR TONGUE TO IT! JOE. WA5TRS

A SIMPLE CALL TONE ALERTER USING CMOS
Or
"A Beeper for All Seasons"

More and more PL type radios are finding their way onto the Amateur market and being pressed into service by active users who find PL a useful function for screening Repeater calls. In addition, many have been constructing Selective Calling units for signalling and screening so that they don't have to listen to the many hours of drivel the FM portions of the band seem to abound in. WA5TRS has characterized Vhf FM repeaters as a giant intercom. But as the population explosion (VHF FM style) takes place, even the intercom function is decreased by listener fatigue. Many amateurs have taken also to using private "split-split" channels to seek some relief, but one basic problem does remain and that is, "How do you communicate with a friend who is not listening or is away from his radio?" Well, the best way is to leave him some type of message or sign that during his frolic, he got a call. I faced this exact problem when installing a couple of Motorola UHF commercial radios for my parents. They are now enjoying a communications range about 5 to 10 times greater than the old CB's they had. I had previously installed a SELCALL type device on the CB's and had it honk the horn on my father's truck whenever my mother was giving him a call. Now I use the PL for that function. However, when my father calls my mother, she has nothing that leaves a reminder to her that he called. Thus she could be out of the room where the radio is and completely miss a message. She asked me for a light or something that would signal her so that when she returns to the room where the radio is, she will know that a call has been received. The following is the evolution of that circuit and the design criteria.

First, I wanted the circuit to be completely self contained inside the radio. This is not too difficult inside a MOCOM 35 since there is lots of room. However, I did not want to drill any holes in the radio and lose the resale value. I wanted to be able to remove the system by just a few solder joints. When she received a call (using a COR circuit described in the August issue of C&E, p. 9), she wanted a light to come on that told her of the call when she returned to the room. The thought occurred to me that some type of aural beep tone coming from the speaker of the radio would be nifty. I could generate the tone and feed it into the audio circuit of the radio past the volume control and squelch. The tone would latch up until she reset it by taking the microphone from the switch hook or by transmitting and pushing the PTT. The first design idea was to use several NE555's (those versitile devils) for all the latch and audio functions. However, after some prodding from WA5JXX, he and I arrived at a design using Cmos. This circuit (after suitable prototyping) develops a good size tone and draws current in the microamp range in the standby mode and about 3-4 mils when the tone oscillators have been activated. This circuit is built out of several interesting building blocks and a brief discussion is something that should be helpful to every amateur.

I first wanted to produce a latching function. This is easy. I had an output from the COR that goes low when ever a carrier is present for more than 3 seconds. (This carrier must have the PL tone present) The simplest solution is to put two Nand gates into an R-S configuration:

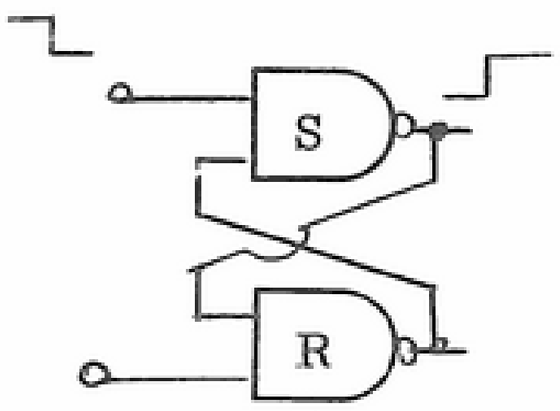


Figure 1. NAND connected as R-S Latch. Nors may be used.

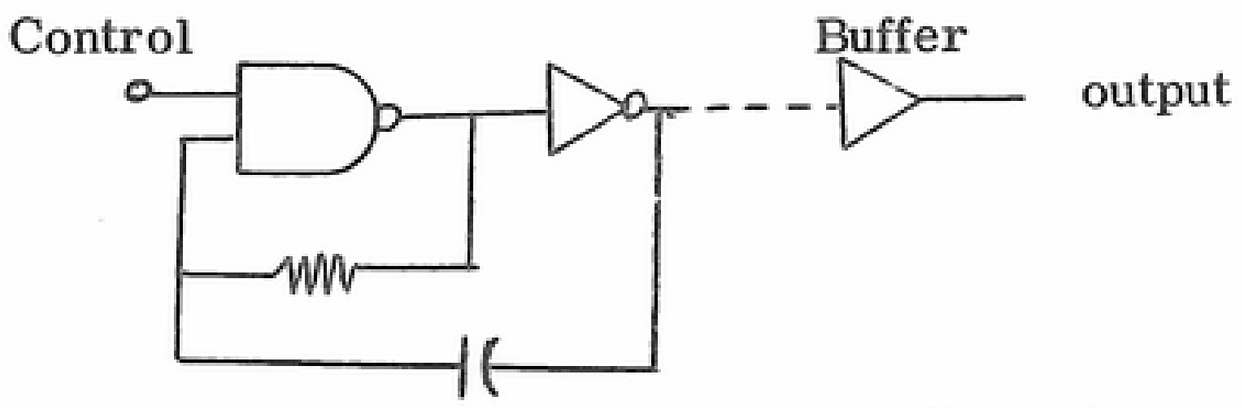


Figure 1a. Basic oscillator from RCA Application Note ICAN 6267.

The "S" gate is the Set input and the "R" gate is the Reset input. This is very common and will not be discussed in much detail. NOR gates may be used with a suitable change in control polarity. When the COR in the radio is tripped, this would set the latch.

I then wanted to connect the output from the R-S latch to two oscillators which would be in series. The first oscillator would pulse at about 2 times a second and would also key a second oscillator running at about 800 hertz to produce the pulsing sound to be fed into the radio audio system. RCA Application Note ICAN 6267 discusses using NOR, NAND, and hex inverters as components in oscillators made with Cmos. All that is basically needed is two inverters connected as shown in Figure 1A. By changing one of the inverters to a dual input NAND or NOR Gate, you can then control the oscillator by grounding the Control input to turn on the tone. The Ap Notes specify that the time constant for a cycle is approximately 1.4 RC where R is the resistance in figure 1A and C is the capacitance. The operation is simple. If the output from the second inverter is high, the capacitor then becomes charged positive and the input to the first Nand gate becomes high and its output is zero. The resistor is returned to the output of the NAND gate to provide a path to ground for discharge of the capacitor.

In addition, I also wanted to pulse a light already in the radio so as to provide a visual indication of the call. This was done by driving an inverter out of the first oscillator and then let it key a transistor which could then handle the proper current requirements. It is also necessary to use a buffer if you anticipate that you might run any type of low impedence operation right out of the oscillator. In prototyping, I did considerable experimenting with various loads and found that in general, the lower the output impedence, the more the tone changed upward in frequency. This would be reasonable since the low circuit allows the capacitor to discharge more easily.

A completed circuit is shown below. I found a point in the radio (in the PL circuit near the audio section) which was an ideal pickoff point for a voltage comparator COR. The first pullup insures noise immunity. When a signal is received, the output of the op amp goes high and turns on the transistor which grounds the input of Gate A. The output of Gate B goes low which sends the output of inverter high. This was done instead of connecting to the output of Gate A directly because ther

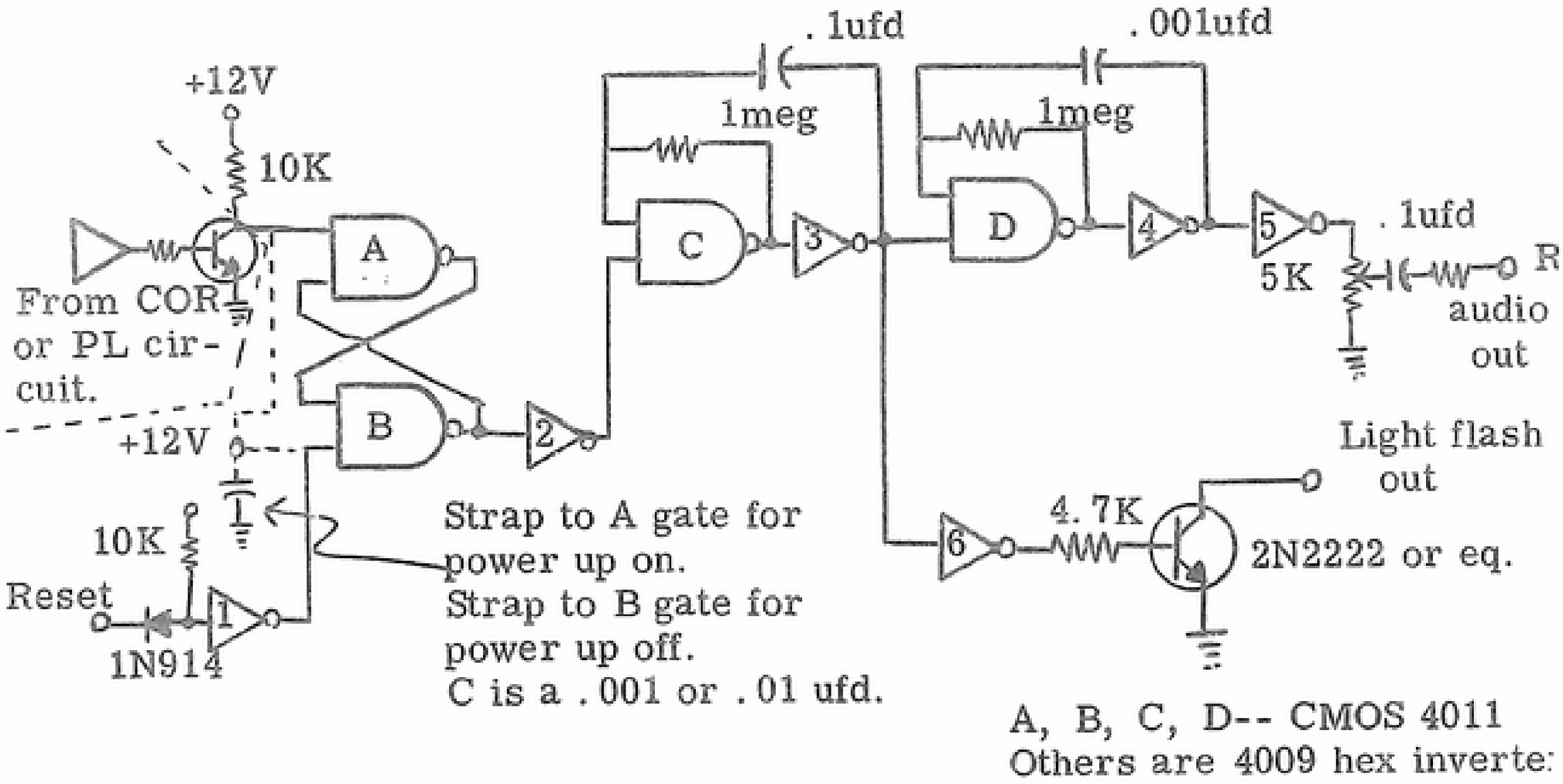


Figure 2. Complete circuit for call tone alert combining two oscillators and R-S latch plus output light flasher. Audio is fed into transceiver audio circuit at some point after volume and squelch controls. A 2N2222 can drive a flashing lamp that pulses at the same rate as the first oscillator.

is a condition that can occur in which both Gate A and Gate B can have low input in which case the output of B is still low. Gate C and Inverter 3 make up the first oscillator which pulses about 5-7 times a second. Inverter 6 isolates the output to drive a transistor switch to flash a light at the same rate. Gate D and Inverter 4 make up the second oscillator which produces a tone around 500 -700 hertz. This tone can be increased by lowering the 1 meg resistor between the input and output of Gate D. Inverter 5 isolates the pulsed audio output where a level control can set the output.

A printed circuit board about 2.3" x 1.2" was laid out and the circuit checked out. How does it work? Like a champ. Any call on the radio which trips the COR sets the latch and produces the pulsed audio tone (quite an attention getter) until the mike is removed from its PL hangup switch or the PTT is keyed. Should I ever decide to sell the radio, all that is necessary to remove the modification is lift a few solder connections and physically remove the board from the radio. The pulsed light output is used to drive the transmit light off and on until reset. The reset circuit is picked from a point which is grounded during the reception of a call. The diode isolates the pullup resistor. A word of caution here. 12 Volts is present at the Reset pickoff point when the mike is removed from the PL hang-up switch. You will need to check your circuit to make sure that this voltage will do no damage. For the usual relay switched PTT, this should be no problem. The only reason the pullup resistor is used is because only 5.7 volts is present at the particular point I pick off the reset voltage and that is not enough to switch Cmos.

There are several variations of this circuit. Some modifications may be required for operation in your use. But the usefulness of the circuit lies in knowing that you won't miss any calls. Even if you don't have this particular use in mind, be sure to keep the audio oscillator Cmos circuit in mind. The low power consumption makes it ideal for CW code practice oscillators that don't need an on-off switch or off the air CW monitors or even a test oscillator. You could build two separate oscillators with buffered outputs with one hex package.

Micheal Salem AA5EPK

CW IDer AND RAM KEYER PC BOARDS AVAILABLE

Ever want to build one of those snazzy RAM keyers that send a stream of CW at the touch of a switch? Need a CW Ider for a repeater or TTY identification? One problem with such construction is that building the project on perf board provides less than elegant construction and PC boards are usually for those who have access to such exotic equipment as Graphic Arts cameras and layout materials. Well, printed circuit boards are available for these two projects from the OU Radio Club at a cost of $6.00 each. This includes a glass epoxy board drilled and tinned plus an instruction sheet.

The TTL Logic CW IDer was featured in the February 1973 issue of 73 and is a popular design that is still being used. You can hardwire in 32 dots, dashes, or spaces which should fit in just about any call. The board has an 18 pin edge connector and keys inverted or noniverted at TTL levels. The Board is the keying circuit only, you will need to provide any tone oscillator or timing circuit for repeater use. Should be able to build the card for about $15-$18 dollars. The Club also has a RAM Keyer board as featured in the January 1976 issue of Ham Radio. The keyer will store two 256 baud messages. That means at 10 wpm, you can store two 30 second messages. At 20 wpm, that's two 15 second messages.

Other Boards which are used in the AF5AFW repeater are also available, the selection varies. For information on all circuitry, contact Micheal Salem AA5EPK, 1324 Lincoln, Norman, Oklahoma 73069 or phone 321-5453. Then dig out the soldering iron and get cracking.

TRANSMISSION LINE, IMPEDANCE CHANGES

Some time ago, while I was on active duty with the Coast Guard, I encountered an situation while measuring the antenna impedance of Loran-A tower. The tower for several years had a history of a SWR of 1.22 even though the antenna has been bridged and tuned to 50 + j0 ohms. The SWR meter was always calibrated prior to the measurement to insure it was accurate. It was never understood why an SWR of 1.00 could not be achieved.

During the visit to the station intended for antenna bridging measurements, several attempts at determining the cause of the "non 1.00 SWR" after tuning were made. One such attempt involved placing a home-made time domain reflectometer in the signal power building to check the transmission line and antenna system for any reflections along the line. The home-made TDR was used in conjunction with an AN/USM-117 scope. Although one might think the idea too crude to be useful, it does provide reliable information and is a valuable tool in determining changes in impedance in the transmission line and antenna.

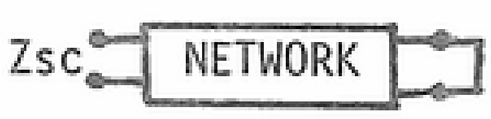
The TDR indicated a mismatch at the junction of the transmission line and the input to the tuning unit. Since the antenna had just been bridged and adjusted to 50 + j0 ohms, it was concluded the connectors were causing the mismatch indicated by the TDR. The connectors were removed, cleaned up, and re-soldered to the transmission line (this is no easy task). The line itself was inspected for breaks and corrosion of the wires along the section on which the connectors are fitted. The TDR was used again to check for mismatch. Nothing had changed in the pattern on the scope. When the transmitter was put on the air, the SWR was still 1.22.

If the antenna was 50 + j0 ohms and the connections were good, then something must have been wrong with the transmission line itself. All this time it was assumed the transmission line was 50 ohms (RG-19/U).

Network theory was then employed to determine the characteristic impedance of the line:

$$Zo = \sqrt{Zsc \times Zoc}$$

Zsc is the measured input impedance of the network (transmission line) with the output shorted. Zoc is the measured input impedance with the output terminals open.



The transmission line was disconnected from the antenna tuning unit and from the transmitter. Then Zoc and Zsc were measured using the same test equipment which measured and set the antenna impedance at 50 + j0 ohms. The equipment involved a Stoddart NM-20A detector, AN/URM-25 R.F. generator, and General Radio 916AL impedance bridge. The line impedance was measured at the Loran frequency, 1850 KHz in this case. The characteristic impedance was found to be 61 ohms! The results were so startling that the equipment was moved to the other end of the RG-19/U transmission line and the impedance measured again. Still 61 ohms. If one calculates the SWR of a 61 ohm transmission line terminated in a 50 ohm load (by formula or Smith Chart), the result is 1.22 -- exactly as the meter had been indicating previously.

On another Loran station, a similar experiment was conducted on a 12 foot length of RG-8/U cable used inside a transmitter. The cable appeared to be an original component, about 25 years old. The impedance was measured at 95 ohms instead of the 52 ohms intended during manufacture.

Several other types of coaxial cables were measured to determine their characteristic impedances. An An/URM-25 was again used as the R.F. generator, but a General Radio 1606 bridge nad a Hallicrafters SX-111 receiver were used as the bridge and detector. Zo was checked at two frequencies far removed from the standard Loran frequencies. The results of the measurements are tabulated below. (NEXT PAGE)

Cable type	Freq. measured	Manufac. Zo	Calculated Zo
18 feet	4 MHz	50 ohms	53.5 ohms
RG-58C/U	29.5 MHz	50 ohms	40.9 ohms
36 feet	4 MHz	52 ohms	54.0 ohms
RG-8A/U	29.5 MHz	52 ohms	57.6 ohms
16 feet	4 MHz	50 ohms	52.6 ohms
RG-213/U	29.5 MHz	50 ohms	---------
15 feet	4 MHz	53.5 ohms	53.4 ohms
RG-58/U	29.5 MHz	53.5 ohms	58.3 ohms
51 feet	4 MHz	50 ohms	49.8 ohms
RG-213/U	29.5 MHz	50 ohms	48.6 ohms

Most manufacturers allow a tolerance of ± 2 ohms within the published characteristic impedance, so some of these cables are within specifications at some frequencies.

Thus, one should be careful to consider the transmission line's actual characteristic impedance when performing antenna tuning or impedance matching techniques requiring precision. Cliff Appel, WB6AWM

REPEATER FREQUENCY COORDINATION

LAST MONTH I DESCRIBED HOW VARIOUS RADIO FREQUENCIES CAN MIX AND CAUSE UNDESIRABLE FREQUENCIES. CAREFUL ANALYSIS OF RF ENERGY EXPECTED TO BE PRESENT AT A RECEIVER SITE CAN PREVENT UNWISE SELECTION OF RECEIVER FREQUENCIES AND DISAPPOINTMENT LATER ON.

THERE IS ANOTHER ASPECT OF REPEATER FREQUENCY SELECTION THAT SOME MAY NOT BE AWARE OF. THERE IS ONLY A FINITE NUMBER OF 30 KHZ CHANNELS ON THE 2 METER REPEATER SUBBAND. IT IS INEVITABLE THAT GROUPS IN CLOSE PROXIMITY ARE GOING TO SELECT THE SAME REPEATER PAIR AND CREATE AN INTERFERENCE SITUATION. IT HAS HAPPENED HERE BUT THE PROBLEM IS NOT TOO SERIOUS OR WIDESPREAD, LARGELY AS A RESULT OF THE EFFORT OF PAT DEVLIN, WA5BPS, IN TULSA. PAT IS FREQUENCY COORDINATOR FOR THIS AREA AND KEEPS TRACK OF REPEATER, REMOTE CONTROL AND LINK FREQUENCIES THAT ARE IN USE SO HE CAN ADVISE POTENTIAL USERS OF A FREQUENCY IF THERE MIGHT BE A PROBLEM WITH INTERFERENCE.

KNOWLEDGE OF FREQUENCY USAGE ON TWO METERS IS NOT TOO HARD TO OBTAIN. THE HIGH POPULATION ON THE BAND AND WIDE AVAILABILITY OF SYNTHESIZED RADIOS MAKES FOR A VERY EFFECTIVE GRAPEVINE. THE FREQUENCY COORDINATOR SHOULD BE CONTACTED, HOWEVER, TO LEARN IF ANOTHER GROUP IS ASSEMBLING A REPEATER AND TOO BUSY WORKING ON IT TO TALK ABOUT IT. ON TEN METERS, SIX METERS, 220 AND 450, THE SITUATION IS A LITTLE DIFFERENT. THERE IS NOT AS GOOD AN INTRA-CITY COMMUNICATION GRAPEVINE ON THOSE BANDS AND THE SERVICES OF THE FREQUENCY COORDINATOR ARE VALUABLE.

THE 450 MHZ BAND, FOR EXAMPLE, IS IN SOMEWHAT OF A STATE OF CONTROVERSY AS TO BEST FREQUENCY ARRANGEMENT I.E., HIGH IN-LOW OUT OR VICE VERSA. IF TWO REPEATERS ARE PUT ON THE SAME FREQUENCY PAIR BUT IN REVERSE ARRANGEMENT, ONE IN OKLAHOMA CITY, ONE IN DALLAS, LOCKUP CAN OCCUR WITH A LITTLE BIT OT TEMPERATURE INVERSION. ANOTHER ACCIDENT CAN OCCUR IF A REPEATER IS PUT UP USING ANOTHER REPEATER GROUP'S CONTROL LINK FREQUENCY AS ONE OF THE REPEATER PAIRS. OOPS!

I ENCOURAGE VHF AND UHF EXPERIMENTERS TO COMMUNICATE WITH PAT EARLY IN THEIR PLANNING STAGES TO PREVENT LATER PROBLEMS. FREQUENCIES WHICH ARE INTENDED TO BE CONFIDENTIAL BECAUSE OF THE NATURE OF THEIR USE REMAIN SO. THERE IS ABSOLUTELY NO REASON WHY WE CAN'T PREVENT SOME OF THE BEDLAM EXPERIENCED ON THE EAST AND WEST COASTS. JOE, WA5TRS

FOR SALE: DRAKE TR-22, CHARLIE, WA5JGU. 943-5631.

WANTED: HEATHKIT SB-200 AMPLIFIER. CONTACT SAM, W5UGA, IN DUNCAN (OR HIS LOCAL AGENT, RAY, WB5BTT, 732-6498)

WANTED: DUAL PADDLE KEY FOR ELECTRONIC SQUEEZE KEYER. PREFER BROWN BROTHERS (OR EQUIVALENT) MIKE AA5EPK 321-5453 OR 360-1302 AT THE OFFICE

C O R A C O M M E N T S

THE PAST THIRTY DAYS SURE HAVE BEEN EXCITING FOR ME!

First off, held the CORA meeting for October; at which the initial action for Ham Holiday '77 was taken. More on this later.

My YF and I then picked up our new travel trailer and took it on a shake-down cruise to Texoma, arriving there Monday, October 25.

You would never believe what we saw when we got there. At the trailer camp area, it looked like the forest had turned to aluminum. There were quite a few tranped verticle trees poking their way skyward with some funny looking round root structure connecting each with some kind of a vehicle that had, as a resident, some kind of Ham. During that week the Hams came, 28 from five land and 2 from nine land.

We really enjoyed the friendship provided by this group during that week. Then, to top it off, there was some wild and wonderful thing called "Texoma Hamorama". More people to meet, more things to do.

Then a return to the everyday life of civilization.

Those of you who could not or did not participate in the Hamorama, really got cheated. The rest of us may have also been cheated. Who knows what might have been, if each and every one had put some little thing toward the betterment of this Amateur endeavor?

Get involved! You might like it! I'll guarantee that you will meet some great people.

During this 30-day period another rather exciting event took place. Twenty-five years ago, I got involved. This year it is called a Silver Wedding Anniversary. When I called FCC, they told me that did not make me eligible for a 1x2 call. Different kind of Amateur, I guess. I wish to go on record to thank Rosy, my YF. Without her, it would have been impossible.

That's about it for now. By this time next month, I hope to be able to provide you with the names of the people who are going to make the Oklahoma Ham Holiday a big success in 1977.

73's

Gene - WB5SQC

MINUTES FOR MEETING OF BOARD OF DIRECTORS OF C-O-R-A 22 Nov 76

Meeting called to order by in-coming president, Gene WB5SQC, 7:30pm at Red Cross Hdqtrs. Bldg. Self introductions were made by 9 members. We were pleased to have as visitors wives of Fred, K6HFN, and Gene, WB5SQC. List of those present is attached.

Minutes of previous meeting were accepted as published in C & E. Treasurer, Ken WB5ORY, presented and reviewed the monthly financial statement. (Copy attached to these minutes and sent to secretary of each club participating in CORA)

Bob, W5HXL, reported on plans and arrangements for Texoma Hamarama- which was only a week away- and on publicity and financing of campaign of Jack Gant, W5GM, for election to office of West Gulf Director to ARRL.

Joe, WA5ZNF, reported that 73 magazine had requested permission to re-print an article from C & E, on an antenna for novice operation. Also, he has had requests for additional copies of C & E from clubs, individuals, license classes, etc. Discussion indicated that distributing these copies is good public relations for amateur radio and will possibly bring in other subsciptions and other clubs and groups to participate in CORA. It was agreed to make a special

printing of the license study guide material for distribution to all of the present license classes and to print up special copies of C & E for distribution at Hamarama. Ellard, W5KE, told of a letter from Sweden expressing appreciation for receipt of C & E and the efforts of all those who aid in publishing it.

Club assignments were made for the four working committees required for Oklahoma Ham-Holiday of 1977.

Auto Patch club	responsible for	Program committee
Bicentennial club	"	" Prizes
MORI club	"	" Registration and Publicity
Aeronautical Center club	"	" Ladies activities

Bob, W5HXL, made a suggestion regarding the make-up of these committees. The CORA directors agreed it is felt that if any club or group associates in CORA it has a responsibility to support with active representatives to CORA meetings and especially to Ham-Holiday committees. Therefore, it was decided each of these committees should be made up of a member from each of CORA's participating clubs. It is requested that each club president appoint these four people from his club, then call the president of each club responsible for each committee and advise him who has been appointed to that particular committee. The representative from the responsible club will then call a meeting of his club's committee to elect its chairman. It is requested each committee report to CORA president, Gene WB5SQC, by Dec. 1 giving him the committee membership and any committee activity and accomplishments to date. Gene will probably call a general meeting of all members of all Ham-Holiday committees by mid December.

CORA secretary was instructed to write Ted Heithecker, W5EJ, who is chairman of Okla/Tex co-ord committee, that Oklahoma Ham-Holiday will be held again in 1977 on August 6-7. These dates being required because we are committed by arrangements for facilities, speakers, etc, some made as much as a year in advance.

There was considerable discussion on Public Relations. Development is proceeding on a program of slides, tapes, demonstrations, etc, for introducing amateur radio to one and all who may be interested. Hobe, WB5MLN, can use all ideas and materials, especially pictures. It was pointed out many opportunities to exhibit at state fairs, shopping center special events, holiday coffee break stations, etc.

C & E managing editor, Joe WA5ZNF, reviewed his policy for adding interest to C & E by having a feature story and picture on the front cover. He will call a participating club each month, in the order in which they appear on inside cover of C & E and expect that club to prepare the write-up and picture to be ready by the 15th of mo. This might be based on accomplishments, service to amateur radio, or anything of general interest to C & E readers.

THE BIG SIGNAL NEWS
OKLAHOMA CITY AUTOPATCH ASSOCIATION, INC.

PRESIDENTS CORNER
WA5ETV

THE OKCAP SHALL HAVE ITS NEXT MEETING ON DECEMBER 14, AT THE OKLAHOMA MILITARY ACADEMY. PLEASE MAKE NOTE OF THE DATE AS IT HAS BEEN MOVED TO THE SECOND TUESDAY IN THE MONTH DUE TO CHRISTMAS.

THE LAST MEETING OF THE OKCAP (OCTOBER) WAS AN EXCELLENT TOUR OF THE NATIONAL WEATHER SERVICE. MR. KEN BROWN MADE AN EXCELLENT PRSENTATION OF THE INNER WORK-INGS OF THE NATIONAL WEATHER SERVICE.

MAKE PLANS TO ATTEND THE DECEMBER MEETING OF THE OKCAP AS MUCH BUSINESS NEEDS TO BE TAKEN CARE SINCE OUR LAST FORMAL MEETING IN AUGUST.

RECENT DISCUSSIONS WITH MEMBERS OF THE GROUP HAVE LED TO THE CALL FOR MORE VOL-UNTEERS TO WORK ON CLUB EQUIPMENT AND PROJECTS. HOW ABOUT SOME NEW FACES????????

RECENT HAPPENINGS ABOUT TIME INCLUDE THE FOLLOWING:
BOTH WB5KDC AND K5JL HAVE MICROPROCESSORS UP AND RUNNING,
A NEW 450 MACHINE WAS HEARD LOCALLY ON 449.2--444.2 MHZ,
SEVERAL LOCAL AMATEURS UP GRADED THEIR TICKET WITH THE OCTOBER VISIT OF THE FCC EXAMINER,
K5PJU BOUGHT A NEW IC 22S----SURE LOOKS LIKE A FB RIG,
WHERE IS THE FAST SCAN ATV WA5CZN HAS PROMISED///??????? *****

14 DEC 76 SEE YOU AT THE DECEMBER MEETING 14 DEC 76

GARY WA5ETV

Radio Interference can be Suppressed...

by R. W. Woodbury, President, Sprague Products Co.

Manufacturers of CB and other 2-way radios strive to produce communications equipment providing clear, clean reception. Most radios are designed with sophisticated circuitry incorporating safeguards against generating noise from within. But even the best of equipment cannot assure interference-free reception when the source of vehicular noise happens to be from devices such as generators, alternators, voltage regulators, ignition coils, etc. Vehicular electrical systems produce one of the worst possible environments for radio reception.

In order to reduce this type of interference, you must take up where the radio manufacturer left off . . . he did all he could to keep his equipment from emitting interference, now it's up to *you* to suppress vehicle originated noise at its source.

Take Time To Do It Right

Satisfactory interference suppression can only be achieved if all components are properly connected where necessary and grounded where necessary. Be sure that paint, oil, grease, dirt, or rust is removed from those areas where good electrical contact is required. This means those areas where filter capacitors will be mounted by their mounting straps and/or brackets. Scrape or wire-brush these areas down to bare metal. When you mount components, use clean hardware and sharp-toothed lock-washers to further ensure positive ground connections. Where wires connect to filter capacitors, be sure that connections are electrically and mechanically *good*. Every soldered joint must be sound. Tape all

(Continued)

SAFETY PRECAUTION

Before carrying out any of the procedures outlined in this article which pertain to mobile radio interference, REMOVE BOTH RED (+) and BLACK (−) CABLES FROM BATTERY TERMINALS. *Failure to remove both cables may result in personal injury.* Follow all installation instructions completely and in the correct sequence. Automotive wiring can be hazardous since the battery can deliver hundreds of amperes instantaneously. Such high currents can heat up finger rings, pliers, and screwdrivers, with resultant burns and other possible physical injuries.

Wanted: Surplus R-392 Receiver, Modulation Transformer for ARC-13, spare parts and Goodies you don't want. Bob Janda 341- 2046.

For Sale: Henery 3 K-A Mint, console model K5GL 787-9545 or 7899547.

exposed connections where there is the slightest possibility of accidental contact with other wires, the grounded engine, or nearby accessories. Whenever it becomes necessary to cut the wiring leading to an alternator or generator in order to put a filter into the circuit, use cable connectors, such as Sprague QH2-5 or QH2-10, on the cut ends to ensure positive and permanent connections.

Careful attention to every aspect of installation of filter components will result in improved radio reception and tape playback.

Pre-Filtering Suggestions

When installing or replacing radio or audio equipment in your car, truck, boat, or tractor, these simple suggestions will minimize any additional steps for reducing interference:

1. Check all suppression components installed as original equipment by the vehicle manufacturer. These include resistor plug wiring, bonding straps, and bypass capacitors. Replace anything that doesn't look right.
2. Have the engine tuned by a good mechanic. This will not only eliminate some of the interference, but will give you better engine performance.
3. Connect the radio or tape deck directly to the battery through the proper in-line fuse.
4. Route all new wiring away from other wires, especially high-voltage ignition wires. THIS IS IMPORTANT!
5. Make certain the antenna lead-in wire shield is properly grounded at each end. All connections must be clean, tight, and properly soldered.

Filtering the Power Line

To suppress radio-frequency noise, which is usually the most troublesome for CB and other AM radio installations, mount a general-purpose .1μF @ 400 VDC, 20-amp feed-thru filter capacitor (Sprague Type QX1-6) on the back of the radio chassis, as shown in Figure 1A. Cut it into the power line as close as possible to the radio. If there is more than one power lead, install the filter in the lighter-gauge lead first. If noise persists, install a second filter in the remaining lead.

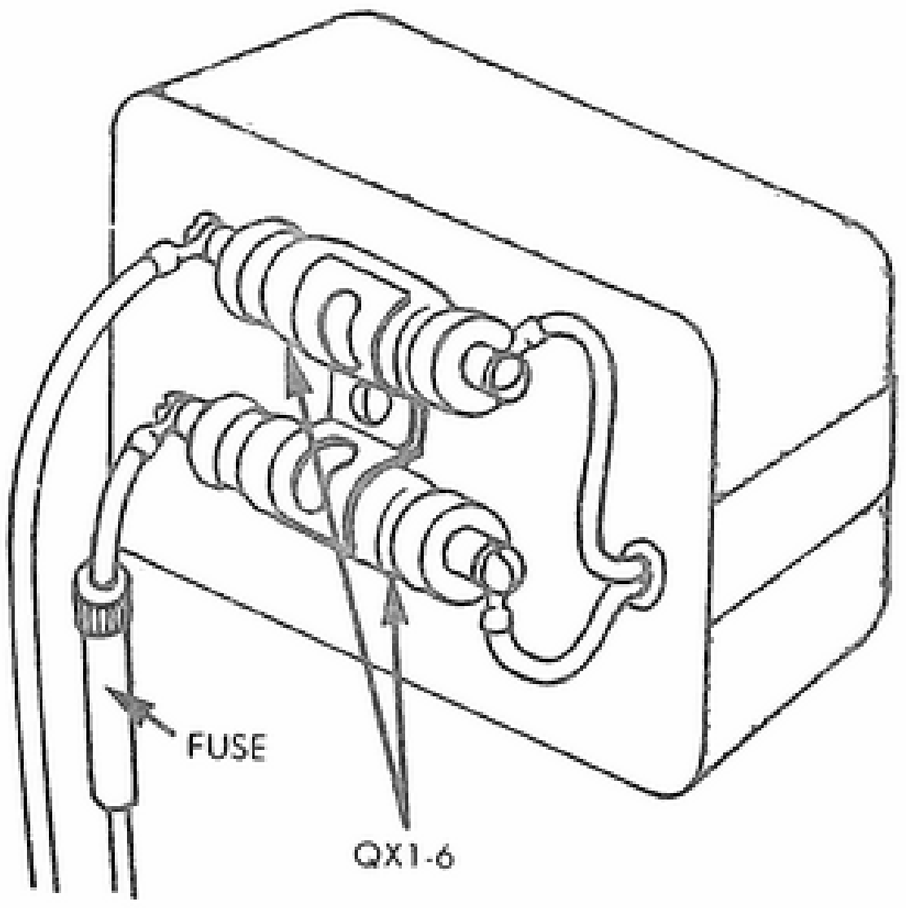


Figure 1A

Audio-frequency noise, especially in tape decks and AM/FM receivers, can be just as annoying and troublesome. In these situations, connect a 200μF @ 200 VDC electrolytic filter capacitor (Sprague Type QE1-486) to the power line as closely as possible to the cabinet, as shown in Figure 1B.

With negative-ground electrical systems connect the black lead to the tape deck cabinet, and the red lead to the power line. With positive-ground electrical systems, ground the red lead and connect the black lead to the power line.

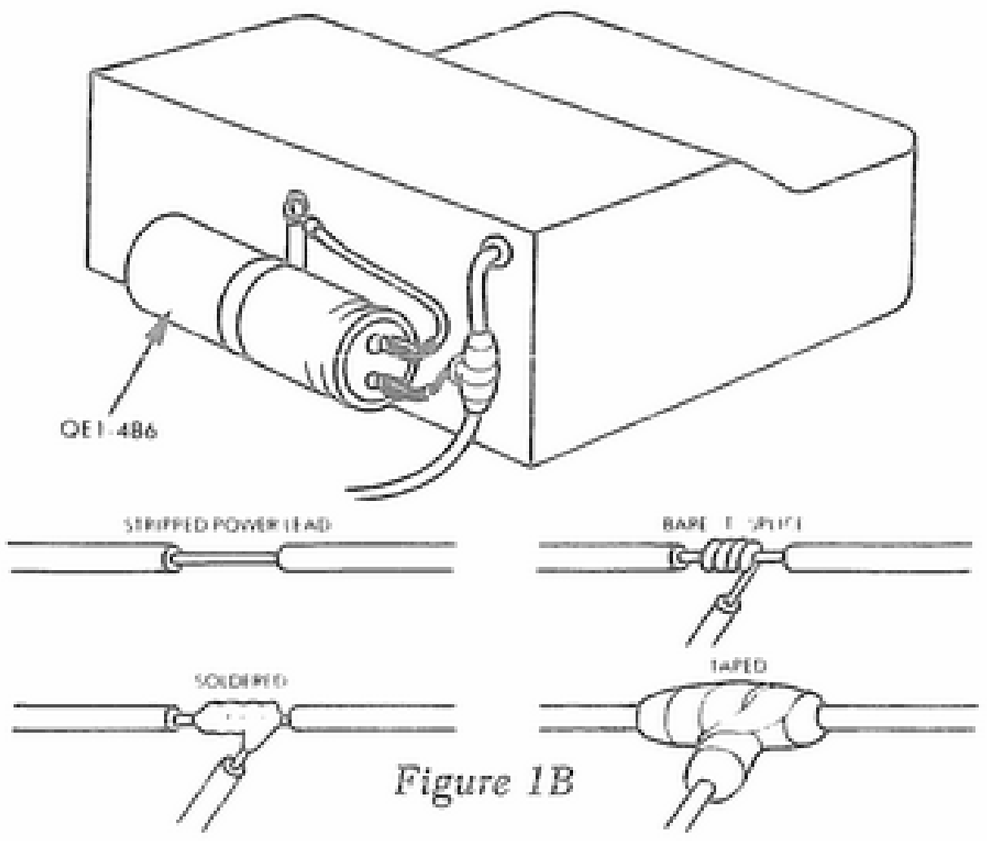


Figure 1B

Filtering the Ignition Coil

Mount a general-purpose .1μF @ 400 VDC, 20-amp feed-thru filter capacitor (Sprague Type QX1-6) as closely as possible to the ignition coil, as shown in Figure 2. Don't mount the filter on the engine block. Disconnect from the coil the wire which leads to the ignition switch. Connect this wire to one end of the

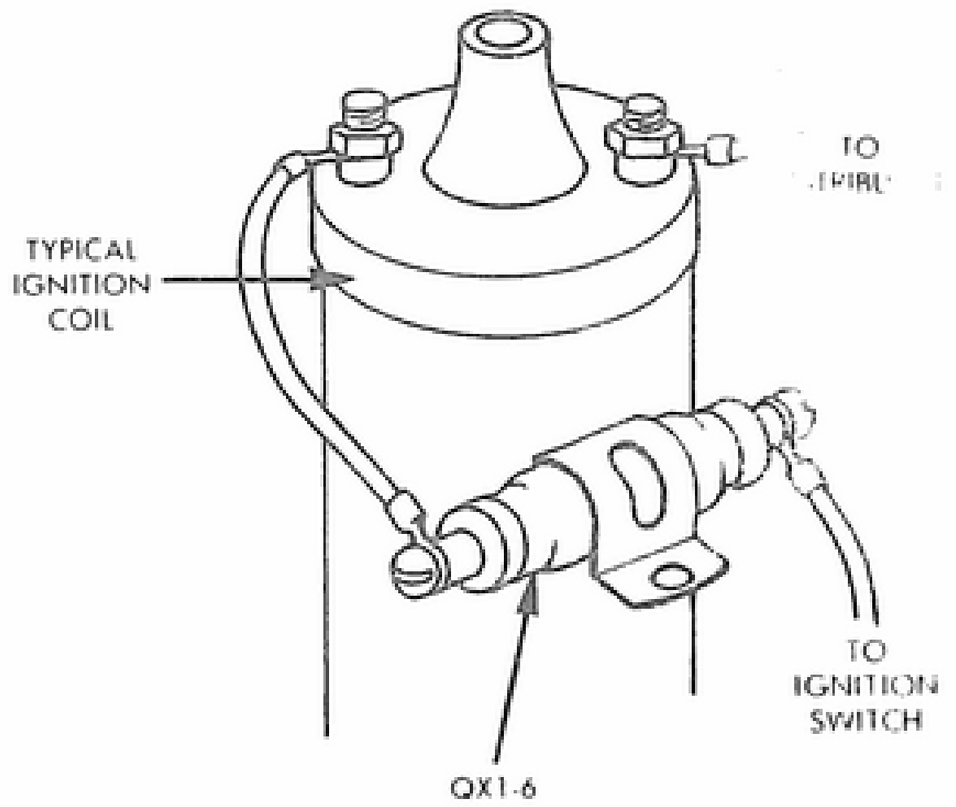


Figure 2

(Continued)

For Sale: Large 2 Meter antenna complete 80 Element with 300 coax Harness and Power dividers. WA 5UNI 787-9545,

Wanted: Mars VFO, or Crystal Box for Swan 500 Steve

KILL THAT IGNITION NOISE *(continued)*

filter capacitor. Install a jumper wire using the same size and type of wire, from the remaining end of the filter to the coil terminal from which the wire was removed.

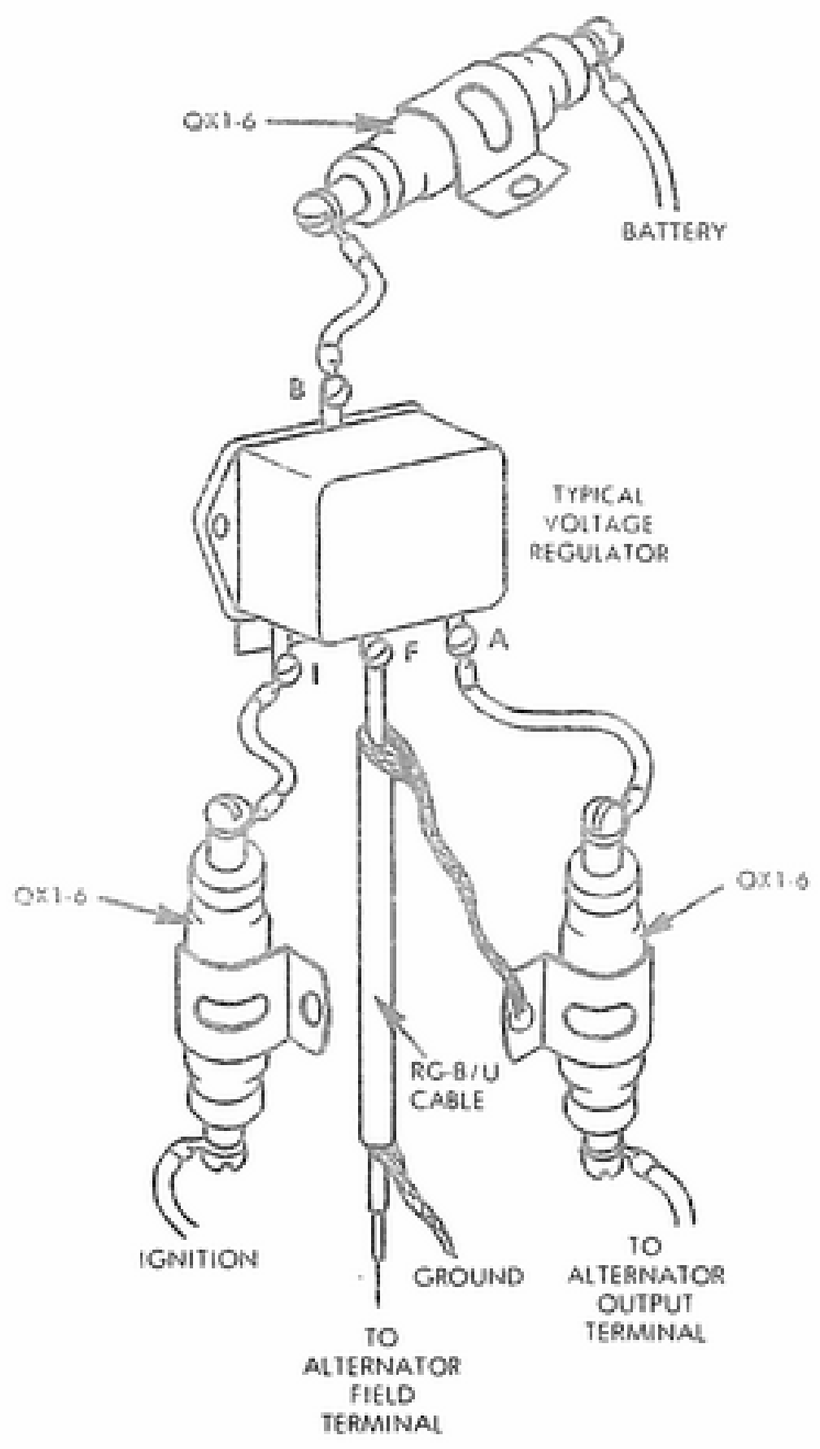


Figure 3

Filtering the Voltage Regulator

For vehicles with plug-in type electrical connectors, check with your auto mechanic for proper wire identification.

Mount a general-purpose .1μF @ 400 VDC, 20-amp feed-thru filter capacitor (Sprague Type QX1-6) as closely as possible to the voltage regulator, as shown in Figure 3. Disconnect the wire from the terminal marked "I" or "ignition", and connect it to one end of the filter capacitor. Install a jumper wire, using the same size and type of wire, from the opposite end of the capacitor to the "I" terminal.

If noise persists, disconnect the wire from terminal "A" (armature) and connect it to one end of a second filter capacitor. Install a jumper wire from the opposite end of the capacitor to the "A" terminal.

If noise persists, disconnect the wire from terminal "B" (battery) and connect it to one end of a third filter capacitor. Install a jumper wire using the same size and type of wire, from the opposite end of the capacitor to the "B" terminal.

If regulator noise still persists, replace the wire from Terminal "F" with Type RG-8/U coaxial cable, grounding both ends of the braided "shield" portion of the cable to the chassis or nearest grounding point other than the engine block. Be certain that the cable does not touch the engine block or any other accessory which may become hot during operation.

WARNING: Do not install any filter device on the terminal marked "F" or field. Permanent damage will result if this terminal is filtered or by-passed.

Filtering the Alternator or Generator

For standard alternators and generators, use a .5μF @ 50 VDC 40-amp feed-thru filter capacitor (Sprague Type QX1-18). For heavier-duty alternators, use a .5μF @ 50 VDC 40-amp feed-thru filter capacitor (Sprague Type QXI-100). For heavy-duty truck alternators, use a .5μF @ 600 VDC 100-amp feed-thru filter capacitor (Sprague Type QX1-500), or a .5μF @ 600 VDC 200-amp feed-thru filter capacitor (Sprague Type QX1-600).

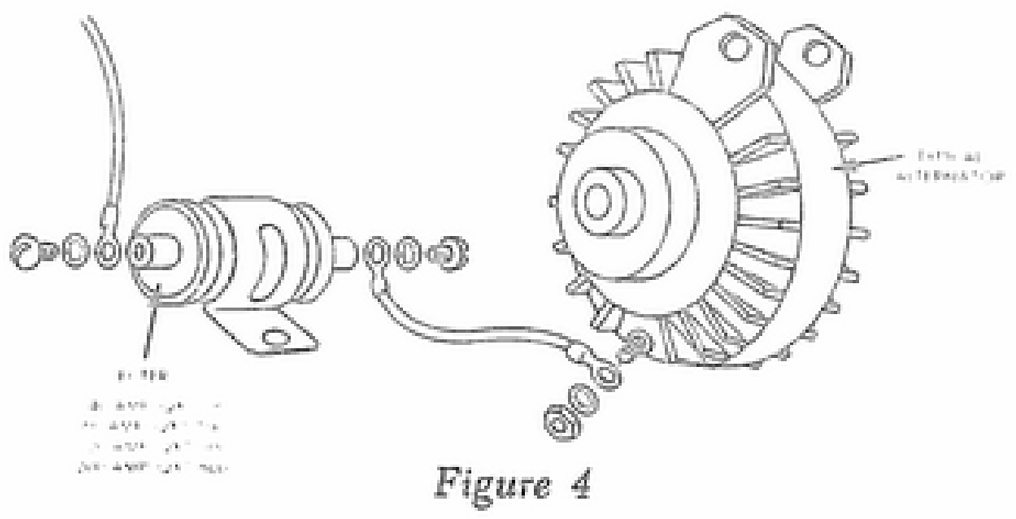


Figure 4

Mount the filter capacitor as close as possible to the alternator or generator, as shown in Figure 4. However, do not mount it on the engine block. Disconnect the wire from the output terminal on the alternator or generator and connect it to one end of the filter capacitor. Install a heavy jumper wire from the other end of the capacitor to the alternator output terminal.

Additional Auto Noise Suppression Measures

Additional suppression steps can be taken at the terminals of such devices as the ammeter, oil pressure gauge, engine temperature gauge, and fuel gauge. It may even be necessary to suppress noise caused by the wiring at the dome light, trunk light, and instrument panel lights. In such cases, a general-purpose .1μF @ 400 VDC, 20-amp feed-thru filter capacitor (Sprague Type QX1-6) should be located as close as possible to the offending accessory, or where its lead wire passes through the engine compartment firewall.

Grounding the exhaust end of the tail-pipe can reduce re-radiated interference. Such grounding can be accomplished by using a length of braided grounding strap.

For severe cases of ignition noise, before you resort to complete ignition system shielding, try the following less-expensive alternatives first:

(Continued)

For Sale: Swan Mark II Tabletop Model, 2000 watts input, new tubes, excelent. WA5UNL 787 9545 or 7879292

Stolen: IC-230 Contact Marshal Williams, WA5UNL if you see one.

KILL THAT IGNITION NOISE *(continued)*

1. Use resistor-type spark plugs, *after* you have checked with your auto mechanic. These plugs are *not* to be used with capacitor discharge ignition systems.

2. Investigate the use of bonding or jumper straps, especially between the engine hood, fenders, engine block, alternator frame, and tail-pipe.

3. General-purpose .1μF @ 400 VDC, 20-amp feed-thru filter capacitors (Sprague Type QX1-6) will often eliminate intermittent noise from turn signal flashers or windshield wipers by installing them at the terminals of the offending devices. NOTE: Feed-thru filter capacitors will have *no effect* on wiper motor noise, or signal fading, where the auto radio antenna is embedded in the windshield.

Automotive noise suppression requirements will vary with different vehicles, engines, and accessories. It is not possible to prescribe pat cure-alls for all noise problems. Each must be considered a custom case, with solutions for that particular car only. However, the information in this article should give you a good step forward in the suppression of noise for most of your specific problems. It remains for you to put the finishing touches to the job.

Boats and Aircraft

Since electrical systems, power sources, and accessories in boats and airplanes are substantially more varied than those found in automotive vehicles, it would be extremely difficult to even generalize on procedures for noise suppression. It is suggested that you consult with your marine or aviation serviceman to determine the best approach and solution to your particular noise problems. Note that in the case of aircraft, a certified, licensed mechanic must be employed. It is always best to check with your dealer.

Filtering at Power Cord of A-C Radios

CAUTION: Before doing any work on A-C line operated equipment, *Pull the Plug!*

If your fixed-station radio rig is used in a properly-grounded electrical system (a 3-wire 110 volt a-c system, a system using BX cable in good condition, or a permanent chassis-to-ground system), an a-c power line filter with a dual 3-amp rating @ 250 VAC/60Hz (Sprague Type QX1-03) may be installed in your radio to suppress line interference, as shown in Figure 5. Remove the line cord from the a-c receptacle and discharge any filters or bypass capacitors connected across the line cord.

Disconnect the line cord from the terminal strip, fuse holder, transformer, etc. Remove any bypass capacitors (usually disc ceramic capacitors) connected across the line cord or connected between the line cord and the chassis ground. Install the filter so that its lead wires reach the points where the line cord was originally connected. Connect the original line cord to the lug terminals of the filter.

CAUTION: When servicing equipment in which a line filter has been installed, always remove the line cord from the receptacle *before* removing the ground connection. Conversely, always connect the ground line *before* plugging the cord back into the receptacle.

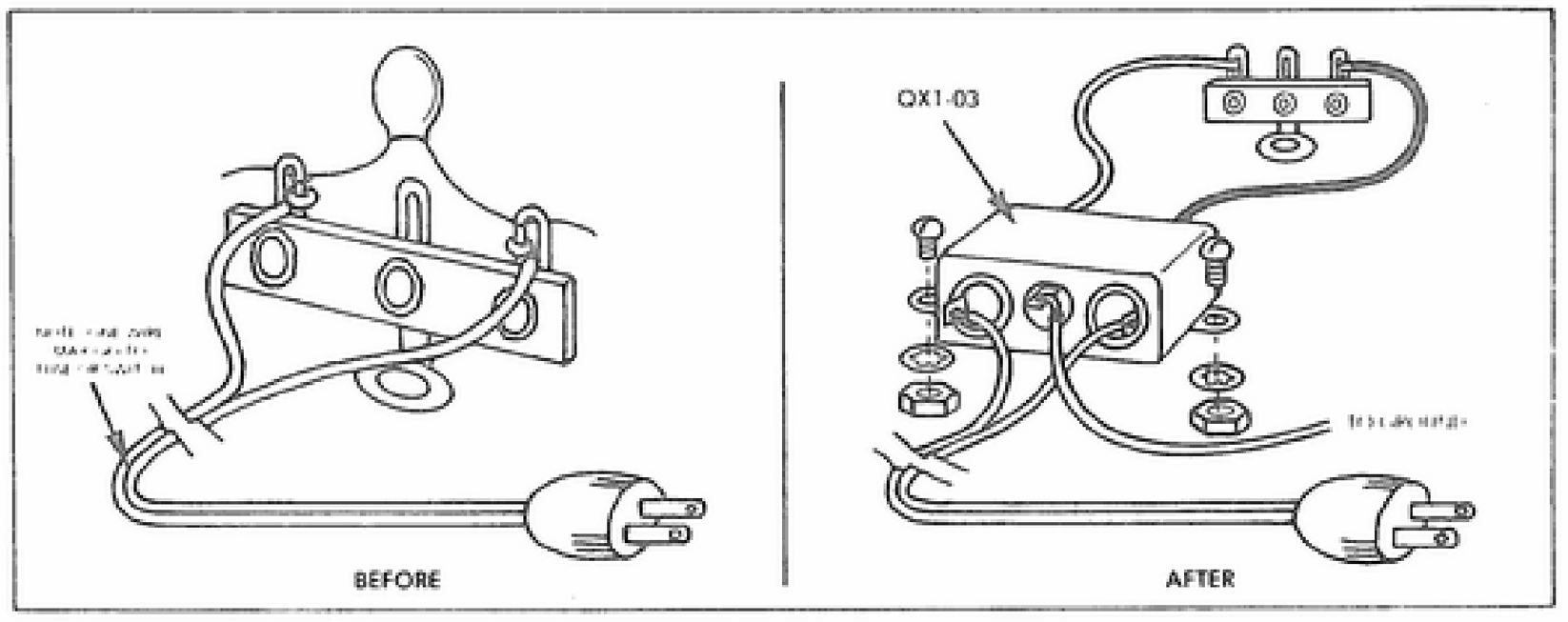


Figure 5

For Sale: Complete Robot Slow Scan TV System, 1 Model 15 Teletype, 1 Model 14 Typing/Reperf, 2 TD Units(tape readers), 1 Audio Converter, 1 Dual Diversity Converter, 1 Collins 75S3, 1 Heathkit SB-610 Monitor Scope, 1 Hallicrafters HA-2(2Meters transverter) , 2,6 meter Power amps (pair 4-1000A's), 6 commercial Transmitters(200to400Mhz) Pair of 4X150A's in Final, 1 Henery 4K Amp, console model. K5 L 737 9545 or 721 3709.

CORA ROSTER CORRECTIONS & ADDITIONS
(CORRECTIONS UNDERLINED)

WB5BNN	Fay Stephenson	9 Redrock Rd	Shawnee OK	273-1336
WA5CBF	Loren Simms	P.O. Box 143	Tipton OK	
K5DNL	Ken Roberson	Rt 6 Box 248B	Shawnee OK	
WB5ELC	Dorothy Diriksen	2201 S.W. 49	Okla City OK	685-0725
W5GC	Howard Gould	2208 S.W. 57	Okla City OK	685-4805
K5GL	Guy Leibmann	3128 Lakeview Manor Dr	Bethany OK	787-9547
WA5lQH	Bill Blakely	Rt 1 Box 109	Byars OK	
W5JES	Robert Runyon	6013 Tipi Rd	Yukon OK	373-1818
WB5KDZ	Mel Perkins	6716 Fawn Canyon Dr	Okla City OK	
WB5KQA	Jesse Kirkham	110 Brown Dr	Warner Robins GA	
K5KZV	Tom Gardner	1421 N.W. 95	Okla City OK	
W5MGP	Dick Strouhal	3308 Ridgewood Dr	Midwest City OK	
WB5MWO	Sue Kinney	1332 Dorchester Dr	Norman OK	329-7572
WB5NXO	Bill Peterson	545 N.W. 36 Terrace	Okla City OK	524-7415
WB5NYA	John Pendleton	205 W. Jarman Dr	Midwest City OK	
W5OEC	Edward Duclos	8028 N.W. 27	Bethany OK	495-2797
WA5OPP	Melvin Zuck	Box 562	Harrah OK	
WA5RPP	Sam Barratt	1619 Wind Hill Rd	Norman OK	
WB5SIP	Ruby Zuck	Box 562	Harrah OK	
WB5SVN	Jack Iman	9813 S Blackwelder	Okla City OK	691-2447
W5TKC	C.C. Drumeller	2947A Summeral Ct	Ft Eustis VA	
WN5VAE	Jack Lovegrove	4432 N.W. 11 Terrace	Okla City OK	946-2966
WN5VGB	Jim Townsend	6610 S Shields	Okla City OK	632-5445
WB5WLS	Fred Miller	Rt 12 Box 262	Okla City OK	
WB5WSV	Wayne Eleazer	517 Harr Drive	Midwest City OK	
WB5WVB	Gaylene Moorehead	528 S.W. 63 Terrace	Okla City OK	634-9601
WB5WVD	Elizabeth Donnelly	7900 N.W. 21 #1004	Bethany OK	789-7431
WB5WVG	Terri Miller	221 N Iowa	Chandler OK	258-1542
WB5XHC	John Lewis	Rt 10 Box 45	Moore OK	
A	Donald Davis	3709 Springlake Dr	Okla City OK	427-3283
A	Nelson Lee	3928 N.W. 59	Okla City OK	946-2743
A	James Pertree	309 W Charlotte	Okla City OK	794-0362

WE HEAR FROM SWEDEN- Ellard, W5KE, received this from SM5CKU:

Hope you are all well and many thanks for putting me on the mailing list of your nice C & E paper.

Could you please send me a list of what you have for sale at the present time? Micromatches? Dummy loads, Bird? Could these dummy loads be emptied of oil and refilled over here? VHF/UHF surplus? N-Connectors? Sockets for 4CX250B. Could you possibly put an ad in C & E like, "Wanted: SK-600 etc. sockets for 4CX250 needed, etc." Please advise prices, shipping costs, etc.

Summer has been very nice but short as usual. Now it iswindy and chilly and soon I guess the first snow will come down.

Like to hear from you again. Say hello to the CORA people from over here. 73 BEN

F L A S H -- JACK GANT WINS A R R L DIRECTORS RACE

Just as I was getting ready to make a negative of this page word arrived that the results of the recent election for Director of West Gulf Division of the ARRL arrived. Jack Gant, W5GM, of Ardmore has been elected by a 4 to 1 margin and Oklahoma finally has a local boy on the staff. Of course Jack has been Vice-Director for several years and the record he made in assisting Roy Albright over these years convinced over 2600 ARRL members (most of them Texans) that Jack was the man for the job.

Jack will have Doug Brooke, K5YHX, Austin as his Vice-Director and it looks like a good team, well balanced, and both willing to work for the best interests of all amateurs.

Congratulations to both of you.

* * * * *

CORA COLLECTOR & EMITTER ISN'T A ONE MAN SHOW - - It takes a lot of people to get each edition of CORA Collector & Emitter to you and you are an important cog in the machine. There are seven club editors who labor at collecting the articles, writing them themselves, typing it all up ready for the camera, showing up in Midwest City one night a month to help paste it all together. The advertising manager has already turned his copy in and the ads are ready to integrate in the paper. That's where I take over with making negatives of the pages, making printing plates, putting it on the press and running off 600 copies of each page. Now the shock troops come on the scene. Each club furnishes seven people to gather, staple and fold the completed magazine and fill a large mail sack to get C & E on its way to you. The other day I had occasion to get a bindry to quote on doing the shock troops job on a similar publication and while I was at it I got a quote on gathering, stapling and folding our average monthly issue and was quoted a price of $57, so you see you seven people who come in each month are saving CORA $57 and doing your share.

While we are talking about mailing. MORI will furnish the shock troops for this issue and next month it will be AUTOPATCH s time. Next months issue will go out early, on December 21 on account of Christmas.

* * * * *

NOW IS THE TIME FOR ALL GOOD MEN TO GET AN EXTRA CLASS LICENSE - -

What with certain relaxations in the rules (you still have to hit that 20 WPM) everyone , just about, is eligible to try and to make it a little easier for you on the technical part we are including the Extra Class Study Guide from FCC in this issue. We received so many favorable comments on the earlier, Novice, Technician, General and Advance Study Guide and so many requests for copies that we had to re print. See CORA COMMENTS. If you feel you aren't up to getting that Extra ticket, keep the study guide and do that, study.

N N F

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REMINDER! A B I G RED "X" HERE WARNS THAT ACCORDING TO RECORDS FURNISHED BY YOUR CLUB SECRETARY YOU ARE DELINQUENT IN CLUB DUES. NEXT MONTHS CORA COLLECTOR/EMITTER MAY BE THE LAST UNLESS YOU CONTACT THE CLUB INDICATED ON PAGE TWO AND RENEW OR CORRECT THE RECORDS.

SECOND CLASS POSTAGE PAID
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Oklahoma City OK 73115

DECEMBER HAM HAPPENINGS

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1	2	MORI DINNER / ACARC DINNER 3	4
5	6	7	8	9	10	11
12	13	AUTOPATCH MEETING 14	15	16	VHF MEETING 17	18
19	EDIT C&E 20	76'ers MEETING 21	22	23	24	MERRY CHRISTMAS 25
26	27	MAIL C&E (AUTOPATCH) 28	29	30	31	

See page 2 and/or individual club sections for details