

# In the DARC



Dallas Amateur Radio Club—[www.w5fc.org](http://www.w5fc.org)

January 2003

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**The Dallas Amateur Radio Club welcomes all who are interested in Amateur Radio be they prospective Amateurs or Amateurs of any License Class in becoming members of our organization.**

**January Business Meeting  
Wednesday, January 8, 2003  
7:00 PM**

**Talk-in on the 146.88 repeater  
Spring Creek BBQ on Midway at  
Beltway Dr. (5 minutes North of LBJ)**

**January Board Meeting  
Wednesday, January 15, 2003**

### **W5FC Repeaters**

146.28/146.88 MHz

223.28/224.88 MHz

447.425/442.425 MHz (110.9)



## *A DARC Special Service Club Event*

It was a cold and blustery day in Dallas for the 35<sup>th</sup> annual Turkey Trot benefiting the Dallas YMCA. As in years past, the dedicated members of the Dallas Amateur Radio Club donned their winter coats, charged their batteries, and made way to the Dallas City Hall for 6 a.m. donuts, assignments and net control check-in.

With an 8 mile track through the City of Dallas, an estimated 20,000 participants with their estimated 1,000 dogs of varying breeds, and a terrain not conducive to cellular or FRS communication the amateurs provided top notch and guaranteed communications for this event. Traffic handled ranged from the traditional event logistics to emergency traffic such as lost children and serious medical incidents. Response time to medical situations was enhanced by having amateur operators riding with

each ambulance assigned to the event. Event logistics was enhanced by dedicated assignments of amateurs to event directors and at all strategic check points as well as with the Dallas Police.

The DARC Emergency Communications Van was located at the Dallas City Hall and housed Net Control. Net Control operated continuously for nearly 5 hours handling all levels of traffic in a controlled, efficient and professional manner. Thanks to Karl Meyers, N5UOI, for his outstanding DARC event coordination; to Johnny Davis, K5JD, for use of his repeater; and to the host of DARC members for their participation in this club event. This is one of the great aspects of Amateur Radio, public service with teamwork!

**Check the DARC website at [www.w5fc.org](http://www.w5fc.org) for all the latest News and happenings around DARC. All newsletters, minutes, breaking news, license classes, items for sale, meeting times and dates, scheduled programs, and much more. Check it frequently for updates.**



## Dallas Amateur Radio Club

Founded 1914

To contact the DARC call (214) 691-2888

### 2003 Officers

#### President

N. T. "Len" Carlson, K4IWL, (972-519-0521)

#### Vice-President

Colin Buckup, N5GG, (817-291-1951)

#### Treasurer

Don Murray, W9VE

#### Secretary

Bill Chapman, WB5DX

#### Directors

Joe Isabella, N3JI

Ron Wycoff, WB0DZY

John Cotton, K5SN

Ginger McCausey, W5AAN

Johnny Davis, K5JD

Bernie Parker, K5BP

### 2003 Other Officers

#### Public Information / Webmaster

Colin Buckup, N5GG

N. T. "Len" Carlson, K4IWL

#### Emergency Officer

Johnny Davis, K5JD

#### Property

Open

#### Public Service

Karl Meyer, N5UOI

#### Programs

Tom Reese, KD5IPJ

#### Trustee / W5FC

Johnny Davis, K5JD

#### Technical Officer

Bernie Parker, K5BP

#### Newsletter

John Carlson, K9SQ

Send any information, articles, and pictures to K9SQ@arrl.net.

The Dallas Amateur Radio Club meets the first Wednesday of each month. Guests are welcome! **The Dallas Amateur Radio Club welcomes all who are interested in Amateur Radio be they prospective Amateurs or Amateurs of any License Class in becoming members of our organization.** See membership application for details. The Dallas Amateur Radio Club is a non-profit, American Radio Relay League Affiliated Special Service Organization. Contributions to In the DARC are always welcome and may be submitted to the Newsletter Chairman by e-mail (K9SQ@arrl.net). Letters to the Editor will be printed as space permits. DARC accepts no responsibility for the accuracy of the contents of this newsletter. Reproduction is permitted provided that this newsletter and the original source are credited.

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## The President's Corner

### N. T. "Len" Carlson — K4IWL

The new year is already here. How time flies! There have been a number of events in the past few years that are reshaping and redefining Amateur Radio from it's 100 year paradigm.

Amateur Radio began as an experimenter's hobby and those with the technical knowledge began experimenting with spark gap and then the triode vacuum tube was developed beginning the age of the *high tech* advances leading to receivers and transmitters that were tunable and capable of generating and receiving signals from around the world.

As time moved on from those very early days, the government began licensing amateur radio operators and establishing bands and band plans and more and more entered the hobby. The development of the vacuum tube made the development of Amplitude Modulation possible and then hams could hear each other's voices for the first time. Prior to that all communication was accomplished by using the Morse Code. After the vacuum tube the CW (Continuous Wave) signals became clearer and could be heard by beating the signal against a BFO (Beat Frequency Oscillator) which allowed for ease of picking a signal out of the pack by the frequency of it's received tone.

Then Single Sideband Suppressed Carrier (later shortened to SSB – Single SideBand) mode had been developed a few years earlier but in 1952, Wes Schum made it possible to transmit and receive SSB inexpensively by developing simple circuits and starting Central Electronics and releasing the first SSB exciter kit – The Central Electronics 10A – to the ham radio market. In the '50s ham radio was still a technician's hobby for the most part. Collins soon

*See President's Corner, continued on page 7*

**Check the mailing label for your DARC membership expiration date. If your membership is due for renewal please forward your check to: DARC, PO Box 744266, Dallas, TX 75374-4266. — Thanks!**



**The deadline for the February 2003, issue of In the DARC is January 17, 2002.**

## Musings from Antennaman



### The G5RV Antenna

Mont O'Leary—K0YCN

The G5RV antenna, invented by Louis Varney(SK), is a very simple, center-fed, multi-band antenna that is easy to construct from readily available, inexpensive materials. When fed properly, it can be a very effective radiator.

The G5RV, as originally designed, has only two specified factors: The electrical length in wavelengths of the "top" or horizontal section and the electrical length of the vertical section. To build one, simply erect a dipole that is 1.5 wavelengths long, end-to-end, at 14.15 MHz. Using #14 wire, the physical length is approximately 102 feet including the center insulator. This portion of the antenna should be as nearly horizontal as possible in your location at a minimum height of 35 feet – higher is better. Center feed this dipole with a section of high-impedance (300 Ohms or greater) balanced line that is ½ wavelength long at 14.15 MHz. If you use 450-Ohm ladder line the physical length of the vertical section will be approximately 31 feet depending on the line's velocity factor. This section of balanced line should be as nearly vertical as possible. The end result will look like a large "T" and that is all there is to a G5RV antenna.

Now comes the part where most installations of the G5RV fail: they simply are not fed properly. First of all, the antenna as designed is a balanced antenna – both sides of the feedpoint (located at the bottom of the vertical section) are physically identical. Yet, virtually no modern transmitters and very few "antenna tuners" provide balanced output capability over a wide range of impedances<sup>1</sup>. So we need a way to feed this antenna using 50 or 75 Ohm unbalanced coaxial feedline. In order for the antenna to operate properly and to prevent common mode current on the feedline you will need to have a 1:1 current choke balun at the feedpoint. This can be easily constructed by looping about 10 turns of the feedline coax into an 8-inch diameter coil just before the inner and outer conductors are attached to the vertical balanced line.

An alternative (one that I personally favor because of its low weight) is to use a ferrite choke balun such as those distributed by Palomar Engineers (www.palomar-engineers.com). Don't even think about omitting the choke balun. If you do, you no longer have a G5RV but some unknown variant with the outer conductor of the coax and part of your shack as the radiating elements.

Unless you intend to use the antenna exclusively on 20 meters, you will need an antenna tuner to cancel the reactance that will be present on other bands. If your transmitter has a built-in tuner you are all set. Otherwise you will need to connect through an external tuner using a short piece of coaxial line. Connect the antenna feedline to the unbalanced output connector of the tuner and you are all set to go.

For a detailed description of the antenna written by the inventor, Louis Varney, see his article extracted from the July, 1984 issue of the British publication *RadioCommunications* at [www.qsl.net/aa3px/g5rv.htm](http://www.qsl.net/aa3px/g5rv.htm). It contains a description of how the antenna operates on each amateur band.

I encourage your comments or suggestions. Please send them to [k0ycn@arrl.net](mailto:k0ycn@arrl.net).

<sup>1</sup> Almost all commercially available antenna tuners that have balanced output terminals provide this by inserting a transformer balun after their unbalanced tuning elements. This is generally very ineffective over a wide range of impedances and can lead to very high losses and substantial internal heating.

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## DARC Treasurer's Report

Don Murray — W9VE

Dec 25, 02

### ASSETS

#### Current Assets

##### Checking/Savings

Checking

General Fund 3,689.95

Griffith Fund 247.57

Repeater Fund 1,307.95

Total Checking 5,245.47

Total Checking/Savings 5,245.47

##### Other Current Assets

##### Investments

Griffith Fund Principal 5,000.00

Griffith Gain/Loss 604.24

Total Investments 5,604.24

Total Other Current Assets 5,604.24

Total Current Assets 10,849.71

**TOTAL ASSETS 10,849.71**

### LIABILITIES & EQUITY

#### Equity

Opening Bal Equity 3,693.44

Retained Earnings 2,468.12

Net Income 4,688.15

Total Equity 10,849.71

**TOTAL LIABILITIES & EQUITY 10,849.71**

## Hamvention 2003

Hamvention 2003 to celebrate "Year of the Young": Dayton Hamvention--the world's largest Amateur Radio gathering and trade show--celebrates its 51st year and its 52nd show, Friday, May 16, through Sunday, May 18, 2003. The focus in 2003 will be on the younger hams and attracting 12-to-18 year olds to Amateur Radio.

The ARRL Letter, Vol 21, No 48

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## How About Texas?

**New Jersey Lawmaker Introduces PRB-1 Bill** (Dec 12, 2002) -- New Jersey State Assemblyman Matt Ahearn (D-Fair Lawn) has introduced an Amateur Radio antenna bill, Assembly Bill 3065. Ahearn, who's KB2PNN and an ARRL member, says the measure would clarify the power of municipalities to zone with respect to certain antenna structures. If approved by New Jersey lawmakers, the measure, put into the legislative hopper December 9, essentially would codify the limited federal preemption known as PRB-1 into the Garden State's statutes.

ARRL Website

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## ARRL Section Manager News

For the first time in many years there will be an election this month for the position of Section Manager in North Texas. It has been my privilege to serve as your SM for the last two years and I would like to continue to serve. There are two other individuals who are also running for the position. I would ask for the support of all the ARRL members of the DARC.

**Thank You — 73 de KA5TXL**

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## 2003 Spectrum Defense Fund

2003 Spectrum Defense Fund well under way: ARRL Chief Development Officer Mary Hobart, K1MMH, says the ARRL Spectrum Defense Fund has generated \$190,000 in contributions from more than 4100 ARRL members. "If you have already sent your contribution, thank you," Hobart said. "But if you've not yet contributed to this vital ARRL program, please consider a generous contribution before December 31." The goal is to raise \$500,000 to support ARRL's work to protect the frequencies amateurs use every day. Financial support from the amateur community funds representation in Washington and the work of the ARRL Lab to support advocacy efforts as well as representation for Amateur Radio at World Radiocommunication Conference 2003 next summer. Contributions can be mailed to ARRL Headquarters or made via the secure ARRL 2003 Spectrum Defense Fund Web site <<http://www.arrl.org/defense>>.

## New Element 2 Question Pool

The Question Pool Committee (QPC) of the National Conference of Volunteer Examiner Coordinators has released a revised and expanded Amateur Technician class (Element 2) question pool into the public domain. **The new question pool becomes effective July 1, 2003, and must be used to generate all Technician written examinations administered on or after that date.**

"The newly revised pool released this week by the QPC includes significant efforts to present the pool in a more friendly and understandable fashion for beginners while maintaining appropriate emphasis on safety, rules and operating procedures," said ARRL VEC Manager Bart Jahnke, W9JJ. "The Technician syllabus was completely revised during 2002 to allow for the revamping of the new question pool."

The new Element 2 question pool contains 511 questions--up from 385 in the April 2000 release that occurred around the time of Amateur Radio restructuring.

The ARRL Letter, Vol 21, No 47

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## DARC Board Meeting Minutes

December 11, 2002

The December Board meeting was brought to order by Pres. Len Carlson K4IWL at approximately 7:04pm. Those present included Ginger McCausey W5AAN, Bill Chapman WB5DX, Bernie Parker K5BP, Don Murray W9VE, John Cotton K5SN, Larry Melby KA5TXL, Karl Meyer K5UOI, Colin Buckup N5GG, and (of course) Len. Also in attendance was John Carlson K9SQ, and Ron Wycoff WB0DZY.

Len noted that the election went smoothly and that there were no notable agenda items sent to Len via email. The upcoming Dino Dash with the Science Center was mentioned. John Cotton said that he will be passing along the upcoming event's contact information. We need a member to pick up the event and assist in the coordination for the club.

The Christmas party idea announced at the last club meeting was not overwhelmingly supported. So a social event may be planned for a later date when other conflicts may not be as prevalent. Len noted that the club would subsidize the individual's costs in order to provide for an upgraded evening and to make it affordable for families. Larry noted that prior notices on the web site and repeater voice announcement were insufficient, whereas the newsletter would be a better supplement.

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*See Board Mtg. Minutes, continued on Page 5*

## Electronics Inventory Reduction

### Ginger McCausey — W5AAN

The DARC board was determined to stop leaking money at the Lewisville Boat Storage, and we accomplished this by closing out the DARC storage locker. The Great DARC Surplus Equipment Inventory Giveaway on November 24th was the means to finally accomplishing that.



**Lucky Reynolds, KD5TBR**  
Happy owner of a free 2-meter beam.

For background, the DARC was renting the cheapest storage within reasonable driving distance of Dallas, yet was paying more in rent every year than the total estimated worth of all the contents. We had already taken most of the "good stuff" out and sold it at flea markets or through the DARC newsletter. But we still had too much inventory in storage for one person to remove and we were still paying rent.

The Sunday before Thanksgiving, several hams came out and helped themselves to the goodies. Then the Friday afterwards, another foray was made to clean out all the trash.

Several people took home some useful items, such as a couple of beam antennas, a good Motorola power supply, some coax cable, an oscilloscope, etc. We call this a win-win situation.

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### **Board Mtg. Minutes — continued from Page 4**

This brought up the issue of the newsletter and the associated mailings and costs. Len noted that the last newsletter, with his personal efforts of printing and colating the entire lot, still cost the club around \$200. This kind of expense, without some kind of subsidizing advertisement, would be too big of an expense for the club to engage every month. Len asked for ideas, such as possible advertising or other sources of revenue to offset the newsletter costs.

It was noted that the board needed a review of the expired memberships in order to send out a timely reminder. Len

noted that we would be sending out renewal notices much more often.

Don Murray reported that the former club storage shed has been cleaned out and vacated. We still technically owe some rental but, for the most part, it is a past issue. Much of the clean-out was accomplished with the free give away. This did include a considerable amount of coax, some of which was used at Field Day. Its age and condition was somewhat suspect and Len noted that new coax would be a good investment.

On a different note, Colin inquired as to the Van Committee, which was reported to have recently met and the participating individuals are researching the future alternatives for the van.

Len announced that an audit committee will be formed for the purpose of completing an inventory of the club's assets. This is required due to the year end and new election of officers.

Larry reported that there is no progress on the generator. He will attempt to obtain the current status and possibly get the rig painted.

Ginger posed a question as to whether anyone has or knows anyone who has any club memorabilia. It was suggested that some of the older members be interviewed for any stories, history, and items of interest that pertain to the club. All accumulations could be passed along to the secretary for safe keeping and assembly. Degolyer Elementary; Len mentioned that we are the official sponsor of the Degolyer Elementary radio club. The school would like some of the club members to occasionally attend with some resources to help with showing the students the aspects of HF and DXing.

Upcoming Tech Class; Larry noted that work has begun on a tech license class. Some thoughts were posed as to the class location which included DeGolyer. Currently the class is planned to be 2 hour sessions, once a week, or for 8 weeks.

Club project; Colin suggested we put together a club project, such as a kit or antenna or other like-kind subjects. Len said this could be brought up at the next club meeting for further input.

Karl re-iterated that the board needs to continue looking for a new public service officer. Upcoming events include HamCom, Field Day, as well as the marathon communication requirements.

At this point, Larry moved we adjourn, which was promptly seconded and approved at 8:20pm.

### **73, de Bill Chapman, WB5DX**

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**DARC VE TEST SESSION**  
**January 11th, 9am, Piedmont-Hawthorne**  
**Terminal at end of G. Coker Circle,**  
**8321 Lemmon Avenue**

## Dallas Amateur Radio Club Minutes

### December 4, 2002

#### Welcome

The December meeting was called to order at approximately 7:06 PM by President Len Carlson K4IWL. We had approximately 22 members and visitors in attendance this evening.

#### Upgrades

Tom Katopody KD5UFI announced he had upgraded to Extra Class. Congratulations. Whit Griffith, although had no upgrades to announce, did note that he had reached 70 years of ham radio involvement. All applauded his achievement!

#### Newsletter

Len checked with the members to see if anyone did not get a December newsletter, as he had brought several copies. This mailing had included a ballot for tonight's officer election. It was also noted that John Carlson has done a wonderful job resurrecting our club newsletter. Check the DARC web site for future installments. If anyone has any contributions, please contact Len or John.

#### Officer Elections

Len began the election procedures noting that the mailed ballots had erroneously omitted the nomination of Mont O'Leary K0YCN from the director's position. At that point, Len pointed out that because of the omission, only the officer election will proceed and the director positions will be elected at the next meeting. Mont then announced that in the interest averting further delay, he would withdraw from the election, thus freeing the vote for a full election. While the ballots were being counted, the balance of the meeting topics proceeded.

#### Treasurers Report

Don Murray W9VE reported that the club remains quite solvent with all accounts continuing to grow over expenses.

#### Public Service

Karl Meyer N5UOI noted the previous event, The Turkey Trot, was a success. We had plenty of help, with the event starting around 9 am and ending around 12 noon. There were around 20,000 participants. The next event will be the Dallas White Rock Marathon. This is a big undertaking and there is still a need for additional operators. If you think you might be interested contact N5TIM (@arrl.net) or W5BJ (@arrl.net). Also continue to check the DARC web site.

#### Van Committee

Larry Melby KA5TXL reported that the first full meeting of the van committee met this past Monday. He noted that investigations are started, exploring the feasibility of various possibilities for replacing the van. These would include a fully equipped trailer as well as other possibilities. The initial time frame is estimated to be around 2 to 3 years which would include the raising of funds.

#### ARRL

Larry reported that the Section Manager position for our area has three hams vying for the position. One of which is Larry. This is the first time in quite a while that there has been more than one candidate and especially three! Larry also noted that the ARRL.net forwarding service experienced some problems with two of the larger ISPs. Apparently the problems have been resolved and service will resume.

#### Old and New Business

Old: Don Murray W9VE reported that the storage shed is no more! It was finally cleaned out and will no longer be a topic of conversation.

New: Larry Melby announced that a tech class will be created soon, slated for early next year. A class site has yet to be determined. Check the DARC web site for future details.

#### Election Results

At this point in the meeting Johnny Davis K5JD announced the results of the ballot count. The final count was:

President:	Len Carlson K4IWL - 26 Votes Colin Backup N5GG – 1 Vote
Vice President:	Colin Backup N5GG – 26 Votes Len Carlson K4IWL – 1 Vote
Secretary:	Bill Chapman WB5DX – 27 Votes
Treasurer:	Don Murray W9VE – 27 Votes
Director (3 Year):	Ron Wycoff WB0DZY – 25 Votes
Director (3 Year):	Joe Isabella N3JI – 26 Votes

Mont O'leary, who had withdrawn earlier, also had 2 write-in votes for Director. Congratulations to the new or re-elected officers and directors.

#### 73, de Bill Chapman, WB5DX

### 1st DARC Service Event for 2003



**Volunteer for the  
DINO DASH  
benefiting the Science  
Place.**

**Contact Len Carlson,  
K4IWL, or Karl Meyers,  
N5UOI.**

**January 25, 2003  
Dallas Fair Park**

**President's Corner, Continued from Page 2**

soon came out with higher end SSB equipment and the hobby began to change but we still designed our own antennas and built our own antenna tuners and matching networks. We were still a hobby of technicians with a few *appliance* operators thrown into the mix.

I came on the scene and received my novice license on August 25, 1952. My first transmitter was designed and built by me with the advice of my Elmer. It was a 6AG7 crystal oscillator driving a pair of push-pull 6L6s with parts salvaged from an old TV set and ran a whopping 15 watts in-pout on CW in the 80, 40, and 15 meter bands. I had wire dipoles in my parent's back yard and worked a lot of "DX" over that first year.

I passed my General Class ticket in August 1953 and spent a very short couple of months on AM with an Elmac AF-57 transceiver but then I became interested in the new SSB mode so my mother bought me the Central Electronics 10A exciter and a Hallicrafter's SX71 receiver. After converting a surplus BC-459 aircraft transmitter as a VFO, I was on the air. I was the third amateur in Michigan (W8LEN) and the eighth amateur in Michigan, Indiana, and Wisconsin on SSB. There were 26 of us on SSB in all the midwest states in early 1953.

Since those days Amateur Radio has become mostly a hobby of non-technical operators and the off-the-shelf transceiver, antenna, and coax ... and you're on the air. But the demands of recent events like 9/11/2001 and the

establishment of the Office of Homeland Security and the designation of Amateur Radio as a primary communications resource for both natural and unnatural disasters is beginning to move amateur radio slightly back to the technical side again. There are new requirements in equipment (how it's lashed up), various other interfaces that will require the operators to create communications links where the environment may be shielded from RF and other radiation. All of these things will initially be created and defined by Amateur Radio and ham operators.

Every ham should begin to experience the technical side of our hobby again. There are many ways to do that, by building kits, by designing or building your own antenna, by becoming familiar with such things as SWR, matching, tuning, and experimenting. There are a number of adjuncts to the hobby that are very active these days like the QRP side of the hobby. Ninety-five percent of all QRP'ers build their own equipment. It's a lot of fun and when it works the first time it's one heck of a rush. There are those groups who experiment with microwave, ATV (Amateur TV), satellite communication (AMSAT), and many other forms of communication. Just pick the one of your interest and get to know it. Play with it. Get on board. Experience it!

These are new times and when you look at the history of ham radio you have to see that today is a new era but it is also a time when a melding of the old and the new will not only strengthen you in the hobby but will also prepare you for when we are needed to save lives and protect our country.

**Upcoming Hamfests - Mark Your Calendar!**

January 11, 2003	San Antonio Radio Club San Antonio SWAPFEST03
January 11, 2003	Minden ARA <a href="http://www.bayou.com/~k5dlh/fest.html">www.bayou.com/~k5dlh/fest.html</a>
January 18, 2003	Arlington Winter-COM 2003 <a href="http://www.wintercom.org">www.wintercom.org</a>
March 15, 2003	Brenham ARC <a href="http://www.alpha1.net/~barc">www.alpha1.net/~barc</a>
May 3-4, 2003	West Texas Section Convention Key City ARC
May 16-18, 2003	51 <sup>st</sup> Dayton Hamvention <a href="http://www.hamvention.org">www.hamvention.org</a>
<b>June 20-22, 2003</b>	<b>HAM-COM 2003</b> <b>2003 ARRL National Convention</b>

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<b>January 2003</b> <b>CALENDAR OF EVENTS</b>			1	2	3	4 VE Session— Arlington ARC 10 AM
5 Dallas Cty. RACES Net 8 PM 146.88 Collin Cty. ARES NET 9 PM 147.18+ (107.2) McKinney ARC VE Test Session 3 PM	6 TX Statewide ARES Net 7:30 PM 3873 kHz	7	8 DARC Meeting 7 PM	9	10	11 DARC VE Session—9 AM
12 Collin Cty. ARES NET 9 PM 146.74	13 Richardson Wireless Meeting 7 PM TX Statewide ARES Net 7:30 PM 3873 kHz Plano ARK Meeting 7:30 PM	14 McKinney ARC Meeting 7 PM	15 DARC Board Meeting 7 PM	16	17 Arlington ARC Meeting 7:30 PM In The DARC February Issue Deadline	18 VE Sessions— Arlington ARC 10 AM Irving ARC 9 AM
19 Dallas Cty. RACES Net 8 PM 146.88 Collin Cty. ARES NET 9 PM 147.18+ (107.2)	20 TX Statewide ARES Net 7:30 PM 3873 kHz	21	22	23 VE Sessions— Garland ARC 7:30 PM	24	25
26	27 GARC Meeting 7:30 PM TX Statewide ARES Net 7:30 PM 3873 kHz	28	29	30	31	



Dallas Amateur Radio Club  
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