



# NARS NEWS

February, 2015

The Northwest Amateur Radio Society  
an ARRL Special Services Club #2120

## Important Dates

Monthly club meeting:  
Third Friday of each month, 7:30 pm.  
Cypress Creek Christian Community  
Ctr. 6823 Cypresswood Drive

Tuesday, February 24, 7:30 pm.  
Board of Directors Meeting  
Ponderosa Fire Station  
17061 Rolling Creek Drive

VE License Exam:  
Saturday, February 28, 8:30 a.m.  
Tomball Fire Station #1  
1200 Rudel Drive, Tomball

### Lunch Break—North

Feb 18, Panera Bread  
Feb 25, Sweet Tomatoes  
Mar 4, BJ's Brewery & Restaurant  
Mar 11, Gianna's Italian Kicthen  
Mar 18, Spring Creek BBQ

### .Lunch Break—Medical Center

Feb 18, Buffalo Grille  
Feb 25, Southwell's Grille  
Mar 4, Marco's Mexican Bar & Grille  
Mar 11, Silver Palace Chinese Buffet  
Mar 18, Pappa's BBQ

Tail Dragger's Lunch Bunch -  
Mondays, 11 am.

Aviator's Grill, Hooks Aerodrome

Notice: NARS membership dues are  
\$20 per year, renewable on anniver-  
sary date.



Photo courtesy of Vibroflex.com

## Friday, February 20 CW is alive and well!

The February General Meeting topic will be on CW. There will be a brief discus-  
sion and demonstration of several types of sending devices - straight keys, bugs,  
paddles, you name it. If you're interested in Morse Code, you won't want to miss  
this opportunity to see these devices and hear from the operators who enjoy the  
art and science of the most reliable mode in amateur radio.

Do you have a unique device for sending code? Bring it with you for bragging  
rights!

### 146.660 Repeater Update

NARS will be testing the replacement for the 146.660 repeater in the next few  
weeks. Anyone wishing to help defray the cost of replacing the repeater, an-  
tenna, connectors, etc. can make a donation to the Repeater Fund by making  
checks payable to NARS and designate "Repeater Fund" in the Memo field.

NARS, P.O. Box 90387, Houston, TX 77290-0387

The cost of this equipment is considerable and will be done in stages as we go  
along. Some equipment, material, and technical assistance has already been do-  
nated, but we have a long way to go towards completion of this massive project.  
Your monetary donations can help in bringing 146.660 up and running sooner.  
More details will follow in future announcements.

**Breakfast  
at Denny's  
7720 Louetta Road  
Saturdays 7 am.**

## President's column

Hopefully everyone made it through the Christmas and New Year's celebrations safe, happy and healthy. Our January meeting was our annual Awards Banquet held this year at the Westador Club House, 17715 Cali Drive, Houston. We had 50 guests in attendance. Prizes included ARRL books through a generous donation by George Avera, AF500 from Conroe. Keith Dutson, NM5G provided a delicious batch of cookies for the attendees to share.

A CW class for those members and friends wishing to learn Morse code or improve their Morse code skills will be starting soon. Details of the class will be announced soon. Keith Dutson will be presiding. The class will start at the beginner level and assume that you are starting from zero. As the class progresses members will have the opportunity to communicate with each other through cw.

I want to thank the all of the club officers, board members and presenters for making 2014 a great year. I hope that all of you enjoy amateur radio this year and participate in our meetings, public service events, emergency preparation exercises, and working with others in furthering your ham skills. We all have a lot to learn from each other. Helping new hams is one of my goals for the coming year.

73 de Brad WD5GNI

*See page 5 for Awards Banquet photos*

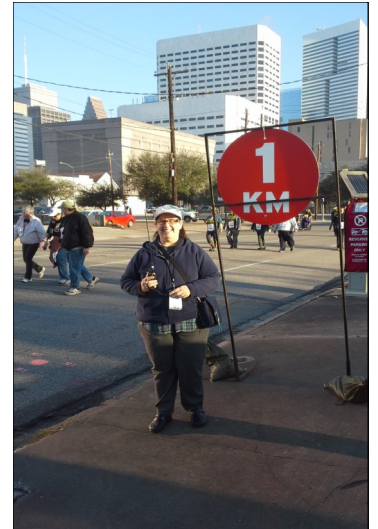
## Chevron Houston Marathon & Aramco Half-Marathon News

Thanks to all of the hams who volunteered to help with the 2015 Chevron Houston Marathon & Aramco Half Marathon. Everything seemed to go well this year. I was only in the back of a police car for a short time. Thanks to Lee Gaspard (WA5QXE) and the entire radio operations team at GRB. They seem to have mastered the tracking and cat herding of about a hundred hams plus several medical and transportation groups. We were glad to have Paul Owen (N5NXS) back as net control. A familiar voice and many years of experience made a tough job sound easy. For the runners, the weather was nice and cool with no rain. There were no course records broken but a couple of personal bests were achieved. See you all next year!

*Ron Horton (KF5LFL)*



*Ron Horton KF5LFL &  
Gary Horenkamp KF5FAU*



*Sheree Horton KF5LMJ at  
1st K Marker*

## NARS in Rewind...

### NARS notes— June 1995

Paul, KF5SB, our Singapore connection, visited with us in May on the occasion of his son's wedding and reports that he and Georgina are doing well over there and looking forward to returning around this Fall. He says that there is very little chance of getting on the air over there.

A letter from Dan Cassiana 9M2NI, our Kaula Lumper connection says he is hoping his (current) year will be his last and hopes to return this year. He is looking forward to getting some extra air time while the family is visiting home this Summer, so give a listen. By the way, KA5AKG will be acting as his QSL manager stateside in case you make a contact.

*Ken Harlan KA5AKG, Editor*

### NARS 2 meter net ....

Held every Wednesday night at 8 pm. We will be temporarily using the Texas DX Society's repeater until ours is back in operation. Please configure your equipment for 147.36/96, Tone: 100. All are welcome, members or not!



**4721 Watonga Blvd.  
Houston, TX 77092  
[www.ofarc.org](http://www.ofarc.org)**

*V.E. Exams every 4th Saturday of  
the month at 9:30 a.m.  
Contact: John Westerlage'  
N5DWI@oafrc.org for further  
info.*

## HOUSTON AMATEUR RADIO SUPPLY, INC.

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**Dave McCombs, NA5CW**  
Owner

281-355-7373  
[contact@harsradio.com](mailto:contact@harsradio.com)

2558 E. FM 1960 Rd.  
Houston, TX 77073

## How Light Emitting Diodes work!

**L**ight emitting diodes, commonly called LEDs, are real unsung heroes in the electronics world. They do dozens of different jobs and are found in all kinds of devices. Among other things, they form numbers on digital clocks, transmit information from remote controls, light up watches and tell you when your appliances are turned on. Collected together, they can form images on a jumbo television screen or illuminate a traffic light.

Basically, LEDs are just tiny light bulbs that fit easily into an electrical circuit. But unlike ordinary incandescent bulbs, they don't have a filament that will burn out, and they don't get especially hot. They are illuminated solely by the movement of electrons in a semiconductor material, and they last just as long as a standard transistor. The lifespan of an LED surpasses the short life of an incandescent bulb by thousands of hours. Tiny LEDs are already replacing the tubes that light up LCD HDTVs to make dramatically thinner televisions.

In this article, we'll examine the technology behind these ubiquitous blinkers, illuminating some cool principles of electricity and light in the process.

A diode is the simplest sort of semiconductor device. Broadly speaking, a semiconductor is a material with a varying ability to conduct electrical current. Most semiconductors are made of a poor conductor that has had impurities (atoms of another material) added to it. The process of adding impurities is called doping.

In the case of LEDs, the conductor material is typically aluminum-gallium-arsenide (AlGaAs). In pure aluminum-gallium-arsenide, all of the atoms bond perfectly to their neighbors, leaving no free electrons (negatively charged particles) to conduct electric current. In doped material, additional atoms change the balance, either adding free electrons or creating holes where electrons can go. Either of these alterations make the material more conductive.

We'll skip the bit about how the electrons react in the basic PNP or NPN type semi-conductor. Go back to your Technician or General License manual as to how "holes" move about in these devices. No need to confuse you with all that stuff at this point. All you have to know is that the interaction between electrons and holes in this setup has an interesting side effect -- it generates light! In the next paragraph, we'll find out exactly why this is.

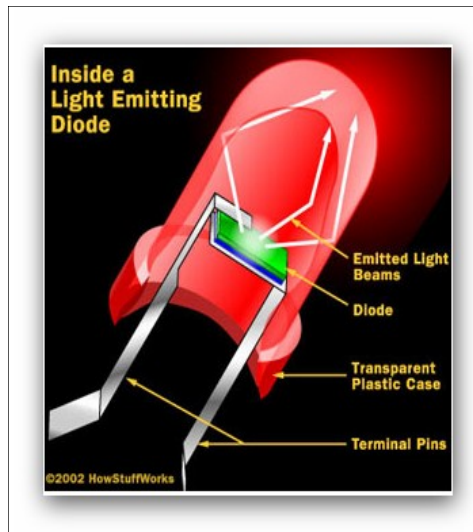
### How can a diode produce light?

Free electrons moving across a diode can fall into empty holes from the P-type layer. This involves a drop from the conduction band to a lower orbital, so the electrons release energy in the form of photons. This happens in any diode, but you can only see the photons when the diode is composed of certain material. The atoms in a standard silicon diode, for example, are arranged in such a way that the electron drops a relatively short distance. As a result, the photon's frequency is so low that it is invisible to the human eye -- it is in the infrared portion of the light spectrum. This isn't necessarily a bad thing, of course: Infrared LEDs are ideal for remote controls, among other things. Visible light-emitting diodes (VLEDs), such as

the ones that light up numbers in a digital clock, are made of materials characterized by a wider gap between the conduction band and the lower orbitals. The size of the gap determines the frequency of the photon -- in other words, it determines the color of the light. While LEDs are used in everything from remote controls to the digital displays on electronics, visible LEDs are growing in popularity and use thanks to their long lifetimes and miniature size. Depending on the materials used in LEDs, they can be built to shine in infrared, ultraviolet, and all the colors of the visible spectrum in between.

### LED Advantages

While all diodes release light, most don't do it very effectively. In an ordinary diode, the semiconductor material itself ends up absorbing a lot of the light energy. LEDs are specially constructed to release a



large number of photons outward. Additionally, they are housed in a plastic bulb that concentrates the light in a particular direction. As you can see in the diagram on your left, most of the light from the diode bounces off the sides of the bulb, traveling on through the rounded end. LEDs have several advantages over conventional incandescent lamps. For one thing, they don't have a filament that will burn out,

so they last much longer. Additionally, their small plastic bulb makes them a lot more durable. They also fit more easily into modern electronic circuits.

But the main advantage is **efficiency**. In conventional incandescent bulbs, the light-production process involves generating a lot of heat (the filament must be warmed). This is completely wasted energy, unless you're using the lamp as a heater, because a huge portion of the available electricity isn't going toward producing visible light. LEDs generate very little heat, relatively speaking. A much higher percentage of the electrical power is going directly to generating light, which cuts down on the electricity demands considerably. Per-watt, LEDs output more lumens of light than regular incandescent bulbs. Light emitting diodes have a higher **luminous efficacy** (how efficiently electricity is converted to visible light) than incandescents -- for example, Sewell's EvoLux LED bulb produces 76.9 lumens per watt compared to an incandescent bulb's 17 lm/W. And they last: LEDs can have lifetimes of **50,000 hours or more**. Up until recently, LEDs were too expensive to use for most lighting applications because they're built around advanced semiconductor material. The price of semiconductor devices has plummeted since the year 2000, however, making LEDs a more cost-effective lighting option for a wide range of situations. While they may be more expensive than incandescent lights up front, their lower cost in the long run can make them a better buy. Several companies have begun selling LED light bulbs designed to compete with incandescent and compact fluorescents that promise to deliver long lives of bright light and amazing energy efficiency.

### LED Light Bulbs vs. Incandescents and Fluorescents

For decades, 100-watt incandescent light bulbs have lit up hallways

and bedrooms; 60-watt incandescents have shone softer light from reading lamps and closets. But incandescent lights have some problems. They're inefficient, wasting lots of energy as heat, and have shorter life spans than fluorescent lamps. Recently, compact fluorescent (CFL) bulbs have become popular alternatives to incandescent bulbs thanks to lower power consumption. Where incandescent lights last an average of around 1,000 hours, CFLs can last 8,000 hours. Unfortunately, **CFLs contain toxic mercury** that makes them potentially hazardous and a pain to dispose of .

Enter the LED light bulb. LEDs offer the advantages of CFLs -- lower power consumption and longer lifetimes -- without the downside of toxic mercury. For example, a 60-watt incandescent light bulb draws more than \$300 worth of electricity per year and provides about 800 lumens of light; an equivalent compact fluorescent uses less than 15 watts and costs only about \$75 of electricity per year. LED bulbs are even better, drawing less than 8 watts of power, costing about \$30 per year, and lasting 50,000 hours or longer. There are only 8,760 hours in a whole year -- imagine how long an LED bulb would last in the average home!

That makes LEDs sound pretty great -- and they are -- but there's a reason incandescent and compact fluorescent bulbs are still around. LED bulbs present a high up-front cost compared to other bulbs. Incandescent bulbs sell in packages for only a few bucks. As of mid-2011, Sewell's EvoLux LED bulbs sold for more than \$70 apiece! However, because of their longer life spans and dramatically lower power usage, LED bulbs make up for the high barrier of entry. Since there's no toxic mercury in an LED, they're also easier and cheaper to dispose of than CFLs. And since LEDs can be built to light up in a variety of colors, they don't need filters like other bulbs.

LED lighting obviously isn't perfect yet. In addition to the high cost barrier, LEDs are vulnerable to high temperatures. If LED circuitry gets too hot, more current will pass through the **junction** mentioned earlier in this article. When too much current courses through the junction, it will cause irreversible burn-out often called **LED meltdown**.

LEDs and fluorescents put off "cool" or bluish light compared to the "warm," yellowish light typical of incandescent bulbs. The difference in lighting types can take some adjustment, but LEDs obviously offer numerous advantages over incandescents. LEDs are even easy to dim and are perfect for encouraging plant growth, since they efficiently put off tons of light without producing heat that could potentially be damaging to plant life.

#### **LED TVs and the Future of Light Emitting Diodes**

LEDs have come a long way since the early days of lighting up digital clock faces. In the 2000s, LCD TVs took over the high definition market and represented a huge step over old standard definition CRT televisions. LCD displays were even a major step above HD rear-projection sets that weighed well over 100 pounds ( 45.4 kilos). Now LEDs are poised to make a similar jump. While LCDs are far thinner and lighter than massive rear-projection sets, they still use cold cathode fluorescent tubes to project a white light onto the pixels that make up the screen. Those add weight and

thickness to the television set. LEDs solve both problems. Have you ever seen a a gigantic flat screen TV barely an inch thick? If you have, you've seen an LED television. Here's where the acronyms get a bit confusing: those LED TVs are still LCD TVs, because the screens themselves are comprised of liquid crystals. Technically, they're **LED-backlit** LCD TVs. Instead of fluorescent tubes, LEDs shine light from behind the screen, illuminating the pixels to create an image. Due to the small size and low power consumption of LEDs, LED-backlit TVs are far thinner than regular LCD sets and are also more energy efficient. They can also provide a wider color gamut, producing more vivid pictures.

Because LED TVs are still in their infancy, several different types of LED-backlit sets are on the market -- and not all LED TVs are created equal. Many sets use white **LED edge lighting** to shine light across the display. The only real advantage afforded by these sets is thinness. **RGB LED-backlit sets**, on the other hand, provide improved color. Some configurations even allow for a technique called **local dimming**, where LEDs in different parts of the display can be brightened or dimmed independently to create a more dynamic picture . And that highlights one more great advantage of LEDs over compact fluorescent lights: Because the LEDs can actually be instantly toggled on and off, they produce awesome black levels in dark scenes. Since the white fluorescent lamps have to remain on during TV use, some light tends to bleed through and lighten the picture in dark scenes.

In the future, some of the most incredible uses of LEDs will actually come from organic light emitting diodes, or **OLEDs**. The organic materials used to create these semiconductors are flexible, allowing scientists to create bendable lights and displays. Someday, OLEDs will pave the way for the next generation of TVs and smart phones -- can you imagine rolling your TV up like a poster and carrying it with you anywhere?

*Article content courtesy of How Stuff Works.com with occasional inserts by your Editor.*



*Never too old for one more Public Service Event ....  
"Working the 200 yard Mosey!"*

## Saturday, Jan 24 VE test session results at Lone Star College Tomball Library:

We had 5 candidates taking 7 tests.  
Element 2 tests given, passed 3  
Element 3 tests given, passed 0  
Element 4 tests given, passed 2

Congratulations to:

Daniel Canales – new Technician  
Robert Rasa W5CPU – upgrade to Extra  
John-Paul Clark K5JPC – upgrade to Extra  
James McClendon – new Technician  
Terry Suzette Wheeler – new Technician

Thanks to the VE's in attendance:

Skip Ferguson K5LLR (acting session mgr.)  
Martin Rogoff N5GPS  
Sheree Horton KF5LMJ  
Ken Mitchell KD2KR  
Michael Bowen N8ILU  
Ron Horton KF5LFL  
William Hielscher KG5WPH

The next monthly session will be held Saturday, February 28 at 10:00 a.m. at Lone Star College Tomball Library, located at the southern entrance to the collage. Official address is 30555 St. Hwy 249. Let me know if you would like to serve at this session. Parking is in the lot to the right of the entrance.

Anyone who wants to observe and/or participate in a session is always welcome. Just let me know if you want to learn more about becoming a volunteer examiner.

Keith Dutson NM5G



Left to right: Mike Bowen N8ILU, Martin Rogoff N5GPS, Joe Sokolowski KD5KR, Brad Nelson WD5GNI, Ron Horton KF5LFL, and Sheree Horton KF5LMJ



Bill Bouy N5BIA, NARS Webmaster and recipient of the NARS Ham of the Year Award.

## Board of Directors for 2015

President: Brad Nelson WD5GNI  
Vice President: \*\*\*\**Position vacant* \*\*\*\*  
Treasurer: Sheree Horton KF5LMJ  
Secretary: Martin Rogoff N5GPS  
Directors:  
Ron Horton KF5LFL  
Al Manard N6VQO  
Deral Kent K5WNO  
Mike Bowen N8ILU

We are still in need of a Vice President for 2015. The pay is not that good, but you do get to pick the site and food for the next Awards Banquet! Come on, folks. We can help. It doesn't take much of your time. One Tuesday each month to attend a meeting, tending to the business of the Northwest Amateur Radio Society. Look at the (ahem,) "power" you could yield.... You're in Texas, now, y'all!

Give it a shot. We need your new ideas on how to keep this organization successful. "Step up to the plate, Re-enlist, For God & Country".... *Cut the hype. Just do it!*

## Awards Banquet 2015 recap -

Well, another successful Awards Banquet is behind us once again. Some fifty members and their guests enjoyed getting together whilst partaking in some good ole' Texas specialty catered by Pappa's BBQ, known throughout the Houston Metropolitan area. And, of course a few folks walked off with a raffle prize or two, just to add to the excitement.

Oh yeah, did I mention the awards given to some of those who deserved recognition for their service to the club and the installation of the new Board of Directors for the year 2015? Wasn't that what we were there for?

Bill Bouy N5BIA was presented with the NARS Ham of the Year Award for his outstanding work in maintaining our web site for the past few years. Bill's work included major upgrades to the site software and the membership database. It takes a lot of talent and determination to keep an organization such as NARS relevant in the eyes of the public. Someone once said, "When you do things right, people won't be sure you did anything at all." Bill's behind the scenes work deserves recognition. It was long overdue!

Joe Sokolowski - Editor

# Welcome, Congratulations and Condolences

Welcome new members,  
John Hearn KG5FEP

## NARS Resource list

### General help:

Allen Majeski WA5REJ  
281 528-0673 wa5rej@yahoo.com

Deral Kent K5WNO  
281 548-7476 k5wno@juno.com

### Digital modes:

Marty Fitzgerald W5MF  
281 251-4301 fitz6@swball.net

### VHF/UHF:

Brian Derx N5BA  
281 251-4301

### PC Programming & Ops:

Keith Dutson NM5G  
281 516-1466 keith1@dutson.net

### Building Electronics & kits:

Mark Tyler K5GQ  
281 587-0256 k5gq@juno.com

### Interference (Basic advice):

Terry Myers KQ5U  
281 443-6042 tmyers1031@sbcglobal.net

### Card checking for awards:

Bob Walworth N5ET—DXCC  
281 292-2221 rwalworth@charter.net

Brian Derx N5BA—WAS, VUCC  
281 894-5942

Bob Walworth N5ET—WAZ  
281 292-2221 rwalworth@charter.net

### NARS Public Info. Officer

Joe Sokolowski KD5KR  
281 353-2196 kd5kr@arrl.net

## NARS Information

### President & Board Chairman

Brad Nelson WD5GNI  
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wd5gni@swbell.net

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### Treasurer

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sher5456@gmail.com

### Secretary

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N5gps.tx@gmail.com

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281 890-4038  
ron.horton88gmail.com

Deral Kent K5WNO  
281 548-7476  
k5wno@juno.com

Mike Bowen N8ILU  
mike5664g@yahoo.com

### Administrative & General Info.

Joe Sokolowski KD5KR  
281 353-2196  
kd5kr@arrl.net

Send changes in address, phone, or email to:

NARS  
P.O. Box 90387  
Houston, TX 77290-0387

### Nets

2 meter Wed. 8 pm. 147.36/96, tone 100  
(Courtesy of Texas DX Society)  
Coordinator: Jerry Whiting KB5VGD  
g\_whiting@sbcglobal.net

### Web site

URL: <http://www.w5nc.net>  
Web Master: Bill Buoy N5BIA  
281 370-3510 n5bia@arrl.net

### NARS Reflector

NARS@mailman.qth.net  
Coordinator: Keith Dutson NM5G  
281 516-1466 keith1@dutson.net

### Texas QSO Party

Co-coordinator: Chuck Sanders NO5W  
832 657-4832  
no5w.chuck@gmail.com

Co-coordinator: Keith Dutson NM5G  
281 516-1466 keith1@dutson.net

### VE Session (ARRL) Manager

Keith Dutson NM5G  
281 516-1466 keith1@dutson.net

### Meetings

Monthly General Membership 3rd. Friday  
each month (except January) at 7:30 pm.  
Cypress Creek Christian Community Ctr.  
6823 Cypresswood Drive

### Saturday Breakfast

Denny's 7720 Louetta Rd. 7 am.

### Wednesday Lunch-11 am.

Various places. Info on front page.

**NARS News** is published monthly by the Northwest Amateur Radio Society. Send all articles and materials for the newsletter to:  
Editor, Joe Sokolowski KD5KR, 281 353-2196 kd5kr@arrl.net Deadline for articles to appear in the next newsletter is the last day of  
each month.

Northwest Amateur Radio Society is a Special Services Club affiliated with the American Radio Relay League, ARRL Club No. 2120.