

PAARAgraphs



Celebrating 63 years as an *active* ham radio club—*Since 1937*
Newsletter for the Palo Alto Amateur Radio Association, Inc.



CALENDAR



- July.....7, **PAARA Meeting**, 7:30,
Menlo Park Recreation Center
700 Alma Street, Menlo Park
- July....12, **PAARA Board Meeting**, 7:30
Red Cross Bld., 400 Mitchell Ln., Palo Alto
- Aug.....4, **PAARA Meeting**, 7:30
- Aug.....9, **PAARA Board Meeting**, 7:30
- Aug....12, Foothill Flea Market, PAARA sponsored
2 m **CODE PRACTICE**, 2000 to 2030 PST Tues
N6NFI 145.23 repeater
Also try 7.100 for 24 hr code practice



PROGRAM

July 7, 2000
7:30 P.M.

"SHOW & TELL"

Join us for pre-meeting eyeball
6 pm— at Su Hong Restaurant , 1039 El Camino Real, Menlo Park

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

NEW PAARA MEMBER

David Cooper **KE6PFF**
Jay Melvin **WA6SBO**
Peter Van Scherpe **KE6KQV**

New Call

Loren Archer **KG6LRN** (was K7LRN)
Jeff Furman **AD6MX** (was KD6MNP)
Gerry Tucker **N6NV** (was WA6LNV)

Upgrades

Bertha Andrews **W6GCG**: General Class
Clarence Andrews **W6CPK**: Amateur Extra Class
Loren Archer **K7LRN** General Class
Jack Daane **KR6CD**: Amateur Extra Class
Mike Gaynon **W6TQH**: General Class
Rene Girerd **W6FNJ**: Amateur Extra Class
Nolan Katz **KB6LT**: Amateur Extra Class
Dennis Kennedy **K6DSK**: Amateur Extra Class
Steve Stearns **KF6OIK** Amateur Extra Class
Bob Stein **W6NBI**: Amateur Extra Class
John Tumminaro **KG6AGX**: General Class

—Thanks to Vic, AB6SO

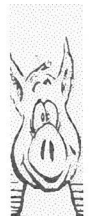
Join us for pre-meeting eyeball

QSO July 7th

gab & gobble

6 pm— at Su Hong Restaurant
1039 El Camino Real, Menlo
Park

—across from Kepler's Book Store—



Miscellaneous Dates

Flea Market at Foothill (info at: <http://joslin.com/FleaMarket>)
 July 8th, American Red Cross, Palo Alto Chapter

PAARA Palo Alto Amateur Radio Association
 meets 1st Friday 7:30 each month, Net 145.230 each Monday 8:30,
 contact: Andreas Junge N6NU.....(650) 233 0843

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 N6NV 650-961-3266

SPECS Southern Peninsula Emergency Communication System
 meets each Monday 8:00PM on Net 145.27, 440.80 MHz, www.specsnet.org
 contact: Tom Cascone, KF6LWZ, 650-688-0441. specs@svpal.org

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:

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: Lou 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, sh@richochet.net

VE Exams, 3rd Saturday each month, 11 AM, 145.23- PL=100Hz
 American Legion Hall, 651 El Camino Real, R.C.
 contact: Al Montoya at WB6IMX@worldnet.att.net

Palo Alto Amateur Radio Association, Inc.

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Menlo Park, CA 94026

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

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 Submit material for PAARAgaphs by the 15th

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

Contest Calendar

~Vic Black, AB6SO~

(for rules and exchanges, see www.contesting.com)

July, 2000

1 RAC Canada Day Contest 0000Z - 2359Z, Jul 1
 1-2 Venezuelan Ind. Day Contest, SSB 0000Z, Jul 1 - 2400Z, Jul 2
 4-5 MI QRP Club July 4th CW Sprint 2300Z, Jul 4 - 0300Z, Jul 5
 8-9 IARU HF World Championship 1200Z, Jul 8 - 1200Z, Jul 9
 8-9 WRTC 2000 1200Z, Jul 8 - 1200Z, Jul 9
 8-9 CQ Worldwide VHF Contest 1800Z, Jul 8 - 2100Z, Jul 9
 9 QRP ARCI Summer Homebrew Sprint 2000Z - 2400Z, Jul 9
 15-16 SEANET WW DX Contest, CW 0001Z, Jul 15 - 2359Z, Jul 16
 15 Pacific 160m Contest 0700Z - 2330Z, Jul 15
 15-16 North American QSO Party, RTTY 1800Z, Jul 15 - 0600Z, Jul 16
 15-16 Six Club Sprint 2300Z, Jul 15 - 0400Z, Jul 16
 16 Colombian Ind. Day Contest 0000Z - 2400Z, Jul 16
 29-30 Venezuelan Ind. Day Contest, CW 0000Z, Jul 29 - 2400Z, Jul 30
 29-30 Russian RTTY WW Contest 0000Z, Jul 29 - 2400Z, Jul 30
 29-30 IOTA Contest 1200Z, Jul 29 - 1200Z, Jul 30





Beginner's Bulletin

edited by Vic Black, AB6SO

Q. I'm going backpacking this summer. I was told to observe the "Wilderness Protocol". What is it?

A. The Wilderness Protocol is a suggestion to monitor standard simplex calling channels at specific times in case others have priority calls whenever they are outside of repeater range. The primary monitoring channel is the 2 meter calling frequency, 146.52 MHz. Secondary frequencies are the other VHF FM calling frequencies: 52.525, 223.5, 446.0 and 1294.5 MHz. The Protocol recommends monitoring the primary frequency (and secondary frequencies, if possible) every three hours starting at 7 AM, local time, for 5 minutes. If you have sufficient power resources, such as a mobile rig when driving through the mountains, you should monitor for 5 minutes starting at the top of every hour, or even continuously.

Q. I listened down low on the 2 meter band and didn't hear any activity so my buddy and I started using that part of the band for our own private FM channels. A guy came on frequency and told us to get out of the weak signal area. I thought I was licensed to use the entire 2 meter band.

A. You are licensed to use the entire band, but portions of the VHF bands are reserved for Single Side Band and CW (Morse code) transmissions only. They're used for terrestrial DX, Earth-Moon-Earth ("Moon Bounce"), aurora and meteor scatter experiments. These are called "weak signal" modes because the received signals are often very difficult to hear even though the transmitted signals may be 1500 watts into gain antennas. FM radios will not hear those other modes so you may think there's no one there. They certainly can hear you, though, since FM signals use much more spectrum than the weak signal modes do. Even very low power FM can completely destroy weak signal reception. Some frequencies have been set aside for satellite use only so you should be aware of that, also. Satellites have very sensitive receivers. Because of the "FM capture effect", the strongest signal will dominate the satellite and no one else will be able to use the frequency for that pass of the satellite if you're on the channel. Unless you're trying to access an FM satellite, only use FM radios in the appropriate FM simplex or repeater portions of the bands.

Q. I want to buy an HT for the 900 MHz Amateur Radio band, but I can't seem to find one. Where are all the radios?

A. The 900 MHz Amateur Radio band is unique to the US. It's a shared band called ISM (Industrial, Scientific, and Medical). Commercial radios used on that band are designed for specific industrial uses. Most of our handie-talkies are made in Japan where half of the world's amateurs live. Many of the radios we get from Japan are Japanese models modified for the US market. If Japan doesn't have a particular band available, such as 900 MHz, and the demand is low in the US, there isn't any in-

centive for the manufacturers to tool up for production. The best we can do at present is to use transverters that convert a common band radio for use on the uncommon band.

Q. I know that Japanese amateurs can buy 2.4 GHz HTs. Why can't we get them here?

A. In order to sell radios in the US, the importers must first have the radios FCC type approved. This is expensive. Since the band plans may be different here than in Japan, the radios must be custom made for the US market and the instruction manuals must be translated into English. That also raises the price if demand is low. If all the required additional work causes the price to become too high, the radios won't sell. Importers will only do all of the extra work if they see enough demand to make it a worthwhile commercial venture. I was once told that we wouldn't have any 1.2 GHz Japanese radios available in the US if it weren't for the strong market demand in California.

Q. In the last VHF contest some guy showed up on the SSB calling frequency using CW. Can he do that?

A. The band plans show that CW can be used any place on the band that SSB can be used. During contests so many people end up on the calling frequencies that they may interfere with each other. Even low power CW gets through that mess with no problem. Cross mode contacts are allowed in VHF contests, so if you know CW, feel free to answer using SSB if you want to. Both modes require that a carrier be inserted on receive so you can hear either one or the other at the same time..

Q. I was reading some old radio magazines. At the end of each article it said -30-. What does that mean?

A. Western Union and railroad landline telegraphers were paid by the letter so that more productive workers earned more money (novel idea, eh?). Western Union operators used numbered messages (Western Union Code) and abbreviations (Phillips code published by Walter Phillips in 1879) in order to speed up their work and ensure economical use of the limited number of telegraph lines. This was especially handy for sending press releases to newspapers. That's where we got the messages 73, or "best wishes" and 88, "love and kisses". A lot of our current CW abbreviations are traditions taken straight from Phillips Code. The number 30 meant "end of message" and was commonly used to end articles in newspapers and magazines. In American (or Railroad) Morse there are spaces in some of the characters and also long as well as short "dahs". The number 3 is sent as "di-di-di-dah dit" (notice the space after the "dah"). The number 0 is sent as a long "dahhh". So, the number 30 is sent in American Morse as "di-di-di-dah dit" plus "dahhh". In International (or Continental) Morse that has been snuggled up and carried over to become the procedural sign, or prosign, SK ("di-di-dit" plus "dah-di-dah") sent as one character so "di-di-di-dah dit" "dahhh" became "di-di-di-dah-di-dah". The numbered message 13 meant "understood". In International Morse the number 1 was dropped and the American Morse 3 was snuggled up. It's occasionally heard as the prosign SN or "di-di-di-dah-dit". -30-



PAARA PONDERINGS

de VIC BLACK, AB6SO

Congratulations and many thanks go out to Helga and Ron Pantou W6VG, Andreas Junge N6NU and Jon Zweig AD6FX for a very successful PAARA Summer Picnic. With very little advance notice they were able to promote a pleasant time for the 30 attendees.

PAARA members Doug Mecham KC6UKJ, Loren Archer KG6LRN (formerly K7LRN), Seth Mallory KF6UZX and Ken Mallory KF6VSC took Boy Scout Troop 5 on a tour of the San Mateo Sheriff and 911 dispatch centers in the Redwood City Hall of Justice as part of their scouting radio education. The group is central to emergency preparedness activities for the Vista Verde neighborhood above Los Trancos Woods in Portola Valley. They obtained a donated 40 foot shipping container and are building an emergency communications and supply storage center for the community.

Los Trancos Woods Community sits on 2000 feet of landslide rubble straddling the San Andreas Fault and has only one windy road out. The other major road, an extension of Alpine Road up to Skyline, is known as "dirt Alpine" by hikers and mountain bikers. It was destroyed in the 1906 earthquake and never reopened to vehicular traffic. A major earthquake or landslide on Los Trancos Woods Road could isolate several hundred families.

Several people have asked about "proof" of previous call signs in order to apply for upgrades or for vanity call signs. They may also want proof of licensing to join Quarter Century Club or ARRL Association, which requires proof of licensing a certain number of years ago. Others want to know the history of reissued call signs. Eileen Sapko, ARRL Awards Manager, sent the following message:

"The only way to find out when you were first licensed is to contact the International Transcription Service (ITS, Inc.). For a fee, they will research the information you request. They are located in the FCC, Room 246, 1919 M Street, N.W. Washington, DC 20037 and Gettysburg, PA at 1270 Fairfield Road. (717) 337-1433. Their corporate address is: 2100 M Street, N. W. Suite 140, Washington, DC 20037 (202) 857-3800." I looked up their web site and found the following address and telephone numbers which you can also try: ITS, Inc., 1231 20th Street, N.W., Washington, DC 20036. (202) 857-3800. E-mail to service@itsdocs.com or FAX (202) 857-3814.

The Amateur Radio Lighthouse Special Events weekend is scheduled for Aug 5 and 6 and the International Lighthouse/Lightship Weekend is Aug 19 and 20. Last year amateur operators activated Field Day-type stations at more than 200 lighthouses in 31 countries. You can work them from home or you might consider setting up an afternoon mobile/portable mini-DXpedition operation from one of them. There are 9 or 10 lighthouses open to the public and within an easy drive from the mid peninsula.

Some that are open to the public include: Alcatraz Island Light, Carquinez Strait Light, East Brother Light (which is also a Bed & Breakfast), Pigeon Point Light, Point Blunt (Angel Is-

land), Point Bonita, Point Montara, Point Reyes, Yerba Buena Island, Lime Point (Sausalito), and Oakland Harbor Light (now a restaurant). Some others are not open to the public, but you can get close enough to count. An example is the Fort Point Light, which is closed because of contamination from toxic lead paint chips falling from the Golden Gate Bridge overhead. Fort Point is open, as is the parking lot adjacent to the light. Several awards are available for working lighthouses. Complete details, a list of lighthouses and registration can be found on the Ham Radio Lighthouse page, <http://www.waterw.com/~weidner/lh-ham.htm> or <http://qsy.to/lighthouses>. For a table of international lighthouses that will participate along with call signs and QSL info, go to <http://www.waterw.com/~weidner/LH-day-table.htm>.

World Radio Team Championships are held every four years in conjunction with the IARU HF Championships. PAARA and several PAARA members hosted national teams from around the world for the second event 4 years ago in the SF Bay Area. Teams of two people are located in the same area and use 100 watt transceivers, a tri-band Yagi antenna for 20-15-10 meters and wire dipoles for 40 & 80 meters. During the 1996 championships, teams used special 1x1 call signs for the first time in US history. Call signs used were W6A through W6Z and N6A through N6Z for a total of 52 teams. This year's competition will be held July 8 & 9. The 53 special call signs for teams during the 3rd WRTC event at Bled, Slovenia July 5-11th 2000 include: S511E, S521H, S531R, S541F, S561C, S571W, S581I, S512T, S522R, S532N, S542B, S562P, S572L, S582A, S513A, S523W, S533G, S543C, S563X, S573O, S583D, S514U, S524G, S534J, S544Z, S564Q, S574V, S584M, S516M, S526O, S536P, S546Q, S566Z, S576K, S586U, S517W, S527K, S537L, S547B, S567F, S577V, S587N, S518N, S528D, S538F, S548X, S568Y, S578R, S588S, S519I, S529A, S539D, and S549L. Call signs S5A-S5Z will be used from Apr. 15th for WRTC promotion. QSL manager for them all is S59L. More info can be found at <http://wrtc2000.bit.si>

Thanks very much to Les Zwiebel WB6ORZ for pointing us to the IPS web site <http://www.ips.gov.au/prediction/hap.html>. This Australian government site shows Hourly Area Prediction propagation charts centered on various cities. The charts, updated HOURLY, are very specific to each targeted city. Information for generating the charts is supplied by the Space Environment Center in Boulder, Colorado. The color-coded charts indicate the best frequency to ensure HF communications from the chosen city to other parts of the world based on real time ionospheric conditions. I clicked on San Francisco and the chart showed the optimum frequency ranges as concentric bands of color radiating from San Francisco. It even shows skip zones and relatively small zones of CURRENTLY reported sporadic-E or F2 communications. This is an extremely valuable web site for contesting and DX hunting. Be sure to check this one out and bookmark it for future reference. As the web page says, "Because of the variability of the ionosphere this type of prediction can only be made for the current hour." Hey, who's complaining?

Foothill Flea Market

Aug 12 PAARA sponsored



WEB WANDERINGS

de Vic Black, AB6SO

Vern Wright W6MMA produces a unique portable transmitting antenna, the PW-1, available at <http://superantennas.com>. The efficient vertical is fashioned after the popular mobile "screwdriver" antennas, but is tuned manually rather than with an electric motor. It folds into a 3" x 3" x 12" package for travel and assembles in about 1 minute. An optional add-on coil extends usual 40 - 10 meters coverage to include 80 meters. The antenna's clever mounting bracket allows it to clamp to any vertical or horizontal surface. It handles up to 100 watts and is a perfect companion to "travel radios." An included counterpoise and clamp allow attachment to a table for instant use. An inexpensive optional kit provides a longer mast below the coil and a 4-foot whip above the coil for mobile use. The whip is flexible enough to fit into a suitcase. Superantennas is a spin off from the QRP movement. Vern is now selling enough antennas that he has his dental practice for sale so he can concentrate on antenna design.

The next time you get low self-esteem because you don't have the latest radio, check the fascinating story of how Cuban amateurs get on the air without benefit of factory made radios. Go to <http://www.radiohc.org/Distributions/Dxers/islanders.html>. Professor Arnie Coro CO2KK from Radio Havana describes the Islander, a transceiver made from defunct Russian TV set parts. His subtitle, "how to be on the air when you cannot buy oriental black boxes" gives a hint of what's to come.

The CW/DSB radio's vacuum tube direct conversion receiver is described as having tolerable background hum with poor selectivity. I was taught that if you can hear them, you can work them. Well, maybe not. They have to be able to hear you, too. The customary CW sidetone, which allows you to monitor your own signal, has been replaced by a "sidehum." Islander VFOs are marginal and drift in frequency, but as Arnie points out, it gets people "ON THE AIR!" Transmitter audio from salvaged telephone carbon microphones is prone to creating "strange howls" caused by RF leaks into the balanced modulator.

"Working 40 meters at night is almost impossible, but YES, they are ON THE AIR!" On CW the rig is described as "a little chirpy". Output power is "2 to 5 watts either DSB or CW on 40 meters and a new Cuban amateur is ON THE AIR!" Recently some Islanders have been replaced by the "Jaguey" which draws from Wes Hayward's Solid State Design for the Radio Amateur, the G-QRP club magazine SPRAT, and the NorCal QRP club magazine QRPP. It uses mostly Russian KT315 transistors, a 2N2222 copy, the cockroach of the transistor world. Jaguey uses parts scrounged from, you guessed it, defunct Russian TV sets. Mobile work is uncommon in Cuba since multivibrator power supplies are difficult to obtain for '51 Chevys.

It's easy to think that we don't have the same problems, but the inevitable is beginning to happen. We're developing a parts shortage, especially of through hole PC mount parts. Even common surface mount capacitors are sometimes back ordered

for up to a year. We may be salvaging parts from discarded TVs sooner than you think.

If you're planning your first mobile installation, you may want to check <http://www.connix.com/~pcb/hfmob.htm>. This is the site of Pete Brunelli N1QDQ. His good advice applies equally to VHF installations, but the real challenges are installing antennas and getting power to the rig for HF. Grounding is especially important for HF mobile. Pete doesn't mention it, but you must be very careful working around the car dashboard if you have air bags installed. It's also important to keep HTs, speakers and other items clear of the air bag area while driving. You don't want to be slapped by a rocket-propelled air bag while holding an HT to your face.

New CW operators or those helping a new ham become comfortable on CW will find that the site maintained by Jack Waggoner WB8FSV at <http://www.netwalk.com/~fsv/CWguide.htm> is a must. Jack's "Beginner's Guide to Making CW Contacts" is equivalent to 11 full pages in PAARagraphs. Main topics include Learning the Code; Finding Someone to Talk With; What Do You Talk About?; Standard Operating Techniques; A Typical Evening on 40 Meters;

Slow Speed CW Traffic Nets; Straight Key, Electronic Keyer, Bug, or Computer Keyboard?; FISTS-a Cool Club For CW Operators; and How to Get Zillions of QSL Cards. If you don't read anything else, you should read Standard Operating Techniques, which is further broken down into 11 sub topics.

Heathkit sold mail order electronic and Amateur Radio kits. My last Heathkit was a wood working kit from a Heath/Zenith retail store. So what was Heath's very first kit? Thanks to Conrad Weiss NN6CW for the answer. Go to http://members.aol.com/wwheco3/images/hs_sup3/hsp82.jpg for a glimpse of the Heath Parasol. Conrad says, "...original cost of the Parasol was \$925 for your very own airplane kit! That's roughly equal to a fully-stuffed Elecraft K2 in today's market." Conrad recommends "Bjorn Heyning's Heath Stories". URL: <http://members.aol.com/wwheco2/index.htm>.

Paper chasers take note of a special award for working Australian stations during the 2000 Olympic year. The VK DX Association sponsors an award for contacting 15 Sydney area stations from July 1 to December 31. The Gathering of the Nations Gold Award is available for contacts on 3 or more bands, a Silver version for QSOs on 2 or more bands and Bronze for one-band contacts. To qualify, collect the postal (ZIP) code for stations worked. Qualifying postal codes are 2000-2249, 2560-2570 & 2745-2770. The web site is at <http://www.qsl.net/vkdx/sydneygold.htm>.

Travelers, anyone with antenna restrictions, or those who love playing with antennas will enjoy the web site of Monty Northrup N5FC at http://www.io.com/~maddog/hamradio/notebk_ant.htm. Monty's simple, inexpensive, portable home brew HF antenna system travels in a 3-ring binder. It's a nifty design with pretty good efficiency. It's fast up, fast down and it works.

Want a cheaper Internet Service Provider (ISP)? Research firm Media Metrix reports that most home users surf the web less than 5 hours per month. Why pay a lot for very little service? PAARA member Steve Stearns KF6OIK recommends

(Continued on page 64) Web Wandrings

EMERGENCY RADIO DRILL MENLO PARK PUBLIC WELCOME

June 24th and 25th at Bayfront Park, east end of Marsh Rd. will be the Palo Alto Amateur Radio Assoc. Nationwide drill. The organization has been effective in establishing emergency communications networks during earthquakes and other major disasters. All power used in this preparedness drill will be produced on site. The club is planning to bring old US Army style generators and batteries backed up with solar cells. The members, who are serious about working under difficult conditions, will put up the radios and antennas. The objective is to see who can make the highest number of contacts during the contest period starting at 11 AM on Saturday. Anyone interested in communications can visit our 24-hour contest, which is sponsored by the Amateur Radio Relay League. Signs will show our location in the Menlo Park city owned park. Activities include making contact with voice, Morse code, packet radio, and satellites. The web site of the club is <http://www.qsl.net/paara/index.html> The talk in frequency is (Stanford Repeater) 145.230 Megahertz. For more information contact Andreas Junge (N6NU Radio License) at his home 650 233-0843.



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PAARAgaphs Ad Rates

PAARAgaphs 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 PAARAgaphs editors reserve the right to reject any ad deemed to be not in the best interest of the Association. All fees payable in advance by the year with "scanner-ready" copy or text-only ads. Give payment and copy to Bob Korte

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

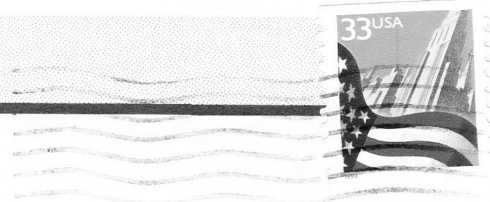
- Club meetings are on the first Friday of each month, 7:30pm at the Menlo Park Recreation Center, 700 Alma Street, Menlo Park, CA. •
- Radio NET every Monday evening, at 8:30pm, on the 145.230-600 MHz repeater, PL tone off. •

Membership in PAARA is \$12.00 per calendar year which includes a subscription to PAARAgaphs, \$6 for additional family members (no newsletter).
 Make payment to the Palo Alto Amateur Radio Association.

Permission is granted to reprint from this publication with appropriate source credit.

PAARAgraphs July 2000

Palo Alto Amateur Radio Association, Inc.
 PAARAgraphs Newsletter
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 Menlo Park, California 94026



FIRST CLASS MAIL

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 1st Friday 7:30 PM

Visitors Welcome

27-19-20-42-09



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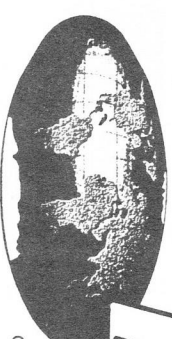
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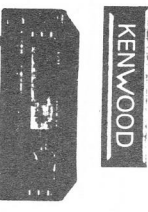
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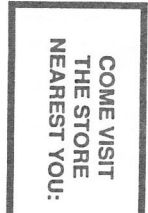


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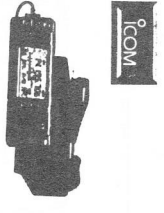


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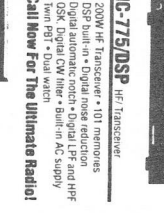
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