U.S. Department of Homeland Security
500 C Street, S.W. Mail Stop 3172
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FEMA

September 27, 2016

SENT VIA EMAIL TO: john@greenewald.com

John Greenewald
[redacted]

Re: **FEMA 2015-FEFO-00289**

Dear Mr. Greenewald:

This is the final response to your Freedom of Information Act (FOIA) request to the Department of Homeland Security (DHS)/Federal Emergency Management Agency (FEMA), dated February 27, 2015, and received by this office on March 02, 2015. You requested a copy of records, electronic or otherwise, of all manuals, procedure books and instructions for the FEMA National Radio System (FNARS).

We conducted a comprehensive search of FEMA's Office of Response and Recovery (ORR), Office of External Affairs (EA), National Continuity Programs (NCP), and Region VII for documents responsive to your request. The search produced a total of 51 pages. After carefully reviewing the responsive documents pursuant to the FOIA, 5 U.S.C. §552, we have determined the documents are appropriate for release. They are enclosed in their entirety; no deletions or exemptions have been claimed.

If you deem this advisement an adverse determination, you may exercise your appeal rights. Should you wish to do so, you must send your appeal and a copy of this letter, within 60 days of the date of this letter, to: Associate General Counsel (General Law), U.S. Department of Homeland Security, Washington, D.C. 20528, following the procedures outlined in the DHS FOIA regulations at 6 C.F.R. § 5.9. Your envelope and letter should be marked "FOIA Appeal." Copies of the FOIA and DHS regulations are available at www.dhs.gov/foia.

Provisions of the FOIA allow us to recover part of the cost of complying with your request. In this instance, because the cost is below the $14 minimum, there is no charge. 6 C.F.R. §5.11(d)(4).

If you have any questions or would like to discuss this matter, you may contact FEMA at (202) 646-3323 and please reference the subsequent case identifier: **FEMA 2015-FEFO-00289.**

Sincerely,

Eric Neuschaefer

Eric Neuschaefer
FOIA Program Specialist

Enclosure: Responsive Documents (51 pages)

FEMA National Radio System Operators' Quick Guide

August 2015

Date	Version	Approvers	Description
6/30/2011	1.0	Tom Cross	First version of the *Quick Guide*
5/18/2012	2.0	Neil Diaz	Inclusion of phone patching
6/8/2012	2.1	Neil Diaz	Updates to the instructions
3/26/2013	2.2	Neil Diaz	General updates
3/18/2015	2.3	Mike Bellamy	General updates
8/12/15	2.4	Richard Pimentel/Mary Daughtrey	Formatting and updates to instructions

Preface

This *Quick Guide* provides abridged instructions, distilled from the detailed *Federal Emergency Management Agency (FEMA) National Radio System (FNARS) Operator Guide*. The instructions herein are designed to provide concise directions to prepare for and establish high frequency (HF) communications over automatic link establishment (ALE) and manual links. This quick reference guide is specifically designed to support standard FNARS configuration settings and equipment. For additional information, please contact the FEMA National Continuity Programs (NCP) Helpdesk at FEMA-NCP-COMMS@fema.dhs.gov.

This document is *FOR OFFICIAL USE ONLY* and not to be distributed beyond FEMA Regional Centers (FRCs), FEMA Regional Offices (RO), and state and territory emergency operations centers (EOC).

Table of Contents

Using This Guide

While knowledge of technical specifications and settings is not required, the instructions found in this guide assume high-level familiarity with the following three key FNARS components:

1. JPS Communications RTU-292 Radio/Telephone Interface Unit (RTU)

Connects FNARS with the Public Switched Telephone Network (PSTN)

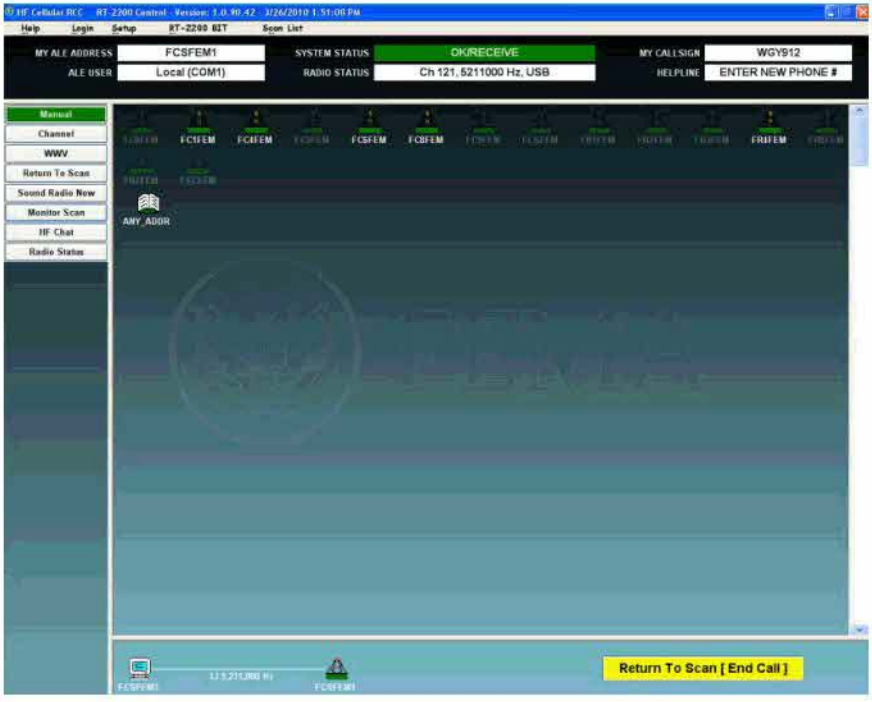
2. Larry McGee 17-95148 Audio Panel

Enables operators to transmit/listen to radio via microphone and speaker

3. Remote Control Console Graphical User Interface

Allows users to interface with electronic devices with images rather than text commands or physical actions. Most of the instructions found in this guide will deal with the remote control console (RCC) graphical user interface (GUI). Note that the instructions in this guide reflect the options and figures available in **USER** mode, which does not require a login. If the **Login** option in the menu bar is replaced with **Logout**, the GUI is in **ADMINISTRATOR** mode.

- To proceed, log out and switch to **USER** mode.



Scanning

Unless sounding or participating in a radio call, all FNARS stations should be in the scanning or listening mode, continuously monitoring for incoming calls. The operator should be familiar with the appropriate scan list for each test or exercise, along with participating stations. If unknown, contact the local FNARS administrator.

- Click on **Scan List**
- Click **Select a Scan List**.

- Select the appropriate scan list from the available options and click **OK**.

- Click **Return to Scan**.

The station will begin to monitor every channel programmed in the selected scan list for incoming calls.

By default, the HF noise is automatically muted until an attempted link is detected.

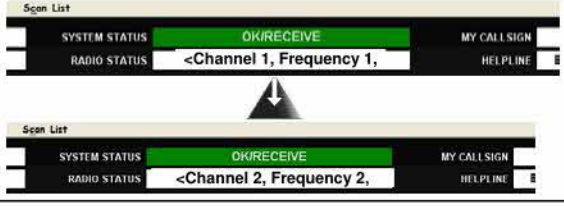
- If you wish to hear the HF noise, click **Monitor Scan**.

Sounding

Radios will automatically sound upon power up and then every 60 to 90 minutes thereafter, on the National Radio Network (NRN). This is to broadcast its presence, to assist other stations in measuring channel quality via link quality analysis (LQA) and determine what frequency(s) to best reach the station. On the Regional Radio Networks (RRN's), state emergency operations centers (EOC's) will not automatically sound and may manually sound if they need to contact Net Control Station (NCS). Stations on either network should manually sound 30 minutes prior to scheduled tests for reasons above. Sounding should be used sparingly as it may disrupt HF calls in progress. To manually sound, perform the following.

- Click **Sound Radio Now** to begin sounding.

The radio will transmit on all channels programmed on the selected Scan List in consecutive order. Transmission activity will appear in **System Status** and **Radio Status.**



At any point, you may abort sounding and resume scanning by clicking **Return to Scan**.

Establishing ALE Links

Unless directed otherwise by the local FNARS contact or Net Control, all FNARS calls should be established using ALE.

- Double-click left on the desired **ALE icon.**

- Monitor the **Call Status Area**:

Initially, the Status will read **CA** (Calling). Once the link has been established, Status will read **L1** (Linked). An alert will sound signifying a successful link is currently active.

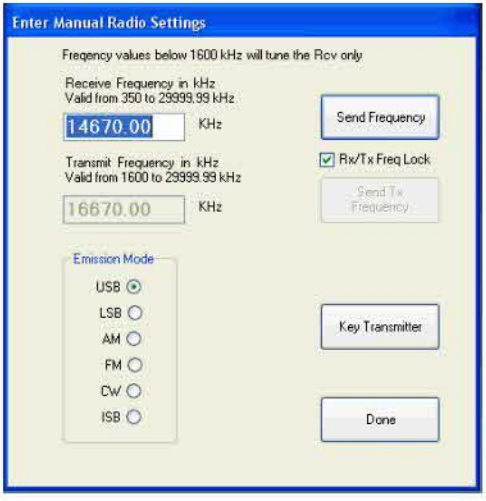
- Begin conducting your call via the established HF ALE link. Refer to the CONDUCTING CALLS section of this manual for more information.

Establishing Manual Links

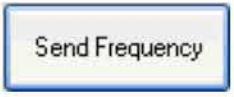
If ALE is unavailable, FNARS calls may be established by manually selecting a mutual frequency between participating stations.

- Pre-select a set of frequencies and a preferred emission mode, typically Upper Sideband (USB).
- Click **Manual** to establish an HF link.

- Enter frequency in the **KHz** box, and select the appropriate **Emission Mode**.
- Check the **Rx/Tx Freq Lock** box for Normal Operation



- Click **Send Frequency.** If the selected frequency is below the acceptable volume level, repeat steps 2 and 3 with a different frequency.



- Begin your call. Refer to the CONDUCTING CALLS section of this manual for further information.

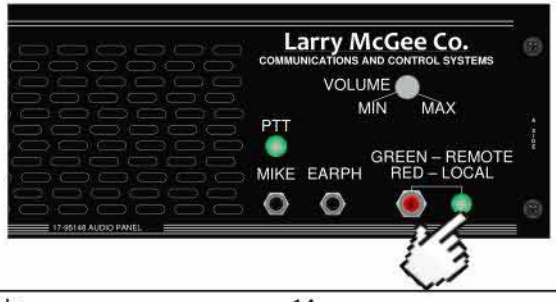
Conducting Calls

Once a link has been established, operators have various end-user transmit/receive options. This section covers those options, as well as how to adjust volume and toggle between handset and speaker.

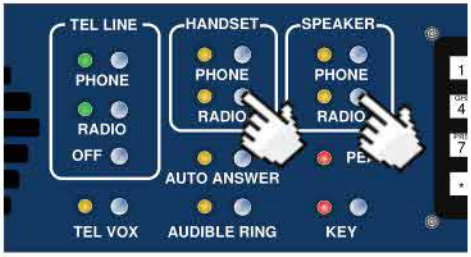
The operator has two equipment options when transmitting voice to the distant station: the Larry McGee Audio Panel or the Rockwell Collins RTU-292 Radio/Telephone Interface Unit. The Audio Panel is the quickest method to transmit radio messages. When available, the Radio/Telephone Interface Unit may be used to patch radio transmissions with telephone recipients.

- Set the Larry McGee Audio Panel to **LOCAL**. The LED light on the bottom right will turn **RED.**
- If the red light does not illuminate, press the **red button** to the left of the LED light to use the attached microphone and foot pedal to transmit voice.

- If the audio panel is unavailable, use the RTU. If the interface unit is connected to an audio panel, set the audio panel to **REMOTE**. The LED light will light **GREEN**.



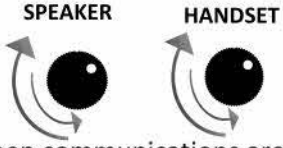
- Press **RADIO** in the Handset box on the RTU to speak via the attached handset.
- Press **RADIO** in the Speaker box to hear incoming transmissions from the built-in speaker.



Once the call connects, a tone sounds and receive audio is heard, communications may begin.

- If using the handset attached to the interface unit, press the button on the interior of the handset to begin transmitting.
- If using the foot pedal connected to the audio panel, step on the pedal to transmit.

Sample transmission scripts may be found on the last page of this guide.



- Adjust the *SPEAKER* and *HANDSET* volume using the dials on the interface as necessary.

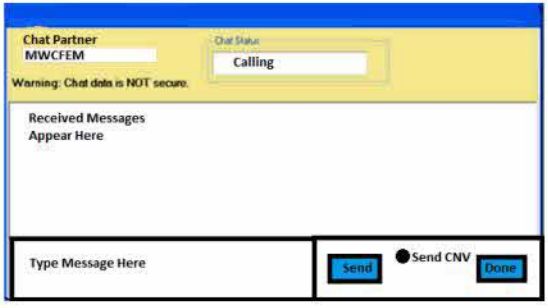
- When communications are complete, click **Return to Scan** to close the HF link.

HF Chat

When a radio call between participating stations provides inaudible voice, HF chat provides an alternative means to communicate.

- Before initiating an HF Chat communication, have the ALE address of the intended recipient available.
- Select **HF Chat.**

- Type message in the bottom left Chat Screen and click **Send**. Received messages will appear in the upper left portion of the screen. Repeat as necessary.



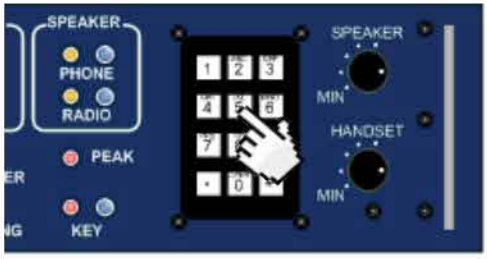
- Click **Done** when finished communicating.

Phone patch

A Phone Patch allows the operator to connect a PSTN line to a radio connection.

- Before initiating a phone patch, have the recipient's telephone number available.
- Establish an active HF radio call before attempting to perform a phone patch.
- Using the RTU-292 radio interface unit, press **PHONE** in the Tel Line box and **PHONE** in the Handset box. If the **RADIO** button in the Handset box is already pressed, press again to turn off.

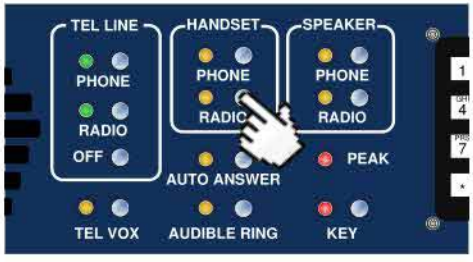
- When you hear a dial tone, enter the phone number of the phone patch recipient on the keypad.



- Adjust the HANDSET volume as necessary using the dials on the interface.

- If an audio panel is located next to the RTU-292, verify the **LOCAL/REMOTE** button is set to **GREEN**. If the light is **RED**, press the **LOCAL/REMOTE** button on the audio panel to switch it to **GREEN**.

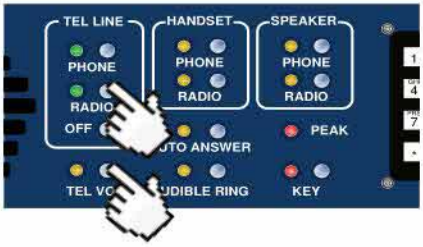
- Press **RADIO** in the Handset box to allow operator voice transmissions to be heard over the Handset.



- Press and hold the button located on the interior of the handset to begin transmitting. Notify both the phone user and the distant-end radio operator to *"Standby for phone patch."*

- Press **RADIO** in the Tel Line box. Wait for the flashing light to turn solid and an audible beep to sound. Press **TEL VOX** below the Tel Line box.

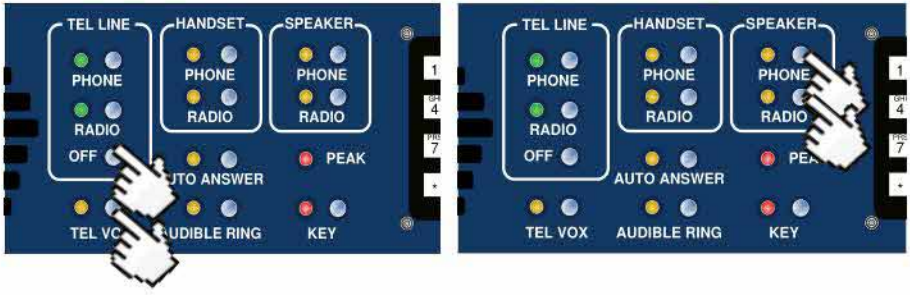
While the RTU-292 processes the connection between phone and radio, the **RADIO** light in the Tel Line box will blink. Once a beep sounds and the light becomes steady, the connection is complete.



- Once the patch is established, notify all parties they may begin voice transmissions.

When communications are complete:

- Press **TEL VOX** in the bottom left corner
- Press **OFF** in the Tel Line box to disconnect and hang up the phone.
- Press **PHONE** and **RADIO** in the Handset box to disengage the handset.



- If an audio panel is available, press the **LOCAL/REMOTE** button to return radio input/output to the audio panel.
- The **LOCAL/REMOTE** light next to the button will change from **GREEN** to **RED**.

- Click **Return to Scan** to terminate the HF link.

Link Quality Analysis

LQA is a measure of the signal quality between two stations. The LQA measurement is collected over time via sounding or when links are established. When initiating ALE calls, the initiating station automatically scans the collected LQA measurements to select the best channel to reach its distant end station.

- Right-click on the desired **ALE Icon**.
- Select **List LQA**

ALE systems use recently-measured radio channel characteristics, or LQA data, stored in a memory matrix. To extract the respective channel, add the corresponding channel numbers, in blue, from the LQA value's row and column. For example, the second column of the fifth row indicates the LQA value of 38 for Channel 42 between the source station and a distant end station, FC1FEM.

CHAN	1	2	3	4	5	6	7	8	9	10
00+	0	0	0	0	0	0	0	0	0	0
10+	0	0	0	0	0	0	0	0	0	0
20+	0	0	0	0	15	0	13	0	0	0
30+	0	0	0	28	0	27	0	0	0	0
40+	0	38	0	0	0	0	0	0	0	0
50+	0	0	0	0	0	0	0	0	0	0
60+	0	0	0	0	0	0	0	0	0	0
70+	0	0	0	0	0	0	0	0	0	0
80+	0	0	0	0	0	0	0	0	0	0
90+	0	0	0	0	0	0	0	0	0	0

The LQA value is an estimated quality of the radio frequency (RF) link between the base station and the distant station for a particular channel. Using these values, ALE stations can select the channel providing the highest LQA value to reach a particular station. LQA values range from 0 to 50, lowest to highest quality: An LQA value of 30 or higher is recommended for optimal quality.

- Click **OK** when complete.

Time Check

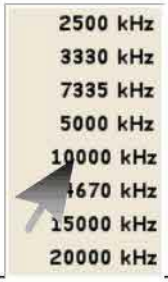
Time check allows operators to quickly assess radio frequency (RF) receiving capability without specialized test equipment. Continuous beacon messages recite the time of day and emit synchronous beeps (or ticks) to verify the time in Coordinated Universal Time (UTC).

- Click on **WWV**.

WWV transmits audio beeps once per second to facilitate accurate manual clock synchronization. A recorded voice announcement occurs at the end of every minute in the following format:

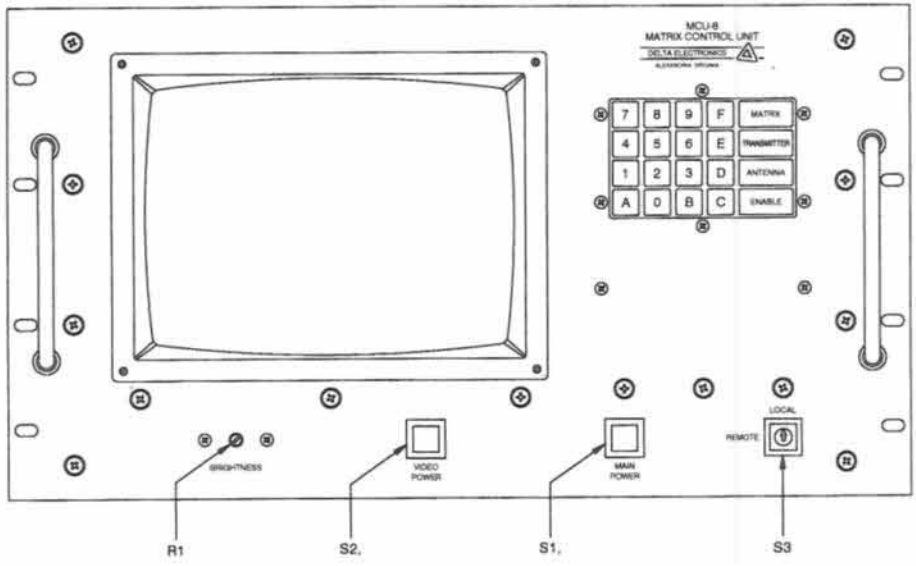
At the tone, X hours, Y minute(s), Coordinated Universal Time.

- Select a frequency from the list that appears. Due to varying propagation correlated with time of day, a wide range of frequencies is provided for validation to ensure a good link.



- Wait to listen to the audio beeps and voice announcements.
- Click **Return to Scan** when complete.

Antenna Matrix



- To change the antenna that the radio (transmitter) connects too, follow this button pattern on the Antenna Matrix:

  Transmitter ## Antenna ## Enable

  For example to change transmitter 01 to antenna 01 press the following key sequence:

  Transmitter 01 Antenna 01 Enable

- To disconnect the radio (transmitter)from any antenna, follow this button pattern on the Antenna Matrix: (this will send the radio to ground (G))

  Transmitter ## Antenna 00 Enable

  For example, to ground transmitter 01 to antenna 00 press the following key sequence:

  Transmitter 01 Antenna 00 Enable

Rotatable Log Periodic (RLP) Antenna Rotation

Manual Tab

Preset Tab

- Using the Antenna Rotation Control Laptop, select or change the direction the antenna is pointing towards by one of two methods:
  - Select a preset, or
  - Change the heading degrees.
- Press the **Turn** button.
- The pointing direction and degrees necessary will depend on your location and the location of the intended receiving system.

References

Operating Rules

The following radio script is intended to serve as an example. It may be modified as needed. However, HF transmissions should be as clear and concise as practicable. A few key operating rules include:

- To avoid interfering with other traffic, **listen** to make certain that a net/frequency is clear before making any transmission;
- **Write** down the text of all messages prior to transmission;
- Always **use** call signs;
- **Begin** each radio transmission by identifying distant end call-sign and your local call sign;
- When necessary, **use** the phonetic alphabet;
- **Ensure** transmissions over radiotelephone are clear and emphasize each word;
- When testing, **begin** and **end** each test session with "This is a test, this is a test";
- **End** each transmission with "over," except at the end of the HF link, which should end with "out"; and
- **Check** signal strength and readability prior to exchanging key messages. See "Strength and Readability" section below.

Strength and Readability

- Check signal strength and readability prior to transmitting any message. Both characteristics may be measured using five standardized descriptive metrics as follows:

Signal		Readability	
Descriptive	Definition	Descriptive	Definition
Loud	Very Strong	Perfectly Readable	Excellent
Good	Strong	Readable	Satisfactory/Good
Weak	Weak	Readable but with difficulty	Marginally good/OK
Very Weak	Very Weak	Readable now and then	Transmission is too weak/ unsatisfactory and the message is intermittent
Fading	Fading signal strength to an extent that continuous reception cannot be relied upon	Unreadable	Scarcely perceptible

Sample Script

Role	Script
Remote Station (Call Sign *WGY903*)	*WGY901, WGY901, this is WGY903. How do you copy? Over.*
Local Station (Call Sign *WGY901*)	*WGY903, this is WGY901. I copy you. How do you read me? Over.*
Remote Station	WGY901, this is WGY903. I copy you. [Message] Over.
Local Station	*WGY901, this is WGY903. Message received. Over.*
Remote Station	*WGY901, this is WGY903. That concludes the message. Out.*

Acronyms/ Meaning

ALE—Automatic Link Establishment

CA—Calling

EOC—Emergency Operations Center

FEMA—Federal Emergency Management Agency

FNARS—FEMA National Radio System

FRC—Federal Regional Center

GUI—Graphical User Interface

HF—High Frequency

L1—Linked/ connected between two stations

LQA—Link Quality Analysis

MWEOC—Mount Weather Emergency Operations Center

NCP—National Continuity Programs

NCS—Network Control Station

NRN—National Radio Network

PSTN—Public Switched Telephone Network

RCC—Rockwell Collins Console

RF—Radio Frequency

RLP—Rotatable Log Periodic

RO—FEMA Regional Office

RRN—Regional Radio Network

RTU—Radio/Telephone interface Unit

TEL—Telephone

USB—Upper Side Band

VOX—Voice Operated Exchange

WWV— Call-Sign for the National Institute of Standards and Technology radio station

FEMA National Radio System Standard Operating Procedures

September 2016

FEMA

For Official Use Only

EXECUTIVE SUMMARY

The Federal Emergency Management Agency's (FEMA) mission is to support our citizens and first responders to ensure that, as a nation, we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards. To effectively collaborate and coordinate the management and implementation of federal and state/territorial government resources and capabilities in accordance with the FEMA mission requires a resilient, survivable communications platform independent from, but interconnected with the normative communications infrastructure.

FEMA's National Continuity Programs Directorate, in accordance with National Security Presidential Directive 51/Homeland Security Presidential Directive 20, *National Continuity Programs*, maintains the FEMA High Frequency Continuity System (FHFCS), a suite of classified and unclassified High Frequency radio communications systems designed to provide resilient communications capabilities across the full spectrum of hazards. The FEMA National Radio System (FNARS) is one element of the FHFCS portfolio, and is supported with commercial-off-the-shelf equipment installed at the Mount Weather Emergency Operations Center (MWEOC), Federal Regional Centers (FRCs), Regional Offices (ROs), the Mobile Emergency Response Support (MERS) detachments, and the Emergency Operations Centers (EOCs) of the 50 states, the District of Columbia, and the U.S. Territories. FNARS provides the FEMA Administrator and Executive Leadership with resilient voice and messaging capabilities for command, control, and communications and Continuity of Operations of FEMA assets and resources, and to communicate, coordinate, and collaborate with Regional Administrators and state/territorial emergency management partners in response to all hazard events.

This Standard Operating Procedures (SOP) document complements the FNARS Concept of Operations document with operational-level information.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

1.1 Purpose

The purpose of this Standard Operating Procedures (SOP) document is to set forth policy and practices for the operation and use of the Federal Emergency Management Agency (FEMA) National Radio System (FNARS).

1.2 Scope

The procedures delineated in this document apply to the FNARS notification process, activation, and operations, at both the national and regional levels.

1.3 Objective(s)

The overarching objective of this SOP is to provide guidance and assistance to all FNARS stakeholders for continuity planning and implementation.

2.0 PROGRAM SUMMARY

2.1 Mission

FEMA requires a resilient, survivable communications platform, independent from, but interconnected with, normal communications for the dual purpose of meeting requirements within FEMA *National Planning Frameworks* core capabilities (public information and warning and operational coordination) and the *National Response Framework* (operational communications and situational assessment).

2.2 System Overview

The FNARS is a nationally-distributed system of high frequency (HF) equipment and capabilities, which serves as a continuity communications channel for FEMA's internal command, control, and communications (C3) traffic, and for external communications and coordination with state and territorial emergency management partners.

FNARS ensures FEMA senior leadership will have external communications in environments of degraded communications infrastructure. FNARS is designed for utilization, either preemptively or reactively, to any event that compromises, or potentially compromises, normal communications infrastructure and operation. The hazards against which FNARS mitigates include the full spectrum of threats to FEMA's continuity, such as:

- Natural disasters (e.g., hurricanes, earthquakes, tornados)
- Terrorist attacks
- Acts of war or civil disorder
- Large-scale communications infrastructure stress or failure (e.g., the 2003 Northeast blackout)
- National Special Security Events

2.3 Operations

2.3.1 Organization

FNARS comprises two network systems ("nets"): the National Radio Network (NRN) and the Regional Radio Networks (RRN).

The NRN is dedicated to maintaining FEMA C3 throughout the United States. FEMA elements, including agency leadership, regional leadership, and Continuity of Operations (COOP) locations, utilize the NRN to maintain positive C3 in degraded communications environments.

The RRNs are dedicated to facilitating communications between FEMA Regional Offices and state/territorial emergency management partners to communicate and coordinate during an all-hazards communications environment. Incidents affecting a limited area of the country may prompt FEMA leadership to activate an RRN. Five Federal Regional Centers (FRCs) (located in Maynard, Massachusetts; Thomasville, Georgia; Denton, Texas; Denver, Colorado; and Bothell, Washington) host FNARS equipment, enabling them to function as Network Control (NC) for their respective RRNs.

2.3.2 System Capabilities

FNARS operates independently of terrestrial and space-based (satellite) infrastructure, and serves as a resilient backup continuity communications capability. Its meshed network of voice and data communications capabilities (including HF data and phone patch) provides long-range coverage while requiring minimal infrastructure. Standard FNARS equipment includes HF radios, antennas, and other ancillary devices.

2.4 Stakeholders

FNARS provides continuity communications support to the following stakeholders:

- FEMA Internal Stakeholders
  - Executive leadership
  - Regional leadership
  - Mobile Emergency Response Support (MERS) detachments
- External Stakeholders
  - State and territorial emergency management leadership
  - Authorized non-governmental organizations

2.5 Mission Support

The National Continuity Programs (NCP) FEMA High Frequency Continuity System (FHFCS) Program Management Office (PMO) supports the FNARS Program Management functions and is responsible for providing programmatic oversight, including policy-making decisions, ranging from project engineering to property management functions for all national security and emergency preparedness-related HF programs. The FHFCS PMO provides support for the following critical functions for FNARS.

2.5.1 Program Administration

Responsibilities include program management and oversight for the FNARS program, conducting risk management assessments and ensuring adherence to program performance measures through regular

assessment of the status of all FNARS HF assets deployed or in storage at the national, regional, and state/territory levels. Program responsibilities also include coordination of installation or decommissioning activities for FNARS equipment with on-site facilities managers and FEMA contacts at the national, regional, and state/territory levels.

2.5.2 Technical Engineering

Responsibilities include providing engineering support for all antennas, radios, and software for the FNARS program, to include, but not limited to, technical expertise and coordination of configuration change management across all aspects of the entire system.

2.5.3 Operations

Responsibilities include ensuring the operational capability of the system at all times, as well as providing guidance on how the system functions and training to all participants.

2.5.4 Security

Responsibilities include providing policy guidance for FNARS, conducting system certification and accreditation as required, and ensuring all FNARS physical and communications security adheres to FEMA standards.

2.6 Roles and Responsibilities

2.6.1 Network Control Operator

FNARS NC is a qualified station operator that:

- Directs and manages other stations on the net
- Clears and processes traffic listed
- Maintains a written record of all stations and radio traffic on the net
- Relays traffic to points outside the net as required
- Primary and alternate NC locations are:
- Mount Weather Emergency Operations Center (MWEOC) serves as primary NC for NRN
- FRCs serve as alternate NCs for the NRN
- FRCs serve as primary NC for the RRN in their respective and adjacent regions
- Mobile Operations Centers (MOCs) serve as alternate NC in their respective and adjacent regions

2.6.2 Station Operator

The FNARS Station Operator is a qualified and trained radio operator who can perform the following key tasks:

- Review FNARS Concept of Operations (CONOPS)
- Maintain familiarity with and perform FNARS SOPs
- Activation and deactivation of the networks
- Perform HF radio operations
- Perform all tasks as outlined in the FNARS Quick Guide
- Perform basic HF system troubleshooting
- Maintain a written record of all stations and radio traffic on the net

2.7 NCS Documentation and Record-Keeping Procedures

NCS is required to maintain and generate a Master Station Log, manage NC transfers to alternate stations, and document decision making and execution of NC functions, including positive acknowledgement of stations. NCP RE will provide a standardized template for reporting results of FNARS communications.

3.0 NETWORK ACTIVATION PROCEDURES

In severe emergencies requiring federal coordination with regional and state authorities, a strong likelihood exists that the commercial communications (such as cellular, landline, and Internet capabilities) upon which normal governmental processes rely may be compromised or unavailable. To mitigate for such a challenge, FEMA NCP offers communications methods that do not depend on the availability of commercial communications, known as out-of-band (OOB) capabilities. OOB capabilities are activated by establishing radio contact with the intended recipient via the FNARS system.

FNARS network activation procedures, roles, and responsibilities are specified in detail to ensure that, in a real-world emergency, senior leadership may rely on the system to expedite C3 in coordinating response efforts with their counterparts at the state and regional levels. Normal day-to-day functions remain the responsibility of regional personnel to include the NRN and RRN. The NRN and RRNs are activated OOB when commercial communications between Regional Offices, MERS detachments, FRCs, state/territorial Emergency Operations Centers (EOCs) and/or FEMA Leadership have been or are likely to be disrupted. The Activation Authority who initiates the request will determine the scope of the activation.

4.0 TESTING, TRAINING, AND EXERCISES

FNARS HF testing of both the NRN and the RRNs will take place once each week. This weekly test is used to exercise equipment, and to train and maintain operator proficiency. Schedules for the NRN will be provided by the PMO and the RRN schedule will be provided by each Region's FRC. These tests will be conducted to improve the efficiency and operation of net procedures and message handling.

Upon testing session activation, the NCS of any FNARS NRN or RRN will provide a weekly report of net activities to the FNARS Program Manager.

To support the FNARS CONOPS, testing reports are generated on a weekly basis for both the FNARS NRN and RRN. Each NCS of the NRN and RRN will submit test results to the NCP Help Desk at FEMA-NCP-COMMS@fema.dhs.gov. The weekly tests are aggregated into a monthly report, which flows into quarterly and annual reports.

5.0 MAINTENANCE

Any maintenance support required for the FNARS systems will be coordinated with and requested through the NCP Help Desk. The PMO will coordinate, assign, and allocate any logistics support or advanced troubleshooting with a senior FNARS operator or technician, or facilitate repairs as needed through the NCP Help Desk's request system. All property movement within the FNARS System must be coordinated

through the Property Custodial Officer and recorded in the Sunflower Asset Management System. Every item in the property inventory that is transferred must be transferred on a Property Transaction Record.

6.0 POINT OF CONTACT

NCP Help Desk
(202) 212-2142
FAX: (202) 646-4691
FEMA-NCP-COMMS@fema.dhs.gov

APPENDIX A – PHONETIC ALPHABET AND PROWORDS

Table A-1 shows the standard phonetic alphabet used for radio messages. Table A-2 lists standard prowords used for radio messages.

Table A-1. Phonetic Alphabet

Letter	Phonetic
A	Alpha
B	Bravo
C	Charlie
D	Delta
E	Echo
F	Foxtrot
G	Golf
H	Hotel
I	India
J	Juliet
K	Kilo
L	Lima
M	Mike
N	November
O	Oscar
P	Papa
Q	Quebec
R	Romeo
S	Sierra
T	Tango
U	Uniform
V	Victor
W	Whiskey
X	X-Ray
Y	Yankee
Z	Zulu

Table A-2. Standard Prowords

Proword	Explanation
Affirmative	Permitted, granted, yes
All After	Say again all which is part of your transmission after
All Before	Say again all which is part of your transmission before
ARL	ARL numbered radiogram message follows
Break	I hereby indicate the separation of the text from other portions of the message. Also used to communicate I desire you to stop your transmission
By Authority Of	Name of official who is authorizing the transmission
Correct	You are correct, or what you have transmitted is correct
Correction	An error has been made in this transmission. Transmission will continue with the last word correctly transmitted. The correct version is _____.
Disregard This Transmission	This transmission is in error. Disregard it. This Proword shall not be used to cancel any message completely transmitted and for which receipt or acknowledgement has been received.
Drill	The Proword Drill will be the first word given in the body of all drill messages. This Proword will be included in the word count.
Figures	Numerals or numbers follow.
From	The originator of this message is indicated by the address designator immediately following.
Groups	This message contains the number of groups indicated by the numeral following.
Incorrect	You are incorrect. The correct version is _____.
Initial	A single letter or initial follows
I Read Back	The following is my response to your instructions to read back. I read back everything exactly as transmitted.
I Say Again	I am repeating transmission or portion indicated.
I Spell	I shall spell the next word phonetically
I Verify	That which follows has been verified at your request and is repeated. To be used only as a reply to VERIFY.
Message Follows	A message which requires recording is about to follow (transmitted immediately after the call).
More to Follow	I have more messages, traffic, or information for you.
Negative	Not received
Out	This is the end of my transmission to you and no answer is required or expected. After the Proword "Out", all stations will pause for a five-second interval to listen for stations desiring to break-in.
Over	This is the end of my transmission to you and a response is necessary. Go ahead, transmit.
Read Back	Repeat this entire transmission exactly as received.
Relay (To)	Transmit this message to all addressees (or addressees immediately following this Proword). The address component is mandatory when this Proword is used.
Roger	I have received your last transmission satisfactorily. The Proword "Roger" is also used by stations confirming receipt of a message and by NET CONTROL when checking stations into a net.
Say Again	Repeat all of your last transmission. Followed by identification data means "Repeat_____ (portion indicated)".
Speak Faster	Your transmission is too slow. Increase speed of transmission
Speak Slower	Your transmission is too fast. Decrease speed of transmission.
Time	That which immediately follows is the time or date-time group of the message.
To	The addressees, whose designations immediately follow, are to act on this message.
Unknown Station	The identity of the station with whom I am attempting to establish communications is unknown.
Verify	Verify entire message (or portion indicted) with the originator and send the correct version. To be used only at the discretion of or by the addresses to which the questioned message was directed.
Wait	I must pause for a few seconds.
Wait—Out	I must pause for [X] minutes (expressed in numerals)
Word After	Repeat the word after.
Word Before	Repeat the word before.
Words Twice	Communication is difficult. Transmit (transmitting) each phrase (or each code group) twice. This Proword may be used an order, request, or as information.

APPENDIX B – SAMPLE SCRIPT FORMAT FOR FNARS VOICE RADIOTELEPHONE

Standard FNARS voice radiotelephone script is detailed as follows in Table B-1. This script is intended as an example and guide.

Table B-1. Example Message Script

Establish:
This is [WGYXXX], on the [National or Regional] Radio Net. This is a directed net. All stations standby for roll call … Out.
Priority Traffic:
Any stations with traffic call now …Over.
Check-in:
This is [WGYXXX], Net Control. Requesting all stations check in by call sign…Over *[WGYXXX] this is [Station call sign] …Over* *Net Control replies "Roger, [Station call sign] ...over" and repeats process for other stations checking in.* NET CONTROL will record all stations checking in.
Closing:
This is [WGYXXX], this concludes the session of the [NRN or RRN] … Out.
Message:
All stations, prepare to copy message … Out. Message is now given. All message lines will begin with the word "line" followed by a number. (Call sign of alternate NET CONTROL or any other station in the net) Read back the message … *Over. Are there any stations requiring fills? … Over.* Do necessary fills for message. *All stations beginning with (call sign) in Region (first region in net) verify receipt of the message … Over.* After stations have verified the receipt of the message *This is [WGYXXX], Net Control for the FNARS net. Are there any other stations wishing to check into this net? If so, call now … Over.*
Transfer Net Control:
This is [WGYXXX], Net Control for the FNARS net. Net Control authority at this time will transfer to [New NET CONTROL call sign]. …Out
All stations on this net [WGYXXX] is now Net Control for the [National or Regional] Radio Net …Out
Message Handling:
Sender: [Dest. Station Call sign] this is [Orig. Station Call sign] with message for copy…acknowledge when ready…Over *Receiver: [Dest. Station Call sign] is ready for message…Over* *Sender: [Dest. Station Call sign] message follows…* *Sender: Line 1…[Line One]….Line 2…[Line Two]…* *Sender:* Continue till message complete *Sender: Message complete…How copy?...Over* *Receiver: [Orig. Station Call sign] good copy…Over* *Sender: [Dest. Station Call sign] this is [Orig. Station Call sign] verify last message…Over* *Receiver: [Orig. Station Call sign] message follows…* *Receiver: Line 1…[Line One]….Line 2…[Line Two]…* *Receiver:* Continue till message complete *Receiver: Message complete…How copy?...Over* *Sender: [Dest. Station Call sign] good copy…Out*

APPENDIX C – FNARS STANDARD MESSAGE FORMAT

The Standard FNARS Message Form uses the following standard instructions, defined in Table C-1.

Table C-1. FNARS Standard Message Format and Instructions

Line	Instruction	Explanation
1	Message Number:	Local number of messages received or originated per day
2	Priority:	Priority of the message: Emergency, Priority, or Routine
3	Originator/FROM:	Person who created message
4	Orig. STN:	Call Sign of Station
5	Orig. NET:	FNARS Radio Network: NRN or RRN
6	Orig. DATE/TIME:	Date and time in standard format: DDMMMYYHHMMZ
7	Destination/TO:	Person Message is intended for
8	Destination STN:	Call Sign of Station
9	Destination NET:	FNARS Radio Network: NRN or RRN
10	Rcvd DATE/TIME:	Date and time in standard format: DDMMMYYHHMMZ
11	Rcvd from STN:	Call Sign of Station
12	Rcvd NET:	FNARS Radio Network: NRN or RRN
13	Sent/Relayed DATE/TIME:	Date and time in standard format: DDMMMYYHHMMZ
14	Sent/Relayed to STN	Call Sign of Station
15	Sent/Relayed NET:	FNARS Radio Network: NRN or RRN
16	Delivered TO:	Person who received the message
17	Delivered DATE/TIME:	Date and time in standard format: DDMMMYYHHMMZ
18	Message Size	Number of words in message
19	Message	The message to be delivered

The message format is as follows, illustrated in Figure C-1.

1. Message #	2. Priority	3. FROM:	4. Station Originate:	5. Originate Network:
	Emergency Priority Routine			RRN or NRN
6. Originate Date/Time:	7. TO:	8. Station Destination:	9. Destination Network:	
			RRN or NRN	
10. Received Date/Time:	11. Received from Station:	12. Received Network	16. Delivered To:	17. Delivered Date/Time:
		RRN or NRN		
13. Sent/Relayed Date/Time	14. Sent/Relayed to Station:	15. Sent/Relayed Network		
		RRN or NRN		
18.Message Size				
19. Message				

Figure C-1. Sample FNARS Message Form

APPENDIX D – TIME CONVERSION

Table D-1 shows the time conversion chart used for scheduling tests.

Table D-1. Time Conversion Chart

UTC/ZULU	PST/ALDT	PDT/MST	MDT/CST	CDT/EST	EDT/AST	ALST	HST
2400/0000	1600	1700	1800	1900	2000	1500	1400
0100	1700	1800	1900	2000	2100	1600	1500
0200	1800	1900	2000	2100	2200	1700	1600
0300	1900	2000	2100	2200	2300	1800	1700
0400	2000	2100	2200	2300	2400/0000	1900	1800
0500	2100	2200	2300	2400/0000	0100	2000	1900
0600	2200	2300	2400/0000	0100	0200	2100	2000
0700	2300	2400/0000	0100	0200	0300	2200	2100
0800	2400/0000	0100	0200	0300	0400	2300	2200
0900	0100	0200	0300	0400	0500	2400/0000	2300
1000	0200	0300	0400	0500	0600	0100	2400/0000
1100	0300	0400	0500	0600	0700	0200	0100
1200	0400	0500	0600	0700	0800	0300	0200
1300	0500	0600	0700	0800	0900	0400	0300
1400	0600	0700	0800	0900	1000	0500	0400
1500	0700	0800	0900	1000	1100	0600	0500
1600	0800	0900	1000	1100	1200	0700	0600
1700	0900	1000	1100	1200	1300	0800	0700
1800	1000	1100	1200	1300	1400	0900	0800
1900	1100	1200	1300	1400	1500	1000	0900
2000	1200	1300	1400	1500	1600	1100	1000
2100	1300	1400	1500	1600	1700	1200	1100
2200	1400	1500	1600	1700	1800	1300	1200
2300	1500	1600	1700	1800	1900	1400	1300

LEGEND			
PST=Pacific Standard Time	MDT=Mountain Daylight Time	EST=Eastern Standard Time	ALDT=Alaskan Daylight Time
PDT=Pacific Daylight Time	CST=Central Standard Time	EDT=Eastern Daylight Time	AST=Atlantic Standard Time
MST=Mountain Standard Time	CDT=Central Daylight Time	ALST=Alaskan Standard Time	HST=Hawaiian Standard Time

APPENDIX E – AUTHORITIES

The NCP FNARS SOP was developed based on the following Executive Orders (EOs), public laws, and national policy:

- National Security Presidential Directive 51/Homeland Security Presidential Directive (HSPD) 20, National Continuity Policy, May 09, 2007
- National Communications Systems Directive 3-10, Minimum Requirements for Continuity Communications Capabilities
- EO 13618, Assignment of National Security and Emergency Preparedness Communications Functions, September 6, 2012
- EO 12656, Assignment of Emergency Preparedness Responsibilities, November 18, 1988, as amended
- EO 13407, Public Alert and Warning System, September 26, 2006
- HSPD 7, Critical Infrastructure Identification, Prioritization, and Protection, December 17, 2003

APPENDIX F – SAMPLE STATION LOG

HF LOG SHEET

STATION CALLSIGN _____ PAGE _____ OF _____

DATE	UTC		FREQ	MODE	CALLSIGN	COMMENTS
	ON	OFF				

Figure F-1 shows a sample station log.

Figure F-1. Sample HF Log Sheet

APPENDIX G – SPACE WEATHER PROTECTIVE GUIDANCE

HF systems are susceptible to interference from space based events that affect the electromagnetic spectrum including radios. National Oceanic and Atmospheric Administration (NOAA) has identified three scales to identify threats, which is similar to the Hurricane Category scale. The three space weather scales are geomagnetic storms (G scale), Solar Radiation (S scale), Radio Blackouts (R scale). Table G-1 lists each rating and instructions to respond to each; Figure G-1 shows a more detailed description of each type of weather discutrbance and descriptions of each rating level. For more information, see the NOAA website for Space Weather Prediction Center at www.swpc.noaa.gov.

Table G-1. NOAA G/R/S Rating Scale

Rating	Description	Action
G/R/S1-3	Minor-Strong	Monitor equipment; anticipate degradation of RF signal and interference with increased noise on radio receiver.
G/R/S4	Severe	FEMA Management Authority will decide to take appropriate action based on situation, most common action is to power down radio systems and disconnect antenna from radios.
G/R/S5	Extreme	FEMA Management Authority will decide to take appropriate action based on situation, most common action is to power down radio systems and disconnect antenna and power from radios.

NOAA Space Weather Scales

Category		Effect	Physical measure	Average Frequency (1 cycle = 11 years)
Scale	Descriptor	Duration of event will influence severity of effects		
Geomagnetic Storms			Kp values* determined every 3 hours	Number of storm events when Kp level was met; (number of storm days)
G 5	Extreme	Power systems: widespread voltage control problems and protective system problems can occur, some grid systems may experience complete collapse or blackouts. Transformers may experience damage. Spacecraft operations: may experience extensive surface charging, problems with orientation, uplink/downlink and tracking satellites. Other systems: pipeline currents can reach hundreds of amps, HF (high frequency) radio propagation may be impossible in many areas for one to two days, satellite navigation may be degraded for days, low-frequency radio navigation can be out for hours, and aurora has been seen as low as Florida and southern Texas (typically 40° geomagnetic lat.)**	Kp=9	4 per cycle (4 days per cycle)
G 4	Severe	Power systems: possible widespread voltage control problems and some protective systems will mistakenly trip out key assets from the grid. Spacecraft operations: may experience surface charging and tracking problems, corrections may be needed for orientation problems. Other systems: induced pipeline currents affect preventive measures, HF radio propagation sporadic, satellite navigation degraded for hours, low-frequency radio navigation disrupted, and aurora has been seen as low as Alabama and northern California (typically 45° geomagnetic lat.)**	Kp=8	100 per cycle (60 days per cycle)
G 3	Strong	Power systems: voltage corrections may be required, false alarms triggered on some protection devices. Spacecraft operations: surface charging may occur on satellite components, drag may increase on low-Earth-orbit satellites, and corrections may be needed for orientation problems. Other systems: intermittent satellite navigation and low-frequency radio navigation problems may occur, HF radio may be intermittent, and aurora has been seen as low as Illinois and Oregon (typically 50° geomagnetic lat.)**	Kp=7	200 per cycle (130 days per cycle)
G 2	Moderate	Power systems: high-latitude power systems may experience voltage alarms, long-duration storms may cause transformer damage. Spacecraft operations: corrective actions to orientation may be required by ground control; possible changes in drag affect orbit predictions. Other systems: HF radio propagation can fade at higher latitudes, and aurora has been seen as low as New York and Idaho (typically 55° geomagnetic lat.)**	Kp=6	600 per cycle (360 days per cycle)
G 1	Minor	Power systems: weak power grid fluctuations can occur. Spacecraft operations: minor impact on satellite operations possible. Other systems: migratory animals are affected at this and higher levels; aurora is commonly visible at high latitudes (northern Michigan and Maine)**	Kp=5	1700 per cycle (900 days per cycle)

* Based on this measure, but other physical measures are also considered.
** For specific locations around the globe, use geomagnetic latitude to determine likely sightings (see www.swpc.noaa.gov/Aurora)

Solar Radiation Storms			Flux level of ≥ 10 MeV particles (ions)*	Number of events when flux level was met**
S 5	Extreme	Biological: unavoidable high radiation hazard to astronauts on EVA (extra-vehicular activity); passengers and crew in high-flying aircraft at high latitudes may be exposed to radiation risk. *** Satellite operations: satellites may be rendered useless, memory impacts can cause loss of control, may cause serious noise in image data, star-trackers may be unable to locate sources; permanent damage to solar panels possible. Other systems: complete blackout of HF (high frequency) communications possible through the polar regions, and position errors make navigation operations extremely difficult.	10^5	Fewer than 1 per cycle
S 4	Severe	Biological: unavoidable radiation hazard to astronauts on EVA; passengers and crew in high-flying aircraft at high latitudes may be exposed to radiation risk.*** Satellite operations: may experience memory device problems and noise on imaging systems; star-tracker problems may cause orientation problems, and solar panel efficiency can be degraded. Other systems: blackout of HF radio communications through the polar regions and increased navigation errors over several days are likely.	10^4	3 per cycle
S 3	Strong	Biological: radiation hazard avoidance recommended for astronauts on EVA; passengers and crew in high-flying aircraft at high latitudes may be exposed to radiation risk.*** Satellite operations: single-event upsets, noise in imaging systems, and slight reduction of efficiency in solar panel are likely. Other systems: degraded HF radio propagation through the polar regions and navigation position errors likely.	10^3	10 per cycle
S 2	Moderate	Biological: passengers and crew in high-flying aircraft at high latitudes may be exposed to elevated radiation risk.*** Satellite operations: infrequent single-event upsets possible. Other systems: effects on HF propagation through the polar regions, and navigation at polar cap locations possibly affected.	10^2	25 per cycle
S1	Minor	Biological: none. Satellite operations: none. Other systems: minor impacts on HF radio in the polar regions.	10	50 per cycle

* Flux levels are 5 minute averages. Flux in particles·s^{-1}·ster^{-1}·cm^{-2} Based on this measure, but other physical measures are also considered.
** These events can last more than one day.
*** High energy particles (>100 MeV) are a better indicator of radiation risk to passengar and crews. Pregnant women are particularly susceptible.

Radio Blackouts			GOES X-ray peak brightness by class and by flux*	Number of events when flux level was met; (number of storm days)
R 5	Extreme	HF Radio: Complete HF (high frequency**) radio blackout on the entire sunlit side of the Earth lasting for a number of hours. This results in no HF radio contact with mariners and en route aviators in this sector. Navigation: Low-frequency navigation signals used by maritime and general aviation systems experience outages on the sunlit side of the Earth for many hours, causing loss in positioning. Increased satellite navigation errors in positioning for several hours on the sunlit side of Earth, which may spread into the night side.	X20 ($2x10^{-3}$)	Fewer than 1 per cycle
R 4	Severe	HF Radio: HF radio communication blackout on most of the sunlit side of Earth for one to two hours. HF radio contact lost during this time. Navigation: Outages of low-frequency navigation signals cause increased error in positioning for one to two hours. Minor disruptions of satellite navigation possible on the sunlit side of Earth.	X10 (10^{-3})	8 per cycle (8 days per cycle)
R 3	Strong	HF Radio: Wide area blackout of HF radio communication, loss of radio contact for about an hour on sunlit side of Earth. Navigation: Low-frequency navigation signals degraded for about an hour.	X1 (10^{-4})	175 per cycle (140 days per cycle)
R 2	Moderate	HF Radio: Limited blackout of HF radio communication on sunlit side of the Earth, loss of radio contact for tens of minutes. Navigation: Degradation of low-frequency navigation signals for tens of minutes.	M5 ($5x10^{-5}$)	350 per cycle (300 days per cycle)
R 1	Minor	HF Radio: Weak or minor degradation of HF radio communication on sunlit side of the Earth, occasional loss of radio contact. Navigation: Low-frequency navigation signals degraded for brief intervals.	M1 (10^{-5})	2000 per cycle (950 days per cycle)

* Flux, measured in the 0.1-0.8 nm range, in W m^{-2}. Based on this measure, but other physical measures are also considered.
** Other frequencies may also be affected by these conditions.

URL: *www.swpc.noaa.gov/NOAAscales* April 7, 2011

Figure G-1. NOAA Space Weather Scales