MINNESOTA MARSGRAM

May, 2004 Volume 8, Number 5

NNN0ALL Minnesota

by NNN0GAZ Tim

Greetings to All,

Much like winter, the spring season is having a hard time getting started this year here in Minnesota. We've had a few outstanding days so far, I'm sure there are more to come, so I hope all of you have had an opportunity to spend some time outside.

We've arrived at another Armed Forces Day celebration. The list of military stations participating in Armed Forces Day is contained here in the May issue of the Minnesota MARSGRAM. Please forward this information to your local club, any nets you may participate in, and your amateur radio friends, this material has not been published in QST or CQ magazines. Your help in spreading the word would be appreciated. Try to make contact with NAV 4 on May 8 during the Armed Forces Day celebration. The past three years Region Four has finished ahead of all others in the number of QSOs, lets keep the tradition going.

To those of you wondering, I have not suffered equipment, antenna, or any other problems. I'm still here, unfortunately my schedule has been pretty full lately. I've spent a lot of time in the classroom this year doing Skywarn classes for the Police Department, EMTs, and a number of private citizens and local civic groups. I certainly hope this is not indicative of a long storm season. I've also spent time with a number of elementary school children in their classrooms talking about severe weather. All of this takes preparation and practice. Add this to my full time job and it makes for some long days. In addition, I've been in the process of changing Internet Service Provider, that's right, my email address, after oh so many years has changed. The new address is nannypoo@mnmars.org. Those of you who have changed providers understand – who knew how many places my email address was that I didn't want to loose contact with or miss a message. As far as mnmars.org, I believe that you will find a description of our new web site elsewhere in this issue and in future issues we, XYA and I, will provide a description of the site and how it came to be. Some may have speculated, with the reissuance of a Chief MARS Broadcast, that I was taking advantage of the fact that sysops are not required to participate in voice nets. Frankly, nothing could be further from the truth. I miss evening nets, the traffic, questions and comments. So to all of you, thanks for your patience and to those of you who filled in for me as NECOS and TREP – a big THANK YOU. Your assistance during this time is much appreciated.

Finally, with warmer weather and the opportunities to spend more hours outside, please don't forget our evening nets. We would like to hear for you during the spring and summer months. Don't miss the opportunity to participate in an evening net, an ecom exercise, you will find that checking in to the evening net to enjoy fellowship with your fellow MARS members is definitely worth the time.

Enjoy this issue of the Minnesota MARSGRAM. BT OVER

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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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

	Dial Frequency
NN0DVD	NCO AFSK/USB
Intranet site	http://.www.communityzero.com/mnmars

FCC proposes wide-ranging changes to Amateur Service rules

The FCC has released an "omnibus" Notice of Proposed Rule Making (NPRM) that seeks comments on a wide range of proposed Amateur Service (Part 97) rule changes. The FCC also denied several petitions for rule making aimed at altering portions of the Amateur Radio regulatory landscape and ordered minor changes in Part 97. The NPRM is a result of a dozen petitions for rule making, all filed more than a year ago and some as long ago as 2001.

Comments on the proposals put forth in WT Docket 04-140 are due by Tuesday, June 15, with reply comments by Wednesday, June 30. Among other changes, the FCC has recommended adopting the ARRL's "Novice refarming" plan, which can be seen on the web at, http://www.arrl.org/announce/regulatory/refarm/.

"Because the ARRL petition addresses the operating privileges of all classes of licensees on these Amateur Service bands, we believe that the ARRL petition provides a basis for a comprehensive restructuring of operating privileges," the FCC said.

The FCC has proposed essentially eliminating its rules prohibiting manufacture or marketing of Amateur Radio Service power amplifiers capable of operating between 24 and 35 MHz. The current rules "impose unnecessary restrictions on manufacturers of Amateur Radio equipment and are inconsistent with the experimental nature of the Amateur Service," the FCC said. The FCC proposed amending Section 97.201(b) of the rules to permit auxiliary operation on 2 meters above 144.5 MHz, with the exception of the satellite subband 145.8 to 146.0 MHz, in addition to frequency segments already authorized.

The FCC proposed extending the bands available for spread spectrum experimentation and use to include 222-225 MHz as well as 6 and 2 meters. Current rules limit SS emissions to frequencies above 420 MHz.

Among other things, the FCC also proposed to prohibit acceptance of more than one application per applicant per vanity call sign; permit retransmission of communications between a manned spacecraft and its associated Earth stations, including the International Space Station; allow current amateurs to designate a specific Amateur Radio club to acquire their call sign in memoriam; eliminate Section 97.509(a) of the rules, which requires a public announcement of volunteer examiner test locations and times; and add to Section 97.505(a) to provide Element 1 (5 WPM Morse) credit to any applicant holding a Technician license granted after February 14, 1991, and who can document having passed a telegraphy examination element.

The Commission ordered some changes in Part 97 without requesting comment. It ordered, among others, the revision of the definition of an "amateur operator" in Section 97.3(a)(1) to reflect that entry in the FCC Universal Licensing System (ULS), not a license document, determines whether a person is an Amateur Radio operator.

The FCC adopted a technical change to specify that the mean power of any spurious emission from a new amateur station transmitter or amplifier operating below 30 MHz be at least 43 dB below the mean power of the fundamental emission.

Among other petitions, the FCC turned down a proposal to establish distinct CW and phone segments in the 160-meter band. Also denied were petitions that would have imposed restrictions on the time, length or transmission frequencies of bulletins or informational transmissions directed at the amateur community and a request to add to the special event call sign system certain call sign blocks designating territories and possessions that lack mailing addresses.

The FCC Notice of Proposed Rule Making, on the web at, http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-79A1.doc, in WT Docket 04-140, is available on the FCC Web site.

As soon as the document has been posted, comments on the NPRM may be filed via the FCC Electronic Comment Filing System at, http://www.fcc.gov/cgb/ecfs/. Click on "Submit a filing." To view filed comments, click on "Search for filed comments." In either case enter the NPRM number in the "Proceeding" field as "04-140" (without the quotation marks).

- BT OVER

Minnesota Area Conference

June 12, 2004
Saturday

American Legion Club
Waite Park, MN

Assemble at 11AM
Lunch at Noon
Meeting to follow

ASG & AS5 will be there!

Additional information will be printed in upcoming issues of the MN MARSGRAM.

ARRL Requests Filing Deadline Extension in BPL Proceeding

The ARRL has asked the FCC to extend the deadline for comments and reply comments by 45 days in the Broadband over Power Line (BPL) Notice of Proposed Rule Making (NPRM) in ET Docket 04-37. Comments now are due by May 3 and reply comments by June 1. Although the FCC does not routinely grant such extensions, the League said it wants to allow time for the National Telecommunications and Information Administration (NTIA) to conclude its study at BPL field trial locations.

"This proceeding stands to have a profound effect on the Amateur Radio Service, and a full and complete opportunity to evaluate the results of the NTIA study is critical to the ability of ARRL to respond in a meaningful manner to the proposals in the instant Notice," ARRL said in filing its request April 9. "At the same time, there is no need for any rush to judgment in this proceeding, since BPL trial sites are only now commencing operation."

If the FCC okays the request, the comment date would move to June 14, and the reply comment deadline would become July 16. Granting the request, the ARRL contended, "will have no adverse effect on any interested party to this proceeding."

The League said the new deadlines would provide everyone with approximately 60 days to review and evaluate the NTIA study before having to file comments.

A copy of the ARRL's Motion For Extension Of Time To Submit Comments is available on the ARRL Web site at, http://www.arrl.org/announce/regulatory/et03-47/arrl-motion.html .

For more information on BPL, visit ARRL's Broadband Over Power Line (BPL) and Amateur Radio page at, http://www.arrl.org/bpl/. *BT OVER*

DROWNING VICTIM'S CLASSMATE TRIES EVERYTHING TO SAVE HIM

By: Teresa Woodard, Reporter

Cell phones wouldn't work when teachers tried to call for help during that field trip to the Smoky Mountains on Friday. The only communication was a ham radio that a 13 year old student brought along.

"We'd been there for probably 30 minutes to an hour, and a whole bunch of people got in the water. I looked over and I saw Chris go under," explains Jordan Webb on Saturday morning, remembering the fear he felt Friday, when the cool waters of Abrams Falls turned cruel and the peaceful surroundings became a problem.

Before he left for his field trip Friday morning, he says he looked at his radio in his bedroom and thought, "well, I might need it for something."

A licensed ham radio operator for almost a year now, he kept the radio with him in his backpack on the two and a half mile hike to the falls. He even had it wrapped in a plastic bag inside his backpack, in case it rained. When he saw his classmate in trouble, Jordan says he jumped in the water to help. Then he remembered the radio.

"So I went and grabbed it and told one of the teachers that if I could get to a high spot I might be able to get in communication with somebody," he says. "So I just started running up the mountain."

He got to a high enough spot and made contact.

"I started calling out 'Break! Break!', which means life threatening emergency," he explains. "When I heard someone I said, 'We're in Cades Cove at Abrams Falls and one of the students is drowning!'"

The ham radio operator he talked with called for help, so Jordan's resourcefulness got rescue crews to the trail. But they didn't arrive in time to save Chris.

"It was a long walk back," Jordan says. "All the kids were just saying stuff, you know, about how nice Chris used to be. He had a very different smile from everybody else."

Because of Jordan and his ham radio, his classmate's body was recovered within hours, not days. He won't forget what happened, but he's at peace knowing he helped.

"Praise God I took it," he says. *BT OVER*

PSK NET
TUESDAY EVENING
FOLLOWING THE 5G1B NET

Prepare your shack for the lightning season

By: Tom Rauch, W8JI
Courtesy of WorldRadio, May 2004.

The Northern hemisphere winter low-band season started somewhat poorly. Solar disturbances were common, and early season "exceptional propagation" days over high latitude were in frequent. Fortunately the low-bands came around a bit in February, and it looks like the winter season will close with few exceptionally good days.

Hopefully everyone's county, state, country, or zone totals ratcheted up enough to make the season worthwhile.

Low-band contact bragging rights should be all about making the difficult contact, but let's not be too dazzled by what big guns appear to accomplish. It is quite easy to work 100 countries and almost all 40 zones in 90 days. On low bands (even on 160 meters), and WAC can be made in July. For the little pistol working all states on 160 or 80 Meter DXCC can actually be a much greater accomplishment than working hundreds of countries with a large station. Unfortunately there is no way to rate actual effort, but we should all take time to congratulate the little pistol who has accomplished his or her own goals.

Winter season's end in north latitudes always brings changes in propagation and operating habits. Activity will concentrate near sunset and sunrise since noise is generally at a minimum during sunrise or sunset. Even though many operators abandon 160 during QRN season, propagation is still there. Northern Europe stations can make it through to the United States all year long, although the summer path is often skewed to the southeast from middle- Georgia! I always wonder where the signal actually bends around and heads north again, and why this happens with great consistency in summer.

The days of 160 being useless in the summer are long gone, having vanished with the low diploes and 200-wat transmitters of the 60s. Stations with modern antenna designs will have quiet days when DX is still good. It is possible to add to state, country, and zone totals even if the rate has slowed down. Southern hemisphere operators become more active. Summer is also a good time to plan or work on antennas, and prepare for the next season of low-band activity.

Of course, there is bad news that comes with warming weather, particularly in the southeast USA. At 3 a.m. on 26 February during a rain-and-sleet storm, a very loud bang rattled the house. I won't repeat the words I muttered when the lights went out in Georgia!

This might be a good time to look at your stations and see how the lightning protection is configured.

If ever a system needs protection, it is something as haywired as mine. I have a 3,000 x 1,599 foot area filled with dozens of permanently connected coaxial cables, towers, and wire antennas. Not only is the target wide, it is also tall. The tallest tower is over 300 feet high. Making things worse, middle-Georgia has a high incidence of summer thunderstorm. Lightning strikes my towers at least a few times every summer.

I'm from the old school before we had instant energy ills. I worked on repeaters and broadcast stations long before MOVs or coaxial line surge suppressors were required. Back then, towers would take hit after hit and stuff would keep on ticking. We were careful with lead routing and grounding, and rarely had lightning failures unless an antenna or feedline actually suffered physical damage.

Old habits die very hard, I actually have been known to rip the gas tubes out of antenna switches, because they sometimes flash over and cause equipment problems (like arced switches) when feedline SWR is high. My lightning protection is mostly in the form of old-school solenoid-coiled feedlines, good ground systems, bulkhead feed thrus, and diode clamps. I bury my cables, ground all the shields, use lightning spark gaps, and isolate my antenna systems in zones. I avoid using cooper braiding in critical ground leads, and stick with wide smooth copper flashing.

I'm not a big fan of in-line coaxial surge protectors. My belief is if a clamp reliably lets a half-thousand volts of peak voltage out, it will allow at least that much voltage back in. Knowing my equipment front ends can't take that much

Lightning cont'd pg 5

Lightning *- cont'd from pg 4*

voltage, I figure my money is best spent on other parts of my system. I do have disconnect relays in all of my transmitting feedlines, but nothing disconnects my control or receiving antenna lines.

I do have MOVs on my power lines, and all grounds for power lines are also common with bulkhead feedthroughs. The system of 30 or 40 control wires, for the most part, has a bank of small disconnect relays. These relays open circuit unused lines when the power switch is off, and ground the internal conductors to the shields. All of my control lines are shielded, and the shields are grounded.

In general, I might lose a little diode on a control line, a 50-volt bypass capacitor, a switching relay on a receive antenna, or a termination resister on a receive antenna, or a termination resistor during a direct hit.

On occasion a coaxial cable shield connecting between two independent ground systems opens up, melting from high currents flowing over long distances. I never have lost a receiver pre-amplifier even though the cables all remain connected, and my control systems largely remain even though solid state and fully connected at all times.

This hit was different; I'd never seen anything like it before. I knew I was in trouble when four 200-ampere mains in my workshop opened up, killing power to all the outbuildings and towers. The 120-volt power feed for a repeater shed blew completely in two, and coaxial pigtails from the repeater shed to feed-lines coming down the 300-foot tower blew in two.

A large 7/8-inch feedline running past the 300-foot tower was blown completely in two, and the feedline from a wire antenna near the 300-foot tower was missing. The lightning gaps on the base of the 400-foot tower had huge chunks of metal blown out, and the copper flashing that ties the radials all in had burns and pits. Virtually every connector near the tower no longer had a shield covering! Every single N-connector in the system failed, even though most standard UHF fittings survived. More interesting than the damage was the devices that survived. Repeater equipment operated perfectly once vaporized jumpers (outside the building and on the tower) were replaced. Even a non-protected GASFET preamp worked perfectly. Other than some cables that were blown in two, all the radio gear was fine.

I attribute the survival of so much equipment to the following:

• The house has a perimeter ground of a buried ½-inch copper tubing, to which every conductor entering the house is grounded.

• All radio cables enter all buildings through bulkhead feedthrus.

• The entrance grounding plates are all connected directly to utility grounds with wide smooth copper flashing.

• All towers have radial systems using at least fifty number 16 AWG bare copper radials that are silver soldered to a wide flashing ground buss.

• Every power line serving radio equipment shares a common connection point with entrance cables before going to equipment outlet strips.

• None of my cables leave any tower above ground level.

• All of my cables are underground as they approach buildings or towers.

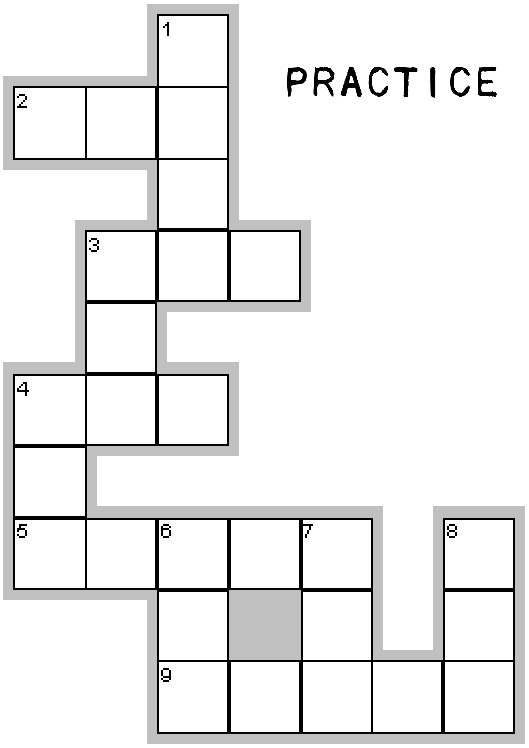
• I use lightning-retarding chokes when they connect to critical targets.

• Even though shields remain connected, they are forced to pass through a well-grounded cable entrance plate. Disconnect relays remove and isolate straight-through connections on large feedlines.

Please, check your systems and follow NEC codes before lightning season. If nothing else, be sure every cable entering your house has a very low impedance connection to the utility entrance ground. The last thing you or your family needs is a few hundred amperes lightning current flowing through house wiring.

BTOVER

PRACTICE WITH OPERATING SIGNALS



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ACROSS

2. Affirmative
3. Transmit traffic to me without waiting for receipts
4. Negative
5. A digital communication mode that uses error correction protocol
9. Continental United States

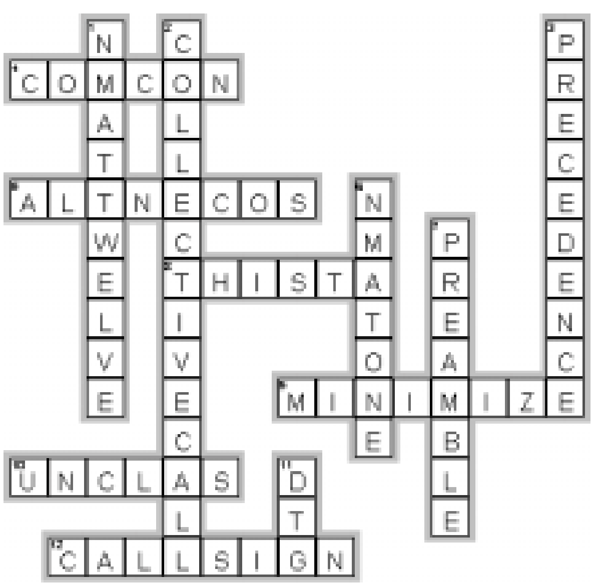
DOWN

1. Federal Emergency Management Agency
3. Exercise (drill) message
4. I have a formal message for you
6. The hardware used to convert computer information to digital communications format
7. Regional Data Network
8. Mars Data System

Navy's Blue Angles

Nantucket, Mass. (Jun. 27, 2003) - The Blue Angels fly a Delta formation low over the waters near Nantucket Island, Mass. The Blue Angels perform more than 70 shows at 34 different locations throughout the country each year. The Blue Angels are homeported in Pensacola, Fla. U.S Navy photo by Lt. Mike Blankenship.

The April Solution



Armed Forces Day 2004

The Army, Air Force, Navy, Marine Corps, and Coast Guard are co-sponsoring the annual Military/Amateur Radio communications test in celebration of the 54th Anniversary of Armed Forces Day. Although the actual Armed Forces Day is celebrated on Saturday, May 15, 2004, the Armed Forces Day Military/Amateur crossband communications test will conducted one week earlier on May 8, 2004. The reason is so that the Armed Forces Day Military/Amateur crossband communications test will not conflict with the Dayton Hamvention (14-168 May 2004) which is on the same weekend as the actual Armed Forces Day.

The annual celebration will include the traditional military-to-amateur crossband communications SSB voice test and the Secretary of Defense message receiving test. These tests give amateur radio operators and shortwave listeners an opportunity to demonstrate their individual technical skills and receive recognition from the Secretary of Defense and/or the appropriate military radio station for their proven expertise.

QSL cards are available to those making contact with military stations. Special commemorative certificates will be awarded to anyone who receives and copies the digital Armed Forces Day message from the Secretary of Defense.

Participating military stations will transmit on selected Military MARS frequencies and listen for Amateur Radio stations in Amateur bands indicated. Military station operators will announce specific amateur frequencies being monitored. Duration of each voice contact should be limited to 1-2 minutes. Stations listed in the schedule will be transmitting on MARS frequencies listed which are provided as "window/dial frquency" in KHz.

Transcripts of the RTTY, PACTOR, AMTOR, CLOVER and/or MT63 receiving test should be submitted *as received*. No attempt should be made to correct possible transmission errors. Provide time, frequency and call sign of the military station copied, and include the name, callsign, and complete address (including zipcode) of the individual submitting the entry. This information should appear on the sheet containing the test message. Each year a large number of acceptable entries are received *with insufficient information* or *necessary information* was *not attached* to the transcriptions and was separated, thereby precluding the issuance of a certificate. Entries must be sent to the appropriate military address as indicated in the schedule.

Included in the newsletter is a listing of the MARS stations, addresses and modes of operation participating in Armed Forces Day 2004.

BT OVER

Secretary of Defense Message Test Via Digital Modes

The Secretary of Defense message will be transmitted via digital modes including RTTY, PACTOR, AMTOR, CLOVER and MT63 from stations listed below, including frequencies, mode, and date/time in Zulu (UTC). All frequencies listed for center of intelligence. Offset as appropriate for your TNC. Please note, not all stations may necessarily operate on all the frequencies listed, depending on propagation and available equipment.

Stations copying **AAZ** or **WAR** send entries to:
Armed Forces Day Celebration,
CDR. NETCOM/9th ASC,
ARMED FORCES DAY CELEBRATION,
ATTN: AFSC-OPE-MA (MARS)(31),
FORT HUACHUCA, AZ 85613-5000

Stations copying **NAV, NAV-3, NAV-4, NBL, NPL or NUW** send entries to:
ARMED FORCES DAY CELEBRATION,
CHIEF, NAVY-MARINE CORPS MARS,
CHEATHAM ANNEX BLDG 117,
108 SANDA AVE,
WILLIAMSBURG, VA 23185-5830

Freq	Mode	Date/Time
AAZ		
6988.0	RTTY	9 May/0230Z
	PACTOR FEC	9 May/0310Z
	CLOVER	9 May/0340Z
24761.5	RTTY	9 May/0230Z
	PACTOR FEC	9 May/0310Z
	CLOVER	9 May/0340Z
WAR		
6988.0	RTTY (Note 1)	8 May/2315Z
	PACTOR FEC	8 May/2330Z
14440.0	PACTOR FEC	8 May/2345Z
	AMTOR FEC	8May/2400Z

Freq	Mode	Date/Time
NAV		
7346.5	RTTY	8 May/2340Z
	AMTOR FEC	9 May/0010Z
	MT63	9 May/0040Z
14480.0	RTTY	8 May/2340Z
	PACTOR FEC	9 May/0010Z
	MT63	9 May/0040Z
NAV-4		
7375.0	RTTY	9 May/0240Z
	AMTOR FEC	9 May/0310Z
	MT63	9 May/0340Z
14468.5	RTTY	9 May/0240Z
	AMTOR FEC	9 May/0310Z
	MT63	9 May/0340Z
NBL		
7370.0	RTTY	8 May/2340Z
	PACTOR FEC	9 May/0010Z
	AMTOR FEC	9 May/0040Z
14393.0	RTTY	8 May/2340Z
	PACTOR FEC	9 May/0010Z
	AMTOR FEC	9 May/0040Z

Freq	Mode	Date/Time
NPL		
7350.0	RTTY	9 May/0240Z
	PACTOR FEC	9 May/0310Z
	AMTOR FEC	9 May/0340Z
14465.0	RTTY	9 May/0240Z
	PACTOR FEC	9 May/0310Z
	AMTOR FEC	9 May/0340Z
NUW		
7380.0	RTTY	9 May/0240Z
	PACTOR FEC	9 May/0310Z
	AMTOR FEC	9 May/0340Z
13530.0	RTTY	9 May/0240Z
	PACTOR FEC	9 May/0310Z
	AMTOR FEC	9 May/0340Z

Check www.mnmars.org/index.htm for current information

5G1B Net Schedule

6:30PM 4007 kHz USB

Day		NECOS	Tfc Rep
Sun.		XYA	XEE
Mon.		KZC	KZC
Tue.		XEE	XEE
Wed.		BQH	BQH
Thu.		???	???
Fri.		ACY	OCF
Sat.		Rotating Duty (see below)	
	May 8	ACY	OCF
	May15	XYA	XEE
	May22	KZC	KZC
	May29	XEE	XEE

NNN0OCI Roger Wise 5/6

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

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.

The Navy Wife

By: Erma Bombeck, 1974

The good Lord was creating a model for Navy wives and was into his sixth day of overtime when an angel appeared. She said, “Lord, you seem to be having a lot of trouble with this one. What’s wrong with the standard model?”

The Lord replied, “Have you seen the specs on this order? She has to be completely independent, possess the qualities of both father and mother, be a perfect hostess to four or forty with an hour’s notice, run on black coffee, handle every emergency imaginable without a manual, be able to carry on cheerfully, even if she is pregnant or disabled and has a flu, and then she must be willing to move to a new location ten times in seventeen years. And oh, yes, she must have six pairs of hands”.

The angel shook her head. “Six pairs of hands? No way”. The Lord continued, “Don’t worry, we will make other Navy wives to help her. And we will give her an unusually strong heart so it can swell with pride of her husband’s achievements, sustain the pain of separations, beat soundly when it is overworked and tired, and be large enough to say, “I understand, when she doesn’t, and say “I love you”, regardless.

“Lord”, said the angel, touching his arm gently, “go to bed and get some rest. You finish this tomorrow”. I can’t stop now, said the Lord, “I am so close to creating something unique. Already this model heals herself when she is sick, can put up six unexpected guests for the weekend, wave goodbye to her husband from the pier, a runway or depot, and understand why it’s important that he leave”.

The angel circled the model of the Navy wife, looked at it closely and sighed, “it looks fine, but its too soft”. “She might look soft”, the Lord replied, “but she has the strength of a lion. You would not believe what she can endure”.

Finally, the angel bent over and ran her finger across the cheek of the Lord’s creation. “There’s a leak”, she announced. “Something is wrong with the construction. I am not surprised that it has cracked. You are trying to put too much into this model”.

The Lord appeared offended at the angel’s lack of confidence. “What you see is not a leak”, he said, “it’s a tear”. “A tear? What is it there for?”, asked the angel. The Lord replied, “Its for joy, sadness, pain, disappointment, loneliness, pride and dedication to all the values that she and her husband held dear”.

“You are a genius!”, exclaimed the angel. The Lord looked puzzled and replied, “I didn’t put it there”.

BTOVER

Test Your Analytical Skills

Twelve Gauge Wire

Courtesy of The Electron, Cleveland Institute of Electronics.

I wanted to run some 12 gauge wire to the outside for lights, but found only some 18 gauge. Twelve(12) gauge has a diameter of 80 mils, whereas 18 gauge only has 40 mils. Can I just run 2 strands of 18 gauge in parallel and expect the same current-carrying capacity?

Answer in the next issue of the Minnesota MARSGRAM

April Solution - Across The Bridge

Answer: Man # 3 and Man #4 stay behind; Man # 1 and Man #2 cross over. (This takes 2 minutes.) Man # 1 crosses back. (This takes 1 minute.)
Man #3 and Man #4 cross over. (This takes 10 minutes.)
Man #2 crosses back. (This takes 2 minutes.)
Man #1 and Man #2 cross over. (This takes 2 minutes.)
In all, 2 + 1 + 10 + 2 + 2 = 17 minutes. Just in time.