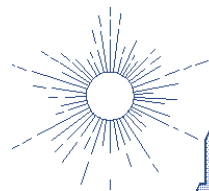


ADAW

4529 W. Park Place
Glendale, AZ 85306-1512



ADAW

Arizona Desert Aire Waves

Vol 42, No 5

May 2017

CLUB MEETINGS SCHEDULE

QCWA

June
TBD
Prescott Area
11:00 AM

WVARC

May 1st
St Clement Catholic Church
Social Hall
7:00 PM

SuperstitionARC

May 16th
Charles K Luster Bldg
7:00 PM

ARA

May 25th
Denny's Restaurant - Tempe
7:30 PM

MARCA

May 16th
Denny's Restaurant - Tempe
6:30 PM

MARA

May 27th
Barrow's Pizza - Maricopa
9:00 AM

ANSR

May 15th
via GoToMeeting
7:30 PM

YARC

May 4th
Mile High Middle School
7:00 PM

OVARC

May 19th
Ascension Lutheran Church
7:00 PM

CARL

TBA
AZ Science Center
TBA

CLUB MEETINGS SCHEDULE

SARC

May 3rd
Scottsdale Senior Center
7:00 PM

AARC

May 11th
Red Cross Bldg. - Phx
7:30 PM

OPRC

Jun 14th
Marshall Conference Ctr
at Tucson Medical Ctr
7:15 PM

TBARC

May 18th
North Phoenix Campus
Northern Arizona University
7:00 PM

MCCARC

May 1st & 15th
Mesa Community College Tech Bldg
7:00 PM

CADXA

May 4th
PERA Club
7:00 PM

ADAW Member Clubs

ARIZONA AMATEUR RADIO CLUB

The Arizona Amateur Radio Club meets on the **SECOND THURSDAY** of each month at 7:30 p.m. at the American Red Cross Building at 4747 N 22nd St. in Phoenix. Visit web site at www.W7IO.org for map. Visitors are welcome.

President	Gary Hamman	K7GH	602.996.8148
Vice President	Joe Cutitta	W0SL	623.215.2226
Secretary			
Treasurer	Bob Hodges	K7JTT	602.375.9982
Activities Mgr	Lori Cripps	WA7EDI	
Membership	Bob Hodges	K7JTT	602.375.9982

AARC c/o Bob Hodges, K7JTT, 15214 N 7th Place, Phoenix, AZ 85022. DUES: \$15.00/YR, Prorated (\$18.00 Family, \$9.00 Student), MEMBERSHIP YEAR BEGINS FEB. 1.

SCOTTSDALE AMATEUR RADIO CLUB, INC.

The Scottsdale Amateur Radio Club meets the **FIRST WEDNESDAY** of each month at 7:00 p.m. in Room 8 at the new Scottsdale Senior Center located at 1700 N Granite Reef Road (west side of Granite Reef Rd., 50 yards north of McDowell Rd. Parking on site). The club also holds a net every Tuesday night at 7:00 p.m. on the 147.78/1.18 repeater.

President	James Wasson	N7ELL	480.456.1154
Vice President	Kelley Law	KF7ZVL	
Secretary	Paul Jorgenson	KE7HR	
Treasurer	Alan Jensen	KE7FSD	
Past President	Paul Finell	W7EFQ	602.741.6563
Board Members	Jerry Jacques	KE7GYM	480.239.8679
At-Large	Dreux Jacques	W7EMU	
	Louis Schmitt	NQ7I	
	Judy Jensen	KE7IXI	480.773.8452
	David Yee	N7AJR	
	Paul Jorgensen	KE7HR	
	Ed Nickerson	WU7S	480.949.5162
	Charlie Brown	NJ7U	
	Bill Kouchis	N9EIV	

SARC, P. O. Box 10878, Scottsdale, AZ 85271-0878. Phone: 602.735.3988. DUES: \$20.00/YR, (\$10.00/Add'l Family Member). Web Site: www.scottsdalearc.org

ARIZONA NEAR SPACE RESEARCH

The Arizona Near Space Research group meets the **THIRD MONDAY** of the month at 7:30 p.m. on Skype. Technical meetings are held the first Monday of the month at 7:30 p.m. on GoToMeeting. Please contact an officer about joining our meetings.

President	Stephen Thomas	KE7TLS	iamgadget1@yahoo.com
Vice President	Clayton Jacobs	KJ6QJS	
Secretary	Steve Miller	W6SDM	
Treasurer	Bill McLean	K7WWM	bmcleanl@gmail.com

ANSR, PO Box 31003, Mesa, AZ 85275-1003. DUES: \$10.00/YR. Web Site: www.ansr.org

THUNDERBIRD AMATEUR RADIO CLUB

The Thunderbird Amateur Radio Club meets the **THIRD THURSDAY** of each month at 7:00 p.m. at North Phoenix Campus of Northern Arizona University located at 15451 N. 28th Avenue (near I-17 and West Greenway Road). The meeting is held in room 147. See the website (<http://w7tbc.org>) for a map and more details.

President	Gary Duffield	WK7B	602.843.7724
Vice President	Chris Johnson	K6OZY	623.866.2777
Secretary	Gary Cline	AF7BJ	
Treasurer	Darren Johnson	AF7CO	
Board Members	Joe Arnold	AD0X	
	Andrew Cornwall	KF7CCC	
	Wayne Hale	W6IZK	
	Robert Fairfield	K7RQN	
Past President	Walt Reinert	NJ8G	602.938.8219

For further information about the ThunderBird Amateur Radio Club, visit our website at <http://w7tbc.org>, send an e-mail to: info@w7tbc.org or call 602.938.8219. Mailing address: PO Box 83615, Phoenix, AZ 85071-3615.

OLD PUEBLO RADIO CLUB

The Old Pueblo Radio Club meets the **SECOND WEDNESDAY** of March, June, September and December at 7:15 p.m. in the Marshall Conference Center at Tucson Medical Center. Visitors are welcome.

President	Ron Kalish	N7SPW	520.207.3852
Vice President & Treasurer	George Devich	N9IUK	520.760.0125
Board of Directors:	Bill Price	N7GUO	
	Cliff Hauser	KD6XH	
	Jim Ulmer	KC7THU	
	Lin Donnelly	KF7CNR	
WebMaster	Ted Willis	AA7HX	520.790.3828
	(www.oprc.org)		
Trustees:	(all repeaters operating under the K7TRA call)		
Primary	Cliff Hauser	KD6XH	
	146.660, 146.820, 147.220-		
	Paul VanBeverhoudt	KA7LFX	224.06+
Secondary	Ted Willis	AA7HX	146.66-
	Ralph Turk	W7HSG	146.82-
	Paul VanBeverhoudt	KA7LFX	224.06+

Mailing address: OPRC, P.O. Box 42601, Tucson, AZ 85733-2601. DUES: Individual - \$20.00/YR, Family - \$30.00/YR.

AZ RED CROSS COMMUNICATIONS CLUB

The Arizona Red Cross Communications Club meets at the Red Cross Building located at 4747 N 22nd Street in Phoenix. The group meets at emergency drills and at the call of the officers.

President	Frank Engstrom	KB7IQ	480.209.7300
Vice President	Larry Buchanan	AA0LB	623.703.9161

Arizona Red Cross Communications Club - K7ARC, 4747 N 22nd Street, Phoenix, AZ 85016.



ADAW Member Clubs

BARRY M GOLDWATER, ARIZONA CHAPTER QUARTER CENTURY WIRELESS ASSOCIATION

The Barry M Goldwater Arizona Chapter of the QCWA includes amateurs from all over Arizona. Four luncheon meetings are planned each year. The meeting months and locations are announced by newsletter, but generally follow the following schedule:

Spring Meeting	March/April	Tucson Area
Summer Meeting	June/July	Prescott Area
Fall Meeting	October	Phoenix Area
Holiday Meeting	December	Carefree Area

The AZ Chapter meets on the air every Sunday morning at 0700 MST (0730 during December and January) on 3890 +/- QRM. During December and January, the net time is moved to 0730 MST.

President	Tom Fagan	K7DF	520.574.1129
Vice President	John Marshall	WA7BST	623.334.2583
Secretary	Clifford Hauser	KD6XH	520.235.7393
Treasurer	Dave Hanson	W7BJ	w7bj@outlook.com
Webmaster	John Marshall	WA7BSR	623.334.2583

Web Site: <http://azqcwa.org> Email: azqcwa@gmail.com.
DUES: \$7.00/year and current national QCWA membership.

MINGUS MOUNTAIN REPEATER GROUP

Meetings are held twice a year, an annual board meeting in Phoenix and a picnic meeting in Chino Valley. Dates, times, and locations are announced in the newsletter.

President	Bob Sitterley	K7POF	928.636.2146
Vice President	Ray Tyrrell	N6MY	n6my73@gmail.com
Treasurer	Linda Sitterley	W7POF	mmrginc@gmail.com
Secretary	Lori Cripps	WA7EDI	602.955.7517

Web Site: <http://www.k7mrg.org>. DUES: \$20.00 per year, due prior to July 1. MEMBERSHIP YEAR - July 1 - June 30.

MARICOPA AMATEUR RADIO ASSOCIATION

The Maricopa Amateur Radio Association (MARA) meets the **LAST SATURDAY** of each month at 9:00 a.m. at Barrow's Pizza, 44600 W Smith-Enke Rd. (Smith-Enke and John Wayne Parkway) in Maricopa.

President	Steve Miller	W6SDM	602.290.1603
Vice President	Chris Canevit	W7CGC	
Secretary	John Wiltberger	NO7IN	
Treasurer	Curt Steger	NA7CS	520.568.9471
Board Members:	Steve Miller	W6SDM	602.290.1603
	David French	N7FAN	480.430.9426
	Bob Howard	W8RH	520.709.6176
	Curt Steger	NA7CS	520.568.9471
	Ronald Beasley	KG7MUV	520.568.4880
PIO:	Steve Miller	W6SDM	602.290.1603
Webmaster:	David French	N7FAN	480.430.9426

The Maricopa Amateur Radio Association is a 501(c)(3) non-profit organization. DUES: \$25.00/year individual, \$30.00/year family. Apply on-line at www.copahams.org. Mailing address: P O Box 951, Maricopa, AZ 85139

WEST VALLEY AMATEUR RADIO CLUB

The West Valley Amateur Radio Club is an Arizona 501(c)(3) non-profit corporation. Meetings are the **FIRST MONDAY** of each month at 7:00 PM in the St Clements Catholic Church Social Hall located at 15800 Del Webb Blvd., Sun City. The board meets the second Monday of the month at Boswell Medical Center, Ironwood Room 2, Sun City. The Emergency Preparedness Group meets the third Monday of the month at 7:00 PM at Boswell Hospital. Club nets are held on 147.300 (tone 162.2) at 9:00 AM daily and Monday - Thursday at 8:00 PM. The preparedness net is held the last Friday before the monthly Monday night meeting at 8 pm on the NY7S repeater 147.300 MHz, Tone 162.2 Hz. A weekly breakfast is held on Thursdays at Lou's Trivoli Gardens, 12535 W Bell Rd., at 7:00 AM.

President	Jim Rogers	N7YTI	623.584.6974
Vice President	Harry Scholz	AF7UT	
Secretary	Sharon Blaylock	KI7DOK	623.584.6974
Treasurer	Geoff Bock	KB7QFP	
Club Directors:	Bob Paul	KG7FIL	623.252.0149
	John Siepmann	N9NA	630.209.4116
	Tom Connor	W7TLC	623.444.7956
	Nancy Collins	KG6QWW	

WVARC, P O Box 1573, Sun City, AZ 85372-1573. DUES: \$15.00/YR for family residing at the same address. MEMBERSHIP YEAR - January - December. Web Site: <http://www.westvalleyarc.org>.

SUPERSTITION AMATEUR RADIO CLUB

The Superstition Amateur Radio Club meets at 7:00 p.m. on the **THIRD TUESDAY** of each month (except December) at the Charles K Luster Building, 640 N. Mesa Drive, Mesa (use the glass door on your left at the main entrance). Visitors are welcome. Board meetings are held at 6:30 p.m. on the second Tuesday of each month (except December) at Black Bear Diner, 1809 E. Baseline Road, Gilbert.

President	Steve Estes	KB7KWK
Vice President	Jeff Machesky	K7ZLX
Secretary	Jeff Harris	KD2DFE
Treasurer	Douglas Mitchell	W7ADD
Board Members:	Andy Keels	KD4ABB
	Brian Butler	W7FK
	Charlie Brown	NJ7V
	Dale Schmidt	N7QJK
	Dan Karnes	W7TWR
	Jeff Heinze	N7CCW
	Larry Fort	AB7C

Superstition ARC, 5155 E Eagle Dr #21522, Mesa, AZ 85277. Web Site: SuperstitionARC.org and SuperstitionSuperFest.org. The Superstition Amateur Radio Club is a 501(c)(3) non-profit organization. For club information, please send email to: Communications@SuperstitionARC.org.

**Please be sure your club has your current
email and/or mailing address.**

ADAW Member Clubs

MARCA, Inc. / W7MOT

MARCA is an Arizona 501(c)(3) Non-Profit organization. The club call sign in W7MOT. Membership is open to all amateur radio enthusiasts. Meetings are held the **THIRD TUESDAY** of each month at 6:30 p.m. at Denny's Restaurant located at 825 S 48th Street in Tempe (SE corner of University & 48th Street). Monthly presentations cover a broad spectrum of interesting subjects. Visitors are welcome to attend. Come early for dinner and socializing. Repeater Problem Reports are encouraged. A Repeater Problem or Comment Reporting is available at <http://www.w7mot.org/index.php/repeaters/report-a-repeater-problem>. Site Managers and officers will take reports for any W7MOT repeater. Contacts are found on website. Club activities include providing voice, aprs, packet, DStar, and Fusion repeaters Central Arizona; ARRL Field Day, special interest groups in SDR, APRS, antennas, digital modes.

President	Norm Johnson	AA7OO	480.278.2886
Vice President	Dave Hall	N7ZPY	
Secretary	T D Kennard	N7ISR	
Treasurer	Don Aldridge	WA7RLL	
Director	Bill Hosking	W7JSW	
Director	Dusty Morris	W7ITM	
Trustee:	Norm Johnson	AA7OO	480.278.2886
Webmaster:	Norm Johnson	AA7OO	480.278.2886

MARCA, Inc., PO Box 28246, Tempe, Arizona 85285. Membership dues \$25 annually. See our website (<http://w7mot.org>) for more information about meeting schedules, membership, repeaters, library, and club activities.

ARIZONA REPEATER ASSOCIATION, INC

The Arizona Repeater Association general meeting is held the **FOURTH THURSDAY** of each month at 7:30 p.m. There are no meetings in July and December. The November meeting is held the Monday before Thanksgiving. Meetings are held at Denny's Restaurant, 825 S 48th Street, in Tempe, near SR 143 and University Drive. Visitors are welcome. Come early for food and social time before the meeting starts. For further information about the ARA, including repeaters, site status, and the tech/board meeting, please visit our web site at www.w7ara.org.

President	Virgil Silhanek, K7VZ	k7vz@w7ara.net
Vice-President	Brian McCarthy, AK7F	ak7f@w7ara.net
Treasurer	Erv Heimbuck, K0OTZ	k0otz@w7ara.net
Secretary	Jim Hoff, N7XXX	n7xxx@w7ara.net
Board Members:		
	Lance Halle, KW7LH	kw7lh@w7ara.net
	Dennis Bietry, KE7EJF	ke7ejf@w7ara.net
	Doug Pelley, WB7TUJ	wb7tuj@w7ara.net
	Joe Godfrey, AE7JG	ae7jg@w7ara.net
	Dennis Campbell, AE7WU	ae7wu@w7ara.net
	Mike Montalvo, KF7MBK	kf7mbk@w7ara.net
	Marty Dusenberry, KE7DGP	ke7dgp@w7ara.net
	James Wasson, N7ELL	n7ell@w7ara.net

For Membership Information, contact (Mike Montalvo, KF7MBK membership@w7ara.net) Arizona Repeater Association, Inc., P. O. Box 35758, Phoenix, Arizona 85069-5758. To join or renew, please visit <http://w7ara.org/mbr/Membership.aspx>. DUES: \$18.00/yr. (Jan. 1 through Dec. 31) with a one-time initiation fee of \$10.00. Life and family memberships are available.

YAVAPAI AMATEUR RADIO CLUB

The Yavapai Amateur Radio Club meets the **FIRST THURSDAY** of every month at the Mile High Middle School located at the end of W Carleton Street west of Montezuma Street (visit web site at www.w7yrc.org for directions and map). YARC is an ARRL Special Service Club dedicated to public service and emergency preparedness. The club serves the quad cities area of Prescott, Prescott Valley, Chino Valley/Paulden, and Dewey/Humboldt.

President	Kathy Laing, KJ6KMK	president@w7yrc.org
Vice-President	John Stevens, AB9JS	vice_president@w7yrc.org
Secretary	Sandy Mattsen, K9WIZ	secretary@w7yrc.org
Treasurer	Tom Bishop, KI7FWZ	treasurer@w7yrc.org
Past President	Frank Bender, K8FB	k8fb@w7yrc.org
Board Members	Art Jackson, KA5DWI	ka5dwi@w7yrc.org
	Rex Mauldin, N7NGM	n7ngm@w7yrc.org
	Art Protas, KG6AY	kg6ay@w7yrc.org

Yavapai Amateur Radio Club, P O Box 11994, Prescott, AZ 86304-1994. DUES: \$20.00/yr. Visit the website at www.w7yrc.org

ORO VALLEY AMATEUR RADIO CLUB

The Oro Valley Amateur Radio Club meets the **THIRD FRIDAY** of each month at 7:00 p.m. at Ascension Lutheran Church located at 1220 W Magee Road in Tucson. (June is normally Field Day. December is annual Christmas Party and date and location varies.) Visitors are welcome. Board Meetings are held at 9:00 a.m. at the Oro Valley PD Substation EOC on Tangerine Rd (next to WalMart) in Tucson. Check the web site at www.tucsonhamradio.org for dates.

President	Steve Wood, W1SR	president@tucsonhamradio.org
Vice-President	Fred Bresani, W2HZ	vicepresident@tucsonhamradio.org
Secretary	Carl Foster, KB7AZ	secretary@tucsonhamradio.org
Treasurer	Hanna Eckert, KG7TPD	treasurer@tucsonhamradio.org
Board Members	Ross Eckert, K4WBR	
	Scott Boone, K7ADX	
	Gary Pierce, WE7GP	
	George Cooley, NG7A	
	Marnee Dearman, KG7SIO	

DUES: \$25.00/year (Household members living at same address \$15.00 each additional). To join or for additional information, visit website at <http://www.tucsonhamradio.org/>.

MESA COMMUNITY COLLEGE AMATEUR RADIO CLUB

The Mesa Community College Amateur Radio Club meets the **FIRST** and **THIRD MONDAY** of each month at 7:00 p.m. at Mesa Community College located at 1833 W Southern Avenue in Mesa. The meetings are held in the Technology Center Building 50, Room TC414 on campus. Every other meeting focuses on beginner topics to assist members in testing for the Technician license. All are welcome to join and there are no membership dues or requirements other than only MCC students may vote and hold club officer positions.

President	Charlie Brown	NJ7V	nj7v@arrl.net
Vice President	T.D. Kennard	N7ISR	n7isr@yahoo.com
Senator	Victor Valderram		vicau50911@maricopa.edu
Secretary	Robert Swanson		robswanson30@yahoo.com

ADAW Member Clubs

CENTER FOR AMATEUR RADIO LEARNING

The Center for Amateur Radio Learning is a hands-on amateur radio station, W7ASC, located within the Arizona Science Center at 600 E. Washington, Phoenix. Board meetings are held the last month of each quarter at the AZ Science Center. Annual meeting for all volunteers is held the **THIRD SATURDAY** of January. Watch ADAW for details.

President	Jack Landon	KD7ROB	480.759.5195
Vice President	Jim Felkey	N7BBS	480.966.7084
Secretary	John O'Neal	K7IP	480.961.1109
Treasurer	Karen McConaghy	NO7D	602.799.7338

Board Members:

Jean W4CIH	ADAW, Publicity
Steve WB4ZSC	Tech/IT, CARL/ASC Interface
Fred K9TOS	Logbook/QSLs
Tom K9TOS	At Large
Sam N7INV	Scheduling
Dave W7PMD	Hamfests
John K7JP	Teacher Packets
Bob KG7QJ	Classes, ASC Contact

Web Master, ARCA Rep - Roger Buel, W9NCQ - 602.493.7242

For information: Email to carl@w7asc.org or call Jack, KD7ROB at 480.759.5195. Web Site: <http://www.w7asc.org>

CENTRAL ARIZONA DX ASSOCIATION

The Central Arizona DX Association meets the **FIRST THURSDAY** each month at 7:00 p.m. (except for January Awards Banquet) at the PERA Club, located at 1 E Continental Drive in Tempe. Visitors always welcome. See www.cadxa.org/meetings.html for a map. The May meeting is an outdoor barbecue at 6:00 p.m. (reservations required).

President	Lee Finkel	KY7M	ars-ky7m@cox.net
Vice President	Fred Hoffert, III	NA2U	cwman1@aol.com
Secretary	Bill Poole	AA4Q	bill@poole.com
Treasurer	Alton Chaney	W7ACX	w7acx.480@gmail.com
Past President	Tom Kramer	NQ7R	tkramer@azci.net
Board Members	Larry Loen	WO7R	lwloen@gmail.com
At-Large	Mickey LeBoeuf	K5ML	k5ml@arrl.net

CADXA, P.O. Box 24616, Tempe, AZ 85285-4646. Email: cadxa@cox.net. Dues are \$25 per year (\$12.50 per additional family member). For more information, DXing resources, and a membership application, visit our website: www.cadxa.org.

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ADAW



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Deadline is 10th of the month

Arizona Hams Take Legislative Action



On Tuesday, March 28, 2017, Arizona Governor Doug Ducey signed SB1132. It becomes law 90 days after the Arizona Legislature adjourns in mid to late April. This concludes many years of hard work by Arizona hams and begins a new chapter for the future of Amateur Radio in Arizona.

FCC Licensed Amateur Radio operators have been able to get their call sign personalized on Arizona license plates long before the state regularly allowed it. In 1995, Arizona created the specialty plate program where non-profit 501c3 organizations can request a special plate and benefit from a portion of the \$25 annual fee. The Amateur Radio plate was created in 2004, but initially set up to return all monies to Arizona general funds. For several years, prior Section Manager Tom Fagan K7DF, Section Manager Robert Spencer KE8DM, and State Government Liaison Tom Boza NE7X have been trying to get that changed. This bill amends Section 28-2407 of the Arizona Revised Statutes to create a fund that contributes \$17 of each plate fee to an organization benefiting Amateur Radio.

The bill, SB1132 Amateur Radio Operator Special Plates, was introduced to the Arizona Senate on January 18th at the beginning of the 53rd Legislature Regular Session by Senator Nancy Barto. As is normal procedure, it was assigned to the Senate Transportation and Technology committee. On January 24th a group of 32 amateur radio operators joined Senator Barto with Virgil Silhanek K7VZ, Tom Boza NE7X, Dennis Bietry KE7EJF, Steve Miller W6SDM, and Robert Spencer KE8DM testifying in favor of the bill. The Transportation and Technology committee then voted 7-0 with a Do Pass recommendation. On January 30th the Rules committee passed the bill as Proper for Consideration (PFC) and with no amendments, it was added to the Consent calendar. On January 31st it was discussed in the Senate Republican and Democrat Caucuses. SB1132's journey through the Senate concluded on February 2nd when the floor voted 29-1 and passed it to the Arizona House.

On February 20th, SB1132 was introduced in the Arizona House with co-sponsor Representative John Allen. Like the Senate, it was assigned to the Transportation and Infrastructure committee. On March 8th, hams once again assembled in the audience as Senator Barto, Tom Boza NE7X, Virgil Silhanek K7VZ, and Steve Miller W6SDM testified before the committee. The motion of Do Pass was confirmed with a vote of 8-0. The House Rules committee approved the bill as Constitutional and in Proper Form (C&P) on March 13th and it was added to the Consent calendar. SB1132 passed the

House Caucuses on March 14th and was scheduled for a Third Read and vote on March 16th. Due to lengthy discussion of other bills, the House Floor adjourned, postponing the vote on SB1132. Finally, it was rescheduled for March 21st where the Arizona House voted, passing SB1132 with 37 yes, 19 no, 4 not voting.

The funds will be directed to the Amateur Radio Council of Arizona (ARCA), a statewide organization comprised of Amateur Radio clubs, working for the betterment of Amateur Radio. ARCA will be able to improve existing scholarship programs, provide better support of club activities and hamfests, and support Amateur Radio education and training in Arizona. The 2016 Arizona Department of Transportation report showed 1078 Amateur Radio Operator plates issued, which would contribute approximately \$18,000 annually to ARCA. At present, ARCA has 26 member clubs that funds will support.

Thank you to everyone who was involved with pushing this legislation forward. Your tireless efforts will benefit Amateur Radio in Arizona for generations to come. Thank you to Senator Barto and Representative Allen who sponsored this bill. They have proven to be great allies to the Amateur Radio community. As well, thank you to all of the Senators and Representatives in the legislature who voted in favor of SB1132's passage.

References / Web Sites:

Arizona Legislature, SB1132 - <http://www.azleg.gov/legtext/53leg/1R/bills/SB1132P.htm>

ARRL Arizona Section - <http://www.az-arrrl.org>

Amateur Radio Council of Arizona (ARCA) - <http://www.arca-az.org/>

SB1132 Videos - https://www.youtube.com/playlist?list=PLUM5eKr21FLrGSEO00gqfMAT_ynSJt1c8

Robert Spencer KE8DM

ARRL Arizona Section - Section Manager

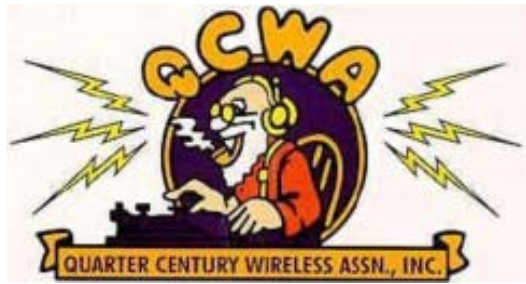
Tom Boza NE7X

ARRL Arizona Section – Section Government Liaison

Virgil Silhanek K7VZ

ARRL Arizona Section – Assistant Section Government Liaison

At time of writing, Mr Spencer was ARRL AZ Section Manager.



**CHAPTER 16
BARRY M. GOLDWATER ARIZONA CHAPTER**

The Barry M Goldwater, Arizona Chapter, Quarter Century Wireless Association, Inc. held their second quarterly meeting on March 25, 2017 at Mimi's Café in Tucson, AZ. The officers for 2017 are Tom Fagan K7DF President, John Marshall WA7BSR Vice President, Clifford Hauser KD6XH Secretary, and David Hanson W7BJ Treasurer. The meeting was run by Tom Fagan K7DF President. Twenty members were present for the lunch and presentation.

Tom Fagan gave out QCWA certificates to hams who had reached their anniversary of being an amateur radio operator. Congratulations!

- 80 Years Jim Swafford W7FF #22983
- 60 Years Pete George KE7XQ #37301

Congratulations to those who achieved the Century Award. This certificate is issued to QCWA members whose age, when added to their number of years as a QCWA member totals 100 or more. Congratulations!

QCWA #	Call	Name
4089	K7ARR	Herb Ash
22983	W7FF	James Swafford
20949	W1RGH	George Chaet
22249	W7ES	Gerald Higgins
10993	WW7P	John Elwood
10877	W3FZV	Philip Battey
14979	K7QWR	Roy Hejhall
17079	W7MC	Sergei Ticknor
17520	K7BHM	Bob Davies
24995	AB7UT	Harvey Zilm Jr
18512	K7MBJ	Howard Fouts
28103	W7UO	Wes Minear

These certificates will be mailed out to those not in attendance.

This meeting also marked the first time we have had four ARRL Arizona Section managers at the same place. A picture was taken with the last four ARRL Arizona Section Managers, Cliff Hauser, KD6XH, Tom Fagan K7DF, Robert Spencer KE8DM and Rick Paquette W7RAP (Elect).

Clifford Hauser KD6XH our secretary, has informed us that he and his wife have sold their house, taken down the antennas and towers and they will be moving to Ohio to be closer to their sons. We wish Cliff and Chris well on the move and hope to visit them to see their new house with the new towers and antennas.

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QCWA Continued from Previous Column

That said, we will need a new secretary. Please nominate yourself or someone who will be able to fill this position.

After a wonderful lunch, our main attraction was a presentation from our new ARRL Arizona Section Manager Elect, Rick Paquette W7RAP. Rick informed us on amateur radio activates in Arizona including the results of the Arizona Amateur Radio Plate Bill, Hands free legislation, and many other topics. Thank you, Rick.

Our next meeting will be in June in Prescott. See you there.





Tales from the Harkins Ham Shack

For the last two issues we have been able to provide readers with a report on Ham radio, as compared to the cell phone, as submitted by a young Ham who had been assigned this topic at school. The question was: "Why do we need Ham radio now that we have cell phones?" If you missed this report, you might find it useful to go back and read it. We are asked this question at W7ASC, the station at the Arizona Science Center. This paper pretty well answers the question. In fact, it raises the question as to why we would want a cell phone if we had a Ham license! Thanks to our guest author for a fine paper.

A question that we ask many times, both on air and in person, is: How did you get started in Ham radio? This question has resulted in many very intriguing answers. Some have appeared in prior issues. We know that there are many more that are waiting to be documented. Tell us your story! Send it to this writer and we will find room for it/them in some future issue. If you just wish to send the details, without concern for format, we will do the formatting for you. Just send what you have. If it got you here, we are sure that your story is interesting. Share it with the ADAW readers.

Here is a story as told to us by Gary N4WU, a Ham Shack volunteer. It would not surprise us to learn that there are many similar stories out there.

From Gary N4WU

Back in the 1950s, when kids got chemistry sets for Christmas, my older brother sparked my interest in science. In those days, sounds like the NBC MonitorRadio beacon on AM radio stations across the county were mysterious and intriguing to a young kid. When I was six, I got a rocket radio for my birthday and would go to sleep at night listening to far away stations in Chicago and New Orleans. By the third grade, I checked out a book at my school library on how to build a Foxhole radio and found it fascinating how a blued razor blade and pencil lead work as a diode detector. At around age 10, my family moved into a new neighborhood and I was lucky to make a new friend, who had just become a new ham on receiving his Novice license.

He motivated me to get my license. My parents ordered a Hallicrafters S-108, from Sears, for my Christmas gift. To prepare for the Novice license, I built a code practice oscillator

CARL Continued from Previous Column

and listened to W1AW code practice sessions. At age 12, I took my Novice examination from Frank Cassen (SK) W4WBK. I upgraded my license over the years: Novice, General, Advanced and Extra. My interest in science and anything electrical motivated me to pursue a technical career. My eclectic technical career ranges from power quality engineer, test engineer, semiconductor process engineer to patent agent and working for Salt River Project, Bechtel, Motorola (20 years) and On Semiconductor.

Gary Malhoit, P.E., Senior Engineer
Power Quality, Testing & Inspections | Salt River Project
Mail Station XCT329 | P.O. Box 52025 | 998 W. Washington
| Tempe, AZ 85281
Phone: 602.236.4494 | Cell: 602.380.8975 | Fax: 602.236.8640
| gary.malhoit@srpnet.com

And now we need a few more good stories from you, our faithful readers. How did you obtain your first Ham, or SW radio, and which model was it? Did you start right in listening to the Ham bands? After you passed the test, can you tell us about your first QSO? Must be some good stories out there.

Back at the Shack, we had a few fun visits. One little girl told us that she had been there not long ago. She had received a code certificate and an "I sent my name in Morse Code" badge. There were both lost. Reluctantly she told us that her dog ate them! She was returning to the Shack to earn replacements, which she did, promising to hide them from her dog.

Then we had the two little girls. An adult lady hovered over them. One was her daughter. The other one was the daughter's friend and classmate. They were quizzed, as usual, as to whether they had ever visited the station or done Morse. They had not. Then we asked the standard question of small visitors - could they write their names on the code sheet? Well! We received a quick, and simultaneous reply from the girls. "Of course," they replied. "We are in the First grade!" And they proceeded to complete the form and then do the code flawlessly.

It is really fun to volunteer at the Harkins Ham Shack in the Arizona Science Center. To receive your share of the fun, call Bob KG7QJ at 480-961-1109 kg7qj@cox.net, or Sam N7INV 480-963-6733

If you are really desperate and feeling neglected, you are always welcome to call the faithful scribe who pens this newsletter.

73 de W4CIH Jean
jol@hotmail.com 480-664-7353

Continued Next Column

ADAW



The heat came on quickly this year. It's already too hot for me to go up into the attic to adjust antennas. All my good intentions for "while the weather was still cool" have evaporated like an ice cube on the sidewalk. The public service season is finishing up too, as runners and cyclists feel the same way about the heat. Now is a great time to do things indoors - or head out to higher altitudes to escape the inevitable.

Our recent General class has finished, and we've got a new cadre of licensees with expanded privileges on the HF bands. They'll be looking for radios and more importantly antenna systems. If they can get something together to make contacts now, they'll be laughing once we're back on the high side of the solar cycle. Congratulations to everyone who passed!

Plans are already afoot for Field Day. A crew of volunteers are already planning, and we want you to be among us in the cool pines in Flagstaff on the fourth full weekend in June. Some people head up for the whole weekend, but if you've never been before and want to see what it's all about, it's certainly possible to drive up early Saturday, operate for a full day and get back into Phoenix before 10:00 p.m. This year, bring your favorite antenna launcher and see how far and accurately you can raise a long-wire antenna.

It looks like we have a good group - around 25 people - for our August Escape - a RV/camping + ham weekend. If you have questions (or just want to let Gary know you're interested) get in touch with him at gchline@cox.net.

If you've been thinking about upgrading your license (or know someone who wants to take a license exam) then don't forget about our VE sessions. You can get more information about them by getting in touch with our VE liaison, Jim Skinnell K7EOG at ve@w7tbc.org. If you are a VE and would like to join the team, Jim's the right person to contact as well. We have a session on the third Wednesday of every month at 6:00 p.m. at the Honor Health Medical Office Building, 19841 N 27th Ave in Phoenix.

Have you been to a TBARC meeting yet? Why not stop by? We'd love to have you join us, and guests are welcome. Our meetings are held on the third Thursday of the month at the North Phoenix Campus of Northern Arizona University. It's near Greenway and I-17, starting at around 7:00 p.m. See the club website at w7tbc.org for directions. In May, we're going to hear about a 1.2 GHz 12-ft Dish EME Antenna from Jim Wzorek, K1MEA. It's hard to believe someone's working off the moon with 23 cm. Is moonbounce Wifi coming next? Join us and find out!

Andrew Cornwall
KF7CCC kf7ccc@arrl.net



This month was a really bad month for MMRG. We lost one of our very beloved members, Russ Sherwin, AA7ZL. Russ was a big help to everyone who needed help whether it be an Arduino project, website, or just plain physical help or encouragement. Russ was control station on the Mingus Mountain Morning Roundtable several times a week until his health didn't permit it. For those interested in reading more about Russ, go to the link below and click on read more.

<http://www.ruffnerwakelin.com/obituaries/Russell-F-Sherwin?obId=1404716#/obituaryInfo>

If any of you wish to memorialize Russ here is a suggestion. In lieu of flowers memorial contributions in Russ's name can be made to the source of Katie. Katie is a rescue dog that Donna and Russ have. The address to which you can send a contribution is:

Saving Paws Rescue
P.O. Box 87148
Phoenix AZ 85080

Their website donation page can be found at <http://savingpawsrescueaz.com/>

I hope to be able to bring better news next month

73,
Bob Sitterley, K7POF



Want Ads

WANTED:

I am looking to purchase an alinco DJ-G29T 222/900 MHz Dual-Band HT. If you have one to sell, please contact:

Larry Stafford, N7WBU
3527 S Chesin Drive
Tucson, AZ 85730-2319
email: TFDFDF@cox.net



ARA Continued from Previous Column

remaining to free standing, heavier load towers at other sites. For example, the new tower on Smith Peak is 150' tall with the 3 legs being 16' on center. The antennas you'll find us using are much larger than hams would mount for a base station antenna as well. Many repeaters use a four-stack collinear design antenna or a fiberglass antenna with approximately 3" diameter and 20'-25' tall. Most link antennas used are a 7-element yagi.

The current Technician question pool mentions the word "repeater" 52 times in 426 questions. To answer correctly, you need to know the basic functions of a repeater, such as what a CTCSS tone is or common transmit and receive offsets. Very little is covered about what hardware is required to build and place a repeater on the air. The hardware requirements for a mobile radio is a power connection and an antenna. Setting up a repeater is a little more complex.



Looking up the middle of the Mt. Ord tower.

If you look at any of our repeater sites, we're not the only one there. Many other buildings and towers sit next to us or even on the same tower. The RF levels are very high and several types of filters must be used to keep unwanted signals off our frequencies and ensure we are not causing interference elsewhere. Each feed line will have an isolator, duplexer, and other filters to reject unwanted signals from getting into our receivers, ensuring clean transmissions.



Aerial photo of Mt. Ord site. ARA building and tower is to the left of the red truck.

The current ARA standard was implemented more than 20 years ago. Each of our sites has commercial power leading to a battery and charger/power supply. Depending on the site, some have large battery banks that can keep the radios online for many days. Sites with generator backup only have enough battery to keep things online for the time it takes the generator to fire up. All equipment in the racks run from DC power.



Isolators used on Mingus

All of that leads up to the radios. The ARA standard is a surplus Motorola Micor from the 1970s. Modifications are made to use them in the Amateur Radio bands and turn the power level down to 10-20 watts output. These radios were built rock solid and continue to perform well, never intended to be throw away items like much of today's modern electronics. They handle the duty cycle and demands placed on them to function as a repeater very well. With the supply of crystals drying up and the electronics skill set it takes to repair them, we've also begun to use Motorola CDM radios at several sites.



Mounting the antennas on Mingus with the much larger towers next to us.

The towers vary with a few Rohn style guyed towers

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ARA Continued from Previous Page

You'll find those newer radios installed at Usery and Mingus.



Motorola Micor radios used for the control and VHF repeater with Motorola CDM radios below for the UHF repeater.

At the heart of the system, you'll find the repeater controller. The ARA uses Link Communications RLC-3 repeater controllers at most sites. The exceptions are Daisy Mtn. which has an RLC-4 and the portable uses a RLC-Club. The RLC-3 is what interfaces the radios for linked systems, adds Autopatch connections, outputs the CW ID, and the synthesized voice announcements. Each controller interfaces to a radio card which adjusts audio levels for the radio, squelch levels, and PL levels.



RLC-3 Link Communications controller with power switch panel above and radio card cage below.

Standardizing equipment allows us to have spares ready for any site that are interchangeable. Instead of driving all the way to a problem site and spending hours fixing the issue, many times we'll go up and swap failing equipment with a spare. This speeds up repair times and allows for more time to troubleshoot and make repairs on the bench at home.

Hopefully this quick overview gave you a better idea of what it takes to put a high quality, reliable repeater on the air. There's a lot of work and knowledge that go into keeping a system online and operating with clean signals.

Virgil K7VZ
ARA President



Our club held out outdoor event today and it was a great success. We met up at Pinal West Park near Highway 84, south of Maricopa. And set up several operating stations. Bob, N6YPE set up a solar station with a rhombic antenna – located at a different Ramada to minimize interference. I set up my IC-706 with a 12AVQ tri-band vertical. Chris, W7CGC, set up his FT-857 and shared the solar panels and battery with me.

Band conditions were good on twenty meters. We wanted a no-contest “get on the air” environment, and although there were several state QSO parties going on, we didn't really get into contest mode. It was just a relaxed day and a chance to pick up the mic when the urge came along.

Chris operated the grill and turned out some delicious burgers, brats, and hotdogs. Tom Abernathy, W3TOM, the ARRL Atlantic Division Director, has been hanging out in his motor home in the area nearby. He came by to socialize with the group.

The area seemed to have everything needed for this year's Field Day – there are Ramadas, covered tables, porta-johns, etc. We all know that it's going to be miserably hot the last weekend of June, but that's true for most places in the state. We want our Field Day this year to be local so that everyone has a chance to operate. So, the board voted to designate Pinal West Park as our 2017 Field Day site.

We also talked about our upcoming Copafest 2017 and did some planning for that event, which will be October 28. We're already contacting vendors and tailgaters and making plans for a fantastic hamfest and Arizona State convention.

Steve Miller, W6SDM





Old Pueblo Radio Club INTERMOD

President's Column

No Report this Month

We had a wonderful turnout for our April meeting with over 40 members and guests in attendance for the program by Carl Foster, KB7AZ, on "Stealth Antennas." Carl provided some wonderful examples of what antennas he has used successfully in an antenna restricted community, both in pictures and with some "props" for his talk. Who knew that a birdhouse could conceal a center insulator or antenna balun? I certainly learned a few things about how to use certain spray paint colors for better antenna camouflage.

I think one the best lessons from Carl's program was the need to be creative and unafraid to try innovative antenna designs until you find the one that works best in your situation. Whether you plant wire in an attic or along a fence or the eaves of your house or in a flagpole, it will radiate RF if it is properly matched for impedance and low SWR. No two QTH's are likely to be identical in terms of the proximity of metal in nearby structures that might interfere with RF transmission. But, where there is a will, there is a way, and ham ingenuity will always prevail.

The CADXA Thursday night net is alive and well. Please join us on non-meeting Thursday evenings at 7:00 p.m. for the net. I hope to hear you on our 147.32+ repeater (no PL tone) to discuss the DX of the day. For those of you who cannot make it to our meetings, it is a chance to talk with other club members and to ask for advice on antennas, equipment, or how to get a QSL card from that station you worked 5 years ago.

May BBQ Meeting on "Star Wars Day" – "May the Fourth Be With You"

Our next meeting will be outdoors on Thursday night, May 4th, at the PERA Club ramada beginning at 6:00 p.m. This is our Annual Barbecue Meeting and we start serving dinner at 6:00 p.m.. Advanced reservations are necessary to make sure we order enough food from our BBQ caterer, Town Talk II. Please make your reservation with the CADXA Treasurer, Alton Chaney, W7ACX. Reservations need to be paid in advance by check or money order or contact Alton if you want to use PayPal.

Who knows that May 4th would be "Star Wars Day?" How ironic!!! The program will be given by Ned Stearns, AA7A, on "My Ham Life Bouncing Signals Off the Moon." Ned has been refining this program for the past year and it tracks his evolution as a ham radio operator back to where it started as a teenager

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OPRC Repeaters

146.66 - PL 110.9	wide coverage	W7GV
146.82 - PL 110.9	wide coverage	W7GV
147.22 - PL 110.9	wide coverage	W7GV

RACES Repeaters

145.150	packet/wide	N7OEM
146.880 - PL 110.9	wide coverage	N7OEM
147.300 - PL 110.9	wide	N7OEM
448.55 - PL 110.9	wide coverage	N7OEM

CADXA Continued from Previous Column

in Cleveland, Ohio. Find out how he first got the bug to conquer this most challenging niche in our hobby and how it has led him now to construct one of the largest 2-meter moonbounce arrays in the ham world.



Please come and join us for the BBQ and feel free to arrive early to socialize with your peers. Refreshments will be served at the break. Guests are especially welcome for this annual event.

73,
Lee, KY7M
CADXA President

ADAW



MONTHLY O.V.A.R.C. OPERATING EVENTS CONTINUE

The Oro Valley Amateur Radio Club continues to organize monthly operating events to continue the excitement that began with the National Parks on the Air Program. The March event was held at the Marana Regional Airport where the Collings Foundation sponsored its Wings of Freedom tour to Arizona. Several World War II vintage aircraft were flown in for the event. There were also many static displays of the era to see. Many thanks to Roger K7ROG for making the connections and helping to organize the activities. These events give members the opportunity to get outside, operate some first class HF radios and meet other hams from the local area. In May, we're hoping for really hot weather outside because we'll be operating inside for the 7th Area QSO Party. Details will be announced at our April 21 meeting.

73, Steve, W1SR

FIELD DAY PREPARATIONS ARE UNDERWAY

Field Day is not far off. This is our biggest operating event of the year. O.V.A.R.C. members will get to select their operating frequencies, modes and operating times. This year we will be adding to our selection of antennas. The addition of a couple of loops will assure us of operations through the nighttime hours when the higher frequencies get quiet. This will also be the first year of our Field Day Challenge where we have challenged The Cochise Amateur Radio Association (C.A.R.A.) and The Coconino Amateur Radio Club. We hope this will spark more interest in Field Day Operations. The winner will receive a spectacular hand-made trophy depicting the spirit of the Southwest shown below. More Field Day Information to come.

73, Steve, W1SR



From the left are Fred-W2HZ, Tom-W8TK, Russ-KG7DYX and Scott-K7ADX. In the background you can see some of the aircraft that flew in for the tour.





ANSR Continued from Previous Column

crew from the first flight came over with the Flight 105 payloads.

There were a few mishaps in near space. While one would expect it to be peaceful and serene in near space, the payloads on a high altitude balloon actually experience a number of violent twists and turns, spinning back and forth almost constantly. Structural integrity is important. Some of the experiments experienced breakage, with cameras or circuit boards breaking free of their mounts and bouncing around inside the container. Nothing, however, was a complete failure. Some of the experiments came back in perfect condition. The lessons learned relative to structural integrity and mounting will be passed on to future flights.

Students and ANSR personnel all gathered for lunch at Love's Truck Stop following the flight for lunch in the parking lot. Each student team gave an initial assessment of their experiment's success and pointed out any anomalies. It is amazing to see what our upcoming generation puts together for us to send into space. I have no doubt that these young people will accomplish great things.

This was also the last flight for Jack Crabtree, W7JLC, who is retiring. Jack is a founder of Arizona Near Space Research and has been a mentor to hundreds of students over the years, as well as a friend and Elmer to hams wanting to be part of high altitude ballooning. Seven-three, Jack. We're glad that your last flights were almost perfect.

Steve Miller

visit my website and blog at w6sdm.net

follow me on Twitter <https://twitter.com/stevedmiller>

Rarely is there a time when everything goes right. Saturday, April 1, 2017, must have been one of those days when Murphy decided not to get out of bed.

Out at the University of Arizona Agricultural Center in Maricopa, Arizona, the ANSR flight crew and students from a number of colleges and universities around the state assembled to prepare two high altitude balloon flights. ANSR 105 was scheduled to launch at 9:00 A.M. and ANSR 106 would follow a half hour later.

The skies without cloud cover. The temperature was somewhere in the mid-60s. Winds at ground level were nonexistent. There really are no better flight conditions. Flight 105 lifted off on schedule without any problems at all. I left with it heading toward the Arizona City/Picacho Peak area, which was the predicted landing site.

During the 45 minutes it took for me to get to the recovery area, ANSR 106 was also launched without incident. By the time I got to the Love's Truck Stop off of Interstate 10, the first balloon had reached about 70,000 feet and was still climbing. It was very visible in the sky – even through the high altitude cloud that had formed. We watched it burst at around 104,000 feet.





At this point, we lost visual contact with flight 105 but almost immediately picked up visual contact with flight 106. The reason that both flights were visible is that the sun lit up the balloon, which had now reached close to 50 feet in diameter. Once the balloon burst, and even after the orange and white parachute deploys, it's not visible to the naked eye until it comes much closer to Earth.

The first chase and recovery crew headed out to locate the first flight. I stayed behind and kept visual contact with the second balloon until it burst. Before long, the Sacaton repeater came alive with reports for both flights in descent, calling out altitude, position, and updating projected landing coordinates. After punching a few numbers into the GPS, it was off for a trip down Sunland Gin Road to the landing site south of Arizona City.

About a dozen cars full of students and ANSR members pulled over and watched as Flight 106 drifted back to Earth in a perfect landing. It came down perfectly parallel to, and in the middle of, a dirt irrigation road in the middle of a farm field. You couldn't ask for a better landing. In the meantime, the recovery



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If anyone is considering a major radio shack, workshop, addition or going into business for yourself, I am offering professional Electrical, Mechanical and Plumbing Engineering services to radio club members at a 20% discount for residential property, and 10% discount for commercial property. Talking is always free.

Continued Next Column



Public Service Calendar

Maricopa County Emergency Communications Group Events

The Yavapai Amateur Radio Club is a very active and community-involved club. The YARC spring and summer schedule is filling rapidly. There are six public service events between the first weekend in April through June. They include the Whiskey Row Marathon and the Whiskey Off-Road bicycle event. YARC provides or participates in communications for these and the other events. The 2017 Prescott Hamfest is scheduled for June 9-10, Field Day is June 24, and this will be the 4th year that we will hold the Granite Mountain Hotshots memorial event on June 30.

The Prescott Hamfest at Embry-Riddle Aeronautical University will be held on Friday, June 9 and Saturday, June 10, 2017. Friday consists of seminars only beginning at noon. On Saturday there will be tailgating from 7:00 A.M. until Noon. Commercial vendors will be indoors from 7:00 A.M. until 3:30 P.M. on Saturday. At Noon Saturday, Yaesu will be making a presentation on their System Fusion. Seminars will run until 3:00 P.M. on Saturday. At that time, the Grand Prize raffle drawing will take place.

Commercial vendors can register for their tables online (www.prescotthamfest.com). You can also find the hamfest flyer on the site. Clubs and related organizations can reserve a free indoor table on Saturday (first come / first served) There will be limited free RV overnight dry camping on Friday night only. You can register for your RV spot on the hamfest website. You can also purchase Grand Prize Raffle tickets on the site. You do not need to be present to win the Grand Prizes.

We hope that you can come and enjoy our hamfest. While it may be very warm here, it will be a respite from the heat in the valley (hint). For further information, check out our web site or contact hamfest chair person Frank Bender K8FB (k8fb@w7yrc.org).

Most of our club operating events are now being held from our club station. Our new permanent antenna tower is going in at the club station as internal upgrades to the station are taking shape as well. All in time for Field Day (hopefully).

YARC continues our series of licensing classes for people interested in Ham radio. A General licensing class was held during March and April. There were eleven students, hoping to upgrade their licenses. Contact Brian at classes@w7yrc.org to sign up for future classes. Check the club website www.w7yrc.org for schedules as they come available. In addition, YARC offers discounted "HamTestOnline"

EVENT	LOCATION	DATE
Auxiliary Communications	Papago Park Military Reservation - JVC Classroom	06/03/17
Barn Buner Mtn Bike Race	NW Flagstaff	09/09/17
Mogollon Monster	Pine AZ Area	09/16/17
Xterra Estrella Mtn Trail Run	Estrella Mtn Park	10/08/17
Phoenix Half Marathon	Downtown Phoenix	11/05/17
Scottsdale Half Marathon	Scottsdale Civic Center	12/10/17
Runner's Den Pancake Run	E Phoenix, Paradise Valley Mall	02/04/18
Lost Dutchman Marathon	Apache Junction	02/18/18
March of Dimes March for Babies	Wesley-Bolin Park, Downtown Phoenix	04/14/18

To sign up for an MCECG Public Service Event: www.mcecg.net

For information, contact Dennis Bietry - KE7EJF at 602.274.3732 - email, ke7ejf@cox.net, or contact the Event Coordinator for the event.

ADAW



YARC Continued from Previous Column

subscriptions. Upcoming regular test sessions are May 13 and July 8, 2017. There is also a test opportunity at the June hamfest on Friday afternoon. For more info on the test schedule, email testing@w7yrc.org

Come join us for one of our monthly club meetings.

Continued Next Column

ADAW



The weather this spring has been really nice, so far. We can get outside and work or play without freezing or roasting. The fine weather never lasts too long, unfortunately. The HF bands have been mostly poor except for the 40-meter band. I have been on 40 in the evening and had the doors open to let the spring air into the shack. There has been quite a bit of activity on both phone and CW. I made a contact in Bay Shore, NY and another one in Seattle on phone. I also made several more on CW from California to Missouri. I was using 100 watts on my dipole at the time. You might give 40 a try.

At the April general club meeting, we had a terrific speaker and a fascinating program. Patrick Stoddard, WD9EWK presented us with an outstanding program on Amateur Radio Satellites. His presentation delineated the history of satellites from the 50's up to today. There are many satellites with amateur radio connections currently open for use. In most cases they respond to 2 meter and 70 centimeter radios, which most of us already have. There is also a lot of information available on line for antennas and software to track the satellites. So, getting into making contacts via satellite does not sound very expensive. And also sounds like a lot of fun.

The program for the May general club meeting will be a presentation by Kelly Law, KF7ZVL, on SOTA. SOTA is an acronym for Summits on the Air. He will be leading a group of hams to Humboldt Mountain on Saturday, April 22. They will make as many VHF and UHF contacts as possible with other mountain top groups. We will hear all about his adventures at the May General Club Meeting.

For many years now, we in the ham community have been getting Amateur Radio automobile license plates for our cars. The full amount for the personalized plate has gone into the general fund. We have wanted a portion of that fee to go for supporting the ham community in Arizona. Finally, the Arizona Legislature has passed a bill and the Governor has signed the bill into law that will do exactly that.

The Ham in the Park is a weekly get-together for playing radio. They are meeting every other week on Friday between 10:00 A.M. and Noon. The location is Pima Park, 88th Street and Thomas Road in Scottsdale. On the off week, they meet at McDonald Drive and Pima Road also between 10:00 A.M. and Noon. They use whatever radios they have and enjoy the beautiful weather. You can check with the club web site for more information.

The club has a net every Tuesday at 7:00 P.M. on our repeater system. The repeaters are on 147.18 with a tone of 162.2 and on 440.00 with a tone of 100.00. Everyone checking

Continued Next Column



After a long hiatus, the Mesa Community College Amateur Radio Club is once again formed and meeting. Paper work was submitted to the Associated Students of MCC and approved and the club held its first meeting and elected new officers. Typically, the election of new officers is done at the beginning of the fall semester in August. After an interest survey was completed, the club decided to alternate twice a month meetings focusing on preparation for licensing and general topics of interest. While we are just beginning to meet, the Spring semester is nearing, so we only have a short time to form our identity before summer break. In a future meeting, we will decide if we will meet over the summer and participate in Filed Day and other activities. We are excited about all the many things we have interest in like home brew, AMSAT, Microprocessors in Ham Radio, High Altitude Ballooning and much more.

Charlie NJ7V
 President

SARC Continued from Previous Column

in can give us a run down on what they have been up to lately. Sometimes we have an interesting question for everyone. So set your clock for Tuesday's at 7:00 and we will see you on the air.

Well, that's all I have for now. Be well and keep hamming.

Ed Nickerson WU7S



SARC CONSTANTS:

SARC is a 501 (c)(3) club. That means all donations are fully tax deductible. Contact Paul Jorgenson, KE7HR at 602.992.8043 for information on estate donations and equipment pick-up.

For membership information, call Judy Jensen, KE7IXI at 480.773.8452. Please send address change requests to Judy no later than the 7th of the month in which you would like the change to occur.





Superstition Continued from Previous Column

thanks to Terry Taylor, N7BDL, for the use of an ICOM IC-706 MK II G with an Internet link between the front faceplate and the rest of the radio over a mile away on his antenna. Not always is the wireless Internet link reliable, but I have worked a few folks across the land on 40 meters on Terry's fan dipole.

May Club Meeting on the 16th at 7:00 P.M. – 640 N Mesa Dr., Mesa

The May presentation will feature Field Day Prep & Logging Software, given by Jeff, K2DFE. Visitors are always welcome.

Field Day is on the fourth weekend in June, this year on the 24th-25th, beginning Saturday at 11:00 A.M. local (1800 UTC). We should have a map detailing the location of the club event in the pine woods up north on meeting night. (From the club events calendar on our secure club site, SuperstitionARC.org)

Mesh Net at 6:30 P.M. on the club repeaters on Thursdays

Since my last appearance in this space, the Superstition Club's Mesh network has grown, and with it comes an information net ahead of the East Valley Swap Net on the 147.12 system. Tune in every Thursday at 6:30 P.M. to find out the latest Mesh news.

In short, we use wireless routers flashed with amateur radio firmware with gain antennas on amateur bands from 2.3 GHZ and up. You are on the Mesh if your router is in range of another, with email, FTP, chat, webcam, and Voice Over IP telephone available, to name a few. No Internet needed!

Superstition Hamfest is Saturday, December 2

The club is making headway on its plans for this year's annual Hamfest, having prizes already in hand. Hours are 8:00 A.M. till 4:00 P.M. according to the SuperstitionSuperFest.org secure website.

YAESU FT-991 Raffle

We have produced just 100 tickets for this drawing, at \$20.00 a pop. They are available at club meetings and events. As soon as they are gone, the radio drawing will take place at the club meeting.

WB7C on the Mend

And finally, I am happy to be back getting involved with my duties here in the ADAW column. I have moved to Apache Junction following my recovery from a fall off of my bicycle, and attend lunch at the AJ Senior Center and use the gym. My

73 – Larry – WB7C



Superstition ARC Repeaters

- 147.120 MHz (+) 162.2 Hz - Usery ***
- 448.275 MHz (-) 100.0 Hz - Usery**
- 449.600 MHz (-) 100.0 Hz - East Mesa ***
- KB7KWK-L Echolink Node 538499 ***

* - Linked Full Time and Carries all Nets (except 10-Meters)

Club Nets

- Morning Drive Time Net:** Mon-Fri, 7:00-8:00 AM - Trivia
- Club Business Net:** Wednesdays, 8:00 PM - Featuring Club News, Elmer Q&A and AR Newslite.
- East Valley Swap Net:** Thursdays, 7:30 PM
- National History Net:** Thursdays at 8:30 PM. Quizzes you on National History.
- 10-Meter Rag Chew:** Thursdays 8:00 PM, 28.465 MHz USB
- Morse Code Class Net:** Saturdays, 7:00 PM

Club Membership is open to anyone with an interest in Amateur Radio. Send email to: membership@SuperstitionARC.org for more information.

Superstition SuperFest

The Superstition SuperFest is held on the first Saturday of December. Visit www.superstitionsuperfest.org for the latest information.



**Memorial Day
May 29, 2017**

Continued Next Column

Hamfest Calendar

6 May 2017 - **The Cochise Hamfest and 7th Region Communications Exercise** - hosted by the Cochise Amateur Radio Association will be held at the club site, 2756 South Moson Road in Sierra Vista. Gates open at 7:00 AM. Free Admission and Parking. Tailgating - \$5. Inside Table - \$10. VE Testing from 9:00 until 11:30 AM. Coffee, Pastry, and Drinks Available. Hourly Prizes with Main Prize drawing at 12:00 Noon. Talk-In on 146.76(-) PI 162.2 Hz. Visit the Web Site at <http://www.k7rdg.org>. For more information, contact Peter, NH6BF at 520.216.6381 or email lr60@yahoo.com.

9 - 10 June 2017 - **Prescott Hamfest** - hosted by the Eagle Amateur Radio Club at ERAU and the Yavapai Amateur Radio Club will be held at Embry Riddle Aeronautical University, 3700 Willow Creek Road in Prescott. Hours are Noon to 4:00 PM on Friday, June 9, for Seminars and Commercial Vendors Only and 7:00 AM to Noon Saturday, June 10, for Tailgating and Commercial Vendors. Saturday Seminars will be held from 1:00 PM until 3:00 PM. VE testing will be available from 4:30 - 6:30 PM on Friday, June 9. Free Admission on Friday. General Admission on Saturday is \$5.00 (free for ERAU Students with ID) Saturday Tailgating - \$10 for one (1) parking lot space (\$5 for each additional). Inside Commercial Vendors - \$20 for 1st table, \$10 each additional. Club Information Booths - Free. Talk-In: 146.880 MHz (-) PL 100 Hz. Check website at www.prescotthamfest.com for updates. Hamfest contact: Frank Bender, K8FB - k8fb@arrl.net. Sorry - No Guns, Drugs, Alcohol, Smoking, Vaping, Fireworks, or Pets per ERAU.

22 July 2017 - **White Mountain Hamfest** - hosted by the Kachina Amateur Radio Club - location to be announced. Free Admission. Vendors/Tailgaters - \$5.00 per space. VE Session begins at 9:00 AM, Walk-Ins Allowed. Demonstrations, Grand Prizes, Hourly Prizes, Coffee & Donuts, Arts & Crafts, and More. Talk-In 145.310 PI 110.9. Visit the web site at www.kachina-arc.org and click on "Hamfest" for up to date information.

28 October 2017 - **Copafest 2017** - hosted by the Maricopa Amateur Radio Association will be held at the UltraStar at Ak-Chin Circle in Maricopa. Swap Meet, Free VE Testing, Educational Seminars, Raffle Prizes and more. In addition, UltraStar offers 12 Cinemas, 24 Lanes of Bowling, Laser Tag, a Video Arcade, Restaurants, Cocktail Lounge and much more. For info, visit the web site at www.copahams.org or email info@copahams.org



Continued Next Column

For Sale

Partly Restored Vintage Tube-type Transmitter - \$485
Baker Williams B&W 5100B AM/CW, 80-10m, 150w(2)6146's, has built in VFO and restored dial. Included is: Matching B&W 51SB-B SSB Generator (for ssb operation). Both will need new electrolytic filter capacitors. Interconnect cables (between 5100B and 51SB-B) included. Contact: Ray, W7GNE @ 480-540-4629.

A-4 Antenna For Sale - \$450

This is an older model that does not have the stainless steel hose clamps on the elements. It is the same size and has the same features as the modern A-4S. The mast mount plate is new, and some of the elements have been replaced with stock A-4S parts. The antenna is stock - does 10, 15, & 20 meters. It does not have the 40 meter add on. It is boxed and ready to go now. Contact: Bob Howard, W8RH at 520.709.6176 voice/text or email w8rh@live.com.

The **West Valley Amateur Radio Club** has radios and ALL kinds of supplies available for sale through the club. We get some old equipment that won't sell that will be added to the items for free. Contact: Ken Jenkins, WB6MMV at kjenkins5623@gmail.com or Bob Kettler WA6MIO at rdkettler@msn.com.

ADAW

Hamfest Calendar Continued from Previous Column

11 November 2017 - **Oro Valley ARC Hamfest** - hosted by the Oro Valley Amateur Radio Club will be held at Marana Middle School, 11279 W Grier Road in Marana. Gates open at 7:00 AM (5:00 AM for sellers) and closes at 1:00 PM. Admission: \$5 (Children under 12 free with a paid adult). Sellers: \$10 per space. Prizes, VE Session, Seminars, Card Checking, Food Truck for Breakfast & Lunch. Talk-In: 146.620(-), 444.100(+), and 147.32(-) all PI 156.7. Contact hamfest@tucsonhamradio.org for more information. (editor's note: Information taken from last year - subject to change.)

2 December 2017 - **Superstition SuperFest 2017** - hosted by the Superstition Amateur Radio Club will be held at Mesa Community College, 1833 W Southern Avenue in Mesa. Hours are 8:00 AM to 4:00 PM. Admission \$5.00 per person, children 12 and under free. Tailgate \$10.00 per space. Grand Prizes and Hourly Door Prizes. VE Testing - Registration from 8:00 AM until 9:00 AM, Testing begins at 9:00 AM. Pre-register at times listed. ARRL Card Checking. Special Events Station - K7A Commemorating the USS Arizona. GOTA Station. Fox Hunts. For more information, contact the SuperFest Chairman at chairman@superstitionhamfest.org.

License Testing Information

When you are ready to take an exam for an Amateur Radio license, there are Volunteer Examiners available to assist you. Each Applicant will need to bring a picture ID (some test sessions require two forms of identification). If you are upgrading your class of license, be sure to bring the original (and a copy) of your license and/or Certificate of Successful Completion of Examination (C.S.C.E.). There may be a fee required.

PLEASE NOTE: Dates, times, locations, fees may change. Arrive promptly at time listed. Fees may vary and exact change or check is required at most sessions. Call test session contact to confirm information. Walk-ins are permitted unless otherwise specified.

May Test Sessions

May 1st - AARC & WVARC -- 12:00 PM

St Clement Church, 15800 N Del Webb Blvd, Sun City
Contact - Joseph Cuttita 623.215.2226

May 4th - CARBA -- 7:00 PM

Lighthouse YMCA, 2900 N Columbus Blvd, Tucson
Contact - Matthew Grossman 520.750.7189
Pre-Reg by email preferred - veregistration@rstclub.org

May 6th - ORO Valley ARC -- 10:30 AM

Oro Valley Police Sub-Station, Oro Valley Marketplace, Oro Valley
Contact - Quinton Gleason qagleason@comcastnet

May 6th - DeVry ARC & WVARC -- 9:00 AM

DeVry University Library, 2149 W Dunlap Ave, Phoenix
Contact - David Morrill 623.680.5011

May 8th - Radio Society of Tucson -- 7:00 PM

Hardesty Mid-Town Police Bldg, 1100 S Alvernon, Tucson
Contact - Diane Zimmerman 520.664.5070

May 13th - Central Phoenix VE Team -- 9:00 AM

Gilbert Farmers Market, 222 N Ash Dr, Gilbert
Contact - Bill Martin 480.205.3625
No Walk-Ins - Call Ahead for important details/instructions

May 13th - Yavapai ARC -- 9:00 AM

Jeep Posse Bldg in Pioneer Park, 1200 Commerce Dr, Prescott
Contact - Donald Bauer 928.775.4690

May 15th - East Valley VE Team -- 6:00 PM

City of Mesa Utilities, 640 N Mesa Dr, Mesa
Contact - Fred Bollinger 480.242.8606

May 16 - Motorola ARC of Arizona -- 5:00 PM

Denny's, 825 S 48th St, Tempe
Contact - Edward Olague 602.885.7725

Continued Next Column



Emergency Communications Since 1961

SHORT SKIP



**West Valley
Amateur Radio Club
High-Speed Multimedia
Special Interest Group**

The West Valley Amateur Radio Club is are starting a high-speed multimedia special interest and mesh networking group. If anyone is interested, please let me know.

We will try from Boswell Hospital next, which looks good from the computer program. Will keep you posted.

Bob KG7FIL kg7fil@arrl.net

Test Sessions Continued from Previous Column

May 17th - Thunderbird ARC -- 6:00 PM

Honor Health Medical Office Bldg, 19841 N 27th Ave, Phoenix
Contact - James Skinnell 602.826.1949
No Walk-Ins

May 17th - Central Phoenix VE Team -- 6:00 PM

South Mountain Community College, 7050 S 24th St, Phoenix
Contact - Bill Martin 480.205.3625
No Walk-Ins - Limit Space - Contact Prior to Exam

May 20th - Un-sponsored -- 10:00 AM

Kingman Middle School, 1969 Detroit Ave, Rm 310, Kingman
Contact - Daniel Miller 928.897.3883

May 20th - Phoenix AMT Radio Team -- 2:00 PM

AEN-MAR Picnic, 2100 Houston Mesa Rd, Payson
Contact - Virgil Silhanek 623.850.1441

May 27th - Arizona ARC -- 7:00 PM

American Red Cross, 4747 N 22nd St, Phoenix
Contact - Gary Hamman 602.996.8148
No Walk-Ins - Pre-Registration Required by Friday night



Arizona Red Cross Communications Club

4747 N 22nd St. - Suite 100 - Phoenix, AZ 85016
VHF – 146.84 MHz – PL 162.2 / UHF – 446.900 MHz – PL 131.8
Echolink Node #731289 – K7ARC-R



Did you get a chance to attend the DeVry Hamfest? It was a great event with beautiful weather and a nice crowd. I managed to sell a few items and somehow to avoid buying anything – a first for me. But then I was stuck at the AARC/ARCA booth for most of the time.

Next Hamfest is scheduled to be in Sierra Vista on May 6th presented by the Cochise Amateur Radio Association. You can check out their flyer on the ARCA website www.arca-az-az.org under AZ Hamfest Calendar. Hope to see you there!

By the time you read this, we should have the UHF repeater back on the air. We had a nasty noise issue which we originally thought was too much PL audio making its way through the transmitter. Turned out to be the IF's of both radios interfering. Adding a simple shield solved that issue, so it now has clear audio. We also turned up the TX audio so hope reports of low audio have been corrected.

This month we welcome our new ARRL section manager, Rick Paquette, W7RAP. We missed him at DeVry, but hope to catch up with him at the next event. Stop by the ARRL booth and say hello.

Don't forget about the Public Service Amateur Radio Group's (PSARG) Tuesday net at noon on the Red Cross repeater (146.84 – PL 162.2) and then again at 6:30 P.M. on Thursday.

Your Humble Scribe,
Mark, N7KKQ

Once again the Arizona Amateur Radio Club held its annual April hamfest at DeVry University. Together with ARCA, the very popular event was held on April 15, 2017. Weather was ideal, and although attendance was not quite as large as some past years, the event was certainly popular. In addition to commercial vendor sales there were many spaces filled with ham equipment bargains for sale by individual operators. Sale of ham equipment seemed to be quite active, and best of all, the hamfest was responsible for many renewed friendships. Coffee and doughnuts were offered for sale, and the “coffee/doughnut shop” became very popular.

The hamfest also provided an opportunity for taking ham radio tests. David Morrill N7TWT, who is a Volunteer Examiner, provided that opportunity during the hamfest, and several new amateur radio operators now have the opportunity to enjoy this great hobby.

Several prizes were given out by drawings using admission tickets and also tickets that could be purchased. Ingrid Geissler, N7ISG, was ecstatic with her prize, a UV/5X3 handy talkie.

The AARC offers our thanks to all who helped to make the hamfest a success. Special thanks to Lee Ilse KD7OED, Jeff Hanna WD7RFY, Bob Howard W8RH, and Melinda Wilson KC7FWR from ARCA.

73,
Lori, WA7EDI

ADAW

ADAW



CINCO DE MAYO

Real Estate

*Are you or someone you know looking for a Ham Home?
I can help you find a home with a tower or one where a tower can be added. Call or email me to get started.*

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Coldwell Banker Residential Brokerage
602-370-1450 Cell, rahaworth@cox.net

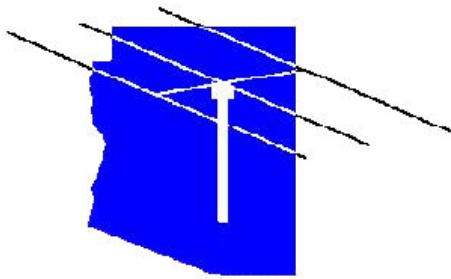


2017



April Hamfest
at DeVry





MARCA INC.

Another W7MOT DStar Update

DStar upgrade to G3 is still in planning stage. The plan review last month is still on track. Watch our website for activity on project.

If anyone has noticed, there have been many service interruptions with W7MOT. Sometimes the server is down, sometimes it's just the internet, others it's the repeaters, and then combinations of all. So what's happening? There have been some AC power outages at the White Tank site that have trickled down to the backup generator, to the Batteries, to the UPS, and finally to the individual equipment in the DStar stack. Different pieces of the DStar system are powered differently with their own power backup sources. And finally, the Linux server with dual power inputs separately sourced is cycled such that the Gateway boots or restarts or shuts down in unpredictable ways. The Linux File System is sensitive to power conditions that cause abrupt shutdowns without time to properly 'close' the FS . . . and another power cycle during an FS check while booting . . . resulting in an unpredictable state of the Gateway server. Unfortunately, our remote access capabilities are also being stressed with limitations to restore the server too. By the time this newsletter is published and after many trips to the site, things should be back to normal.

Raspberry Pi as an Echolink Repeater Server

We put together a special interest group to lean the Raspberry Pi, Linux, and apply this to Ham Radio applications. Our first project started a few months ago with Echolink. Our group meets somewhat every 1 or 2 weeks for a 2-3 hour work session. We do some basic Linux, some server admin, and some svxlink Echolink. A typical working session involves project review & configuration progress, new & review of Linux commands, and Raspberry Pi "parts."

We are using Raspbian Jessie as the Operating System and 'svxlink' as the Echolink application. There are many Linux OS's that will run on the Rpi. And as part of our project, we are evaluating CentOS vs. Raspbian.

No, we're not taking the mainstream Echolink path of Windows. Echolink? Why not AllStar or IRLP? Only because most members of the group are familiar with Echolink. Why the Pi? Because the Raspberry Pi Model 3 B has the processing horsepower to handle the traffic of an Echolink server connected to a Duplex FM Repeater.

Continued Next Column

MARCA Continued from Previous Column

We aren't doing anything 'leading edge new', svxlink has been in use as a Linux OS Echolink server many years. And svxlink has been used with RPi as an Echolink Node for almost as long. What is a challenge is using svxlink with RPi as an Echolink Repeater, a much smaller community with this configuration.

Echolink and svxlink touch most aspects of the Raspberry Pi capability. A great learning project that just keeps pushing a beginner's learning threshold. So if you're curious about this project; some time while we're testing software and hardware (no repeaters on the air yet), you might see our Echolink call sign, EL-W7MOT on aprs.fi .

If you're interested in participating in sessions and learning more about our Echolink project, please join us. Don't worry if you're a beginner, you can join at any time, we'll get you up to speed quickly. Check out our website for more details about the project, schedule, and joining the RPi activity sessions.

Till next month, 73s.

Having repeater problems with any of MARCA's W7MOT repeaters, please let us know by using the simple & quick online report at <http://www.w7mot.org/index.php/repeaters/report-a-repeater-problem>. Nothing fancy or complicated, just a few quick entries and the system notifies half a dozen site managers.

Our website is www.w7mot.org.

Follow us on Facebook [www.FB.com/W7MOT](https://www.facebook.com/W7MOT).

Norm Johnson, aa7oo

President MARCA

MARCA ADAW Editor

ADAW



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TM-D710G | 2M/440 Dualband

- V-VV+U/U+U operation • Built-in GPS • Built-in TNC for APRS & DX-Cluster operation • 50W 2M & UHF • 1,000 memories • Dual receive • Green or amber backlight colors • Latest APRS firmware w/new features • Sky Command II remote functions

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KLEINER COUPON

TS-480SAT/HX | HF + 6M Transceiver

- 480HX 200W HF & 100W 6M (no tuner) • 480SAT 100W HF & 6M w/AT • Remotable w/front panel/speaker • DSP built-in

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NEW

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TS-590SG | HF/50MHz Transceiver

- Equipped with 500 Hz/2.7 kHz roofing filter as standard • ALC derived from TS-990S eliminating spike issues • Antenna output function (shared with DRV connector) • CW - morse code decoder function • Improved 1st mixer • New PFB key with multi-function knob • New split function enabling quick setting • LED backlight with selectable color tone



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TM-V71A | 2M/440 DualBand

- High RF output (50W) • Multiple Scan • Dual receive on same band (VxV, UxU) • Echolink® memory (auto dialer) • Echolink® Sysop mode for node terminal ops • Invertible front panel • Choice of green/amber for LCD panel • 104 code digital code squelch • "Five in One" programmable memory • 1000 multifunction memory

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TH-D72A | 2M/440 HT w/extended RX

- 5W TX, RX 118-524MHz, VxU, VxV, UxU • APRS w/built-in 1200/9600 TNC • Built-in GPS, Built-in USB, digipeater • Echolink® compatible, • Mi-Spec STD810

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TS-2000

\$250
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TS-2000X

TS-2000/2000X | HF/VHF/UHF Transceiver

- 100W HF, 6M, 2M • 50W 70CM • TS-2000X 10W 1.2GHz • Built-in TNC, DX packet cluster • IF Stage DSP • Backlit front key panel

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TM-281A | 2 Mtr Mobile

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TH-D74A | 2M/220/440 HT w/D-STAR!

- D-STAR compatible • APRS ready w/built in GPS • Color weather station information • Built-in KISS mode TNC • High-performance DSP voice processing • Standard compatibility for Bluetooth

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TH-K20A | 2M Handheld

- 2M 5.5W • VOX • CTCSS/DCS/1750 Burst built-in • Weather alert

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