

SCOPE October 2008 ❄️

A newsletter by and for the Palomar Amateur Radio Club of San Diego, CA, USA.

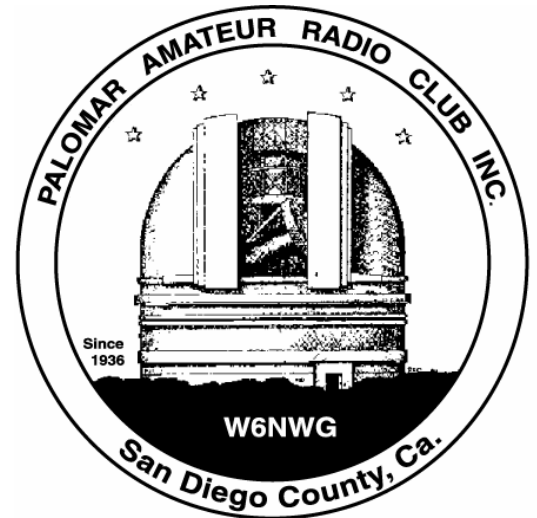
Club Meeting

1 October 7:00pm at the Carlsbad Safety Center

Annual Club Auction

Board Meeting

8 October 7:00pm at W6GNI QTH



President's Message

August was a very busy month for me and September is promising to be the same.

The September 3rd program featured a revisit of D-Star, presented by Ken Cohen (KI6HRH) and Cecil Casillas (WD6FZA), which brought us up to speed on what has happened in the last year. The October 1st program will be the annual PARC Auction. And yes, we have contingency plans in the event that our regular room is not available this year. Because of the expected duration, the door will open to sellers around 6:00pm and to buyers around 6:30pm. The auction will start 7:00pm. Also on October 1st, PARC will announce this year's nominating committee.

Like our great nation, PARC will have a new president next year. I have served for four years and I believe that I have done what good I can and it is time for a new person to lead the PARC charge. Our board of directors has done a great job for that last four years, maintaining membership when most other clubs have declined, providing a mix of good monthly presentations and four very well-attended Field Days.

Our board of directors has worked diligently to keep cost down and the club solvent. More importantly, they kept your president on an even keel when "colorful" personalities made unreasonable demands

regarding PARC assets and/or attempted to include PARC in their personal disputes.

I would like to publicly thank each and every PARC board member that has served with me, for a job well done. In doing so, though, I must remind and admonish you that it is the PARC membership that will decide who will lead and administer the club for the next year. I ask you to look amongst yourselves to determine who has continually participated and supported the club and who has only talked about it. Ask yourself whom has been a diligent steward of the club and whom is merely critical. Seek out the steward and encourage him or her to stand and lead PARC for the next year. Then let the PARC nominating committee know.

On November 5th, nominations will be made for the elected PARC board positions: President, Vice President, Secretary, Treasurer, Director #1 and Director #2. On December 3rd, PARC members will hold a vote for any contested offices. At the end of the meeting, we will have a new PARC President.

Also on October 3rd, 4th and 5th, the Amateur Radio Emergency Service (ARES) will be needing volunteers for the Miramar Air Show. Contact acting Section Emergency Coordinator Steve Early (me), AD6VI, at 619-461-2818 or ad6vi@arrl.org, if you think you can help. I hope to see you on October 1st. Bring a friend!

Steve Early, PARC President. 🏠

Membership Report

New Members Joining PARC:

KI6SMT, KE7TQ, K6SML, KI6SAU, and N6KTC.

Be sure to greet these new members when you see or hear them on the repeaters.

In addition, 5 reinstated their membership; and N6PIG and KI6LLC each renewed for 5 years. Thank you, thank you.

We get a number of new members that download the application form from the club web site. This is great, and the web site is a good way to tell potential members about the club. Do you know our web address? Palomararc.org Think - Palomar amateur radio club dot Org.

Al
W6GNI

Goodie Givers for September

KG6RCW Tom

September Issue Fold & Staple Crew

Last Month's Fold & Staple Crew

KB6NMK Jo KD6TUJ Dennis

W6GNI Al & Kathy

WA5ACE Sonny

We could use one or two more on the list of Fold & Staple folks. Stop by the membership table and volunteer. A social work exercise, and get a participation point too.

Licensing and Class Information

Register 5-7 days in advance for the following test sessions.

PARC Testing is in Carlsbad on the 2nd Saturday of the month at 9:30am at the Carlsbad Safety Center.

<http://www.kiloxray.com/vec/>

Test sessions may be cancelled if no one pre-registers.

EARS Testing is in Escondido on the last Saturday of the month at 9:00 am at the LDS Church.

The address is 1917 East Washington Avenue, Escondido , 92025.

Contact Harry W6YOO (760) 743-4212 or W6YOO@amsat.org.

Radio Club Resources

Check out these great local radio clubs on the web at the following addresses.

<http://www.fallbrookarc.org/>

<http://www.sddxc.org/>

<http://www.earsclub.org/>

<http://roars.net/>

<http://www.wa6bgs.org/>

<http://n6six.50megs.com/>

Show And Tell – November Meeting!

PARC welcomes members to bring items to the meetings for a "show and tell". These items could be projects in progress or completed old and/or restored equipment, short items of interest, or unusual items, and happens 5-10 minutes prior to the evening's presentation.

Contact Dennis KD6TUJ at (760)802-2573 or email at KD6TUJ@amsat.org to coordinate.

Since the club auction will take up all our time for October, please plan on bringing your show and tell to the November meeting instead.

Do you have a story about a recent exciting contact?
Contest?
Special event station worked?
Funny story?
Know of a San Diego area amateur radio group that is worth mentioning?
Send it in to the SCOPE!

Ham4Less.com

1(800) 230-0458

1(760) 945-9503

call us—we may have it!

Arrow Antennas

Hustler Antennas

Opek Antennas

Gordon West books

Workman Products

Anderson Powerpoles

SPECIAL:

New G5RV Antenna

(57 ft total length)

\$ 44.00

California CQP Contest Announcement

by Rick "The Rhino" N6RNO
@Tehama for California QSO Party,
October 4-5, 2008
Where will you be?

Get you and your station tuned up for the start of the next contest season. Join me (N6RNO the new chairman) in the premiere state QSO party, the California QSO Party.

This is a ton of fun and has great rewards: real lumber plaques, wine, certificates and for just 100 QSO's and some cash you can have the ever popular CQP T-shirt. For you county hunters, this is a great chance to complete the WACC (Worked all California Counties)

...and the whole WORLD will be looking for CA stations !!!

Key Information

When: 1600 UTC October 4, 2008 to 2159

UTC October 5, 2008

Where: 160m, 80m, 40m, 20m, 15m, 10m, 6m, 2m

Modes: CW, SSB

Logs Due: November 15, 2008

Website: <http://www.cqp.org>

"The Victorian Internet" by Tom Standage **A Book Review by Charlie NN3V**

This book is a must read for any ham radio operator.

From the confirmed DX champion, to the dyed in the wool CW contester, or the newest tech licensee, everyone will find amusement and wonder in this book's pages describing the incredible impact Morse code and telegraphy had on the world in the mid 1800s.

Mr. Standage takes the reader on a jargon-free, can't-put-the-book-down amusing narrative on the triumphs and foibles among many early inventors who contributed to the development of telegraphy and the codes and ciphers that led directly to today's internet wired world.

Starting in 1746 (yes, the mid-eighteenth century) with French monks who painfully demonstrated the instantaneous transmission of electric current along a one mile pair of electric cables, the book describes the

amazing interconnection of European cities using optical telegraph towers, many located on high ground points that retain the name "Telegraph Hill" to this day.

Pioneered by the French, the optical telegraph systems permeated everyday living, giving rise to the first commercial distance communication efforts. But it was not until 1832 that Samuel B Morse, then a portrait painter by trade, happened upon the inspiration for telegraphy while discussing distance communications with a fellow steamship passenger returning from Europe. Years earlier Morse had suffered the late receipt of news of his wife's death (news from his home town of Boston took five days to reach Washington DC where was staying). The discussion of electromagnetic phenomena for distance effects with the fellow steamship passenger sparked Morse's interest in developing a "code" and the means to transmit news to distant locations. As they say, "the rest is history".

The book describes the many parallel efforts that transpired simultaneously with the development of the earliest telegraphs. Morse's apparatus was far simpler than European versions, however competition was fierce. In England, Cooke's system was adopted by the railroad companies at first, eventually to be nationalized into the British Post Office service.

Fascinating account is given of the effort to connect Europe to North America using telegraph wires. The pioneer effort of Wheatstone (for whom the Wheatstone bridge is named) nearly sank the effort due to Wheatstone's incompetence. Fortunately cooler heads prevailed, and in August 1857 the two continents were connected with the first transatlantic cable. The frenzy that ensued soon had the world interconnected to such an extent that diplomats toasted one another with the expectation that wars and strife would become a thing of the past thanks to instantaneous communications!

The book presents lively chapters dedicated to "Codes, Hackers, and Cheats" describing how for every idea of useful telegraphy use, a scam soon followed (sound familiar?). "Love Over The Wires" describes how amorous encounters and weddings were arranged via telegraph, and how the family of
continued on page 4

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telegraph operators became an eclectic and highly paid stratum of society in mass demand for their code skills. "War And Peace in the Global Village" recounts the beginning use of telegraphy to deceive and confuse military and commercial competitors, giving rise to the era of disinformation!

As the use of telegraphy mushroomed, interconnecting countries, businesses, and even families, Morse, Cooke, and others started looking for ways to automate telegraphy and improve the efficiency of information transmission. The era of bandwidth expansion ensued, the system became automated, and the family of telegraph operators lamented the loss of skills among the newcomers to the code transmission business!

The last two chapters of the book, "Information Overload" and "The Legacy of the Telegraph" describe how the advances of telegraphy paved the way for the telephone, FAX, and the modern day means of communications. For example, Henry Baudot pioneered the electronic optical scanner for one automatic telegraph system, and in the process created the Baudot code on which the ASCII protocol for modern day internet communications are based.

Many anecdotal references are present throughout the book. For example, professional telegraphers in the major telegraph offices referred to lesser operators in rural offices as "hams". A "ham" was considered an inferior code transmitter!

The book closes with a vivid description of the demise of telegraphic service in the United States when Western Union ceased all telegraph service in 2006, and then paints a vivid contrast between the Victorian Internet and our current internet wired world. In essence, all that is old is new again!

"The Victorian Internet" by Tom Standage is a 200 page eminently readable paperback that lists for \$14.95, is available from Amazon.com for \$10.17, and can be purchased used online for \$7.61. The book is a fun, fast read, full of fascinating information about a technology near and dear to the amateur radio hobby, and will complement any serious library of technology information. I rate it a "must read". 
73 de NN3V

Minutes

Palomar Amateur Radio Club Board of Directors September 10th 2008

The meeting was called to order at 7:09 PM by Vice-President Dennis Baca KD6TUJ. The meeting was held at the home of Al Donlevy W6GNI. Present at the meeting were:

President Steve Early AD6VI
Vice-President Dennis Baca KD6TUJ
Secretary Loren Hunt AD6ZJ
Director #1 Tom Martin KG6RCW
Membership Al Donlevy W6GNI
Treasurer Bob Birch KG6RGI
Scope Editor Michelle Thompson W5NYV
Repeater Site Mike Pennington K6MRP
Guest Conrad Lara KG6JEI, 2008 Field Day Chair

---Treasurer's Report

Bob KG6RGI distributed the report. Total Assets are \$14,107.72. The prepaid dues are \$7,029.00. The Scope ad fees need to be billed to the advertisers. Bob KG6RGI will call Jo KB6MNK and see about it. A motion to accept the report was made by Loren AD6ZJ and seconded by Dennis KD6TUJ. Motion was carried.

Secretary's Report

Loren AD6ZJ presented the Secretary's report. A motion to accept the report was made by Tom KG6RCW and seconded by Mike K6MRP. Motion was carried.

Discussion Items

1. Annual Auction

- Runners – John WB6IQS, Tom KG6RCW and Conrad KG6JEI
 - Auctioneer – Art KC6UQH
 - Bob KG6RGI will record
 - Setup at 5:30, seller door 6:00, buyers door 6:30 meeting starts at 7:00 with brief announcements and auction starting at 7:15
 - EARS and Six Shooters nets have been announcing the event to their members
 - Tom KG6RCW will bring a generator and lights in case we get locked out (like last year)
- ##### 2. General Meeting: Annual Auction.
- Future Topics:


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- Need to include more HF and DX topics and less repeater topics
- Auction is set for October what will be November? December is the party
- Membership Report: Presented by Al W6GNI
- Current club membership is 361.
- Repeater Technical Report: Presented by Mike K6MRP
- Building #4 (old generator) has been wired and 3 of the repeaters have been wired into it.
- The lights are working in the cargo room but needs a switch
- The lights are on now working in the battery building
- We need to replace the 12V 20A power supplies- Loren will check on availability and will provide one 42A open frame supply to Mike to test
- Need 42" tall 19" rack, with slide outs would be preferred
- Repeater Site Report: Presented by Michelle W5NYV
- Conrad KG6JEI was the only one who made it to the last work party. We need to do a better job communicating availability for work parties.
- We still have a Site Chair vacancy and need to find someone to fill the role that has some construction experience.
- Painting of the green building will be on the list for the November 9th work party
- We need to come up with a list of priorities of items of things to be done before winter sets in.
- Tower painting needs to commence soon but the one quote for painting was deemed too high, required the purchase of much more paint (overspray) and lacking detail. Steve, AD6VI will check his sources from work as they regularly paint with two part epoxy. Tom KG6RCW will check a local paint shop to find qualified painters.
- Stripping off unused cables and antennas will need to be handled as time permits but likely separate from the painting at this point.
- Guy cables still need to be re-tensioned
- We need a PSA at the club meeting or in the Scope or both about proper repeater usage, specifically Kerchunk type activity that is caused by sitting on the PTT button.
- New Business:
- 1) Nominating committee
- Needs to be announced at the October meeting
- Michelle W5NYV will ask at the Friday Lunch

Bunch and get names of volunteers

- We have incoming QSL cards and blank PARC QSL cards. Loren AD6ZJ will act as the W6NWG QSL manager for FD.


Place of next Board Meeting: Home of Al Donlevy W6GNI 

PARC Annual Auction

By Loren AD6ZJ

If you have never been to the annual club auction you are probably wondering how on earth an auction of old ham gear is fun and exciting. You may also be thinking of staying home that night as you don't need any more stuff cluttering up your garage or your shack. Let me try to persuade you otherwise.

Yes it is true there is a lot of old "junk" at the auctions but as they say "one ham's junk is another ham's treasure". There are also lots of good bargains to be found even if you don't know what you're looking for. For instance, at the 2001 auction there was a box of partial spools of 22 gauge insulated wire that had no bids. Eventually KC6UQH, the auctioneer spoke the words I have come to love "will anyone give me a dollar?" and I raised my number and won the box. To this day I am still using that wire for ground radials and portable antennas and I still have about 1500 feet remaining! Speaking of Art, he runs the auction like no other. He is not a fast talking auctioneer but instead will dive into great detail about various auction items as the night progresses. It is truly an entertaining experience and Art makes it worthwhile and fun to come to the auction even if you have no intention of buying or selling.

Some auction items seem to like the auction as much as club members. There is an ancient oscilloscope that has been to the auction five years in a row. It goes home with a new owner every year. Will it be back again this year? I usually don't know exactly what I'm bringing to the auction until just a few days before. I start setting stuff aside that is taking up space or might have value to others. Sometimes the stuff I win inspires me to build something. One year I purchased a used power triode and during the course of the following year tried to build an HF amplifier around it. By the following auction I had lost interest in that project and took the partially finished amp to the auction. Who know but one year I might find a completed amp built from those parts! 

Club Classified Advertisements

Personal equipment ads are free to members and could be bumped after 3 months. Make up your ad like the ones on this page and send to
SCOPE@PALOMARARC.ORG.

Commercial ads in big boxes: \$2/col. inch/month. We will squash your ad copy to the number of inches bought.

(10.1) Switching Power Supply, MFJ-4225MV, 25 amps, continuously variable voltage. Dual panel meters for voltage and current. NO HASH! \$50

Dual Band VHF-UHF antennas. Mini-mag mount, window mount and HT mount \$15 (for all 3)

Assorted Coax adapters of all sorts. All new. Estimated value over \$85. Asking \$25

SWR meter High-Tech mini-size with panel meter. (no power reading) \$5

**"Hear It" Noise eliminating Speaker by GAP. Works great on H.F. noise, Adjustable \$50
Kirt Salisbury KK7QT
Phone: 760-994-0127**

(8.24) FOR SALE : AMERITRON AMPLIFIER AL-80B 1 KW OUTPUT Linear Amplifier 70 % Efficient with 3-500 ZG Tube 60 thru 10 Meters Very clean no scratches 120 or 240 VAC INPUT \$800.00 OBO Call Bayard K6GAO at 858-755-5507.

(8.24) FOR SALE : Kenwood TH-K2AT 144 MHZ FM Transceiver Like new Priority Scan, 100 Memory Channels, Weather Alert. 5 Watts, Rec. 136.000 MHZ to 174.000 MHZ , TX . 144 to 148 MHZ. Double Super Heterodyne Receiver. Charger and book. Asking \$75.00 OBO Please Call Bayard K6GAO 858-755-5507.

**(7.28) Hi-quad by Higain. New in the box except partially assembled at field day 2008. New and never used but about 25-30 years old.
Don Johnson (760) 613-5154 WD6FWE. Make me an offer. Proceeds to be used to get new field day antenna.**

(6.8) Wanted: Cushcraft R7 vertical multiband antenna for HF use. Contact Mickey 760-744-2034 or mickeykc@juno.com.

Statement of Ownership, Management, and Circulation (From PS Form 3526)

1. SCOPE	2. 0765-30	3. 09/24/08	
4. Monthly	5. 12	6. \$3	
7. Palomar Amateur Radio Club P.O. Box 73 Vista CA 92085 San Diego County			
8. Al Donlevy 1651 Mesa Verde Dr. Vista, CA 92084			
9. Palomar Amateur Radio Club P.O. Box 73 Vista CA 92085 Editor Michelle Thompson 5379 Carmel Knolls Drive San Diego, CA 92130			
10. Palomar Amateur Radio Club P.O. Box 73 Vista, CA 92085-0073			
11. None	12. No Change		
13. SCOPE	14. 09/08		
15. Copies	Average	09/08	Notes
a.	303.	300	Printed
b1.	0	0	PD out of Co.
b2.	276	270	Pd in Co
b3.	0	0	
b4.	6	5	Other mailed
c.	282	275	
d1.	0	0	Free out Co (3541)
d2.	7	7	Free in Co
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d4.	10	14	1 st Class Paid
e.	19	23	Sum 15d 1 - 4
f.	301	298	Total Free/Dist.
g.	2	2	Publisher Copies
h.	303	300	Sum 15f + g
i.%	93.69	92.28	15c / 15g x 100

Printed October 2008 issue of SCOPE
(Mailed Sept. 2008)
Signed: A.L. Donlevy Publisher
09/24/2008

A MILESTONE RECEIVER: DRAKE 1A by Ron K2RP

In the mid 1950s, the big metamorphosis in amateur radio was the rapid growth of SSB, and the beginning of the decline of AM. Obviously, great changes were needed in transmitters. There were a few adapters made that enabled the use of some AM transmitters to SSB, but most of the SSB stations used transmitters made specifically for the new mode.

It is less obvious that a new breed of receiver was required to optimize operation on SSB, too. While nearly any receiver with a BFO could be used to receive sideband signals, new designs were required to utilize this mode efficiently. Better stability, better filtering to isolate each sideband, improved AGC action with BFO present, and product detectors were required for a receiver to be used effectively for the new mode.

By the mid to late 50s, the major manufacturers were producing receivers that incorporated these features, and performed at least adequately, and in some cases superbly on SSB. Collins, of course, set the standard in 1955 with the introduction of the 75A4. Hallicrafters was a bit earlier with their SX88, followed by the SX96, SX100, (all general coverage), and SX101 (ham band only.) Hammarlund offered the HQ170 and others, National had the NC 300 and NC 303. Heathkit even had an entry, the RX 1 Mohawk. There were other receivers capable of SSB reception produced by these and other manufacturers. They were also designed to be used for AM and CW as well.

The R.L. Drake Company was not yet in the amateur radio market, but had been in business since 1943 making military equipment and accessories. Bob Drake felt that the time was right to make major improvements in the receiver field. He thought there was a market for a receiver designed strictly for SSB use that would incorporate the stability, selectivity, AGC, and response characteristics optimized for SSB service. Including unneeded features such as AM detector and narrow CW filter added cost, complexity, and size. In fact, the front panel is labeled "Drake 1A Sideband Receiver."

Legend has it that he first offered his design to

National and Hallicrafters, who showed no interest, so he decided to build it himself. It was first offered in 1957.

The Drake 1A was unique in several respects. It had no way to turn off the BFO, so AM reception was only possible by zero beating the carrier. The AGC was always on, and although CW is easily copied, there is no provision for a narrow bandwidth filter. For stability, the HF oscillator is crystal controlled and a tuned IF is used in a triple conversion circuit. Tuning is done in the second conversion stage, and a bandpass control is used to select the sideband. The BFO is set to the proper frequency, and as a result the frequency shown on the dial is the suppressed carrier frequency if the voice sounds "normal."

Although many features of the circuit are innovative, the most striking aspect is the packaging of the unit. It is only about 7 inches wide and 15 inches deep, and weighs less than 18 pounds. Compare this to the popular Hallicrafters SX101, which was 20 inches wide and 16 inches deep, and weighed a breathtaking 70 pounds! The Drake weighed a quarter of the SX101, and took up less than a third of the "real estate" on the operating desk. On SSB, the performance was comparable. The power consumption was a miserly 45 watts, less than half that of the others. At an introductory price of about \$300, it was more affordable than the \$400 or so that an equivalent Hallicrafters, National, or Hammarlund receiver cost. The Heathkit was about the same price, but of course it required assembly. The Drake unit, (after the first production run) also included an internal speaker, which was extra cost (and space) on all the others. Including the tuning control, there are only 6 controls, compared to about 15 on the competitors, making it easy to use. Everything unnecessary has been eliminated.

In the "Recent Equipment" product review in QST for November, 1957, the author remarked that "it will be interesting to see what its acceptance is in the amateur market."

Measured by the production figures, the acceptance was not great! I can only speculate why this was so. Perhaps most hams were not ready to give up the flexibility of being able to use the station receiver for
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PARC and PARC Affiliated Repeaters

Frequency	Tx	Tone	Call Sign	Remarks
52.680	-	107.2	W6NWX	
146.730	-	107.2	W6NWX	See note 1
147.075	+	107.2	W6NWX	
147.130	+	107.2	W6NWX	
447.000	-	107.2	W6NWX	
224.380	-	107.2	KK6KD	Americas Unidos
224.900	-	107.2	WD6HFR	Convair/220 ARC
224.940	-	107.2	KK6KD	Sharp Hospital Coverage
446.140	-	123.0	WB6FMT	Vista
146.175	+	107.2	N6FQ	Fallbrook ARC; linked to 445.600
445.600	-	107.2	N6FQ	Fallbrook ARC; linked to 146.175
145.050	(s)	None	W6NWX-1	Packet node; linked to Metro 9600 net
146.700	-	None	W6NWX-4	Packet duplex repeater; Duplex; PALBBS use OK

PARC also conducts the following ATV (amateur fast-scan television) operations:

ATV in: 915 MHz WBFM, 2441.5 MHz WBFM

Intercom: 146.415 MHz NBFM simplex (tone 79.7)

ATV out: 1241.25 MHz AM

Regular Nets Sponsored by PARC

Day	Time	Frequency	Name	Manager
T/Th/Sa	2000	146.730	NTS Traffic Net	Marvin KD6YJB KD6YJB@arrl.net
Sunday	0830	146.730	ARES Net	Jo Ashley KB6NMK@amsat.org
Sunday	1900	147.130	Handi-Hams	Marcia De Runtz KG6FIX
Sunday	2045	147.075	MARA	Glenn Jones KG6JDF@amsat.org
Monday	1915	146.730	RACES Sub-net	
Monday	2100	146.730	Microwave Net	Kerry B.
Tuesday	1900	147.130	Red Cross Net	Ted tthompson@sdarc.org
Tuesday	2100	146.730	Off-Road Net	Dick Wilimek KA7AYTrwilimek@cox.net
Thursday	2000	147.075	SATERN	tomcarmody@cox.net
Thursday	2100	146.730	Ham Help Net	Lin Robertson kj6ef@amsat.org
Friday	2100	146.730	Hiker's Net	Ed KF6DXX@juno.com

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Repeater Tech - Mike Pennington	K6MRP	760-749-8888	k6mrp@amsat.org
Membership - Al Donlevy	W6GNI	760-630-3096	w6gni@amsat.org

¹ The 146.730 repeater transmits a CTCSS tone of 107.2, but does not usually require any tone for access. When necessary, an access tone of 107.2 can be enabled.

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AM and CW. Perhaps the size did not inspire confidence. Also, Drake did virtually no advertising that I was able to find in QST or CQ in those years. Reportedly only slightly more than 1000 units were made, and very few have survived. I am fortunate in owning serial number 799, and it is in excellent physical and electrical condition, with the original manual. I have never seen another one, and don't know of anyone else who has one! It is by far the rarest radio in my collection.

Even though not a sales success, the 1A ended the longstanding trend of building ever larger and heavier receivers. If the ham community did not recognize that bigger wasn't necessarily better, the other manufacturers did! It wasn't long before the famous Collins S line was introduced, succeeding the 75A series that began in the 40s. The last of that line had 22 tubes, was 17 by 15 inches, and weighed 35 lbs. The 75S1, which replaced in 1958, weighed only 20 lbs, and had 10 tubes plus some solid state devices. Heathkit soon came out with the SB300 line, similar in size.



Drake itself quickly followed with the 2A and 2B models, which were very successful. An AM detector was back, in addition to variable bandwidth filters for CW and AM use, as well as other more traditional features. Even though there were more features and controls, these units were even smaller and lighter than the 1A, although an external speaker was required. Drake continued with a line of very high quality receivers, transmitters, and transceivers throughout the 60s and 70s, many of which are still in use.

So the first (and possibly only) receiver designed strictly for SSB use was not a commercial success, but was a milestone in other ways, inspiring the equipment we use today. ☆

Digital speech within 80 Hz bandwidth A Project Proposal

By Michael E. Lebo

Objective

To modify and write code needed to convert analog voice into narrow band digital modulation.

Why do this?

The bandwidth of voice is about 2400 Hz. When speech could be reduced to 80 Hz, the gain would be 14.8 dB (30X). Processing gain by a computer is cost free. This project receives weak signals 11 dB (12.6X) below SSB (Single Side Band) noise floor of the radio.

Generating of the transmit phonemes

A phoneme is to speech as the alphabet is to reading or writing. Since each person sounds different from another, it is clear that the computer must recognize the unique phonemes used by only that person while operating this software. The software must be able to teach itself the phonemes so that it can recognize that person's voice, which is done by reading words shown on the monitor into the microphone while holding down the space bar of the keyboard.

The code used

The 45 phonemes are represented by a code made up of 1's and 0's. The code is similar to a court recorder typing out steno, which can be read back. All code groups start with 1 and end with two or more 0's.

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continued from page 9

Since phonemes are grouped by the shape of the mouth, tongue and lips, the codes used in one group of phonemes should be as different as possible from other groups. Some phonemes are longer than others and they should have a longer code. Of the 53 codes, only 45 are used with eight as spares. This code is exactly the same Varicode used in PSK-31, (Phase Shift Keying with 31 Hz bandwidth).

100, 1100, 10100, 11100, 101100, 111100, 1010100, 1011100, 1101100, 1110100, 1111100, 10101100, 10110100, 10111100, 11010100, 11011100, 11101100, 11110100, 11111100, 101010100, 101011100, 101101100, 101110100, 101111100, 110101100, 110110100, 110111100, 111010100, 111011100, 111101100, 111110100, 111111100, 1010101100, 1010110100, 1010111100, 1011010100, 1011011100, 1011101100, 1011110100, 1011111100, 1101010100, 1101011100, 1101101100, 1101110100, 1101111100, 1110101100, 1110110100, 1110111100, 1111010100, 1111011100, 1111101100, 1111110100, 1111111100

As shown, the code is the fastest speed for each phoneme. By adding one or more extra 0's to any code, the length of that phoneme is stretched by increments of 1/80 of a second. This is very important because voice speed is constantly changing. The original 45 phonemes are expanded to many new phonemes.

The software summary

Voice received through the computer's microphone is converted into numbers, amplified to a constant level, converted into 16 bands of frequency, cut into three parallel 37.5ms sections of time, compared in a two-stage process to a library of 45 phonemes that have been made by the operator of the radio, converted to a digital code, stretched to fit the operator's real speech, and sent to the radio in a way similar to QPSK-63 (Quadrature Phase Shift Keying with 63 Hz bandwidth) to be transmitted.

The modification of the WinPSK program

This software is modified from the QPSK-63 software. Moe Wheatley, ae4jy, has done an outstanding job on his open source WinPSK program and his documentation of the software. Please read the PSKCore.DLL (Dynamic-Link Library) Software Specification and Technical Guide at <http://www.moetronix.com/ae4jy/winpsk.htm>. The new

QPSK-80 (Quadrature Phase Shift Keying with 80 Hz bandwidth) is a modification of the QPSK-63 software that is now being used over-the-air. It has a built-in error correcting code that corrects for one out of five digits being wrong. Before installing this QPSK-80 software, make sure your radio, interface and computer are working by testing the WinPSK program with PSK-31 over-the-air.

The transmit sequence

The transmit sequence starts with the pressing of the space bar on the computer keyboard and continues until the space bar is released. The computer speakers' D/A (Digital to Analog) converter is forced to zero. The AGC (Automatic Gain Control) is un-frozen.

The 400 ms synchronizing alternating series of ones and zeros is sent to the transmit section of the WinPSK program. This 80 Hz BPSK code is used by the other computers' receiver section of the WinPSK program to re-synchronize the 80 Hz clock. This insures that the receiver section of the WinPSK program is sampled in the middle of each code digit and is not sampled during the transitions.

The sampling 66,000 Hz clock starts the A/D (Analog to Digital) converter from the microphone input of the computer. Each clock cycle makes the A/D output a 16-digit signed number. Each number goes to the AGC (Automatic Gain Control) array and the AGC level adjustor.

The AGC is used to amplify the weak signal from the microphone to about 90% of the maximum value for the 16-digit signed number. This is done by TBD (To Be Determined) method. It will use the normal fast attack and slow decay, but it will be frozen when the space bar is not pressed.

The project description continues at:

http://docs.google.com/View?docid=dggwnj3m_37fmw_kfkhz

At this time I have not succeeded in learning any version of C++. Without help modifying and writing code, this project ends at this paper! Would you be interested in working on this project? Please contact me at mike-lebo@ieee.org or 858-278-5851 or Skype (Michael E. Lebo). ☆



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Scope (USPS #076530) is published monthly by the Palomar Amateur Radio Club 1651 Mesa Verde Drive, Vista, CA 92084. POSTMASTER: Send address changes to SCOPE, P.O. Box 73, Vista, CA 92085. Periodicals postage paid at Vista, CA 92084. Dues are \$20 per year or \$35 per year for a family. Dues include a subscription to Scope. Editor: Michelle Thompson W5NYV.

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Questions? Ideas? Comments? W6NWG@amsat.org

This month's General Meeting will be held on 1 October, 2008 (The first Wednesday of each month) at the Carlsbad Safety Center. This month the program features the annual auction. Talk-in on 146.730 MHz repeater. Usually, our general meeting starts at 19:30 but members show up at 19:00 for setup and visiting beforehand. Because it's the auction, doors will open at 18:00 for sellers. Ridesharing and coordinating for dinner beforehand often occurs on the repeater on Wednesday afternoons. Everyone is welcome! Founded in 1936, PARC endeavors to serve the amateur radio community in San Diego County through various events and assets. Starting with monthly club meetings, weekly nets, and annual events (such as Field Day), PARC has a place for just about everyone. Our nets include the traditional NTS traffic net, emergency service nets such as Palomar, MARA, SATERN, and the Red Cross, and a number of special interest nets, such as Handi-Hams, Microwave, Off-Road, Ham Help, Hikers, and Facetious Group nets. With repeaters high upon Palomar Mountain, we are able to serve the local community under almost any condition, and particularly in times of need. Come by and visit with us on the first Wednesday evening of each month at the Carlsbad Safety Center.

See you there, *Steve Early, AD6VI, President*