



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



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



Radiotelephone

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



Radiotelegraph

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



Digital 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



THE AMERICAN RADIO RELAY LEAGUE									
RADIOGRAM									
VIA AMATEUR RADIO									
1	R	WB1HX	20	WESTLAND	MI				MAY 1
JOSEPH P. HANN 229 MAIN ST. JACKSON, MI. 48506 517-555-1234					THIS RADIO MESSAGE WAS RECEIVED AT STATION TIME DATE				
MESSAGE SERIAL NUMBERS SHOULD BEGIN WITH THE BEGINNING OF THE YEAR OR MONTH. THE MESSAGE SHOULD BE RECEIVED AT THE STATION OF THE RECIPIENT. THE MESSAGE SHOULD BE RECEIVED AT THE STATION OF THE RECIPIENT. THE MESSAGE SHOULD BE RECEIVED AT THE STATION OF THE RECIPIENT.									
J. WHITNEY									
RECD					SENT				

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.



THE AMERICAN RADIO RELAY LEAGUE									
RADIOGRAM									
VIA AMATEUR RADIO									
2	R	WB1HX	23	ALLEGAN	MI				MAY 2
TO: K5QMN					THIS RADIO MESSAGE WAS RECEIVED AT STATION TIME DATE				
THERE ARE FOUR PRECEDENCES DEFINING THE IMPORTANCE OF THE MESSAGE. THEY ARE IN ORDER OF IMPORTANCE: EMERGENCY, PRIORITY, WELFARE, ROUTINE.									
W8891w									
RECD					SENT				

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



THE AMERICAN RADIO RELAY LEAGUE
RADIOGRAM
VIA AMATEUR RADIO

TO: 5 P W9REOC 25 LANSING MI MAY 5
JIM WADES W9B31V
P.O. BOX 19822
KALAMAZOO MI 49019
616-673-8845

THE CHECK IS A COUNT
OF THE NUMBER OF WORDS
OR GROUPS IN THE TEXT
COMBINATIONS SUCH AS F00210 OR
49019 COUNT AS ONE WORD

RECD: Roder Edwards W9WJV SENT

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



THE AMERICAN RADIO RELAY LEAGUE
RADIOGRAM
VIA AMATEUR RADIO

TO: 6 R G W9ZZ 16 HIGHLAND PARK MI MAY 6
JEFF MEYER
3485B HUNTERS RD
FARMINGTON HILLS MI 48024
313-477-3957

THE PLACE OF ORIGIN IS
THE LOCATION OF THE INDIVIDUAL
OR AGENCY WHOSE NAME APPEARS
IN THE SIGNATURE

RECD: Clyde Darr W9ZZ SENT

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



THE AMERICAN RADIO RELAY LEAGUE
RADIOGRAM
VIA AMATEUR RADIO

TO: 7 R W911C 14 ELKHART IN 2230 Z MAY 7
KATHY GSTERMAN
AMERICAN RED CROSS
2330 PACKARD RD.
ANN ARBOR MI 48104
734-971-5500

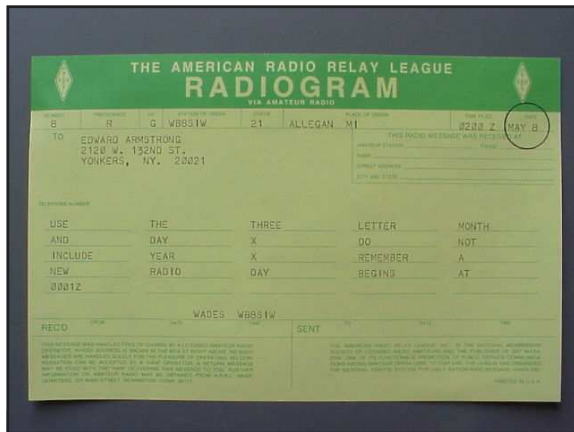
THE TIME OF ORIGIN IS
OPTIONAL X IT IS ALWAYS
EXPRESSED IN UTC/GMT TIME

RECD: SENT

Date of Origin

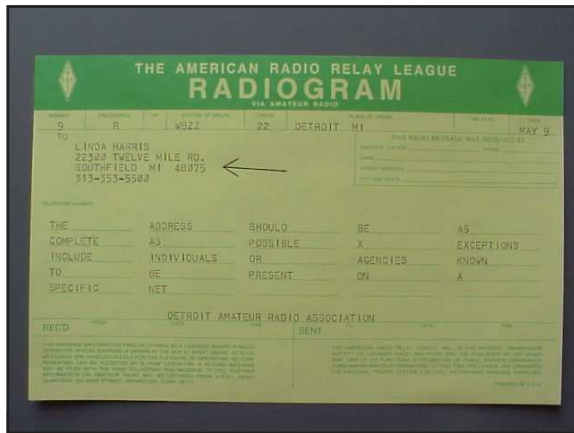
- ☞ Always expressed as a three-letter month and day
- ☞ Example: "Jun 10" or "Jul 4"
- ☞ Must reflect date in UTC (e.g. new day starts at 7 PM EST or 6 PM CST)





Address

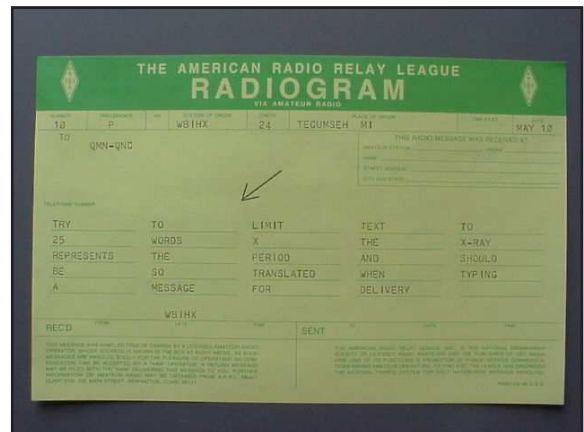
- ☞ Should be as complete as possible
- ☞ Include telephone number
- ☞ In some cases, it may be abbreviated
 - ◆ When an agency has a direct liaison on air:
 - “NWS-DTX” for National Weather Service
 - “MSP-EMD” for Michigan State Police EOC
 - ◆ When addressed to a radio amateur active on a net



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



ARRL 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**



ARRL 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.

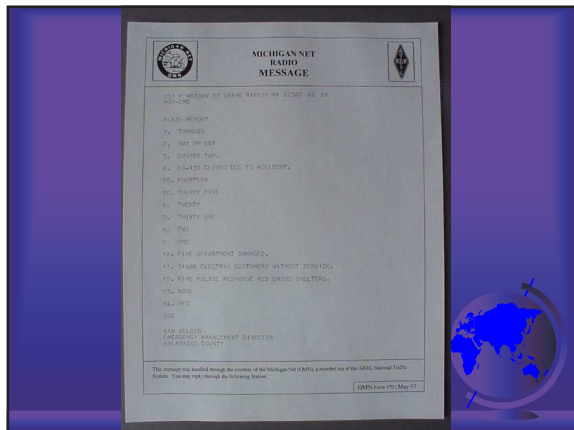




Flash Report via data mode

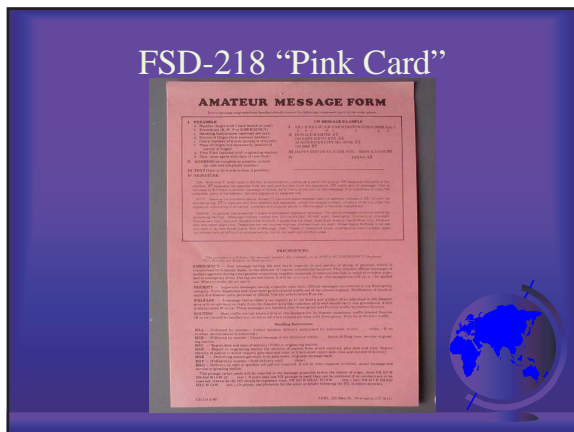
- Use the following format only if you are certain the message will stay entirely on packet radio or data circuits.
- Format utilizes advantages of these modes in that format is similar to printed document.





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/



Radiotelephone procedures

Effective procedures common to all nets

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, Wisniewski



Some Names from the Ann Arbor Michigan Directory

Aljassar	Allan	Allen
Burnstein	Corson	Dempsey
Glovinsky	Gmytrasiewicz	Harmon
Jaworski	Lkeiman	Lamb
Jenkins	Nichols	Powell
Qiao	Regan	Takao
Vanboven	Witkowski	Faletti



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”



- ☞ Do precede handling instructions with the letters HX (e.g. HXA, HXC, etc)
- ☞ Always give the handling instruction using phonetic alphabet



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 the 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”



Drill

In this part of the program, we will practice transmitting some NTS messages

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



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 O/U 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 3663 kHz (primary)
6:30 PM 7068 kHz (alternate)

☞ QMN-Late 3663 kHz (primary)
10:00 PM 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/



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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