

The eKilo - What

Monthly Newsletter of the San Angelo Amateur Radio Club

Jan 2013



As I write this, SAARC is just now looking forward to a new year. My hope is that we will all be able to look back upon 2013 as having been a very good if not one of our best years. I believe that one of SAARC's goals for this year should be to lay the groundwork for a revitalization of Amateur Radio in our area. I have

heard several pundits theorize that Amateur Radio will fall victim to the internet and cell phones. If you look at the increase in the total number of licensed Ham operators, this is not happening. The first quarter 2012 growth in new license applications was 30% higher than in the same period of 2011. In October 2011 we broke 700,000 licensed amateurs in the United States. When I was first licensed in 1957, there were only 200,000 of us. I would like to see us make a real contribution to keeping this trend alive in 2013.

Looking around at our club meetings, I am struck by how old we, as a group, we have become. I would like to see us focus on attracting more young people. I personally plan to visit area schools to try and introduce students and teachers in our hobby. Establishing radio clubs with operating stations in schools would certainly help in keeping Amateur Radio and SAARC higher in the awareness of our community. I would appreciate your thoughts and ideas on how we might best be able to get something like this under way. Our first Special Event this year will be the celebration of Weatherman's Day on Saturday February 9th from 9:00AM-2:00PM at the club house. We will have a chili lunch and invite everyone from the NWS office to join us. Please drop by if you can.

Being relatively new, both to San Angelo and SAARC I might not be aware of everything that needs to happen regarding the club and its recurring obligations and events. If you see something on the horizon that has not been addressed, please call it to my attention and I will make every effort to make sure that it receives our attention.

Again this year we are looking for the best possible site for Field Day 2013. Most importantly, it must be available for the weekend of June 22 and 23. It is always good if we can access the site on Friday as well. Please bear in mind that it is good if the site has public traffic close by. This gives us a great chance to introduce the general public to Ham Radio.

Yet another objective that I would like to accomplish this year is to put together an SAARC directory which would include a picture of all club members and a brief profile of each person i.e. specific interests within the hobby (rag chewing, traffic handling, building/restoring equipment, DXing, digital, preferred operating frequencies, etc.). I believe that each of us will probably find someone who shares some of our specific interests that we didn't previously know about.

I am looking forward to a good 2013 for both SARC and Amateur Radio in general. My contact information is:

Tom Austin, Jr. K4OTM Phone: 325-835-7601
101 Bryant Ranch Rd. Cell: 602-821-8851
San Angelo, TX 76904

73 & good propagation,
Tom, K4OTM

Meeting Minutes 01-10-12

January Meeting Minutes de Gary Chaffin/W5ETJ

The regular meeting of the San Angelo Amateur Radio Club was called to order by outgoing President Joe Kent/W5UI on January 10, 2013. Incoming President Tom Austin/K4OTM was introduced as well as the remaining officers for calendar year 2013. The officers for 2013 are: President – Tom Austin/K4OTM, Vice President - Joe Kent/W5UI, Secretary/Treasurer - Bob Freeman/KD5PIX, Emergency Coordinator – Mike Dominy/KD5URW, Activities Manager – Hughbert Robinson/KC5NPC, Grounds Chairman – Marcus O'Quin/KF5GKC and W5QX Trustee – Charlie Campbell/KC5EZZ.

As usual, the Christmas party was an unqualified success and Billy Roberts/W5NPR our ARRL West Texas Section Manager and his lovely wife were in attendance. After introductions, the meeting was turned over to the new President who shared some history about himself and how he came to become involved in the ham radio hobby. Tom was first introduced to ham radio and obtained his license in 1950 making him one of the longest continuously licensed hams in our club. Tom informed the membership that he plans to visit local schools to try and interest young people in our hobby with the ultimate goal of starting ham radio clubs in those locations.

The financial report was not available to be read at this meeting. Mike Dominy/KD5URW announced the monthly ARES meeting will be held Thursday, January 17. He also announced the annual SKYWARN training session will be held March 30 at 0900 at the Trinity Lutheran Church location on YMCA Drive. Donations for door prizes are being solicited and you may contact Mike to drop off those items or bring them to the February or March SAARC or ARES meetings. It was noted that the 146.940 repeater was off-line for a period of time but is now up and functioning thanks to Charlie Campbell/KC5EZZ.

New Business: The annual National Weatherman's Day Special Event Station will be operating out of the SAARC clubhouse on Saturday, February 9th starting at 0900. Lunch will be provided and all are welcome to attend and participate. The annual San Angelo Stock Show and Rodeo parade will be held on Saturday, February 16th. Gary Pittman/KE5TXL is on the Parade Board and will provide additional information. David Lewis/W5DLL requested that this information be provided earliest so that those who wish to participate can make preparations. Joe Kent/W5DLL stated that he has ordered flowers for the funeral of club member and silent key Ken Pearson/KD5NXX. The funeral is set for Friday January 11 at 1400. Graveside services will be held at Lawnhaven Memorial Gardens. Our condolences to wife Elta/KD5NXY; Ken will be greatly missed.

Pete Norris/KG5SS has volunteered to assume the duties of Editor for the eKilo-What. He is currently acquiring the needed software and previous Editor Gary Chaffin/W5ETJ will provide templates and any assistance requested. Thanks to Pete for getting this important publication back up and running.

The "Good of the Order" drawing was won by Gary Pittman/KE5TXL and he donated his share to the club; thank you Gary.

The program began at 2015 with Jack Roberts/KB5TMY providing a demonstration of digital scanner programming. During the demonstration he provided handy tips on programming locally used frequencies. Jack said the Police Call 2002 publication would be a handy reference for programming scanners and to keep an eye out for copies of these at hamfests and used book sales.

The meeting was adjourned at 2033 hours.

HF Nets of Note de Gary Chaffin/W5ETJ

NET	DAYS	LOCAL TIMES	DIAL
Concho Valley Ragchew	M-T-W-T-F	1800 - 1900	3825
Texas Traffic Net	S-M-T-W-T-F-S	0830 - 0930	7285
7290 Traffic Net	M-T-W-T-F-S	1000 - 1200	7290
7290 Traffic Net	M-T-W-T-F	1300 - 1400	7290
Texas Traffic Net	S-M-T-W-T-F-S	1830 - 1930	3873
Central Gulf Coast Hurricane Net	S-M-T-W-T-F-S	1900 - 2000	3935
Texas ARES Net	Monday	1930 - 2000	3873
Big Bend Emergency Net	Sunday	0830 - 0930	3922
Texas Trader's Net	Sunday	0900 - 1000	7245

Club/ARRL News

Club Repeater News

On January 7th the 146.940 Repeater went off the air for the first time since it was installed in 1995. I traveled to the site and found that the repeater was indeed dead. I took the repeater back to my shop and found that the 10Volt power buss was shorted. After some late-night troubleshooting, I was able to isolate the problem to a shorted tantalum capacitor on the oscillator multiplier board that was buried in the receiver casting. This is a rare occurrence but capacitors do short. Keeping in mind that the birth date of this "newer" repeater was the 1970's. I replaced the cap along with a cooling fan, re-tuned the repeater and receiver, hopefully giving it a little bit better range in the process. Despite an on-going evening shower, I was able to get the repeater back to its resting place on the 10th floor of Concho Hall. Thanks to the assistance of my wife Anna, we were able to get the cabinet lifted back to its' resting place on top of the duplex cabinet. (whew)

During my visit to the Angelo State University Facilities Department head office to obtain access to Concho Hall, I visited with the University Facilities Management folks and am happy to report that the Club repeater WILL NOT need to relocate to Willeke Hill. The University is currently in the process of renovating Concho Hall High Rise. When completed, this building will be used as leased space for overflow events that may take place around our city like the rodeo, university events, etc. As we San Angeloans are becoming aware, the room capacity of our local hotels is shrinking due to the oilfield business.

If you notice that there is a problem with a repeater please do not hesitate to contact me. Also don't forget that the club does own the 145.270- Repeater. This repeater is located at Willeke and has extremely good coverage through out our city and county.

73

Charlie Campbell
KC5EZZ
W5QX Repeater Trustee

---West Gulf Division Announces New Annual Division Awards---

Here is another reminder of the newly created West Gulf Division Annual Division Awards. There are two primary awards: Ham of the Year and Young Ham of the Year, which will be complimented by a third award, the West Gulf Division Excellence Award.

Divisional Awards will be presented at the West Gulf Division Convention each year. Nominations for 2012 Award Winners will be accepted until April 15, 2013 for presentation at HamCom in June.

Nomination forms for each nominee (by category) must be supported by at least three ARRL members on the award nomination form, a minimum 150-word statement and any available supporting documentation. Other rules do apply and can be found on the WGD website at www.ARRLWGD.org.

The Division Awards judging panel consists of four (4) ARRL members, selected by each of the Section Managers in North Texas, Oklahoma, South Texas and West Texas Sections. The Section Manager may opt to appoint his/herself to the committee. The fifth judge is selected by the Division Director and may reside anywhere within the West Gulf Division. Neither the Division Director nor the Vice Director will participate in the vote. Please remember, the deadline is April 15th!

---ARRL Membership Numbers on the Increase---

David Woolweaver, West Gulf Division Director, announced that ARRL memberships at the end of 2012 were at a record high, and commented that it is interesting to see an increase during a down economy. It is encouraging to see ARRL growth. Although memberships and license numbers are not one and the same, although both on the increase, an email from Jim Musgrove K5BZH discussed the fact that there is an alarming number of new licensees that never become active in any part of amateur radio. We all need to do our best to see that these newly licensed hams become a part of our clubs, our radio activities and become useful amateur radio operators. Let's not "plant the garden and then fail to follow up with regular water". In a telephone conversation with Ron Hardin KB5HGN Abilene, who is President of the Key City ARC, I mentioned that some clubs offer newly licensed hams a free first year membership in their respective clubs, and that this might be an incentive for newcomers to become active. Although numbers are encouraging, they don't always tell the whole story. Let's keep them going!

For Sale**NEW ITEMS ADDED**

Coleman Powermate Generator, 6,250 Watt, excellent condition. Used one time for Field Day (approximately 36 hours). With wheel kit—\$400.00; Yaesu FT-736R UHF/VHF Base Station w/new tone board—\$500.00; Kenwood 2000—\$1200.00; Yeasu FT736R—\$450.00; ICOM IC910H all mode transceiver—\$1150.00; Heathkit Station monitor SV-614—\$100.00. Contact Joe Kent/W5UI at joew5ui@gmail.com or (325) 896-2038.

Kenwood TS-930SAT HF transceiver, \$400; Mirage KS-1/440 70 cm preamp, \$75; Icom AG-25 mast mount 2 meter pre-amp, \$90; Cushcraft AP-8 8-band trap vertical with radial kit \$100.00. Contact Glenn Miller/AA5PK at aa5pk@outlook.com or (325) 949-4775 (evenings).

**Scanner Jack's Corner**

Scanner Jack will return by March

The Brazos ARC Hamfest, March 23, 2013, is estimated to have almost 200 tables.

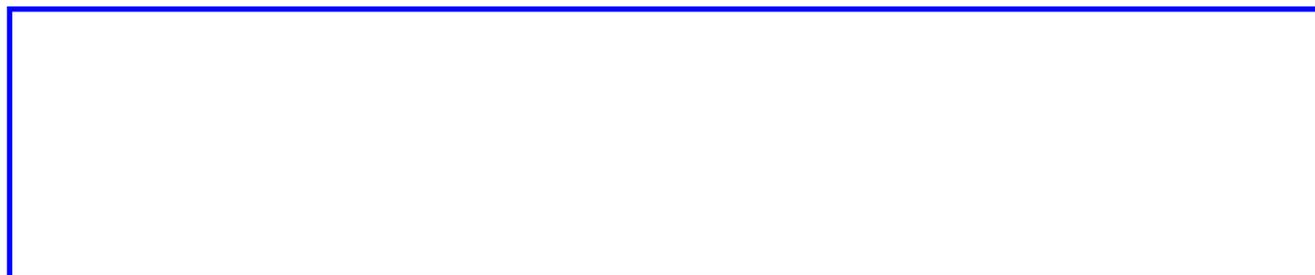
Among many demonstrations and presentations, Rick Hiller/W5HR will present "The G5RV Antenna System—An Analysis (The truth, the whole truth and nothing but the truth; so help me, Louis Varney)

Recent Programs

Dec'12	Christmas Dinner—Eatin Meetin
Jan '13	Scanner Jack/KB5TMY—Scanners
Feb '13	

Upcoming Hamfests & Conventions

Date	Event	Location	Information
03/08/2013	Green Country Hamfest	Claremore, OK	http://www.greencountryhamfest.org
03/16/2013	Williamson County ARC's Hamfest	Georgetown, TX	http://www.wcarc.com
03/16/2013	St. Patrick's Day Hamfest	Midland, TX	http://www.hamfest.w5qgg.org/index.html
03/23/2013	Greater Houston Hamfest	Rosenberg, TX	http://www.houstonhamfest.org
04/20/2013	Ham Expo	Belton, TX	http://www.tarc.org/hamexpo/



Emergency Communications

de Mike Dominy/KD5URW - Emergency Coordinator

Tom Green County ARES Net

Meets every Monday night at 8:30 CST (2030 hr) on the 444.350 MHz (PI 162.2) (N5SVK). The net can also be reached by EchoLink at WB5VRM-R or Node 412402. Other frequencies are announced on the Concho Valley Net at 8:00 pm.

ARES Net Report

Date	Net Ctrl	Check-ins	Time	Freq
11/05	KD5URW	15	14	444.350

A PLL PROBLEM

By Pete Norris, KJ5SS

Some time ago my ICOM-725 would lose sensitivity for small portions of each HF band. The noise level would drop for several tens of kilohertz and then come back to its previous level for another portion of the band. The drop in noise level was thought to be caused by the RF amplifier and preamplifier noise not being mixed down to the IF amplifier chain. Typically, the noise level was high for about 512 KHz and low for about 35 KHz. This pattern was repeated throughout all HF bands. Signals could not be heard in these “dead” zones and the transmitter could not be activated in CW mode in these zones.

A call to ICOM was disturbing: First, they no longer provide parts support for the 725. Second, the hourly rate, I believe, was quoted at \$84.00/hour plus S&H. Conclusion? Try to fix it myself.

To locate the most probable failure area, the analysis went like this: The problem was common to both receiver and transmitter. The dead zone seemed to slowly increase in width over several years. These considerations lead to the idea the problem was component degradation and not a catastrophic failure, probably in an analog portion of the radio. More specifically, a mixer may not be receiving the proper input in the dead zones.

Although the manual was written to describe installation and operation, a block diagram and schematic were provided. The block diagram shows the radio is divided into four functional groups. The Power Amplifier contains a linear amp, drivers and output band filters. The Main Unit contains the receiver, receiver filters, signal processing for the various modes, modulation circuits and front panel interface circuits. The Phase Lock Loop (PLL) Unit contains a CPU, a crystal controlled oscillator, a section called a DDS and five PLLs. The DDS was not described in the manual but is thought to be a “Direct Digital Synthesizer” and processes digital signals from the CPU, which, in turn, receives input from the main tuning dial which sets the operating frequency in 10 Hz increments.

One of four PLLs is selected by a VCO switch to establish the receiver/transmitter gross operating frequency range. These four VCOs cover a range of over 30 MHz. A fifth PLL controls a VCO which is common to all bands. This VCO feeds into the first four loops and the DDS controls this loop. Going on-line, it was found other ICOM products contain variable capacitors that degraded over time in PLLs and that needed replacement. Seemed the PLL Unit was the place to look and, in particular, the common VCO circuit.

A PLL consists of three elements as Seen in Figure 1. A phase detector compares the phase of to signals (θ_R & θ_0) and produces a difference signal called ($\theta_R - \theta_0$) in the diagram. This signal is proportional to the difference in the phase of a reference signal (θ_R) and the VCO signal phase (θ_0). A constant (K_D), to account for the magnitude of V_D , is included. The V_D signal then may passed through a low pass filter and amplified. The output of the amplifier/filter, V_C , is used to control a VCO forcing the frequency, or multiple of the frequency, and phase angle of the VCO to match the reference. These circuits may be analog only or have analog and digital components.

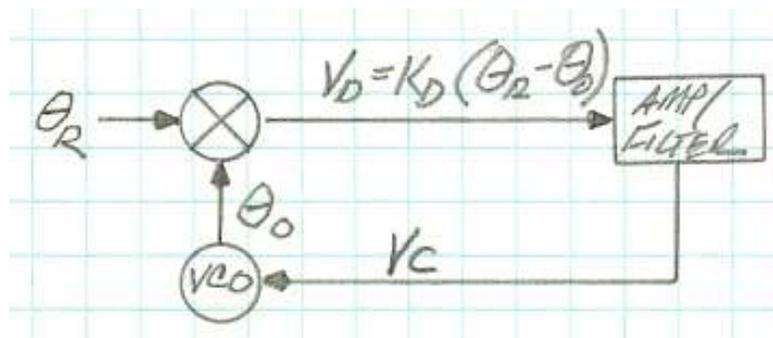


Figure 1. A PLL

The portion of ICOM-725 schematic of interest is shown in Figure 2. Only the components of interest are labeled. The mixer is IC17. The reference signal (θ_R) is 61.44 MHz derived from a crystal controlled oscillator. The oscillator is the master oscillator for the set and was available in a "standard" option or a high stability unit. The output of the mixer (V_D) is filtered and amplified and shaped by Q32. This signal is further processed in the DDS with data from the CPU. The DDS analog output at PO is again filtered and applied to voltage variable capacitor, D56. This is shown as V_C . The VCO is Q29 wired as a Colpitts oscillator. D56, C116, C117, C118, and L30 essentially determine the frequency oscillation. C118 is a coupling cap and L31 in an RF choke. C119 and C120 provide the feedback for the oscillator. The output of Q29 is sent to another mixer creating a signal for the transmitter and receiver sections. Another output is buffered and filtered, becoming the VCO input, θ_0 , for mixer IC17.

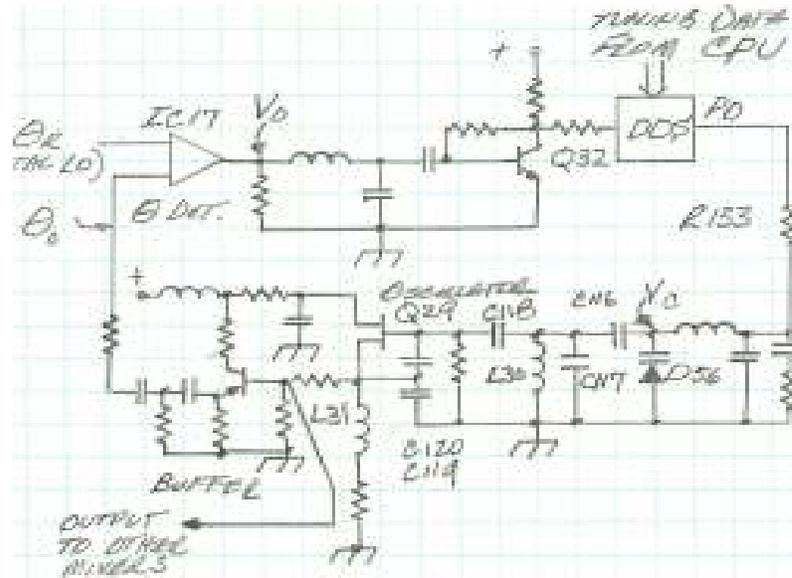


Figure 2. Portion of the IC-725 PLL Unit

The voltage variable capacitor, used here as a tuning capacitor, is reverse biased. As the bias increases the depletion layer capacitance becomes smaller. The capacitance variation may be as low as 4:1 or up to 10:1 over the allowed reverse bias range. In this case, the tuning range is quite low as whatever amount the diode capacitance varies is diminished by the series and parallel combination of capacitors in the gate circuit. From measurements of the zones of satisfactory operation and the dead zones this VCO tunes over 500 KHz, or so, supporting the comment that D56 provides a limited tuning range.

To test the analysis, a scope probe was connected to R133 on the PO side and the voltage observed as the tuner was advanced up the band. The voltage would steadily increase with tuning until the dead zone was reached and lock was lost. It appeared that the VCO could not be tuned to the upper frequency required. As there are no variable capacitors for adjustment in the circuit, L30 was examined. L30 is an air core coil consisting of perhaps 10 turns of 16 gauge enameled wire, the ends being inserted and soldered into the circuit board. A dollop of wax covered the coil. Some of the wax was removed and the coils separated slightly. After several adjustments the VCO would tune the entire range with out losing lock!

A happy ending: problem solved with no soldering, component searches, component purchasing or replacement. Good has triumphed and evil has been driven out.

Questions or comments? Call Pete, KJ5SS at 325-617-4387.

Concho Valley Two Meter Net

<u>Date</u>	<u>NCS</u>	<u>Check-ins</u>	<u>Duration</u>
11/05	KB5TMY	20	13 min

This net meets every Monday night at 8 p.m. on the club's 146.94 repeater. All amateurs licensed to operate on that frequency are invited to participate.

Concho Valley Open FM Repeaters

2 Meter		70 centimeter	
145.27-	San Angelo PL 88.5	441.750+	San Angelo PL 162.2
or PL 100.0 for local transmit		442.250+	San Angelo PL 162.2
146.72-	Eldorado PL 100.0	444.225+	Robert Lee PL 162.2
146.88-	San Angelo PL 88.5	444.350+	San Angelo PL 162.2 (Echo-Link Node)
146.94-	San Angelo PL 103.5	444.875+	Brady PL 162.2 Linked to 444.225+
147.06+	San Angelo PL 103.5		
147.34+	Robert Lee PL 88.5	147.30	San Angelo PL 88.5
146.90-	Brady PL 162.2		
146.62-	Brady PL 114.8 (Echo-Link Node)		

Membership Renewal

Membership renewals are due in January 2013. Prices are as follows:

- Regular memberships: \$20
- Each additional family member: \$5
- Seniors (age 65+) and Juniors (under age 19): \$10
- Renewal package deal: 5 years for \$80
- Associate members: \$20



P.O. Box 4002
San Angelo, TX 76902-4002

Get all the latest club news on the World
Wide Web at www.w5qx.org

2012 SAARC Officers:

President - Tom Austin/K4OTM
Vice President - Joe Kent/W5UI
Secretary/Treasurer - Bob Freeman/KD5PIX
Emergency Coordinator - Mike Dominy/KD5URW
Activities Manager - Hughbert Robinson/KC5NPC
Grounds Chairman - Marcus O'Quin/KF5GKC
W5QX Trustee - Charlie Campbell/KC5EZZ

SAARC Monthly Meetings: 2nd Thursday,
1930, Clubhouse, 5513 Stewart Lane

Annual Dues: \$20, Sr. & Jr. \$10

The Kilo-What: Edited by Pete Norris/KJ5SS
325-617-4387, norrispeter26@gmail.com

Article submission deadline: Ten days prior
to monthly club meeting.



NEXT MEETING: 2/14/2013
**PROGRAM: TINY TRACKER GPS POSI-
TION ENCODER**