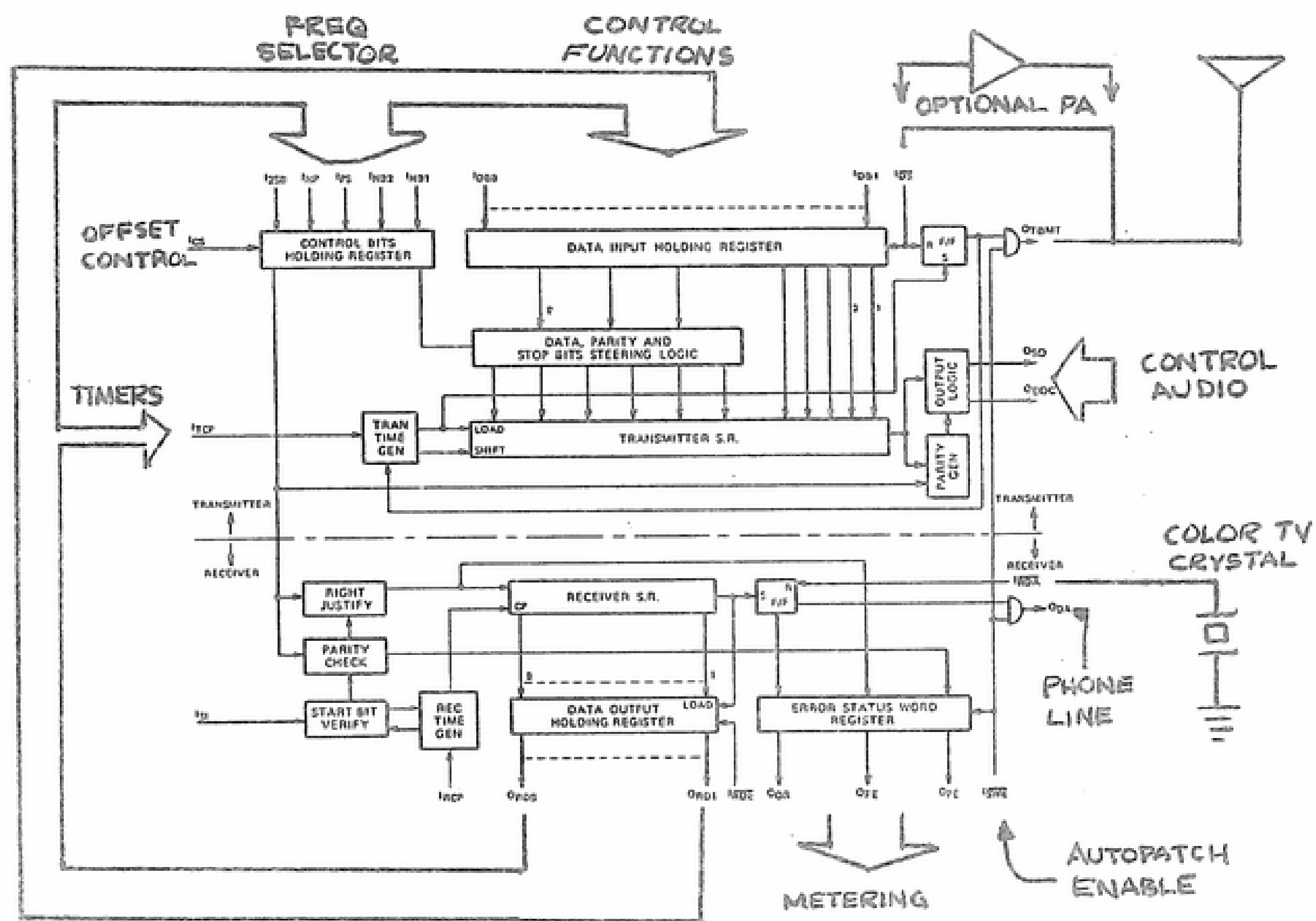


AND ANYONE INTERESTED IN
LEARNING ABOUT IT

REPEATER
BREAKTHROUGH



EVERY CONCEIVABLE REPEATER FUNCTION ON ON A SINGLE CHIP. SEE PAGE THREE FOR FOR A CORA C&E EXCLUSIVE ON THIS NEW DEVICE!

Central Oklahoma Radio Amateurs

COLLECTOR AND EMITTER



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AT OKLAHOMA CITY OK

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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PARTICIPATING CLUBS FOR CORA COLLECTOR & EMITTER:

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

Pres Dave Langley W4YDY 722-0462
Assist Lloyd Kirk WB5HUP 685-6566
V-P Bill Hulse W5NI 376-2125
Sec/Tr Robert Runyon W5JES 373-1818

MID-OKLAHOMA REPEATER
MEETS: 8:00 PM Tuesday, first full week
in month. Okla City EOC, 4600 N Eastern

Pres Chet Hazelwood W5GDL 427-1439
V-P John Huckaby K5QDR 672-4706
Sec/Tr Richard Zanni WB6FYL 691-1809
Dues: Sid Gerber, 829 E Bouse, MWC, 73110

OKLAHOMA UNIVERSITY AMATEUR RADIO CLUB
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MEETS: 7:30 PM Alternate Tuesday STUDENT
UNION Room 161

Pres Kim Elmore WB5CLC 325-6717
V-P Kenny Hutchison WB5RXZ 364-3001
Sec James Jones WB5RKQ
Treas Mike Salem WA5EPK 321-5453

BICENTENNIAL AMATEUR RADIO CLUB
MEETS: 3rd Tuesday each month 7:00 PM
AIR National Guard, Will Rogers Airport

Pres Ken Newberry WB5PYN 685-2717
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Sec Jim Townsend WB5VCB 632-5445
Treas C Y Chandler WB5TKG 232-9005

OKLAHOMA CENTRAL AMATEUR RADIO CLUB
323 NW 10th, Okla City OK 73103
MEETS: 8:00 PM third Friday each month
American Red Cross Bldg, 10th & Hudson

Pres T. Van Woody W5FMX 942-2831
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

Pres Gary McCormick WA5ETV 946-2898
V-P Guy Liebman K5GL 787-9547
Sec/Tr Jim Derman WB5EOL 681-6048
7705 S Charlotte Dr OKC 73159

EDMOND AMATEUR RADIO CLUB

MEETS: 7:30 PM first Monday of odd
numbered month, 3220 N Santa Fe (GE)

Pres Larry Dillard WB5CWB 685-4065
V-P Bart Wortham WA5JUJ 751-9536
Sec/Tr W. H. Thompson W5UIV 348-1475



Amateur Radio News Service



Club NEWS

W5LWV
The Elmer Goodier Memorial
Station

REVOLUTION IN REPEATER DESIGN

A REMARKABLE INTEGRATED CIRCUIT HAS BEEN DEVELOPED WHICH MAY DISPROVE THE OFTEN MADE CLAIM THAT AMATEURS DON'T CONTRIBUTE MUCH TO STATE OF THE RADIO ART. DURING AN EXCLUSIVE INTERVIEW WITH TWO COLLECTOR AND EMITTER REPORTERS, IT WAS REVEALED THAT A COMPLETE REPEATER ON A CHIP HAD BEEN DEVELOPED AND WILL BE AVAILABLE SHORTLY IN PRODUCTION QUANTITIES.

THE DEVICE WAS SHOWN TO MIKE, WA5EPK, AND ROGER, WA5JXX, DURING A RECENT VISIT WITH SHILLELAGH O'CONNELL, PRESIDENT OF SEMICONDUCTOR HYBRID ANALOG MICROCIRCUITS, INC., SAN PABLO, CA. SHILL, WHO IS LICENSED IN IRELAND, HAS NEVER APPLIED FOR A LICENSE IN THE U.S. THOUGH HE HAS AN INTENSE INTEREST IN AMATEUR RADIO ACTIVITIES. IN THE COURSE OF DEVELOPMENT OF A HYBRID INTEGRATED CIRCUIT TO BE USED FOR MULTIPLEXING TELEPHONE CONVERSATIONS, HE SAW AN RF APPLICATION THAT WOULD SERVE AMATEUR AND COMMERCIAL USERS OF REPEATERS.

WORKING ON HIS OWN TIME, HE COMBINED THE LATEST TECHNOLOGIES OF DIGITAL, LINEAR AND RF TECHNOLOGIES TO CREATE A COMPLETE REPEATER ON A CHIP. THE CHIP, DESIGNATED APR/1B-S (AUTO PATCH REPEATER, MODEL 1B, REVISION S) IS A STANDARD TWENTY NINE PIN DIP WITH HEAT SINK TAB. PERHAPS THE MOST INGENIOUS FEATURES ARE THE RF DUPLEXING AND CONTROL MULTIPLEXING. AS THE BLOCK DIAGRAM ON THE COVER SHOWS, THERE IS ONLY ONE ANTENNA CONNECTION. RF FROM THE TRANSMITTER IS SAMPLED AND FED IN THE PROPER PHASE AND MAGNITUDE TO A MIXER WHICH CANCELS THE TRANSMITTER OUTPUT AND SENDS ZERO SIGNAL TO THE RECEIVER RF AMPLIFIER. THE MIXER HAS A 2.1dB NOISE FIGURE AND EFFECTIVE SENSITIVITY OF THE RECEIVER, WHILE REPEATING, IS 0.05 MICROVOLTS FOR 20 dB QUIETING. DURING THE COURSE OF DESIGNING THE PHASE CANCELLATION CIRCUIT, SHILL WAS ATTEMPTING TO REMOVE ENERGY THAT RE-ENTERED THE ANTENNA BY REFLECTION FROM NEARBY OBJECTS. AN UNEXPLAINABLE SIGNAL WAS FOUND TO BE PRESENT WHEN THE ANTENNA WAS OFF RESONANCE. ALL ATTEMPTS TO CANCEL THIS SIGNAL FAILED UNTIL HE DISCOVERED PRESENCE OF CURRENT ON THE OUTSIDE OF THE COAXIAL FEEDLINE CAUSED BY THE HIGH SWR. IT WAS NECESSARY TO MAKE A SECOND CONNECTION TO THE OUTSIDE OF THE SHIELD TO CANCEL THIS SIGNAL. AS A RESULT, THE REPEATER CHIP WILL WORK WITHOUT DEGRADATION INTO A 5:1 SWR. ONLY DRAWBACK IS NECESSITY FOR A SPECIAL RF CONNECTOR THAT PROVIDES SEPARATE CONNECTIONS TO INSIDE AND OUTSIDE OF THE SHIELD. IN ORDER TO ENCOURAGE APPLICATIONS, THE COMPANY WILL PROVIDE THE NECESSARY CONNECTOR FREE OF CHARGE TO PURCHASERS OF THE IC.

WHEN SHILL WAS DEVELOPING THE CONTROL CIRCUITRY, HE WAS PLAGUED WITH A LARGE NUMBER OF TERMINALS ON THE IC. SINCE DEVICE COST IS PROPORTIONAL TO NUMBER OF TERMINALS, HE BURNED MIDNIGHT OIL TRYING TO REDUCE NUMBER OF CONNECTIONS REQUIRED WITHOUT SACRIFICING FLEXIBILITY. HIS SOLUTION WAS INGENIOUS. FIVE TERMINALS ARE MULTIPLEXED ADDRESS AND PSEUDO-DATA LINES. BY FOLLOWING A CHARTED PATTERN SUPPLIED BY THE COMPANY, THESE TERMINALS ARE CONNECTED TO FUNCTION CONTROL, TIME GENERATING AND DATA INPUT CIRCUITS IN SUCH A WAY TO OBTAIN THE FOLLOWING:

1. FREQUENCY CAN BE SET ANYWHERE FROM 136 TO 174 MHZ. TRANSMITTER AND RECEIVER OFFSET CAN BE 600 KHZ, 1, 1.2, OR 5 MHZ AND THE DEVICE CAN OFFSET THE TRANSMITTER HIGH OR LOW. FREQUENCY STEPS ARE 5KHZ. A COLOR BURST TV CRYSTAL IS USED FOR REFERENCE FREQUENCY.
2. TONE CONTROLLED ACCESS CAN BE ENABLED BY CONNECTING ONE PIN TO ONE OF THE DATA OUTPUT LINES. STANDARD TONE SUPPLIED IS 102.2 HZ WHICH IS LASER TRIMMED ON THE CHIP TO .005%. OTHER TONES CAN BE USED BY CONNECTING THE DESIRED REED FROM THE FREQUENCY CONTROL CRYSTAL TO VCC. TONE ACCESS CAN BE DISABLED BY CONTROL PHONE LINE OR UHF RECEIVER AUDIO CONNECTED TO THE CHIP.
3. SQUELCH TAIL AND TIME OUT TIMER INTERVALS CAN BE ADJUSTED BY CONTROL LINE AUDIO TONES. SQUELCH TAIL IS ADJUSTED IN ONE SECOND INTERVALS FROM ZERO TO FIVE SECONDS AND TIME OUT TIMER IS ADJUSTABLE IN 30 SECOND INTERVALS FROM 30 SECONDS TO 5 MINUTES. THE TIME PERIODS ARE DERIVED FROM THE FREQUENCY CONTROL CRYSTAL AND ARE THUS VERY ACCURATE. ANTICIPATING THAT MORE AMATEURS WILL WANT TO RUN DUPLEX USING THIS DEVICE, SHILL INCORPORATED A BEEPER WARNING IN THE TIME OUT TIMER TO WARN USERS TEN SECONDS BEFORE TIME OUT. IF THE REPEATER IS LOCKED ON AND TIMED OUT WITH A WEAK SIGNAL, IT CAN BE RESET WITH A CARRIER 10dB STRONGER THAN THE SIGNAL THAT CAUSED THE LOCKOUT. THIS FEATURE CAN BE DISABLED BY CONTROL TONES FROM THE CONTROL RECEIVER OR PHONE LINE. THE ON CHIP TOUCH-TONE® DECODER HAS PREFILTERING AND 30dB AGC TO PREVENT CONTROL DIFFICULTIES.



Club NEWS

W5L0W
The Elmer Gooder Memorial
Station

4. C.W. IDENTIFICATION IS PROGRAMMABLE BY PULLING THE CW READ-WRITE LINE TO VCC AND KEYING IN THE DESIRED MESSAGE. UP TO 512 BITS OF MESSAGE CAN BE STORED. THE ID IS ENABLED BY TYING THE R/W PIN TO GROUND AND THE ID FUNCTIONS LIKE ON ANY OTHER REPEATER. THE ID MEMORY IS NON VOLATILE, RETAINING THE STORED MESSAGE INDEFINITELY WITH POWER OFF, ALL OTHER FEATURES THAT ARE STORED IN MEMORY, SUCH AS TIMER INTERVALS, ARE ALSO RETAINED IF POWER IS OFF.
5. TRANSMITTER HAS TWO POWER LEVELS OF 200 MILLIWATTS AND 2 WATTS SELECTABLE BY CONTROL TONE PROGRAMMING. IF EXTERNAL POWER AMPLIFIER IS TO BE ADDED, A JUMPER BETWEEN TWO PINS IS REMOVED AND INPUT AND OUTPUT OF THE AMPLIFIER ARE CONNECTED TO THE TWO PINS TO PROVIDE RF SENSING FOR THE PHASE CANCELLATION CIRCUIT. THE IC CAN BE USED WITH AMPLIFIERS HAVING UP TO 200 WATTS OUTPUT WITHOUT AN ATTENUATOR AND COMPENSATION CIRCUIT. SHILL EXPLAINED THAT DURING TESTS WITH POWER LEVELS OF 1KW, IT WAS NECESSARY TO PROVIDE CAREFUL SHIELDING TO THE CHIP TO PREVENT PROBLEMS. AT POWER LEVELS OF 200 WATTS AND BELOW, NO SHIELDING IS NECESSARY BECAUSE OF A PROPRIETARY SUBSTRATE GROUNDING TECHNIQUE THAT SAMPLES GROUND LOOP CURRENTS AND CANCELS TROUBLESOME RF ENERGY OUT OF ALL CONTROL AND AUDIO CIRCUITRY.
6. AUDIO OUTPUT IS PROVIDED FOR LOCAL SPEAKER BY PUTTING A 1.2 UH CHOKE ON THE ANTENNA TERMINAL AND CONNECTING TO THE SPEAKER. THE REASON FOR THIS IS THAT THE SAME POWER AMPLIFIER SUB-CIRCUIT IS USED FOR AUDIO THAT PROVIDES THE RF OUTPUT. SEE FIGURE 1 FOR A PORTION OF THE POWER AMPLIFIER AND PHASE CANCELLATION SUB-CIRCUIT. NOTICE ALSO THAT A MICROPHONE CAN BE PARALLELED WITH THE SPEAKER FOR IMPROVED TRANSMIT AUDIO WHEN USING THE CHIP AS A TRANSCEIVER. SINCE THE COMPANY SPECIALIZES IN AUDIO MULTIPLEXING, THIS FEATURE WAS DUCK SOUP TO INCLUDE. AUDIO OUTPUT IS ALSO SET AT 200 MW OR 2 WATTS BY PROGRAMMING INTO MEMORY.

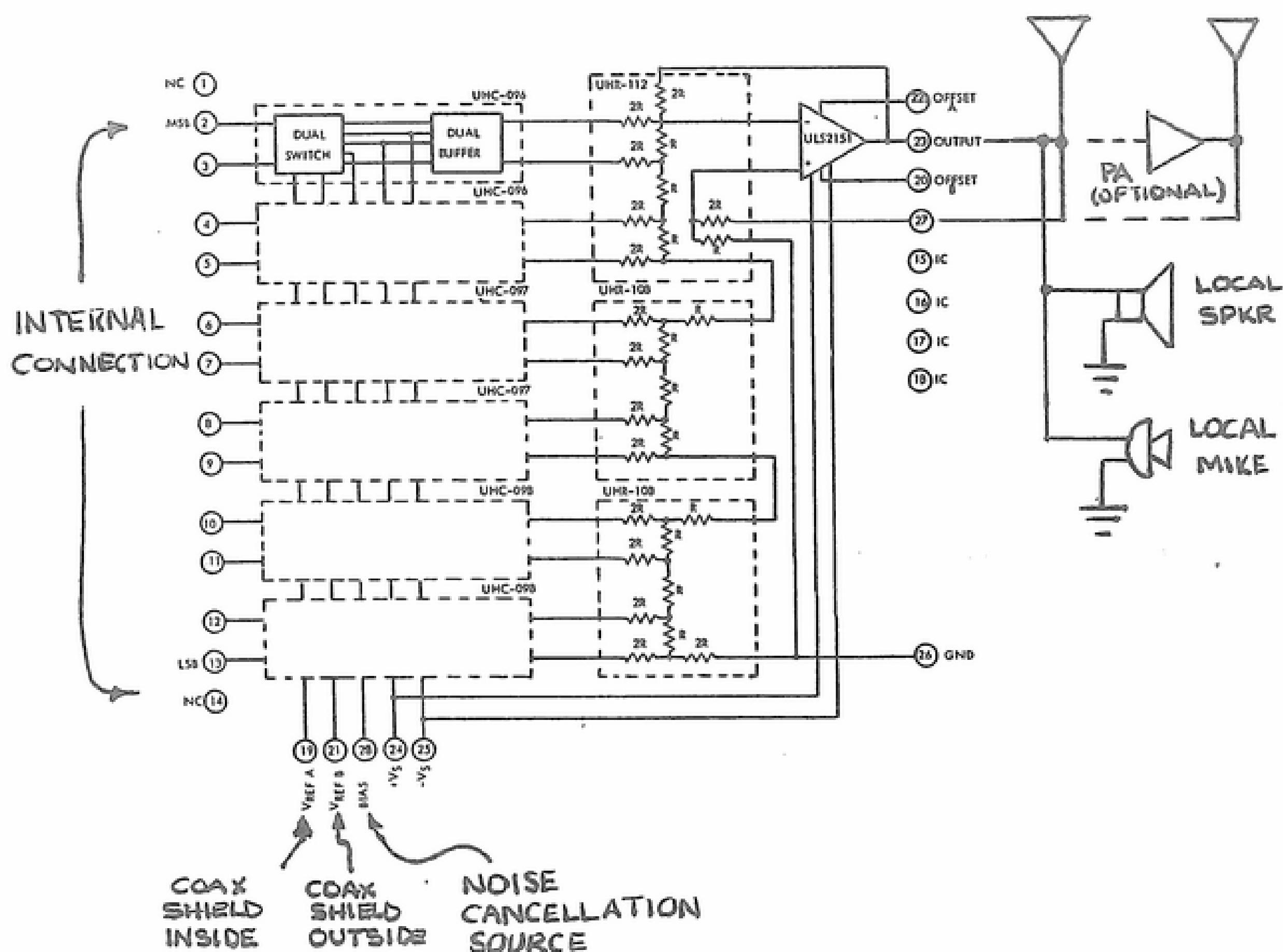


FIGURE 1. PORTION OF REPEATER IC
CORA Collector & Emitter



Club
NEWS

WSLOV
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7. NOISE CANCELLATION OF LOCAL MICROPHONE IS OBTAINED OPTIONALLY BY CONNECTING A SECOND MICROPHONE TO THE CHIP AND MOUNTING IT BACK TO BACK TO THE PRIMARY MICROPHONE CARTRIDGE. SOUNDS PICKED UP BY BOTH ELEMENTS ARE CANCELLED OUT. SOUNDS PICKED UP STRONGER BY CLOSE TALKING THE PRIMARY ELEMENT ARE SUBTRACTED FROM THE NOISE, PROCESSED, AND FED TO THE TRANSMITTER MODULATOR CIRCUITRY. OF COURSE, DEVIATION LIMITS ARE SET BY THE PROGRAM MEMORY.
8. COMPLETE METERING OF RECEIVED SIGNAL STRENGTH, FREQUENCY CENTERING, DEVIATION, TOUCH-TONE® ACCURACY AND SWR ARE AVAILABLE BY CONNECTING THREE PINS TO A MICROPROCESSOR. IF THE SWR IS CONSIDERED UNIMPORTANT, A VOM CAN BE SUBSTITUTED AND CONNECTED IN VARIOUS WAYS TO THE THREE PINS TO GET THE OTHER PARAMETERS.
9. AUTOPATCH ACCESS CODES ARE ALSO PROGRAMMED INTO MEMORY ALONG WITH TIMING INTERVALS. CODES CAN CONSIST OF FROM ONE TO THREE DIGITS. A CLEVER FEATURE WHICH CAN BE OPTIONALLY PROGRAMMED IS REDUCED LEVEL (OR ELIMINATED) TONES ON THE TRANSMITTED AUDIO. WHEN THIS FEATURE IS SELECTED, TONES CAN BE REDUCED TO A LESS IRRITATING VOLUME SO USERS DO NOT HAVE TO LISTEN TO THE BLEEP BLOOPS OF OTHERS DIALING PHONE NUMBERS.

SHILL IS CONTINUING TO DEVELOP NEW FEATURES FOR THE DEVICE BUT HE FELT THAT IT WAS TIME TO MARKET THE THING. ON THE DRAWING BOARD ARE, A 450 MHZ TRIPLER, AND TIME DIVISION MULTIPLEXING TO ALLOW SINGLE FREQUENCY REPEATING (TWO CHIPS WILL BE NEEDED EXCEPT WHERE PHONE PATCHING IS THE ONLY INTENDED USE). HE IS ALSO EXPERIMENTING WITH MODES OTHER THAN FM INCLUDING SINGLE SIDE BAND, INDEPENDENT SIDEBAND, WIDE BAND TRANSLATING AND VIDEO VESTIGAL SIDEBAND.

THE DEVICE WILL BE AVAILABLE APRIL FIRST IN SMALL QUANTITIES. ENGINEERING SAMPLES, RF CONNECTORS AND APPLICATION NOTES WILL COST \$27.50 PER SET. IF THE USER HAS NO WAY TO GENERATE TOUCH-TONE®, THE COMPANY WILL PROGRAM ALL FUNCTIONS FOR \$2.50. SHILL ADVISED THAT CORRESPONDENCE SHOULD BE ADDRESSED TO THE ATTENTION OF MISS DEE MEANOR. HER BOYFRIEND RHEE PETERS IS IN CHARGE OF PROGRAMMING AND WORKS ON THE PROJECT IN HIS BASEMENT AFTER DELIVERING HIS PAPER ROUTE EVERY DAY. IF TELEPHONING ASK FOR LOOF LIPRA PRONOUNCED BACKWARDS.

FOOTNOTE: MIKE, WASEPK AND ROGER, WASJXX REPORTED THAT SAMPLES THEY GOT FROM SHILL ARE WORKING FINE. MIKE REMOVED THE CIRCUIT BOARD FROM HIS HANDIE TALKIE® AND PUT THE APR/1B-S IN ONE CORNER USING THE SPACE WIRED TECHNIQUE DESCRIBED IN LAST MONTH'S C & E. HE CAN NOW OPERATE FULL DUPLEX AND SINCE THERE IS NOTHING IN THE RADIO BUT THE BATTERY AND IC, HE REPORTS THERE IS ROOM TO KEEP PENCILS, COOKIES, LOOSE CHANGE, A ROLL OF LIFE SAVERS® AND OTHER MISCELLANY IN THE RADIO. HE THEREBY NEVER MISPLACES HIS THINGS BECAUSE HE NEVER GOES ANYWHERE WITHOUT HIS RADIO. ROGER ON THE OTHER HAND, PUT A MICROPROCESSOR CHIP IN HIS HANDIE TALKIE® AND IS SCANNING ALL FREQUENCIES AT 200 CHANNELS PER SECOND. HE LINED THE UNUSED VOLUME IN HIS RADIO WITH SILICON RUBBER BATHTUB SEAL® AND KEEPS THE CASE FULL OF CHOCOLATE MILK FOR A REFRESHING REPAST BETWEEN QSO'S. JOE, K5JB (ALIAS WA5TRS) © 1977, BUSWELL

PROSPECTIVE WRITERS FOR CORA C & E - ITEM: MICROCOMPUTERS

CLIFF APPEL, OUR CALIFORNIA CORRESPONDENT INFORMED ME THAT THERE IS GOING TO BE A MICROCOMPUTER CONFERENCE IN OKLAHOMA CITY APRIL 6-8. THE FOCUS OF THE MEETING WILL BE ON RESEARCH, DEVELOPMENT AND APPLICATIONS OF MICROPROCESSORS AND MICROCOMPUTERS. HE SUGGESTED THAT SOMEONE MIGHT LIKE TO ATTEND AND PREPARE A REPORT FOR C & E. THOSE INTERESTED SHOULD CONTACT DR. S. C. LEE, GENERAL CHAIRMAN, MICROCOMPUTER '77, SCHOOL OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE, UNIVERSITY OF OKLAHOMA, NORMAN, OK 73019.
WA5TRS

FOR SALE: ICOM 22S, STILL UNCEER WARRANTY, \$275. DRAKE DC-4 POWER SUPPLY, \$90. HUSTLER HF MOBILE ANTENNA ACCESSORIES INCLUDING MAST, SPRING, 75, 40 AND 20 METER RESONATORS, ETC., \$???. PAIR OF 4-400A'S WITH SOCKET, \$60. HUSTLER 4-BTV VERTICAL ANTENNA, 10-40 METERS, \$65. ALL ITEMS ARE NEGOTIABLE. STEVE RICHERT, WB5ANA, 672-0453.



Club
NEWS

W5LW
The Elmer Goshier Memorial
Station

RULES CHANGE - PURITY OF EMISSIONS

QUOTED BELOW IS REVISION TO PART 97, FCC RULES AND REGULATIONS, ADOPTED MARCH 2, 1977, RELEASED MARCH 10, 1977, FROM FEDERAL REGISTER, MARCH 15, 1977.

"97.73 PURITY OF EMISSIONS

(A) THE MEAN POWER OF ANY SPURIOUS EMISSION OR RADIATION FROM ANY AMATEUR TRANSMITTER OR EXTERNAL RADIO FREQUENCY POWER AMPLIFIER BEING OPERATED WITH A CARRIER FREQUENCY BELOW 30 MHZ SHALL BE AT LEAST 40 DECIBELS BELOW THE MEAN POWER OF THE FUNDAMENTAL WITHOUT EXCEEDING THE POWER OF 50 MILLIWATTS. FOR EQUIPMENT OF MEAN POWER LESS THAN 5 WATTS, THE ATTENUATION SHALL BE AT LEAST 30 DECIBELS.

(B) THE MEAN POWER OF ANY SPURIOUS EMISSION OF RADIATION FROM ANY AMATEUR TRANSMITTER OR EXTERNAL RADIO FREQUENCY POWER AMPLIFIER BEING OPERATED WITH A CARRIER FREQUENCY ABOVE 30 MHZ BUT BELOW 235 MHZ SHALL BE AT LEAST 60 DECIBELS BELOW THE MEAN POWER OF THE FUNDAMENTAL. FOR TRANSMITTERS HAVING MEAN POWER OF 25 WATTS OR LESS, THE MEAN POWER OF ANY SPURIOUS RADIATION SUPPLIED TO THE ANTENNA TRANSMISSION LINE SHALL BE AT LEAST 40 DECIBELS BELOW THE MEAN POWER OF THE FUNDAMENTAL WITHOUT EXCEEDING THE POWER OF 25 MICROWATTS, BUT, IN ANY EVENT, NEED NOT BE REDUCED BELOW THE POWER OF 10 MICROWATTS.

(C) SPURIOUS EMISSION OF RADIATION FROM AN AMATEUR TRANSMITTER OR EXTERNAL RADIO FREQUENCY POWER AMPLIFIER BEING OPERATED WITH A CARRIER FREQUENCY ABOVE 235 MHZ SHALL BE REDUCED OR ELIMINATED IN ACCORDANCE WITH GOOD ENGINEERING PRACTICE.

(D) FOR THE PURPOSE OF THIS SECTION, A SPURIOUS EMISSION OR RADIATION IS ANY EMISSION OR RADIATION FROM A TRANSMITTER OR ANY EXTERNAL RADIO FREQUENCY POWER AMPLIFIER WHICH IS OUTSIDE OF THE AUTHORIZED AMATEUR RADIO SERVICE FREQUENCY BAND BEING USED.

(E) THE ABOVE NOTWITHSTANDING, SHOULD ANY SPURIOUS RADIATION, INCLUDING CHASSIS OR POWER LINE RADIATION, CAUSE HARMFUL INTERFERENCE TO THE RECEPTION OF OTHER RADIO STATIONS, THE LICENSEE MAY BE REQUIRED TO TAKE SUCH FURTHER STEPS AS MAY BE NECESSARY TO ELIMINATE THE INTERFERENCE IN ACCORDANCE WITH GOOD ENGINEERING PRACTICES."

THIS IS A RESULT OF DOCKET NO. 20777. NOTICE OF PROPOSED RULE MAKING WAS RELEASED APRIL 22, 1976. COMMENTS WERE DUE JUNE 23 AND REPLY COMMENTS WERE DUE JULY 23, 1976.

JOE, W5TRS

MINUTES OF MARCH MEETING

MEETING WAS CALLED TO ORDER AT 8:00 PM BY PRESIDENT WOODY, W5FMX WITH 18 MEMBERS AND GUESTS PRESENT. THERE WAS NO FORMAL BUSINESS TO BE CONDUCTED. BOB, W5HXL, GAVE A PROGRAM ON PROPAGATION CONDITIONS, TRANSMISSION LINES AND ANTENNAS. CHARLIE, W5JGU, DISCUSSED DISASTER COMMUNICATIONS INCLUDING LOCAL AND NATIONAL WEATHER CRISES, AND CITY, COUNTY AND STATE CIVIL DEFENSE. FUNCTIONS OF RACES, AREC, AND MARS WERE DISCUSSED. LOCAL COMMUNICATION PATTERNS, NET FREQUENCIES AND OPERATING PROCEDURES WERE COVERED.

IT WAS ANNOUNCED THAT APRIL 9TH THERE WOULD BE A SWAP MEET AT OKLA. MILITARY ACADEMY, 9 AM TO 2 PM. THE MEETING AJOURNED AT 9:30 AND THE GROUP MOVED TO THE RADIO ROOM FOR COFFEE AND DONUTS.

JOE, W5TRS, SECRETARY

CANCER SOCIETY DRIVE

JIM, K5VRL, ADVISED THAT THE ANNUAL AMERICAN CANCER SOCIETY DRIVE, WHICH USES COMMUNICATION AND TRANSPORTATION BY AMATEURS, WILL BE ON APRIL 7, THIS YEAR. DETAILS ARE FOUND ELSEWHERE IN C&E, OR CONTACT JIM FOR DETAILS.

JOE, W5TRS

FOR SALE GLB Synthesizer \$125 - SWAN FM 2X with AC & DC power supply 46/46, 22/82, 63/03, 34/94, 94/94, 16/76, 07/67, 28/88/37/97, 55/55, 52/52 xtals. \$175. - SBE 144 -- 9sets xtals. \$150 TR - 22 with mobile mounting bracket and extra Antenna, 22/82, 34/94, 94/94, 07/67, 16/76, 52/52. \$140 Wayne W5AOB 732-1870

CORA Collector & Emitter



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

* * * * *

H A M H O L I D A Y C A N C E L L E D

* * * * *

NO! You won't see this as a headline this year. There are a few very dedicated and very competent individuals in the local area that are going to devote many, many hours of their valuable time to see that this year's Ham Holiday will not be cancelled. You all know who these people are. Some of their names appear on Page 2 of the Collector and Emitter. They have been elected or appointed, in full faith, by you, to a position of trust then apparently abandoned to flounder along with not even a simple phone call to rededicate your faith and assistance. Others who deserve, need, want, and probably should demand your assistance, loyalty, and participation are listed below as the Committee members of Ham Holiday 1977.

Could anyone really believe that out of the more than 480 members of CORA, less than 9% are actively involved in making Ham Holiday 1977? Would you believe that four of the seven member clubs of CORA have 0% participation on the Ham Holiday committees? Each committee should have a representative from each of the clubs. Look at the list of the committee members.

Even if you feel that you cannot actively participate as a committee member, why don't you call your club representative? Tell him that you can offer minimal aid, but you are at least offering that! Each and every one of the CORA members should have some input to this effort. Each and every one of the CORA members is an expert in some area. It may seem unrelated, but sometimes we cannot see the trees for the forest. We may be so comfortable in our expertise, we cannot see how it could benefit the group. We may be mistaken. Try it, you may like it!

Here is the list of those who will prevent Ham Holiday 1977 from being cancelled:

C O R A D I R E C T O R S

MID-OKLAHOMA REPEATOR

Frank Arnold - W5PDH

Bob Pace - WA5CJG

Fred Wright - K5HFN

AERONAUTICAL CENTER ARC

Carl Drumiller - W5JJ

Bill Oliver - K5KDR

Gene Halley - WB5SQC

OKLAHOMA CENTRAL ARC

J. W. Word - WA5KFT

Tom Stinson - W5OZE

Bob Ashby - W5HXL

OKLAHOMA CITY AUTOPATCH

Hobe Burgan - WB5MLN

Frank McCollom - WB5JBL

Wendell Cochran - WB5ISO

BICENTENNIAL ARC

Coy Day - K5IMG

Joe Schilling - WB5YKD

Bob Wall - WB5SSX

EDMOND ARC

Joe Garland - WA5FLT

Jef Casey - WB5GWB

Gene Taylor - W5GC

HAM HOLIDAY COMMITTEES

PRIZES

Bill Riddles - WA5MZW - Bicentennial ARC
Ivan Miller - W5HFU - Aeronautical Center ARC
Ellard Foster - W5KE - Oklahoma Central ARC
Ed Duclos - W5OEC - Mid-Oklahoma Repeater

PUBLICITY - REGISTRATION

H. O. Townsend - WA5MLT - MORI
George Lagaly - WA5NTL - ACARC
Carl Drumiller - W5JJ - OCARC
Joe Schilling - WB5YKD - BARC

PROGRAM

D. C. MacDonald - K2GKK - MORI
Joe Buswell - WA5TRS - OCARC
Robby Runyon - W5JES - ACARC
Fred Miller - WB5WLS - BARC

LADIES ACTIVITIES

Rosey Halley - ACARC
Liz Donnelly - WB5WVD - MORI
Edie Day - WB5YHG - BARC

HERE'S A GOOD LIST! GET ON IT!

73

Gene

DO YOU JUST BELONG?

Are you an active member
The kind that would be missed?
Or are you just contented
That your name is on the list?
Do you attend the meetings
And mingle with the flock?
Or do you stay home
To criticize and knock?
Do you take an active part
To help the work along?
Or are you satisfied
To only just belong?
Do you work with your committee
And get right in and mix?
Or leave the work to just a few
And talk about the "cliques"?
Think this over, member,
You know right from wrong!
Are you an active member,
Or do you just belong?

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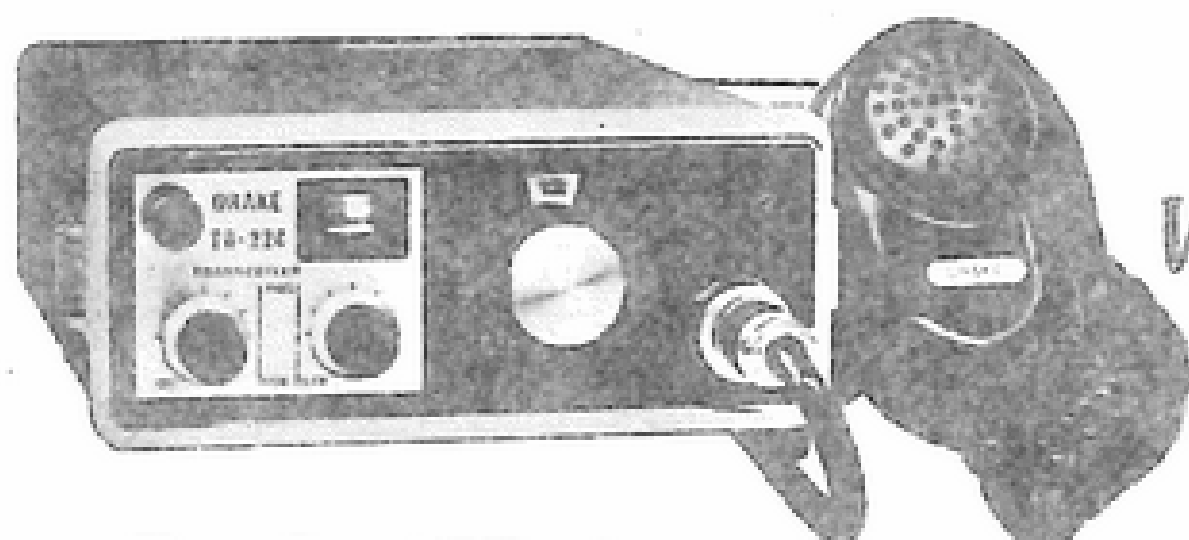
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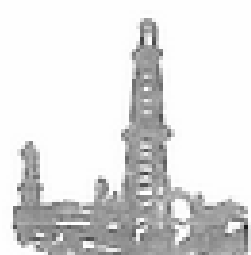
+ + + AMATEURS DEPARTMENT + + +

1516 S.E. 44

PHONE 672-1381

OKLAHOMA CITY

ONE BLOCK EAST OF I-35



MID-OKLAHOMA REPEATER INC.

MINUTES OF THE MARCH 1977 MORI MEETING

The meeting was called to order at 8:00PM by Vice President John Huckaby, K5QDR. There were self-introductions by the 45 members and guests present.

John announced that the MORI president, Chet, W5GDL is in St. Anthony's Hospital, room 2019.

Ken, K5VVZ said he needs a technician to help with the maintenance of the 07/67 machine. Call Ken if you wish to help.

The 34/94 machine now has a 55 second time-out timer. We are requested to keep transmissions to 55 seconds or less.

Bob, W5HXL announced that there will be a swap-meet Saturday, April 9 at the Oklahoma Military Academy.

Fred, K5HFN needs an XYL to represent MORI at the Ham Holiday. Anyone willing to volunteer, please contact Fred.

Mack, K2GKK said there was good participation in the recent storm net on 22/82 during a tornado watch. He thanks all of those who joined in this operation.

Several new members had joined tonight. These were introduced.

There was a general discussion on DF operation.

The technical program for the evening was by Wayne, WA5AOB and Joe, K5JB. They explained the operation of repeaters. Wayne pointed out that repeaters were really quite simple. Joe demonstrated his portable repeater which included an ICOM IC 230 and IC 30. After a question & answer session, the meeting was adjourned at 9:14 PM.

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UNLESS YOU HELP WHEN HELP IS NEEDED, YOU DON'T HELP

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The AMERICAN CANCER SOCIETY drive will be April 7 at 7:30 PM. Volunteers are needed to help pick up collections. Call Jim Williams, K5VRL, 789-0769, if you will help. The 34/94 repeater will be used and there will be a net control for this operation.

OPERATING Various officials of MORI provided some operating procedures. Sid, W5K0Z said the 34/94 machine now times out at 55 seconds. Let the squelch tail drop out sometime before 55 seconds, then you can keep talking, or another operator can do his transmission. Letting the squelch tail drop out gives another operator an opportunity to either join in or make a call. Give your call letters rather than by saying "break". Use "break" for more urgent requests.

Someone suggested reading "Operating Courtesy" in March 1977 QST, page 89.

Ken, K5VVZ announced that you must hold the enter (star) or exit (pounds) for at least one second when operating the 07/67 patch. Also, he again reminded us to identify properly. Give your call letters when entering the patch. (Also see FCC rules - raq).

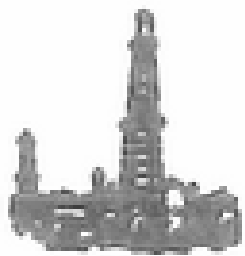
Bill, WA5RAQ

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Last December we published a story about a little girl in Mexico City who was born prematurely, required two operations and was seriously ill. AmateurRadio provided some medicine for her in less than 24 hours from Oklahoma City through the efforts of Rafael Elias, CP1GM/W5, Frank Arnold, W5PDH and many others. We have just received the news that the little girl died despite all the heroic efforts to save her.

Bill, WA5RAQ

WANTED Schematic for Globe Scout 65. I will copy & return original or pay cost of copying. Call D. L., WB5OIL, 390-8440 (Choctaw).



MID-OKLAHOMA REPEATOR INC.

AMATEUR RADIO CLUB COUNCILS by Bill, WA5RAQ

Loren, WA5CBF, President of The Ham Club, sent Joe, WA5ZNF a copy of a letter to "Leonard" with an enclosure titled "Once Upon a Council". The letter suggests a state wide council or federation for Oklahoma and praises our efforts in CORA Collector and Emitter. We are doing some of the things mentioned in "Once Upon a Council", but could we do more for Amateur Radio ? Or could we conduct an expansion program?

Joe asked me to prepare this material for C & E. The letter and part of "Once Upon a Council" are reproduced below:

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February 11, 1977

Dear Leonard:

I just wanted to put out an idea or two that has been floating around for about a year. The latest issue of Radio Club News from ARRL HQ started me thinking about it. I wanted to share it with you and others (Joe Harding, editor of Collector and Emitter and Jack Gant). I sent them a letter with the same information for consideration.

Please read the page five, topic "Once Upon a Council" of RCN. Now then, what are the chances of the various clubs located in Oklahoma banding together in a council or federation. Full members of the council would be those clubs with ARRL affiliation. Associate membership would be open to those clubs who are not. The purpose of this would be communication among the various clubs of Oklahoma. The western part of the state does not know what the eastern half is doing. The Eastern half for the Western Half.

We all have a common bond and the information of what other clubs are doing would be extremely interesting. A good example of common purpose and communication is the CORA "Collector and Emitter" for the Oklahoma City area. Five or six of that area clubs have a way of telling other hams what they are doing. Their success at this is to be congratulated.

Why can't the ARRL affiliated clubs band together and start the ball rolling on such a project? The cost of printing such a "News letter" or "Magazine" could be shared with each club. The more clubs the less the cost. The amount to be paid would be based on proportion to the size of the printed material for each participating club and the number of members of that club. Thus a small club would not have to worry about a big bill for printing. Distribution could be based by the number of club members it had. A bulk shipment could be sent to either the club President or Secretary for handing out at the next club meeting.

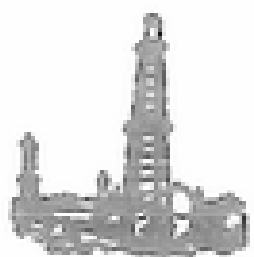
This was just an idea I had and wanted to share with you.

73's es CUL, Loren, WA5CBF, President, The Ham Club

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ONCE UPON A COUNCIL

"One day during an attack of curiosity I decided to look through the massive files of papers in the bottom drawer of the last file cabinet. Behind the last club file, the York Radio Club (IL), was a brown, crumbling folder with the title, "Federations and Councils." Inside were letters dated as far back as 1946 (before I was born!) and envelopes with 2¢ stamps affixed to them. The records included lists of officers, constitutions, newsletters and information sheets for councils and federations in many states and provinces. The oldest sheet of paper found was dated July 8, 1946 which was the constitution of the Chicago (IL) Area Radio Club Council, going strong even then.



MID-OKLAHOMA REPEATOR INC.

(Amateur Radio Club Councils, Continued)

Just what is a council or federation? It's a group of people who represent clubs in a geographical area and have a good reason for wanting to work together. The reason is often to put on a convention or hamfest. The reason usually expands to more than one, as time goes along, such as lobbying for call-letter license plates, promoting good relations between amateurs and the public, advising their ARRL division director about how clubs feel about issues, etc. Back in 1950, St. Louis (Mo) Area Radio Club Council was enlisting the cooperation of broadcast and television stations in RFI cases! In 1947, the Cleveland (Oh) Area Council of Amateur Radio Clubs was sponsoring an amateur radio display.

Almost every council's constitution states that its activities shall not interfere with the internal affairs of its member clubs. Rather, the whole idea is to develop clubs and promote cooperation and progress. The Tennessee Council of Amateur Radio Clubs gave "need for communication between clubs" as one of its founding reasons.

"To present a united front on matters of interest to its member clubs" was stated by the Indiana Radio Club Council. Federation of Eastern Massachusetts Amateur Radio Associations feels they can draw from a large number of amateurs in a wide area in order to find experts in one particular field whenever needed.

How are councils run? A representative per club; a vote per representative. Proxy or absentee votes are allowed. If an agreement cannot be reached, at least a list of pros and cons can be drawn up with the number of delegates recorded for or against. This gives the director, or whomever, an idea of how everyone feels. Directors, vice directors, SCMs and SECs may attend meetings but have no vote. Most councils are non-profit. Some have dues; some don't. Officers are elected by and from delegates of the member clubs. Meetings are bi-monthly, quarterly or bi-annually and upon the request of a director or the majority of the member clubs. Meetings are often held in conjunction with hamfests. Over-the-air meetings can be arranged. Area covered? A division, a state/province, a metropolis, with all clubs being welcome. Council bulletins/newsletters/ report of the minutes (on their own letterhead) are sent to member clubs, SCMs, directors and Hq.

Activities of the councils and federations are many and varied and don't put the burden on just one club. Divisional and national conventions, hamfests and auctions are sponsored. Emergency communications can be organized on a wider-than-town basis. Besides legislating for call-letter license plates (and for lowering their cost), lobbying has occurred for doing away with tower-height limitations (Wisconsin Council of Radio Clubs). Sacramento (Ca) Council of Radio Clubs has in the past brought about California Amateur Radio Week. Indiana Radio Club Council has set up an Indiana State Fair station. An address book of area hams was compiled and published by British Columbia Amateur Radio Associations. Money can be pooled to build/buy and license a repeater. State QSO parties are sponsored; worked-all-counties awards are handled; all kinds of friendly contests between member clubs can be thought up.....

Programs for each member club are listed in the council news bulletin which gives ideas to other program chairpersons..... Conflicting dates for hamfests, auctions, etc. can be avoided through consolidating the list of dates. This also advertises these functions ... over large geographical areas... If nothing else, a council can be an open forum for ideas to be exchanged--maybe the most important activity of all....."

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PERSONAL SKETCHES
JOE HARDING, WA5ZNF

Joe passed the Novice class test, then before he made use of the license, took and passed the General class exam. Joe didn't want to give the FCC or himself any rest, so during the next FCC visit to town, Joe took and passed the Advanced test. All of this happened in six months. Joe had entered the CB arena but he lost interest quickly. There was no challenge, he said. Joe was a student in the amateur classes at Bob's, the FAA and he listened to WIAW code. So, you see, we help ourselves when we conduct these amateur classes because Joe has been managing editor of CORA C&E since its inception. With help from the various clubs, he does the whole thing - photographic work, the printing, mailing.

Joe said he is still looking for challenges. He is now studying computers, is taking a course and plans on building one soon. Joe took a Bell & Howell electronics course and built the TV set and the instruments involved in the course.

Joe is net control for Air Force Mars on Tuesday nights. He has been net control for six years, but this is his only scheduled HF operating. He makes an occasional random contact but does not pursue DX or contests.

When it comes to publishing the CORA C&E, one of his main retirement activities, Joe is not an amateur. He began printing when he was twelve. He and his wife, Frances founded and operated a weekly newspaper in Sasakwa, Oklahoma. She is an expert typesetter. Incidentally Frances obtained her Novice license, so she knows a little about what Joe is doing. Joe served 20 years in photography work in the Air Force, retired, then worked for 13 years in Civil Service and retired again. He has kept his interest and some activity going in printing all this time.

Joe has received many compliments on the joint efforts we are doing with CORA. The C&E is widely read. Some of these comments come from across the country during HF contacts. They want to know how we have managed to get together in a cooperative effort. Joe tells them that first we are a bunch of Okies. Then he says that we all want the benefits that cooperation brings.

I asked Joe for an evaluation on the PERSONAL SKETCHES column. He said that people want to know about people. While he and Frances were operating the newspaper in Sasakwa they found that news of the local townspeople and their relatively unearthshaking activities was in high demand for material for the paper. Joe liked the SKETCHES and suggested another type of article a little different from the SKETCHES format. Joe's idea is to write a briefer summary but include more amateurs into a column, and write about the new-comers to help in the get-acquainted process and to make them feel more welcome.

From a tape recorded interview by Bill, WA5RAQ

The TORNADO & SEVERE WEATHER net of March 10th found several who checked in who didn't have a Channel 9 weather reporting map, therefore coordinates could not be given. The CODE CHART on page 20 of September 1976 C & E was made using the map data. The code Chart is only 3" x 5½", so they fit into glove compartments, pockets, etc. Xerox several copies, spray with plastic and have them handy.

..- -.- Bill, WA5RAQ

ZODIAC - - somebody who's hung up on ZOADS.

Seen on hamberger joint: "No cover charge on open-face sandwiches".

HAM HELPER- - Does your gear need repair? Bob McClain, W5QPH, a retired FAA electronics technician, needs some activity and makes this offer: I'll repair your gear for the cost of parts plus whatever you feel the effort is worth. I make no charge for the time involved. Call 528-6461 or drop the gear by 1815 NW 27th, OKC. Bring instruction book and any associated equipment such as mike and power supply.

All Clubs Co-operating To Advance Amateur Radio

MINUTES OF MEETING OF C-O-R-A BOARD OF DIRECTORS 25 Feb 77

Meeting at Red Cross Hdqtrs. Bldg. at OKC 1945 hrs. local
Pres. Gene, WB5SQC, presiding Fifteen present with three ladies
wives of K5HFN, WB5SQC and WB5KCU List attached to these min.

Treasurer's report. Treas. Ken was not present but his report was distributed to those present. Copy is attached to these minutes. Joe, WA5ZNF, said that there were still outstanding bills for about \$75 for printing, etc.

Public Relations. Hobe, WB5MLN, reported on the status of our library of materials for presentation of programs to interested non-amateurs. He says, considering the small quantity of 35mm slides now on hand, he recommends waiting a while before buying a projector (as authorized in last meeting - see minutes). Joe, WA5ZNF, suggested a scenario be written, including script and plan for showing slides and films, so that an in-experienced person could present the program by simply following the scenario. Hobe states this has already been done. He has put a small ad in the lodge section of the local papers, stating we have a program available for showing at clubs, etc. He says he is prepared to give one or two talks a week - with an eleven minute movie illustrating amateur radio activities. Bob, W5HXL, volunteered to help plan what is needed and take photos for color slides which would be representative of all amateur activities.

Ham Holiday. Joe, WA5ZNF, announced that the Chamber of Commerce has offered the services of two ladies with typewriters with LARGE FACE TYPE to help with registration desk and make identification badges for Okla. Ham Holiday. HO, WA5MLT, proposed a motion which was passed, that we see if they are also available to type the pre-registration cards with names and call signs, using a card similar to the one used last year. There was no objection to that card. These pre-registration cards to be delivered to the ladies in groups of 50 or 100 as the pre-reg. came in.

Tent for fleamarket at H-H. Fred, K5HFN, reported that he had contacted eleven companies in the OKC area regarding renting a tent. Only one had a suitable tent. For delivery, set-up, and take-down cost would be \$850 for a 75 x 150 tent or \$349 for 75 x 30. It was agreed, without formal vote, that this was too much for the H-H budget. Discussed the possibility of turning all indoors meeting rooms for use of fleamarket, and having all talks, lectures, etc. in the patio area. However, it was recognized that the sound system in the patio area may not be adequate to compete with swim pool.

Local Fleamarket. Bob, W5HXL, said that this activity, which was proposed at last meeting, "to have fun and move some junk" is set, tentative, for April 9, if Okla. Military Academy bldg. has no conflict it will be reserved.

Repeater Link-up. Rich, WB6FYL/5, (MORI) reported on a proposed plan to use 450MHz links to inter-connect a group of Okla repeaters and eventually with Texas repeaters. The main advantage of such link-up would be for weather reporting and emergency use. He requested each C-O-R-A member question his club to see if clubs are willing to participate with man-power, materials, and financial support. There was much discussion of this plan and questions asked of Rich. He used the chalkboard to illustrate many possible linkage paths across the state and into Texas. Bob, W5HXL, suggested that the group sponsoring the plan make a presentation letter, with all info. to be distributed to all C-O-R-A participating clubs to get their reactions regarding support.

VHF Repeater Conference. Tom, WA5WKV, of the Stillwater club, invited all interested amateurs to this conference. He referred to article in last issue of C & E for date, etc. Talk-in on 13/73 and 52/52.

SIGNAL MULTIPLICATION AND SECURITY

Or

"I'll Have Mine Scrambled, Please"

© 1977

Salem

The idea of eavesdropping on radio communications probably occurred shortly after the invention of the wireless and not even the passage of the Secrecy Section of the Communications Act of 1934 has changed that much. Although a person can not divulge certain information heard on the airwaves, that still does not prevent that person from hearing the transmission himself. There is no doubt that radio eavesdropping has become a big pasttime by itself, but it hasn't taken spies and law enforcement officials long to turn to electronics to insure, to some extent, the security of their transmissions by borrowing, surprisingly, techniques right out of communications systems textbooks. I first became interested in the subject in 1970 after receiving literature concerning scramblers when I circled a bingo card in an electronics journal. This was just about the time that scanners and scanning receivers were beginning their ascendancy in popularity and the law soon found out that everytime a cruiser stopped off for a cup of coffee at the local bistro, everybody was soon to know. In addition, burglars, by purchasing a pocket scanner, had found an extra lookout that didn't get in the way or demand a cut of the take. Talking in 10 codes and signals was not enough. There was a need for more security and enterprising companies provided the answer through the use of scramblers. My interest at this time was more academic than practical. I had just enrolled in a class involving communications systems and was interested in using my new found knowledge concerning multipliers by building a scrambler. About that time, the city of Norman purchased scrambling devices for communications between squad cars and headquarters. If you wanted all the action, you had to have a descrambler. The task was born. Although I never placed one of my descramblers in service with a scanner, the project did lead to a prototype that was used as an exhibit at Open House for the Engineering School. I prerecorded a message on an endless tape loop and played it through the scrambler, then into a telephone. I provided two handsets for listening, one of which was a scrambled version of the tape and an unscrambled version. It was quite simple, yet very effective and brought many questions. One person asked if I was considering making these for sale. Hum.

The fact is that security is a big problem and not only for the boys in blue. There can be no doubt that thousands of conversations are monitored yearly whether by the use of expensive electronic equipment or by someone listening on the extension. Yet, in order to prevent the gentle reader from scratching his head and grabbing his net for a trip to Norman, let me say that I, personally, have never felt the need for everyday use of this type of device. My interest in the subject waxed and waned until I recently approached by a friend who wanted a descrambler for his scanner. I obliged by providing a PC Board. That circuit will be presented after a suitable technical discussion. Just remember this: Coded transmissions are illegal on the Ham Bands and I would suggest that you use or limit your use of such devices to your own private telephone or other private line arrangements. I shall not digress any further.

The simplest method of speech scrambling is called inversion. This nothing more than mixing the desired signal to be transmitted with another audio signal known as a carrier so that the signal to be transmitted becomes inverted about the carrier. There are other techniques which involved double inversion with complex carriers and several systems that I remember reading about that include an upconversion into the RF region where the signal is processed, then down converted back to audio. The systems can get as complicated or simple as you would like to make them. My illustrations and examples will be for a simple single inversion system.

In order to properly understand how this inversion or signal translation takes place, it will be necessary to examine a quick example. The carrier and the desired signal will be characterized as two simple sine waves which will be defined as follows:

Cosine A = Carrier Frequency

Cosine B = Desired signal

The Carrier and the Desired Frequency are multiplied together and the translation takes place because the products of two frequencies is equal to the sum and differences of the two frequencies. I will cite some practical examples:

Ex 1: Mix 400 Hz with 1000 Hz and you get a product of 1400 Hz and 600 Hz.

Ex 2: Mix 1200 Hz with 1000 Hz and you get 200 Hz and 2200 Hz.

How does this take place? A little bit of simple mathematics provides the answer. When a Cos A and Cos B are multiplied together, the result is given by a Trigonometric identity dredged up from the CRC Math Table Book:

$$\cos A \cos B = \frac{1}{2} \cos (A-B) + \frac{1}{2} \cos (A+B) \quad (1)$$

Now just because we have slipped in a math formula is no reason to turn the page. Besides, this article goes on for a couple of pages. This formula is not as difficult as you think. Just about every amateur I know who has taken an FCC exam above a Technician Class has read the old adage that when you mix two frequencies together, you get the old signals back plus new frequencies equal to the sum and difference of the first two frequencies. The examples provided above and the formula show the truth of this statement. This formula is basic in communications theory and is the first step in single inversion scrambling.

Once the signal has been scrambled, how do you descramble? Simple. Just multiply the scrambled signal once again by the carrier, Cos A. If you were to expand the terms of this multiplication, you would find that the desired signal, Cos B returns with just a simple loss in amplitude. For those who profess a slight interest in more than just the application of the formula as it applies to scramblers might just recognize the right hand side of Equation 1 as a double sideband suppressed carrier signal. The mixing formula is indispensable for any of the three normally accepted methods of generating a SSB signal. An interesting project would be to take each of equations for the various methods of SSB generation and expand them. Before you begin, let me refer you to an article on the Third Method of SSB Generation in the February 1977 issue of 73 Magazine at page 52. The multiplication is shown graphically on page 53.

Now that we know what happens when scramblers scramble, how do we implement the hardware for achieving this result? Well the article in 73 describes a circuit capable of multiplying two signals and one of them is pictured below:

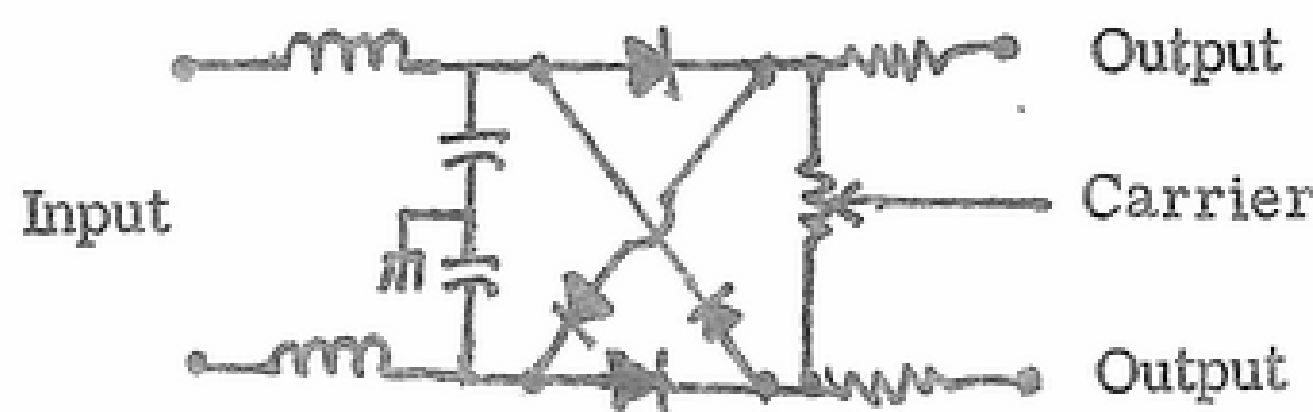


Figure 1: Simplified multiplier circuits
From 73 Magazine, Feb. 1977, p. 54
Very common circuit

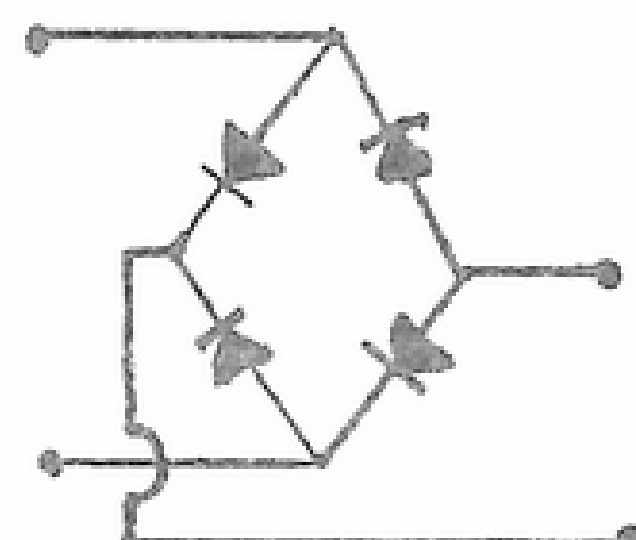


Figure 1B. Full Wave Bridge

In Figure 1, it can be seen that input is applied through a couple of chokes and the Carrier is applied through a split capacitor arrangement and a potentiometer on the output. The pot is adjusted to null out the carrier appearing on the output.

The question now is, "Has anybody recognized this circuit in its more common form?" The circuit is commonly called a ring modulator or multiplier. However, simply redraw the circuit as shown in Figure 1B and you see the ubiquitous and simple Full Wave Bridge Rectifier. The wonderful multiplying properties of the full wave bridge have been known for quite some time, so it can be seen that signal processing is not such a difficult process after all. The theory behind operation is as follows: Carrier is applied between the split capacitors and the wiper of the pot. If you were to trace the signal through the circuit, you will find that when it reaches the ground between the split capacitors, it can follow two different paths and can arrive in phase. It can also be traced to show that the same signal (out phase) can be traced to the output. By adjustment of the pot, the carrier can be nulled out so that it will not appear at the output. When the desired signal (voice or audio) appears at the input terminals, it unbalances the carrier and allows bursts of the carrier to pass through to the output in time with the desired signal. This output consists of the sum and difference frequencies. Please note that how well the carrier is suppressed depends upon how evenly matched the diodes and other components of the circuit are. A weak diode or a poorly manufactured component can unbalance the multiplier with the result that carrier appears on the output.

This is the basic operation of the scrambler. As noted above, the simplest way to return your desired signal is to multiply the signal again using a carrier of the same frequency as the encoding carrier. Anyone who has ever tuned a SSB receiver can attest to the requirement that the decoding carrier injection must be the same frequency as the encoding carrier.

A complete circuit for an audio descrambler is shown below. The circuit provides for a balanced modulator and oscillator. The circuit connects in series with the audio output from the scanner receiver (or if used on a telephone, it can be put between the phone and phone line, if so, you must provide a dc voltage to operate the phone).

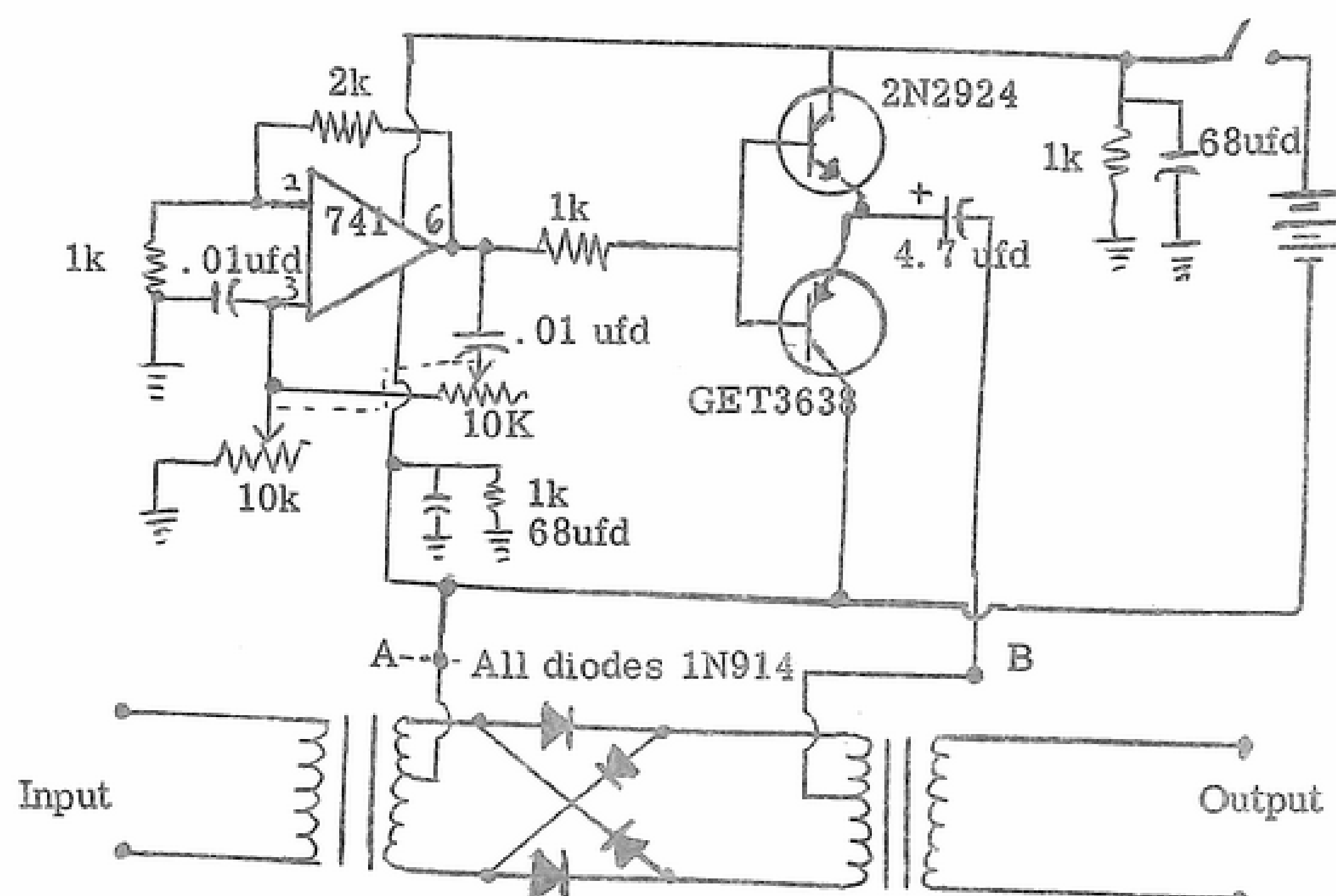


Figure 2: Complete scrambler circuit. The two 10k pots are mounted on one shaft. (Dual type). The .01 ufd capacitors are polystyrene for low temp drift. The op amp is a 741. The transformers should be identical and should have a secondary impedance of around 1k with center tap. This is not too critical. Layout is not critical. The input impedance of the transformers should be matched for your use. If it is used on the output of a receiver, it should be about 8 ohms or so. If it is used in a telephone, then the proper value is 600Ω.

It is possible to substitute your own oscillator for the one shown by breaking the circuit at points A and B and feeding in your own signal. If you want a simpler circuit, you might build up a 8038 Function generator.

What is the current status on the use of scramblers? Well, as I indicate, the City of Norman uses them in the single inversion construction. I have no doubt that if descramblers get as popular as scanners, there will be a multitude of ways for security to be increased. The most obvious method is to change the carrier frequency. It could be increased to a complex waveform which would decrease the amplitude of the demodulated signal and increase the amplitude of other spurious signals. In addition, it is possible to further code the signal by inverting the signal again around another carrier. Double inversion scramblers with complex coded carriers are available which will make deciphering literally impossible for the average listener of normal means. Microcircuits will make these add on devices to the handie talkies and other portable devices. Thus ultimately, there will be little use or future in building these devices to crack police calls. There might be a future in building them for the police. I have toyed with the idea of constructing a couple of these devices as an add on to my telephone and equipping several of my friends with similiar units. It occurred to me that it would be possible to use the touch tone pad in the telephone (if the phone is manufactured by ITT or otherwise not owned by the Bell System) or you could build up a MC14410 digital encoder and use it as the source of your carriers. If you want to make the system secure, use the 14410 and purchase a crystal off of the normal 1 mhz frequency. You could change the carrier frequency on demand or by a prearranged code by just selecting another button. I doubt that you could go past a single inversion system without having to add a few audio amplifiers.

Multipliers are among the most useful circuits in communications electronics. They permeate almost every aspect of the field. Bringing the multiplier down to audio frequencies not only provide a basic understanding of its operation, but also entertains and protects by its usefulness.

Micheal Salem WA5EPK

TO CALL OR NOT TO CALL? That is not the question in most uses of the autopatch. However, based on recent monitoring of the new autopatch on WR5ADF, it seems a reiteration of the rules might be appropriate. First, any autopatch call which addresses a business firm, individual or corporate, can be construed as "in the pecuniary interest" of one of the parties, i.e., TABOO!!! Second, any autopatch call originating from outside of the Oklahoma City Wide-Area Dial system is in violation of FCC tariffs. We cannot legally do Ma Bell out of her long-distance call charges. Either of the above violations endangers not only the autopatch system, but also the repeater license and ultimately your friendly (but fearful) trustee. So let's all live up to the honor code we amateurs so proudly extoll in comparison to our "contemporaries" on another band. TO CALL OR NOT TO CALL? If you have to ask, FORGET IT!!! Don, WA5TAW

FOR SALE OR TRADE: Two Hallicrafters HC-100 two-channel portable VHF transceivers with nicad batteries, crystals (07/67, ~~22~~22/82), rubber duckie, and leather case. \$80 or ??? Also one Motorola HT-200 UHF Handi-Talkie with nicad battery, crystals(449.1/444.1), rubber duckie, and leather belt holster. \$130 or ??? WA5TAW Don Graham 733-3044.


The next meeting of the Oklahoma City Auto Patch Association shall be held April 19, 1977. Hobe Burgen will give the program. Hobe has been working on a presentation to introduce newcomers to Amateur Radio. Hobe has an excellent collection of slides, movies and commentary to explain Amateur Radio. All interested persons are urged to attend. If you know of someone who has expressed interest in Amateur Radio, take the time to bring them out to the meeting.

The weather meeting held in February at Channel 9 was an overwhelming success. I want to thank all of those who made it a success and all of those that attended. The outstanding showing made our position at Channel 9 that much better.

Any takers on field day this year? CORA will not sponsor field day activities this year. Many of you have expressed interest in this area on a club-type basis. Give me a call if you are interested and let's see if we can put it all together.

K5JL recently purchased a new Atlas Transceiver for his mobile. It sure looks like it might be F. B. rig for mobile operation. The rig has an excellent noise blanker and super small size. I've heard that a few Kenwood 7400's have shown-up in town. I would like to see one and get the owner's comments.

Gary McCormick
President



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YAKKEY-DEE-YAK FROM THE PRESIDENT

Thanks to Carl, W5JJ, for an outstanding presentation on the misconceptions of VSWR. I think everyone enjoyed it very much and it opened the door for a lot of "discussion". Our next meeting will feature Leonard Hollar, WA5FSN, ARRL SCM for Oklahoma. Everyone will have to look up at him, because I'm sure he will be a little taller since the Kingfisher girls took the State Basketball Championship!

I haven't been able to get anyone to start a Novice class shortly, so I guess we will wait until the Fall to keep from going through the summer. We have some people that are willing to help out, but we still need someone to lead the project. There are a number of people at the Center that want to get their amateur license.

Thanks to Gene Taylor, W5GC, for becoming Public Relations Chairman of the club. If you have any special news that should get out to the public or the Aeronautical Center, get in touch with Gene.

Field Day is closer than you think. Get in touch with George, W5NTL, or Rob, W5JES. They're planning to have a lot of fun this year.

I would like to welcome all of the new club members that have joined us this year. We are approaching 150. Not bad for a general purpose amateur radio club. So far this year, we are averaging about 50 per meeting. W5PAA has been kept busy by FAA students and we will be updating this equipment before long.

Dave, W4YDY

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YAKKEY-DEE-YAK FROM DAVE, W4YDY

Back in 1971, I saw some very attractive awards for 5BDXCC and 5BWAS at the Raleigh Amateur Radio Society May club meeting and I couldn't help but envy K4CIA and W4HHN. I had been on the air for over 18 years and still had not worked 100 countries and didn't even know if I had ever worked all states. Too lazy to count. So I decided to go after both awards and be the first RARS club member to receive both awards. A grand slam! But first I had to get ready.

I set to work on putting the rig in top shape with a complete tube check and alignment. When I finished, it was twice as sensitive as it had ever been. Not bad for a twelve year old KWM-s. And the 30L-1 was tuned up a special way for 89% efficiency. The triband beam, a TA-33, was measured and a full 10 DB gain was realized after cleaning and polishing. A heath frequency counter connected to the KWM-2 gave me continuous readouts on my receiving and transmitting frequencies. The adapter in the May, 1971 QST made that possible. In the meantime the 5-band kits come in from the ARRL and I picked up some good tips from K4CIA on 10 meters one night, so I was ready to go.

Since I was working nights for a couple of weeks, I decided to hit the 10 and 15 meter bands heavy. I started on a lucky string, and 39 states and 73 countries were worked on 10 meters and 47 states and 105 countries were worked on 15 meters the first week. At least, now I was one-tenth completed. Later at nights, I would get on 75 and 40 meters when things started to slow down on 20 meters. I would occasionally look out the window and almost see smoke coming the Ham-M rotator. It was going around so much, that some of the neighbors thought I had installed my own radar set!

After five weeks of intensive operating, I was almost there. I just
CORA Collector & Emitter

needed a few more stations on 75 meters. I had really caught propagation conditions at their peak. How lucky could one be? Now I had to concentrate on 75 meters and after the sixth week was up, I had 99 countries and 49 states. All I needed was Hawaii. That would qualify me for both awards. I talked to many KH6's on the other bands, but when we went to 75 meters, conditions just were not good enough. If I could just get this one contact, I would have both five-band awards in record time.

It was about 11:00 pm and I was on 3865 kHz telling K4CIA and W4HHN about my troubles with Hawaii. And then way in the background, I thought I heard my call. We all stood by and listened closely. It was a KH6 calling me!!!! I returned his call and when he came back, his signal had jumped up to Q5 and S7. I was about to make history! It was KH6DAK in Hilo, Hawaii. But that was Lee, WA4ZNA, our RARS Vice-President. He had that call in 1959! And then I heard a loud noise and I looked out and saw my telephone pole and antennas falling toward the house and me! I fell out of the chair, it shook me so. And then I woke up laying on the floor in front of the rig. Now why did I have to fall out of that chair just as I was having such a great dream?

* * *

HOW TO DOUBLE YOUR MONEY-BACK WITH THE ACARC -OR- ATTENDING MEETINGS FOR FUN AND PROFIT.

I enjoy attending the ACARC meetings. The people I meet and engage in conversation are among some of the most interesting and informed in the world today. Plenty has been written in the recent past about the nature of the average amateur...what makes him tick...how diversified he is in his interest etc... At any rate I'm glad to be counted as a member of such a group of folks as my fellow amateur.

But I've just realized what real bargain I'm getting with my ACARC membership along with the associations...

Did you ever stop to think what you get for your dollar and a half annual dues? Besides the Collector and Emitter (worth many times that price alone); you can attend a meeting filled with associations with these fine folks...you can be treated to some excellent technical programs...you can have at least a cup of coffee, and a donut on-the-house.... and, you can operate the club station at your leisure if you desire.

Now, the monthly cost of your membership is 12 1/2 cents (1.50X12). Figure the cost of a cup of coffee at 15 cents (these days that's low) and a donut at 10 cents, for a total of 25 cents in refreshments alone (not to mention all the other fine things).

Now simple arithmetic has to lead you to the conclusion that if you attend a meeting and partake of the coffee and donuts you get a 25 cent value for just half price 12 1/2 cents...a real double-your-money-back deal.

If you carry the logic a step further, and apply the value of the C&E to the calculation, (say 50 cents), then you are getting back 62 1/2 cents every month...enough to buy your gas to and from the meeting at least.

So... COME ON TO THE NEXT MEETING...ENJOY YOURSELF...AND GET YOUR EXPENSES PAID.

73
Robby W5JES

* * *

TECHNICAL REVIEW
-W5JJ-

IEEE Spectrum, Feb, holds interest with articles on optical communications and on digital applications.

RADIO COMMUNICATION, Jan, starts things off with a simple explanation of the use of the Smith chart for feedline and antenna computations. There's an active bandpass AF filter, too. And, as always, the cream of the world's technical press is scimmed off for Technical Topics.

73, Mar, is difficult to comment upon. There's a whole flock of fair-to-middling articles but only one that jumps out and grabs you by the eyeballs..... and holds on! It's a history of amateur radio, a start of a series and written by one who was there. You'll probably find other worth-reading articles, too, depending upon your taste.

QST, Mar, shows a VFO for 7 MHz, another in the endless series of speech processors, a signal source for 1296 MHz, a review of the 1927 transmitter, stuff on recharging NiCad cells, the evolution of the quad antenna, a novel approach to linear tuning, and much FCC info.

ELECTRONIC TECHNICIAN/DEALER, Feb, courtesy of W5KE, treats VSWR quite well, marred by only one flight into the region of popular fiction.

HAM RADIO, Mar, as usual, is anything but "ham"! It has very scholarly dissertations on IF amplifier design, reduction of intermodulation distortion in HF receivers, and voltage regulators. Other articles concern an audible S-meter for repeaters, trouble-shooting oscillators, and calibrating time-base oscillators.

IEEE VTG NEWSLETTER, Feb, courtesy of W5KE, calls attention to the fact that the 27-MHz Citizens Band was established in the "Goo Band," the band assigned to Industrial, Scientific, and Medical Service, not a band assigned to the Amateur Radio Service as ignorant persons have often claimed!

POPULAR ELECTRONICS, April, talks about active filters and about full-wave loops for amateur applications.

ELECTRONIC COMPONENT NEWS, Mar, has a complete run-down on power semiconductors.....a wealth of information.

HAM RADIO HORIZONS, May(!), Gives good advice on learning the code, tells of the development of stable VFOs, has WA5TRS explain how to build an electronic keyer, describes a version of the "umbrella antenna" so popular about 1910, and slays many myths in an article on RF transmission lines.

AMATEUR RADIO, Jan, has two articles on antenna couplers. It starts an eight-part series on radioteleprinters.

CQ, Apr, has W6SAI tell about the new Millen 90673 Antenna Bridge; no mention of the cost, but it sounds like a honey! There's a review of the Palomar R-X Noise Bridge, too. W9EGQ touts the use of low-Z headphones with amateur receivers. The "April Fool" article is amusing!

WORLD RADIO, Mar, has good advice on traffic handling. Also, the article on electric shock may be life saving information.

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AMATEUR RADIO OPERATING TRADITIONS
-W5JJ-

This month's account concerns radiotelegraphy, mostly because many
CORA Collector & Emitter

radio amateurs start as Novice Class operators and thereby imprint their "on the air" practices almost indelibly at this period. Remember the Rule of Primacy in learning? First-learned practices often are those most retained.

Because of this, its important that a neophyte operator be guided into practices compatible with long-standing operating traditions. Each person assisting a newcomer to obtain a license has a deep obligation to provide sage operating advice along with technical and code-learning assistance.

What do you pass on to this newcomer? Well, he must start his radio operation by a call, be it a CQ, a reply to anothers CQ, or a scheduled call to or from a friend. Lets tell him first how to call a General Inquiry, an invitation for a reply from any station. (And, contrary to what that newcomer may have heard from phone lids, its not QRZ!)

Heres a suggested General Inquiry call:

```
KA  CQ CQ CQ CQ CQ de WD5XAA
    CQ CQ CQ CQ CQ de WD5XAA WD5XAA
    CQ CQ CQ CQ CQ de WD5XAA WD5XAA K
```

Lets see what was done and why. KA is the Attention signal. You can leave it off, but its a good way to start an initial transmission. CQ was sent five times. An old ploy to avoid too-long CQs is to mentally off on the fingers of your free hand as you key that call; when you've reached the last digit on the hand, send de and start your call letters! At first, you're more concened with having a listener hear the CQ than your call letters; so you send your call only once. The second go-around, you send your call twice. On the third, you want to make certain that your call is understood; so you send it three times. Thats enough! Then you send K. Thats the signal for Go Ahead.

To reply to another operator's CQ, a suggested procedure is this:

```
WD5XAB WD5XAB WD5xab de WD5XAA WD5XAA WD5XAA AR
```

That AR at the end of your call signifies you've not yet established communication. After communication has been established, you'll use K at the end of each exchange.

A scheduled call would follow closely the procedure used for a reply to a CQ. You may, though, have to repeat the series several times before communication is established. That is, you make the call as shown, then listen. If no reply is heard, you run it through again.

If an operator calls CQ and receives a reply, then he has the obligation to initiate the conversation. Also, its his privilege to terminate the exchange.

Note the use of the word conversation. Thats what it should be! Try not to let your contacts fall into the category of stereotyped, stilted exchanges.

But you'll have to terminate that contact sooner or later. Try to bow out gracefully. Avoid, though, too much wordiness! A simple thanks for the chat (and thats not QSO=means I can communicate with... directly), wish him luck, give him your best regards (73), and then sign out. This time, instead of K after your call letters, you use SK to signify its your final transmission. If you're leaving the air, you might add CL, which means you'll not be available to answer any other station that might call you.

Next month (if the editors concur) we'll talk about what a beginner might want to say on his first few radiotelegraph contacts.

Minutes of the Meeting ACARC Friday March 4, 1977:

The Meeting was held at the Aeronautical Center. Was opened by President Dave W4YDY/5 at 2004 CDT.

The Club Call Books for 1976 were given away at the meeting by a drawing conducted by Lloyd WB5HUD, and Suzan W4YAKB/5. WB5GZU, Charlie won the DX call book, and CP1GM/5 Rafael won the US Call Book. Rafael, by the way is a new member of the club, and we welcome him to our ranks.

49 Members and guests were in attendance for the meeting.

President Dave made the following appoints (willingly accepted?):

Program Chairman - WB5HUP Lloyd

Public Relations - W5GC Gene

Dave asked for volunteers for license classes, and received none... anyone interested...with Daves track record you may be appointed next meeting, so come forward now guvs.

OLD BUSINESS:

K5HFN Fred presented an anemometer to the group which can be held into the wind for MPH measurements. It is available to Amateurs through Gary England for \$18.75. Fred also presented his ICOM rig box which he fashioned from a carrying case from Sears costing \$5.00. Very cleverly done...and worth while investigating from you folks who carry your portables with you on the road.

ARRL life memberships are not available through affiliated clubs, and any one seeking the life membership nomination should contact ARRL direct.

W5JJ, Carl, reported not too much interest from the other clubs vis-a-vis the bumper sticker project. The ACARC re-affirmed our interest in the project providing the other clubs in CORA are.

W5NTL, George, and W5JES, Robbie, rendered a report on Field preparation as follows: WE ARE READY!!!!. We have no volunteers as yet and are prepared to man the positions ourselves... The QRP position is now down the drain because Robby's order for an Argonaut turned into an order for the Triton IV. Any suggestions???

W5HXL, Bob, reported the flea market proposition has matured to the point where it will now be held (rain-or-shine) at 0900-1400 on Saturday, April 9, 1977 at the Oklahoma Military Academy 36th & Grand.

Is anyone interested in an AUCTION AT THE SAME TIME? Contact HXL

Robby has certified to the ARRL a membership of 144 full members for the continued affiliation.

NEW BUSINESS:

Carl, W5JJ, alerted the group concerning a bad question on the Novice exam which will be counted correct no matter how it is answered.

Elsewhere in this issue you will see an ad for W5QFH offering technical assistance on your rig. Bob is well qualified in the field and is recently retired...this is a great opportunity to get some help with that knotty problem at little or no cost. No commercial.

President Dave suggested that we will have a RFI program next month. Y'ALL COME!!!!!!

PROGRAM:

Carl, W5JJ presented the program for this meeting on SWR, Antennas and certain misconceptions...once again proving the fact that VSWR and associated subjects bring out much-much discussion where ever

they are dicussed... Thanks, Carl, for a very interesting evening.

The meeting was adjourned for the coffee and donuts mentioned before at 2146. It was a very good meeting for all.

Robby, W5JES, Sec.-Treas.

* * * * *

The following is from Ed, K5LIL who recently had a rather enlightening experience in the area. It is reproduced from a manual used in the Avionic Engineering area of the FAA. The jist is self-explanitory:

"Many failures have been due to handling of the complementary metal oxide semi-conductor (CMOS) circuits. Failures have resulted from exposing these sensitive circuits to electrostatic voltages or other differences of potential in test and/or assembly.

Procedures normally used to protect semi-conductors are not adequate for protection of MOS type components due to the very high electrical resistance of these devices. The source which most commonly destroys MOS devices is the human body, and voltages of 20,000 volts may be developed by merely walking across the floor. Significant potential differences may be developed at the work bench in handling of ungrounded test equipemnt and tools.

In order to adequately protect MOS devices precautions normally used for semi-conductors should be followed. In addition, no two objects, including fingers, test equipment, and tools should simultaneously contact an MOS device unless they have first been placed in electrical contact with each other. This contact should have a resistance path of one megohm or less and be maintained for several seconds prior to contact with the MOS device.

Virtually all semi-conductor devices exhibit the above susceptibility to some degree, and it is recommended that all avionics maintenance facilities be reminded fo the importance of using proper techniques in handling semi-conductors."

73 Robby W5JES

Notice to Club Members: If your rig is sick and you don't have the time, equipment or inclination to fix it, call Bob McClain , W5QFH, at 528-6461. Cost will be for parts and anything you care to offer for the effort involved. If you're broke, I'll fix it for nothing. This offer is for amateurs only. I don't fix CB rigs.
Bob McClain

* * * * *

FOR SALE: Waters Mfg coaxial bandpass filter Model 373-2 for 144-148 MHz. Will handle 100 watts. Equally effective for receiving as for sending. \$12.00, W5JJ, 789-3788.

FOR SALE: Coax relays, Type N connectors, 24-V DC coils. Really husky construction. \$12.00 each, W5JJ, 789-3788.

* * * * *

GETTING TO KNOW YOU.....

In our radio contacts we often miss discovering interesting facts about our fellow amateurs. Heres a sidelight on one of the QCWA members in central Oklahoma.

Never pick a quarrel with Ivan, W5HFU!! Why? Hes a champion pistol shot. Using a Colt .45, Ivan could designate which ventricle of your heart he was going to perforate and make good his prognostication!

How about your coming up with interesting sidelights concerning other amateurs? We'd all like to know each other better!

WANTED: Touchtone pad suitable for ICOM-230, which has a 9-pin jack for accessories. Major Clarence C. Drumeller, W5TKC, 2947 A Summerall, Ft. Eustis, VA 23604 (or phone W5JJ, 789-3788).

FOR SALE: Dual power supply for Hammarlund Super Pro Receiver. \$10.00 or best offer. W5JJ, 789-3788.

FOR SALE: Power supply for BC-639 receiver. \$5.00 or best offer. W5JJ, 789-3788.

FOR SALE: DeVry (Bell & Howell) 5" oscilloscope. DC to 5MHz. \$45.00
TRVM (Transistor Volt Meter) \$22.00 Call 721-4156, Ray Murray

WE LOAN AND PAY MORE FOR ANYTHING OF VALUE

INCLUDING, GUNS, RADIOS, TAPE PLAYERS, ETC.

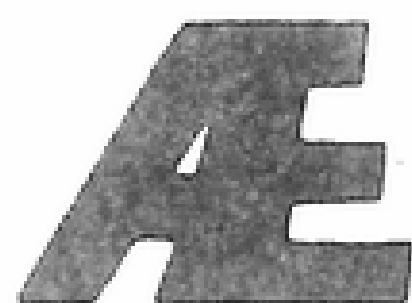
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AMATEUR RADIO SERVICE



Amateur Electronics

IN STOCK: LARSON 2 METER ANTENNA WITH MAGNETIC MOUNT
KENWOOD TS-520 TRANSCEIVER
YAESU MUSEN FRG-7 COMMUNICATION RECEIVER
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PARAMETRIC X-BAND RADAR RECEIVER "FUZZBUSTER"

TRADE-INS ARE ALWAYS WELCOME. ALL MAKES OF AMATEUR EQUIPMENT REPAIRED. A COURTEOUS INVITATION IS EXTENDED TO "ALL" TO VISIT OUR NEW AMATEUR STORE IN THE REDING SHOPPING CENTER. A PUBLIC ADDRESS AMPLIFIER IS AVAILABLE TO LOAN AT NO COST. ASK ABOUT THE CODE CLASS NOW BEING CONDUCTED AT THIS STORE INCLUDING THEORY FOR AMATEUR EXAMINATIONS

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Okla. City, Okla. 73109
(405) 634-8844

YAESU
Kenwood

Wilson 2 Meter Handy Talkies

Wilson & Sonar
Business Band

CORA "JUNQUE" EXCHANGE

SATURDAY APRIL 9, 0900 - 1400 hours at OMA, 3535 GRAND BOULEVARD, North East.

(Same place Autopatch had it last year)

Bring the lemons you want to get rid of - Bring green stuff for the goodies you cant resist - or just come out to eyeball the goodies and shoot the bull. W5HXL



Are you an RV addict? Want to plan some semi-(dis)organized campouts? Several have talked about doing something like this - shall we get rolling?

A campout is planned at Lake Carl Blackwell concurrent with the VHF Repeater meeting at Stillwater March 26. This will be history as you read this.

For starters - lets try one at Roman Nose State Park the weekend of April 16 & 17, and see what developes. Be ready for a weiner roast Saturday night - BYOG. If interested, be there or contact Bob Ashby W5HXL. 2837 N W 19 OKC 73107 phone 942-5375.

HELP:

#"4/8"

Having power line noise problems?

Arley, WB5NKC is experiencing more than his share. If you are having problems, contact him at 681-0534 to compare notes, type of interference, and hopefully work out some cure.

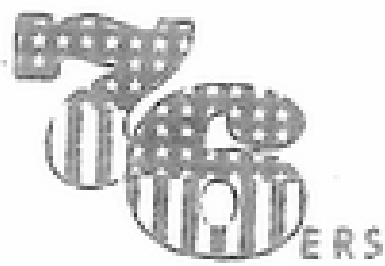
LAWTON - FORT SILL HAMFEST

The 233 registered Amateurs and YL's had a very enjoyable weekend at Montigo Bay. The ICOM IC-215 Grand Prize was carried off by Danny Roberts, WB5ORE from Nikona. CORA members took their share. Pre-Registration went to Ray Long, W5TY, with his YL Dorothy taking one of the ladies prizes. Other winners included Bill WA5FWD, Jerry W5MCJ, and Jim WA5LKS. The lovely YL's taking home ladies prizes included Ruby w/WA5OPP, Garnett w/W5KE and Daisey w/WB5KCU.

LADY HAMS - - - - -YF'S- - - - -XYL'S

How about taking an active part in the Ham Holiday this year? The committee for the Ladies Activities would like ideas from you. We would like to know the type of activities in which you would participate, during the Ham Holiday. Some of the things mentioned so far; Graphanalysis, Arts & Crafts, Book Review, Contests, Wine and Cheese Tasting. Give us some ideas! How about calling Rosey Halley, 381-2228 or come to the CORA meeting and give us your name and/or ideas. Our committee has not had a formal meeting yet (one is being planned soon) so get in on the planning for the Ham Holiday 1977!

FOR SALE: Heathkit Two'er, HW-12. Radio Shack 12volt 1.75amp Power Converter & Telephone Amplifier. Bob, W5HXL 942-5375



THE BICENTENNIAL AMATEUR RADIO CLUB



Minutes of the meeting of March 15, 1977.

President Ken Newberry, WB5PYM, opened the meeting at 7:05 PM.

Sect. Jim Townsend, WB5VCB, gave a report on C.O.R.A. regular meeting of Feb 25, 1977.

Suggestions were made to sell Bumper Stickers through Clubs belonging to C.O.R.A. A show of hands indicated the Clubs interest in purchasing these stickers.

Report was given that Gary England was making available for purchase of a hand held wind speed indicator. Further reports will be forthcoming on these purchases for about \$ 18.00 to \$ 20.00 per unit, depending on the numbers or quantity ordered.

Pres. Newberry reported that our Club was to help with the next publication of the Collector & Emitter. About 8 people are needed to help on Thursday night, March 24. For time & place contact Pres. Newberry.

The Lawton Ham Fest will be this week-end, Sat & Sun. March 19 & 20.

Don, K5UKP, was appointed Chairman of committee to see about getting some 10" patches made similar to our small patches.

Treasurer's report was given by C.Y. Chandler, WB5TEG. His report included new prices of Q.S.T. and W.I.A.W. schedules for code practice.

C.Y. reported that Woodson Park was available for use as the site of the Club Field Day. Parking and area will be restricted as to co-ordinate with their ball games. Date is June 24, 25, & 26. Starting on a Friday.

Members & Guests introduced themselves from their positions from the floor and gave their call letters if they had one. All guests, students and members were made welcome and asked to come and visit anytime in the future.

Meeting dispersed for coffee and fellowship at 7:45 PM.
MEETING RECONVENED AT 8:10 PM.

Club membership was opened up at this time. Paul Aspen became a member of the Club during coffee break time.

Pres. Newberry asked anyone that has information for the Collector & Emitter to see him.

Coy, K5LMG, suggested that anyone interested in using the Call Book to call him at home. He will be glad to look up addresses for anyone. No objections was given to Coy keeping the Call Book at his home.

Coy gave a report on Field Day of 1976. We were in 3rd A Class and made a good showing. Placed top in Okla. in our class. We had 15 participants in our group.

Suggestions were to use two separate sites, a little distance apart for better operations.

The purpose of Field Day was explained for use of emergency situations throughout different areas.

A list of materials was made up which will be needed for the Field Day activities. These include: (A) Generators, (B) Gasoline, (C) Tents or Campers, (D) Food Services, (E) Antennas, (F) Logs & Cross Checks, (G) Clocks, (H) Lights, (I) Sign (Poster) & Flags, (J) Shift Operators.

Coys report was well received and appreciated by all members and guests.

An error in the Jan. minutes was brought to the Sect's. attention, as reported incorrectly, Bill Riddles, WA5MZW, was announced as a Delegate for the program Committee. This should have been reported as a Delegate to the Prize Committee.

Motion made and seconded to adjourn. Motion carried.

Meeting adjourned at 8:55 PM.

Jim Townsend, WB5VCB
Sect.

FROM THE PRESIDENT

Well, I must say time sure passes quickly. Seems like the period between Collectors and Emitters become shorter and shorter. As they say, time passes quickly when you are having fun.

There has been a lot of activity since the last issue to occupy my time. This last weekend was a good example. the last part of the C.W. DX Contest was on and the Lawton Hamfest was on. It was hard to choose between the two, since I wanted to work the contest and go to Lawton also. The only answer was to work the contest Saturday and go to Lawton on Sunday.

Band conditions for the contest were the best in quite sometime. All bands were open most of the weekend. 15 was really open to Europe Saturday morning. 40 was good to Hawaii and Japan Saturday night and Sunday morning. I also worked a VR3 on 10 meters Sunday afternoon.

I was glad to see the Lawton Hamfest work out well. There was a good crowd on Sunday, the only day I could go. C.Y., WB5TKG, and I drove down Sunday morning and really enjoyed meeting many people and looking over the flea market, which had been pretty well picked over the day before.

We got to see Abe's, WB5AUF, Slow Scan TV display which is very impressive. If you haven't seen it, be sure to catch it when you can.

In closing, if C.Y. comes to your house and says he isn't hungry, don't invite him to dinner. For a man that wasn't hungry, he sure ate heavily at the buffet on Sunday, hi.

73
Ken, WB5PYN

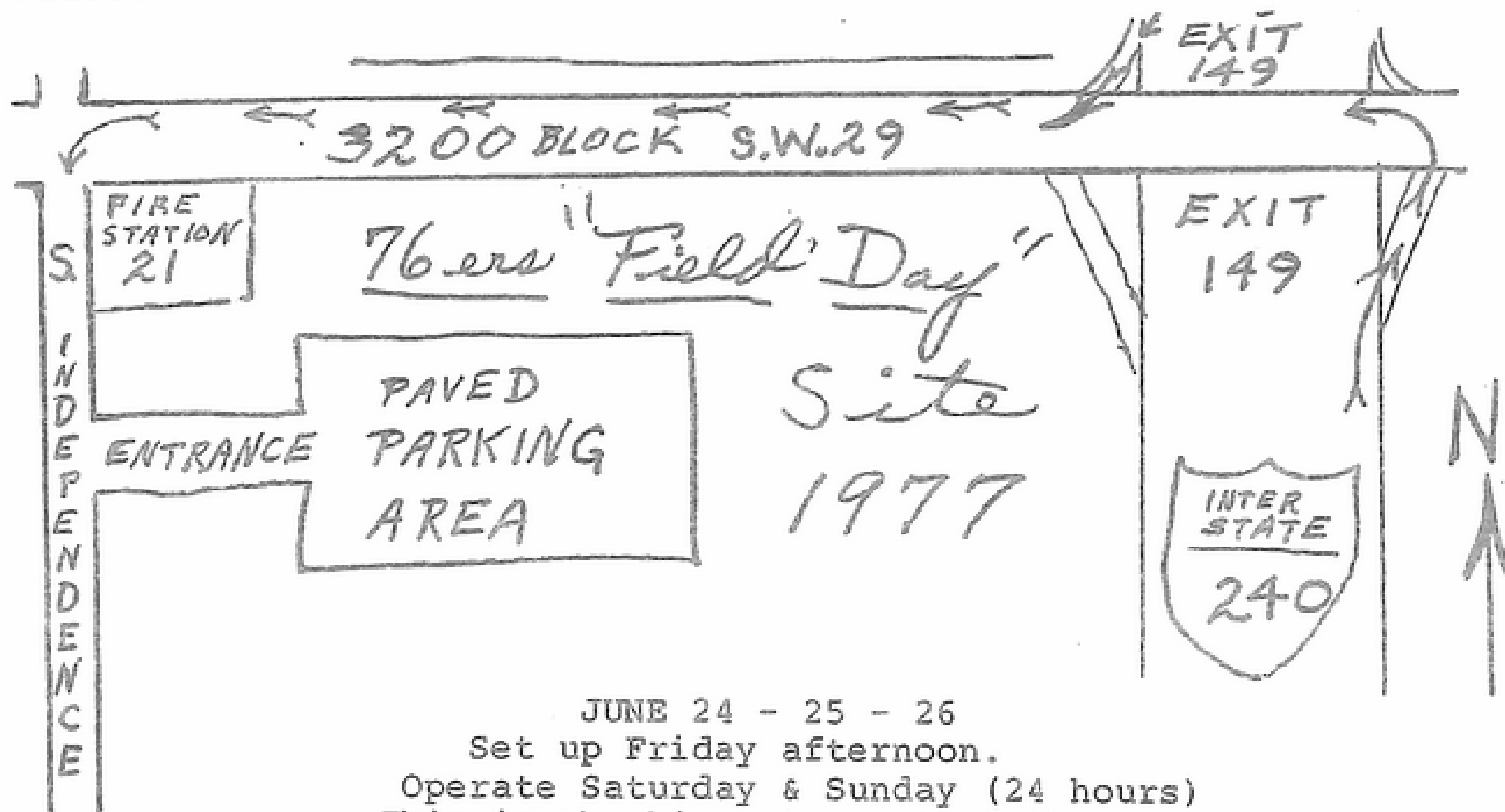
FOR SALE OR TRADE: Collins 75A-1 receiver in excellent condition.
Dick, WB5TMW, 685-2867

CORA ROSTER ADDITIONS & CORRECTIONS

K5CLS	Dewitt Roland	3420 Paradise Dr	Spencer	
WB5LER	John Sneed	4017 Leonhardt	Del City	
K5OMM	Larry Reusser	1832 Cedar Ridge	Mustang	
WB5PTJ	Roger Rylott	9105 Salsbury Lane	OKC	
WB5QPI	H. B. Zachry	3505 Rolling Lane	MWC	732-2888
K4UTK	Carroll Ayres	808 Brierlane Road	Del City	
K5YVL	Patricia Gilliam	4040 SW 25	OKC	
K5YVN	Robert Gilliam	4040 SW 25	OKC	
WB5ZND	James Whited	3224 N. Peebly	MWC	732-4682
WB5ZOI	Lloyd Wright	3120 NW 63	OKC	843-6811

C.Y. has the membership cards and receipts completed and ready to be picked up at club or school, for the following "76ers": Joe J Couch, W L Adams, Jack Allison, Paul Asplin, Mike Cartwright, Howard Kinsley Roy W Klotz, Phillip W Pack, Lee Smith, Chuck Wilhite and Alden L Woods.

73 - C Y - WB5TKG



JUNE 24 - 25 - 26

Set up Friday afternoon.

Operate Saturday & Sunday (24 hours)

This is the biggest event of the year!

Emergency Power Test - learn how to perform when the chips are down!

WOODSON PARK - OKLAHOMA CITY

"76ers" QRA?

WITH NEW CALLS, 1 x 2 CALLS (N5RA already), WN TO WB, WB5X-- FOUL UPS, ETC., IT IS NOT EASY TO KEEP THEM STRAIGHT, BUT HERE IS THE WAY WE HAVE THEM NOW. IF YOUR CALL IS NOT LISTED CORRECTLY, OR IS NOT ON THIS LIST, LET US KNOW NOW, SO WE CAN GET IT RIGHT. WE SHURE DON'T WANT NO ERRERS!

WD5ABT	BOB ODOM	WB5SVN	JACK O. IMAN
WD5AGT	JOE PAUL COUCH	WB5SVU	CHRIS MOSLEY
WB8AQZ	RICH BARBER	WB5TDW	JOE T. RAMAGE
K5AWD	WILLIAM F. JONES	WB5TEC	ROBERT L. HARTMAN
WD5BDS	JOHN VAN HAUEN	WB5TEL	ALLEN MOSLEY
WD5BLM	RON G. LEWIS	WB5TFM	CLIF DAY
WD5BMP	JOE J. COUCH	WB5TKG	C. Y. CHANDLER
WB5CPR	CHUCK WILHITE	WB5TMW	RICHARD BAKER
K5EA	BILL TUCK	WB5TNO	BOB L. WALL
WA5EBG	A.C. "JEFF" JEFFRIES	WB5TRF	LEE FRANKLIN
WB5HUP	LLOYD KIRK	WB5UAP	DONALD H. DUCK
WB5KGP	KEVIN S. JOHANNES	K5UKP	DON D. JONES
K5LMG	COY DAY	WB5UVW	THOMAS HAWKINS
WA5MZW	BILL RIDDLES, JR.	WB5VAE	JACK LOVEGROVE
WB5ORY	KEN L. BURDICK	WB5VCB	JIM TOWNSEND
WB5PNV	GREG PECK	W5VZU	ROBERT E. KELLEY
WB5PYN	KEN NEWBERRY	WB5WLS	FRED C. MILLER
WB5PZG	JOHN L. OLTMANNS	WA5YGX	BILL BEAMER
WN5QOJ	MIKE CARTWRIGHT	WB5YHG	EDIE DAY
WA4QXB	MARVIN C. MOORE	K5YKD	EARNEST G. WOLF
WB5SIK	JAMES T. KERR, JR.	WB5YKD	JOE SCHILLING
WB5SRX	O. J. WATKINS	WB5ZGP	HEINZ SCHILLING
WB5SSX	BOB J. WALL	WB5ZKV	LAWRENCE A. LANGER
WB5SUV	ROGER D. WALKER	WB5ZLP	JAY T. TREAT
WB5SVH	DEE COLLINS	WB5ZLQ	EDWARD B. HALE
WB5SVJ	JOHNNIE L. HAM	WB5ZLU	BOBBY D. STUBBS

73, C.Y. WB5TKG

THE ZANY NEWS FREQUENCY

Joe, WA5ZNF

Dear Zany News Frequency:

I don't know if you get any output from the local Shawnee members but if you haven't, I would like to take this opportunity to inform you of our recently installed repeater, WR5AOQ, now in operation on 146.31 in and 146.91 out. It is a low powered rig but suffices for this area. We stand ready to assist in the event of severe weather.

I noticed the small map at bottom of the front cover of the March issue of CORA C & E and the S.E. looked rather bare, if Shawnee was placed in this hole it would look more complete.

We have 24 stations in this area that are active and participating in the activities of weather watching.

We enjoyed the meeting and slides presented at KWTW and had four or five attending from this area.

We also have a A.R.E.C. net on 146.52 each Friday evening at 2000 hours CST, we invite any checkins that would desire to participate. This is sponsored by the SHAWNEE RADIO CLUB and is called the -- Pottowatomie A.R.E.C. Net.

We're continuing to grow and update our equipment. Just didn't want you to forget the CORA members in this area.

Yours for better amateur fraternity.

BOB, K5LZF

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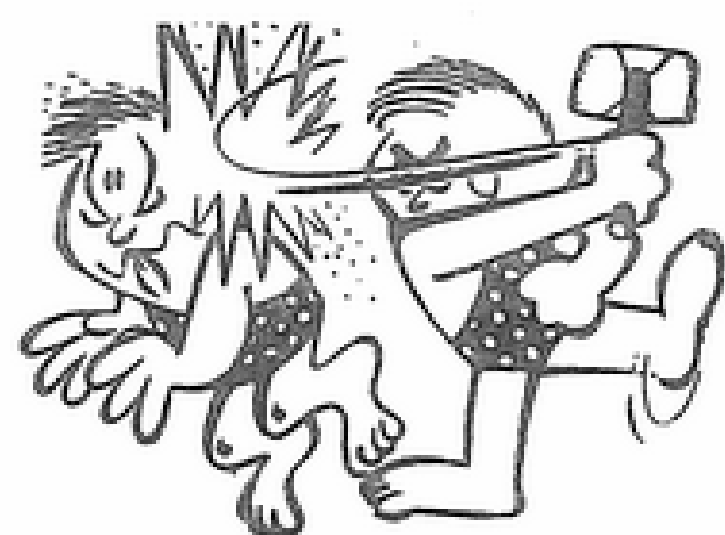
Hey, that shows that we are getting out and people are reading this publication. Shawnee area is important to CORA, there are 15 copies of C & E going in that direction. We need to hear from other clubs and/or individuals who read us. Tell us when we are wrong or negligent and come join CORA as a club to lend weight to what we are trying to do to further amateur radio and let's fraternize.

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MAKE NO BONES ABOUT IT -- Us old printers who used to do everything by hand used shaped and polished cows bones to fold papers without wearing blisters on our hands and to insure a sharp, flat fold. Well there hasn't been too much change around here for the mailing volunteers still fold C & E by hand and have been using "bones" made from old window shades. BUT, no more. Thanks to the handi-work of Odis Wilson, WA5LNX, (from the area mentioned above) we have some super, hand finished, hard, walnut "bones" for the crew who mailed this issue and the ones to follow. TNX from all of us.

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SECOND HAND, BUT FROM A RELIABLE SOURCE -- I hear that G. C. Bandy, Phone 794-3414, has a heavy duty public address system that he will lend, free, to most any non-profit organization -- Hope it is available the first weekend in August for HAM HOLIDAY, that's a pretty big party and with 500 people packed in their PA system seems to sag. If he doesn't answer his phone, drop by his new store in Reding Shopping center. Also check with him about code classes.



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.

