



Tropical Storm Network Standard Operating Guidelines

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Tropical Storm Network Standard Operating Guidelines

Preface:

Tropical weather events regularly impact a large portion of the United States and Canada. Tropical storms can develop into hurricanes, major winter storms, which propagate up the Eastern Seaboard of North America, major flooding disasters or other significant meteorological events.

In addition to preparing for communications outages, Radio Relay International networks are available to provide supplemental interoperability between served agencies, facilitate the delivery of overflow message traffic from commercial or government networks or collect weather data or situation reports during a major event. Situation reports may include reports of widespread utility disruptions, highway closures, evacuations, significant damage to communities and related information of interest to emergency response and relief agencies.

I Why use RRI?

In recent years, the density and reliability of government and commercial telecommunications infrastructure has improved dramatically. However, outages and even widespread isolation of communities have occurred. Therefore, it is important to not only exercise our survivable networks, which operate without infrastructure, but to also stage our resources to ensure operational readiness. While it may be tempting to utilize the Internet or cellular mobile networks to originate weather data or situation reports to served agencies, these latter actions do nothing to exercise networks or stage survivable resources so that they may perform effectively in the event they are needed. Therefore, RRI encourages all radio amateurs to utilize our networks to facilitate such public service activities. We will then be staged for rapid response when "all else fails."

II Tier One Response:

During the period leading up to impact, RRI members are asked to report weather conditions on an hourly basis and situation reports (SITREPS) as needed for use by served agencies. This "ground truth" information will be utilized to better understand the extent of storm effects and improve initial response during the early phases of any potential disaster. RRI members are cautioned to avoid emulating "broadcast techniques" such as those often heard on the wide-coverage 20-meter radiotelephone nets during which radio amateurs replicate information commonly available via broadcast media. In other words, *the emphasis should be on collecting information in the field and conveying that information TO the appropriate served agency.*

The following guidelines are intended to ensure a high level of quality control and consistency in the reporting process. A standard message format ensures that information is conveyed accurately. It also ensures that data is easily harvested and consolidated by served agency personnel.

A Weather_Data:

Real-time weather reports transmitted from locations within the affected area may be requested. The reporting interval or schedule will be specified in the activation protocol based on the intensity of the event. Upon activation, there are two thresholds, which should trigger the transmission of a weather report. These are:

- Rainfall exceeding one inch per hour or storm total precipitation greater than or equal to three inches.
- Sustained winds exceeding 30-mph and/or gusts of greater than or equal to 40 mph.

A complete weather report will consist of the following:

1. Storm total rainfall measured to the nearest 100th of an inch.
2. Measured wind speed and maximum gusts observed within 30 minutes of observation (if available).
3. Barometric pressure (submit only if barometer is calibrated and adjusted to mean sea level).

Message Format:

Radiogram format provides the necessary accountability and network management information required for this task. An example of a weather report in radiogram format might be:

**22 P W4ABC 8 MYRTLE BEACH SC 1300Z OCT 5
NWS-LTX**

HORRY COUNTY RAIN 6R50 WIND 47/65 PRESSURE 29R34

**WILLIAMS
FIRE CHIEF**

Explanation of above:

1. The message serial number is assigned by the originating station for administrative purposes.
2. Message precedence is "priority"
3. Station of origin is "W4ABC"
4. Group count (check) is "8"
5. The city (or township) in which the observation was made is "Myrtle Beach, SC"
6. The observation was made at 1300Z on October 5 (remember the new radio day starts at 0001Z)
7. The observation was made within the NWS-LTX County Warning Area (CWA) and is therefore addressed to that NWS office. However, such traffic may be routed via the National Hurricane Center (NHC) when appropriate.
8. Myrtle Beach is located in "Horry County."
9. Rainfall total is 6.50 inches, sustained winds are at 47 mph with gusts to 65 mph measured, and barometric pressure is 29.34 inches. The "R" is used to represent the decimal point.
10. The information was provided by the Fire Chief ("Williams"). It could have been provided directly by the radio amateur himself, a nearby weather observer, or another individual providing the weather data. Regardless of source, the last name (and title, if appropriate) of the actual observer should appear in the signature.

When submitting a weather report, please observe these guidelines:

- Messages containing any one element are acceptable. For example, if one's observational capabilities are limited only to rainfall measurements, then the message text can be limited to a report of storm total precipitation accumulated since the start of the reporting period (to be specified).
- If barometric pressure is to be provided, be sure to calibrate your barometer BEFORE the storm arrives. This can be done by referencing official barometer readings from nearby locations and interpolating as required. Calibration is best done during settled/stable conditions with a shallow pressure gradient.
- Even if the Internet is available, please use RF-only methods. The purpose is two-fold. First, we want to activate networks and establish connectivity in order to facilitate the transition into operational messaging should the need arise. Likewise, please keep in mind that local APRS, VoIP nodes and ISP connectivity may fail during a major storm.
- Please follow the above example message format and sequence as closely as possible. This makes logging and data transfer easier for all involved.

B Situation Reports (SITREPS):

RRI and other EMCOMM members are encouraged to report significant storm damage, disruptions to infrastructure, significant flooding, levy breaches and the like. In order of priority, this information will originate from:

- *Emergency Services Personnel:* This includes information provided by the local EOC, fire service, department of public works or similar responsible agencies/individuals.
- *First-hand observations:* In this case, the radio amateur reporting an observed event should exercise discretion. For example, a flooded basement would not meet the reporting threshold, but a river above flood stage, which is inundating a community or blocking a highway, may be significant. Likewise, one tree uprooted may not meet the reporting threshold, but a large area of heathy, large trees uprooted and/or blocking roadways or rail networks may be significant.
- *Vetted third-party observations:* Observations meeting the above criteria from known reliable sources or cooperating organizations are acceptable. Examples include other EMCOMM groups, CERTs, relief agency personnel, etc.

An example of a SITREP report might be:

**23 P W4ABC 31 MYRTLE BEACH SC 2130Z OCT 5
FEMA
NWS-LTX**

**SITREP HORRY COUNTY X STATE HIGHWAY 23 IMPASSIBLE BETWEEN ROUTE
10 AND US HIGHWAY 51 DUE TO WASHOUT X SAINT
JAMES HOSPITAL EVACUATED DUE TO FLOODING X FIRE STATION THREE
EVACUATED**

**WENDEL WILLKE
HORRY COUNTY EMERGENCY MANAGER**

Explanation of Above:

1. Message serial number is 23
2. Message precedence is "priority"
3. Group count (check) is 31 groups/words
4. Message drafted and presented for transmission at 2130Z on October 5
5. Message addressed to **both** FEMA and NWS
6. Brief, concise summary of recent events beginning with the phrase "SITREP"
7. Official source identified and accountable for content
8. Note: "FEMA" may serve as a generic term for distribution to multiple emergency services organizations.

When originating a SITREP, please follow these guidelines:

- Avoid hearsay. Confirm any third-party reports with the source before originating a message to FEMA and/or NHC. The preferred source of information will be via reliable organizations and vetted individuals at the local level.
- If the report is in response to a first-hand observation, ensure that the event being reported is significant enough to warrant attention. Report significant flooding, damaged/destroyed or blocked roads, widespread damaged or inoperative infrastructure, evacuations, disruption to critical services (hospitals, fire, police), etc.
- Be brief and concise. Avoid abbreviations. Instead, spell out all but the most obvious acronyms or abbreviations. Limit punctuation to the "x-ray" for "period"
- Try to build a relationship in advance with local agencies to collect and forward this information when necessary.
- Again; **use RF.** The idea is to not only provide a good quality, accurate data set, but also activate and exercise the network during this preliminary process so it can quickly and seamlessly transition into operational message traffic duties.

III Tropical Events other than Hurricane

A Winter Storms - Snow

As stated in the preface, tropical events often exhibit other effects. Examples include tropical depressions, which transition into major winter storms impacting utility services and transportation networks across wide areas of the Eastern Seaboard. In other cases, tropical depressions may stall or propagate slowly, thereby causing significant flooding events. In such cases, served agencies may request activation of our network to collect "ground truth" information or SITREPs.

In the event of non-hurricane events, such as a major winter storm, the weather data format is essentially identical. However, certain terminology changes pertaining to precipitation type may be necessary. In addition, snowfall events require a mean (average) value; the procedure for determining this being covered in a latter portion of this document.

Sample message indicating Snowfall amount:

**22 P W2ABC 8 PERTY AMBOY NJ 1300Z OCT 5
NWS-PHI**

MIDDLESEX COUNTY SNOW 6R50 WIND 47/65 PRESSURE 29R34

STEVENSON

One will note that the precipitation type is changed to "snow." Snow is typically measured to one tenth of an inch. However, an accuracy level to one quarter inch is acceptable. RRI volunteers are encouraged to melt precipitation to determine liquid equivalent (equivalent in liquid precipitation). The same message with liquid equivalent might be as follows:

**22 P W2ABC 10 PERTH AMBOY NJ 1300Z OCT 5
NWS-LTX**

MIDDLESEX COUNTY SNOW 6R50 LIQUID 0R73 WIND 47/65 PRESSURE 29R34

STEVENSON

Here are the basic rules for snowfall reports:

1. The snowfall amount should reflect the total snowfall from the current storm.
2. Note that the R represents the decimal point in the amounts. This is copied/presented as a decimal point when formatting a report for delivery/transfer to a served agency (i.e. 6.50 inches; 0.73 inches; 29.34 inches Hg)
3. Snowfall observations should be based on an average if possible. For example, take three to five measurements across a yard or grassy area and then determine the average of these measurements.

4. Snowfall measurements are best taken in areas that are protected from drifting by low shrubs, fences, hedge rows and other obstructions, which break up wind patterns. Avoid areas close to roofs and walls, which tend to be impacted by drifts.

B Winter Storms – Mixed Precipitation

Situations may arise in which an observer experiences both rain and snow. In such cases, it may be best to use the term “MIXED” *combined* with a liquid equivalent value. In other words; “MIXED 2.30 LIQUID 0.60...” For example:

**22 P W3ABC 10 MYRTLE BEACH SC 1300Z OCT 5
NWS-LTX**

HORRY COUNTY MIXED 2R30 LIQUID 060 WIND 47/65 PRESSURE 29R34

STEVENSON

C Winter Storms - Ice Storms

In the case of ice storms, the combination of ice accumulation and wind speed information is of significant interest to emergency management because it indicates the potential for widespread damage to utility infrastructure.

Ice accumulation is often best measured on wires, tree branches or other objects. However, be certain to measure the *radius* of the ice accumulation on such objects and not the diameter. One quarter inch or greater accumulation is the reporting threshold for ice accumulation.

An example of an ice storm report might be:

**22 P W8ABC 6 MATEWAN, WV 1300Z DEC 5
NWS-RIX**

MINGO COUNTY ICE 1R50 WIND 15/20

STEVENSON

Explanation:

1. The observation occurred in Matewan, WV.
2. Matewan, WV is in the Charleston, WV National Weather Service CWA (NWS-RIX)
3. Matewan, WV is in Mingo County, WV.
4. Current ice accumulation from the storm is 1.50 inches.
5. Average wind speed is 15 mph, gusting to 20.
6. The observer did not report barometric pressure. While he/she is at liberty to include pressure, it is typically not as critical during these weather events. In all cases, pressure is optional.

IV Network and liaison structure:

This radiogram traffic may be originated via any one of the following methods:

- Section and/or local traffic nets using digital, radiotelephone or radiotelegraph modes may be activated to collect weather data and SITREPs from the field. A liaison station will then be assigned to transfer message traffic to one of the assigned RRI IATN liaison stations, who will be responsible for collecting the reports and delivering them to the appropriate agency. The default RRI frequency/mode matrix is included with these SOGs.
- If an observer does not have access to an operational section net, either within his section of an adjacent section, he may inject his report directly into the RRI IATN circuits specified in the frequency/mode matrix.
- Be sure to check the latest RRI bulletins for the specific operational frequencies and networks. Generally, the following bands are assigned for this purpose:

Daytime: 20, 40 and 30 meters

Nighttime: 80, 40 and 30 meters

- A specially assigned key station will be assigned to receive reports originated via DTN (*RRI Digital Traffic Net*). More than one key station may be assigned, with the duty roster being sequenced by schedule. The address of this key station may change depending upon the duty roster, so be certain to check the latest RRI bulletins. Please note that DTN routes by zip-code. The zip code provided for message routing may be OTHER THAN that of the agency to which the message is addressed.

Again, please note that if the primary target for a given time-period is unavailable, message traffic may be transmitted to one of the alternates, regardless of time-period.

- When originating reports via the manual-mode IATN watch-frequencies, please use the following methods to request assistance or list message traffic:

Radiotelegraph: "CQ RRI QTC ____ (indicate number of messages and precedence in file)"

Radiotelephone: "CQ RRI"

Please note that some frequency flexibility may be necessary. The station maintaining the radio watch is encouraged to periodically transmit a net call, particularly if he has moved from the published QSX frequency to avoid interference. For example, a CW operator might transmit "QSX RRI de WOABC K"

V Tier Two Response: Operational Support

At any point, the tier one reporting operation may transition into a support operation. Priority will be given to any operational message traffic. When a circuit/net is not being utilized for priority reports or priority operational messages, it may be utilized for welfare message traffic per usual RRI policy.

During the initial 72-hours after land-fall, the origination of disaster welfare inquiries originating *outside* the disaster area and addressed to individuals within the affected area are discouraged. However, when circuit capacity is available and priority traffic has been cleared, welfare messages originating from within the affected area to points throughout the United States and Canada may be originated.

VI Individual Preparedness

RRI members should prepare now for emergency operations. This includes:

- Prepare and test generators and other standby power sources.
- Ensure adequate message forms are on hand.
- Familiarize oneself with disciplined, structured net procedures.
- Establish contact with one's emergency communications coordinator (as appropriate)
- Ensure weather instruments are calibrated and secure.

VII Bulletins:

E-mail broadcasts to RRI leadership and members will announce when operations will commence and areas from which weather data and SITREPs are requested. If for some reason the storm weakens significantly or does not make landfall, the operation can be cancelled.

Net Managers should issue concise bulletins using "QNC" techniques when appropriate. The "QNC" will indicate mission status and provide additional guidance, particularly at the local and section level.

VIII Key Stations and Others Delivering Messages:

- Radiograms delivered in print (e-mail, FAX, etc.) should display in all capitals when practical. All other message content such as notes, contact information and so forth may be in mixed case.
- When delivering message traffic via FAX or e-mail, please insert three blank lines between each radiogram listed. Type either five or ten words to a line for message traffic transcribed using a word processor or "mill," or five words to a line for message traffic transcribed by hand. Typewritten or word processor methods are preferred for such delivery methods to ensure readability.
- All traffic delivered should be reviewed and checked for completeness.
- All message deliveries should be prefaced with, or otherwise indicate that the reports were received via Radio Relay International.
- All message deliveries should include contact information for the delivering station when appropriate.

IX Records and Reports:

Net/Node Managers and those stations clearing traffic via one of the "watch frequencies" should file an after-action report with the following station:

WB8SIW: james.wades@radio-relay.org

The report should indicate the total number of messages of each precedence handled during the operation. An example of such a report might be:

**24 R W2ABC 10 PERTH AMBOY NJ OCT 12
WB8SIW
MARION IL 62959
269-650-0215**

HURRICANE CAMILLE REPORT X EMERGENCY 0 PRIORITY 25 WELFARE 7

JOE SMITH W2ABC

The Radio Relay International North American Response Plan Mode/Frequency Matrix is attached. Please note that DTN (digital) operations will require routing messages to one or more specific "key stations" depending upon time of day. These target stations will be identified in operational bulletins.

IMPORTANT NOTICE: Section Nets are encouraged to collect reports, which may be forwarded by a manual mode liaison station or DTS using the RRI frequencies/nodes specified in the frequency/mode matrix provided in Appendix A. In the absence of an active or functioning section network, individual RRI or EMCOMM stations may inject traffic directly into the RRI system.

All RRI members and other interested EMCOMM operators are encouraged to support this operation. We thank you in advance for your assistance and interest in the Radio Relay International program.

Manual Mode Matrix (radiotelegraph/radiotelephone)

Radio Relay International NRP Matrix						4 Oct 2016
Primary frequencies and access points to DTN highlighted in Yellow						
DTN frequency application RMS						
TCC Primay QSX frequency and time period						
IATN Mode/Frequencies		DOCUMENT CONFIDENTIAL – DO NOT PUBLISH – INTERNAL RRI USE ONLY!				
<u>Designator</u>	<u>kHz</u>	<u>Mode</u>	<u>Watch</u>		<u>Primary Time Periods</u>	<u>Notes</u>
NAA	3563	CW	NIGHT			
NAB	3845	SSB	NIGHT			
NBA	7115	CW	NIGHT			
NBB	7232	SSB	NIGHT			
NCA	10115	CW	24 HOURS			
NDA	14115	CW		DAY		
NDB	14345	SSB		DAY		
NFA	21115	CW		DAY		
NFB	21345	SSB		DAY		
<u>Notes:</u>	1. See IATN Duty Roster for further details					
	2. All frequencies are +/- 5 kHz to accommodate other					
	3. Liaisons please call "QSX RRI de (call sign) periodically					
	4. QSX maintained through watch period when specified					

Digital Traffic Net Frequency/Mode Matrix

<u>DTN SCAN/ALE FREQUENCIES</u>					
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RRIW DTN MBO							
<u>Designator</u>	<u>QRG</u>					<u>Location</u>	<u>Notes</u>
W5KAV	3587	3591	3597			Rochester, WA	9. Western Area Hub
	7100.4	7102.4	7104.4				
	10144	10145.9					
	14095.9	14097.9	14104.9	14113.9			
	18103	18108.4					
WS6P	3591.9	3593.9				West Point, CA	10. RN6 Digital Hub
	7102.4	7104.4					
	14112.4	14113.9					
K6HTN	7065.9	7102.4				Pasadena, CA	DTS
K7EAJ	3587					Hillsboro, OR	DTS
AC7AI	3587					Montesano, WA	DTS
VE7GN	3571.5	3587	3591.9	3593.9	3593	Babriolo, BC. Canada	RN7 Hub
	3597	3615					Primary Entry Point
	7065.4	7065.9	7091	7104.4	7100.4		
	7102.4						
	14064	14113.9					
KA7HRC	3587					Mount Hood, OR	11. Hood River Co. ARES
W7ARC	3587					Lynnwood, WA	
AG6QO	3586.5	3591.9				Winters, CA	DTS
	7103						12. Note VHF access
	14107.9						13. AG6QO-1 RRI & BBS traffic
	144.37						AG6QO-2 for BPQ chat
							AG6QO-10 WinLink gateway
							14. Liaison Yolo Co. ARES
N7JJ	3587					Shoreline, WA	DTS
WB6OTS	3587	3590.5	3597			Sierra Vista, AZ	15. Alt. Western Area Hub
	7094.9	7100.4	7102.4	7104.4			
	10144						
	14098.9	14105	14108.4	14110.4			

RRIW DTN MBO						
Designator	QRG				Location	Note
KC7ZZ	3591.9				Tuscon, AZ	DTS
	7102.4					
KC5ZGG	3591.9				Yuma, AZ	DTS
	7102.4					
KF7PVD	3591.9				Beaverton, OR	DTS
	7102.4					
W7JSW	3591.9				Scottsdale, AZ	DTS
	7102.4					
K7FLI	3591.9				Sahuarita, AZ	DTS
	7102.4					
K0TER	3591.9				Colorado Springs,	DTS
	7102.4					
	14113.9					
N5HC	3591.9				Rio Rancho, NM	DTS
	7102.4					
N7IE	3591.9				Layton, UT	DTS
	7102.4					
	10142.9					
	14113.9					
N7JCO	3591.9				Clinton, UT	DTS
	7102.4					
	14113.9					
NS7K	3587	3591.87			Clearfield, UT	DTS
	7095.77	7101.27	7103.25			
	10147					
	14114.75					

RRIC DTN MBO								
Designator	QRG					Location	Notes	
W5SEG	3589	3591				Segiun, TX		
	7091.5	7098.5						
	10143	10145						
	14111.5	14112.4						
WB9FHP	3591	3591.9	3593.9			Paoli, IN		
	7091.4	7100.4	7102.4					
	10140.9	10141.9	10142.9					
	14095.9	14097.9	14104.9	14112.4	14113.9			
	18108.4							
	21093.4							
KMOR	3591.9	3593.9				Columbia, MO		
	7100.4	7102.4	10140.9	10142.9				
	14097.9	14109.9	14112.4	14113.9				

RRIE DTN MBO							
Designator	QRG					Location	Notes
WB2FTX	3591.9	3593.9				Butler, NJ	RRIE DIGITAL HUB, 3RN backup
	7091.4	7094.9	7100.4	7102.4			
	10140.9	10142.9					
	14095.9						
KW1U	3591.9	3593.9				Concord, MA	RRIE backup
	7091.5	7100.4					
	10140.9						
	14097.9	14112.4					
	21093.4						
WA4ZXV	3591.9	3593.9				Norcross, GA	
	7100.4	7102.4					
	10140.9	10142.9					
	14097.9	14112.4					
	21093.4						
W4DNA	3591.9	3593.9				Goldsboro, NC	
	7100.4	7102.4					
	10140.9	10142.9					
	14095.9	14097.9					
W3JY	3591.9	3593.9				Malvern, PA	3RN DIGITAL HUB
	7091.4	7102.4					
	10142.9						
	14112.4						
N3OS	3591.9					Dade City, FL	
	7100.4						
	10140.9						
	14112.4						
	18102.4						
	21093.4						