NATIONAL TRAFFIC SYSTEM
The key to effective Amateur Radio emergency communications

National Traffic System
A system of layered networks providing a systematic exchange of message traffic throughout North America

Local Nets
- Cover one or perhaps several counties
- Serve as the most basic origination or delivery point
- Often serve both an ARES (RACES) and NTS function

Section Nets
- Cover a State or an ARRL Section
- Phone, CW or data
- Provide for the exchange of traffic throughout a State or Section

Region Nets
- Cover several Sections
- Typically a call district
- Example: 8RN covers Michigan, Ohio, and West Virginia

Area Nets
- Cover Eastern, Central, and Pacific Areas of the United States
- Provide for the exchange of traffic between regions within the area
- Linked by TCC
TCC
Transcontinental Corps
A group of highly skilled operators exchanging traffic between Area Nets on a point-to-point circuit
Typically high-speed CW or data

NTS Cycle One
10:00 AM  Section Net
10:45 AM  Region Net
11:30 AM  Area Net
12:30 AM  Region Net

NTS Cycle Two
1:00 PM  Section Net
1:45 PM  Region Net
2:30 PM  Area Net
3:30 PM  Region Net

NTS Cycle Three
4:00 PM  Section Net
4:45 PM  Region Net
5:30 PM  Area Net
6:30 PM  Region Net

NTS Cycle Four
7:00 PM  Section Net
7:45 PM  Region Net
8:30 PM  Area Net
9:30 PM  Region Net
Standardized Message Format
- Limits liability
- Insures message integrity
- Includes all necessary service data
- Indicates critical information such as time and place of origin

Which Mode?
- The competent emergency communications manager develops all available modes of communications
- Each mode has distinct advantages and disadvantages; choose accordingly

Radiotelephone Nets
Advantages
- Minimal Skill required
- Excellent for tactical communications
- Fast when no written record is required

Disadvantages
- Less accurate than CW
- Slower than CW for written message traffic
- Subject to propagation anomalies

Radiotelegraph Nets
Advantages
- Faster than phone for message traffic
- More accurate
- Resistant to propagation anomalies
- Spectrum efficient

Disadvantages
- Considerable skill level required
- Inexperience operators more disruptive
- Smaller pool of volunteers
Data Networks

Advantages
- Low skill level required
- Accurate
- Automation
- Fast for VHF/UHF applications

Disadvantages
- Complex equipment
- Poor on HF circuits
- Discourages prioritization
- Diffusion of responsibility
- Traffic must still be cleared / delivered

Applications
Using the mode best suited to a communications function

Radiotelephone

- VHF and UHF circuits
- HF Networks handling low priority traffic
- Tactical functions (e.g. “Unit 12 proceed to...”)
- Administrative coordination

Radiotelegraph (CW)

- HF networks handling high priority message traffic
- Low power or portable HF applications
- Medium or Long-haul message traffic requiring a degree of communications security

Digital

- Point-to-Point high volume circuits
- Computer mailbox applications
- Bulletin dissemination
- Routine data reports (weather conditions, etc.)
Three-Deep Rule

- Each ARES/RACES program should have at least three operators skilled in the use of each mode (CW, phone, digital).
- Ideally, a total of nine experienced NTS operators.

NTS Message Format

NTS messages made easy

Message Number

- Serial Number assigned by originating station.
- Begins with the numeral “1” at beginning of year or month.
- Allows easy reference to message in the event of service or delivery problem.

Precedence

- Indicates importance of message to originator (or served agency).
- Provides guidance for Net Operators.
- Four categories:
  - Emergency = “Life and Death”
  - Priority = “Time Sensitive”
  - Welfare = Notification of well-being in disaster area
  - Routine = Day-to-day greetings, etc.
Precedence
- **Emergency**: Life or Death – *always spelled out!*
- **Priority**: Time sensitive – *abbreviated “P”*
- **Welfare**: Information pertaining to the well being of an individual in a disaster area – *abbreviated “W”*
- **Routine**: Casual greeting or routine public service message – *abbreviated “R”*

Handling Instructions
- Provide instructions to delivering station or those handling the traffic
- **Optional component**
- Example: HXC = “Report time and date of delivery to originating station.”
- Seven different instructions; HXA through HXG

Station of Origin
- Call sign of first station to place message on air
- Example: If W8ZZ calls W8IHX on the phone and asks the later to originate the message, the Station of Origin is “W8IHX.”

Check or “Group Count”
- The number of words or groups in the text
- Does not include address or signature
- Mixed groups, such as “6th” or “FSD-212” count as one word
- The “X-ray” (“X”), used in place of a period, counts as one word
Place of Origin

- This is the location of the individual whose name appears in the “Signature” portion of the message
- It is **not** the location of the station that places the message on-air

Time of Origin

- Four figure time group in UTC (GMT)
- Example: 2330Z
- Never use local time
- Indicates the time the message was drafted or the time the event occurred

Date of Origin

- Always expressed as a three-letter month and day
- Example: “Jun 10” or “Jul 4”
- Must reflect date in UTC (e.g. new day starts at 7 PM EST or 6 PM CST)
Address

- Should be as complete as possible
- Include telephone number
- In some cases, it may be abbreviated
  - When an agency has a direct liaison on air:
    - “NWS-DTX” for National Weather Service
    - “MSP-EMD” for Michigan State Police EOC
  - When addressed to a radio amateur active on a net

The portion of the message containing the preceding service information is called the **Preamble**.

The Text

- Try to limit to 25 words or less for routine messages
- Keep as brief as possible for official traffic
- Avoid difficult or confusing language
- Utilize the “X” for a period.
- Always convert the “X” to a period when delivering traffic in writing.
The Signature

- The name of the individual or agency originating the message.
- May include additional data, such as address or telephone number, title, etc.

Example of a Routine Message

ARL Texts

- Common message texts designated by a code to speed transmission of traffic

Example:

- ARL One = “Everyone safe here please don’t worry”
- ARL numbers are always spelled out

ARL Numbered Radiograms

Routine Message with ARL Numbers
**DWI Message Form**

**Disaster Welfare Messages**
- It is better to *give* than to *receive*
- ECs should prepare packets of disaster welfare message forms for use at Red Cross Shelters
- Avoid data programs such as “ARES Data”

**MSP-EMD Flash Report Form**
- Utilized by Emergency Management to notify State of emergency event or disaster.
- Should be brief and concise.
- Should be signed by competent authority.
- May be transmitted via CW, SSB, or data modes.

**Flash Report via data mode**
- Use the following format only if you are certain the message will stay entirely on packet radio or data circuits.
- Format utilizes advantages of these modes in that format is similar to printed document.
Radiotelephone procedures
Effective procedures common to all nets

FSD-218 “Pink Card”

References for Traffic Handling
- Michigan Net Public Service Communications Handbook
- ARRL Public Service Communications Manual
- ARRL Net Directory
- ARRL “Pink Card” FSD-218
- QMN Web Page: www.qsl.net/w8ihx/

General Net Procedures
- Comply immediately with directions of NCS
- Eliminate unnecessary language or comments
- Use UTC (GMT) time for all NTS operations

Under emergency conditions
- Listen! Listen! Listen!
- Messages should be signed by competent authority whenever possible
- Pay attention to message priority
- Never change message content
ICAO Phonetic Alphabet

- Also known as the “ITU” Phonetic Alphabet.
- All public service communicators should use this phonetic system on a daily basis; make it automatic!

Prowords

- **Affirmative** = Yes (not ROGER)
- **Negative** = No
- **Over** = Go ahead
- **Out/Clear** = Do not respond
- **Say Again** = Repeat
- **I Spell** = Spell phonetically
- **Figures** = Numerals follow

“ROGER”

- Dates back to the “big one,” WW 2
- Means “Received and understood”
- **Does not mean “YES”**

Transmitting Names and difficult words

- **Pronounce Name**
- **Spell Name (phonetically)**
- **Pronounce Name**

**Example:**
Wisniewski  I spell whiskey india sierra
            november india echo whiskey sierra kilo
            india, Wisneiwski

Some Names from the Ann Arbor Michigan Directory

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<tr>
<td>Vanboven</td>
<td>Witkowski</td>
<td>Faletti</td>
<td></td>
</tr>
</tbody>
</table>

Transmitting figures

- Typically telephone numbers, street numbers, and zip codes
- Precede with the proword “Figures”
- Avoid lid procedures such as “numerals”, “number groups”, etc.
**Combination Groups**

- All combination groups (which include both numbers and letters) should be preceded by the phrase “I spell”.
- This includes Amateur Call Signs.
- **Example:** “I spell Whiskey 8 Sierra Charlie Whiskey”

**Transmitting the Message**

- The receiving operator knows the message format.
- Do not precede content with words or phrases such as:
  - “Place of Origin”
  - “Date”
  - “Telephone Number”

**Checking into the Net - Without Traffic -**

_NCS_ This is XYZ Net are there any stations wishing to enter or leave the net over

_QNI_ This is (pause/un-key) WB8SIW no traffic over

_NCS_ Roger WB8SIW no traffic out

**Checking into the Net - With Traffic -**

_NCS_ This is XYZ net are any stations wishing to enter or leave the net over

_QNI_ This is (pause/un-key) WB8SIW

1 Routine Detroit
2 Priority Lansing over

_NCS_ Roger WB8SIW
1 Routine Detroit
2 Priority Lansing

out
Requesting “fills”

- Precede all fill requests with the phrase “Say again”
- Follow with any one of the following:
  - “Word Before ______”
  - “Word After ______”
  - “Group (number)”
  - “From____ To____

Examples

- “Say again word after soon over”
- “Say again group number 13 over”
- “Say again from soon to deliver”

Up to three fill requests can be given at once.

Responding to “Fill” requests

- Repeat the fill request
- Provide missing word or group
- Spell missing words phonetically

Example

“Say again word after Megan over”

“I say again word after Megan; Gilge, I spell Gulf, India, Lima, Gulf, Echo, Gilge over”

Acting as Net Control Station

- Be polite but firm
- Remind participating stations of net rules as often as necessary
- Break into net to maintain order or aid the functioning of the net
- Keep a running record of net activity
- Think before transmitting

Drill

In this part of the program, we will practice transmitting some NTS messages
### File Net Report with NM

- **QNS**
- **Traffic Handled**
- **Time in Session**
  - 221 R WB8SIW 22 ALLEGAN MI APR 30 K8AE
  - QMN/E APR 30 X QNS SIW/NCS RTN WX8Y SB AE UN PI BDL OUO NX8S X TFC 12 TIME 20 X 73
  - JIM WB8SIW

### MICHIGAN NTS Radiotelephone NETS

**Michigan Traffic Net (MITN)** 3952 Khz  
7:00 PM Daily  
6:45 PM Daily (during winter)

**Upper Peninsula Net (UPN)** 3921 Khz  
4:00 PM Daily  
12:00 PM Sunday

### GLETN (Great Lakes Emg/Tfc) 3932 Khz
8:00 PM Daily

### MACS 3953 Khz
11:00 AM Daily  
1:00 PM Sunday

### SEMTN 145.330 Mhz (-600 Khz)
10:15 PM Daily

### Michigan NTS Radiotelegraph Nets

- **QMN-Early** 6:30 PM  
  - 3663 kHz (primary)  
  - 7068 kHz (alternate)
- **QMN-Late** 10:00 PM  
  - 3663 kHz (primary)  
  - 1812 kHz (alternate)

### QMN Packet Radio Network

- 145.760 MHz 1200 baud
- Frequency voluntarily reserved for public service communications only.
- High-profile digipeaters provide wide coverage.
- KA-Nodes available
- See QMN Web Page: [www.qsl.net/w8ihx/](http://www.qsl.net/w8ihx/)
QMN PBBS Facilities

- Detroit:  W8IHX-1
- Allegan:  W8IHX-8

A variety of served agencies maintain terminals on the network, including the SEOC, NWS, American Red Cross, etc.

QMN Pactor Network

- 7072.5 kHz (reference)  W8IHX
- 3636.0 kHz (reference)  K8QMN

Gateways to VHF Packet Net
- 24-hour / emergency power / hardened

Michigan Calling & Emergency Frequencies

- Radiotelephone:
  - 3932 kHz (evening / night)
  - 7232 kHz (day)

- Radiotelegraph:
  - 3663 kHz (evening / night)
  - 7068 kHz (day)

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