



AARC OVER

Keeping Austin Wireless for Over 91 Years!

Bulletin of Austin Amateur Radio Clubs

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Issue 6-2011

FIELD DAY ANTENNA Provides BOTH NVIS and SKIP SIGNAL PERFORMANCE

By Stuart Rohre, K5KVH

Regular attendees of Austin Amateur Radio Club's FIELD DAYS in Austin, TX, have seen the voice station regularly deploy a low band antenna consisting of two dipoles, or a combination dipole, no more than six feet off level ground, with an insulated reflector wire strung from the same 1X2 supports under it. Guys at the ends counter the pull of the wire up on the slim 1X2 sticks.

This was primarily for daytime use, (we thought), for NVIS contacts on 75 and 40 meters during the Field Days. This would overcome Summer Static the bane of Field Day use of 80 and 40. At night, we planned to concentrate on 20m, thinking 40 might or might not be very useful due to summer static, and that being all the more true for 75.

One thing the NVIS low dipoles showed at our first Field Day of use over a rocky, hillside location: They had superior Signal to Noise ratio compared to conventional half wave horizontal dipoles at usual heights.

This was obviously the result of being less sensitive to skip signals and long distance low angle static propagation. On the other hand, NVIS signals in state and from nearby states on 75 and 40m would "Pop" out of the background, which would be more quiet than regular band conditions during a contest. The signals would be typically 5, 8 or some dB over S9, even to 20 dB over S9 or more. No problem would be seen working Austin to Dallas, East TX, LA, and even as far as Mobile AL, on 40m during a day with good NVIS conditions. That was an up to 850 mile path, and possibly on the second Zenith bounce.

(Continued on page 8)

Periodic Events

Sun	7:30 p.m.	Travis ARES net	147.36 MHz + (131.8)
Sun	8:00 p.m.	Travis ARES Packet	145.73 MHz -
Sun	8:00 p.m.	Williamson ARES net	146.64 MHz - (162.2)
Sun	9:00 p.m.	ARO Swapnet	146.94 MHz -
Sun	(After Swapnet)	Newsline	146.94 MHz -
Mon.	7:30 p.m.	STX ARES Net	3.873 MHz
Tues.	7:30 p.m.	Hays ARES net	444.150 + (114.8)
Tues.	8:00 p.m.	Bastrop ARES Net	443.750 + (114.8)
Wed	11:30 a.m.	Ham Social Luncheon, Jim's	146.94 MHz -
Thu	9:00 p.m.	2m SSB Net	144.250 (USB)
Thu	11:00 a.m.	Lunch, Pokey Joe's 183&Great Hills	444.1 MHz+
Fri	8:00 p.m.	6m SSB Net	50.230(texasvhf.org/)
Sat	7:00 - 8:30a.m.	Breakfast @ Waterloo Ice House	444.1 MHz +
Sat	9:00 a.m.	Chapter 67 QCWA QSO Net.	3.920 MHz LSB
Daily	6:30 p.m.	Central Texas Traffic Net	147.14MHz+

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Ham Radio Exams Results

The following are the results of the ARRL VE Test Session held on May 7th at Bethany United Methodist Church :

Technician Class Licenses Processed

Steven L. Bonds KF5KZO
Justin R. Parker KF5KZQ

Chris K. Cutlip KF5KZP
Jack R. Wall KF5KZN

John V. Lee KF5KZU

General Class Licenses Processed

Kirk D. Brandau KF5KZT
Mark E. Howard II KF5KZS
Mark R. Sequerth KF5KZL

William A. Curtis KF5KZM
Robert L. Klem KF5KOH
Quentin H. Stephenson KF5KON

John F. Figer KF5GMJ
Richard E. Nichols KF5KZV
Steven R. Tull KF5KZR

Extra Class License Processed

David O. Anderton AE5XY

Examiners Participating in this Test Session

Milt Cram W8NUE
Gene Hinkle, K5PA

Larry Gunter WB5BEK
Joe Makeever W5HS

Howard Glueck K5ZUA
Joe Thiel N5SMN

Next ARRL VE Test Sessions

June 4th - Bethany United Methodist Church, Disciple Bldg. Room 213
July 2nd - Bethany United Methodist Church, Disciple Bldg. Room 213

TNX ES 73 DE W5HS
Joe

5-21-2011

The South Austin W5YI VE team heartily congratulates all of the following people who earned new or upgraded amateur radio licenses at our May 21st session:

Extra Class –

Walter J. Marusa, Jr., KF5ESJ

General Class –

Michael D. Crager, KF5AKY

David L. Hoskins, WB55GNR

Technician Class (all new) –

Christopher Freeman
Floyd H. Pruett, Jr.

Robert C. Horton, Jr.
Betty A. Temple

Sarah K. Martin

Our administering volunteer examiners were:

Craig Bean, AC5KW

Jim Greenwood, AB5EK

Gary Popp, AE5JR

Our next two amateur radio exam sessions will start at 2 PM on June 18th
and July 16th in room 118 of Fleck Hall on the campus of
St. Edward's University. All sessions are walk-in and the exam fee is \$14.

For additional information regarding our amateur radio examination sessions,
please contact Jim, AB5EK at (512) 327-6184 or by e-mail to
hamradioexams@hotmail.com or visit our web page at
hamradioexams@hotmail.com or visit our web page at <http://texashams.org/w5yi-austin/>

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TC ARES PIO	Steven Polunsky	W5SMP		tcares-pio@gmail.net

Please contact a club officer, attend a meeting, mail us to join the organization, you can also join or renew online.

The Austin Amateur Radio Club, Inc. (AARC) has annual membership dues of \$20.00 per person or \$30.00 per family. AARC maintains the following repeaters:

FREQUENCY	AUTOPATCH	USE
146.780	No	
146.880	Yes	General
146.940 107.2 PL Tone	No	Most popular, WX, Swapnet & Newslite
224.800	No	
444.100	No	
444.650 +5	No	70cm D-Star Repeater [W5KA]
146.480/+1.0	No	2m D-Star Repeater [W5KA C]
1293.200/-20	No	23cm D-Star Repeater[W5KA A]
1248.200	No	23cm D-Star DD (data, simplex/reversible) [W5KA A]

Persons using the repeaters are asked to join the club to help support these valuable resources. To use the autopatch, announce your call sign, press * and dial the phone number then release the PTT. When finished, press # to hang up the phone. Dial 911 (no * needed) for emergency services.

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Viewpoints expressed in the AARCOVER do not necessarily reflect those of any club, or of its members, directors, or officers. Material quoted from the ARRL Letter is supplied by the American Radio Relay League, Inc.

Members and other readers are encouraged to submit material for publication. Call Mitch London, if mailed submissions are required. Electronic files are encouraged! Submissions may be edited for publication. **Deadline is the 20th of the month.** Material may be used in a later issue. Unless otherwise noted, permission is granted to reprint AARCOVER articles, provided you credit the author and the AARCOVER.

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“XYL” is printed with permission by Carolyn Canfield, KE5DTS. Cartoons may not be reprinted without written permission.

For Changes in your ADDRESS, PHONE NUMBER or CALL SIGN:

See Jay Hoffman, KA5OST (512) 388-4404 ka5ost@arrl.net

Jay handles all changes for membership information .

Over the WWWaves...

A Collection of Various Websites sent in your friendly neighborhood hams...

NPR Story on ham radio...

<http://www.npr.org/2011/04/30/135873302/ham-radio-volunteers-worry-about-spectrum-plan>

Sent by Bruce, N1BN

<http://blog.makezine.com/archive/2011/05/how-to-set-up-an-electronics-lab.html>

This is from the folks at MAKE: magazine and blog fame. I read this blog every day (not all entries...just the ones that interest me).

This fellow's voice is about as irritating as they come, but his points are well taken. Worth a view if your bandwidth connection to the Internet is good enough to see a video. The tools are just as useful for beginning ham radio operators. And the auxiliary videos and his asides are very good tips.

Rick Herndon, K5FNI

FCC Vanity Call Fee Change Proposal

The FCC released a Notice of Proposed Rulemaking and Order (NPRM) on May 3, seeking to raise the fee for Amateur Radio vanity call signs.

Currently, a vanity call sign costs \$13.30 and is good for 10 years.

The new fee, if the FCC plan goes through, will go up to \$14.20 for 10 years, an increase of 90 cents. The FCC is authorized by the Communications Act of 1934 (as amended) to collect vanity call sign fees to recover the costs associated with that program.

The vanity call sign regulatory fee is payable not only when applying for a new vanity call sign, but also upon renewing a vanity call sign for a new term. Instructions on how to comment on this NPRM are available on the FCC Web site at, <http://www.fcc.gov/cgb/consumerfacts/howtocomment.html>.

The vanity call sign fee has fluctuated over the 14 years of the current program -- from a low of \$11.70 in 2007 to a high of \$70 (as first proposed in the FCC's 1994 Report and Order). In 2007, the Commission lowered the fee from \$20.80 to \$11.70. The FCC said it anticipates some 14,600 Amateur Radio vanity call sign "payment units" or applications during the next fiscal year.

The vanity call sign regulatory fee is payable not only when applying for a new vanity call sign, but also upon renewing a vanity call sign for a new term. The first vanity call sign licenses issued under the current Amateur Radio vanity call sign program that began in 1996 came up for renewal five years ago.

Those holding vanity call signs issued prior to 1996 are exempt from having to pay the vanity call sign regulatory fee at renewal, however. That's because Congress did not authorize the FCC to collect regulatory fees until 1993. Such "heritage" vanity call sign holders do not appear as vanity licensees in the FCC Amateur Radio database.

Amateur Radio licensees may file for renewal only within 90 days of their license expiration date. All radio amateurs must have an FCC Registration Number (FRN) before filing any application with the Commission. Applicants can obtain an FRN by going to the ULS at, <http://wireless.fcc.gov/uls/index.htm?job=home>, and clicking on the "New Users Register" link. You must supply your Social Security Number to obtain an FRN.

Officers Meeting Recap

UPS Batteries Needed: Don is asking for money to buy UPS Batteries for S. Austin Medical for D-star and HSSM. Don is asking for 350.00 but may be able to get them cheaper. Batteries are(8) 12V 16-20AH. They are to be bought as a set. Mitch, Alan and Lori approved up to \$350 for the purchase.

Door Prizes: Lori will bring some door prizes with her at June's General Club Meeting.

APRS Trackers: We have 9 units. There are 6 trackers that are working.

There has been some discussion about loaning out the Trackers to Club Members when they are not being used for Events. Paul Fenrich will give a run down on how the trackers work and how to set them up at the July Club Meeting. We will make up a sign out sheet for the Trackers. There also needs to be a responsibility clause signed as well. A time limit on how long the Trackers can be signed out was discussed.

Field Day: Have Trailer. Joe Fisher is our Cook. Mitch will miss Sat, But will be there on Sunday.

Lori is to talk to Lew about use of the Inflatable Army tent with Air Cond. For use on Field Day. Fri through Sun afternoon.

Dave will not be there to run the Mesh network.

Red Cross: Mitch still needs to write the letter. He has been a little busy; he will get the letter out.

The Austin Amateur Radio Club, Inc.

Membership Form for the year ending December 31, 20____

Application for: (check applicable box and enclose payment)

- AARC Individual \$20
 Family (all with same mailing address) \$30
 Student rate (thru 12th grade, no mail) \$ 5
 ARRL Individual ARRL (new or renewal) \$39
 Senior ARRL (new or renewal) \$36
 Family member ARRL (at same address) - \$8ea x ____ =
 First time ARRL discount -\$15
 TEXAS HAMPAC (Political Action Committee) \$ _____
 Total Enclosed _____

Mail this form with payment to:

AARC - P O Box 4739 - Austin, TX 78765-4739

Check One: -New member -Renew membership -Update Info

ARRL member Y N License class E A G T+ T N Year first licensed _____

Call sign _____ First Name _____ Last Name _____

Mail Address _____

City/Str/Zip _____

Hm Ph _____ Cel Ph _____ Wk Ph _____

Pager # _____ e-mail _____

Please list additional family members here and check the family member box above.

2nd Call _____ Name _____ ARRL mem Y N

3rd Call _____ Name _____ ARRL mem Y N

4th Call _____ Name _____ ARRL mem Y N

I/WE have interest in the following.

- Monthly meetings Field Day Working Events Transmitter Hunts
 Talking on 2 mtrs DXing Newsletters Holding Office
 Presenting programs CW Net Control Emergency Comm's
 Holding ARRL office Education Public Awareness Working w/Youth
 Others _____

Rcvd ____/____/____ Amt \$ ____ Ck ____ Cash ____ Dep ____ Post ____
 (for office use only)

JMH 20110315

Dues are Due for 2011

If you have not paid your dues, the time is now! Just print this form and mail it in, you can pay online at www.austinhams.org/join. Become a member today!

Just In: Joplin, Missouri Tornado Disaster

ARES E-Letter May 25th

Here is a brief report from Missouri SEC W0KRB, just forwarded by Dale Temple, W5RXU, Arkansas Section Manager, at press time: "Thanks to all who volunteered to help provide radio support for the Joplin tornado. Last night, Amateur Radio was used to provide communications between Freeman hospital (in Joplin) to the hospitals in Springfield to help provide information about resources needed in Joplin. We also had a link-up for Red Cross between the main office in Springfield and the satellite office in Joplin.

"John Howard, K0VET, activated the Missouri Emergency Services Net (MESN) and it was up until 2300 hours last night. It ended up steering a lot of people to the proper Web site for health and welfare messages. The hospital requirements for radio communications were terminated at 0900 this morning and at 5:00 PM tonight we are on a standby status for Red Cross between the two locations.

"We still have a couple of the Jasper County ARES® and Newton County ARES® members providing communications between the Red Cross Shelter and the HQ for Red Cross that was set up away from the normal chapter office as this is now a national-level Red Cross response. It is anticipated that this need will be fulfilled by noon tomorrow.

"Again, thanks to all of you for asking if you could help and especially for not self-deploying, which ends up adding to the problem. Our professionalism again came shining through. -- Kenneth Baremore, W0KRB, Section Emergency Coordinator ARES®, Missouri Section
 The Associated Press called the event the worst single tornado disaster since 1950.

AARC Meeting Minutes: May 3, 2011

Space Wx: (presented first due to technical problems) Things have settled down, but the max of Solar Cycle 24 is predicted to be around mid-2013. Solar winds have increased lately raising the critical frequency and helping open 10M. Solar flux has been relatively low lately.

Meeting called to order: 7:15pm by President Mitch London, KD5HCV.

Meeting started with a welcome to all and quick look at the agenda.

We had 49 in attendance, 4 visitors, and no new members. One upgrade was reported.

Minutes: April's minutes approved as written in AARCOVER.

Upcoming Events: Smithville Hamfest (5/7), Friendly Frontier Abilene Hamfest (5/7), WCARC Picnic (5/14). These items, other upcoming events, and scheduled presentations are listed in the AARC Swapnet newsletter, at www.austinhams.org, and on the Yahoo user group.

Announcements: MS-150 had 13,000 to 15,000 riders, no major injuries, but some SAG transports. Tour De Cure (6/4&5) needs volunteers. It's a tenth the size of MS-150, but 10 times the fun. QCWA meeting cancelled this month, but some will still meet for lunch. HamComm (6/10&11) in Plano has ARRL National Convention this year, making it relatively close. Field Day (6/25&26) briefly explained, the solar trailer will be there, and Joe Fisher, K5EJL, is cooking. HSMM has been installed at the Red Cross, so give it a try when in the area, along with work on our antennas. Austin Summerfest is in August. ARES still needs two or more NC operators. The Club is planning to swap out the rotor at the Red Cross.

REPORTS

President: Mitch reported the APRS project is coming along with ~\$800 spent so far; the AARC screwdrivers are available, please take some; and the daughter of a SK donated his old 73 Magazine collection.

Vice-President: Lori reminded everyone about the Ham Radio Cruise and its deadline.

Treasurer: Mitch reported money spent and money received by donation, from Austin Marathon, for the APRS trackers.

Editor: Mitch asked the club to write-up anything you do and submit to the newsletter.

Tech Committee: Stuart mentioned some troubles people have are due to the rubber duck antenna they are using, try a mag mount or better antenna.

ARES: Glen Reid, K5FX, introduced himself as the new EC and said he is planning no changes just yet.

SIG's: QRP group meeting is held on 2nd Saturdays.

Old Business: none discussed this time.

New Business: none discussed this time.

Ham of the Month: Paul Fenrich, KA5FZU.

Door Prizes: Deroy Howard, AA5R – 1972 Electronics Comic Book; Joe Jelinski, KC2KG – mini-MagLite; James Robbins, N5OUJ – stack of old 73 Magazines; Frank Jared, AE5BD – chocolate bunny.

Meeting Adjourned: 7:53pm

Presentation: "What the Heck is HSMM?" by Jeff Schmidt, N5MNV.



The ARRL National Convention hosted by Ham-Com

June 10-11, 2011 at the
Plano Centre in Plano, Texas

www.arrl.org/expo

www.hamcom.org



PROGRAM HIGHLIGHTS

Ham-Com – “The BIGGEST Hamfest in Texas,” will feature equipment dealers, manufacturers, forums, license examinations, transmitter hunts and more. Tailgate Market opens at 7 AM each day!

ARRL EXPO 2011 – A special exhibit area including ARRL program representatives, activities and a huge ARRL bookstore.

DXCC Card Checking – and other ARRL operating awards.

W5DXCC Dinner – Friday evening, sponsored by the Lone Star DX Association.

ARRL Youth Activities and Youth Lounge

Boy Scout One-day Radio Merit Badge Program – sponsored by Ham-Com.

WIAW/5 Special Event Station

ARRL Wouff Hong Ceremony

...and much more!

See www.arrl.org/expo for lodging options and links to travel information.

ARRL
The national association for
AMATEUR RADIO™



Photo by Caroline Anshel
Radio Group - K4LFG.CRG

TICKETS

www.hamcom.org
Purchase advance tickets online
by May 31.

General admission
in advance \$8
at the door \$10

Additional family members
in advance \$6
at the door \$8

Children 12 and under and
uniformed Scouts are FREE.

Visit hamcom.org for exhibit
booth reservations.

Tailgaters \$8 per space per day,
first-come, first-served.

ARRL SPECIAL GUEST

Riley Hollingsworth, K4ZDH

Before his retirement from the
Federal Communications
Commission in 2008,
Riley Hollingsworth was
recognized as the man who
embodied Amateur Radio
Enforcement. Today, he
continues to champion good
amateur practice, responsibility
for our radio spectrum
privileges, and respect for the
Amateur Radio Service as part
of the American heritage.

**Riley, K4ZDH, will give the
ARRL National Convention
keynote address.**

NEARBY

Historic downtown Plano
Interurban Railway Museum
The Shops at Legacy
Bring your family & friends!

Southfork Ranch

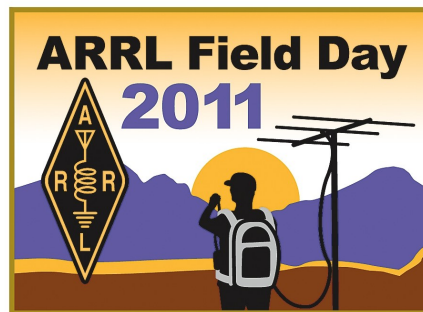


(Continued from page 1)Field Day Antenna

After a very successful day of using the NVIS antenna; and loop antennas for the higher bands, we ran out of 20m propagation early enough to long for a higher dipole to chase long skip on the lower bands.

But, with only our six foot high dipole, we decided to try what it might offer. Much to our surprise, we experienced consistent 5 by 5 signals on SSB from the West Coast. They did not have the usual Summer static on them, and moreover, they answered our calls and we could easily work them with 100 watts! Surely this must be an anomaly of that Summer!

Over 5 years and a second Field Day site later, we have learned an exciting lesson.



www.arrrl.org

A low dipole may work both NVIS by day and have enough response to SKIP by night, to give many useful contacts cross country. These contacts typically are West Coast, never stronger than S6, but always R5!

Whatever is going on, a number of common points exist from two locations tried: The signals are from the West coastal states and usually at further North Latitude than Austin TX. This skip is after 9 PM local, at night, and lasts all night. One site was over very rocky ground on a hill side, while the more recent years, the same effects have been experienced from flat land over rich soil farm lands east of the IH 35 corridor through Central TX. In all cases the identical NVIS dipoles were in use year to year.

Now what can allow a Dipole too low for DX to exhibit such performance?

One theory is Chordal Hops. Perhaps our signal starts out as a Zenith directed signal, but as it reflects from the F layer ionosphere, some of it gets trapped by remaining ionization from the daytime, that has not dissipated over the Western states. This signal travels along the curvature of the ionosphere over earth until it hits higher levels of Western ionization that causes a reflection downward to the West Coast stations. (Scattering?)

Obviously, the transition from a land mass to an ocean mass can introduce weather effects, Perhaps the proximity of the ocean affects ionization above, and that is how the downward reflection is induced.

What is significant, at the times we are hearing a West Coast station R5, but at S5, we are not hearing stations clearly in states East of the coastal states. And for the number of hams heard earlier in CA, we would think we would work them as well, but we don't hear them as clearly, if at all, on the lower bands. Just the Great Northwest is heard.

The majority of our observation years have been on the decline of the Sunspot cycle. Now that the Sunspots have turned around, and we are on the upswing, it will be interesting to see if we again have a combination of propagation effects using low horizontal reflector equipped, NVIS dipoles.

Besides the utility of being able to maximize contacts under varying conditions of Field Days, the meaning of this observation is that the ham finding themselves in an antenna restricted situation has another option good for differing types of propagation. Most houses afford a back yard hidden from view of Antenna critics. A ham can put up a low dipole over a reflector, even one 60 per cent of a full half wave, and with a wide range tuner and ladder line, tune it for several bands.

At 60 per cent of a half wave, L. B. Cebik, W4RNL, found that the antenna still is 90 per cent efficient. The low dipole will certainly work NVIS on 160, 80/75, 60, and 40m. The bonus it brings is the possibility of added contacts on the low bands, and higher bands, from skip such as described above. Any outdoor antenna has an efficiency advantage over indoor, or attic antennas, that are often close to good conductors and reflectors of RF in undesired ways.

The six foot high dipole was a convenient Field Day, easy to put up, antenna. Higher than six foot would likely increase the skip performance, but still allow it to be hidden by the house. One idea has been to place PVC poles out from the eaves and erect the dipole between them, well above the foot traffic through the yard. NVIS performance is retained up to 0.25 wave high, for a dipole on the lowest band.

A ham should never give up hope about antenna options, now that this combination performance has been proved. There is ample room to experiment to extend these results of high signal to noise skip operation to higher bands. I would urge other hams to try this with existing or new antennas and let us know how it works for you. Remember, any antenna is better than no antenna at all, and no ability to operate in your chosen hobby.

AARC Meeting Info.

Waterloo Icehouse

8600 Burnet Rd. South of 183

(Meeting at 7pm, come early and have dinner!)

Business Meeting 7pm

June 7th - Field Day is near, find out what we are doing this year!

Officers Meeting 7 pm

**June 21st - Meeting at Waterloo Icehouse—
Members welcome to watch the officer at work!**

2011 Upcoming Amateur Exams

ARRL VEC— June 4th & July 2nd 9a.m. at Bethany United Methodist Church. Contact Joe Makeever, W5HS (345-0800) or Joe Thiel, N5SMN (832-0450) for info. \$15 fee.

W5YI VEC- June 18th & July 16th 2p.m. in room 106, Fleck Hall, St. Edwards University. Contact Jim Greenwood, AB5EK@arrl.net, (327-6184) for more info.

<http://texasparadise.com/w5yi-austin>

2011Calendar of Events

Jun 4-5 *Tour De Cure Diabetes SA-SM-ATX Bike Ride*

SA Hams contact Lee N5NTG
H/C Hams contact David KC5MML
ATX Hams contact Jeff N5MNW@arrl.net
<http://main.diabetes.org/austintourdecure>

Jun 4 *11th annual AM Vintage Field Day*

Cibolo Creek 10AM-6PM
Jerry K5AXN 210-653-0430
carolbnsa@gmail.com

Jun 4 *PARC Tailgate*

Summit High School 1838 E Sam Houston Pkwy
Beltway 8 between Pasadena Blvd & Red Bluff in
Pasadena, TX

Jun 4 *Texas Combined ARES Exercise*

0900 to noon local time 3873 and 7285
Rik K5RIK@arrl.net

Jun 10-11 *HamCom*

Plano Center in Plano, TX
Future HamComs at Plano Center: 2012:8-9
June, 2013:7-8 June, 2014:13-14 June

Jun 25-26 *ARRL Field Day*

AARC at Red Cross Pershing Dr. Austin W5KA
Stuart K5KVH@arrl.net or Mitch KD5HCV@arrl.net

Upcoming Meetings...

June	July	Austin Meetings/Happenings	Time	Address
7	5	AARC Meeting Waterloo Ice House*	7:00 p.m.	8600 Burnet Rd.
11	9	Austin QRP, Alvin's Sandwich Shop	11:00 a.m.	12200 Research Blvd.
14	12	ATV Club Meeting Mangia's Pizza	7:00 p.m.	12001 Burnet Rd.
18	16	QCWA IHOP 183 Near Duval	1:30 p.m.	11654 Research Blvd.
15	20	Digital Wednesday at Red Cross	7:00 p.m.	2218 Pershing
27	25	Travis Co. REACT Jim's 183 & Burnet	7:30 p.m.	9091 Research Blvd.
28	26	Travis County A.R.E.S., ARL Auditorium	7:00 p.m.	10000 Burnet Rd.
23	25	CERT Meeting CTECC	6:30 p.m.	5010 Old Manor Rd.

**AARC Business Meeting is at Waterloo Ice House Come early and grab dinner before the meeting.*