



MINNESOTA MARSGRAM



Information for Minnesota Navy-Marine Corps. MARS Members

December, 2005

Volume 9, Number 12

NNN0ALL Minnesota

by NNN0GAZ Tim

Greetings,

Finally Mother Nature has decided the time has come for winter weather, and when she decided it was with some particularly nasty weather for the west and southwest parts of Minnesota. As I sit here in my warm radio shack gathering material for the December newsletter, there are people in the western reaches of our state that have been without power for at least three days and there is a chance it will be after December 1 before they do have their power restored. Reminds me – those of you close the action – did you file an EEI report? Remember, we don't have to be in an emergency situation for EEI reports to be submitted – and yes they can be brought to the net and passed to the evening traffic rep for relay to the switch.

A few housekeeping chores ... As of December 1, 2005 – the draft version of NTP8 (D) will become the document that guides the operation of Navy-Marine Corps MARS. This document is available for download at the national Navy-Marine Corps MARS site. Shortly after December 1 the various NTP8 (C) corrections and changes will be removed from the Minnesota Intranet site at [http://](http://www.communityzero.com/mnmars)

www.communityzero.com/mnmars. As changes are published for NTP8 (D), and I'm almost sure there will be some updates and corrections, the revisions will be posted.

The November MARSGRAM article "Future Challenges for MARS," raised some questions from members about NTIA frequency specifications. In this issue we are including the text of Chief MARS Info Broadcast 31-05 that clarifies the view Chief Navy-Marine Corps MARS has on the NTIA standards.

Yes, it's the fourth quarter of the year and we're due for an exercise. Actually we will have an opportunity to contribute to the quarterly FEMA NECN exercise as well as our own Minnesota exercise. Please see the brief description by NNN0GAZ TWO regarding our 4th quarter exercise. If the scenario sounds familiar – you're correct, it's playing out in western and southwestern Minnesota.

As 2005 draws to a close I find that we've had another good year. Each of you should be proud of the contributions that

you have made and will no doubt continue to make to the MARS program. Bravo Zulu to all. On behalf of my family and the staff of Minnesota Area Navy-Marine Corps MARS, let me wish you and yours a very Happy Holiday season. Thank you for your service to Navy-Marine Corps MARS. Enjoy this issue of the Minnesota MARSGRAM.

BT OVER

Share the Christmas Spirit!



Merry Christmas

MINNESOTA TRAFFIC NETS

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

MINNESOTA ADMIN. NET

5G4A	Pri. NCE	19:00 2nd Sunday
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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

More on Noise

Carl Luetzelschwab, K9LA
WorldRadio, August 2005

We'll look at the three important issues that are under the umbrella of 'noise': receiver sensitivity (internal noise), external noise, and quality of service. Then we'll work through two examples. Let's start with receiver sensitivity. I should mention that I'm going to throw out many numbers in this Noise series - so be forewarned.

Receiver sensitivity

Our receivers are not perfect - they have internally generated noise (produced by the movement of electrons in any substance that has a temperature above absolute zero) that limits our ability to hear. One measure of the sensitivity of a receiver is called its minimum discernible signal (MDS), or noise floor. It's the level of an RF signal that increases the no-signal audio output by 3dB. In other words, the RF signal level generates the same audio output power as the internally generated receiver noise.

The ARRL measures MDS in their product reviews. For example, in the product review of the Ten-Tec OMNI VI Plus in the November 1997 QST (I picked an OMNI VI Plus because it's the rig at my main station), the MDS on 3.5 MHz when using the 500 Hz IF filter is -135 dBm (this will vary a bit from unit to unit). What does this mean? It says a signal level of -135dBm increases the no signal audio output by 3dB-when using the 500Hz filter. Does the MDS change with different filter bandwidths? Yes, it does, by 10 times the log of the ratio of the bandwidths (we use 10 times the log since we're dealing with noise powers). A 3 kHz filter

for SSB lets in more noise, so one would expect the MDS in SSB to be worse by 10 times the log of 3 kHz/500 Hz = 7.8 dB. Thus the MDS would be -127.2 dBm with a 3 kHz IF filter. In other words, with the wider SSB filter, you can't hear down as far.

An interesting question to ask is "How does the OMNI VI's MDS compare to the lowest theoretical noise power?" The lowest theoretical noise power is k (Boltzmann's constant = 1.38×10^{-23}) times the temperature in degrees Kelvin galactic noise versus frequency times the bandwidth in Hz. Here's where a calculator really comes in handy. At room temperature ($25^\circ\text{C} = 298^\circ\text{K}$) in a 1 Hz bandwidth, the lowest theoretical noise power is -174 dBm. If an OMNI VI had a 1 Hz filter, the MDS would be better than the -135 dBm value by 10 times the log of 500 Hz/1 Hz = 27 dB (it's better because the 1 Hz filter lets in less noise). This works out to an MDS of -162 dBm in a 1 Hz bandwidth. Note that it's 12 dB away from being 'perfect' -which is the -174 dBm theoretical limit (this 12 dB difference is the noise figure of the OMNI VI). This brings up another interesting question: "Is there any reason to make the OMNI VI's MDS better to allow it to hear signals closer to the theoretical limit?" We'll answer that question in the next section.

External noise

So far we've discussed a receiver and its internal noise. Now let's hook it, up to an antenna to see what external noise does to our ability to hear.

Since external noise has a great impact on propagation, it, has been studied extensively. One excellent reference on noise is Recommendation ITU-R P 3727 (the old CCIR Report 322), which is appropriately titled "Radio Noise." You can purchase this 75-page document on the ITU (International Telecommunications Union) website (<http://www.itu.int>) for 36 Swiss Francs.

There are three sources of external noise that can impact our HF operations: man-made noise, galactic noise, and atmospheric noise due to lightning discharges. Let's look at man-made and galactic noise first.

The ITU document includes a plot of man-made noise and galactic noise versus frequency, and this is reproduced in Figure 1 (it's Figure 10 in the ITU document). All noise powers are monthly median values and were measured with short vertical monopole antennas. And as indicated in the vertical axis legend, they're in a 1 Hz bandwidth.

There are several important pieces of information with

Noise cont'd pg. 3

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Noise *cont'd from pg. 2*

respect to HF operation in Figure 1. First, the environment you live in determines how man-made noise will impact your QTH. Ideally, you would like to be in the quiet rural (D) environment. Second, as you go lower in frequency, the noise increases. So if you're a lowband aficionado, noise is critical. Third, unless you live in a quiet rural environment and are an aficionado of the higher HF bands, galactic noise (the E curve) is probably not a big issue (galactic noise generally doesn't go

below 10 MHz as it doesn't get through the ionosphere). And fourth, if you have an OMNI VI with its extrapolated MDS of -162 dBm in a 1 Hz bandwidth (the dashed F curve, which assumes the MDS is constant for all the ham bands

- a pretty fair assumption), man-made noise limits your ability to hear. Thus making the OMNI VI's MDS better won't help (here's where trading sensitivity for strong signal performance is very important).

Now let's address atmospheric noise due to lightning discharges - better known as QRN. What this represents is the constant drizzle of noise propagating into your QTH from lightning discharges worldwide (it is estimated that there are two thousand thunderstorms occurring worldwide at any given moment). The ITU document has worldwide maps of monthly median atmospheric noise in four-hour time periods for the four seasons - for a total of 24 maps. Each map gives the noise (in dB above -174 dBm) at 1 MHz, along with two other plots that allow you to calculate the noise at other frequencies and to show) low the noise varies statistically.

For my QTH in a winter month in the 4 PM to 8 PM local time period (2100-0100 UTC), the noise versus frequency is roughly halfway between the rural C curve and the quiet rural D curve in Figure 1 up to about 10 MHz - above which it drops off significantly (due to the energy spectrum of a

lightning discharge). As would be expected, the atmospheric noise propagating into my QTH is greatest during the summer months (lots of thunderstorms). And since it's mostly a low frequency phenomenon, it's greatest when my QTH is in full darkness (atmospheric noise propagates just like our signals).

Now we have information about our receiver sensitivity and estimates of the external noise at our QTH. But before we go through the examples, we need to quickly cover one other issue. Quality of service

Just because a signal is at the noise floor of our system doesn't mean we can copy it well. We need to know what's commonly called the quality of service. This is -the signal-to-noise ratio for a given intelligibility requirement (or bit error rate with a digital wave-

form), and it's dependent on the waveform. For example, for 90% intelligibility with suppressed carrier SSB, the signal-to noise ratio relative to noise in a 1 Hz bandwidth needs to be at least 48 dB for an operator-to-operator link (from Table 4 in the Ionospheric Communications Enhanced Profile Analysis and Circuit Prediction Program User's Manual that comes with downloading VOACAP - see the January 2001 column). Using the "10 times the log of the ratio of the bandwidths" equation, this translates to a 13 dB signal-to-noise ratio in a typical 3 kHz SSB bandwidth.

- BT OVER -

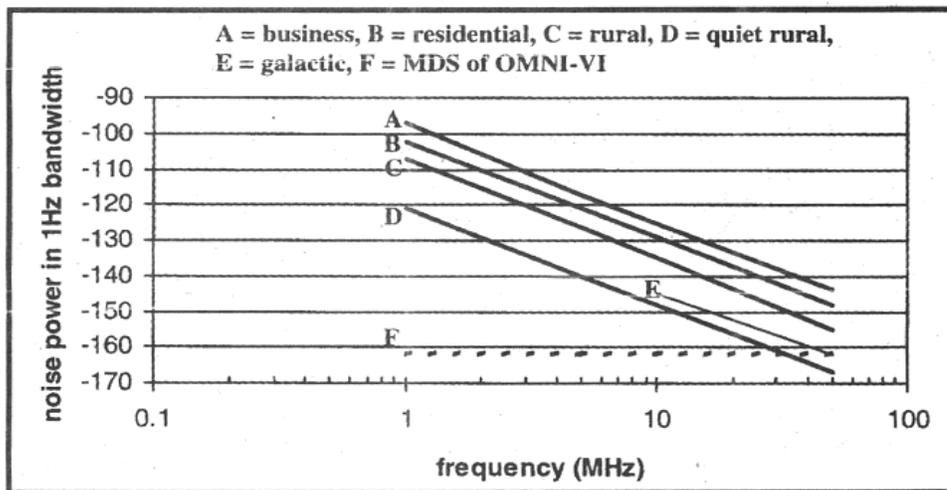


Figure 1 — Man-made noise and galactic noise versus frequency



Training Corner

Requesting Fills

Handling messages by voice on MARS traffic nets is becoming more and more a rare event. The digital modes have made traffic handling almost automatic. Writing messages by hand on paper is even rarer. Even so, in situations when power is off, computers are down, and only back up batteries are running our radios then pencil on paper becomes a vital tool.

It is frequently necessary to obtain missing or scrambled text in messages that are sent by sideband or by digital means. It is vital to remember that you may not ROGER for any MARS message unless you have a complete (meaning 100%) copy of the text. If you have any questions about the accuracy of your copy of the message you must ask the sender of the message to resolve these questions. You do this by asking for FILLS.

When requesting a message FILL the only authorized proword is SAY AGAIN. Do not ask for fills by saying "I need," or "give me." These are not authorized prowords. When giving fills the only authorized proword is I SAY AGAIN.

This bears repeating. When asking for fills, use the prowords SAY AGAIN. When giving fills, use the prowords I SAY AGAIN.

When requesting fills you need to be very specific with your request. For example you might any one of the following options to request the information you need; SAY AGAIN WORD BEFORE (BLANK), SAY AGAIN WORD AFTER (BLANK), SAY AGAIN FROM (BLANK TO BLANK) or SAY AGAIN PRECEDENCE, etc.

If you are the sending station you would reply to the request for information as follows; I SAY AGAIN WORD BEFORE (BLANK), I SAY AGAIN WORD AFTER (BLANK), I SAY AGAIN FROM (BLANK TO BLANK), or I SAY AGAIN PRECEDENCE, etc.

When copying Administrative traffic, fills may be requested and given from proword to proword. Some examples would be: SAY AGAIN FROM LINE (#) TO LINE (#), SAY AGAIN TO LINE (#) TO INFO LINE, or SAY AGAIN INFO LINE (#) TO BT.

Copying third party traffic includes important information in the message header that is not found in Administrative traffic. Fills in the header of Third Party, Health & Welfare, or MARSGRAM messages will be requested and given as follows: SAY AGAIN PRECEDENCE, SAY AGAIN DATE-TIME-GROUP, SAY AGAIN FROM LINE, etc.

You can substitute any of the message parts in the SAY AGAIN format. The other components of the header are; ORIGINATOR, ORIGINATING STATION, TO LINE (entire TO line), ACTION ADDEE, STREET LINE, CITY, STATE LINE, CODE (entire zip code), PHONE FIGURES (entire number).

This leaves only one part of the message we haven't discussed, the text. Use the same basic procedure when requesting fills in the message text. Use the prowords SAY AGAIN with any of the variations described above to accurately identify the missing text.

BT OVER



Boston (Aug. 26, 2005) - Two Massachusetts-based U.S. Coast Guard assets, a 47-foot motor lifeboat from Coast Guard Station Gloucester and a HH-60 Jayhawk helicopter from Air Station Cape Cod, transit-out of the Gloucester Harbor during a training exercise. U.S. Coast Guard photo by Public Affairs Specialist 3rd Class Luke Pinneo

Navy-Marine Corps MARS and the NTIA Frequency Standard

In the November issue of the Minnesota MARSGRAM, the article "Future Challenges for MARS" by Bill Sexton was published. In this article Mr. Sexton included a section on Frequency Stability and the NTIA frequency requirements. Since the publication of this article several questions have come up as to how this affects members of Navy-Marine Corps MARS.

In August of 2005, Bob Sutton, Chief Army MARS, issued a broadcast to Army MARS members indicating the "grandfather" period for MARS members would end by January 2008. Chief Navy-Marine Corps MARS, Bo Lindfors, addressed the issue as it relates to those of us in Navy-Marine Corps MARS in the Chief Navy-Marine Corps MARS info broadcast 31-05. Below is the text of that broadcast. Hopefully this will answer many of the questions posed by Mr. Sexton's article.

SUBJ: CHNAVMA RCORMARS INFO BCST 31-05

1. RECENTLY, CHIEF ARMY MARS AND CHIEF AIR FORCE MARS HAVE ISSUED BROADCASTS AS TO HOW ARMY AND AIR FORCE MARS ARE HANDLING THE MORE RESTRICTIVE NTIA HF FREQUENCY STABILITY AND BANDWIDTH REQUIREMENTS. THE REQUIRED OPERATIONAL CHANGES FOR NAVMA RCORMARS HAVE BEEN INCLUDED IN NTP 8(D) WHICH I HOPE WILL BE APPROVED AND PROMULGATED THIS MONTH.

2. THE NTIA 'RED BOOK' DELINEATES THE NEW REQUIREMENTS. FOR HF, WE MUST OPERATE WITH A FREQUENCY STABILITY OF PLUS/MINUS 20 HZ. THE OLD NTP 8(C) REQUIREMENTS FOR SSB WERE PLUS/MINUS 100 HZ BUT WAS ALREADY PLUS/MINUS 20 HZ FOR SCD. ALL SSB HF CHANNELS ARE BEING REDUCED IN WIDTH FROM 3000 HZ TO 2800 HZ.

3. NOWHERE IN THE NTIA 'RED BOOK' REGULATIONS IS THERE A REQUIREMENT THAT YOU MUST PURCHASE A NEW RADIO TO MEET THESE REQUIREMENTS. ONLY FEDERAL GOVERNMENT AGENCIES THAT PURCHASE NEW RADIOS MUST PURCHASE RADIOS THAT MEET THE NEW SPECIFICATIONS. OLDER RADIOS CAN CONTINUE TO OPERATE AS LONG AS THEY DO NOT CAUSE INTERFERENCE. ANY OPERATIONS THAT CAUSE INTERFERENCE MUST BE CORRECTED BEFORE FURTHER OPERATIONS MAY CONTINUE.

4. NEARLY ALL CURRENT AMATEUR RADIOS MEET THE BANDWIDTH REQUIREMENTS FOR SSB RIGHT OUT OF THE BOX SINCE THEY TRANSMIT A 2.4 KHZ TO 2.7 KHZ WIDE SSB SIGNAL. MOST NEW AMATEUR RADIOS (AND MANY OLDER ONES) ALREADY

MEET (OR CAN EASILY BE MODIFIED TO MEET) THE NTIA FREQUENCY STABILITY REQUIREMENTS.

5. BOTTOM LINE - DO YOU NEED TO PURCHASE A NEW RADIO? THE SHORT ANSWER IS NO. YOU MUST, HOWEVER, ENSURE THAT YOU OPERATE WITHIN THE NTIA SPECIFICATIONS. HERE ARE SOME OPERATING PRACTICES TO ENSURE YOU STAY ON FREQUENCY:

A. START YOUR RADIO AS LONG AS POSSIBLE BEFORE YOU INTEND TO TRANSMIT TO ENSURE IT IS UP TO NORMAL OPERATING TEMPERATURE.

B. CHECK YOUR FREQUENCY WITH WWV TO DETERMINE YOUR FREQUENCY ERROR PRIOR TO ACTING AS NECOS. AN EASY WAY TO DO THIS IS TO TUNE IN TO WWV ON AM AND THEN SWITCH TO SSB; THEN ADJUST FREQUENCY SO THE TONE HEARD ON SSB MATCHES THE TONE HEARD ON AM. ANY SOUND CARD PROGRAM WITH A WATERFALL DISPLAY CAN BE USED TO AID IN THIS PROCEDURE.

C. IF YOU ARE NOT THE NECOS, BE SURE TO FINE TUNE TO THE NECOS FREQUENCY - IF YOU THINK NECOS IS OFF FREQUENCY, INFORM NECOS IMMEDIATELY SO NAVMA RCORMARS DOES NOT OPERATE OFF-FREQUENCY.

6. EVEN IF YOU DO HAVE A TEMPERATURE COMPENSATED CRYSTAL OSCILLATOR (TCXO) AND THINK THIS DOESN'T REQUIRE YOU TO CHECK YOUR FREQUENCY, THINK AGAIN. ALTHOUGH NOT LIKELY, THESE CIRCUITS CAN ALSO MALFUNCTION AND CAUSE YOU TO GO OFF FREQUENCY.

7. NAVMA RCORMARS: PROUDLY SERVING THOSE WHO SERVE.

BT OVER



Test Your MARS skills – Dec. 2005

You receive a message addressed to you on a MARS voice net. The text begins with the following line: ZUI UR 231455Z SEP 02. What does this mean?

- Please cancel your message of 231455Z SEP 02.
- Please confirm delivery of the message bearing the date-time-group 231455Z SEP 02.
- I draw your attention to your message of 231455Z SEP 02.
- The accuracy of the heading in your message of 231455Z SEP 02 is questionable.

Check for the answer in next month's MN MARSGRAM

SKYWARN RECOGNITION DAY IS DECEMBER 3



The seventh annual SKYWARN Recognition Day (SRD) special event will take place Saturday, December 3, from 0000 until 2400 UTC (i.e., starting Friday, December 2 in US time zones). Cosponsored by the National Weather Service (NWS) and ARRL, SKYWARN Recognition

Day is the Weather Service's way of expressing its appreciation to Amateur Radio operators for their commitment to helping keep communities safe. During this 24-hour special event, teams of radio amateurs set up stations at local NWS offices to contact other hams across the US and around the world.

"Ham radio operators volunteering as storm spotters are an extremely valuable asset to National Weather Service operations since they are cross-trained in both communications and severe storm recognition," says SRD organizer Scott Mentzer, N0QE, the Meteorologist-In-Charge at the Goodland, Kansas, NWS office, home of WX0GLD.

Last year, 114 NWS offices participated in SRD, logging more than 15,000 QSOs during the 24-hour event, says David Floyd, N5DBZ, the Warning Coordination Meteorologist at Goodland. The object is for amateur stations to exchange QSO information with as many NWS stations as possible on 80, 40, 20, 15, 10, 6 and 2 meters, and 70 cm. Contacts via repeaters and Voice over Internet Protocol (VoIP) modes, such as EchoLink and IRLP also welcome.

Operators exchange call sign, signal report, QTH, and a one or two word description of their weather, such as "sunny," "partly cloudy," "windy," etc.

According to Floyd, in typical SKYWARN operations during severe weather, direct communication between mobile spotters and local NWS offices provides critical

"ground truth" information for forecasters. "Spotter reports of hail size, wind damage and surface-based rotation in real time greatly assist the radar warning operator, since that information can be correlated with Doppler radar displays," he says. The result may be a more strongly worded statement to convey greater urgency or issue a tornado warning a few minutes earlier than would otherwise have been possible.

"While NWS offices utilize the real-time reporting of severe weather events to assist in warning operations,

hurricanes Katrina and Rita have shown us that ham radio operators are equally important during the recovery phase of natural disasters," Floyd points out.

Floyd also cites the example of the Hurricane Watch Net (HWN) on 14.325 MHz. He notes that the HWN, which organized in 1965 during Hurricane Betsy, started out as an informal group of amateurs but has since developed a more

formal relationship with the National Hurricane Center in Miami via its Amateur Radio station WX4NHC (formerly W4EHW). HWN ham radio members and volunteers at WX4NHC work together when hurricanes threaten to provide real-time weather data and damage reports to NHC forecasters.

So far, some 75 NWS offices in the US are planning to participate along with the Prairie Storm Prediction Center in Winnipeg, Manitoba, Canada. An official EchoLink/Internet Radio Linking Project (IRLP) reflector is expected to be available for use during SRD.

An 8.5 x 11-inch certificate is available in exchange for a self-addressed, stamped envelope with a list of NWS stations worked. Address requests to SKYWARN Recognition Day, 920 Armory Rd, Goodland, KS 67735. Separate stations also will issue individual QSL cards.

- BT OVER -



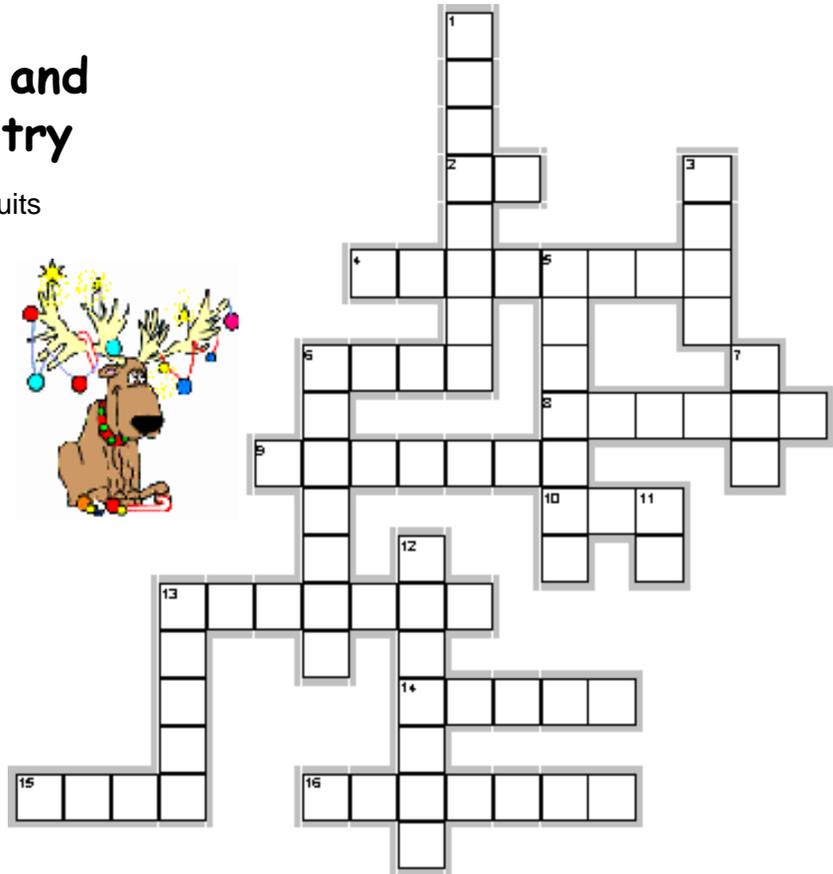
Power and Circuitry

Across

2. Opposite of OFF
4. Devices used to open and/or close circuits
6. Double _____, Double-throw
8. Motor part that is stationary
9. Attach to a circuit
10. Automatic Link Establishment
13. Short _____
14. Non-radiating load
15. Energized circuit
16. Used to carry AC wiring

Down

1. Used to fuel a home generator
3. Binding _____
5. Ham's rock
6. Function of a fuse
7. The black wire is _____
11. Electrical Engineer
12. Component of a motor that forms inductance
13. Resists the flow of RF



Created with EclipseCrossword — www.eclipsecrossword.com

Forgot Your FCC FRN Password? Reset it Online!

The Federal Communications Commission (FCC) has announced two new online capabilities that were implemented at the end of September 2005:

- Online FRN Password Reset — This will allow users to instantly reset their FCC Registration Number (FRN) passwords online via the Commission Registration System (CORES).
- Call Sign/FRN Association — This will provide users with self-service tools within the Universal Licensing System (ULS) to help manage the association of call signs, antenna registration numbers, and FRNs.

Customers doing business with the FCC are required to register for a FCC Registration Number (FRN) and password obtained from the Commission Registration System (CORES). Previously, users had to contact FCC support staff to assist in resetting a forgotten password. The new “self-service” password reset feature allows authorized users to reset their own FRN password online instantly via the CORES website. Resetting a forgotten password is achieved by establishing and then using your Personal Security Question (PSQ) and answer. To register for an FRN, or to update a current FRN with a new PSQ and answer, visit <http://www.fcc.gov/frnreg>.

Minnesota 4th Quarter ECOM Exercise Mighty Winds

by: AI - NNN0GAZ TWO



A large deep low pressure cell developed in Kansas, moving north east bringing heavy rains to southern Minnesota and blowing snow and freezing rain to northwestern Minnesota on Dec. 13th causing wide spread power and communications outages in north central Minnesota.

As a result, Interstate 94 and state highway 10 were closed from Fargo, N.D. to St. Cloud and Brainerd.

As the low pressure cell moved northeast on Dec. 14th, the storms counter-clockwise winds and accompanying cold front changed over to freezing rain and heavy ice as it moved into south central Minnesota causing further power and communications outages in and around the Twin Cities. Interstate and state highways around the Twin Cities were also closed for sometime.

There will be two ECOM nets. The 5G5E nets will be called on Tuesday, Dec. 13th and Wednesday, Dec. 14th (local time) following the 5G1B voice traffic nets.

Members are asked to prepare an EEI and at least one SITREP message to be transmitted on one of the two nets.

- BT OVER

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.	SXU	SXU
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
Dec 3	SXU	SXU
Dec 10	ACY	OCF
Dec 17	XYA	XEE
Dec 24	XEE	XEE
Dec 31	KZC	KZC
Jan 7	BQH	BQH

HAPPY BIRTHDAY

NNN0OCF Paul Leska Sr Dec. 5
NNN0OCE Joel Jensen Dec. 17

Service Recognition

NNN0XEE Timothy Isom 14 yrs

Don't forget your paperwork!



HO HO HO

Merry Christmas

Test Your MARS skills – Nov. 2005

TRUE/FALSE - Indicate whether each statement is True or False.

- T The Region Director has the authority to address NNN0ALL (State) (all Navy-Marine Corps MARS members in your State).
- F The operating signal ZUI means that the originator of the message wants to know when the message was delivered.
- F Individual members not holding staff positions have the authority to use collective call signs within their own State when they originate administrative messages.
- F Your State training officer has the authority to address messages to NNN0ALL (State) (all Navy-Marine Corps MARS members in your State) as long as the message deals with ECOM planning issues.
- F The operating signal ZEN is only used with third party messages.
- F A State Director has the authority to address messages to NNN0ALL REGION FIVE (all Navy-Marine Corps MARS members in Region Five).
- T Only Chief, MARS, NNN0ASA, has the authority to address NNN0ALL (all Navy-Marine Corps MARS members).
- T Service messages are never sent to third parties.
- T Service messages always include your Area Director and the Area Director of the originating stations as addressees.
- F A message addressed to NNN0ALC should be read on your State voice net even though the State Director is not present on the net, as there is something in the message you think everyone has a right to hear.

Test Your Analytical Skills - Dec. '05 Power Supply

Santa brought you a new rig that needs 14 A at 13.2 V. Your existing 13.2 V power supply also runs equipment that consumes 10, 25 and 55 W. If the existing supply is rated at 20 A. Can it handle the load or is it time for a trip to the store.

Answer in the next of the Minnesota MARSGRAM

Test Your Analytical Skills Nov. '05 Computer Back-up Power

You've finally decided to protect that computer of yours from power dropouts, the purchase of an uninterruptible power supply (UPS) is in your future. You know the following about your computer system:

- your computer draws 100 Watts
- your monitor draws 200 watts
- your printer draws just 25 W (that's right you're still using a dot matrix)

What is the minimum UPS rating in Volt-Amps (V-A) you can buy and still safely operate?

Answer: The total power load of your system is

$$100 \text{ W} + 200 \text{ W} + 25 \text{ W} = 325 \text{ Watts}$$

Computer equipment is rarely a resistive load and often has turn-on current surges. For your setup, a 500 VA unit would be a good choice.