Ham Radio Emergency Communications (Emcomm)

# Ham Radio Emergency Communications (Emcomm)

- After Action Report from an EMA at a Hurricane 'Near Miss'
  - Nearly every Field Representative complained
    - Could not get needed information
    - Could not disseminate information
  - Yet, not a single Comms system failed
    - Radios, cell phones, Internet – all operational
- What happens in a real emergency when normal comms fail?
- Hams can help

Ham Radio Emergency Communications (Emcomm)

- Hams provide supplemental communications when disaster destroys or significantly damages normal communications systems

- Hurricane Katrina as one example -
  - 37 of 41 Radio/TV stations off air, some for months
  - Thirty-eight 911-call centers down, some for weeks
  - 20 million phone calls dropped/blocked day after storm
  - New Orleans Police communications system failed for three days
 - Mississippi Nat. Guard Comms reduced to "Runners"

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- Hams are **NOT** First Responders !
- Hams may not be Second or even Third Responders
- Hams provide back-up or supplemental communications at the direction of EMA   - Disaster/Incidents
- Hams work under direction of County EMA Director
- Hams are licensed, vetted & trained
    - Tactical Communications: Voice & Digital
    - FEMA ICS / NIMS / AUXCOM
- May provide Comms for other Public Events - Parades, Walk-A-Thons, Biking/Cycling

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- Voice communications has limits
  - Great for tactical communications - short messages
  - Slow & Error prone for detailed lists - Data entry at reception point
- Digital Modes Significantly Increases Throughput
  - Data entry at origin– less error
  - Complex, High Volume messages
    - Files, Lists, Spreadsheets, Databases
    - Transmit, Log, Date-stamp & Print – much faster than voice
  - Provides Internet-like eMail via Radio

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OUTSIDE DISASTER AREA
w/NORMAL COMMS

HAM RADIO
VHF / HF
Packet & Winlink

DISASTER AREA
NO NORMAL COMMS

HAM RADIO
HF WINLINK

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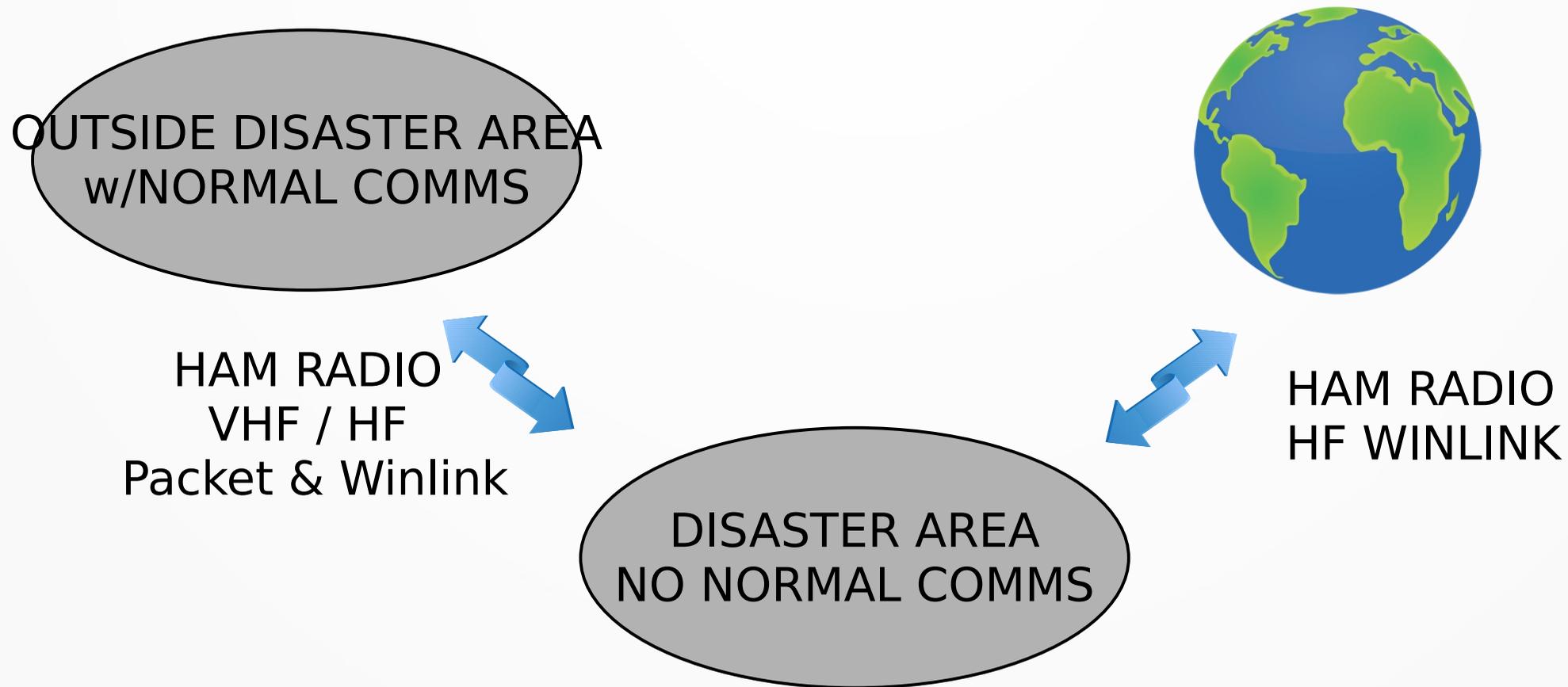
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- ## What is Packet Radio ?
  - A method to send digital messages and files over a standard voice channel
  - Faster messaging than Voice and Error free
  - Emulates binary data by sending two audio tones
  - 1200 baud - Slow by comparison to today's Internet
  - Packet "NODES" - provide routing and networking
  - Amateur Packet Radio standard (AX.25) derived from an early Bell protocol redesigned for a Radio Channel
  - Packet of Data - Frame = Address header, Data Payload, CRC

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- Packet Station Equipment
  - Antenna
  - Radio
  - Computer (Terminal)
  - MODEM (TNC)
  - Power Source

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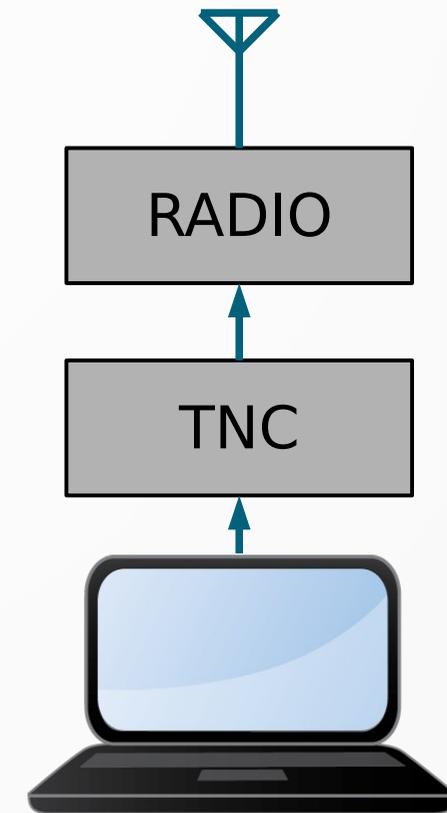
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- Benefits of a Packet Radio NODE
  - Provides Error-Free printed messaging – Including FEMA ICS Forms
  - Store & Forward BBS/eMail
  - Communicates across inter-agency and inter-jurisdictional boundaries *
  - On-demand Comms to Non-agency locations:
    - Schools, Hospitals, Emergency Shelters, Red Cross, CERT
    - Connect to other EMA agencies and MEMA (Mutual Aid)
  - Comms Redundancy to Agency locations
    - Incident Command Sites, Police/Fire, Public Works, Utilities
  - Connects to Internet/Global eMail through Winlink
  - Other Digital modes available: Pactor, FLDIGI Suite of Programs

  * A requirement of 9-11 Commission, incorporated into FEMA NIMS and ICS

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- **FORMS**
  - ICS
  - RED CROSS
  - PLAIN TEXT
  - CUSTOM

GENERAL MESSAGE (ICS-213)

1. **Incident Name** (optional): Red Cross - EMA Shelter Exercise	
2. **To** (Name and Position): A. Cleaves	EMA Director
3. **From** (Name and Position): Roger Pience, N1XP	Ham Volunteer
4. **Subject** : FLMSG Form Generation	5. **Date** : 2019-01-04 6. **Time** 1233Z

7. **Message** :

"REAL WORLD"

THE MESSAGE OR LIST IS TYPED BY THE ORIGINATOR
or can be "dragged and dropped" from an existing text file or email.

THIS FILE MAY BE SAVED FOR FUTURE TRANSMISSION BY PACKET, WINLINK OR THE MANY MODES OF FLDIGI

THIS FILE MAY BE SAVED FOR FORWARDING BY STANDARD EMAIL

This message and preformatted-form will require 39 seconds of radio transmission time.

"REAL WORLD"

8. **Approved by:** Name : RPience, N1XP   Signature : _____   Position/Title : ECT Member

9. **Reply** :

10. **Replied by:** Name :   Position/Title :   Signature: _____
ICS-213   Date/Time :

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GENERAL MESSAGE (ICS-213)

1. **Incident Name** (optional): Red Cross Shelter Drill		
2. **To** (Name and Position): Joe Chappell	Dir CCEMA	
3. **From** (Name and Position): Karen	Red Cross	
4. **Subject** : Drill	5. **Date** :	6. **Time**

7. **Message** :

This is a drill
Exercise document 2018 Shelter Exercise CCART Veterinarian Requested Medication
Supply list

acepromazine
aminophyline
apomorphine
atenolol
carprofen
cefpodoxime
ceftiofur
clavamox
deracoxib
dexamethasone
dichlorophene
diphenhydramine
doxycycline
enrofloxacin
gabapentin
glycopyrrolate
evetiracetam
maropitant
metacham
metoclopramide
morphine
moxifloxacin
neomychin
pentobarbital
theophylline
tramodol
xylazine
yohimbine
This is a drill

8. **Approved by:** Name :   Signature : _____   Position/Title :

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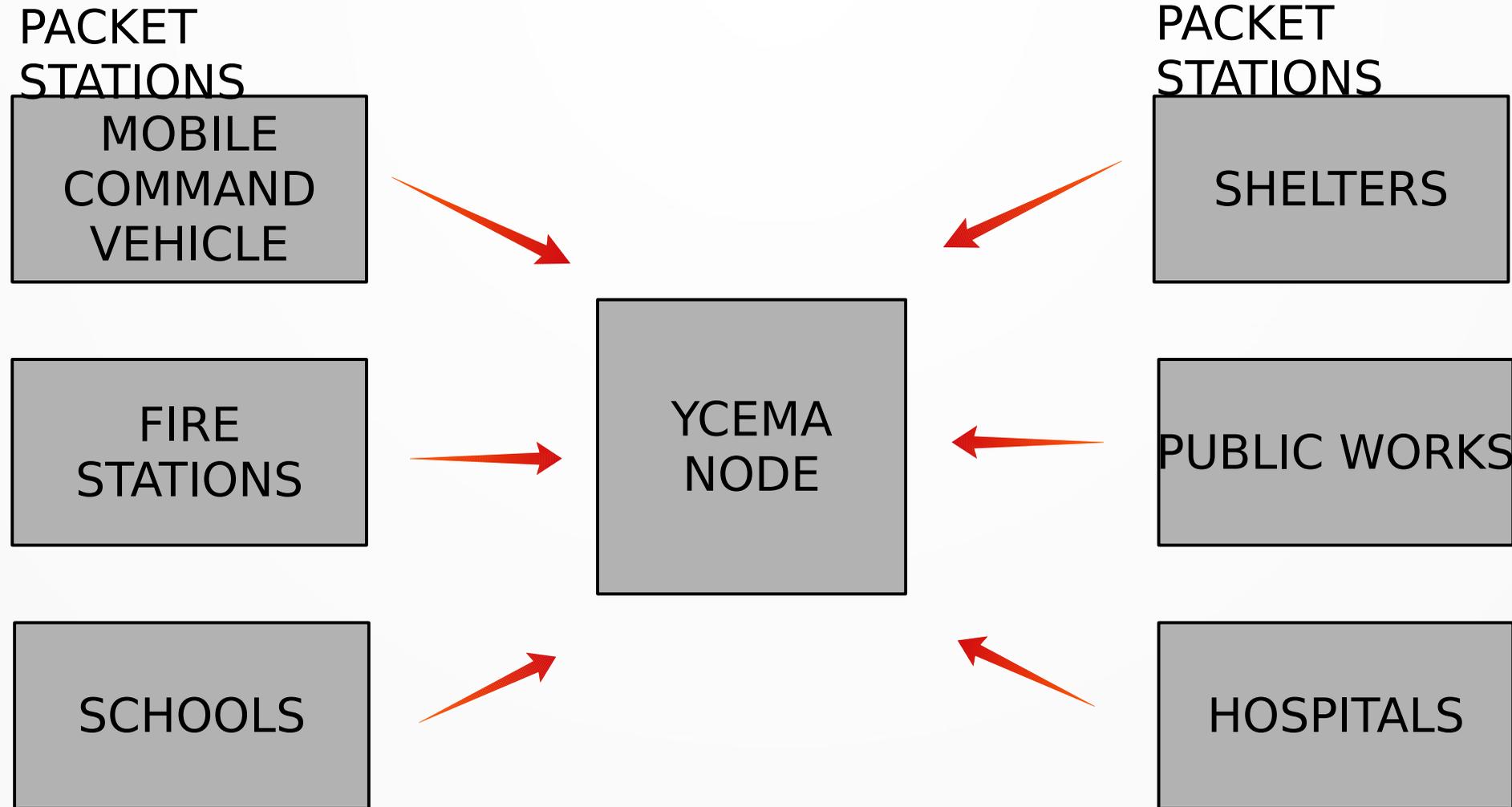
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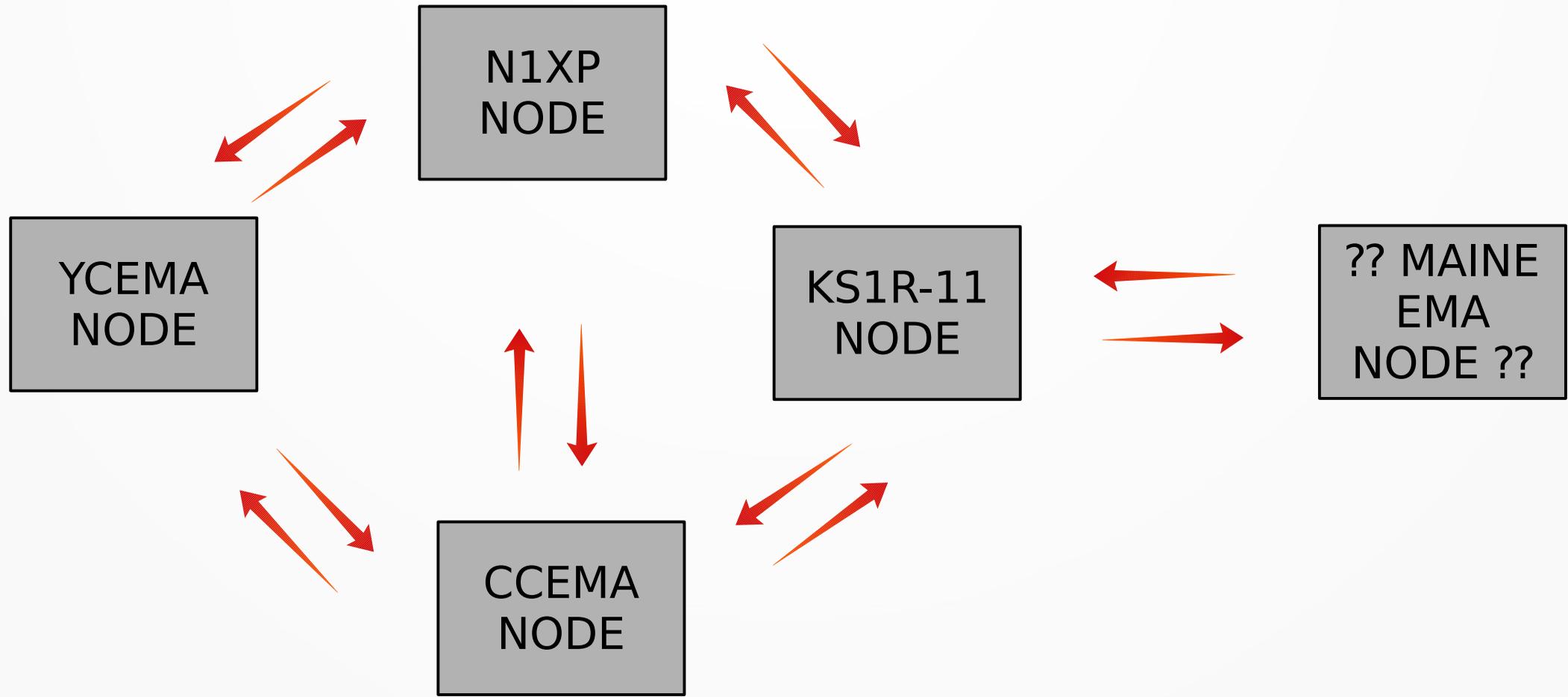
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- SIMPLE PACKET NODE
  - RADIO
  - TNC (Red Board)
  - COMPUTER – Raspberry Pi
- LOW COST
- LOW POWER REQUIRED

2017/01/24

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Ham Radio Emergency Communications (Emcomm)

- ## BPQ Packet NODE
  - Complex Software, Suite of Programs
  - Open Source Software
  - Free to HAMS
  - Over 1,000 NODES
  - Written by John Wiseman
  - Maintained by a Global Team
  - Regularly Updated
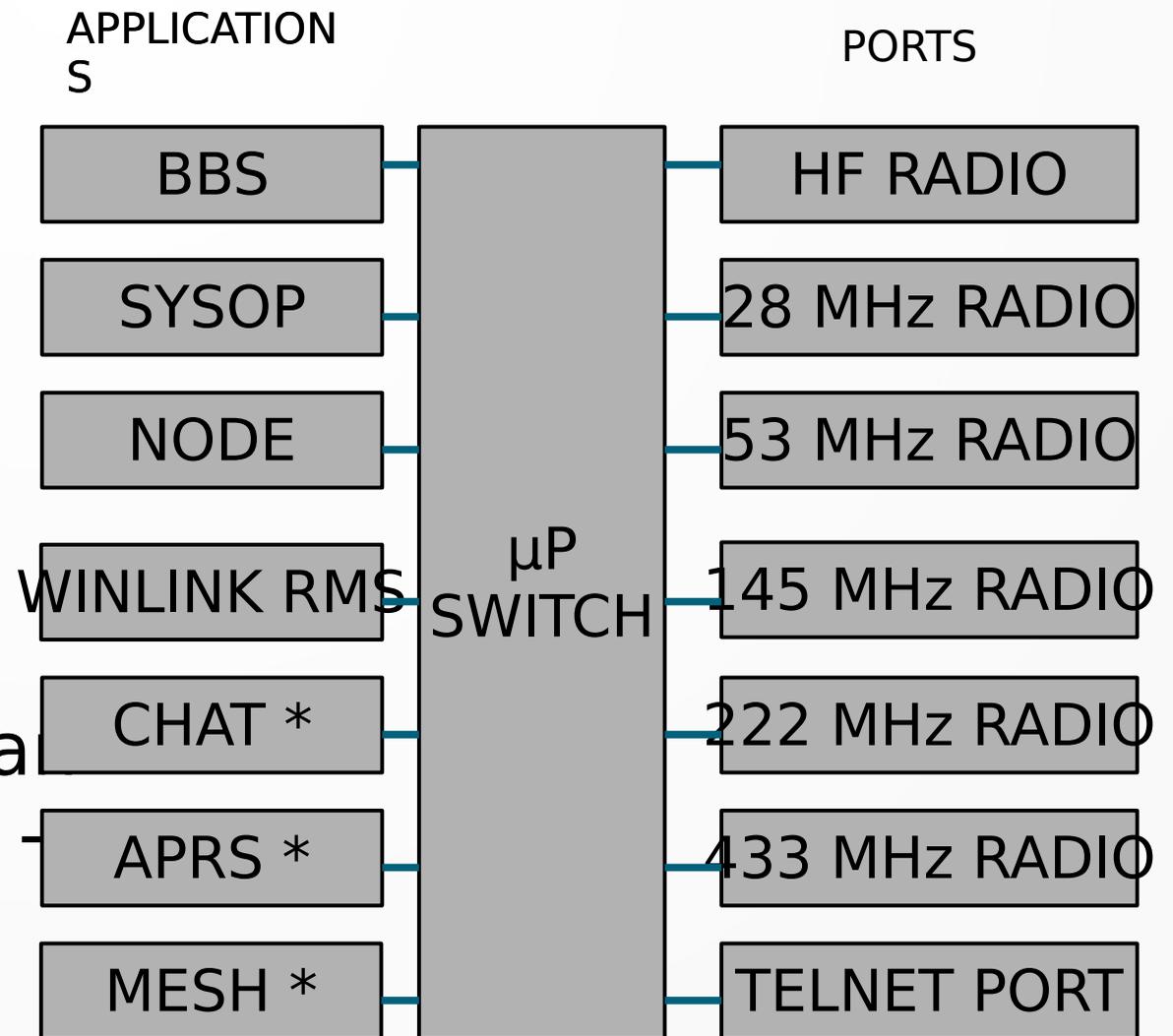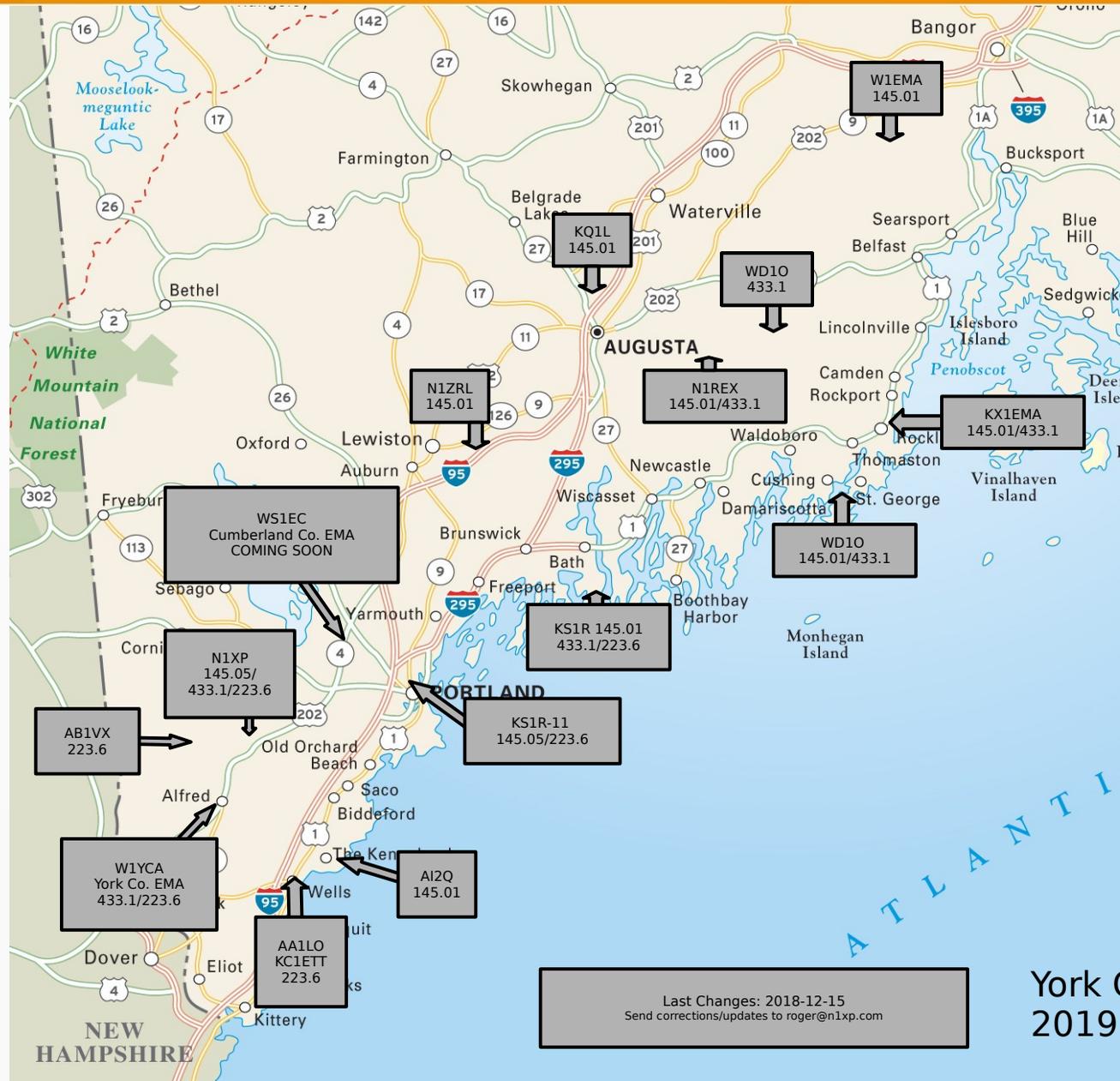
APPLICATIONS

PORTS

BBS		HF RADIO
SYSOP		28 MHz RADIO
NODE	μP	53 MHz RADIO
WINLINK RMS	SWITCH	145 MHz RADIO
CHAT *		222 MHz RADIO
APRS *		433 MHz RADIO
MESH *		TELNET PORT

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ULTIMATE HAM RADIO PACKET STATION

http://www.ariss.org/contact-the-iss.html

VHF Packet Uplink and Downlink: 145.825 (Worldwide)

UHF Packet Uplink and Downlink: 437.550

Astronaut Reid Wiseman, KF5LKT

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- LINKS
  - http://www.ddrov.com/packet/images/MainePacketMap.pdf
  - http://n1xp.com/HAM/content/pkt/MEPktMap.pdf
  - https://www.febo.com/packet/index.html   (John Ackermann, N8UR)
  - http://www.cantab.net/users/john.wiseman/Documents/index.html   (John Wiseman, G8BPQ)
  - https://nts-digital.net/mw/index.php/BPQ_Overview
  - https://packet-radio.net/bpq32/

- Who am I ?
  - Roger Pience, N1XP
  - First Ham License 1962
  - Professional Telecommunications Engineering Career
    - International Satellite Systems
    - Interstate Digital Microwave Systems
    - Mobile DATA Systems
    - Fiber Optics
    - WDC Telecommunications Lobbiest

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