



PAARAGraphs

Celebrating 61 years as an *active* ham radio club—*Since 1937*
Newsletter for the Palo Alto Amateur Radio Association, Inc.



CALENDAR

- Oct.....2, PAARA Meeting, 7:30
Menlo Park Recreation Center
700 Alma Street, Menlo Park
Oct.....7, PAARA Board Meeting, 7:30
Red Cross Bldg., 400 Mitchell Ln., Palo Alto
Oct..16-18, Pacificon
Nov.....6, PAARA Meeting, 7:30
Nov....11, PAARA Board Meeting, 7:30
Nov....14, PAARA Auction & Flea Market, 9:30 AM
American Legion Hall,
651 El Camino Real, Redwood City
Dec.....4, PAARA Meeting, 7:30
Dec.....9, PAARA Board Meeting, 7:30



PROGRAM

October 2, 1998
7:30 P.M.

Speaker:

Bob Dyer, KD6VIO,

"Ham Radio and QRP"

PAARA Radio NET every Monday evening at 8:30 P.M., local time
on the 145.230 -600 MHz repeater, PL tone off



VE session held September 19 at the American Legion Hall in Redwood City. Present were Joe Horne Sr. WB6OWG, Gordon Girton W6NW, Gene Irazzary KK6LO, Al Montoya WB6IMX, Dan Curry WB6STW, & Ron Panton W6VG. Weather was nice, but turnout of applicants was small. Next month (October) there will be no usual 3rd Saturday VE session at the Legion Hall. However, by previous enrollment there will be a teaching session by Al Montoya (WB6IMX) on Saturday, October 3rd and a VE examination of the students on Sunday, October 4th. This is going to be held at the Redwood City Yacht Club. However, only previously enrolled applicants will be accepted. ☺☺☺

—Ron, W6VG



PAARA PONDERINGS

PAARA member Dennis Freeman KF6OHO took a page from PAARA's book after we hosted special event station N6M honoring the 129th Air Rescue Wing of the Air National Guard. On September 26 Dennis and the mostly new hams of Loma Mar held a Special Event Station to help celebrate the opening of the new Loma Mar Fire Station. The special 1 X 1 callsign K6L (for Loma Mar) was used on HF, VHF and UHF to demonstrate ham radio to the dedication attendees. The fire station houses an emergency communications 2 meter base station and antenna which can access the San Mateo County Sheriff's Office of Emergency Services repeaters in La Honda and Pacifica. The special event station tested access to other repeaters from Loma Mar which is located "in a hole" on the western flanks of the Santa Cruz Mountains. The special event station was a major tribute to amateur radio, which was the only means of communication into and out of the area for several weeks during last winter's major storms.

It's interesting to note that callsign K6L was previously issued for the 1996 World Radio Team Championship. Team members were SP9HWN and SP9IJU from Poland with judge JA7RHJ from Japan. Their QTH for the contest? The home of PAARA member Kit Kohlmoos W6ISO.

—Vic, AB6SO

Miscellaneous Dates

Flea Market at Foothill (info at: <http://joslin.com/FleaMarket>)
 Oct. 10 Electronics Museum Amateur Radio Club (EMARC)

PAARA Auction & Flea Market

November 14, 9:30 AM,
 American Legion Hall, 651 El Camino Real, Redwood City

PAARA Palo Alto Amateur Radio Association
 meets 1st Friday 7:30 each month, Net 145.230 each Monday 8:30,
 contact: Dave Bailey, WS6W 408 730 5215

EMARC Electronics Museum Amateur Radio Club
 meets 4th Friday 7:30 each month,
 contact: Sheldon Edelman 650-858-2176, Edelman@richochet.net

NCDXC Northern California DX Club
 meets 2nd Friday 7:30 each month, repeater for member info 147.360, Thur
 8:00PM, contact: Bob Mammarella KB6FEC 408 729 1544.

NorCalQRP Northern California QRP Club
 meets 1st Sunday each month,
 contact: Jim Cates 3241 Eastwood Rd., Sacramento, CA 95821.

Perham Foundation,
 contact: Jerry Tucker WA6LNV 650-961-3266

SPECS Southern Peninsula Emergency Communication System
 meets each Monday 8:00PM on Net 145.27, 224.36, 440.80 MHz
 contact: Mike Hastings KB6LCJ, 408-243-6745 or 408-249-6909.

SCARES South County Amateur Radio Emergency Service
 meets 3rd Thursday 7:30 each month, San Carlos City Hall.
 Net is on 144.45 & 444.50 (PL-100) 7:30 Monday evenings.
 contact: Dick Collins K6ANN 650-593-8952

SCCARA Santa Clara County Amateur Radio Association
 Operates W6UU repeater 146.385+ Nets: 2m, W6UU, 7:30 Mon; 10m,
 28.385, 8:00 Thur. meets 2nd Mon each month.
 contact: Jack Ruckman AC6FU

SVECS Silicon Valley Emergency Communications
 Operates WB6ADZ repeater (146.115 MHz+)
 contact: Los Stierer WA6QYS 408 241 7999

WVARA West Valley Amateur Radio Association
 operates W6PIY repeater 147.39+, 223.96, 441.875, 1286.2
 meets 3rd Wed every month.
 contact: Glen Lokke Jr. KE6NBO at 408 971 8626, or glokke@pacbell.net

Disaster Services

PALO ALTO CHAPTER, American Red Cross
 Meets 3rd Wed. each month 7:30PM,
 HF, packet, BBS, ATV, OSCAR Gateway, NASA satellite,
 contact: Alan Ball 650-688-0423.

SAN JOSE CHAPTER, American Red Cross
 contact: Scott Hensley KB6UOO, 408 249 7093, fsh@richochet.net

VE Exams, 3rd Saturday each month, 11AM, 145.23- PL=100Hz
 American Legion Hall, 651 El Camino Real, R.C.
 contact: Joe KB6OWG.



Hi, I write the monthly product evaluation column for "SPURIOUS EMISSIONS" magazine--got any of those "HIGH-IMPACT" handheld radios?

Palo Alto Amateur Radio Association, Inc. PO Box 911 Menlo Park, CA 94026

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Steve Stuntz, K6FS	(650) 322 4952 '99
Vic Black, AB6SO,	(650) 366 0636 Past Pres

(see "Calendar" for Board meeting times, visitors welcome)

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Submit material for PAARAGraphs by the 15th

PAARA Website <http://www.qsl.net/paara/index.html>

New Ham Classes

October 3 & 4, Saturday and Sunday. FARS will hold a 2-day Technician Class course at the Boardroom, Los Altos School District Office, 201 Covington Rd, Los Altos. Fee is \$50, which includes the text book Now You're Talking! (\$19.95 value), VEC testing fees and a one year membership in FARS (\$20 value). Contact: **Paul Zander, AA6PZ**, 650-941-7821 (Home).

November 21 & 22, Saturday and Sunday. The City of San Mateo OES and WA6TOW repeater will present a 2-day no-code Technician Class course and test session. Class hours are 8:30 AM to 4:00 PM followed by the test session from 4:00 PM to 5:00 PM. Saturday will cover Novice instruction with the Novice written test that afternoon. Sunday will extend this to cover the Technician materials, with that test in the afternoon. Fee is \$15, which covers class and testing fees. Reservations required. Contact: **Ross Peterson WB6ZBU** at 650-349-5349, or Email at WB6ZBU@pacbell.net.

—Vic Black, AB6SO

PAARA MONDAY NIGHT NET

8:30 PM 145.230-600 MHz repeater

PL tone off

Latest news between monthly issues of PAARAGraph

WEB WANDERINGS

de Vic Black, AB6SO



The ARRL awards web page <http://www.arrl.com/awards> describes awards chasing as "one of the most exciting facets of Amateur Radio." It goes on to say, "Aside from the fun of operating itself, awards chasing is also a good way to get maximum performance from your station, become familiar with propagation, and even learn about the geography, history or culture of places near and far."

Most hams are familiar with the DX Century Club (DXCC) Award for confirmed contacts with at least 100 foreign countries. Somewhat less well known is the VHF/UHF Century Club (VUCC) Award for VHF/UHF contacts.

VUCC is awarded for confirmed simplex or satellite contacts with stations located in a minimum number of 2 degree (longitude) by 1 degree (latitude) Maidenhead grid locators (note: they're called grid squares, even though they're actually rectangles). 100 grids are required for VUCC on 6 meters, 2 meters or satellite contacts. A Half Century Award requires 50 grids on the 222 and 432 MHz bands. A Quarter Century Award is available for 25 grids on 902 and 1296 MHz while 2.3 GHz requires only 10 credits. All higher bands require 5 credits. VHF/UHF contests are a good way to accumulate grid squares for your VUCC award. Endorsements are available for additional confirmed contacts on the various bands.

Key to the VUCC award is the use of Maidenhead grid locators. Maidenhead designators are a combination of two letters (the field) plus two numbers (the square). The grids are named for the small village of Maidenhead, near London, where hams invented the system in 1980. Local SF Bay area grid squares include CM87, CM97 and CM88, each covering an area of about 70 by 100 miles.

A good way to visualize the Maidenhead system is to look at a world map with the equator across the middle dividing north from south and the prime meridian (zero degrees east-west) dividing the map vertically down the middle. From Northern California we could say that we're in the north west quadrant. To make the description more meaningful, the hams who invented the Maidenhead system started at the south pole and international date line.

They called the 20 degree by 10 degree rectangle "field AA" from 180 to 160 west and 90 to 80 degrees south. Eighteen fields were numbered northerly in 10 degree steps through AR to reach the north pole. Then they moved over 20 degrees east to 90 degrees south and 160 east and named the fields BA through BR northerly. This was continued on around the earth for a total of 18 fields in each direction ending in field RR. Starting in the south west corner of each field the fields were then divided into 2 X 1 degree "squares" (0 - 9 easterly and 0 - 9 northerly with longitude listed first, followed by latitude). An excellent explanation with charts is at <http://www.bridge.de/~tom/maiden.htm>.

You'll need to know your grid square in order to give the

proper exchange. ARRL sells a grid square map of the US for \$1, available at HRO. A local map with longitude and latitude will pinpoint your location so you can convert to grid squares. On the SF Peninsula, CM87 includes the area from 124 to 122 W and 37 to 38 North. Neighboring CM97 extends from 122 to 120 W and 37 to 38 N. Most road maps don't indicate latitude and longitude, but USGS topo maps or atlases by Rand McNally, Benchmark and De Lorme show them.

The "Buckmaster World Wide Ham Call Server" at http://www.buck.com/cgi-bin/do_hamcall lists latitude/longitude and grid squares, searchable by callsign. The QRZ! Web page for "The World Radio Amateur Directory" lists only latitude/longitude for the center of the postal ZIP code area. It's located at <http://www.qrz.com/wrad/directory.cgi>.

Try the interactive web-based converter "Amsat GridSquare Converter" at <http://www.amsat.org/amsat/toys/gridcon.html>. Enter decimal degrees or degrees/minutes/seconds to convert to grid squares. If you enter a grid square, it will convert to latitude and longitude at the center of the grid. The ARRL Grid Locator requires only the latitude and longitude in degrees to convert to a 4-digit grid square. If you also enter minutes and seconds, it will convert to the more accurate 6-digit grid square designator (the "cell") which is used on the microwave bands and corresponds to a grid of approximately 3 X 4 miles in the continental US. It's located at <http://www.arrl.org/locate/grid.html>.

You may also use a GPS personal navigator to find your grid square. If you're using a Garmin GPS you can pay the accessory price (i.e. big bucks) for a DC power cable to run it off your car's cigarette lighter plug or you can go to http://pfranc.com/projects/g45contr/g45_idx.htm. For a small donation (\$5 seems to work) you can buy a custom molded plug and instructions for making your own power/data cable. The connector fits Garmin models 12, 12xl, 38, 40, 45, 48, 89, 90, GPS II, II+ and GPS III, but not the 95 or 195.-). ☺☺—Vic, AB6SO

1952

ANNUAL

1998

PAARA

PALO ALTO AMATEUR RADIO ASSOCIATION

AUCTION

&

FLEA MARKET

SATURDAY NOVEMBER 14, 9:30 AM

AMERICAN LEGION HALL

651 EL CAMINO REAL, REDWOOD CITY

HAM RADIO GEAR
TEST EQUIPMENT
COFFEE & DOUGHNUTS SERVED
DOORS OPEN AT 7:30 AM



LOCAL CALL-IN 147.45 SIMPLEX

Flea Market Table Space \$10.00 each. Some tables available.

AUCTION CHARGES 10% OF SALES PRICE
BUY BACK SUBJECT TO \$5.00 MAX. CHARGE PER LOT

PAARAGraphs October 1998
Celebrating 61 years as an active ham radio club—Since 1937

(From the Memorial Service program, September 11, 1998)

SY STEIN

November 23, 1913 - June 21, 1998

Sy, as he preferred to be called, was a very active and dedicated leader. He was involved in a wide array of professional and volunteer organizations. Some are noted on the following page.

Sy always wanted to be a medical doctor. His father was a pharmacist in Chicago, which had a dramatic influence on his choice of careers.

Sy used to deliver medication to his father's customers, and when permitted, tagged along with physicians on their house calls.

Sy had to maintain a straight "A" average in medical school to keep his scholarship at the University of Illinois. Sy was awarded his M.D. degree in 1943 and went immediately into war time service with the U. S. Navy. Sy's detailed description of performing surgery on a rolling and pitching destroyer in a Pacific storm will always stay in my mind.



WA6ROM REMEMBERED

In January of 1995, while a two-week-long "guest" of Stanford Medical Center, I was honored by a visit from a fellow PAARA member, Seymour "Sy" Stein, M.D., WA6ROM. The time of his visit was spent, after customary exchange of medical data, reminiscing about earlier times:

Almost 20 years earlier, at a meeting of Santa Clara Valley Section hams called by then-SEC Ed Gribi, WB6IZF (now SK), Sy, his late XYL Betty, my own XYL (also Betty), and I had gravitated to a 4-seat lunch table during the noon break in a daylong amateur radio emergency-preparedness seminar. It quickly came out that all four of us had been in New London, Connecticut, during the early 1950's, at the Navy's Medical Research Laboratory - but although we had several friends and colleagues in common, we had never met! Sy was investigating the effects of (then potential) long-term submerged cruises upon crew performance and physiological states. My own work, in psychoacoustics and communication, took me cruising aboard a number of post WW-II submarines, as did Sy's - but we never actually were aware of each other's presence.

During that period, Sy was actually dividing his time between New London and Pensacola, Florida, where he was overseeing studies of performance in low-oxygen environments at the Navy's Aeromedical Laboratory. He evidently came and went frequently, between Connecticut and Florida; thus our tracks remained asymptotic until that day in 1976, when they finally crossed at the lunch table.

Sma llllll World! -30- —Steve Stuntz, K6FS

PROGRAM NOTES:

**PAARA Program,
September 11, 1998**

— Steve Stuntz, K6FS



Gerry Tucker, WA6LNV, past president of PAARA and frequent Field Day captain, was our guest speaker. Long-time consultant to a number of companies in the "space business" and currently designing specialized power-supplies for Loral Aerospace Corporation's portion of the International Space Station, Gerry described and illustrated the present version of the Space Station, expected to be in partial operation by the year 2002. He noted that almost all of the station's vital components are being built right here in Silicon Valley.

Using projected imagery borrowed from NASA sources, Gerry showed and discussed structural and power features of the station. He pointed out that the entire station will utilize 120-volt DC to meet basic power requirements, but that this voltage will be transformed to other voltages, as well as to high-frequency AC, for supporting the specialized instrumentation, control housekeeping, and cargo-handling capabilities necessary to maintain life and research aboard the station.

Primary source for electric power is the sun, which will energize a group of eight photovoltaic panels, each about half the size of a football field. Output from these arrays will mainly charge specially-designed battery-banks, which will support all systems in the station, providing doubly- and triply-redundant protection against potential malfunction.

Within the station itself are to be both living-quarters and laboratory working-facilities for the crew, who will reside for months at a time. Their daily cycles will differ significantly from those of their predecessors' more intensive short-term duties, since it is expected that crew-members will live a near-normal routine of rest, work and recreation during their assignments. Within the complex of habitation and laboratory ("hab-lab") spaces, an essentially "shirt-sleeve" environment will prevail, extending an the experience already gained by US and other nations' astronauts.

It is expected that the station will be a "low-orbit" vehicle, making a complete turn around Earth in 90 minutes.

Gerry closed by observing that amateur radio may very well play an important role in life "on station", as both recreational relief from workaday routine, and as potential communication backup in time of need.

-30-

Thanks to Doug Schliebus, K1DIT, PAARA now has a Membership Form. The Board would like all members to have one in club files. Please mail yours or bring it to the next meeting.



Are You Ready for CCW and BPSK?

de Vic Black, AB6SO

(published in QRPP, the Journal of the NorCal QRP Club)

There's been a lot of recent press concerning the rebirth of Ham Radio about every 11 years, coinciding with the sunspot cycle. All's gloom and doom during sunspot lows and nothing but DX, happiness and TVI at the peaks. At the 1957 sunspot high, QRM was so great that SSB was developed to save spectrum space. Using SSB was considered almost unsociable because of the racket it created compared to AM, even though there were fewer squeals and squawks from adjacent interfering carriers with SSB. The ensuing upheaval meant we had to upgrade equipment which had worked fine up until then, but in the long run it proved to be the best solution to the challenges of HF voice communications.

During the 1960's FM repeaters were introduced. I was working in Palo Alto at Hewlett-Packard when a PA system announcement was made that Varian had installed an FM repeater on Black Mountain for ham use. This was a revolutionary idea at the time. We now know it as the 147.315 repeater whose trusteeship recently changed to the HP club WW6HP.

Later developments included development and general use of SSTV, satellites and packet radio. During the last cycle, packet gave up ground to Amtor, Pactor, Pactor II, Clover and the Automatic Packet Reporting System (APRS). Predictions for the future are tough since we have no control over the future. Anyhow, I'll stick my neck out and predict that this next cycle will finally see wider acceptance of coherent CW, or variants such as BPSK, as viable digital modes.

Coherent CW (CCW) is a 25 year old Morse code mode that uses tight time and frequency control, very narrow bandwidth signals (less than 10 Hz), perfectly sent code and very tight CW filters to bring weak signals up out of the noise. Amateur Radio CCW inventor Ray Petit, W7GHM also invented the digital mode Clover. The first ham QSO was by Andy McCaskey, WA7ZVC using a Ten-Tec PM-1.

How does it work? First, the basic CW element, a "dit", is established as 100 milliseconds long (equivalent to 12 wpm). The receiving computer can then latch onto a dit and expect another dit, dah or space at multiples of exactly 100 msec. In other words, the more you know about a signal before it arrives, the less information you need to acquire from the signal itself. This is how we copy plain text Morse by ear. A couple of letters into a word is often sufficient to know, from context, what the word is probably going to be. A couple of words into a sentence is often enough to finish up the sentence. The rest is only validation of what we anticipated.

Secondly, if the receiver filter passband is too wide, the filter will pass through a lot of noise along with the desired signal. On the other hand, if the signal bandwidth and the filter passband are extremely narrow, the amount of noise passed through decreases and the ratio of signal-to-noise is increased tremendously. The effect is similar to raising the power at the transmitter.

Until now this hardware based system, which relies on tight

frequency control and detection of varying amplitude, has been difficult to achieve by most hams because the infrastructure didn't exist to support it adequately. With the advent of extremely stable VFO's, GPS for time control and inexpensive microprocessors and excellent software to send perfect keyboard code and do the necessary digital signal processing (DSP), we may see the mode flourish.

Why would anyone want to use an "outdated" mode like CW in this day of computers, packet, Pactor, etc.? Mainly because you can work around the world on 40 meters during daylight hours using only a few milliwatts of power with CCW. You may not be able to hear the signals by ear on an ordinary receiver, but the DSP can bring them up out of the noise so you can easily copy the code by ear.

Early CCW proponent Professor "Woody" Woodson W6NEY told me he used to carry a 40 meter QRPP beacon on European lecture trips. A prearranged set of dits and dahs would allow his wife, who was monitoring in Berkeley, to know if he was going to be on time getting home or whether he would be delayed by a day or two. The weak signal wasn't heard by anyone else.

This time around CCW will probably be reincarnated as Binary Phase Shift Keying (BPSK), a form of radio teletype. Several groups are working on kits to build standardized rigs analogous to the Tucson Amateur Packet Radio (TAPR) TNC's that allowed easy packet radio access. Johan Forrer KC7WW, TAPR moderator for the HF special interest group, is involved with BPSK experiments. G3PLX Peter Martinez, who created Amtor by adding error detection and correction to the commercial SITOR, has joined BPSK nets on 20 meters. Incidentally, Amtor is pretty much obsolete now that Pactor and newer modes have replaced it during the past two years.

The original CCW scheme relies heavily on the fact that two signals with the same 100 milliseconds mark length and space length will stay in lock step indefinitely if they both start at the same time. Accurate timing and element length control are extremely critical requiring tight frequency and time control at each end of the path. This hardware dependent system is replaced by DSP software control with BPSK.

Receiving CW depends on differentiating the signal from surrounding noise. We can hear frequency and amplitude changes by ear and use those to receive ordinary CW. We are accustomed to thinking of RF signals as having both a frequency and amplitude, but they also have phase relationships. The human ear cannot differentiate phase differences. In fact, quadrature modulation allows us to modulate one signal starting at zero degrees, for instance, and another at 90 degrees on the same carrier sine wave and then differentially detect, or separate, the two signals at the receiver. When the transmitted and received signals are in phase, or synchronized, we say they are "coherent".

BPSK is a modulation scheme which shifts the phase of an RF carrier with respect to a digital bit stream. It requires a simple transmit interface board which mixes a stable audio reference tone derived from a crystal controlled clock with an

(Continued on page 90) ccw/bpsk

New Members (add to your roster) 9/20/98

—Don Trask, KF6JMQ

Last	First	Call	Phone	Street	City	St	Zip
Callas	George	KF6RPK	650-948-1527	4372 Miller Ct.	Palo Alto	CA	94306
Gaynon	Lisa	KF6JEN	650-853-6049	1340 Hamilton Ave	Palo Alto	CA	94301-3122
Gaynon	Susan	KF6OBX	650-853-6049	1340 Hamilton Ave	Palo Alto	CA	94301-3122
Izuta	Saeko	N6SXQ	408-637-0622	1230 Jan Avenue	Hollister	CA	95023-3439
Lonero	George	KE6FFU	415-333-4268	1004 Arlington Lane	Daly City	CA	94014
Luhrs	Arne	KF6EDK	650-941-0483	1501 Topar Ave.	Los Altos	CA	94024
McGlohn	Robin	KF6SRI	650-328-0319	1145 Pine Street	Menlo Park	CA	94025-3406
Rice	Dave	W6NUC	650-593-7840	POB 3193	Redwood City	CA	94064
Thomas	Gil	KN6BQ	650-367-0620	1841 Pruneridge Ave.	Santa Clara	CA	95050
West	Paul	KQ6WN		2670 Kentworth Way	Santa Clara	CA	95051

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800Hz digital signal through a double balanced mixer or an exclusive-OR gate to produce the binary phase modulation and then inputs the signal into an SSB transceiver audio input. The interface board can be built on perfboard for as little as \$10.

The receiver compares the phase of each bit with the phase of the preceding bit to perform the differential coherent (i.e. synchronized) detection. A receive interface board accepts the 800 Hz audio tone from the receiver, performs an analog to digital conversion and feeds the signal to the computer where the software does the rest. A simple 12 MHz AT computer is sufficient to handle the software under DOS control. The shareware, called "Coherent" is used by the low frequency and very low frequency experimenters (LowFERS) all the way up the spectrum to ham use with lasers. Setting up the software is similar to setting the parameters for a computer modem (start and stop bits, parity and baud rate).

LowFERS are especially interested in raising signal-to-noise ratios since they are restricted to low power using antennas only 50 feet long (including feedline!) on a band with a wavelength of 1750 meters. That's the definition of "inefficient".

Results are best with stable frequency control, but this is nowhere as important as with hardware dependent CCW since we're comparing phase, not frequency or amplitude. Receiving requires setting the BFO to exactly 800 Hz, displaying frequency in 1 Hz steps and having a single frequency reference for internal oscillators. The currently preferred transceiver is the ICOM 706, especially with the optional temperature controlled crystal oscillator, although this is not an absolute requirement.

On-air operation is done with the transceiver in the split frequency mode, receiving in CW and transmitting in SSB up 1800 Hz on the lower side band. Note that the transmitted signal is data, not phone. Bill de Carle VE2IQ produces freeware which allows you to compare your receiver's frequency counter to WWV and apply a correction to accurately set your receive frequency to the standard BPSK calling frequencies, if desired. The software also sets the received CW audio sidetone to exactly 800 Hz.

If this mode catches your fancy you can check the progress of cutting edge work by going to the web site in Aitkin, MN of Lyle Koehler K0LR at <http://www.qsl.net/k0lr/watsbpsk.html>. For schematics, & freeware see Bill de Carle VE2IQ's site <http://www.ietc.ca/home/bill/bbs.htm>. For a BPSK reflector, subscribe to bpsk@qth.net. Thanks to Andreas Junge KF6NEB for these addresses. Bill de Carle's new program, AFRICA, uses a tracking filter so the signals don't have to be at exactly 800 Hz so long as any drift is at a constant rate. It will run on faster, modern PC's. For PCB's and kits see <http://users.aol.com/part15/readccw.txt>.

George Heron N2APB of Sparta, NJ reports by e-mail that he and fellow New Jersey QRP members Joe Everhart N2CX and Clark Fishman WA2UNN are working on a modular R2/T2 transceiver with integrated DSP board for audio phasing and CCW processing. George calls this "hot stuff!" and says to expect an important announcement at Dayton Hamvention in May.

Jim Mortensen N2HOS of Indian Rock Beach, FL has a nifty newsletter at <http://www.n2hos.com/digital/frontpage.html>. "Jim's Gazette" is dedicated to digital modes including

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PAARA/Palo Alto Amateur Radio Association P.O. Box 911, Menlo Park, California 94026-0911

Club meetings are on the first Friday of each month, 7:30pm at the Menlo Park Recreation Center, 700 Alma Street, Menlo Park, CA. • Radio NET every Monday evening, at 8:30pm, on the 145.230-600 MHz repeater, PL tone off. • Membership in PAARA is \$12.00 per calendar year which includes a subscription to PAARAGraphs, \$6 for additional family members (no newsletter). • Make payment to the Palo Alto Amateur Radio Association.

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PAARA

Since 1937

PAARAGraphs Ad Rates

PAARAGraphs accepts paid advertisements from non-members.
(short personal ads remain free for members in good standing).

All ad rates listed are per issue only.

1. Not for profit ads by association members for ham-related items and wants. No cost for business card size ads (additional space at \$2.50 per business card size).

2. For Profit organizations and/or individuals: \$5-business card size, \$25-half page, \$50 full page or back cover.

These fees may be reduced or waived in exchange for a valuable consideration that is given to the Association or its general membership. Such consideration must be in addition to any existing arrangements with the association.

The PAARAGraphs editors reserve the right to reject any ad deemed to be not in the best interest of the Association. All fees are for "scanner-ready" copy or text-only ads.

(Continued from page 90) ccw/bpsk

CCW and BPSK and should appeal to anyone who likes digital communications.

CCW didn't catch on earlier because it was dependent on highly stable standard oscillators and transceivers at both ends. Some early experimenters went so far as burying oscillators underground in order to control temperature and thus frequency drift. Now, only reasonably stable transceivers and frequency standards are required because of modern computer program development, although results are better if highly stable hardware is used. You don't need special equipment to join in if you can hear the CCW stations (listen for "CQ CCW" in perfectly sent code). Daily QSO's are now routine with unmodified rigs such as the ICOM 706.

There is daily activity on 3591, 7081, 10141, 14081 and 18081 kHz. Some of the same weak signal and QRP groups responsible for getting thousands of new users on the air with simple, inexpensive kit radios and on FM packet with inexpensive TNC's are now working on BPSK in conjunction with the LowFERS, or very low frequency fraternity. Time will tell if their efforts will achieve wide spread acceptance of this new (old) binary mode.

—Vic Black, AB6SO

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