

1. Overview

This exercise will be a Field Deployment exercise utilizing both fixed “Command” stations and portable / mobile “Reporting” stations. There will be 2 “Command” stations per zone (East, Central, Mountain and Pacific). Command Stations will send information requests to the Reporting stations within their respective zones and receive abbreviated responses in PIR format and other modalities as designated by Command stations. The Reporting stations will report back to the Command stations specific requested information by HF radio from different locations within a specified time frame. The exercise will be conducted over a 7 hour period on the selected date.

2. Exercise Goals:

- a) AmRRON will demonstrate its ability, as a national communications network, to collect, consolidate, and transfer requested information (Priority Intelligence Information (PIRs) from 48 States to a designated location via HF radio in grid down unsupported conditions and collect reference information and data to improve future operations.
- b) AmRRON operators will demonstrate the ability to collect exercise information (PIRs) in a timely manner, consolidate, summarize, and report to AmRRON National within 24 hours of conclusion of the exercise.
- c) Command stations will demonstrate the ability to effectively request specific information from Reporting stations, receive responses, consolidate responses, and forward consolidated responses to AmRRON National and regional nets.
- d) Reporting stations will demonstrate rapid mobilization / deployment and demobilization of a grid independent station radio to receive and transmit information to and from a central “Command” station within specific time constraints. This will simulate a situation where radio operators in a specific region may need to assess local conditions and report and then relocate rapidly to escape or avoid environmental hazards. The MRX will also allow operators to test field deployment techniques, off-grid power, field deployed antennas and radio equipment and conveyances.

3. AMRMRX prerequisites

Command Station:

- 1 - Current active AmRRON NCS.
- 2 - HF radio with 100 watt capability.
- 3 - Digital HF capability utilizing both FLdigi suite and JS8call simultaneously.
- 4 - Practical coverage of HF signals over the MRX specified zone.
- 5 - Secure encrypted email.
- 6 - PTE encryption program.
- 7 - Off grid power.

*JSmapper is recommended for all Command Stations but not required. However, stations not using JSmapper should be prepared to manually enter grid coordinates and PIR's of reporting stations into a .txt file for transmission to AmRRON national.

** Stations wishing to participate as “Command Stations” should submit a request to AmRRON national by email to johnjacob@amrron.com. Requests should be

submitted no later than 2 weeks prior to the exercise. Slots are limited to 2 per zone (4 zones). Selections will be based on: Geographic location, past participation in exercises, net control activities and compliance with the above prerequisites. If you are not selected as a "Command Station", you are encouraged to participate as a "Reporting Station".

Reporting Station:

- 1 - AmRRON member
- 2 - Portable or Mobile HF radio capability (low power acceptable).
- 3 - Multi band antenna capable of reception / transmission on 40 & 80M.
- 4 - Digital HF capability utilizing FLdigi suite and JS8call simultaneously.
- 5 - Transportation (A conveyance capable of moving the operator and all equipment a distance of 3 miles in under 30 minutes).
- 6 - Off grid power (preferably PV panel and battery or equivalent).
Generator power is acceptable but use caution in transporting and using flammable liquids.
- 7 - Operation from your vehicle as a mobile station is acceptable.

4. Scenario

A major solar flare has occurred 7 days prior to the exercise. The X-10 class flare was accompanied by a CME 28 hours after the flare. The CME was a full on impact with Earth and collapsed most of the grid, disabled all satellites including GPS, knocked out all communications and caused widespread fires and weather disruption. It is anticipated that AmRRON operators would have taken precautions such as securing their sensitive equipment in Faraday boxes, secured their homes and disconnected their homes from external power and prepared for the arrival of the CME. After the CME, it is expected that all radio communications will have been disrupted and rendered HF communications near impossible during the resultant geomagnetic storm. After 5 days, the geomagnetic instability has subsided to some degree and radio communications are again possible although degraded. AmRRON National is attempting to do an assessment of the damage through the use of Priority Intelligence Requirements (PIR's) and what response we may play in the recovery.

Exercise Implementation

- The exercise will be conducted as a rolling net beginning on the east coast at 0945 local. Each subsequent AmRRON zone will follow at 0945 local for their time zone.
- The exercise will be divided into 4 segments with a relocation between each segment.
- The first 3 segments will be 2 hours each and the final segment will be 1 hour. Total time of the exercise will be 7 hours. Reporting station may return to "home or base" for the 4th segment but must remain grid down and on alternate power.
- Command stations will operate from a fixed position for the duration of the exercise and should use at minimum 50 watts RF power and will remain "grid down" utilizing only back up power during the exercise.
- Command stations will maintain a persistent presence on the assigned frequencies throughout the exercise when not transmitting for the duration of the exercise. Command stations may operate as a team if desired.

- Reporting stations will operate from pre-selected* mobile / portable operating positions. Reporting stations may operate as a team if desired. Each operating position will be at least 3 miles from the subsequent position. Operating positions should endeavor to offer some level of safety from environmental hazards. Reporting stations should “pre-deploy” prior to the start of the exercise to the initial starting position and should be fully operational and ready to receive at the start of the exercise. Reporting stations should remain “radio silent” until they receive transmissions from the Command station.
- Transmissions from Command stations will be on multiple HF bands so reporting stations will need radios and antennas that are multi-band capable.
- Prior to the start of the exercise, Command stations will append their call signs in JS8call as follows: Command-1 = W1ABC/C1 Command-2 = W1ABC/C2.
- Command-1 will send a time standard (Heartbeat) for JS8calltime synchronization prior to the start of their transmission of Reporting station instructions. (see following JS8call time sync considerations).
- At the top of each segment, Command-1 will send a JS8call Heartbeat which will be immediately followed by a FLdigi “net call up” transmission in mode Contestia 4/250. No check ins will be taken during this phase. This will be followed by instructions for the Reporting stations in mode MFSK-32 or per the Command stations preference utilizing FLmsg format. Reporting stations, please have RXID enabled.
- Immediately following Command-1, Command-2 will follow with the same sequence of transmissions and message traffic.
- After Command-2 finishes their transmission of message traffic, all reporting stations should report their PIR’s utilizing JS8call. Reporting stations should provide adequate spacing on the JS8call waterfall between 1800 Hz to 2250 Hz so that signals are not on the same frequency. Please attempt to provide spacing between transmissions by other stations in the band-pass.
- After sending their PIR’s, Reporting stations should standby on frequency until they receive acknowledgement that their PIR’s have been received. Once their PIR’s, are acknowledged, Reporting stations may relocate to their next position. If they do not receive an acknowledgement, they should check their JS8call time sync against other transmissions, readjust the time sync and attempt to send again. If there is no acknowledgement after the second transmission, they should cease further attempts in JS8call and follow the instructions below. (Special Consideration for JS8call)
- Upon arrival at that the final location (segment 4), reporting stations will receive further communications from Command stations only in FLdigi modes. Please have rxID on so that you can follow modes used by the Command stations.

5. Special Consideration for JS8call operation without internet or GPS timing

Since this exercise includes the loss of both internet and GPS, it will be necessary for operators to adjust the timing requirements of JS8call without the above adjuncts. Please review the white paper on this procedure.

- Command stations will provide a “heartbeat” signal to enable Reporting stations and other command stations to synchronize their JS8call program. If possible, Command-1 should attempt to synchronize their JS8call to a known time standard such as WWV. If WWV is not on the air, try to be as accurate as possible to a reliable watch or clock.
- Command-1 will begin sending a “heartbeat” every 3 minutes beginning at 15 minutes before the top of the designated time for each segment up to the time of

their instruction transmission. i.e., 0945 - 1000 Heartbeat every 3 min / 0945-1000 Heartbeat every 3 min / etc.

- Command-2 and all Reporting stations in each zone should synchronize their JS8call to this Heartbeat.
- If a reporting station is unable to synchronize their JS8call time on the second attempt, please wait until the bottom of the hour and send your PIR using Contestia 4/250 in clear text format.

6. Exercise time, frequency and mode parameters

Traffic and reporting segments will be divided into three 2 hour intervals and a final 4 hour segment. Each 2 hour interval will define a new traffic & reporting segment.

Time Segment / Frequency / Mode Table

Segment	time	traffic	mode	frequency	origin	destination
1	0945	JS8call Heartbeat	JS8Call	3.586 usb	Com-1	Reporting
	1000	Net call up	CT 4/250	3.586 usb	Com-1	Reporting
	TF	Msg#1 FLmsg	MFSK 32	3.586 usb	Com-1	Reporting
	TF	JS8call Heartbeat	JS8call	3.586 usb	Com-2	Reporting
	TF	Net call up	CT 4/250	3.586 usb	Com-2	Reporting
	TF	Msg #1 FLmsg	MFSK 32	3.586 usb	Com-2	Reporting
	TF	PIR reports	JS8call	3.586 usb	Reporting	Com- 1&2
	1030*	PIR reports	CT-4/250	3.586 USB	Reporting	Com- 1&2
	1100	Relocate				
2	1145	JS8call Heartbeat	JS8call	7.115 usb	Com-1	Reporting
	1200	Net call up	CT 4/250	7.115 usb	Com-1	Reporting
	TF	Msg #2 FLmsg	MFSK 32	7.115 usb	Com-1	Reporting
	TF	JS8call Heartbeat	JS8call	7.115 usb	Com-2	Reporting
	TF	Net call up	CT 4/250	7.115 usb	Com-2	Reporting
	TF	Msg #2 FLmsg	Op	7.115 usb	Com-2	Reporting
	TF	PIR reports	JS8call	7.115 usb	Reporting	Com- 1&2
	1230*	PIR reports	CT-4/250	7.115 usb	Reporting	Com - 1&2
	1300	Relocate				
3	1345	JS8call Heartbeat	JS8call	7.115 usb	Com-1	Reporting
	1400	Net call up	CT-4/250	7.115 usb	Com-1	Reporting
	TF	Msg #3 FLmsg	MFSK 32	7.115 usb	Com-1	Reporting
	TF	JS8call Heartbeat	JS8call	7.115 usb	Com-2	Reporting
	TF	Net call up	CT-4/250	7.115 usb	Com-2	Reporting
	TF	Msg #3 FLmsg	MFSK 32	7.115 usb	Com-2	Reporting
	TF	PIR Reports	JS8call	7.115 usb	Reporting	Com - 1&2
	1430*	PIR Reports	CT-4/250	7.115 usb	Reporting	
	1400	Relocate				
4	1600	Net call up	CT-4/250	7.115 ***	NCS	Reporting
	TF**	Net call up	CT-4/250	7.115 ***	ANCS **	Reporting
	TF***	Sitreps / TFC	Varied		"" ""	"" ""
	1700	EndEx				

*Only if station is unable to sync JS8call -- Reporting stations please use RXid for FLdigi.

** Com-2 will act as ANCS for Com-1 during segment 4.***Segment 4 will have a variety of traffic with instructions from Com-1 and ANCS. Be prepared to use both FLmsg and FLamp.

*** Possible band changes depending on propagation. Please follow the instructions from NCS and ANCS in this regard.

7. **JS8Call Station Info Field Settings and PIR's** : enter the information requested in the PIR(s):

- Your Six-character grid locator, e.g. EN09ab.
- One semicolon character (;) and NO SPACES. (Semicolons also separate multiple PIRs, when present.)
- Requested information for your AO, with Green/Yellow/Red/Unknown (abbreviated G, Y, R, U) conditions. The conditions are defined as follows:

PIR#1 - Loss of electrical power in your zone - Reported as G-green / Y-yellow / R-Red

Green / G - I have grid electrical power in my area.

Yellow / Y - I have intermittent electrical power or brown outs in my area.

Red / R - I have no grid electrical power in my area.

Unknown/U - I am unable to determine this requirement.

PIR#2 - Infrastructure damage

Green / G - No damage to any structure is evident.

Yellow / Y - There is minor damage to infrastructure but no significant threats (fire, etc)

Red / R - There is major damage to infrastructure and significant threats to property and/or life. (fire/downed power lines/transformer explosions, etc)

Unknown/U - I am unable to determine this requirement.

*****You will need to delete previous PIR's and enter new PIR's for each new location*****

8. **JS8Call Mode Settings:**

S8Call (Normal....) However, stations may try different (faster/slower modes) depending on their signal strength with the AS. For example, transmission times for the "Station Info" field *DN09ab;PIR1=G* are: Normal=45sec, Fast=30 sec, Turbo=18 sec).

- Enable Simultaneous Decoding of all Speeds...
- Disable Autoreply (Auto)
- Disable Heartbeat Networking
- Disable Heartbeats
- Disable Heartbeat Acknowledgements
- Enable Grid Locator Column (View>Show Call Activity Columns>Grid Locator)
- Turn OFF all reporting (Settings>Reporting), and verify that the SPOT button (upper right-hand corner of the main screen) is grayed out

9. **Transmitting you station info field (Reporting Stations only)**

1. Select the exercise group by with a right mouse click.
2. Select "**Directed to (group name)**"-Send my station information. Your transmission command string will look like this: **KN0NOT@AMRMRX INFO EM68;PIR1=G;PRI2-R**

10. Command Station JS8call acknowledgement instructions:

- Prior to the exercise, open the JS8call >file>settings tab. Open the “saved messages” tab at the top of the page.
- From the “saved messages” pane, select add and type “ACK” into the top text box. Select “OK” and exit.
- During the exercise, as stations grid and PIR’s are received, right click on the the call sign you wish to acknowledge in the right hand pane (received call sign box) and from the drop down menu, select “saved messages”. From the “saved messages” pane select “ack”. This should put your call sign and “ack” into the transmit pane. Your JS8call program should automatically transmit that information to the selected station. You may wish to wait until you have several stations PIR’s and the band is clear, then sequentially go down the list and acknowledge their report.
- Move on to the next station you wish to “ack” and repeat the process.

11. Exercise Best Practices

- Scout and Recon potential radio sites for mobile / portable operations in your area.
- In the days leading up to the exercise, you should be familiarizing yourself with JS8, alternate time sync methods and your ability to be heard by other AmRRON stations. Learn how much (little) power it takes to be heard in multiple adjacent States by querying SNRs, Station Info, sending short messages and receiving acknowledgments, and such. Experiment with the various JS8 transmission speeds and how your radio propagates at higher speeds. (if you are reliably received by adjacent States and a higher speed than “Normal”, feel free to use it). By doing this you will have a good idea of you “reach” in times of emergency or exercise.
- This is an “Observe, Evaluate, Report and Relocate” exercise for all Reporting Stations. Reporting stations will **NOT** be querying any station for their info. Reporting stations will NOT be transmitting any Beacons, Acknowledgments, Signal Report Requests, Directed Messages or other extraneous transmissions (power saving mode). Limited transmission time and reduced RF power output is essential in preserving off grid power capability.

12. Maidenhead Grid Map

If you do not have a mapping solution, you can use the Maidenhead U.S. Grid Square Map available at: <https://dxcluster.ha8tk.s.hu/hamgeocoding/>

Since this is a grid down exercise, you will need to do the following prior to the exercise:

- Go to the above website and move the map so that it is centered on your home location.
- Zoom in on the map until you have several 6 character grids surrounding your home location.
- Print the map as a hard copy to take with you.
- Use this map to report your grid locations.

13. Post Exercise Instructions

Reporting Stations - Police all operating stations and clean up trash prior to demobilization and return to base. Recover and store equipment. If you have comments or suggestions for improving this exercise or pertinent notes about your performance and the operation of your equipment, please drop us an "After Action Review" at johnjacob@amrron.com.

Command Stations - Save your JSmapper file for this exercise and append it with the last 2 digits of your call sign. Please send the saved JSmapper file by garim to a Tier 5 station for forwarding to AmRRON national via gARIM or vARIM or email it as an attachment to johnjacob@amrron.com. Title the subject line as "JSmapper AMRMRX".