

**W6OTX****W6ARA**PAARA NEWSLETTER  
VOLUME 63, NUMBER 9, Sept 2013**K6OTA****K6YQT**

# PAARAgraphs



The Official Newsletter of the

**Palo Alto Amateur Radio Association, Inc.**Celebrating 76 years as an *active* amateur radio club—Since 1937<http://www.paara.org/>

## PhoneSat; NASA's Smartphone Nanosatellite

PhoneSat is a nanosatellite, with a mass between one and ten kilograms and has a volume of around one liter. The PhoneSat Project strives to decrease the cost of satellites while not sacrificing performance. In an effort to achieve this goal, the project is based around Commercial Off-The-Shelf (COTS) electronics to provide functionality for as many parts as possible while still creating a reliable satellite. This has resulted in satellites that cost under \$8000 and that can survive in space as proven by our first LEO launch.

### How Amateur radio operators can help.

PhoneSat satellites are emitting packets on the amateur radio spectrum to report different types of message. The details of these packets can be found on the [packets](#) page. If you are an amateur radio operator and you can receive these packets, you have the great opportunity to contribute to the project by submitting them. The [dashboard](#) page will give you all the information you need to track the satellites in real time. Visit the PhoneSat web site at <http://www.phonesat.org>.

### Ken Oyadomari biography

Ken is the Communications and Software Engineer for the PhoneSat team. He graduate of the University of Hawaii with a degree in Electrical Engineering. Ken's position is integration and test of the radios that will become a part of the satellite system.

**Sept 6, 2013****7:00 pm****Cubberley Community Center****Room H-6****4000 Middlefield Road****Palo Alto, CA 94303**

## President's Corner

September 2013

It's Fall contest season already, and the equinox is not far away. Neither is CQP, which means that the PAARA meeting will be one week later in October. The mini PAARashoot was a real "blast" for everyone. And, I'll see you at SWHAMCON in Buellton.



Unbelievably, it's almost September as I write this. I cannot believe how quickly the year has progressed. My son Christopher, KG6SVI, is back at Berkeley and classes start in just a couple of days. The light fades noticeably earlier and earlier each day. I just returned from Japan about a week ago as of this writing, and since they are shifted in their time zone and don't observe Daylight Savings Time, I didn't notice how much things had changed until I returned. Japan was very hot and very humid, as is typical of Asia at this time of the year. I did get a chance to stop by all of the ham stores, and I saw the new Kenwood TS990S, or at least the JA version of it in Akihabara. It was really nice. I scanned 40m and listened to some CW and a few phone stations. It has good audio, and the large band scope is great. I'm mostly over my jet lag, though I had almost no time to

*(Continued on page 2)*

*(Continued from page 1)*

recover. I had to work through my 'vacation' and then have been working solidly since I returned. Life has been a bit hectic.

Speaking of hectic, we could use some help from our membership. We have two openings in the PAARA leadership team. Long time PAARA Secretary and Database Administrator Rick, K6RDM, has had to resign since he is moving, so we need to find one or two people to fill those roles. If you are interested, or know of someone who is interested, please contact me directly. You know how to reach me (see the masthead). I want to take this opportunity to thank Rick for his many years of service to PAARA. I have always been able to count on him to take care of the DB and the Secretary's duties without fail. I and PAARA thank you Rick.

For those of you who didn't attend the mini PAARASHOOT event at the San Jose Municipal Firing Range, a.k.a. the 10th Street Range, you really missed out on a fun time. A group of us, some of whom were first time shooters, assembled there on the morning of the 4th of August as the guest of Carla, WA6UBE. After a bit of organization and range safety instruction, we fixed our sights on some paper target that we put downrange, and the fun commenced. There was a nice selection of firearms brought by our members, and we all got a chance to test our marksmanship with different sights and calibers. There was also much fun to be had with several shotguns on the range. Of particular note, new ham, new shooter, and PAARA member Amanda, KK6CWV, was an extraordinary shot. A big thanks go to Carla and Dick (our range master) for their time with us on that day.

The Fall contest season is just starting, and that means more fun on the air. There will be a number of the big contests coming up like CQWW, ARRL DX, NAQP, and many state QSO Parties. It's also a great time to get on the air because the propagation reaches a sweet spot. The F layer of the ionosphere charges up

nice during the day, but the D layer is not so charged up that it attenuates HF signals as it does during the summer. There can be fantastic chances for gray line propagation (that is along the day-night line) to South America during this period. Take advantage of it while you can.

Right after the next PAARA meeting in September, I will be going to speak at the ARRL 2013 Southwestern Division Convention at the The Marriott Santa Ynez Valley Hotel and Convention Center. If you get a chance, I'd love to see you there. No matter what, though CU AT PAARA IN SEPT DE K6WX

### **W6P at Pacificon 2013**

PAARA will be heading up the W6P Radio operation at Pacificon this year. Most of the equipment will be furnished by the Mt. Diablo Amateur Radio Club. The radio station will be set up on Friday morning, Oct. 11. It will operate Friday evening, Saturday, and Sunday morning then be taken down Sunday afternoon.

I am looking for people to help get the station up and on the air; to operate during the active hours. Twenty four hour operation is not necessary unless someone wants to volunteer for the overnight shifts. This will be a fun event with no pressure like Field Day. I hope many of you would like to become involved and participate at any level.

Please contact me by email at mcwayne2@comcast.net or w6nev@arrl.net. If you want to chat, call me at 408-234-8023 (cell, best) or 408-246-7531 (home).

Come join the fun and help promote ham radio and PAARA at Pacificon.

Marty, W6NEV  
 PAARA VP



**From Left to Right: KK6CWV, KD6W, Jane Random, KI6KVV, KD6KYT, K6WGY, KG6GLU**

### CQ Field Day

It's that time of the year when lots of clubs dig their equipment out of where ever it may be stashed or in use to take into the field. PAARA is no exception to this effort. Over the years many a fine ham and volunteer has helped with the effort of getting on the air and getting out into the public to demonstrate communications and stir interest in others who visit the site. Though roughly the same event, there are always variables from year to year. The types of antennas, towers, radios, band conditions, different operators and let's not forget Murphy make every year a bit different. Hopefully with careful planning and lots of participation, the amount of effort is reduced and the fun factor is increased.

Thanks to the ARRL's new web site, I was able to extract historic Field Day data from the last 10 years of PAARA's participation. As you can see, the club has participated in a few different categories over the years, used a couple of call signs and not always had a GOTA station. For the most part every year our overall ranking has gotten better. Now I know this isn't a contest, but the amount of effort is also reflected in how well we do and how much fun is had by all. After all, this is a learning experience for all, especially new hams, to see what it takes to stage such an event, make a bunch of radios work next to each other, and if there should be an emergency, where activation of the equipment is needed, more people have an idea how to get things setup.

The table is divided into three areas. On the left is the general information on the year, calls used, category, points, number of QSO's, and number of participants. The next area is the National ranking by the category PAARA participated in and rank out of all categories. The last group looks only at the Pacific Division. I'll let you interpret the data but generally, PAARA has improved and held its own.

Here's to another successful Field Day in 2013. 73's de Jim KI6KVV





Welcome to PAARA Shoot



Briefing — Always point down range!



Listening Intently



Ready on the Right, ...



Choose your weapon



Fire at will





Did I hit it?



Ready for the Olympics



Tool Box



Relaxing with a Hot Dog



Blast Them

PAARAGraphs—Sept 2013  
 Celebrating 76 years as an active ham radio club—Since 1937

Historic look @ PAARA Field Day results

Year	Call	GOTA	Category	Points	QSO's	Participants	NATIONAL				PACIFIC DIVISION			
							Category rank	Out of	Category top points	All Categories Rank	Category rank	Out of	All categories rank	Out of
2012	W6AR A	W6OT X	4A	17,158	5,332	82	1	158	17158	6	1	7	3	158
2011	W6AR A	W6OT X	4A	14,066	4,356	75	4	125	16668	20	1	5	2	143
2010	W6AR A	W6OT X	4A	13,570	4,114	108	3	155	17140	16	1	8	3	154
2009	W6AR A	W6OT X	4A	11,326	3,480	74	3	130	14404	32	1	8	3	151
2008	W6AR A	W6OT	4A	10,738	3,276	53	5	109	14202	33	1	4	3	137
2007	W6AR A	K6OTA	3A	10,774	3,207	123	6	282	19288	34	1	13	3	117
2006	W6AR A	K6OTA	3A	8,644	2,197	95	9	277	18142	70	1	9	7	113
2005	W6OT X	K6OTA	4A	6,378	1,939	132	15	127	12518	149	1	8	8	114
2004	W6OT X		2A	6,004	1,764	126	56	454	13972	182	4	21	11	126
2003	W6OT X		2A	8,740	2,617	42	11	429	14336	50	1	24	3	122
2002	W6OT X		2A	7,994	2,355	36	22	467	14696	95	1	22	4	125

Data source:  
<http://www.arrl.org/results-database>

**Palo Alto Amateur Radio Association, Inc.**

PO Box 911 Menlo Park, CA 94026

**Officers**

President .....	Kristen McIntyre, K6WX	510-703-4942
	kristen@alum.mit.edu	
Vice President.....	Marty Wayne, W6NEV	408-246-7531
	w6nev@arrl.net	
Secretary.....	Rick Melrose K6RDM	408-341-9070
	k6rdm@arrl.net	
Treasurer .....	Ron Chester, W6AZ	408-243 2221
	ron@taxhelp.com	

**Directors**

Director ('13) .....	Byron Beck KG6UOB	408-369-1913
	kg6uob@arrl.net	
Director ('14) .....	Rob Riley, KI6INR	650 799-1607 (cell)
	ki6inr@arrl.net	
Director ('14) .....	Larry Rebarchik N6DB	650-465-8210 (cell)
	n6db@arrl.net	
Director ('14) .....	Darryl Presley, KI6IDM	650 255-2454
	ki6idm@arrl.net	

**Appointed Positions**

Membership .....	Vic Black, AB6SO	650-366 0636
	ab6so@smrn.com	
Database.....	Rick Melrose K6RDM	408-341-9070
	k6rdm@arrl.net	
Chaplain.....	<i>Position Vacant</i>	
Public Affairs .....	<i>Position Vacant</i>	
Station Trustee W6OTX, K6YQT, W6ARA	Gerry Tucker, N6NV	
Station Trustee K6OTA.....	Ron Chester, W6AZ	
Property Manager .....	Gerry Tucker, N6NV	
Fund Raising Coordinator..	Bob Korte, KD6KYT	408 396 4745
	bob@rgktechsales.com	
Badge Coordinator.....	Doug Teter, KG6LWE	650-367-6200
	dteter@wcwi.com	
HistorianPosition .....	<i>Position Vacant</i>	
Raffle Coordinator.....	Jim Rice, K6AK	650-851-2274
Ticket Master .....	Marty Wayne, W6NEV	408-246-7531
Field Day Coordinator .....	Doug Teter, KG6LWE	650-367-6200
ASVARO Rep .....	Rolf Klibo, N6NFI	650-856-2748
	n6nfi@arrl.net	
Webmaster.....	John Miller K6MM	
	webaron@gmail.com	
Technical Coordinator.....	Joel Wilhite, KD6W	650-325-8239
	kd6w@arrl.net	
QSL Manager.....	Rob Riley, KI6INR	650 799-1607 (cell)
	ki6inr@arrl.net	
Speaker Coordinator.....	Marty Wayne, W6NEV	408-246-7531

**PAARAgaphs Staff**

Editorial Board		
	Bob Van Tuyl K6RWY	Kristen McIntyre k6wx
	Ron Chester W6AZ	Vic Black AB6SO
	Joel Wilhite, KD6W	
Editor.....	Bob Van Tuyl, K6RWY	408 799-6463
	rrvt@swde.com	
Advertising .....	Ron Chester, W6AZ	408-243-2221
	ron@taxhelp.com	
Member Profiles.....	<i>Position Vacant</i>	
Technical Tips.....	Vic Black, AB6SO	650-366 0636
	ab6so@smrn.com	
Photographer .....	Bill Young, K6VWO	
	jsinger@sbcglobal.net	

**Future PARRA Meeting Dates**

Sept 6<sup>th</sup>, Oct 11<sup>th</sup>, Nov 1<sup>st</sup>

**VE Exams**

3rd Saturday each month, 10:30AM, 145.23- PL=100Hz  
 Redwood City Main Library, Community Conference Room  
 1044 Middlefield Road, Redwood City, CA  
 Contact: <http://amateur-radio.org> or Al, [WB6IMX@att.net](mailto:WB6IMX@att.net)

**Electronics Flea Market**

Sponsorship by **A.S.V.A.R.O.** — Association of Silicon Valley Amateur Radio Organizations  
 Second Saturday of month, March-October, 6am-2pm  
 Howard M. Krawetz, N6HM 650-856-9761  
 Contact: <http://www.electronicfleamarket.com/>

**PAARA — Palo Alto Amateur Radio Association**

Meets 1<sup>st</sup> Friday 7:00pm each month at Room H-6, Cubberley Community Center; Net 145.230 - PL 100Hz Mondays at 8:30. See our website at <http://www.paara.org> for more information or contact: Joel Wilhite KD6W, [kd6w@ARRL.NET](mailto:kd6w@ARRL.NET), 650-325-8239

**FARS — Foothills Amateur Radio Society**

Meets 4<sup>th</sup> Friday each month at 7:30pm  
 Contact: <http://www.fars.k6va.org>

**NCDXC — Northern California DX Club**

Meets 3<sup>rd</sup> Thursday 7:30pm each month,  
 Repeater for member info 147.360, Thursday 8:00PM  
 Contact: <http://ncdxc.org> or Mike Gavin W6WZ, (650) 851 8699

**QCWA Chapter 11**

**Northern California Quarter Century Wireless Association**

Meets third Wednesday monthly at Harry's Hofbrau in Redwood City @ 11:30 AM.  
 Guests are welcome. Saturday morning net on 146.850 MHz, PL 114.8

**NorCalQRP — Northern California QRP Club**

Meets 1<sup>st</sup> Sunday each month  
 Contact: <http://www.norcalqrp.org>

**SPECS**

**Southern Peninsula Emergency Communication System**

Meets each Monday 8:00pm on Net 145.27, 440.80 MHz  
 Contact: <http://specsnet.org> or Tom Cascone, KF6LWZ, 650-688-0441

**SCARES**

**South County Amateur Radio Emergency Service**

Meets 3<sup>rd</sup> Thursday 7:30pm each month, Belmont EOC, Belmont City Hall, One Twin Pines Lane, Belmont CA 94002. Net is on 146.445 [PL 114.8] & 444.50 (PL-100) 7:30 Monday evenings. Contact: President Gary D. Aden, K6GDA 650-743-1265 (D), 650- 595-5590 (N)  
 Web: <http://k6mpn.org> E-mail: [pres@k6mpn.org](mailto:pres@k6mpn.org)

**SCCARA**

**Santa Clara County Amateur Radio Association**

Operates W6UUU & W6UU/R, repeater 146.985-pl  
 Nets: 2m, 7:30pm Mon; 70cm, 442.425+ (pl 107.2) Thur.  
 Meets 2<sup>nd</sup> Mon each month @ 7:30 PM.  
 Contact: <http://www.qsl.net/sccara> or Clark Murphy KE6KXO 408-262-9334  
 ARRL/VEC license testing contact 408-507-4698

**SVECS — Silicon Valley Emergency Communications**

Operates AA6BT repeater (146.115 MHz+)  
 contact: <http://www.svecs.net> or Lou Stierer WA6QYS 408 241 7999

**TEARS — The Elmer Amateur Radio Society**

Dedicated to operational training, knowledge building & FCC exam testing.  
 KV6R repeater under construction.  
 Contact: [AA6T@ARRL.NET](mailto:AA6T@ARRL.NET)  
 Most members are Extra Class or VE's. See QRZ dot com/kv6r for class info

**WVARA — West Valley Amateur Radio Association**


W6PIY six-meter repeater on 52.58MHz. Normally, six-meters is linked with 147 and 223, while 441 and 1286 repeaters are linked.  
 VHF: 52.58 (-500) 151.4 ctcss UHF: 441.35 (+5.0) 88.5 ctcss  
 147.39 (+600) 151.4 ctcss 1286.20 (-12m) 100.0 ctcss  
 223.96 (+1.6) 156.7 ctcss  
 Meetings are 3<sup>rd</sup> Wednesday of every month.  
 Contact: <http://wvara.org>, Bill Ashby N6FFC, 408-267-3118, [N6FFC@Juno.com](mailto:N6FFC@Juno.com), or [N6FFC@ARRL.NET](mailto:N6FFC@ARRL.NET)

**American Red Cross, Santa Clara Valley Chapter**

Contact: <http://santacalaravalley.redcross.org> or Scott Hensley KB6UOO, (408) 967 7924 [shensley@Novell.com](mailto:shensley@Novell.com)

(Please send changes to [PAARAgaphs editor](mailto:PAARAgaphs editor))





**James Farrey**  
 Sales Manager

James Electronics Ltd  
 1355 Shoreway Road, Belmont, CA 94002  
 Tel: 650•592•6718 x 350 Fax: 650•802•1520  
 Direct: 650•802•1511 jfarrey@jameco.com

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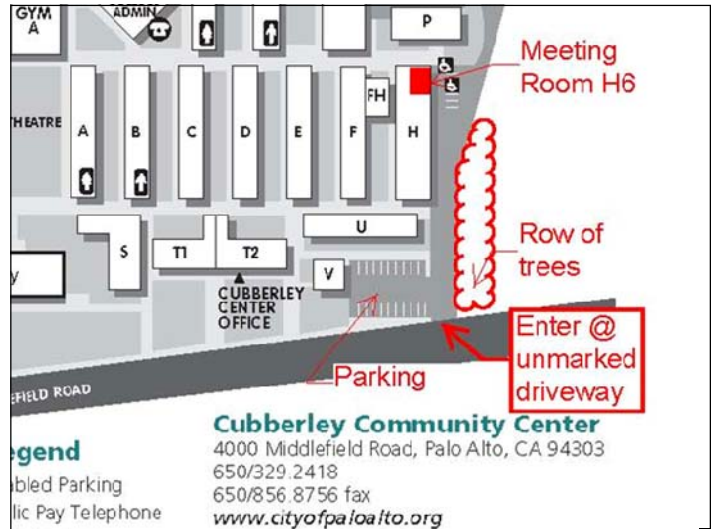
**Badges are ready for pickup.**

If you would like to order a badge, see **Doug Teter, KG6LWE.**

**PAARA Weekly Radio Net**  
 Info and Swap Session every Monday evening at 8:30pm on the N6NFI 145.230 MHz repeater

<u>Week</u>	<u>Control Operator</u>
1 <sup>st</sup>	Open
2 <sup>nd</sup>	Doug - KG6LWE
3 <sup>rd</sup>	Jack - N1VSL
4 <sup>th</sup>	Marty - W6NEV
5 <sup>th</sup>	Up for Grabs!

If you're interested in trying out at Net Control, Contact Doug, KG6LWE. It's good practice, and lots o' fun! Give it a try.



**Meeting Location — Middlefield Road between San Antonio and Charleston in Palo Alto. 4000 Middlefield Road**

<http://www.foto.mail.ru/list/shkurkin>

Vladimir Vladimirovich  
 SHKURKIN  
 Editing and Translation Services  
 English-Russian-English  
 shkurkin@ix.netcom.com

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

Club meetings are on the first Friday of each month, 7:00pm at the Room H-6, Cubberley Community Center.

Radio NET & Swap Session every Monday evening, at 8:30pm, on the 145.230 –600 MHz repeater, PL 100Hz.

Membership in PAARA is \$20.00 per calendar year, which includes one subscription to PAARAgaphs \$6 for each additional family member (no newsletter).  
 Make payment to the  
 Palo Alto Amateur Radio Association,  
 P.O. Box 911, Menlo Park, CA 94026-0911

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<p><b>Amateur Radio Technology Day</b></p> <p>WILL RESUME WHEN A NEW VENUE IS DETERMINED.</p> <p><b>8AM TO 6PM</b></p>	<p>Ilse Beck, E. A. , KI6IBM</p> <p>Beck Business Services</p> <p>441 N. Central Avenue, #9 Campbell, CA 95008</p> <p>Enrolled Agent Income Tax Bookkeeping/Payroll Elder Care Consultations Billing and A/R</p> <p>Phone/FAX: 408-267-8234 Email: ilsebeck@jps.net</p>
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**Starbucks Store 5686**  
**3605 El Camino Real**  
**Santa Clara CA 95051**  
 (Corner of Lawrence Expwy and El Camino)

**PAARA thanks the crew at Starbucks Store 5686 for their generous support of our radio club.**

**This spot is available for your advertisement.**

**Reasonable rates, see below.**

**W6AZ**



Ron Chester  
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**Order on eBay** or call 650-322-2476  
 (search for "PowerFlare")

Submit items to **PAARAgaphs** by the  
3<sup>rd</sup> Wed to: [rrvt@swde.com](mailto:rrvt@swde.com)  
 Text: .doc, .rtf, or .txt  
 Photos: jpg, png or tiff

Subscription Problems? Contact Database  
 Manager: Rick Melrose K6RDM,  
 888 725-1895, [k6rdm@arrl.net](mailto:k6rdm@arrl.net)

**PAARAgaphs Ad Rates**

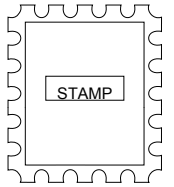
PAARAgaphs accepts paid advertisements from non-members. (short personal ads remain free for members in good standing). **All ad rates listed are per issue.**

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

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 Ron Chester, W6AZ**

# PAARAgaphs — Sept 2013

Accept no substitutes. Produced and printed in California USA



Palo Alto Amateur Radio Association, Inc.  
 PAARAgaphs Newsletter  
 P.O. Box 911  
 Menlo Park, California 94026

## FIRST CLASS MAIL



**ANHEIM, CA**  
 (Near Disneyland)  
 5531 N. Central St., 92801  
 (800) 554-6046  
 Mark, W7YU, Mgr.  
[radio@hamradio.com](mailto:radio@hamradio.com)

**BIRBAK, CA**  
 1525 W. Memorial Blvd., 91916  
 (800) 942-7788  
 (877) 892-1748  
 Eric, K8EJC, Mgr.  
 So. from Hwy. 8 & Sierra Vista  
[hamradio@hamradio.com](mailto:hamradio@hamradio.com)

**OAKLAND, CA**  
 2210 Livingston St., 94606  
 (510) 594-5757  
 (877) 892-1745  
 Mark, W7YU, Mgr.  
 1880 at 23rd Ave. ramp  
[radio@hamradio.com](mailto:radio@hamradio.com)

**SAN DIEGO, CA**  
 5375 Kearny Villa Rd., 92123  
 (602) 592-4900  
 (877) 1328-8093  
 Hwy. 153 & Carrington Mesa  
[sandiego@hamradio.com](mailto:sandiego@hamradio.com)

**SUNNYVALE, CA**  
 510 Lawrence Exp. #102, 94085  
 (408) 736-9496  
 (877) 892-1749  
 Jon, KG6W, Mgr.  
 So. from Hwy. 101  
[sunnyvale@hamradio.com](mailto:sunnyvale@hamradio.com)

**NEW CASTLE, DE**  
 (Near Philadelphia)  
 1001 E. 2nd Street Hwy., 19720  
 (800) 554-6046  
 (800) 544-4175  
 Chuck, W1UC, Mgr.  
 RT1314 Rd., So. I-295  
[marc@hamradio.com](mailto:marc@hamradio.com)

**PORTLAND, OR**  
 11705 S. W. Pacific Hwy.  
 97223  
 (503) 598-6556  
 (800) 554-6046  
 (800) 544-4175  
 Hwy. 171 & 15th  
 from Hwy. 5 & 217  
[portland@hamradio.com](mailto:portland@hamradio.com)

**DENVER, CO**  
 8400 E. Hill Ave. #3, 80231  
 (303) 746-7273  
 (800) 444-9176  
 East, N. on I-70  
[denver@hamradio.com](mailto:denver@hamradio.com)

**PHOENIX, AZ**  
 11613 N. 43rd Ave., 85029  
 (602) 242-3616  
 (800) 559-8938  
 East, N. on I-17  
[phoenix@hamradio.com](mailto:phoenix@hamradio.com)

**ATLANTA, GA**  
 6770, 285-7700  
 (800) 444-7927  
 Mark, K4AO, Mgr.  
 Dunwoody, 1 mi. no. of I-285  
[atlanta@hamradio.com](mailto:atlanta@hamradio.com)

**WOODBRIDGE, VA**  
 (Near Washington D.C.)  
 14803 Dulles America Dr. 22191  
 (800) 444-4709  
 Steve, W4SHG, Mgr.  
 Exit 161, 195, So. to US 1  
[woodbridge@hamradio.com](mailto:woodbridge@hamradio.com)

**SALEM, NH**  
 (Near Boston)  
 224 N. Broadway, 00709  
 (603) 888-2791  
 (800) 444-8017  
[salem@hamradio.com](mailto:salem@hamradio.com)  
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 200 No. of Boston  
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## 12 STORE BUYING POWER



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 • 100W 1.2 GHz motor DT-20 module  
 • 150W 1.2 GHz motor DT-20 module  
 • 150W 1.2 GHz motor DT-20 module  
 • Lithium battery  
**Call Now For Special Price!**



**TH-5FA**  
 • Dual Channel Receiver  
 • TX, RX, SSX  
 • SW/20W/20V/440 TX, PM  
 • 435 Memories  
 • Lithium Battery  
**Call For Low Price!**



**TM-D71DA** 2M/440 Dualband  
 • 50W 2M & 1HF  
 • Optional Voice synthesizer  
 • 100W transmitter • Dual receiver  
 • Advanced APRS features  
 • Built-in TNC • SWX Command II+  
 • GPS 100 Feet  
 • Choice of Green/Amber LED backlight  
**Call Now For Special Introductory Price!**



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 Royal Distributors From  
 The Store nearest to You!



**FT-897D** HF • VHF • UHF  
 • 100W HF, 50W 2M, 20W UHF  
 • DSP included • 32 color display  
 • 200 memos • Accessible on hand  
 • 3 ft. rotator  
**Call For Low Price!**



**FT-2000** HF • 60W 10V  
 • 100W HF, 60W 10V  
 • Built-in Power supply  
 • DSP included • 32 color display  
 • 200 memos • Accessible on hand  
 • 3 ft. rotator  
**Call Now For Low Price!**



**REMOTE RIG**  
 The set of interface allows remote control of your remote radio station near the interface box using a computer and a remote rig. Remote rig gives you control of the radio coupled with crystal clear TX & RX audio and sending QW with your own paddle!  
 Works with all Computer-compatible radios from: **Alinco • Elecraft • ICOM • Kenwood • Yaesu**  
**For information, visit our website:**  
[www.hamradio.com](http://www.hamradio.com)  
 TS-4000KCAT, TS-2000, RC-2000, HTD1, IC-7000plus, IC-706 series, DX-390RT, IC-2000H, IC-2500



**RRG-1258 MM1-Set**  
 The set of interface allows remote control of your remote radio station near the interface box using a computer and a remote rig. Remote rig gives you control of the radio coupled with crystal clear TX & RX audio and sending QW with your own paddle!  
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**DL-67T** 2m/440/1.2 Transceiver  
 • Full duplex carry two bands  
 • Interchangeable antennas  
 • Hi-capacity Lithium battery  
 • 1000 Memories  
**Low Pricing!**



**DR-135PT** 2M mobile  
 • 50 Watt out • Alpha numeric display  
 • 100 memos • Built-in TNC, 700 & 900 Band  
 • Remote Paddle GPS in • Near 95-90  
 • On-Screen Encoder/Decoder built in  
**Low Pricing!**

Available exclusively from all HRO Locations:

**TS-2000** HF/VHF/UHF TOWER

- 100W HF, 60W 2M • 50W 70CM
- 100W 1.2 GHz motor DT-20 module
- 150W 1.2 GHz motor DT-20 module
- 150W 1.2 GHz motor DT-20 module
- Lithium battery

**Call Now For Special Price!**

**TH-5FA**

- Dual Channel Receiver
- TX, RX, SSX
- SW/20W/20V/440 TX, PM
- 435 Memories
- Lithium Battery

**Call For Low Price!**

**RRG-1258 MM1-Set**

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**Low Pricing!**