



June, 2015

Accurate, Reliable Emergency Communications for our Community

Volume 15, Number 6

Field Day 2015

It's HERE! June 27th

The Field Day 2015 emergency communications exercise will take place the last full weekend this month on June 27th - 28th. All amateur radio operators in Scott County are invited to join the fun! The local media have also been sent a media release previewing the event.

Scott ARES volunteers have reserved the park shelter at Canterbury City Park, 13400 Inglewood Ave. in Savage for the exercise. You can find details and directions to the site on the Scott ARES website: www.scottares.org. Click on the Field Day notice.

The goal of the Field Day exercise is to contact as many other portable emergency stations as possible within the 24 hours of the exercise and enjoy the company of other ARES members. Scott ARES members finalized their plan for the exercise during their monthly breakfast on the second Saturday of the month, June 13th. The group meets at the Perkins Restaurant in Savage starting around 8:00am.

Scott ARES will be operating from Canterbury City Park during the park hours on Saturday, June 28th. Set-up will begin around 11 AM to be prepared for the starting gun at 1:00PM on Saturday. The Field Day operation will conclude with the close of the park by 10:00 PM on Saturday evening.

All Hams are invited to stop by and make some contacts if they want to jump in the contest. Non-hams are welcome to come and learn about amateur radio and emergency communications activity in Scott County. Of course people who just happen to be driving down Glendale Road and wonder what is going on in the park are also welcome to stop by! If you plan on visiting, be aware, ham radio can be infectious. You just might leave with a new hobby.

There is additional information on the Scott ARES website including pictures from last year's Field Day. Plan now to stop by the park on Saturday the 27th and see what is going on.

Updates on the planning will be available on the weekly

The ARES COMMUNICATOR is published for the benefit of Amateur Radio Operators in Scott County and other interested individuals.
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Reader submissions encouraged!

training net on Monday evening at 7:00 pm on 146.535 simplex. Check in and contribute your two cents worth!

The Field Day exercise is sponsored by The American Radio Relay League (ARRL), the national organizations for Amateur Radio, has been an annual event since 1933. You can find other Field Day sites by using the Field Day locator on the ARRL website here: <http://www.arrl.org/field-day-locator>



BREAK - OVER

ARES Activities

Weekly Net Monday 7 PM 146.535 mhz (s)
Breakfast Saturday, July 11th
Digital Monday, July 13th

ARES Nets

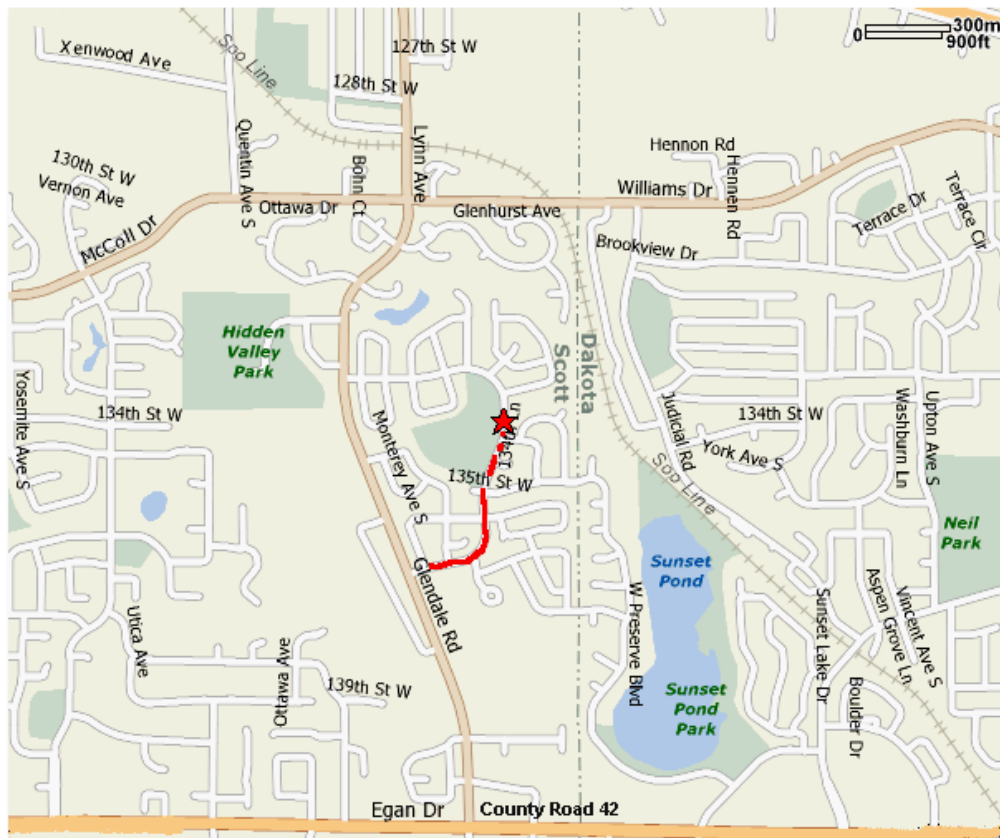
MN ARES Phone Net
6:00PM Sunday Freq: 3.860 mhz
ARRL MN Phone Net
12:00p, 5:30p CST Daily Freq: 3.860 mhz
ARRL MN CW Net
6:30p, 9:50p CST Daily Freq: 3.568 mhz

NETS WITH OUR NEIGHBORS

North Dakota: Daily 3.937 mhz 6:30pm
South Dakota: Daily 3.860 mhz 6:00pm
Wisconsin: Daily 3.985 mhz 5:30pm
Iowa: Daily 3.970 mhz 12:30/5:30pm

Field Day 2015 Location

Everyone is welcome to the nation's largest annual emergency communications exercise!



Picnic Shelter
Canterbury City Park
13400 Inglewood Ave
Savage, MN

Saturday June 27, 2015

Set-up and Testing
10:30 AM to 1:00 PM -
Field Day Operation
1:00 PM to Park Close

CubeSats Up

The APRS/PSK31-equipped US Naval Academy satellites appear to be operating, with one exception, following their May 20 launch. Included in the launch was a pair of 1.5U CubeSats — the PSAT APRS/PSK31 satellite and BRICsat, a propulsion/PSK31 satellite — as well as a 3U CubeSat, USS Langley (Unix Space Server Langley), and The Planetary Society's LightSail-1.

PSAT, a USNA student project named in honor of USNA alum Bradford Parkinson, of GPS fame, contains an APRS transponder for relaying remote telemetry, sensor, and user data from remote users and Amateur Radio environmental experiments or other data sources back to Amateur Radio experimenters via a global network of Internet-linked ground stations.

Brno University transponders on PSAT and BRICsat support multi-user PSK31 text messaging (28.120 MHz uplink/435.350 MHz FM downlink). The BRICsat and PSAT PSK31 transponders operate on the same frequency, although one has PSK telemetry on 315 Hz, the other on 375 Hz.

Bob Bruninga, WB4APR, said the PSAT telemetry on 145.825 MHz (1200 baud AX.25) is working okay, and the APRS downlink page (<http://www.findu.com/cgi-bin/pcsat.cgi>) has been capturing PSAT telemetry.

Bruninga said BRICsat's telemetry has been heard, but has been cycling off, due to low power. He said the BRICsat PSK31 downlink has been copied too, but only barely. "BRICsat seems to have some kind of problem," he told ARRL. The USS Langley spacecraft has not been heard yet, he said.

Scott County ARES Contacts

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Amateur Radio License Exam

Now that you have done the work to study for your upgrade, here is where to find a convenient exam session near you. There is a VE exam search engine at: http://www.arrrl.org/exam_sessions/search

Walk-ins allowed at most sessions however it is always best to check the details at the specific session you are planning to attend.

Below is a list of scheduled sessions close to Scott County. Good Luck!

June 22 2015 Monday, 6:00 PM

Chanhassen MN
Contact: Dale A. Blomgren
(952) 402-2155 kd0b@arrrl.net
Carver County Library
7711 Kerber Blvd
Pre-reg requested.

July 8 2015 Wednesday 7:00 PM

Lakeville, MN
Contact: James C. Rice
(612) 384-7709 jrice@danpatch.org
Perkins Restaurant & Bakery
17387 Kenyon Avenue
Lakeville MN 55044-4459
Walk-ins allowed.

July 18 2015 Saturday 9:00 AM

Contact: SEMARC
(651) 769-0358
Zion Lutheran church
8500 Hillside Trail South
Cottage Grove MN 55016-3273
Walk-ins allowed



Take a Dip in the General Pool

Time to test your knowledge of the information covered by the General Class license exam. Each month we'll take a look at a selection from the question pool.

Strap on your thinking cap and see what you can recall. Here is this month's sample:

1. What is the purpose of an electronic keyer?
 - A. Automatic transmit/receive switching
 - B. Automatic generation of strings of dots and dashes for CW operation
 - C. VOX operation
 - D. Computer interface for PSK and RTTY operation
2. Which of the following is a use for the IF shift control on a receiver?
 - A. To avoid interference from stations very close to the receive frequency
 - B. To change frequency rapidly
 - C. To permit listening on a different frequency from that on which you are transmitting
 - D. To tune in stations that are slightly off frequency without changing your transmit frequency
3. What is an advantage of a digital voltmeter as compared to an analog voltmeter?
 - A. Better for measuring computer circuits
 - B. Better for RF measurements
 - C. Better precision for most uses
 - D. Faster response

(Check next month's issue of the ARES Communicator for the answer.)



May General Pool Answers

1. What is a purpose of using Automatic Level Control (ALC) with a RF power amplifier?
 - C. To reduce distortion due to excessive drive
2. Why is a time delay sometimes included in a transmitter keying circuit?
 - C. To allow time for transmit-receive changeover operations to complete properly before RF output is allowed
3. What problem can occur when making measurements on an antenna system with an antenna analyzer?
 - B. Strong signals from nearby transmitters can affect the accuracy of measurements

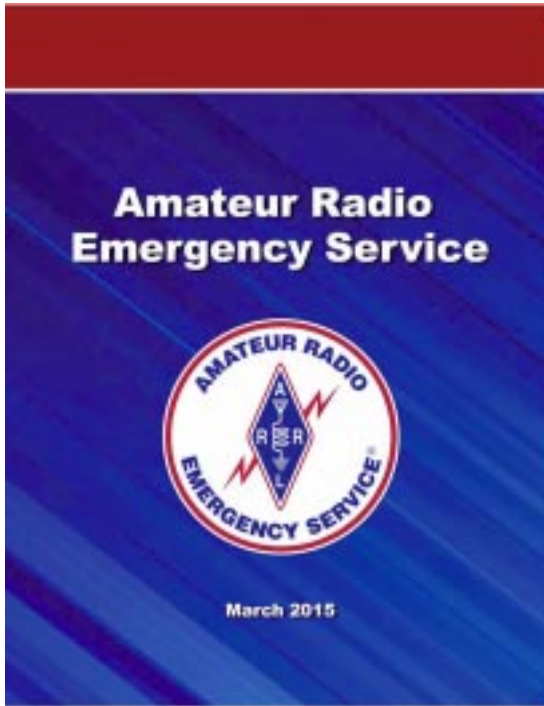
New Emergency Service Manual

ARRL Letter

The updated and revised *Amateur Radio Emergency Service Manual* has now been posted on the ARRL Web page (in PDF), and it can be downloaded. A link to the *Amateur Radio Emergency Service Manual* can be found on the ARES Web page.

<http://www.arrl.org/ares>

This manual is a great resource for all emergency communicators. It is well worth your time to download the manual and browse the contents. You will learn something new or be reminded of past lessons learned.



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NBEMS Current Versions

The current version of the Fldigi manual is available at NBEMS Info page at www.scottares.org. Look under the 'Help Sheets' heading.

Now is a good time to check to your digital software to make sure you are running the newest versions. You can find the most recent versions posted at both: www.w1hki.com/download.html and <http://www.scottares.org/NBEMS.htm>

Here are the most recent releases as of 2015.

Software	Version
Fldigi	3.22.10
Flwrap	1.3.4
Flmsg	2.0.10
Flamp	2.2.02

The Monday evening training net is a great place to have your digi questions answered and problems solved! Join the Scott ARES group on 146.535 MHz simplex at 7:00pm on Monday evenings.



Test Your NIMS Knowledge

This month we will begin our review of ICS-800: National Response Framework. The purpose of the National Response Framework is to ensure that all response partners across the Nation understand domestic incident response roles, responsibilities, and relationships in order to respond more effectively to any type of incident. The Framework focuses on response and short-term recovery instead of all of the phases of incident management.

Check your recall of the course material with this question.

1. Select the false statement from the following:

Make sure your emergency plans: _____

- A. Leave leadership roles and responsibilities undefined so the plan is more flexible.
- B. Are developed using hazard identification and risk assessment methodologies.
- C. Are integrated, operational, and incorporate key private-sector and nongovernmental elements.
- D. Include provisions for all persons, including special needs populations and those with household pets.

Check next month's ARES Communicator for the solution

May NIMS Knowledge Solution

The National Incident Management System (NIMS):

- B. Provides a proactive approach to ensuring that responders from across the country are organized, trained, and equipped in a manner that allows them to work together seamlessly.

BREAK - OVER



Dad's Day History

Father's Day wasn't made a national holiday until 1972. The efforts of Sonora Dodd in Washington sparked a movement to celebrate Dad's long before then.

In 1909, onora Smart Dodd was inspired to create a holiday honoring fathers. William Jackson Smart, her father, was a farmer and Civil War veteran that raised Sonora and her five younger brothers by himself after his wife, Ellen, died giving birth to their youngest child in 1898. While attending a Mother's Day church service in 1909, Sonora, then 27, came up with the idea.

Within a few months, Sonora had convinced the Spokane Ministerial Association and the YMCA to set aside a Sunday in June to celebrate fathers. She proposed June 5, her father's birthday, but the ministers chose the third Sunday in June so that they would have more time after Mother's Day (the second Sunday in May) to prepare their sermons.

So it was that on June 19, 1910, Sonora delivered presents to handicapped fathers, boys from the YMCA decorated their lapels with fresh-cut roses (red for living fathers, white for the deceased), and the city's ministers devoted their homilies to fatherhood.

The widely publicized events in Spokane struck a chord that reached all the way to Washington, D.C., and Sonora's celebration started it's path to becoming a national holiday.

In 1916, President Woodrow Wilson and his family personally observed the day. It was eight years later, President Calvin Coolidge signed a resolution in favor of Father's Day "to establish more intimate relations between fathers and their children and to impress upon fathers the full measure of their obligations."

In 1966, President Lyndon Johnson signed an executive order that the holiday be celebrated on the third Sunday in June.

Under President Richard Nixon, in 1972, Congress passed an act officially making Father's Day a national holiday. (Six years later, Sonora died at age 96.)

Fathers are honored in other countries around the world as well. In traditionally Catholic countries such as Spain and Portugal, Father's Day is observed on March 19, the Feast of St. Joseph.

Taiwanese celebrate Father's Day on August 8, the eighth day of the eighth month, because the Mandarin Chinese word for eight sounds like the word for "Papa."

In Thailand, Father's Day occurs on the king's birthday, which for current King Bhumibol Adulyadej is December 5.

Let Dad know you care this Father's Day, June 21st.

BREAK - OVER

Vanity Callsigns

The FCC is eliminating the regulatory fee to apply for an Amateur Radio vanity call sign. The change will not go into effect, however, until required congressional notice has been given. This will take at least 90 days. As the Commission explained in a Notice of Proposed Rulemaking, Report and Order, and Order (MD Docket 14-92 and others), released May 21, it's a matter of simple economics.

"The Commission spends more resources on processing the regulatory fees and issuing refunds than the amount of the regulatory fee payment," the FCC said. "As our costs now exceed the regulatory fee, we are eliminating this regulatory fee category. The current vanity call sign regulatory fee is \$21.40, the highest in several years. The FCC reported there were 11,500 "payment units" in FY 2014 and estimated that it would collect nearly \$246,100.

In its 2014 Notice of Proposed Rule Making (NPRM) regarding the assessment and collection of regulatory fees for FY 2014, the FCC had sought comment on eliminating several smaller regulatory fee categories, such as those for vanity call signs and GMRS. It concluded in the subsequent Report and Order (R&O) last summer, however, that it did not have "adequate support to determine whether the cost of recovery and burden on small entities outweighed the collected revenue or whether eliminating the fee would adversely affect the licensing process."

The FCC said it has since had an opportunity to obtain and analyze support concerning the collection of the regulatory fees for Amateur Vanity and GMRS, which the FCC said comprise, on average, more than 20,000 licenses that are newly obtained or renewed, every 10 and 5 years, respectively.

"The Commission often receives multiple applications for the same vanity call sign, but only one applicant can be issued that call sign," the FCC explained. "In such cases, the Commission issues refunds for all the remaining applicants. In addition to staff and computer time to process payments and issue refunds, there is an additional expense to issue checks for the applicants who cannot be refunded electronically."

The Commission said that after it provides the required congressional notification, Amateur Radio vanity program applicants "will no longer be financially burdened with such payments, and the Commission will no longer incur these administrative costs that exceed the fee payments. The revenue that the Commission would otherwise collect from these regulatory fee categories will be proportionally assessed on other wireless fee categories."

The FCC said it would not issue refunds to licensees who paid the regulatory fee prior to its official elimination.

BREAK - OVER

Prowords !

Rapid, accurate, and reliable communications describes our goal during an emergency communications. The majority of our emergency communications will take place within a directed net.

The purpose of a directed emergency net is to provide a means for orderly communication within a group of stations who provide communication for one or more served agencies, or to the general public, in an emergency. The net control station in a directed net operation controls the activity on the net.

When we are driving our cars, there are numerous signals that contribute to the efficient movement of vehicles that get us home from work. Brake lights, turn signals, stop lights, street signs are all examples. During net operation the signals that help guide our communications are called pro-words.

Pro-words are procedural terms with specific meanings. They are used to save time and ensure that everyone understands precisely what is being said. Some pro-words are used in general communication, others while sending and receiving formal messages.

Pro-word	Meaning
Over	Used to let a specific station know to respond
Out	Transmission complete, will not be listening
Stand by	A temporary interruption of the contact
Roger	Indicates that a transmission has been received correctly and in full
Negative	"No" or That is not correct
Affirmative	"Yes" or That is correct

When operating on a repeater we come to rely on the courtesy beep to replace the pro-word "over". It is a different story however when we operate on HF or VHF simplex, where there is no courtesy beep. The use of the pro-words "over" or "out" in these situations eliminates any guess work and contributes to accurate, speedy communications.

Prowords are especially important to the net control station (NECOS). The NECOS must be constantly monitoring the flow of communications during the net. The NECOS takes his cue from the prowords used during communications to run an efficient net.

When two stations are communicating one-to-one during a directed net the use of prowords eliminates wasted time and confusion. Here is an example.

When one of the pair concludes their remarks, that station ends their exchange with their callsign and the proword OUT. The other station in the exchange may also respond with their callsign and the proword OUT.

Note that while ending their exchange, neither of the stations uses the phrase that immediately identifies themselves as un-trained operators, "Back to net".

Upon hearing the proword OUT, the NECOS knows the two

stations have completed their communications and the net is under his control.

When the NECOS is communicating directly with a station, the NECOS depends on the other station to indicate they have concluded their remarks by using the proword OUT.

If you are ever in doubt about which proword to use when concluding your remarks, you can always use the proword OVER. If it is not obvious you have completed your message, the other station can ask, "Do you have anything further?" You can then reply, "Negative, OUT."

Would you like a review of directed net procedures? You can find examples of the various communications on the Scott ARES website. Check the "Directed Net Procedures" on the Member Resources page at: <http://www.scottares.org/Member%20Resources.htm>

Hey, check-in and practice those skills on the weekly net every Monday.

BREAK - OVER

Computer RFI

Reflector on RFI

An on-line group was posting remedies they had found for quieting computer generated interference. One poster offered his experience.

"I found that replacing the AC connector of the computer p/s with a CorCom 6EF1 line filter works getting rid of the RFI/hash from the switching p/s which is most likely the problem.

They are the solder type I believe and fit right into the AC socket hole of the computer p/s. Took out all the RFI in the HF/6m bands!"

Here is a picture of the filter the poster suggested.



If you are curious, you can find out more by downloading the Corcom brochure here from DigiKey: www.digikey.com/Web%20Export/Supplier%20Content/Tyco_8004/PDF/te-qrg-corcom-emi-rfi-filters.pdf

Printer Ink Cartridges

The Truth and Trade-offs

You have heard people say that “*printer makers sell printers at little or a loss in profit, only to make a killing on the ink to make them go*”. This is usually said out of frustration with cost of OEM cartridges, making it sound as if this practice of making a profit on the consumables to make your printer work is somehow ‘evil’ business at work.

There are many products that utilize this practice. Ever received a ‘free’ razor in the mail? What about the coffee machines that use the manufacture’s branded little plastic “K” cups?

When it comes to printers and ink, two questions are: Do the third party ink tanks perform as well, in terms of print quality and page yield, as the OEM cartridges, and will the third-party inks, as some printer manufacturers have claimed, hurt your printer?

Do replacement cartridges void your guarantee? Without thinking vary much about the claim, I thought that that it might be true, that using third party cartridges would void the manufacturer’s warrantee. Looking at the profits the company stands to lose isn’t it reasonable they would try to hold printer users hostage?

Come to find out, not only is this not true, but in the United States voiding a warrantee for using ink manufactured by a company other than the printer maker is illegal. The Magnuson-Moss Warranty Act (15 U.S.C.A. 2302) forbids the conditioning of a warranty upon the purchase of any product or service “which is identified by brand, trade or corporate name.”

So, prohibiting the printer owner from using non OEM inks doesn’t provide sufficient means for voiding the guarantee.

Some printer makers, during the installation process, provide software tattlers that warn when non OEM inks are detected, of possible damage to the printer. The truth is that if indeed the ink damages the printer (and that can be proven), the warrantee *might* be voided, but probably not. The real issue is, how much hassle are you willing to go through to get your warranty honored?

Is the cost difference the only factor at work when buying ink? What about print quality? There are many cost conscious printer users using a third party ink, who swears by the print quality. The consensus seems to be that if your objective is the utmost in detailed prints, the OEM inks produce superior detailed and colorful photos, as well as accurately colored graphics-laden business documents. There may be other performance differences that the most stringent printer user may discover.

If you won’t lose any sleep over the exact shade of green in that image you pasted into your document then you probably won’t notice any difference. (*You aren’t counterfeiting Franklins, are*

cont’d col. 2

you?) If high quality prints are more important to you than cost, by all means use the manufacturers’ inks. They have been tested and retested, and improved, again and again. In fact, some high-end photo printers, such as the Epson SureColor P600 (\$1,200 printer with \$39.00 ink cartridges), or the Canon’s Pixma Pro-1 (\$900 printer and \$22.00 ink cartridges) professional photo printers, wouldn’t function nearly as well without Canon’s tried and tested Lucia inks.

Okay, any other points to consider? Well, third party inks generally⁷ print more pages. One of the benefits of third party inks is that the cartridges often contain more ink than OEM model tanks. Sometimes contain twice as much ink. When you combine the low prices with the cartridges’ higher yields, you get some incredible costs per page.

Well, are there any advantages to OEM ink? Some manufacturers’ inks resist fading longer. Canon, Epson, HP, Brother and most other major printer makers hawk their own inks. These companies research, test, and improve the inks they make regularly. As a result, the inks themselves hold up to degradation due to ozone and ultraviolet fade better than most third party inks, often lasting years longer. If you are going to print your message to future generations to be included in a time capsule, be sure to use OEM ink.

So, which is best? Depends on what you want. If maximum color reproductions and maximum longevity is your goal, hit the bank and buy OEM. On the other hand, if your objective is readable documents and prints most people with deem “good” then save some bucks, buy third party ink and enjoy a couple of cold adult beverages.

BREAK - OVER

What are the Odds?

Aunt Bessie loved to visit her nieces and nephews. However, she had relatives all over the country.

The problem was that no matter how much she enjoyed seeing them, she hated flying. No matter how safe people told her it was, she was always worried that someone would have a bomb on the plane.

She read books about how safe it was and listened to the stewardess demonstrate all the safety features. But she still worried herself silly every time a visit was coming up.

Finally, the family decided that maybe if she saw the actual statistics she’d be convinced. So they sent her to a friend of the family who was an actuary.

“Tell me,” she said suspiciously, “what are the chances that someone will have a bomb on a plane?”

The actuary looked through his tables and said, “A very small chance. Maybe one in five hundred thousand.”

She nodded, then thought for a moment. “So what are the odds of two people having a bomb on the same plane?”

Again he went through his tables. “Extremely remote,” he said. “About one in a billion.”

Aunt Bessie nodded and left his office. And from that day on, every time she flew, she took a bomb with her.

BREAK - OVER

Overextended ?

Timely Tip for Extension Cord Use

Field Day always brings an unusual set of electric power distribution problems. Here are some tips to make your Field Day a safe event for everyone, visitors and operators.

When used and cared for properly, they can be a convenient and safe solution to a temporary electrical need. Safe usage also involves acknowledging they are a temporary solution, and not meant to be used as a long-term "extension" of your household's electrical system.

The Electrical Safety Foundation International (ESFI) offers the following tips to help avoid electric shock and electrical fires:

- Don't overload extension cords.
 - Don't substitute extension cords for permanent wiring.
 - Don't run extension cords through walls, doorways, ceilings or floors. If the cord is covered, heat cannot escape, which may result in a fire hazard.
 - Never tape extension cords to floors or attach them to surfaces with staples or nails.
 - Don't use an extension cord for more than one appliance.
 - Make sure the extension cord or temporary power strip you use is rated for the products to be plugged in.
 - For outdoor projects, use only extension cords marked for outdoor use. If you are using them outdoors, do not allow them to run through water or snow on the ground.
 - Don't use an extension cord that has a lower wattage rating than that of the appliance or tool you are using with the cord.
 - Never use a cord that feels hot or is damaged in any way.
- Touching even a single exposed strand can give you an electric shock or burn.

- Use extension cords with polarized and/or three-prong plugs.
- Never remove an extension cord's grounding pin in order to fit it into a two-prong outlet.
- Buy only cords approved by an independent testing laboratory, such as Underwriters Laboratories (UL)

A temporary solution: Remember, extension cords are a temporary wiring solution and are not a substitute for permanent wiring. If you find you're using them on a permanent basis, consider updating your home's electrical system.

BREAK - OVER



CONGRATULATIONS
GRADS AND DADS

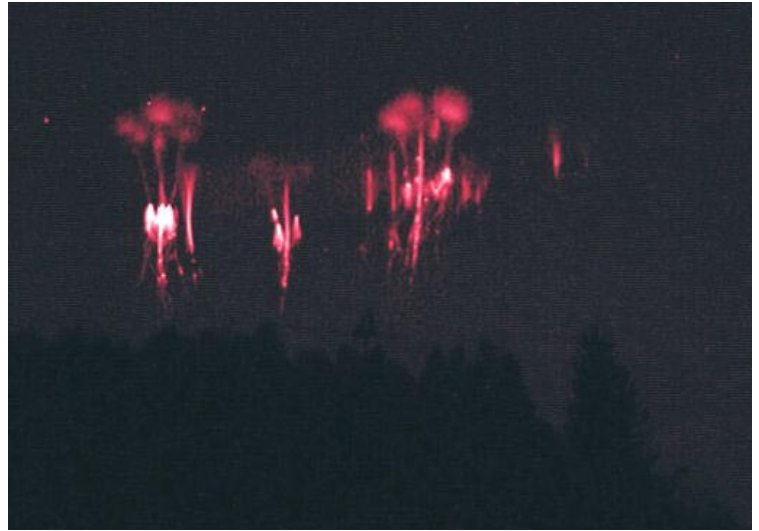
Sprite Season

Space Weather.com

High above Earth in the realm of meteors and noctilucent clouds, a strange and beautiful form of lightning dances at the edge of space. Researchers call the bolts "sprites"; they are red, fleeting, and tend to come in bunches.

Because sprites are associated with thunderstorms, they tend to occur in late spring and summer. Thunderstorm season is sprite season.

"Sprites are a true space weather phenomenon," explains lightning scientist Oscar van der Velde of the Technical University of Catalonia, Spain. "They develop in mid-air around 80 km altitude, growing in both directions, first down, then up. This happens when a fierce lightning bolt draws lots of charge from a cloud near Earth's surface. Electric fields [shoot] to the top of Earth's atmosphere—and the result is a sprite. The entire process takes about 20 milliseconds."



Sprite chaser Martin Popek photographed these specimens over Nydek, Czech republic, on May 13th

Although sprites have been seen for at least a century, most scientists did not believe they existed until after 1989 when sprites were photographed by cameras onboard the space shuttle. Now "sprite chasers" routinely photograph sprites from their own homes.

BREAK - OVER



Leap Second

June 30th Enjoy it!

On Tuesday, June 30th, you'll have a little extra time on your hands because, at precisely 23:59:59 GMT, the world's clocks will add a second to the day, making it 24 hours and one second long.

Although a standard year is 365 days long, the Earth actually makes its journey around the Sun in about 365.25 days. This means that, over time, the calendar will start to get out of synch with the Sun, and the Vernal Equinox marking the beginning of spring will get later and later in the year. In fact, by 1586, the old Julian calendar invented by the Romans was off by a full 11 days.

The modern Gregorian calendar includes leap years which adjust the calendar so the seasons keep matching the calendar dates.

The leap second is based on a similar, but much more subtle and complex problem, which is how to reconcile the length of the day with the length of the second.

The Earth is constantly being pulled at by the Moon, the Sun, and the planets, creating the tides that slowly, but surely slow down the Earth's rotation. Worse, the Earth isn't solid. Much of it is in a molten liquid or plastic state. To see how this affects the day, try spinning a hard-boiled egg and a raw one (in the shell, of course). The hard-boiled one will spin like a top while the raw one will fall over because the liquid yolk and white are sloshing about. A similar thing happens to the Earth, causing all sorts of unpredictable wobbles.

Due to these variables, when measured astronomically against quasars and GPS measurements, and, according to NASA, the day has lengthened by an average of 2.5 milliseconds since 1820.

Big Whoop! However, we live in a world that requires extremely precise timing in order to function. Navigation, astronomy, mobile phones, satellites, the internet, submarines, and a huge number of other systems rely on extremely precise clocks – in this case, atomic clocks. The atomic clocks are based on oscillations of a cesium atom with a second defined as 9,192,631,770 oscillations of the atom's microwave signal.

The tricky bit is taking the extreme accuracy of the atomic clocks and matching them to the more variable rotation of the Earth, which by 1972 was already 10 seconds out of synch. To remedy this discrepancy, the atomic clocks are used to keep tabs on the Earth's rotation. When astronomical measurements indicate that they clocks and the Earth are getting too far out of step, a correction is calculated and periodically applied, producing what is now called Coordinated Universal Time (UTC).

Since January 1, 1972, there have been 26 leap seconds. These leap seconds aren't anything as regular as leap years. Instead of regular intervals, leap seconds have since 1999 been set at intervals of 7, 3, 3.5, and 3 years. During these leap seconds, clocks and watches showing legal time must synch with a new time signal or stop for one second.

Enjoy your free time!

BREAK - OVER

2015 Hamfests

Compiled by Doug, N0NAS

Make your calendars! Here is a list of some of the scheduled Hamfests in the area. Time to refine your shopping list and get ready to comb the flea market tables.

July 11, 2015

MAGIC Tailgater Yard Sale, Roseville, MN
www.magicrepeater.net/

July 11, 2015

51st International Hamfest
The Peace Garden, N. Dakota/Manitoba border
www.mts.net/~holderr/ihf.htm

July 18, 2015

CVARC Tail Gate Swap Fest, Chippewa Falls, WI
www.w9cva.org

Aug 2, 2015

CVARC Summerfest, Cedar Rapids, IA
www.cvarc.rf.org/2014Summerfest.pdf

Sept 19, 2015

SMARTFEST 2015, Henderson, MN (SW of Belle Plaine)
www.arrrl.org/hamfests/smartfest-2015

BREAK - OVER



ARES Breakfast

Saturday July 11th
7:30AM
Perkins Restaurant
Savage, MN

NECOS Schedule June 2015

The first Monday or the month the net is held on the WB0RMK repeater, Carver. You will find WB0RMK here: 147.165/765 PL 107.2

June

Jun 15 KB0FH Bob
Jun 22 WA0DGW John
Jun 29 KD0UWZ Chad

July

Jul 6 KC0YHH Tony
Jul 13 KB0FH Bob
Jul 20 WA0DGW John
Jul 27 KD0UWZ Chad