MINNESOTA MARSGRAM

Information for Minnesota Navy-Marine Corps. MARS Members

February, 2006 Volume10, Number 2

NNN0ALL Minnesota

by NNN0GAZ Tim

Greetings to all. Am I still in Minnesota? I have maybe an inch of "snow", if you can call it that on my lawn. January was above normal in temperature and below normal in snowfall – makes me really wonder what spring and summer will bring.

Many of you have noted that during any given week we are forced by propagation to move to our secondary frequency to conduct our net. While not an enjoyable task, it is good practice. As outlined in last month's newsletter – if you don't find us on the primary – check NBG to see if the net has moved. As stated in the Minnesota Area Broadcast 01-05, during unfavorable conditions the NECOS will call the net and spend at least five minutes on the primary frequency – NCE, before moving to our secondary of NBG. Don't be surprised if you hear other stations on NBG – we share this frequency with OH, another Region Five member.

Speaking of frequencies, a little clarification on the frequency matrix is in order. While we are in Region Five, the Frequency Matrix is still using old (pre-reorganization) Region designators. Minnesota - along with Illinois, Indiana, Iowa, Kansas, Michigan, Missouri, Nebraska, North and South Dakota made up Region Four. Ohio was a member of Region One. When viewing the frequency matrix – one has to look for NMR4, on the *All NAVY-MARINE CORPS MARS Authorized Frequencies and Power Level* report or on the *NMCM Frequency Matrix* document find the "Explanation of Use" to determine region priority – always keeping in mind that we are still designated as Region Four (4). New frequency allocations continue to be made, however, they are noted in pre-reorganization designations. The matrix will transform to the new structure, a definitive timetable has not yet been determined.

Remember, we are in need of a NECOS/TREP substitute for Thursday evenings through March. This is not a permanent assignment, so if you want to try your hand at the NECOS, TREP or both let Bob Reid, NNN0GAZ THREE know and we will put you on the schedule. You can take one week, two, or the whole assignment.

As always, thank you for your participation and support of MARS program in Minnesota. Enjoy this issue of the Minnesota MARSGRAM.

BT OVER

EMERGENCY EXERCISE ALERT

Our first quarter Ecomm exercise will take place next month.

This will NOT be the usual scenario of lost communications due to local weather.

Prepare now by reviewing the EEI and SITREP message formats and research the players in your local emergency management structure.

Details will follow next month

MINNESOTA TRAFFIC NETS

Designator	Frequency		Local Times
5G1B	Pri.	NCE	18:30 Daily
	Sec.	NBG	
	Ter.	NAR	

MINNESOTA ADMIN. NET

5G4A	Pri.	NCE	19:00 2nd Sunday

MARS DATA SYSTEM

	Frequency
NN0DVD	NCO AFSK/USB

Intranet site http://.www.communityzero.com/mnmars

The MINNESOTA MARSGRAM is published for the benefit of
Amateur Radio Operators in Minnesota and other interested individuals.
The contents DO NOT reflect official Navy positions.
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Content Contributions Welcomed and Encouraged

DON'T THROW OUT YOUR OLD TELEPHONE

During power outages the landline telephone system usually will remain operational for an extended period. However, most cordless phones and many business telephone systems will not work without power. In a recent power outage amateur radio emergency communication was provided between post offices because all of their telephones required line power. (The electronic postage scales, computer cash register, and of course the lights were also out.) Keep an old-fashioned telephone instrument handy to plug in to the modular outlet. Chances are you will hear the friendly dial tone! This tip for everyone (not just radio operators). Pass it on to your family, friends and neighbors.

BT OVER

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Income Tax information relating to MARS

For most of us this is the time of year that income tax forms, W2s, 1099s and everything else related to filing our tax statements for the past year begins arriving in the mail. As you prepare your taxes, you may wish to review Chief Navy-Marine Corps MARS Info broadcast DTG 061200Z FEB 04 (CHNAVMARCORMARS INFO BCST 05-04). The Chief of Navy-Marine Corps MARS provided the following list as a guide to MARS related items are deductible.

(GAZ note: We typically see a broadcast for the current calendar year in early February. Some of you may have already begun preparations so use this list as a reference and watch for a new broadcast. As always, for definitive answers, consult your tax preparer or contact the IRS at 1-800-829-1040 or via the internet at www.irs.gov)

Income Tax deductions for MARS

Basically, you can deduct non-reimbursed out-of-pocket expenses incurred solely for the purpose of participating in MARS operations.

Allowable Deductions include:

- Cost of equipment, maintenance and repair, provided the equipment is used EXCLUSIVELY, repeat, EXCLUSIVELY for MARS operations.
- Cost of electric power used to perform or support MARS operations. A prorated portion of your total home bill is allowable. You can include power consumption for primary equipment, as well as station lighting and test or ancillary/auxiliary equipment. Ensure you keep supporting records/logs.
- Mileage, tolls, meals and lodging required for participating or attendance at MARS meetings or events. (GAZ note – did you attend the area or region conference?)
- Consumable items used EXCLUSIVELY for MARS operations.
- Telephone costs necessary to coordinate and/or perform MARS operations.

The following are NOT allowable deductions:

- Contribution of services (ie., you CANNOT deduct for your time).
- Cost of equipment, maintenance and repair, if the equipment is also used for any other purpose besides MARS.

The Chief goes on to state in this broadcast that "this is a very brief and non-authoritative summary. If you have specific questions, you should consult your tax preparer or call the IRS toll-free number

BT OVER

Switch Information

Propagation is once again favoring many of us who access the switch. This is a double edged sword. On the one hand members want to check the switch for the most recent traffic and the designated nightly traffic rep also needs to access the switch to pick up traffic – often times these are not the same people.

To allow the scheduled traffic rep the opportunity to download traffic from the switch, as sysop, I would like to ask that all stations please cooperate with the following request: The one hour preceding the net be reserved for the designated/scheduled traffic rep for the evening to access the switch. This allows the traffic rep adequate time to access the switch, download any traffic and do any housekeeping necessary.

For those messages that arrive after the scheduled traffic rep has completed his download, they can wait until the next evening for action.

This also brings up some questions regarding traffic handling. If you are the designated/scheduled traffic rep, you are expected to download and be prepared to pass all traffic destined for stations in Minnesota – not just ALL messages. Do not assume that NNN0AS5, NNN0AS5 TWO and NNN0ASG FOUR are going to access the switch and download their messages – be prepared to pass these messages, this is part of the traffic representative's responsibility. For further reference please review the article titled "*Traffic Handling*" in the May 2005 Minnesota MARSGRAM.

BT OVER

If anyone wonders why or where Frank NNN0AAT came up with the N1UW amateur call sign, it's not because he spent any time in "One Land". This vanity call sign comes from the fact that he is a die-hard University of Wisconsin (U of W) Badger alumnus. As luck would have it, N1UW is also the tail number of the University of Wisconsin Hospital lead medical evacuation helicopter. Frank only wishes the pictured helio was his permanent aeronautical mobile!

Power to the Ham Shack

Understanding the troubleshooting of branch circuit problems.

By Patrick C Elliott, IDEAL Industries, Inc

Branch circuit wiring practices are primarily code (National Electric Code) driven with little thought as to why such stringent requirements are necessary. But these practices are necessary to ensure safe and efficient branch circuits. Hidden problems within a branch circuit can result in fire, electrocutions and equipment failure.

What Are the Real Problems?

Most fixed wiring and receptacle hazards are hidden from inspection. A visual inspection in the rough-in stage of residential construction may identify obvious problems, such as a staple cutting through the conductors, but they may not identify a loose wiring connection or a bad splice. A simple static non-load test performed with a receptacle tester or digital voltage meter cannot identify hidden defects in a circuit that could be caused by a high resistance fault. Problems and hazards arise when current flows through these high impedance defects resulting in hot spots, leading to fires, breakdown in insulation and poor efficiency of the electrical system. The objective is to minimize high impedance in an electrical distribution system.

Simple receptacle testers are excellent for quick checks and general branch testing but are not suited as an analysis tool. However, testing under load and calculating the voltage drop can identify 90 percent of these hidden defects.

How Can We Locate a Fault?

Voltage Drop or Percent of Voltage Drop is a measure of how much a circuit's voltage is influenced by circuit impedance once a load is applied. On a single-phase branch circuit we have two methods, Calculated or Measured, using a meter with load or circuit analyzers.

How Much Voltage Drop is Acceptable?

The National Electrical Code (NEC) recommends that the combined voltage drop of the electrical system (branch circuit & feeders) not exceed five percent for optimum efficiency. This recommendation not only can improve safety but can insure proper equipment operation and power efficiency. (It is important to note that this is only a recommendation and that local governing bodies may use their own judgment on what is an acceptable level of voltage drop.)

For example, the Philadelphia Housing Development Corp. (PHDC) requires contractors to calculate the voltage drop prior to installing blown insulation in existing homes. If the voltage drop is 10 percent or higher, the contractor must

Power *cont'd pg. 4*

Training Corner

Net Calls and Check-ins

Imagine this…. You are the net control station (NECOS) for the 5G1B, a directed net, you've made your first net call and you have eight stations checked in, a second, follow-up net call yields to more 2 more stations for check-in. You've authorized abbreviated callsigns. You have a Chief MARS info broadcast that the TREP will pass to all stations on the net and then you begin with comments. In the midst of comments, without a net call for additional stations, station NNN0NNN calls to check-in and report that he has no traffic.

Do you acknowledge the check-in? *No.* A station is not allowed to break into a net, at will, unless the station has a *very* good reason – like emergency traffic to send. There are specific methods to be followed when breaking into a directed note and they are covered later in this article. Under normal circumstances, the only transmissions made during a directed net, are those that are specifically *directed* by the NECOS.

Without a net call, the station attempting the check-in needs to wait for the NECOS to make a net call for additional stations. Here is one reason for frequent net calls and net identification – at least once every 10 minutes, minimum. Stations aboard the net, at the appropriate time may indicate to the NECOS that a station is waiting to be acknowledged, however, the NECOS maintains the direction and flow of the net, including net calls. Simply because a station is heard is not reason enough for anyone to interrupt the NECOS station in directing the net.

There are procedures in place that do allow for breaking into a net without a net call, these are: First, the station attempting to check in has a message of higher precedence than the transmission in progress and may break-in and suspend the transmission in the following circumstances. Immediate precedence traffic, may break-in at once and pass the message. On a directed net, NECOS approval to transmit the message must be obtained. The following is an example: "IMMEDIATE IMMEDIATE IMMEDIATE (NECOS CALLSIGN) THIS IS NNN0XYZ OVER." Priority precedence traffic, is handled the same as immediate, except that only long routine message should be interrupted.

When you hear the precedence spoken three times it means "Cease transmitting immediately." Silence will be maintained until the station breaking in has pass his/her message.

Training *cont'd col. 2*

Power *cont'd from pg. 3*

replace/repair the circuit prior to proceeding with the insulation.

Prior to instituting this requirement, half a dozen smoldering fires resulted from the insulation installations. In the 2,500 homes insulated in the two-years after this electrical integrity test was instituted, there were no fires reported. At least 15 other municipalities have followed the PHDC's lead in requiring the electrical load test as part of their winterization programs.

Measured Voltage Drop & Percent of Voltage Drop Method

When using a digital multimeter to calculate voltage drop, all loads for the circuit must be removed for the no-load measurement. Next, find a load that will draw 60 to 80 percent of the maximum rating of the circuit. In this example we have a 15-amp circuit, so a 1400-watt load should do the trick.

Now take your first reading with no loads on the circuit at the last device or receptacle. Apply your 1400-watt to the circuit and measure the loaded RMS voltage reading. Now make the calculations; Voltage Drop = (no-load voltage-loaded voltage), Percentage of Voltage Drop = (Voltage drop/no-loaded voltage) x 100

The total impedance of the circuit can be calculated if you know the current: Total resistance = Voltage Drop/Current (R=E/I)

As an example, if the voltage drop on a circuit was 3 volts and the load drew 12 amperes then the impedance of both conductors would be 0.25 ohms. (3volts/12amp)

Remember that voltage drop and impedance of the circuit are based on the load. So if you use an 800-watt hair dryer you are only drawing a little over 6 amperes. The voltage drop on a 120V circuit at 6 amperes would be about half compared with a 12 amperes load.

Calculated Voltage Drop & Percent of Voltage Drop Method

This calculation is for a single-phase branch circuit only. In this example, the branch circuit is 100 feet of 12-gauge wire at a temperature of 72 degrees Fahrenheit. The Load current

Power *cont'd pg. 5*

Training *cont'd from col. 1*

Second, the station attempting to check-in requires urgent contact with another station, but not having message traffic to pass, may break-in transmitting the call sign of the NECOS station. Attempting to check-in to the net does not qualify as requiring urgent contact with the NECOS station.

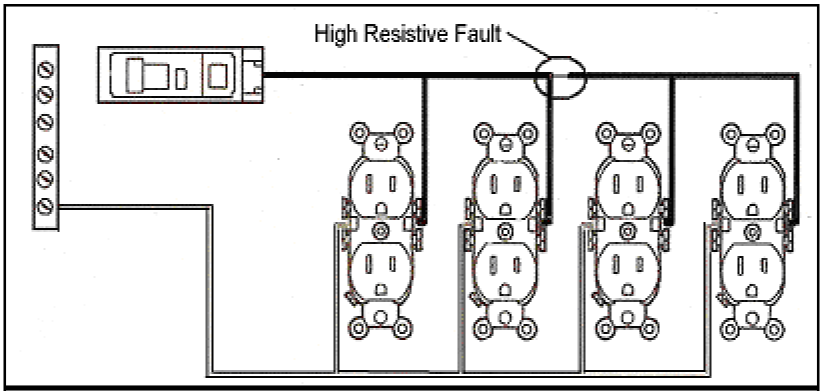
The use of the word BREAK in radiotelephone procedure for the purpose of breaking into a net is NOT authorized.

BT OVER

Power *cont'd from pg. 4*

is 16 amperes. So what is the total Voltage Drop and Percentage of Voltage Drop?

First, let's look at the wire and wire size. The resistance of 12-gauge wire is 2 ohms per 1000 feet "R" (Resistance of the wire) is equal to 0.4 ohms. (We find the resistance of wire per 1000 feet in Chapter 9, Table 9 of the NEC codebook.) (2 ohms/ 1000) x 200 feet = 0.4 ohms) Where did the 200 feet come from? Remember you have two conductors at 100 feet each, Line and Neutral.



In this example, there is a High Resistive Fault between the 2nd and 3rd receptacle. The Voltage drop increased from the 2nd to the 3rd. The high resistance was identified as a poor connection

Voltage Drop = Load Current X Circuit Resistance or Voltage Drop = 16 amperes x 0.4 ohms
Voltage Drop = 6.4 volts

Percentage of Voltage Drop = (Voltage Drop/No-load Voltage) x100 Percentage of Voltage Drop = (6.4volts/ 120volts) x100 Percentage of Voltage Drop= 5.3 percent

Operating Voltage = 120 volts - 6.4 volts Operating Voltage =113.6

Troubleshooting Standard Circuits.

Troubleshooting to identify the cause of high impedance within the electrical system is actually quite simple. First measure the voltage drop at the furthest receptacle from the panel on the branch circuit under test. If the voltage drop is high, then further investigation is necessary.

Test the remaining receptacles in sequence, from next furthest from the panel to the closest to the panel. This will help you identify where and what is causing the problem.

If the voltage drop reading changes significantly from one receptacle to the next, then the problem is likely between the two. It is usually located at a termination point, such as a bad splice or loose wire connection, but it might also be a bad receptacle.

If the reading steadily decreases, as you get closer to the panel, with no significant decreases between receptacles, then the wire may be undersized for the length of run, or rated load for the circuit. Check at the panel to see if the wire is sized per code, for the circuit.

Some residential homes are wired with 14-gauge wire with running in excess of 60 feet or more. Although this may not meet the NEC recommendation of five percent or less voltage drop, it may meet local code requirement and are acceptable runs.

The reading may not decrease at all from the last receptacle to the first. This would indicate that the problem is someplace between the first device and the panel itself. Check the wiring and connections at the panel. Most poor panel connections show up as hot spots. These can be checked quickly with an infrared temperature meter.

Testing the integrity of the branch circuit under load can have a dramatic effect on the ability to positively identify hidden defects within the branch circuit.

Summary

The dangers associated with branch circuit wiring are serious, but the precautions are straightforward. We can protect ourselves and equipment by using certified devices and testing equipment from reputable manufacturers and implement policies on branch circuit testing. These policies should include verifying proper wiring, testing devices, checking the integrity of the branch circuit, and measuring the integrity of the grounding system.

- BT OVER -

Test Your MARS Skills

February 2006 Test

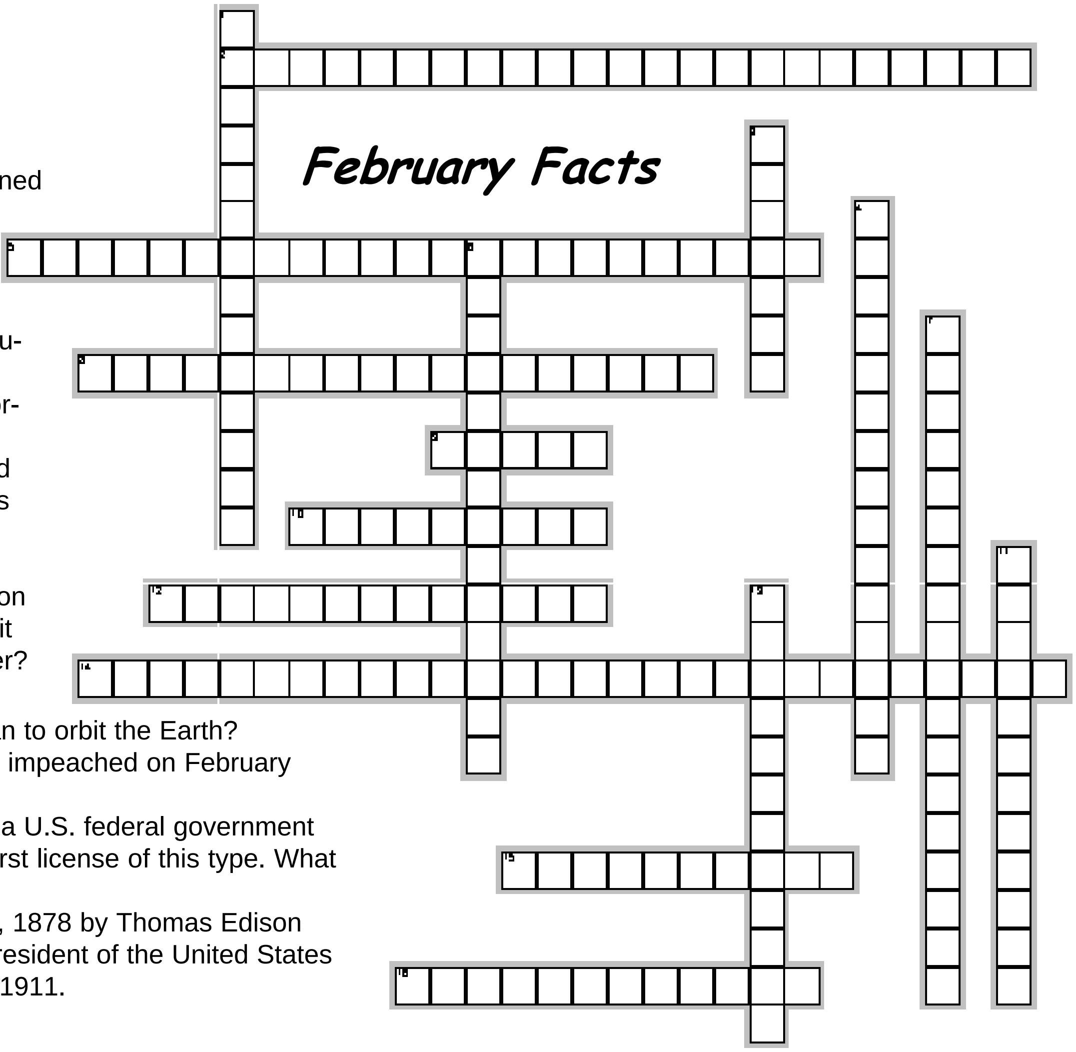
For the purposes of complying with the maximum word limit in MARSGRAMS, how many words are in the following text: "MY NEW TELEPHONE NUMBER IS 618-555-2314 AND MY NEW ADDRESS IS P. O. BOX 123, ANYTOWN, IL 62254"?

A. 11. B. 19. C. 20. D. 18.

January Solution

You are participating in a State voice net. The NECOS has announced to the net that 'THE USE OF ABBREVIATED CALL SIGNS IS AUTHORIZED.' How do you identify yourself when transmitting under those circumstances? For the purpose of this question, your call sign is NNN0WBTT.

Answer A. You may either use your full call sign or just the suffix (the letters after the zero) when transmitting, i.e., 'THIS IS WHISKEY BRAVO TANGO TANGO'

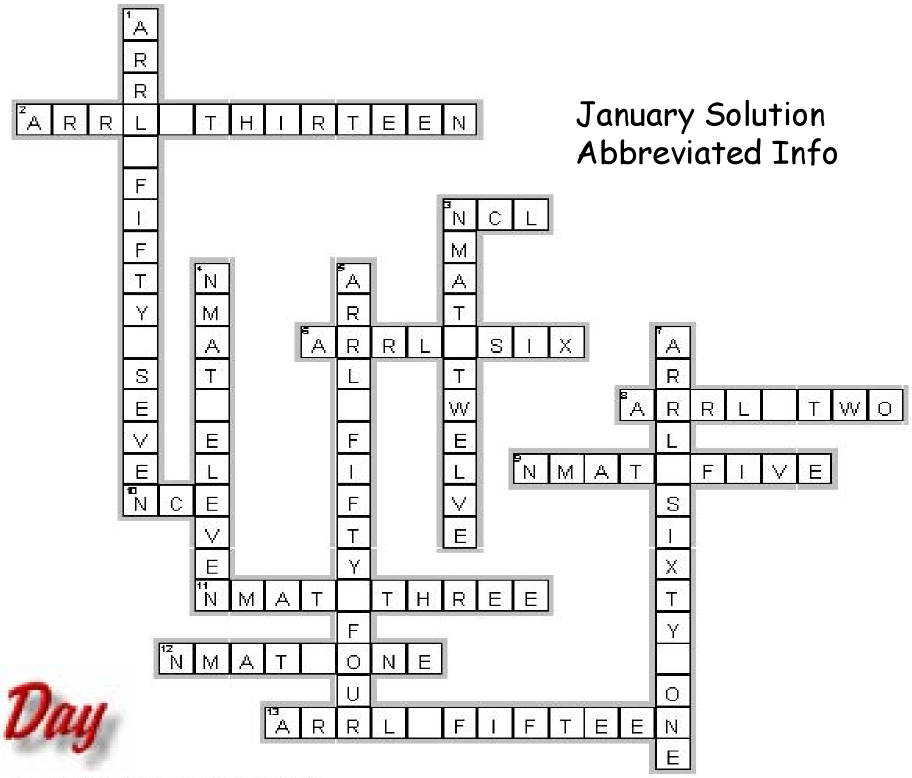


Across

2. What historic event happened in Chicago on February 14th, 1929?
5. This college, the second oldest college in the United States, was chartered in February 1693.
8. This organization was incorporated in February, 1910. James E. West was appointed the first Chief Executive of this organization in 1911.
9. What country successfully launched a satellite into orbit on February 11th, 1970, making it the world's fourth space power?
10. On February 20th, 1962, who became the first American to orbit the Earth?
12. What U.S. President was impeached on February 24th, 1868?
14. On February 25th, 1928, a U.S. federal government commission issued the very first license of this type. What kind of license?
15. Patented on February 19, 1878 by Thomas Edison
16. This man was the 40th president of the United States and was born on February 6, 1911.

Down

1. On February 1st, 1790, this group met for the very first time in the Royal Exchange Building in New York City.
3. February was named for this Roman god
4. What star of 'Dallas', 'Flamingo Road', and 'Pee Wee's Big Adventure' was born with the name Patsy McClenny on February 3rd, 1950?
6. Born on February 12, 1809 this man would become the 16th President of the United States
7. The United States Senate ratified the peace treaty ending this war on February 6, 1899.
11. Inventor Thomas Edison, born on February 11th, 1847, said "Genius is 1% inspiration and 99%...
13. The Roman Catholic Church celebrates February 2 as ....



January Solution
Abbreviated Info

Happy Valentine's Day

Created with EclipseCrossword — www.eclipsecrossword.com

FCC Orders Amateur Rule Changes

Conform with WRC-03

The FCC has ordered several rule revisions to implement changes agreed to at the international level during World Radiocommunication Conference 2003 (WRC-03). Acting Wireless Telecommunications Bureau Chief Catherine W. Seidel signed the Order, released January 19. The changes affect §97.111, Authorized transmissions; §97.113, Prohibited transmissions; §97.115, Third party communications, and §97.117, International communications.

"These amendments will ensure that the Commission's Amateur Radio Service rules conform to Article 25 of the international Radio Regulations adopted at the 2003 World Radiocommunication Conference, and will further the Commission's ongoing efforts to streamline its Amateur Service Rules," the FCC said. "The overall effect of this action is to update the Part 97 Amateur Radio Service rules in the Code of Federal Regulations to conform to now-effective international agreements."

The rule changes will become effective upon publication in The Federal Register. The FCC Order revises:

§97.111(a)(1) to permit "transmissions necessary to exchange messages with other stations in the Amateur Service, except those in any country whose administration has notified the ITU that it objects to such communications. The FCC will issue public notices of current arrangements for international communications." The old language permitted communication among amateur stations in different countries "except those in any country whose administration has given notice that it objects to such communications." The FCC said the change does not prejudice its proposal to amend §97.111(a)(2) to clarify that amateur stations may, at all times and on all authorized channels, transmit communications necessary to meet essential needs and to facilitate relief actions.

§97.115(a)(2) to facilitate the transmission of international communications on behalf of third parties in emergency or disaster-relief situations, whether or not a third-party agreement is in place between the US and the countries involved. The revision now permits communication with any non-US station "when transmitting emergency or disaster relief communications" as well as with any non-US station "whose administration has made arrangements with the United States to allow amateur stations to be used for transmitting international communications on behalf of third parties." The revised rule further provides that no station may transmit third-party traffic other than emergency or disaster relief communications to a station in a country lacking a third-party arrangement. Still excepted from the prohibition is any third party eligible to be the control operator of an amateur station.

§97.113(a)(4) to prohibit amateur stations exchanging messages with amateur stations in other countries from making transmissions that are encoded for the purpose of obscuring their meaning, except for control signals exchanged between Earth command stations and space stations in the Amateur-Satellite service, something Part 97 already provides for. The old rule referred to the use of "codes and ciphers." The same rule also already prohibits transmitting music, communications intended to facilitate a criminal act, obscene or indecent words or language and false or deceptive messages, signals or identification.

§97.117 to state that amateur stations may transmit communications incidental to the purposes of the Amateur Service and to remarks of a personal character.

The FCC also revised §97.3 and 97.309 to update the definition of International Morse code and of various digital codes in the amateur rules to reflect changes in the international Radio Regulations.

- BT OVER -

NASCAR BUSCH SERIES

NO. 88
Go Navy!

Pensacola, Fla. (Feb. 1, 2006) – Driver of the Navy sponsored NASCAR Busch series number 88 car, Mark McFarlane, completes the parachute drag during survival training at the Aviation Survival Training Center onboard Naval Air Station Pensacola. McFarlane has completes his qualifications to fly with the U.S. Navy flight demonstration team, the Blue Angels later this month. U.S. Navy photo by Megan Kohr

5G1B Net Schedule

6:30PM 4007 kHz USB

Day	NECOS	Tfc Rep
Sun.	XYA	XEE
Mon.	XEE	XEE
Tue.	KZC	KZC
Wed.	BQH	BQH
Thu.	Substitute Needed	
Fri.	ACY	OCF
Sat.	Rotating Duty (see below)	

Don't be bashful, if the net has not been called by the net control station within 2 minutes, jump in and start things rolling.

Saturday NECOS / TREP Schedule

	NECOS	TREP
Feb 4	XEE	XEE
Feb 11	KZC	KZC
Feb 18	BQH	BQH
Feb 25	Substitute needed	
Mar 4	ACY	OCF
Mar 11	XYA	XEE

NNN0XEE	Tim Isom	2/18
NNN0APD	Bob Ross	2/28

Service Recognition

NNN0EMO	John Oehlenschlager	36 yrs
NNN0XAY	Skip Green	24 yrs
NNN0KZC	Alderic Doree	15 yrs
NNN0OCF	Paul Leska Sr	15 yrs
NNN0AAT	Frank Karnauskas	4 yrs

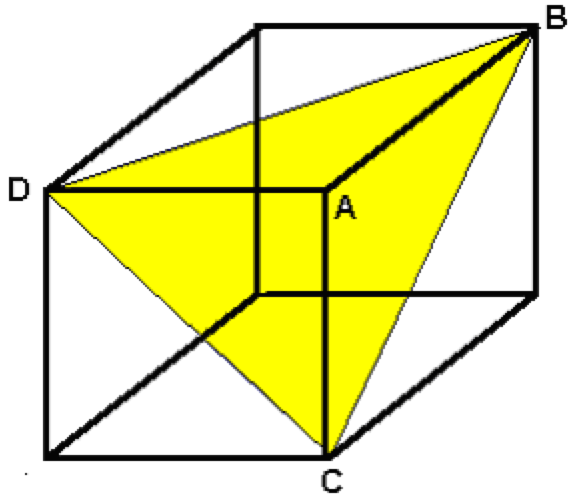
Don't forget your paperwork!

Test Your Analytical Skills

Tetrahedron Height

Contributed by: Bruce Meyer, NNN0BQH

Tiger's New Yacht?



Picture a cube. Label one corner “A.” There are three equal edges of the cube leading from “A” to corners “B,” “C” and “D,” respectively. The latter three corners define a plane triangle that has three equal sides.

If corner “A” is placed at the top, one sees a triangular pyramid (tetrahedron). The task is to define the distance from point “A” to the center of the base plane triangle.

Answer in the next issue of the Minnesota MARSGRAM

January Analytical Skills Solution

Attenuation of Harmonic Emission

A ship radiotelephone transmitter operates on 2738 kHz. At a certain point distant from the transmitter, the 2738kHz signal has a measured field of 147 millivolts per meter. The second harmonic field at the same point is measured at 405 microvolts per meter. To the nearest whole unit in decibels, how much has the harmonic emission been attenuated below the 2739 kHz fundamental?

Answer: 51 Db

2738 kHz signal = $147 \text{ X } 10^{-3}$ volt

5476 kHz signal = $405 \text{ X } 10^{-6}$ volt

db attenuation = $20 \log (147 \times 10^{-3} / 405 \times 10^{-6})$

db = 20 log 363

db = 20 x 2.55991

db = 51.1982

Last Reminder

Tuesday Feb. 14th

Valentine's Day