MARS & AMATEUR RADIO SUPPORTING THE MISSION

What is MARS?

- The Military Auxiliary Radio System (MARS) is a group of volunteers who support Department of Defense (DoD) National Support Net (NSN).
- The NSN provides contingency radio communications to the Department of Defense in a variety of circumstances including:
  - Complex catastrophes.
  - Cyber denied or impaired conditions.
- MARS is the program that trains, organizes and tasks volunteer Amateur Radio operators to support the NSN.
- Information on MARS is available at www.usarmymars.org.

MARS Command Regions Coincide with FEMA Regions.

The MARS MISSION

PRIMARY - **Provide contingency HF radio communications to DoD and Military Services.**

ANCILLARY - Provide international humanitarian assistance and disaster relief to US Combatant Commands.

Provide contingency communications for Defense Support to Civil Authorities (DSCA).

Provide morale and welfare communications support to deployed DoD personnel.

MARS is **CONTINGENCY** support for the Army communications plan.

MARS Activation

MARS is a self activating organization dependent on specific trigger events. MARS members generally do not deploy, MARS operates as a hub, gathering vital information and moving traffic to support the DoD.

- **Who is Served:**
  - Requesting Agencies through the Department of Defense.

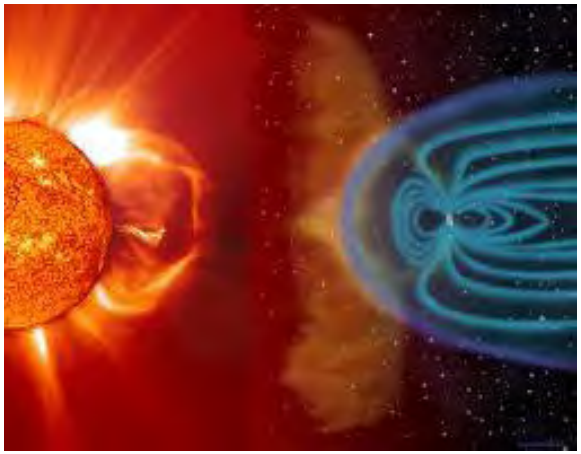
- **When are MARS stations triggered (activated)?**
  - A nation-wide emergency or crisis condition where telecommunications services are impaired within the military and federal agencies.
  - Impaired communications are imminent.

- **Information requested by our Federal customers:**
  - County status report.
  - METAR weather observations from ATIS/ASOS at airports.
  - Status of locations of interest/critical infrastructure.
  - Other traffic handling and information as requested.

Bad Day - Electrical Grid

Human Caused Damage to our Electrical Grid Structure on a Multi Region Scale.

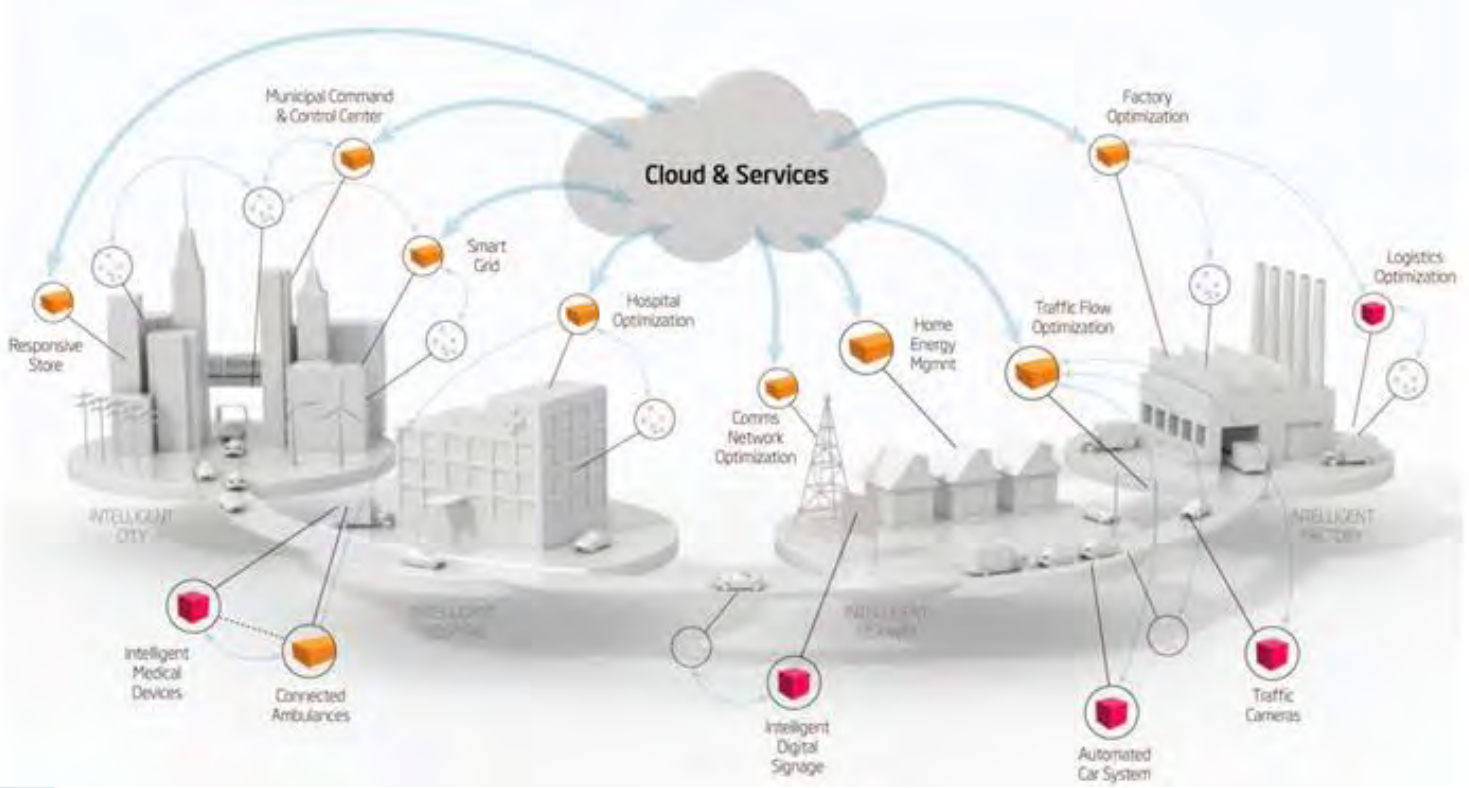
Natural Event Such as Earthquakes, Fires, Floods, Covering a Large Geographic Area.



Coronal Mass Ejection (CME) from the Sun.

Bad Day - Wide Spread Internet Outage

Loss of Internet could cause infrastructure problems that can cripple our Cities, States, and Nation in a very short time.



HOW WOULD THE LOSS OF THE INTERNET EFFECT FINANCES?

Systems would be out of service in a matter of hours.

Debit Cards and Credit Cards will not work.

Resulting Issues?

Contaminated Water

Dwindling Food and Water Supplies

Solid Waste

Social Anarchy

No Fuel

Amateur Radio Services Meeting Mission Requirements for Bad Day Scenario

- There are hundreds of thousand amateur radio operators in US.
  - Amateur radio operators can talk to each other via VHF/UHF and HF radio, like a giant party line.
- MARS stations will distribute requests for information.
  - Amateur radio operators will be asked to gather this information.
- Information will be correlated by MARS operations.
  - Correlated information will be sent to a central point for assembly and distribution to our federal customer.
- The information will be specially formatted for rapid analysis by the federal customers.

Inter-Relationship…
Fitting the Pieces Together

Amateur Radio Supporting the Mission Requirements	
Swim lanes of Interrelationship and Support	
ARS Community	• **Individual Amateur Radio Stations (ARS) and Clubs** provide the vast majority of the local contributors supporting emergency services nationwide. **Authorized under Title 47 USC Part 97, Governance - FCC**
ARES	• **Amateur Radio Emergency Services (ARES) focuses on a local response.** **Authorized under Title 47 USC Part 97, Governance - ARRL**
RACES	• Radio Amateur Civil Emergency Services (RACES) focuses on the statewide response. Authorized under Title 47 USC Part 97.407, Governance – State and Local Government
MARS	• Military Auxiliary Radio System (MARS) focuses on a national response supporting the DoD by liaising with DHS and amateur radio operators at the state and county . Authorized under DODI 4650.02, NTIA RedBook para 7.3.9

5MHz (60 Meter)
The Circuit for Inter-Operability

The 5MHz inter-operational frequencies provide a "party line" for amateur radio services, government stations, and the military to communicate. If primary and alternate DoD systems fail, MARS provides contingence communications support and information to the DoD.

The 5, 60m channels are the only frequencies approved for US Government stations and Amateur Radio Stations to exchange emergency communications (as defined under part 97.111) during ordinary times.

These 5MHz inter-operational frequencies allow digital and voice communications on the same circuit along with no symbol rate limitations. This allows for the use of military waveforms like M110A.

5MHz (60 Meter)
The Circuit for Inter-Operability

DHS, FEMA, USCG, MARS, other select Federal entities: have primary frequency authorizations; Amateur radio service has secondary authorization on these channels.

- **Dial Frequency, KHz, USB:**
  - 5330.5 (channel 1)
  - 5346.5 (channel 2)
  - 5357.0 (channel 3)
  - 5371.5 (channel 4)
  - 5403.5 (channel 5)

Government stations use their government issued call sign when approved; amateur radio operators use their FCC Amateur radio call sign.

WHAT IS A COUNTY INFORMATION REQUEST

- **County Information Request** assists the MARS Federal customer to see the **"BIG PICTURE"** as to how an event has affected the entire nation and contributes to how allocation of support resources may be deployed.

- The county information strip is a SIMPLE REQUEST , for information from the amateur radio community that shows how wide spread the event is and how the event has affected our communities.

INFORMATION REQUESTED FOR COUNTY STATUS

The following information will be requested from the amateur radio community via HF and VHF for a county status request:

- **Is power, electrical service available?**
- **Is there a potable water supply available?**
- **Are sanitation/waste water systems working?**
- **Do you know the condition of medical services, hospital, EMS?**
- **What communication services are working, cell, landline ?**
- **Are transportation services working, buses, trains, cars freely driving down the road?**

It is OK to not know all the answers; any information is appreciated and useful.

WHAT IS A METAR REPORT

METAR reports are the official weather reports obtained by VHF AM broadcast of ATIS/ASOS weather station located at an airport near your location. These frequencies can be heard on most 2m VHF radios, frequencies are available from a number of locations including:

- http://www.airnav.com/airports/
- VFR Section Maps.
- Airport Facility Directory.
- THE AOPA Airport Directory.

You may want to prepare before weather observations are requested by obtaining the frequencies and phone numbers for your local airports.

INFORMATION REQUESTED FROM A METAR REPORT

A METAR Report contains the following information from the ATIS/ASOS at your local airport:

Reports basic weather elements:

- Sky condition: cloud height and amount (clear, scattered, broken, overcast) up to 12,000 feet.
- Visibility (to at least 10 statute miles).
- Basic present weather information: type and intensity for rain, snow, and freezing rain.
- Obstructions to vision: fog, haze.
- Pressure: sea-level pressure, altimeter setting.
- Ambient temperature, dew point temperature.
- Wind: direction, speed and character (gusts, squalls).
- Precipitation accumulation.
- Selected significant remarks including- variable cloud height, variable visibility, precipitation beginning/ending times, rapid pressure changes, pressure change tendency, wind shift, peak wind

It is OK to not know all the answers; any information is appreciated and useful.

WHAT IS A REQUEST FOR STATUS OF LOCATIONS OF INTEREST

A request for status of a location of interest typically contains the following information:

- **The request is an interview style conversation between the MARS station and the amateur radio operator.**
- **The amateur radio operator's responses will be formatted by the MARS station as required.**
- **Care should be taken not to alarm the community with this type of request for information.**

MARS/AMATEUR RADIO ASSISTANCE
Quick Reference Guide

County Status Report contains the following information:

- Is electrical service available?
- Is there a potable water supply?
- Are sanitation/waste water systems working?
- Do you know the condition of medical services, hospital, EMS?
- What communication services are working, cell, landline ?
- Are transportation services working, buses, trains, cars freely driving down the road?

METAR Weather Observation Report contains the following information from the ATIS/ASOS at your local airport:

- Sky condition
- Visibility
- Basic present weather information
- Obstructions to vision
- Pressure
- Ambient temperature, dew point temperature.
- Wind
- Precipitation accumulation.
- Selected significant remarks

Reports are obtainable by any means possible (VHF, Phone, Internet).

Request for status of a location of interest typically contains the following information:

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Vers 26 AUG 2019

Critical Infrastructure Status Cooperative Effort with ARS

An example of Travis County Texas ARES efforts.

Department of Homeland Security
Infrastructure Sectors
Chemical Sector
Commercial Facilities Sector
Communications Sector
Critical Manufacturing Sector
Dams Sector
Defense Industrial Base Sector
Emergency Services Sector
Energy Sector
Financial Services Sector
Food and Agriculture Sector
Government Facilities Sector
Healthcare and Public Health Sector
Information Technology Sector
Nuclear Reactors, Materials, and Waste Sector
Sector-Specific Agencies
Transportation Systems Sector
Water and Wastewater Systems Sector

Crtical Infrastructure	Address	Assigned to
Power Plants		
Decker (927MW)	8003 Decker Ln, Austin	
Sand Hill (579 MW)	1101 Fallwell Ln, Del Valle	Janet McCracken
Mueller Energy Center (4.6 MW)	4901 Lancaster Dr, Austin	Joe Fisher
Mansfield dam (102 MW)	4370 Mansfield Dam Park Rd.	Joe Canfield
Webberville Solar Field (35 MW)	18580 FM 969, Manor	
Tom Miller (17 MW)	3700 Lake Austin Blvd.	Glenn Meter
Dams w/o genrators		
Longhorn	River and Pleasant Valley Rd	
Water Treatment Plants		
Davis	3500 West 35th Street, Austin	Ed Cates
Ullrich	1000 Forest View Dr, Austin	Glenn Meter
Plant #4	6800 N Ranch to Market 620	Joe Canfield
West Travis Co. PUA	12117 Bee Caves Rd, Bee Cave	
LCRA Glenlake	Off City Park Road	Lenor White
LCRA Lakeway Regional Raw Wate	Lakeway	Lenor White
Waste Water		
Walnut Creek	7113 FM 969, Austin, TX 78724	
South Austin Regional	Del Valle	
LCRA Rollingwood	Rollingwood	
LCRA West Travis Co.	Bee Caves	
LCRA Westlake Hills	Westlake	
Commercial		
Samsung	12100 Samsung Blvd, Austin	Tim Lamb
NXP	6501 W William Cannon Dr	John Roberts
Cypress	5204 E Ben White Blvd, Austin	Janet McCracken
ICU Medical (formerly Hospira)	3900 Howard Lane	Michael Marks
Military		
Camp Mabry	2210 W. 35th St; Austin	Ed Cates
Government		
Capitol Complex	1100 Congress Ave	Don Lewis
DPS Headquarters	5805 N Lamar Blvd ·	Roy Walker
Pickle Research Center	10100 Burnet Rd, Austin,	Stuart Rohre
CTECC	5010 Old Manor Rd	Joe Fisher
Back-up EOC (Only if CTECC down)	1520 Rutherford Ln	Michael Butterfield
Back-up 911 (Only if CTECC down)	6800 Burleson Rd #165	Kerby Spruiell

Critical Infrastructure Status Cooperative effort with ARS

Reporting Format MARS/ARES Critical Infrastructure					
Facility Name/	**Date Time Group/**	**Overall Condition/**	**Cars in Parking Lot/**	**Security in Place/**	**Operating//**
Decker Powerplant/	191425Z APR 2018/	N/	Y/	H/	Y//
		N - Normal	Y - Yes	Y - Normal Security	Y - Yes
		D - Minor Damage	N - No	H - Highten Secuity	N - No
		M - Major Damage	O - NA	N - No	O - NA
		X - Missing		O - NA	
Decker Power/191425Z APR 2018/N/Y/H/Y//					

Format Example

DECKER POWERPLANT/191425 APR 2018/N/Y/H/Y//

Tactics Techniques & Procudures

- MARS Requests Critical Infrastructure (CI) information from ARES contact on 60m.
- ARES collections information based on ARES operational direction and TT&P.
- ARES stations report collected information in format and communicate to NCS by VOICE.
- ARES creates tasking information in text format and sends digitally to MARS tasking collector in unencrypted digital format (M110A) on 60M.

Which Hat to Wear?
Wear the Hat that Fits the Situation

SHARES is supported by infrastructure partners reinforcing services restoration [1].

Amateur Radio Emergency Services (ARES) focuses on a local response.

MARS focuses on the national response to the DoD and federal support.

Radio Amateur Civil Emergency Services (RACES) focuses on the statewide response, SOC to DOC support.

Individual ARS and Clubs provide the vast majority of the local contributors supporting emergency services nationwide.

[1] Shared Resources (SHARES) is a FEMA program utilizing telecommunications, electrical generation and distribution, and other infrastructure partners to provide a network of HF stations to aid in systems status and restart.

Meeting the Mission…Building the Team

Amateur radio stations (ARS) in all forms and organizations provide an excellent position to assist the local, county, state, national support with vital information in times of disaster.

Amateur radio stations provide the **“feet on the ground”,** taking time out of their primary mission to support the national MARS mission.

With over 750,000 (2018) US licensed amateur radio operators, ARS provide a valuable asset that can report conditions through the “long haul conduit” of the MARS HF network, supplying vital information to the DoD and federal support mechanisms.